GROUP 22C

TWIN CLUTCH-SPORTRONIC SHIFT TRANSMISSION (TC-SST)

CONTENTS

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GENERAL INFORMATION

M1225000100022

Item		Specification
Transaxle model		W6DGA
Transaxle type		6-speed forward, 1-speed reverse constant mesh
Clutch		Wet multiplate clutch x 2
Gear ratio	1st	3.655
	2nd	2.368
	3rd	1.754
	4th	1.322
	5th	1.008
	6th	0.775
	Reverse	4.011
Final gear ratio		4.062
Helical gear LSD (front differential)		Present
Transfer	Reduction ratio	3.307
	Differential gear unit	Hydraulic pressure multiplate clutch (ACD)

LUBRICANT

M1225000200018

Item		Brand	Capacity
Transmission oil dm ^{3} (qt)		Mitsubishi genuine Dia-Queen SSTF-I	7.1 (7.5) [Including 0.6 (0.63) in oil cooler]
Transfer oil dm ^{3} (qt)		Mitsubishi genuine Dia-Queen LSD Gear Oil	0.8 (0.9)
AWC fluid dm ^{3} (qt)		Mitsubishi genuine Dia-Queen ATF SPIII	1.0 (1.1)
Front propeller shaft	Sleeve yoke section	Mitsubishi genuine Dia-Queen Super Hypoid Gear Oil SAE 90 (GL-5)	Adequate amount
Transfer	O-ring	Mitsubishi genuine Dia-Queen ATF SPIII	
	Spline section of input shaft (outer edge)		
Transaxle assembly	O-ring	Molykote BR2-Plus	
	Spline sections of input shaft and flywheel		

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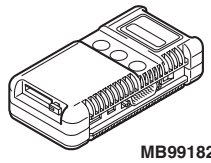
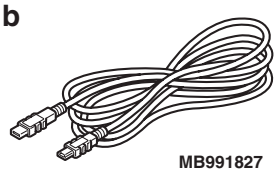
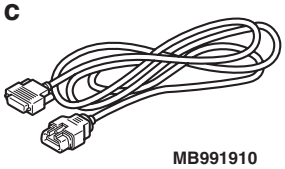
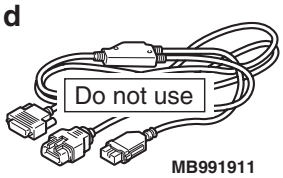
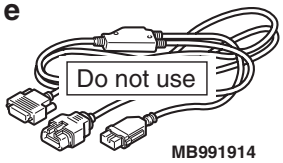
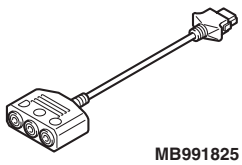
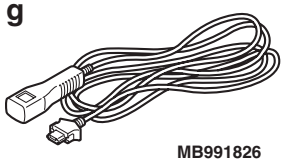
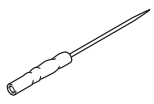
SPECIAL TOOLS

M1225000300015

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

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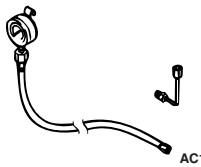
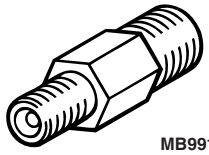
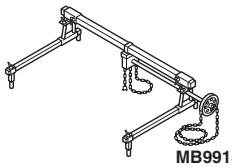
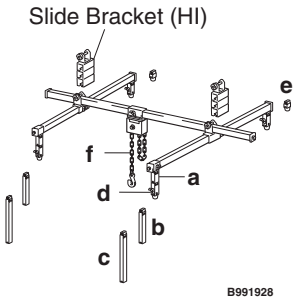
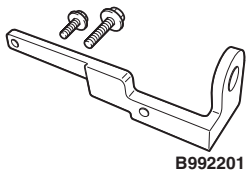
Tool	Tool number and name	Supersession	Application
 AC103525	MD998330 (Includes MD998331) Oil pressure gauge (3.0 MPa, 427 psi)	MD998330-01	Measurement of hydraulic pressure
 MB991705	MB991705	Adapter	
 MB991895	MB991895 Engine hanger	Tool not available	When the engine hanger is used: Supporting the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

DIAGNOSIS <TC-SST>

INTRODUCTION

The TC-SST system can exhibit any of the following symptoms: noise or vibration is generated or fluid leaks.

TROUBLESHOOTING STRATEGY

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

1. Gather as much information as possible about the complaint from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any TC-SST Diagnostic Trouble Codes (DTCs).
4. If you cannot verify the condition and there are no DTCs, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.

PRECAUTIONS FOR DIAGNOSIS

With the TC-SST assembly, the IG shutoff delay system is adopted to improve the engine starting performance.

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The causes of these symptoms could come from: incorrect mounting, the fluid level may be low, or a component of the TC-SST may be faulty.

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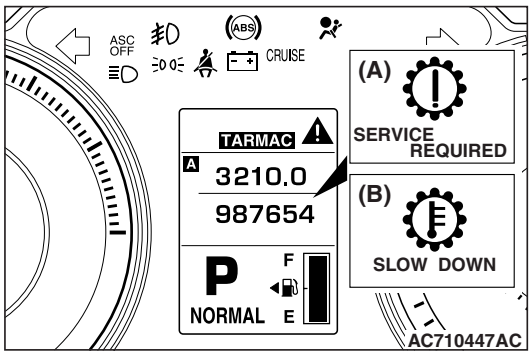
5. If you can verify the condition but there are no DTCs, or the system cannot communicate with scan tool, refer to the Symptom Chart P.22C-15.
6. If there is a DTC, record the number of the code, then erase the code from memory using scan tool.
7. Reconfirm the symptom.
8. If a DTC is set again, go to the Inspection Chart for Diagnostic Trouble Codes.
9. If a DTC is not set again, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.
10. Verify malfunction is eliminated. After repairs are completed, the complaint conditions to confirm the malfunction has been eliminated.

When the ignition switch is turned OFF, the IG shutoff delay system release the gear engagement in preparation for the next engine starting. This is a system to delay the engine stop for approximately 1 second, and the delay is not a malfunction.

DIAGNOSIS FUNCTION



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WARNING INDICATOR

When a malfunction occurs in the TC-SST system, the figure (A) remains displayed on the information screen of multi information display.
If the figure (A) remains displayed on the information screen of multi information display, check whether or not a diagnostic trouble code is set.

NOTE: When the figure (B) is displayed on the information screen of multi information display, the transmission oil temperature is high.

FAIL-SAFE FUNCTION

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

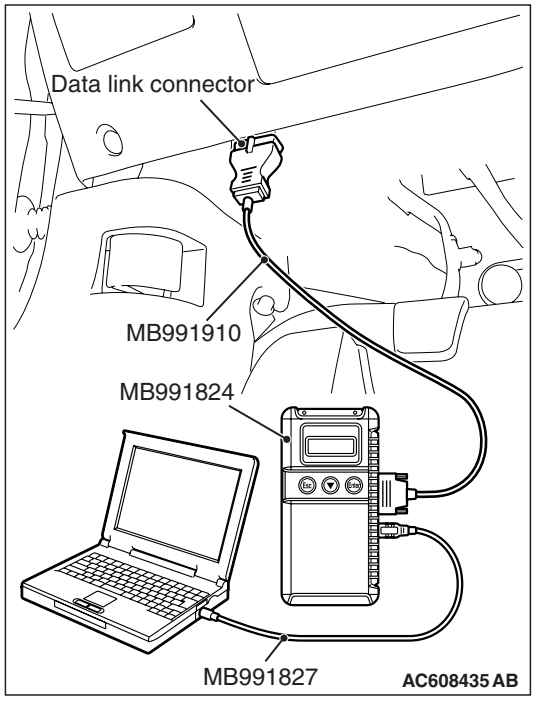
FAIL-SAFE REFERENCE TABLE

DTC No.			Control content
P0702 P1803 P1804 P1805	P1806 P1807 P1857 P1858	P185D P1866 P1868 P1872	Clutch open prohibits the vehicle from driving, and displays an occurrence of trouble to the multi information display to warn the driver.
P0776 P0777 P0964 P0965 P0966	P0968 P0970 P0971 P1852 P2733	P2736 P2738 P2739	Continues driving with the current gear fixed, and an occurrence of trouble is displayed to the multi information display to warn the driver.
P0715 P0716 P0753 P0758 P0841 P0842 P0843 P0846 P0847 P0848 P0973 P0974 P0976 P181B P181C P181E P181F P1820	P1821 P1822 P1824 P1825 P1826 P1827 P1829 P182A P182B P182C P182E P1831 P1832 P1833 P1835 P1836 P183D P1844	P184B P1855 P1859 P185B P2718 P2719 P2720 P2721 P2728 P2729 P2730 P2766 P2809 P2812 P2814 P2815	Drives with the odd number gear axle (1st, 3rd, 5th gear) or with the even gear axle (2nd, 4th, 6th gear), and an occurrence of trouble is displayed to the multi information display to warn the driver.
P1862 P1863 P186A P186B	P1876 P1877 P1878 P1879	P187A P187B P187C	Drives with the gears other than the gears related to the part in trouble, and an occurrence of trouble is displayed to the multi information display to warn the driver.
P1871	U0001	U0100	The creep driving cannot be performed, and displays an occurrence of trouble to the multi information display to warn the driver.
P0746 P0963	P1870	P1871	Shift shock or shift response deterioration occurs, and displays an occurrence of trouble to the multi information display to warn the driver.
P0630 P0701 P0711 P0712 P0713 P0960 P0961	P0962 P0967 P1637 P1676 P180C P1864 P1867	P186C P186D P186E P186F P1873 P1874 P1875	Normal driving can be performed, and displays an occurrence of trouble to the multi information display to warn the driver.

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

Required Special Tools:

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



⚠ CAUTION

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

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

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

FREEZE FRAME DATA CHECK

Various data of when the diagnostic trouble code is determined is obtained, and the status of that time is stored. By analyzing each data using the scan tool, troubleshooting can be performed efficiently.

Display items of the freeze frame data are as follows.

FREEZE FRAME DATA REFERENCE TABLE

Item No.	Item	Display contents
1	Odometer	mile
2	Ignition cycle	Count
4	Current trouble accumulative time	min
5	System power supply	V
7	Clutch pressure (Odd number gears)	mbar
8	Clutch pressure (Even number gears)	mbar

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Item No.	Item	Display contents
9	Clutch status (Odd number gears)	• Inactive • Closed (During the torque control) • Hydraulic pressure charging • Pre-stroke • During hydraulic pressure relief • Clutch not engaged • Open • Clutch in engagement • Clutch in disengagement
10	Clutch status (Even number gears)	• Inactive • Closed (During the torque control) • Hydraulic pressure charging • Pre-stroke • During hydraulic pressure relief • Clutch not engaged • Open • Clutch in engagement • Clutch in disengagement
11	Shift fork position sensor 1	mm
12	Shift fork position sensor 2	mm
13	Shift fork position sensor 3	mm
14	Shift fork position sensor 4	mm
15	Input shaft speed sensor 1	r/min
16	Input shaft speed sensor 2	r/min
21	Fluid temperature	°F
22	Current gear	• N • 1st • 2nd • 3rd • 4th • 5th • 6th • R • N (Odd number) • N (Even number) • Undefined gear

Item No.	Item	Display contents
23	Target gear	• N • 1st • 2nd • 3rd • 4th • 5th • 6th • R • N (Odd number) • N (Even number) • Undefined gear
24	SST control mode	• CITY • SPORT • SUPER-SPORT
25	Gear change mode	• AUTO • Manual
26	Torque limit request (Fuel cut)	• ON • OFF
27	Torque limit request (Throttle open)	• ON • OFF
28	Torque limit request (Retard)	• ON • OFF
29	Requested engine speed	r/min
30	MU (internal malfunction code) No. 1	BCD
31	MU (internal malfunction code) No. 2	BCD
32	MU (internal malfunction code) No. 3	BCD
33	MU (internal malfunction code) No. 4	BCD
34	MU (internal malfunction code) No. 5	BCD
35	MU (internal malfunction code) No. 6	BCD
36	MU (internal malfunction code) No. 7	BCD
37	MU (internal malfunction code) No. 8	BCD

NOTE: BDC: Binary Coded Decimal

DIAGNOSTIC TROUBLE CODE CHART

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⚠ CAUTION

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

DTC No.	Diagnostic item	Reference page
P0630	VIN not recorded	P.22C-15
P0701	EEPROM system (Malfunction)	P.22C-16
P0702	Internal control module, monitoring processor system (Malfunction)	P.22C-16
P0711	TC-SST-ECU temperature sensor system (Gradient error)	P.22C-18
P0712	TC-SST-ECU temperature sensor system (Output low range out)	P.22C-20

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DTC No.	Diagnostic item	Reference page
P0713	TC-SST-ECU temperature sensor system (Output high range out)	P.22C-22
P0715	Input shaft 1 (odd number gear axle) speed sensor system (Output high range out)	P.22C-24
P0716	Input shaft 1 (odd number gear axle) speed sensor system (Poor performance)	P.22C-26
P0717	Input shaft 1 (odd number gear axle) speed sensor system (Output low range out)	P.22C-30
P0725	Engine speed signal abnormality	P.22C-32
P0746	Line pressure solenoid system (Drive current range out)	P.22C-33
P0753	Shift select solenoid 1 system (Open circuit)	P.22C-35
P0758	Shift select solenoid 2 system (Open circuit)	P.22C-36
P0776	Clutch cooling flow solenoid system (Drive current range out)	P.22C-38
P0777	Clutch cooling flow solenoid system (Stuck)	P.22C-39
P0841	Clutch 1 pressure sensor system (Poor performance)	P.22C-41
P0842	Clutch 1 pressure sensor system (Output low range out)	P.22C-43
P0843	Clutch 1 pressure sensor system (Output high range out)	P.22C-45
P0846	Clutch 2 pressure sensor system (Poor performance)	P.22C-47
P0847	Clutch 2 pressure sensor system (Output low range out)	P.22C-49
P0848	Clutch 2 pressure sensor system (Output high range out)	P.22C-51
P0960	Line pressure solenoid system (Open circuit)	P.22C-53
P0961	Line pressure solenoid system (Overcurrent)	P.22C-54
P0962	Line pressure solenoid system (Short to ground)	P.22C-56
P0963	Line pressure solenoid system (Short to power supply)	P.22C-58
P0964	Clutch cooling flow solenoid system (Open circuit)	P.22C-59
P0965	Clutch cooling flow solenoid system (Overcurrent)	P.22C-61
P0966	Clutch cooling flow solenoid system (Short to ground)	P.22C-63
P0967	Clutch cooling flow solenoid system (Short to power supply)	P.22C-65
P0968	Shift/cooling switching solenoid system (Open circuit)	P.22C-66
P0970	Shift/cooling switching solenoid system (Short to ground)	P.22C-68
P0971	Shift/cooling switching solenoid system (Short to power supply)	P.22C-69
P0973	Shift select solenoid 1 system (Short to ground)	P.22C-71
P0974	Shift select solenoid 1 system (Short to power supply)	P.22C-72
P0976	Shift select solenoid 2 system (Short to ground)	P.22C-74
P0977	Shift select solenoid 2 system (Short to power supply)	P.22C-75
P1637	EEPROM system (DTC storing malfunction)	P.22C-77
P1676	Coding incomplete	P.22C-78
P1802	Shift lever system (LIN communication malfunction)	P.22C-80

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DTC No.	Diagnostic item	Reference page
P1803	Shift lever system (CAN or LIN time-out error)	P.22C-82
P1804	Shift fork position sensor 1 and 2 system (Power supply voltage low range out)	P.22C-84
P1805	Shift fork position sensor 1 and 2 system (Power supply voltage high range out)	P.22C-86
P1806	Shift fork position sensor 3 and 4 system (Power supply voltage low range out)	P.22C-88
P1807	Shift fork position sensor 3 and 4 system (Power supply voltage high range out)	P.22C-90
P1808	TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)	P.22C-92
P180C	Clutch pressure cut spool sticking	P.22C-93
P181B	Clutch 1 (Pressure low range out)	P.22C-94
P181C	Clutch 1 (Pressure high range out)	P.22C-95
P181E	Clutch 2 (Pressure low range out)	P.22C-99
P181F	Clutch 2 (Pressure high range out)	P.22C-101
P1820	Shift fork position sensor 1 system (Voltage low range out)	P.22C-105
P1821	Shift fork position sensor 1 system (Voltage high range out)	P.22C-107
P1822	Shift fork position sensor 1 system (Output range out)	P.22C-109
P1823	Shift fork position sensor 1 system (Neutral)	P.22C-111
P1824	Shift fork position sensor 1 system (Poor performance)	P.22C-113
P1825	Shift fork position sensor 2 system (Voltage low range out)	P.22C-116
P1826	Shift fork position sensor 2 system (Voltage high range out)	P.22C-118
P1827	Shift fork position sensor 2 system (Output range out)	P.22C-120
P1828	Shift fork position sensor 2 system (Neutral)	P.22C-122
P1829	Shift fork position sensor 2 system (Poor performance)	P.22C-124
P182A	Shift fork position sensor 3 system (Voltage low range out)	P.22C-127
P182B	Shift fork position sensor 3 system (Voltage high range out)	P.22C-129
P182C	Shift fork position sensor 3 system (Output range out)	P.22C-131
P182D	Shift fork position sensor 3 system (Neutral)	P.22C-133
P182E	Shift fork position sensor 3 system (Poor performance)	P.22C-135
P1831	Shift fork position sensor 4 system (Voltage low range out)	P.22C-137
P1832	Shift fork position sensor 4 system (Voltage high range out)	P.22C-139
P1833	Shift fork position sensor 4 system (Output range out)	P.22C-141
P1834	Shift fork position sensor 4 system (Neutral)	P.22C-143
P1835	Shift fork position sensor 4 system (Poor performance)	P.22C-145
P1836	Shift fork 1 malfunction	P.22C-148
P183D	Shift fork 2 malfunction	P.22C-156

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DTC No.	Diagnostic item	Reference page
P1844	Shift fork 3 malfunction	P.22C-164
P184B	Shift fork 4 malfunction	P.22C-171
P1852	Shift fork 1 or 2 opposite direction movement	P.22C-179
P1855	Shift fork 3 or 4 opposite direction movement	P.22C-182
P1857	Odd number gear axle interlock	P.22C-185
P1858	Even number gear axle interlock	P.22C-187
P1859	Disengagement too late with clutch 1	P.22C-189
P185A	Engagement too late with clutch 1	P.22C-190
P185B	Disengagement too late with clutch 2	P.22C-191
P185C	Engagement too late with clutch 2	P.22C-193
P185D	Clutch open not possible	P.22C-193
P1862	High side 1 system (Overcurrent)	P.22C-195
P1863	High side 1 system (Open circuit)	P.22C-197
P1864	High side 1 system (Short to power supply)	P.22C-199
P1866	High side 2 system (Overcurrent)	P.22C-201
P1867	High side 2 system (Open circuit)	P.22C-203
P1868	High side 2 system (Short to power supply)	P.22C-205
P186A	High side 3 system (Overcurrent)	P.22C-207
P186B	High side 3 system (Open circuit)	P.22C-209
P186C	High side 3 system (Short to power supply)	P.22C-211
P186D	High side 1 system (Voltage low range out)	P.22C-213
P186E	High side 2 system (Voltage low range out)	P.22C-215
P186F	High side 3 system (Voltage low range out)	P.22C-217
P1870	Engine torque signal abnormality	P.22C-219
P1871	APS system (Signal abnormality)	P.22C-221
P1872	Between shift lever and TC-SST system (Q-A function abnormality)	P.22C-223
P1873	Clutch 1 system (Pressure abnormality)	P.22C-225
P1874	Clutch 2 system (Pressure abnormality)	P.22C-225
P1875	Damper speed sensor system (Poor performance)	P.22C-226
P1876	Gear block 1st	P.22C-229
P1877	Gear block 2nd	P.22C-230
P1878	Gear block 3rd	P.22C-232
P1879	Gear block 4th	P.22C-233
P187A	Gear block 5th	P.22C-235
P187B	Gear block 6th	P.22C-236
P187C	Gear block reverse	P.22C-238

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DTC No.	Diagnostic item	Reference page
P1880	EOL Mode Active	P.22C-239
P1881	Twin clutch SST control mode switch system (Malfunction)	P.22C-240
P2718	Clutch/shift pressure solenoid 1 system (Open circuit)	P.22C-241
P2719	Clutch/shift pressure solenoid 1 system (Overcurrent)	P.22C-243
P2720	Clutch/shift pressure solenoid 1 system (Short to ground)	P.22C-245
P2721	Clutch/shift pressure solenoid 1 system (Short to power supply)	P.22C-247
P2727	Clutch/shift pressure solenoid 2 system (Open circuit)	P.22C-249
P2728	Clutch/shift pressure solenoid 2 system (Overcurrent)	P.22C-251
P2729	Clutch/shift pressure solenoid 2 system (Short to ground)	P.22C-253
P2730	Clutch/shift pressure solenoid 2 system (Short to power supply)	P.22C-255
P2733	Clutch/shift switching solenoid 1, spool stuck	P.22C-257
P2736	Clutch/shift switching solenoid 1 system (Open circuit)	P.22C-259
P2738	Clutch/shift switching solenoid 1 system (Short to ground)	P.22C-261
P2739	Clutch/shift switching solenoid 1 system (Short to power supply)	P.22C-262
P2741	Fluid temperature sensor system (Gradient error)	P.22C-264
P2742	Fluid temperature sensor system (Output low range out)	P.22C-266
P2743	Fluid temperature sensor system (Output high range out)	P.22C-268
P2766	Input shaft 2 (even number gear axle) speed sensor system (Poor performance)	P.22C-270
P2809	Clutch/shift switching solenoid 2, spool stuck	P.22C-274
P2812	Clutch/shift switching solenoid 2 system (Open circuit)	P.22C-276
P2814	Clutch/shift switching solenoid 2 system (Short to ground)	P.22C-278
P2815	Clutch/shift switching solenoid 2 system (Short to power supply)	P.22C-280
U0001	Bus off	P.22C-282
U0100	Engine time-out error	P.22C-284
U0103	Shift lever time-out error	P.22C-286
U0121	ASC time-out error	P.22C-287
U0136	AWC time-out error	P.22C-287
U0141	ETACS time-out error	P.22C-288

SYMPTOM CHART

M1225005200035

⚠ CAUTION

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

Symptom	Inspection procedure No.	Reference page
The scan tool cannot communicate with TC-SST-ECU.	1	P.22C-289
The driving mode cannot be changed.	2	P.22C-290
Speed change with the paddle shift is impossible.	3	P.22C-292
TC-SST-ECU power supply circuit malfunction	4	P.22C-295

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC P0630: VIN not Recorded

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the chassis number is normal.

(TC-SST-ECU receives chassis number information from the engine control module via CAN, and write to TC-SST-ECU.)

DESCRIPTIONS OF MONITOR METHODS

The chassis number is determined to be written abnormally.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Scan tool diagnostic trouble code

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

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 3.

TSB Revision

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. P0630 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0701: EEPROM System (Malfunction)

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the EEPROM and RAM in the TC-SST-ECU is normal.

DESCRIPTIONS OF MONITOR METHODS

The EEPROM writing data is determined to be abnormal.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0701 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0702: Internal control module, monitoring processor system (Malfunction)

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the internal module and monitoring processor are normal.

DESCRIPTIONS OF MONITOR METHODS

The internal module and monitoring processor are determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

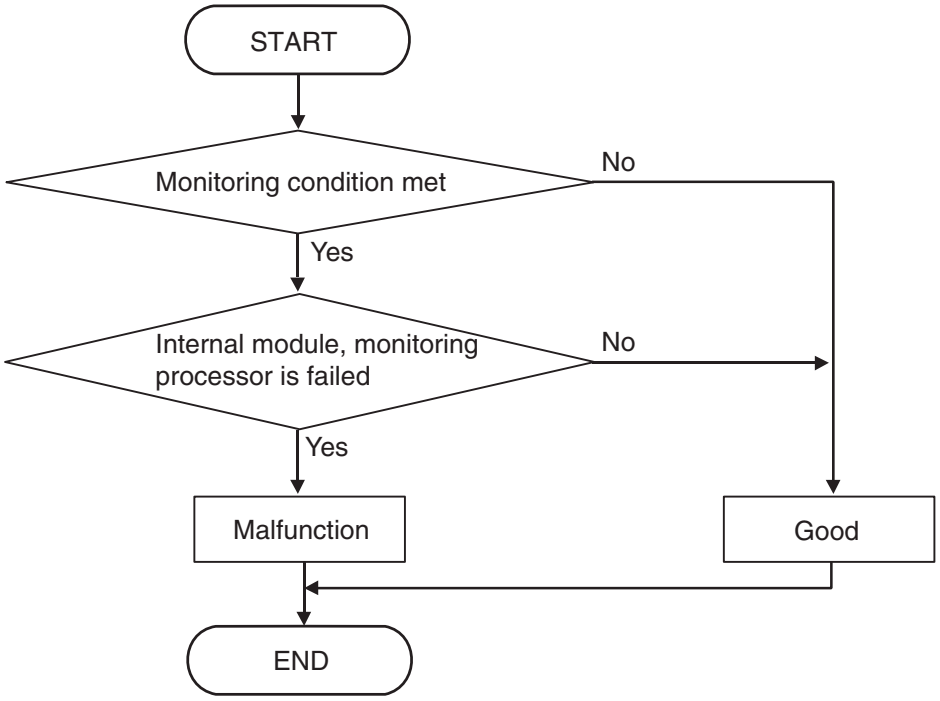
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Internal module, Monitoring processor: fault.

OBD-II DRIVE CYCLE PATTERN

The internal module and monitoring processor are normal.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0702 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0711: TC-SST-ECU temperature sensor system (Gradient 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the output gradient of the ECU temperature sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The ECU temperature change is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

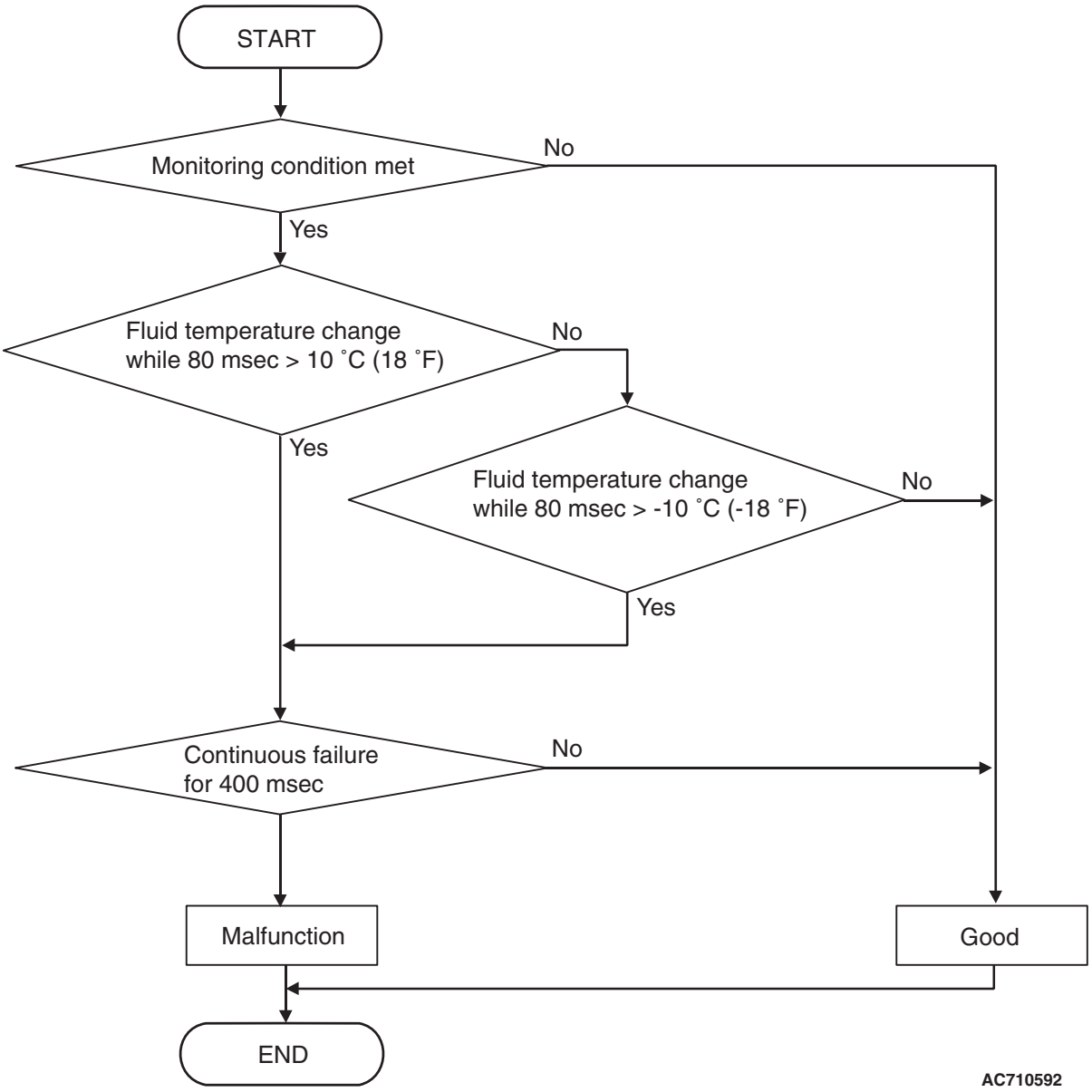
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0712: TC-SST-ECU temperature sensor system (Output low range out)
- P0713: TC-SST-ECU temperature sensor system (Output high range out)
- P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Fluid temperature change while 80 millisecond: 10° C (18° F) or more, or fluid temperature change while 80 millisecond: −10° C (−18° F) or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The absolute value of the temperature rise or drop at every 80 milliseconds remains 10° C (18° F) or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0711 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0712: TC-SST-ECU temperature sensor system (Output low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the ECU temperature sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the ECU temperature is determined to be too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

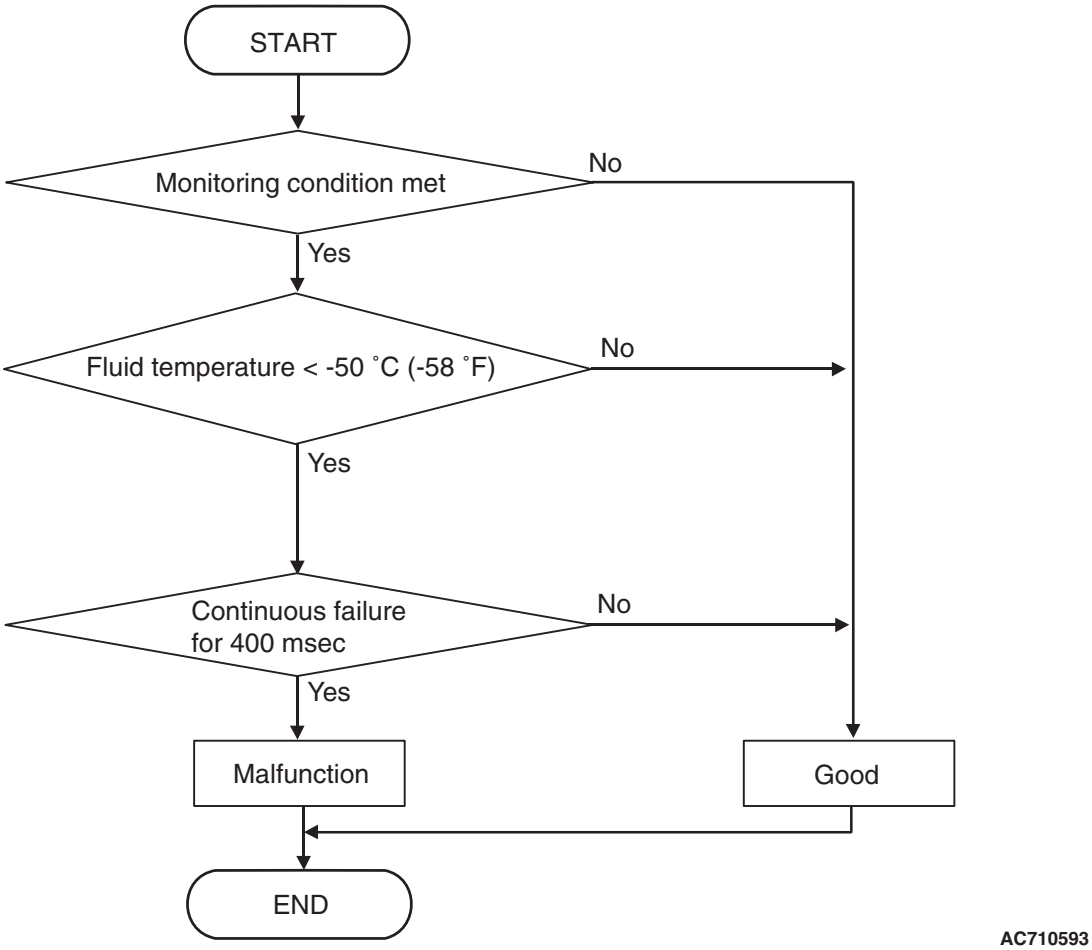
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0711: TC-SST-ECU temperature sensor system (Gradient error)
- P0713: TC-SST-ECU temperature sensor system (Output high range out)
- P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Fluid temperature: −50° C (−58° F) or less. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The TC-SST-ECU temperature remains −50° C (−58° F) or more for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0712 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0713: TC-SST-ECU temperature sensor system (Output high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the ECU temperature sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the ECU temperature is determined to be too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

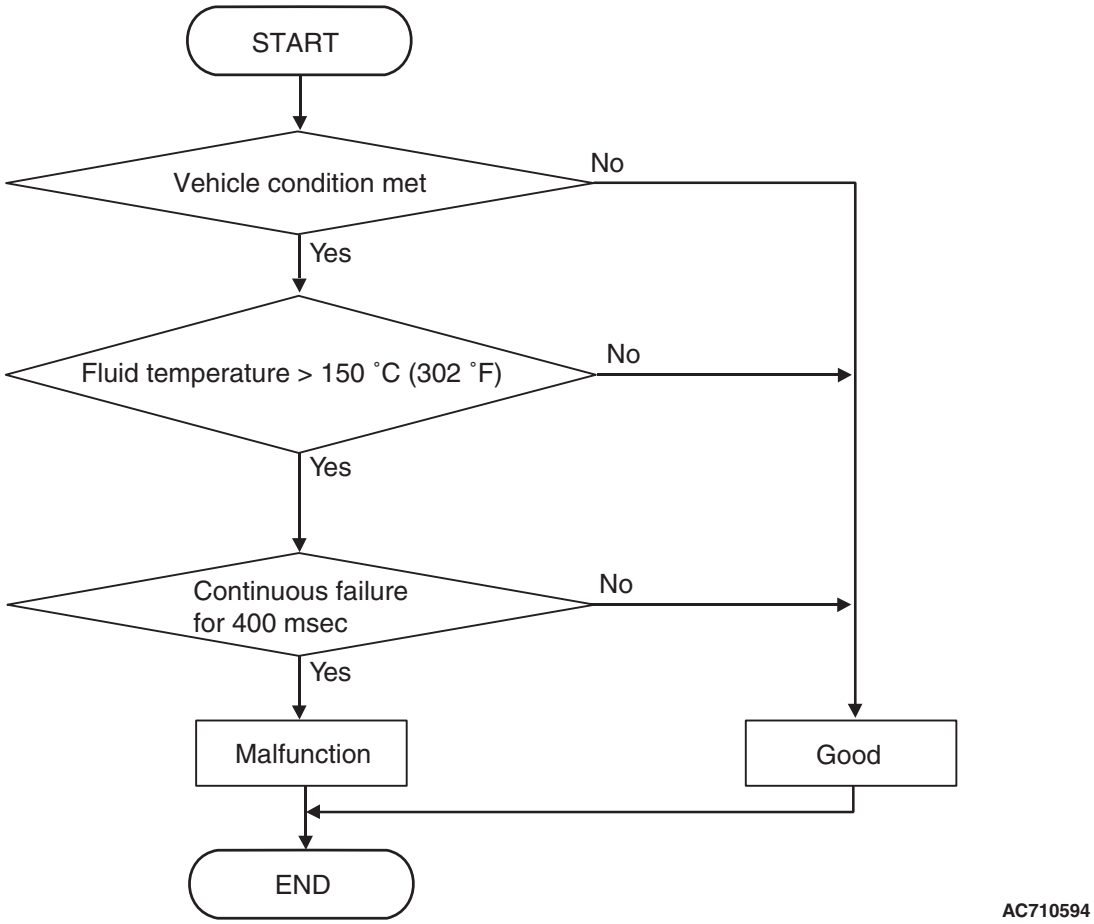
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0711: TC-SST-ECU temperature sensor system (Gradient error)
- P0712: TC-SST-ECU temperature sensor system (Output low range out)
- P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Fluid temperature: 150° C (302° F) or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The TC-SST-ECU temperature remains 150° C (302° F) or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0713 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0715: Input shaft 1 (odd number gear axle) speed sensor system (Output high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the input shaft 1 (odd number gear axle) speed sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the input shaft 1 (odd number gear axle) is determined to be too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

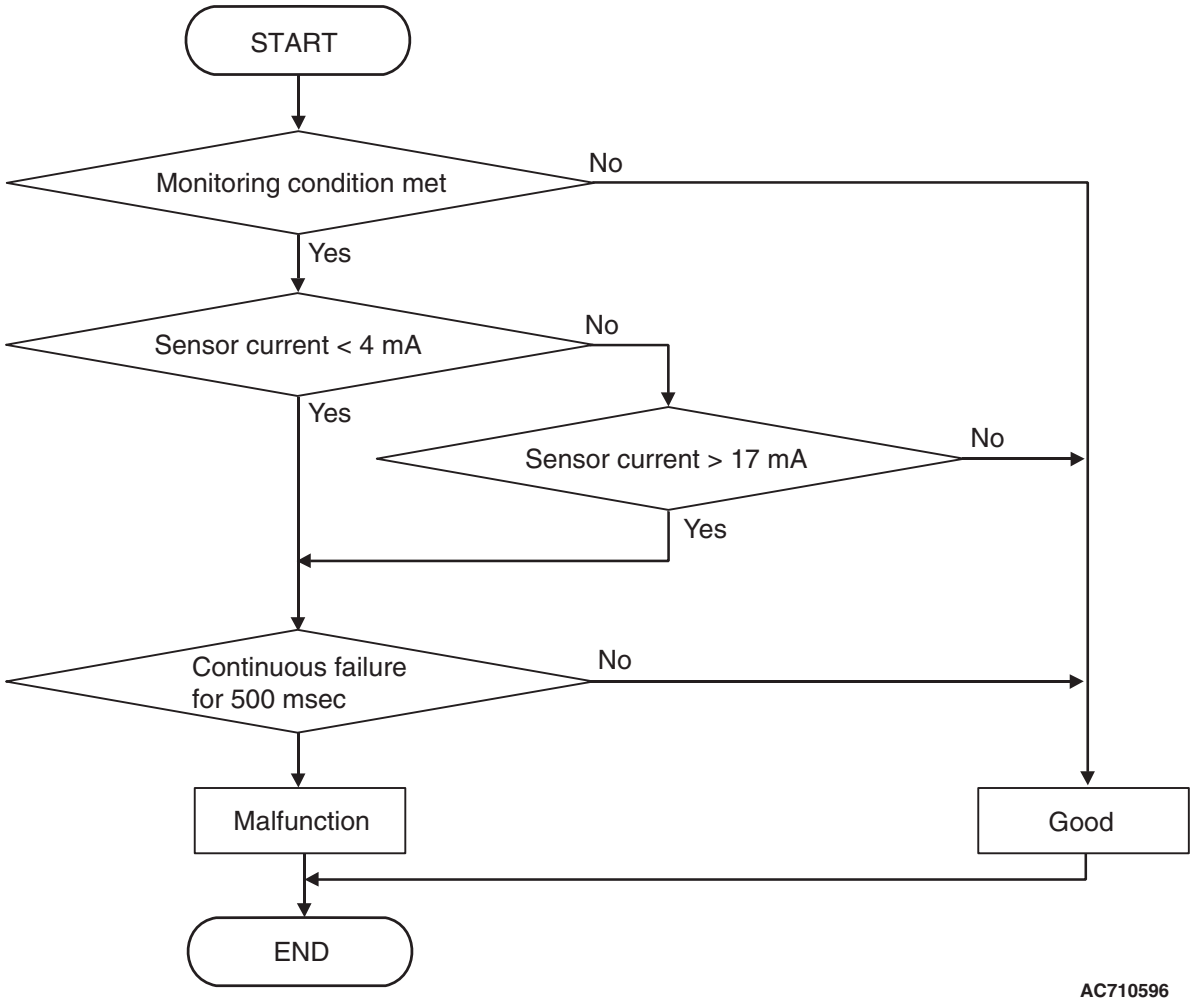
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0716: Input shaft 1 (odd number gear axle) speed sensor system (Poor performance)
- P0717: Input shaft 1 (odd number gear axle) speed sensor system (Output low range out)
- P2766: Input shaft 2 (even number gear axle) speed sensor system (Poor performance)

Sensor (The sensor below is determined to be normal)

- Input shaft 2 (even number gear axle) speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after engine start: 400 millisecond or more.

JUDGMENT CRITERIA

- Sensor current: 17 mA or more. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The sensor current remains 17 mA or less for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0715 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0716: Input shaft 1 (odd number gear axle) speed sensor system (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the input shaft 1 (odd number gear axle) speed sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The rotation speed of the input shaft 1 (odd number gear axle) is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

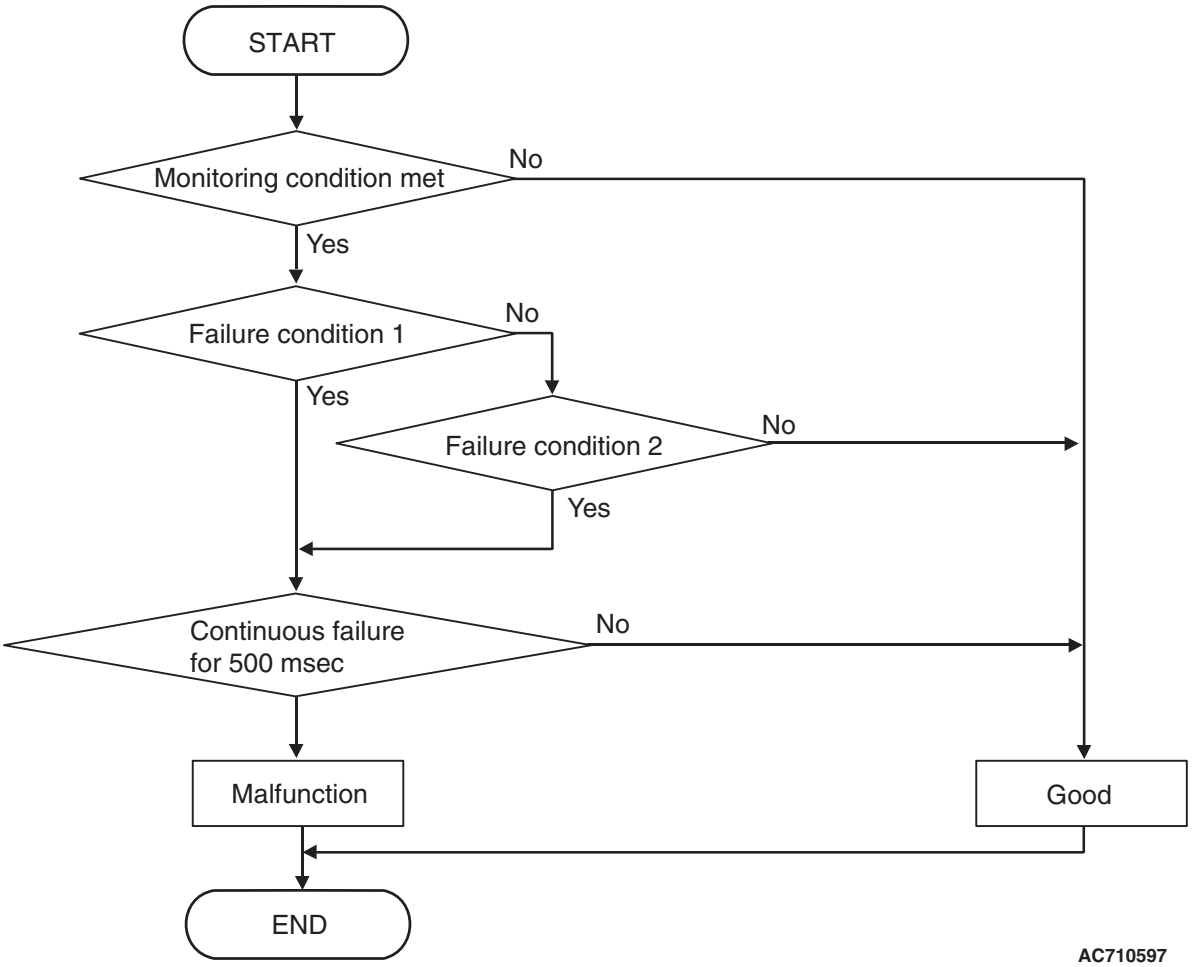
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0715: Input shaft 1 (odd number gear axle) speed sensor system (Output high range out)
- P0717: Input shaft 1 (odd number gear axle) speed sensor system (Output low range out)
- P2766: Input shaft 2 (even number gear axle) speed sensor system (Poor performance)

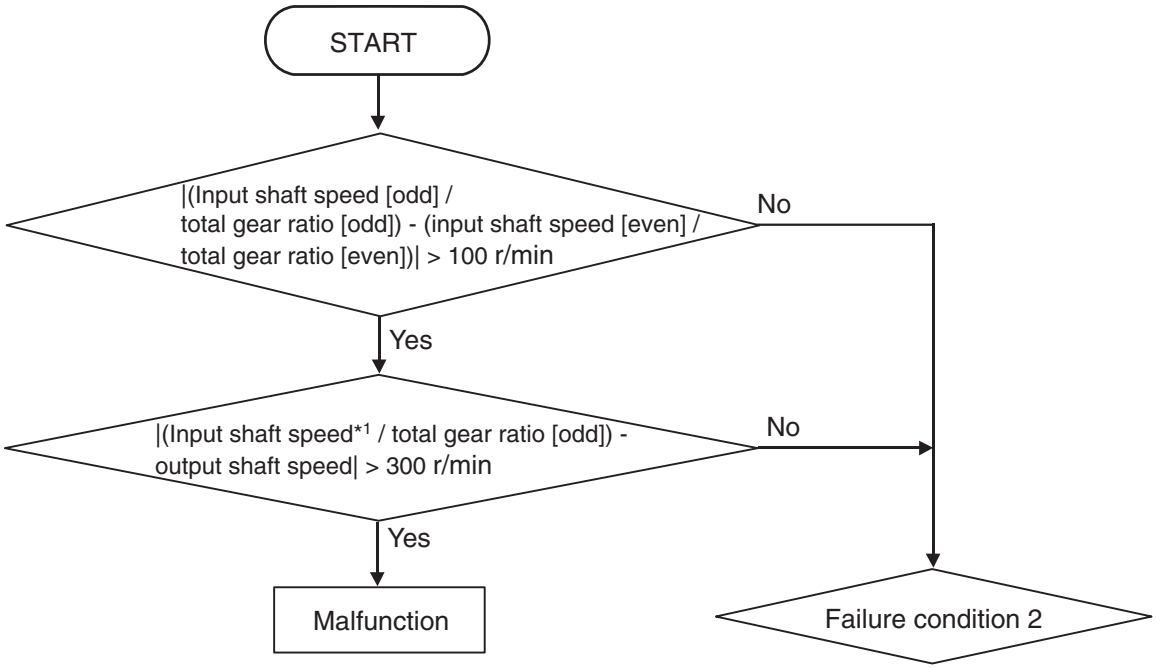
Sensor (The sensor below is determined to be normal)

- Input shaft 2 (even number gear axle) speed sensor

LOGIC FLOW CHARTS (Monitor Sequence) <Rationality>



LOGIC FLOW CHARTS (Monitor Sequence) <Rationality (Failure condition 1)>



*1 : In case of input speed sensor A monitor, this is speed of input shaft (odd).
In case of input speed sensor B monitor, this is speed of input shaft (even).

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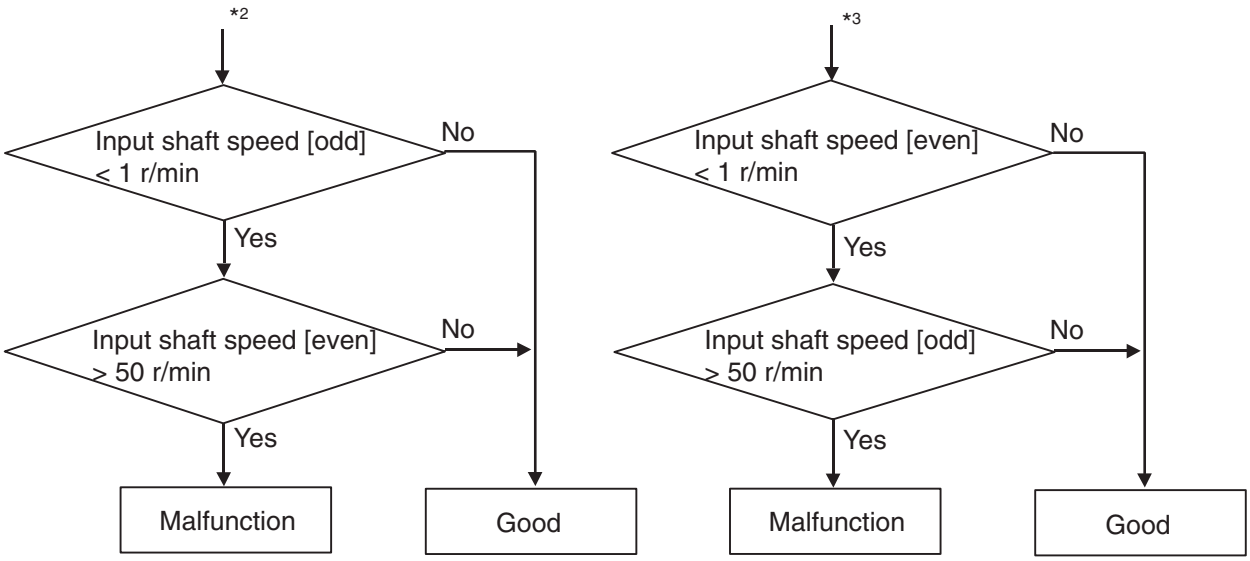
LOGIC FLOW CHARTS (Monitor Sequence) <Rationality (Failure condition 2)>



*2 :In case of input speed sensor A monitor

*3 :In case of input speed sensor B monitor

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DTC SET CONDITIONS

Check Conditions <Rationality>

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Input shaft [odd] gear: engaged.
- Input shaft [even] gear: engaged.

TSB Revision

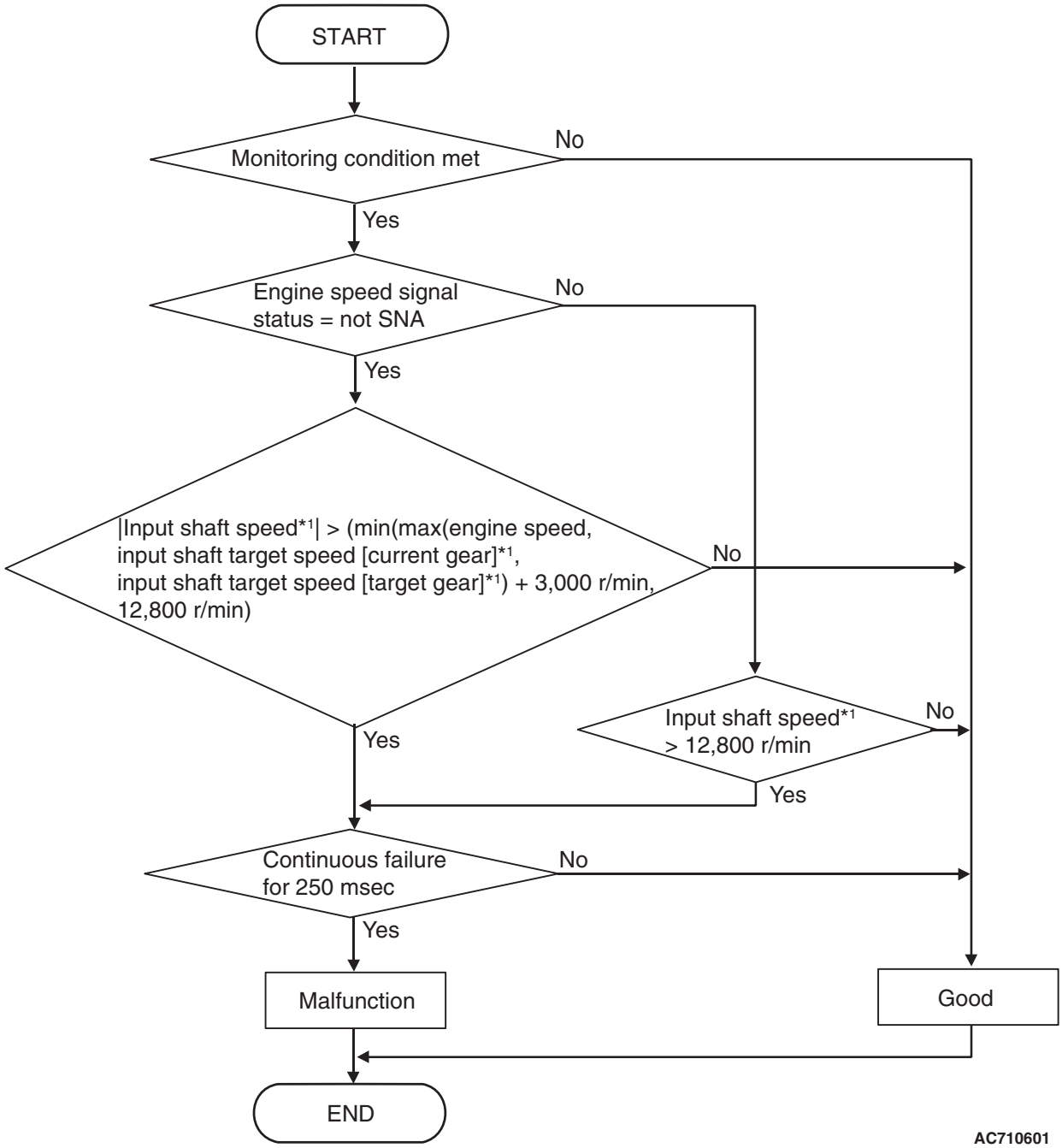
JUDGMENT CRITERIA <Rationality>

- Failure condition 1 or failure condition 2 (Refer to Logic Flow Charts (Monitor Sequence) <Rationality>). (500 millisecond)

OBD-II DRIVE CYCLE PATTERN <RATIONALITY>

Each value of failure condition 1 or failure condition 2 (Logic Flow Charts (Monitor Sequence) <Rationality>) returns to the normal value and remains in the state for 500 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Rationality - plausibility failure>



*1 :In case of input shaft 1 (odd) speed sensor monitor, this is speed of input shaft (odd).
In case of input shaft 2 (even) speed sensor monitor, this is speed of input shaft (even).

TSB Revision

Check Conditions <Rationality plausibility failure>
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA <Rationality plausibility failure>
- Input shaft 1 (odd) speed: Refer to Logic Flow Charts (Monitor Sequence) <Rationality plausibility failure>. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <RATIONALITY PLAUSIBILITY FAILURE>

The value of the Logic Flow Charts (Monitor Sequence) <Rationality plausibility failure> returns to the normal value and remains in the state for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0716 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0717: Input shaft 1 (odd number gear axle) speed sensor system (Output current low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the input shaft 1 (odd number gear axle) speed sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the input shaft 1 (odd number gear axle) speed sensor is determined to be too low.

MONITOR EXECUTION

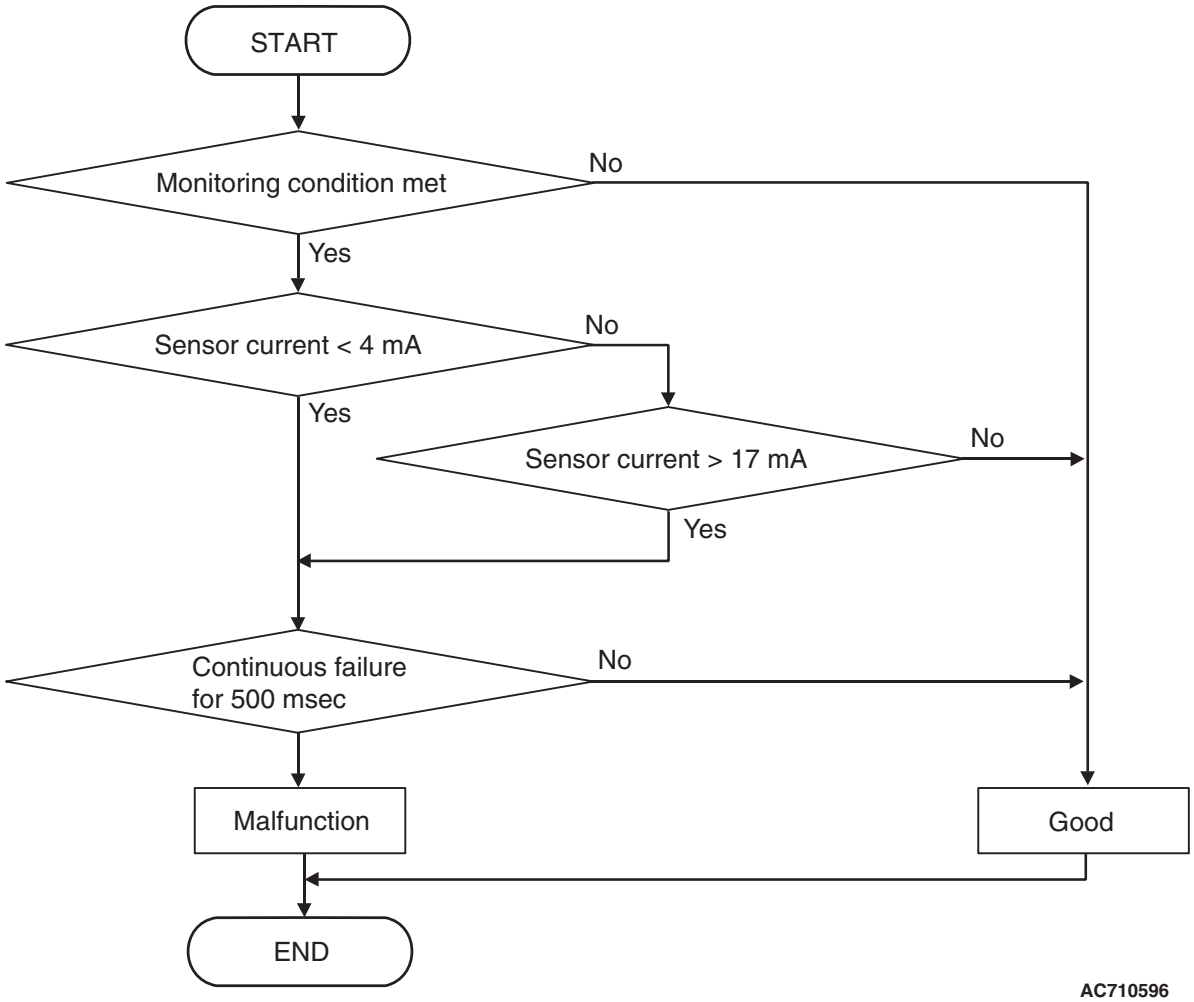
- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P0715: Input shaft 1 (odd number gear axle) speed sensor system (Output high range out)
- P0716: Input shaft 1 (odd number gear axle) speed sensor system (Poor performance)
- P2766: Input shaft 2 (even number gear axle) speed sensor system (Poor performance)

Sensor (The sensor below is determined to be normal)
- Input shaft 2 (even number gear axle) speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after engine start: 400 millisecond or more.

JUDGMENT CRITERIA

- Sensor current: 4 mA or less. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The sensor current remains 4 mA or more for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0717 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0725: Engine speed signal 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU receives the periodic communication data from the engine control module via the CAN bus lines, and checks the data for abnormality.

DESCRIPTIONS OF MONITOR METHODS

The engine speed signal from the engine control module is determined to be abnormal.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of crankshaft position sensor
- Malfunction of engine control module
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using the scan tool, diagnose the CAN bus lines.

Q: Is the check result normal?

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

STEP 2. Scan tool diagnostic trouble code

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. P0725 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0746: Line Pressure Solenoid System (Drive current range out)

⚠ 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 FUNCTION
TC-SST-ECU checks that the line pressure solenoid is normal.

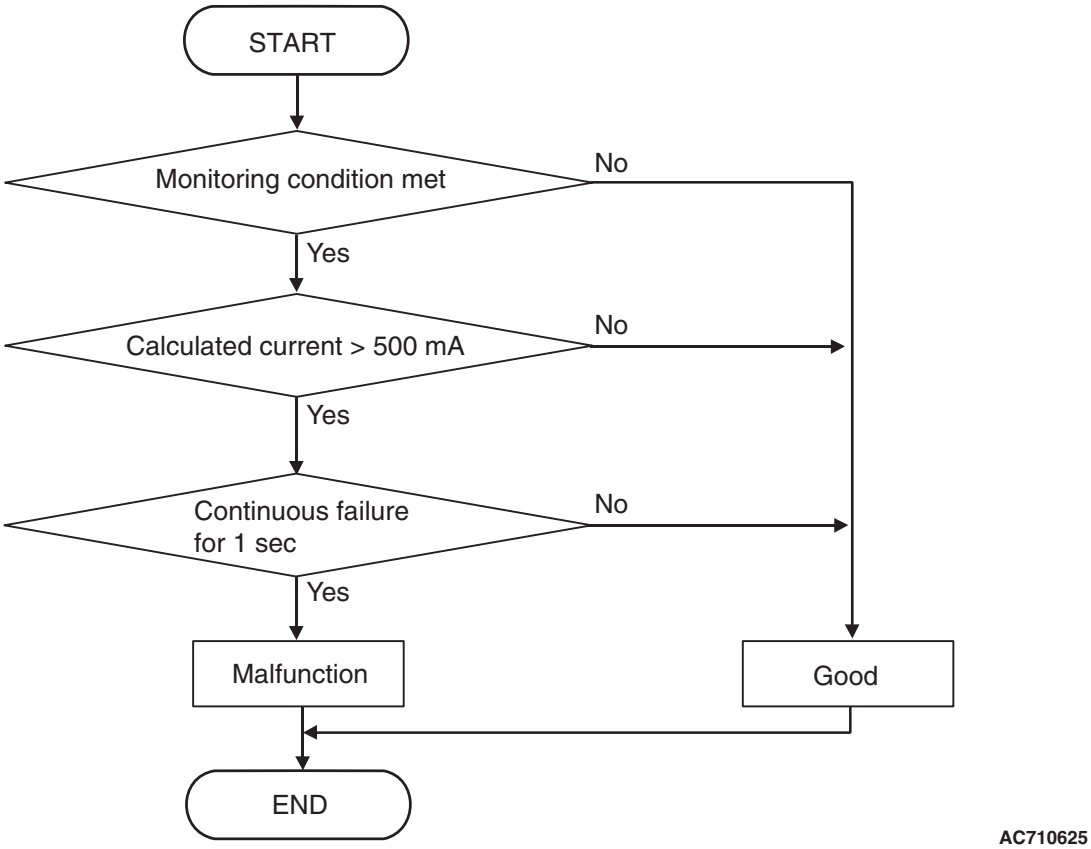
DESCRIPTIONS OF MONITOR METHODS
The difference between the actual current of the line pressure solenoid and target current is large.

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)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)

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

LOGIC FLOW CHARTS (Monitor Sequence) <Rationality - high>



AC710625

DTC SET CONDITIONS
Check Conditions <Rationality-high>
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

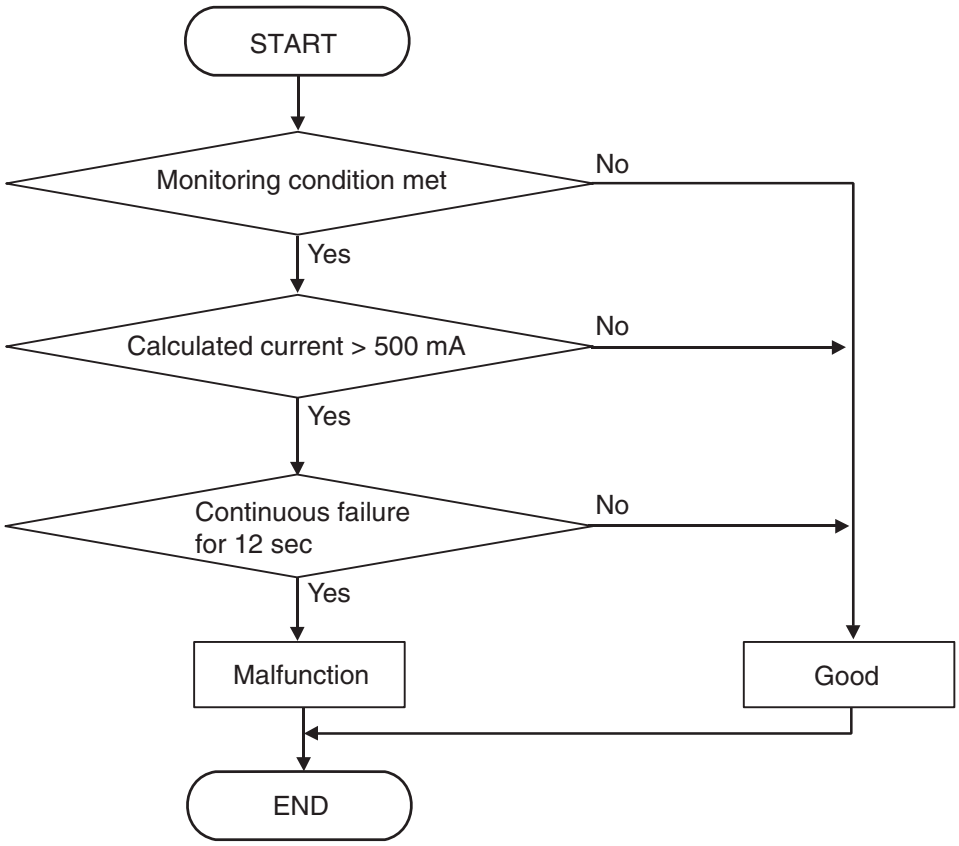
JUDGMENT CRITERIA <Rationality-high>
- Calculated current (actual current –target current): 500 mA or more. (1 second)

TSB Revision

OBD-II DRIVE CYCLE PATTERN <RATIONALITY-HIGH>

The value of the calculated current (actual current – target current) remains 500 mA or less for 1 second.

LOGIC FLOW CHARTS (Monitor Sequence) <Rationality - low>



DTC SET CONDITIONS

Check Conditions <Rationality-low>

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA <Rationality-low>

- Calculated current (target current –actual current): 500 mA or more. (12 seconds)

OBD-II DRIVE CYCLE PATTERN <RATIONALITY-LOW>

The value of the calculated current (target current – actual current) remains 500 mA or less for 12 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0746 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0753: Shift Select Solenoid 1 System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the shift select solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift select solenoid 1 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

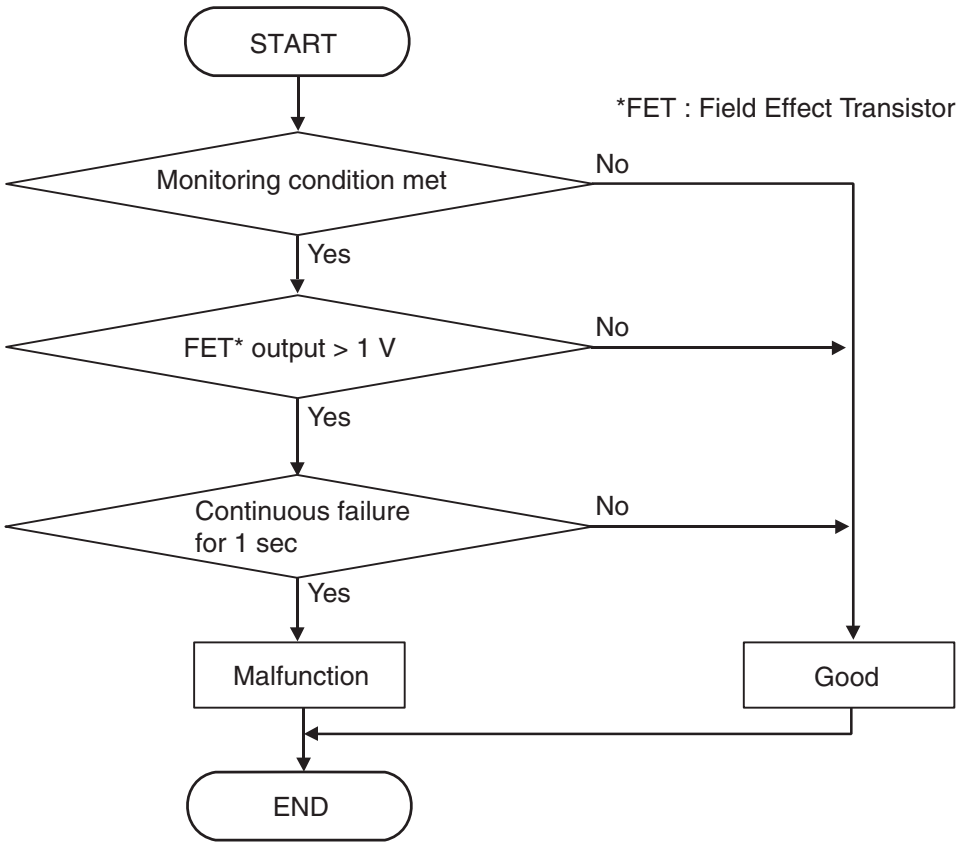
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



TSB Revision

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (1 second)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0753 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0758: Shift Select Solenoid 2 System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the shift select solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift select solenoid 2 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

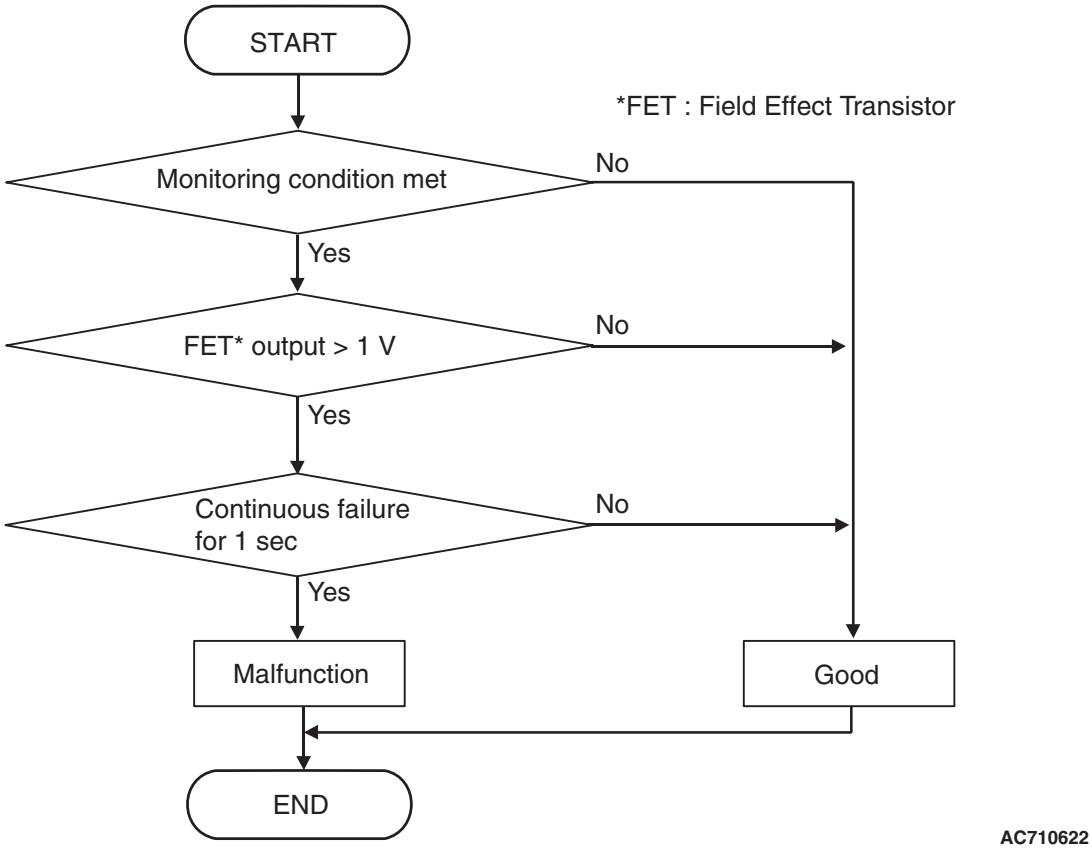
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (1 second)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0758 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0776: Clutch Cooling Flow Solenoid System (Drive current range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch cooling flow solenoid is normal.

DESCRIPTIONS OF MONITOR METHODS

The difference between the actual current of the clutch cooling flow solenoid and target current is large.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

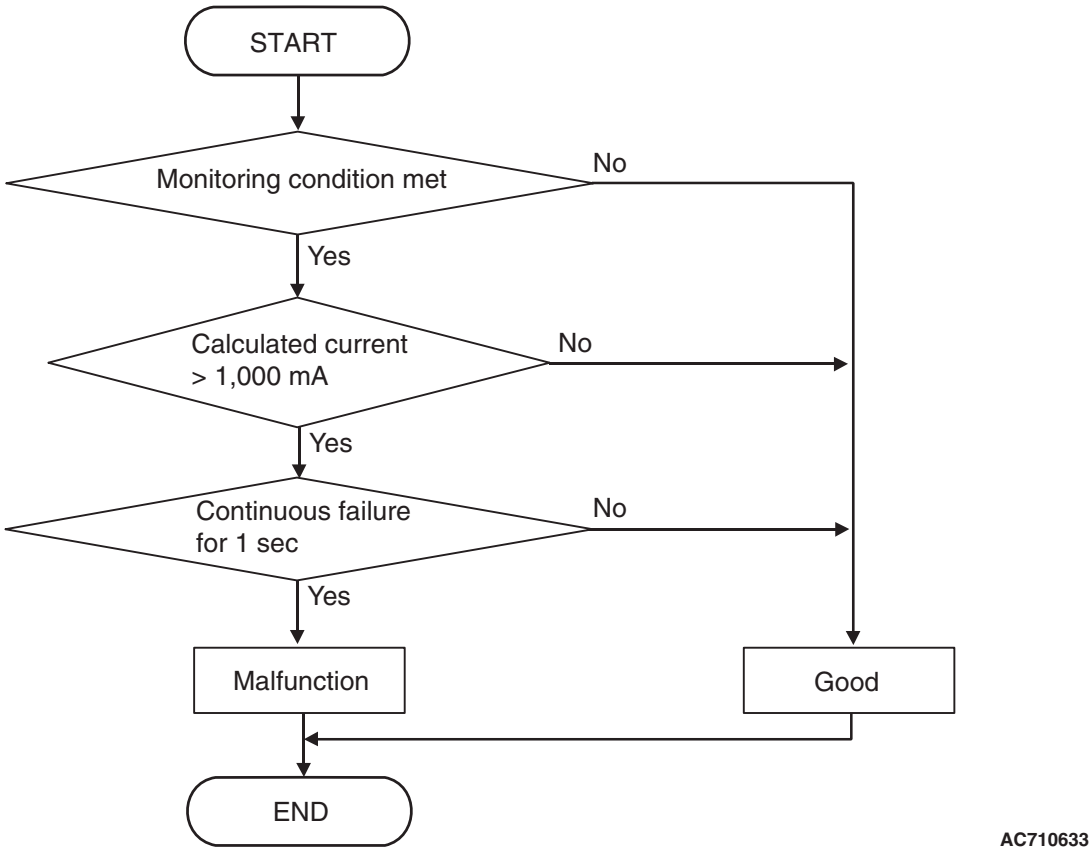
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



TSB Revision

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA <Rationality-high>

- Calculated current (actual current –target current): 1,000 mA or more. (1 second)

JUDGMENT CRITERIA <Rationality-low>

- Calculated current (target current –actual current): 1,000 mA or more. (1 second)

OBD-II DRIVE CYCLE PATTERN <RATIONALITY-HIGH>

The value of the calculated current (actual current – target current) remains 1,000 mA or less for 1 second.

OBD-II DRIVE CYCLE PATTERN <RATIONALITY-LOW>

The value of the calculated current (target current – actual current) remains 1,000 mA or less for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0776 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0777: Clutch Cooling Flow Solenoid System (Stuck)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch cooling flow solenoid is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch cooling flow solenoid is determined to be seized.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

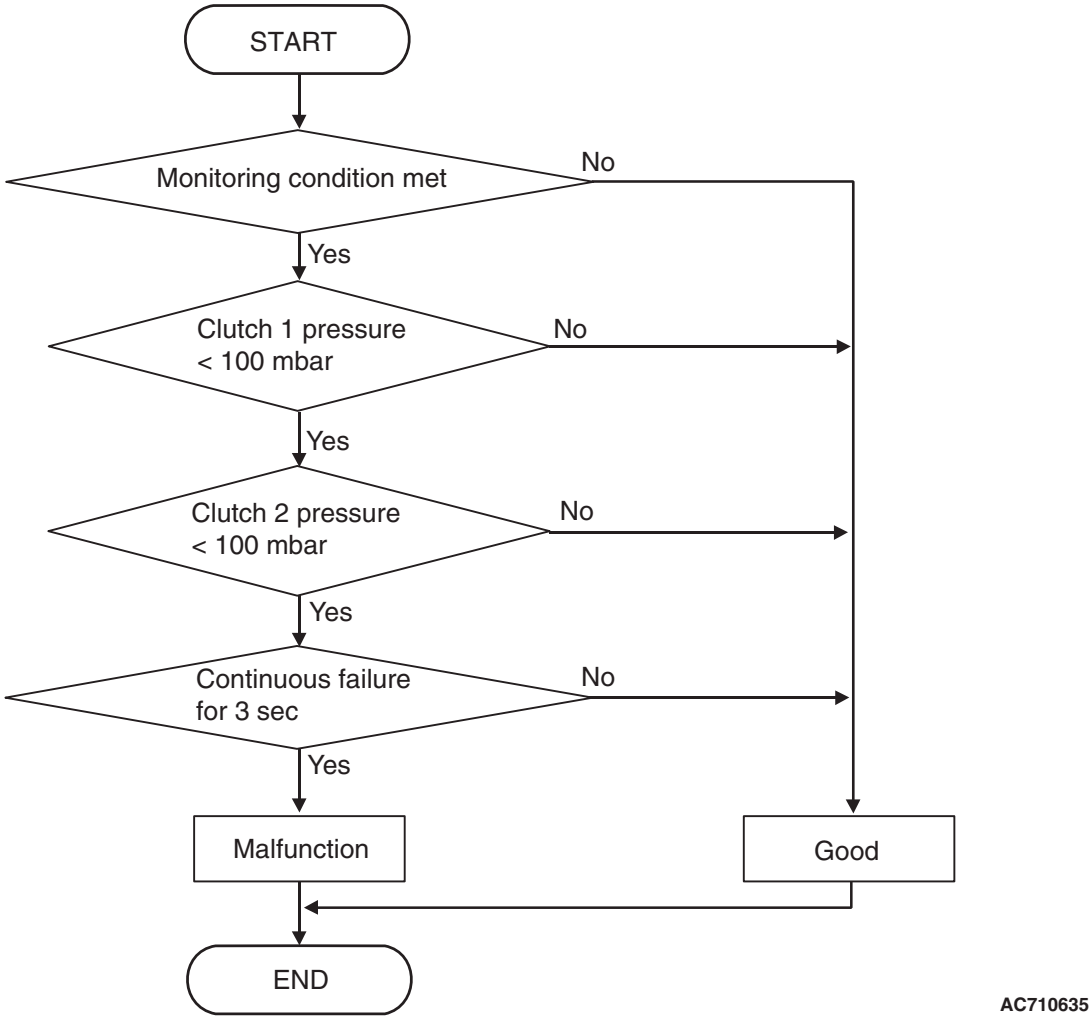
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)

- P0967: Clutch cooling flow solenoid system (Short to power supply)

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

LOGIC FLOW CHARTS (Monitor Sequence)



AC710635

DTC SET CONDITIONS

Check Conditions
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 1 target pressure: 380 mbar or more.
- Clutch 2 target pressure: 380 mbar or more.

JUDGMENT CRITERIA
- Clutch 1 pressure: 100 mbar or less, and clutch 2 pressure: 100 mbar or less. (3 seconds)

OBD-II DRIVE CYCLE PATTERN
The Clutch 1 pressure and clutch 2 pressure remain 100 mbar or more for 3 seconds.

PROBABLE CAUSES
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0777 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0841: Clutch 1 Pressure Sensor System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 1 pressure sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The difference between the allowable torque of clutch 1 and the engine torque is large.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

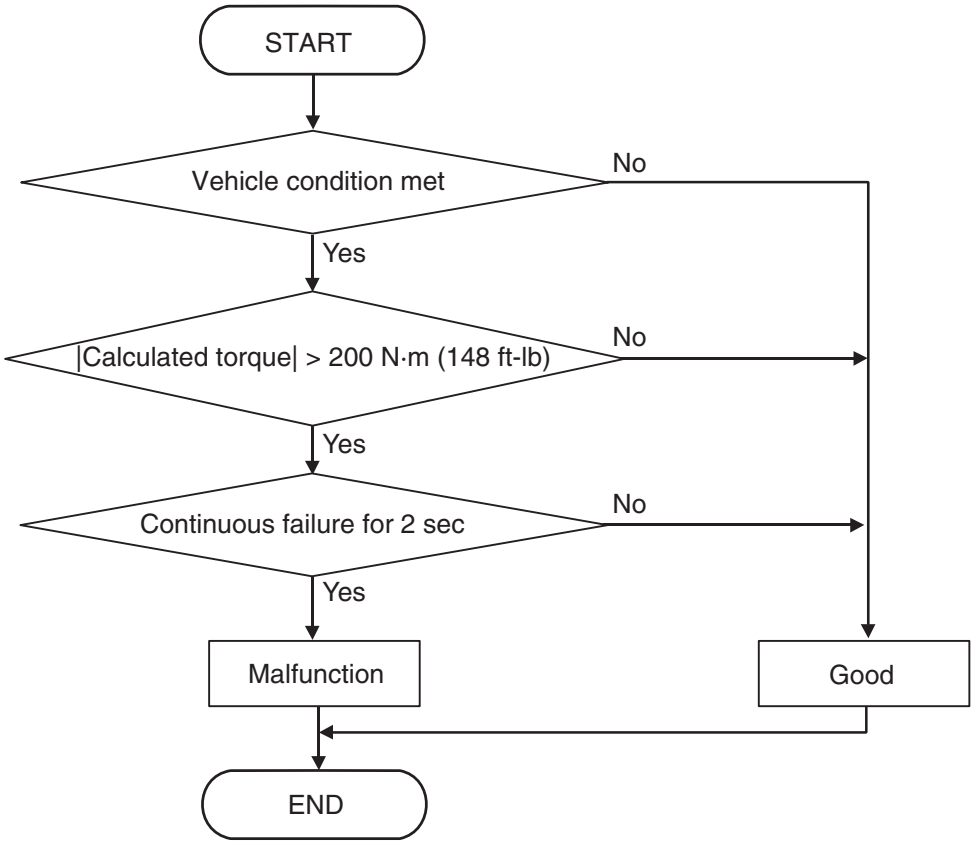
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2
- P185D: Clutch open not possible

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Engine speed: 6,800 r/min or less.
- Clutch 1 (odd) slip state: Slip or engaged.
- Clutch 1 (odd) slip speed: 20 r/min or more.
- Clutch 2 (even) state: Disengaged.

JUDGMENT CRITERIA

- Calculated torque (Clutch 1 (odd) permit torque – engine torque): 200 N· m (148 ft-lb) or more. (2 seconds)

OBD-II DRIVE CYCLE PATTERN

The value of the calculated torque (clutch 1 (odd) permit torque –engine torque) remains 200 N· m (148 ft-lb) or less for 2 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0841 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0842: Clutch 1 Pressure Sensor System (Output low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 1 pressure sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the clutch 1 pressure sensor is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

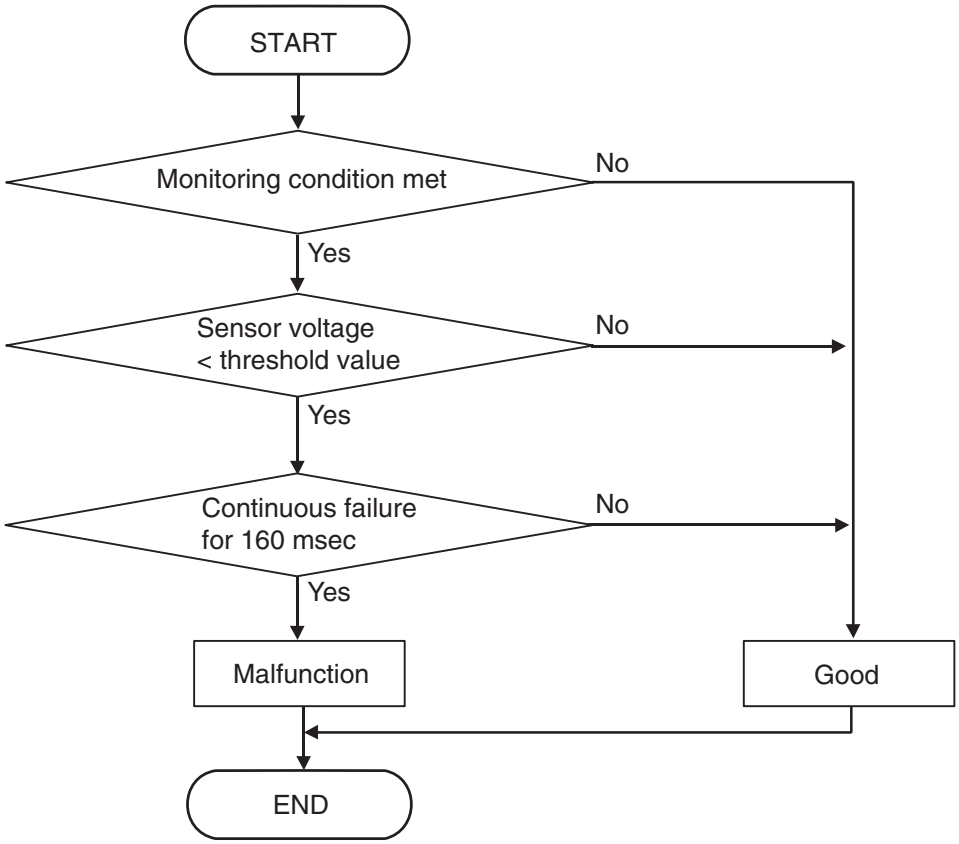
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2
- P185D: Clutch open not possible

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- Sensor voltage: 1.16 V or less. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The voltage of the clutch 1 pressure sensor remains 1.16 V or more for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0842 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0843: Clutch 1 Pressure Sensor System (Output high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 1 pressure sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the clutch 1 pressure sensor is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

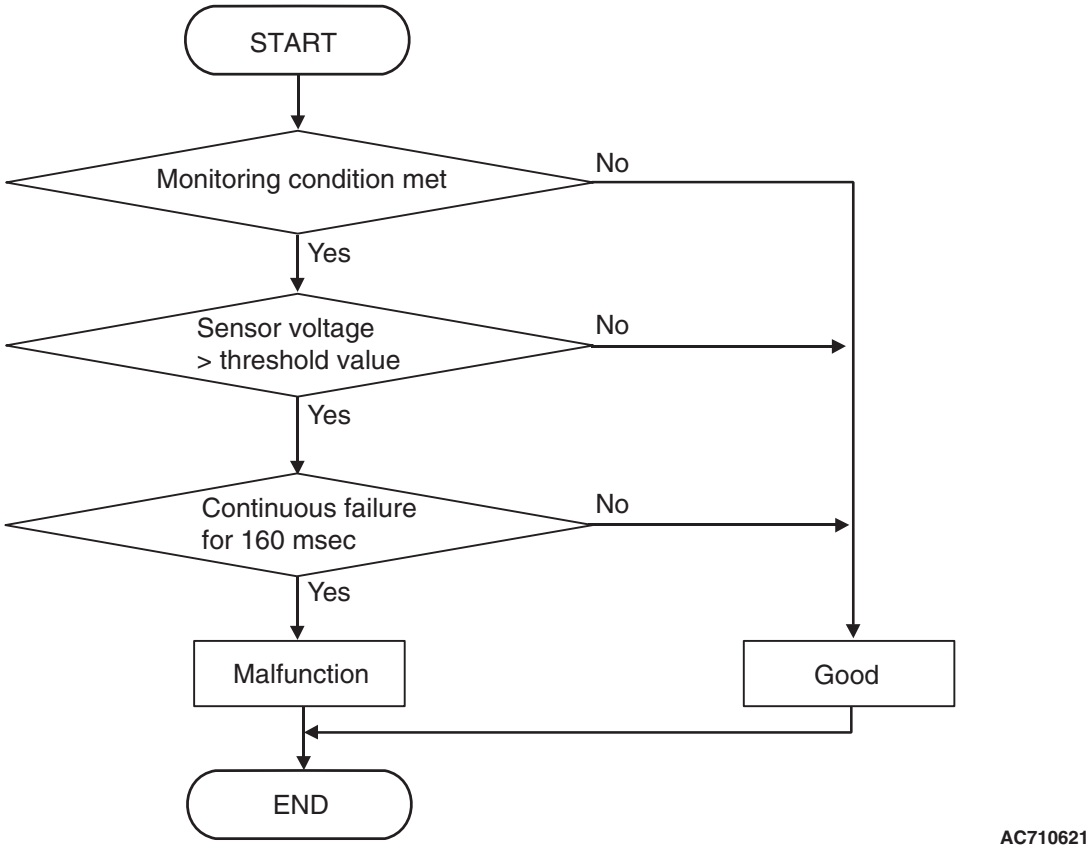
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2
- P185D: Clutch open not possible

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- Sensor voltage: 2.48 V or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The voltage of the clutch 1 pressure sensor remains 2.48 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0843 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0846: Clutch 2 Pressure Sensor System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 2 pressure sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The difference between the allowable torque of clutch 2 and the engine torque is large.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

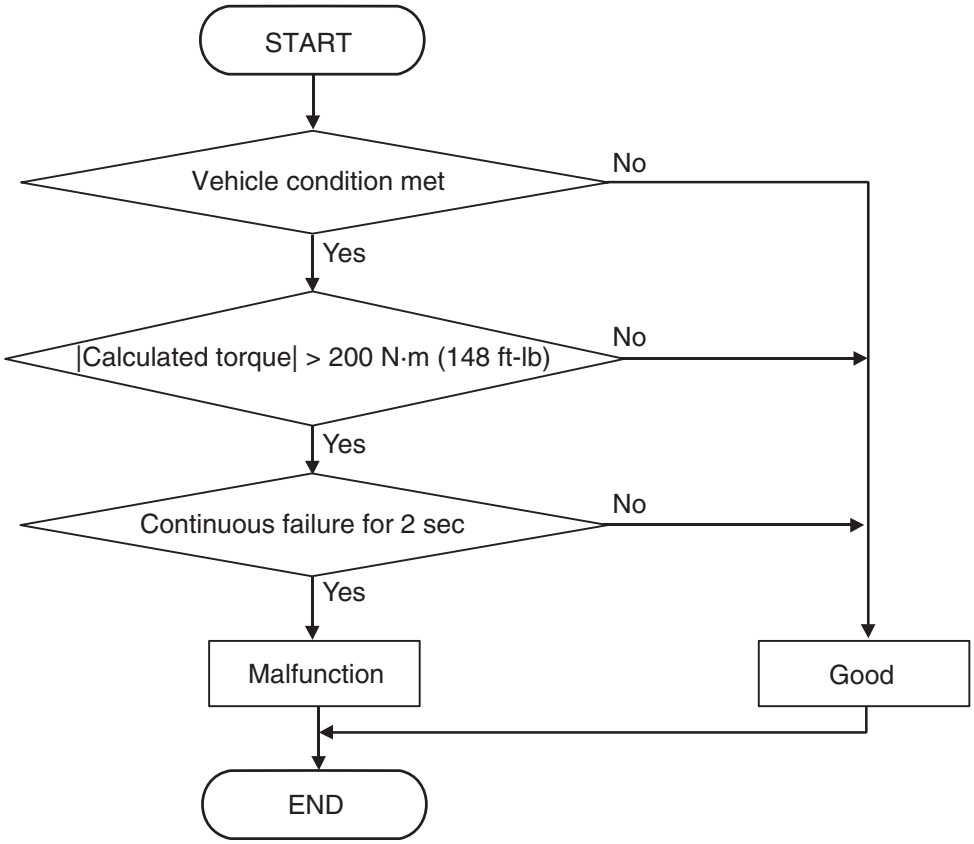
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2
- P185D: Clutch open not possible

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



AC710619

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Engine speed: 6,800 r/min or less.
- Clutch 2 (even) slip state: Slip or engaged.
- Clutch 2 (even) slip speed: 20 r/min or more.
- Clutch 1 (odd) state: Disengaged.

JUDGMENT CRITERIA

- Calculated torque (Clutch 2 (even) permit torque – engine torque): 200 N· m (148 ft-lb) or more. (2 seconds)

OBD-II DRIVE CYCLE PATTERN

The value of the calculated torque (clutch 2 (even) permit torque –engine torque) remains 200 N· m (148 ft-lb) or less for 2 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0846 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0847: Clutch 2 Pressure Sensor System (Output low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 2 pressure sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the clutch 2 pressure sensor is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

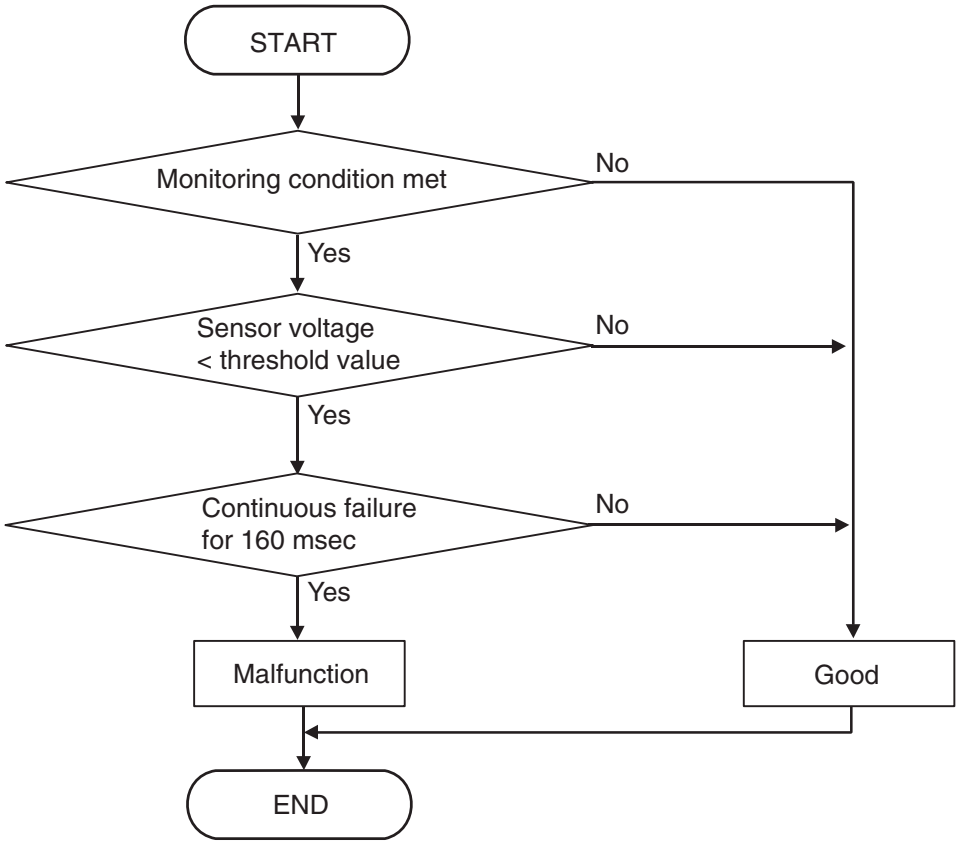
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2
- P185D: Clutch open not possible

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- Sensor voltage: 0.69 V or less. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The voltage of the clutch 2 pressure sensor remains 0.69 V or more for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0847 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0848: Clutch 2 Pressure Sensor System (Output high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 2 pressure sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the clutch 2 pressure sensor is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

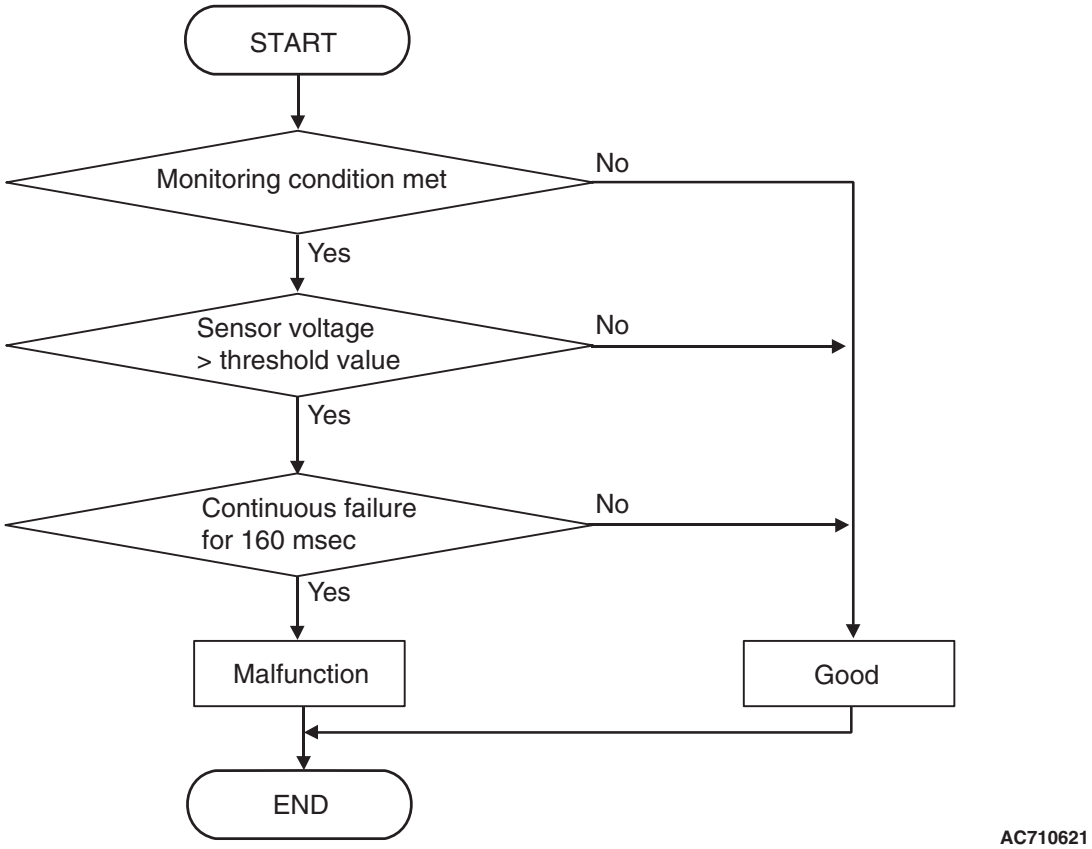
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2
- P185D: Clutch open not possible

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- Sensor voltage: 2.66 V or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The voltage of the clutch 2 pressure sensor remains 2.66 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0848 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0960: Line Pressure Solenoid System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the line pressure solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The line pressure solenoid circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

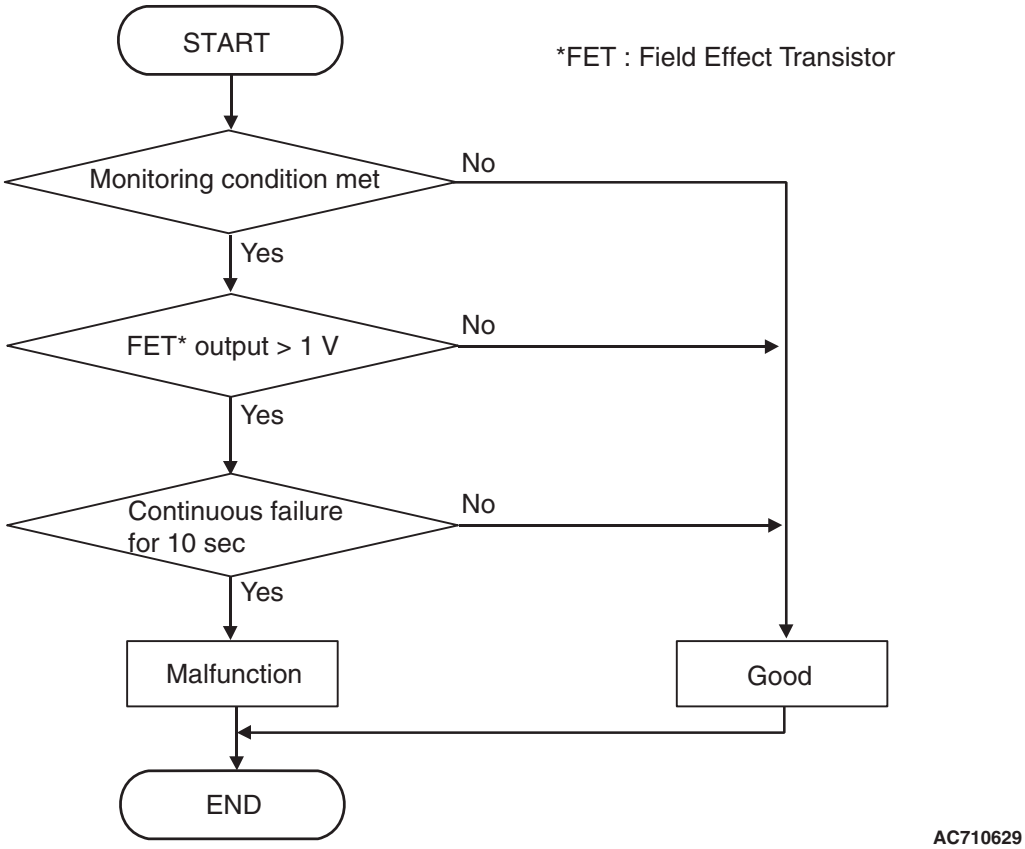
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0746: Line pressure solenoid system (Drive current range out)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



TSB Revision

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (10 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 10 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0960 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0961: Line Pressure Solenoid System (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the line pressure solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the line pressure solenoid is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

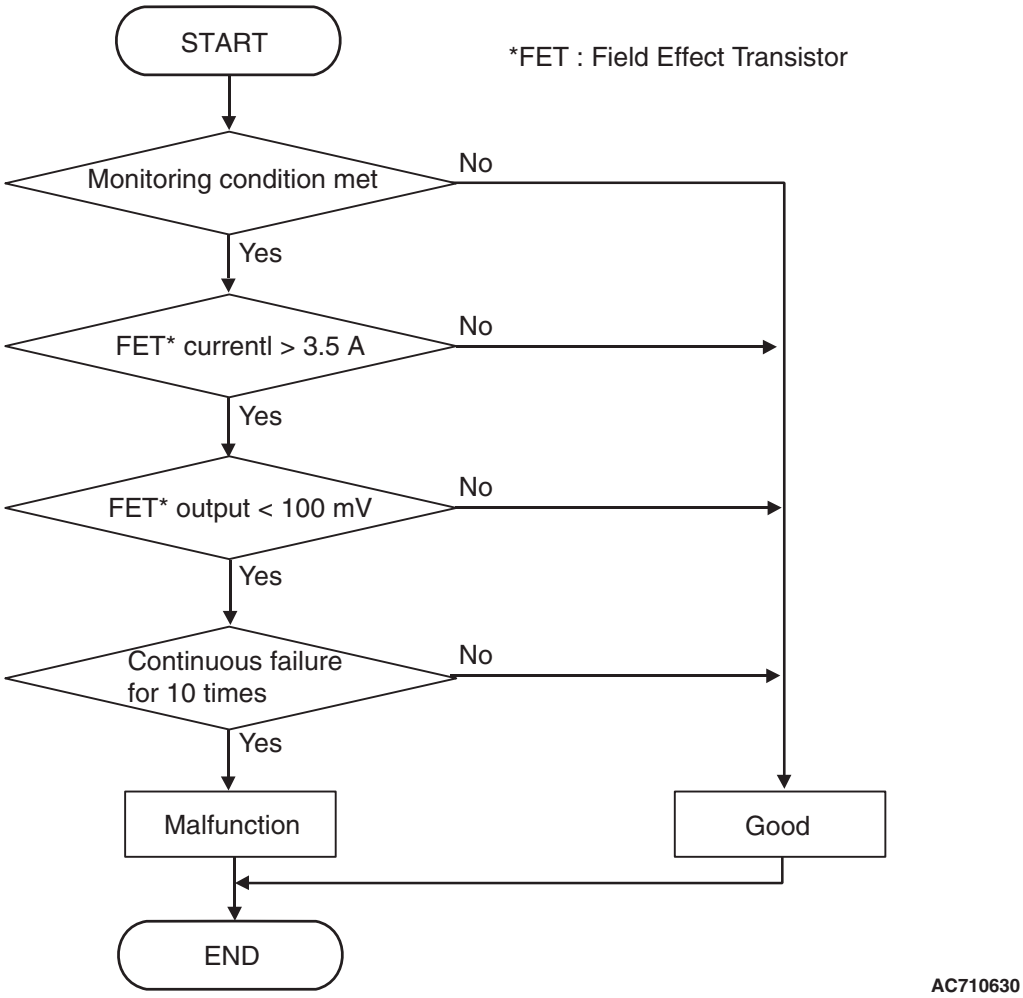
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 3.5 A or more, and FET (Field Effect Transistor) output: 100 mV or less (10 times).

OBD-II DRIVE CYCLE PATTERN

The current of the FET channel shunt is 3.5 A or less, and the FET channel output is 100 mV or more.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0961 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0962: Line Pressure Solenoid System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the line pressure solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The line pressure solenoid circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

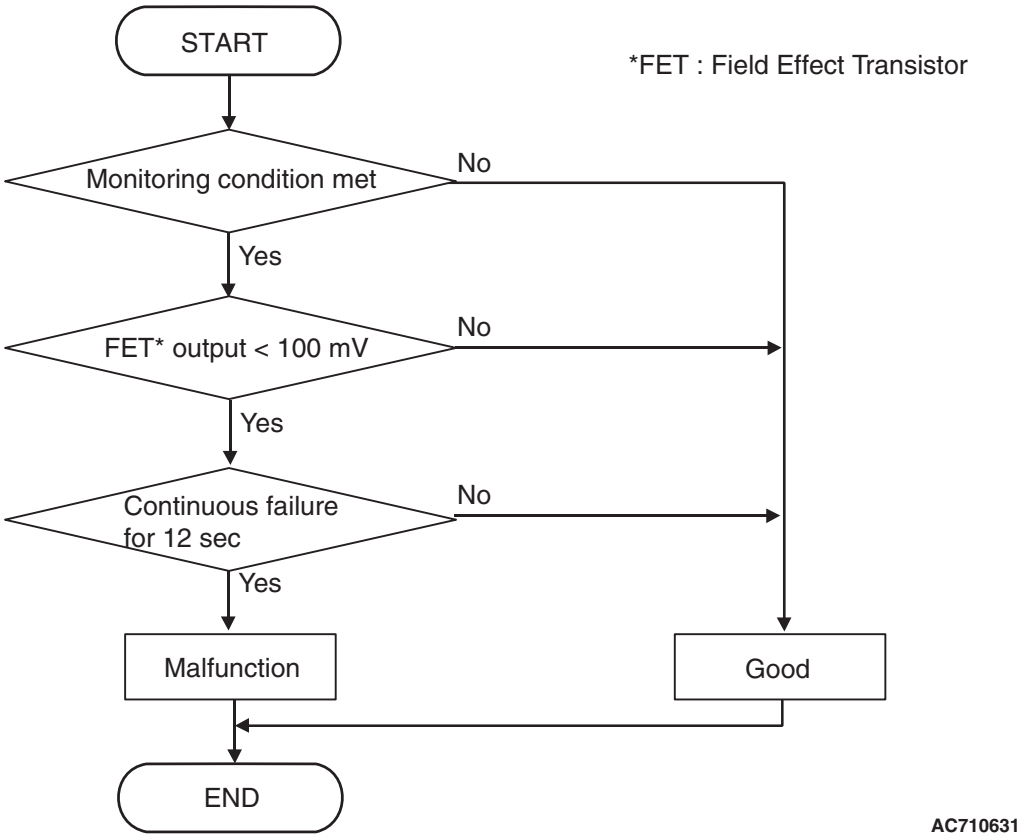
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0963: Line pressure solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (12 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 12 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0962 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0963: Line Pressure Solenoid System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the line pressure solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The line pressure solenoid circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

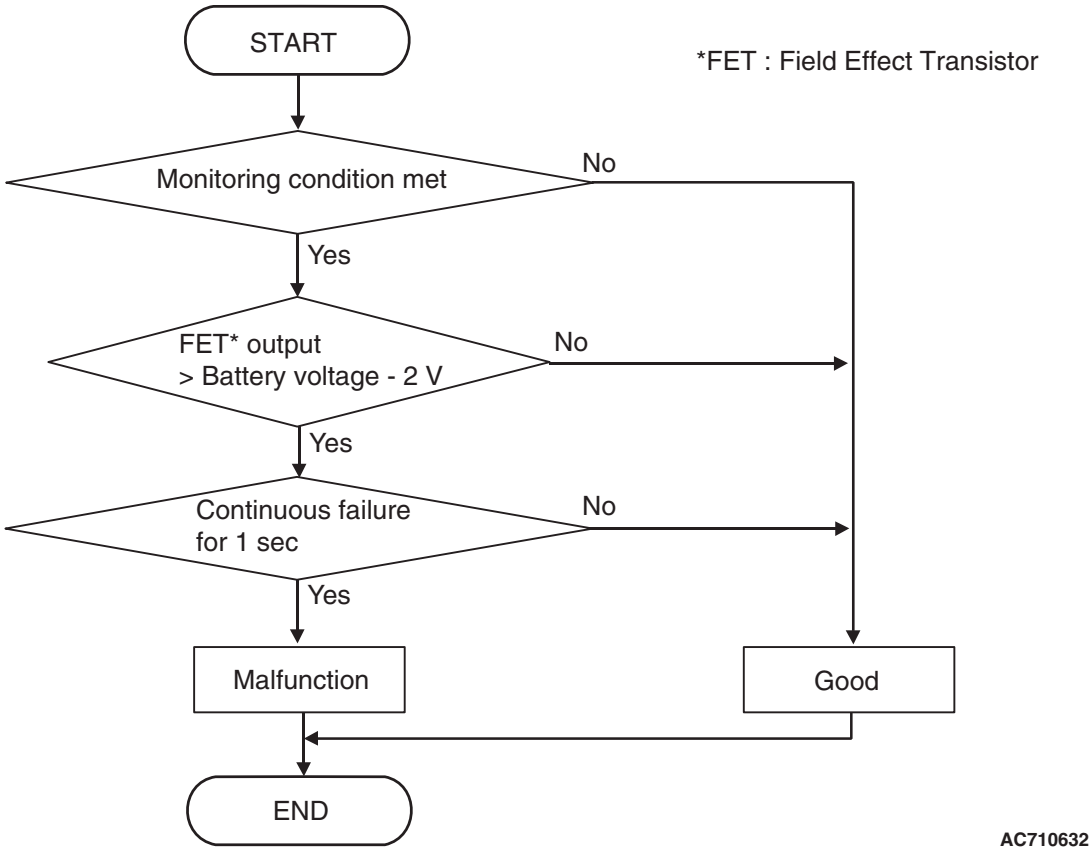
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Line pressure solenoid: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (1 second)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0963 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0964: Clutch Cooling Flow Solenoid System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch cooling flow solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch cooling flow solenoid circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

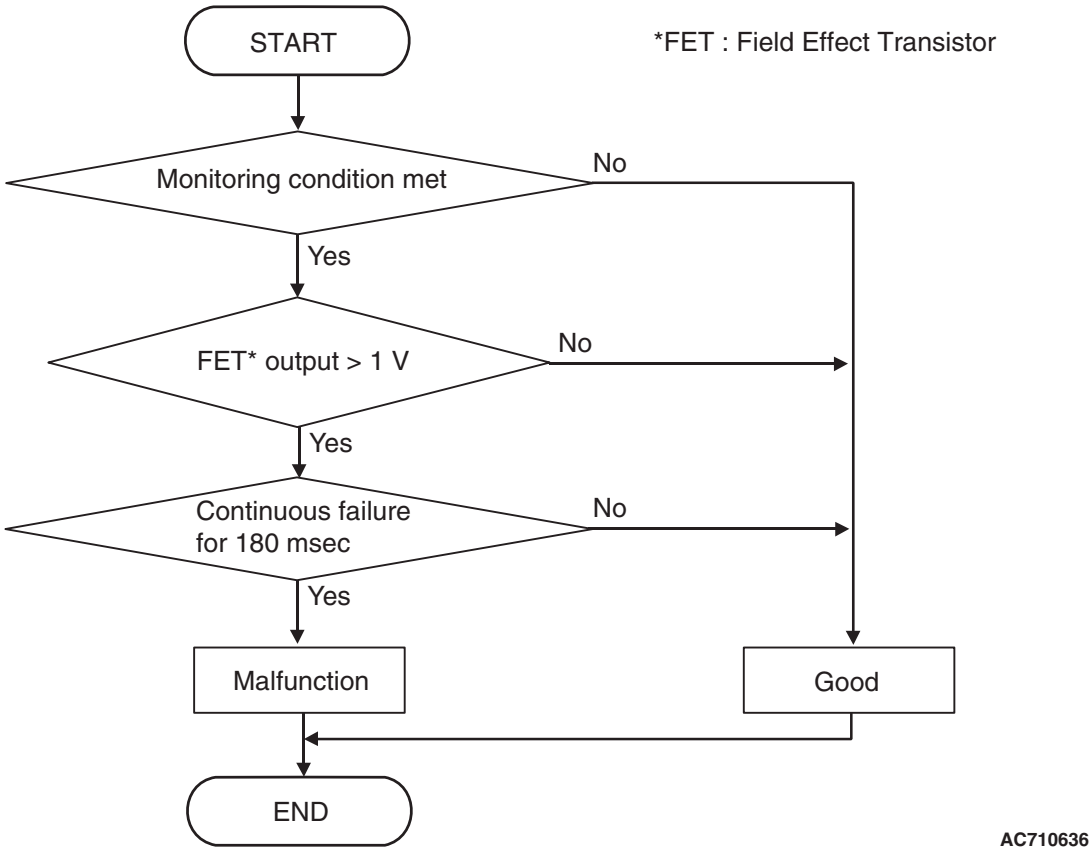
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (180 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0964 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0965: Clutch Cooling Flow Solenoid System (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch cooling flow solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the clutch cooling flow solenoid is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

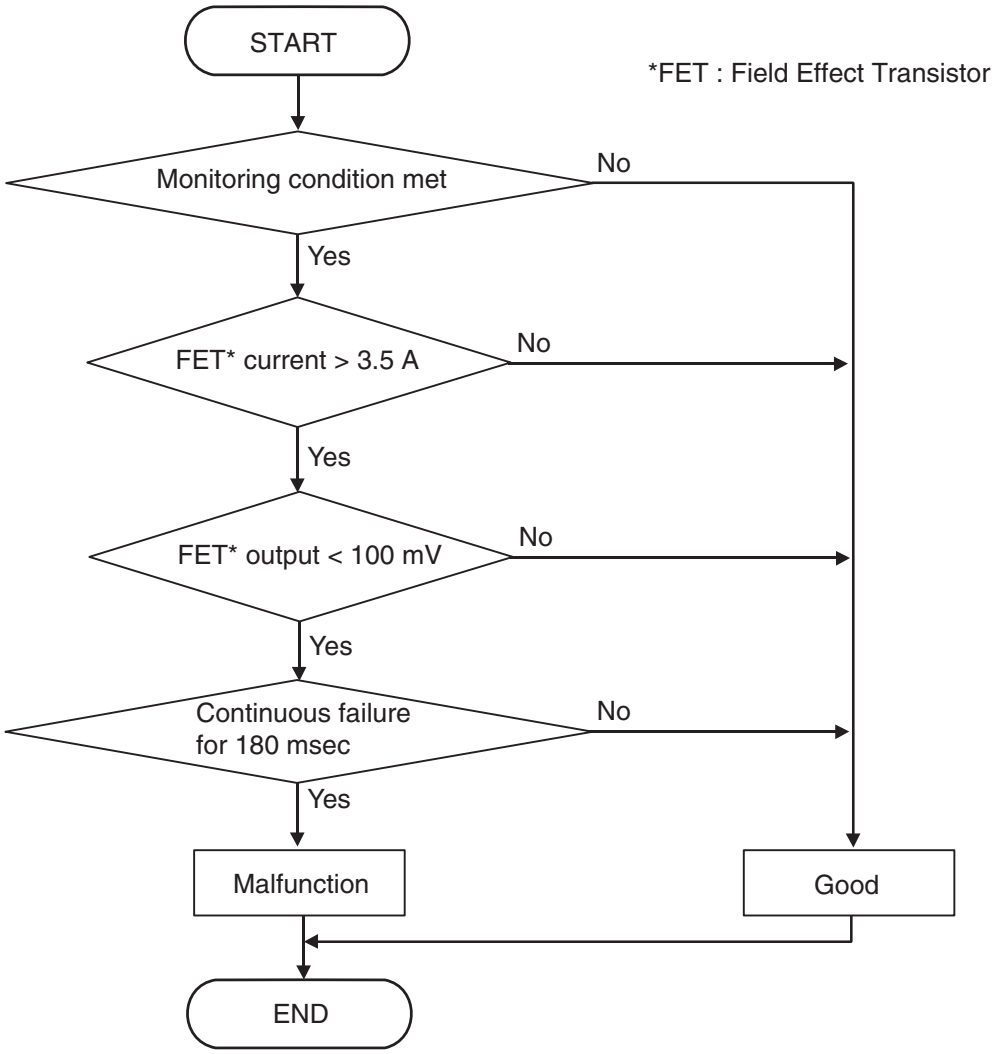
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 3.5 A or more, and FET (Field Effect Transistor) output: 100 mV or less (180 millisecond).

OBD-II DRIVE CYCLE PATTERN

The status with the current of the FET channel shunt 3.5 A or less and with the FET channel output 100 mV or more continues for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0965 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0966: Clutch Cooling Flow Solenoid System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch cooling flow solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch cooling flow solenoid circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

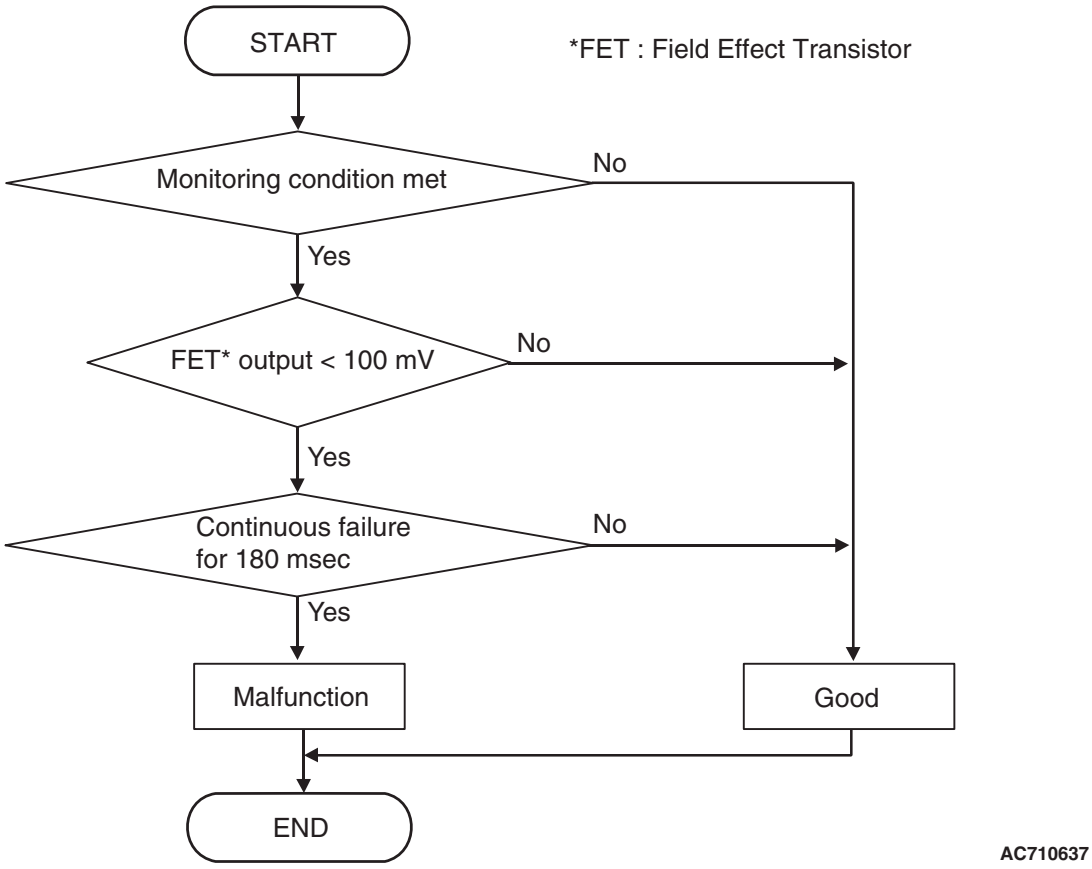
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0967: Clutch cooling flow solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (180 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0966 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0967: Clutch Cooling Flow Solenoid System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch cooling flow solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch cooling flow solenoid circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

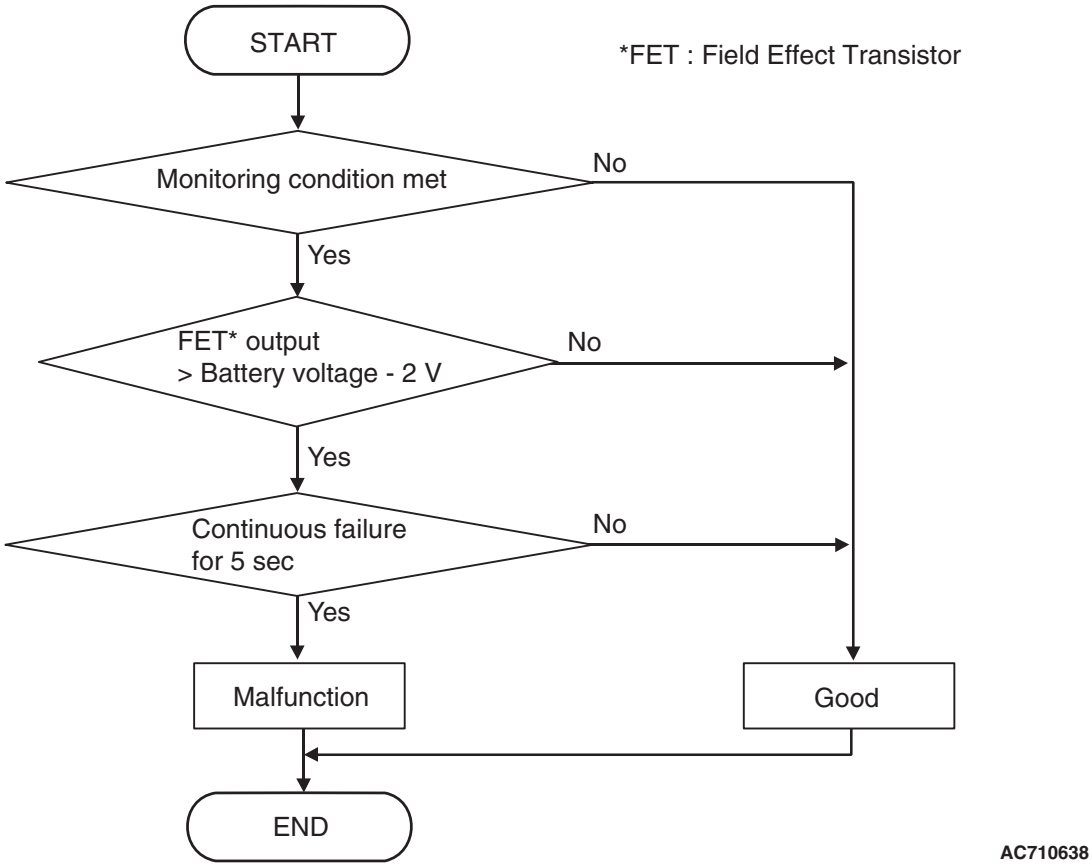
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Clutch cooling flow solenoid: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 5 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0967 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0968: Shift/Cooling Changeover Solenoid System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the shift/cooling changeover solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift/cooling changeover solenoid circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

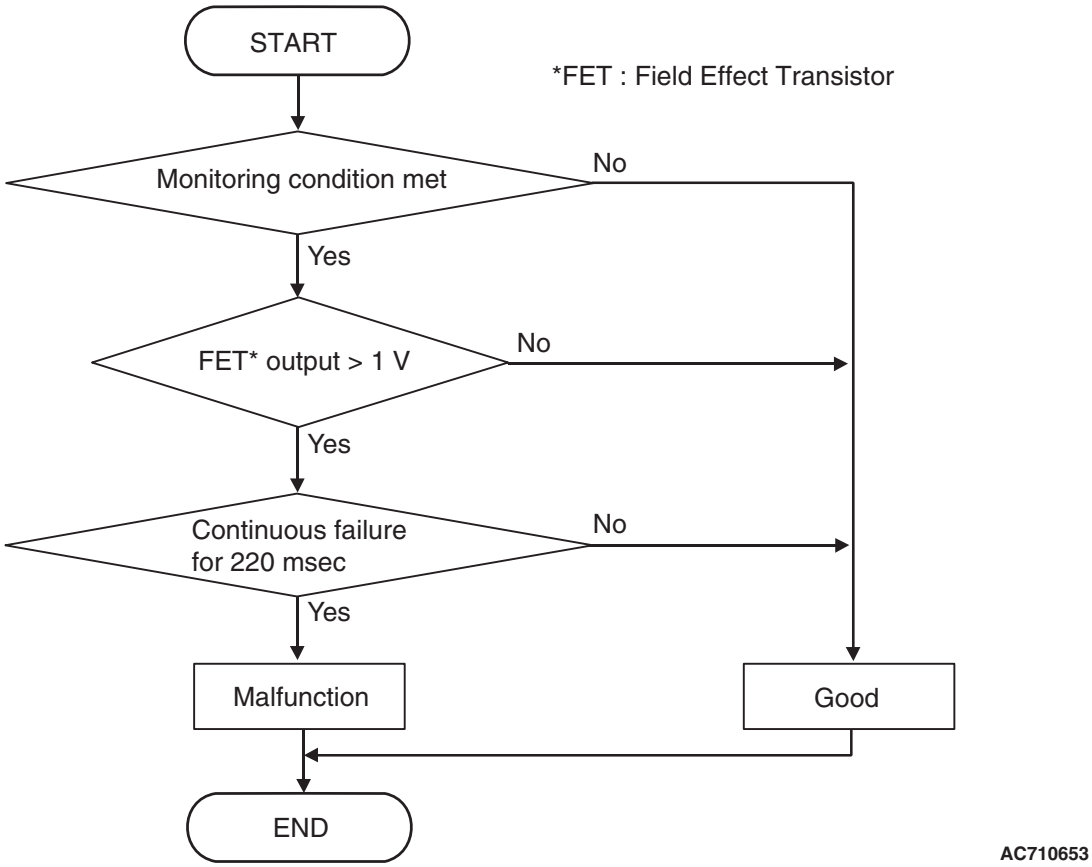
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 220 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0968 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0970: Shift/Cooling Changeover Solenoid System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift/cooling changeover solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift/cooling changeover solenoid circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

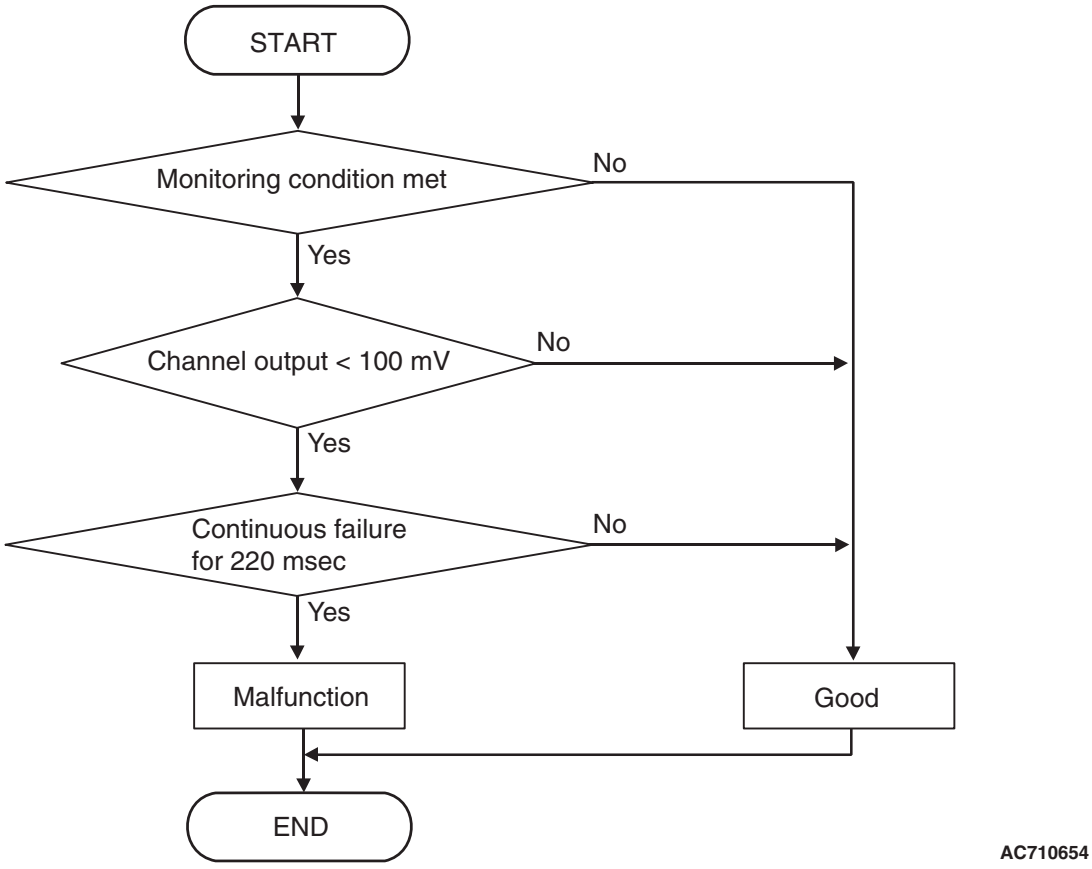
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (220 millisecond)

TSB Revision

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 220 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0970 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0971: Shift/Cooling Changeover Solenoid System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift/cooling changeover solenoid circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift/cooling changeover solenoid circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

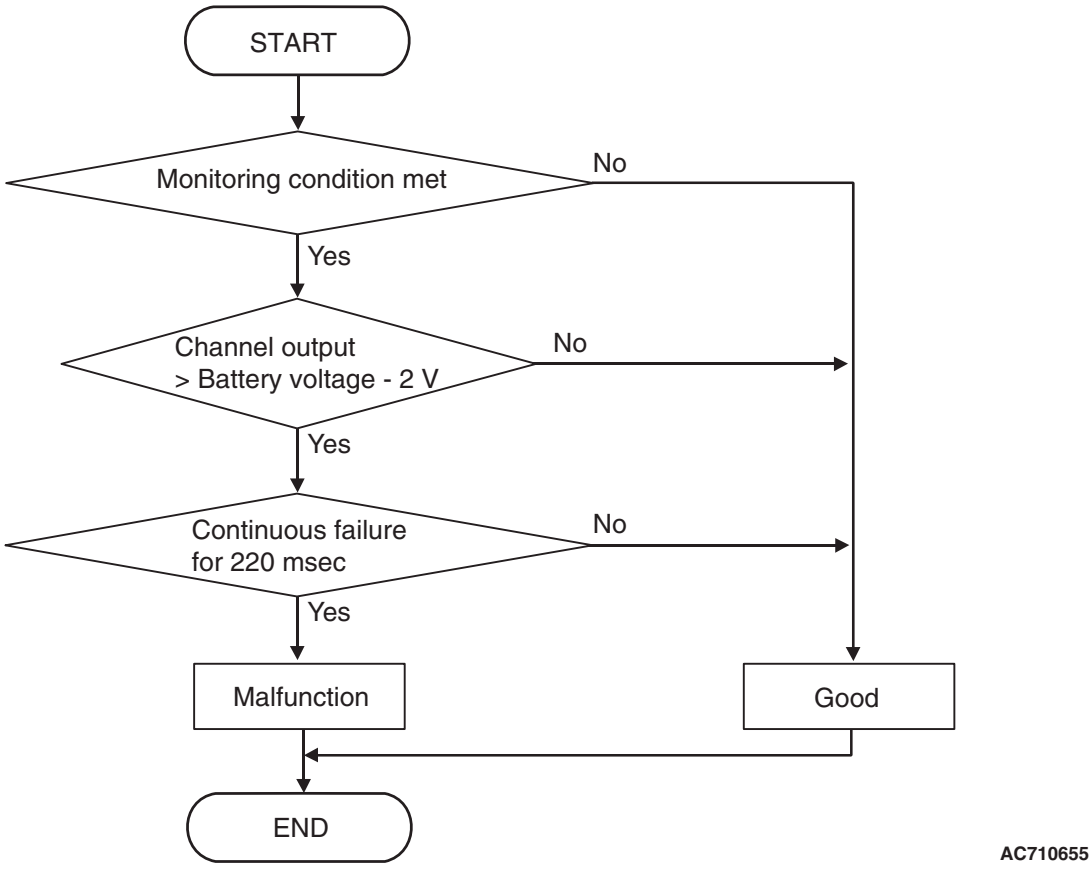
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Shift/cooling changeover solenoid: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 220 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0971 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0973: Shift Select Solenoid 1 System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift select solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift select solenoid 1 circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

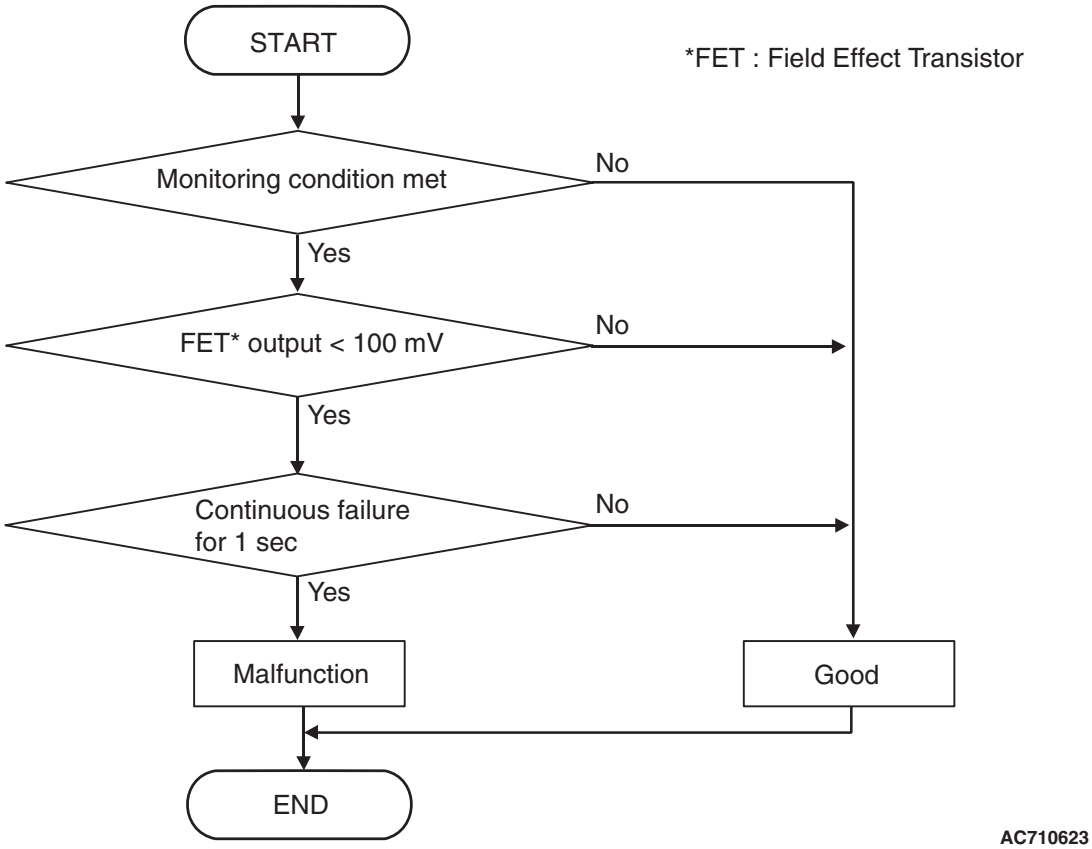
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 1 second.

TSB Revision

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0973 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P0974: Shift Select Solenoid 1 System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift select solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift select solenoid 1 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

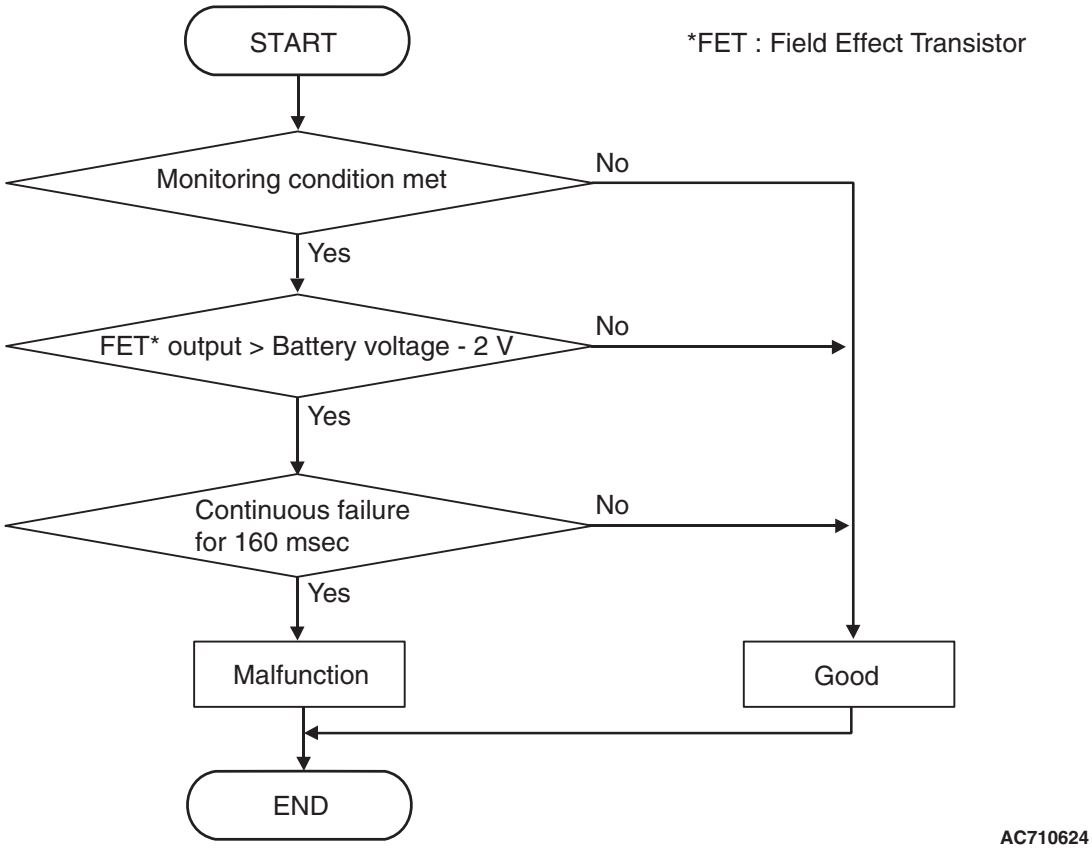
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Shift select solenoid 1: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0974 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P0976: Shift Select Solenoid 2 System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift select solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift select solenoid 2 circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

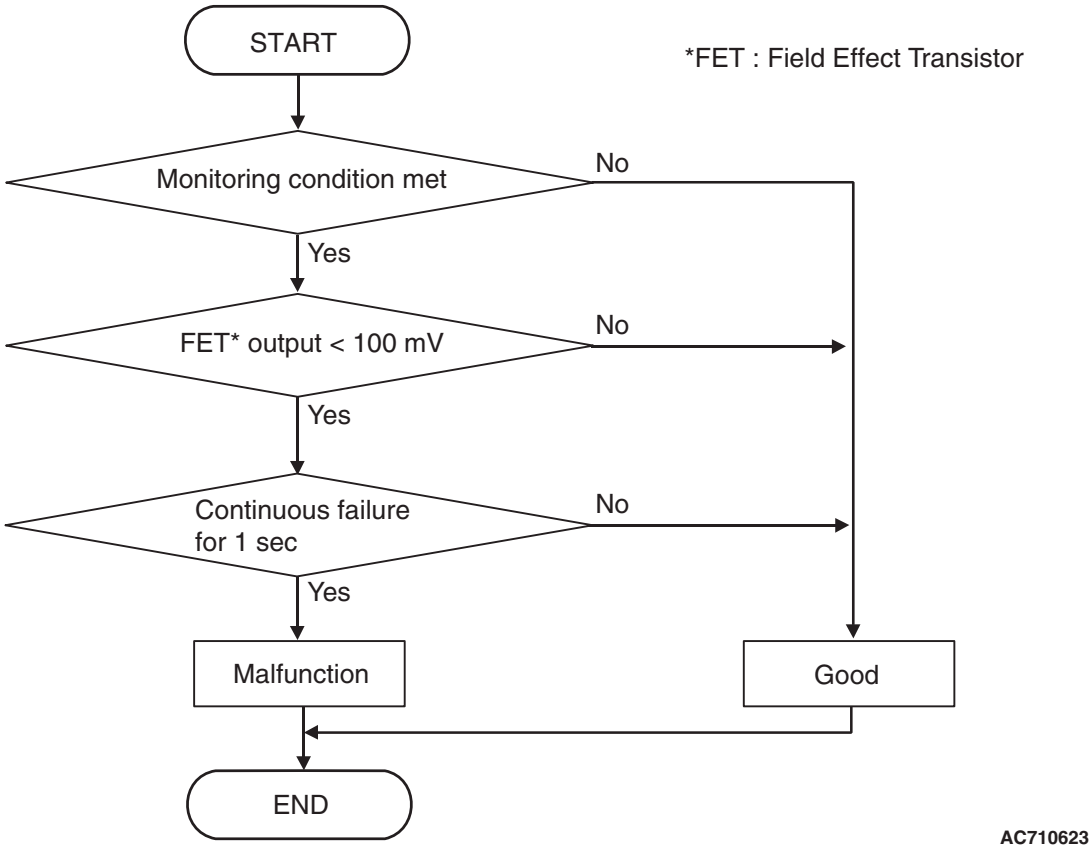
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 1 second.

TSB Revision

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0976 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P0977: Shift Select Solenoid 2 System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift select solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift select solenoid 2 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

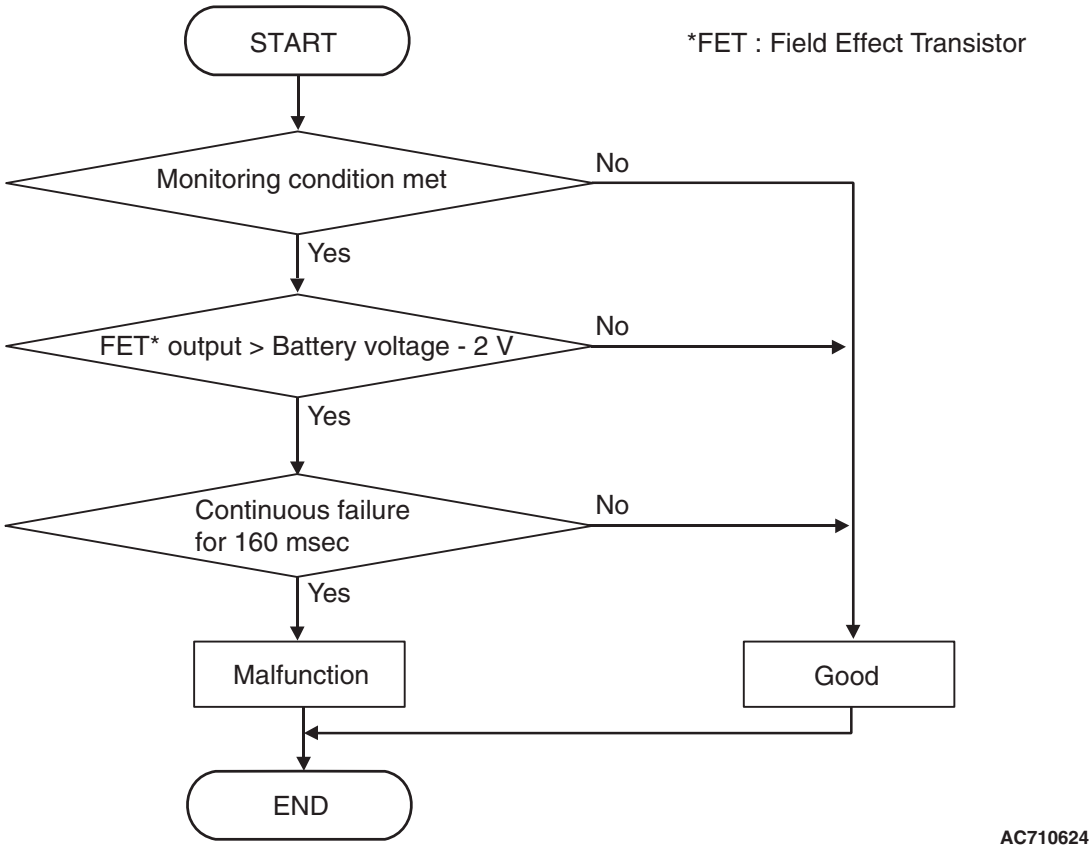
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Shift select solenoid 2: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0977 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1637: EEPROM System (DTC storing 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.**

DIAGNOSTIC FUNCTION
TC-SST-ECU checks that EEPROM in TC-SST-ECU is normal.

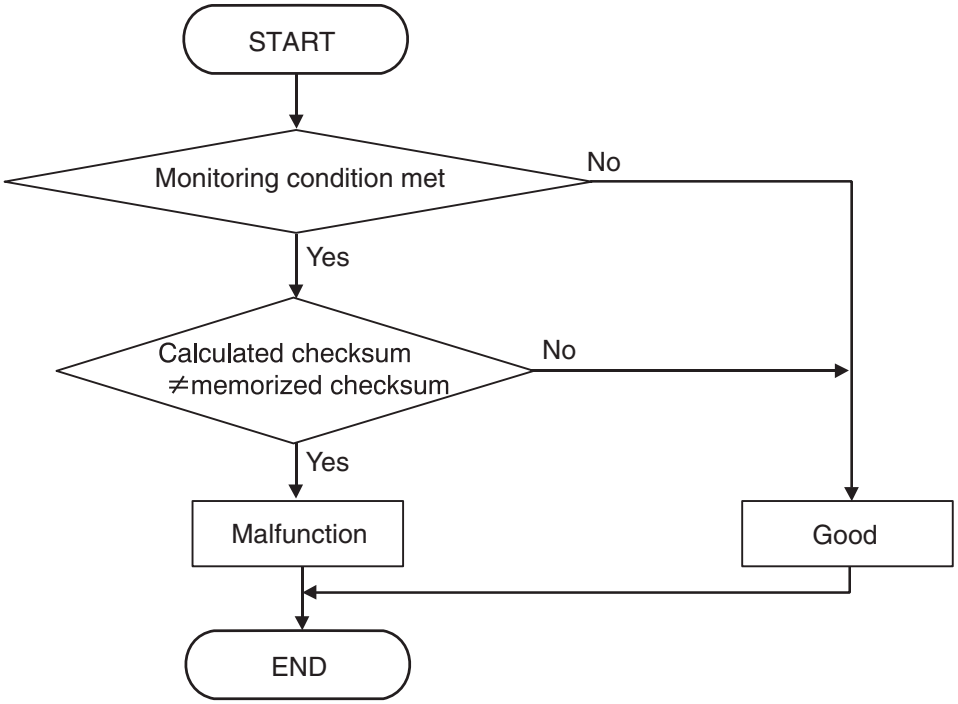
DESCRIPTIONS OF MONITOR METHODS
The EEPROM writing data is determined to be abnormal.

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
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA
- Calculated checksum: Not equal the memorized checksum.

OBD-II DRIVE CYCLE PATTERN
The calculated checksum corresponds with the memorized checksum.

PROBABLE CAUSES
- Malfunction of TC-SST-ECU

TSB Revision

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1637 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1676: Coding incomplete

⚠ 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 FUNCTION

TC-SST-ECU checks that the coding is normal. (TC-SST-ECU is a local coding.)

DESCRIPTIONS OF MONITOR METHODS

The coding is determined to be abnormal. (This abnormality occurs when the vehicle information has been incorrectly written to TC-SST-ECU at a factory before shipment.)

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

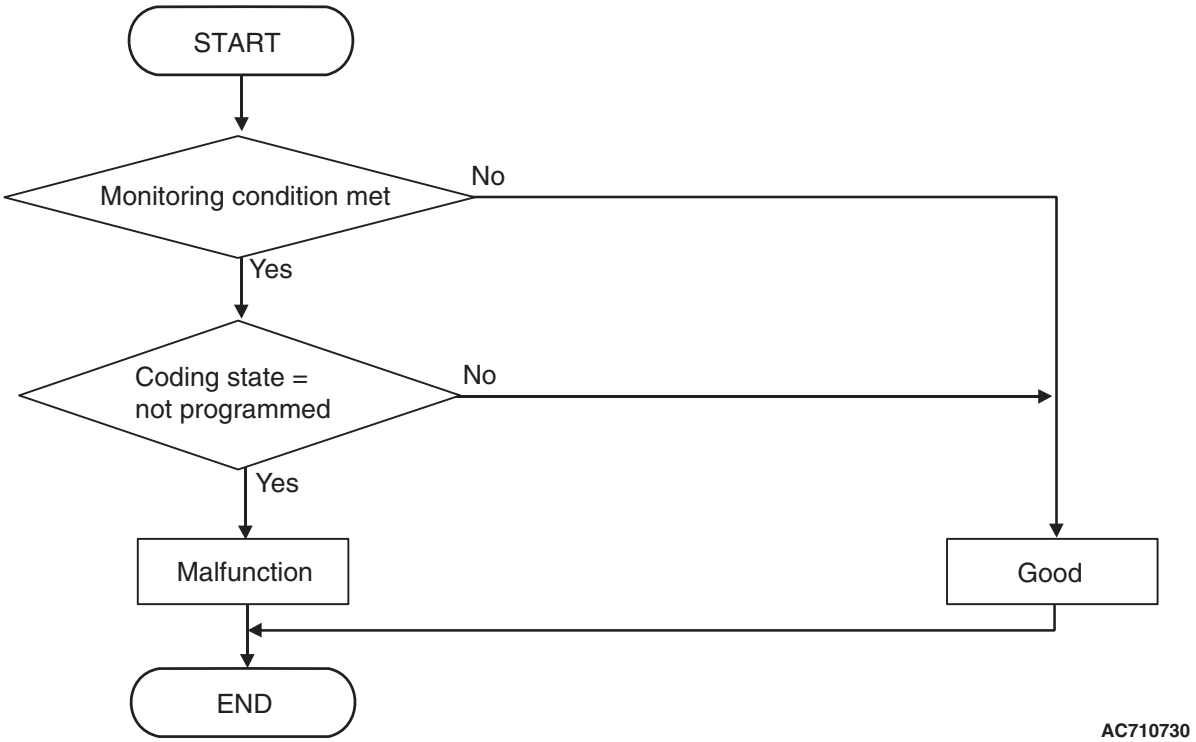
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Ignition switch: ON

JUDGMENT CRITERIA

- Coding state: Not programmed. (Immediately)

OBD-II DRIVE CYCLE PATTERN

The coding is completed.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1676 set?

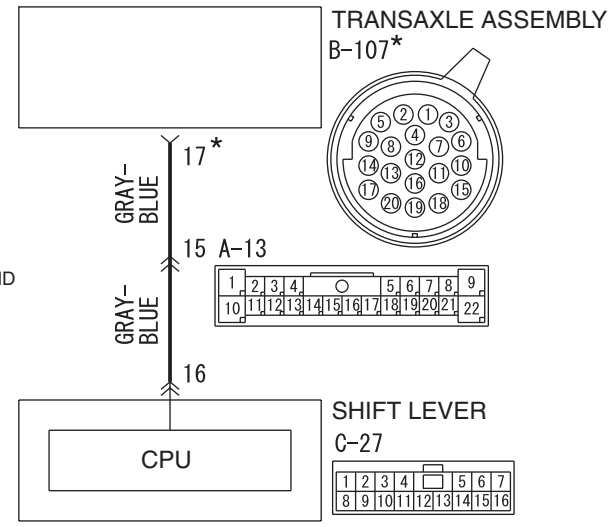
YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1802: Shift Lever System (LIN communication malfunction)

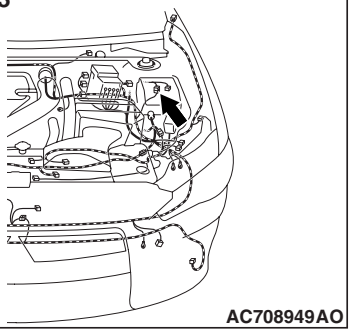
LIN communication system circuit



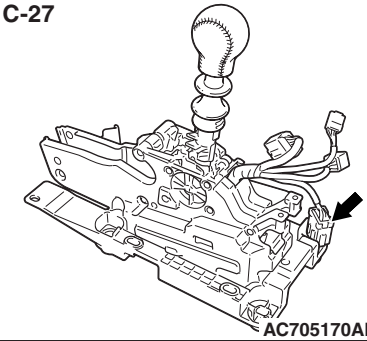
NOTE
*: THE TERMINAL NUMBERS DESCRIBED IN THE CIRCUIT DIAGRAM AGREE WITH THE NUMBERS MARKED ON THE TRANSAXLE ASSEMBLY CONNECTOR AND HARNESS SIDE CONNECTOR.

W8H22M013A

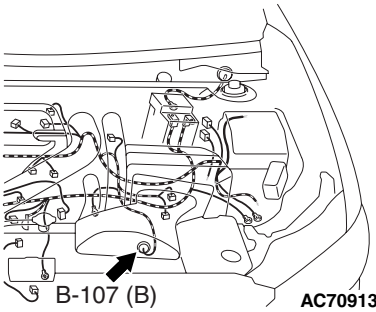
Connector: A-13



Connector: C-27



Connector: B-107



⚠ 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 FUNCTION

TC-SST-ECU checks that the CAN back-up communication (LIN) is normal.

DESCRIPTIONS OF MONITOR METHODS

The CAN back-up communication is determined to be abnormal.

TSB Revision

PROBABLE CAUSES

- Malfunction of the shift lever-ECU
- Malfunction of the LIN bus
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Scan tool diagnostic trouble code
Check the shift lever diagnostic trouble code. (Refer to P.22C-302.)

Q: Is the DTC set?

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

STEP 3. Inspection of the TC-SST-ECU connector, intermediate connector, and shift lever-ECU connector: B-107, A-13, C-27
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 4. Check the wiring harness between B-107 TC-SST-ECU connector terminal No. 17 and C-27 shift lever-ECU connector terminal No. 16.
Check the communication line for open or short circuit.

Q: Is the check result normal?

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

STEP 5. Replace the shift lever assembly, and check if the diagnostic trouble code is reset.
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Check the DTC.

Q: Is DTC No. P1802 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1803: Shift Lever System (CAN, LIN Time-out Error)

SHIFT LEVER SYSTEM CIRCUIT

Refer to P.22C-80.

⚠ 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 FUNCTION

TC-SST-ECU checks that the communication with the shift lever-ECU (CAN and LIN) is normal.

DESCRIPTIONS OF MONITOR METHODS

The CAN and LIN communication with the shift lever-ECU is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

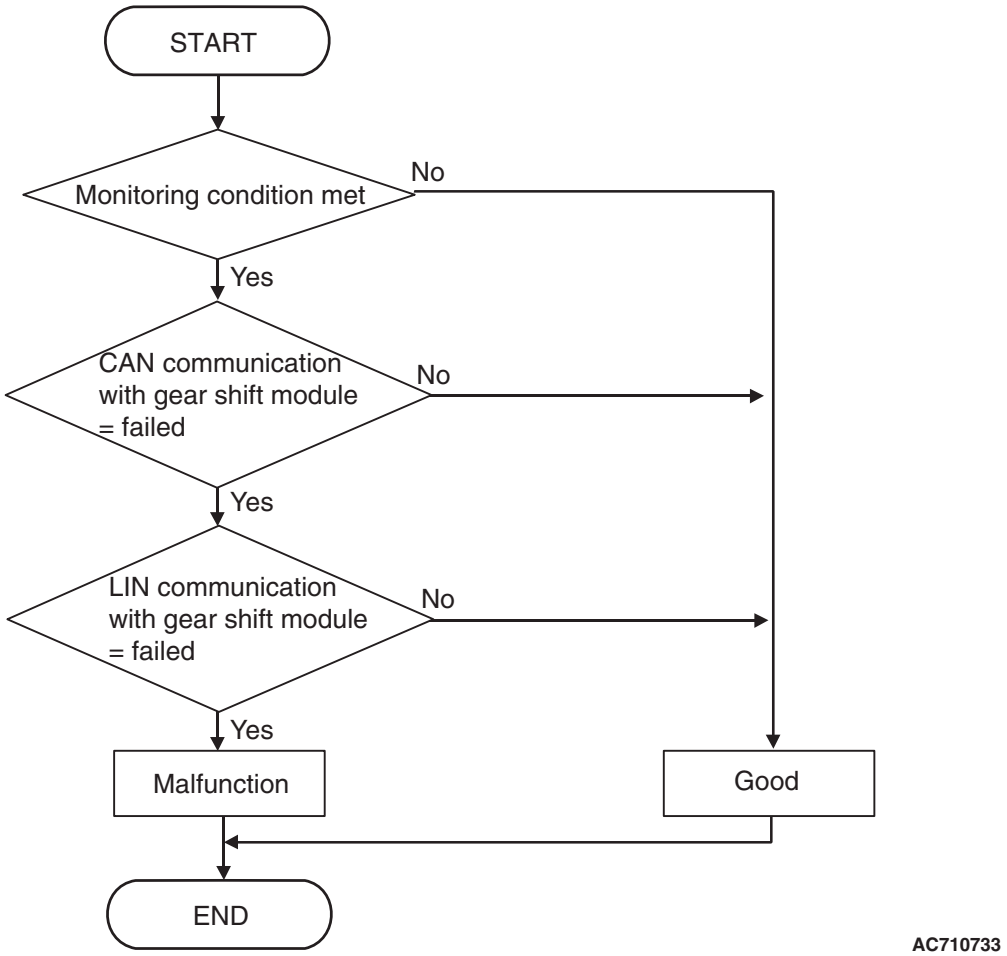
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P185D: Clutch open not possible
- U0001: Bus off
- U0100: Engine time-out error
- P1870: Engine torque signal abnormality
- P1871: APS system (Signal abnormality)
- P1872: Between shift lever and TC-SST system (Q-A function abnormality)

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch 2 pressure sensor
- APS
- Shift lever-ECU

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after TC-SST-ECU start: 5 seconds or more.

JUDGMENT CRITERIA

- LIN communication with shift lever-ECU: Fail, and CAN communication with shift lever-ECU: Fail (Immediately).

OBD-II DRIVE CYCLE PATTERN

Receives LIN and CAN signal from shift lever-ECU.

PROBABLE CAUSES

- Malfunction of the shift lever-ECU
- Malfunction of the LIN bus
- The CAN bus line is defective.
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Scan tool diagnostic trouble code
Check the shift lever diagnostic trouble code. (Refer to P.22C-302.)

Q: Is the DTC set?

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

STEP 3. Inspection of the TC-SST-ECU connector, intermediate connector, and shift lever-ECU connector: B-107, A-13, C-27
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 4. Check the wiring harness between B-107 TC-SST-ECU connector terminal No. 17 and C-27 shift lever-ECU connector terminal No. 16.
Check the communication line for open or short circuit.

Q: Is the check result normal?

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

STEP 5. Replace the shift lever assembly, and check if the diagnostic trouble code is reset.
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Check the DTC.

Q: Is DTC No. P1803 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1804: Shift Fork Position Sensor 1 and 2 System (Power supply voltage low range out)

⚠ 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 FUNCTION
TC-SST-ECU checks that the supply voltage to the shift fork position sensor 1 and 2 is normal.

DESCRIPTIONS OF MONITOR METHODS
The supply voltage to the shift fork position sensor 1 and 2 is too low.

MONITOR EXECUTION
- Continuous

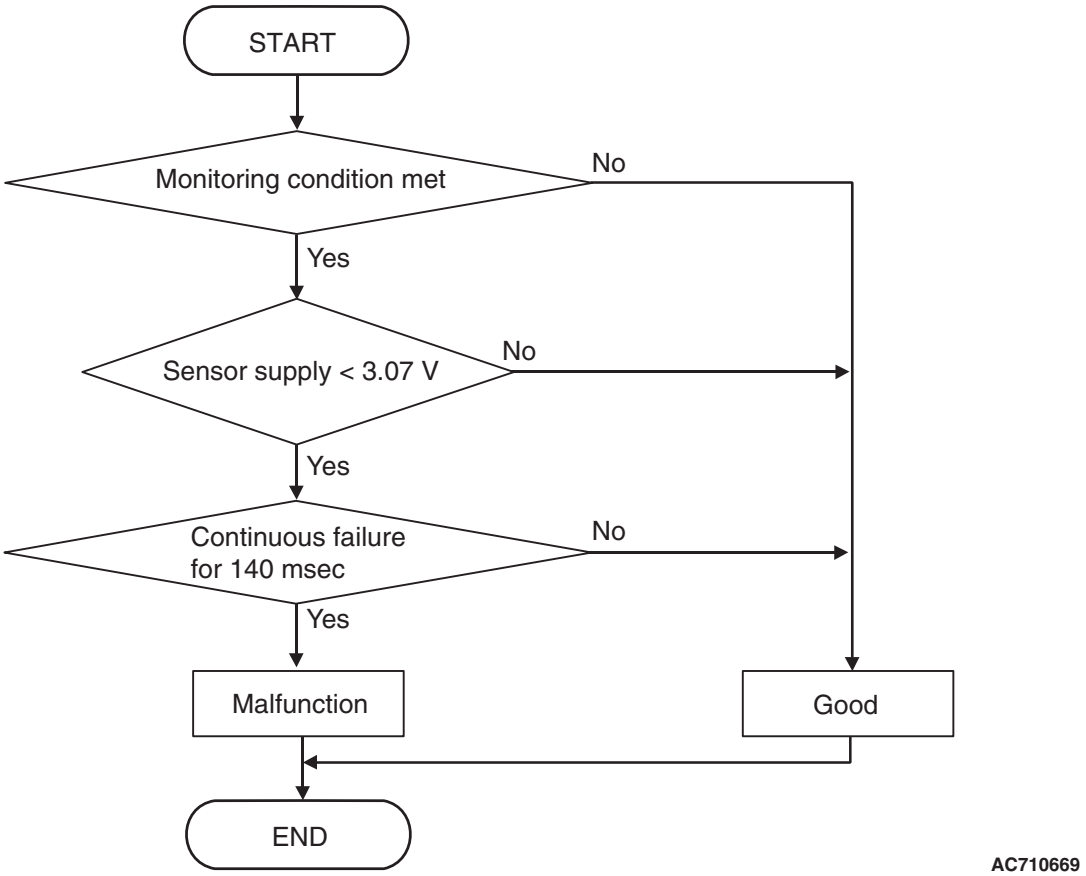
MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P1820: Shift fork position sensor 1 system (Voltage low range out)
- P1821: Shift fork position sensor 1 system (Voltage high range out)
- P1822: Shift fork position sensor 1 system (Output range out)

TSB Revision

- P1824: Shift fork position sensor 1 system (Poor performance)
- P1825: Shift fork position sensor 2 system (Voltage low range out)
- P1826: Shift fork position sensor 2 system (Voltage high range out)
- P1827: Shift fork position sensor 2 system (Output range out)
- P1829: Shift fork position sensor 2 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)
- Shift fork position sensor 1
- Shift fork position sensor 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA
- Supply voltage: 3.07 V or less. (140 millisecond)

OBD-II DRIVE CYCLE PATTERN

The supply voltage remains 3.07 V or more for 140 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

TSB Revision

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1804 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1805: Shift Fork Position Sensor 1 and 2 System (Power supply voltage high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the supply voltage to the shift fork position sensor 1 and 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply voltage to the shift fork position sensor 1 and 2 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

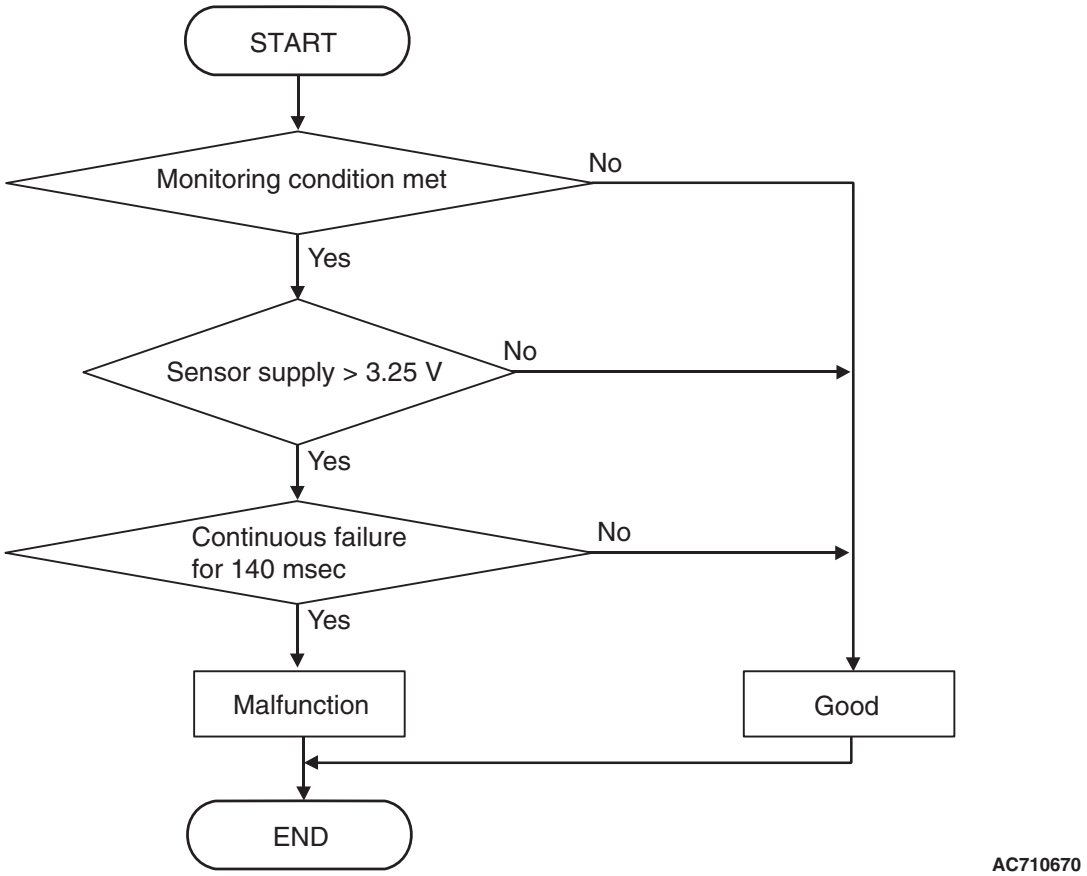
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1820: Shift fork position sensor 1 system (Voltage low range out)
- P1821: Shift fork position sensor 1 system (Voltage high range out)
- P1822: Shift fork position sensor 1 system (Output range out)
- P1824: Shift fork position sensor 1 system (Poor performance)
- P1825: Shift fork position sensor 2 system (Voltage low range out)
- P1826: Shift fork position sensor 2 system (Voltage high range out)
- P1827: Shift fork position sensor 2 system (Output range out)
- P1829: Shift fork position sensor 2 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Shift fork position sensor 1
- Shift fork position sensor 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Supply voltage: 3.25 V or more. (140 millisecond)

OBD-II DRIVE CYCLE PATTERN

The supply voltage remains 3.25 V or less for 140 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1805 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1806: Shift Fork Position Sensor 3 and 4 System (Power supply voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the supply voltage to the shift fork position sensor 3 and 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply voltage to the shift fork position sensor 3 and 4 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

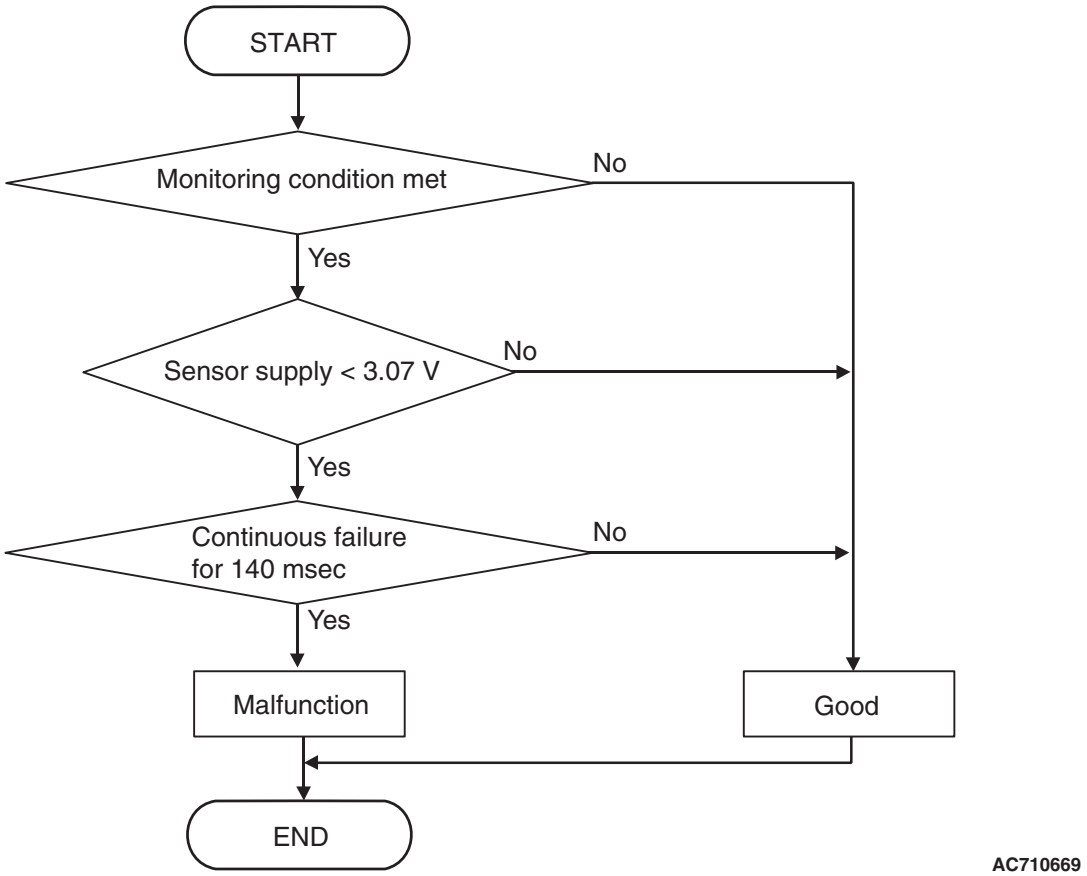
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182A: Shift fork position sensor 3 system (Voltage low range out)
- P182B: Shift fork position sensor 3 system (Voltage high range out)
- P182C: Shift fork position sensor 3 system (Output range out)
- P182E: Shift fork position sensor 3 system (Poor performance)
- P1831: Shift fork position sensor 4 system (Voltage low range out)
- P1832: Shift fork position sensor 4 system (Voltage high range out)
- P1833: Shift fork position sensor 4 system (Output range out)
- P1835: Shift fork position sensor 4 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Shift fork position sensor 3
- Shift fork position sensor 4

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Supply voltage: 3.07 V or less. (140 millisecond)

OBD-II DRIVE CYCLE PATTERN

The supply voltage remains 3.07 V or more for 140 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1806 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1807: Shift Fork Position Sensor 3 and 4 System (Power supply voltage high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the supply voltage to the shift fork position sensor 3 and 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply voltage to the shift fork position sensor 3 and 4 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

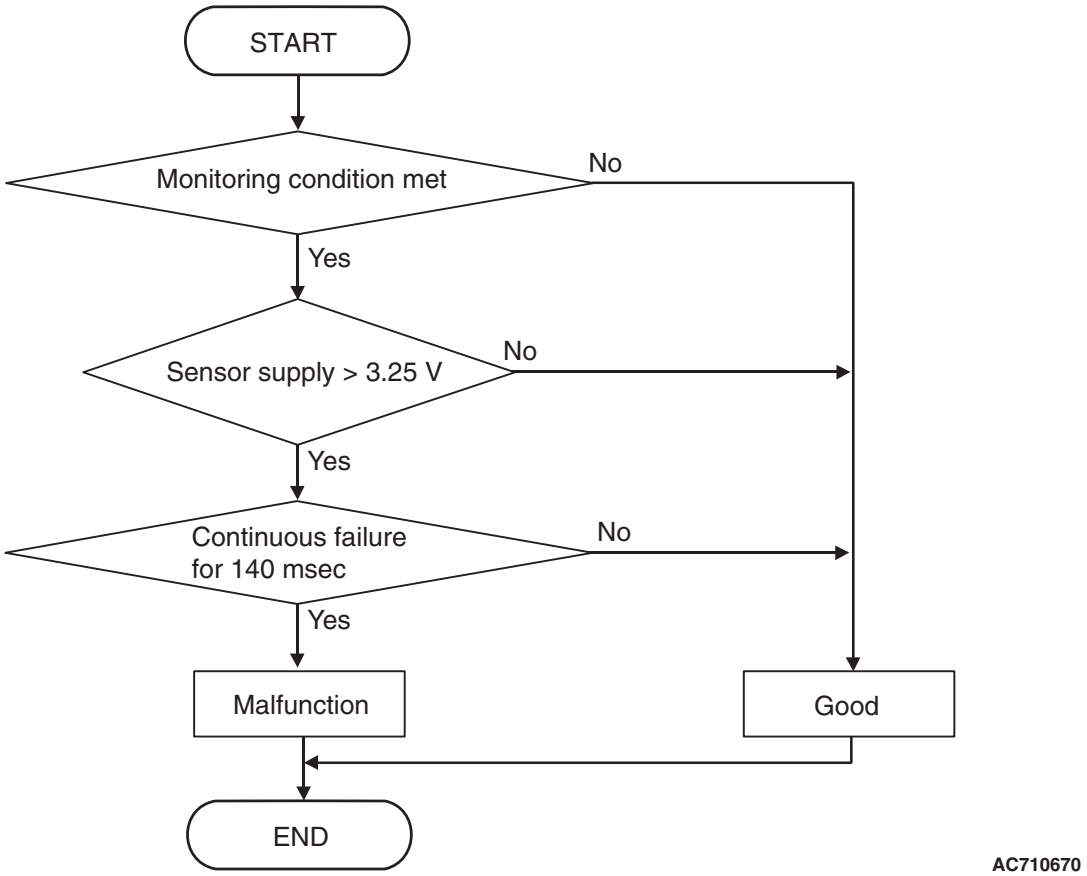
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182A: Shift fork position sensor 3 system (Voltage low range out)
- P182B: Shift fork position sensor 3 system (Voltage high range out)
- P182C: Shift fork position sensor 3 system (Output range out)
- P182E: Shift fork position sensor 3 system (Poor performance)
- P1831: Shift fork position sensor 4 system (Voltage low range out)
- P1832: Shift fork position sensor 4 system (Voltage high range out)
- P1833: Shift fork position sensor 4 system (Output range out)
- P1835: Shift fork position sensor 4 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Shift fork position sensor 3
- Shift fork position sensor 4

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Supply voltage: 3.25 V or more. (140 millisecond)

OBD-II DRIVE CYCLE PATTERN

The supply voltage remains 3.25 V or less for 140 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1807 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation 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.**

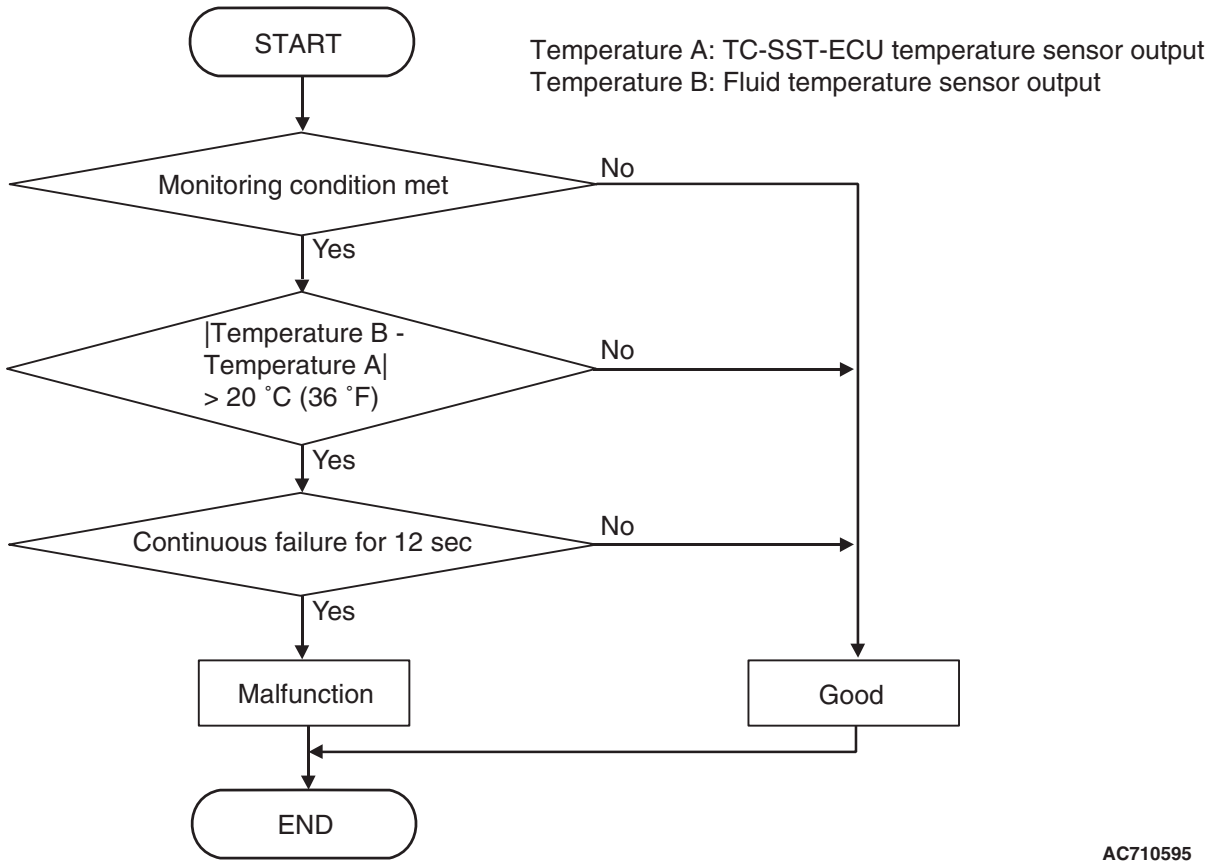
DIAGNOSTIC FUNCTION
TC-SST-ECU checks that the temperature sensor and the fluid temperature sensor are normal.

DESCRIPTIONS OF MONITOR METHODS
The difference of the output between the ECU temperature sensor and fluid temperature sensor is large.

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
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA
- Calculated temperature ("Temperature B: Fluid temperature sensor output" –"Temperature A: TC-SST-ECU temperature sensor output"): 20° C (36° F) or more. (12 seconds)

TSB Revision

OBD-II DRIVE CYCLE PATTERN

The difference of the calculated temperature is 20° C (36° F) or less.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1808 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P180C: Clutch pressure cut spool sticking

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch pressure cut spool is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch pressure cut spool is determined to be seized.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P180C set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P181B: Clutch 1 (Pressure low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 1 pressure is normal.

DESCRIPTIONS OF MONITOR METHODS

The pressure of the clutch 1 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

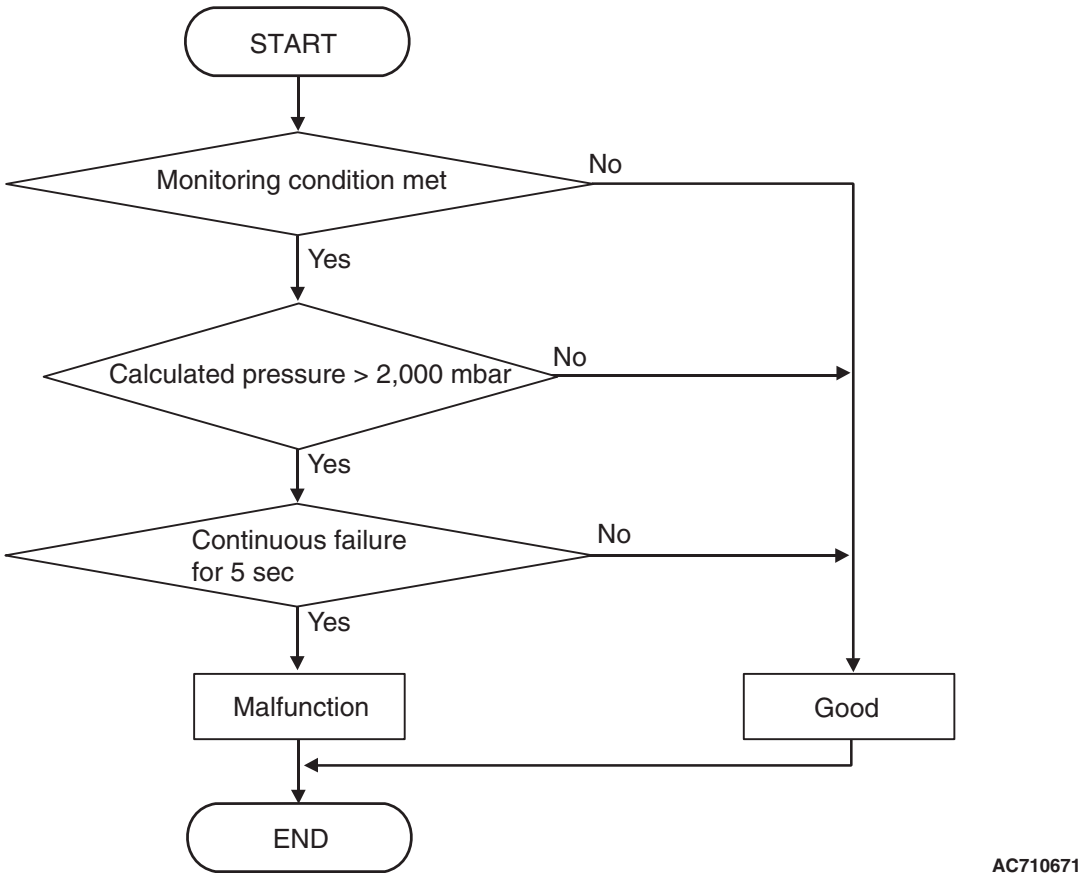
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

TSB Revision

- Clutch 1 (odd) state: Slip or engaged.
- Clutch/shift pressure solenoid 1: Not OFF or not in valve cleaning mode.

JUDGMENT CRITERIA

- Calculated pressure: 2,000 mbar or more. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The calculated pressure remains 2,000 mbar or less for 5 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P181B set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P181C: Clutch 1 (Pressure high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 1 pressure is normal.

DESCRIPTIONS OF MONITOR METHODS

The pressure of the clutch 1 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

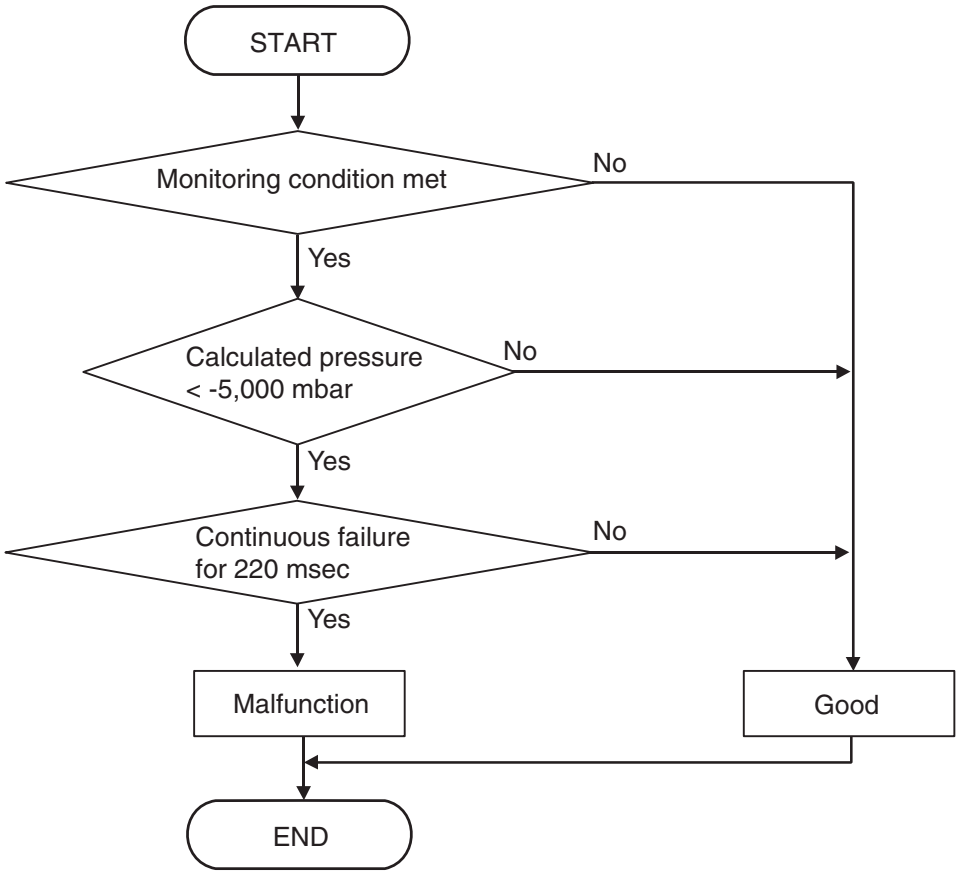
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor

LOGIC FLOW CHARTS (Monitor Sequence) <Target clutch 1 (odd) pressure: 3,000 mbar or more>



DTC SET CONDITIONS <TARGET CLUTCH 1 (ODD) PRESSURE: 3,000 MBAR OR MORE>

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 1 (odd) state: Slip or engaged.
- Target clutch 1 (odd) pressure: 3,000 mbar or more.

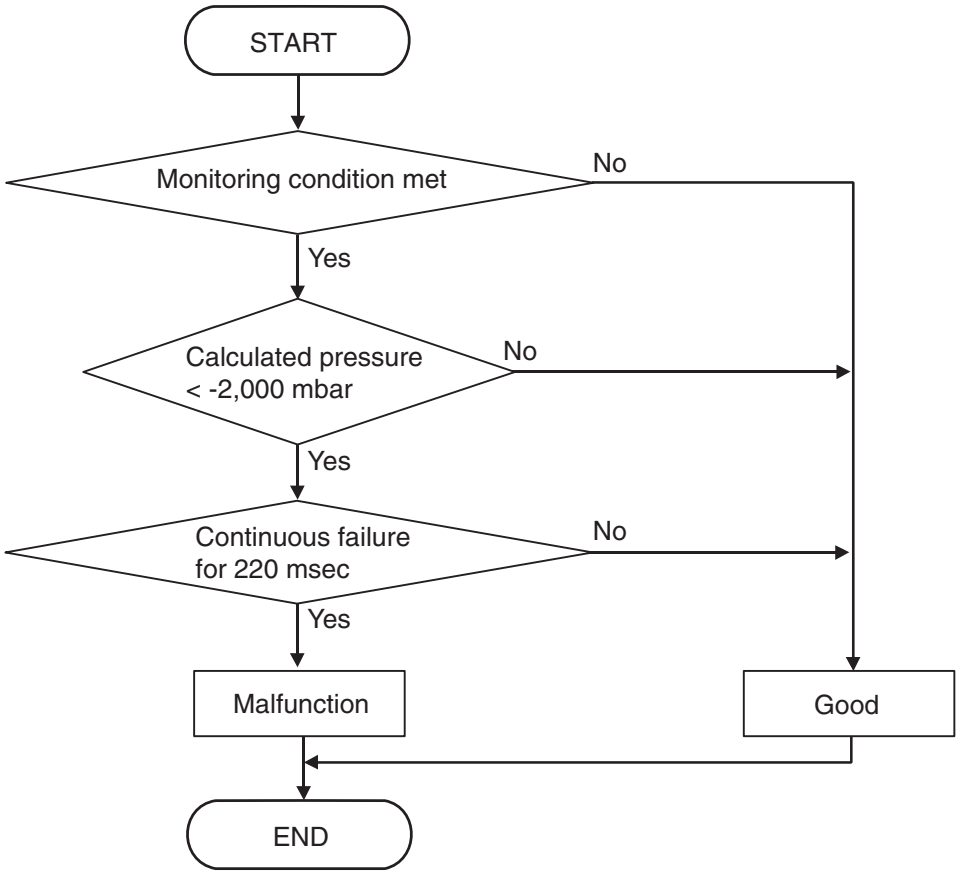
JUDGMENT CRITERIA

- Calculated pressure: −5,000 mbar or less. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN <TARGET CLUTCH 1 (ODD) PRESSURE: 3,000 MBAR OR MORE>

The calculated pressure remains −5,000 mbar or more for 220 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Target clutch 1 (odd) pressure: 1,400 mbar or more to 3,000 mbar or less>



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DTC SET CONDITIONS <TARGET CLUTCH 1 (ODD) PRESSURE: 1,400 MBAR OR MORE TO 3,000 MBAR OR LESS>

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 1 (odd) state: Slip or engaged.
- Target clutch 1 (odd) pressure: 1,400 mbar or more.

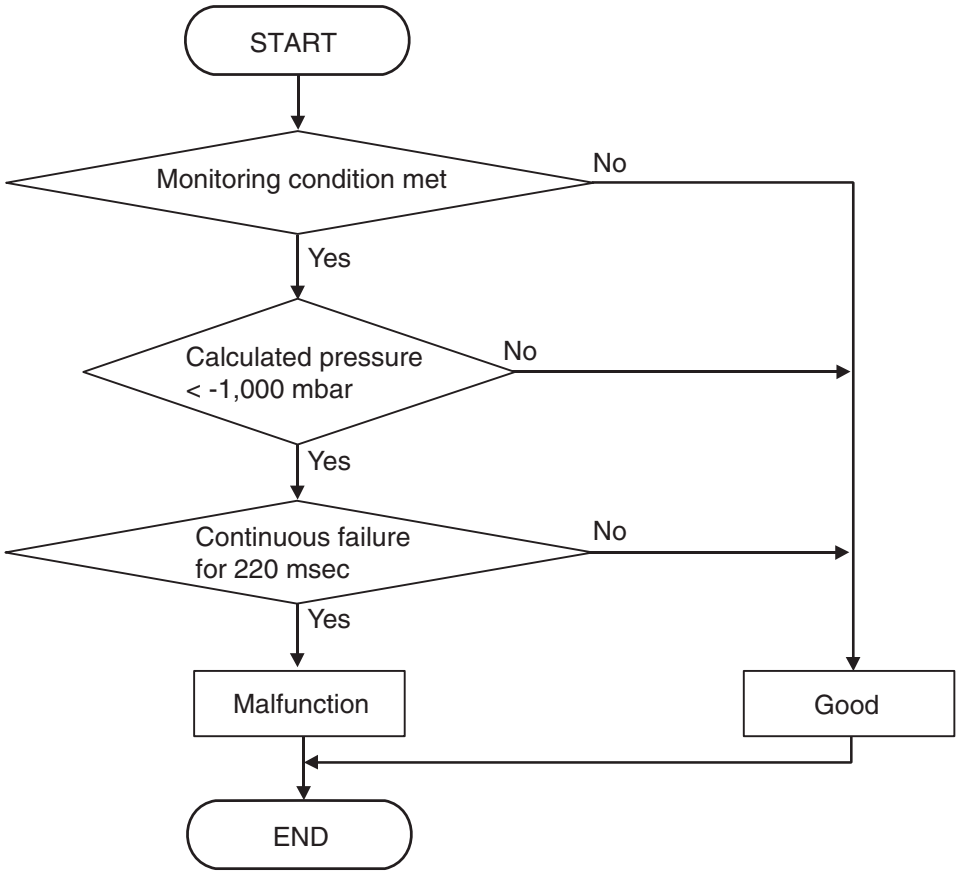
JUDGMENT CRITERIA

- Calculated pressure: −2,000 mbar or less. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN <TARGET CLUTCH 1 (ODD) PRESSURE: 1,400 MBAR OR MORE TO 3,000 MBAR OR LESS>

The calculated pressure remains −2,000 mbar or more for 220 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Target clutch 1 (odd) pressure: 1,400 mbar or less>



DTC SET CONDITIONS <TARGET CLUTCH 1 (ODD) PRESSURE: 1,400 MBAR OR LESS>

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 1 (odd) state: Slip or engaged.
- Target clutch 1 (odd) pressure: 1,400 mbar or less.

JUDGMENT CRITERIA

- Calculated pressure: −1,000 mbar or less. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN <TARGET CLUTCH 1 (ODD) PRESSURE: 1,400 MBAR OR LESS>

The clutch 1 (odd) pressure remains −1,000 mbar or more for 220 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P181C set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P181E: Clutch 2 (Pressure low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 2 pressure is normal.

DESCRIPTIONS OF MONITOR METHODS

The pressure of the clutch 2 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

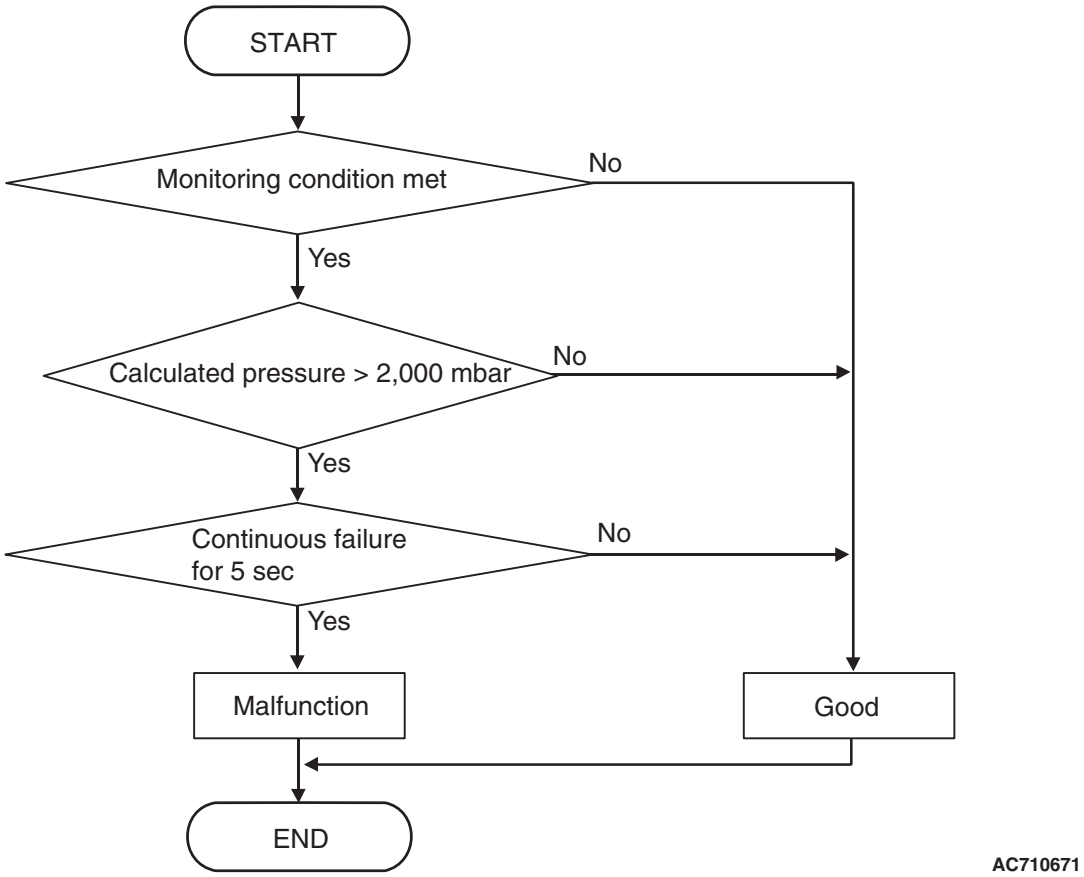
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 2 (even) state: Slip or engaged.
- Clutch/shift pressure solenoid 2: Not OFF or not in valve cleaning mode.

JUDGMENT CRITERIA

- Calculated pressure: 2,000 mbar or more. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The calculated pressure remains 2,000 mbar or less for 5 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P181E set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P181F: Clutch 2 (Pressure high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch 2 pressure is normal.

DESCRIPTIONS OF MONITOR METHODS

The pressure of the clutch 2 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

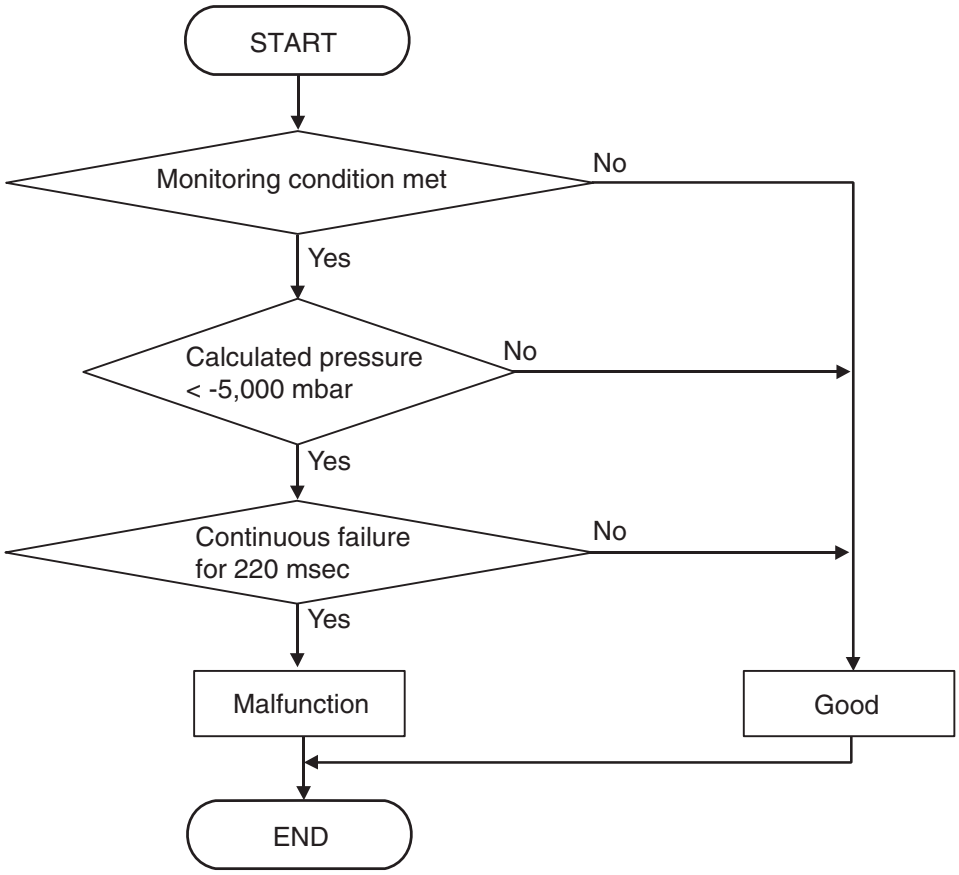
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor

LOGIC FLOW CHARTS (Monitor Sequence)
<Target clutch 2 (even) pressure: 3,000 mbar or more>



DTC SET CONDITIONS <TARGET CLUTCH 2 (EVEN) PRESSURE: 3,000 MBAR OR MORE>

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 2 (even) state: Slip or engaged.
- Target clutch 2 (even) pressure: 3,000 mbar or more.

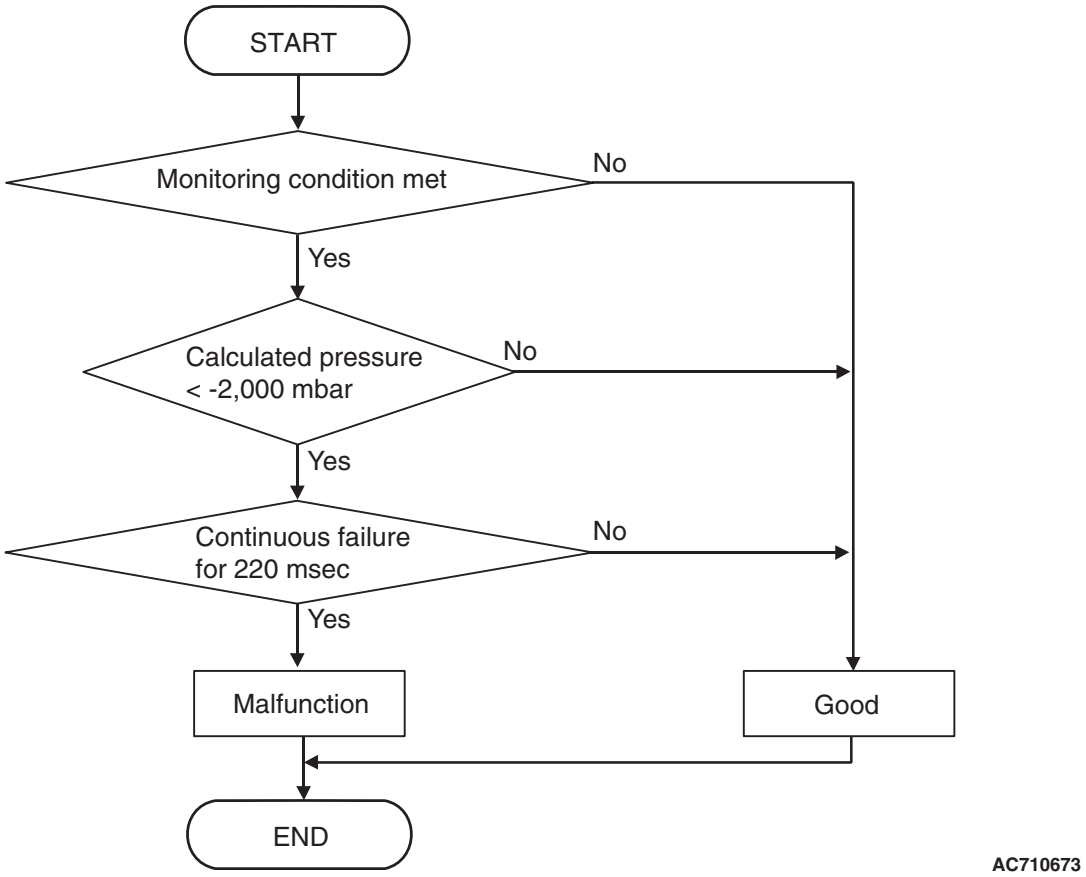
JUDGMENT CRITERIA

- Calculated pressure: −5,000 mbar or less. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN <TARGET CLUTCH 2 (EVEN) PRESSURE: 3,000 MBAR OR MORE>

The calculated pressure remains −5,000 mbar or more for 220 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Target clutch 2 (even) pressure: 1,400 mbar or more to 3,000 mbar or less>



DTC SET CONDITIONS <TARGET CLUTCH 2 (EVEN) PRESSURE: 1,400 MBAR OR MORE TO 3,000 MBAR OR LESS>

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 2 (even) state: Slip or engaged.
- Target clutch 2 (even) pressure: 1,400 mbar or more.

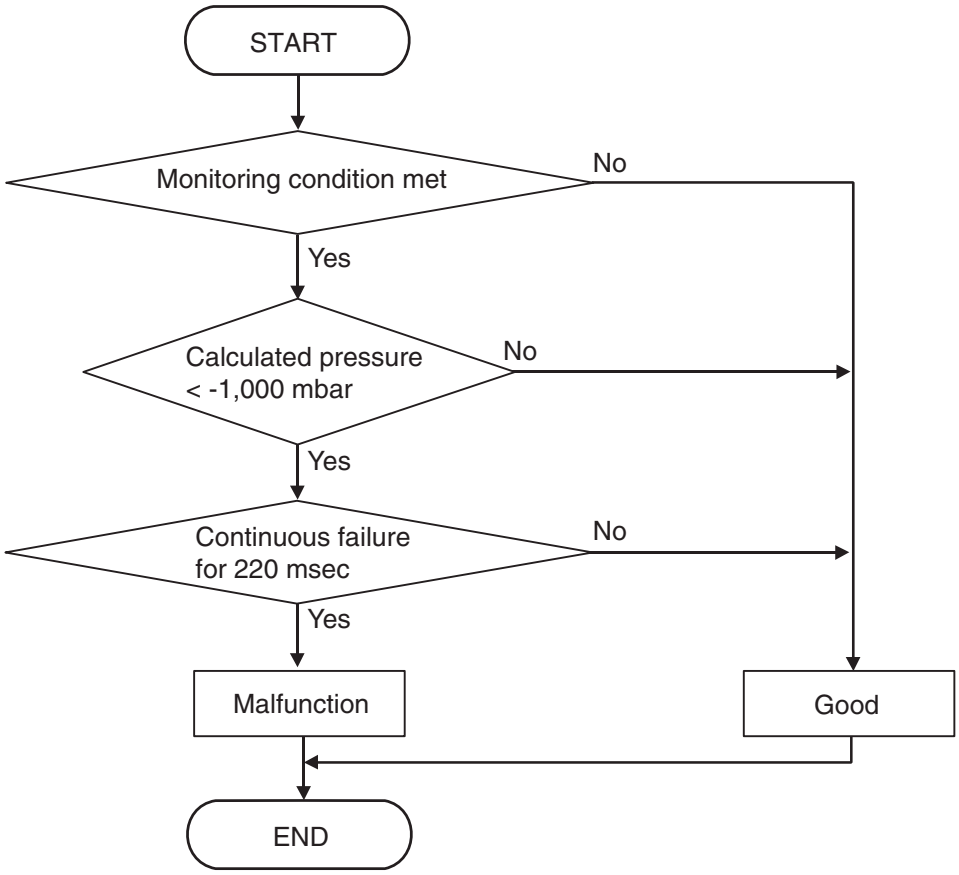
JUDGMENT CRITERIA

- Calculated pressure: −2,000 mbar or less. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN <TARGET CLUTCH 1 (ODD) PRESSURE: 1,400 MBAR OR MORE TO 3,000 MBAR OR LESS>

The calculated pressure remains −2,000 mbar or more for 220 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Target clutch 2 (even) pressure: 1,400 mbar or less>



DTC SET CONDITIONS <TARGET CLUTCH 2 (EVEN) PRESSURE: 1,400 MBAR OR LESS>

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 2 (even) state: Slip or engaged.
- Target clutch 2 (even) pressure: 1,400 mbar or less.

JUDGMENT CRITERIA

- Calculated pressure: −1,000 mbar or less. (220 millisecond)

OBD-II DRIVE CYCLE PATTERN <TARGET CLUTCH 2 (EVEN) PRESSURE: 1,400 MBAR OR LESS>

The clutch 2 (even) pressure remains −1,000 mbar or more for 220 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P181F set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1820: Shift Fork Position Sensor 1 System (Voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 1 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

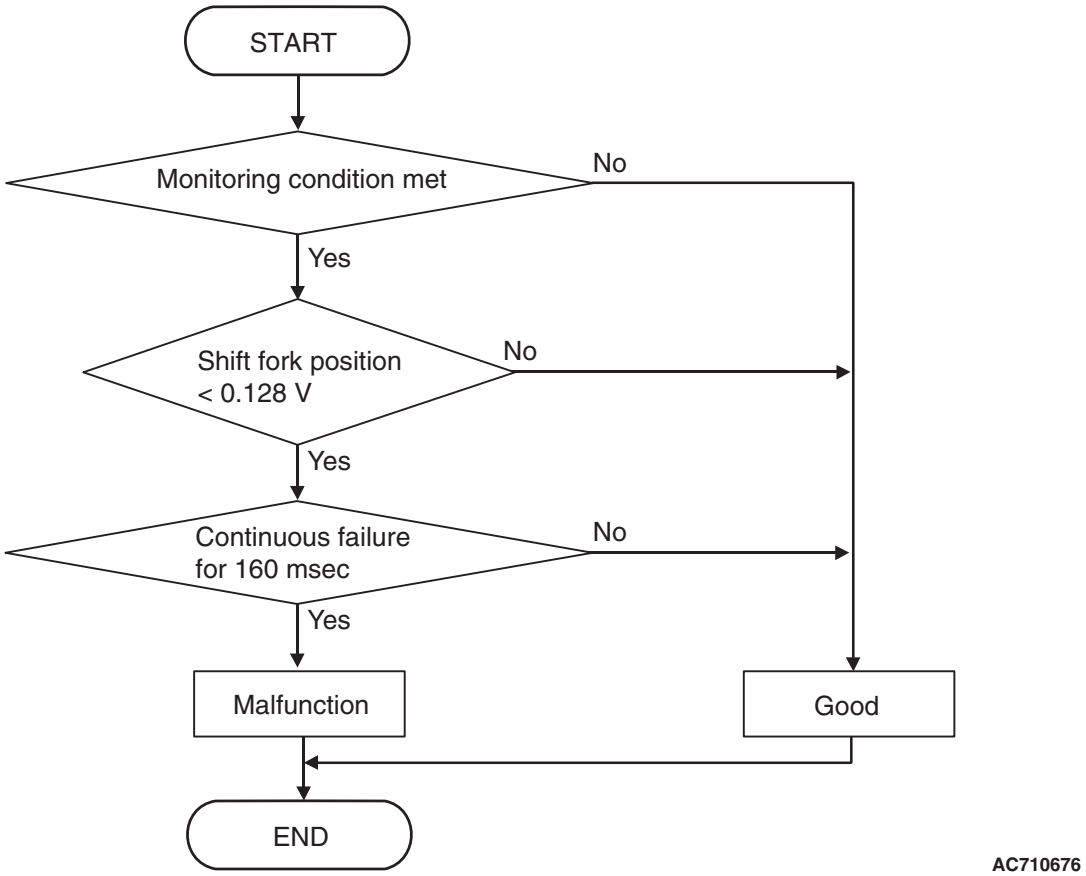
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1821: Shift fork position sensor 1 system (Voltage high range out)
- P1822: Shift fork position sensor 1 system (Output range out)
- P1823: Shift fork position sensor 1 system (Neutral)
- P1824: Shift fork position sensor 1 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 0.128 V or less. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 0.128 V or more for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1820 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1821: Shift Fork Position Sensor 1 System (Voltage high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 1 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

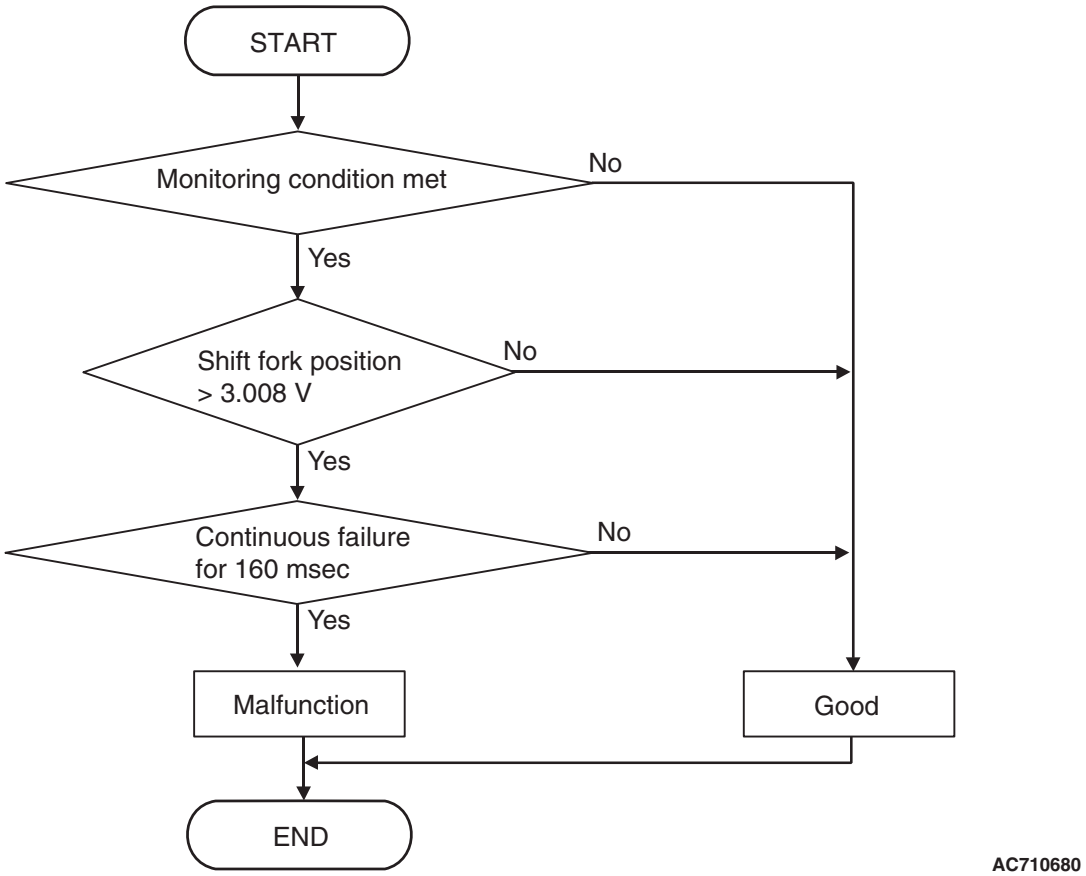
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1820: Shift fork position sensor 1 system (Voltage low range out)
- P1822: Shift fork position sensor 1 system (Output range out)
- P1823: Shift fork position sensor 1 system (Neutral)
- P1824: Shift fork position sensor 1 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 3.008 V or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 3.008 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1821 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1822: Shift Fork Position Sensor 1 System (Output range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the shift fork position sensor 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the shift fork position sensor 1 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

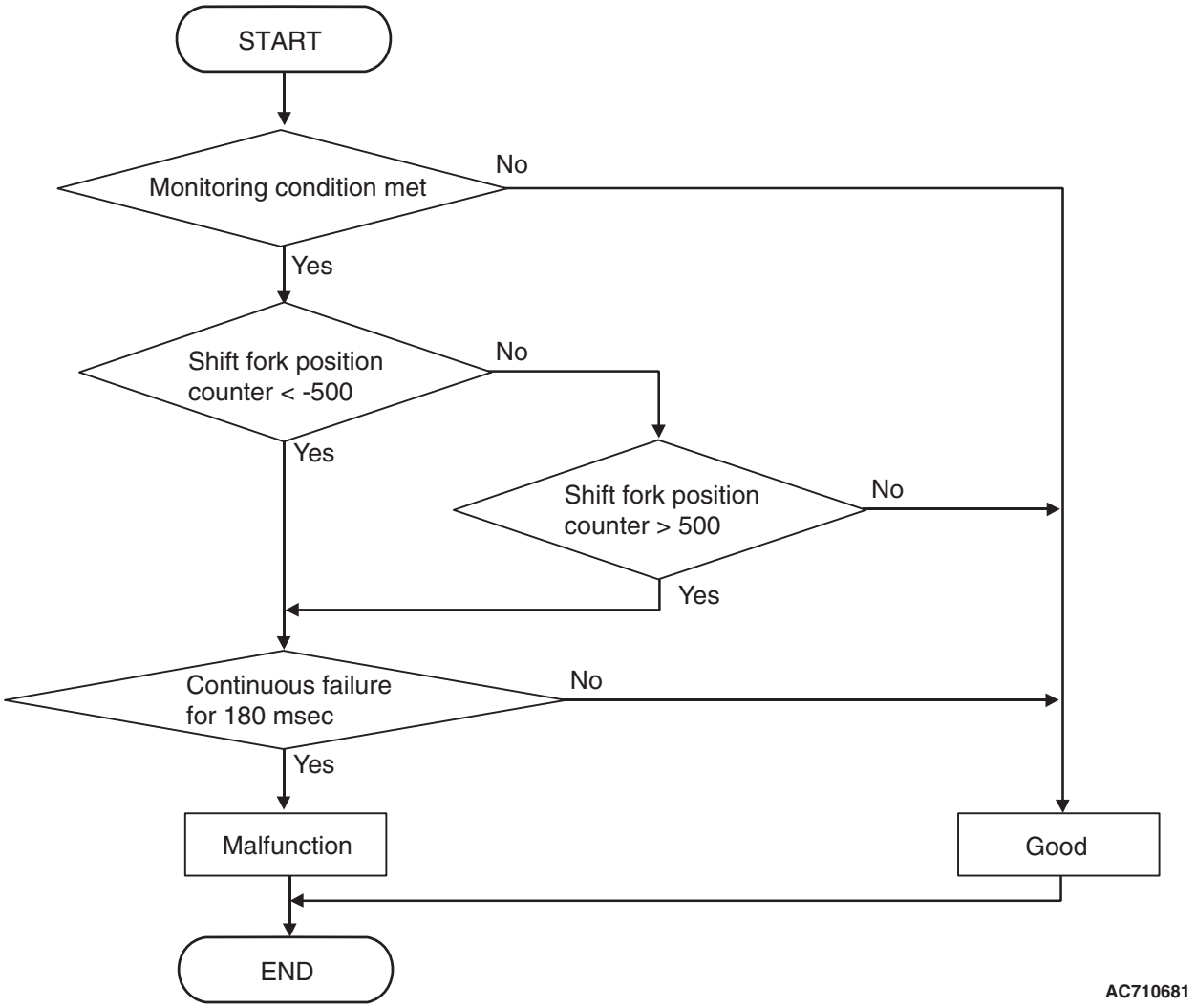
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1820: Shift fork position sensor 1 system (Voltage low range out)
- P1821: Shift fork position sensor 1 system (Voltage high range out)
- P1823: Shift fork position sensor 1 system (Neutral)
- P1824: Shift fork position sensor 1 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift system status: Gear change mode (during shift fork moving).

JUDGMENT CRITERIA

- Shift fork 1 position counter (digitized sensor value): −500 counts or less, or shift fork 1 position counter (digitized sensor value): 500 counts or more. (180 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the shift fork 1 position counter (digitized sensor value) −500 counts or more, or with the shift fork 1 position counter (digitized sensor value) 500 counts or less continues for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1822 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1823: Shift Fork Position Sensor 1 System (Neutral)

⚠ 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 FUNCTION
TC-SST-ECU checks that the shift fork position sensor 1 is normal.

DESCRIPTIONS OF MONITOR METHODS
The shift fork position sensor 1 is determined to be abnormal.

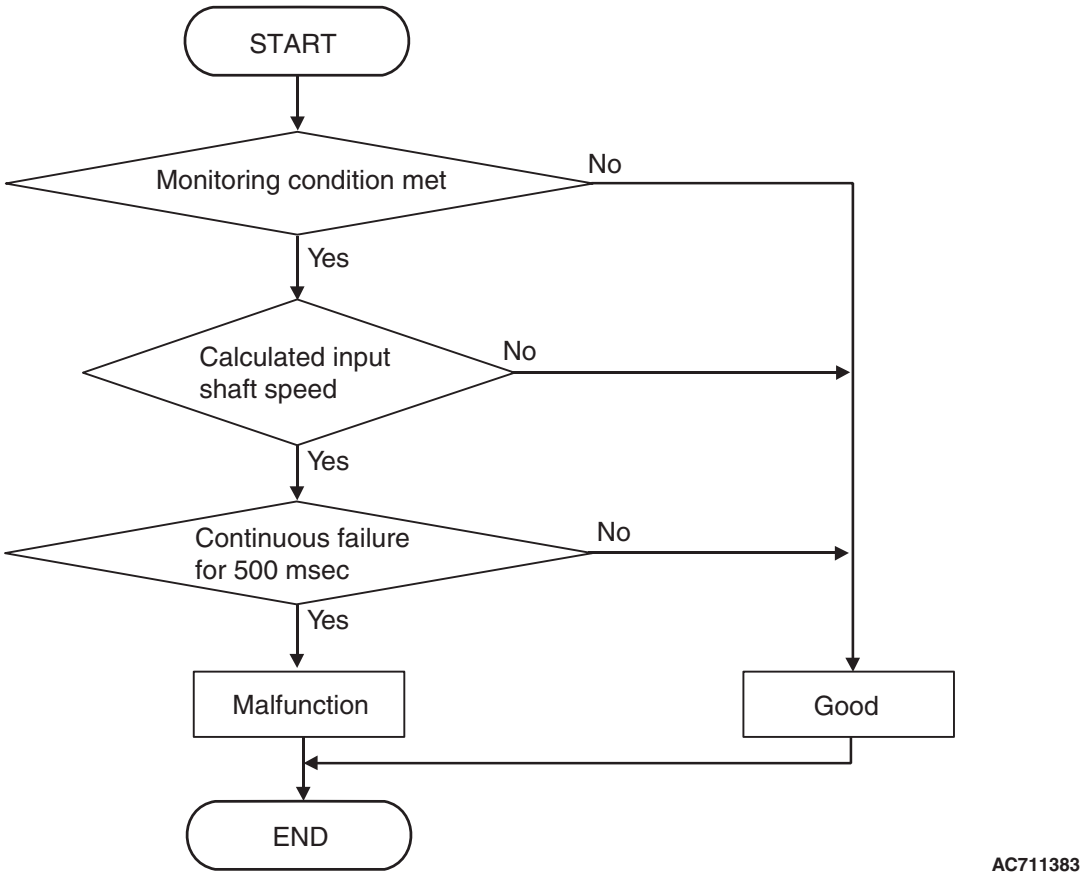
MONITOR EXECUTION
- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P1820: Shift fork position sensor 1 system (Voltage low range out)
- P1821: Shift fork position sensor 1 system (Voltage high range out)
- P1822: Shift fork position sensor 1 system (Output range out)
- P1824: Shift fork position sensor 1 system (Poor performance)
- P1836: Shift fork 1 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

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

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 1 position: Neutral.
- Input shaft 2 (even) gear: Engaged.
- Engine speed –input shaft 2 speed: 50 r/min or less.

JUDGMENT CRITERIA

- Calculated speed: 40 r/min or less. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The calculated speed remains 40 r/min or more for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1823 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1824: Shift Fork Position Sensor 1 System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 1 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

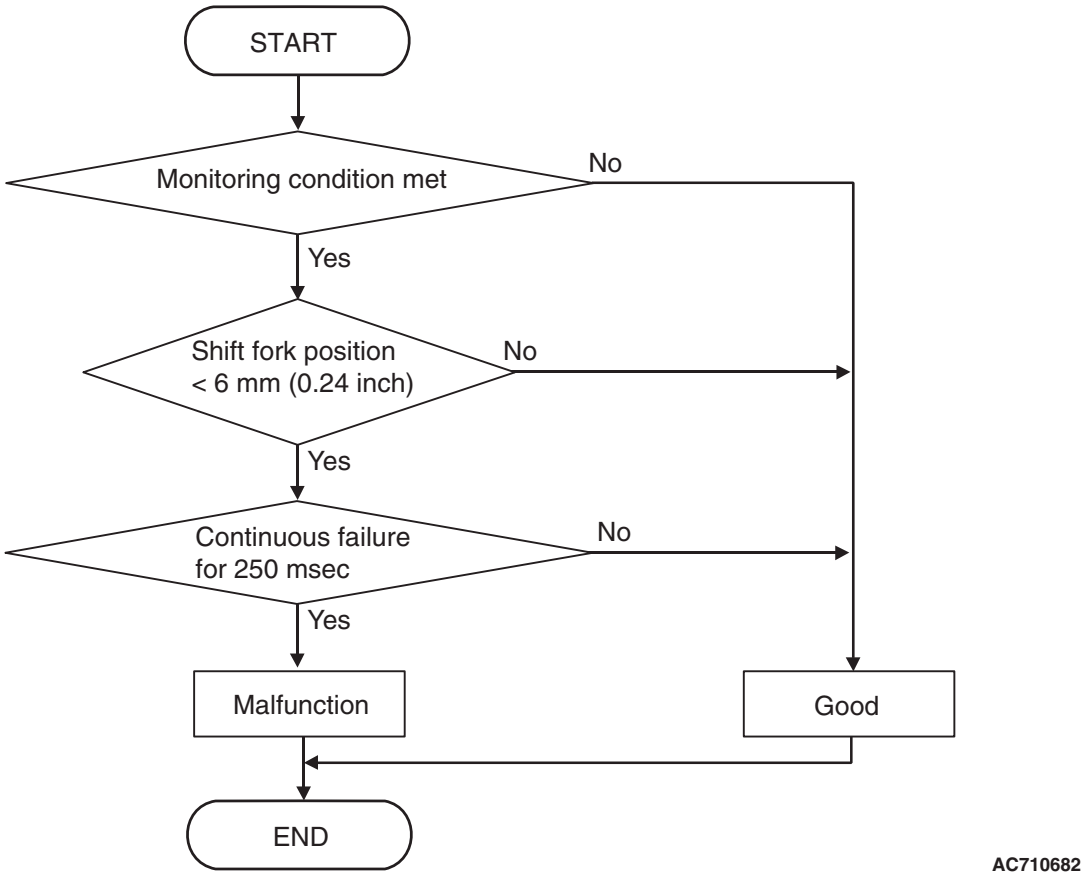
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1820: Shift fork position sensor 1 system (Voltage low range out)
- P1821: Shift fork position sensor 1 system (Voltage high range out)
- P1822: Shift fork position sensor 1 system (Output range out)
- P1823: Shift fork position sensor 1 system (Neutral)
- P1836: Shift fork 1 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Shift fork 1 current gear: 1st gear>



DTC SET CONDITIONS <SHIFT FORK 1 CURRENT GEAR: 1ST GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Shift fork 1 current gear: 1st gear.
- Synchro (1st gear) slip speed: 80 r/min or more.
- Requested shift fork: Not shift fork 1.

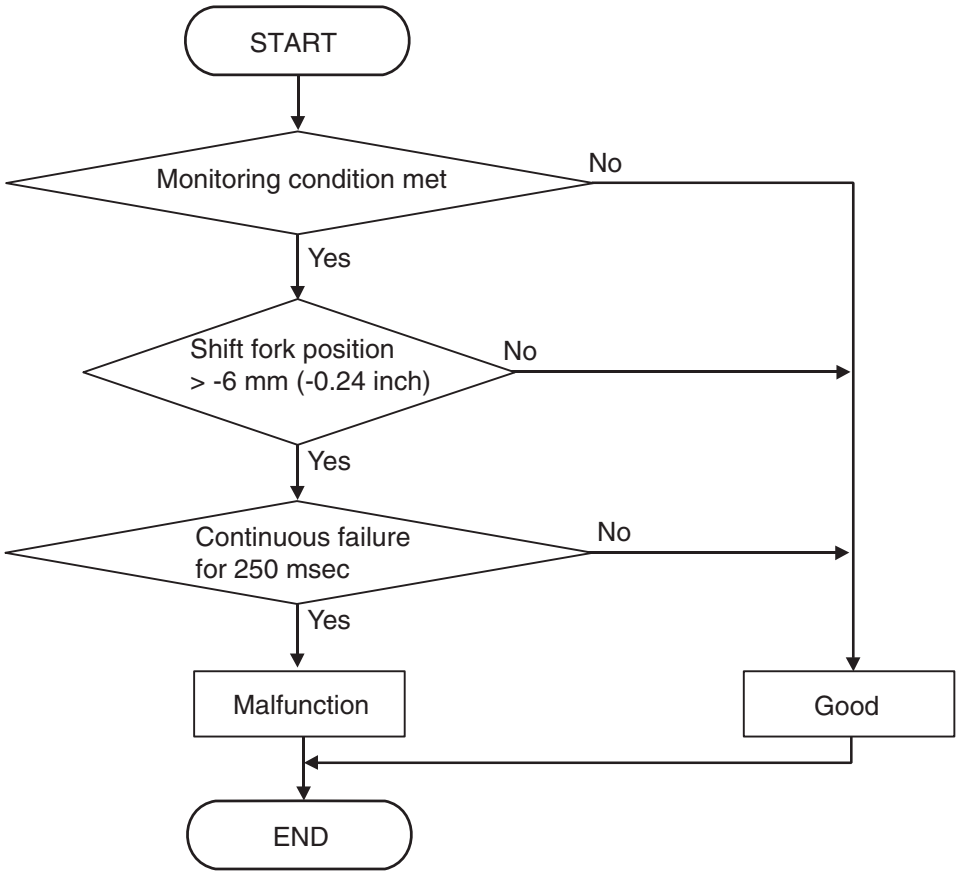
JUDGMENT CRITERIA

- Shift fork 1 position: 6 mm (0.24 inch) or less. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <SHIFT FORK 1 CURRENT GEAR: 1ST GEAR>

The travel distance of the shift fork 1 remains 6 mm (0.24 inch) or more for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Shift fork 1 current gear: Reverse gear>



DTC SET CONDITIONS <SHIFT FORK 1 CURRENT GEAR: REVERSE GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Shift fork 1 current gear: Reverse gear.
- Synchro (reverse gear) slip speed: 80 r/min or more.
- Requested shift fork: Not shift fork 1.

JUDGMENT CRITERIA

- Shift fork 1 position: −6 mm (−0.24 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <SHIFT FORK 1 CURRENT GEAR: REVERSE GEAR>

The travel distance of the shift fork 1 remains −6 mm (−0.24 inch) or less for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1824 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1825: Shift Fork Position Sensor 2 System (Voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 2 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

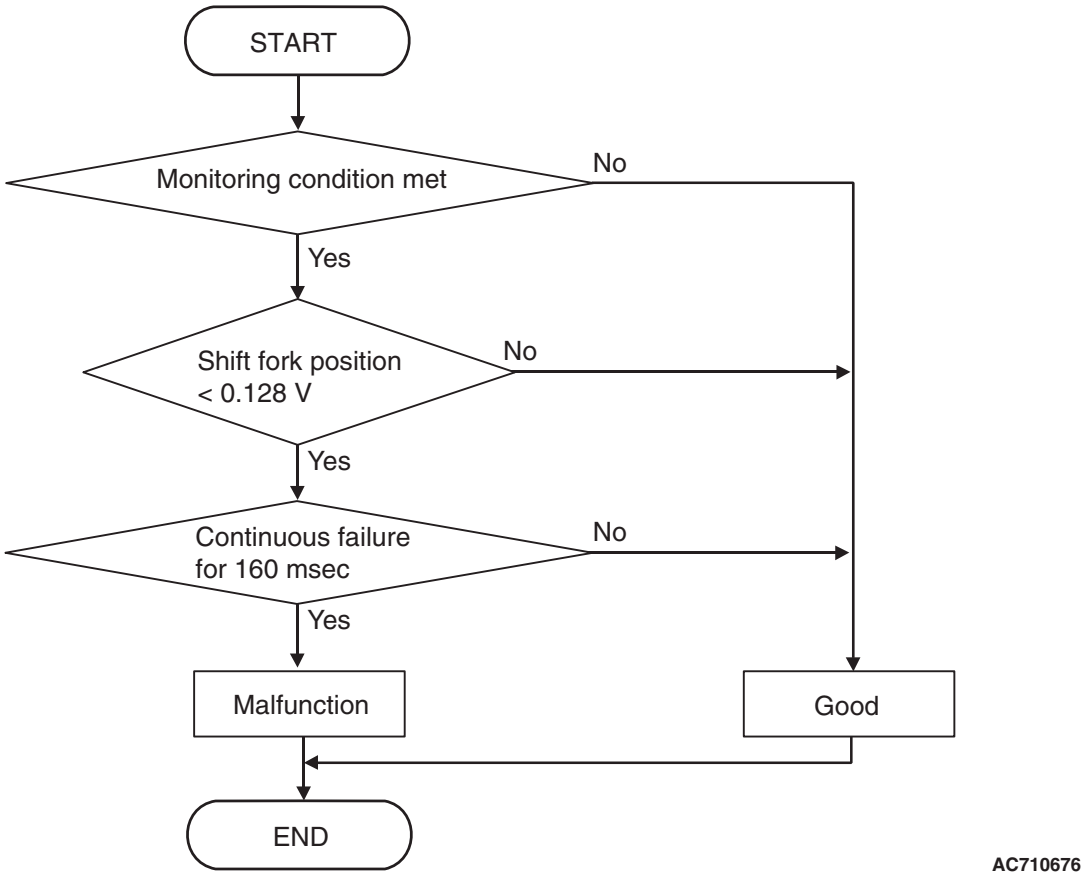
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1826: Shift fork position sensor 2 system (Voltage high range out)
- P1827: Shift fork position sensor 2 system (Output range out)
- P1828: Shift fork position sensor 2 system (Neutral)
- P1829: Shift fork position sensor 2 system (Poor performance)
- P183D: Shift fork 2 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 0.128 V or less. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 0.128 V or more for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1825 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1826: Shift Fork Position Sensor 2 System (Voltage high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 2 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

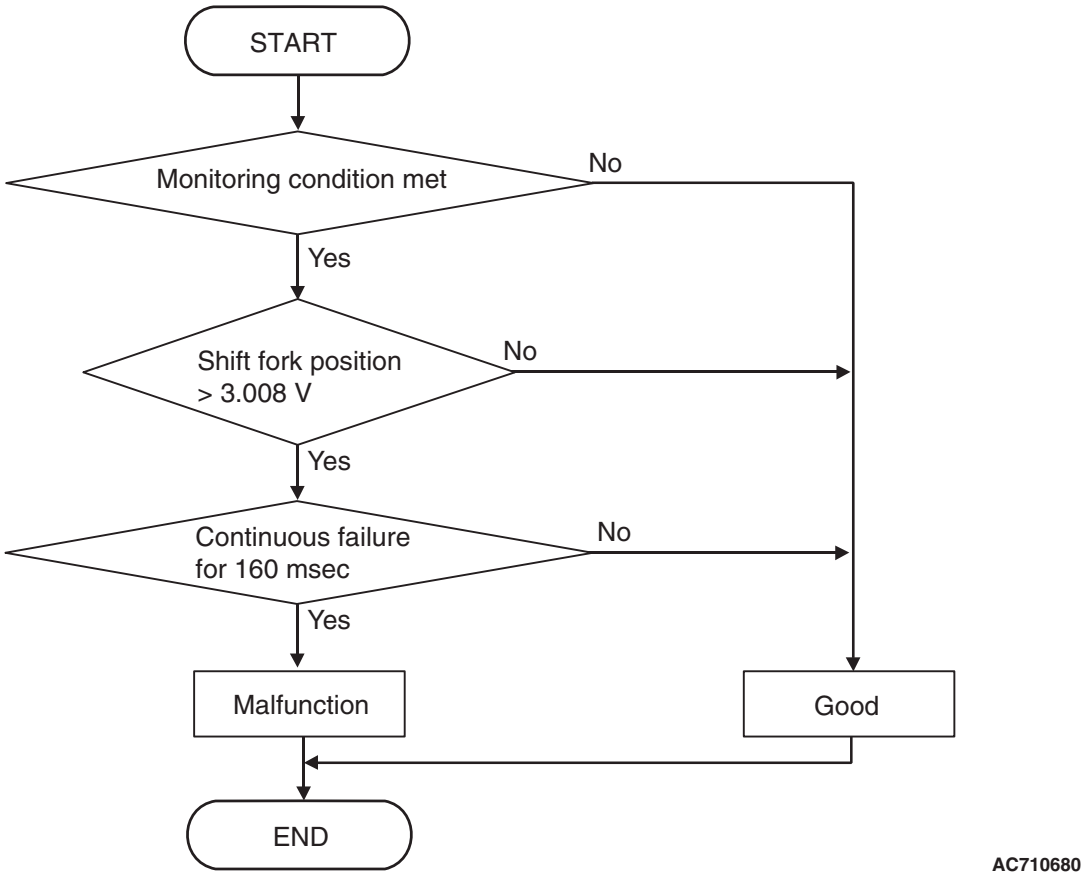
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1825: Shift fork position sensor 2 system (Voltage low range out)
- P1827: Shift fork position sensor 2 system (Output range out)
- P1828: Shift fork position sensor 2 system (Neutral)
- P1829: Shift fork position sensor 2 system (Poor performance)
- P183D: Shift fork 2 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 3.008 V or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 3.008 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1826 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1827: Shift Fork Position Sensor 2 System (Output range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the shift fork position sensor 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the shift fork position sensor 2 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

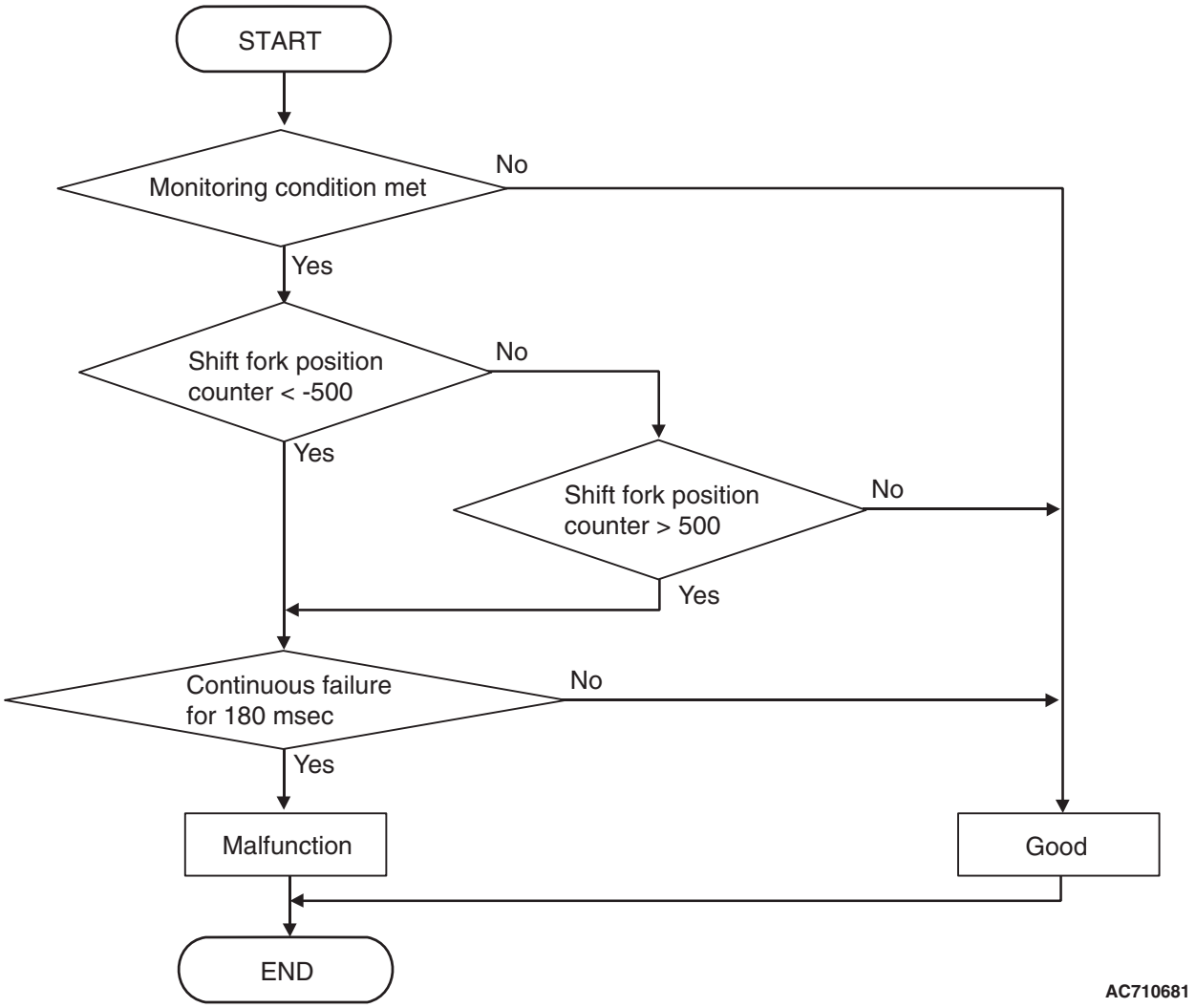
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1825: Shift fork position sensor 2 system (Voltage low range out)
- P1826: Shift fork position sensor 2 system (Voltage high range out)
- P1828: Shift fork position sensor 2 system (Neutral)
- P1829: Shift fork position sensor 2 system (Poor performance)
- P183D: Shift fork 2 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift system status: Gear change mode (during shift fork moving).

JUDGMENT CRITERIA

- Shift fork 2 position counter (digitized sensor value): −500 counts or less, or shift fork 2 position counter (digitized sensor value): 500 counts or more. (180 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the shift fork 2 position counter (digitized sensor value) −500 counts or more, or with the shift fork 2 position counter (digitized sensor value) 500 counts or less continues for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1827 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1828: Shift Fork Position Sensor 2 System (Neutral)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 2 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

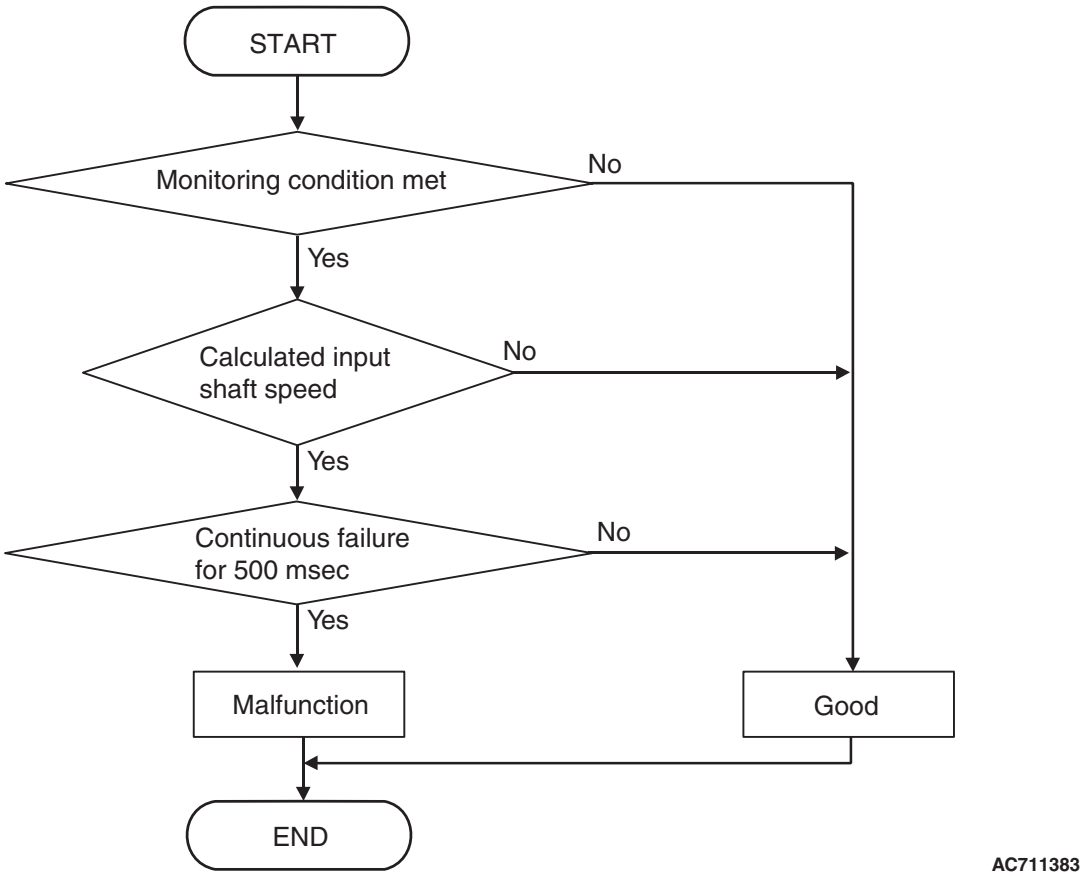
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1825: Shift fork position sensor 2 system (Voltage low range out)
- P1826: Shift fork position sensor 2 system (Voltage high range out)
- P1827: Shift fork position sensor 2 system (Output range out)
- P1829: Shift fork position sensor 2 system (Poor performance)
- P183D: Shift fork 2 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 2 position: Neutral.
- Input shaft 2 (even) gear: Engaged.
- Engine speed –input shaft 2 speed: 50 r/min or less.

JUDGMENT CRITERIA

- Calculated speed: 40 r/min or less. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The calculated speed remains 40 r/min or more for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1828 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1829: Shift Fork Position Sensor 2 System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 2 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

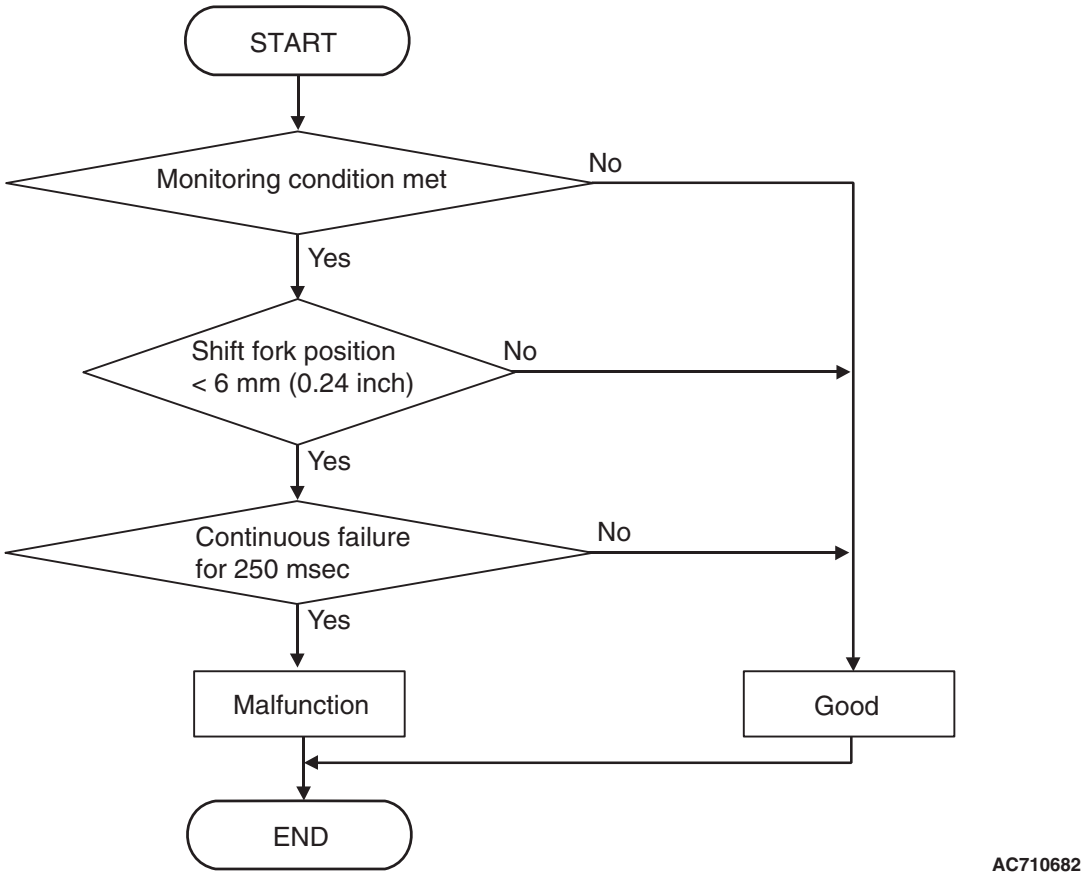
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1825: Shift fork position sensor 2 system (Voltage low range out)
- P1826: Shift fork position sensor 2 system (Voltage high range out)
- P1827: Shift fork position sensor 2 system (Output range out)
- P1828: Shift fork position sensor 2 system (Neutral)
- P183D: Shift fork 2 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1857: Odd number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Shift fork 2 current gear: 5th gear>



DTC SET CONDITIONS <SHIFT FORK 2 CURRENT GEAR: 5TH GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Shift fork 2 current gear: 5th gear.
- Synchro (5th gear) slip speed: 80 r/min or more.
- Requested shift fork: Not shift fork 2.

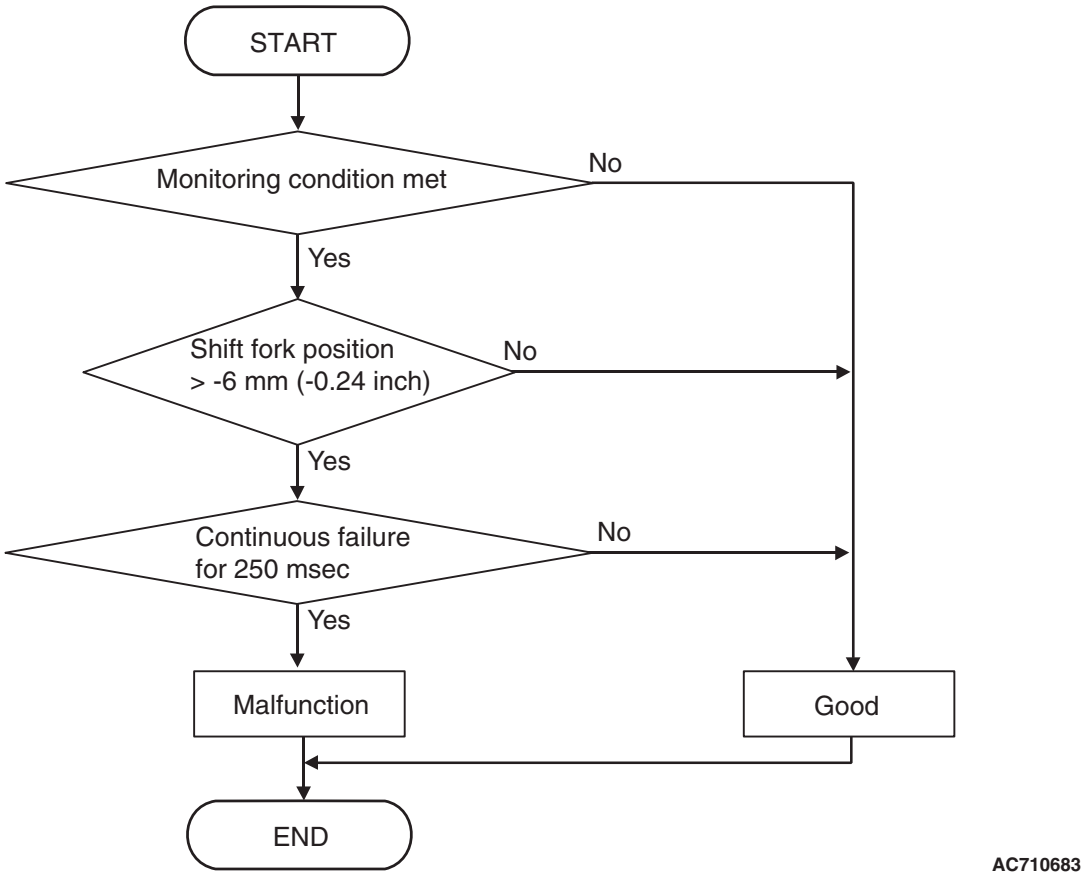
JUDGMENT CRITERIA

- Shift fork 2 position: 6 mm (0.24 inch) or less. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <SHIFT FORK 2 CURRENT GEAR: 5TH GEAR>

The travel distance of the shift fork 2 remains 6 mm (0.24 inch) or more for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Shift fork 2 current gear: 3rd gear>



DTC SET CONDITIONS <SHIFT FORK 2 CURRENT GEAR: 3RD GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Shift fork 2 current gear: 3rd gear.
- Synchro (3rd gear) slip speed: 80 r/min or more.
- Requested shift fork: Not shift fork 2.

JUDGMENT CRITERIA

- Shift fork 2 position: −6 mm (−0.24 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <SHIFT FORK 2 CURRENT GEAR: 3RD GEAR>

The travel distance of the shift fork 2 remains −6 mm (−0.24 inch) or less for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1829 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P182A: Shift Fork Position Sensor 3 System (Voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 3 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 3 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

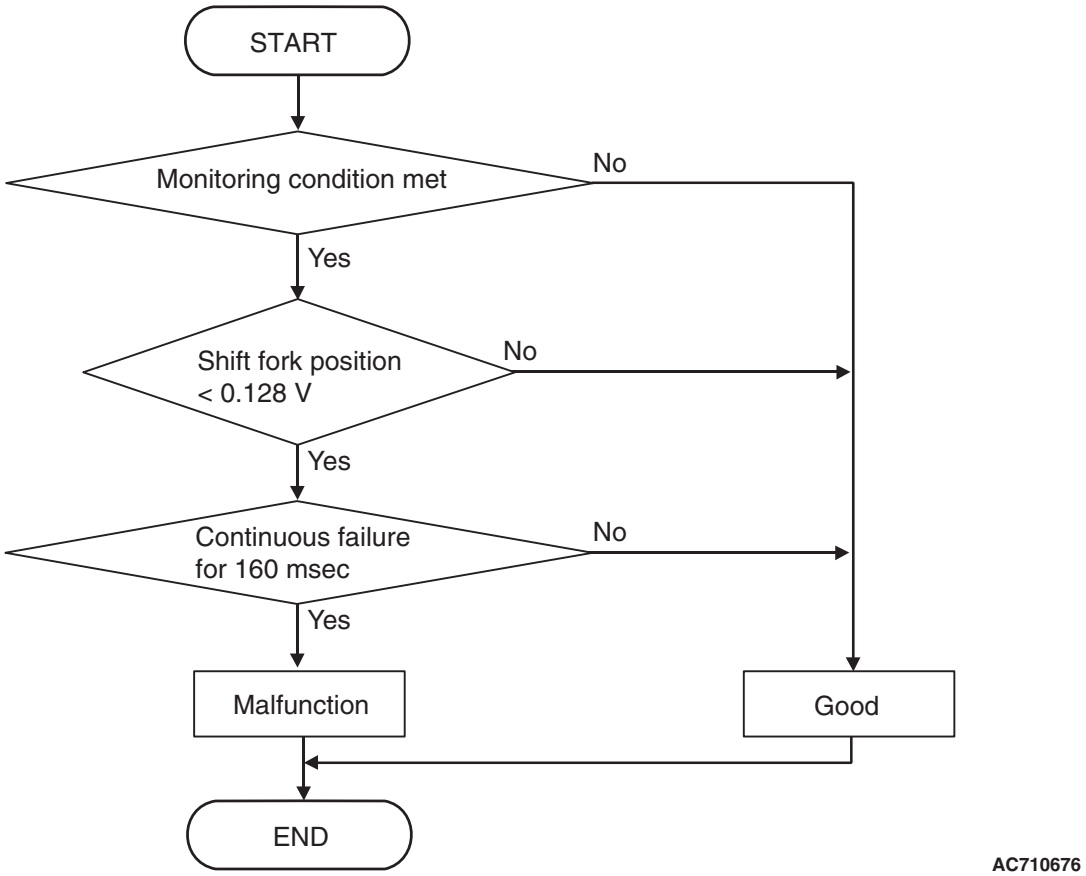
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182B: Shift fork position sensor 3 system (Voltage high range out)
- P182C: Shift fork position sensor 3 system (Output range out)
- P182D: Shift fork position sensor 3 system (Neutral)
- P182E: Shift fork position sensor 3 system (Poor performance)
- P1844: Shift fork 3 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 0.128 V or less. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 0.128 V or more for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P182A set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P182B: Shift Fork Position Sensor 3 System (Voltage high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 3 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 3 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

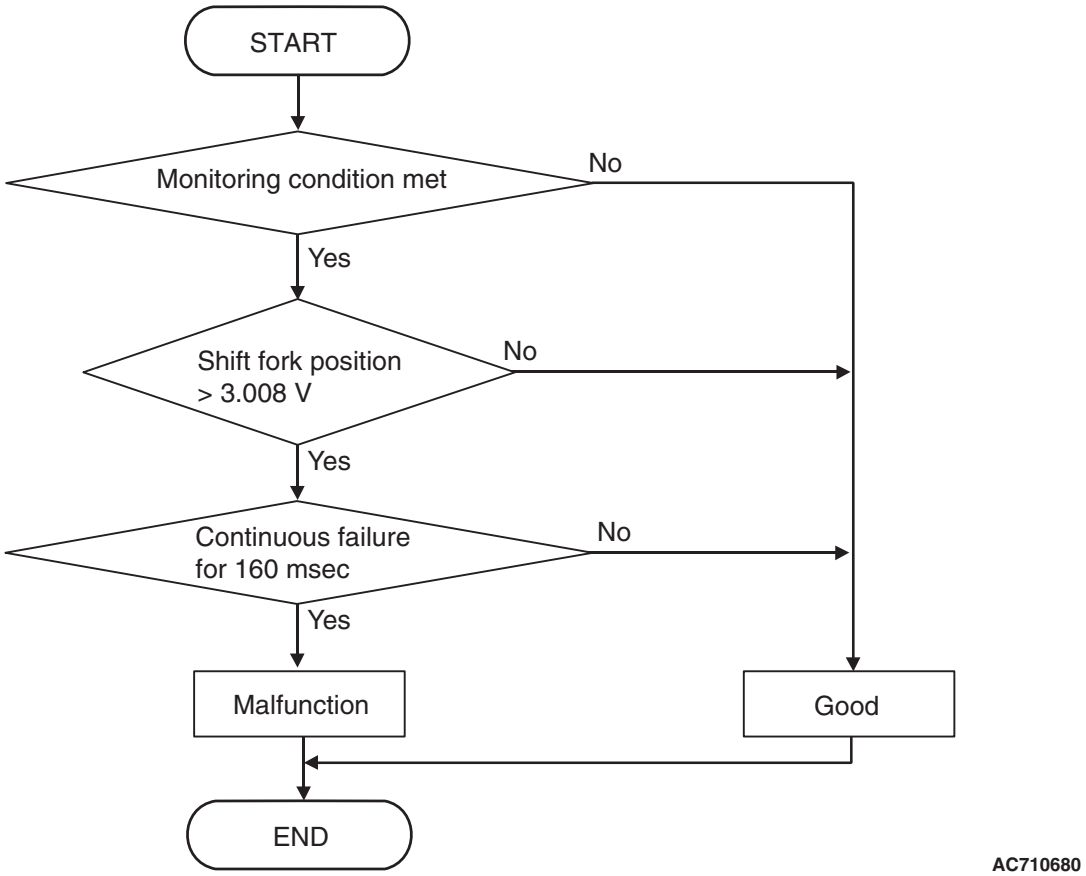
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182A: Shift fork position sensor 3 system (Voltage low range out)
- P182C: Shift fork position sensor 3 system (Output range out)
- P182D: Shift fork position sensor 3 system (Neutral)
- P182E: Shift fork position sensor 3 system (Poor performance)
- P1844: Shift fork 3 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 3.008 V or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 3.008 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P182B set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P182C: Shift Fork Position Sensor 3 System (Output range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the shift fork position sensor 3 is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the shift fork position sensor 3 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

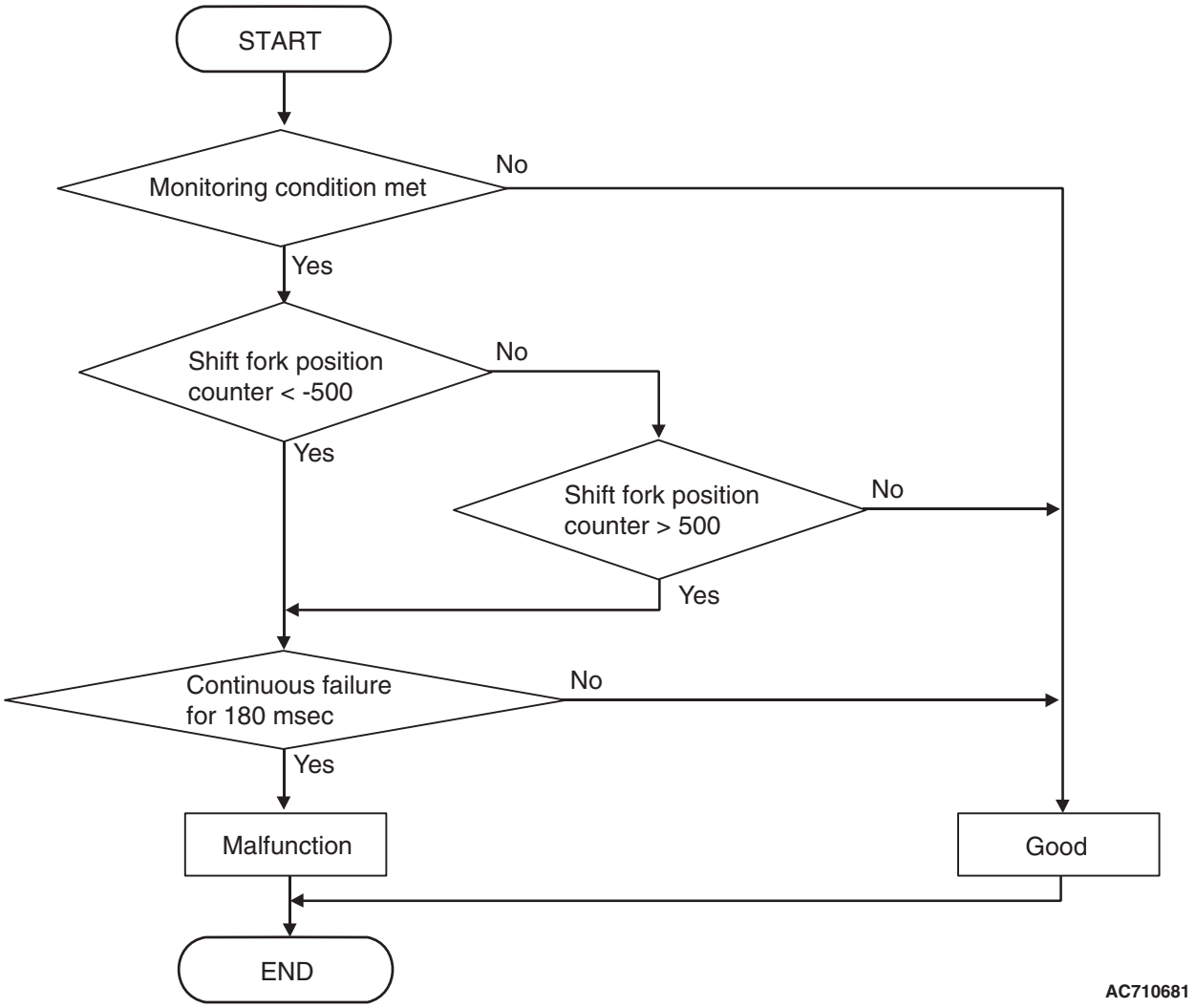
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182A: Shift fork position sensor 3 system (Voltage low range out)
- P182B: Shift fork position sensor 3 system (Voltage high range out)
- P182D: Shift fork position sensor 3 system (Neutral)
- P182E: Shift fork position sensor 3 system (Poor performance)
- P1844: Shift fork 3 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift system status: Gear change mode (during shift fork moving).

JUDGMENT CRITERIA

- Shift fork 3 position counter (digitized sensor value): −500 counts or less, shift fork 3 position counter (digitized sensor value): 500 counts or more. (180 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the shift fork 3 position counter (digitized sensor value) −500 counts or more, or with the shift fork 3 position counter (digitized sensor value) 500 counts or less continues for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P182C set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P182D: Shift Fork Position Sensor 3 System (Neutral)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 3 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 3 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

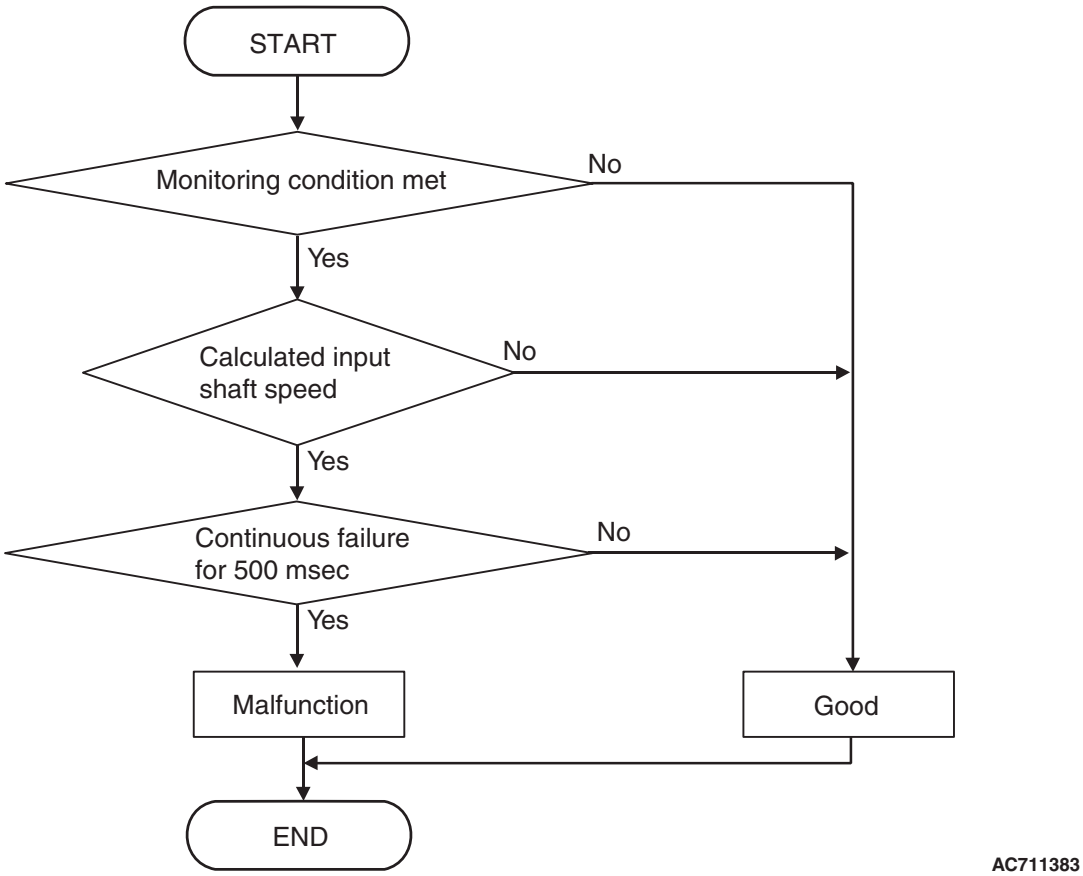
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182A: Shift fork position sensor 3 system (Voltage low range out)
- P182B: Shift fork position sensor 3 system (Voltage high range out)
- P182C: Shift fork position sensor 3 system (Output range out)
- P182E: Shift fork position sensor 3 system (Poor performance)
- P1844: Shift fork 3 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 3 position: Neutral.
- Input shaft 1 (odd) gear: Engaged.
- Engine speed –input shaft 1 speed: 50 r/min or less.

JUDGMENT CRITERIA

- Calculated speed: 40 r/min or less. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The calculated speed remains 40 r/min or more for 500 milliseconds.

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P182D set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P182E: Shift Fork Position Sensor 3 System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 3 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 3 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

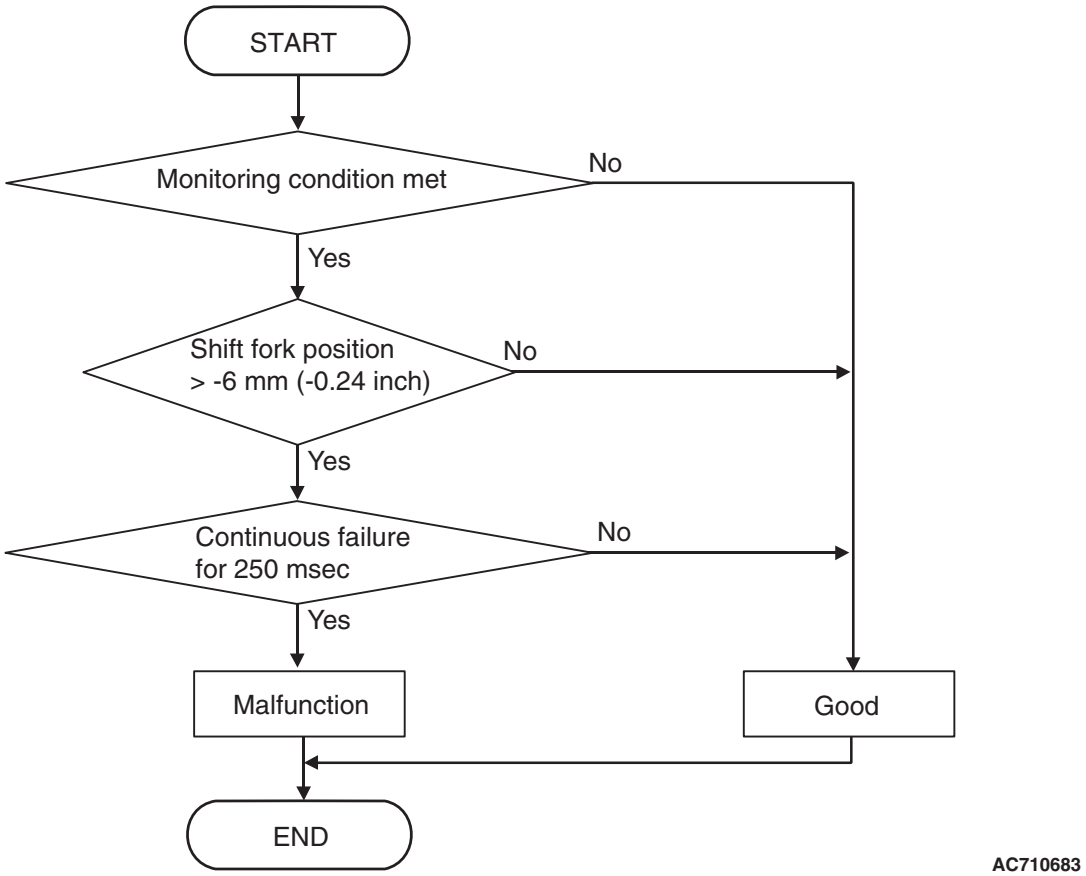
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P182A: Shift fork position sensor 3 system (Voltage low range out)
- P182B: Shift fork position sensor 3 system (Voltage high range out)
- P182C: Shift fork position sensor 3 system (Output range out)
- P182D: Shift fork position sensor 3 system (Neutral)
- P1844: Shift fork 3 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 3 current gear: 6th gear.
- Synchro (6th gear) slip speed: 80 r/min or more.
- Requested shift fork: Not shift fork 3.

JUDGMENT CRITERIA

- Shift fork 3 position: -6 mm (-0.24 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN

The travel distance of the shift fork 3 remains -6 mm (-0.24 inch) or less for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P182E set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1831: Shift Fork Position Sensor 4 System (Voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 4 is too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

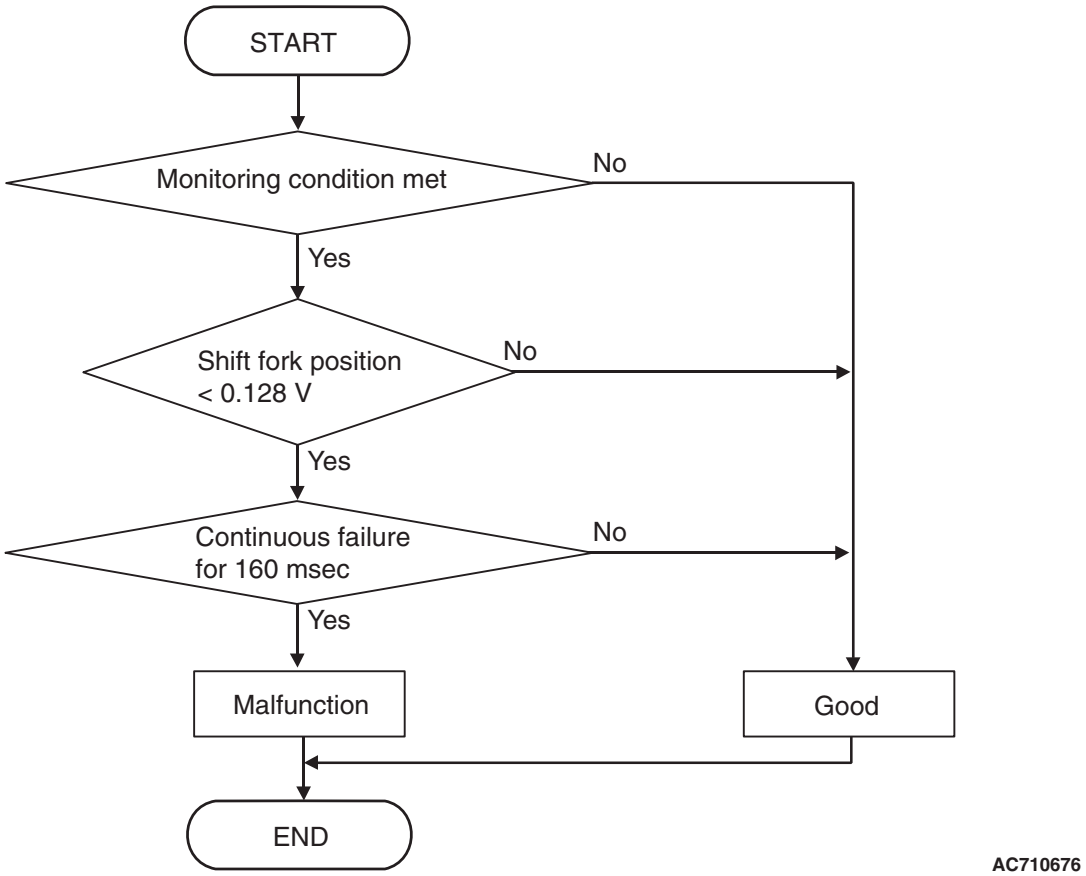
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1832: Shift fork position sensor 4 system (Voltage high range out)
- P1833: Shift fork position sensor 4 system (Output range out)
- P1834: Shift fork position sensor 4 system (Neutral)
- P1835: Shift fork position sensor 4 system (Poor performance)
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 0.128 V or less. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 0.128 V or more for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1831 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1832: Shift Fork Position Sensor 4 System (Voltage high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the voltage of the shift fork position sensor 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the shift fork position sensor 4 is too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

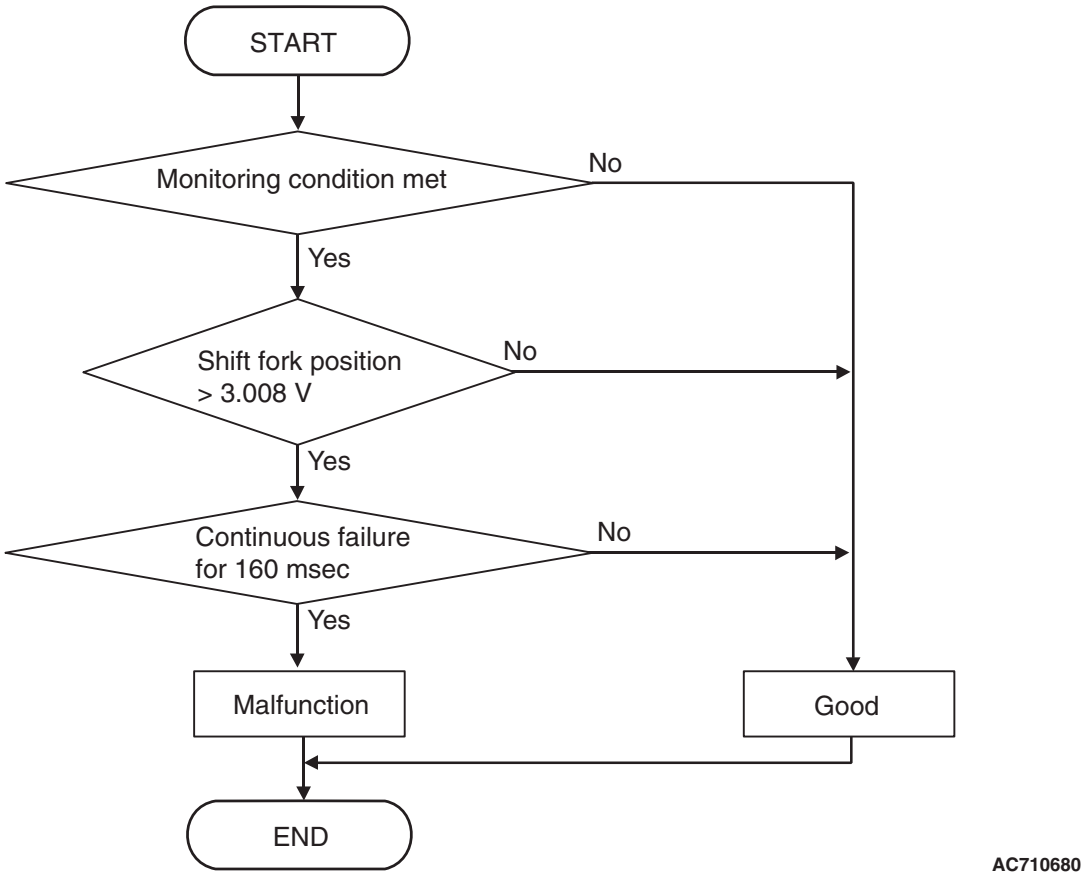
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1831: Shift fork position sensor 4 system (Voltage low range out)
- P1833: Shift fork position sensor 4 system (Output range out)
- P1834: Shift fork position sensor 4 system (Neutral)
- P1835: Shift fork position sensor 4 system (Poor performance)
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Position sensor voltage: 3.008 V or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The position sensor voltage remains 3.008 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1832 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1833: Shift Fork Position Sensor 4 System (Output range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the shift fork position sensor 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The output of the shift fork position sensor 4 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

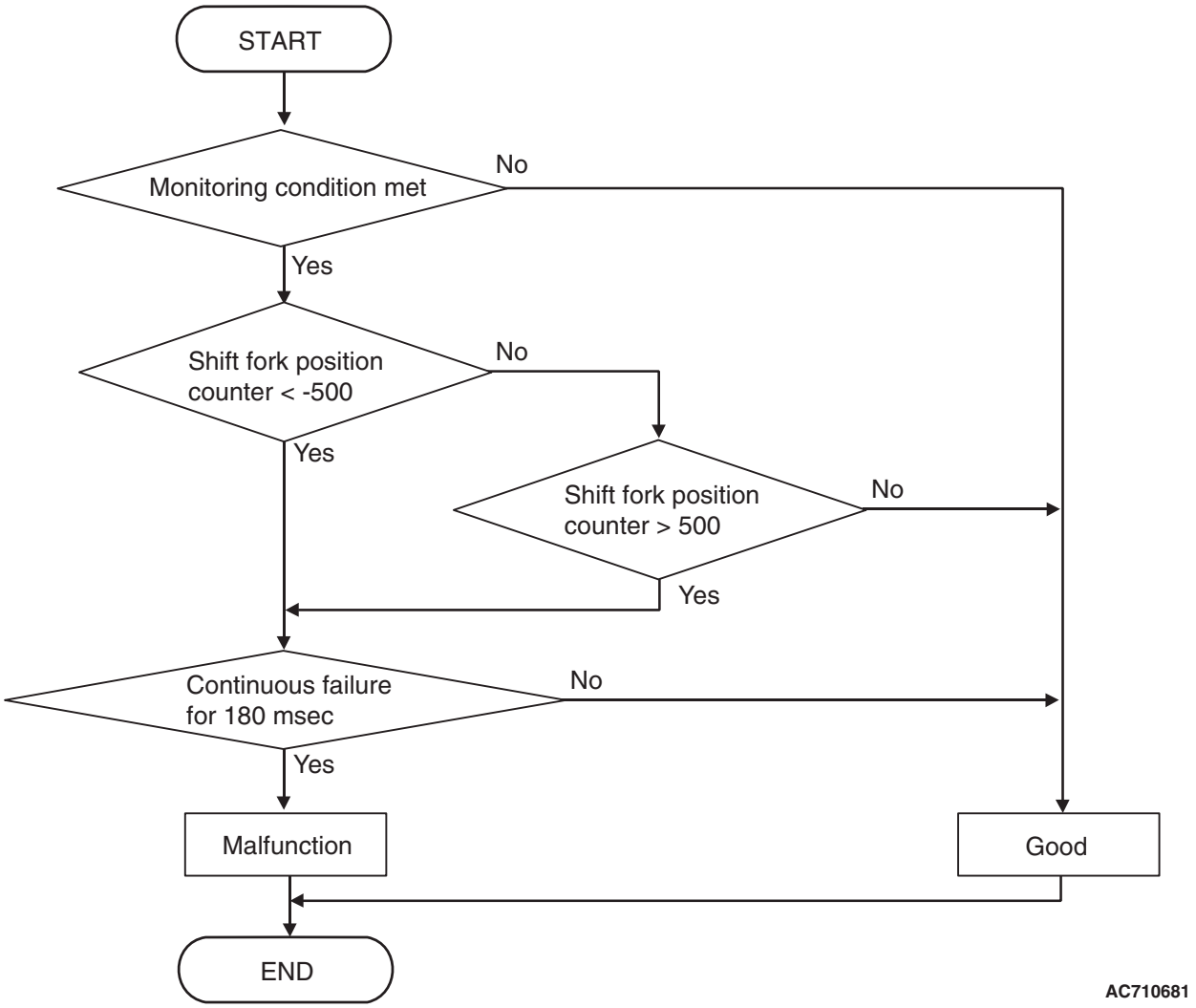
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1831: Shift fork position sensor 4 system (Voltage low range out)
- P1832: Shift fork position sensor 4 system (Voltage high range out)
- P1834: Shift fork position sensor 4 system (Neutral)
- P1835: Shift fork position sensor 4 system (Poor performance)
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift system status: Gear change mode (during shift fork moving).

JUDGMENT CRITERIA

- Shift fork 4 position counter (digitized sensor value): −500 counts or less, or shift fork 4 position counter (digitized sensor value): 500 counts or more. (180 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the shift fork 4 position counter (digitized sensor value) −500 counts or more, or with the shift fork 4 position counter (digitized sensor value) 500 counts or less continues for 180 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1833 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1834: Shift Fork Position Sensor 4 System (Neutral)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 4 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

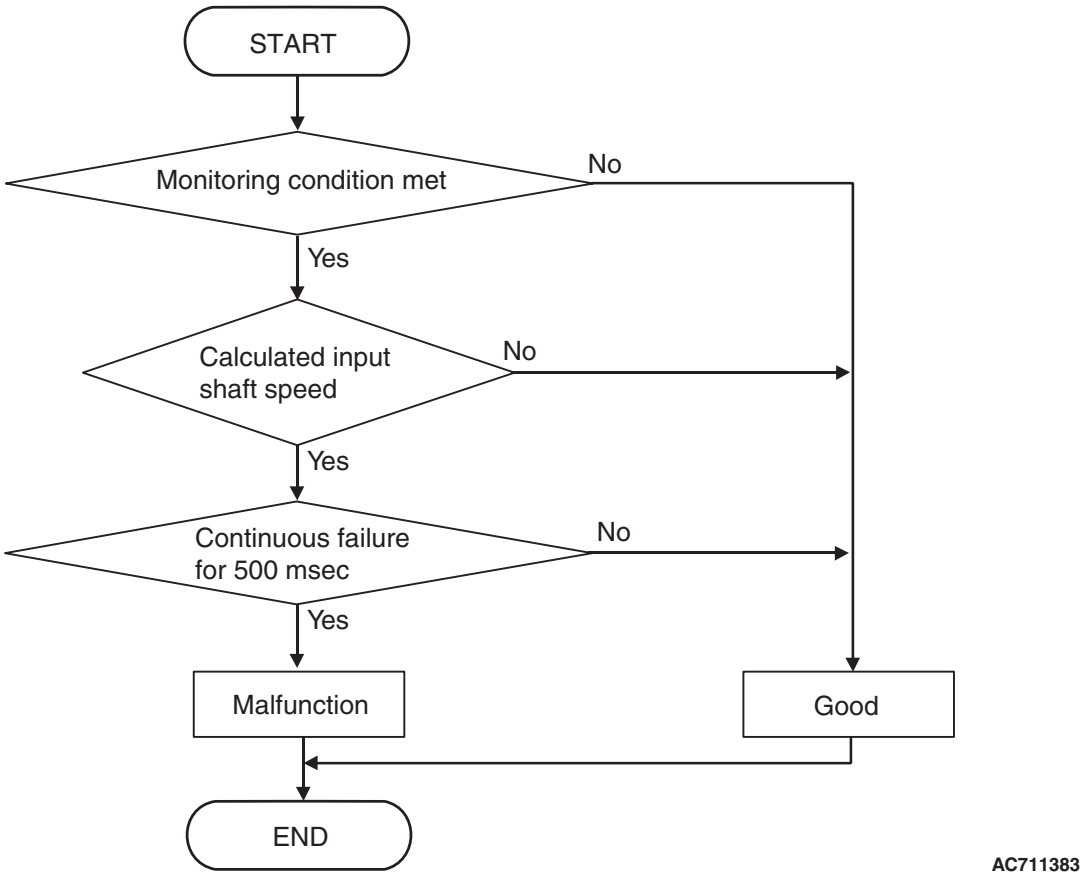
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1831: Shift fork position sensor 4 system (Voltage low range out)
- P1832: Shift fork position sensor 4 system (Voltage high range out)
- P1833: Shift fork position sensor 4 system (Output range out)
- P1835: Shift fork position sensor 4 system (Poor performance)
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 1 (odd) speed: 500 r/min or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 4 position: Neutral.
- Input shaft 1 (odd) gear: Engaged.
- Engine speed –input shaft 1 speed: 50 r/min or less.

JUDGMENT CRITERIA

- Calculated speed: 40 r/min or less. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The calculated speed remains 40 r/min or more for 500 milliseconds.

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1834 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1835: Shift Fork Position Sensor 4 System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the shift fork position sensor 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift fork position sensor 4 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

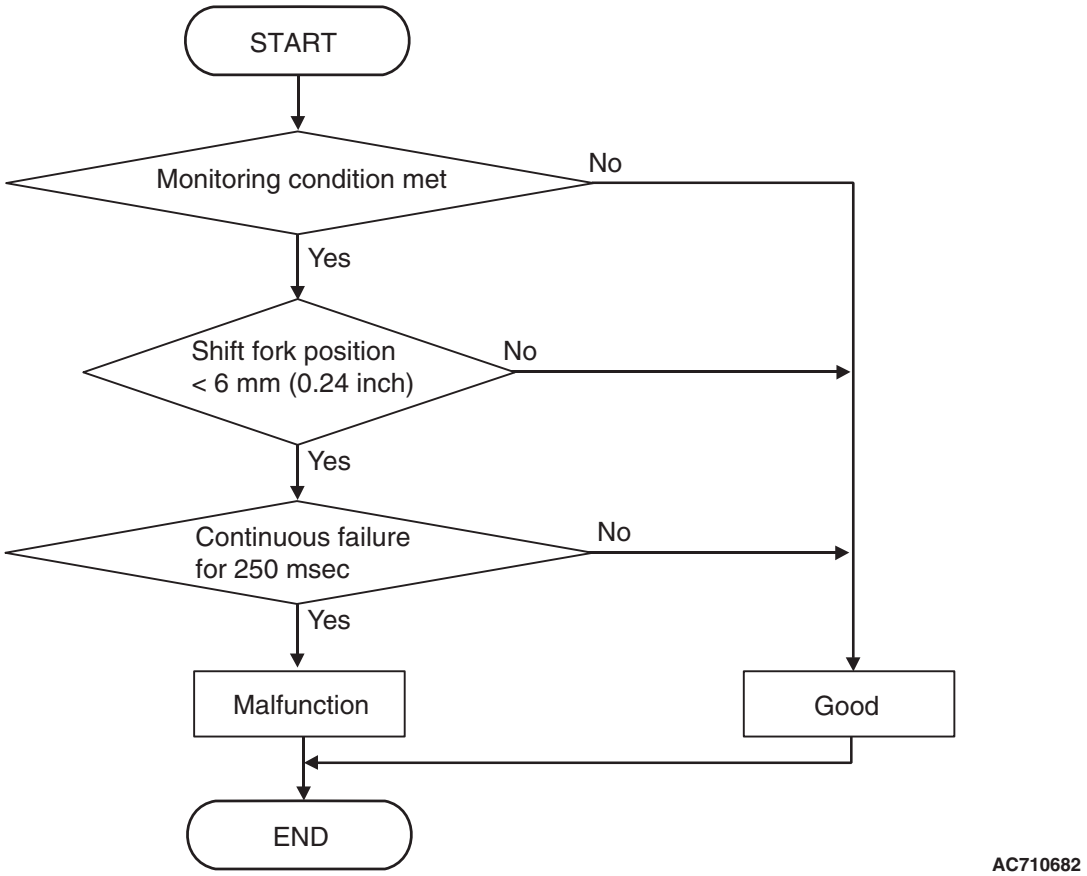
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1831: Shift fork position sensor 4 system (Voltage low range out)
- P1832: Shift fork position sensor 4 system (Voltage high range out)
- P1833: Shift fork position sensor 4 system (Output range out)
- P1834: Shift fork position sensor 4 system (Neutral)
- P184B: Shift fork 4 malfunction
- P1852: Shift fork 1 or 2 opposite direction movement
- P1855: Shift fork 3 or 4 opposite direction movement
- P1858: Even number gear axle interlock
- P1876: Gear block 1st
- P1877: Gear block 2nd
- P1878: Gear block 3rd
- P1879: Gear block 4th
- P187A: Gear block 5th
- P187B: Gear block 6th
- P187C: Gear block reverse

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Shift fork 4 current gear: 4th gear>



DTC SET CONDITIONS <SHIFT FORK 4 CURRENT GEAR: 4TH GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 4 current gear: 4th gear.
- Synchro (2nd gear) slip speed: 80 r/min or more.
- Requested shift fork: Not shift fork 4.

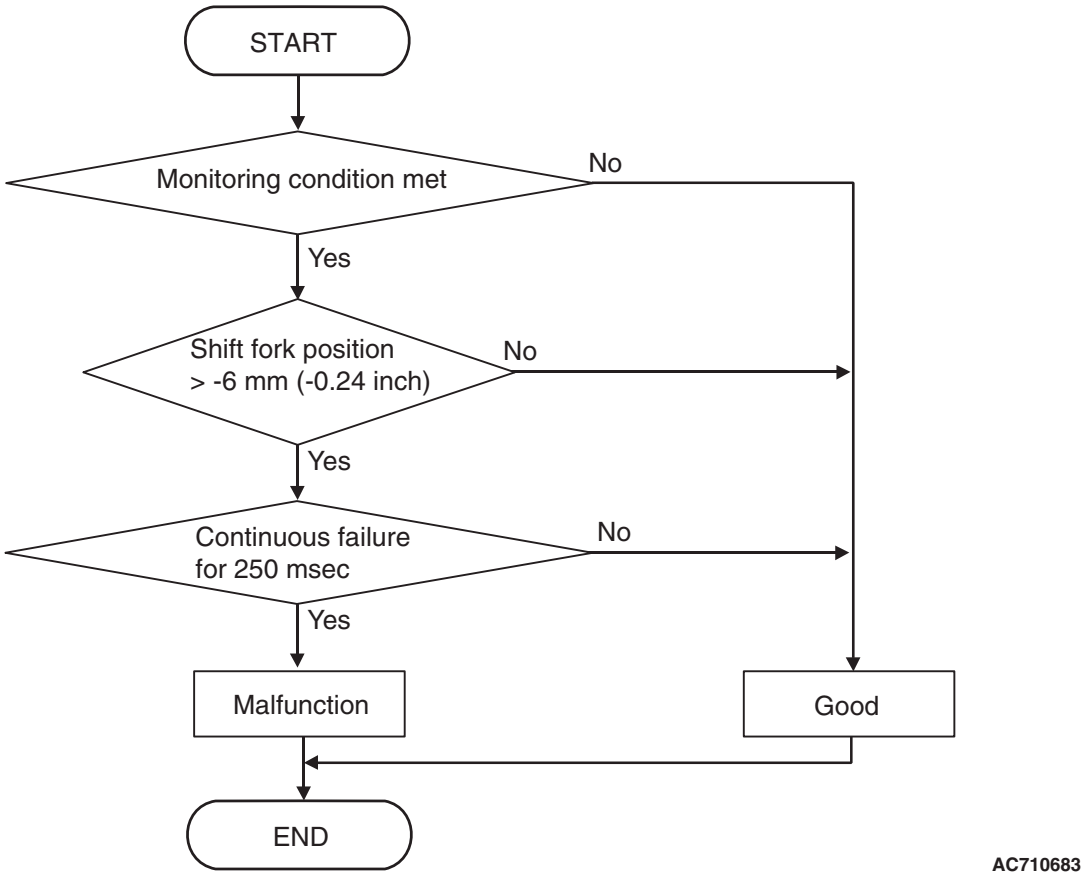
JUDGMENT CRITERIA

- Shift fork 4 position: 6 mm (0.24 inch) or less. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <SHIFT FORK 2 CURRENT GEAR: 4TH GEAR>

The travel distance of the shift fork 4 remains 6 mm (0.24 inch) or more for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Shift fork 4 current gear: 2nd gear>



DTC SET CONDITIONS <SHIFT FORK 4 CURRENT GEAR: 2ND GEAR>

Check Conditions

- Voltage of battery: 8 volts or more.
- Voltage of battery: 16.5 volts or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Input shaft 2 (even) speed: 500 r/min or more.
- Shift fork 4 current gear: 2nd gear.
- Synchro (4th gear) slip speed: 80 r/min or more.
- Requested shift fork: not shift fork 4.

JUDGMENT CRITERIA

- Shift fork 4 position: −6 mm (−0.24 in) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <SHIFT FORK 2 CURRENT GEAR: 3RD GEAR>

The travel distance of the shift fork 4 remains −6 mm (−0.24 inch) or less for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1835 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1836: Shift Fork 1 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the movement of the shift fork 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The movement of the shift fork 1 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

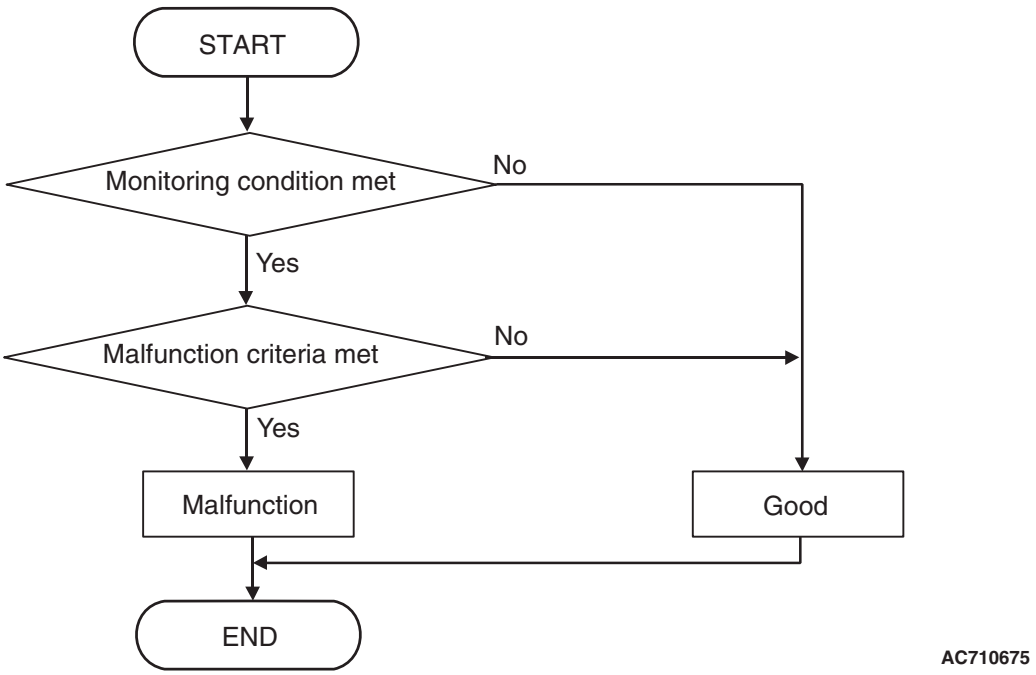
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - blocked>



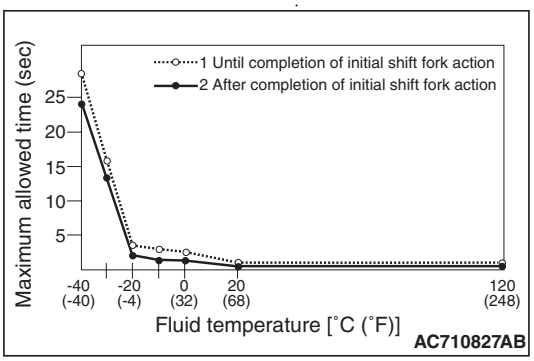
TSB Revision

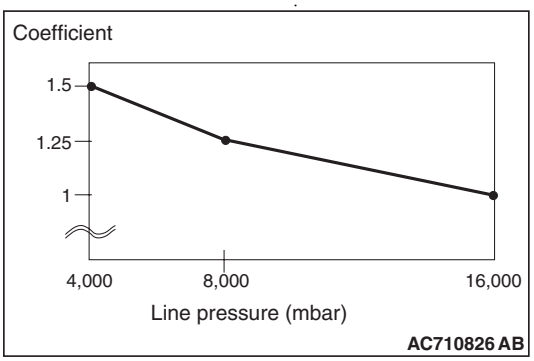
DTC SET CONDITIONS <FUNCTIONAL CHECK - BLOCKED>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Common high side 1 voltage: 2.5 V or more.
- Common high side 3 voltage: 2.5 V or more.

JUDGMENT CRITERIA



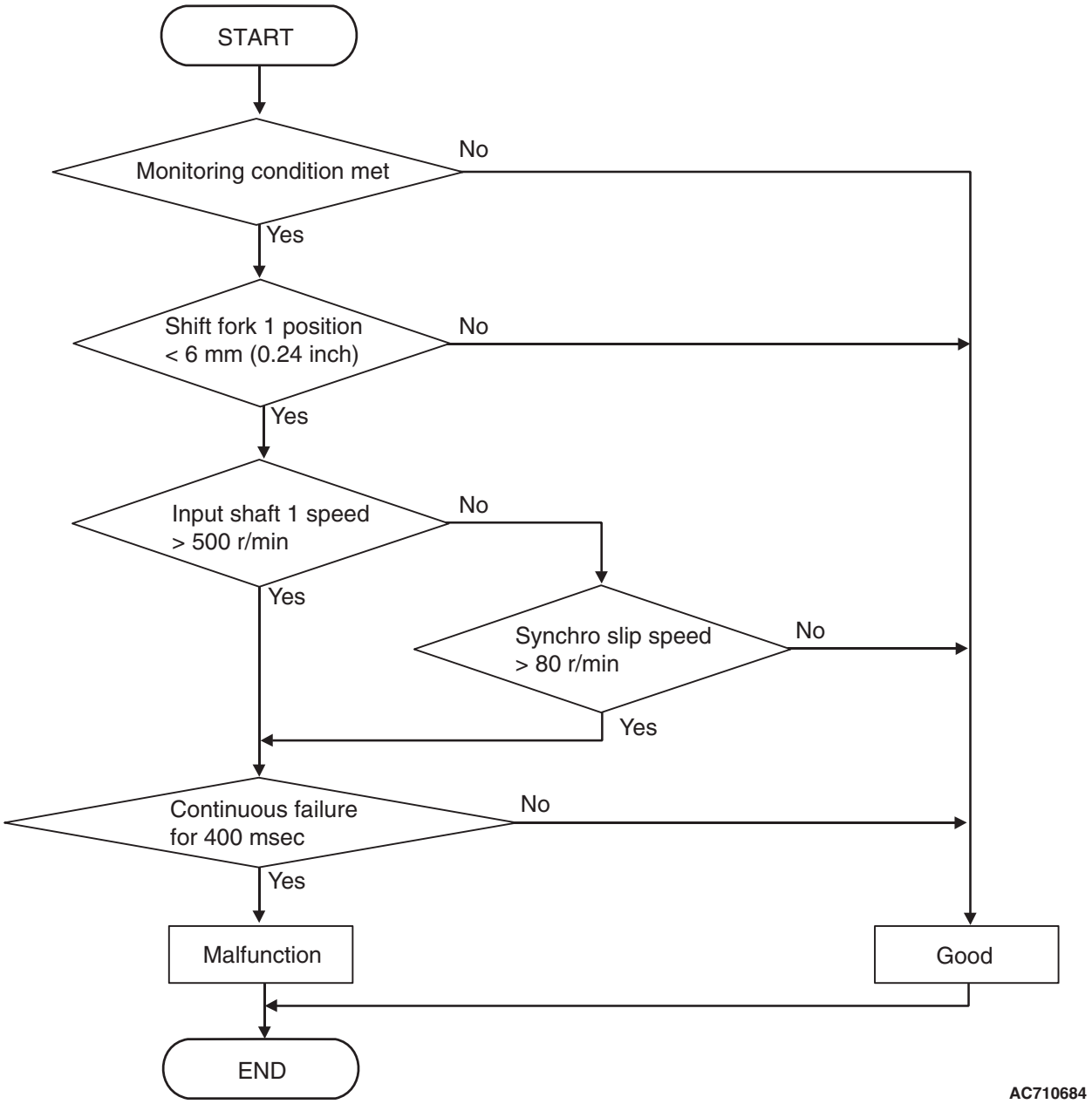


- Shift fork operation time: Shift fork operation time (threshold value) or more. (immediately)
- Shift fork operation time (threshold value): Equal the maximum allowed time x Coefficient. (immediately)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - BLOCKED>

The shift fork operation time is threshold value or less.

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - 1st gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - 1ST GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 1 current gear: 1st gear.

JUDGMENT CRITERIA

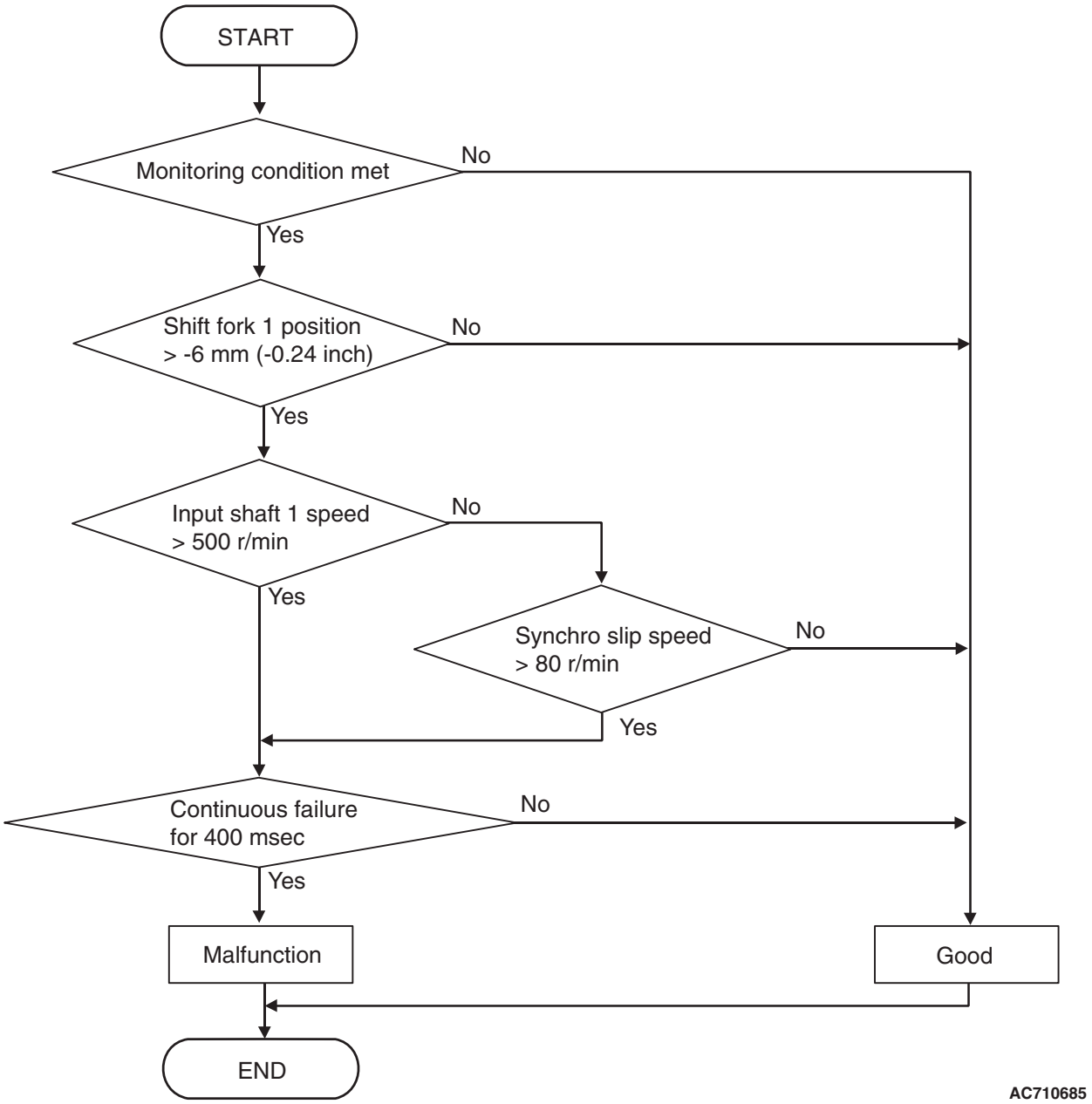
- Shift fork position: 6 mm (0.24 inch) or less, and input shaft 1 (odd) speed: 500 r/min or more, or synchro (1st gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - 1ST GEAR>

The status with the shift fork position 6 mm (0.24 inch) or more and with the input shaft 1 (odd) speed 500 r/min or less, or with the synchro (1st gear) slip speed 80 r/min or less continues for 400 milliseconds.

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - Reverse gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - REVERSE GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 1 current gear: Reverse gear.

JUDGMENT CRITERIA

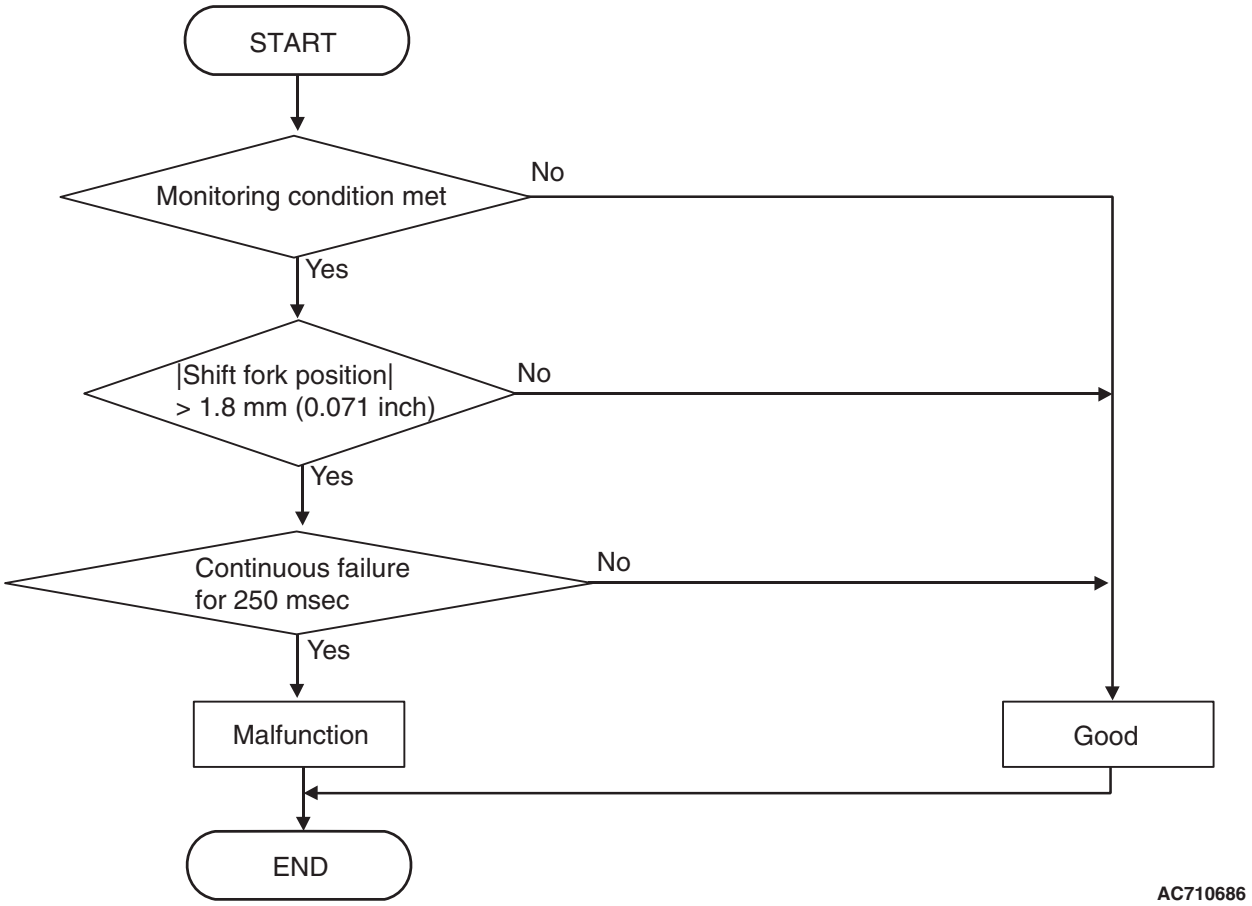
- Shift fork position: −6 mm (−0.24 inch) or more, and input shaft 1 (odd) speed: 500 r/min or more, or synchro (Reverse gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - REVERSE GEAR>

The status with the shift fork position −6 mm (−0.24 inch) or less and with the input shaft 1 (odd) speed 500 r/min or less, or with the synchro (reverse gear) slip speed 80 r/min or less continues for 400 milliseconds.

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - Neutral>



DTC SET CONDITIONS <FUNCTIONAL CHECK - NEUTRAL>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 1 current gear: Neutral.

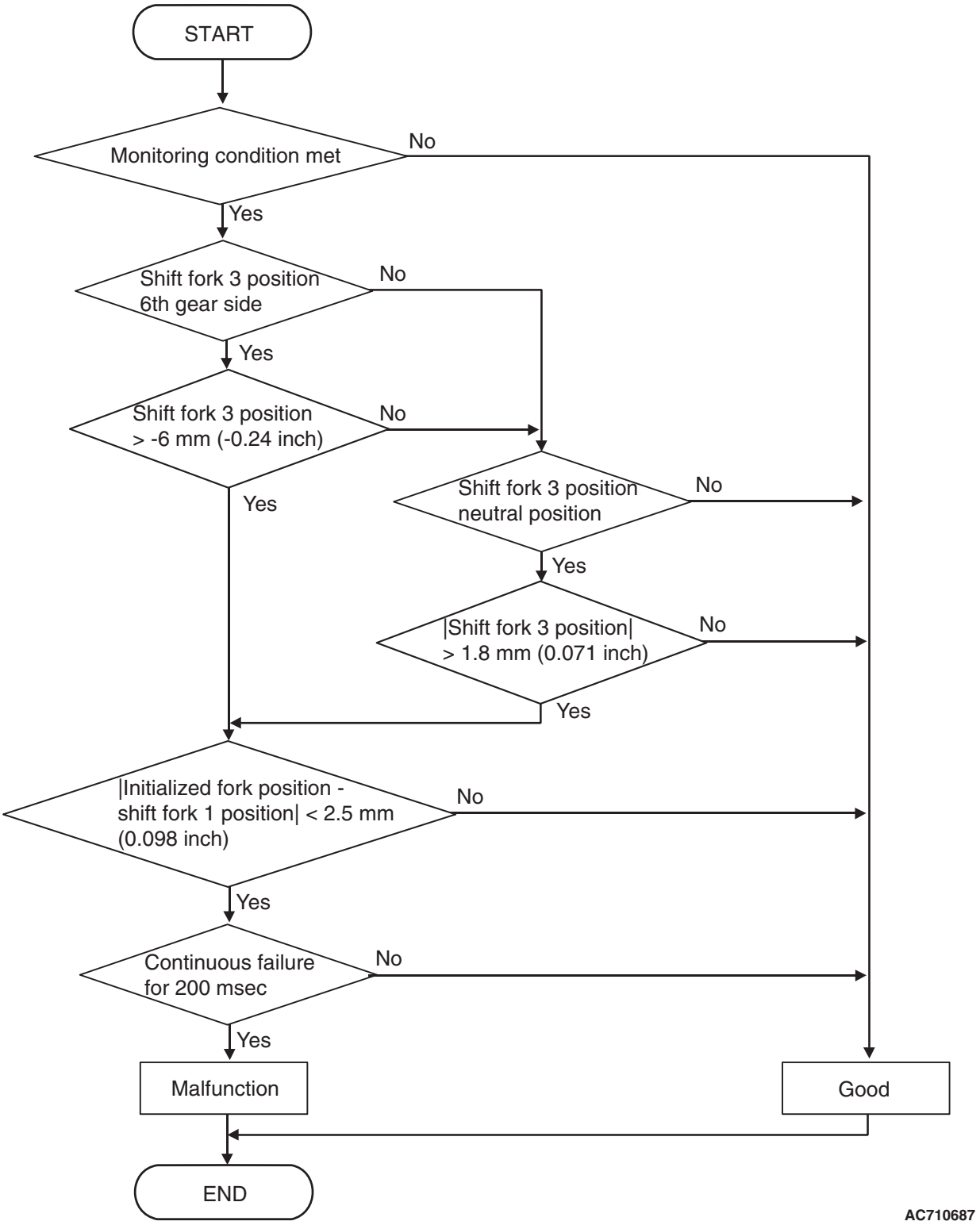
JUDGMENT CRITERIA

- Shift fork position: 1.8 mm (0.071 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - NEUTRAL>

The shift fork position remains 1.8 mm (0.071 inch) or less for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - Shift fork 1 requested but shift fork 3 movement>



DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 1 REQUESTED BUT SHIFT FORK 3 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 1.

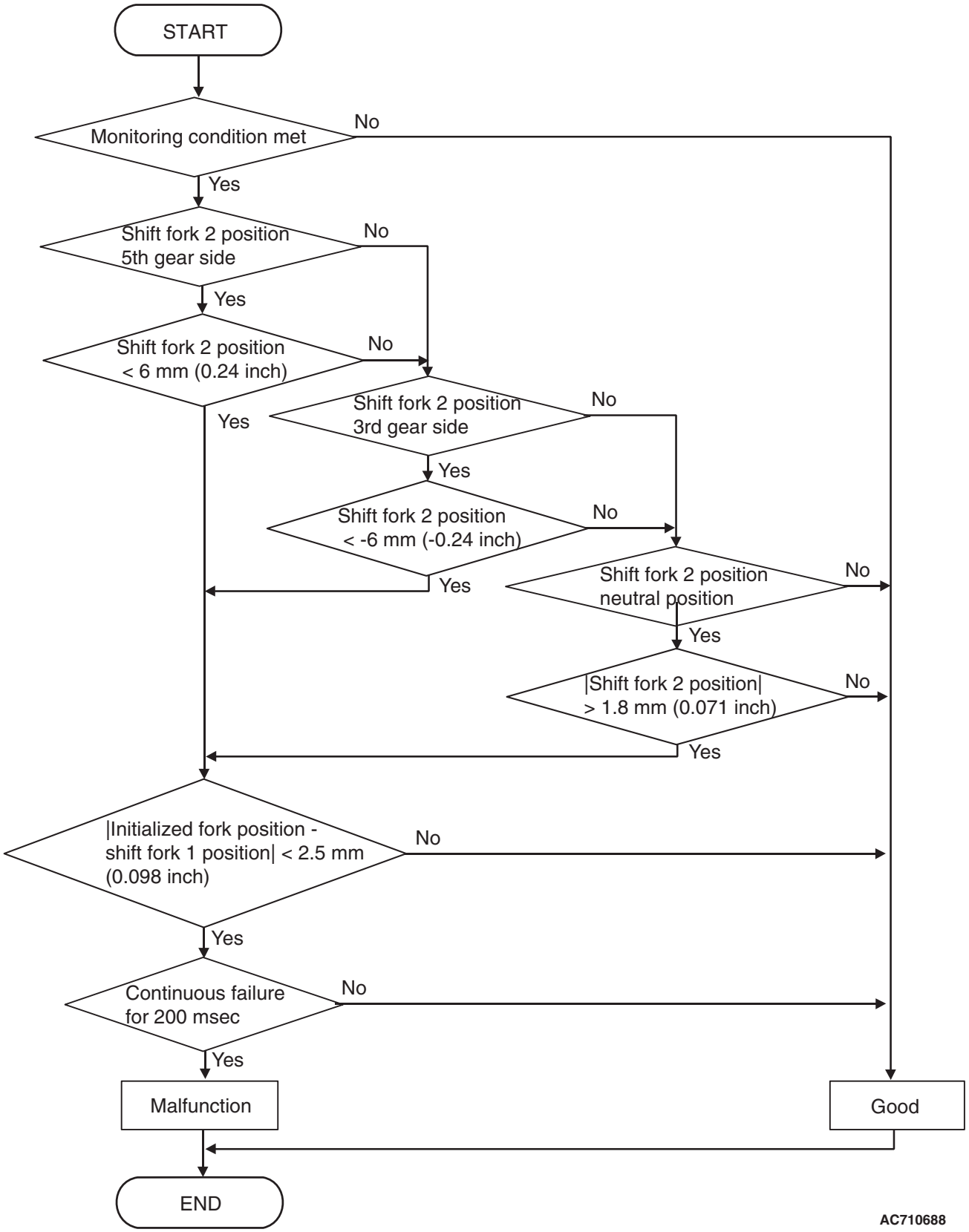
JUDGMENT CRITERIA

- Shift fork 3 position: −6 mm (−0.24 inch) [6th gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and initialized fork position – shift fork 1 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 1 REQUESTED BUT SHIFT FORK 3 MOVEMENT>

The status with the shift fork position −6 mm (−0.24 inch) [6th gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position –shift fork 1 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - Shift fork 1 requested but shift fork 2 movement>



DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 1 REQUESTED BUT SHIFT FORK 2 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 1.

JUDGMENT CRITERIA

- Shift fork position: 6 mm (0.24 inch) [5th gear side] or less, or −6 mm (−0.24 inch) [3rd gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and initialized fork position −shift fork 1 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 1 REQUESTED BUT SHIFT FORK 2 MOVEMENT>

The status with the shift fork position 6 mm (0.24 inch) [5th gear side] or more, or with −6 mm (−0.24 inch) [3rd gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position −shift fork 1 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST shift fork

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1836 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P183D: Shift Fork 2 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the movement of the shift fork 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The movement of the shift fork 2 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

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MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

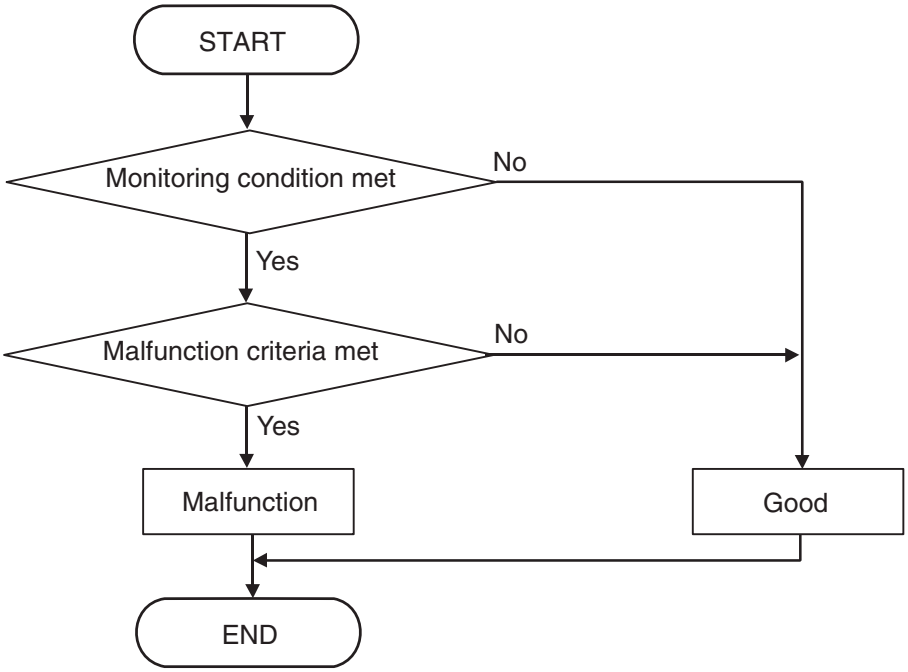
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1836: Shift fork 1 malfunction

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - blocked>



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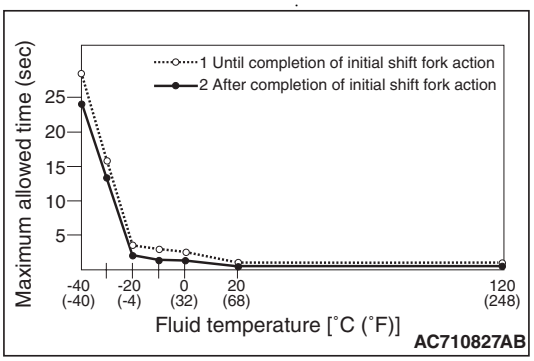
DTC SET CONDITIONS <FUNCTIONAL CHECK - BLOCKED>

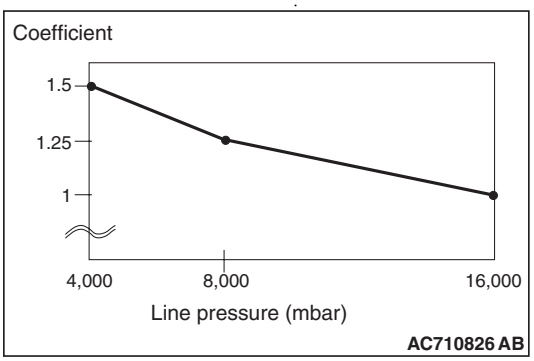
Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Common high side 1 voltage: 2.5 V or more.
- Common high side 2 voltage: 2.5 V or more.

Judgement Criteria



AC710827AB



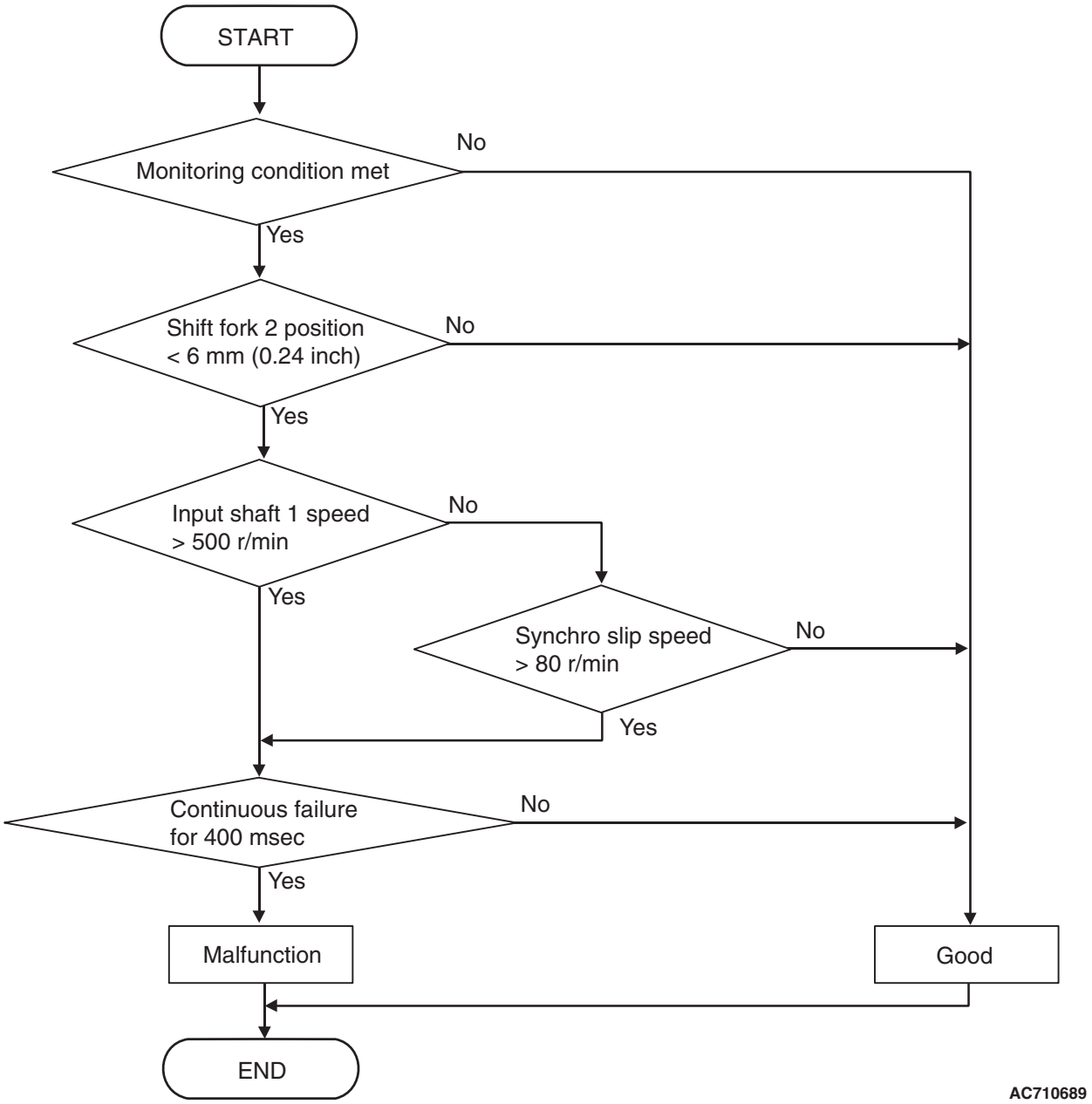
AC710826 AB

- Shift fork operation time: Shift fork operation time (threshold value) or more. (immediately)
- Shift fork operation time (threshold value): Equal the maximum allowed time x Coefficient. (immediately)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - BLOCKED>

The shift fork operation time is threshold value or less.

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - 5th gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - 5TH GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 2 current gear: 5th gear.

Judgement Criteria

- Shift fork position: 6 mm (0.24 inch) or less, and input shaft 1 (odd) speed: 500 r/min or more, or synchro (5th gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - 5TH GEAR>

The status with the shift fork position 6 mm (0.24 inch) or more and with the input shaft 1 (odd) speed 500 r/min or less, or with the synchro (5th gear) slip speed 80 r/min or less continues for 400 milliseconds.

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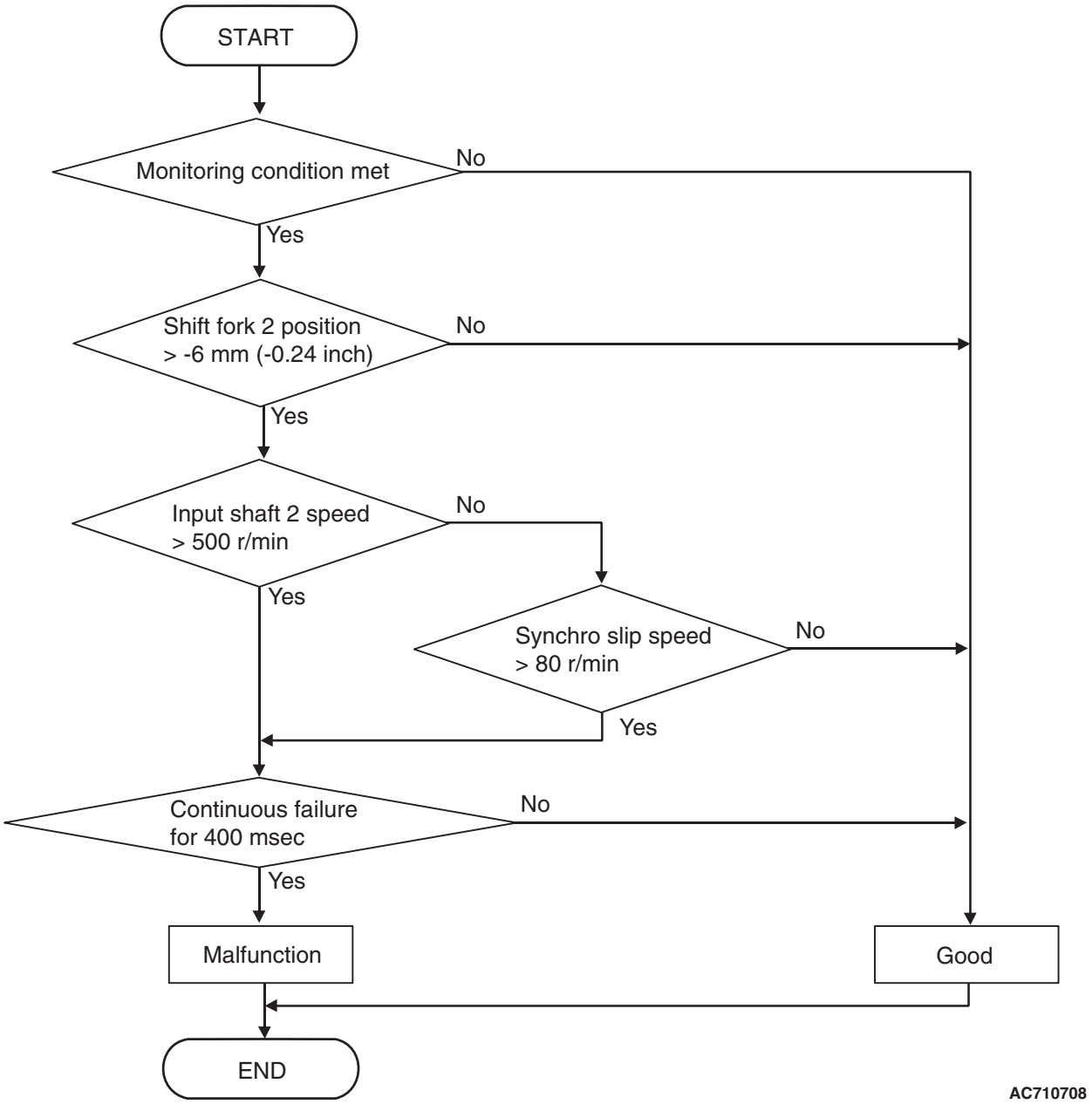
LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - 3rd gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - 3RD GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 2 current gear: 3rd gear.

Judgement Criteria

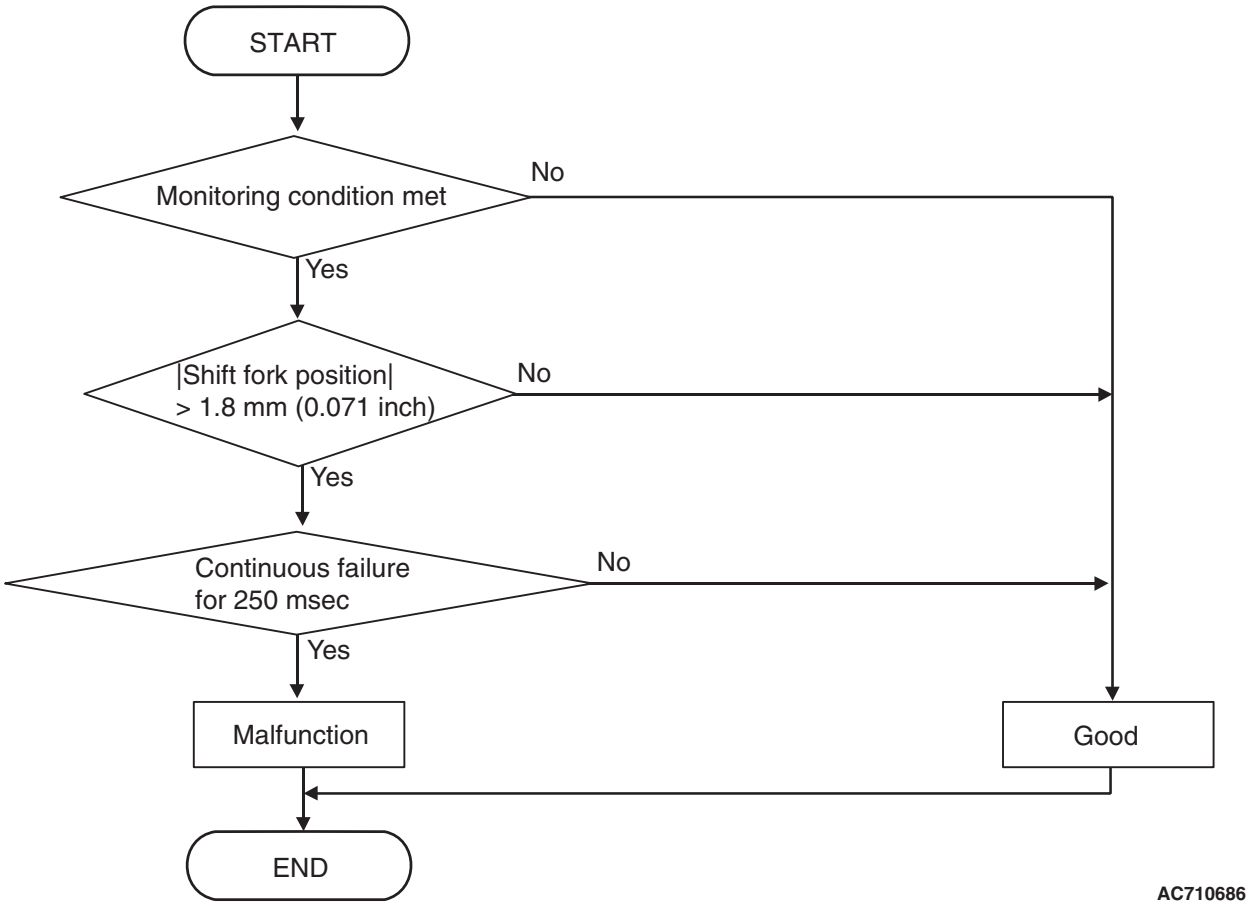
- Shift fork position: −6 mm (−0.24 inch) or more, and input shaft 1 (odd) speed: 500 r/min or more, or synchro (3rd gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - 3RD GEAR>

The status with the shift fork position −6 mm (−0.24 inch) or less and with the input shaft 1 (odd) speed 500 r/min or less, or with the synchro (3rd gear) slip speed 80 r/min or less continues for 400 milliseconds.

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - Neutral>



DTC SET CONDITIONS <FUNCTIONAL CHECK - NEUTRAL>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 2 current gear: Neutral.

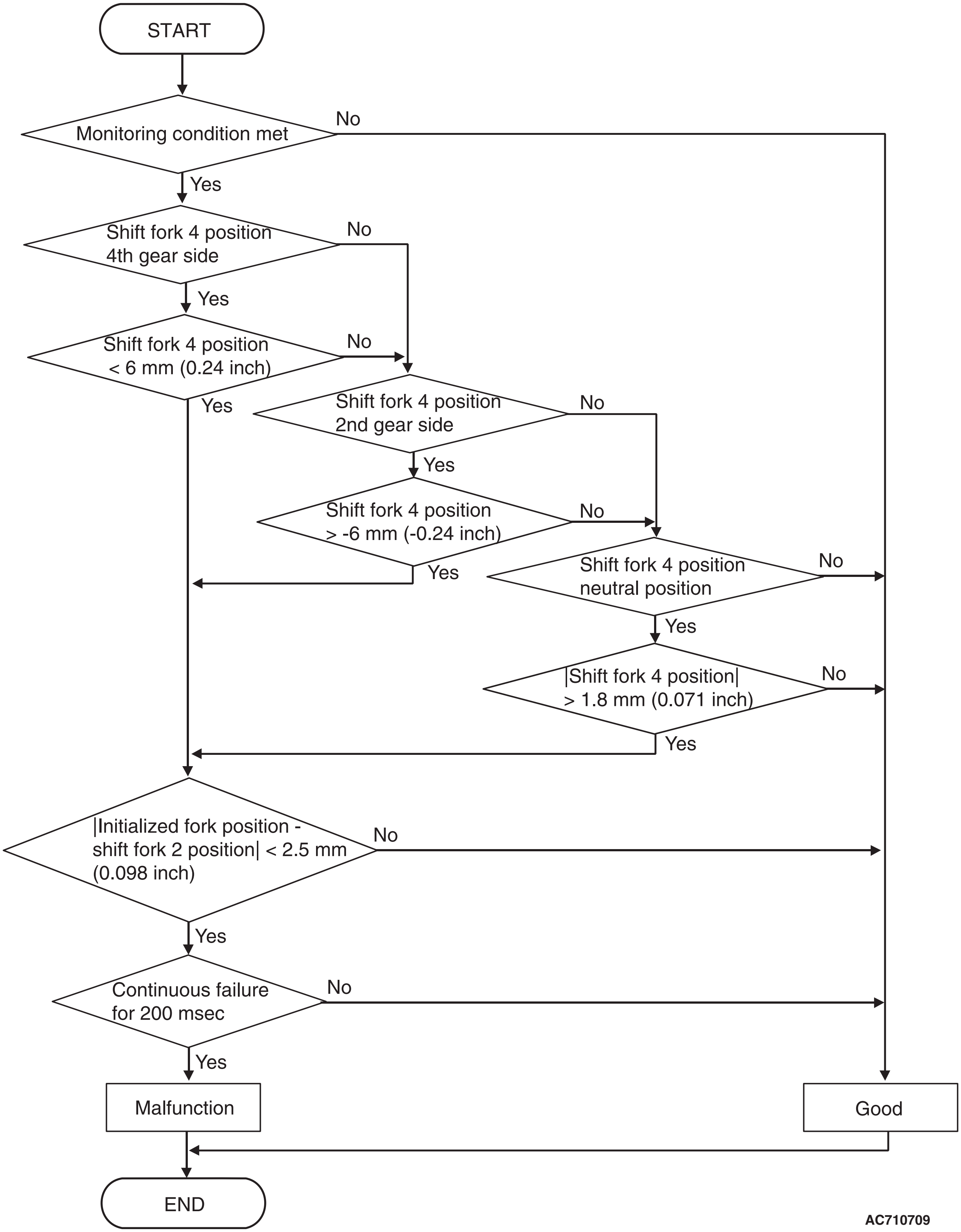
Judgement Criteria

- Shift fork position: 1.8 mm (0.071 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - NEUTRAL>

The shift fork position remains 1.8 mm (0.071 inch) or less for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - Shift fork 2 requested but shift fork 4 movement>



DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 2 REQUESTED BUT SHIFT FORK 4 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 2.

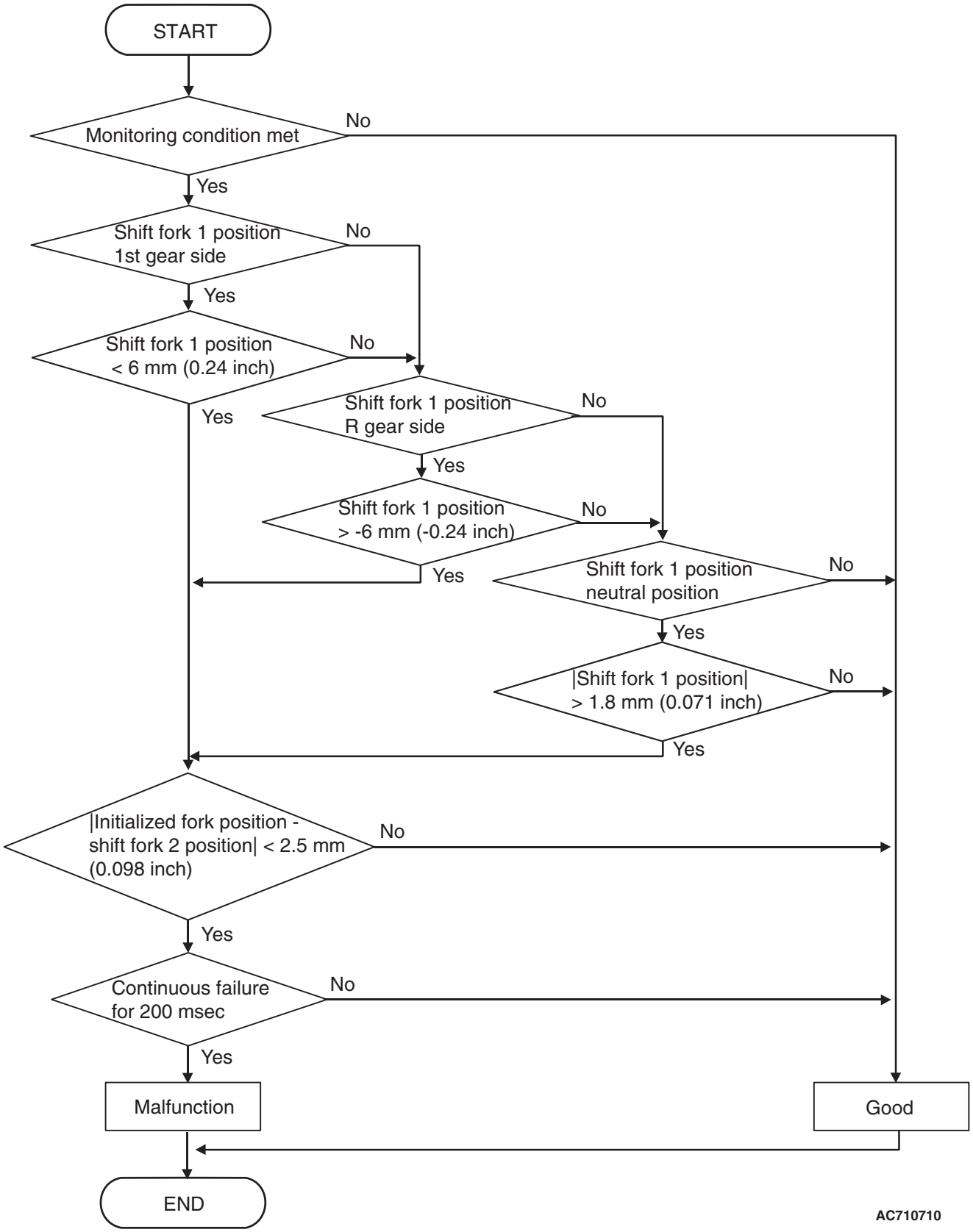
Judgement Criteria

- Shift fork position: 6 mm (0.24 inch) [4th gear side] or less, or −6 mm (−0.24 inch) [2nd gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and Initialized fork position – shift fork 2 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 2 REQUESTED BUT SHIFT FORK 4 MOVEMENT>

The status with the shift fork position 6 mm (0.24 inch) or more, or with −6 mm (−0.24 inch) or less, or with 1.8 mm (0.071 inch) or less and with the initialized fork position – shift fork 1 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - Shift fork 2 requested but shift fork 1 movement>



DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 2 REQUESTED BUT SHIFT FORK 1 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 2.

Judgement Criteria

- Shift fork position: 6 mm (0.24 inch) [1st gear side] or less, or −6 mm (−0.24 inch) [reverse gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and initialized fork position – shift fork 2 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 2 REQUESTED BUT SHIFT FORK 1 MOVEMENT>

The status with the shift fork position 6 mm (0.24 inch) [1st gear side] or more, or with −6 mm (−0.24 inch) [reverse gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position –shift fork 2 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST shift fork

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P183D set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P1844: Shift Fork 3 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the movement of the shift fork 3 is normal.

DESCRIPTIONS OF MONITOR METHODS

The movement of the shift fork 3 is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

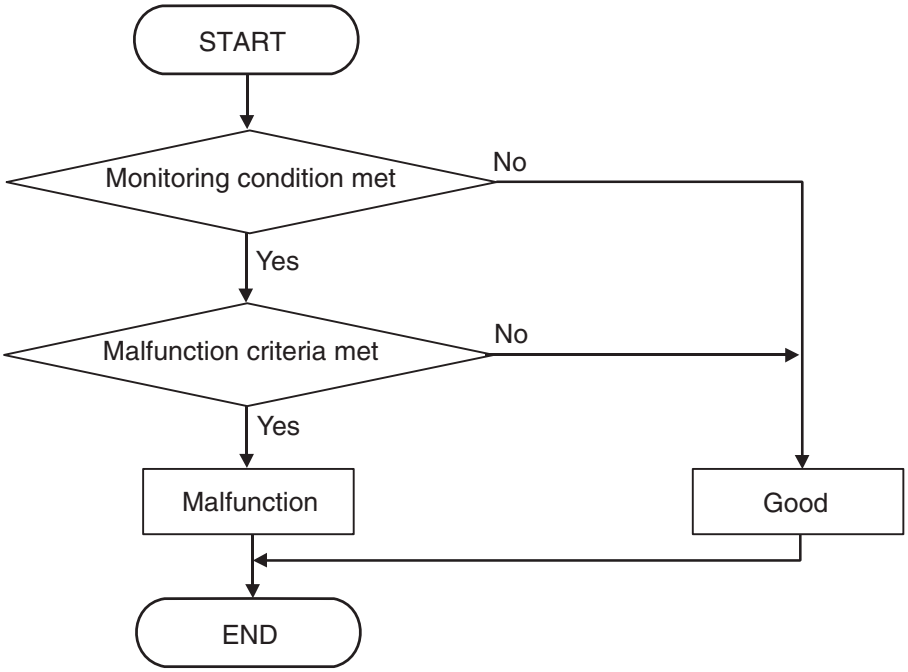
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1836: Shift fork 1 malfunction
- P184B: Shift fork 4 malfunction

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - blocked>



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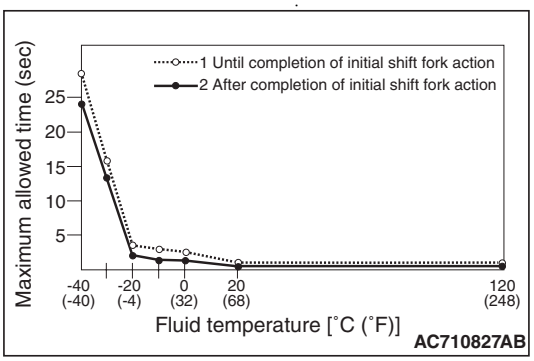
DTC SET CONDITIONS <FUNCTIONAL CHECK - BLOCKED>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Common high side 1 voltage: 2.5 V or more.
- Common high side 2 voltage: 2.5 V or more.

JUDGMENT CRITERIA



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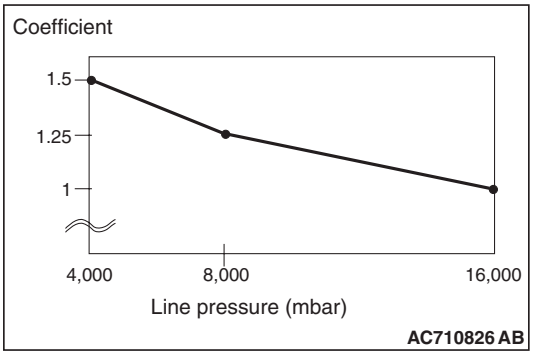

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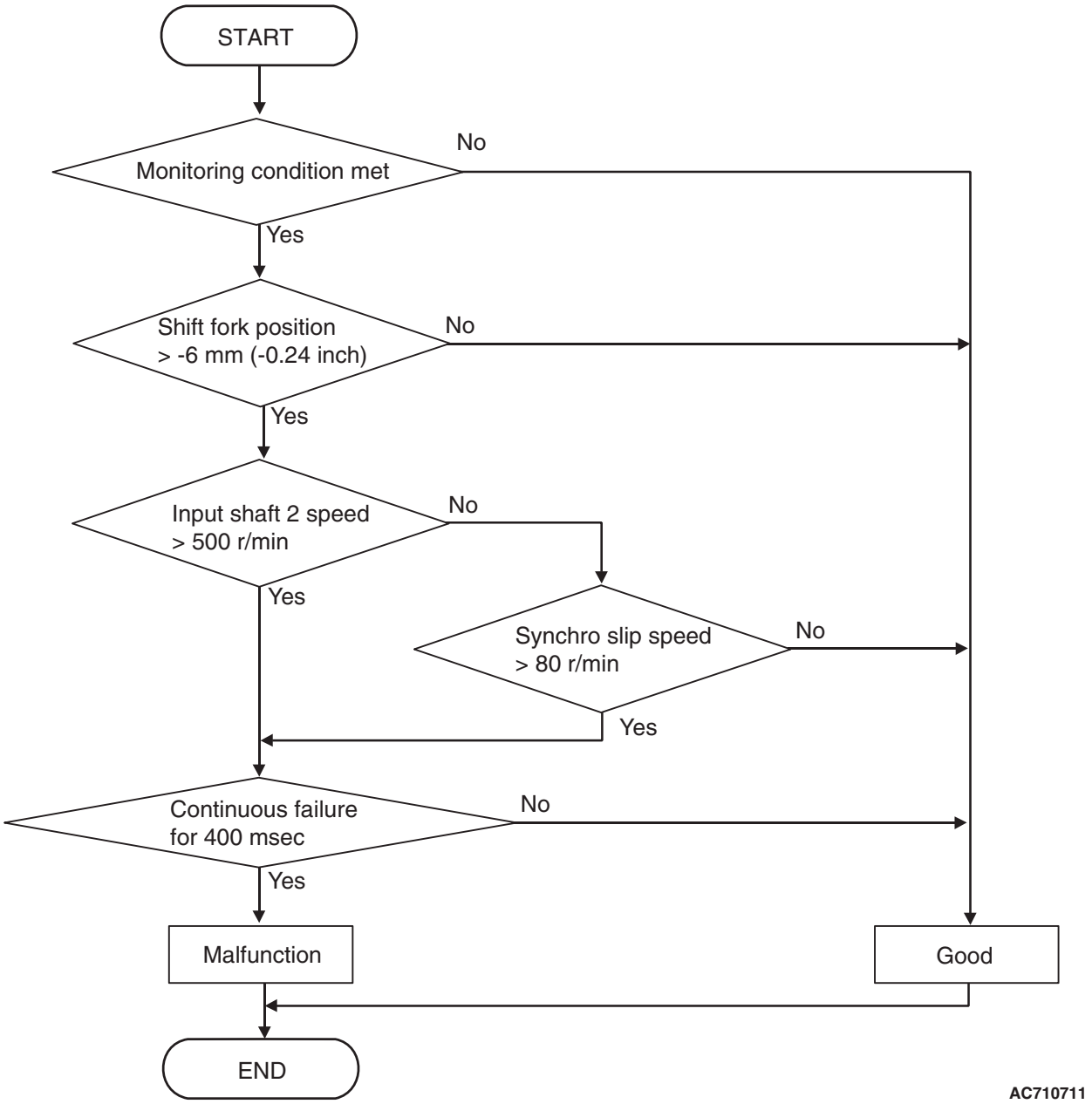
- Shift fork operation time: Shift fork operation time (threshold value) or more. (immediately)
- Shift fork operation time (threshold value): Equal the maximum allowed time x Coefficient. (immediately)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - BLOCKED>

The shift fork operation time is threshold value or less.

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - 6th gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - 6TH GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 3 current gear: 6th gear.

JUDGMENT CRITERIA

- Shift fork position: −6 mm (−0.24 inch) or more, and input shaft 2 (even) speed: 500 r/min or more, or synchro (6th gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - 6TH GEAR>

The status with the shift fork position −6 mm (−0.24 inch) or less, or with the input shaft 2 (even) speed 500 r/min or less and with the synchro (6th gear) slip speed 80 r/min or less continues for 400 milliseconds.

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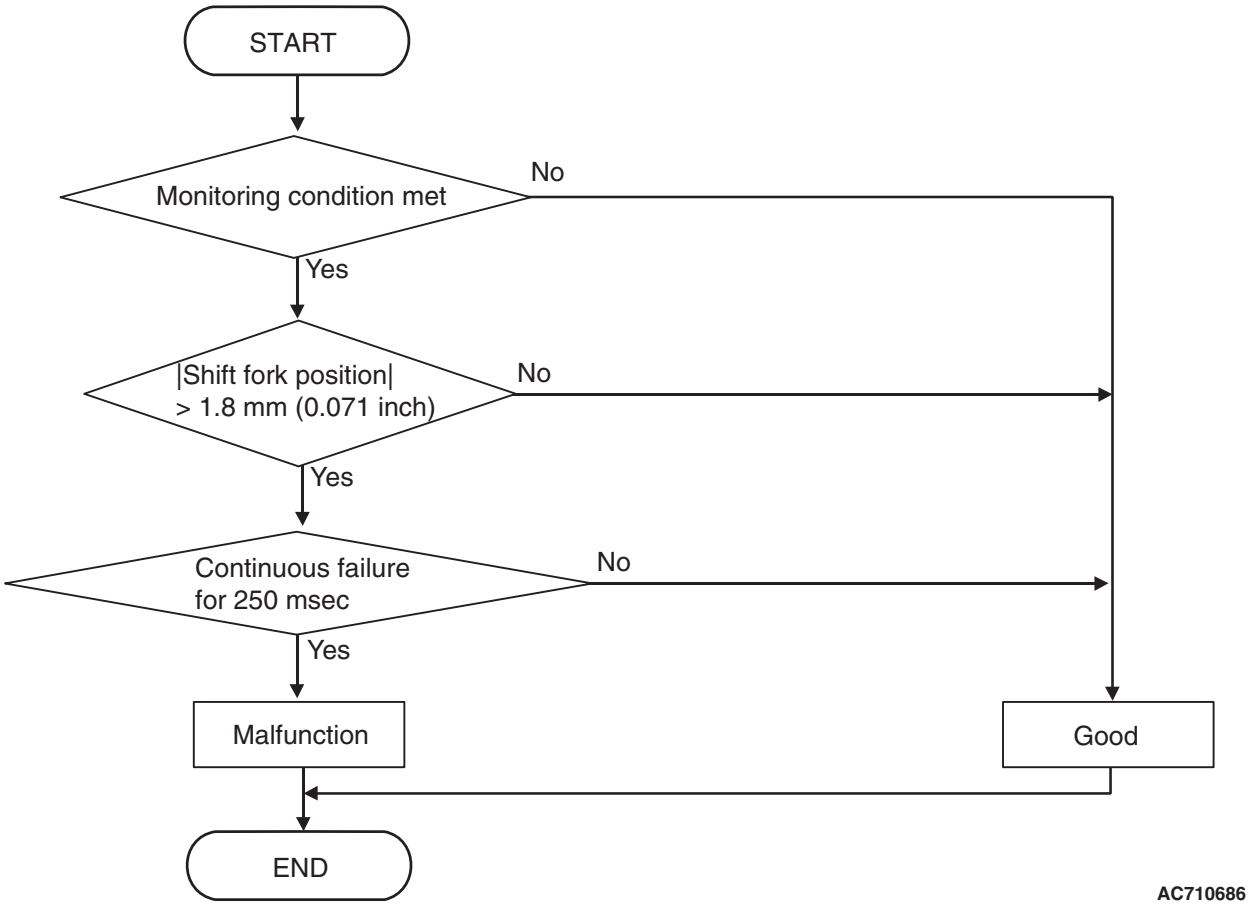
LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - Neutral>



DTC SET CONDITIONS <FUNCTIONAL CHECK - NEUTRAL>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 3 current gear: Neutral.

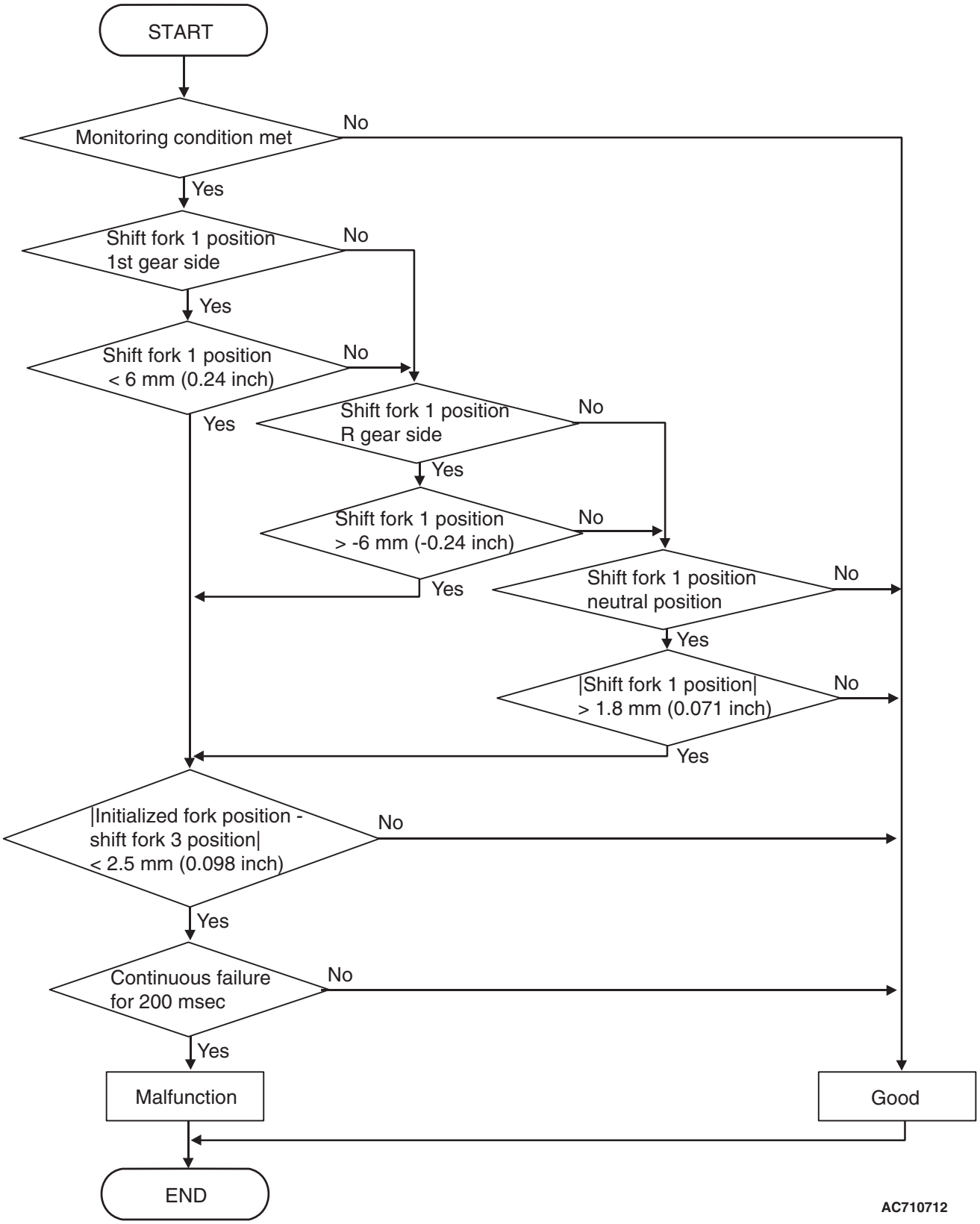
JUDGMENT CRITERIA

- Shift fork position: 1.8 mm (0.071 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - NEUTRAL>

The shift fork position remains 1.8 mm (0.071 inch) or less for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - Shift fork 3 requested but shift fork 1 movement>



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DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 3 REQUESTED BUT SHIFT FORK 1 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 3.

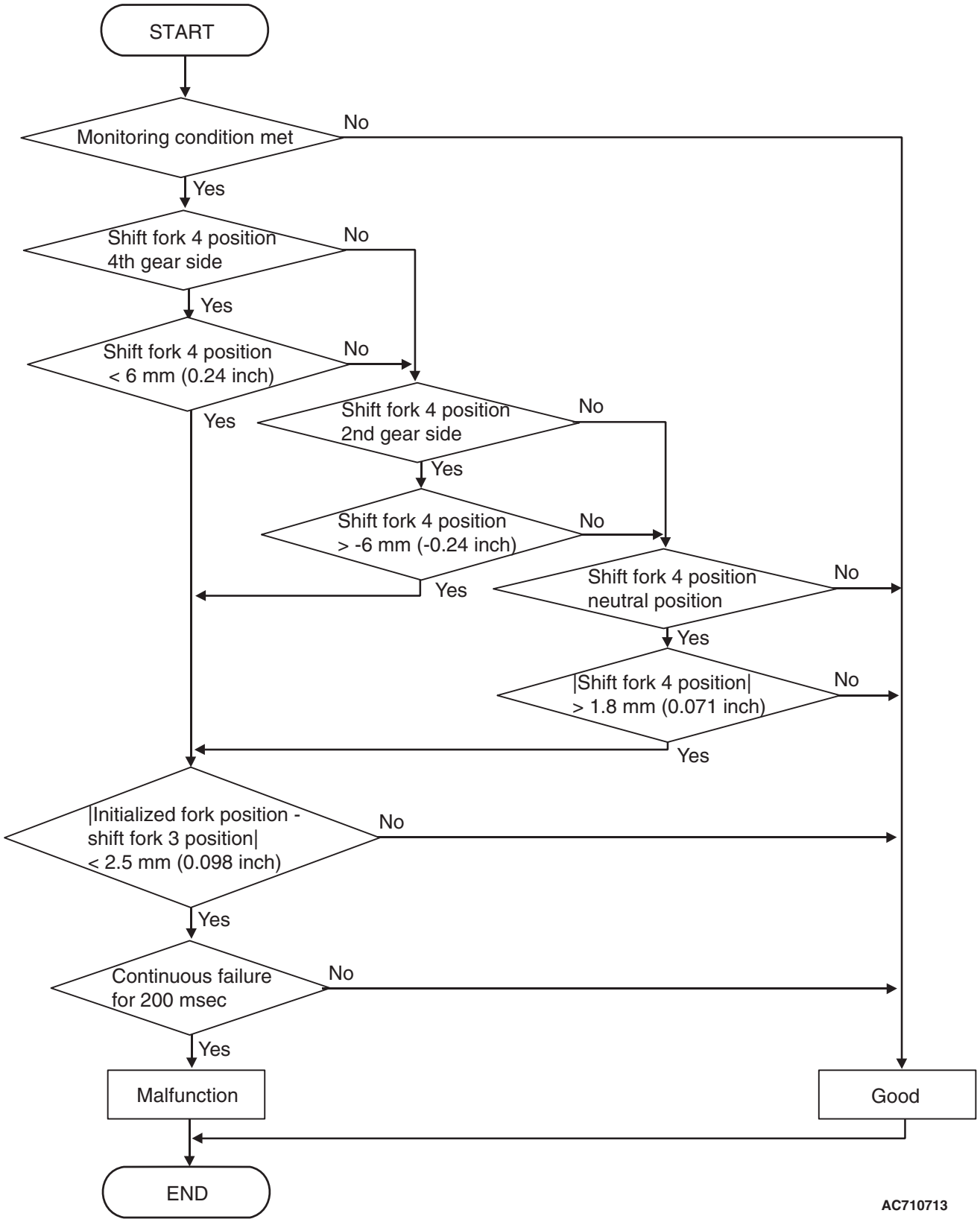
JUDGMENT CRITERIA

- Shift fork position: 6 mm (0.24 inch) [1st gear side] or less, or −6 mm (−0.24 inch) [reverse gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more and initialized fork position − shift fork 3 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 3 REQUESTED BUT SHIFT FORK 1 MOVEMENT>

The status with the shift fork position 6 mm (0.24 inch) [1st gear side] or more, or with −6 mm (−0.24 inch) [reverse gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position −shift fork 3 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - shift fork 3 requested but shift fork 4 movement>



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DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 3 REQUESTED BUT SHIFT FORK 4 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 3.

JUDGMENT CRITERIA

- Shift fork position: 6 mm (0.24 inch) [4th gear side] or less, or −6 mm (−0.24 inch) [2nd gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and initialized fork position –shift fork 3 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 3 REQUESTED BUT SHIFT FORK 4 MOVEMENT>

The status with the shift fork position 6 mm (0.24 inch) [4th gear side] or more, or with −6 mm (−0.24 inch) [2nd gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position –shift fork 3 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST shift fork

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1844 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P184B: Shift Fork 4 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the movement of the shift fork 4 is normal.

DESCRIPTIONS OF MONITOR METHODS

The movement of the shift fork 4 is determined to be abnormal.

MONITOR EXECUTION

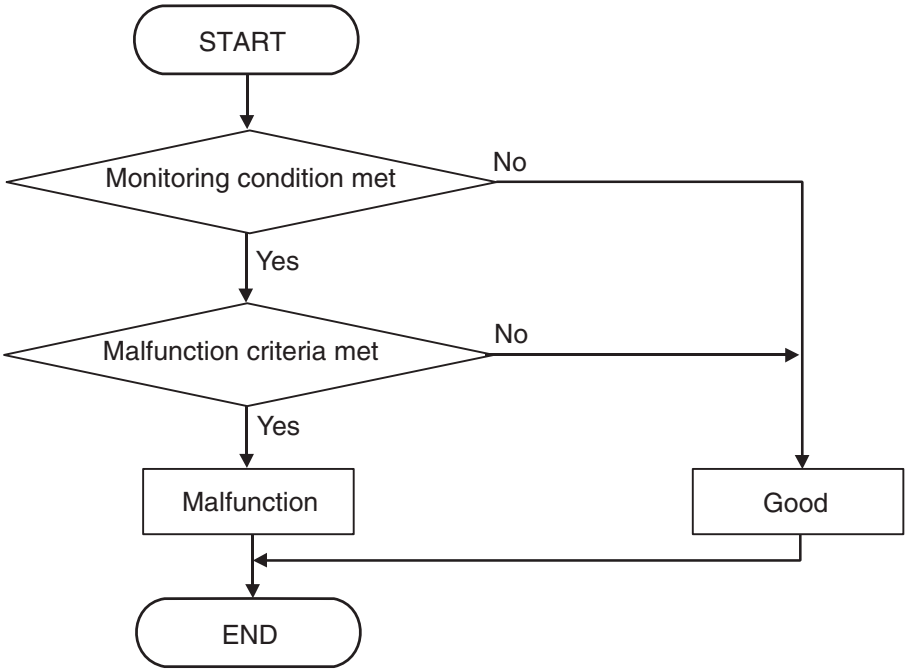
- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P1844: Shift fork 3 malfunction

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

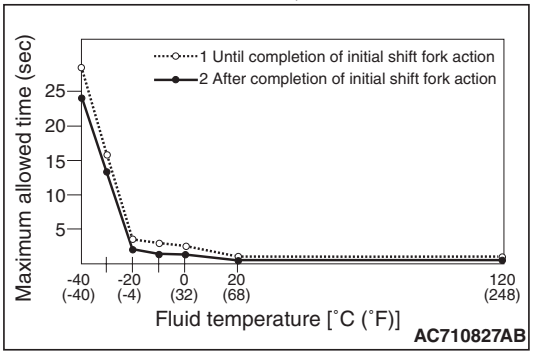
LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - blocked>

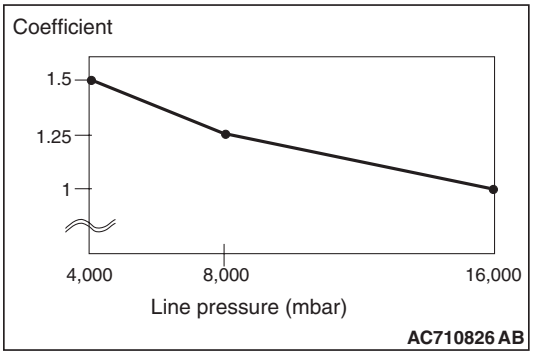


DTC SET CONDITIONS <FUNCTIONAL CHECK - BLOCKED>

Check Conditions
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Common high side 1 voltage: 2.5 V or more.
- Common high side 3 voltage: 2.5 V or more.

JUDGMENT CRITERIA



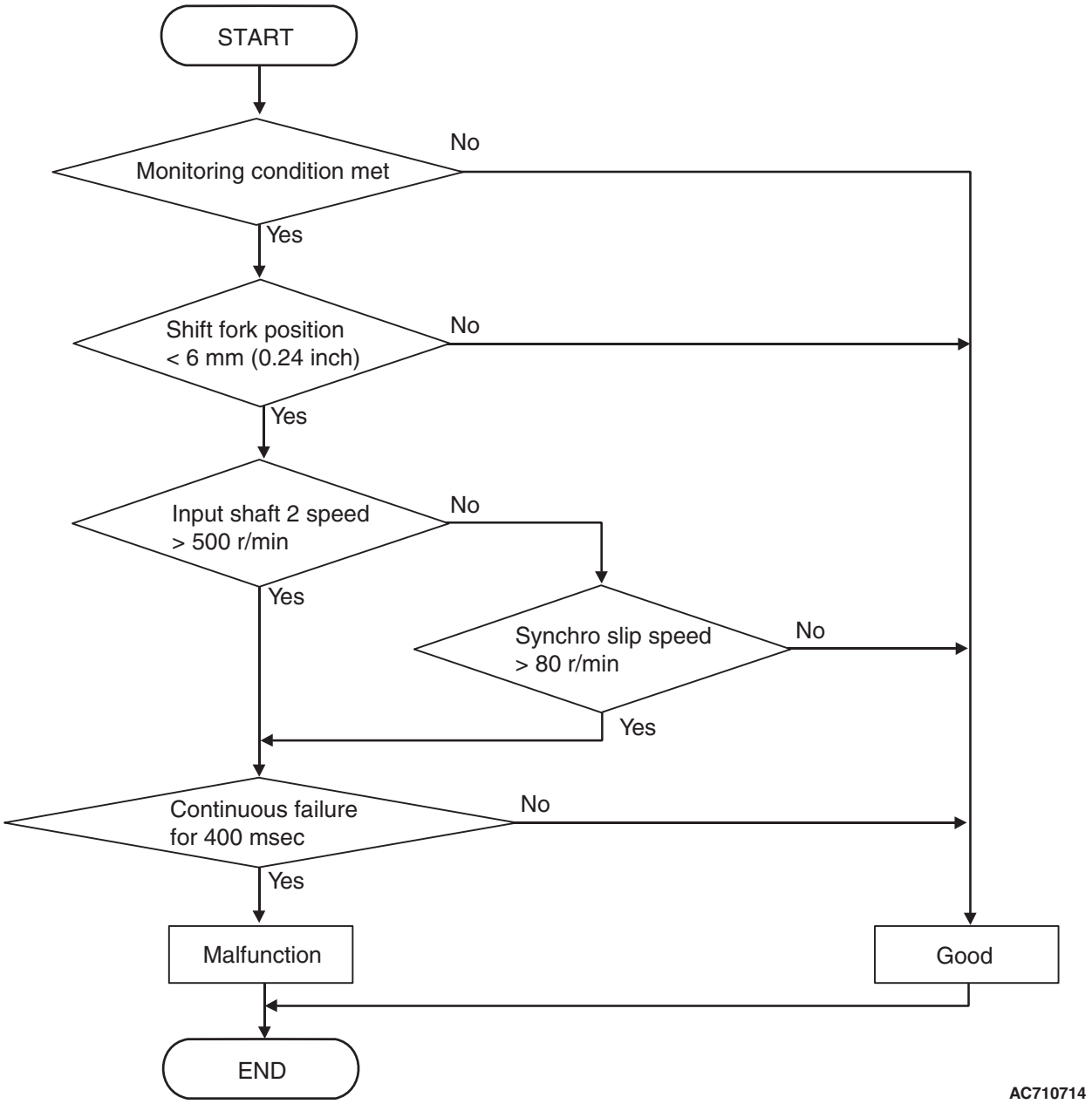


- Shift fork operation time: Shift fork operation time (threshold value) or more. (immediately)
- Shift fork operation time (threshold value): Equal the maximum allowed time x Coefficient. (immediately)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - BLOCKED>

The shift fork operation time is threshold value or less.

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - 4th gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - 4TH GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 4 current gear: 4th gear.

JUDGMENT CRITERIA

- Shift fork position: 6 mm (0.24 inch) or less, and input shaft 2 (even) speed: 500 r/min or more, or synchro (4th gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - 4TH GEAR>

The status with the shift fork position 6 mm (0.24 inch) or more and with the input shaft 2 (even) speed 500 r/min or less, or with the synchro (4th gear) slip speed 80 r/min or less continues for 400 milliseconds.

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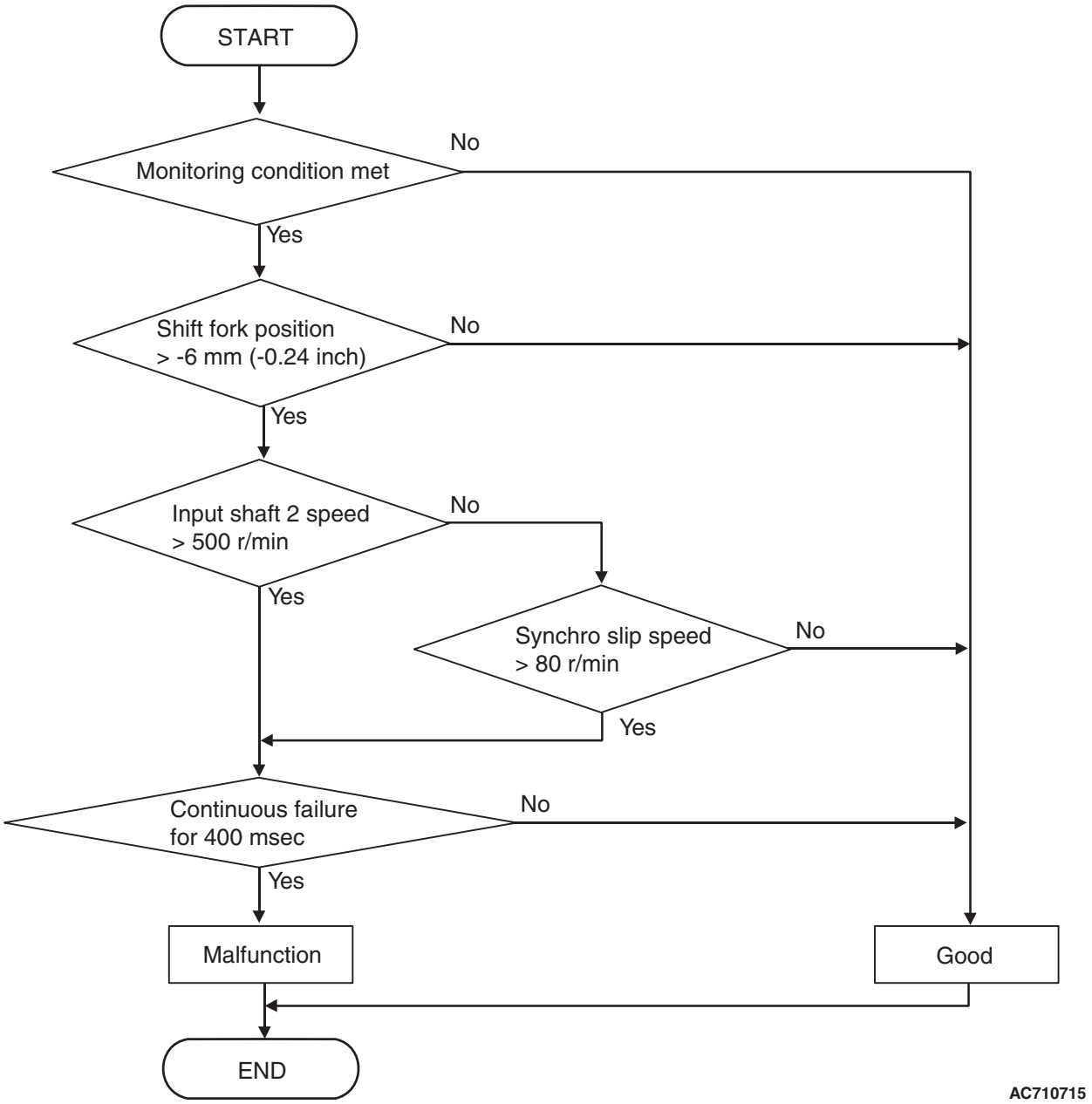
LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - 2nd gear>



DTC SET CONDITIONS <FUNCTIONAL CHECK - 2ND GEAR>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 4 current gear: 2nd gear.

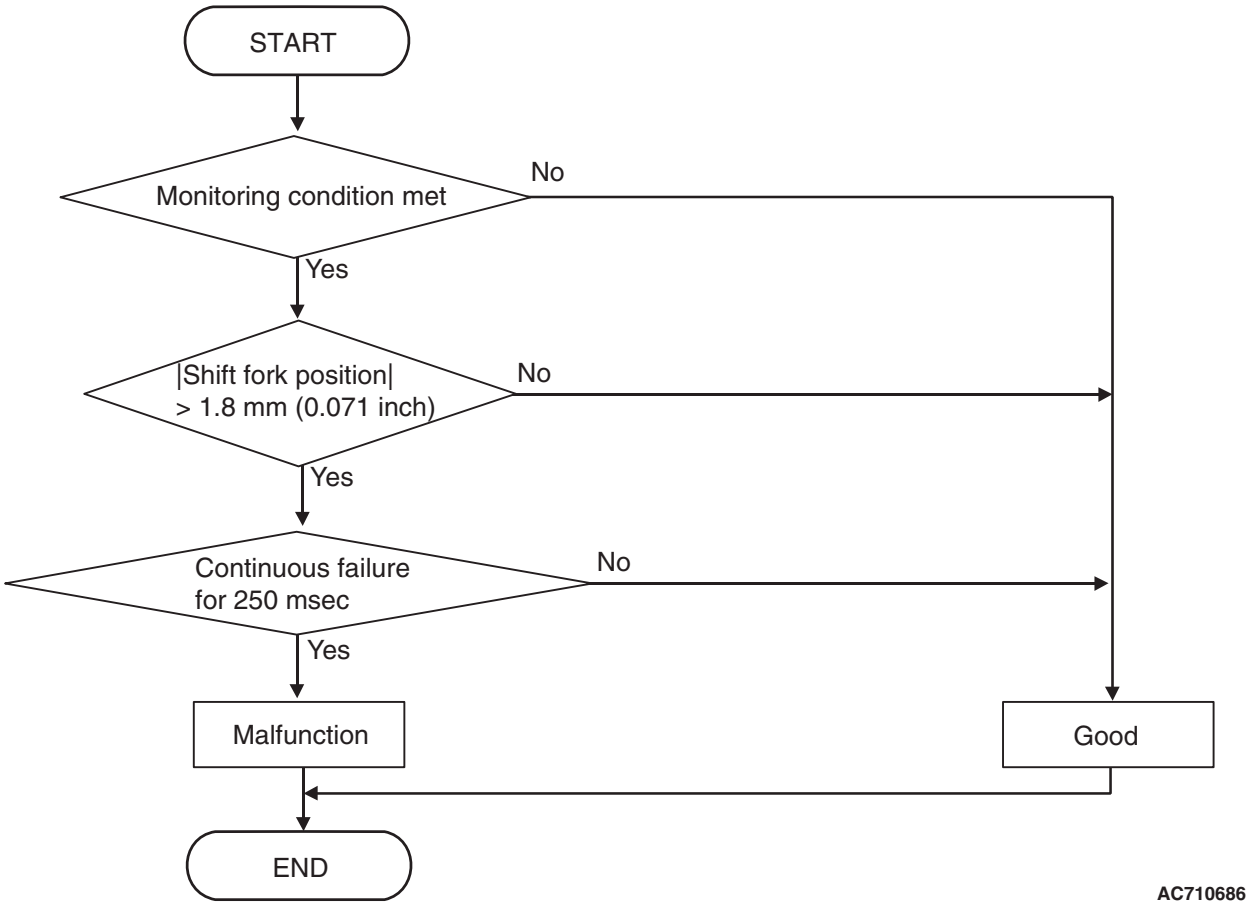
JUDGMENT CRITERIA

- Shift fork position: −6 mm (−0.24 inch) or more, and input shaft 2 (even) speed: 500 r/min or more, or synchro (2nd gear) slip speed: 80 r/min or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - 2ND GEAR>

The status with the shift fork position −6 mm (−0.24 inch) or less and with the input shaft 2 (even) speed 500 r/min or less, or with the synchro (2nd gear) slip speed 80 r/min or less continues for 400 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - Neutral>



DTC SET CONDITIONS <FUNCTIONAL CHECK - NEUTRAL>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 4 current gear: Neutral.

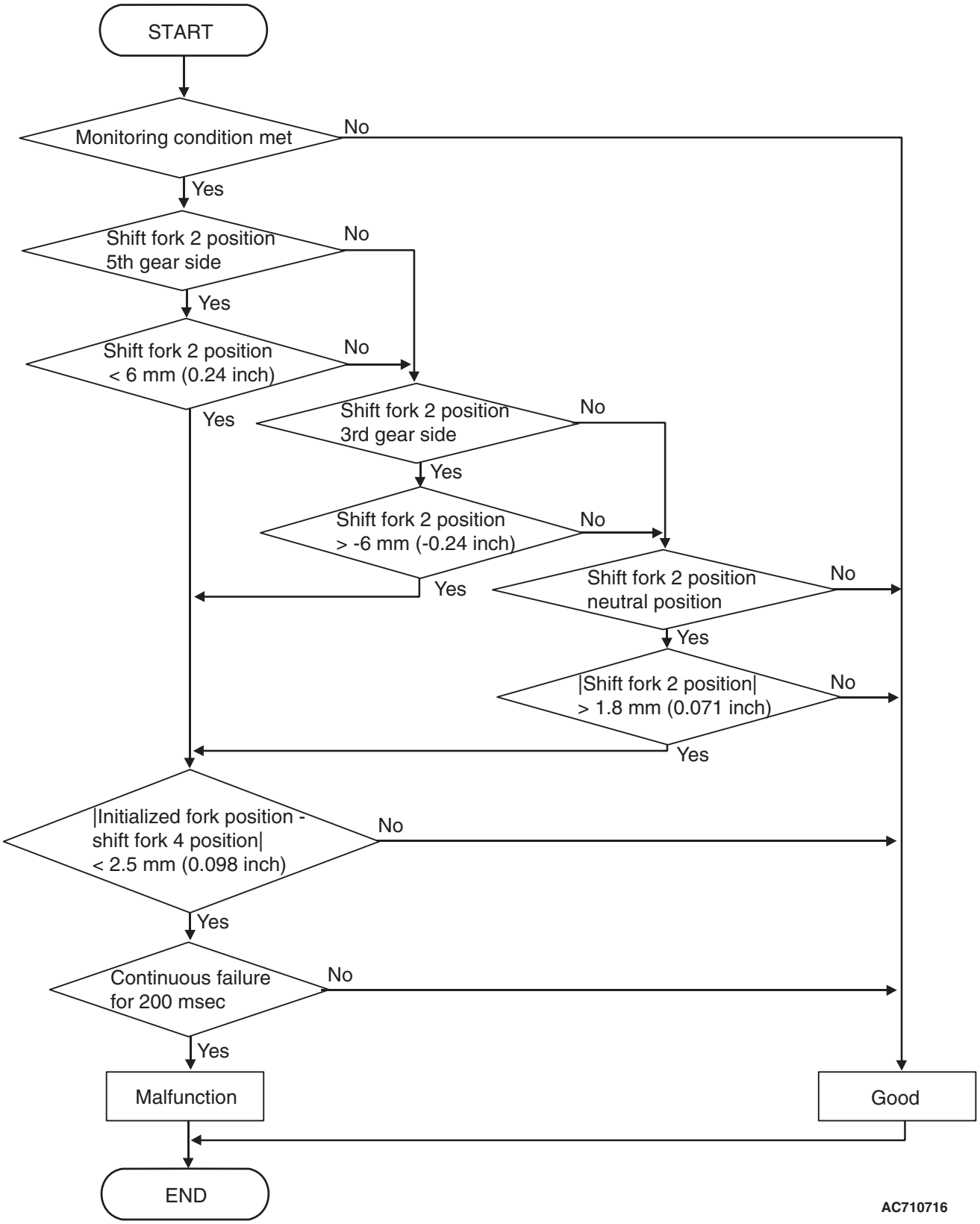
JUDGMENT CRITERIA

- Shift fork position: 1.8 mm (0.071 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - NEUTRAL>

The shift fork position remains 1.8 mm (0.071 inch) or less for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - Shift fork 4 requested but shift fork 2 movement>



DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 4 REQUESTED BUT SHIFT FORK 2 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 4.

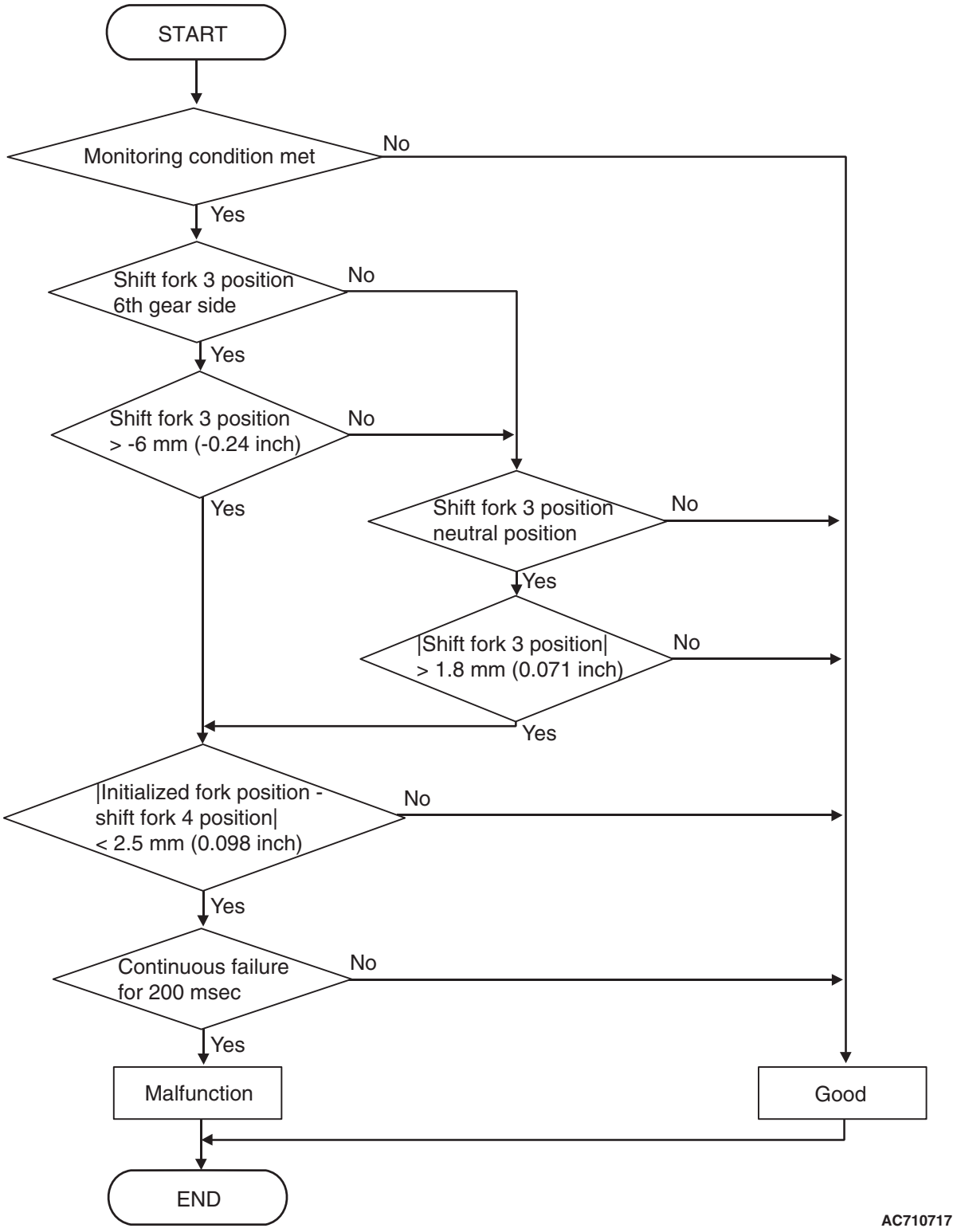
JUDGMENT CRITERIA

- Shift fork position: 6 mm (0.24 inch) [5th gear side] or less, or −6 mm (−0.24 inch) [3rd gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and Initialized fork position −shift fork 4 position: 2.5 mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 4 REQUESTED BUT SHIFT FORK 2 MOVEMENT>

The status with the shift fork position 6 mm (0.24 inch) [5th gear side] or more, or with −6 mm (−0.24 inch) [3rd gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position −shift fork 4 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - shift fork 4 requested but shift fork 3 movement>



DTC SET CONDITIONS <FUNCTIONAL CHECK - SHIFT FORK 4 REQUESTED BUT SHIFT FORK 3 MOVEMENT>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Requested shift fork: Shift fork 4.

JUDGMENT CRITERIA

- Shift fork position: −6 mm (−0.24 inch) [6th gear side] or more, or 1.8 mm (0.071 inch) [neutral position] or more, and initialized fork position – shift fork 4 position: 2.5mm (0.098 inch) or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - SHIFT FORK 3 REQUESTED BUT SHIFT FORK 4 MOVEMENT>

The status of the shift fork position −6 mm (−0.24 inch) [6th gear side] or less, or with 1.8 mm (0.071 inch) [neutral position] or less and with the initialized fork position –shift fork 3 position 2.5 mm (0.098 inch) or more continues for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST shift fork

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is the DTC No. P184B set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P1852: Shift Fork 1 or 2 opposite direction movement

⚠ 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 FUNCTION

TC-SST-ECU checks that the movement of the shift fork is normal.

DESCRIPTIONS OF MONITOR METHODS

The movements of the shift fork 1 and 2 are determined to be abnormal.

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)

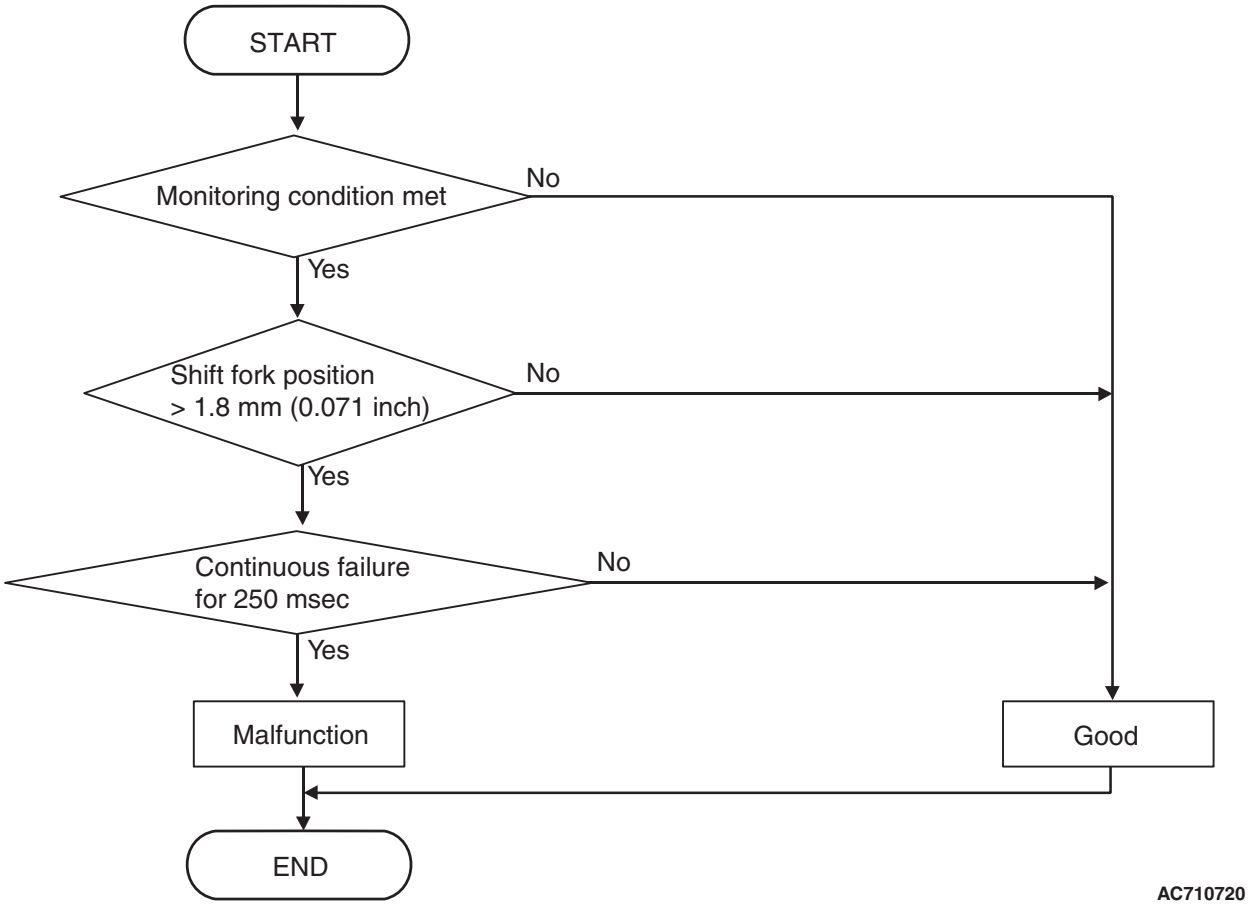
- P1836: Shift fork 1 malfunction

- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - move opposite direction right side>



DTC SET CONDITIONS <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION RIGHT SIDE>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 1 and 2 current gear: Neutral.
- Shift fork 1 and 2 target direction: 0 mm (0 inch) or less.

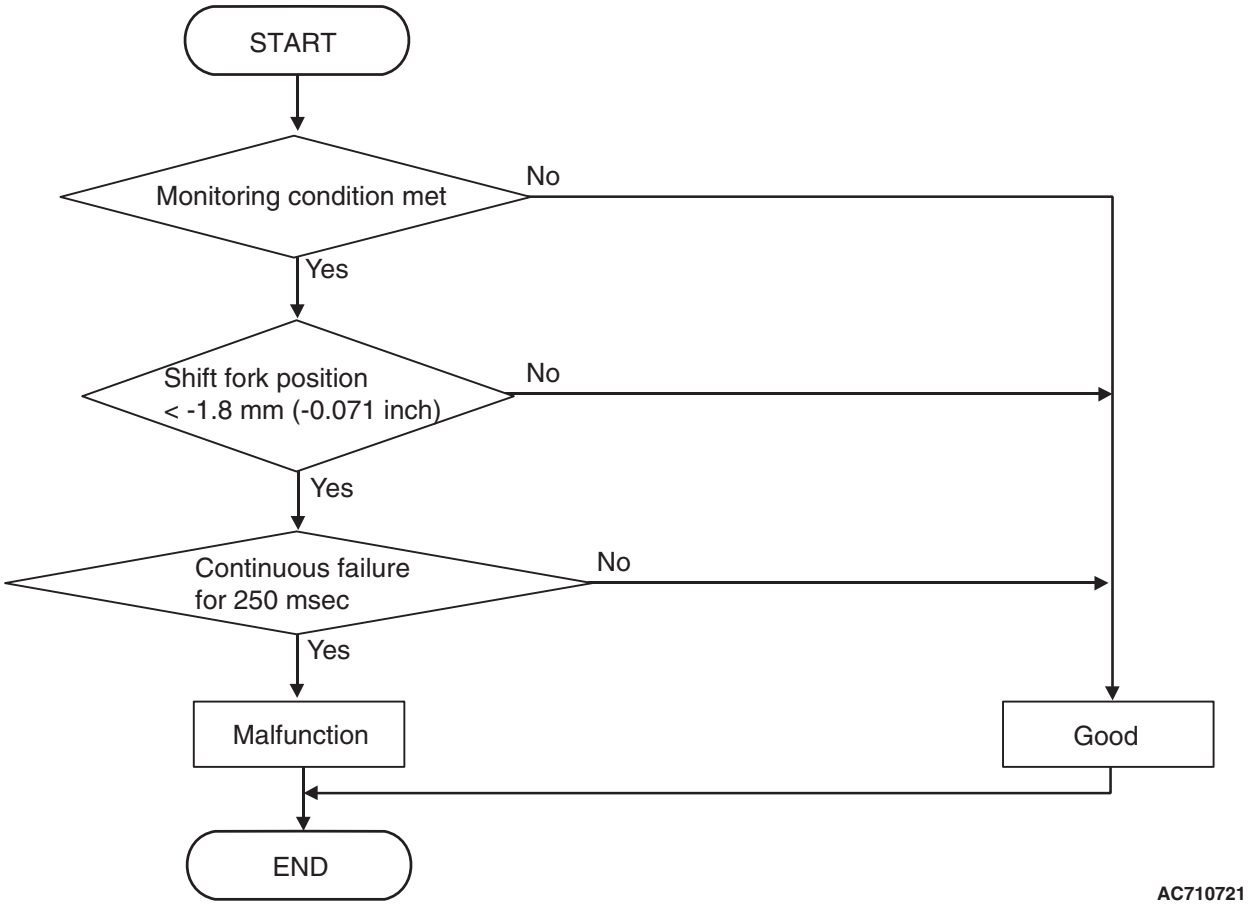
JUDGMENT CRITERIA

- Shift fork 1 and 2 position: 1.8 mm (0.071 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION RIGHT SIDE>

The shift fork 1 and 2 positions remain 1.8 mm (0.071 inch) or less for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence)
<Functional check - move opposite direction left side>



DTC SET CONDITIONS <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION LEFT SIDE>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 1 and 2 current gear: Neutral.
- Shift fork 1 and 2 target direction: 0 mm (0 inch) or more.

JUDGMENT CRITERIA

- Shift fork 1 and 2 position: −1.8 mm (−0.071 inch) or less. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION LEFT SIDE>

The shift fork 1 and 2 positions remain −1.8 mm (−0.071 inch) or more for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST shift fork

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is the DTC No. P1852 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1855: Shift Fork 3 or 4 opposite direction movement

⚠ 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 FUNCTION

TC-SST-ECU checks that the movement of the shift fork is normal.

DESCRIPTIONS OF MONITOR METHODS

The movements of the shift fork 3 and 4 are determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

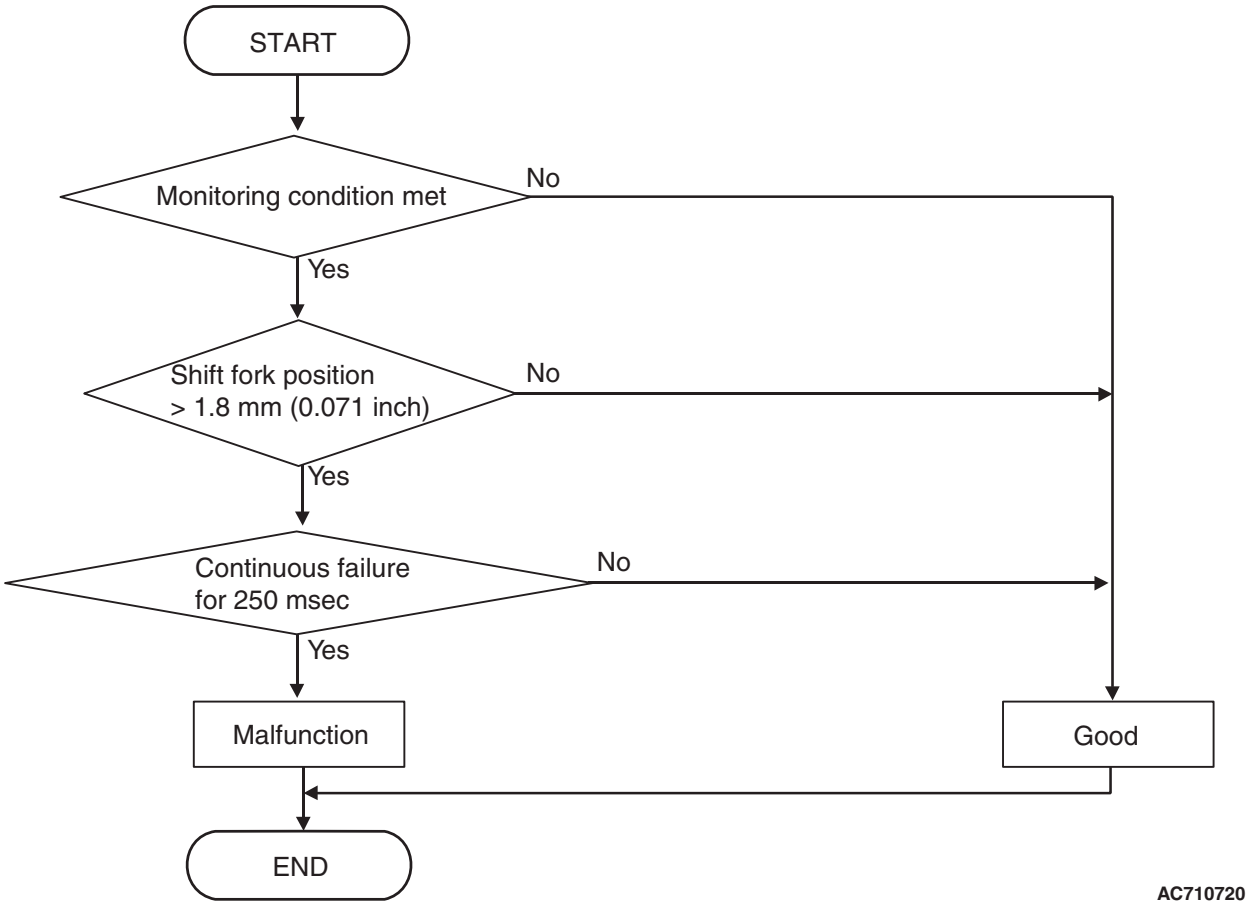
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - move opposite direction right side>



DTC SET CONDITIONS <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION RIGHT SIDE>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 3 and 4 current gear: Neutral.
- Shift fork 3 and 4 target direction: 0 mm (0 inch) or less.

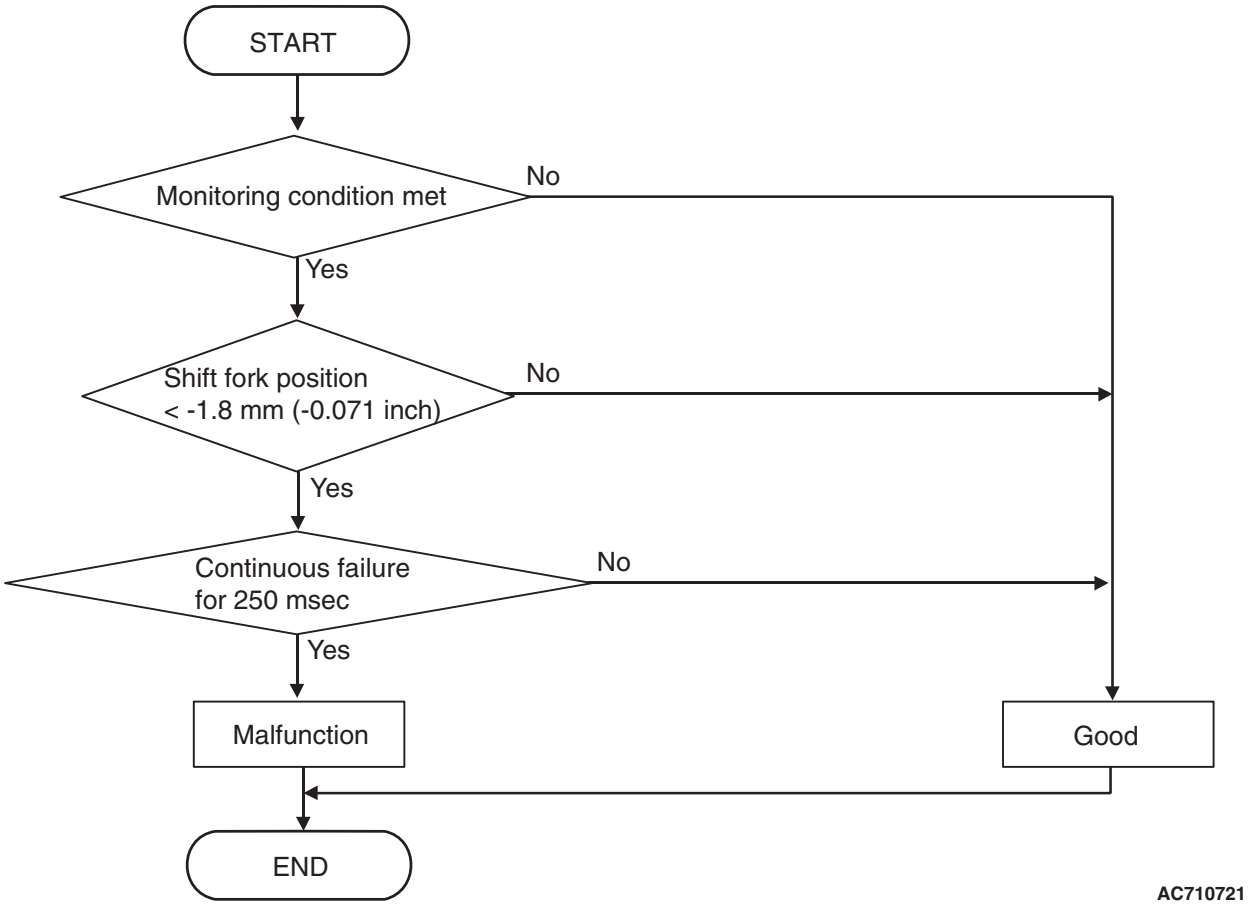
JUDGMENT CRITERIA

- Shift fork 3 and 4 position: 1.8 mm (0.071 inch) or more. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION RIGHT SIDE>

The shift fork 3 and 4 positions remain 1.8 mm (0.071 inch) or less for 250 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Functional check - move opposite direction left side>



DTC SET CONDITIONS <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION LEFT SIDE>

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Shift fork 3 and 4 current gear: Neutral.
- Shift fork 3 and 4 target direction: 0 mm (0 inch) or more.

JUDGMENT CRITERIA

- Shift fork 3 and 4 position: −1.8 mm (−0.071 inch) or less. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <FUNCTIONAL CHECK - MOVE OPPOSITE DIRECTION LEFT SIDE>

The shift fork 3 and 4 positions remain −1.8 mm (−0.071 inch) or more for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST shift fork

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is the DTC No. P1855 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1857: Odd number gear axle interlock

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The two gears are determined to be engaged in the odd number gear range.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

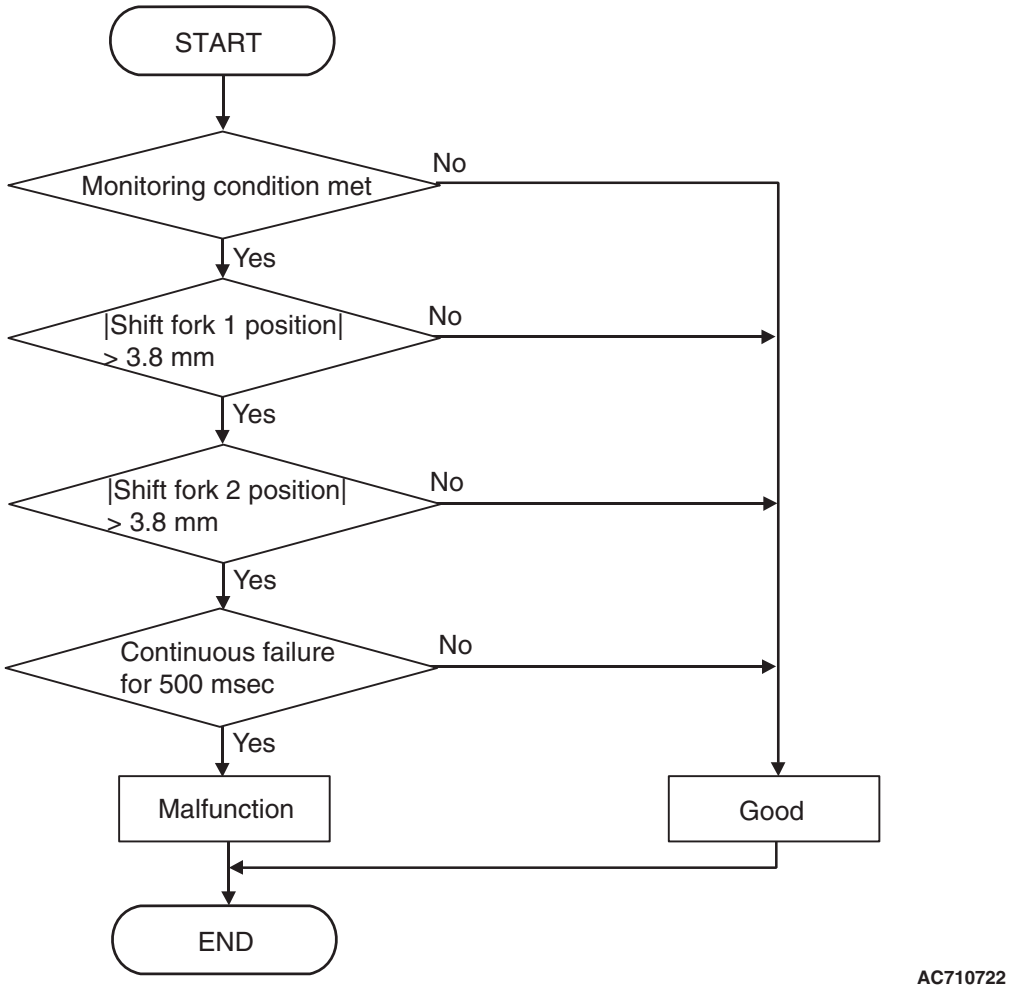
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- Shift fork 1 and 2 position: 3.8 mm (0.15 inch) or more. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The shift fork 1 and 2 positions remain 3.8 mm (0.15 inch) or less for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1857 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1858: Even number gear axle interlock

⚠ **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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The two gears are determined to be engaged in the even number gear range.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

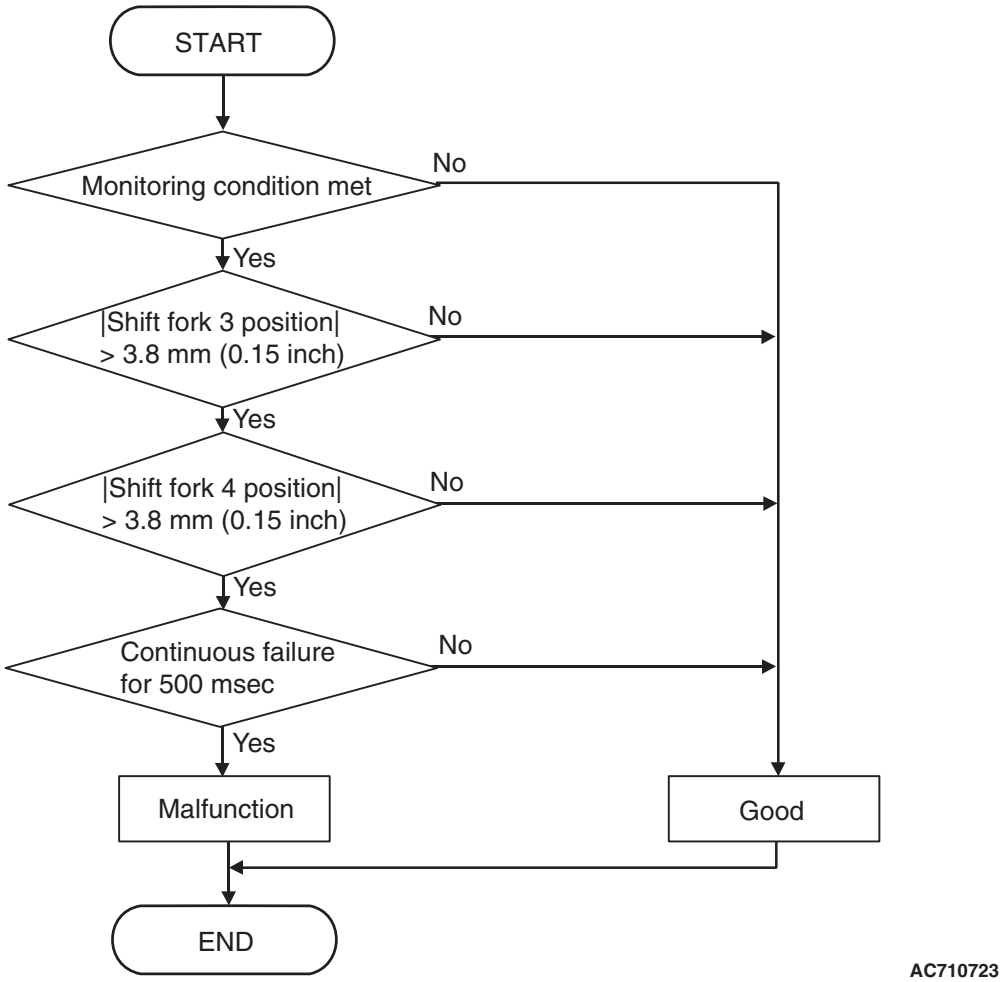
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- Shift fork 3 and 4 position: 3.8 mm (0.15 inch) or more. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

The shift fork 3 and 4 positions remain 3.8 mm (0.15 inch) or less for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1858 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1859: Disengagement too late with clutch 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The disengagement of the clutch 1 is determined to be late.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

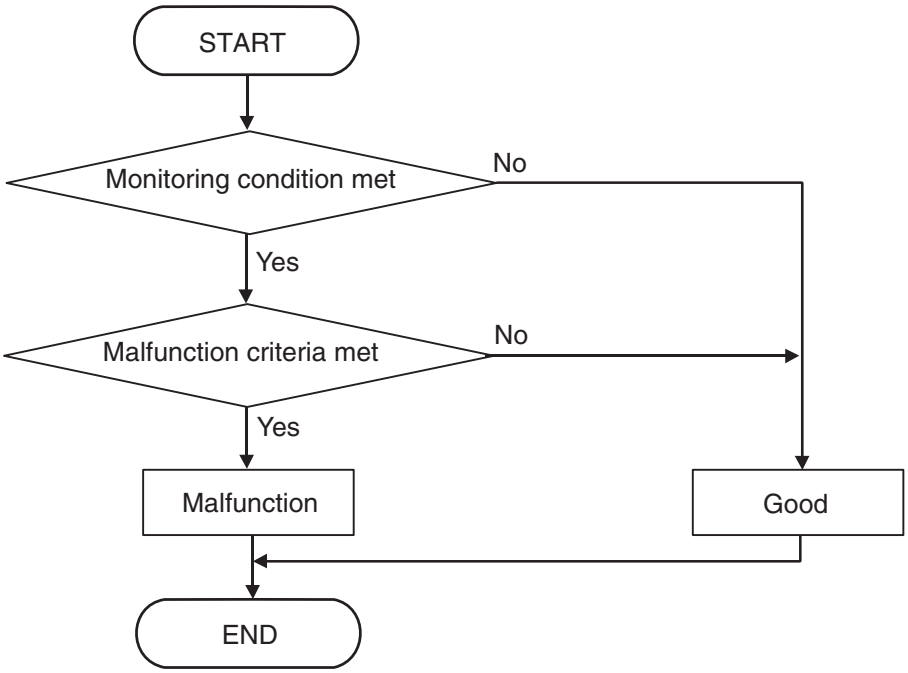
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P1836: Shift fork 1 malfunction
- P183D: Shift fork 2 malfunction

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor

LOGIC FLOW CHARTS (Monitor Sequence)



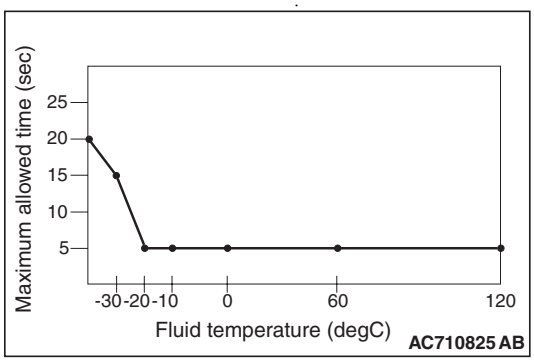
TSB Revision

DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 1 (odd) state: Disengaging.

JUDGMENT CRITERIA



- The disengagement time of the clutch (depends on the fluid temperature) is outside the threshold value.

OBD-II DRIVE CYCLE PATTERN

The disengagement time of the clutch (depends on the fluid temperature) corresponds with the threshold value.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1859 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P185A: Engagement too late with clutch 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the clutch 1 is determined to be late.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P185A set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P185B: Disengagement too late with clutch 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The disengagement of the clutch 2 is determined to be late.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

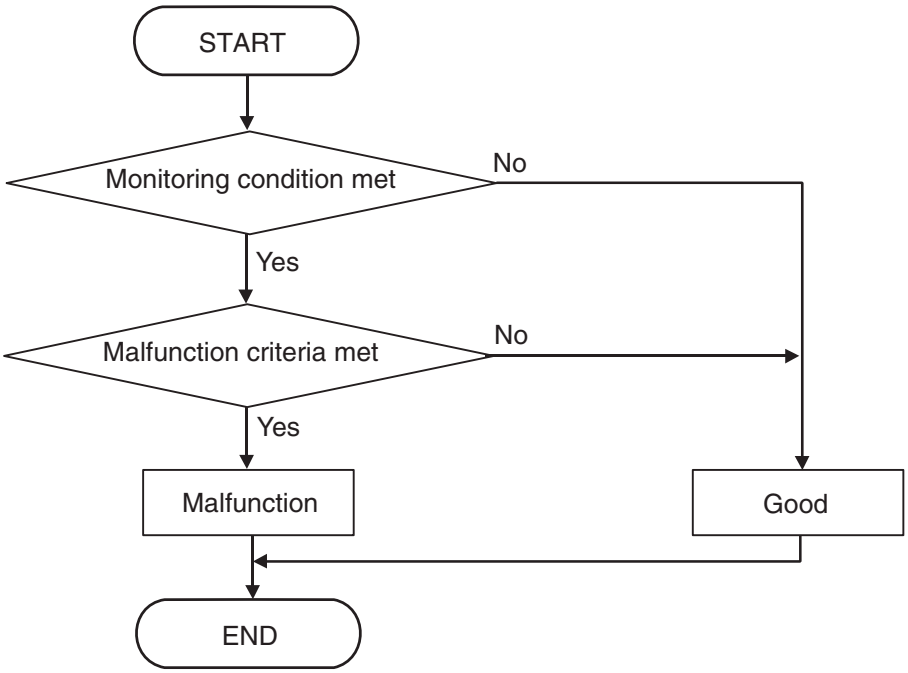
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P1844: Shift fork 3 malfunction
- P184B: Shift fork 4 malfunction

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor

LOGIC FLOW CHARTS (Monitor Sequence)

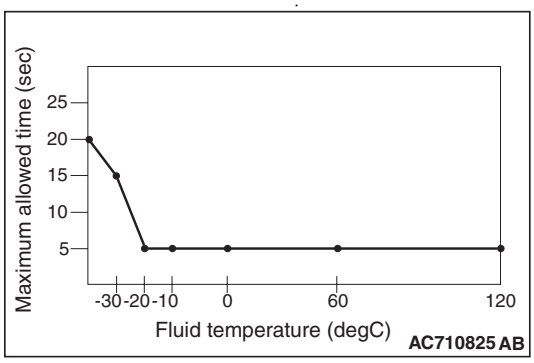


DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 2 (even) state: Disengaging.

JUDGMENT CRITERIA



- The disengagement time of the clutch (depends on the fluid temperature) is outside the threshold value.

OBD-II DRIVE CYCLE PATTERN

The disengagement time of the clutch (depends on the fluid temperature) corresponds with the threshold value.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P185B set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P185C: Engagement too late with clutch 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.**

DIAGNOSTIC FUNCTION
TC-SST-ECU checks that the clutch 2 is normal.

DESCRIPTIONS OF MONITOR METHODS
The engagement of the clutch 2 is determined to be late.

PROBABLE CAUSES
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P185C set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P185D: Clutch open not possible

⚠ 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 FUNCTION
TC-SST-ECU checks that the clutch 1 and 2 are normal.

DESCRIPTIONS OF MONITOR METHODS
The disengagement of the clutch 1 and 2 are determined to be impossible.

MONITOR EXECUTION
- Continuous

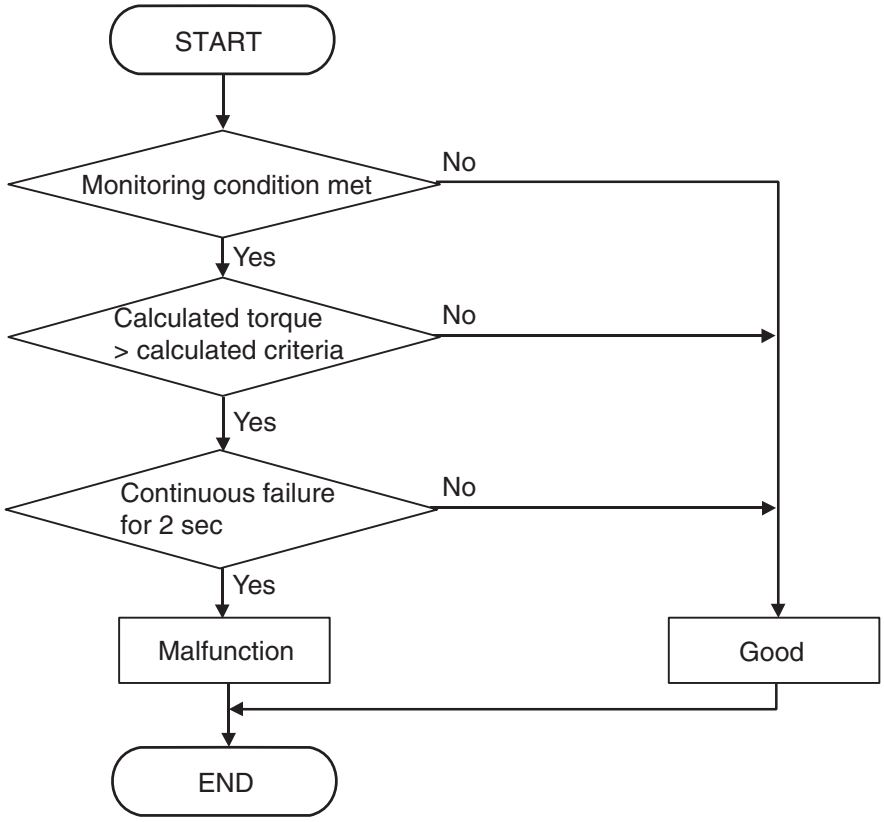
TSB Revision

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
- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch 1 state: Not stroking (not to close).
- Clutch 2 state: Not stroking (not to close).
- Input shaft 1 (odd) gear: Engaged.
- Input shaft 2 (even) gear: Engaged.
- Current gear: Not 1st gear and reverse gear.

JUDGMENT CRITERIA
- Current clutch torque –Clutch 1 (odd) permit torque –Clutch 2 (even) permit torque: (100 N· m (74 ft-lb) + (Current clutch torque × 0.25%)) or more. (2 seconds)

OBD-II DRIVE CYCLE PATTERN

The current clutch torque –clutch 1 (odd) permit torque –clutch 2 (even) permit torque remain (100 N· m (74 ft-lb) + (current clutch torque × 0.25%)) or less for 2 seconds.

PROBABLE CAUSES

- Clutch malfunction

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P185D set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1862: High side 1 system (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the high side 1 is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

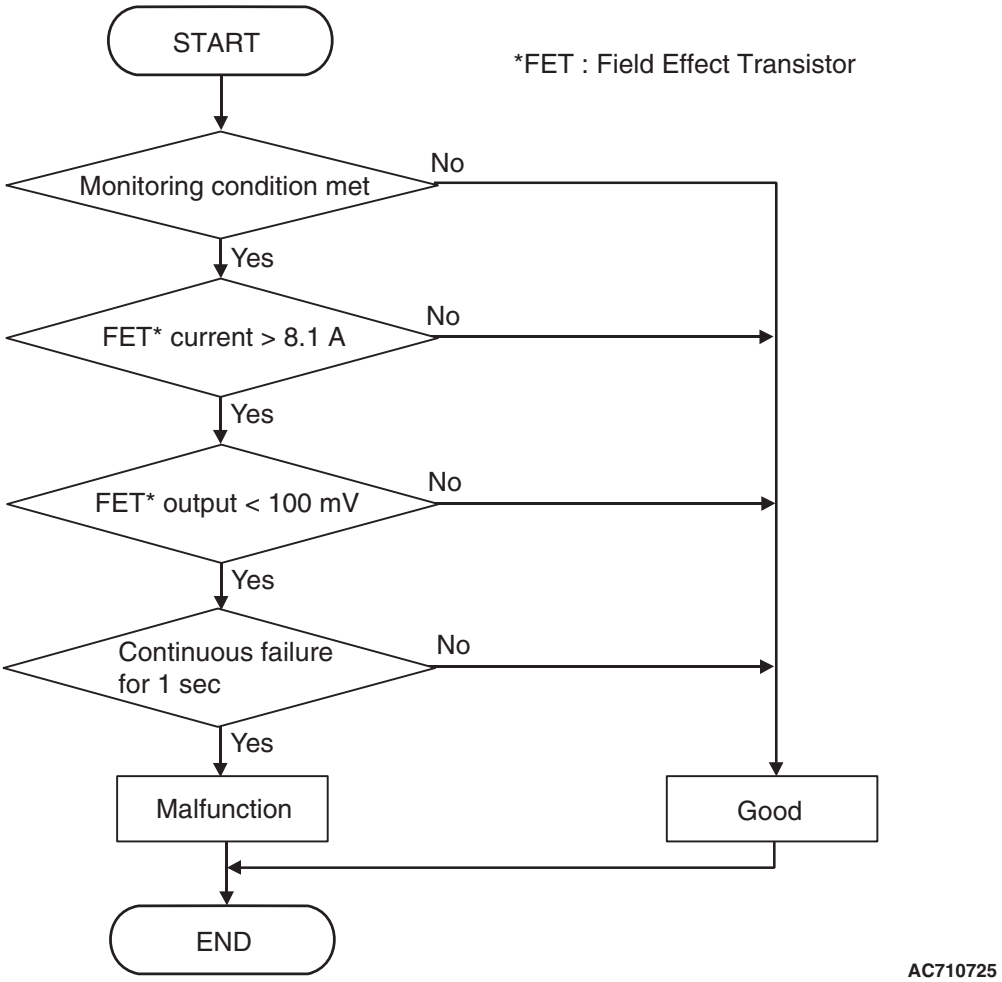
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0758: Shift select solenoid 2 system (Open circuit)
- P0976: Shift select solenoid 2 system (Short to ground)
- P0977: Shift select solenoid 2 system (Short to power supply)
- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)
- P0968: Shift/cooling switching solenoid system (Open circuit)
- P0970: Shift/cooling switching solenoid system (Short to ground)
- P0971: Shift/cooling switching solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 2
- Line pressure solenoid
- Shift/cooling switching solenoid

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 1 switch: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 8.1 A or more, and FET (Field Effect Transistor) output: 100 mV or less (1 second).

OBD-II DRIVE CYCLE PATTERN

The status with the current of the FET channel shunt 8.1 A or less and with the FET channel output 100 mV or more continues for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1862 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1863: High side 1 system (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the high side 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The high side 1 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

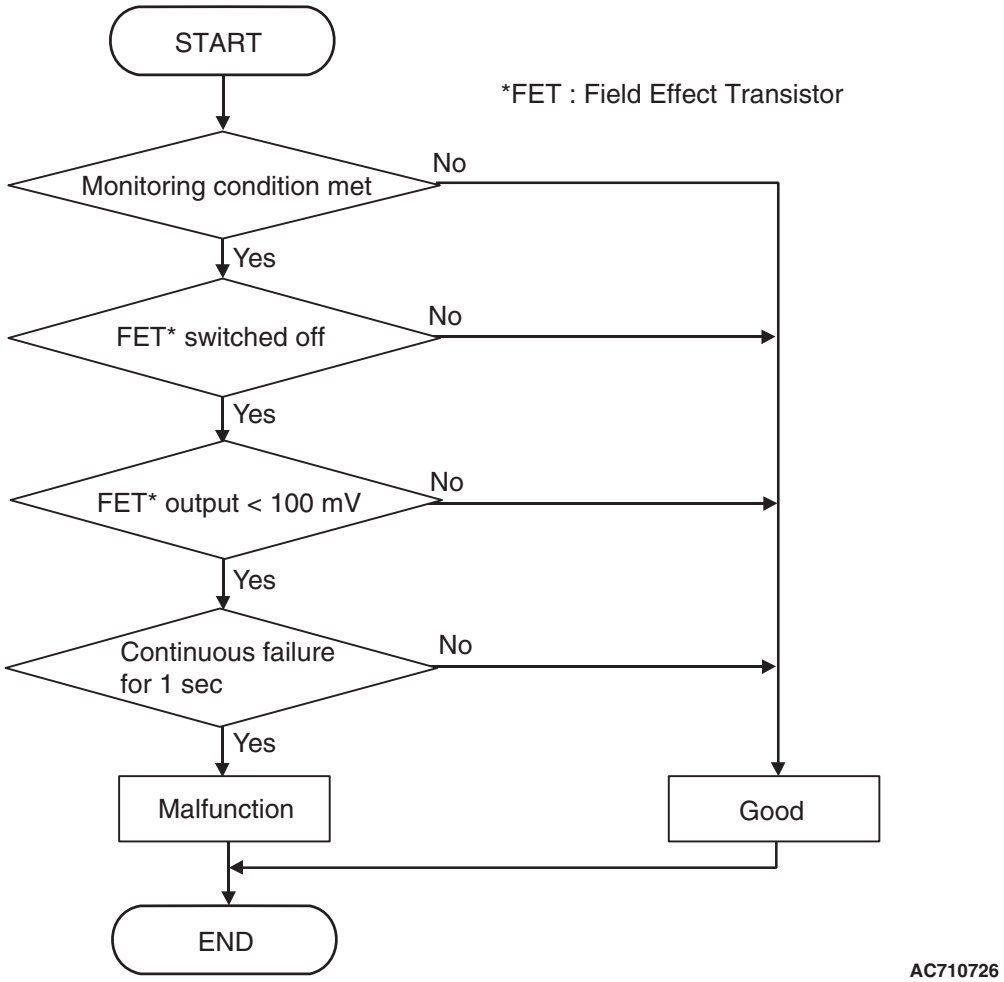
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0758: Shift select solenoid 2 system (Open circuit)
- P0976: Shift select solenoid 2 system (Short to ground)
- P0977: Shift select solenoid 2 system (Short to power supply)
- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)
- P0968: Shift/cooling switching solenoid system (Open circuit)
- P0970: Shift/cooling switching solenoid system (Short to ground)
- P0971: Shift/cooling switching solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 2
- Line pressure solenoid
- Shift/cooling switching solenoid

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 1 switch: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor): Can't be switched on, and FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The status with the FET switch ON and with the FET channel output 100 mV or more continues for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1863 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1864: High side 1 system (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The high side 1 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

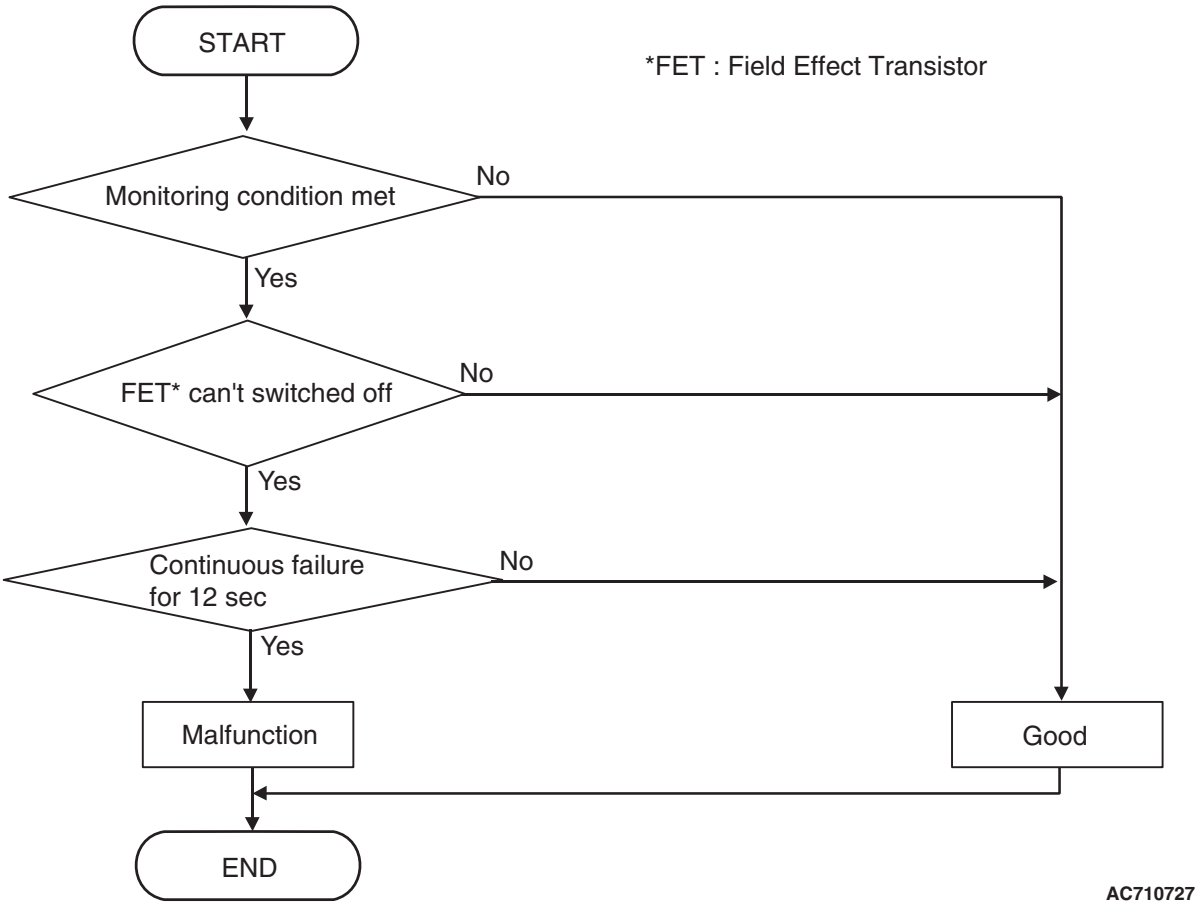
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0758: Shift select solenoid 2 system (Open circuit)
- P0976: Shift select solenoid 2 system (Short to ground)
- P0977: Shift select solenoid 2 system (Short to power supply)
- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)
- P0968: Shift/cooling switching solenoid system (Open circuit)
- P0970: Shift/cooling switching solenoid system (Short to ground)
- P0971: Shift/cooling switching solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 2
- Line pressure solenoid
- Shift/cooling switching solenoid

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 1 switch: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor): Can't be switched off. (12 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET switch remains OFF for 12 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1864 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1866: High side 2 system (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the high side 2 is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

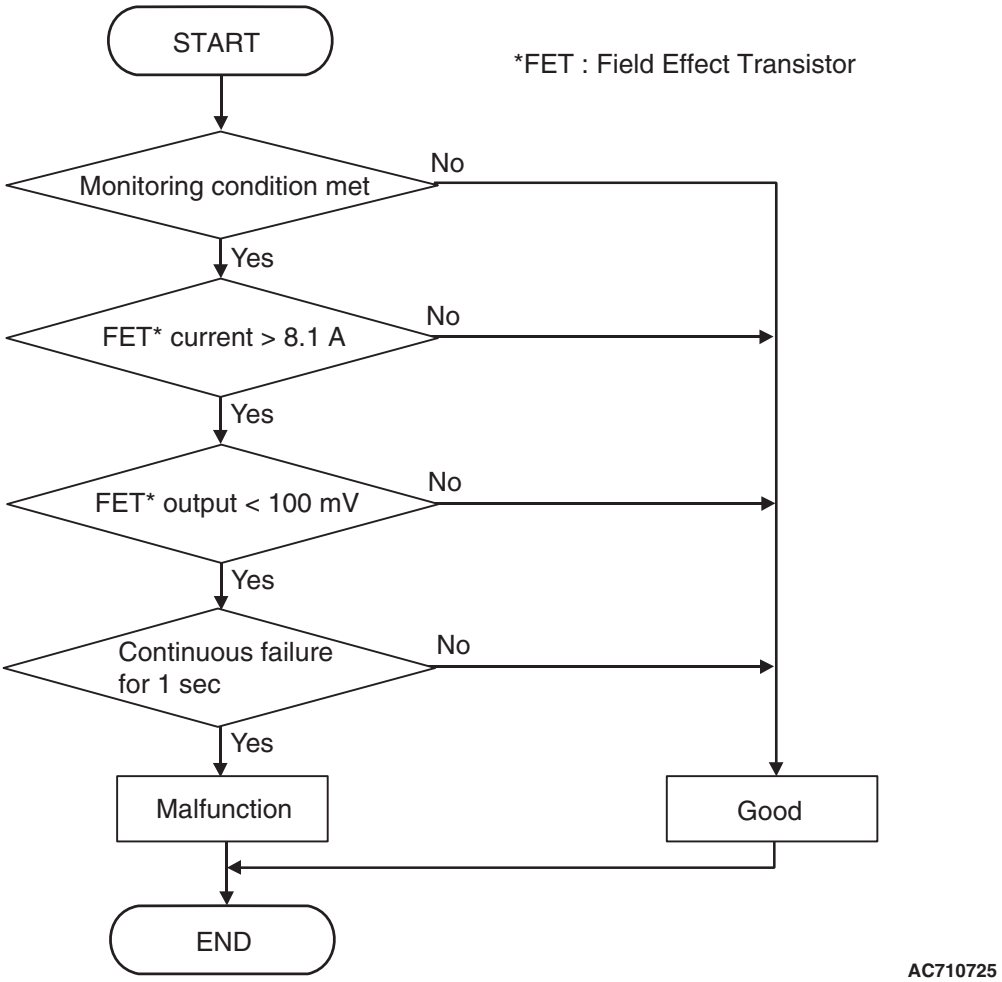
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)
- P2718: Clutch/shift pressure solenoid 1 system (Open circuit)
- P2719: Clutch/shift pressure solenoid 1 system (Overcurrent)
- P2720: Clutch/shift pressure solenoid 1 system (Short to ground)
- P2721: Clutch/shift pressure solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch cooling flow solenoid
- Clutch/shift pressure solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 2 switch: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 8.1 A or more, and FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The status with the current of the FET channel shunt 8.1 A or less and with the FET channel output 100 mV or more continues for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1866 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1867: High side 2 system (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the high side 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The high side 2 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

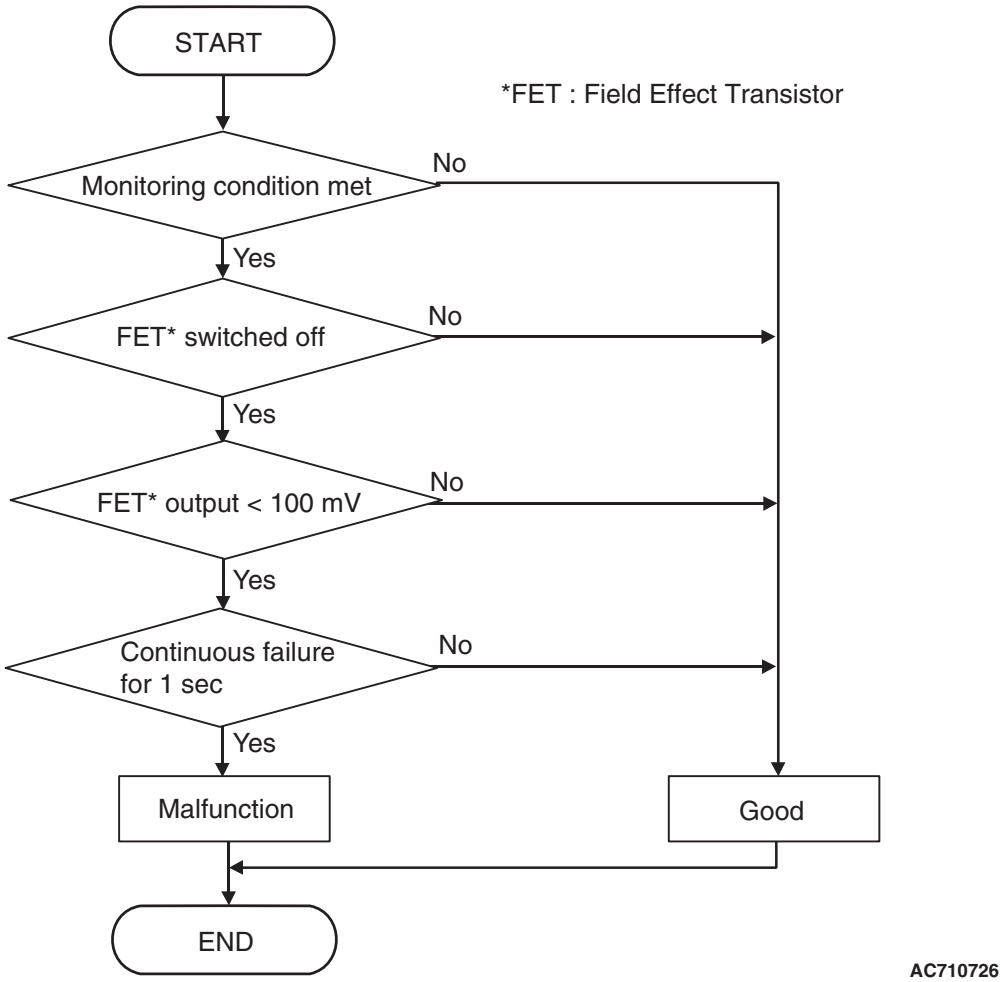
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)
- P2718: Clutch/shift pressure solenoid 1 system (Open circuit)
- P2719: Clutch/shift pressure solenoid 1 system (Overcurrent)
- P2720: Clutch/shift pressure solenoid 1 system (Short to ground)
- P2721: Clutch/shift pressure solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch cooling flow solenoid
- Clutch/shift pressure solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 2 switch: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor): Can't be switched on, and FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The status with the FET switch ON and with the FET channel output 100 mV or more continues for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1867 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1868: High side 2 system (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The high side 2 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

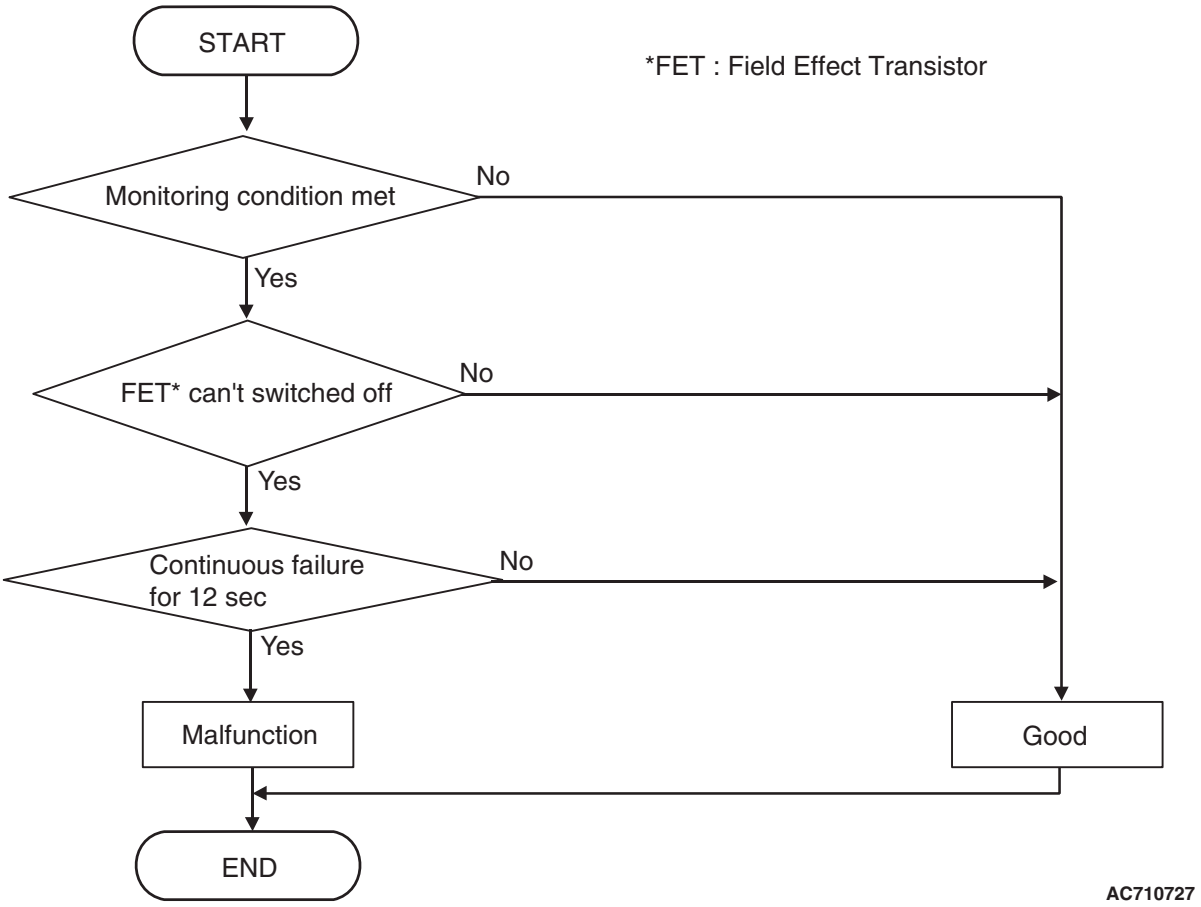
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)
- P2718: Clutch/shift pressure solenoid 1 system (Open circuit)
- P2719: Clutch/shift pressure solenoid 1 system (Overcurrent)
- P2720: Clutch/shift pressure solenoid 1 system (Short to ground)
- P2721: Clutch/shift pressure solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch cooling flow solenoid
- Clutch/shift pressure solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 2 switch: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor): Can't be switched off. (12 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET switch remains OFF for 12 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1868 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P186A: High side 3 system (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 3 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the high side 3 is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

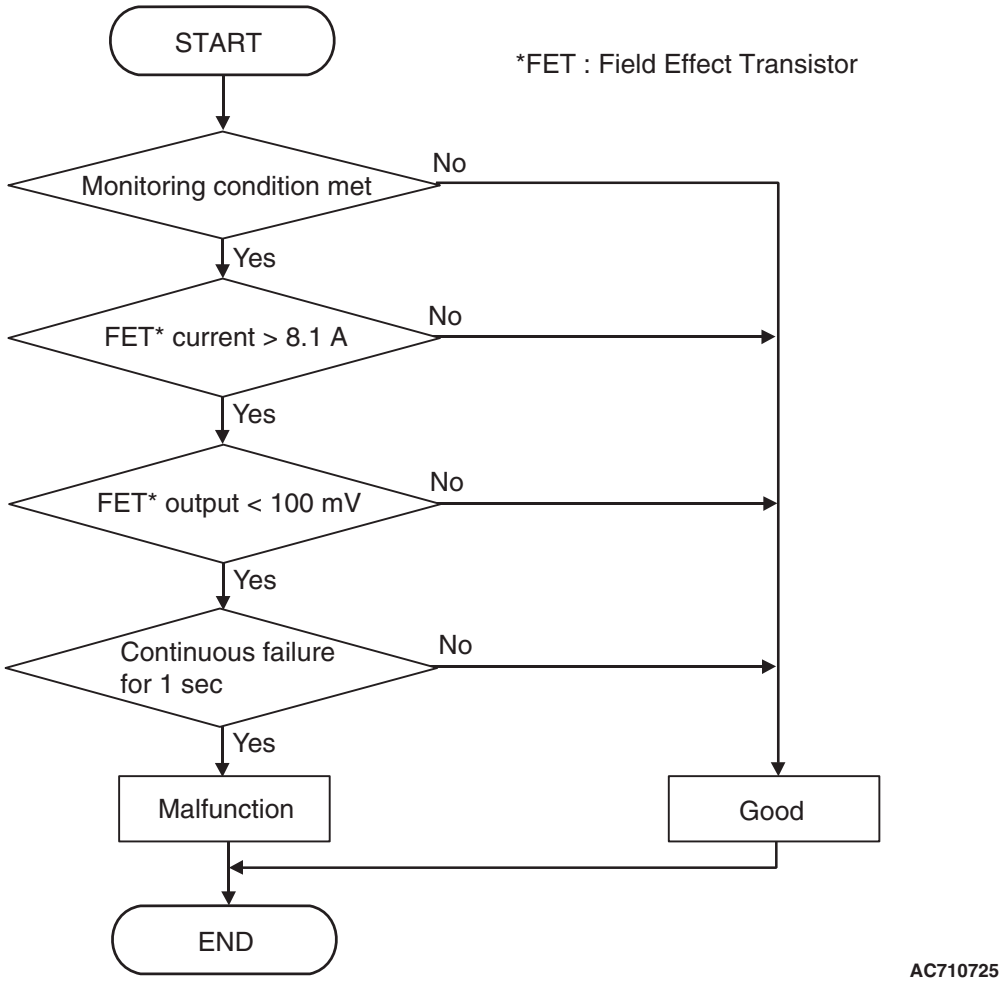
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2727: Clutch/shift pressure solenoid 2 system (Open circuit)
- P2728: Clutch/shift pressure solenoid 2 system (Overcurrent)
- P2729: Clutch/shift pressure solenoid 2 system (Short to ground)
- P2730: Clutch/shift pressure solenoid 2 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift pressure solenoid 2
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 3 switch: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 8.1 A or more, and FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The status with the current of the FET channel shunt 8.1 A or less and with the FET channel output 100 mV or more continues for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P186A set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P186B: High side 3 system (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the high side 3 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The high side 3 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

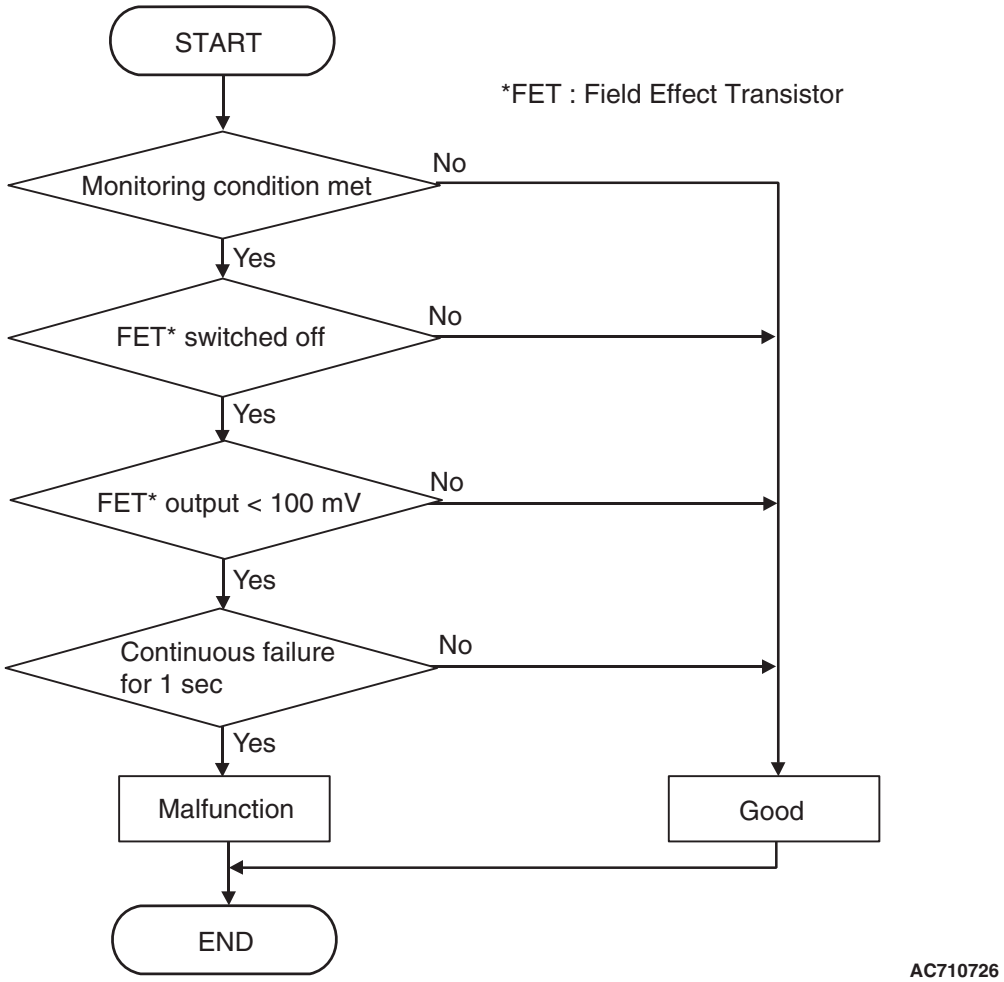
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2727: Clutch/shift pressure solenoid 2 system (Open circuit)
- P2728: Clutch/shift pressure solenoid 2 system (Overcurrent)
- P2729: Clutch/shift pressure solenoid 2 system (Short to ground)
- P2730: Clutch/shift pressure solenoid 2 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift pressure solenoid 2
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 3 switch: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor): Can't be switched on, and FET (Field Effect Transistor) output: 100 mV or less. (1 second)

OBD-II DRIVE CYCLE PATTERN

The status with the FET switch ON and with the FET channel output 100 mV or more continues for 1 second.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P186B set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P186C: High side 3 system (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 3 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The high side 3 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

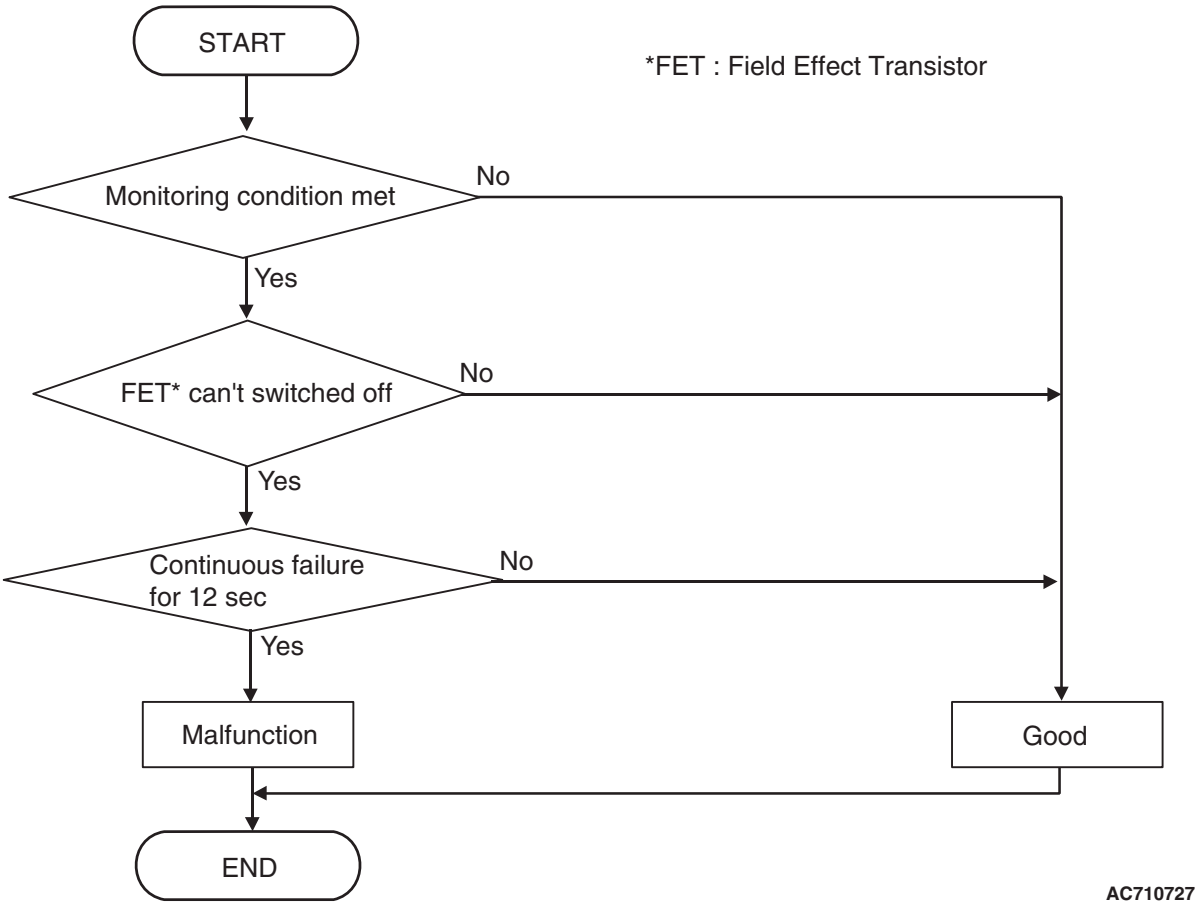
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2727: Clutch/shift pressure solenoid 2 system (Open circuit)
- P2728: Clutch/shift pressure solenoid 2 system (Overcurrent)
- P2729: Clutch/shift pressure solenoid 2 system (Short to ground)
- P2730: Clutch/shift pressure solenoid 2 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift pressure solenoid 2
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- High side 3 switch: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor): Can't be switched off. (12 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET switch remains OFF for 12 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P186C set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P186D: High side 1 system (Voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the high side 1 circuit is determined to be too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

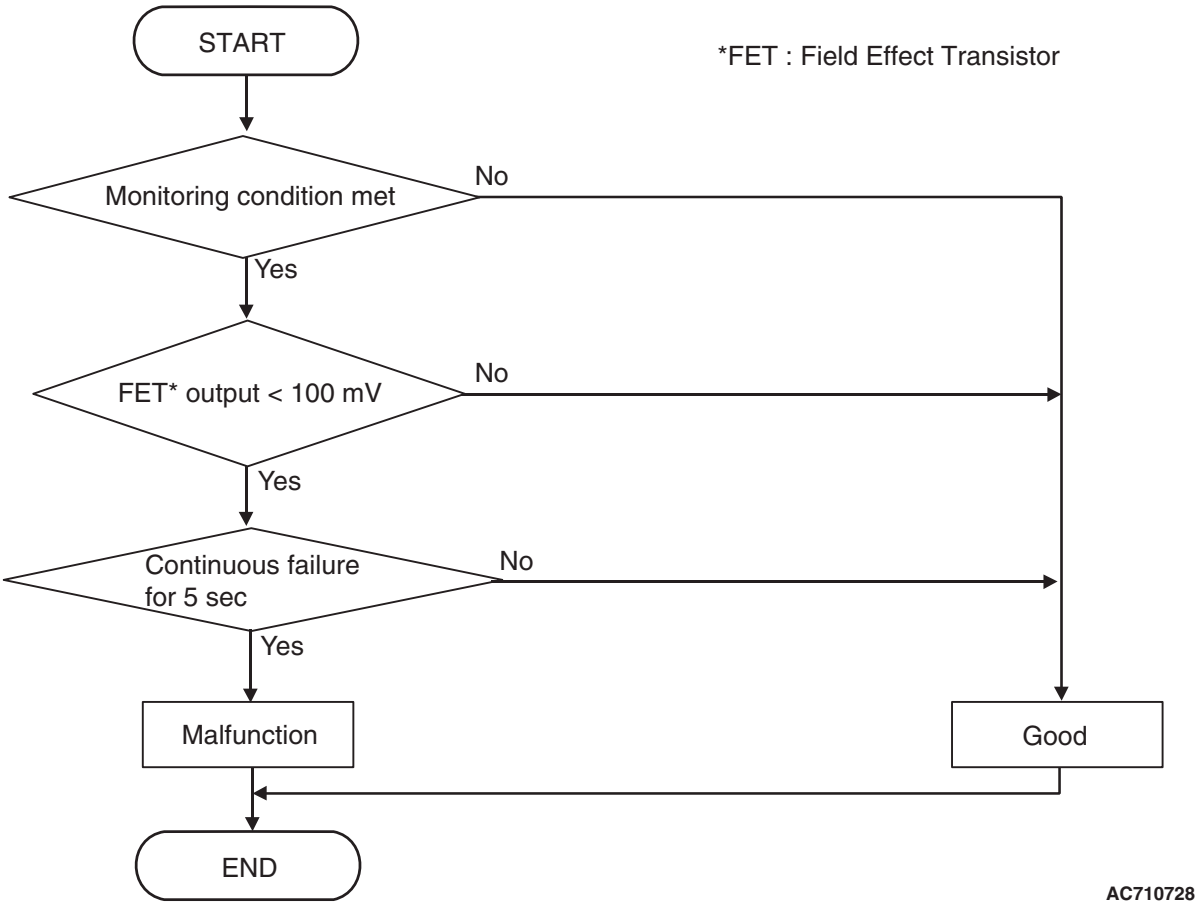
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0758: Shift select solenoid 2 system (Open circuit)
- P0976: Shift select solenoid 2 system (Short to ground)
- P0977: Shift select solenoid 2 system (Short to power supply)
- P0746: Line pressure solenoid system (Drive current range out)
- P0960: Line pressure solenoid system (Open circuit)
- P0961: Line pressure solenoid system (Overvoltage)
- P0962: Line pressure solenoid system (Short to ground)
- P0963: Line pressure solenoid system (Short to power supply)
- P0968: Shift/cooling switching solenoid system (Open circuit)
- P0970: Shift/cooling switching solenoid system (Short to ground)
- P0971: Shift/cooling switching solenoid system (Short to power supply)

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 2
- Line pressure solenoid
- Shift/cooling switching solenoid

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- FET (Field Effect Transistor) of high side 1: Switched off.

JUDGMENT CRITERIA

- FET output: 100 mV or less. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 5 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P186D set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P186E: High side 2 system (Voltage low range out)

⚠ **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 FUNCTION
TC-SST-ECU checks that the high side 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS
The voltage of the high side 2 circuit is determined to be too low.

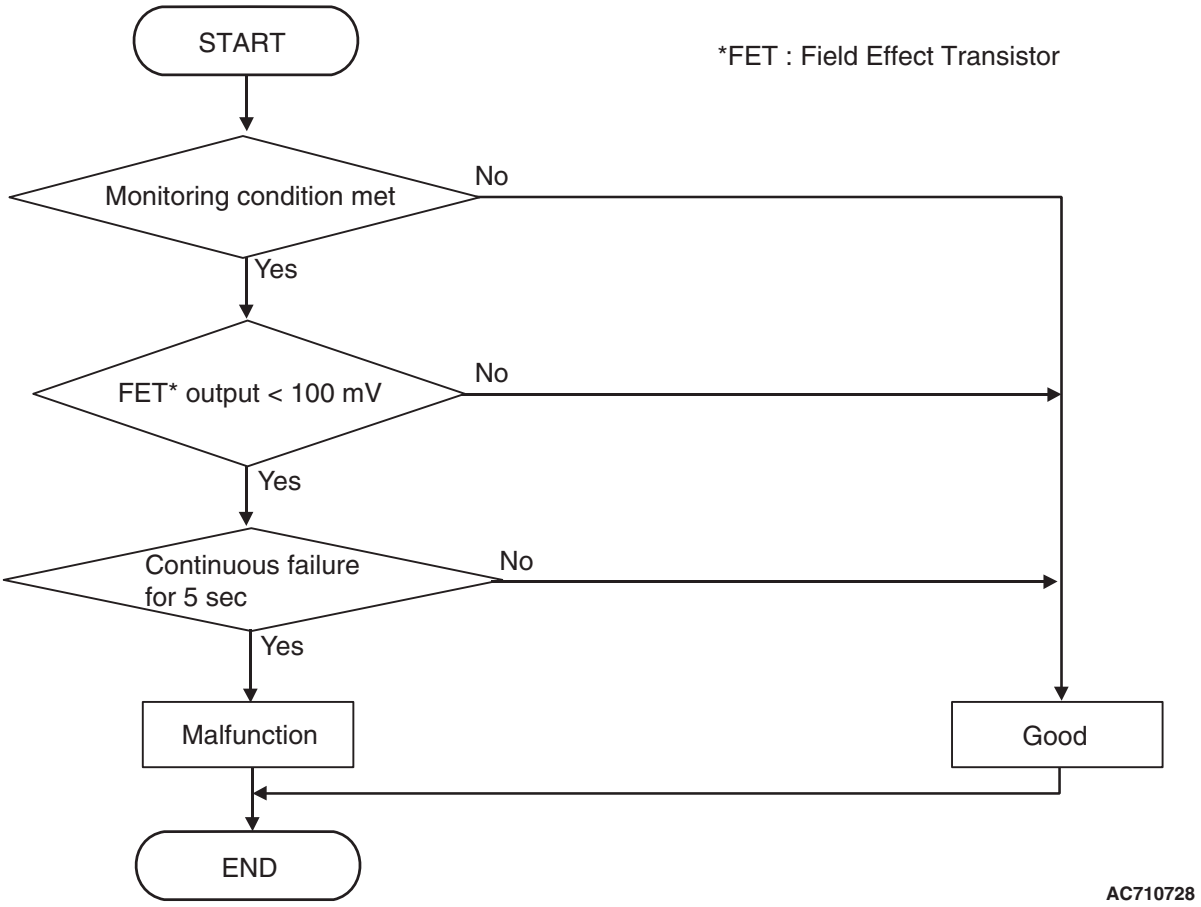
MONITOR EXECUTION
- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P0776: Clutch cooling flow solenoid system (Drive current range out)
- P0777: Clutch cooling flow solenoid system (Stuck)
- P0964: Clutch cooling flow solenoid system (Open circuit)
- P0965: Clutch cooling flow solenoid system (Overvoltage)
- P0966: Clutch cooling flow solenoid system (Short to ground)
- P0967: Clutch cooling flow solenoid system (Short to power supply)
- P2718: Clutch/shift pressure solenoid 1 system (Open circuit)
- P2719: Clutch/shift pressure solenoid 1 system (Overcurrent)
- P2720: Clutch/shift pressure solenoid 1 system (Short to ground)
- P2721: Clutch/shift pressure solenoid 1 system (Short to power supply)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)
- Clutch cooling flow solenoid
- Clutch/shift pressure solenoid 1
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- FET (Field Effect Transistor) of high side 2: Switched off.

JUDGMENT CRITERIA

- FET output: 100 mV or less. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 5 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P186E set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P186F: High side 3 system (Voltage low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the high side 3 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The voltage of the high side 3 circuit is determined to be too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

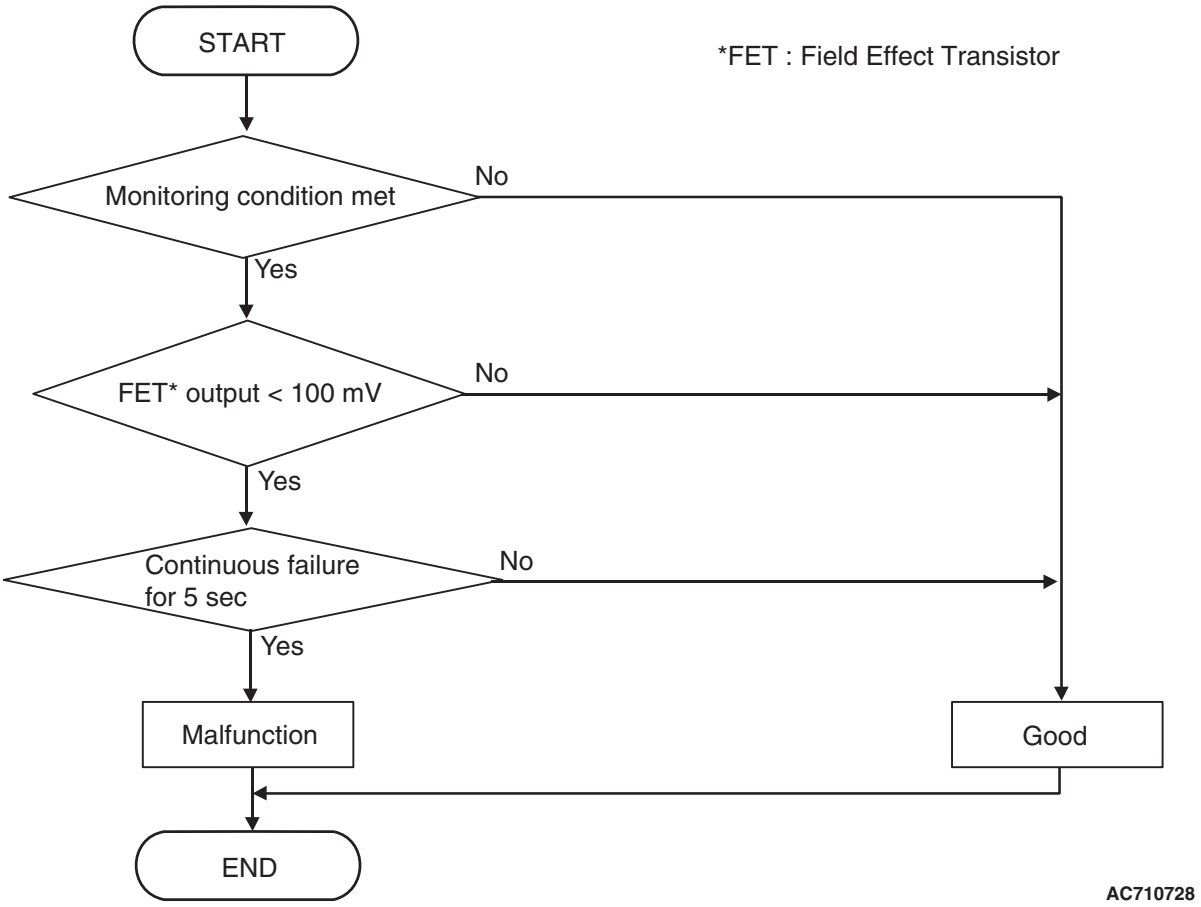
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0753: Shift select solenoid 1 system (Open circuit)
- P0973: Shift select solenoid 1 system (Short to ground)
- P0974: Shift select solenoid 1 system (Short to power supply)
- P2727: Clutch/shift pressure solenoid 2 system (Open circuit)
- P2728: Clutch/shift pressure solenoid 2 system (Overcurrent)
- P2729: Clutch/shift pressure solenoid 2 system (Short to ground)
- P2730: Clutch/shift pressure solenoid 2 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Shift select solenoid 1
- Clutch/shift pressure solenoid 2
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- FET (Field Effect Transistor) of high side 3: Switched off.

JUDGMENT CRITERIA

- FET output: 100 mV or less. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 5 seconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P186F set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1870: Engine torque signal 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU receives the periodic communication data from the engine control module via the CAN bus lines, and checks the data for abnormality.

DESCRIPTIONS OF MONITOR METHODS

The engine torque signal from the engine control module is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

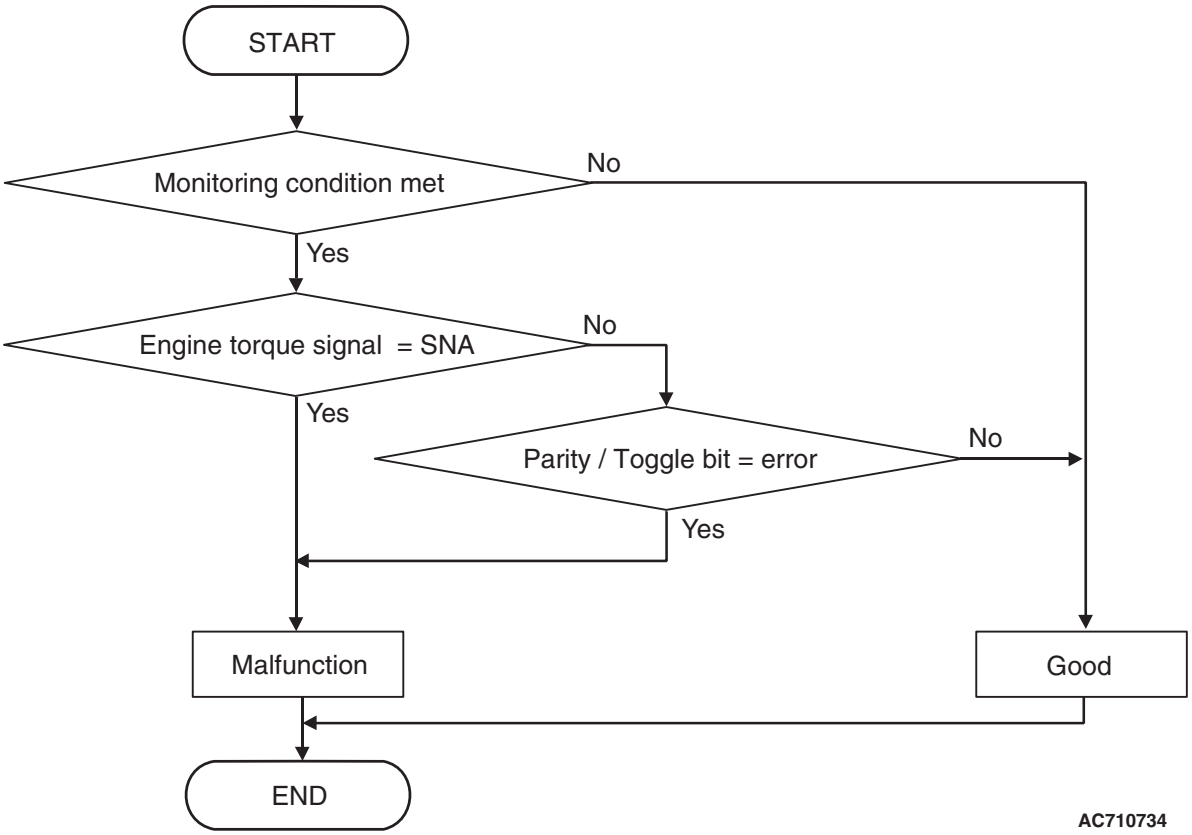
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P185D: Clutch open not possible
- U0001: Bus off
- U0100: Engine time-out error
- P1803: Shift lever system (CAN or LIN time-out error)
- P1871: APS system (Signal abnormality)
- P1872: Between shift lever and TC-SST system (Q-A function abnormality)

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch 2 pressure sensor
- APS
- Shift lever-ECU

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after TC-SST-ECU start: 5 seconds or more.

JUDGMENT CRITERIA

- Engine torque signal: SNA, or parity/toggle error.

OBD-II DRIVE CYCLE PATTERN

Receives the normal value of the engine torque signal, or the parity/toggle are normal.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using the scan tool, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Scan tool diagnostic trouble code

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. P1870 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1871: APS system (Signal 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU receives the periodic communication data from the engine control module via the CAN bus lines, and checks the data for abnormality.

DESCRIPTIONS OF MONITOR METHODS

The APS signal from the engine control module is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

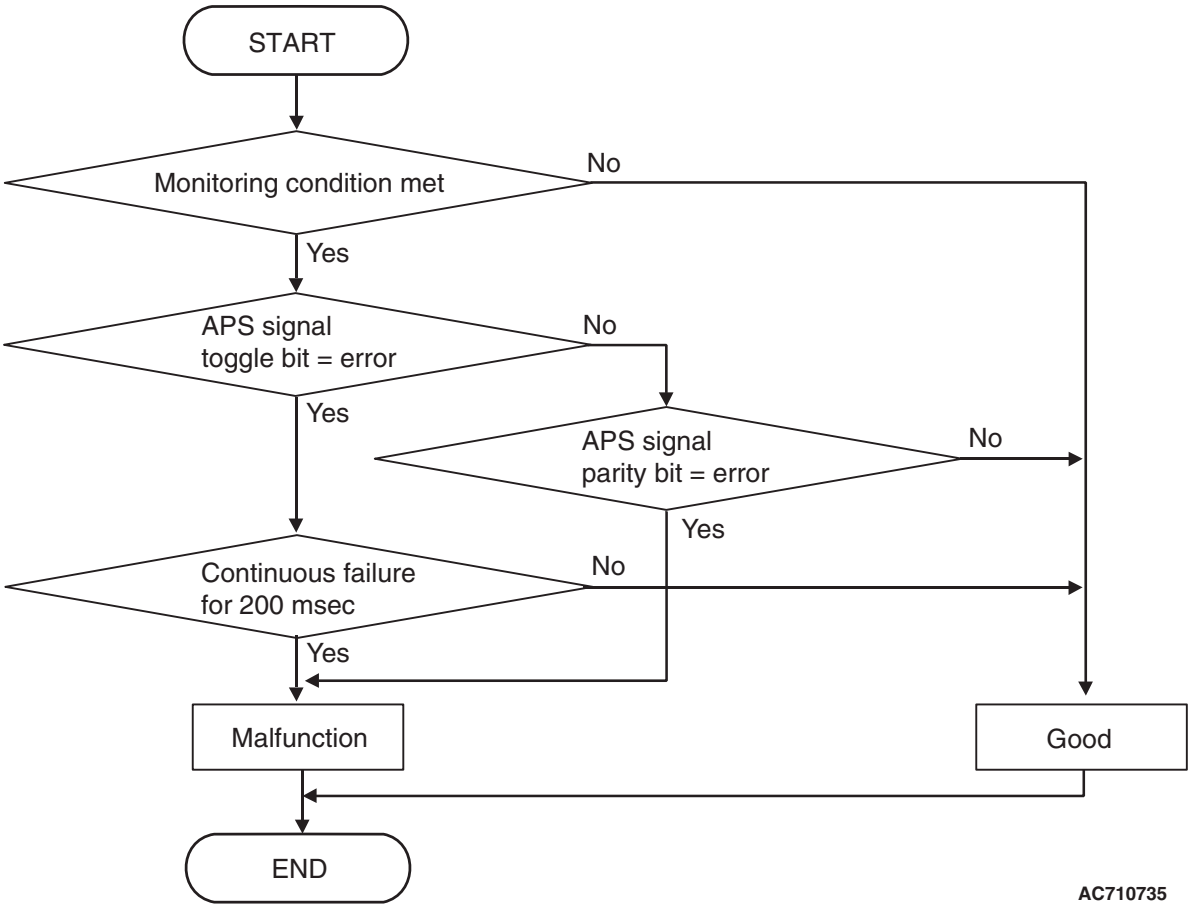
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P185D: Clutch open not possible
- U0001: Bus off
- U0100: Engine time-out error
- P1803: Shift lever system (CAN or LIN time-out error)
- P1870: Engine torque signal abnormality
- P1872: Between shift lever and TC-SST system (Q-A function abnormality)

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch 2 pressure sensor
- APS
- Shift lever-ECU

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after TC-SST-ECU start: 5 seconds or more.

JUDGMENT CRITERIA

- APS signal: Parity or toggle error

OBD-II DRIVE CYCLE PATTERN

Receives the normal value of the APS signal, or the parity, toggle are normal.

PROBABLE CAUSES

- The CAN bus line is defective.
- APS malfunction
- Malfunction of engine control module
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using the scan tool, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Scan tool diagnostic trouble code

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. P1871 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1872: Between shift lever and TC-SST system (Q-A function 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the shift lever-ECU is normal.

DESCRIPTIONS OF MONITOR METHODS

The shift lever-ECU is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

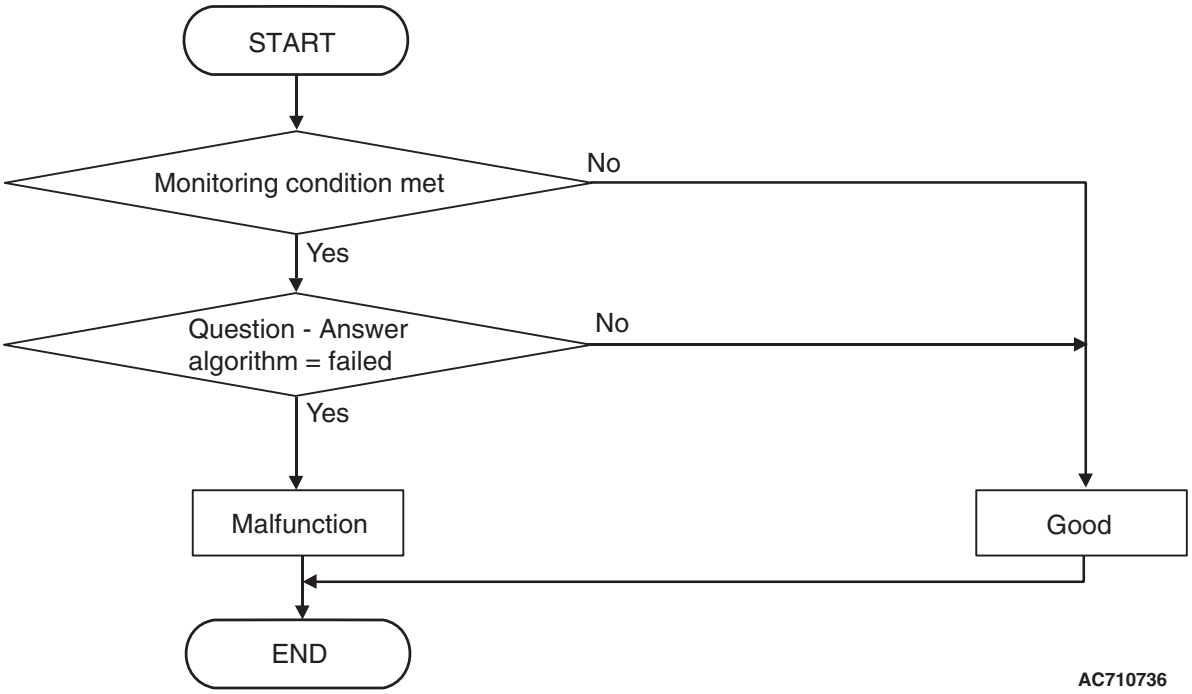
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P185D: Clutch open not possible
- U0001: Bus off
- U0100: Engine time-out error
- P1803: Shift lever system (CAN or LIN time-out error)
- P1870: Engine torque signal abnormality
- P1871: APS system (Signal abnormality)

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch 2 pressure sensor
- APS
- Shift lever-ECU

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after TC-SST-ECU start: 5 seconds or more.

JUDGMENT CRITERIA

- Communication algorithm: Undesigned signal.

OBD-II DRIVE CYCLE PATTERN

The communication algorithm is normal.

PROBABLE CAUSES

- Malfunction of the shift lever-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Scan tool diagnostic trouble code

Check the shift lever diagnostic trouble code. (Refer to P.22C-302.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 3.

TSB Revision

STEP 3. Replace the shift lever assembly, and check if the diagnostic trouble code is reset.
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Check the DTC.

Q: Is DTC No. P1872 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1873: Clutch 1 System (Pressure 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.**

DIAGNOSTIC FUNCTION
TC-SST-ECU checks that the clutch 1 pressure is normal.

DESCRIPTIONS OF MONITOR METHODS
The clutch 1 pressure is determined to be abnormal.

PROBABLE CAUSES
- Malfunction of TC-SST-ECU
- Malfunction of TC-SST clutch

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1873 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1874: Clutch 2 System (Pressure 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.**

DIAGNOSTIC FUNCTION
TC-SST-ECU checks that the clutch 2 pressure is normal.

TSB Revision

DESCRIPTIONS OF MONITOR METHODS

The clutch 2 pressure is determined to be abnormal.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST clutch

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1874 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P1875: Damper Speed Sensor System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the damper (closer to the engine than input shaft) is normal.

DESCRIPTIONS OF MONITOR METHODS

The damper speed sensor is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

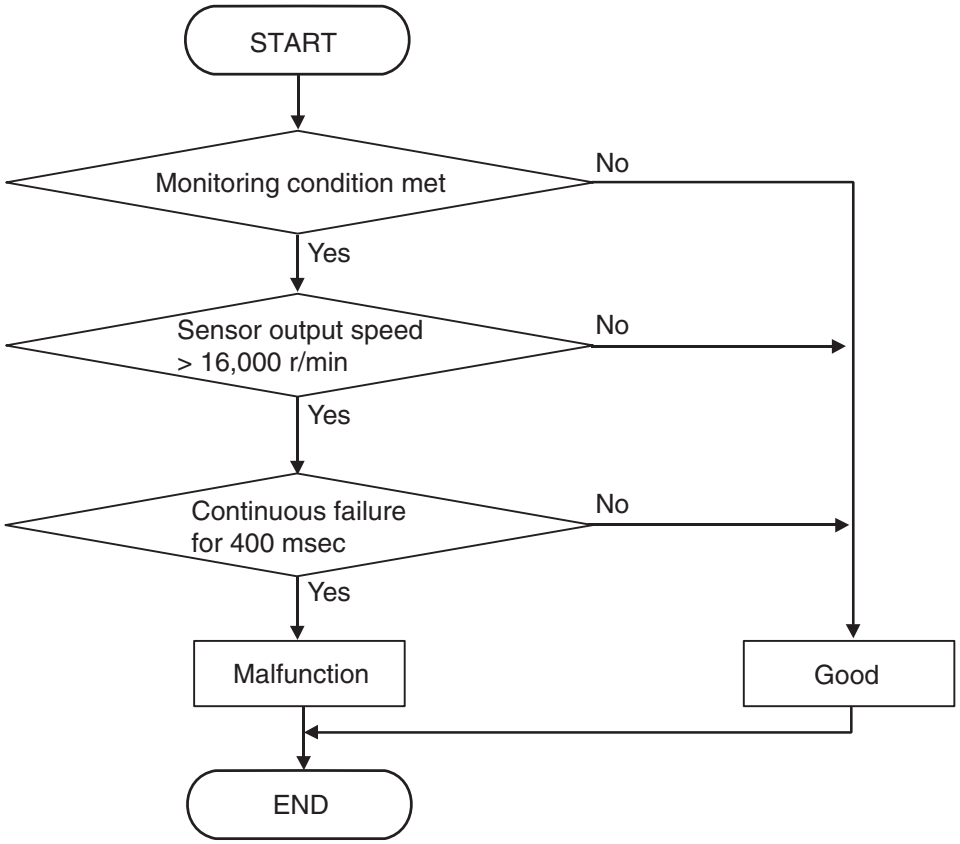
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0715: Input shaft 1 (odd number gear axle) speed sensor system (Output high range out)
- P0716: Input shaft 1 (odd number gear axle) speed sensor system (Poor performance)
- P0717: Input shaft 1 (odd number gear axle) speed sensor system (Output low range out)
- P2766: Input shaft 2 (even number gear axle) speed sensor system (Poor performance)

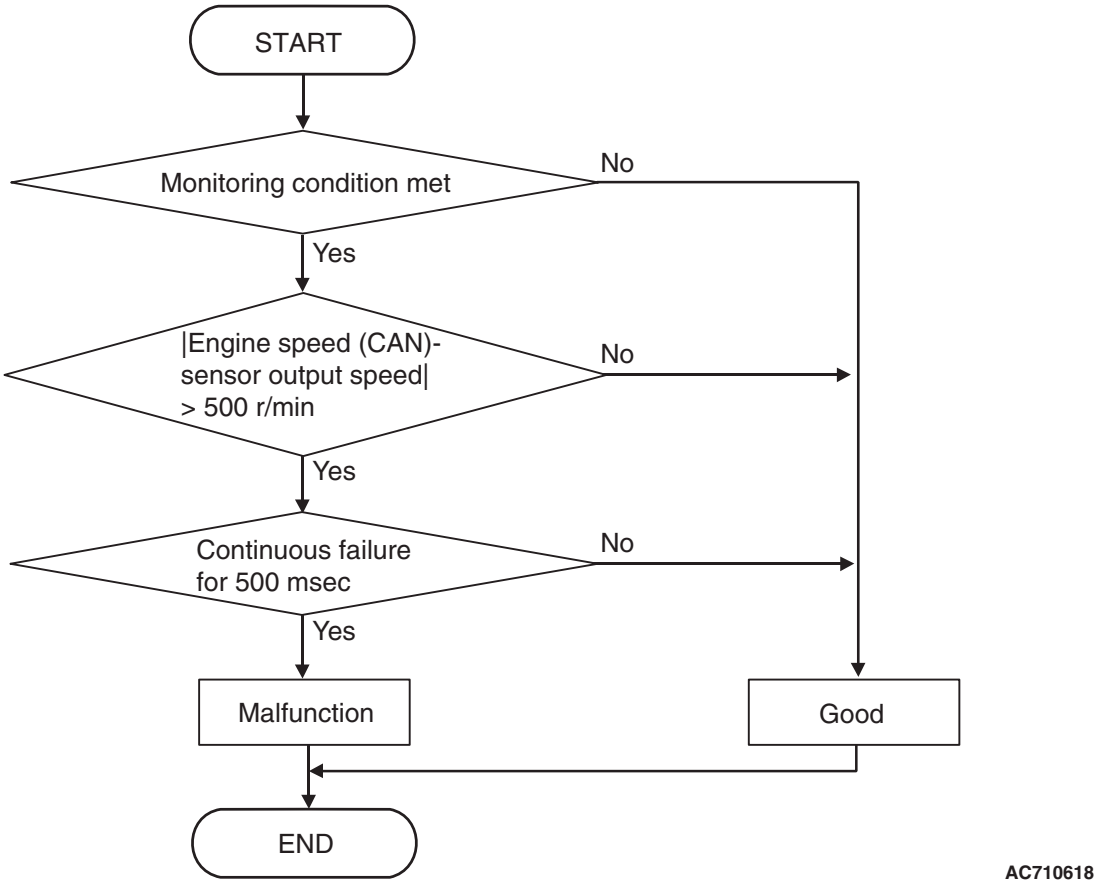
Sensor (The sensor below is determined to be normal)

- Input shaft 1 (odd number gear axle) speed sensor
- Input shaft 2 (even number gear axle) speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond.

JUDGMENT CRITERIA

- Sensor output speed: 16,000 r/min or more. (400 millisecond)
- |"Engine speed via CAN" –"Sensor output speed"|: 500 r/min or more. (500 millisecond)

OBD-II DRIVE CYCLE PATTERN

- The output of the sensor remains 16,000 r/min or less for 400 milliseconds.
- The value of the |"Engine speed via CAN" –"Sensor output speed"| remains 500 r/min or less for 500 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1875 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1876: 1st Gear Block

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the 1st gear is determined to be impossible.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

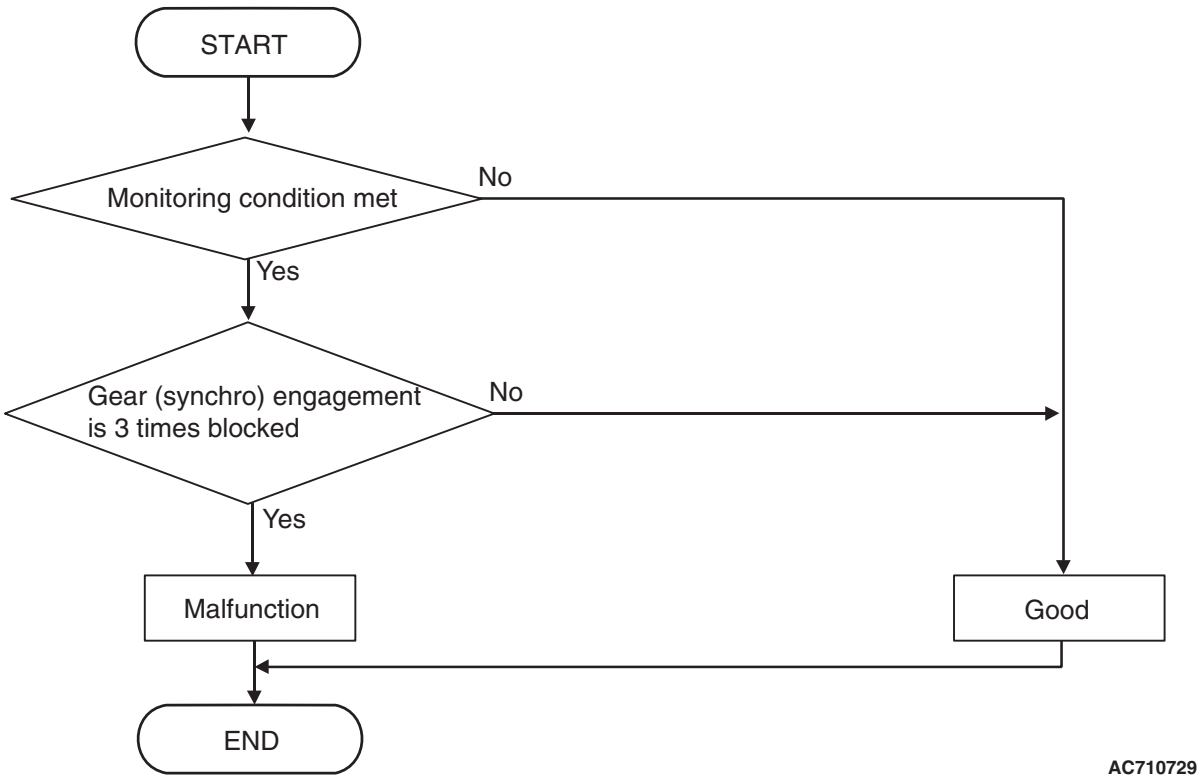
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



TSB Revision

DTC SET CONDITIONS

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: 1st gear.

JUDGMENT CRITERIA

- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN

The 1st gear is engaged.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1876 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P1877: Gear Block 2nd Gear

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the 2nd gear is determined to be impossible.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

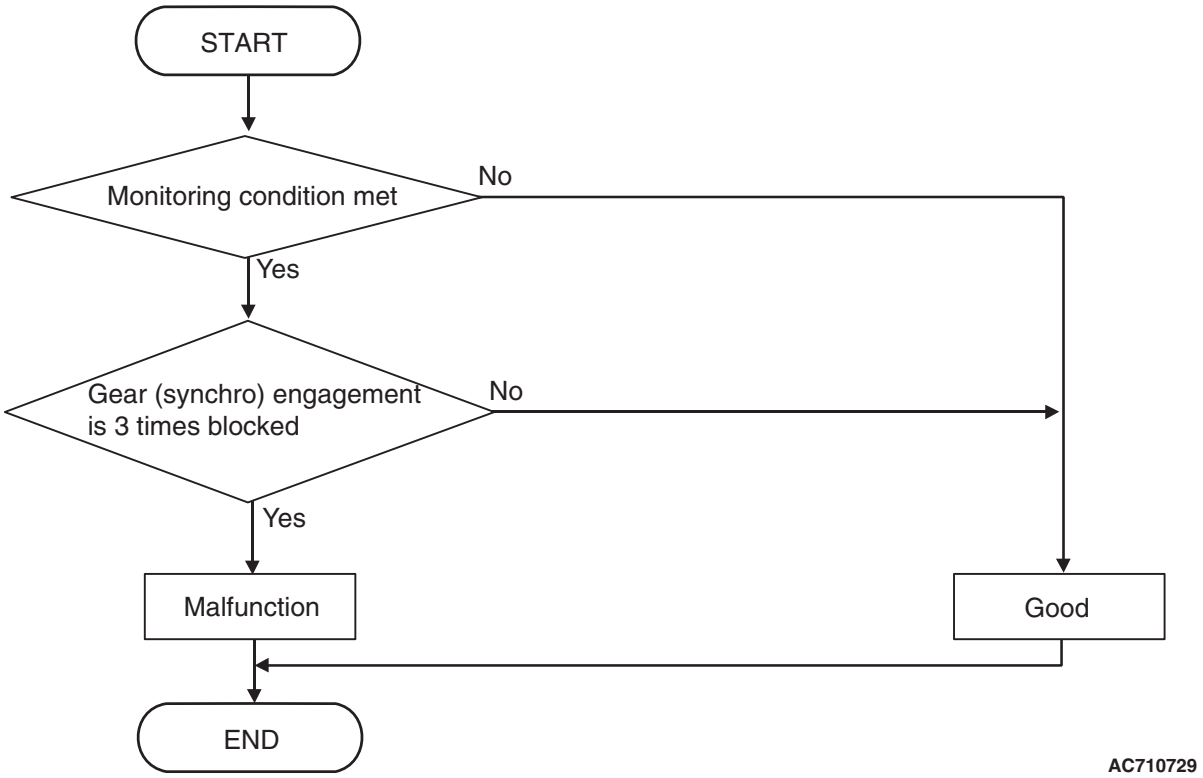
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: 2nd gear.

JUDGMENT CRITERIA

- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN

The 2nd gear is engaged.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1877 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P1878: Gear Block 3rd Gear

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the 3rd gear is determined to be impossible.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

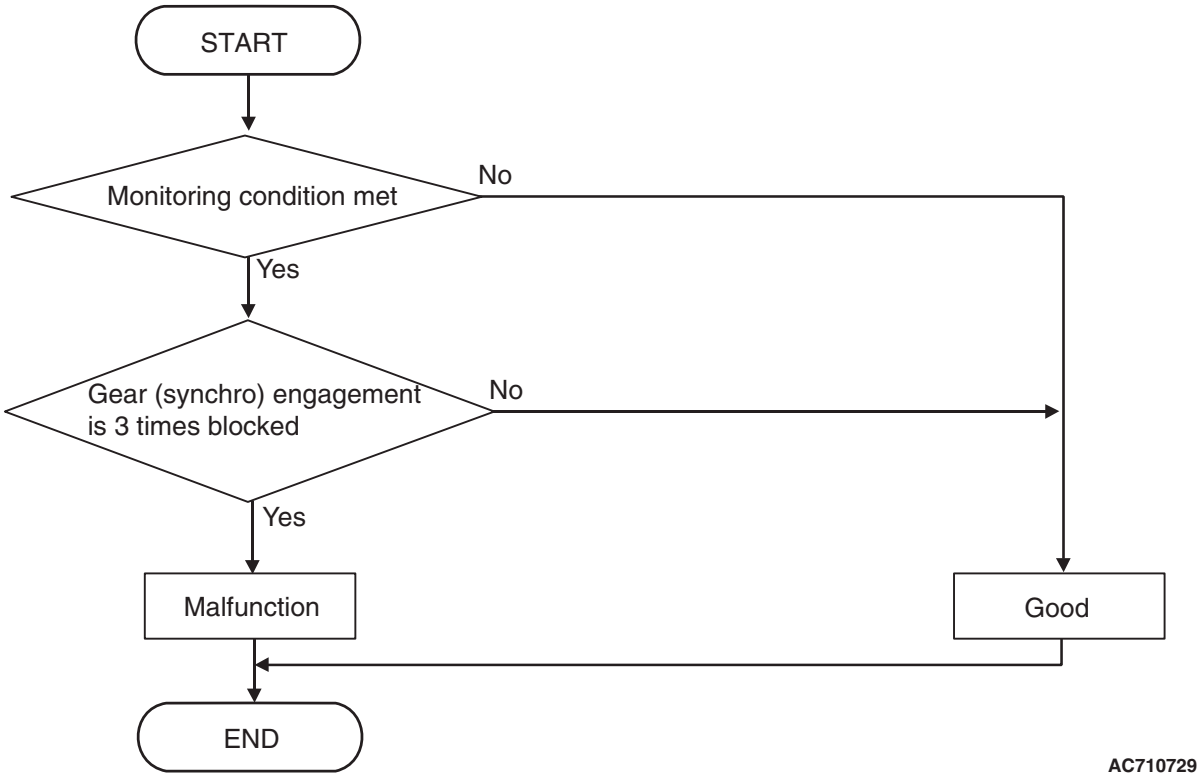
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: 3rd gear.

JUDGMENT CRITERIA

- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN

The 3rd gear is engaged.

TSB Revision

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1878 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P1879: Gear Block 4th Gear

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the 4th gear is determined to be impossible.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

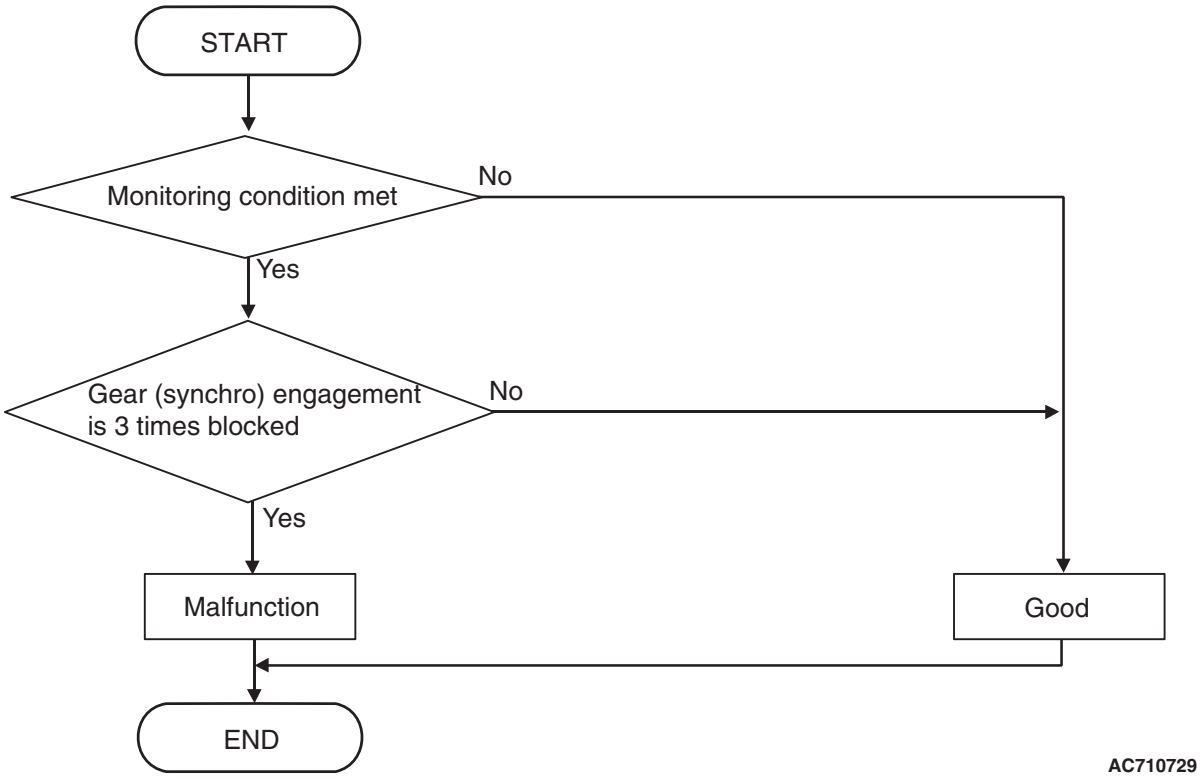
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: 4th gear.

JUDGMENT CRITERIA

- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN

The 4th gear is engaged.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1879 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P187A: Gear Block 5th Gear

⚠ 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 FUNCTION
TC-SST-ECU checks that the gear engagement is normal.

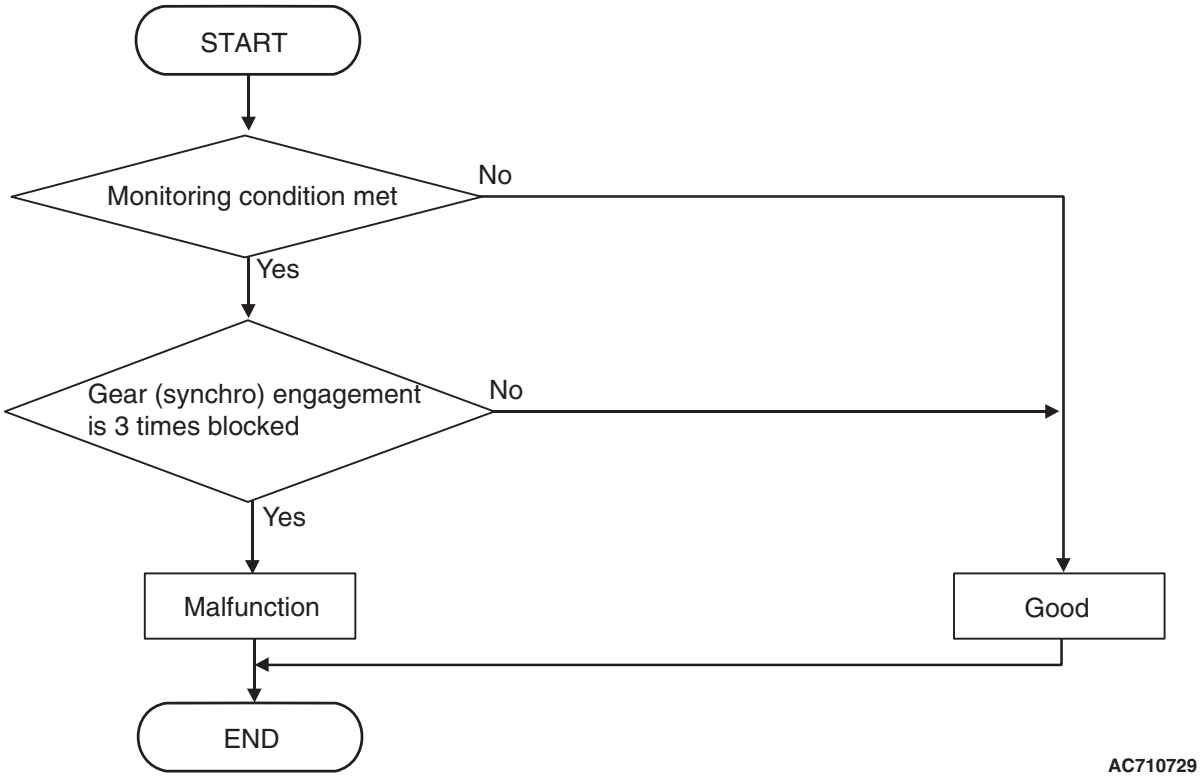
DESCRIPTIONS OF MONITOR METHODS
The engagement of the 5th gear is determined to be impossible.

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
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: 5th gear.

JUDGMENT CRITERIA
- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN
The 5th gear is engaged.

TSB Revision

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P187A set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P187B: Gear Block 6th Gear

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the 6th gear is determined to be impossible.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

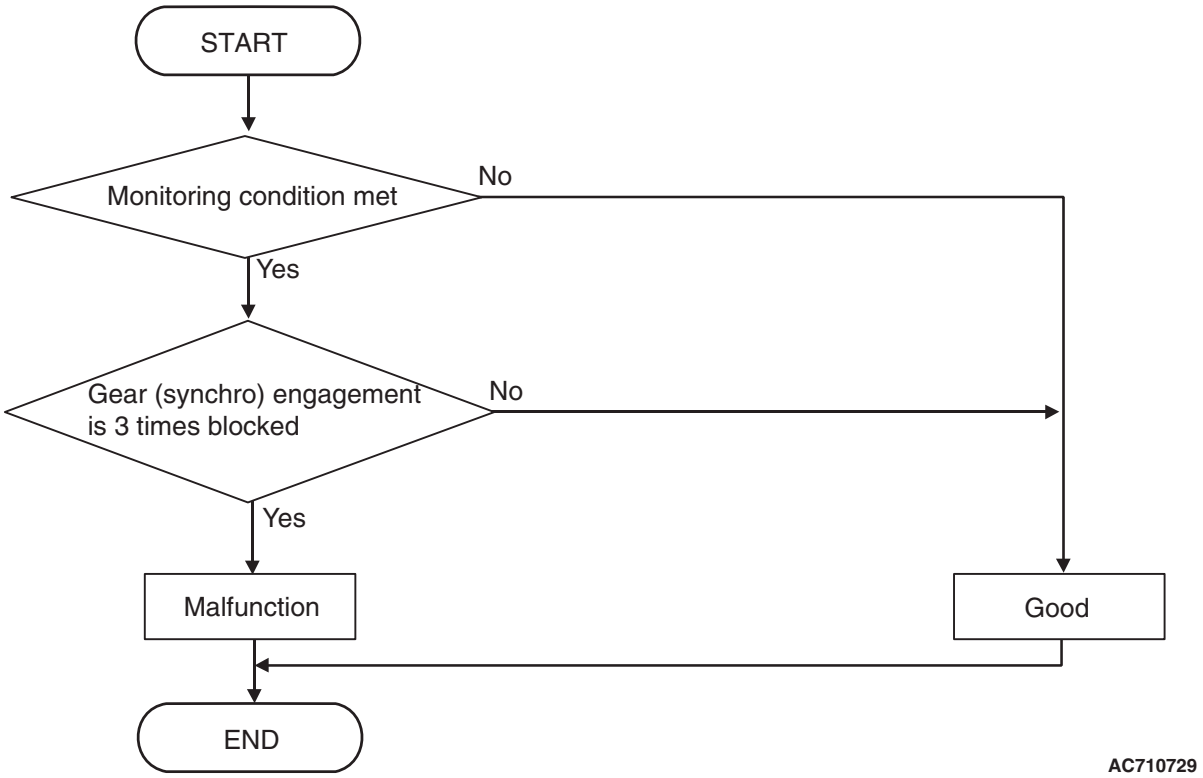
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: 6th gear.

JUDGMENT CRITERIA

- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN

The 6th gear is engaged.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P187B set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P187C: Gear Block Reverse Gear

⚠ 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 FUNCTION

TC-SST-ECU checks that the gear engagement is normal.

DESCRIPTIONS OF MONITOR METHODS

The engagement of the reverse gear is determined to be impossible.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

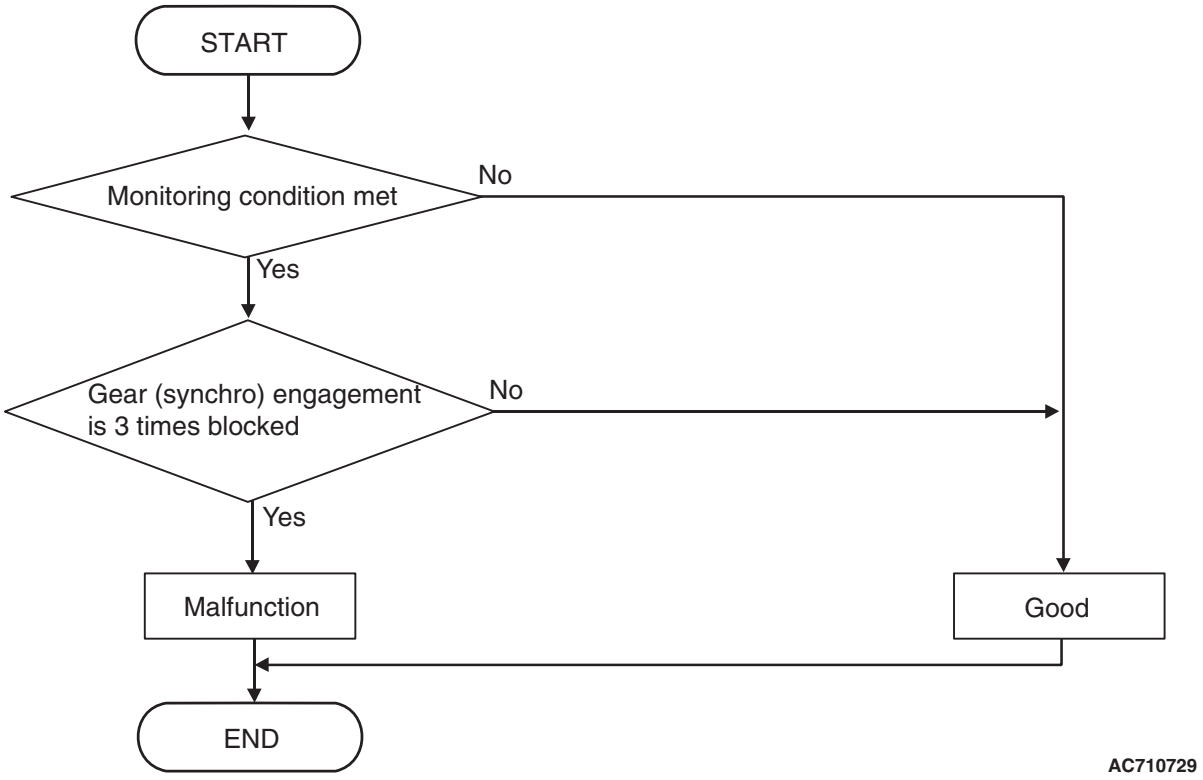
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Target gear: Reverse gear.

JUDGMENT CRITERIA

- Gear (synchro) engagement: 3 times blocked. (immediately)

OBD-II DRIVE CYCLE PATTERN

The reverse gear is engaged.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU
- Malfunction of TC-SST gear

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P187C set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1880: EOL Mode Active

⚠ 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 FUNCTION

TC-SST-ECU checks that the TC-SST setting mode is normal.

DESCRIPTIONS OF MONITOR METHODS

The TC-SST setting mode is determined to be EOL (end of line) mode.

PROBABLE CAUSES

- The setting mode changeover mistake when TC-SST is shipped.
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1880 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P1881: Twin clutch SST control mode switch system (Malfunction)

⚠ CAUTION

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

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the twin clutch SST control mode switch is normal.

DESCRIPTIONS OF MONITOR METHODS

"+" and "–" signals of the twin clutch SST control mode switch is determined to be stuck on.

PROBABLE CAUSES

- Twin clutch SST control mode switch malfunction
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P1881 set?

YES : Go to Step 3.

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

STEP 3. Twin clutch SST control mode switch check

Refer to P.22C-349.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the twin clutch SST control mode switch.(Refer to P.22C-349.)

STEP 4. Shift lever assembly replacement

(1) Replace the shift lever assembly. (Refer to P.22C-334.)

(2) Check if the DTC is set.

Q: Is DTC No. P1881 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P2718: Clutch/Shift Pressure Solenoid 1 System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift pressure solenoid 1 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

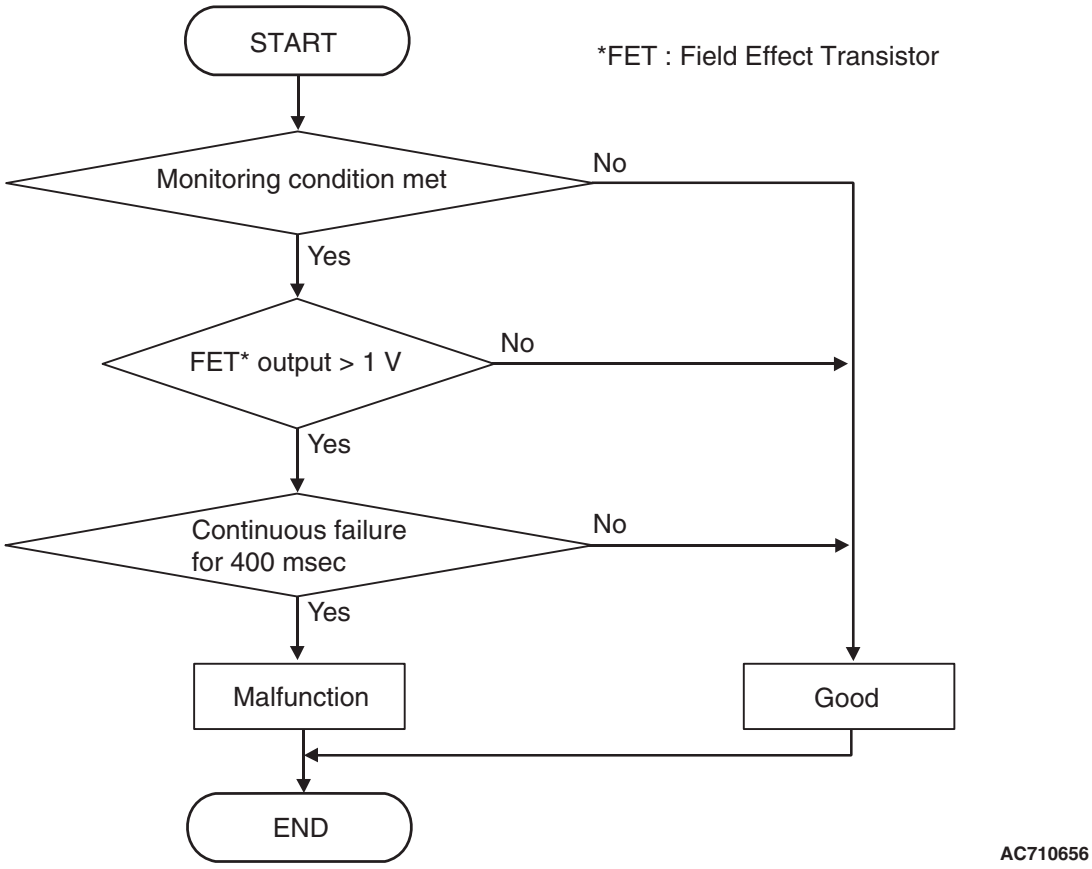
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2718 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2719: Clutch/Shift Pressure Solenoid 1 System (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the clutch/shift pressure solenoid 1 is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

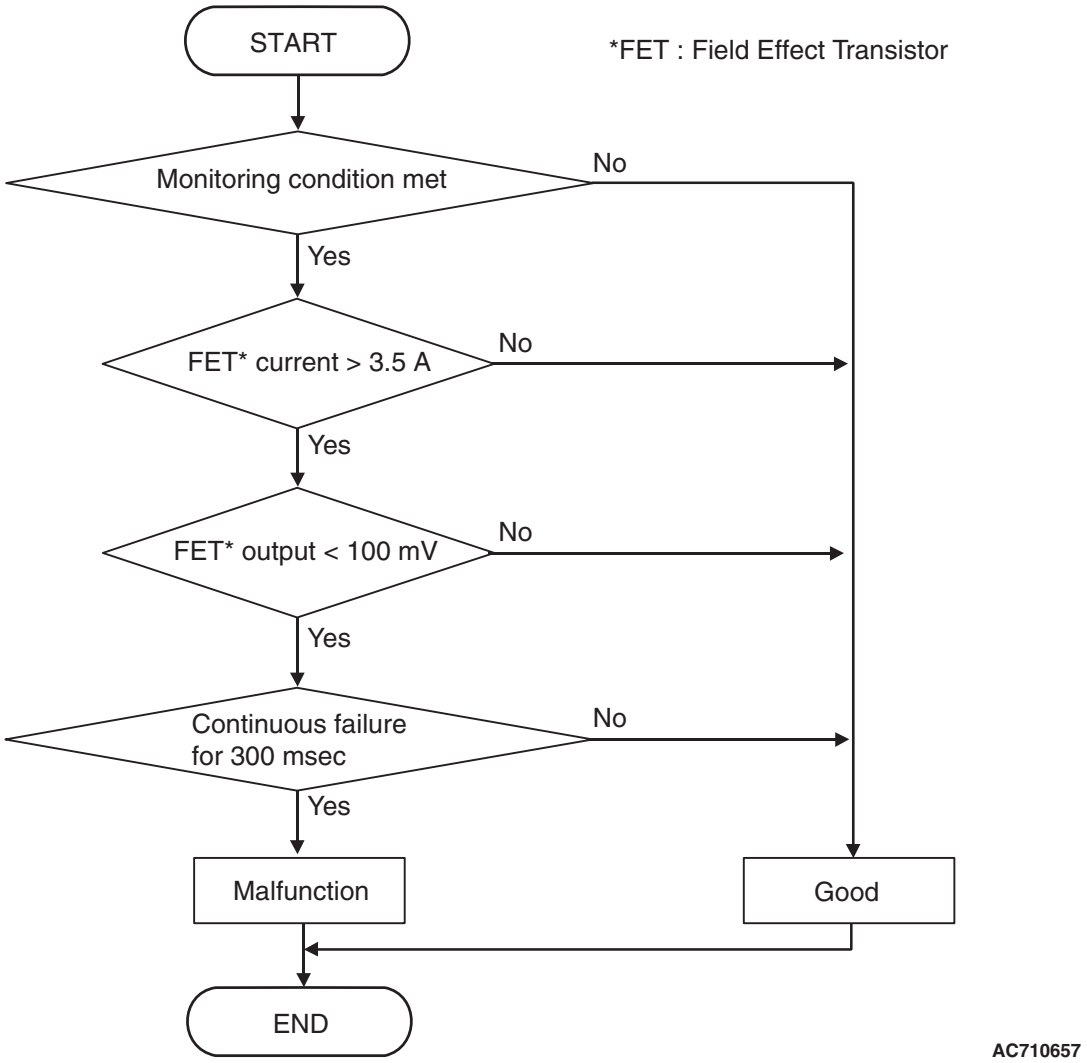
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 3.5 A or more, and FET (Field Effect Transistor) output: 100 mV or less. (300 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the current of the FET channel shunt 3.5 A or less and with the FET channel output 100 mV or more continues for 300 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

TSB Revision

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2719 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2720: Clutch/Shift Pressure Solenoid 1 System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift pressure solenoid 1 circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

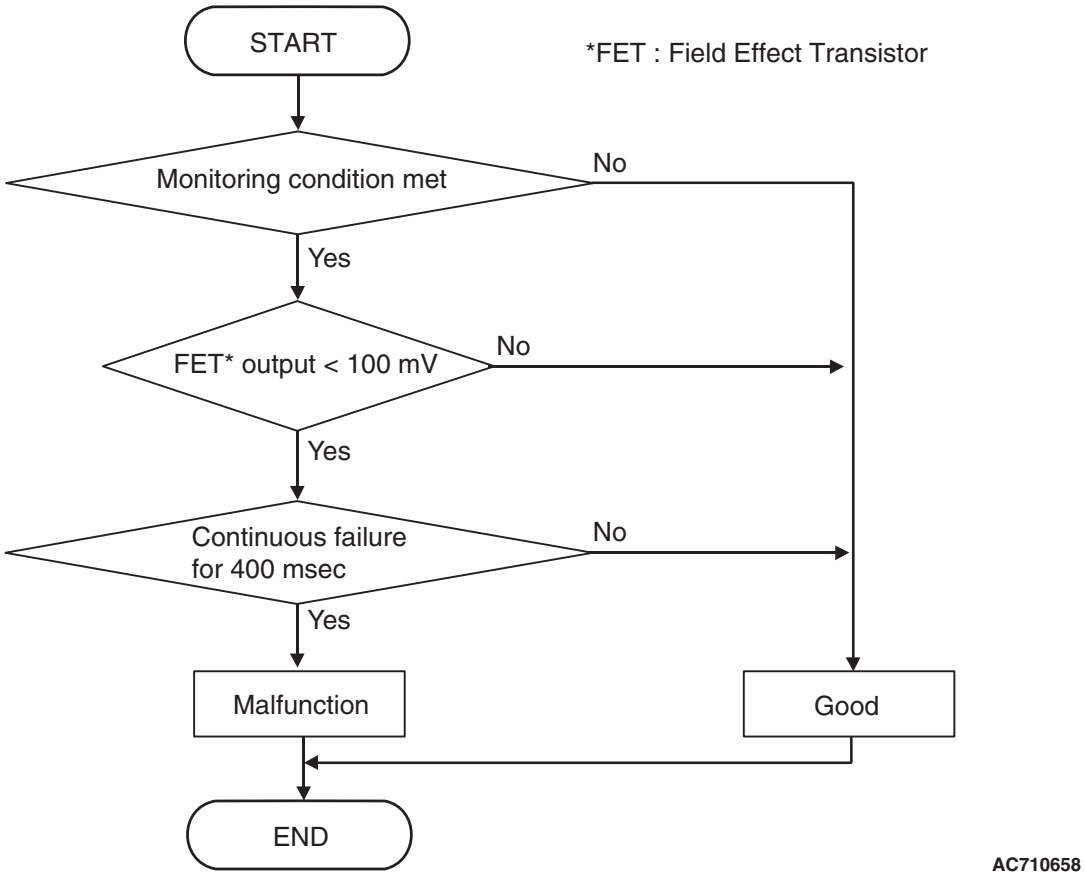
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2720 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2721: Clutch/Shift Pressure Solenoid 1 System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift pressure solenoid 1 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

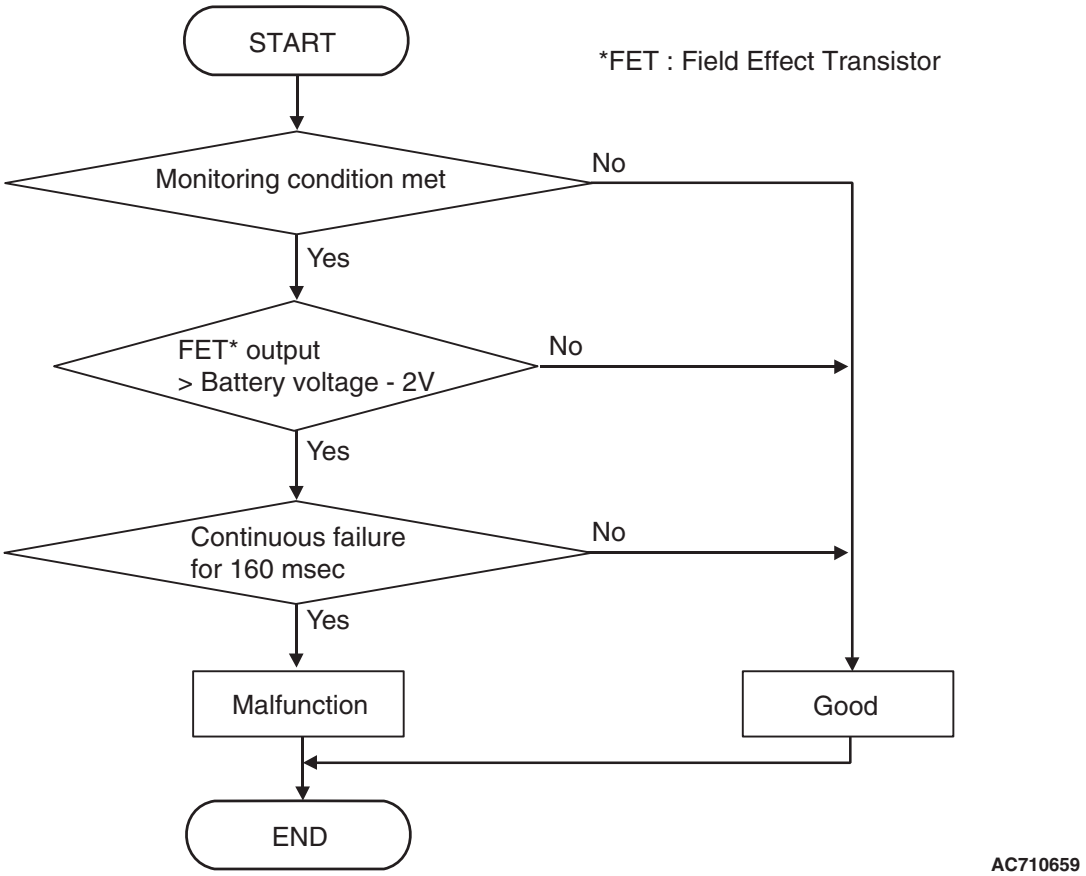
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Clutch/shift pressure solenoid 1: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains the battery voltage –2 V or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2721 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2727: Clutch/Shift Pressure Solenoid 2 System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift pressure solenoid 2 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

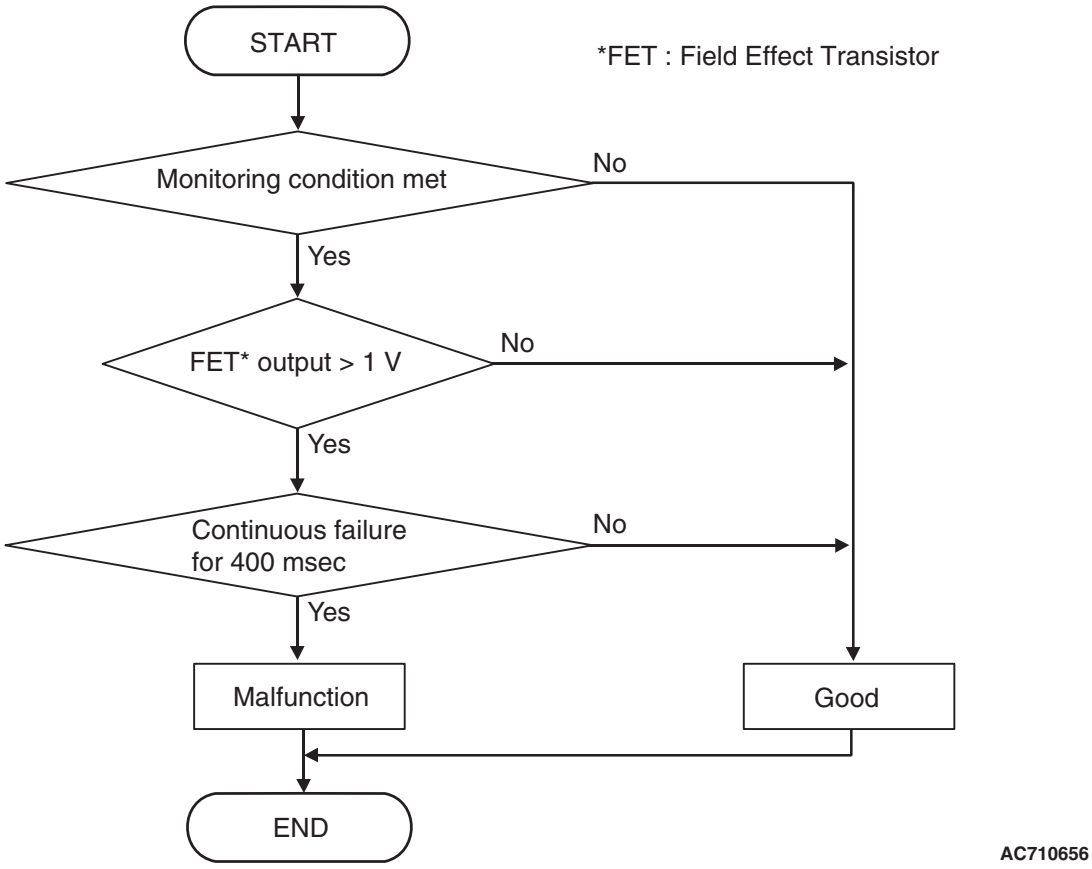
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2727 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2728: Clutch/Shift Pressure Solenoid 2 System (Overcurrent)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The supply current to the clutch/shift pressure solenoid 2 is determined to be overcurrent.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

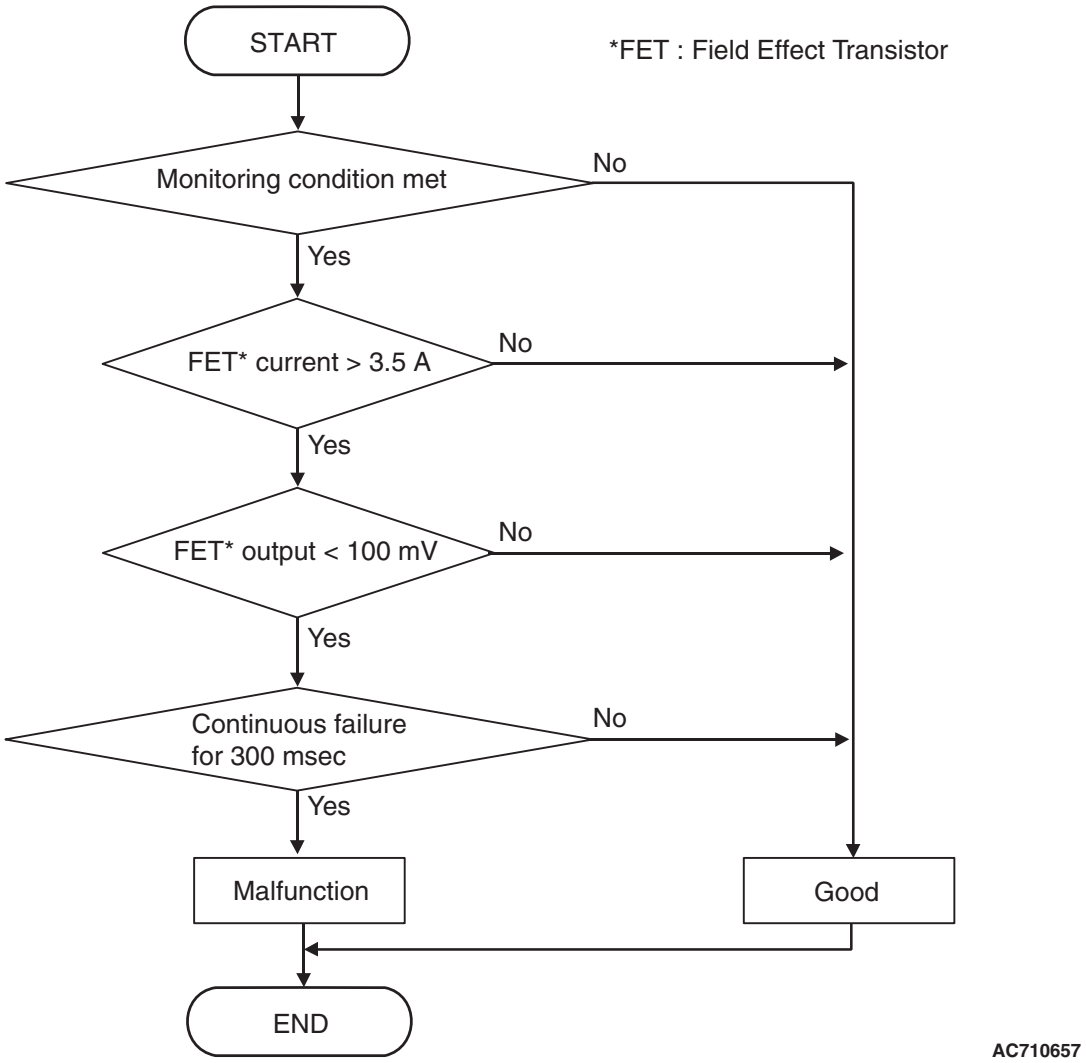
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) current: 3.5 A or more, and FET (Field Effect Transistor) output: 100 mV or less. (300 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the current of the FET channel shunt 3.5 A or less and with the FET channel output 100 mV or more continues for 300 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2728 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2729: Clutch/Shift Pressure Solenoid 2 System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift pressure solenoid 2 circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

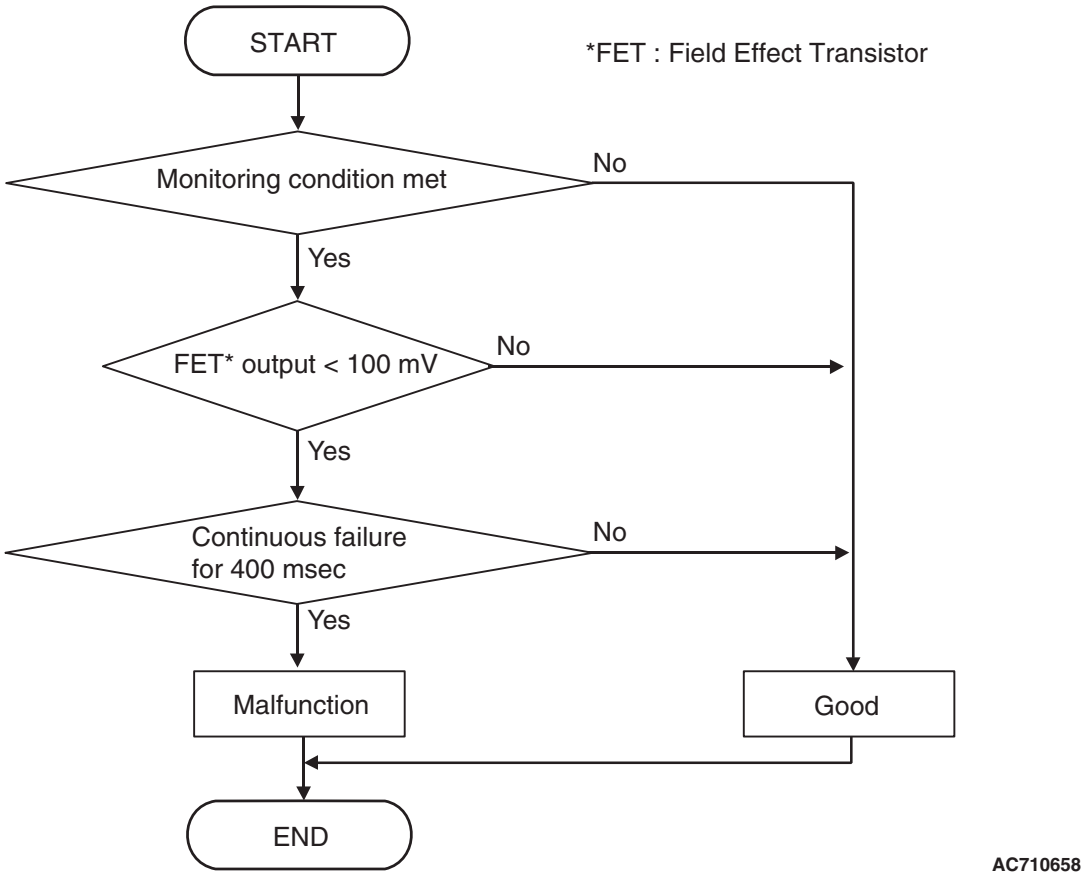
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2729 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2730: Clutch/Shift Pressure Solenoid 2 System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift pressure solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift pressure solenoid 2 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

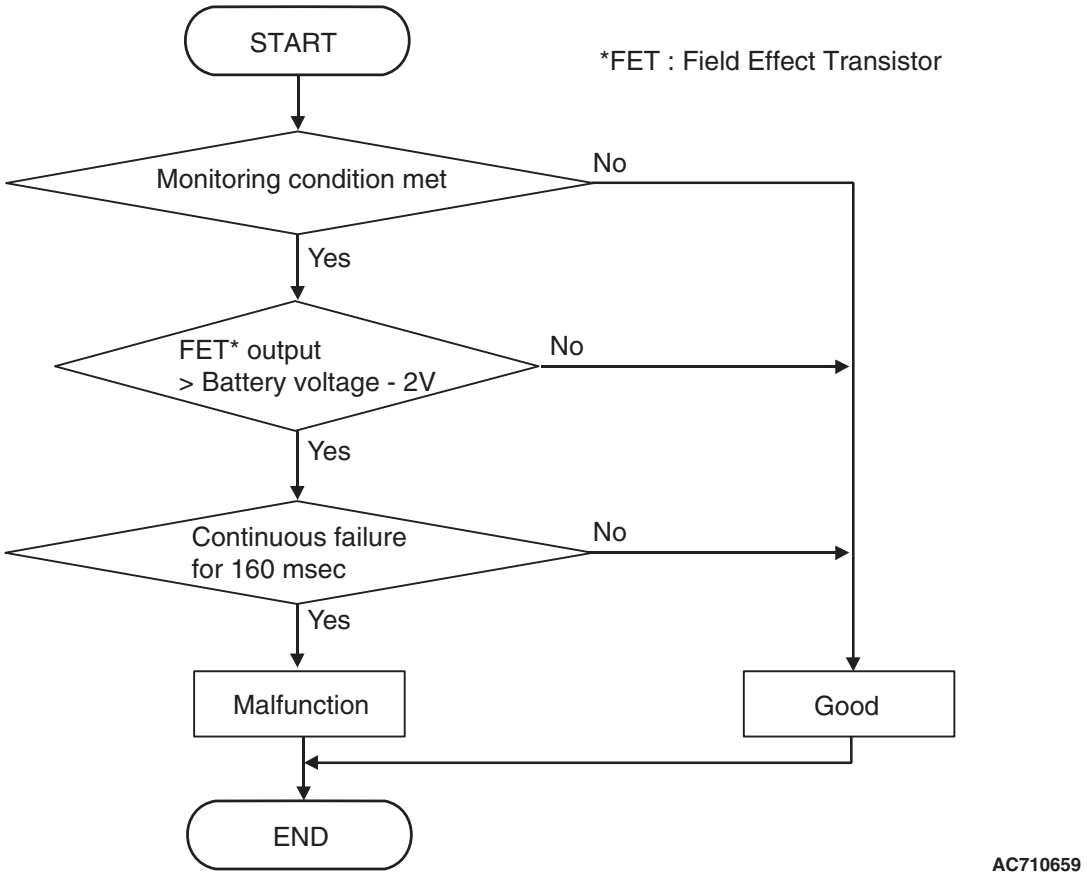
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch 2 pressure sensor
- Clutch/shift switching solenoid 2

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Clutch/shift pressure solenoid 2: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2730 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2733: Clutch/Shift Changeover Solenoid 1, spool stuck

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 1 is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 1 is determined to be seized.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

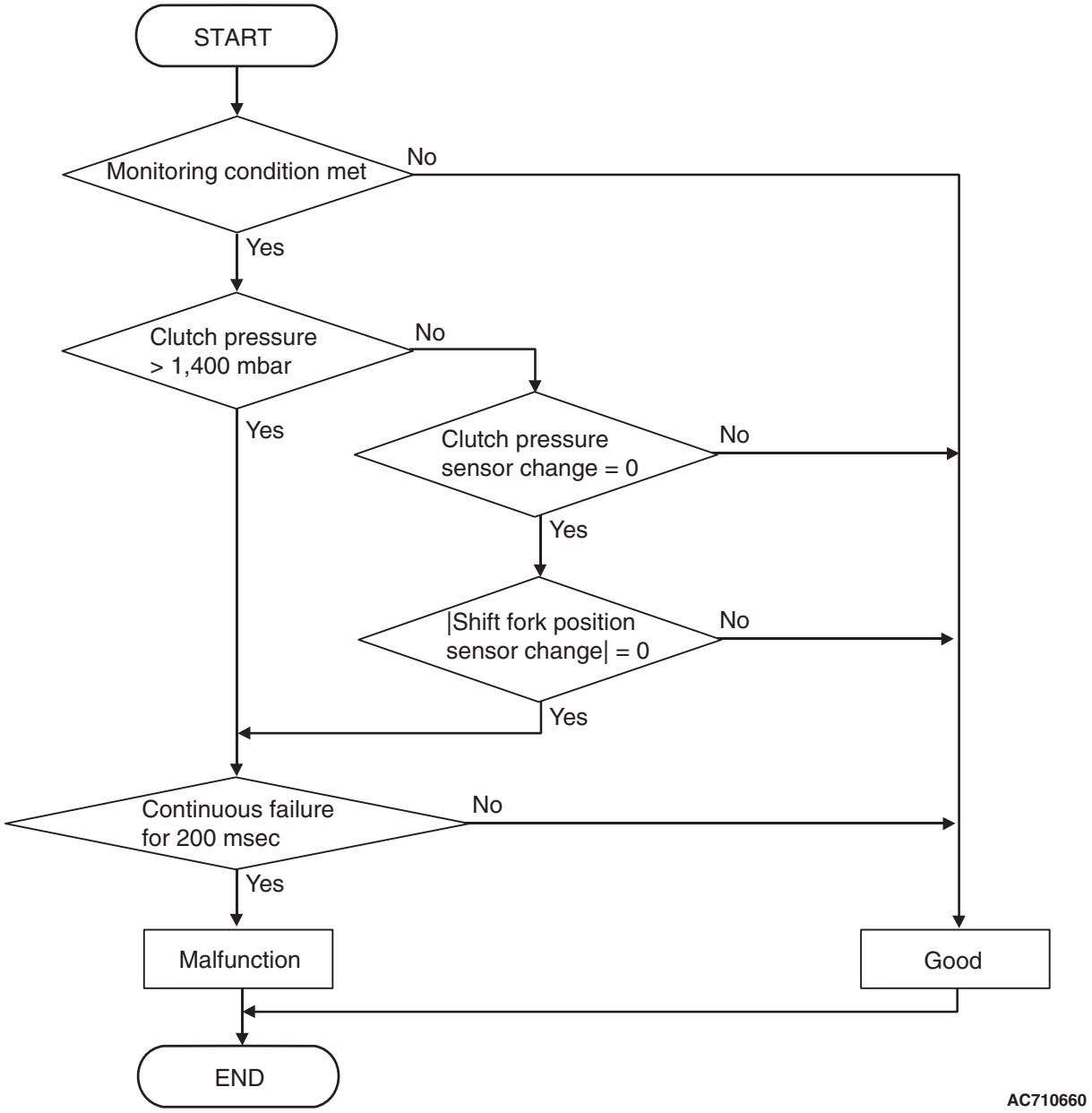
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch/shift changeover solenoid 1: ON.
- Clutch/shift changeover solenoid 2: OFF.
- Clutch cooling flow solenoid: OFF.
- Clutch/shift pressure solenoid 1: ON.

JUDGMENT CRITERIA

- Clutch 1 (odd) pressure: 1,400 mbar or more, or clutch 1 pressure sensor (odd) change: 0, and shift fork position sensor 1 and 2 change: 0. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN

The status with the clutch 1 pressure 1,400 mbar or less, or with the clutch 1 pressure sensor (odd) and shift fork position sensor 1 and 2 changed continues for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

TSB Revision

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2733 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2736: Clutch/Shift Changeover Solenoid 1 System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 1 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

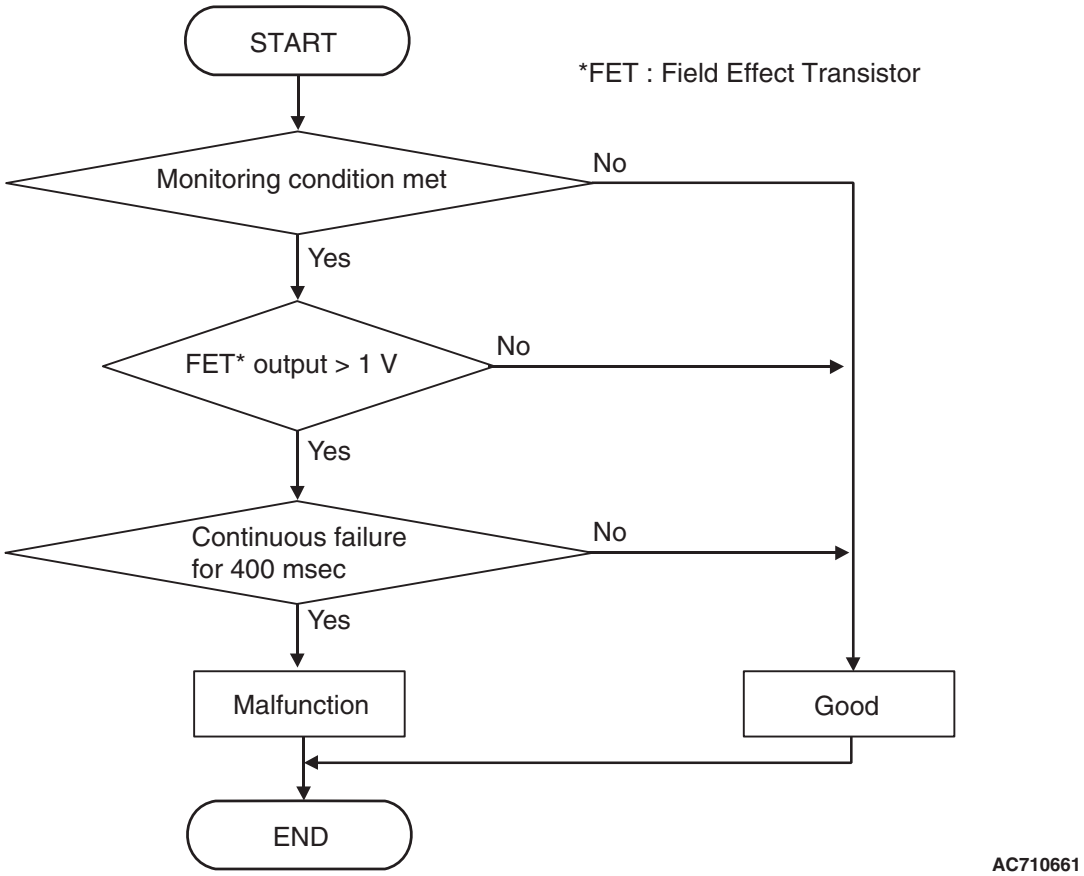
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2736 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2738: Clutch/Shift Changeover Solenoid 1 System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 1 circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

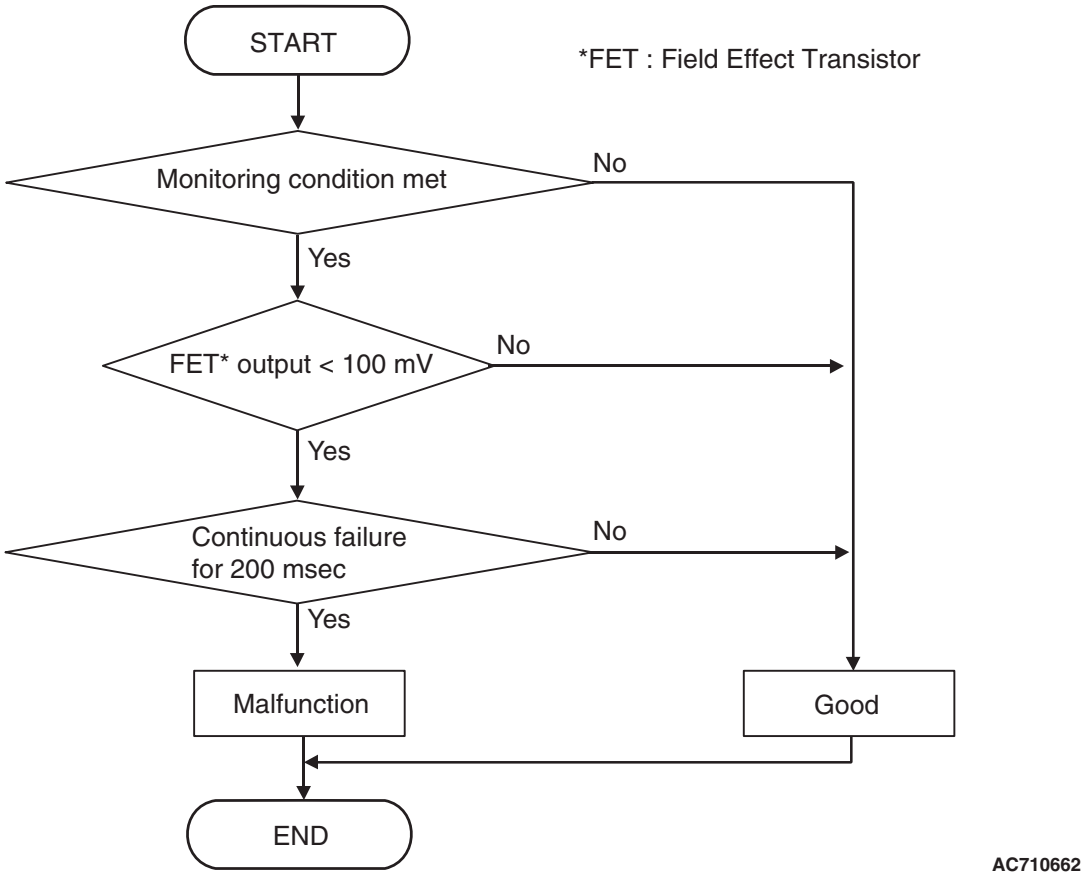
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2738 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P2739: Clutch/Shift Changeover Solenoid 1 System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 1 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 1 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

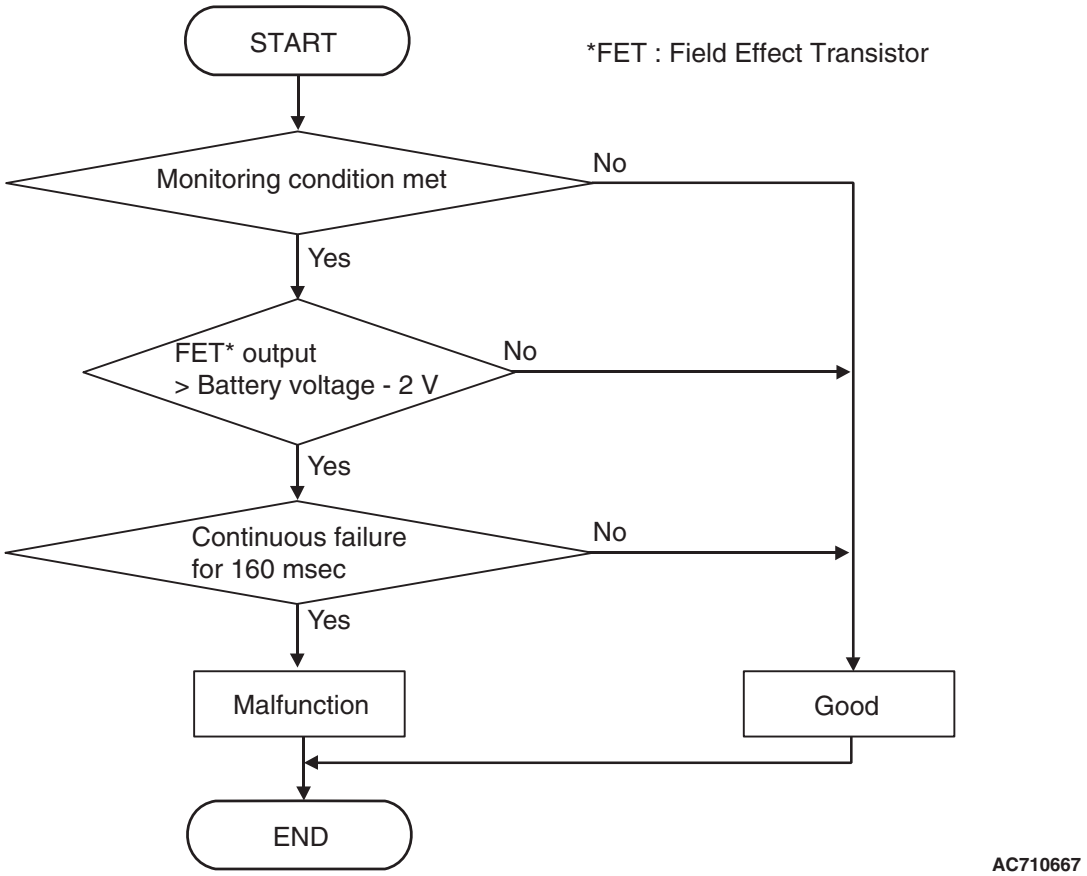
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P181B: Clutch 1 (Pressure low range out)
- P181C: Clutch 1 (Pressure high range out)
- P1859: Disengagement too late with clutch 1

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Clutch / shift changeover solenoid 1: OFF.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2739 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2741: Fluid Temperature Sensor System (Gradient 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the output gradient of the fluid temperature sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The temperature change is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

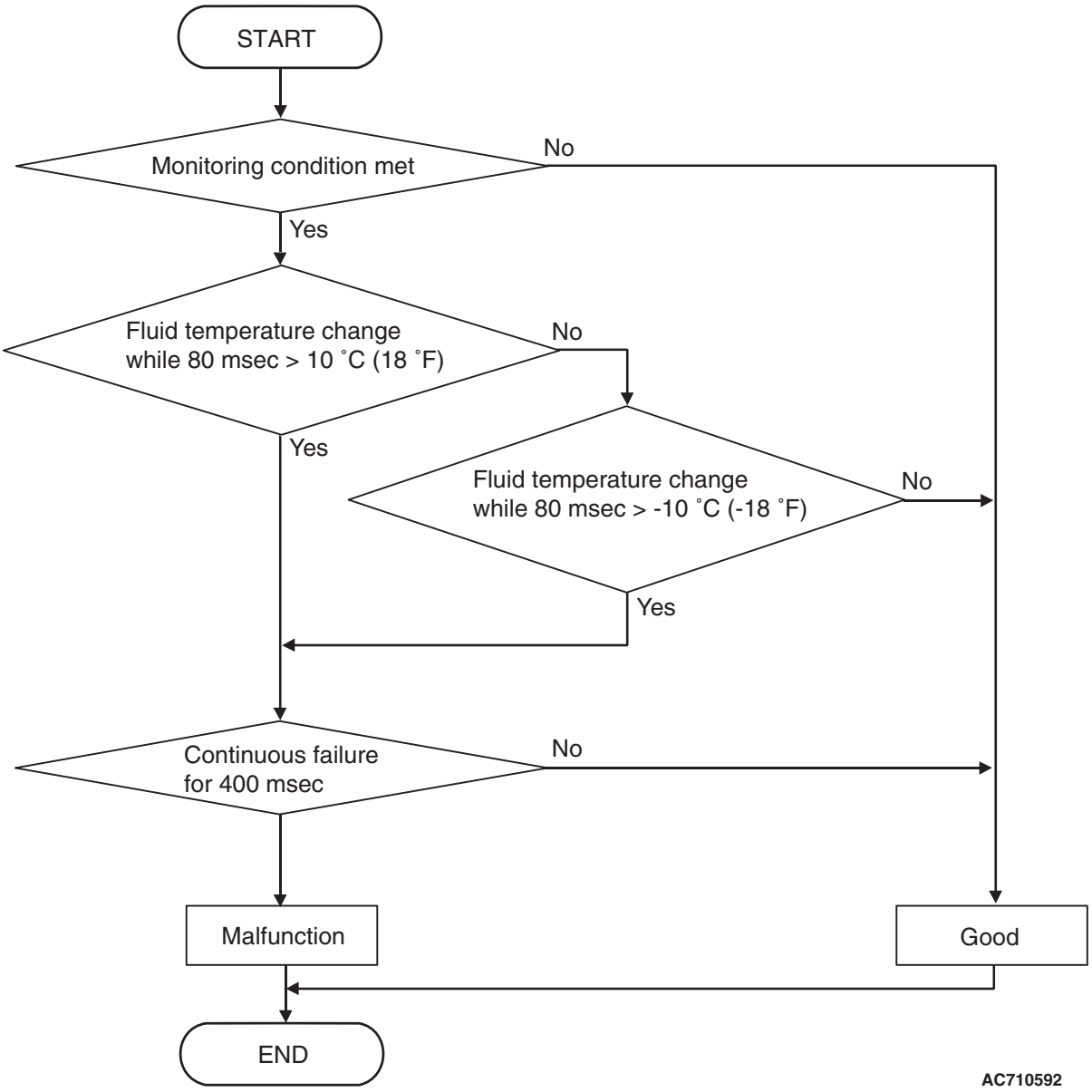
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2742: Fluid temperature sensor system (Output low range out)
- P2743: Fluid temperature sensor system (Output high range out)
- P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Fluid temperature change while 80 millisecond: 10° C (18° F) or more, or fluid temperature change while 80 millisecond: −10° C (−18° F) or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The absolute value of the temperature rise or drop at every 80 milliseconds remains 10° C (18° F) or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2741 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2742: Fluid Temperature Sensor System (Output low range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the fluid temperature sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output is determined to be too low.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

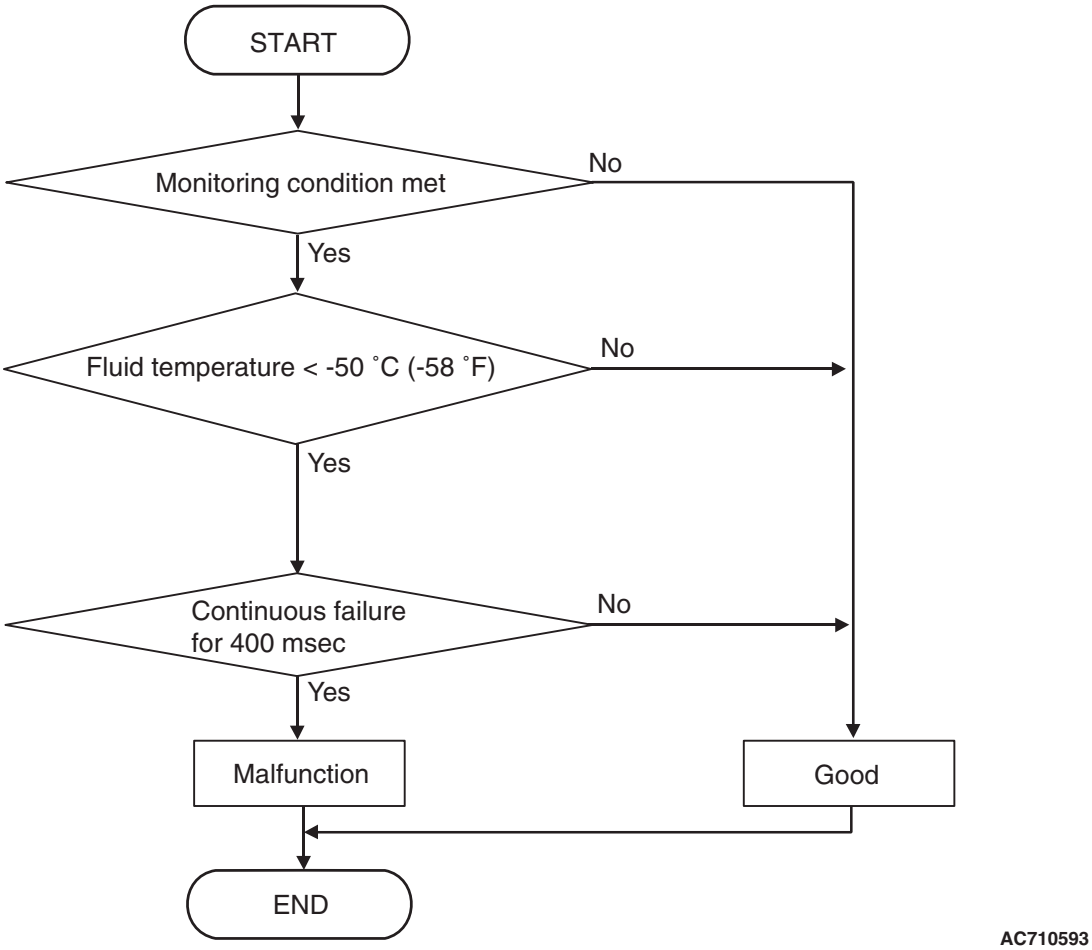
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2741: Fluid temperature sensor system (Gradient error)
- P2743: Fluid temperature sensor system (Output high range out)
- P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Fluid temperature: −50° C (−58° F) or less. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The fluid temperature remains −50° C (−58° F) or more for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2742 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2743: Fluid Temperature Sensor System (Output high range out)

⚠ 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 FUNCTION

TC-SST-ECU checks that the output of the fluid temperature sensor is normal.

DESCRIPTIONS OF MONITOR METHODS

The output is determined to be too high.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

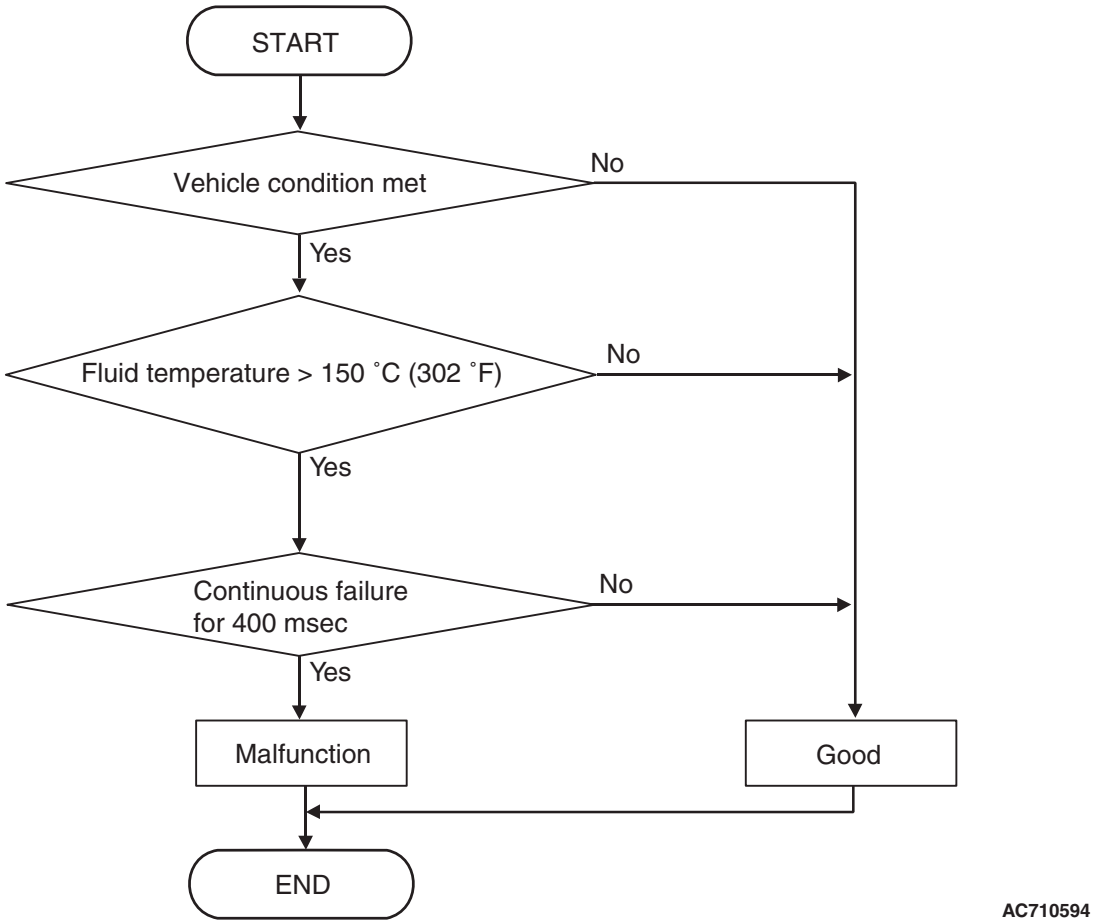
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2741: Fluid temperature sensor system (Gradient error)
- P2742: Fluid temperature sensor system (Output low range out)
- P1808: TC-SST-ECU temperature, fluid temperature sensor system (Correlation error)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- Fluid temperature: 150° C (302° F) or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The fluid temperature remains 150° C (302° F) or more for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2743 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P2766: Input Shaft 2 (Even number gear axle) Speed Sensor System (Poor performance)

⚠ 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 FUNCTION

TC-SST-ECU checks that the input shaft sensor 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The even number gear side input shaft speed (revolution) is determined to be abnormal.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

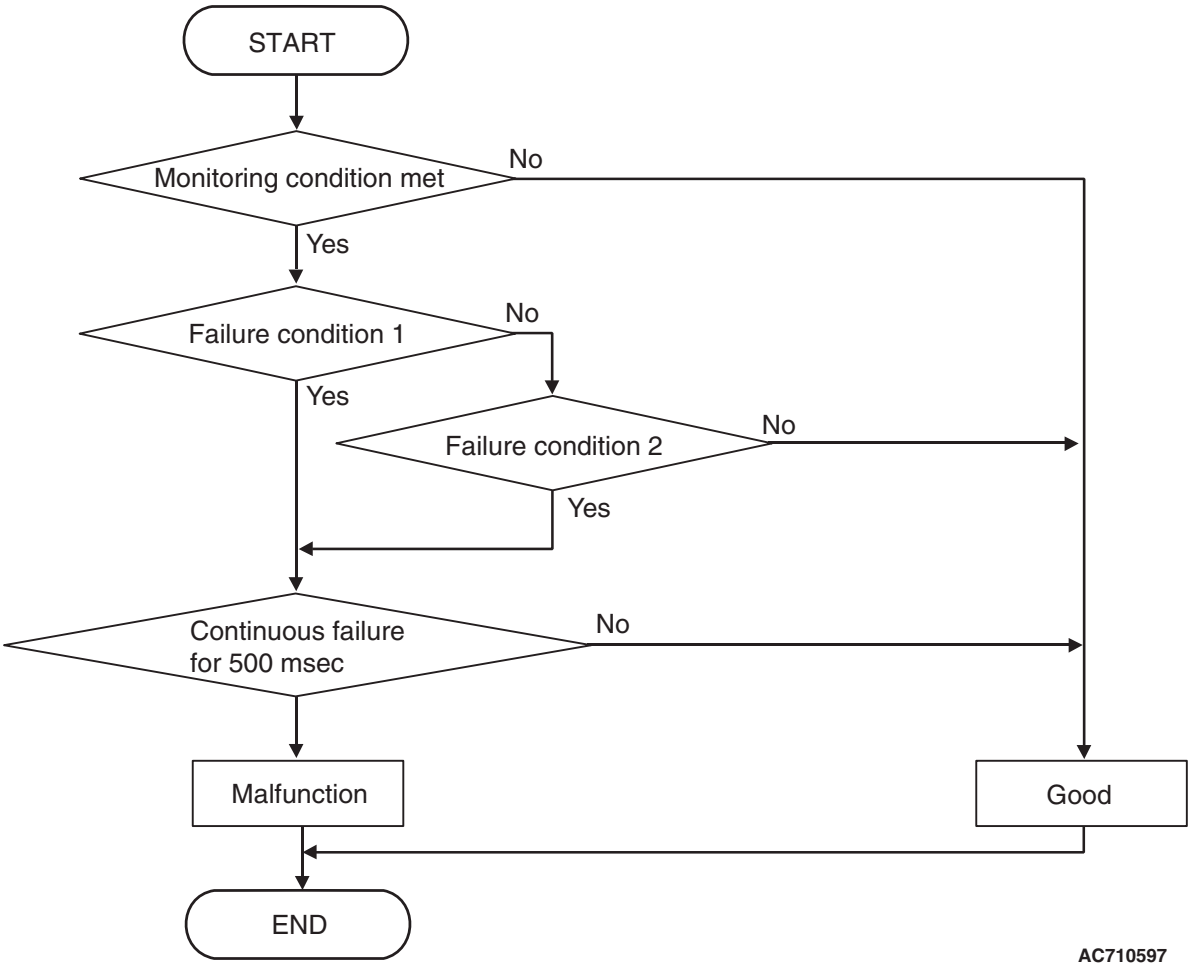
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0715: Input shaft 1 (odd number gear axle) speed sensor system (Output high range out)
- P0716: Input shaft 1 (odd number gear axle) speed sensor system (Poor performance)
- P0717: Input shaft 1 (odd number gear axle) speed sensor system (Output low range out)

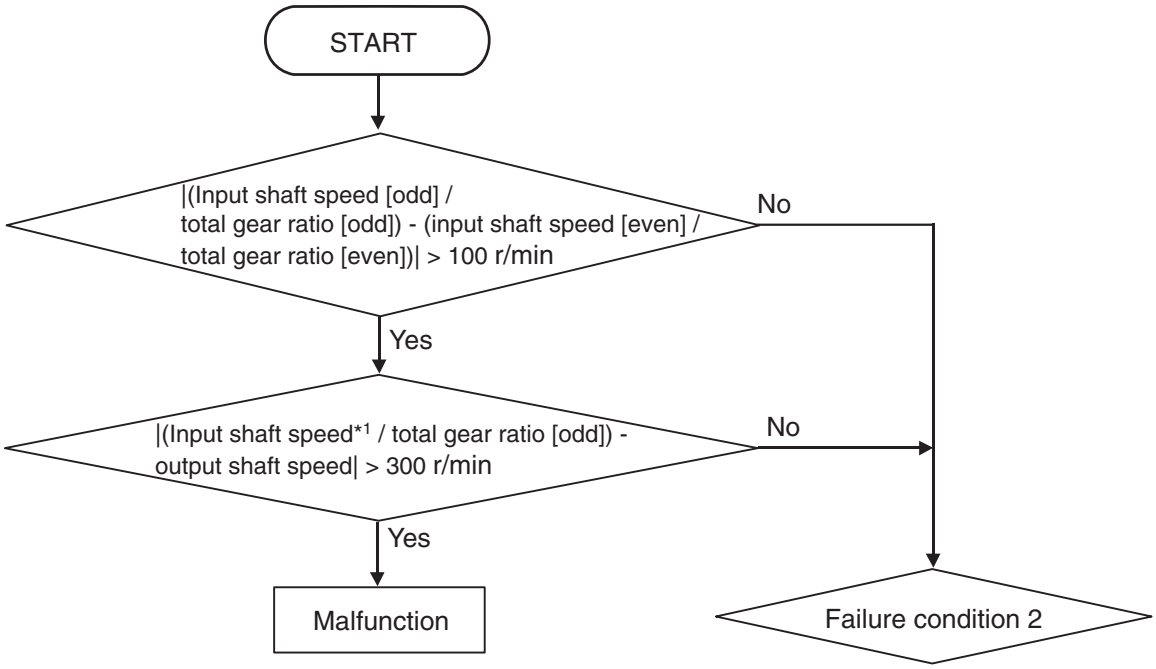
Sensor (The sensor below is determined to be normal)

- Input shaft 1 (odd number gear axle) speed sensor

LOGIC FLOW CHARTS (Monitor Sequence) <Rationality>



LOGIC FLOW CHARTS (Monitor Sequence) <Rationality (Failure condition 1)>



*1 : In case of input speed sensor A monitor, this is speed of input shaft (odd).
In case of input speed sensor B monitor, this is speed of input shaft (even).

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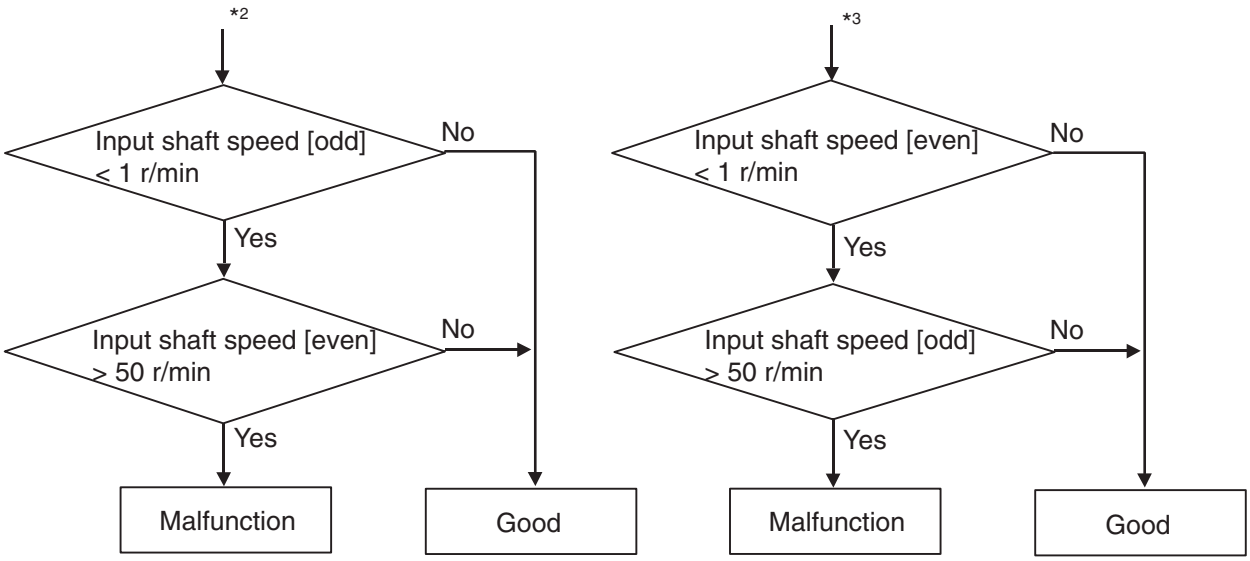
LOGIC FLOW CHARTS (Monitor Sequence) <Rationality (Failure condition 2)>



*2 :In case of input speed sensor A monitor

*3 :In case of input speed sensor B monitor

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DTC SET CONDITIONS

Check Conditions <Rationality>

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Input shaft [odd] gear: engaged.
- Input shaft [even] gear: engaged.

JUDGMENT CRITERIA <Rationality>

- Failure condition 1 or failure condition 2 (Refer to Logic Flow Charts (Monitor Sequence) <Rationality>). (500 millisecond)

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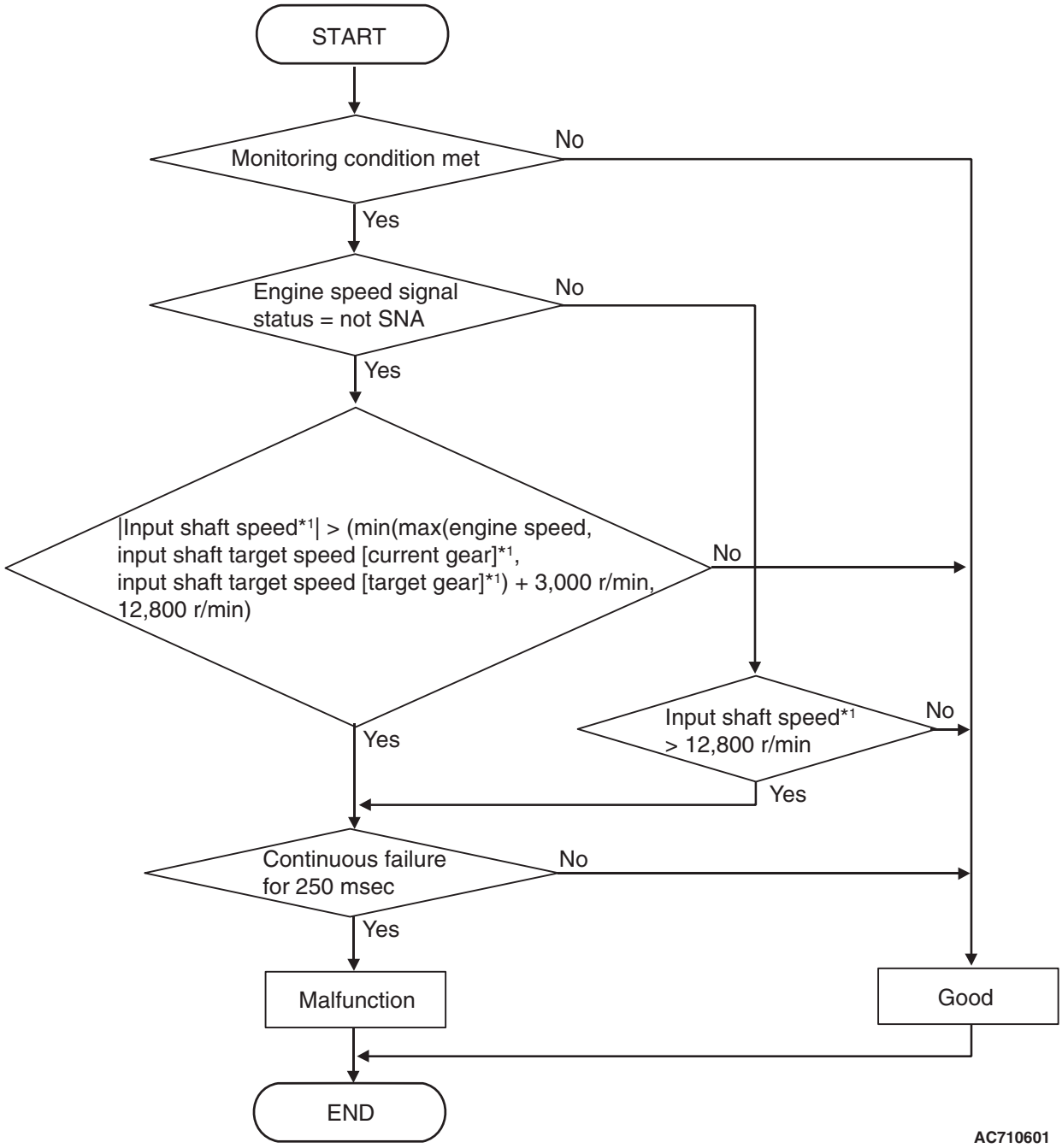
OBD-II DRIVE CYCLE PATTERN
<RATIONALITY>

Each value of failure condition 1 or failure condition 2 (Logic Flow Charts (Monitor Sequence) <Rationality>) returns to the normal value and remains in the state for 500 milliseconds.

LOGIC FLOW CHARTS (Monitor Sequence) <Rationality - plausibility failure>



*1 :In case of input shaft 1 (odd) speed sensor monitor, this is speed of input shaft (odd).
In case of input shaft 2 (even) speed sensor monitor, this is speed of input shaft (even).

TSB Revision

DTC SET CONDITIONS

Check Conditions <Rationality plausibility failure>

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA <Rationality plausibility failure>

- Input shaft 2 (even) speed: Refer to Logic Flow Charts (Monitor Sequence) <Rationality plausibility failure>. (250 millisecond)

OBD-II DRIVE CYCLE PATTERN <RATIONALITY PLAUSIBILITY FAILURE>

The value of the Logic Flow Charts (Monitor Sequence) <Rationality plausibility failure> returns to the normal value and remains in the state for 250 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2766 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P2809: Clutch/Shift Changeover Solenoid 2, spool stuck

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 2 is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 2 is determined to be seized.

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)

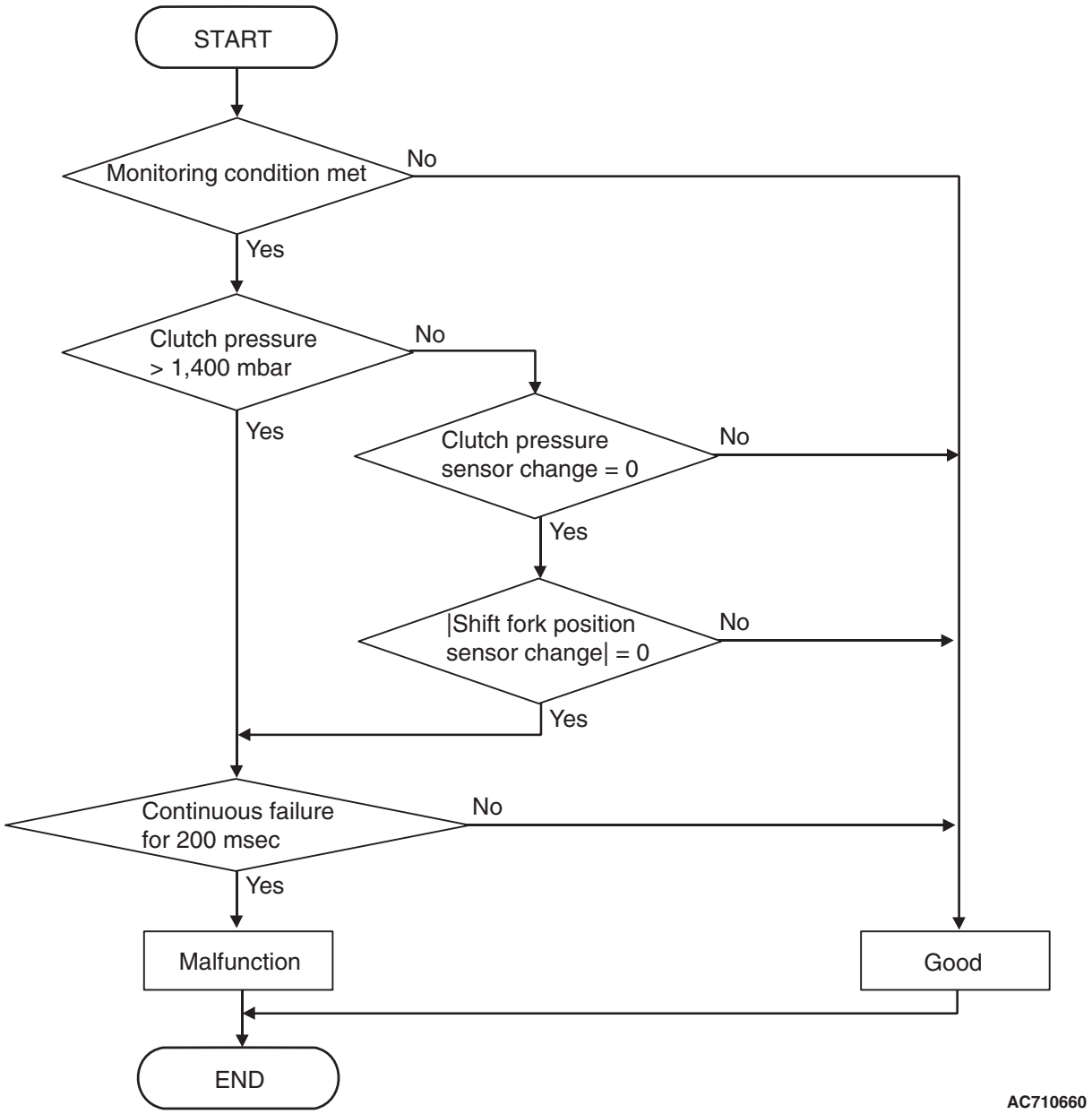
- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181E: Clutch 2 (Pressure low range out)

- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Engine speed: 500 r/min or more.
- Time since above engine condition: 400 millisecond or more.
- Clutch/shift changeover solenoid 2: ON.
- Clutch cooling flow solenoid: OFF.
- Clutch/shift pressure solenoid 2: ON.

JUDGMENT CRITERIA

- Clutch 2 (even) pressure: 1,400 mbar or more, or clutch 2 pressure sensor (even) change: 0, and shift fork position sensor 3 and 4 change: 0. (200 millisecond)

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OBD-II DRIVE CYCLE PATTERN

The status with the clutch 2 pressure 1,400 mbar or less, or with the clutch 2 pressure sensor (even) and shift fork position sensor 3 and 4 changed continues for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2809 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

DTC P2812: Clutch/Shift Changeover Solenoid 2 System (Open 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.**

DIAGNOSTIC FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 2 circuit is determined to be open.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

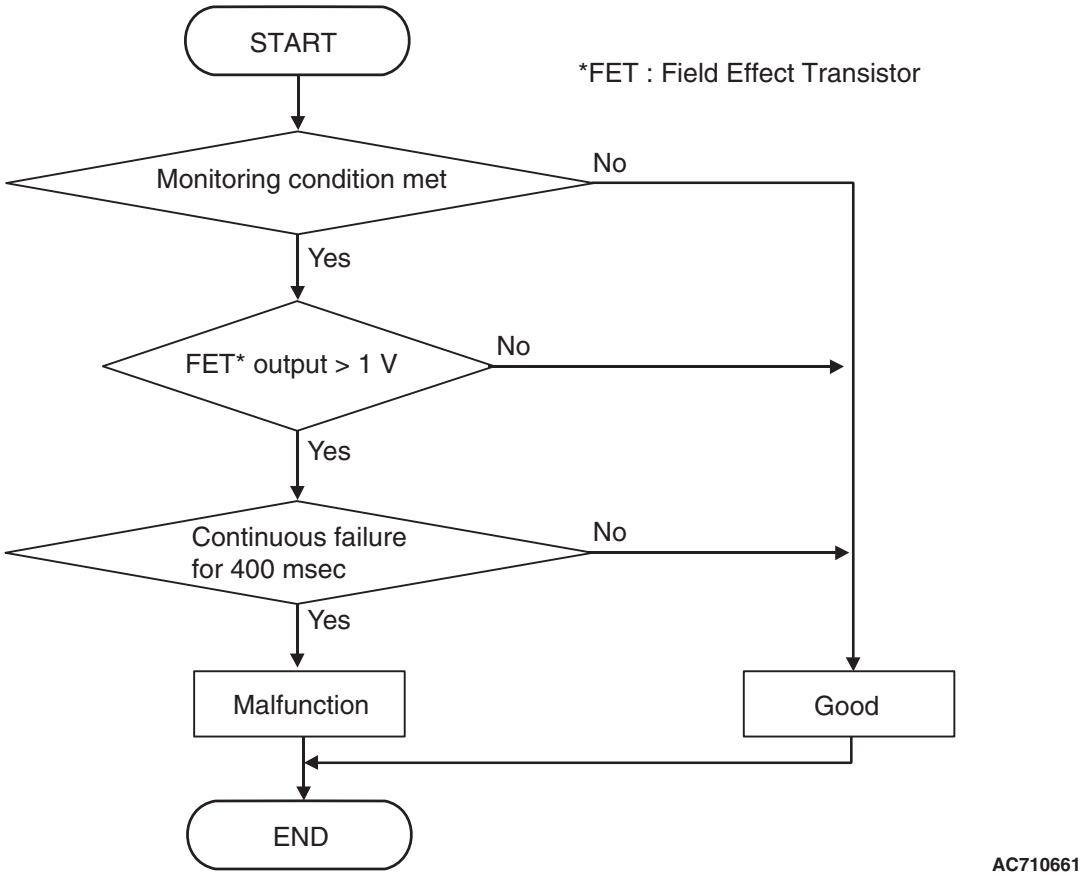
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 1 V or more. (400 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 1 V or less for 400 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2812 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2814: Clutch/Shift Changeover Solenoid 2 System (Short to ground)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 2 circuit is determined to be short to ground.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

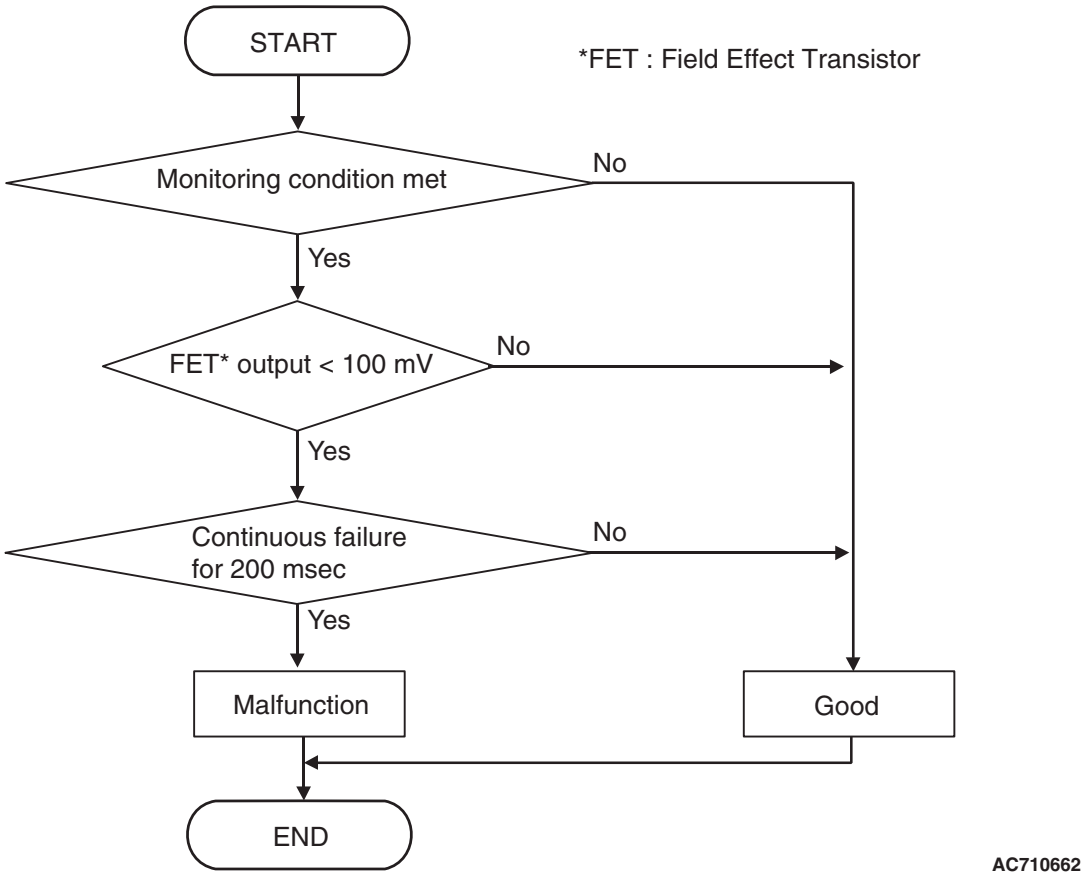
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2815: Clutch/shift switching solenoid 2 system (Short to power supply)
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: 100 mV or less. (200 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains 100 mV or more for 200 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2814 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)

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

TSB Revision

DTC P2815: Clutch/Shift Changeover Solenoid 2 System (Short to power supply)

⚠ 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 FUNCTION

TC-SST-ECU checks that the clutch/shift changeover solenoid 2 circuit is normal.

DESCRIPTIONS OF MONITOR METHODS

The clutch/shift changeover solenoid 2 circuit is determined to be short to power supply.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

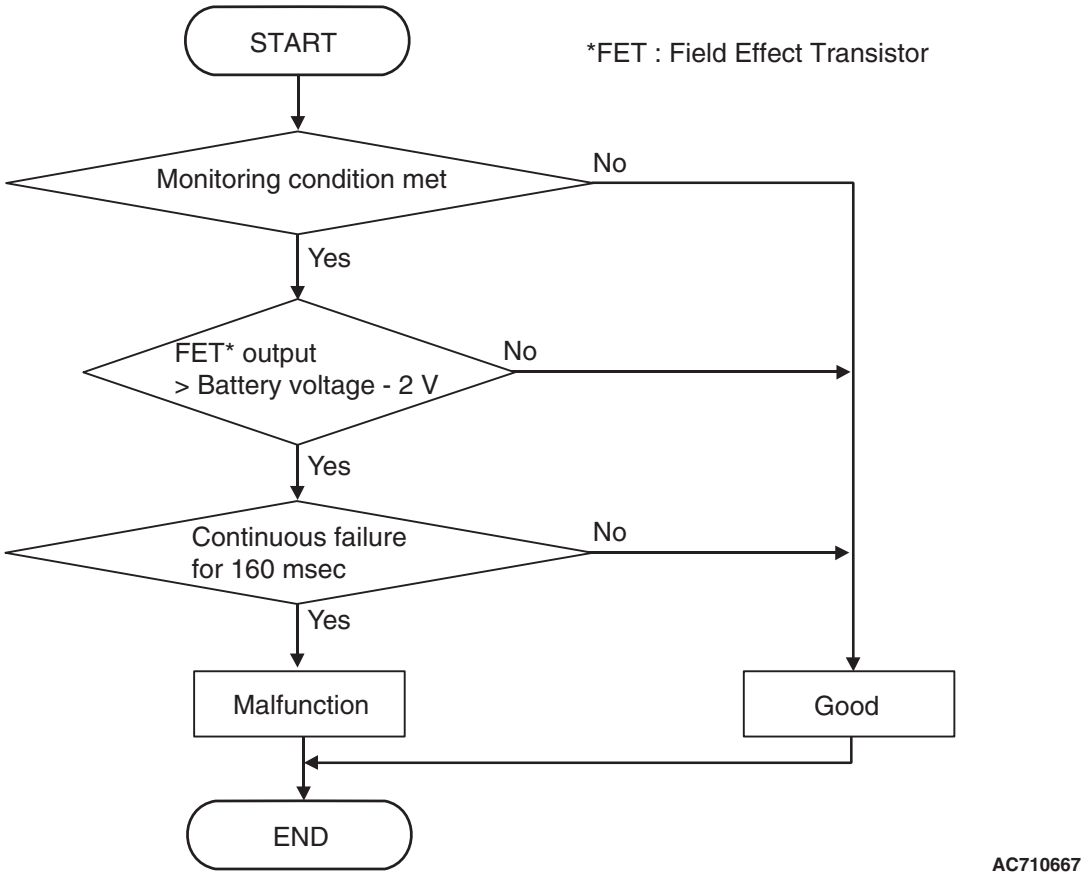
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P2733: Clutch/shift switching solenoid 1, spool stuck
- P2736: Clutch/shift switching solenoid 1 system (Open circuit)
- P2738: Clutch/shift switching solenoid 1 system (Short to ground)
- P2739: Clutch/shift switching solenoid 1 system (Short to power supply)
- P2809: Clutch/shift switching solenoid 2, spool stuck
- P2812: Clutch/shift switching solenoid 2 system (Open circuit)
- P2814: Clutch/shift switching solenoid 2 system (Short to ground)
- P181E: Clutch 2 (Pressure low range out)
- P181F: Clutch 2 (Pressure high range out)
- P185B: Disengagement too late with clutch 2

Sensor (The sensor below is determined to be normal)

- Clutch/shift switching solenoid 1

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Clutch / shift changeover solenoid 2: ON.

JUDGMENT CRITERIA

- FET (Field Effect Transistor) output: (Battery voltage –2 V) or more. (160 millisecond)

OBD-II DRIVE CYCLE PATTERN

The FET channel output remains (Battery voltage –2 V) or less for 160 milliseconds.

PROBABLE CAUSES

- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P2815 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0001: Bus-off

⚠ CAUTION

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

DESCRIPTIONS OF MONITOR METHODS

TC-SST-ECU ceases communication (bus-off).

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

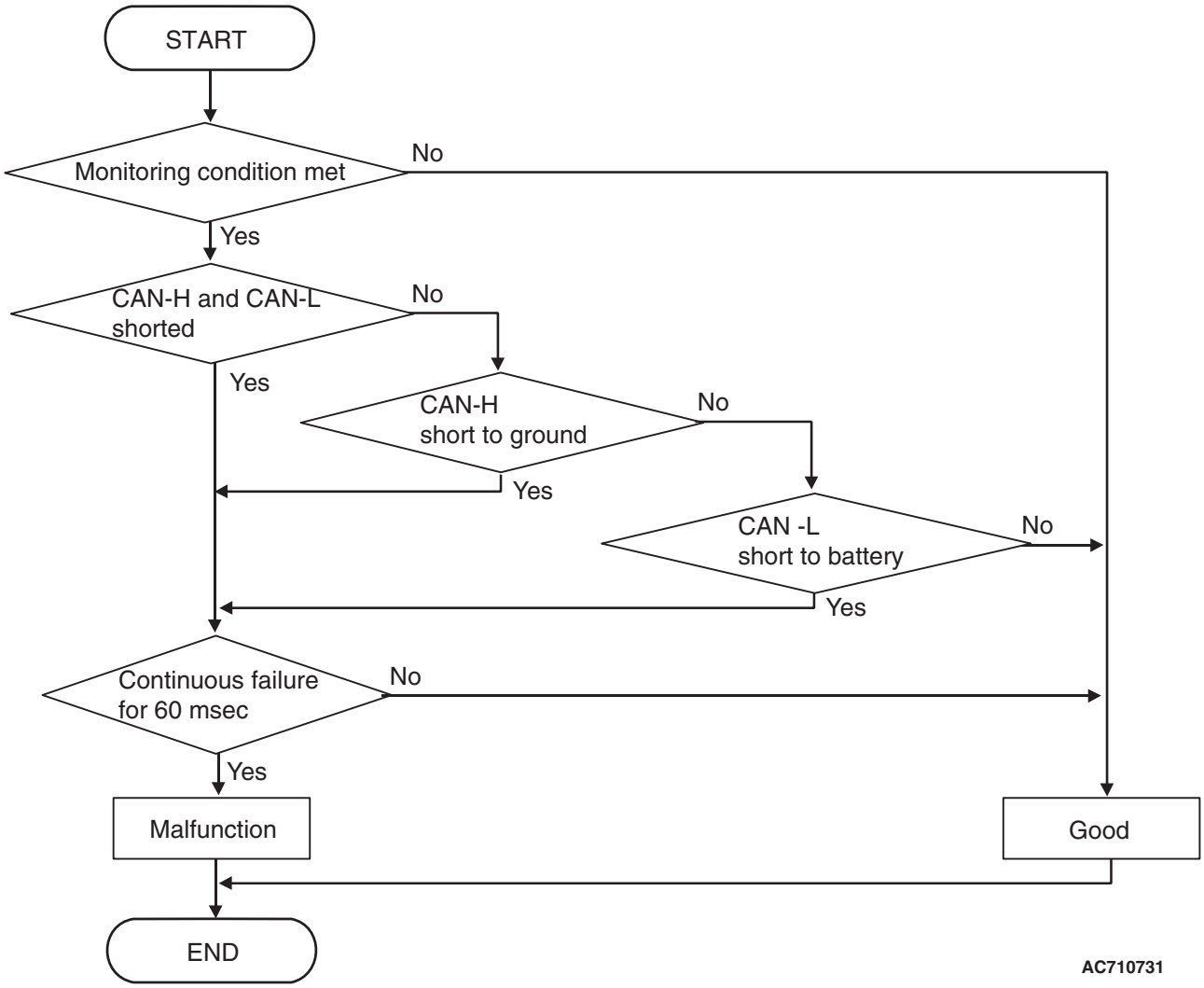
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P185D: Clutch open not possible
- U0100: Engine time-out error
- P1803: Shift lever system (CAN or LIN time-out error)
- P1870: Engine torque signal abnormality
- P1871: APS system (Signal abnormality)
- P1872: Between shift lever and TC-SST system (Q-A function abnormality)

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch 2 pressure sensor
- APS
- Shift lever-ECU

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after TC-SST-ECU start: 5 seconds or more.

JUDGMENT CRITERIA

- CAN communication: Error. (60 millisecond)

OBD-II DRIVE CYCLE PATTERN

The CAN communication remains normal for 60 milliseconds.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. U0001 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0100: Engine Time-out Error

⚠ CAUTION

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

DESCRIPTIONS OF MONITOR METHODS

The periodic communication data from the engine control module cannot be received.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

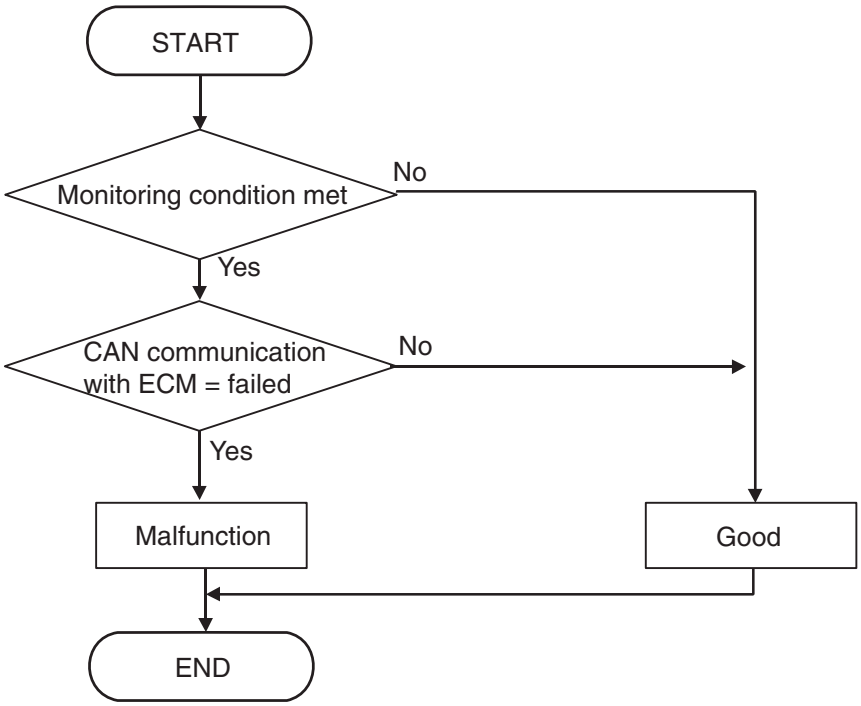
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0841: Clutch 1 pressure sensor system (Poor performance)
- P0842: Clutch 1 pressure sensor system (Output low range out)
- P0843: Clutch 1 pressure sensor system (Output high range out)
- P0846: Clutch 2 pressure sensor system (Poor performance)
- P0847: Clutch 2 pressure sensor system (Output low range out)
- P0848: Clutch 2 pressure sensor system (Output high range out)
- P185D: Clutch open not possible
- U0001: Bus off
- P1803: Shift lever system (CAN or LIN time-out error)
- P1870: Engine torque signal abnormality
- P1871: APS system (Signal abnormality)
- P1872: Between shift lever and TC-SST system (Q-A function abnormality)

Sensor (The sensor below is determined to be normal)

- Clutch 1 pressure sensor
- Clutch 2 pressure sensor
- APS
- Shift lever-ECU

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 8 V or more.
- Voltage of battery: 16.5 V or less.
- Time after TC-SST-ECU start: 5 seconds or more.

JUDGMENT CRITERIA

- CAN communication with ECM: Fail. (Immediately)

OBD-II DRIVE CYCLE PATTERN

Receive the signal from ECM.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using the scan tool, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Scan tool diagnostic trouble code

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

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 3.

TSB Revision

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0100 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0103: Shift Lever 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.**

DESCRIPTIONS OF MONITOR METHODS

The periodic communication data from the shift lever-ECU cannot be received.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of the shift lever-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using the scan tool, diagnose the CAN bus lines.

Q: Is the check result normal?

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

STEP 2. Scan tool diagnostic trouble code

Check the shift lever diagnostic trouble code. (Refer to P.22C-302.)

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0103 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0121: ASC Time-out Error

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

DESCRIPTIONS OF MONITOR METHODS
The periodic communication data from the ASC-ECU cannot be received.

PROBABLE CAUSES
- The CAN bus line is defective.
- Malfunction of ASC-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0121 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0136: AWC 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.**

DESCRIPTIONS OF MONITOR METHODS
The periodic communication data from the engine control module cannot be received.

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

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Scan tool diagnostic trouble code
Check the AWC diagnostic trouble code. (Refer to GROUP 22A –Troubleshooting P.22A-11.)

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0136 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0141: ETACS Time-out Error

⚠ CAUTION

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

DESCRIPTIONS OF MONITOR METHODS

The periodic communication data from the ETACS-ECU cannot be received.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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

Q: Is the DTC set?

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

TSB Revision

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0141 set?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The scan tool cannot communicate with TC-SST-ECU.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The CAN bus line, TC-SST-ECU power supply circuit, or TC-SST-ECU may have a problem.

PROBABLE CAUSES

- Wrong M.U.T.-III wiring harness
- The CAN bus line is defective.
- Malfunction of TC-SST-ECU power supply circuit
- Malfunction of TC-SST-ECU
- ECU malfunction of other system

STEP 1. Scan tool CAN bus diagnostics

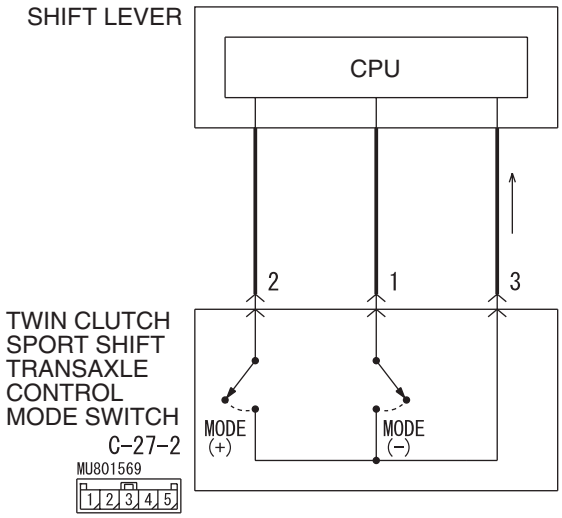
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

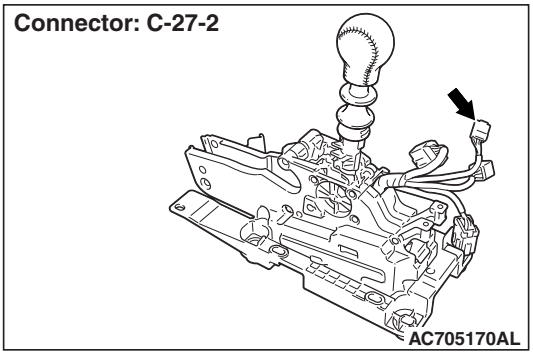
YES : Check and repair the TC-SST-ECU power supply circuit. (Refer to P.22C-295.)
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

INSPECTION PROCEDURE 2: The driving mode cannot be changed.

Twin clutch sport shift transaxle control mode switch circuit



W8H22M010A



⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The twin clutch SST control mode switch, or TC-SST-ECU may have a problem.

PROBABLE CAUSES

- Malfunction of the twin clutch SST control mode switch
- Damaged harness wires and connectors
- Malfunction of the shift lever-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

TSB Revision

STEP 2. Scan tool service data
Item No. 30: Drive mode switch (Refer to Service Data Reference Table P.22C-298.)

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. Twin clutch SST control mode switch check
Refer to P.22C-349.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the twin clutch SST control mode switch. (Refer to P.22C-349.)

STEP 4. Twin clutch SST control mode switch connector check: C-27-2
Check for the contact with terminals.

Q: Is the check result normal?

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

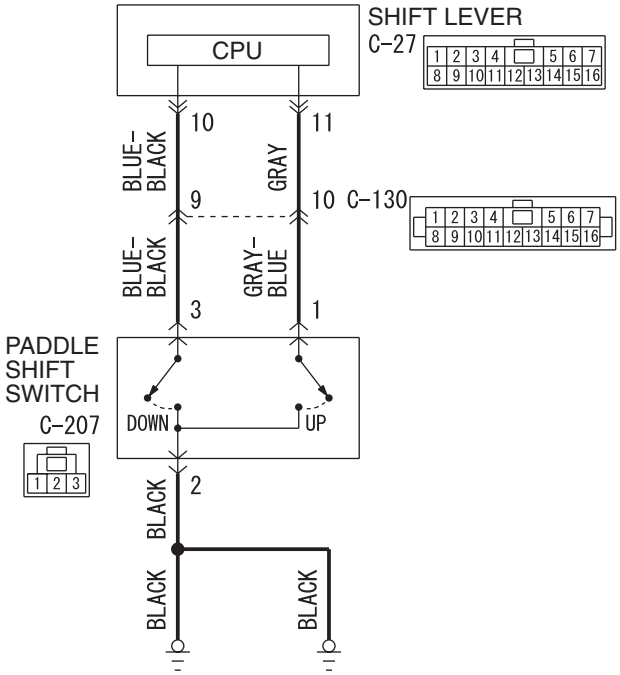
STEP 5. Trouble symptom recheck after replacing the shift lever assembly
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Verify that the condition described by the customer exists.

Q: Does a malfunction take place again?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

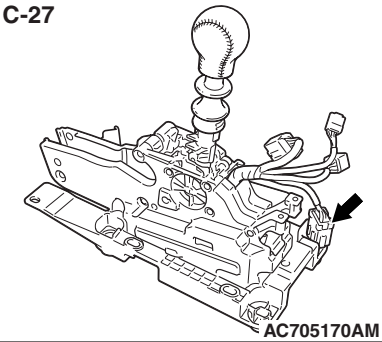
INSPECTION PROCEDURE 3: Speed change with the paddle shift is impossible.

Paddle shift switch system circuit



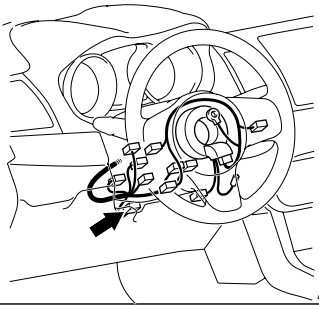
W8H22M011A

Connector: C-27



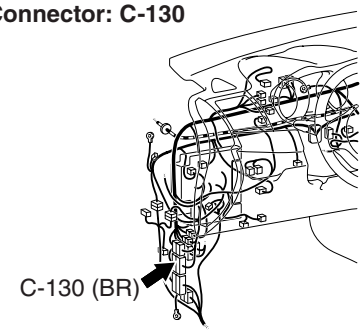
AC705170AM

Connector: C-207



AC708953AK

Connector: C-130



AC708950CM

⚠ CAUTION

Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The paddle shift switch, or TC-SST-ECU may have a problem.

TSB Revision

PROBABLE CAUSES

- Malfunction of the paddle shift switch
- Damaged harness wires and connectors
- Malfunction of the shift lever-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. PADDLE SHIFT SWITCH CHECK
Refer to P.22C-348.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the paddle shift assembly. (Refer to P.22C-348.)

STEP 3. Measure the resistance at C-207 paddle shift switch connector.
Disconnect the connector, and measure the resistance between terminal No.2 and ground at the wiring harness side.

OK: Continuity exists. (2 Ω or less)

Q: Is the check result normal?

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

STEP 4. Paddle shift switch connector check: C-207
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 5. Check the wiring harness between C-207 paddle shift switch connector terminal No. 2 and the body ground.
Check the ground line for open circuit.

Q: Is the check result normal?

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

STEP 6. Inspection of the shift lever assembly connector, intermediate connector, and paddle shift switch connector: C-27, C-130, C-207
Check for the contact with terminals.

Q: Is the check result normal?

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

TSB Revision

STEP 7. Check the wiring harness between C-207 paddle shift switch connector terminal No. 1 and C-27 shift lever assembly connector terminal No. 11, and between C-207 paddle shift switch connector terminal No. 3 and C-27 shift lever assembly connector terminal No. 10.
Check the output line for short or open circuit.

Q: Is the check result normal?

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

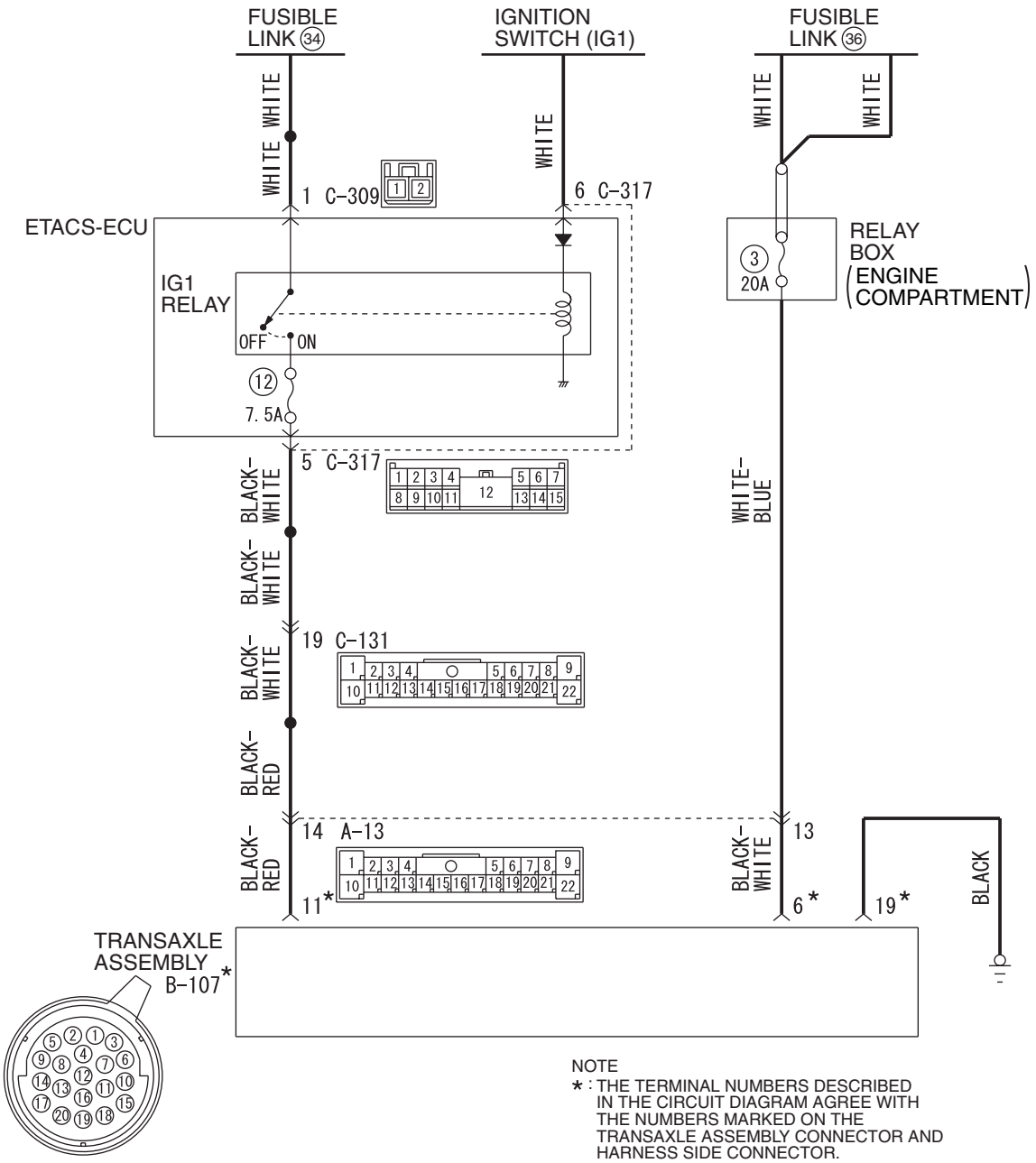
STEP 8. Trouble symptom recheck after replacing the shift lever assembly
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Verify that the condition described by the customer exists.

Q: Does a malfunction take place again?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

INSPECTION PROCEDURE 4: TC-SST-ECU power supply circuit malfunction

Power supply system circuit



NOTE
* : THE TERMINAL NUMBERS DESCRIBED IN THE CIRCUIT DIAGRAM AGREE WITH THE NUMBERS MARKED ON THE TRANSAXLE ASSEMBLY CONNECTOR AND HARNESS SIDE CONNECTOR.

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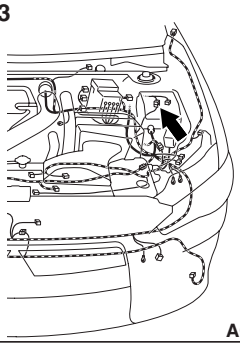
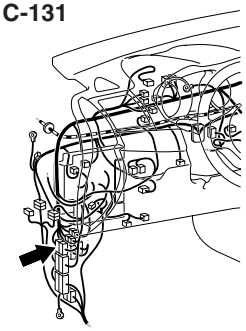
TSB Revision

Connector: A-13



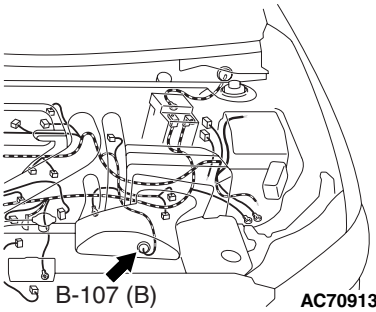
AC708949AO

Connector: C-131



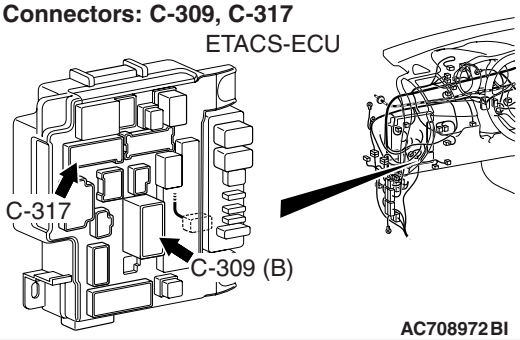
AC708950CN

Connector: B-107



AC709137AD

Connectors: C-309, C-317



AC708972BI

⚠ CAUTION

Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

TC-SST-ECU power supply circuit, ground circuit, or TC-SST-ECU may have a problem.

PROBABLE CAUSES

- Defective battery
- Damaged harness wires and connectors
- Malfunction of the ETACS-ECU
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Check the battery.

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

Q: Is the battery in good condition?

YES : Go to Step 2.
NO : Charge or replace the battery.

STEP 2. Measure the resistance at B-107 TC-SST-ECU connector.

Disconnect the connector, and measure the resistance between terminal No. 19 and ground at the wiring harness side.

OK: Continuity exists. (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 3.

STEP 3. TC-SST-ECU connector check: B-107

Check for the contact with terminals.

Q: Is the check result normal?

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

TSB Revision

STEP 4. Check the wiring harness between B-107 TC-SST-ECU connector terminal No. 19 and body ground.
Check the ground line for open circuit.

Q: Is the check result normal?

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

STEP 5. Measure the voltage at B-107 TC-SST-ECU connector.
Disconnect the connector, and measure the voltage between terminal No. 6 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 6.

STEP 6. Inspection of the intermediate connector and TC-SST-ECU connector: A-13, B-107
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 7. Check the wiring harness between B-107 TC-SST-ECU connector terminal No. 6 and fusible link No. 36.
Check the power supply line for short or open circuit.

Q: Is the check result normal?

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

STEP 8. Scan tool diagnostic trouble code
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

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

STEP 9. Measure the voltage at B-107 TC-SST-ECU connector.
(1) Disconnect the connector, and measure the voltage between terminal No. 11 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 12.
NO : Go to Step 10.

STEP 10. Inspection of the intermediate connector, TC-SST-ECU connector, and ETACS-ECU connector: A-13, C-131, B-107, C-317
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 11. Check the wiring harness between B-107 TC-SST-ECU connector terminal No. 11 and C-317 ETACS-ECU connector terminal No. 5.
Check the power supply line for short or open circuit.

Q: Is the check result normal?

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

STEP 12. Retest the system.

Q: Does a malfunction take place again?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DATA LIST REFERENCE TABLE

M1225006700011

Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
4	Engine torque control source	Engine torque control status	Engine: Idling		Idle control
			• Engine: Idling • Accelerator pedal: Depressed		Driver request
5	Brake SW	Stoplight switch	Ignition switch: ON	Brake pedal: Depressed	ON
				Brake pedal: Released	OFF
14	Lever position	Shift lever position	Ignition switch: ON	Shift lever position: P	P
				Shift lever position: P⇔R	P-R
				Shift lever position: R	R
				Shift lever position: R⇔N	R-N
				Shift lever position: N	N
				Shift lever position: N⇔D	N-D
				Shift lever position: D	D
				Shift lever position: Manual mode	Manual
				Shift lever position: Upshift and hold	+
				Shift lever position: Downshift and hold	–
20	Output shaft speed (calculation)	Output shaft speed (Calculated value)	Driving at a constant engine speed of 2,000 r/min in 5th		1,900 –2,000 r/min

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Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
23	Current gear	Gear	Ignition switch: ON	Shift lever position: N	N
			Driving at a constant speed in 1st		1st
			Driving at a constant speed in 2nd		2nd
			Driving at a constant speed in 3rd		3rd
			Driving at a constant speed in 4th		4th
			Driving at a constant speed in 5th		5th
			Driving at a constant speed in 6th		6th
			Reverse		R
			Ignition switch: ON	Shift lever position: N	N (Odd number)
			Ignition switch: ON	Shift lever position: N	N (Even number)
24	Target gear	Target gear	Ignition switch: ON	Shift lever position: N	N
			Driving at a constant speed in 1st		1st
			Driving at a constant speed in 2nd		2nd
			Driving at a constant speed in 3rd		3rd
			Driving at a constant speed in 4th		4th
			Driving at a constant speed in 5th		5th
			Driving at a constant speed in 6th		6th
			Reverse		R
			Ignition switch: ON	Shift lever position: N	N (Odd number)
			Ignition switch: ON	Shift lever position: N	N (Even number)

TC-SST-ECU TERMINAL VOLTAGE REFERENCE CHART

M1225006800018

B-107

AC707707AC

Terminal No.	Check items	Check conditions	Standard value
2	CAN_H	–	–
5	CAN_L	–	–
6	Back-up power supply	Always	Battery positive voltage

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Terminal No.	Check items	Check conditions	Standard value
11	Power supply	Ignition switch: ON	Battery positive voltage
		Ignition switch: OFF	1 V or less
17	LIN	–	–
19	Ground	Always	1 V or less

DIAGNOSIS <SHIFT LEVER>

INTRODUCTION

M1225024900022

The shift lever can exhibit any of the following symptoms: Impossible to move, or does not work.

The causes of these symptoms could come from: incorrect mounting or a component of the shift lever may be faulty.

TROUBLESHOOTING STRATEGY

M1225007900029

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will find most shift lever malfunctions.

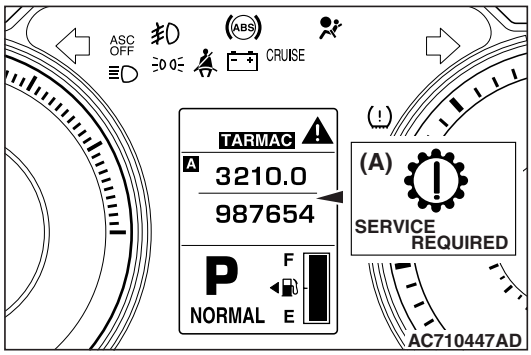
1. Gather as much information as possible about the complaint from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any shift lever Diagnostic Trouble Codes (DTCs).
4. If you cannot verify the condition and there are no DTCs, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.
5. If you can verify the condition but there are no DTCs, or the system cannot communicate with scan tool, refer to the Symptom Chart P.22C-302.
6. If there is a DTC, record the number of the code, then erase the code from memory using scan tool.
7. Reconfirm the symptom.
8. If a DTC is set again, go to the Inspection Chart for Diagnostic Trouble Codes.
9. If a DTC is not set again, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.
10. Verify malfunction is eliminated. After repairs are completed, the complaint conditions to confirm the malfunction has been eliminated.

DIAGNOSIS FUNCTION

M1225000500020

WARNING INDICATOR

When a malfunction occurs to the shift lever, the figure (A) remains displayed on the information screen of multi information display.
If the figure (A) remains displayed on the information screen of multi information display, check whether or not a diagnostic trouble code is set.



FAIL-SAFE FUNCTION

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

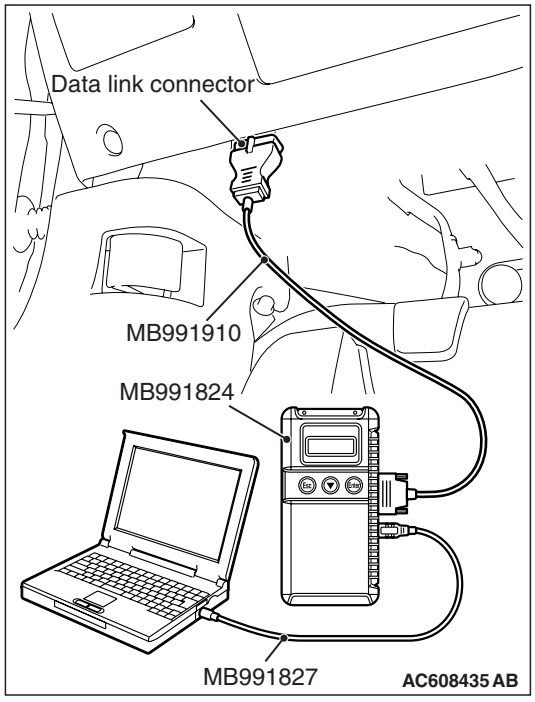
FAIL-SAFE REFERENCE TABLE

Code No.	Item	Control content
P198D	EEPROM	Normal driving can be performed, and displays an occurrence of trouble to the multi information display to warn the driver.
P198E	Lever position sensor system (Malfunction of one sensor)	Normal driving can be performed, and displays an occurrence of trouble to the multi information display to warn the driver.
P198F	Lever position sensor system (Malfunction of two sensors)	The lever position cannot be identified, and the clutch open at TC-SST side prohibits the vehicle from driving. Then displays an occurrence of trouble to the multi information display to warn the driver.

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

Required Special Tools:

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



⚠ CAUTION

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

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

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

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

FREEZE FRAME DATA CHECK

Various data of when the diagnostic trouble code is determined is obtained, and the status of that time is stored. By analyzing each data using the scan tool, troubleshooting can be performed efficiently.
Display items of the freeze frame data are as follows.

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FREEZE FRAME DATA REFERENCE TABLE

Item No.	Item	Display contents
4	Current trouble accumulative time	min
5	Shift lever position	• P • R-P • R • N-R • N • D-N • D • Manual • + • –
6	Battery positive voltage	V

DIAGNOSTIC TROUBLE CODE CHART

M1225000600027

⚠ CAUTION

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

DTC No.	Diagnostic item	Reference page
P0563	Power supply system	P.22C-303
P198D	EEPROM system	P.22C-304
P198E	Lever position sensor system	P.22C-304
P198F		
U0001	Bus off	P.22C-305
U0100	Engine time-out error	P.22C-306
U0101	TC-SST time-out error	P.22C-306
U0121	ASC time-out error	P.22C-307
U0141	ETACS time-out error	P.22C-308

SYMPTOM CHART

M1225005200024

⚠ CAUTION

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

Symptom	Inspection procedure No.	Reference page
The scan tool cannot communicate with the shift lever-ECU.	1	P.22C-309
Shift indicator light does not illuminate.	2	P.22C-309
Back-up light does not illuminate.	3	P.22C-312
The driving mode cannot be changed.	4	P.22C-316
Speed change with the paddle shift is impossible.	5	P.22C-317
Shift lever-ECU power supply circuit abnormality	6	P.22C-319

TSB Revision

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC P0563: Power Supply System

⚠ 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 shift lever-ECU checks that the power supply circuit is normal.

DTC SET CONDITIONS

The voltage from the battery is determined to be overvoltage.

PROBABLE CAUSES

- Malfunction of the shift lever-ECU
- Generator malfunction

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P0563 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Generator system check

Refer to GROUP 16 –Charging System, On-vehicle Service P.16-7.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair or replace the generator related parts.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. P0563 set?

YES : Shift lever assembly replacement. (Refer to P.22C-334.)

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

DTC P198D: EEPROM System

⚠ 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 shift lever-ECU checks that EEPROM or RAM is normal.

DTC SET CONDITIONS
The EEPROM writing data is determined to be abnormal.

PROBABLE CAUSES
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. P198D set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC P198E, P198F: Lever Position Sensor System

⚠ 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 shift lever-ECU has lever position sensors, and checks for abnormality.

DTC SET CONDITIONS
- When one position signal is determined not to be, P198E is set.
- When two position signals are determined not to be, P198F is set.

PROBABLE CAUSES
- Malfunction of the shift lever-ECU
- Malfunction of the lever position sensor

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Are DTC Nos. P198E, P198F set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0001: Bus-off

⚠ CAUTION

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

DTC SET CONDITIONS

The shift lever-ECU ceases communication (bus-off).

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. U0001 set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0100: Engine Time-out Error

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

DTC SET CONDITIONS
The periodic communication data from the engine control module cannot be received.

PROBABLE CAUSES
- The CAN bus line is defective.
- Malfunction of engine control module
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0100 set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0101: TC-SST Time-out Error

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

JUDGMENT CRITERIA
The periodic communication data from TC-SST-ECU cannot be received.

PROBABLE CAUSES
- The CAN bus line is defective.
- Malfunction of TC-SST-ECU
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0101 set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0121: ASC Time-out Error

⚠ CAUTION

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

JUDGMENT CRITERIA

The periodic communication data from the ASC-ECU cannot be received.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of ASC-ECU
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0121 set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC U0141: ETACS Time-out Error

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

JUDGMENT CRITERIA
The periodic communication data from the ETACS-ECU cannot be received.

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

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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

Q: Is the DTC set?

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

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0141 set?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

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SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The scan tool cannot communicate with the shift lever-ECU.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM
The CAN bus line, shift lever-ECU power supply circuit, or shift lever-ECU may have a problem.

PROBABLE CAUSES
- Wrong M.U.T.-III wiring harness
- The CAN bus line is defective.
- Malfunction of the shift lever-ECU power supply circuit
- Malfunction of the shift lever-ECU
- ECU malfunction of other system

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

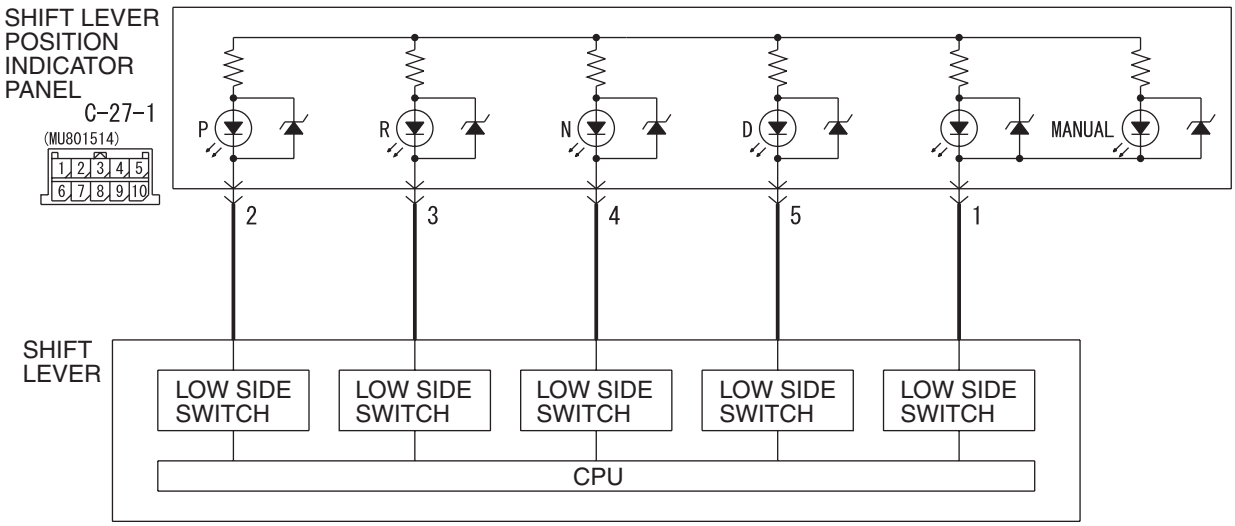
Q: Is the check result normal?

YES : Check and repair the shift lever-ECU power supply circuit. (Refer to P.22C-319.)

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

INSPECTION PROCEDURE 2: Shift indicator light does not illuminate.

Shift lever position indicator panel circuit



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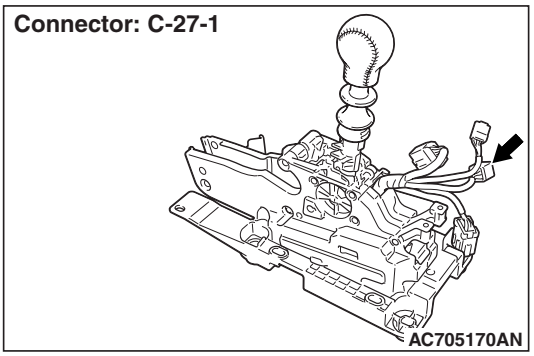

⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The shift indicator light or shift lever-ECU may have a problem.

PROBABLE CAUSES

- Malfunction of the shift indicator light
- Damaged harness wires and connectors
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. Scan tool service data
Item No. 1: Shift lever position (Refer to Service Data Reference Table P.22C-322.)

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the shift lever assembly. (Refer to P.22C-334.)

STEP 3. Scan tool actuator test
Item No. 1: Shift indicator (Refer to Special Function (Actuator Test Reference Table P.22C-325.)

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.

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STEP 4. Inspection of the floor console panel assembly connector: C-27-1

Check for the contact with terminals.

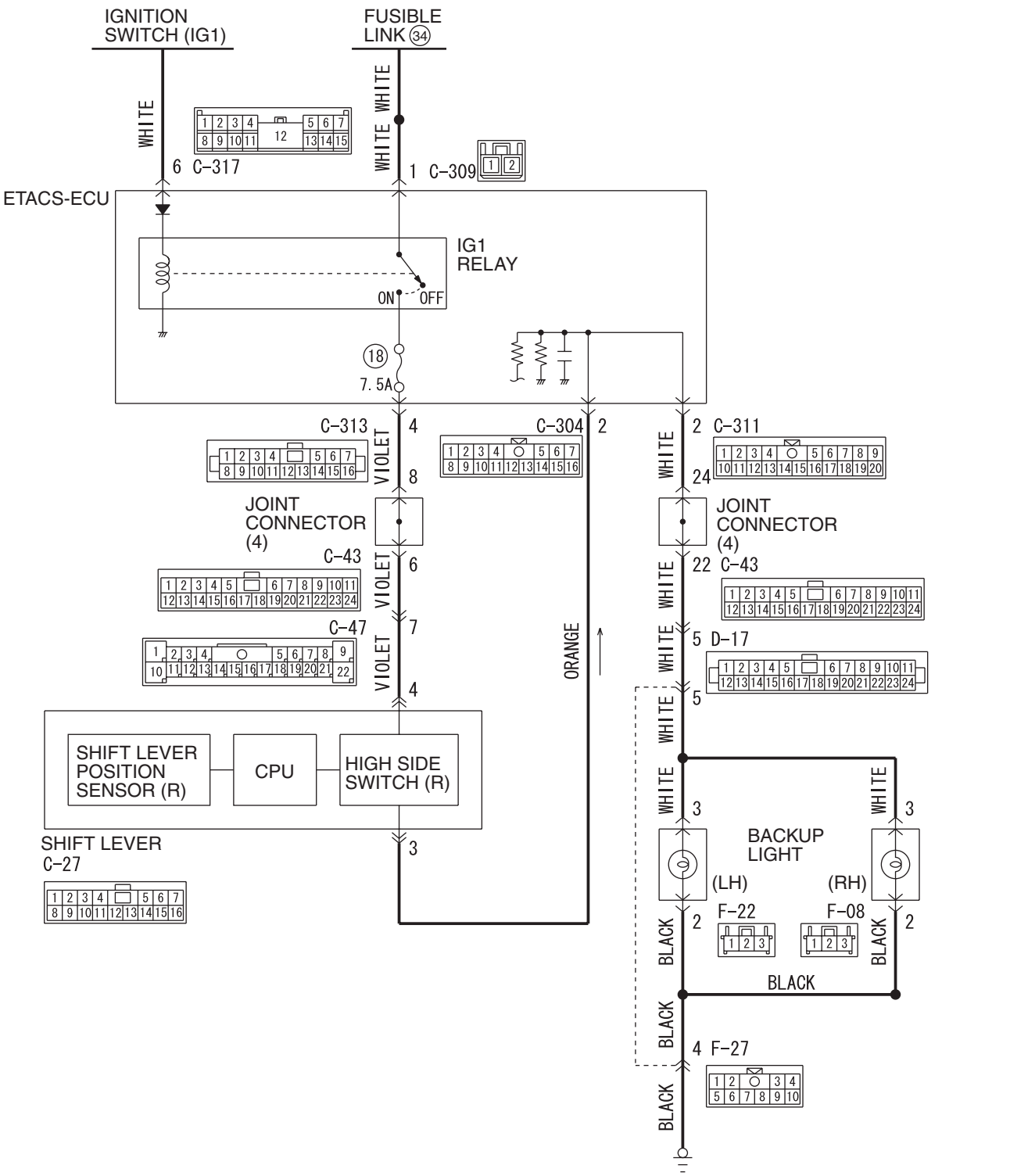
Q: Is the check result normal?

YES : Replace the floor console panel assembly. (Refer to GROUP 52A –Floor Console Assembly P.52A-9.)

NO : Repair the defective connector.

INSPECTION PROCEDURE 3: Back-up light does not illuminate.

Backup lamp switch system circuit



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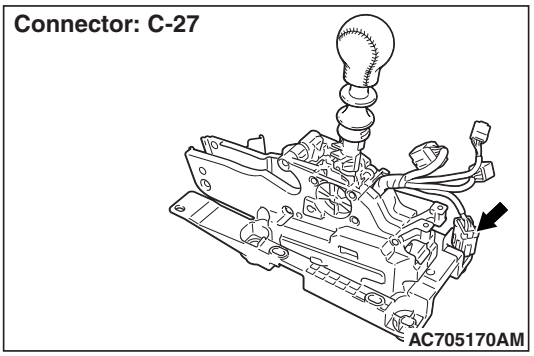

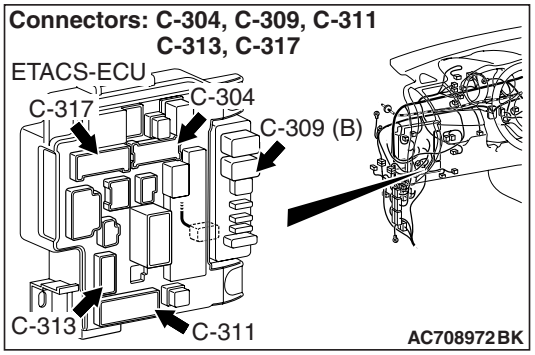

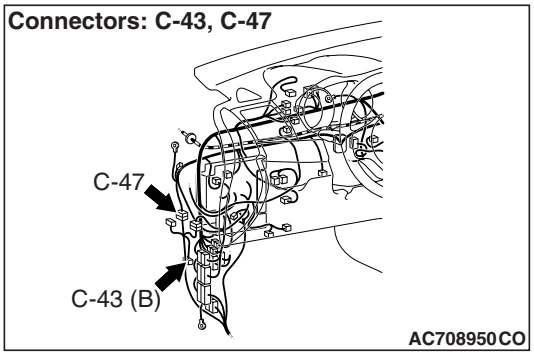

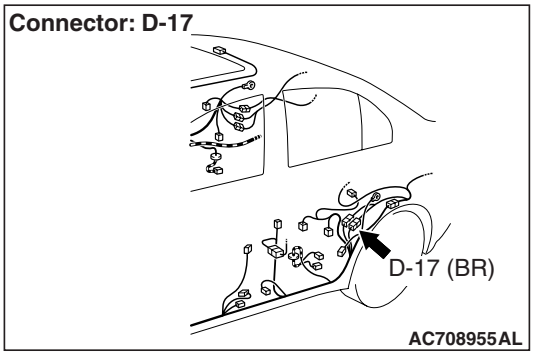

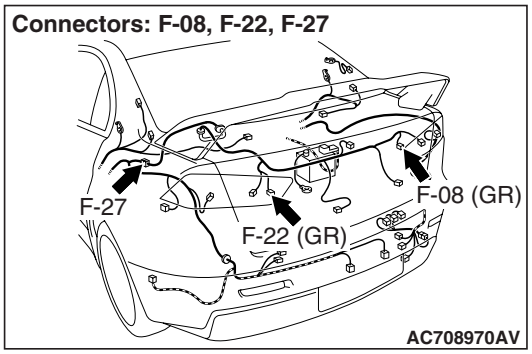

⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The back-up light, ETACS-ECU, or shift lever-ECU may have a problem.

PROBABLE CAUSES

- Malfunction of the ETACS-ECU
- Malfunction of the back-up light
- Damaged harness wires and connectors
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

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STEP 2. Scan tool actuator test
Item No.2: Back-up light (Refer to Special Function (Actuator Test Reference Table P.22C-325.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 3.

STEP 3. Scan tool diagnostic trouble code
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

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

STEP 4. Bulb check
Check if the bulb of the back-up light which does not illuminate is normal.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the bulb which does not illuminate.

STEP 5. Measure the resistance at F-08 back-up light (RH) connector and F-22 back-up light (LH) connector.
Disconnect the connector of the light which does not illuminate, and measure the resistance between the connector terminal No. 2 and ground at the wiring harness side.

OK: Continuity exists. (2 Ω or less)

Q: Is the check result normal?

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

STEP 6. Inspection of the back-up light (RH) connector, back-up light (LH) connector, and intermediate connector: F-08, F-22, F-27
Check for the contact with the connector terminals of the light which does not illuminate.

Q: Is the check result normal?

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

STEP 7. Check the wiring harness between F-08 back-up light (RH) connector terminal No. 2 and body ground, and between F-22 back-up light (RH) connector terminal No. 2 and body ground.

Check the ground harness of the light which does not illuminate for open circuit.

Q: Is the check result normal?

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

NO : Repair the wiring harness.

STEP 8. Measure the voltage at F-08 back-up light (RH) connector and F-22 back-up light (LH) connector.

(1) Disconnect the connector of the light which does not illuminate, and measure the voltage between the connector terminal No. 3 and ground at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Place the shift lever to the R range.

OK: Battery positive voltage

Q: Is the check result normal?

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

NO : Go to Step 9.

STEP 9. Inspection of J/C (4), intermediate connector, shift lever assembly connector, ETACS-ECU connector, and back-up light connector: C-43, C-47, C-27, C-304, C-311, C-313, D-17, F-08, F-22, F-27

Check for the contact with the connector terminals of the light which does not illuminate.

Q: Is the check result normal?

YES : Go to Step 10.

NO : Repair the defective connector.

STEP 10. Check the wiring harness between F-08 back-up light (RH) connector terminal No. 3 and C-313 ETACS-ECU connector terminal No. 4, and between F-22 back-up light (RH) connector terminal No. 3 and C-313 ETACS-ECU connector terminal No. 4.

Check the power supply line of the light which does not illuminate for open or short circuit.

Q: Is the check result normal?

YES : Go to Step 11.

NO : Repair the wiring harness.

STEP 11. Retest the system.

Q: Does a malfunction take place again?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)

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

INSPECTION PROCEDURE 4: The driving mode cannot be changed.

TWIN CLUTCH SPORT SHIFT TRANSAXLE CONTROL MODE SWITCH CIRCUIT

Refer to P.22C-290.

⚠ CAUTION

Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The twin clutch SST control mode switch, or shift lever-ECU may have a problem.

PROBABLE CAUSES

- Malfunction of the twin clutch SST control mode switch
- Damaged harness wires and connectors
- Malfunction of the shift lever-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

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

STEP 2. Scan tool service data

Item No. 30: Drive mode switch (Refer to Service Data Reference Table P.22C-322.)

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. Twin clutch SST control mode switch check

Refer to P.22C-349.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the twin clutch SST control mode switch. (Refer to P.22C-349.)

STEP 4. Twin clutch SST control mode switch connector check: C-27-2
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 5. Trouble symptom recheck after replacing the shift lever assembly
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Verify that the condition described by the customer exists.

Q: Does a malfunction take place again?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

INSPECTION PROCEDURE 5: Speed change with the paddle shift is impossible.

PADDLE SHIFT SWITCH SYSTEM CIRCUIT
Refer to P.22C-292.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM
The paddle shift switch, or shift lever-ECU may have a problem.

PROBABLE CAUSES
- Malfunction of the paddle shift switch
- Damaged harness wires and connectors
- Malfunction of the shift lever-ECU
- Malfunction of TC-SST-ECU

DIAGNOSTIC PROCEDURE

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

Q: Is the check result normal?

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

STEP 2. PADDLE SHIFT SWITCH CHECK
Refer to P.22C-348.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the paddle shift assembly. (Refer to P.22C-348.)

STEP 3. Measure the resistance at C-207 paddle shift switch connector.
Disconnect the connector, and measure the resistance between terminal No.2 and ground at the wiring harness side.

OK: Continuity exists. (2 Ω or less)

Q: Is the check result normal?

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

STEP 4. Paddle shift switch connector check: C-207
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 5. Check the wiring harness between C-207 paddle shift switch connector terminal No. 2 and the body ground.
Check the ground line for open circuit.

Q: Is the check result normal?

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

STEP 6. Inspection of the shift lever assembly connector, intermediate connector, and paddle shift switch connector: C-27, C-130, C-207
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 7. Check the wiring harness between C-207 paddle shift switch connector terminal No. 1 and C-27 shift lever assembly connector terminal No. 11, and between C-207 paddle shift switch connector terminal No. 3 and C-27 shift lever assembly connector terminal No. 10.
Check the output line for short or open circuit.

Q: Is the check result normal?

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

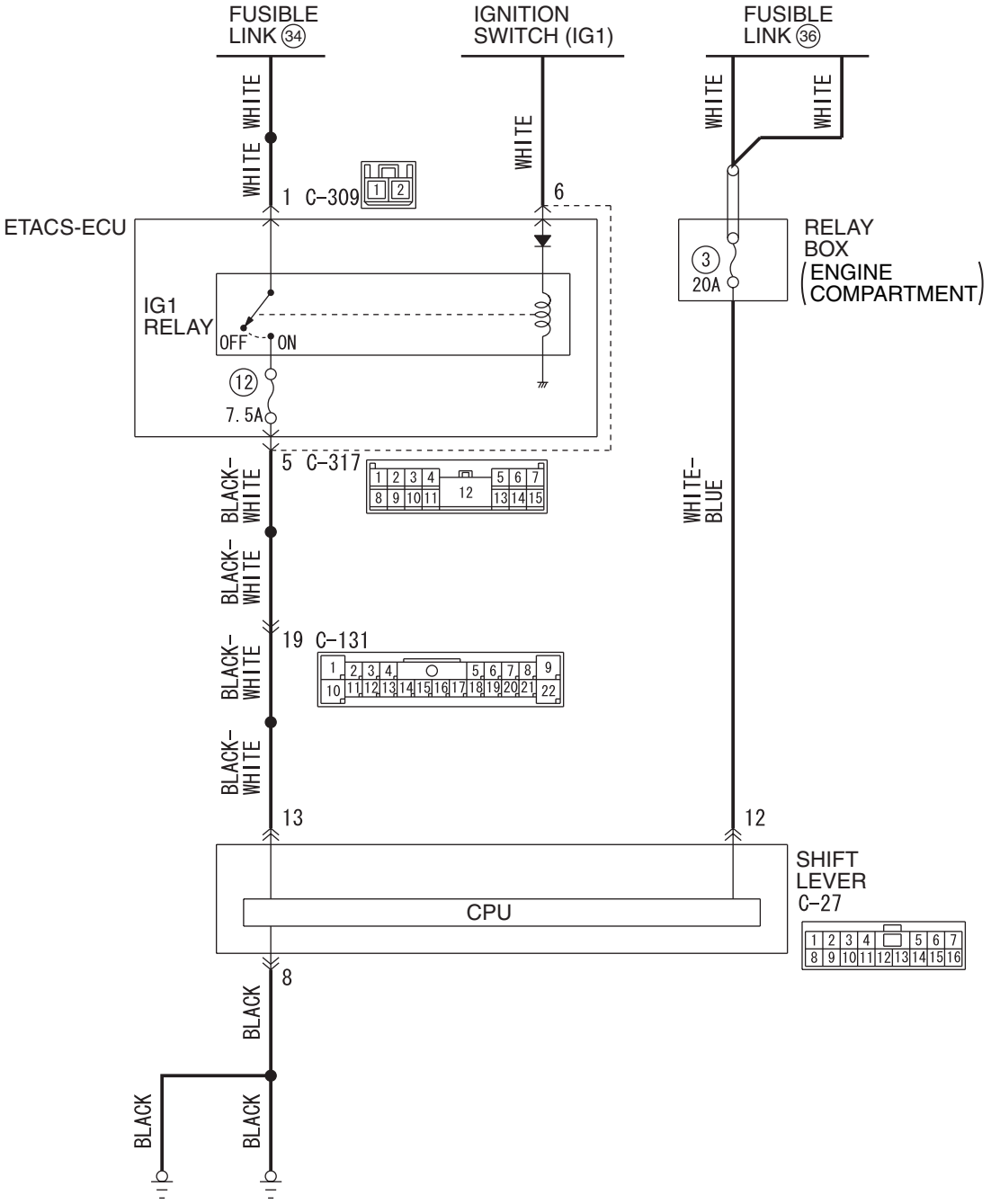
STEP 8. Trouble symptom recheck after replacing the shift lever assembly
(1) Replace the shift lever assembly. (Refer to P.22C-334.)
(2) Verify that the condition described by the customer exists.

Q: Does a malfunction take place again?

YES : Replace the TC-SST assembly. (Refer to P.22C-341.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

INSPECTION PROCEDURE 6: Shift lever-ECU power supply circuit abnormality

Power supply system circuit



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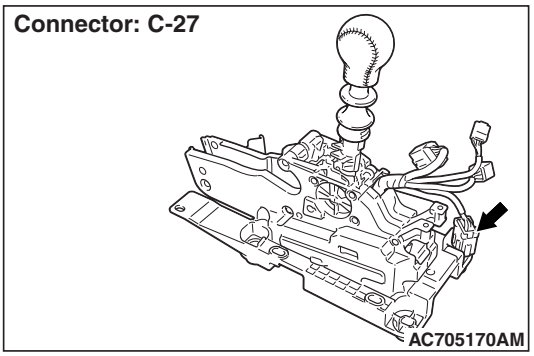
Connector: C-27



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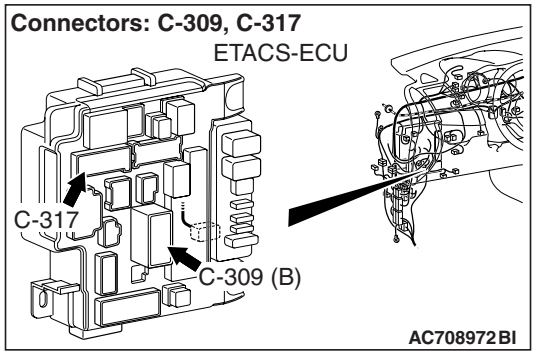
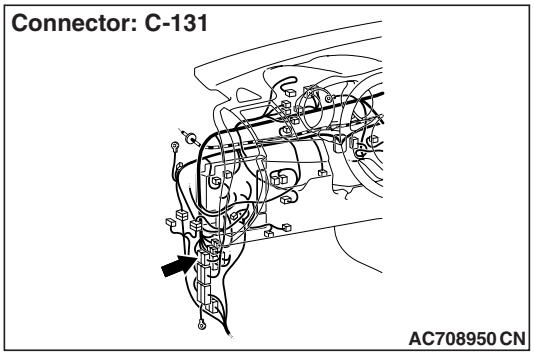
Connectors: C-309, C-317



AC708972BI

Connector: C-131



AC708950CN

⚠ CAUTION
Whenever the ECU is replaced, ensure that the CAN bus lines are normal.

COMMENTS ON TROUBLE SYMPTOM

The shift lever-ECU power supply circuit, ground circuit, or shift lever-ECU may have a problem.

PROBABLE CAUSES

- Defective battery
- Damaged harness wires and connectors
- Malfunction of the ETACS-ECU
- Malfunction of the shift lever-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Check the battery.
Refer to GROUP 54A –Battery Test P.54A-9.

Q: Is the battery in good condition?
YES : Go to Step 2.
NO : Charge or replace the battery.

STEP 2. Measure the resistance at C-27 shift lever-ECU connector.
Disconnect the connector, and measure the resistance between terminal No. 8 and ground at the wiring harness side.

OK: Continuity exists. (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 3.

STEP 3. Shift lever-ECU connector check: C-27
Check for the contact with terminals.

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

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STEP 4. Check the wiring harness between C-27 shift lever-ECU connector terminal No. 8 and body ground.
Check the ground line for open circuit.

Q: Is the check result normal?

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

STEP 5. Measure the voltage at C-27 shift lever-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 6.

STEP 6. Shift lever-ECU connector check: C-27
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 7. Check the wiring harness between C-27 shift lever-ECU connector terminal No. 12 and fusible link No. 36.
Check the power supply line for short or open circuit.

Q: Is the check result normal?

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

STEP 8. Scan tool diagnostic trouble code
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

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

STEP 9. Measure the voltage at C-27 shift lever-ECU connector.
(1) Disconnect the connector, and measure the voltage between terminal No. 13 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 12.
NO : Go to Step 10.

STEP 10. Inspection of the shift lever-ECU connector, intermediate connector, and ETACS-ECU connector: C-27, C-131, C-317
Check for the contact with terminals.

Q: Is the check result normal?

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

STEP 11. Check the wiring harness between C-27 shift lever-ECU connector terminal No. 13 and C-317 ETACS-ECU connector terminal No. 5.
Check the power supply line for short or open circuit.

Q: Is the check result normal?

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

STEP 12. Retest the system.

Q: Does a malfunction take place again?

YES : Replace the shift lever assembly. (Refer to P.22C-334.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DATA LIST REFERENCE TABLE

M1225006700022

Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
1	Lever position	Shift lever position	Ignition switch: ON	Shift lever position: P	P
				Shift lever position: P⇔R	R-P
				Shift lever position: R	R
				Shift lever position: R⇔N	N-R
				Shift lever position: N	N
				Shift lever position: N⇔D	D-N
				Shift lever position: D	D
				Shift lever position: Manual mode	Manual
				Shift lever position: Upshift and hold	+
				Shift lever position: Downshift and hold	–
3	Battery voltage (CAN data)	Battery voltage (CAN data)	Ignition switch: ON		Battery voltage (12 V)
4	Back light voltage	Back-up light voltage	Ignition switch: ON	Shift lever position: R	20 –120 digits
				Shift lever position: Other than above	10 digits or less

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Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
5	Shift lock voltage	Shift lock voltage	Ignition switch: ON	Shift lever position: P	500 digits or more
				Shift lever position: Other than above	100 digits or less
6	Battery voltage	Battery positive voltage	Ignition switch: ON		520 –920 digits
7	Shift indicator voltage(D range)	Shift indicator voltage (D range)	Ignition switch: ON	Shift lever position: D	10 –370 digits
				Shift lever position: Other than above	10 digits or less
8	Shift indicator voltage(M mode)	Shift indicator voltage (M range)	Ignition switch: ON	Shift lever position: Manual mode	10 –370 digits
				Shift lever position: Other than above	10 digits or less
9	Shift indicator voltage(N range)	Shift indicator voltage (N range)	Ignition switch: ON	Shift lever position: N	10 –370 digits
				Shift lever position: Other than above	10 digits or less
10	Shift indicator voltage(P range)	Shift indicator voltage (P range)	Ignition switch: ON	Shift lever position: P	10 –370 digits
				Shift lever position: Other than above	10 digits or less
11	Shift indicator voltage(R range)	Shift indicator voltage (R range)	Ignition switch: ON	Shift lever position: R	10 –370 digits
				Shift lever position: Other than above	10 digits or less
16	Shift indicator PWM (Day)	Shift indicator PWM value (daytime)	Ignition switch: ON		100%
17	Shift indicator PWM (Night)	Shift indicator PWM value (nighttime)	Ignition switch: ON		20%
20	ILL+	ILL+	Ignition switch: ON	Headlight (small light): ON	Active
				Headlight (small light): OFF	In Active
23	Ignition SW	Ignition switch	Ignition switch: ON		ON
			Ignition switch: START		START

Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
24	Shift position	Shift position	• Shift lever position: Manual mode • Driving at a constant speed in 1st		1st
			• Shift lever position: Manual mode • Driving at a constant speed in 2nd		2nd
			• Shift lever position: Manual mode • Driving at a constant speed in 3rd		3rd
			• Shift lever position: Manual mode • Driving at a constant speed in 4th		4th
			• Shift lever position: Manual mode • Driving at a constant speed in 5th		5th
			• Shift lever position: Manual mode • Driving at a constant speed in 6th		6th
			Ignition switch: ON	Shift lever position: D	D
			Ignition switch: ON	Shift lever position: N	N
				Shift lever position: P	P
				Shift lever position: R	R
			• Shift lever position: D • Driving at a constant speed in 1st		D1
			• Shift lever position: D • Driving at a constant speed in 2nd		D2
			• Shift lever position: D • Driving at a constant speed in 3rd		D3
			• Shift lever position: D • Driving at a constant speed in 4th		D4
			• Shift lever position: D • Driving at a constant speed in 5th		D5
			• Shift lever position: D • Driving at a constant speed in 6th		D6
25	Vehicle speed	Vehicle speed	Driving at a constant speed of 20 km/h		20 km/h
26	Back light current	Back light current	• Ignition switch: ON • Shift lever position: R		1 to 6 A
30	Drive mode SW (output data)	Drive mode switch (output data)	Ignition switch: ON	Shift lever position: Upshift and hold	+
				Shift lever position: Downshift and hold	–
				Shift lever position: Other than above	Inactive

TSB Revision

Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
32	Lever position (output data)	Shift lever position (Output data)	Ignition switch: ON	Shift lever position: P	P
				Shift lever position: P⇔R	R-P
				Shift lever position: R	R
				Shift lever position: R⇔N	N-R
				Shift lever position: N	N
				Shift lever position: N⇔D	D-N
				Shift lever position: D	D
				Shift lever position: Manual mode	Manual
				Shift lever position: Upshift and hold	+
				Shift lever position: Downshift and hold	–

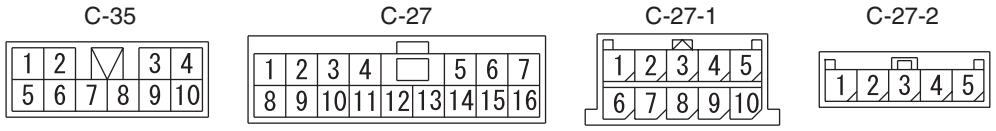
SPECIAL FUNCTION (ACTUATOR TEST REFERENCE TABLE)

M1225027200011

Item No.	Display on scan tool	Check items	Test content	Check conditions	Normal conditions
1	Shift indicator	Shift indicator	Display the shift position requested by the scan tool for 3 seconds.	• Ignition switch: ON • Shift lever position: P • Engine: Stopped	The requested position is displayed.
2	Back up light	Back-up light	Illuminate the back-up light for 3 seconds.		The back-up light illuminates.

SHIFT LEVER -ECU TERMINALVOLTAGE REFERENCE CHART

M1225007800011



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Connector number	Terminal No.	Check items	Check conditions	Standard value
C-35	3	Shift lock solenoid power supply	Ignition switch: ON	Battery positive voltage
			Ignition switch: Other than above	1 V or less
	4	Stoplight switch	Brake pedal: Depressed	Battery positive voltage
			Brake pedal: Released	1 V or less
	5	Ignition switch (ACC)	Ignition switch: ACC	Battery positive voltage
			Ignition switch: Other than above	1 V or less
	6	Ground	Always	1 V or less

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Connector number	Terminal No.	Check items	Check conditions		Standard value
C-27	1	CAN_H	–		–
	2	CAN_L	–		–
	3	R range output	Ignition switch: ON	Shift lever position: R	Battery positive voltage
				Shift lever position: Other than above	1 V or less
	4	R range input	Always		Battery positive voltage
	5	N range output	Ignition switch: ON	Shift lever position: N	Battery positive voltage
				Shift lever position: Other than above	1 V or less
	6	Illumination power supply (for floor console panel)	Taillight: Turned ON		Battery positive voltage
			Taillight: Turned OFF		1 V or less
	7	P/N range input	Always		Battery positive voltage
	8	Ground	Always		–
	10	Paddle switch (Down)	Ignition switch: ON	Paddle shift position: Downshift and hold	1 V or less
				Paddle shift position: Other than the above	Battery positive voltage
	11	Paddle switch (Up)	Ignition switch: ON	Paddle shift position: Upshift and hold	1 V or less
				Paddle shift position: Other than the above	Battery positive voltage
	12	Power supply	Always		Battery positive voltage
	13	Ignition switch (IG1)	Ignition switch: ON		Battery positive voltage
			Ignition switch: Other than above		1 V or less
	14	Ground to the A/C illumination	Always		1 V or less
	15	P range output	Ignition switch: ON	Shift lever position: P	Battery positive voltage
				Shift lever position: Other than above	1 V or less
	16	LIN	–		–

Connector number	Terminal No.	Check items	Check conditions		Standard value
C-27-1	1	D range light	Ignition switch: ON	Shift lever position: D	1 V or less
				Shift lever position: Other than above	Battery positive voltage
	2	N range light	Ignition switch: ON	Shift lever position: N	1 V or less
				Shift lever position: Other than above	Battery positive voltage
	3	R range light	Ignition switch: ON	Shift lever position: R	1 V or less
				Shift lever position: Other than above	Battery positive voltage
	4	P range light	Ignition switch: ON	Shift lever position: P	1 V or less
				Shift lever position: Other than above	Battery positive voltage
	5	Manual mode light	Ignition switch: ON	Shift lever position: Manual mode	1 V or less
				Shift lever position: Other than above	Battery positive voltage
	6	Ground to the A/C illumination	Always		1 V or less
	7	Power supply	Always		Battery positive voltage
	10	Power supply to the A/C illumination	Taillight: Turned ON		Battery positive voltage
			Taillight: Turned OFF		1 V or less

Connector number	Terminal No.	Check items	Check conditions		Standard value
C-27-2	1	Twin clutch SST control mode switch (Down)	Ignition switch: ON	Switch position: Down (to frontward of vehicle) operation, then hold	1 V or less
				Switch position: Other than above	Battery positive voltage
	2	Twin clutch SST control mode switch (Up)	Ignition switch: ON	Switch position: Up (to frontward of vehicle) operation, then hold	1 V or less
				Switch position: Other than above	Battery positive voltage
	3	Ground	Always		1 V or less
	4	Ground to the A/C illumination	Always		1 V or less
	5	Power supply to the A/C illumination	Taillight: Turned ON		Battery positive voltage
			Taillight: Turned OFF		1 V or less

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

INTRODUCTION

M1225024900033

For the troubleshooting of S-AWC, refer to GROUP 22A, Manual Transaxle P.22A-8.

ON-VEHICLE SERVICE

TRANSMISSION OIL LEVEL CHECK

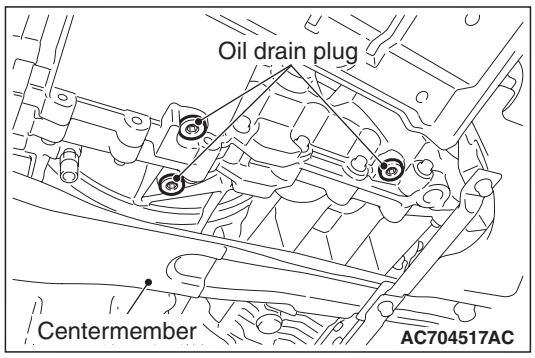
M1225008000018

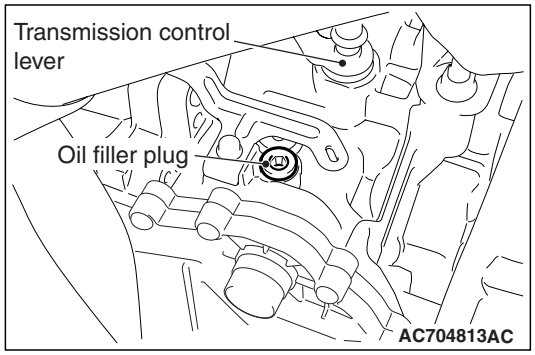
1. After cleaning the outer surface of transaxle, visually check that there is no oil oozing or oil leaking from the transaxle.
2. If an oil oozing or leaking is present, replace the transaxle assembly.

TRANSMISSION OIL CHANGE

M1225008100015

1. Remove the engine compartment under cover front B assembly. (Refer to GROUP 51 –Under Cover P.51-16.)





2. Remove the oil drain plug to drain the oil.
   NOTE: Because the oil in the oil cooler and oil filter cannot be drained, the amount of drained oil will be approximately 5.5 dm^3.
3. Tighten the oil drain plug to the specified torque.
   Tightening torque: 25 N· m (19 ft-lb)
4. Remove the air cleaner element, air cleaner intake duct, and air cleaner body. (Refer to GROUP 15 –Air Cleaner P.15-10.)
5. Remove the oil filler plug, then fill the oil.
   Brand name: Mitsubishi genuine Dia-Queen SSTF-I
   Filling amount: Approximately 5.5 dm^3 (approximately 5.8 quarts)
6. Tighten the oil filler plug to the specified torque.
   Tightening torque: 25 N· m (19 ft-lb)
7. Install the air cleaner element, air cleaner intake duct, and air cleaner body. (Refer to GROUP 15 –Air Cleaner P.15-10.)
8. Start the engine, then let it idle for 1 to 2 minutes.
9. Move the shift lever to every position, and then move it to the P or N range.
10. Stop the engine, then perform Steps 2 to 5 again.
11. Check the oil level and oil fouling. (Refer to P.22C-328.) If fouling is found, repeat Steps 2 to 5 until the fouling is eliminated.
12. Install the engine compartment under cover front B assembly. (Refer to GROUP 51 –Under Cover P.51-16.)

TRANSFER OIL CHECK

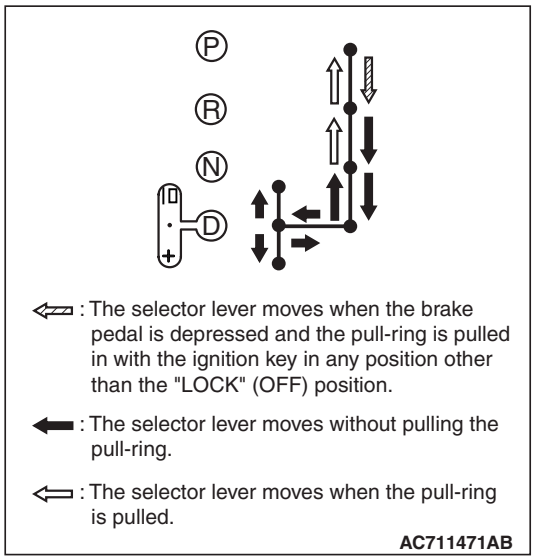
M1225008200012

Refer to GROUP 22A –On-vehicle Service P.22A-117.

TRANSFER OIL CHANGE

M1225008300019

Refer to GROUP 22A –On-vehicle Service P.22A-117.



⇦ : The selector lever moves when the brake pedal is depressed and the pull-ring is pulled in with the ignition key in any position other than the "LOCK" (OFF) position.

⬅ : The selector lever moves without pulling the pull-ring.

⇦ : The selector lever moves when the pull-ring is pulled.

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SHIFT LEVER OPERATION CHECK

M1225008400016

1. Check that the engine starts when the shift lever is in the N or P range, and that the engine does not start in other ranges.
2. Start the engine, and release the parking brake. Then, check that the vehicle travels forward when the shift lever is in the D range or the mode is set to the sport mode, and that the vehicle travels backward when the shift lever is set in the R range.
3. Stop the engine.
4. Turn ON the ignition switch, and move the shift lever from the P to R range. Check that the back-up light becomes on and the tone alarm sounds at this time.

   NOTE: Because the misoperation preventive device is equipped, the shift lever cannot be moved out of the P position unless the ignition switch is turned to the position other than LOCK (OFF) and the brake pedal is depressed.

KEY INTERLOCK MECHANISM CHECK

M1225008500013

1. Perform the following checks.

Inspection procedure	Check conditions		Items to be checked (Normal status)
1	Brake pedal: Depressed	Ignition switch position: LOCK (OFF) or ACC	The shift lever cannot be moved out of the P position.
2		Ignition switch position: ON	The shift lever can be moved from the P position to other positions smoothly.
3	Selector lever position: Other than P		The ignition switch cannot be turned to the LOCK (OFF) position.
4	Selector lever position: P		The ignition switch can be turned to the LOCK (OFF) position smoothly.

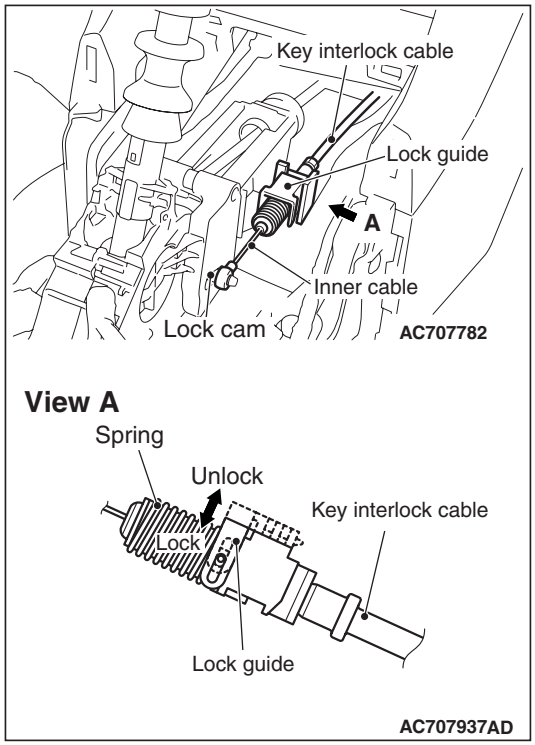
2. If there is a problem with above operations, install the key interlock cable according to the procedure below. (Automatic adjustment)
   (1) Disconnect the key interlock cable connection (shift lever side).(Refer to P.22C-337.)

⚠ CAUTION

Leave the ignition switch in the LOCK (OFF) position until the key interlock cable installation is completed.

   (2) Move the shift lever to the P position, and turn the ignition switch to the LOCK (OFF) position.

TSB Revision



(3) Install the tip of key interlock cable to the lock cam of shift lever assembly, using a caution not to twist the inner cable.
(4) Install the adjuster case with its lock guide pulled up (unlocked).
(5) Firmly 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

M1225008600010

SYSTEM CHECK

Inspection procedure	Check conditions		Items to be checked (Normal status)	Possible cause of abnormality
1	Release the brake pedal.	Ignition switch position: LOCK (OFF) or ACC	The shift lever cannot be moved out of the P position.	• Shift lever assembly abnormality (seizure, damage, or others) • Electrical circuit abnormality (short circuit in solenoid or wiring harness) • Key interlock mechanism abnormality
2	Depress the brake pedal.			• Shift lever assembly abnormality (seizure, damage, or others) • Key interlock mechanism abnormality
3	Release the brake pedal.	Ignition switch position: ON		• Shift lever assembly abnormality (seizure, damage, or others) • Electrical circuit abnormality (short circuit in solenoid or wiring harness)
4	Depress the brake pedal.		The shift lever can be moved from the P position to other positions smoothly.	• Shift lever assembly abnormality (seizure, damage, or others) • Electrical circuit abnormality (open circuit in solenoid or wiring harness)

COMPONENTS CHECK

1. Troubleshoot the shift lever.
2. Remove the shift lever assembly. Then, check that there is no damage to each part, and that the shift lever can be moved to each position.(Refer to P.22C-334.)
3. After performing the check above, if an abnormality is found, replace the shift lever assembly.

FLUID CHECK

M1225008700017

Refer to GROUP 27 –On-vehicle Service P.27-29.

BLEEDING

M1225008800014

Refer to GROUP 22A –On-vehicle Service P.22A-118.

TSB Revision

ACD OPERATION CHECK

M1225008900011

Refer to GROUP 22A –On-vehicle Service P.22A-119.

HYDRAULIC PRESSURE CHECK

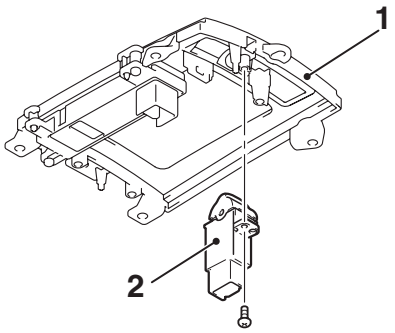
M1225009000011

Refer to GROUP 22A –On-vehicle Service P.22A-119.

TWIN CLUTCH SST CONTROL MODE SWITCH

REMOVAL AND INSTALLATION

M1225009200015



AC710482AB

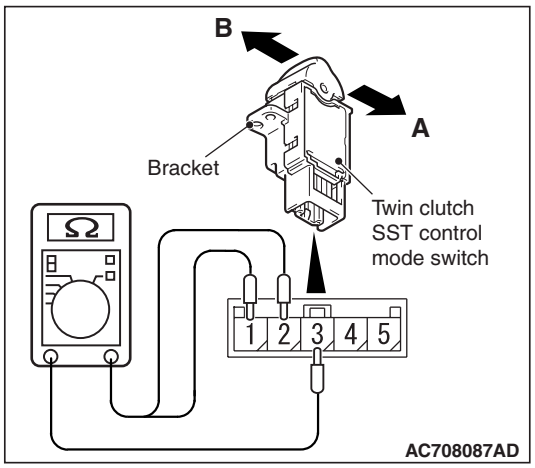
Removal steps

1. Floor console panel assembly (Refer to GROUP 52A –Floor Console Assembly P.52A-9).
2. Twin clutch SST control mode switch

INSPECTION

TWIN CLUTCH SST CONTROL MODE SWITCH CHECK

M1225009100018



AC708087AD

1. Check the continuity between the connector terminals of twin clutch SST control mode switch.

Terminal number	Switch position	Continuity
2 –3	Operate to direction A, then hold.	Yes (2 Ω or less)
	Other than above	Not present
1 –3	Operate to direction B, then hold.	Yes (2 Ω or less)
	Other than above	Not present

2. When other than above, replace the twin clutch SST control mode switch.

TSB Revision

TRANSMISSION CONTROL

REMOVAL AND INSTALLATION

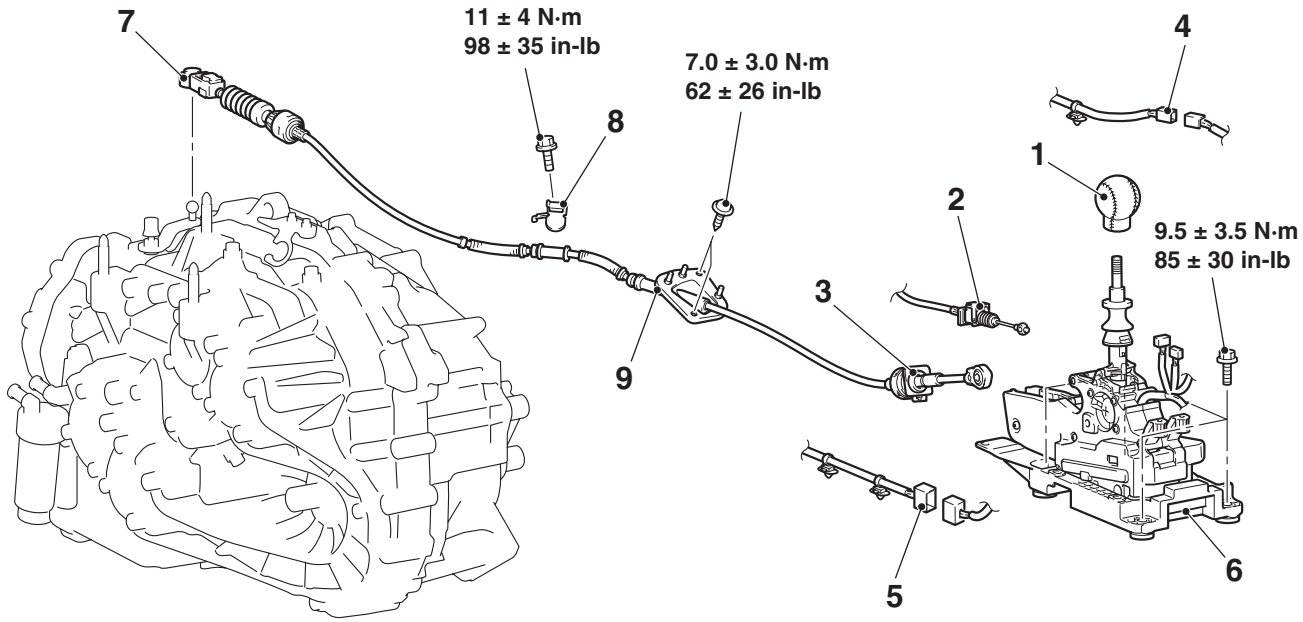
M1225009600013

⚠ CAUTION

When the transaxle control cable is disconnected, check after the installation that the cable is properly connected, and that the parking lock mechanism operates normally. At this time, do not check by simply using the display on the combination meter and shift indicator panel. Always check according to the procedure below.

- **With the P range, the vehicle does not move on a slight slope or when pushed by hands.**
- **When driving at 5 km/h or less, the vehicle stops when the shift lever is moved to the P range.**

Post-installation Operation
- Key interlock mechanism check (Refer to P.22C-330.)
- Shift lock mechanism check (Refer to P.22C-332.)
- Shift lever operation check (Refer to P.22C-330.)



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SHIFT LEVER ASSEMBLY REMOVAL STEPS

1. Shift knob
- Floor console bracket (A) (Refer to GROUP 52A –Floor Console Assembly P.52A-9.)

>>B<<

2. Key interlock cable connection (shift lever side)
3. Transaxle control cable connection (shift lever side)
4. Shift lever-ECU connector connection
5. Shift lock solenoid connector connection
6. Shift lever assembly

Transaxle control cable removal steps

1. Shift knob
- SRS-ECU (Refer to GROUP 52B –SRS-ECU P.52B-383.)
- G and yaw rate sensor and G and yaw rate sensor bracket (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.)

>>A<<

3. Transaxle control cable connection (shift lever side)
- Air cleaner assembly (Refer to GROUP 15 –Air Cleaner P.15-10.)
- Engine control wiring harness connector bracket (Refer to GROUP 54A –Battery P.54A-10.)

TSB Revision

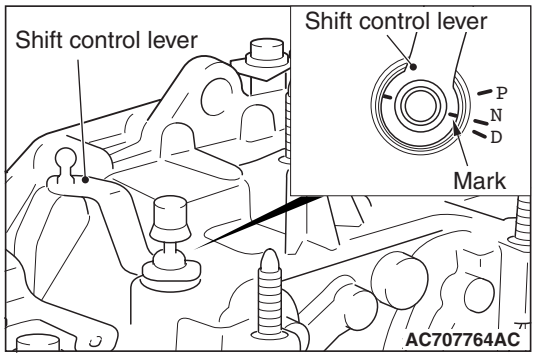
Transaxle control cable removal steps (Continued)

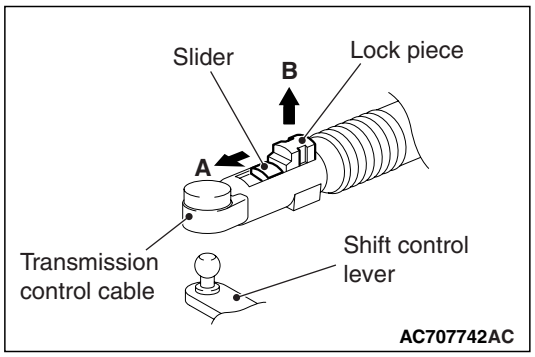
>>A<< 7. Transaxle control cable connection (transaxle side)
8. Transaxle control cable bracket
9. Transaxle control cable

INSTALLATION SERVICE POINTS

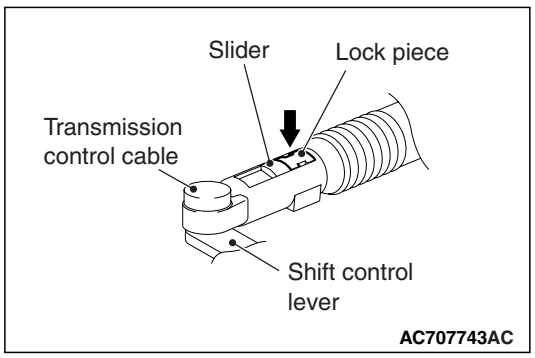
>>A<< TRANSAXLE CONTROL CABLE (TRANSAXLE SIDE/SHIFT LEVER SIDE) INSTALLATION

1. Connect the transaxle control cable (shift lever side) to the shift lever assembly.
2. Set the shift lever to the N position.
3. Operate the lever so that the shift control lever positioning mark is set to the N position.





4. Move the slider of the transaxle control cable (transaxle side) tip to the direction A to pull up the lock piece to the direction B.



5. Align the transaxle control cable and the shift control lever joint (positioning only, do not connect), and firmly push down the lock piece to lock it. Then, connect the transaxle control cable and the shift control lever.

   NOTE:
   - *The slider automatically returns to the fixed position by the spring.*
   - *The lock position of transaxle control cable is automatically adjusted by a spring.*

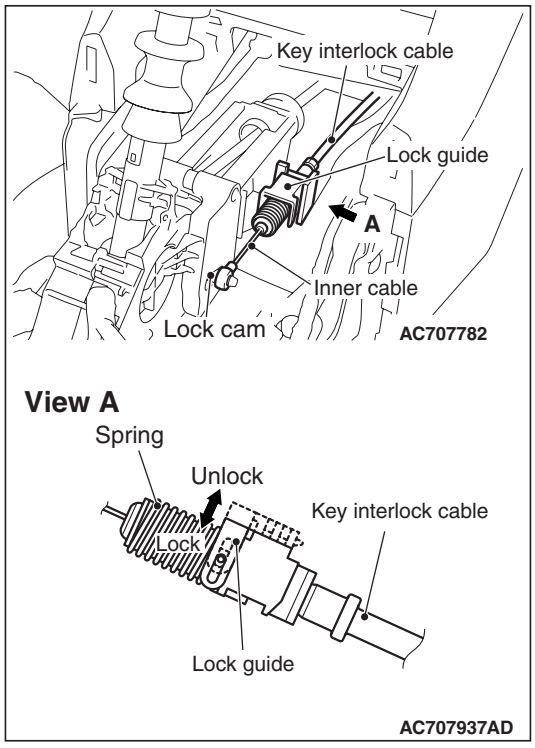
>>B<< KEY INTERLOCK CABLE INSTALLATION

⚠ CAUTION

Leave the ignition switch in the LOCK (OFF) position until the key interlock cable installation is completed.

1. Move the shift lever to the P position, and turn the ignition switch to the LOCK (OFF) position.
2. Install the tip of key interlock cable to the lock cam of shift lever assembly, using a caution not to twist the inner cable.
3. Install the adjuster case with its lock guide pulled up (unlocked).
4. Firmly push down the lock guide to lock it.

   NOTE: The lock position of the key interlock cable is automatically adjusted by a spring.

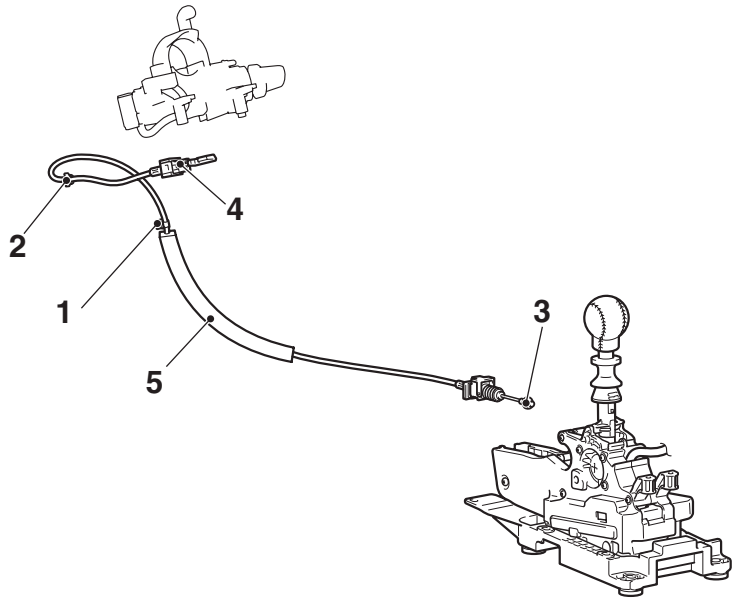


KEY INTERLOCK AND SHIFT LOCK MECHANISMS

REMOVAL AND INSTALLATION

M1225009800017

Pre-removal Operation	Post-installation Operation
• Floor console bracket (A) and floor console side cover removal (Refer to GROUP 52A –Floor Console Assembly P.52A-9.) • Instrument panel cover lower removal <Leather combination interior package (Vehicles without side air bag)> (Refer to GROUP 52A –Instrument Lower Panel P.52A-8.) • Steering column lower cover removal (Refer to GROUP 37 –Steering Shaft P.37-26.) • Foot duct (driver's side) removal (Refer to GROUP 55 – Duct P.55-138.)	• Foot duct (driver's side) installation (Refer to GROUP 55 – Duct P.55-138.) • Steering column lower cover installation (Refer to GROUP 37 –Steering Shaft P.37-26.) • Instrument panel cover lower installation <Leather combination interior package (Vehicles without side air bag)> (Refer to GROUP 52A –Instrument Lower Panel P.52A-8.) • Floor console bracket (A) and floor console side cover installation (Refer to GROUP 52A –Floor Console Assembly P.52A-9.) • Key interlock mechanism check (Refer to P.22C-330.) • Shift lock mechanism check (Refer to P.22C-332.) • Shift lock mechanism check (Refer to P.22C-330.)



AC709660AB

Removal steps
1. Band clip
2. Wiring harness clip

>>**B**<< 3. Key interlock cable connection (shift lever side)

<<**A**>> >>**A**<< **Removal steps**

4. Key interlock cable connection (steering side)
5. Key interlock cable

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REMOVAL SERVICE POINTS

<<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 SIDE) INSTALLATION

Turn the ignition switch to the ACC position and then install the key interlock cable to the ignition key cylinder.

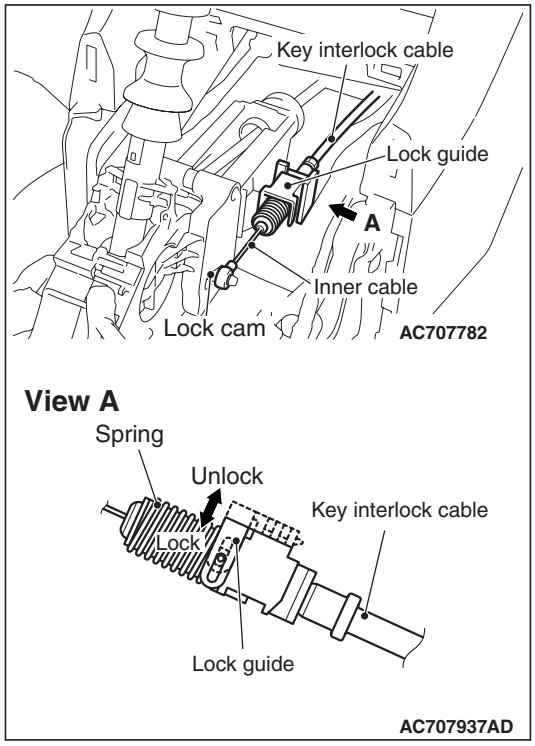
>>B<< KEY INTERLOCK CABLE (SHIFT LEVER SIDE) INSTALLATION

⚠ CAUTION

Leave the ignition switch in the LOCK (OFF) position until the key interlock cable installation is completed.

1. Move the shift lever to the P position, and turn the ignition switch to the LOCK (OFF) position.
2. Install the tip of key interlock cable to the lock cam of shift lever assembly, using a caution not to twist the inner cable.
3. Install the adjuster case with its lock guide pulled up (unlocked).
4. Firmly push down the lock guide to lock it.

   NOTE: The lock position of the key interlock cable is automatically adjusted by a spring.

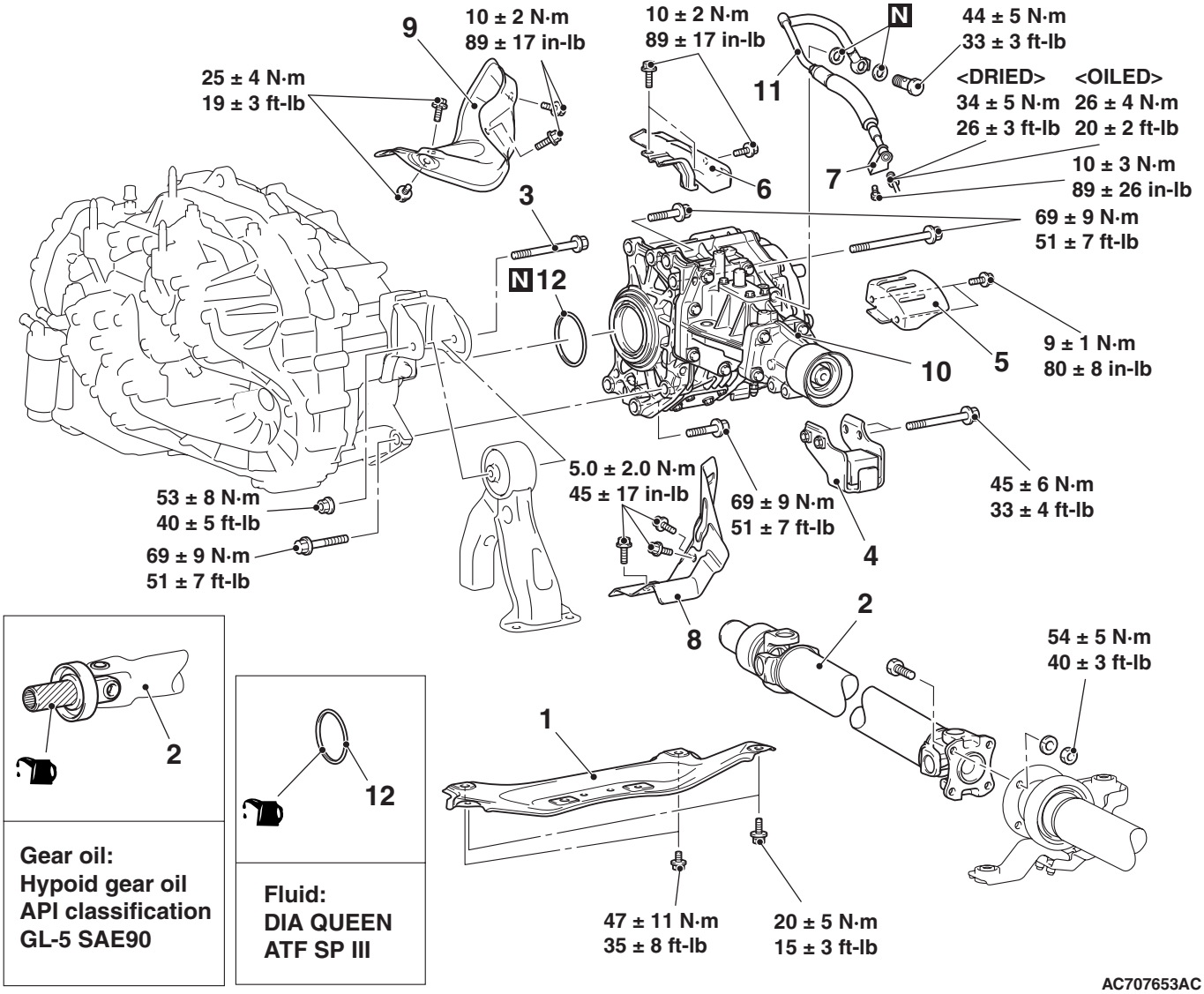


TRANSFER ASSEMBLY

REMOVAL AND INSTALLATION

M1225010000015

Pre-removal Operation	Post-installation Operation
• Engine compartment under cover front B assembly removal (Refer to GROUP 51 –Under Cover P.51-16.) • Transfer oil draining (Refer to P.22C-329.)	• ACD air bleeding (Refer to P.22C-332.) • Transfer oil filling (Refer to P.22C-329.) • Engine compartment under cover front B assembly installation (Refer to GROUP 51 –Under Cover P.51-16.)



AC707653AC

<<A>>

Removal steps

1. Front floor backbone brace
2. Front propeller shaft assembly
   - Front driveshaft assembly, output shaft assembly (Refer to GROUP 26 – Driveshaft assembly P.26-15.)

Removal steps

- Center member and front roll stopper assembly (Refer to GROUP 32 –Engine Roll Stopper and Center Member P.32-8.)
- Front exhaust pipe (Refer to GROUP 15 –Exhaust Pipe and Main Muffler P.15-24.)

3. Rear roll stopper center bolt
4. Dynamic damper
5. Driveshaft heat protector
6. Transfer heat protector

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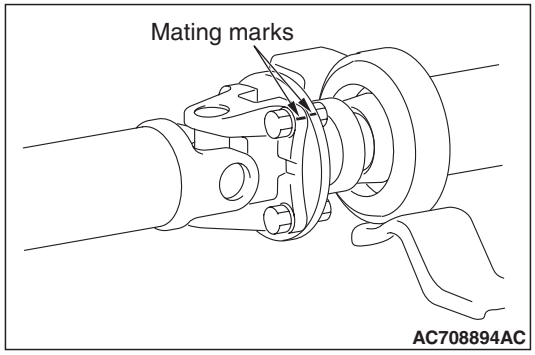
Removal steps
7. Transfer pressure hose assembly connection <<**B**>>
8. Steering gear and linkage heat protector
9. Turbocharger protector A
10. Transfer assembly >>**A**<<
11. Transfer pressure hose assembly
12. O-ring

REMOVAL SERVICE POINTS

<<A>> FRONT PROPELLER SHAFT ASSEMBLY REMOVAL



Make mating marks on the front propeller shaft assembly and companion flange, then remove the connecting nut.

<<B>> TRANSFER ASSEMBLY REMOVAL

Move the engine and transaxle assembly toward the front of the vehicle to create a gap between the engine/transaxle assembly and the crossmember. Pull out the transfer assembly through this gap.

INSTALLATION SERVICE POINTS

>>A<< TRANSFER PRESSURE HOSE ASSEMBLY INSTALLATION

⚠ CAUTION
When installing the transfer pressure hose assembly, use caution that the assembly does not interfere with surrounding components.

TRANSAXLE ASSEMBLY

REMOVAL AND INSTALLATION

M1225010200019

⚠ CAUTION

When the transaxle control cable is disconnected, check after the installation that the cable is properly connected, and that the parking lock mechanism operates normally. At this time, do not check by simply using the display on the combination meter and shift indicator panel. Always check according to the procedure below.

- **With the P range, the vehicle does not move on a slight slope or when pushed by hands.**
- **When driving at 5 km/h or less, the vehicle stops when the shift lever is moved to the P range.**

Pre-removal Operation	Post-installation Operation
• Engine compartment under cover front B assembly and engine compartment side cover removal (Refer to GROUP 51 –Under Cover P.51-16.) • Transmission oil draining (Refer to P.22C-328.) • Engine upper cover removal (Refer to GROUP 16 –Ignition Coil P.16-39.) • Air cleaner assembly and air cleaner bracket removal (Refer to GROUP 15 –Air Cleaner P.15-10.) • Headlight support panel cover removal (Refer to GROUP 51 –Front Bumper Assembly and Radiator Grille P.51-3.) • Engine Control Wiring Harness Connector Bracket Removal (Refer to GROUP 54A –Battery P.54A-10.) • Radiator cap assembly mounting bolt, radiator condenser tank, and radiator condenser tank bracket removal (Refer to GROUP 14 –Radiator P.14-31.) • Relay box mounting bolt removal • Front Exhaust Pipe Removal (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-24.) • Water pump pulley removal (Refer to GROUP 14 –Water Pump P.14-25.)	• Water pump pulley installation (Refer to GROUP 14 –Water Pump P.14-25.) • Front Exhaust Pipe Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-24.) • Relay Box Mounting Bolt Installation • Radiator cap assembly mounting bolt, radiator condenser tank, and radiator condenser tank bracket installation (Refer to GROUP 14 –Radiator P.14-31.) • Engine control wiring harness connector bracket installation (Refer to GROUP 54A –Battery P.54A-10.) • Headlight support panel cover installation (Refer to GROUP 51 –Front Bumper Assembly and Radiator Grille P.51-3.) • Air cleaner assembly and air cleaner bracket installation (Refer to GROUP 15 –Air Cleaner P.15-10.) • Engine upper cover removal (Refer to GROUP 11A –Camshaft P.11A-25.) • Transmission oil refilling (Refer to P.22C-328.) • Engine compartment under cover front B assembly and engine compartment side cover installation (Refer to GROUP 51 –Under Cover P.51-16.)

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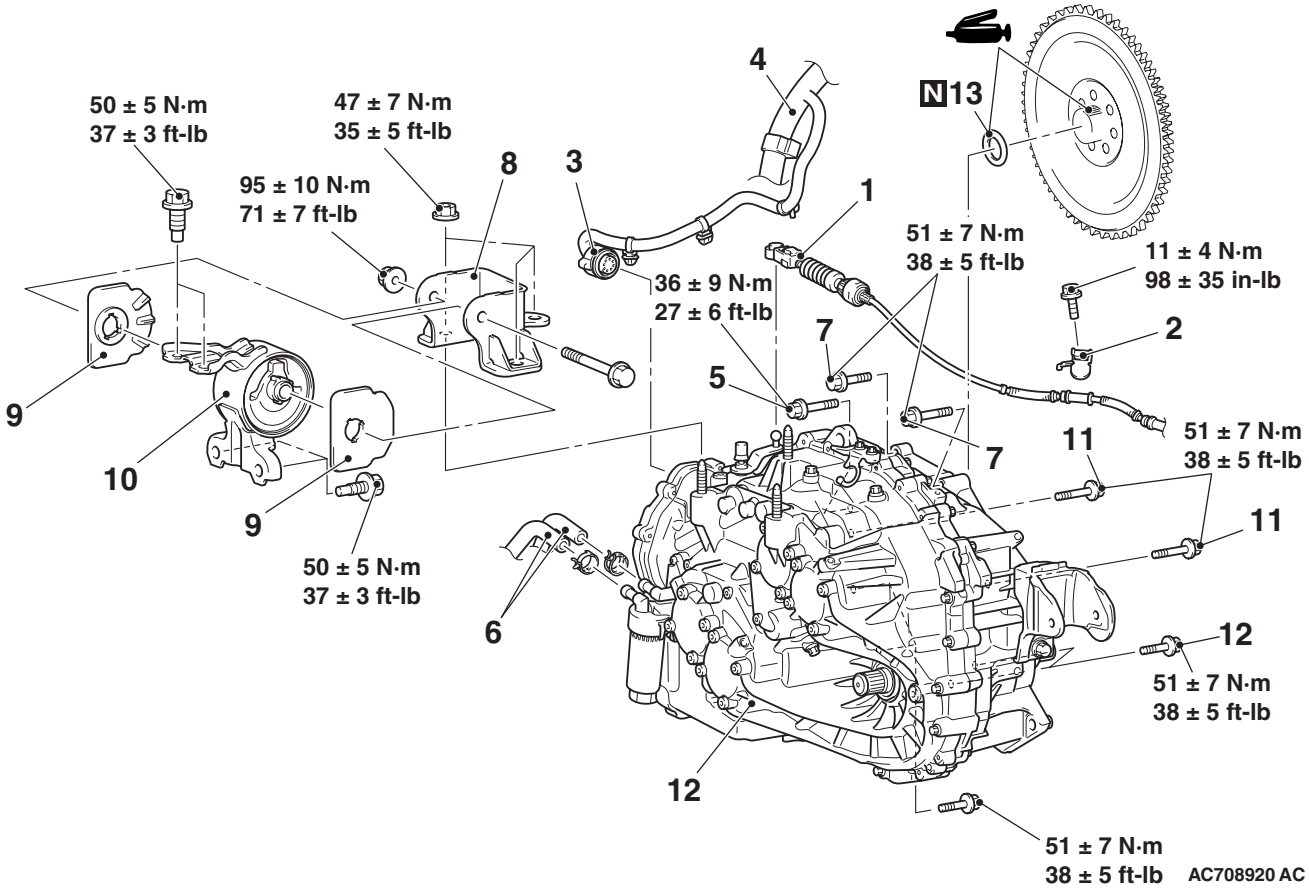

Removal steps

<<A>>
- Strut tower bar (Refer to GROUP 42 –Strut Tower Bar P.42A-15.)
- Front driveshaft assembly, output shaft assembly (Refer to GROUP 26 –Driveshaft assembly P.26-15.)

>>C<<
1. Transaxle control cable connection
2. Transaxle control cable bracket

<<B>>
3. Transaxle assembly connector connection
4. Control wiring harness connection

<<C>>
5. Starter mounting bolt
6. Oil cooler hose assembly connection

<<D>>
7. Transaxle assembly upper part coupling bolt

<<E>>
8. Transaxle mounting bracket

>>B<<
9. Transaxle mounting insulator stopper
10. Transaxle mounting insulator

<<F>>
- Engine assembly support

11. Transaxle assembly lower part coupling bolt

>>A<<
12. Transaxle assembly

>>A<<
13. O-ring

Removal steps

- Front axle crossmember assembly (Refer to GROUP 32 –Crossmember P.32-10.)
- Transfer assembly (Refer to P.22C-339.)

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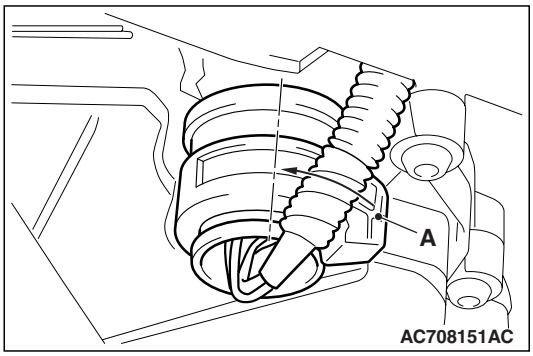
REMOVAL SERVICE POINTS

<<A>> STRUT TOWER BAR REMOVAL

After removing the strut tower bar, temporarily install the strut assembly.

<<B>> TRANSAXLE ASSEMBLY CONNECTOR REMOVAL



Rotate the section A of the connector 90° to the direction of the arrow to disconnect the connector.

<<C>> STARTER MOUNTING BOLT REMOVAL

Remove the starter with its connector connected. Keep the starter fixed to the engine side.

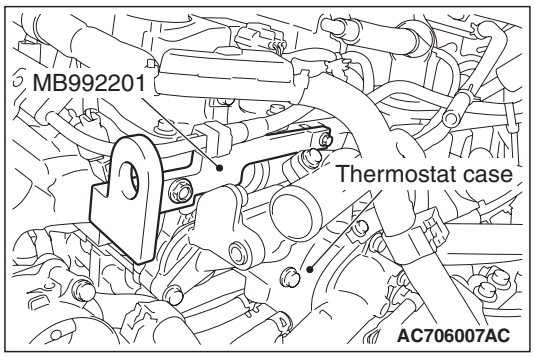
<<D>> TRANSAXLE ASSEMBLY UPPER PART COUPLING BOLT REMOVAL

Only loosen the bolts from the engine and transaxle assembly (do not remove).

<<E>> 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 the garage jack so that the engine and transaxle assembly weight is not applied to the transaxle mounting insulator, and remove the transaxle mounting bracket.

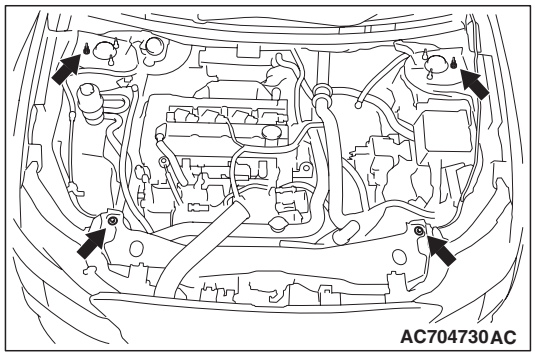
<<F>> ENGINE ASSEMBLY SUPPORTING



1. Remove the vacuum pipe assembly (refer to GROUP 14 – Water Hose and Water Pipe P.14-26), and install the engine hanger plate (Special tool: MB992201), then tighten the bolts to the specified torque.

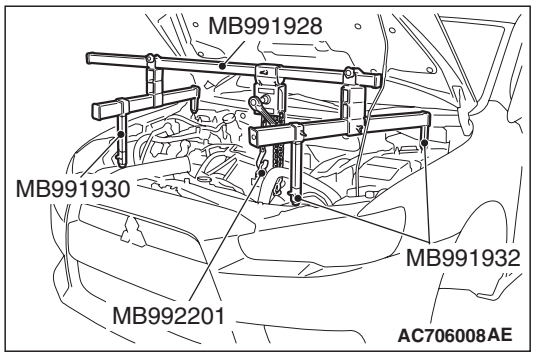
   Tightening torque: 11±1 N·m (8±1 in-lb)

2. <When engine hanger (special tool MB991928) is used>
   (1) Assemble the engine hanger (special tool MB991928). (Set following parts to the base hanger.)
   - Slide bracket (HI)
   - Foot x 4 (standard) (MB991932)
   - Joint x 2 (90) (MB991930)



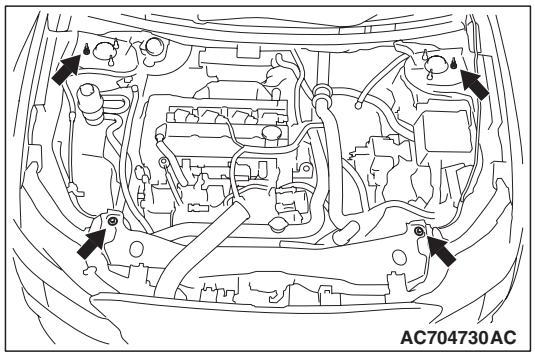
(2) Set the feet of the special tool as shown in the figure.

NOTE: Adjust the engine hanger balance by sliding the slide bracket (HI).



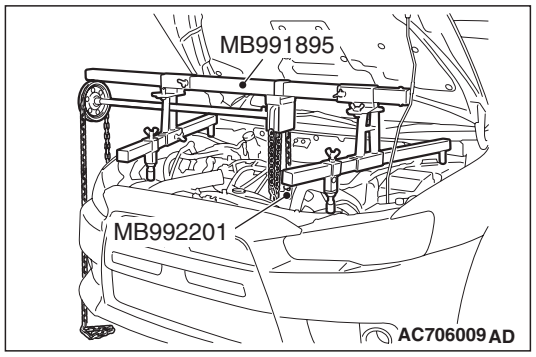
(3) Set the chain to the engine hanger plate (Special tool: MB992201) to support the engine and transaxle assembly. Remove the garage jack, and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

3. <Engine mechanical hanger (special tool MB991895) is used>



(1) Set the feet of the engine mechanical hanger (special tool MB991895) as shown in the figure.

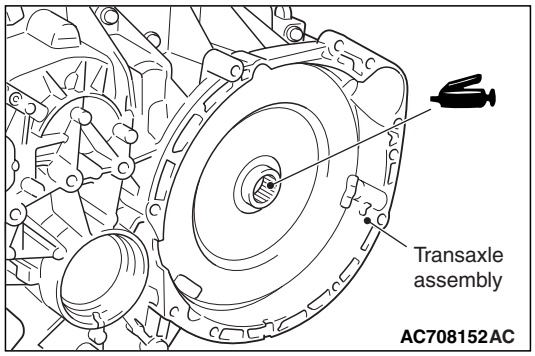
NOTE: Slide the front foot of the engine mechanical hanger (Special tool: MB991895) to balance the engine hanger.



(2) Set the chain to the engine hanger plate (Special tool: MB992201) to support the engine and transaxle assembly. Remove the garage jack, and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

INSTALLATION SERVICE POINTS

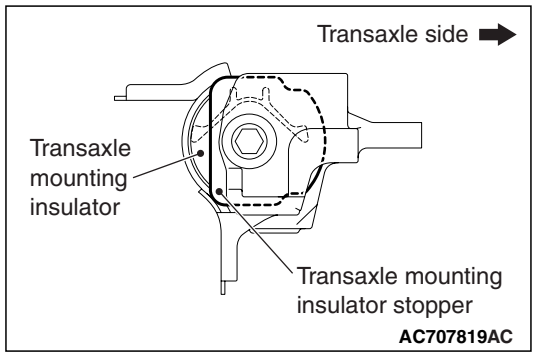
>>A<< O-RING/TRANSAXLE ASSEMBLY INSTALLATION



Apply the specified grease to the flywheel spline section, O-ring, and spline section of transaxle assembly input shaft.

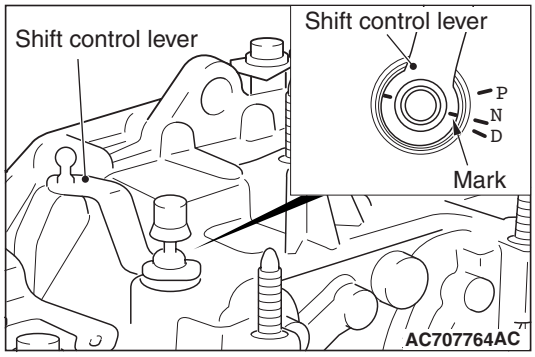
Grease
Brand name: Molykote BR2-Plus

>>B<< TRANSAXLE MOUNTING INSULATOR STOPPER INSTALLATION

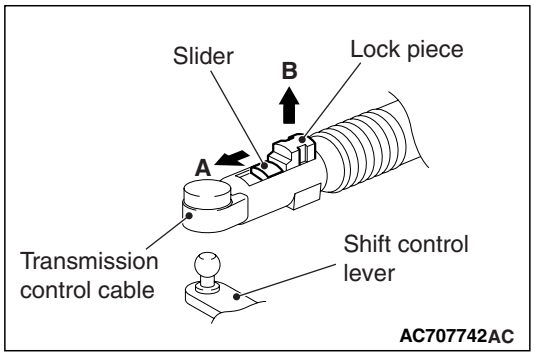


Install the transaxle mounting insulator stopper as shown in the figure.

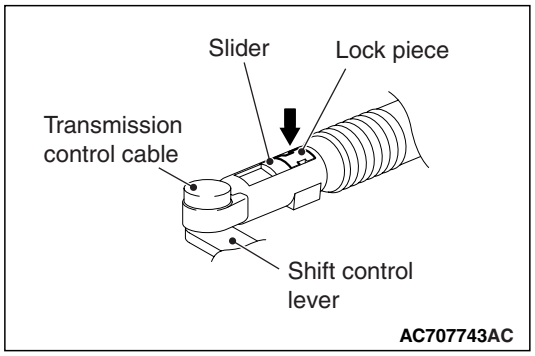
>>C<< TRANSAXLE CONTROL CABLE INSTALLATION



1. Set the shift lever to the N position.
2. Operate the lever so that the shift control lever positioning mark is set to the N position.



3. Move the slider of the transaxle control cable (transaxle side) tip to the direction A to pull up the lock piece to the direction B.



4. Align the transaxle control cable and the shift control lever joint (positioning only, do not connect), and firmly push down the lock piece to lock it. Then, connect the transaxle control cable and the shift control lever.

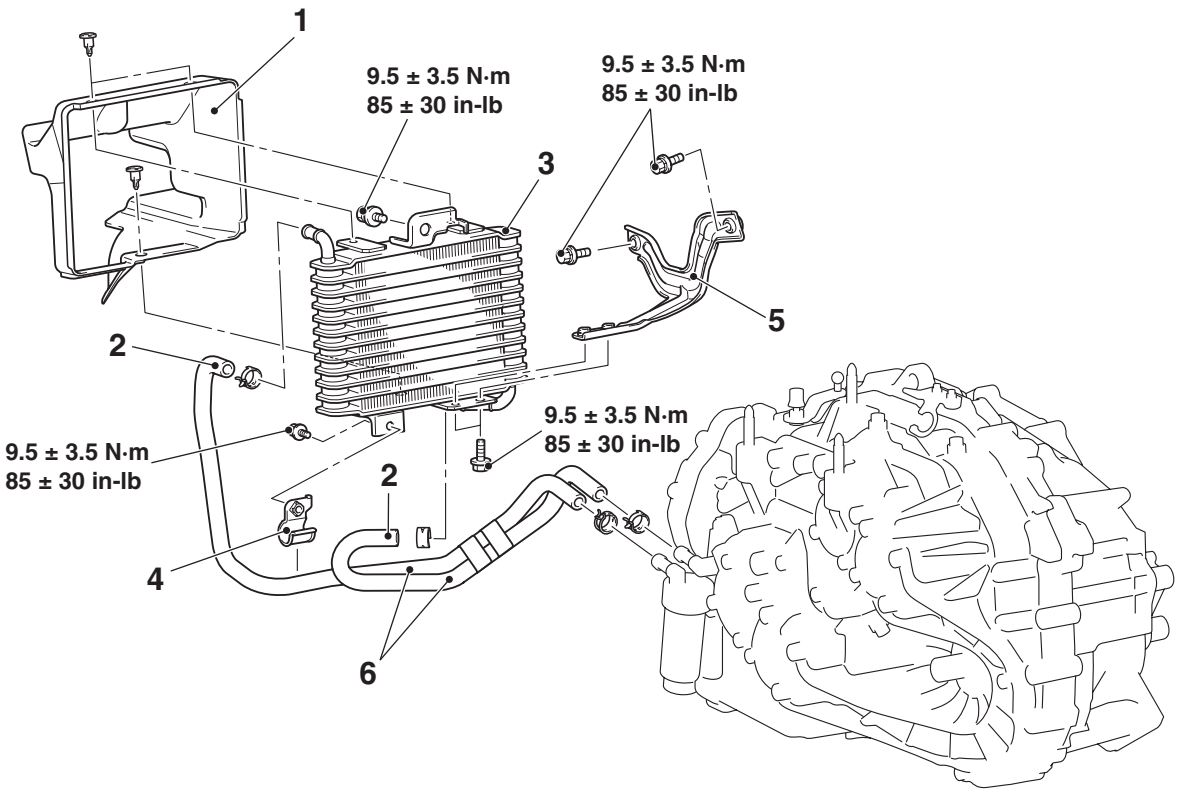
   NOTE:
   - *The slider automatically returns to the fixed position by the spring.*
   - *The lock position of transaxle control cable is automatically adjusted by a spring.*

OIL COOLER

REMOVAL AND INSTALLATION

M1225010400013

Pre-removal and Post-installation Operation
- Transmission oil draining and refilling (Refer to P.22C-328.)
- Front bumper and radiator grille assembly removal and installation (Refer to GROUP 51 –Front Bumper and Radiator Grille Assembly P.51-3.)



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Removal steps
1. Oil cooler duct
2. Oil cooler hose assembly connection
3. Oil cooler assembly

Removal steps (Continued)
4. Hose clamp
5. Oil cooler bracket
6. Oil cooler hose assembly

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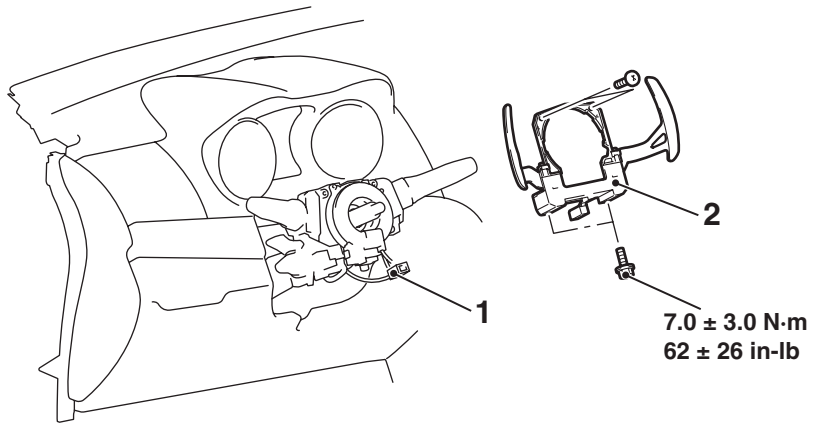
PADDLE SHIFT ASSEMBLY

REMOVAL AND INSTALLATION

M1225010600017

Pre-removal Operation	Post-installation Operation
• Steering wheel assembly and driver's air bag module removal (Refer to GROUP 37 –Steering Wheel P.37-22.) • Steering column lower cover and steering column upper cover removal (Refer to GROUP 37 –Steering Shaft P.37-26.)	• Steering column lower cover and steering column upper cover installation (Refer to GROUP 37 –Steering Shaft P.37-26.) • Steering wheel assembly and driver's air bag module installation (Refer to GROUP 37 –Steering Wheel P.37-22.) • Steering wheel at straight-ahead position check



AC710518 AB

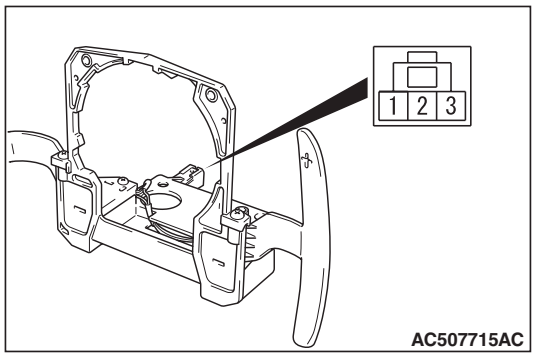
Removal steps

1. Paddle shift switch connector connection
2. Paddle shift assembly

INSPECTION

PADDLE SHIFT SWITCH CHECK

M1225011300019



AC507715AC

1. Check the 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	

2. In the cases other than the above, replace the paddle shift assembly.

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AWC-ECU

REMOVAL AND INSTALLATION

M1225010800011

Refer to GROUP 22A P.22A-132.

SENSOR, SWITCH AND RELAY

REMOVAL AND INSTALLATION

M1225011200012

Refer to GROUP 22A P.22A-132.

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

M1225011000018

Refer to GROUP 27, Hydraulic unit P.27-58.

NOTES