

ENGINE (DIAGNOSTICS)

EN(DOHC TURBO)

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BASIC DIAGNOSTIC PROCEDURE

Engine (Diagnostics)

1. Basic Diagnostic Procedure

S088501

A: PROCEDURE

S088501E45

1. ENGINE

S088501E4501

No.	Step	Check	Yes	No
1	CHECK ENGINE START FAILURE. 1) Ask the customer when and how the trouble occurred using the interview check list. <Ref. to EN(DOHC TURBO)-4, CHECK, Check List for Interview.> 2) Start the engine.	Does the engine start?	Go to step 2.	Inspection using "Diagnostics for Engine Start Failure". <Ref. to EN(DOHC TURBO)-63, Diagnostics for Engine Starting Failure.>
2	CHECK ILLUMINATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).	Does CHECK ENGINE malfunction indicator lamp illuminate?	Go to step 3.	Inspection using "General Diagnostics Table". <Ref. to EN(DOHC TURBO)-344, General Diagnostic Table.>
3	CHECK INDICATION OF DTC ON DISPLAY. 1) Turn ignition switch to OFF. 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector. 3) Turn ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON. 4) Read DTC on the Subaru Select Monitor or OBD-II general scan tool.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Record diagnostic trouble code. Repair the trouble cause. <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> Go to step 4.	Repair the related parts. NOTE: If DTC is not shown on display although the MIL illuminates, perform diagnostics of MIL (CHECK ENGINE malfunction indicator lamp) circuit or combination meter. <Ref. to EN(DOHC TURBO)-50, Engine Malfunction Indicator Lamp (MIL).>
4	PERFORM THE DIAGNOSIS. 1) Perform the clear memory mode. <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> 2) Perform the inspection mode. <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Inspect using "Diagnostics Procedure with Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-90, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Complete the diagnosis.

2. AUTOMATIC TRANSMISSION S088501E4502

When trouble code about automatic transmission is shown on display, carry out the following basic check. After that, carry out the replacement or repair work.

- 1) ATF level check <Ref. to AT-9, Automatic Transmission Fluid.>
- 2) Differential gear oil level check <Ref. to AT-11, Differential Gear Oil.>
- 3) ATF leak check <Ref. to AT-9, Automatic Transmission Fluid.>
- 4) Differential gear oil leak check <Ref. to AT-11, Differential Gear Oil.>
- 5) Stall test <Ref. to AT-11, Differential Gear Oil.>
- 6) Line pressure test <Ref. to AT-16, Line Pressure Test.>
- 7) Transfer clutch pressure test <Ref. to AT-18, Transfer Clutch Pressure Test.>
- 8) Time lag test <Ref. to AT-15, Time Lag Test.>
- 9) Road test <Ref. to AT-12, Road Test.>
- 10) Shift characteristics <Ref. to AT-18, Transfer Clutch Pressure Test.>

CHECK LIST FOR INTERVIEW

Engine (Diagnostics)

2. Check List for Interview S088502

A: CHECK S088502A04

1. CHECK LIST NO. 1 S088502A0401

Check the following items when problem has occurred.

NOTE:

Use copies of this page for interviewing customers.

Customer's name		Engine no.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km
Vin no.			miles
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others:		
Outdoor temperature	°C (°F) ☐ Hot ☐ Warm ☐ Cool ☐ Cold		
Place	☐ Highway ☐ Suburbs ☐ Inner city ☐ Uphill ☐ Downhill ☐ Rough road ☐ Others:		
Engine temperature	☐ Cold ☐ Warming-up ☐ After warming-up ☐ Any temperature ☐ Others:		
Engine speed	rpm		
Vehicle speed	MPH		
Driving conditions	☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH)		
Headlight	☐ ON/ ☐ OFF	Rear defogger	☐ ON/ ☐ OFF
Blower	☐ ON/ ☐ OFF	Radio	☐ ON/ ☐ OFF
A/C compressor	☐ ON/ ☐ OFF	CD/Cassette	☐ ON/ ☐ OFF
Cooling fan	☐ ON/ ☐ OFF	Car phone	☐ ON/ ☐ OFF
Front wiper	☐ ON/ ☐ OFF	CB	☐ ON/ ☐ OFF
Rear wiper	☐ ON/ ☐ OFF		

CHECK LIST FOR INTERVIEW

Engine (Diagnostics)

2. CHECK LIST NO. 2 S088502A0402

Check the following items about the vehicle's state when MIL turns on.

NOTE:

Use copies of this page for interviewing customers.

a) Other warning lights or indicators turn on. ☐ Yes/ ☐ No
☐ Low fuel warning light ☐ Charge indicator light ☐ AT diagnostics indicator light ☐ ABS warning light ☐ Engine oil pressure warning light
b) Fuel level
● Lack of gasoline: ☐ Yes/☐ No ● Indicator position of fuel gauge:
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: ☐ Yes/ ☐ No
● What:
d) Intentional connecting or disconnecting of hoses: ☐ Yes/ ☐ No
● What:
e) Installing of parts other than genuine parts: ☐ Yes/ ☐ No
● What:
● Where:
f) Occurrence of noise: ☐ Yes/ ☐ No
● From where:
● What kind:
g) Occurrence of smell: ☐ Yes/ ☐ No
● From where:
● What kind:
h) Intrusion of water into engine compartment or passenger compartment: ☐ Yes/ ☐ No
i) Troubles occurred
☐ Engine does not start. ☐ Engine stalls during idling. ☐ Engine stalls while driving. ☐ Engine speed decreases. ☐ Engine speed does not decrease. ☐ Rough idling ☐ Poor acceleration ☐ Back fire ☐ After fire ☐ No shift ☐ Excessive shift shock

GENERAL DESCRIPTION

Engine (Diagnostics)

3. General Description

S088001

A: CAUTION

S088001A03

1) Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when servicing the engine control module (ECM), transmission control module (TCM), main relay and fuel pump relay.

2) Never connect the battery in reverse polarity.

- The ECM will be destroyed instantly.
 - The fuel injector and other part will be damaged in just a few minutes more.
- 3) Do not disconnect the battery terminals while the engine is running.

- A large counter electromotive force will be generated in the alternator, and this voltage may damage electronic parts such as ECM, etc.

4) Before disconnecting the connectors of each sensor and the ECM, be sure to turn OFF the ignition switch.

5) Poor contact has been identified as a primary cause of this problem. To measure the voltage and/or resistance of individual sensors or all electrical control modules at the harness side connector, use a tapered pin with a diameter of less than 0.64 mm (0.025 in). Do not insert the pin more than 5 mm (0.20 in) into the part.

6) Before removing ECM from the located position, disconnect two cables on battery.

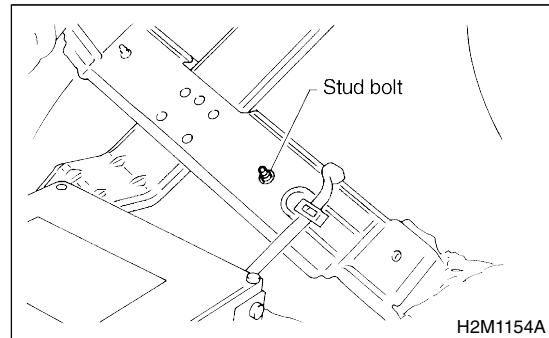
- Otherwise, the ECM may be damaged.

CAUTION:

When replacing ECM, be careful not to use the wrong spec. ECM to avoid any damage on fuel injection system.

7) The connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.

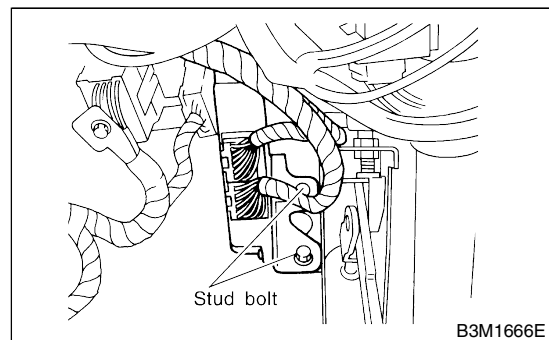
8) Use ECM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.



9) Use engine grounding terminal or engine proper as the grounding point to the body when measuring voltage and resistance in the engine compartment.



10) Use TCM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.



11) Every MFI-related part is a precision part. Do not drop them.

12) Observe the following cautions when installing a radio in MFI equipped models.

CAUTION:

- The antenna must be kept as far apart as possible from the control unit.

(The ECM is located under the steering column, inside of the instrument panel lower trim panel.)

- The antenna feeder must be placed as far apart as possible from the ECM and MFI harness.
- Carefully adjust the antenna for correct matching.
- When mounting a large power type radio, pay special attention to the three items above mentioned.
- Incorrect installation of the radio may affect the operation of the ECM.

13) Before disconnecting the fuel hose, disconnect the fuel pump connector and crank the engine for more than five seconds to release pressure in the fuel system. If engine starts during this operation, run it until it stops.

14) Problems in the electronic-controlled automatic transmission may be caused by failure of the engine, the electronic control system, the transmission proper, or by a combination of these. These three causes must be distinguished clearly when performing diagnostics.

15) Diagnostics should be conducted by rotating with simple, easy operations and proceeding to complicated, difficult operations. The most important thing in diagnostics is to understand the customer's complaint, and distinguish between the three causes.

16) On ABS vehicle, when performing driving test in jacked-up or lifted-up position, sometimes the warning light may be lit, but this is not a malfunction of the system. The reason for this is the speed difference between the front and rear wheels. After diagnosis of engine control system, perform the ABS memory clearance procedure of self-diagnosis system.

B: INSPECTION S088001A10

Before performing diagnostics, check the following items which might affect engine problems:

1. BATTERY S088001A1001

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V

Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. ENGINE GROUNDING S088001A1002

Make sure the engine grounding terminal is properly connected to the engine.

en0945



C: NOTE S088001A15

1. DESCRIPTION S088001A1501

- The on-board diagnostics (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter indicates occurrence of a fault or trouble.

- Further, against such a failure or sensors as may disable the drive, the fail-safe function is provided to ensure the minimal driveability.

- The OBD system incorporated with the vehicles within this engine family complies with Section 1968.1, California Code of Regulations (OBD-II regulation). The OBD system monitors the components and the system malfunction listed in Engine Section which affects on emissions.

- When the system decides that a malfunction occurs, MIL illuminates. At the same time of the MIL illumination or blinking, a diagnostic trouble code (DTC) and a freeze frame engine conditions are stored into on-board computer.

- The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction first.

- If the OBD system detects the various malfunctions including the fault of fuel trim or misfire, the OBD system first stores freeze frame engine conditions about the fuel trim or misfire.

- When the malfunction does not occur again for three consecutive driving cycles, MIL is turned off, but DTC remains at on-board computer.

- The OBD-II system is capable of communication with a general scan tool (OBD-II general scan tool) formed by ISO 9141 CARB.

- The OBD-II diagnostics procedure is different from the usual diagnostics procedure. When troubleshooting OBD-II vehicles, connect Subaru

GENERAL DESCRIPTION

Engine (Diagnostics)

Select Monitor or the OBD-II general scan tool to the vehicle.

2. ENGINE AND EMISSION CONTROL SYSTEM

S088001A1502

- The Multipoint Fuel Injection (MFI) system is a system that supplies the optimum air-fuel mixture to the engine for all the various operating conditions through the use of the latest electronic technology.

With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system where the electro-magnetic injection valve (fuel injector) opens only for a short period of time, depending on the quantity of air required for one cycle of operation. In actual operation, the injection quantity is determined by the duration of an electric pulse applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

- Further, all the operating conditions of the engine are converted into electric signals, and this results in additional features of the system, such as large improved adaptability, easier addition of compensating element, etc.

The MFI system also has the following features:

- Reduced emission of harmful exhaust gases.
- Reduced in fuel consumption.
- Increased engine output.
- Superior acceleration and deceleration.
- Superior startability and warm-up performance in cold weather since compensation is made for coolant and intake air temperature.

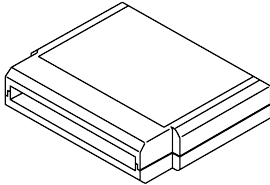
3. AUTOMATIC TRANSMISSION AND ELECTRONIC-HYDRAULIC CONTROL SYSTEM

S088001A1503

The electronic-hydraulic control system consists of various sensors and switches, a transmission control module (TCM) and the hydraulic controller including solenoid valves. The system controls the transmission proper including shift control, lock-up control, overrunning clutch control, line pressure control and shift timing control. It also controls the AWD transfer clutch. In other words, the system detects various operating conditions from various input signals and sends output signals to shift solenoids 1, 2 and low clutch timing solenoid and 2-4 brake timing solenoid, line pressure duty solenoid, lock-up duty solenoid, transfer duty solenoid and 2-4 brake duty solenoid (a total of eight solenoids).

D: PREPARATION TOOL

S088001A17

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 B2M3876	24082AA150 (New adopted tool)	CARTRIDGE	Troubleshooting for electrical systems.
 B2M3877	22771AA030	SELECT MONITOR KIT	Troubleshooting for electrical systems. • English: 22771AA030 (Without printer) • German: 22771AA070 (Without printer) • French: 22771AA080 (Without printer) • Spanish: 22771AA090 (Without printer)

GENERAL DESCRIPTION

Engine (Diagnostics)

MEMO:

EN(DOHC TURBO)-9

ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

4. Electrical Components Location

S088507

A: LOCATION

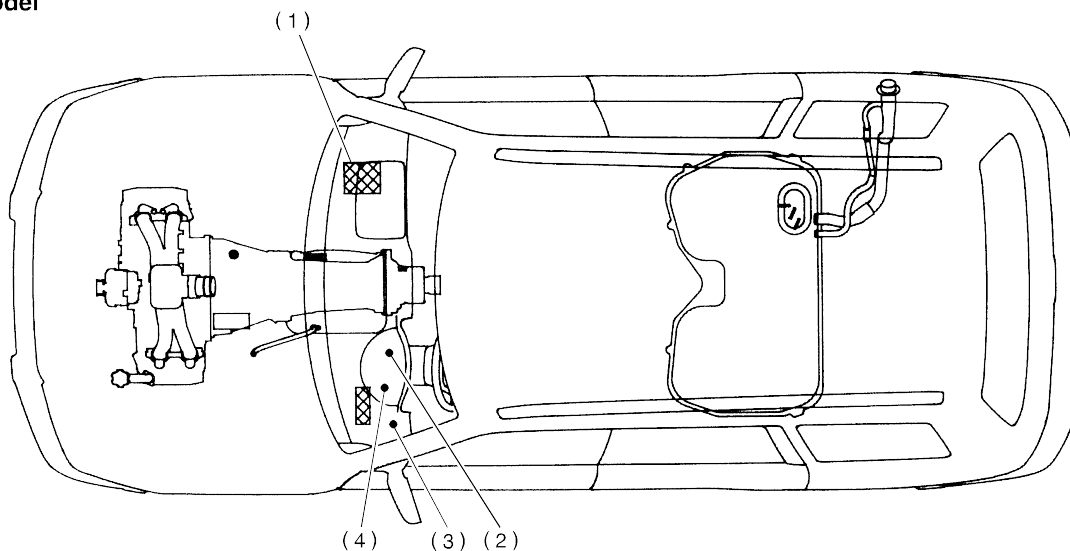
S088507A13

1. ENGINE

S088507A1301

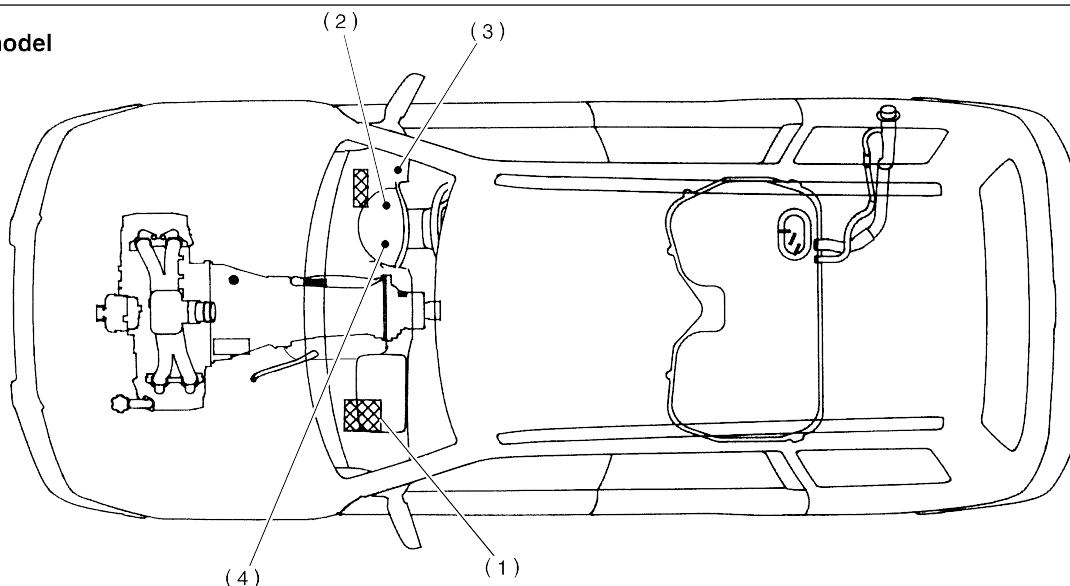
● MODULE

LHD model



S2M0226H

RHD model



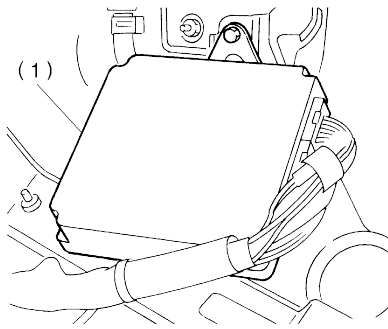
S2M1401E

(1) Engine control module (ECM)
(2) CHECK ENGINE malfunction
indicator lamp (MIL)

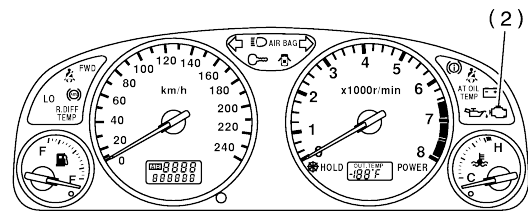
(3) Data link connector
(4) Test mode connector

ELECTRICAL COMPONENTS LOCATION

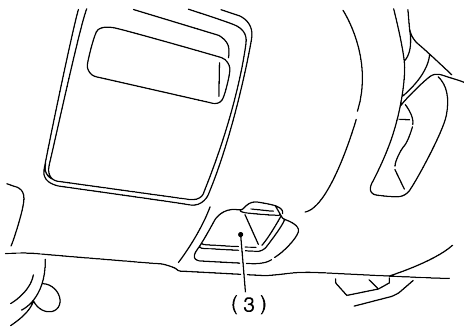
Engine (Diagnostics)



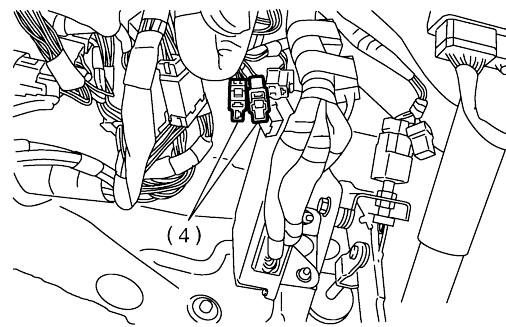
B3M1575A



S2M2215A



S2M2157A

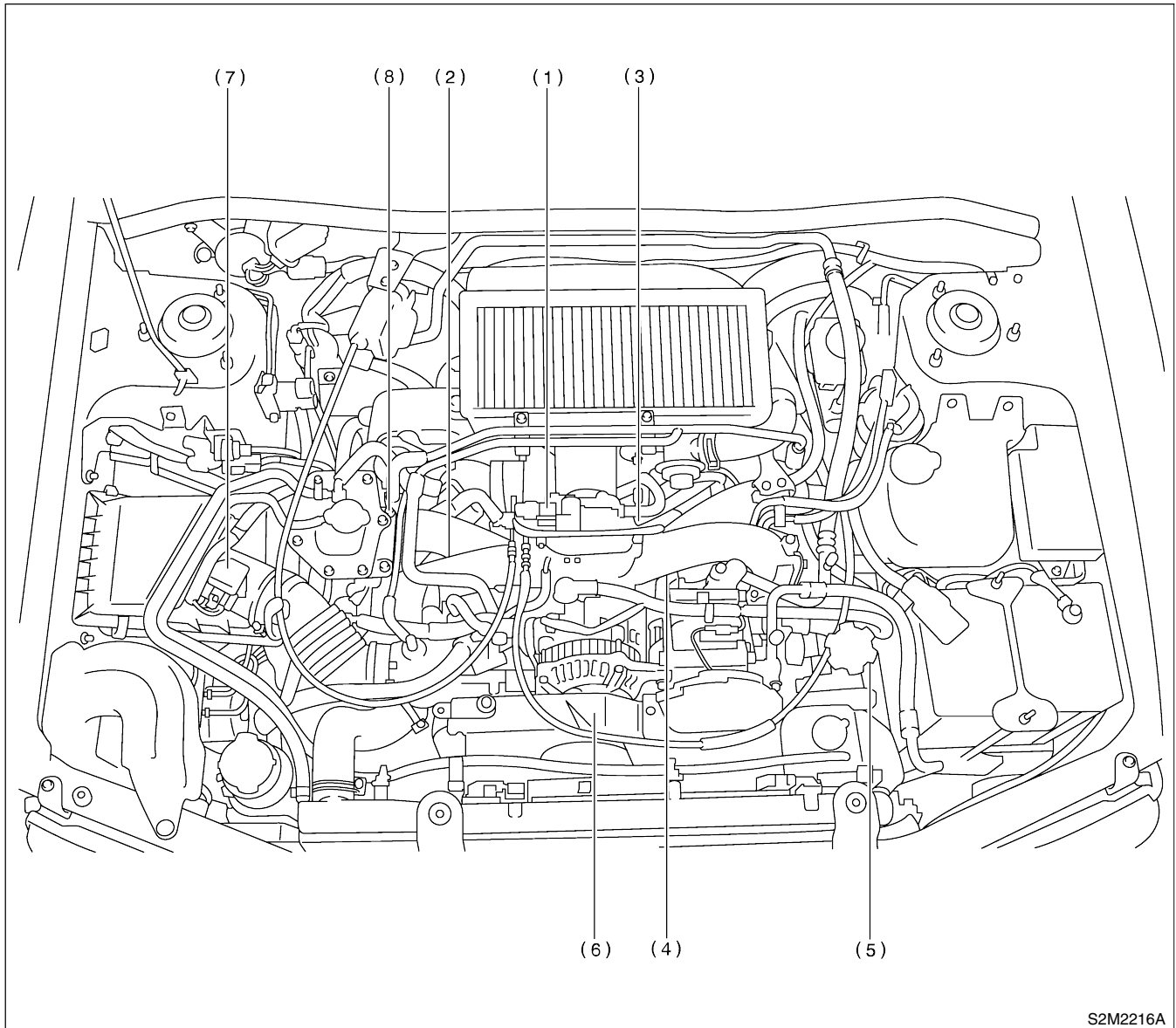


S2M2244B

ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

● SENSOR



- | | | |
|---------------------------------------|--------------------------------|---|
| (1) Pressure sensor | (4) Knock sensor | (7) Mass air flow and intake air temperature sensor |
| (2) Engine coolant temperature sensor | (5) Camshaft position sensor | (8) Tumble generator valve position sensor |
| (3) Throttle position sensor | (6) Crankshaft position sensor | |

EN(DOHC TURBO)-12

ELECTRICAL COMPONENTS LOCATION

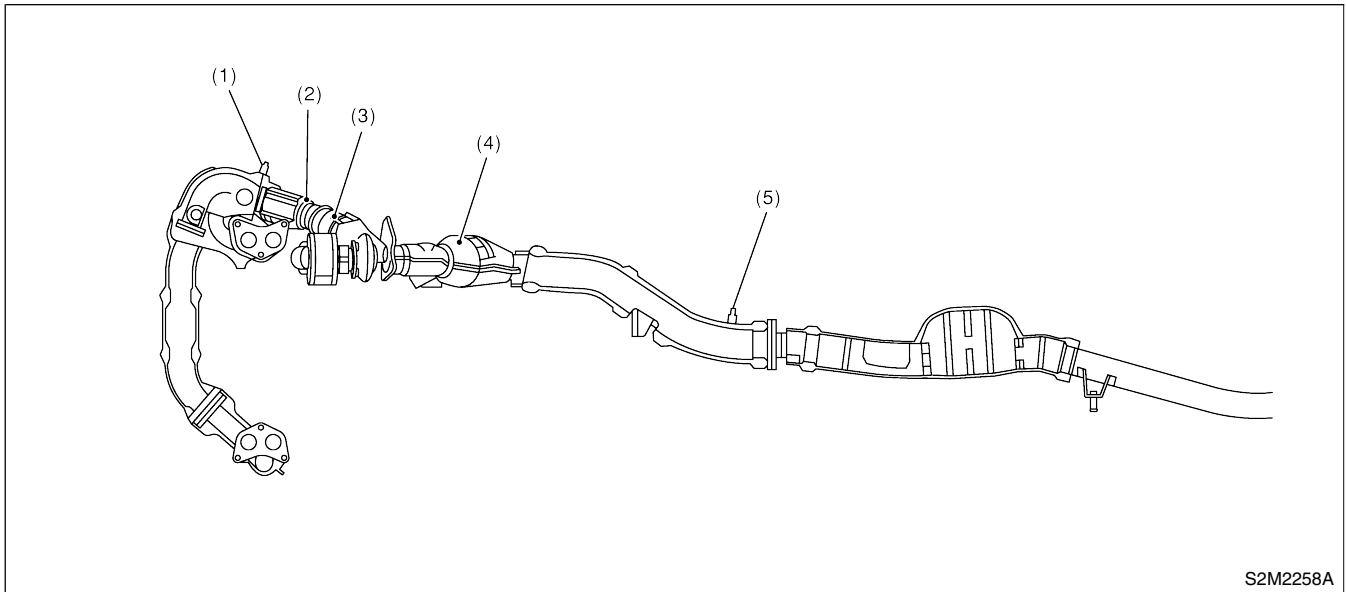
Engine (Diagnostics)

en1008	en1009
EN1008	EN1009
en1010	en1011
EN1010	EN1011
en1012	en1013
EN1012	EN1013
en1014	en1015
EN1014	EN1015

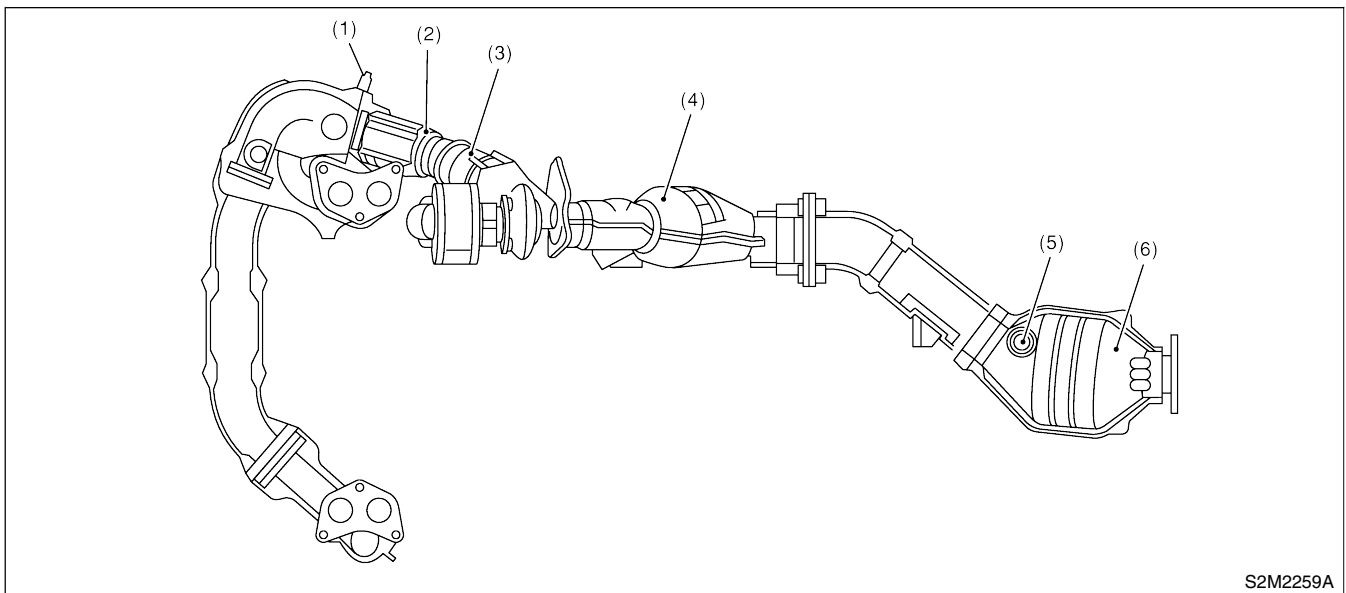
ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

● Australia Model



● Except Australia Model



- (1) Front oxygen (A/F) sensor
- (2) Precatalytic converter
- (3) Exhaust temperature sensor

- (4) Front catalytic converter
- (5) Rear oxygen sensor

- (6) Rear catalytic converter
(Except Australia model)

ELECTRICAL COMPONENTS LOCATION

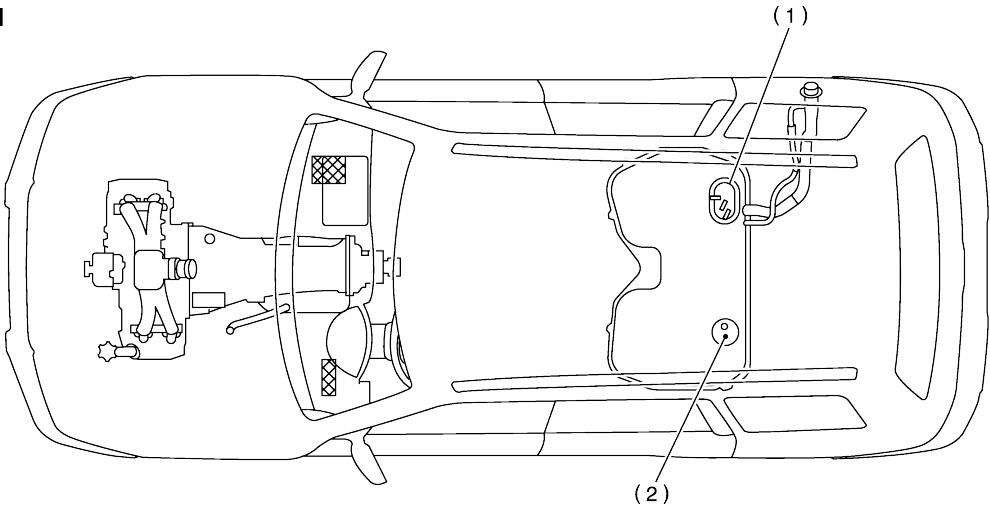
Engine (Diagnostics)

en1016	en1017
EN1016	EN1017
en0949	en1018
EN0949	EN1018
en0950	SUBARU®
EN0950	

ELECTRICAL COMPONENTS LOCATION

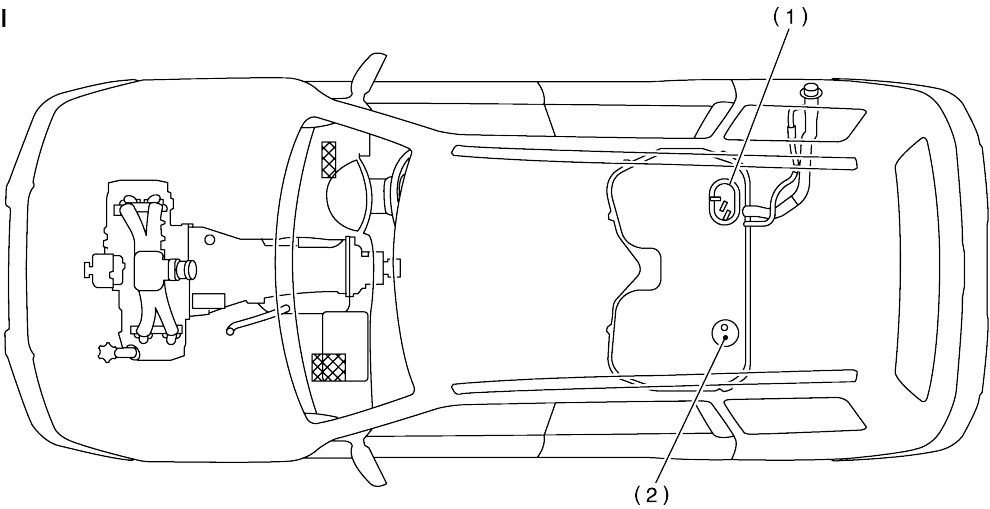
Engine (Diagnostics)

LHD model



S2M2217A

RHD model



S2M2218A

(1) Fuel level sensor

(2) Fuel sub level sensor

en1036	en1037
EN1036	EN1037

ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

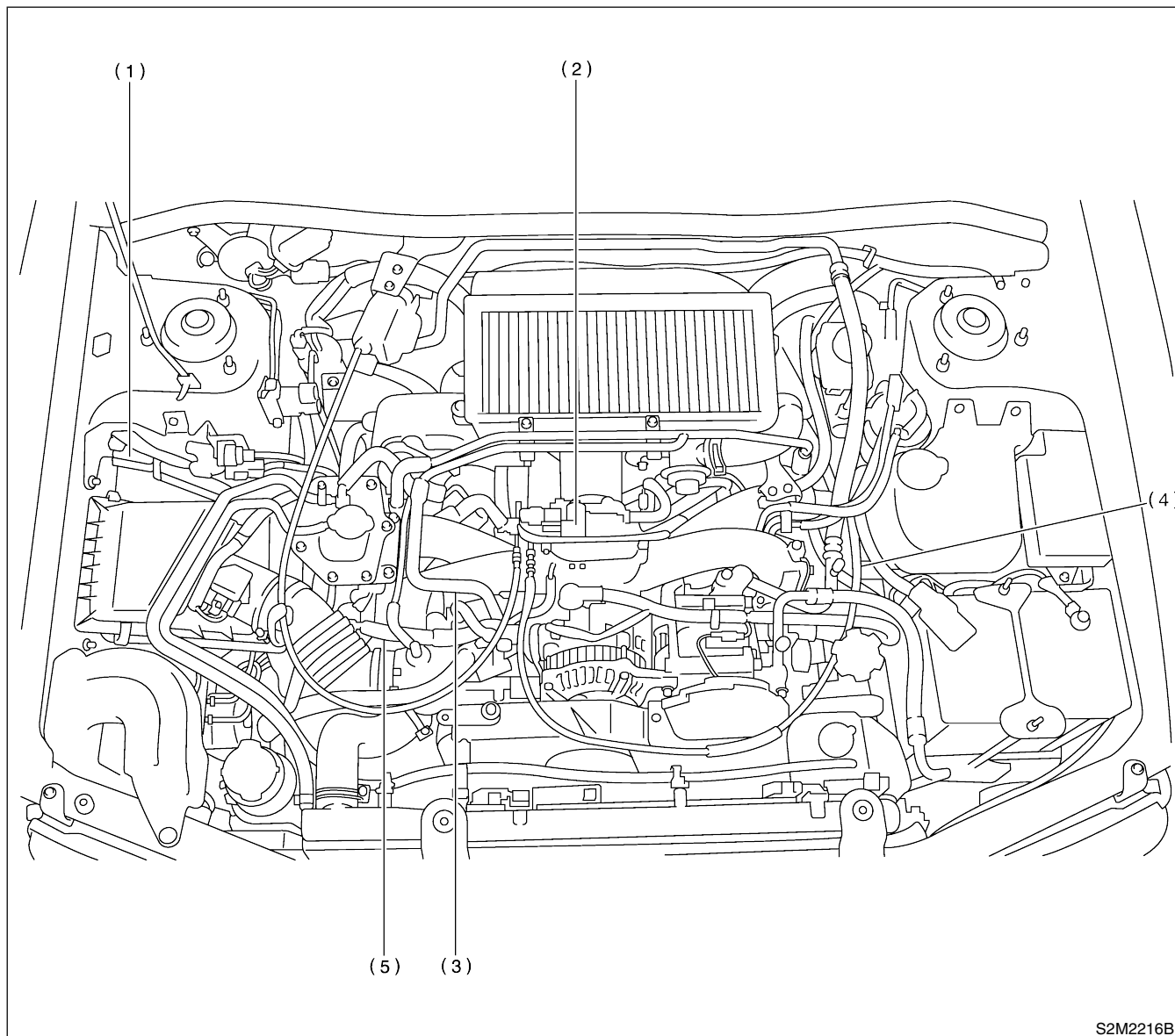
MEMO:

EN(DOHC TURBO)-17

ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

● SOLENOID VALVE, ACTUATOR, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS



S2M2216B

(1) Wastegate control solenoid valve

(2) Idle air control solenoid valve

(3) Purge control solenoid valve

(4) Ignition coil

(5) Tumble generator valve actuator

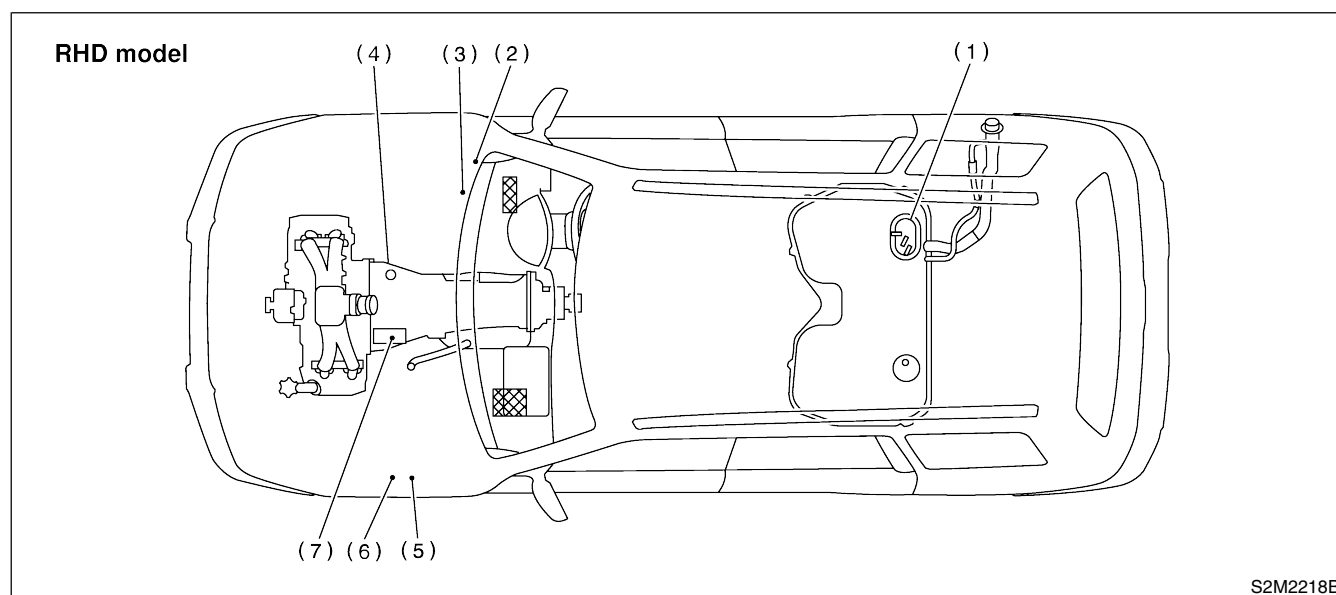
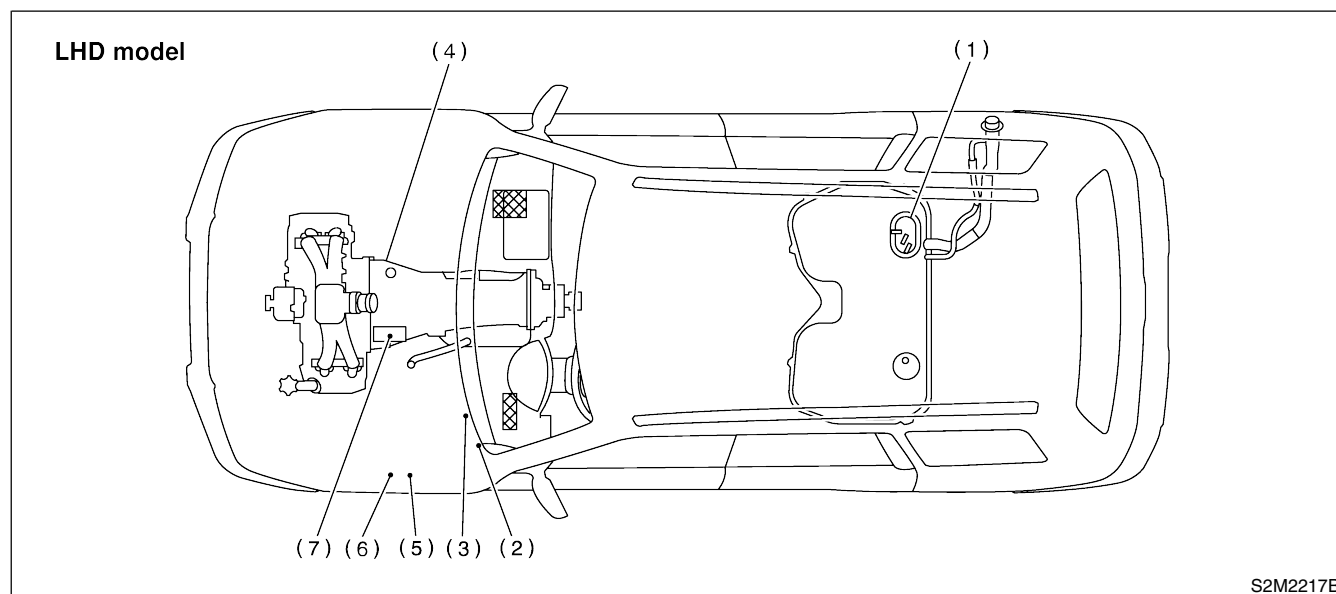
ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

en1021	en1022
EN1021	EN1022
en1023	en1024
EN1023	EN1024
en0952	SUBARU
EN0952	

ELECTRICAL COMPONENTS LOCATION

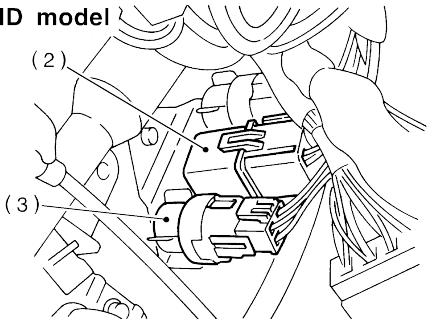
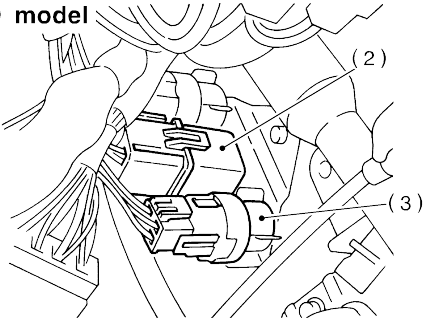
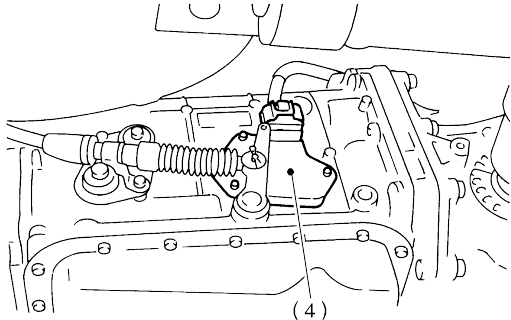
Engine (Diagnostics)



- | | | |
|---------------------|-----------------------------|-------------|
| (1) Fuel pump | (4) Inhibitor switch | (7) Starter |
| (2) Main relay | (5) Radiator main fan relay | |
| (3) Fuel pump relay | (6) Radiator sub fan relay | |

ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

en0953 EN0953	LHD model  S2M0278B
RHD model  en0746 S2M0663A	 en1030 B2M2246G
EN0746	EN1030

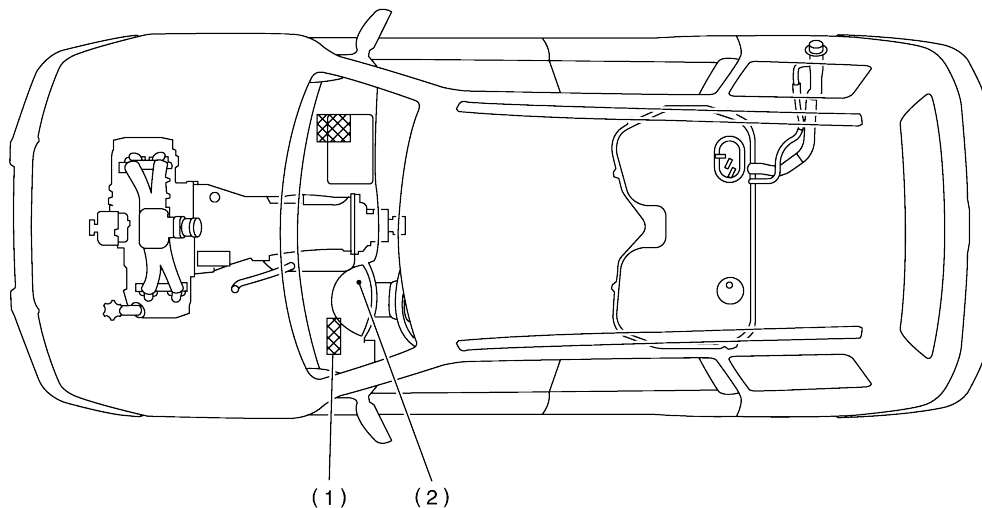
ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

2. TRANSMISSION S088507A1302

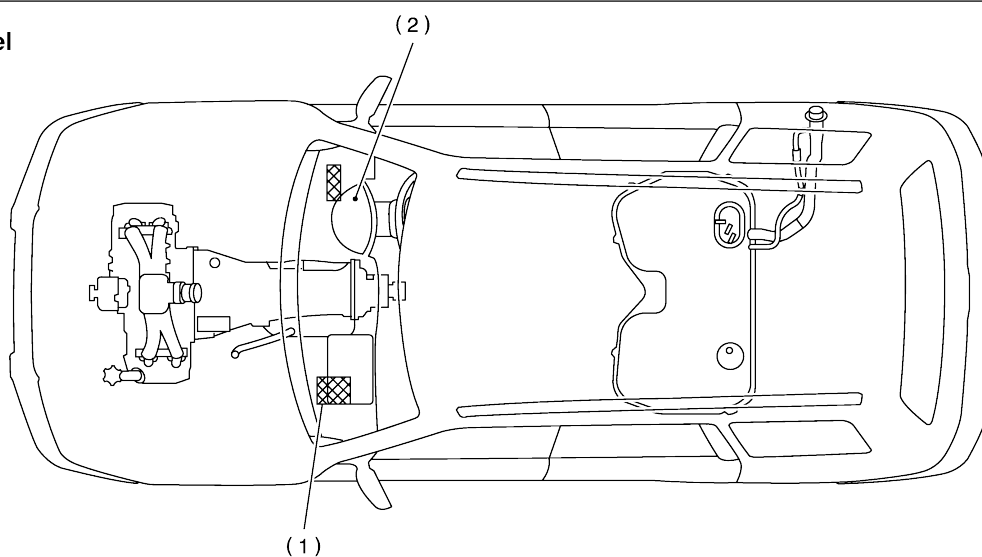
● MODULE

LHD model



S2M2217C

RHD model



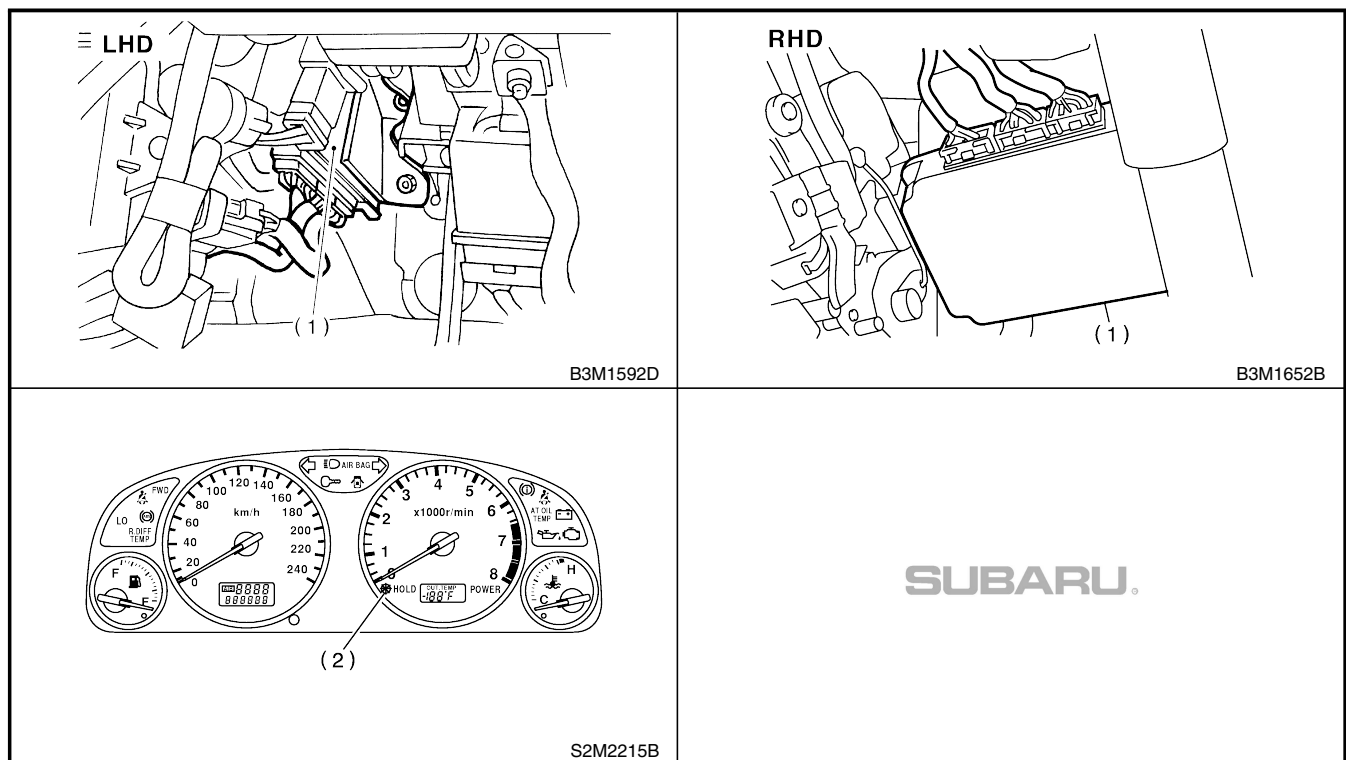
S2M2218C

(1) Transmission Control Module
(TCM) (for AT vehicles)

(2) AT diagnostic indicator light (for
AT vehicles)

ELECTRICAL COMPONENTS LOCATION

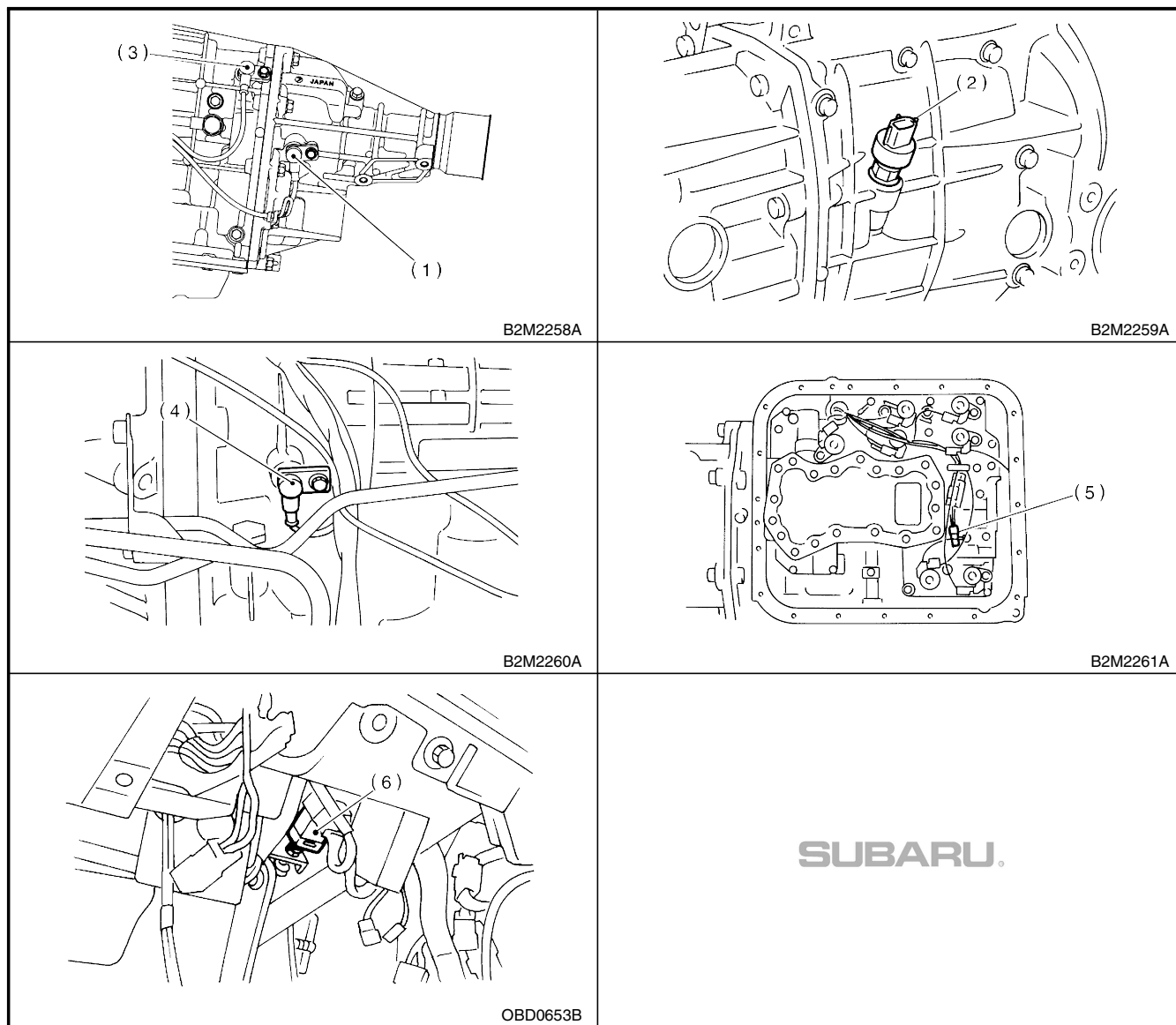
Engine (Diagnostics)



ELECTRICAL COMPONENTS LOCATION

Engine (Diagnostics)

● SENSOR

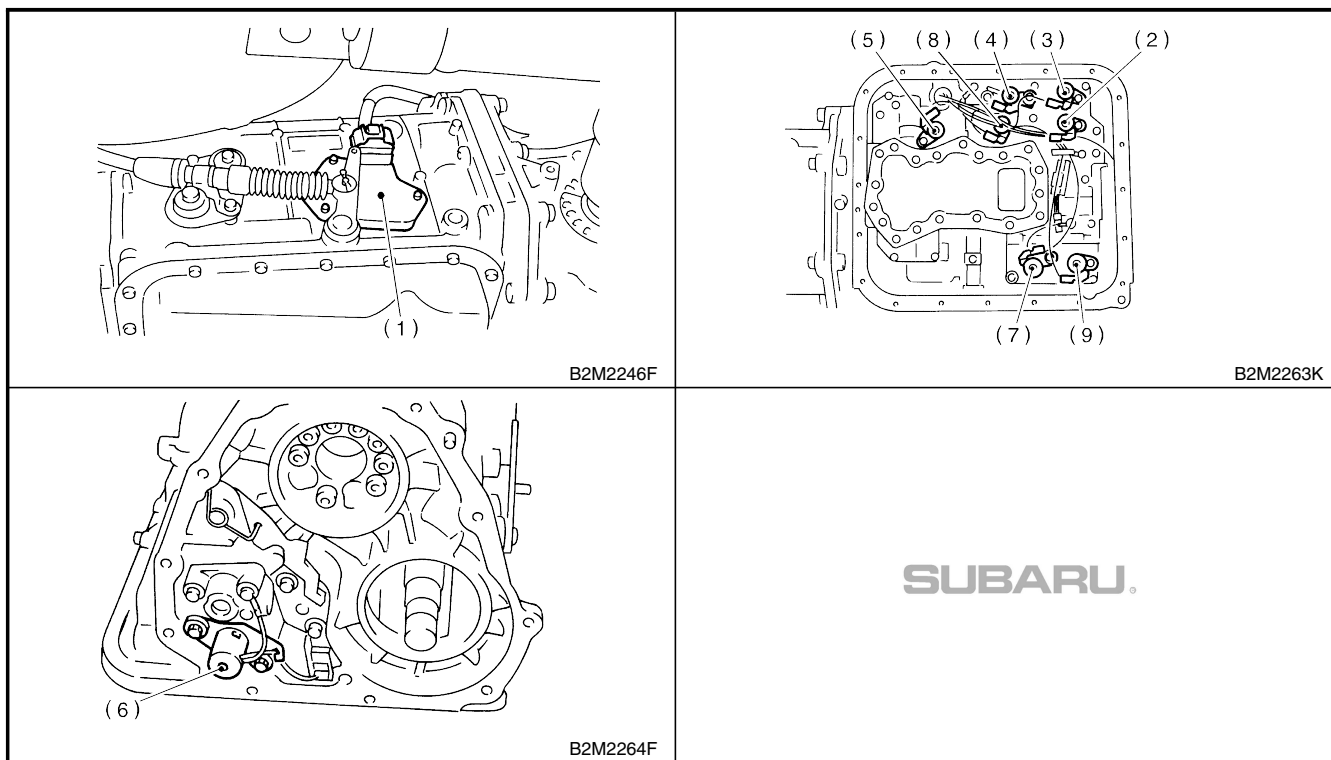


- (1) Rear vehicle speed sensor (for AT vehicles)
- (2) Front vehicle speed sensor (for MT vehicles)
- (3) Front vehicle speed sensor (for AT vehicles)
- (4) Torque converter turbine speed sensor
- (5) ATF temperature sensor (for AT vehicles)
- (6) Brake light switch

ELECTRICAL COMPONENTS LOCATION

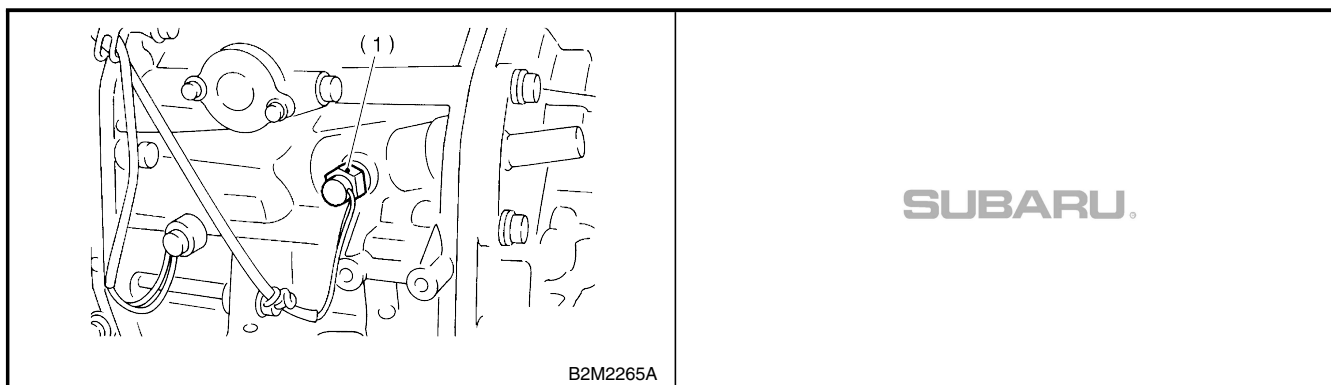
Engine (Diagnostics)

● SOLENOID VALVE AND SWITCH (AT VEHICLES)



- (1) Inhibitor switch
- (2) Shift solenoid valve 1
- (3) Shift solenoid valve 2
- (4) Line pressure duty solenoid
- (5) Lock-up duty solenoid
- (6) Transfer duty solenoid
- (7) 2-4 brake duty solenoid
- (8) Low clutch timing solenoid valve
- (9) 2-4 brake timing solenoid valve

● SOLENOID VALVE AND SWITCH (MT VEHICLES)



- (1) Neutral position switch

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

Engine (Diagnostics)

5. Engine Control Module (ECM) I/O Signal S088526

A: ELECTRICAL SPECIFICATION S088526A08

en0955

EN0955

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B135	2	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	11	0	0	—
	Shield	B135	21	0	0	—
Camshaft position sensor	Signal (+)	B135	1	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	10	0	0	—
	Shield	B135	21	0	0	—
Throttle position sensor	Signal	B135	7	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power sup- ply	B135	9	5	5	—
	GND (sen- sor)	B135	19	0	0	—
Rear oxy- gen sensor	Signal	B135	17	0	0 — 0.9	—
	Shield	B135	26	0	0	—
	GND (sen- sor)	B135	19	0	0	—
Front oxy- gen (A/F) sensor heater	Signal 1	B137	4	0 — 1.0	0 — 1.0	—
	Signal 2	B137	5	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B136	13	0 — 1.0	0 — 1.0	—
Engine coolant tempera- ture sensor	Signal	B135	18	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sen- sor)	B135	19	0	0	After warm-up the engine.
Vehicle speed signal		B134	1	0 or 5	0 or 5	"5" and "0" are repeatedly dis- played when vehicle is driven.

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

Engine (Diagnostics)

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Mass air flow sensor	Signal	B84	13	—	0.3 — 4.5	—
	Shield	B84	8	0	0	—
	GND	B84	7	0	0	—
Intake air temperature sensor signal		B135	27	—	—	—
Exhaust gas tem- perature sensor	Signal	B135	16	—	—	—
	GND (sensor)	B135	19	0	0	—
Tumble generator valve posi- tion sensor RH	Signal	B84	23	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power sup- ply	B135	9	5	5	—
	GND (sensor)	B135	19	0	0	—
Tumble generator valve posi- tion sensor LH	Signal	B84	13	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power sup- ply	B135	9	5	5	—
	GND (sensor)	B135	19	0	0	—
Tumble generator valve RH (open)		B84	4	0 or 5	0 or 5	—
Tumble generator valve RH (close)		B84	5	0 or 5	0 or 5	—
Tumble generator valve LH (open)		B84	11	0 or 5	0 or 5	—
Tumble generator valve LH (close)		B84	10	0 or 5	0 or 5	—
Wastegate control sole- noid valve		B137	24	10 — 13	13 — 14	—
Starter switch		B134	16	0	0	Cranking: 8 — 14
A/C switch		B134	6	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B134	14	10 — 13	13 — 14	—
Neutral position switch	MT	B135	8	ON: 12±0.5 OFF: 0		Switch is ON when gear is in neutral position.
	AT	B135	8	ON: 0 OFF: 12±0.5		Switch is ON when shift is in “N” or “P” position.
Test mode connector		B134	5	5	5	When connected: 0
Knock sen- sor	Signal	B135	4	2.8	2.8	—
	Shield	B135	22	0	0	—
Back-up power supply		B137	10	10 — 13	13 — 14	Ignition switch “OFF”: 10 — 13
Control unit power sup- ply	B137	2	10 — 13	10 — 13	13 — 14	—
	B137	3	10 — 13	10 — 13	13 — 14	—
Sensor power supply		B135	9	5	5	—
Line end check 1		B134	10	0	0	—
Ignition control	#1	B136	24	0	13 — 14	Waveform
	#2	B136	23	0	13 — 14	Waveform
	#3	B136	22	0	13 — 14	Waveform
	#4	B136	21	0	13 — 14	Waveform

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

Engine (Diagnostics)

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Fuel injec- tor	#1	B137	1	10 — 13	1 — 14	Waveform
	#2	B136	6	10 — 13	1 — 14	Waveform
	#3	B136	5	10 — 13	1 — 14	Waveform
	#4	B136	4	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	Signal	B136	10	0 or 13 — 14	0 or 13 — 14	Waveform
A/C relay control		B137	27	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		B137	17	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control		B137	28	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Malfunction indicator lamp		B137	15	—	—	Light “ON”: 1, or less Light “OFF”: 10 — 14
Engine speed output		B136	9	—	0 — 13, or more	Waveform
Purge control solenoid valve		B137	16	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Pressure sensor	Signal	B135	8	1.7 — 2.4	1.1 — 1.6	—
	Power sup- ply	B135	9	5	5	
	GND (sen- sor)	B135	19	0	0	
Fuel level sensor		B135	25	0.12 — 4.75	0.12 — 4.75	—
Small light switch		B134	17	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Blower fan switch		B134	9	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Rear defogger switch		B134	3	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Power steering oil pres- sure switch		B135	24	10 — 13	ON: 0 OFF: 13 — 14	—
Front oxygen (A/F) sen- sor signal (+)		B137	19	2.8 — 3.2	2.8 — 3.2	—
Front oxygen (A/F) sen- sor signal (–)		B137	29	2.4 — 2.7	2.4 — 2.7	—
Front oxygen (A/F) sen- sor shield		B136	7	0	0	—
SSM/GST communica- tion line		B134	21	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—
GND (sensors)		B135	19	0	0	—
GND (injectors)		B136	8	0	0	—
GND (ignition system)		B136	18	0	0	—
GND (power supply)		B136	17	0	0	—
		B134	22	0	0	—
GND (control systems)		B134	7	0	0	—
		B134	15	0	0	—
GND (oxygen sensor heater 1)		B137	9	0	0	—
GND (oxygen sensor heater 2)		B137	8	0	0	—

6. Engine Condition Data S088530

A: ELECTRICAL SPECIFICATION

S088530A08

Content	Specified data
Engine load	1.6 — 2.9 (%): Idling
	6.4 — 12.8 (%): 2,500 rpm racing

Measuring condition:

- After warm-up the engine.
- Gear position is in neutral position.
- A/C is turned OFF.
- All accessory switches are turned OFF.

ENGINE CONDITION DATA

Engine (Diagnostics)

7. Engine Condition Data S088506

A: ELECTRICAL SPECIFICATION S088506A08

tr0532

TR0532

Check with ignition switch ON.						
Content		Con- nector No.	Termi- nal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Back-up power supply		B56	1	Ignition switch OFF	10 — 16	—
Ignition power supply		B54	23	Ignition switch ON (with engine OFF)	10 — 16	—
		B54	24			
Inhibitor switch	“P” range switch	B55	1	Select lever in “P” range	Less than 1	—
				Select lever in any other than “P” range (except “N” range)	More than 8	
	“N” range switch	B55	14	Select lever in “N” range	Less than 1	—
				Select lever in any other than “N” range (except “P” range)	More than 8	
	“R” range switch	B55	3	Select lever in “R” range	Less than 1	—
				Select lever in any other than “R” range	More than 8	
	“D” range switch	B55	4	Select lever in “D” range	Less than 1	—
				Select lever in any other than “D” range	More than 8	
	“3” range switch	B55	5	Select lever in “3” range	Less than 1	—
				Select lever in any other than “3” range	More than 8	
	“2” range switch	B55	6	Select lever in “2” range	Less than 1	—
				Select lever in any other than “2” range	More than 8	
	“1” range switch	B55	7	Select lever in “1” range	Less than 1	—
				Select lever in any other than “1” range	More than 8	
Brake switch		B55	12	Brake pedal depressed.	More than 10.5	—
				Brake pedal released.	Less than 1	

EN(DOHC TURBO)-30

ENGINE CONDITION DATA

Engine (Diagnostics)

Check with ignition switch ON.					
Content	Con- nector No.	Termi- nal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
ABS signal	B55	21	ABS switch ON	Less than 1	—
			ABS switch OFF	6.5 — 15	
Hold switch	B55	16	Hold switch ON	Less than 1	—
			Hold switch OFF	More than 8	
Power switch	B55	23	Power switch ON	Less than 1	—
			Power switch OFF	More than 10	
Kick-down switch	B55	11	Throttle fully opened.	Less than 1	—
			Throttle fully closed.	More than 6.5	
POWER indicator light	B56	11	Light ON	Less than 1	—
			Light OFF	More than 9	
AT OIL TEMP indicator light	B56	10	Light ON	Less than 1	—
			Light OFF	More than 9	
Throttle position sensor	B54	3	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.0 — 4.6	
Throttle position sensor power supply	B54	2	Ignition switch ON (With engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B54	11	ATF temperature 20°C (68°F)	1.6 — 2.0	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	0.4 — 0.9	275 — 375
Rear vehicle speed sensor	B55	24	Vehicle stopped.	0	450 — 650
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Front vehicle speed sensor	B55	18	Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	450 — 650
Torque converter turbine speed sensor	B55	8	Engine idling after warm-up. (D range)	0	450 — 650
			Engine idling after warm-up. (N range)	More than 1 (AC range)	
Vehicle speed output signal	B56	17	Vehicle speed at most 10 km/h (6 MPH)	Less than 1← →More than 4	—
Engine speed signal	B55	17	Ignition switch ON (with engine OFF)	More than 10.5	—
			Ignition switch ON (with engine ON)	8 — 11	
Cruise set signal	B55	22	When cruise control is set (SET lamp ON)	Less than 1	—
			When cruise control is not set (SET lamp OFF)	More than 6.5	
Torque control signal 1	B56	5	Ignition switch ON (with engine ON)	4	—
Torque control signal 2	B56	14	Ignition switch ON (with engine ON)	4	—
Torque control cut signal	B55	10	Ignition switch ON	8	—
Mass air flow signal	B54	1	Engine idling after warm-up.	0.5 — 1.2	—
Shift solenoid 1	B54	22	1st or 4th gear	More than 9	10 — 16
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B54	5	1st or 2nd gear	More than 9	10 — 16
			3rd or 4th gear	Less than 1	

ENGINE CONDITION DATA

Engine (Diagnostics)

Check with ignition switch ON.					
Content	Con- nector No.	Termi- nal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Line pressure duty solenoid	B54	9	Ignition switch ON (with engine OFF) Throttle fully closed after warm-up.	1.5 — 4.0	2.0 — 4.5
			Ignition switch ON (with engine OFF) Throttle fully open after warm-up.	Less than 0.5	
Lock-up duty solenoid	B54	7	When lock up occurs.	More than 8.5	10 — 17
			When lock up is released.	Less than 0.5	
Transfer duty solenoid	B54	6	Fuse on FWD switch	More than 8.5	10 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
2-4 brake duty solenoid	B54	18	Ignition switch ON (with engine OFF) Throttle fully closed after warm-up.	1.5 — 4.0	2.0 — 4.5
			Ignition switch ON (with engine OFF) Throttle fully open after warm-up.	Less than 0.5	
2-4 brake timing solenoid	B54	16	1st gear	Less than 1	10 — 16
			3rd gear	More than 9	
Low clutch timing solenoid	B54	15	2nd gear	Less than 1	10 — 16
			4th gear	More than 9	
Sensor ground line 1	B54	20	—	0	Less than 1
Sensor ground line 2	B55	9	—	0	Less than 1
Sensor ground line 3	B54	10	—	0	Less than 1
Sensor ground line 4	B54	19	—	0	Less than 1
System ground line	B56	19	—	0	Less than 1
	B54	21			
FWD switch	B55	20	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
FWD indicator light	B56	2	Fuse ONFWD switch	Less than 1	—
			Fuse removed from FWD switch	More than 9	
Data link signal (Subaru Select Monitor)	B56	15	—	—	—
		6	—	—	

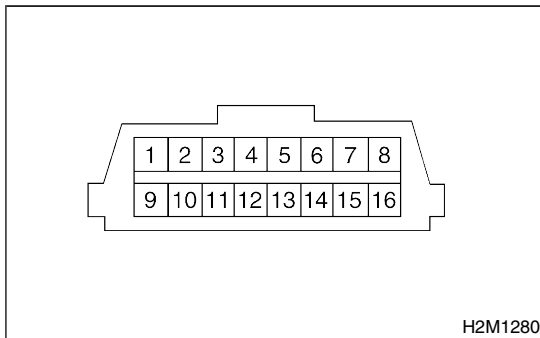
8. Data Link Connector S088505

A: NOTE S088505A15

This connector is used both for OBD-II general scan tools and the Subaru Select Monitor.

CAUTION:

Do not connect any scan tools other than the OBD-II general scan tools and the Subaru Select Monitor, because the circuit for the Subaru Select Monitor may be damaged.



Terminal No.	Contents	Terminal No.	Contents
1	Power supply	9	Blank
2	Blank	10	K line of ISO 9141 CARB
3	Blank	11	Blank
4	Blank	12	Ground
5	Blank	13	Ground
6	Line end check signal 1	14	Blank
7	Blank	15	Blank
8	Line end check signal 2	16	Blank

OBD-II GENERAL SCAN TOOL

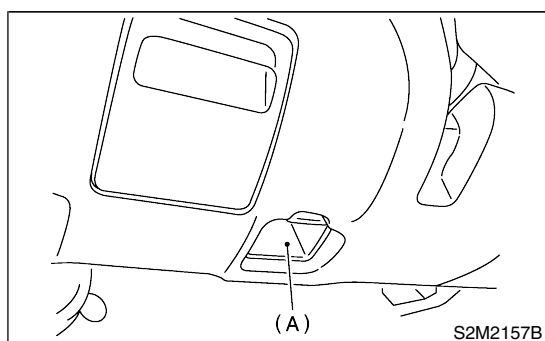
Engine (Diagnostics)

9. OBD-II General Scan Tool S088527

A: OPERATION S088527A16

1. HOW TO USE OBD-II GENERAL SCAN TOOL S088527A1601

- 1) Prepare a general scan tool (OBD-II general scan tool) required by SAE J1978.
- 2) Open the cover and connect the OBD-II general scan tool to the data link connector (A) located in the lower portion of the instrument panel (on the driver's side).



- 3) Using the OBD-II general scan tool, call up diagnostic trouble code(s) and freeze frame data. OBD-II general scan tool functions consist of:

- (1) MODE \$01: Current powertrain diagnostic data
- (2) MODE \$02: Powertrain freeze frame data
- (3) MODE \$03: Emission-related powertrain diagnostic trouble codes
- (4) MODE \$04: Clear/Reset emission-related diagnostic information

Read out data according to repair procedures. (For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.)

NOTE:

For details concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC).
<Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

2. MODE \$01 (CURRENT POWERTRAIN DIAGNOSTIC DATA) S088527A1602

Refers to data denoting the current operating condition of analog input/output, digital input/output and/or the powertrain system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
01	Number of emission-related powertrain trouble codes and MIL status	ON/OFF
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate from pressure sensor	g/sec
11	Throttle valve opening angle	%
13	Check whether oxygen sensor is installed.	—
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor—bank 2	V and %
24	A/F sensor 1 output voltage and short term fuel trim associated with A/F sensor 1	V and %
1C	On-board diagnosis system	—

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access generic OBD-II PIDs (MODE \$01).

3. MODE \$02 (POWERTRAIN FREEZE FRAME DATA) S088527A1603

Refers to data denoting the operating condition when trouble is sensed by the on-board diagnosis system. A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
02	Trouble code that caused CARB required freeze frame data storage	—
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access freeze frame data (MODE \$02).

4. MODE \$03 (EMISSION-RELATED POWERTRAIN DIAGNOSTIC TROUBLE CODE) S088527A1604

Refer to Read Diagnostic Trouble Code for information about data denoting emission-related powertrain diagnostic trouble codes. <Ref. to EN(DOHC TURBO)-43, Read Diagnostic Trouble Code.>

5. MODE \$04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION) S088527A1605

Refers to the mode used to clear or reset emission-related diagnostic information (OBD-II trouble diagnostic information).

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to clear or reset emission-related diagnostic information (MODE \$04).

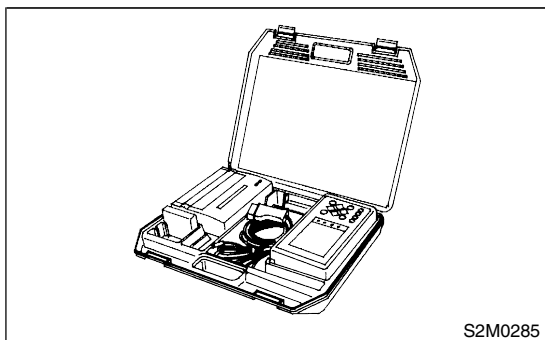
SUBARU SELECT MONITOR

10. Subaru Select Monitor S088503

A: OPERATION S088503A16

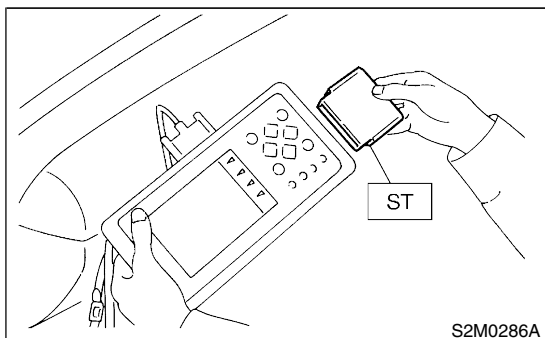
1. HOW TO USE SUBARU SELECT MONITOR S088503A1601

1) Prepare Subaru Select Monitor kit. <Ref. to EN(DOHC TURBO)-8, PREPARATION TOOL, General Description.>



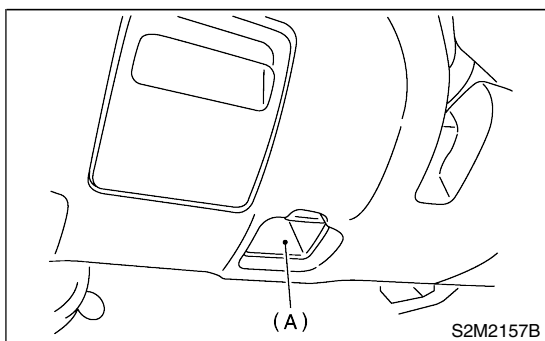
2) Connect diagnosis cable to Subaru Select Monitor.

3) Insert cartridge into Subaru Select Monitor. <Ref. to EN(DOHC TURBO)-8, PREPARATION TOOL, General Description.>



4) Connect Subaru Select Monitor to data link connector.

(1) Data link connector located (A) in the lower portion of the instrument panel (on the driver's side).

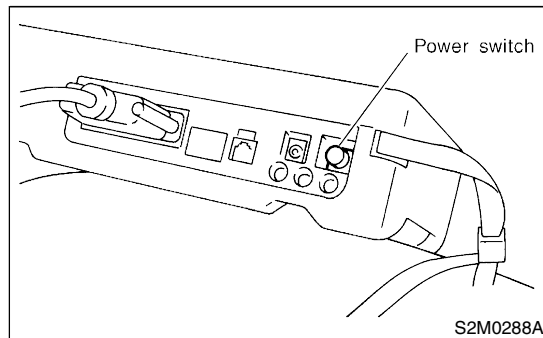


(2) Connect diagnosis cable to data link connector.

CAUTION:

Do not connect scan tools except for Subaru Select Monitor and OBD-II general scan tool.

5) Turn ignition switch to ON (engine OFF) and Subaru Select Monitor switch to ON.



6) Using Subaru Select Monitor, call up diagnostic trouble code(s) and various data, then record them.

2. READ DIAGNOSTIC TROUBLE CODE (DTC) FOR ENGINE. (NORMAL MODE)

S088503A1602

Refer to Read Diagnostic Trouble Code for information about how to indicate DTC. <Ref. to EN(DOHC TURBO)-43, Read Diagnostic Trouble Code.>

3. READ DIAGNOSTIC TROUBLE CODE (DTC) FOR ENGINE. (OBD MODE) S088503A1603

Refer to Read Diagnostic Trouble Code for information about how to indicate DTC. <Ref. to EN(DOHC TURBO)-43, Read Diagnostic Trouble Code.>

SUBARU SELECT MONITOR

Engine (Diagnostics)

4. READ CURRENT DATA FOR ENGINE. (NORMAL MODE) S088503A1604

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the «Engine Diagnosis» display screen, select the {Current Data Display & Save} and press the [YES] key.
 - 5) On the «Data Display Menu» display screen, select the {Data Display} and press the [YES] key.
 - 6) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed signal	Vehicle Speed	km/h or MPH
Engine speed signal	Engine Speed	rpm
Engine coolant temperature signal	Coolant Temp.	°C or °F
Ignition timing signal	Ignition Timing	deg
Throttle position signal	Throttle Opening Angle	%
Throttle position signal	Throttle Sensor Voltage	V
Injection pulse width	Fuel Injection #1 Pulse	ms
Idle air control signal	ISC Valve Duty Ratio	%
Alternator duty control signal	ALT Duty	%
Fuel pump duty control signal	Fuel Pump Duty	%
A/F sensor current	A/F Sensor #1 Current	mA
A/F sensor resistance	A/F Sensor #1 Resistance	Ω
Front oxygen (A/F) sensor output signal	A/F Sensor #1	—
Rear oxygen sensor output signal	Rear O2 Sensor	V
Short term fuel trim	A/F Correction #1	%
Knock sensor signal	Knocking Correction	deg
Atmospheric absolute pressure signal	Atmosphere Pressure	mmHg or kPa or inHg or psi
Intake manifold relative pressure signal	Mani. Relative Pressure	mmHg or kPa or inHg or psi
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or inHg or psi
A/F correction (short term fuel trim) by rear oxygen sensor	A/F Correction #3	%
Long term whole fuel trim	A/F Learning #1	%
Front oxygen (A/F) sensor heater current	A/F Heater Current 1	A
Rear oxygen sensor heater voltage	Rear O2 Heater Voltage	V
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Primary supercharged pressure control signal	Primary Control	%
Tumble generator valve position sensor signal (right side)	TGV Position Sensor R	V
Tumble generator valve position sensor signal (left side)	TGV Position Sensor L	V
Tumble generator valve drive signal	TGV Drive	OPEN or CLOSE
Fuel level signal	Fuel Level	V
Intake air temperature signal	Intake Air Temp.	°C or °F
Learned ignition timing	Learned Ignition Timing	deg
Mass air flow sensor signal	Mass Air Flow	g/s
Mass air flow sensor signal	Air Flow Sensor Voltage	V
Ignition switch signal	Ignition Switch	ON or OFF
Test mode connector signal	Test Mode Signal	ON or OFF
Neutral position switch signal	Neutral Position Switch	ON or OFF
Air conditioning switch signal	A/C Switch	ON or OFF
Air conditioning signal	A/C Compressor Signal	ON or OFF

SUBARU SELECT MONITOR

Engine (Diagnostics)

Contents	Display	Unit of measure
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF
Fuel pump relay signal	Fuel Pump Relay	ON or OFF
Knocking signal	Knocking Signal	ON or OFF
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF
Power steering switch signal	P/S Switch	ON or OFF
Engine torque control signal #1	Torque Control Signal #1	ON or OFF
Engine torque control signal #2	Torque Control Signal #2	ON or OFF
Engine torque control permission signal	Torque Permission Signal	ON or OFF
Rear oxygen sensor rich signal	Rear O2 Rich Signal	ON or OFF
Starter switch signal	Starter Switch	ON or OFF
Idle switch signal	Idle Switch	ON or OFF
Crankshaft position sensor signal	Crankshaft Position Sig.	ON or OFF
Camshaft position sensor signal	Camshaft Position Sig.	ON or OFF
Rear defogger switch signal	Rear Defogger SW	ON or OFF
Blower fan switch signal	Blower Fan SW	ON or OFF
Small light switch signal	Light Switch	ON or OFF
Tumble generator valve output signal	TGV Output	ON or OFF

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

SUBARU SELECT MONITOR

Engine (Diagnostics)

5. READ CURRENT DATA FOR ENGINE. (OBD MODE) S088503A1605

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
 - 5) On the «OBD Menu» display screen, select the {Current Data Display & Save} and press the [YES] key.
 - 6) On the «Data Display Menu» display screen, select the {Data Display} and press the [YES] key.
 - 7) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Number of diagnosis code	Number of Diagnosis Code	—
Malfunction indicator lamp status	MI (MIL)	Complete or incomplete
Monitoring test of misfire	Misfire monitoring	Complete or incomplete
Monitoring test of fuel system	Fuel system monitoring	Complete or incomplete
Monitoring test of comprehensive component	Component monitoring	Complete or incomplete
Test of catalyst	Catalyst Diagnosis	No support
Test of heated catalyst	Heated catalyst	No support
Test of evaporative emission purge control system	Evaporative purge system	No support
Test of secondary air system	Secondary air system	No support
Test of air conditioning system refrigerant	A/C system refrigerant	No support
Test of oxygen sensor	Oxygen sensor	Complete or incomplete
Test of oxygen sensor heater	O2 Heater Diagnosis	Complete or incomplete
Test of EGR system	EGR system	No support
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—
Engine load data	Calculated load value	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition timing adv. #1	°
Intake air temperature signal	Intake Air Temp.	°C or °F
Intake air amount	Mass Air Flow	g/s
Throttle position signal	Throttle Opening Angle	%
A/F sensor equipment	A/F sensor	ON or OFF
Rear oxygen sensor output signal	Oxygen Sensor #12	V
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%
On-board diagnostic system	OBD System	—

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

SUBARU SELECT MONITOR

Engine (Diagnostics)

6. READ FREEZE FRAME DATA FOR ENGINE. (OBD MODE) S088503A1606

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
 - 5) On the «OBD Menu» display screen, select the {Freeze Frame Data} and press the [YES] key.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Diagnostic trouble code (DTC) for freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	ON or OFF
Engine load data	Engine Load	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

7. READ OXYGEN SENSOR MONITORING TEST RESULTS DATA FOR ENGINE. (OBD MODE) S088503A1607

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
 - 5) On the «OBD Menu» display screen, select the {O2 Sensor Monitor} and press the [YES] key.
 - 6) On the «O2 Sensor Select» display screen, select the {Bank 1-Sensor1} or {Bank 1-Sensor2} and press the [YES] key.
- Bank 1-Sensor1 indicates the front oxygen or A/F sensor, and Bank 1-Sensor2 indicates the rear oxygen sensor.
 - A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Oxygen sensor for monitoring test	<O2 Sensor Monitor (-----)>	—
Rich to lean oxygen sensor threshold voltage	Rich to lean sensor volt	V
Lean to rich oxygen sensor threshold voltage	Lean to rich sensor volt	V
Low oxygen sensor voltage for switch time calculation	Low sensor voltage	V
High oxygen sensor voltage for switch time calculation	High sensor voltage	V
Rich to lean oxygen sensor switch time	Rich to lean switch time	sec
Lean to rich oxygen sensor switch time	Lean to rich switch time	sec
Maximum oxygen sensor voltage for test cycle	Maximum sensor Voltage	V
Minimum oxygen sensor voltage for test cycle	Minimum sensor Voltage	V

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

SUBARU SELECT MONITOR

Engine (Diagnostics)

8. LED OPERATION MODE FOR ENGINE S088503A1608

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the «Engine Diagnosis» display screen, select the {Current Data Display & Save} and press the [YES] key.
 - 5) On the «Data Display Menu» display screen, select the {Data & LED Display} and press the [YES] key.
 - 6) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is turned ON.
Test mode connector signal	Test Mode Signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral SW	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C SW	ON or OFF	When air conditioning switch is turned ON.
Air conditioning relay signal	A/C Relay	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF	When radiator main fan relay is in function.
Knocking signal	Knocking Signal	ON or OFF	When knocking signal is entered.
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF	When radiator sub fan relay is in function.
Engine torque control signal #1	Torque Control Signal #1	ON or OFF	When engine torque control signal 1 is entered.
Engine torque control signal #2	Torque Control Signal #2	ON or OFF	When engine torque control signal 2 is entered.
Engine torque control permission signal	Torque Control Permit	ON or OFF	When engine torque control permission signal is entered.
Rear oxygen sensor rich signal	Rear O2 Rich Signal	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Starter switch signal	Starter Switch Signal	ON or OFF	When starter switch signal is entered.
Idle switch signal	Idle Switch Signal	ON or OFF	When idle switch signal is entered.
Crankshaft position sensor signal	Crankshaft Position Sig.	ON or OFF	When crankshaft position sensor signal is entered.
Camshaft position sensor signal	Camshaft Position Sig.	ON or OFF	When camshaft position sensor signal is entered.
Power steering switch signal	P/S SW	ON or OFF	When power steering switch is entered.
Rear defogger switch signal	Rear Defogger SW	ON or OFF	When rear defogger switch is turned ON.
Blower fan switch signal	Blower Fan SW	ON or OFF	When blower fan switch is turned ON.
Light switch signal	Light SW	ON or OFF	When small light switch is turned ON.
Tumble generator valve actuator signal	TGV Signal	ON or OFF	When TGV actuator signal is entered.
Tumble generator valve drive signal	TGV Drive	ON or OFF	When TGV moves and valve opens.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

SUBARU SELECT MONITOR

Engine (Diagnostics)

9. READ CURRENT DATA FOR AT. S088503A1609

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
 - 2) On the «System Selection Menu» display screen, select the {Transmission Control System} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of transmission type.
 - 4) On the «Transmission Diagnosis» display screen, select the {Current Data Display & Save} and press the [YES] key.
 - 5) On the «Data Display Menu» display screen, select the {Data Display} and press the [YES] key.
 - 6) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Battery voltage	Battery Voltage	V
Rear vehicle speed sensor signal	Vehicle Speed #1	km/h or MPH
Front vehicle speed sensor signal	Vehicle Speed #2	km/h or MPH
Engine speed signal	Engine Speed	rpm
Automatic transmission fluid temperature signal	ATF Temp.	°C or °F
Throttle position signal	Throttle Sensor Voltage	V
Gear position	Gear Position	—
Line pressure control duty ratio	Line Pressure Duty Ratio	%
Lock up clutch control duty ratio	Lock Up Duty Ratio	%
Transfer clutch control duty ratio	Transfer Duty Ratio	%
Power supply for throttle position sensor	Throttle Sensor Power	V
Torque converter turbine speed signal	AT Turbine Speed	rpm
2-4 brake timing pressure control duty ratio	2-4B Duty Ratio	%
Intake manifold pressure sensor voltage	Mani. Pressure Voltage	V
2 wheel drive switch signal	2WD Switch	ON or OFF
Kick down switch signal	Kick Down Switch	ON or OFF
Stop lamp switch signal	Stop Lamp Switch	ON or OFF
Anti lock brake system signal	ABS Signal	ON or OFF
Cruise control system signal	Cruise Control Signal	ON or OFF
Neutral/Parking range signal	N/P Range Signal	ON or OFF
Reverse range signal	R Range Signal	ON or OFF
Drive range signal	D Range Signal	ON or OFF
3rd range signal	3rd Range Signal	ON or OFF
2nd range signal	2nd Range Signal	ON or OFF
1st range signal	1st Range Signal	ON or OFF
Shift control solenoid A	Shift Solenoid #1	ON or OFF
Shift control solenoid B	Shift Solenoid #2	ON or OFF
Torque control output signal #1	Torque Control Signal #1	ON or OFF
Torque control output signal #2	Torque Control Signal #2	ON or OFF
Torque control cut signal	Torque Control Cut Sig.	ON or OFF
2-4 brake timing control solenoid valve	2-4 Brake Timing Sol.	ON or OFF
Low clutch timing control solenoid valve	Low Clutch Timing Sol.	ON or OFF
Automatic transmission diagnosis indicator lamp	AT Diagnosis Lamp	ON or OFF

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

11. Read Diagnostic Trouble Code S088508

A: OPERATION S088508A16

1. SUBARU SELECT MONITOR (NORMAL MODE) S088508A1601

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the «Engine Diagnosis» display screen, select the {Diagnostic Code(s) Display} and press the [YES] key.
- 5) On the «Diagnostic Code(s) Display» display screen, select the {Current Diagnostic Code(s)} or {History Diagnostic Code(s)} and press the [YES] key.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For detailed concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

2. SUBARU SELECT MONITOR (OBD MODE) S088508A1602

- 1) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
- 5) On the «OBD Menu» display screen, select the {Diagnosis Code(s) Display} and press the [YES] key.
- 6) Make sure that a diagnostic trouble code (DTC) is shown on the display screen.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For detailed concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

3. OBD-II GENERAL SCAN TOOL S088508A1603

Refers to data denoting emission-related powertrain diagnostic trouble codes.

For details concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access emission-related powertrain diagnostic trouble codes (MODE \$03).

INSPECTION MODE

12. Inspection Mode S088510

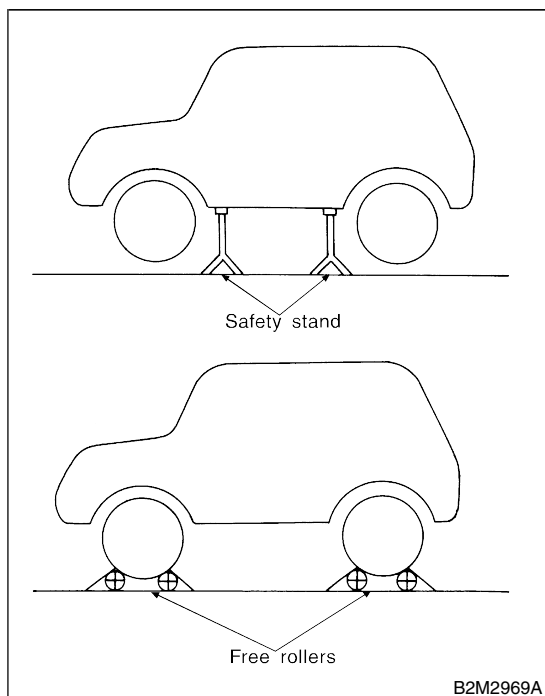
A: OPERATION S088510A16

1. PREPARATION FOR THE INSPECTION MODE S088510A1601

Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

WARNING:

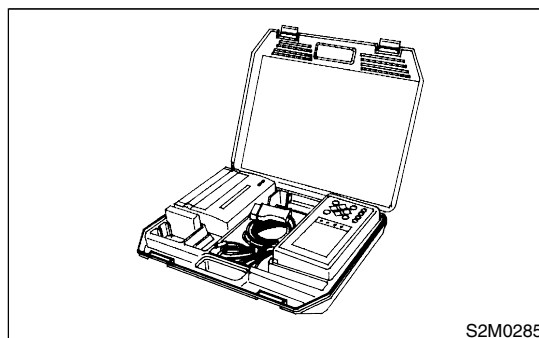
- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a safety stand.
- Secure a rope or wire to the front and rear towing or tie-down hooks to prevent the lateral runout of front wheels.
- Do not abruptly depress/release clutch pedal or accelerator pedal during works even when engine is operating at low speeds since this may cause vehicle to jump off free rollers.
- In order to prevent the vehicle from slipping due to vibration, do not place any wooden blocks or similar items between the safety stands and the vehicle.
- Since the rear wheels will also rotate, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.



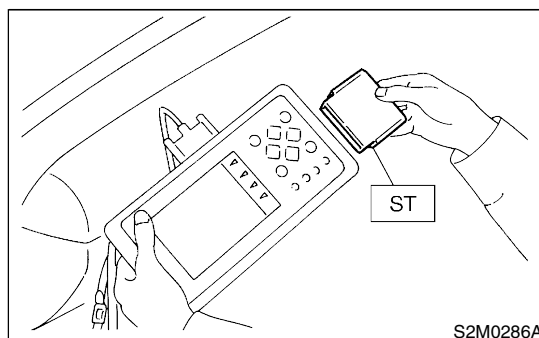
2. SUBARU SELECT MONITOR S088510A1602

After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data.

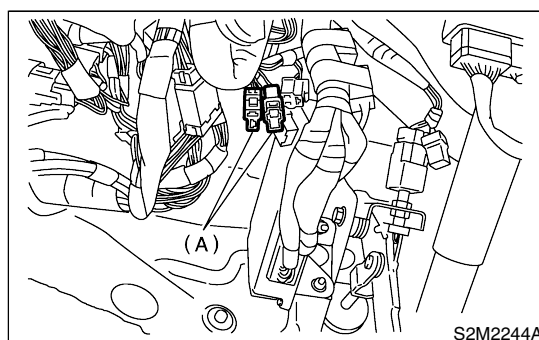
- 1) Prepare Subaru Select Monitor kit. <Ref. to EN(DOHC TURBO)-8, PREPARATION TOOL, General Description.>



- 2) Connect diagnosis cable to Subaru Select Monitor.
- 3) Insert cartridge into Subaru Select Monitor. <Ref. to EN(DOHC TURBO)-8, PREPARATION TOOL, General Description.>

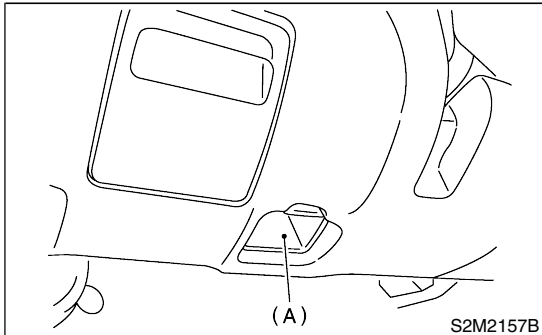


- 4) Connect test mode connector (A) at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



5) Connect Subaru Select Monitor to data link connector.

(1) Connect Subaru Select Monitor to data link connector (A) located in the lower portion of the instrument panel (on the driver's side).

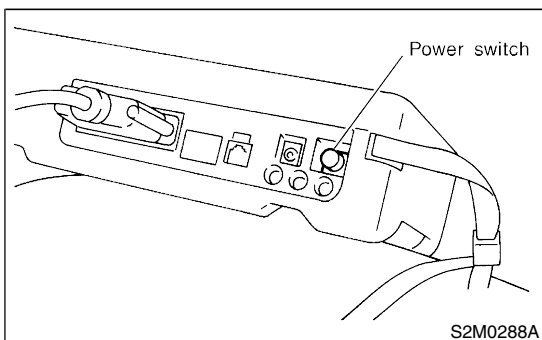


(2) Connect diagnosis cable to data link connector.

CAUTION:

Do not connect scan tools except for Subaru Select Monitor and OBD-II general scan tool.

6) Turn ignition switch to ON (engine OFF) and Subaru Select Monitor switch to ON.



7) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.

8) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.

9) Press the [YES] key after displayed the information of engine type.

10) On the «Engine Diagnosis» display screen, select the {Dealer Check Mode Procedure} and press the [YES] key.

11) When the "Perform Inspection (Dealer Check) Mode?" is shown on the display screen, press the [YES] key.

12) Perform subsequent procedures as instructed on the display screen.

● If trouble still remains in the memory, the corresponding diagnostic trouble code (DTC) appears on the display screen.

NOTE:

● For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

● For detailed concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

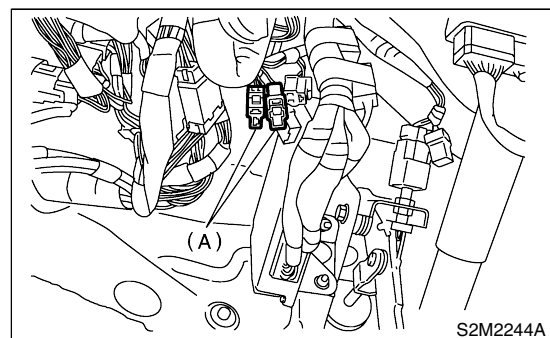
● Release the parking brake.

● The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

3. OBD-II GENERAL SCAN TOOL S088510A1603

After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data:

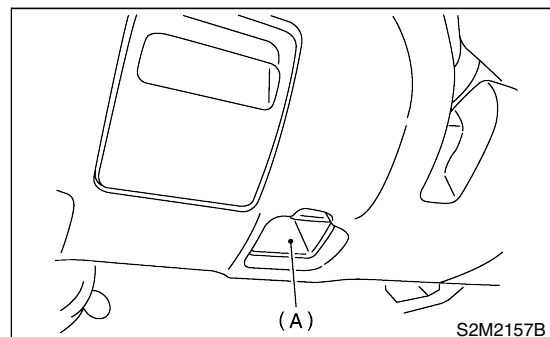
1) Connect test mode connector (A) at the lower side of the instrument panel (on the driver's side), to the side of the center console box.



2) Connect the OBD-II general scan tool to its data link connector (A) in the lower portion of the instrument panel (on the driver's side).

CAUTION:

Do not connect the scan tools except for Subaru Select Monitor and OBD-II general scan tool.



3) Start the engine.

NOTE:

● Ensure the selector lever is placed in the "P" position before starting. (AT vehicles)

INSPECTION MODE

Engine (Diagnostics)

- Depress clutch pedal when starting the engine. (MT vehicles)

4) Using the selector lever or shift lever, turn the “P” position switch and the “N” position switch to ON.

5) Depress the brake pedal to turn the brake switch ON. (AT vehicles)

6) Keep engine speed in the 2,500 — 3,000 rpm range for 40 seconds.

NOTE:

On models without tachometer, use the tachometer (Secondary pickup type).

7) Place the selector lever or shift lever in the “D” position (AT vehicles) or “1st” gear (MT vehicles) and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

NOTE:

- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

8) Using the OBD-II general scan tool, check for diagnostic trouble code(s) and record the result(s).

NOTE:

- For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.
- For detailed concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

13. Clear Memory Mode S088513

A: OPERATION S088513A16

1. SUBARU SELECT MONITOR (NORMAL MODE) S088513A1601

- 1) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the «Engine Diagnosis» display screen, select the {Clear Memory} and press the [YES] key.
- 5) When the 'Done' and 'Turn Ignition Switch OFF' are shown on the display screen, turn the Subaru Select Monitor and ignition switch to OFF.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

2. SUBARU SELECT MONITOR (OBD MODE) S088513A1602

- 1) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
- 5) On the «OBD Menu» display screen, select the {4. Diagnosis Code(s) Cleared} and press the [YES] key.
- 6) When the 'Clear Diagnostic Code?' is shown on the display screen, press the [YES] key.
- 7) Turn Subaru Select Monitor and ignition switch to OFF.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

3. OBD-II GENERAL SCAN TOOL S088513A1603

For clear memory procedures using the OBD-II general scan tool, refer to the OBD-II General Scan Tool Instruction Manual.

COMPULSORY VALVE OPERATION CHECK MODE

Engine (Diagnostics)

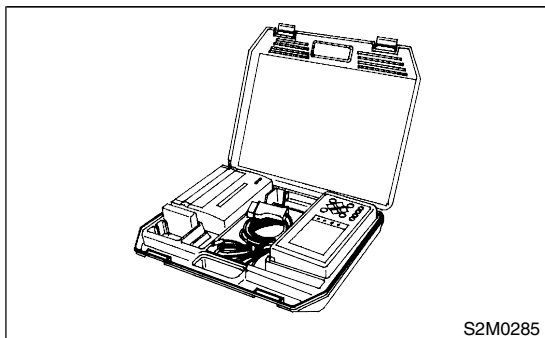
14. Compulsory Valve Operation Check Mode

S088528

A: OPERATION

S088528A16

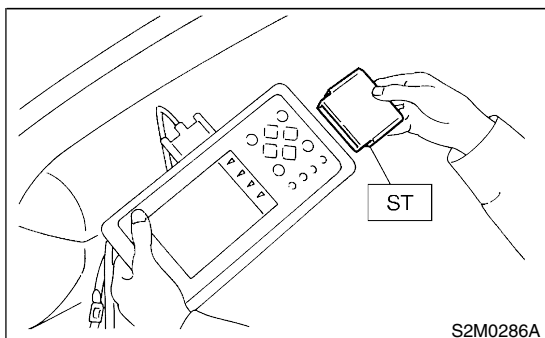
1) Prepare Subaru Select Monitor kit. <Ref. to EN(DOHC TURBO)-8, PREPARATION TOOL, General Description.>



S2M0285

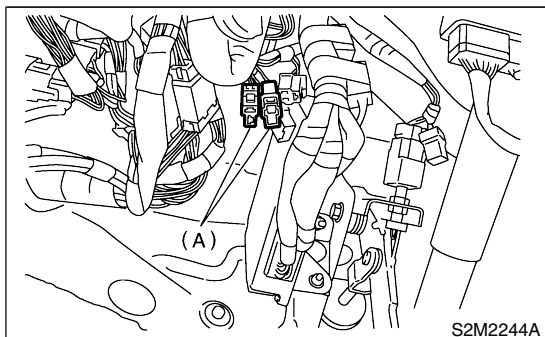
2) Connect diagnosis cable to Subaru Select Monitor.

3) Insert cartridge into Subaru Select Monitor. <Ref. to EN(DOHC TURBO)-8, PREPARATION TOOL, General Description.>



S2M0286A

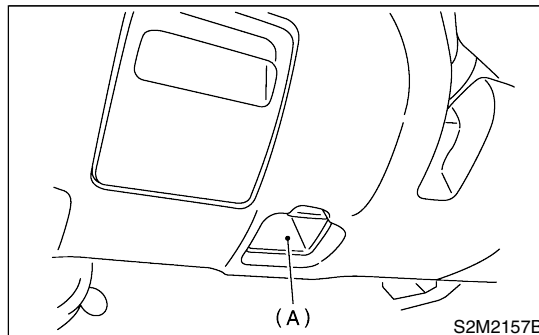
4) Connect test mode connector (A) at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



S2M2244A

5) Connect Subaru Select Monitor to data link connector.

(1) Connect Subaru Select Monitor to data link connector (A) located in the lower portion of the instrument panel (on the driver's side).



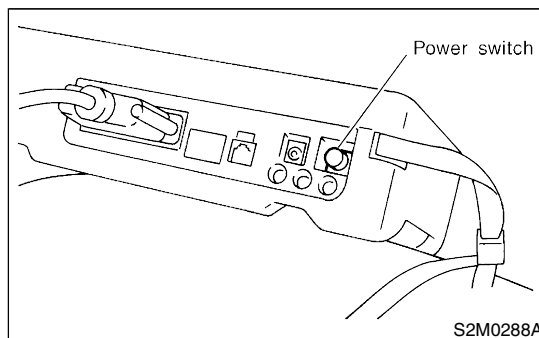
S2M2157B

(2) Connect diagnosis cable to data link connector.

CAUTION:

Do not connect scan tools except for Subaru Select Monitor and OBD-II general scan tool.

6) Turn ignition switch to ON (engine OFF) and Subaru Select Monitor switch to ON.



S2M0288A

7) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.

8) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.

9) Press the [YES] key after displayed the information of engine type.

10) On the «Engine Diagnosis» display screen, select the {System Operation Check Mode} and press the [YES] key.

11) On the «System Operation Check Mode» display screen, select the {Actuator ON/OFF Operation} and press the [YES] key.

12) Select the desired compulsory actuator on the «Actuator ON/OFF Operation» display screen and press the [YES] key.

13) Pressing the [NO] key completes the compulsory operation check mode. The display will then return to the «Actuator ON/OFF Operation» screen.

COMPULSORY VALVE OPERATION CHECK MODE

Engine (Diagnostics)

- A list of the support data is shown in the following table.

Contents	Display
Compulsory fuel pump relay operation check	Fuel Pump Relay
Compulsory radiator fan relay operation check	Radiator Fan Relay
Compulsory air conditioning relay operation check	A/C Compressor Relay
Compulsory purge control solenoid valve operation check	CPC Solenoid Valve

NOTE:

- The following parts will be displayed but not functional because they are not installed on the vehicle.

Display
EGR Solenoid Valve
ASV Solenoid Valve
PCV Solenoid Valve
Vent Control Solenoid Valve
FICD Solenoid
Pressure Switching Sol. 1
Pressure Switching Sol. 2
AAI Solenoid Valve
Fuel Tank Sensor Control Valve

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

15. Engine Malfunction Indicator Lamp (MIL) S088653

A: PROCEDURE S088653E45

1. Activation of check engine malfunction indicator lamp (MIL). <Ref. to EN(DOHC TURBO)-51, ACTIVATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL), Engine Malfunction Indicator Lamp (MIL).>
↓
2. Check engine malfunction indicator lamp (MIL) does not come on. <Ref. to EN(DOHC TURBO)-52, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON., Engine Malfunction Indicator Lamp (MIL).>
↓
3. Check engine malfunction indicator lamp (MIL) does not go off. <Ref. to EN(DOHC TURBO)-55, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT GO OFF., Engine Malfunction Indicator Lamp (MIL).>
↓
4. Check engine malfunction indicator lamp (MIL) does not blink at a cycle of 3 Hz. <Ref. to EN(DOHC TURBO)-56, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 HZ., Engine Malfunction Indicator Lamp (MIL).>
↓
5. Check engine malfunction indicator lamp (MIL) remains blinking at a cycle of 3 Hz. <Ref. to EN(DOHC TURBO)-60, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) REMAINS BLINKING AT A CYCLE OF 3 HZ., Engine Malfunction Indicator Lamp (MIL).>

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

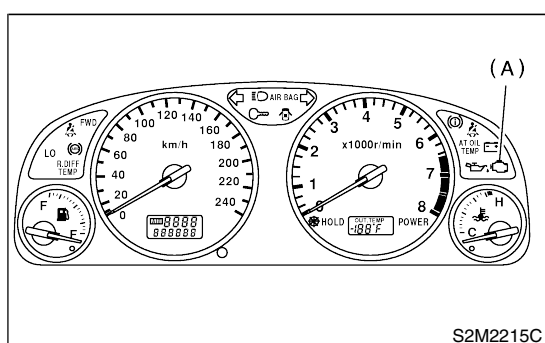
B: ACTIVATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

S088653E89

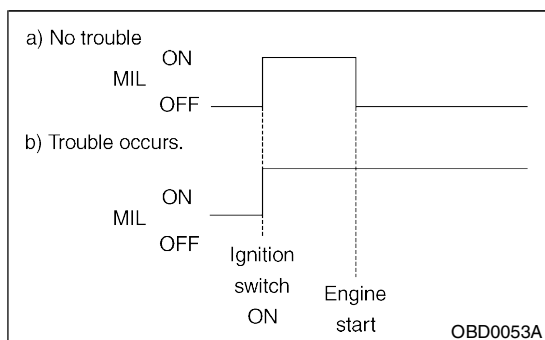
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) (A) in the combination meter illuminates.

NOTE:

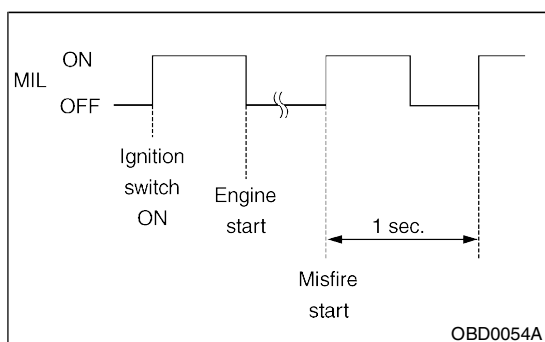
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Ref. to EN(DOHC TURBO)-52, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON., Engine Malfunction Indicator Lamp (MIL).>



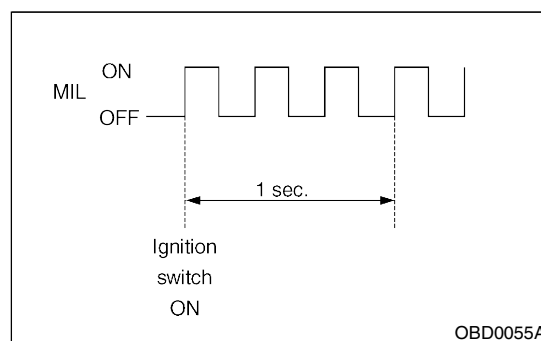
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.



3) If the diagnosis system senses a misfire which could damage the catalyzer, the MIL will blink at a cycle of 1 Hz.



4) When ignition switch is turned to ON (engine off) or to "START" with the test mode connector connected, the MIL blinks at a cycle of 3 Hz.



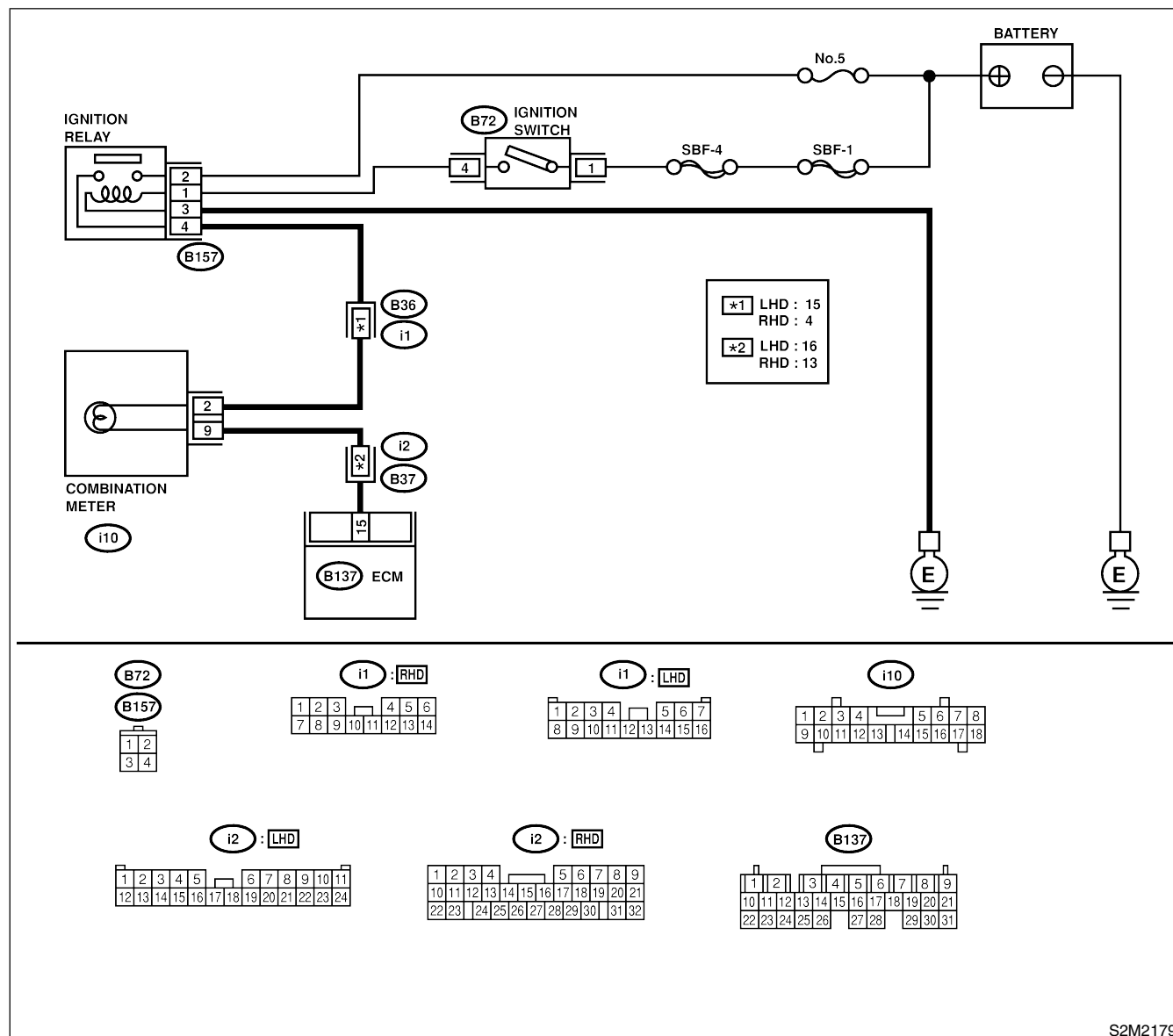
ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

C: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON.

S088653E90

- **DIAGNOSIS:**
 - The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- **TROUBLE SYMPTOM:**
 - When ignition switch is turned ON (engine OFF), MIL does not come on.
- **WIRING DIAGRAM:**



S2M2179

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector and chassis ground. <i>Connector & terminal</i> <i>(B137) No. 15 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 4.	Go to step 2.
2	CHECK POOR CONTACT.	Does the MIL come on when shaking or pulling ECM connector and harness?	Repair poor contact in ECM connector.	Go to step 3.
3	CHECK ECM CONNECTOR.	Is ECM connector correctly connected?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Repair connection of ECM connector.
4	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Remove combination meter. <Ref. to IDI-15, Combination Meter Assembly.> 3) Disconnect connector from ECM and combination meter. 4) Measure resistance of harness between ECM and combination meter connector. <i>Connector & terminal</i> <i>(B137) No. 15 — (i10) No. 9:</i>	Is resistance less than 1 Ω ?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and combination meter connector ● Poor contact in coupling connector
5	CHECK POOR CONTACT. Check poor contact in combination meter connector.	Is there poor contact in combination meter connector?	Repair poor contact in combination meter connector.	Go to step 6.

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between combination meter connector and chassis ground. Connector & terminal <i>(i10) No. 2 (+) — Chassis ground (-):</i>	Is voltage more than 10 V?	Go to step 7.	Check the following and repair if necessary. NOTE: ● Broken down ignition relay. ● Blown out fuse (No. 5). ● If replaced fuse (No. 5) blows easily, check the harness for short circuit of harness between fuse (No. 5) and ignition relay connector. ● Open or short circuit in harness between fuse (No. 5) and battery terminal ● Open circuit in harness between fuse (No. 5) and ignition relay connector ● Poor contact in ignition relay connector ● Poor contact in ignition switch connector
7	CHECK LAMP BULB. Remove engine malfunction indicator lamp bulb.	Is lamp bulb condition OK?	Repair combination meter connector.	Replace lamp bulb.

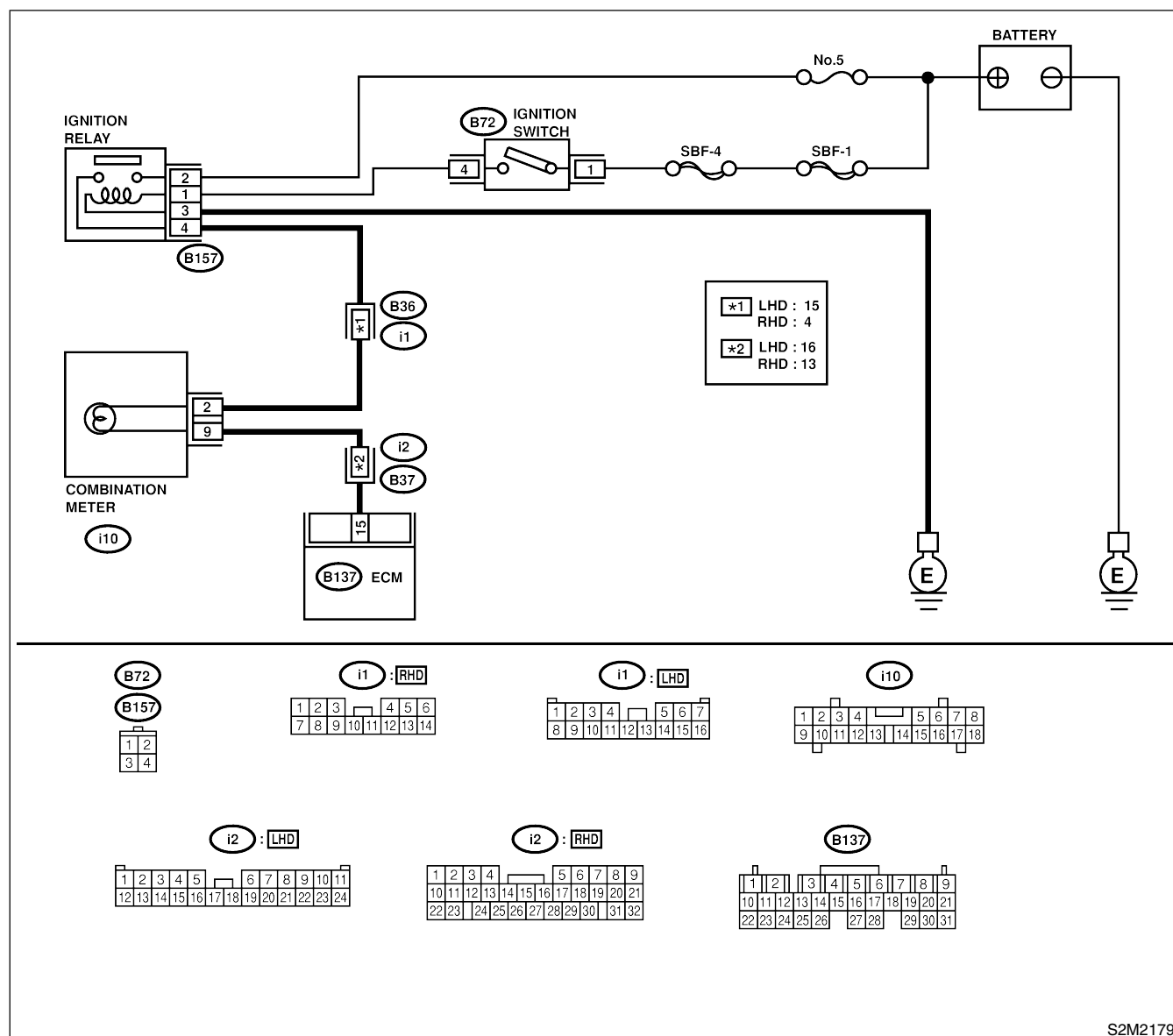
ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

D: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT GO OFF.

S088653E91

- **DIAGNOSIS:**
 - The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.
- **TROUBLE SYMPTOM:**
 - Although MIL comes on when engine runs, trouble code is not shown on Subaru select monitor or OBD-II general scan tool display.
- **WIRING DIAGRAM:**



S2M2179

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Turn ignition switch to ON.	Does the MIL come on?	Repair short circuit in harness between combination meter and ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

E: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 Hz.

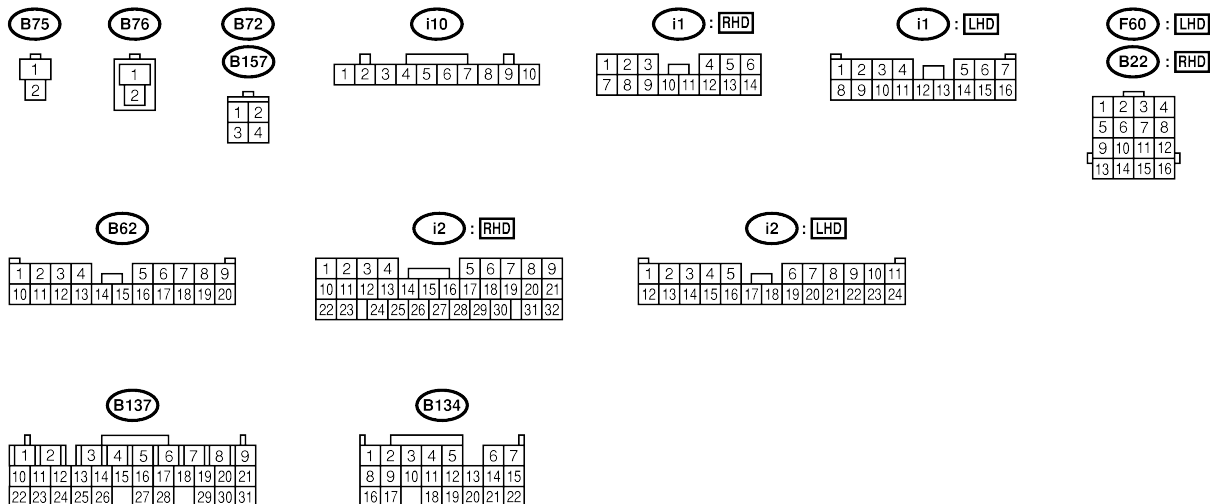
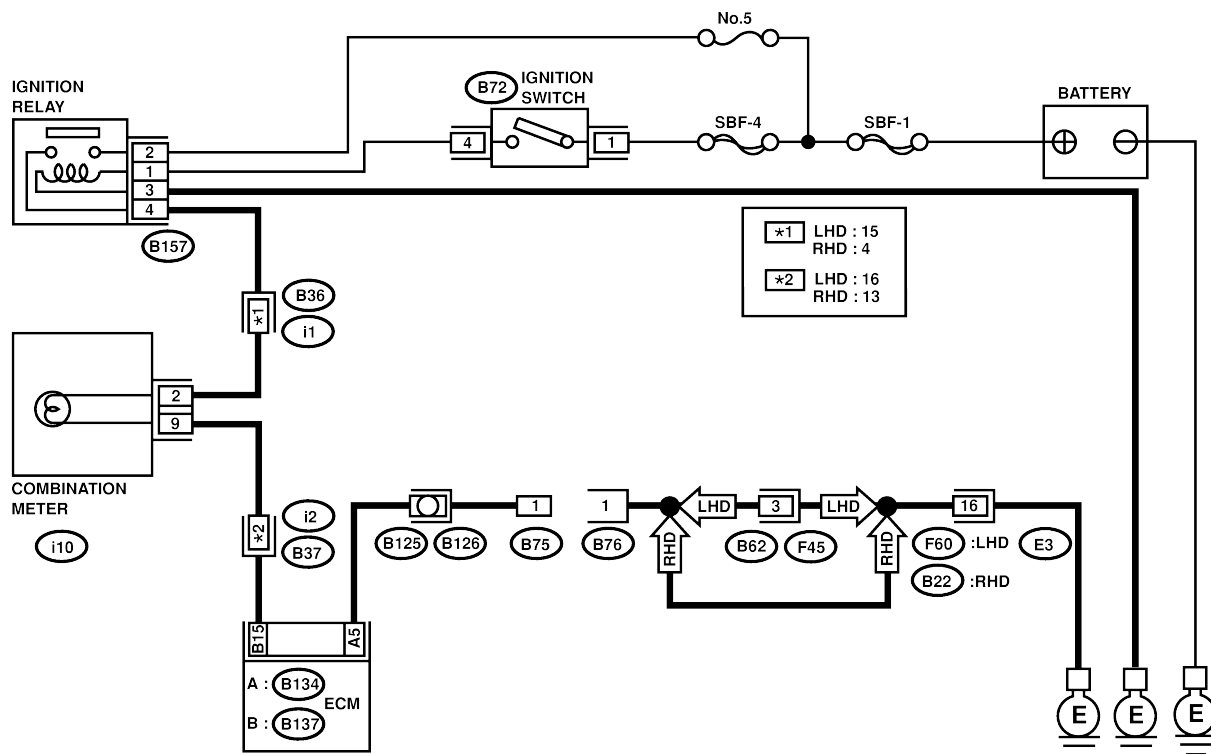
S088653E92

- **DIAGNOSIS:**
 - The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
 - Test mode connector circuit is in open.
- **TROUBLE SYMPTOM:**
 - When inspection mode, MIL does not blink at a cycle of 3 Hz.

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

● WIRING DIAGRAM:



S2M2180

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK STATUS OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL). 1) Turn ignition switch to OFF. 2) Disconnect test mode connector. 3) Turn ignition switch to ON. (engine OFF)	Does the MIL come on?	Go to step 2.	Repair the MIL circuit. <Ref. to EN(DOHC TURBO)-52, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON., Engine Malfunction Indicator Lamp (MIL).>
2	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Turn ignition switch to ON.	Does the MIL come on?	Repair ground short circuit in harness between combination meter and ECM connector.	Go to step 3.
3	CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND CHASSIS GROUND. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between test mode connector and chassis ground. Connector & terminal (B76) No. 1 — Chassis ground:	Is resistance less than 1 Ω ?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between test mode connector and chassis ground
4	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Go to step 5.
5	CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR. 1) Connect test mode connector. 2) Measure resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground:	Is resistance less than 1 Ω ?	Go to step 6.	Repair open circuit in harness between ECM and test mode connector.
6	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

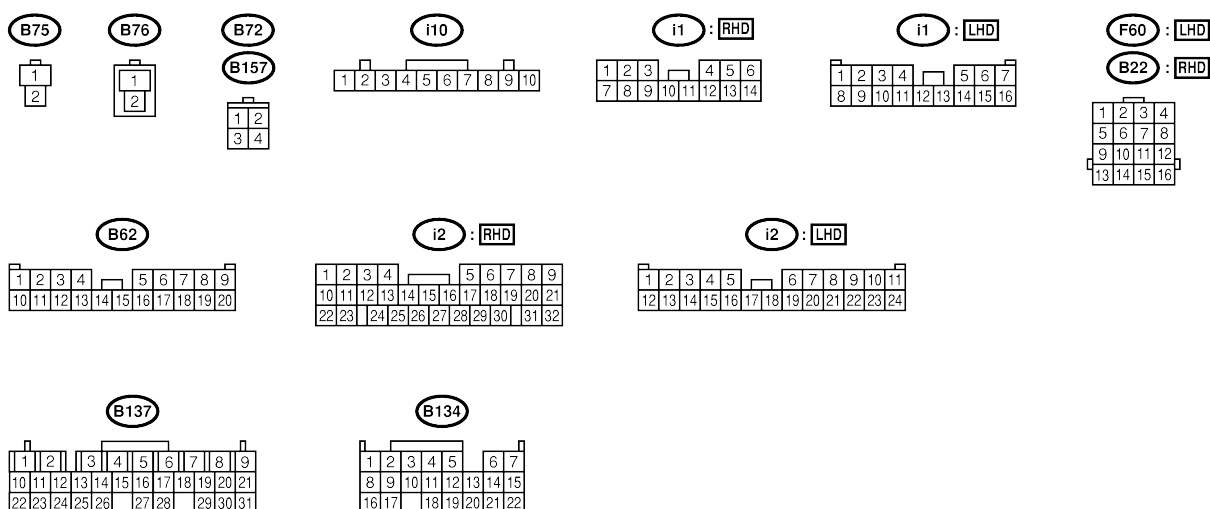
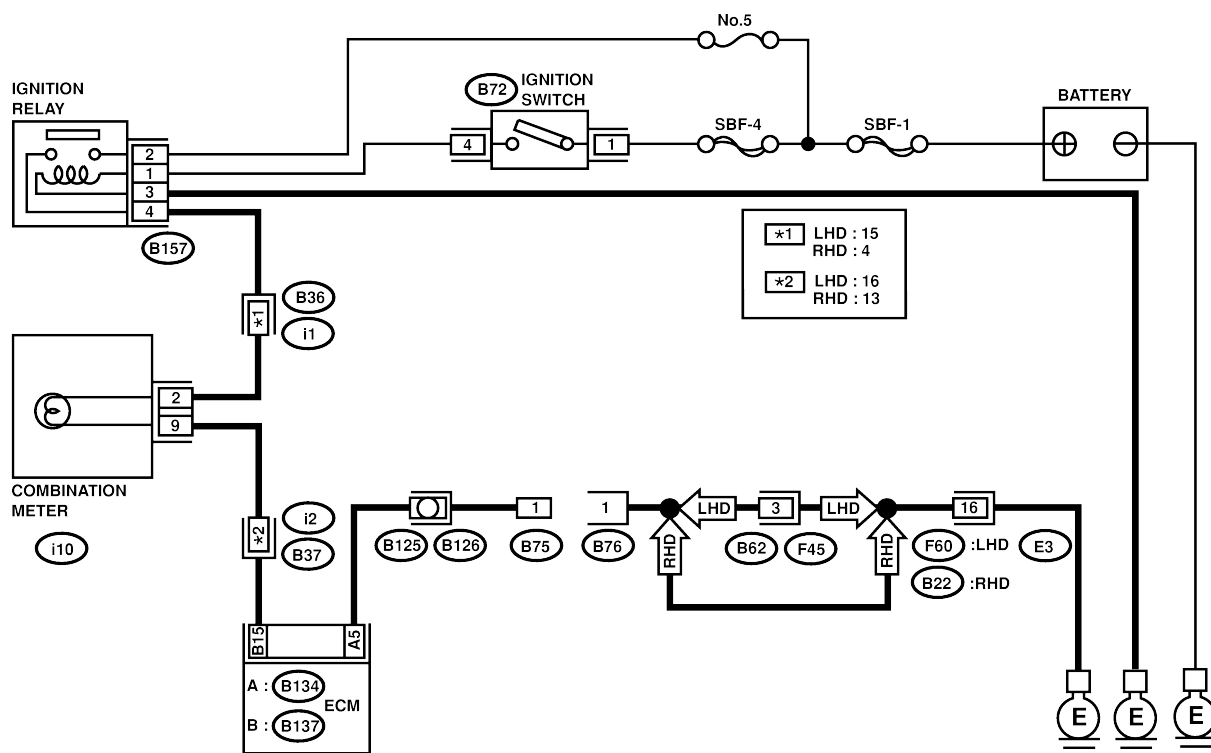
MEMO:

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

F: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) REMAINS BLINKING AT A CYCLE OF 3 Hz. S088653E93

- **DIAGNOSIS:**
 - Test mode connector circuit is shorted.
- **TROUBLE SYMPTOM:**
 - MIL blinks at a cycle of 3 Hz when ignition switch is turned to ON.
- **WIRING DIAGRAM:**



S2M2180

EN(DOHC TURBO)-60

ENGINE MALFUNCTION INDICATOR LAMP (MIL)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK TEST MODE CONNECTOR. 1) Disconnect test mode connector. 2) Turn ignition switch to ON.	Does MIL flash on and off?	Go to step 2.	System is in good order. NOTE: MIL blinks at a cycle of 3 Hz when test mode connector is connected.
2	CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUNDING TERMINAL. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground:	Is resistance less than 5 Ω ?	Repair short circuit in harness between ECM and test mode connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

MEMO:

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

16. Diagnostics for Engine Starting Failure S088533

A: PROCEDURE S088533E45

1. Inspection of starter motor circuit. <Ref. to EN(DOHC TURBO)-64, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
2. Inspection of ECM power supply and ground line. <Ref. to EN(DOHC TURBO)-68, CONTROL MODULE POWER SUPPLY AND GROUND LINE, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ignition control system. <Ref. to EN(DOHC TURBO)-72, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
4. Inspection of fuel pump circuit. <Ref. to EN(DOHC TURBO)-76, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel injector circuit. <Ref. to EN(DOHC TURBO)-78, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

EN(DOHC TURBO)-63

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

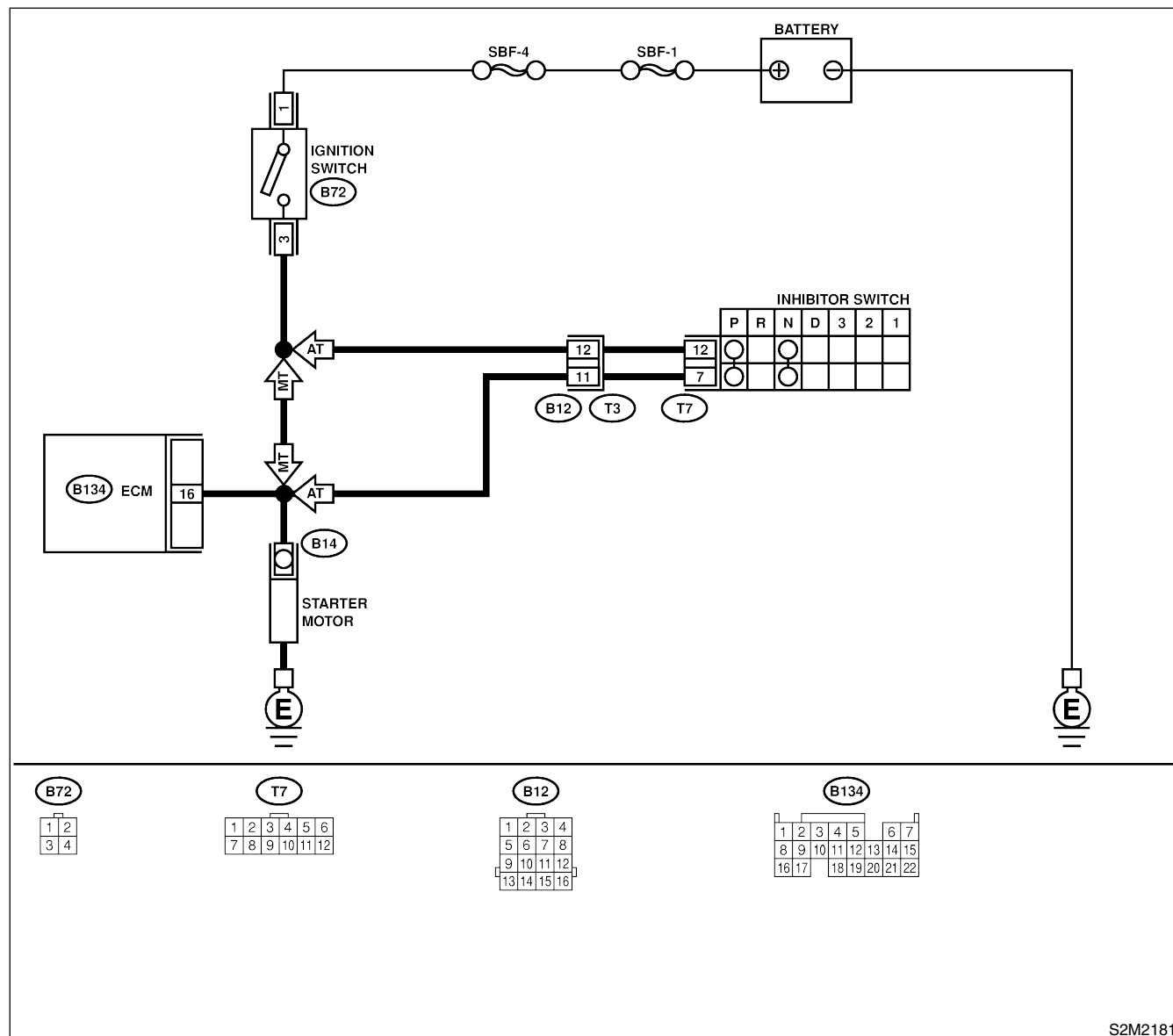
B: STARTER MOTOR CIRCUIT

S088533E94

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2181

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OPERATION OF STARTER MOTOR.	Does starter motor operate when the switch starts?	Go to step 2.	Go to step 3.
2	CHECK DTC. <Ref. to EN(DOHC TURBO)-43, OPERATION, Read Diagnostic Trouble Code.>	Is the trouble code stored in memory? <Ref. to EN(DOHC TURBO)-82, LIST, List of Diagnostic Trouble Code (DTC).>	Record DTC. Repair the trouble case. <Ref. to EN(DOHC TURBO)-90, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Go to step 3.
3	CHECK INPUT SIGNAL FOR STARTER MOTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from starter motor. 3) Turn ignition switch to ST. 4) Measure power supply voltage between starter motor connector terminal and engine ground. Connector & terminal (B14) No. 1 (+) — Engine ground (-): NOTE: On AT vehicles, place the selector lever in the "P" or "N" position.	Is the voltage more than 10 V?	Go to step 4.	Go to step 5.
4	CHECK GROUND CIRCUIT OF STARTER MOTOR. 1) Turn ignition switch to OFF. 2) Disconnect terminal from starter motor. 3) Measure resistance of ground cable between ground cable terminal and engine ground.	Is resistance less than 5 Ω?	Check starter motor. <Ref. to SC-5, Starter.>	Repair open circuit of ground cable.
5	CHECK HARNESS BETWEEN ECM AND STARTER MOTOR CIRCUIT. 1) Turn ignition switch to OFF. 2) Measure resistance between starter motor and ECM. Connector & terminal (B14) No. 1 — Engine ground:	Is resistance less than 1 Ω?	Repair ground short circuit.	Go to step 6.
6	CHECK HARNESS BETWEEN ECM AND STARTER MOTOR CIRCUIT. 1) Turn ignition switch to START. 2) Measure resistance of fuse. Connector & terminal (B14) No. 1 — Engine ground:	Is resistance less than 1 Ω?	Go to step 7.	Repair ground short circuit.
7	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR. 1) Ignition switch to OFF. 2) Disconnect connector from ignition switch. 3) Measure power supply voltage between ignition switch connector and chassis ground. Connector & terminal (B72) No. 1 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 8.	Repair open circuit in harness between ignition switch and battery.
8	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR. 1) Connect connector to ignition switch. 2) Turn ignition switch to START. 3) Measure voltage between ignition switch and chassis ground. Connector & terminal (B72) No. 3 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 9.	Replace ignition switch.

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
9	CHECK TRANSMISSION TYPE.	Is the vehicle AT?	Go to step 10.	Repair open circuit between ignition switch and starter motor circuit.
10	CHECK INHIBITOR SWITCH CIRCUIT. 1) Turn ignition switch to OFF. 2) Place the selector lever in the "P" or "N" position. 3) Separate transmission harness connector. 4) Measure resistance between transmission harness connector receptacle's terminals. Connector & terminal (T3) No. 11 — No. 12:	Is the resistance less than 1 Ω ?	Repair open circuit in harness between starter motor and ignition switch connector.	Go to step 11.
11	CHECK TRANSMISSION HARNESS. 1) Disconnect connector from inhibitor switch. 2) Measure resistance of harness between transmission harness and inhibitor switch connector. Connector & terminal (T3) No. 11 — (T7) No. 1:	Is the resistance less than 1 Ω ?	Go to step 12.	Repair open circuit in harness between transmission harness and inhibitor switch connector.
12	CHECK POOR CONTACT. Check poor contact in inhibitor switch connector.	Is there poor contact in inhibitor switch connector?	Repair poor contact in inhibitor switch connector.	Replace inhibitor switch.

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

MEMO:

EN(DOHC TURBO)-67

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

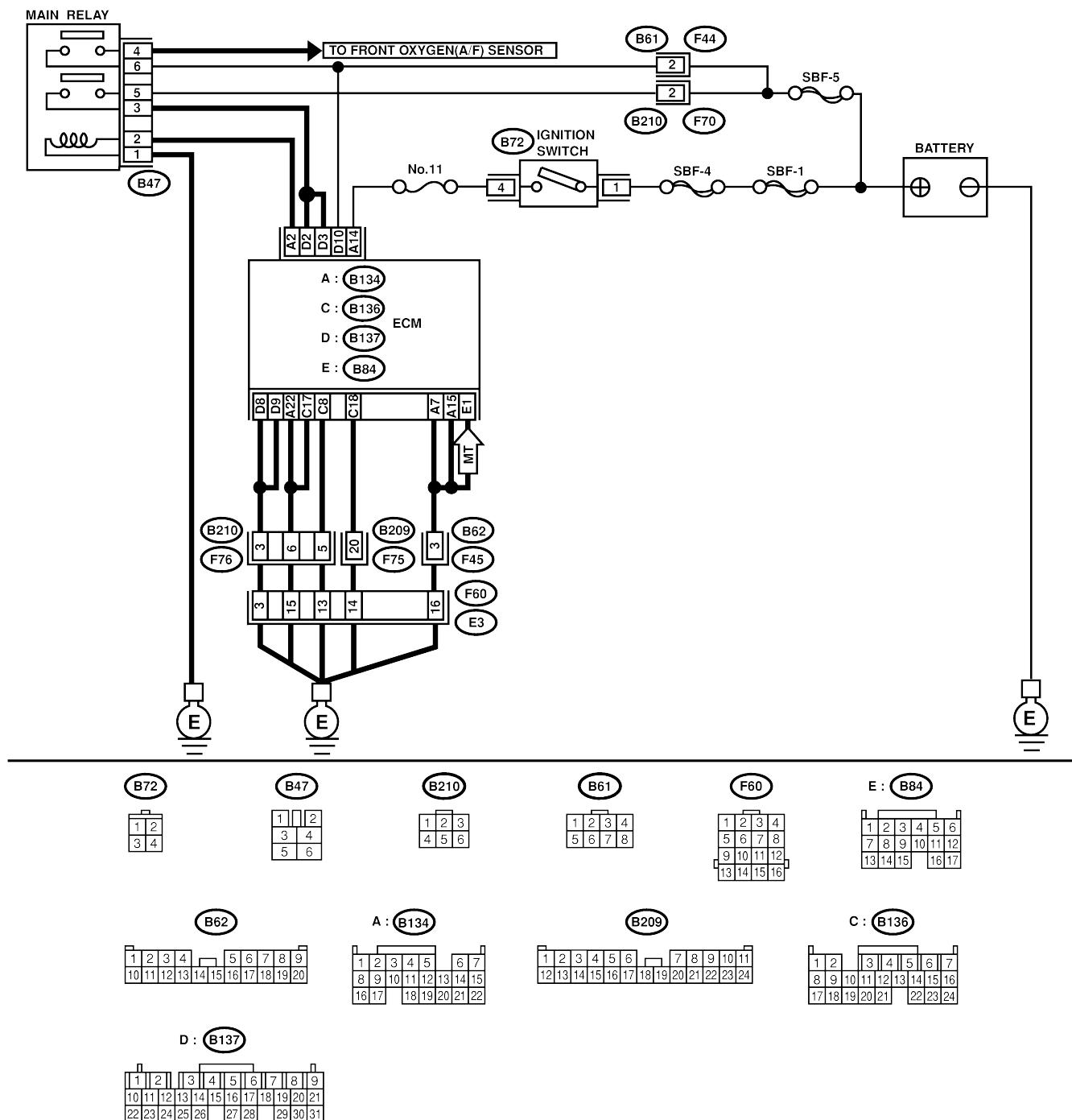
C: CONTROL MODULE POWER SUPPLY AND GROUND LINE

S088533E37

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> and INSPECTION MODE. <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>

- WIRING DIAGRAM:
- LHD MODEL



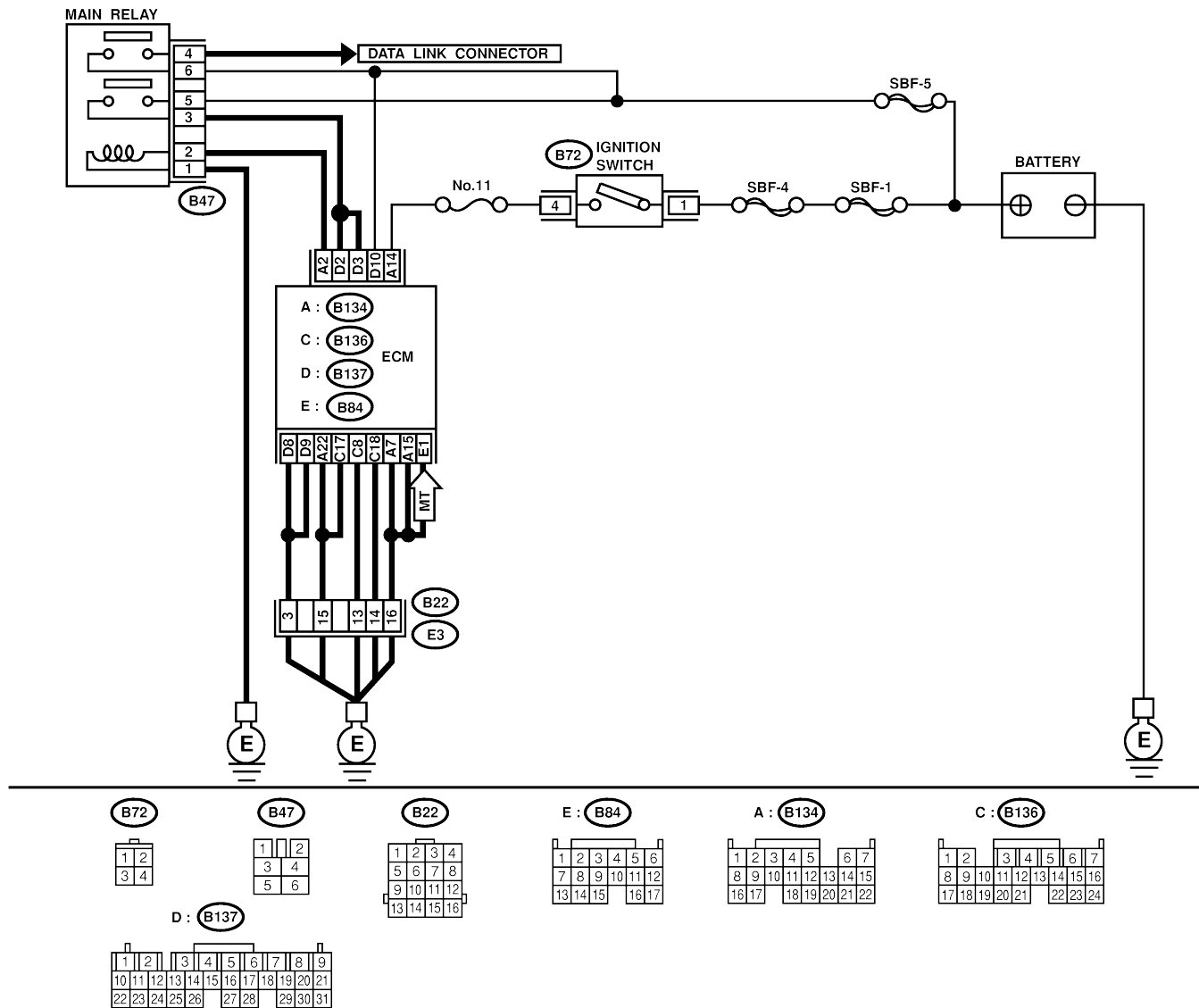
S2M2182

EN(DOHC TURBO)-68

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

● RHD MODEL



S2M2183

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK MAIN RELAY. 1) Turn the ignition switch to OFF. 2) Remove main relay. 3) Connect battery to main relay terminals No. 1 and No. 2. 4) Measure resistance between main relay terminals. Terminals No. 3 — No. 5: No. 4 — No. 6:	Is the resistance less than 10 Ω?	Go to step 2.	Replace main relay.
2	CHECK GROUND CIRCUIT OF ECM. 1) Disconnect connector from ECM. 2) Measure resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 7 — Chassis ground: (B134) No. 15 — Chassis ground: (B134) No. 22 — Chassis ground: (B136) No. 8 — Chassis ground: (B136) No. 17 — Chassis ground: (B136) No. 18 — Chassis ground: (B137) No. 8 — Chassis ground: (B137) No. 9 — Chassis ground: (B84) No. 1 — Chassis ground: (MT model)	Is the resistance less than 5 Ω?	Go to step 3.	Repair open circuit in harness between ECM connector and engine grounding terminal.
3	CHECK INPUT VOLTAGE OF ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 10 (+) — Chassis ground (-): (B134) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair open or ground short circuit of power supply circuit.
4	CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance between ECM and chassis ground. Connector & terminal (B134) No. 2 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 5.	Repair ground short circuit in harness between ECM connector and main relay connector, then replace ECM.
5	CHECK OUTPUT VOLTAGE FROM ECM. 1) Connect connector to ECM. 2) Turn ignition switch to ON. 3) Measure voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 2 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 6.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>
6	CHECK INPUT VOLTAGE OF MAIN RELAY. Check voltage between main relay connector and chassis ground. Connector & terminal (B47) No. 2 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 7.	Repair open circuit in harness between ECM connector and main relay connector.
7	CHECK GROUND CIRCUIT OF MAIN RELAY. 1) Turn ignition switch to OFF. 2) Measure resistance between main relay connector and chassis ground. Connector & terminal (B47) No. 1 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 8.	Repair open circuit between main relay and chassis ground.

EN(DOHC TURBO)-70

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
8	CHECK INPUT VOLTAGE OF MAIN RELAY. Measure voltage between main relay connector and chassis ground. Connector & terminal <i>(B47) No. 5 (+) — Chassis ground (-):</i> <i>(B47) No. 6 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 9.	Repair open or ground short circuit in harness of power supply circuit.
9	CHECK INPUT VOLTAGE OF ECM. 1) Connect main relay connector. 2) Turn ignition switch to ON. 3) Measure voltage between ECM connector and chassis ground. Connector & terminal <i>(B137) No. 2 (+) — Chassis ground (-):</i> <i>(B137) No. 3 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Check ignition control system. <Ref. to EN(DOHC TURBO)-72, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair open or ground short circuit in harness between ECM connector and main relay connector.

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

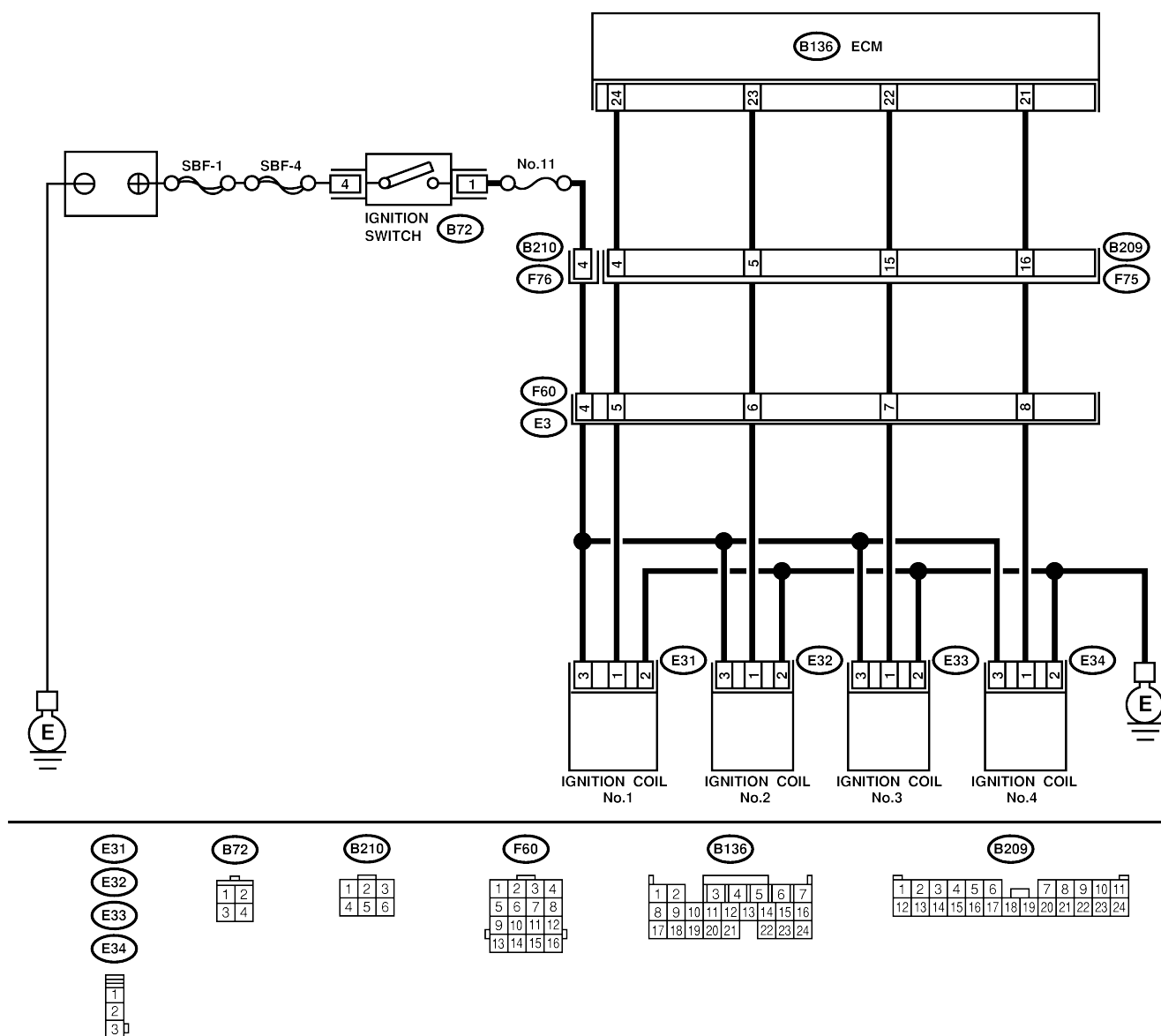
D: IGNITION CONTROL SYSTEM

S088533E95

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- WIRING DIAGRAM:
- LHD MODEL



S2M2184

EN(DOHC TURBO)-72

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

● RHD MODEL

en0962

EN0962

No.	Step	Check	Yes	No
1	CHECK SPARK PLUG CONDITION. 1) Remove spark plug. <Ref. to IG(DOHC TURBO)-4, Spark Plug.> 2) Check spark plug condition. <Ref. to IG(DOHC TURBO)-4, Spark Plug.>	Is spark plug's status OK?	Go to step 2.	Replace spark plug
2	CHECK IGNITION SYSTEM FOR SPARKS. 1) Connect spark plug to ignition coil. 2) Release fuel pressure. <Ref. to FU(DOHC TURBO)-50, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.> 3) Contact spark plug's thread portion on engine. 4) While opening throttle valve fully, crank engine to check that spark occurs at each cylinder.	Does spark occur at each cylinder?	Check fuel pump system. <Ref. to EN(DOHC TURBO)-76, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 3.

EN(DOHC TURBO)-73

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
3	CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL & IGNITOR ASSEMBLY. 1) Turn ignition switch to OFF. 2) Disconnect connector from ignition coil & ignitor assembly. 3) Turn ignition switch to ON. 4) Measure power supply voltage between ignition coil & ignitor assembly connector and engine ground. Connector & terminal <i>(E31) No. 3 (+) — Engine ground (-):</i> <i>(E32) No. 3 (+) — Engine ground (-):</i> <i>(E33) No. 3 (+) — Engine ground (-):</i> <i>(E34) No. 3 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ignition coil & ignitor assembly, and ignition switch connector ● Poor contact in coupling connectors
4	CHECK HARNESS OF IGNITION COIL & IGNITOR ASSEMBLY GROUND CIRCUIT. 1) Turn ignition switch to OFF. 2) Measure resistance between ignition coil & ignitor assembly connector and engine ground. Connector & terminal <i>(E31) No. 2 — Engine ground:</i> <i>(E32) No. 2 — Engine ground:</i> <i>(E33) No. 2 — Engine ground:</i> <i>(E34) No. 2 — Engine ground:</i>	Is the resistance between less than 5 Ω ?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ignition coil & ignitor assembly connector and engine grounding terminal
5	CHECK HARNESS BETWEEN ECM AND IGNITION COIL & IGNITOR ASSEMBLY CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Disconnect connector from ignition coil & ignitor assembly. 4) Measure resistance of harness between ECM and ignition coil & ignitor assembly connector. Connector & terminal <i>(B136) No. 21 — (E34) No. 1:</i> <i>(B136) No. 22 — (E33) No. 1:</i> <i>(B136) No. 23 — (E32) No. 1:</i> <i>(B136) No. 24 — (E31) No. 1:</i>	Is the resistance less than 1 Ω ?	Go to step 6.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and ignition coil & ignitor assembly connector ● Poor contact in coupling connector
6	CHECK HARNESS BETWEEN ECM AND IGNITION COIL & IGNITOR ASSEMBLY CONNECTOR. Measure resistance of harness between ECM and engine ground. Connector & terminal: <i>(B136) No. 21 — Engine ground:</i> <i>(B136) No. 22 — Engine ground:</i> <i>(B136) No. 23 — Engine ground:</i> <i>(B136) No. 24 — Engine ground:</i>	Is the resistance more than 1 M Ω ?	Go to step 7.	Repair ground short circuit in harness between ECM and ignition coil & ignitor assembly connector.
7	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ignition coil and ignitor assembly.

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

MEMO:

EN(DOHC TURBO)-75

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

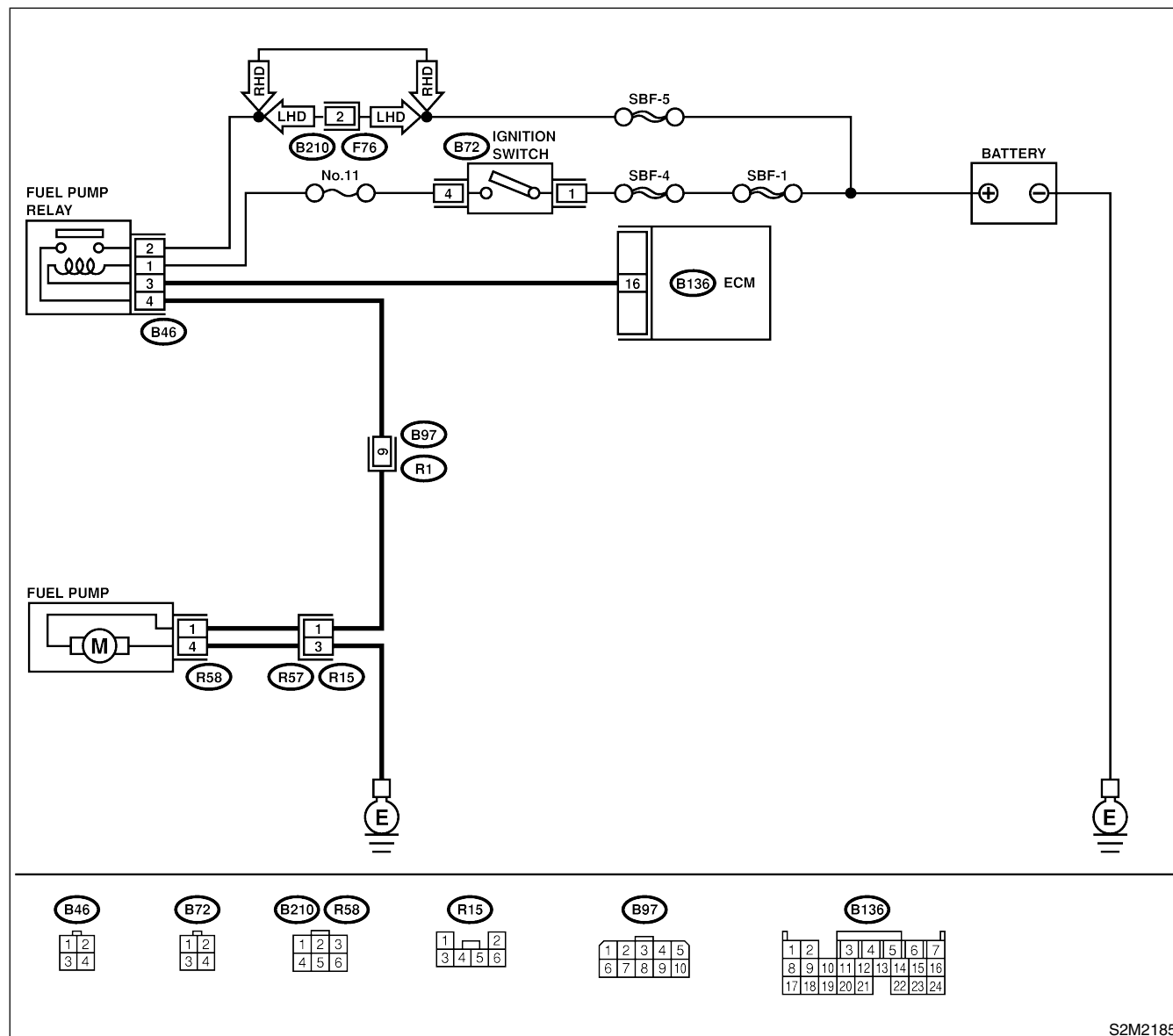
E: FUEL PUMP CIRCUIT

S088533E96

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2185

EN(DOHC TURBO)-76

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OPERATING SOUND OF FUEL PUMP. Make sure that fuel pump is in operation for two seconds when turning ignition switch to ON. NOTE: Fuel pump operation can also be executed using Subaru Select Monitor (Function mode: FD01). For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(DOHC TURBO)-48, Compulsory Valve Operation Check Mode.>	Does fuel pump produce operating sound?	Check fuel injector circuit. <Ref. to EN(DOHC TURBO)-78, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>	Record DTC. Repair the trouble case. <Ref. to EN(DOHC TURBO)-90, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

F: FUEL INJECTOR CIRCUIT S088533E97

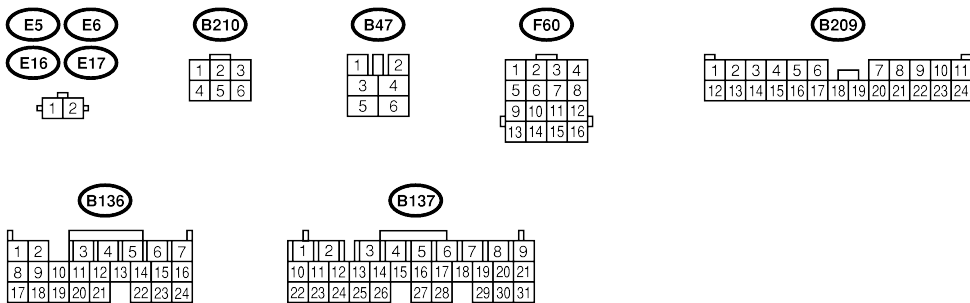
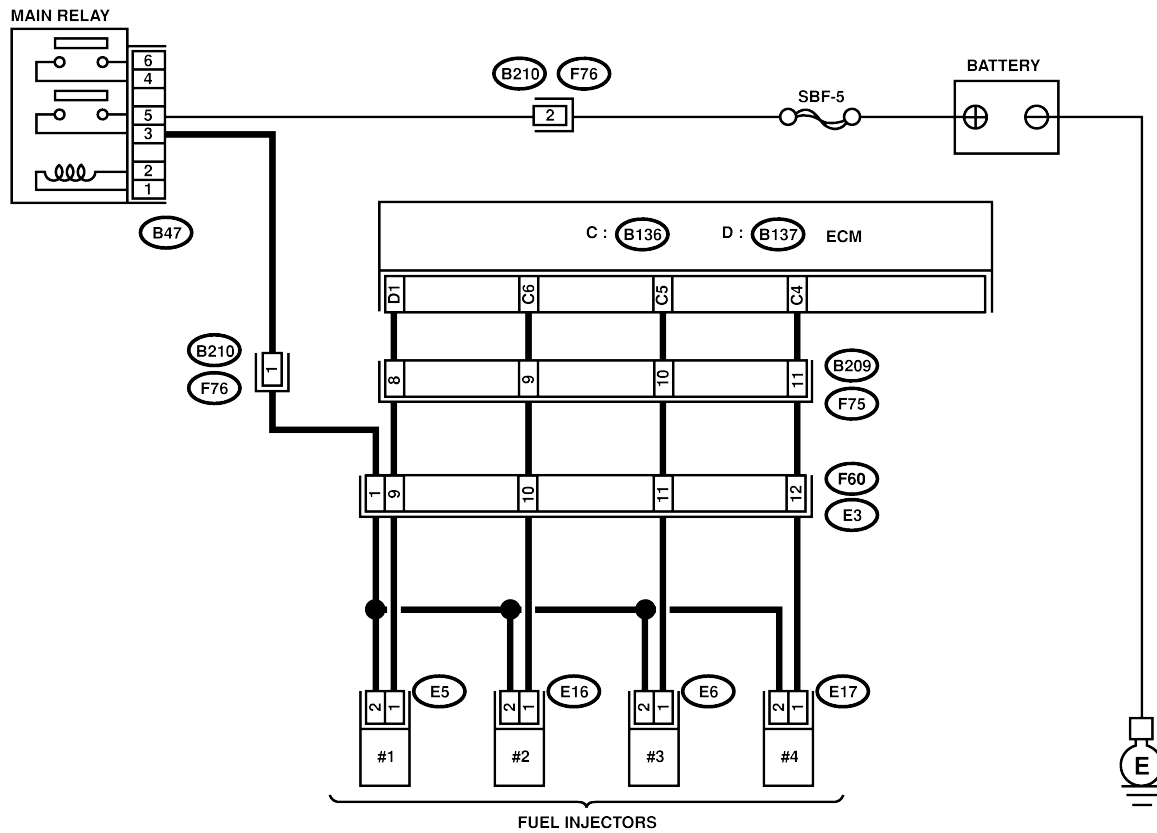
CAUTION:

- Check or repair only faulty parts.
- After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> and INSPECTION MODE. <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

- WIRING DIAGRAM:
- LHD MODEL



S2M2186

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

● RHD MODEL

en0965

EN0965

No.	Step	Check	Yes	No
1	CHECK OPERATION OF EACH FUEL INJECTOR. While cranking the engine, check that each fuel injector emits “operating” sound. Use a sound scope or attach a screwdriver to injector for this check.	Is the fuel injector emits “operating” sound?	Check fuel pressure. <Ref. to ME(DOHC TURBO)-27, INSPECTION, Fuel Pressure.>	Go to step 2.

EN(DOHC TURBO)-80

DIAGNOSTICS FOR ENGINE STARTING FAILURE

Engine (Diagnostics)

No.	Step	Check	Yes	No
2	CHECK POWER SUPPLY TO EACH FUEL INJECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from #1 cylinder fuel injector. 3) Turn ignition switch to ON. 4) Measure power supply voltage between the fuel injector terminal and engine ground. Connector & terminal #1 (E5) No. 2 (+) — Engine ground (-): #2 (E16) No. 2 (+) — Engine ground (-): #3 (E6) No. 2 (+) — Engine ground (-): #4 (E17) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 3.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between main relay and fuel injector connector ● Poor contact in main relay connector ● Poor contact in coupling connector ● Poor contact in fuel injector connector
3	CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. 1) Disconnect connector from ECM. 2) Measure resistance of harness between ECM and fuel injector connector. Connector & terminal (B137) No. 1 — (E5) No. 1: (B136) No. 6 — (E16) No. 1: (B136) No. 5 — (E6) No. 1: (B136) No. 4 — (E6) No. 1:	Is the resistance less than 1 Ω?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and fuel injector connector ● Poor contact in coupling connector
4	CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. Measure resistance of harness between ECM and fuel injector connector. Connector & terminal (B137) No. 1 — Chassis ground: (B136) No. 6 — Chassis ground: (B136) No. 5 — Chassis ground: (B136) No. 4 — Chassis ground:	Is the resistance less than 1 Ω?	Repair ground short circuit in harness between ECM and fuel injector connector.	Go to step 5.
5	CHECK EACH FUEL INJECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance between each fuel injector terminals. Terminals No. 1 — No. 2:	Is the resistance between 5 and 20 Ω?	Go to step 6.	Replace faulty fuel injector.
6	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Inspection using "General Diagnostic Table". <Ref. to EN(DOHC TURBO)-344, INSPECTION, General Diagnostic Table.>

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

17. List of Diagnostic Trouble Code (DTC)

S088525

A: LIST

S088525A12

DTC No.	Item	Index
P0031	Front oxygen (A/F) sensor heater circuit low input	<Ref. to EN(DOHC TURBO)-90, DTC P0031 — FRONT OXYGEN (A/F) SENSOR HEATER CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0032	Front oxygen (A/F) sensor heater circuit high input	<Ref. to EN(DOHC TURBO)-94, DTC P0032 — FRONT OXYGEN (A/F) SENSOR HEATER CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0037	Rear oxygen sensor heater circuit malfunction	<Ref. to EN(DOHC TURBO)-96, DTC P0037 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0038	Rear oxygen sensor heater circuit high input	<Ref. to EN(DOHC TURBO)-100, DTC P0038 — REAR OXYGEN SENSOR HEATER CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0101	Mass air flow sensor circuit range/performance problem (high input)	<Ref. to EN(DOHC TURBO)-102, DTC P0101 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0102	Mass air flow sensor circuit low input	<Ref. to EN(DOHC TURBO)-104, DTC P0102 — MASS AIR FLOW SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0103	Mass air flow sensor circuit high input	<Ref. to EN(DOHC TURBO)-108, DTC P0103 — MASS AIR FLOW SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0106	Pressure sensor circuit range/performance problem (low input)	<Ref. to EN(DOHC TURBO)-110, DTC P0106 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0107	Pressure sensor circuit low input	<Ref. to EN(DOHC TURBO)-114, DTC P0107 — PRESSURE SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0108	Pressure sensor circuit high input	<Ref. to EN(DOHC TURBO)-118, DTC P0108 — PRESSURE SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0111	Intake air temperature sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-122, DTC P0111 — INTAKE AIR TEMPERATURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0112	Intake air temperature sensor circuit low input	<Ref. to EN(DOHC TURBO)-124, DTC P0112 — INTAKE AIR TEMPERATURE SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0113	Intake air temperature sensor circuit high input	<Ref. to EN(DOHC TURBO)-126, DTC P0113 — INTAKE AIR TEMPERATURE SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0117	Engine coolant temperature sensor circuit low input	<Ref. to EN(DOHC TURBO)-130, DTC P0117 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0118	Engine coolant temperature sensor circuit high input	<Ref. to EN(DOHC TURBO)-132, DTC P0118 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0121	Throttle position sensor circuit range/performance problem (high input)	<Ref. to EN(DOHC TURBO)-136, DTC P0121 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0122	Throttle position sensor circuit low input	<Ref. to EN(DOHC TURBO)-138, DTC P0122 — THROTTLE POSITION SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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Engine (Diagnostics)

DTC No.	Item	Index
P0123	Throttle position sensor circuit high input	<Ref. to EN(DOHC TURBO)-142, DTC P0123 — THROTTLE POSITION SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0125	Insufficient coolant temperature for closed loop fuel control	<Ref. to EN(DOHC TURBO)-146, DTC P0125 — INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0131	Front oxygen (A/F) sensor circuit range/performance problem (low input)	<Ref. to EN(DOHC TURBO)-148, DTC P0131 — FRONT OXYGEN (A/F) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0132	Front oxygen (A/F) sensor circuit range/performance problem (high input)	<Ref. to EN(DOHC TURBO)-150, DTC P0132 — FRONT OXYGEN (A/F) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0133	Front oxygen (A/F) sensor circuit slow response	<Ref. to EN(DOHC TURBO)-152, DTC P0133 — FRONT OXYGEN (A/F) SENSOR CIRCUIT SLOW RESPONSE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0136	Rear oxygen sensor circuit malfunction	<Ref. to EN(DOHC TURBO)-154, DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0139	Rear oxygen sensor circuit slow response	<Ref. to EN(DOHC TURBO)-158, DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0171	Fuel trim malfunction (A/F too lean)	<Ref. to EN(DOHC TURBO)-160, DTC P0171 — FUEL TRIM MALFUNCTION (A/F TOO LEAN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0172	Fuel trim malfunction (A/F too rich)	<Ref. to EN(DOHC TURBO)-161, DTC P0172 — FUEL TRIM MALFUNCTION (A/F TOO RICH) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0244	Wastegate control solenoid valve malfunction (high input)	<Ref. to EN(DOHC TURBO)-164, DTC P0244 — WASTEGATE CONTROL SOLENOID VALVE MALFUNCTION (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0245	Wastegate control solenoid valve circuit low input	<Ref. to EN(DOHC TURBO)-166, DTC P0245 — WASTEGATE CONTROL SOLENOID VALVE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0246	Wastegate control solenoid valve circuit high input	<Ref. to EN(DOHC TURBO)-170, DTC P0246 — WASTEGATE CONTROL SOLENOID VALVE CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0301	Cylinder 1 misfire detected	<Ref. to EN(DOHC TURBO)-172, DTC P0301 — CYLINDER 1 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0302	Cylinder 2 misfire detected	<Ref. to EN(DOHC TURBO)-172, DTC P0302 — CYLINDER 2 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0303	Cylinder 3 misfire detected	<Ref. to EN(DOHC TURBO)-172, DTC P0303 — CYLINDER 3 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0304	Cylinder 4 misfire detected	<Ref. to EN(DOHC TURBO)-172, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0327	Knock sensor circuit low input	<Ref. to EN(DOHC TURBO)-182, DTC P0327 — KNOCK SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0328	Knock sensor circuit high input	<Ref. to EN(DOHC TURBO)-184, DTC P0328 — KNOCK SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0335	Crankshaft position sensor circuit malfunction	<Ref. to EN(DOHC TURBO)-186, DTC P0335 — CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

DTC No.	Item	Index
P0336	Crankshaft position sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-188, DTC P0336 — CRANKSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0340	Camshaft position sensor circuit malfunction	<Ref. to EN(DOHC TURBO)-190, DTC P0340 — CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0341	Camshaft position sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-192, DTC P0341 — CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0420	Catalyst system efficiency below threshold	<Ref. to EN(DOHC TURBO)-196, DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0444	Evaporative emission control system purge control valve circuit low input	<Ref. to EN(DOHC TURBO)-198, DTC P0444 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0445	Evaporative emission control system purge control valve circuit high input	<Ref. to EN(DOHC TURBO)-202, DTC P0445 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0461	Fuel level sensor circuit range/performance problem	<Ref. to EN(DOHC TURBO)-206, DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel level sensor circuit low input	<Ref. to EN(DOHC TURBO)-210, DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel level sensor circuit high input	<Ref. to EN(DOHC TURBO)-214, DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0464	Fuel level sensor intermittent input	<Ref. to EN(DOHC TURBO)-218, DTC P0464 — FUEL LEVEL SENSOR INTERMITTENT INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0480	Cooling fan relay 1 circuit low input	<Ref. to EN(DOHC TURBO)-222, DTC P0480 — COOLING FAN RELAY 1 CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0483	Cooling fan function problem	<Ref. to EN(DOHC TURBO)-226, DTC P0483 — COOLING FAN FUNCTION PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0500	Vehicle speed sensor malfunction	<Ref. to EN(DOHC TURBO)-230, DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0506	Idle control system RPM lower than expected	<Ref. to EN(DOHC TURBO)-232, DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0507	Idle control system RPM higher than expected	<Ref. to EN(DOHC TURBO)-234, DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0508	Idle control system circuit low input	<Ref. to EN(DOHC TURBO)-236, DTC P0508 — IDLE CONTROL SYSTEM CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0509	Idle control system circuit high input	<Ref. to EN(DOHC TURBO)-238, DTC P0509 — IDLE CONTROL SYSTEM CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0512	Starter switch circuit high input	<Ref. to EN(DOHC TURBO)-240, DTC P0512 — STARTER SWITCH CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0513	Incorrect immobilizer key	<Ref. to IM-34, DTC P0153 — INCORRECT IMMOBILIZER KEY (USE OF UNREGISTERED KEY) —, Diagnostics Chart with Trouble Code.>

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DTC No.	Item	Index
P0545	Exhaust gas temperature sensor circuit low input	<Ref. to EN(DOHC TURBO)-242, DTC P0545 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0546	Exhaust gas temperature sensor circuit high input	<Ref. to EN(DOHC TURBO)-244, DTC P0546 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0604	Internal control module memory check sum error	<Ref. to EN(DOHC TURBO)-248, DTC P0604 — INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0703	Brake switch input malfunction	<Ref. to EN(DOHC TURBO)-252, DTC P0703 — BRAKE SWITCH INPUT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0705	Transmission range sensor circuit malfunction	<Ref. to AT-122, CHECK INHIBITOR SWITCH., Diagnostic Procedure for No-trouble Code.>
P0710	Transmission fluid temperature sensor circuit malfunction	<Ref. to AT-46, TROUBLE CODE 27 — ATF TEMPERATURE SENSOR —, Diagnostic Procedure with Trouble Code.>
P0715	Torque converter turbine speed sensor circuit malfunction	<Ref. to AT-64, TROUBLE CODE 36 — TORQUE CONVERTER TURBINE SPEED SENSOR —, Diagnostic Procedure with Trouble Code.>
P0720	Output speed sensor (vehicle speed sensor 2) circuit malfunction	<Ref. to AT-58, TROUBLE CODE 33 — FRONT VEHICLE SPEED SENSOR —, Diagnostic Procedure with Trouble Code.>
P0725	Engine speed input circuit malfunction	<Ref. to AT-42, TROUBLE CODE 11 — ENGINE SPEED SIGNAL —, Diagnostic Procedure with Trouble Code.>
P0731	Gear 1 incorrect ratio	<Ref. to EN(DOHC TURBO)-254, DTC P0731 — GEAR 1 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0732	Gear 2 incorrect ratio	<Ref. to EN(DOHC TURBO)-254, DTC P0732 — GEAR 2 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0733	Gear 3 incorrect ratio	<Ref. to EN(DOHC TURBO)-254, DTC P0733 — GEAR 3 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0734	Gear 4 incorrect ratio	<Ref. to EN(DOHC TURBO)-255, DTC P0734 — GEAR 4 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0741	Torque converter clutch system malfunction	<Ref. to EN(DOHC TURBO)-256, DTC P0741 — TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0743	Torque converter clutch system (Lock-up duty solenoid) electrical	<Ref. to AT-96, TROUBLE CODE 77 — LOCK-UP DUTY SOLENOID —, Diagnostic Procedure with Trouble Code.>
P0748	Pressure control solenoid (Line pressure duty solenoid) electrical	<Ref. to AT-88, TROUBLE CODE 75 — LINE PRESSURE DUTY SOLENOID —, Diagnostic Procedure with Trouble Code.>
P0753	Shift solenoid A (Shift solenoid 1) electrical	<Ref. to AT-72, TROUBLE CODE 71 — SHIFT SOLENOID 1 —, Diagnostic Procedure with Trouble Code.>
P0758	Shift solenoid B (Shift solenoid 2) electrical	<Ref. to AT-76, TROUBLE CODE 72 — SHIFT SOLENOID 2 —, Diagnostic Procedure with Trouble Code.>
P0778	2-4 brake pressure control solenoid valve circuit malfunction	<Ref. to AT-92, TROUBLE CODE 76 — 2- BRAKE DUTY SOLENOID —, Diagnostic Procedure with Trouble Code.>
P0785	2-4 brake timing control solenoid valve circuit malfunction	<Ref. to AT-84, TROUBLE CODE 74 — 2-4 BRAKE TIMING SOLENOID —, Diagnostic Procedure with Trouble Code.>
P1086	Tumble generator valve #2 (LH) position sensor circuit low input	<Ref. to EN(DOHC TURBO)-258, DTC P1086 — TUMBLE GENERATOR VALVE #2 (LH) POSITION SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1087	Tumble generator valve #2 (LH) position sensor circuit high input	<Ref. to EN(DOHC TURBO)-262, DTC P1087 — TUMBLE GENERATOR VALVE #2 (LH) POSITION SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1088	Tumble generator valve #1 (RH) position sensor circuit low input	<Ref. to EN(DOHC TURBO)-266, DTC P1088 — TUMBLE GENERATOR VALVE #1 (RH) POSITION SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

DTC No.	Item	Index
P1089	Tumble generator valve #1 (RH) position sensor circuit high input	<Ref. to EN(DOHC TURBO)-270, DTC P1089 — TUMBLE GENERATOR VALVE #1 (RH) POSITION SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1090	Tumble generator valve #1(RH) malfunction (stuck open)	<Ref. to EN(DOHC TURBO)-273, DTC P1090 — TUMBLE GENERATOR VALVE SYSTEM #1 (RH) MALFUNCTION (STUCK OPEN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1091	Tumble generator valve #1(RH) malfunction (stuck close)	<Ref. to EN(DOHC TURBO)-274, DTC P1091 — TUMBLE GENERATOR VALVE SYSTEM #1 (RH) MALFUNCTION (STUCK CLOSE) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1092	Tumble generator valve #2(LH) malfunction (stuck open)	<Ref. to EN(DOHC TURBO)-275, DTC P1092 — TUMBLE GENERATOR VALVE SYSTEM #2 (LH) MALFUNCTION (STUCK OPEN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1093	Tumble generator valve #2(LH) malfunction (stuck close)	<Ref. to EN(DOHC TURBO)-276, DTC P1093 — TUMBLE GENERATOR VALVE SYSTEM #2 (LH) MALFUNCTION (STUCK CLOSE) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1094	Tumble generator valve circuit #1 (opencircuit)	<Ref. to EN(DOHC TURBO)-278, DTC P1094 — TUMBLE GENERATOR VALVE CIRCUIT #1 (OPEN CIRCUIT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1095	Tumble generator valve circuit #1 (overcurrent)	<Ref. to EN(DOHC TURBO)-280, DTC P1095 — TUMBLE GENERATOR VALVE CIRCUIT #1 (OVERCURRENT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1096	Tumble generator valve circuit #2 (opencircuit)	<Ref. to EN(DOHC TURBO)-282, DTC P1096 — TUMBLE GENERATOR VALVE CIRCUIT #2 (OPEN CIRCUIT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1097	Tumble generator valve circuit #2 (overcurrent)	<Ref. to EN(DOHC TURBO)-284, DTC P1097 — TUMBLE GENERATOR VALVE CIRCUIT #2 (OVERCURRENT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1110	Atmospheric pressure sensor low input	<Ref. to EN(DOHC TURBO)-286, DTC P1110 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1111	Atmospheric pressure sensor high input	<Ref. to EN(DOHC TURBO)-286, DTC P1111 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1112	Atmospheric pressure sensor range/performance problem	<Ref. to EN(DOHC TURBO)-287, DTC P1112 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1130	Front oxygen sensor circuit malfunction (open circuit)	<Ref. to EN(DOHC TURBO)-288, DTC P1130 — FRONT OXYGEN (A/F) SENSOR CIRCUIT MALFUNCTION (OPEN CIRCUIT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1131	Front oxygen sensor circuit malfunction (short circuit)	<Ref. to EN(DOHC TURBO)-290, DTC P1131 — FRONT OXYGEN (A/F) SENSOR CIRCUIT MALFUNCTION (SHORT CIRCUIT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1134	Front oxygen (A/F) sensor micro-computer problem	<Ref. to EN(DOHC TURBO)-292, DTC P1134 — FRONT OXYGEN (A/F) SENSOR MICRO-COMPUTER PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1139	Front oxygen (A/F) sensor #1 heater circuit performance/range problem	<Ref. to EN(DOHC TURBO)-294, DTC P1139 — FRONT OXYGEN (A/F) SENSOR #1 HEATER CIRCUIT RANGE/PERFORMANCE PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1141	Mass air flow sensor circuit range/performance problem (low input)	<Ref. to EN(DOHC TURBO)-296, DTC P1141 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1142	Throttle position sensor circuit range/performance problem (low input)	<Ref. to EN(DOHC TURBO)-298, DTC P1142 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1146	Pressure sensor circuit range/performance problem (high input)	<Ref. to EN(DOHC TURBO)-300, DTC P1146 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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Engine (Diagnostics)

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P1230	Fuel pump control unit malfunction	<Ref. to EN(DOHC TURBO)-xx, DTC P1230 — FUEL PUMP CONTROLLER MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1244	Wastegate control solenoid valve malfunction (low input)	<Ref. to EN(DOHC TURBO)-304, DTC P1244 — WASTEGATE CONTROL SOLENOID VALVE RANGE/PERFORMANCE PROBLEM (LOW INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1245	Wastegate control solenoid valve malfunction (fail-safe)	<Ref. to EN(DOHC TURBO)-306, DTC P1245 — WASTEGATE CONTROL SOLENOID VALVE MALFUNCTION (FAIL-SAFE) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1301	Fire due to increased exhaust temperature	<Ref. to EN(DOHC TURBO)-308, DTC P1301 — FIRE DUE TO INCREASED EXHAUST TEMPERATURE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1312	Exhaust temperature sensor malfunction	<Ref. to EN(DOHC TURBO)-310, DTC P1312 — EXHAUST GAS TEMPERATURE CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1480	Cooling fan relay 1 circuit high input	<Ref. to EN(DOHC TURBO)-312, DTC P1480 — COOLING FAN RELAY 1 CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1507	Idle control system malfunction (fail-safe)	<Ref. to EN(DOHC TURBO)-316, DTC P1507 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1518	Starter switch circuit low input	<Ref. to EN(DOHC TURBO)-318, DTC P1518 — STARTER SWITCH CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1544	High exhaust temperature detected	<Ref. to EN(DOHC TURBO)-320, DTC P1544 — HIGH EXHAUST TEMPERATURE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1560	Back-up voltage circuit malfunction	<Ref. to EN(DOHC TURBO)-322, DTC P1560 — BACK-UP VOLTAGE CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1570	Antenna	<Ref. to IM-35, DTC P1570 — ANTENNA —, Diagnostics Chart with Trouble Code.>
P1571	Reference code incompatibility	<Ref. to IM-26, DTC P1571 — REFERENCE CODE INCOMPATIBILITY —, Diagnostics Chart with Trouble Code.>
P1572	IMM circuit failure except antenna circuit	<Ref. to IM-27, DTC P1572 — IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT) —, Diagnostics Chart with Trouble Code.>
P1574	Key communication failure	<Ref. to IM-33, DTC P1574 — KEY COMMUNICATION FAILURE —, Diagnostics Chart with Trouble Code.>
P1576	EGI control module EEPROM	<Ref. to IM-34, DTC P1576 — EGI CONTROL MODULE EEPROM —, Diagnostics Chart with Trouble Code.>
P1577	IMM control module EEPROM	<Ref. to IM-34, DTC P1577 — IMM CONTROL MODULE EEPROM —, Diagnostics Chart with Trouble Code.>
P1590	Neutral position switch circuit high input (AT model)	<Ref. to EN(DOHC TURBO)-326, DTC P1590 — NEUTRAL POSITION SWITCH CIRCUIT HIGH INPUT (AT MODEL) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1591	Neutral position switch circuit low input (AT model)	<Ref. to EN(DOHC TURBO)-330, DTC P1591 — NEUTRAL POSITION SWITCH CIRCUIT LOW INPUT (AT MODEL) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1594	Automatic transmission diagnosis input signal circuit malfunction	<Ref. to EN(DOHC TURBO)-332, DTC P1594 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1595	Automatic transmission diagnosis input signal circuit low input	<Ref. to EN(DOHC TURBO)-334, DTC P1595 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

DTC No.	Item	Index
P1596	Automatic transmission diagnosis input signal circuit high input	<Ref. to EN(DOHC TURBO)-336, DTC P1596 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1700	Throttle position sensor circuit malfunction for automatic transmission	<Ref. to AT-50, TROUBLE CODE 31 — THROTTLE POSITION SENSOR —, Diagnostic Procedure with Trouble Code.>
P1701	Cruise control set signal circuit malfunction for automatic transmission	<Ref. to EN(DOHC TURBO)-338, DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1703	Low clutch timing control solenoid valve circuit malfunction	<Ref. to AT-80, TROUBLE CODE 73 — LOW CLUTCH TIMING SOLENOID —, Diagnostic Procedure with Trouble Code.>
P1711	Engine torque control signal 1 circuit malfunction	<Ref. to EN(DOHC TURBO)-340, DTC P1711 — ENGINE TORQUE CONTROL SIGNAL 1 CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1712	Engine torque control signal 2 circuit malfunction	<Ref. to EN(DOHC TURBO)-342, DTC P1712 — ENGINE TORQUE CONTROL SIGNAL 2 CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

18. Diagnostic Procedure with Diagnostic Trouble Code (DTC) S088521

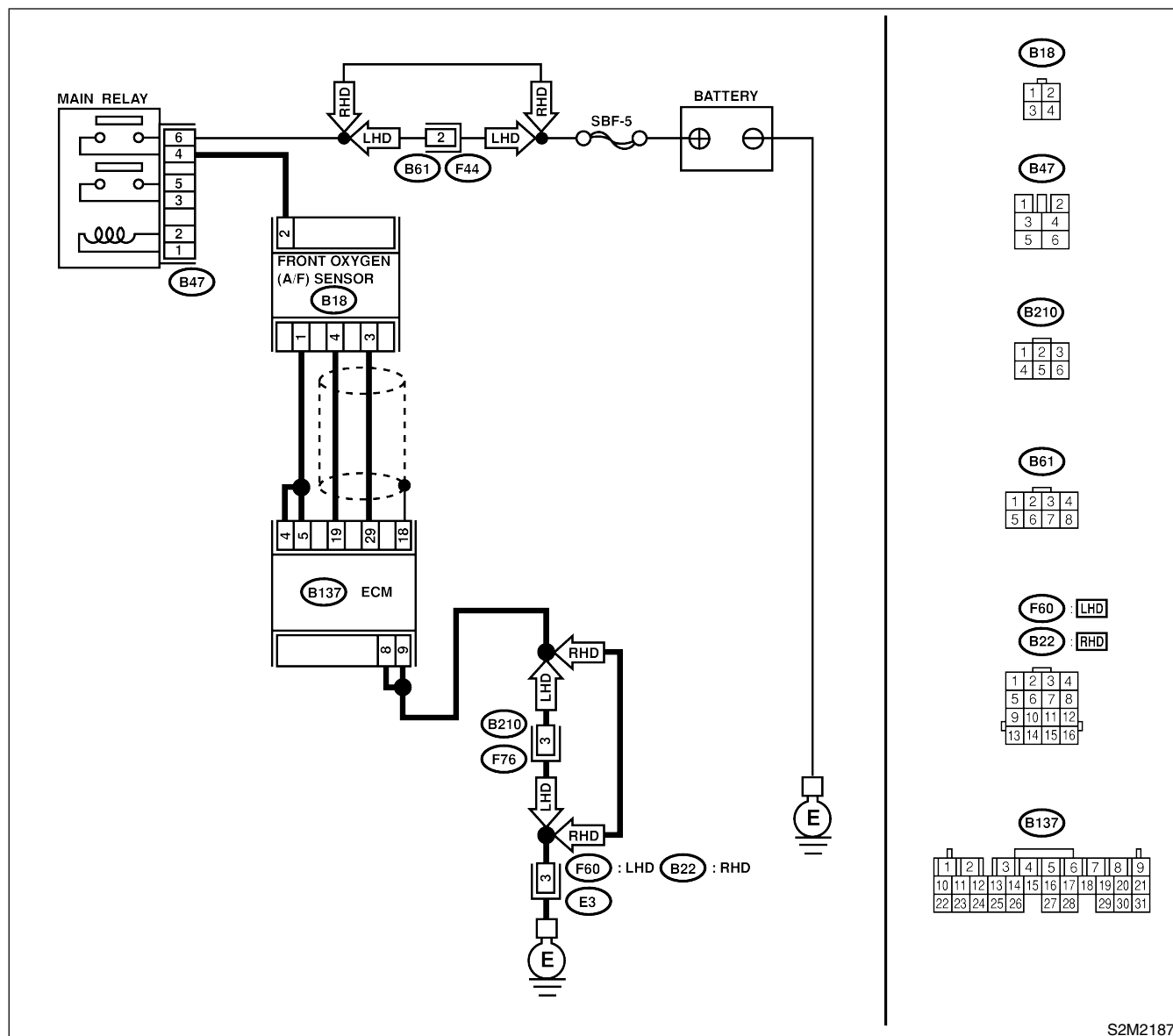
A: DTC P0031 — FRONT OXYGEN (A/F) SENSOR HEATER CIRCUIT LOW INPUT — S088521F83

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0031 and P0037 at the same time?	Go to step 2.	Go to step 5.
2	CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from front oxygen (A/F) sensor. 3) Turn ignition switch to ON. 4) Measure voltage between front oxygen (A/F) sensor connector and engine ground. Connector & terminal (B18) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 3.	Repair power supply line. NOTE: In this case, repair the following: ● Open circuit in harness between main relay and front oxygen (A/F) sensor connector ● Poor contact in front oxygen (A/F) sensor connector ● Poor contact in main relay connector
3	CHECK GROUND CIRCUIT OF ECM. Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B137) No. 8 — Chassis ground: (B137) No. 9 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and engine ground terminal ● Poor contact in ECM connector - Poor contact in coupling connector
4	CHECK CURRENT DATA. 1) Start engine 2) Read data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 0.2 A?	Repair poor contact in connector. NOTE: In this case, repair the following: ● Poor contact in front oxygen (A/F) sensor connector ● Poor contact in ECM connector	Go to step 5.
5	CHECK OUTPUT SIGNAL FROM ECM. 1) Start and idle the engine. 2) Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 4 (+) — Chassis ground (-): (B137) No. 5 (+) — Chassis ground (-):	Is the voltage less than 1.0 V?	Go to step 7.	Go to step 6.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK OUTPUT SIGNAL FROM ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal <i>(B137) No. 4 (+) — Chassis ground (-):</i> <i>(B137) No. 5 (+) — Chassis ground (-):</i>	Does the voltage change less than 1.0 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Go to step 7.
7	CHECK FRONT OXYGEN (A/F) SENSOR. 1) Turn ignition switch to OFF. 2) Measure resistance between front oxygen (A/F) sensor connector terminals. Terminals <i>No. 2 — No. 1:</i>	Is the resistance less than 10 Ω ?	Repair harness and connector. NOTE: In this case, repair the following: ● Open or ground short circuit in harness between front oxygen (A/F) sensor and ECM connector ● Poor contact in front oxygen (A/F) sensor connector ● Poor contact in ECM connector	Replace front oxygen (A/F) sensor. <Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

B: DTC P0032 — FRONT OXYGEN (A/F) SENSOR HEATER CIRCUIT HIGH INPUT —

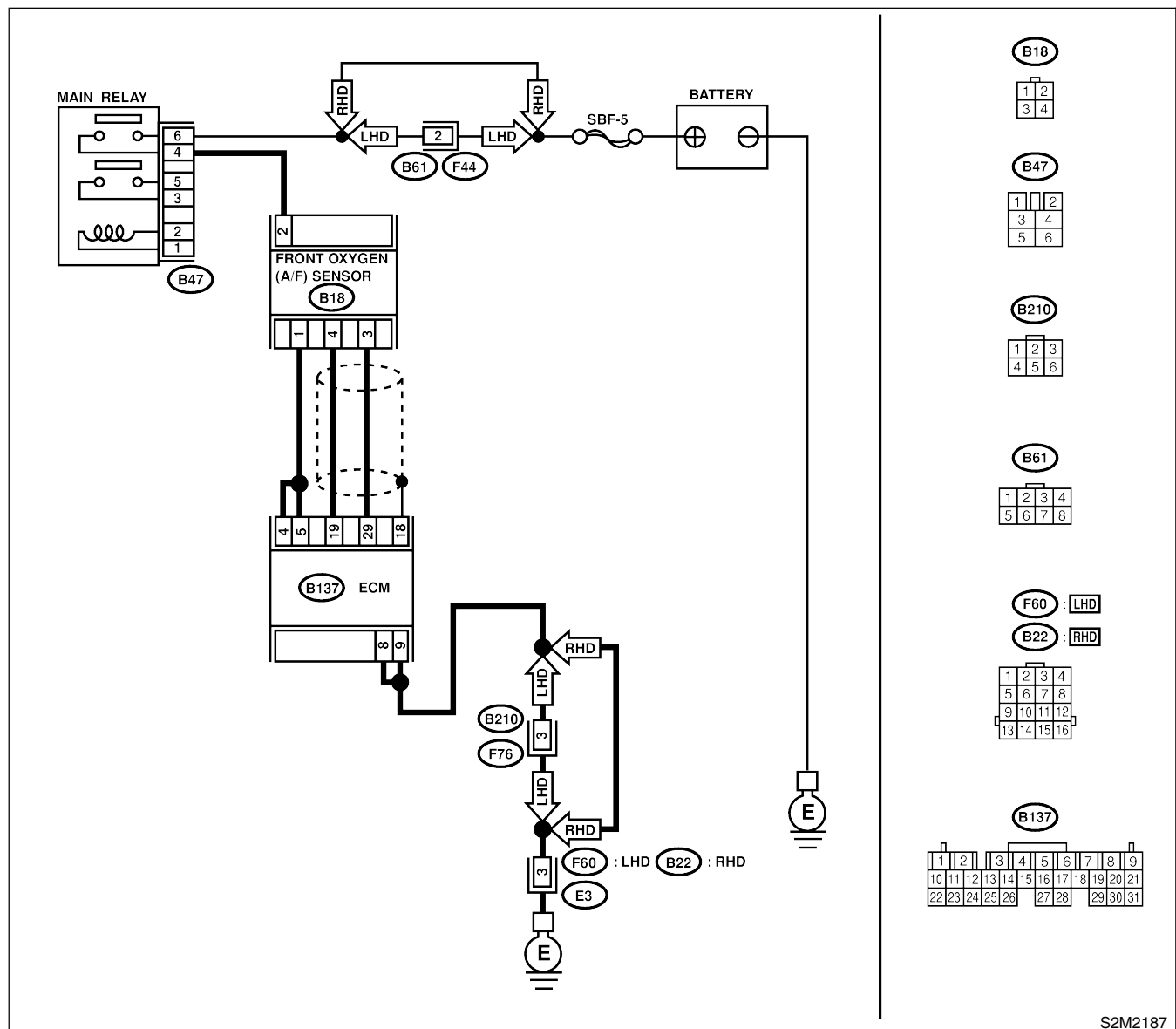
S088521F84

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 4 (+) — Chassis ground (-): (B137) No. 5 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 3.	Go to step 2.
2	CHECK FRONT OXYGEN (A/F) SENSOR HEATER CURRENT. 1) Turn ignition switch to OFF. 2) Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. 3) Turn ignition switch to ON. 4) Read data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or the OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 2.3 A?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	END
3	CHECK OUTPUT SIGNAL FROM ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 4 (+) — Chassis ground (-): (B137) No. 5 (+) — Chassis ground (-):	Does the voltage change more than 8 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.	END

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

C: DTC P0037 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION

S088521F85

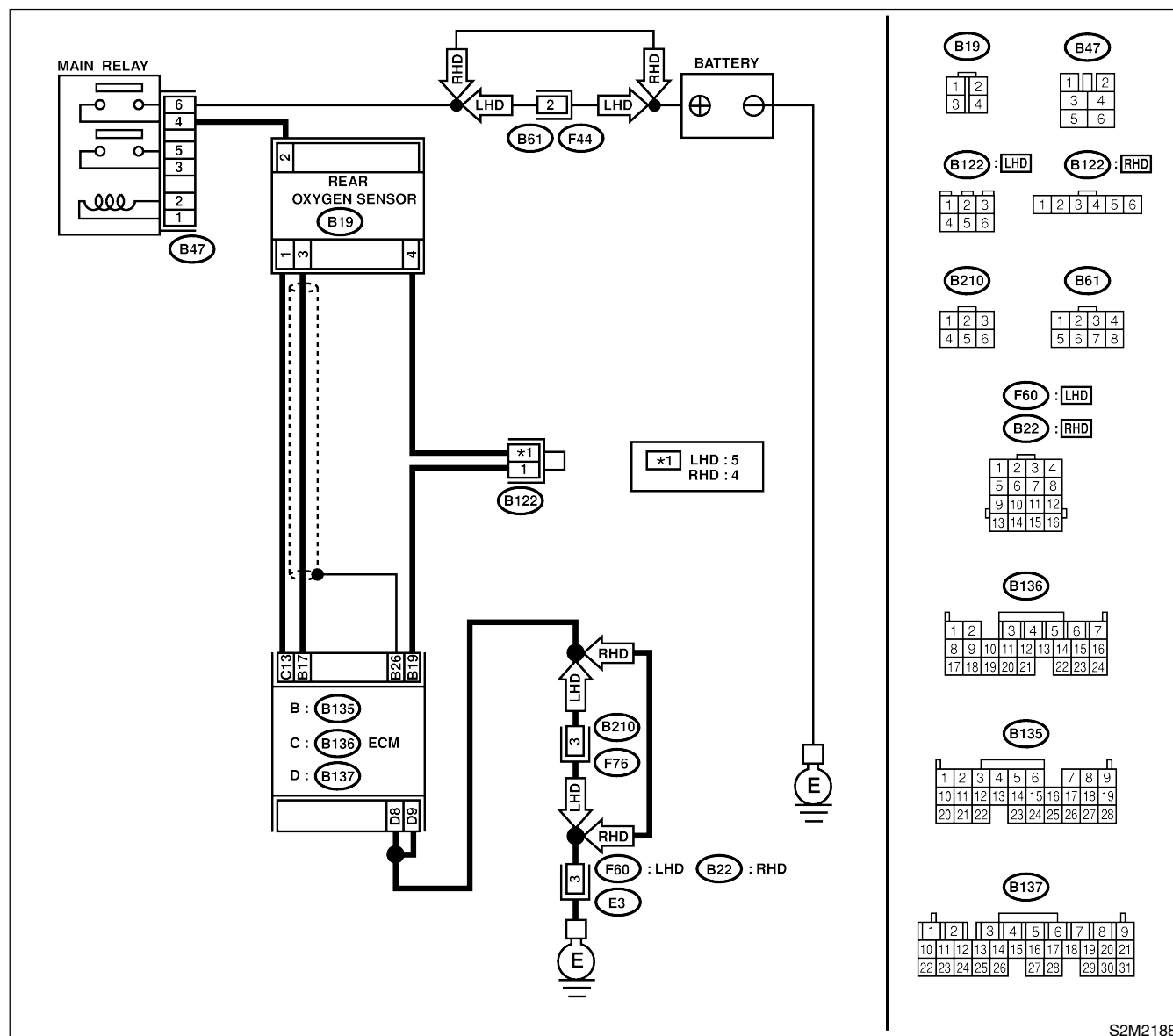
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2188

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK GROUND CIRCUIT OF ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B137) No. 8 — Chassis ground: (B137) No. 9 — Chassis ground:	Is the resistance less than 5 Ω ?	Go to step 2.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and engine ground terminal ● Poor contact in ECM connector ● Poor contact in coupling connector
2	CHECK CURRENT DATA. 1) Start engine. 2) Read data of rear oxygen sensor heater current using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 0.2 A?	Repair connector. NOTE: In this case, repair the following: ● Poor contact in rear oxygen sensor connector ● Poor contact in rear oxygen sensor connecting harness connector ● Poor contact in ECM connector	Go to step 3.
3	CHECK OUTPUT SIGNAL FROM ECM. 1) Start and idle the engine. 2) Measure voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 13 (+) — Chassis ground (-):	Is the voltage less than 1.0 V?	Go to step 6.	Go to step 4.
4	CHECK OUTPUT SIGNAL FROM ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 13 (+) — Chassis ground (-):	Does the voltage change less than 1.0 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Go to step 5.
5	CHECK OUTPUT SIGNAL FROM ECM. 1) Disconnect connector from rear oxygen sensor. 2) Measure voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 13 (+) — Chassis ground (-):	Is the voltage less than 1.0 V?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Repair battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK POWER SUPPLY TO REAR OXYGEN SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from rear oxygen sensor. 3) Turn ignition switch to ON. 4) Measure voltage between rear oxygen sensor connector and engine ground or chassis ground. Connector & terminal (B19) No. 2 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 7.	Repair power supply line. NOTE: In this case, repair the following: ● Open circuit in harness between main relay and rear oxygen sensor connector ● Poor contact in rear oxygen sensor connector ● Poor contact in coupling connector
7	CHECK REAR OXYGEN SENSOR. 1) Turn ignition switch to OFF. 2) Measure resistance between rear oxygen sensor connector terminals. Terminals No. 1 — No. 2:	Is the resistance less than 30 Ω ?	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between rear oxygen sensor and ECM connector ● Poor contact in rear oxygen sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector	Replace rear oxygen sensor. <Ref. to FU(DOHC TURBO)-44, Rear Oxygen Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

D: DTC P0038 — REAR OXYGEN SENSOR HEATER CIRCUIT HIGH INPUT —

S088521F86

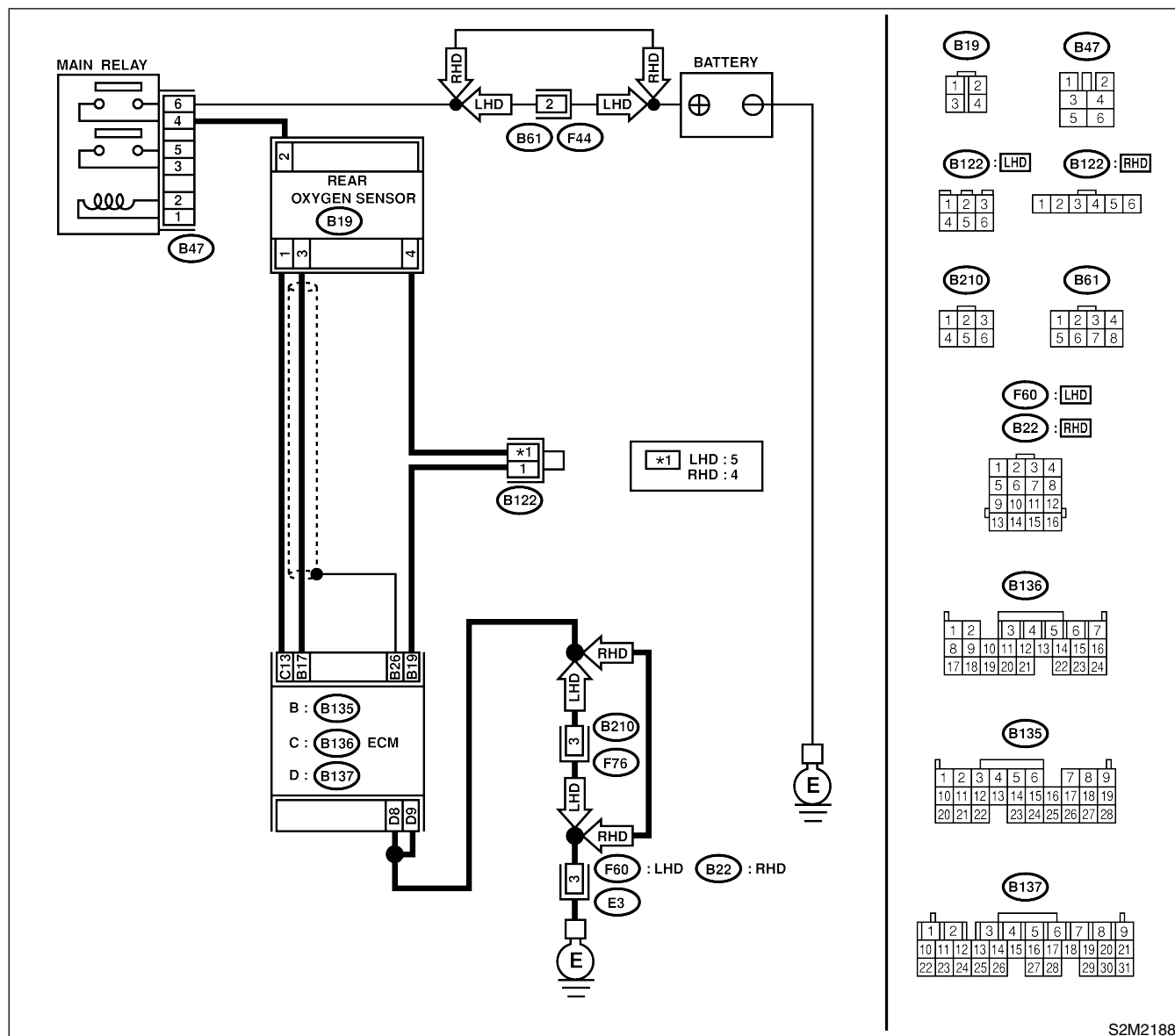
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2188

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B136) No. 13 (+) — Chassis ground (-):	Is the voltage more than 8 V?	Go to step 2.	Go to step 3.
2	CHECK CURRENT DATA. 1) Turn ignition switch to OFF. 2) Repair battery short circuit in harness between ECM and rear oxygen sensor connector. 3) Turn ignition switch to ON. 4) Read data of rear oxygen sensor heater current using Subaru Select Monitor or the OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 7 A?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	END
3	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	END

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

E: DTC P0101 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

S088521B08

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

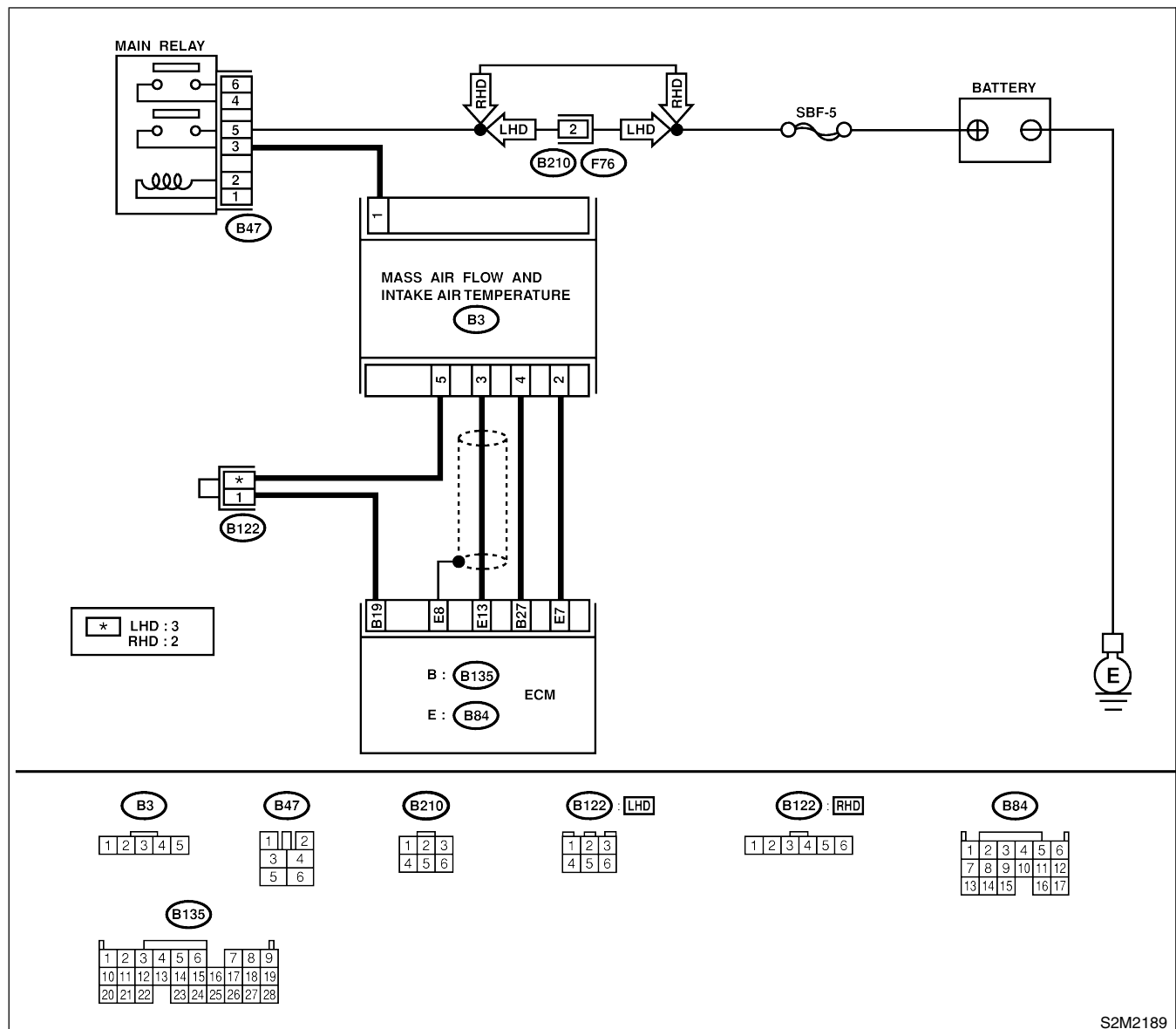
• TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

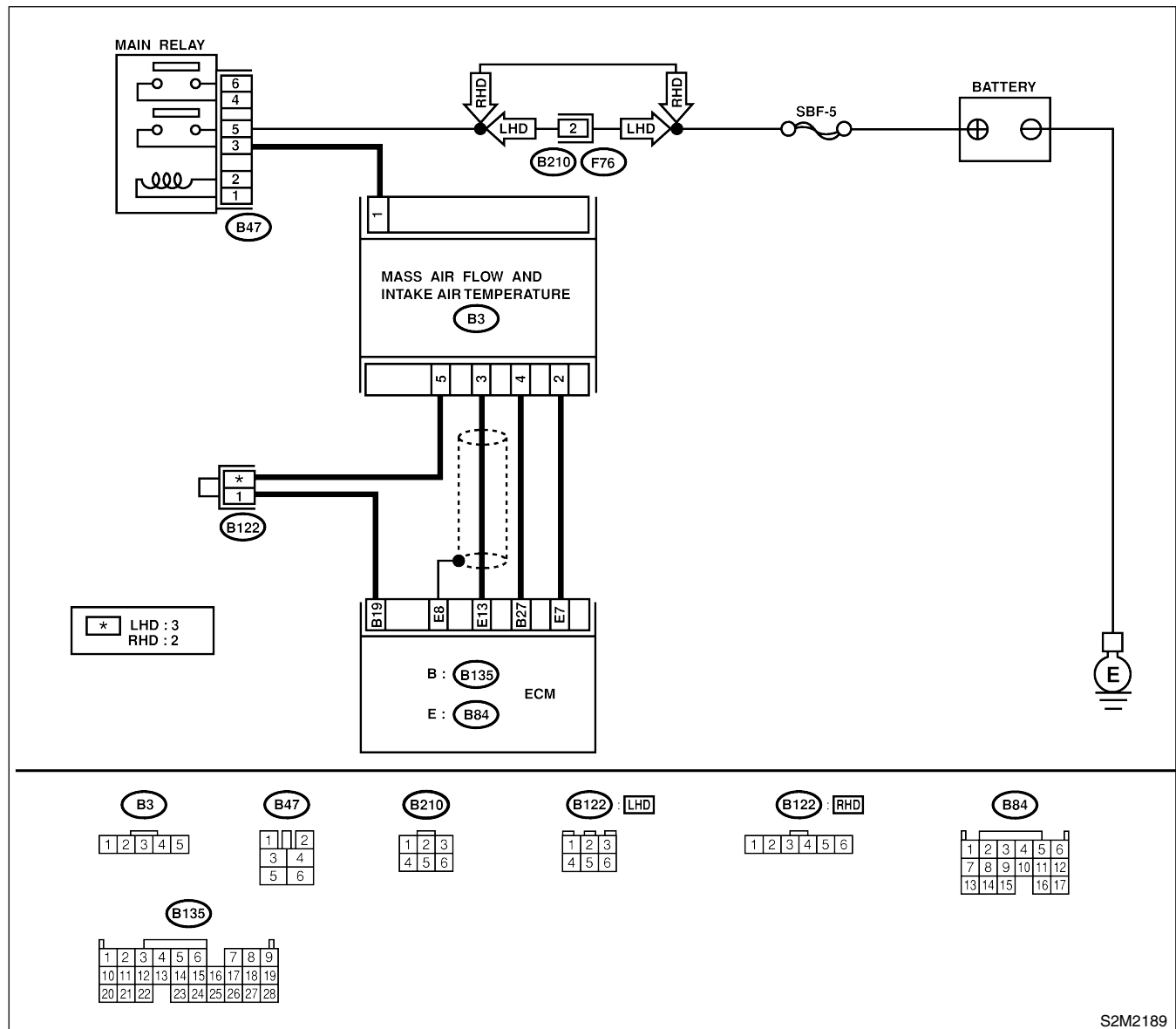
No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0102 or P0113?	Inspect DTC P0102 or P0103 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0101.	Replace mass air flow and intake air temperature sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

F: DTC P0102 — MASS AIR FLOW SENSOR CIRCUIT LOW INPUT — S088521B09

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance
- **WIRING DIAGRAM:**



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA. 1) Turn ignition switch to OFF. 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector. 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON. 4) Start engine. 5) Read data of mass air flow sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value equal to or more than 1.3 g/sec (0.172 lb/min) or 0.3 V and equal to or less than 240 g/sec (32 lb/min) or 4.58 V?	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor. NOTE: In this case, repair the following: - Open or ground short circuit in harness between mass air flow sensor and ECM connector - Poor contact in mass air flow sensor or ECM connector	Go to step 2.
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground while engine is idling. Connector & terminal (B84) No. 13 (+) — Chassis ground (-):	Is the voltage less than 0.2 V?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR). Measure voltage between ECM connector and chassis ground while engine is idling.	Does the voltage change more than 0.2 V by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4	CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from mass air flow sensor. 3) Turn ignition switch to ON. 4) Measure voltage between mass air flow sensor connector and chassis ground. Connector & terminal (B3) No. 1 (+) — Chassis ground (-):	Is the voltage more than 10V?	Go to step 5.	Repair open circuit between mass air flow sensor and main relay

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM and mass air flow sensor connector. Connector & terminal (B84) No. 13 — (B3) No. 3: (B135) No. 27 — (B3) No. 4: (B135) No. 19 — (B3) No. 5:	Is the resistance less than 1Ω?	Go to step 6.	Repair open circuit between ECM and mass air flow sensor connector.
6	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR Measure resistance of harness between ECM and chassis ground. Connector & terminal (B84) No. 13 — Chassis ground: (B135) No. 27 — Chassis ground: (B135) No. 19 — Chassis ground:	Is the resistance more than 1MΩ?	Go to step 7.	Repair ground short circuit between ECM and mass air flow sensor connector.
7	CHECK POOR CONTACT Check poor contact in mass air flow sensor connector.	Is there poor contact in mass air flow sensor connector?	Repair poor contact in mass air flow sensor connector.	Replace mass air flow and intake air temperature sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

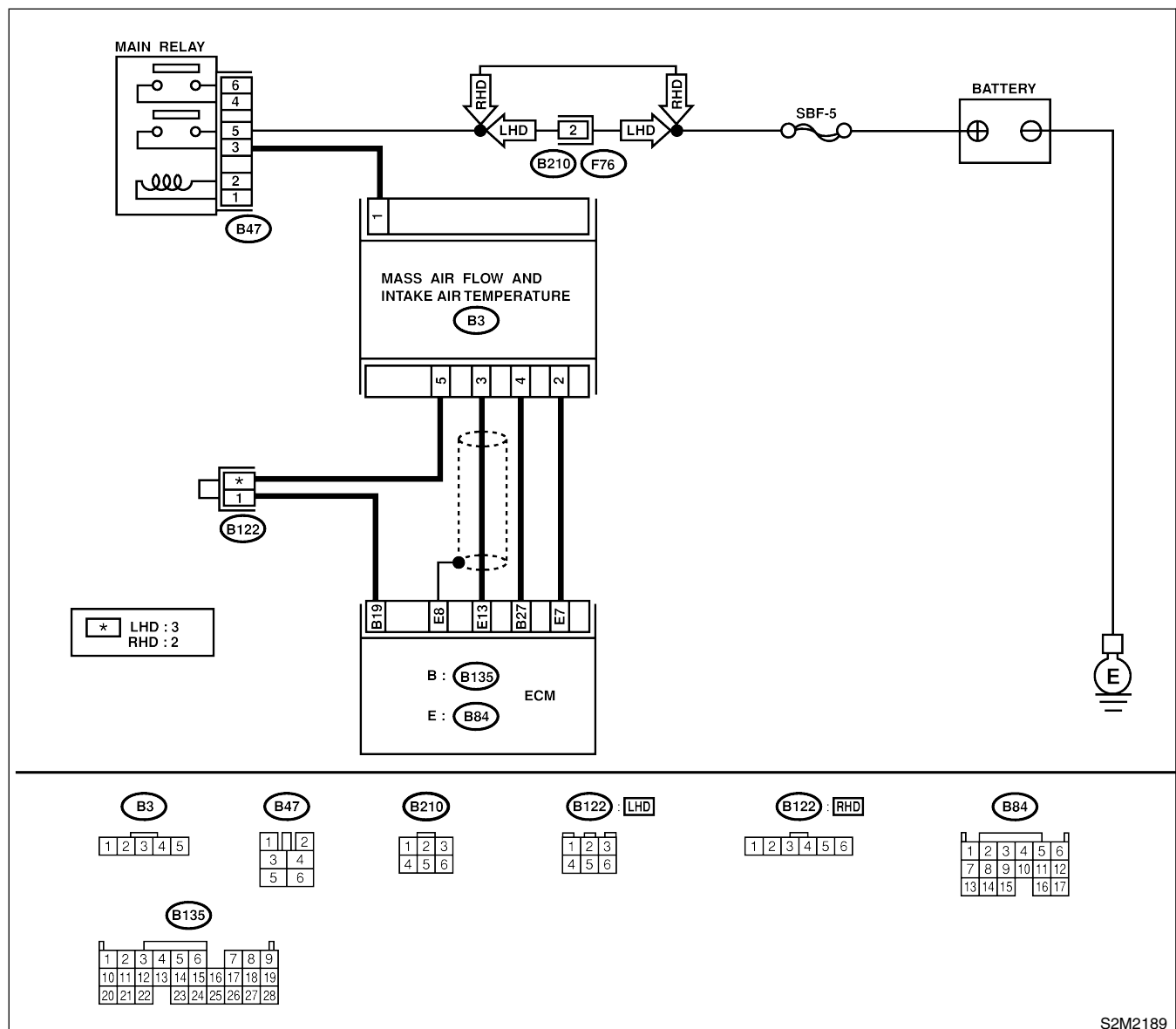
G: DTC P0103 — MASS AIR FLOW SENSOR CIRCUIT HIGH INPUT — S088521B10

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA. 1) Turn ignition switch to OFF. 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector. 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON. 4) Start engine. 5) Read data of mass air flow sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value equal to or more than 1.3 g/sec (0.172 lb/min) or 0.3 V and equal to or less than 240 g/sec (32 lb/min) or 4.58 V?	Even if MIL lights up, the circuit has returned to a normal condition at this time.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR. 1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF. 2) Disconnect connector from mass air flow sensor. 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON. 4) Read data of mass air flow sensor signal using Subaru select monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 240 g/sec (32 lb/min) or 4.58 V in function mode F06?	Repair battery short circuit in harness between mass air flow sensor and ECM connector. After repair, replace ECM.	Replace mass air flow sensor.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

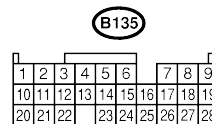
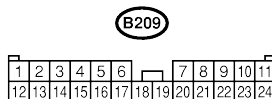
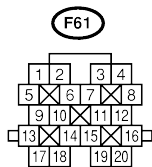
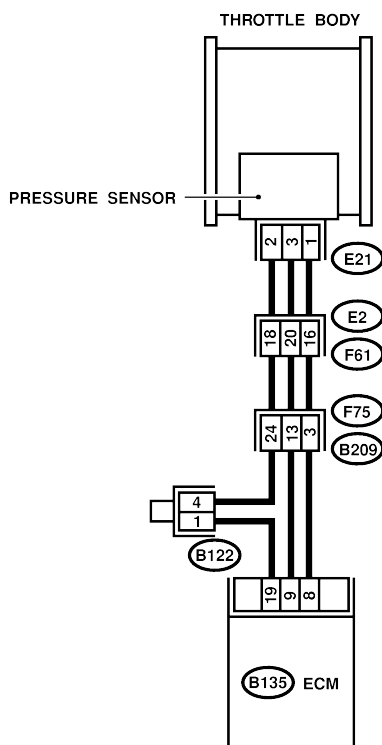
H: DTC P0106 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) — S088521F90

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● LHD MODEL:

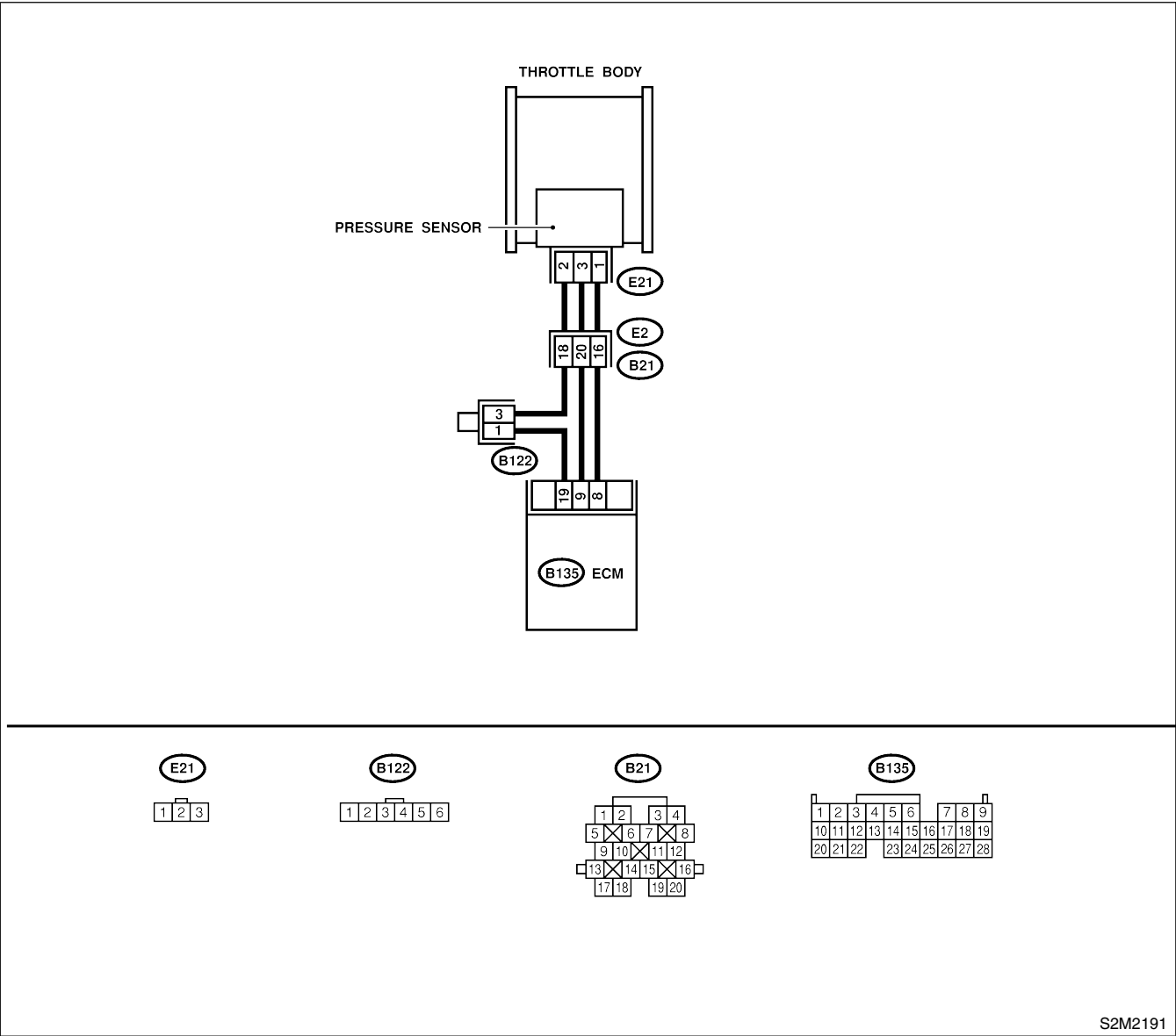


S2M2190

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK IDLE SWITCH SIGNAL. 1) Turn ignition switch to ON. 2) Operate the LED operation mode for engine using Subaru Select Monitor. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "LED OPERATION MODE FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.>	Does the LED of {Idle Switch Signal} come on?	Go to step 2.	Check throttle position sensor circuit. <Ref. to EN(DOHC TURBO)-136, DTC P0121 - THROTTLE POSITION SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM (HIGH INPUT) -, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0106.
2	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0107 or P0108?	Inspect DTC P0107 or P0108 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0106.	Go to step 3.
3	CHECK CONDITION OF INTAKE MANIFOLD PRESSURE SENSOR.	Is the pressure sensor installation bolt tightened securely?	Go to step 4.	Tighten pressure sensor installation bolt securely.
4	CHECK CONDITION OF THROTTLE BODY.	Is the throttle body installation bolt tightened securely?	Replace pressure sensor. <Ref. to FU(DOHC TURBO)-35, Pressure Sensor.>	Tighten throttle body installation bolt securely.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

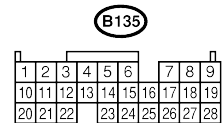
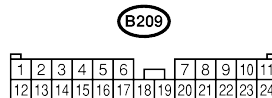
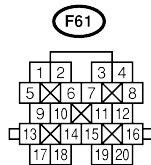
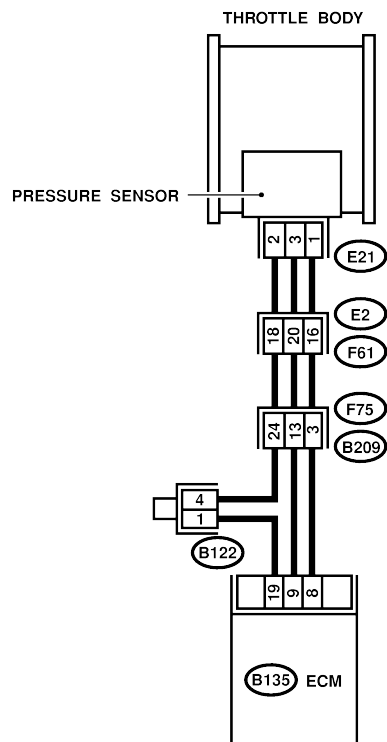
I: DTC P0107 — PRESSURE SENSOR CIRCUIT LOW INPUT — S088521B12

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

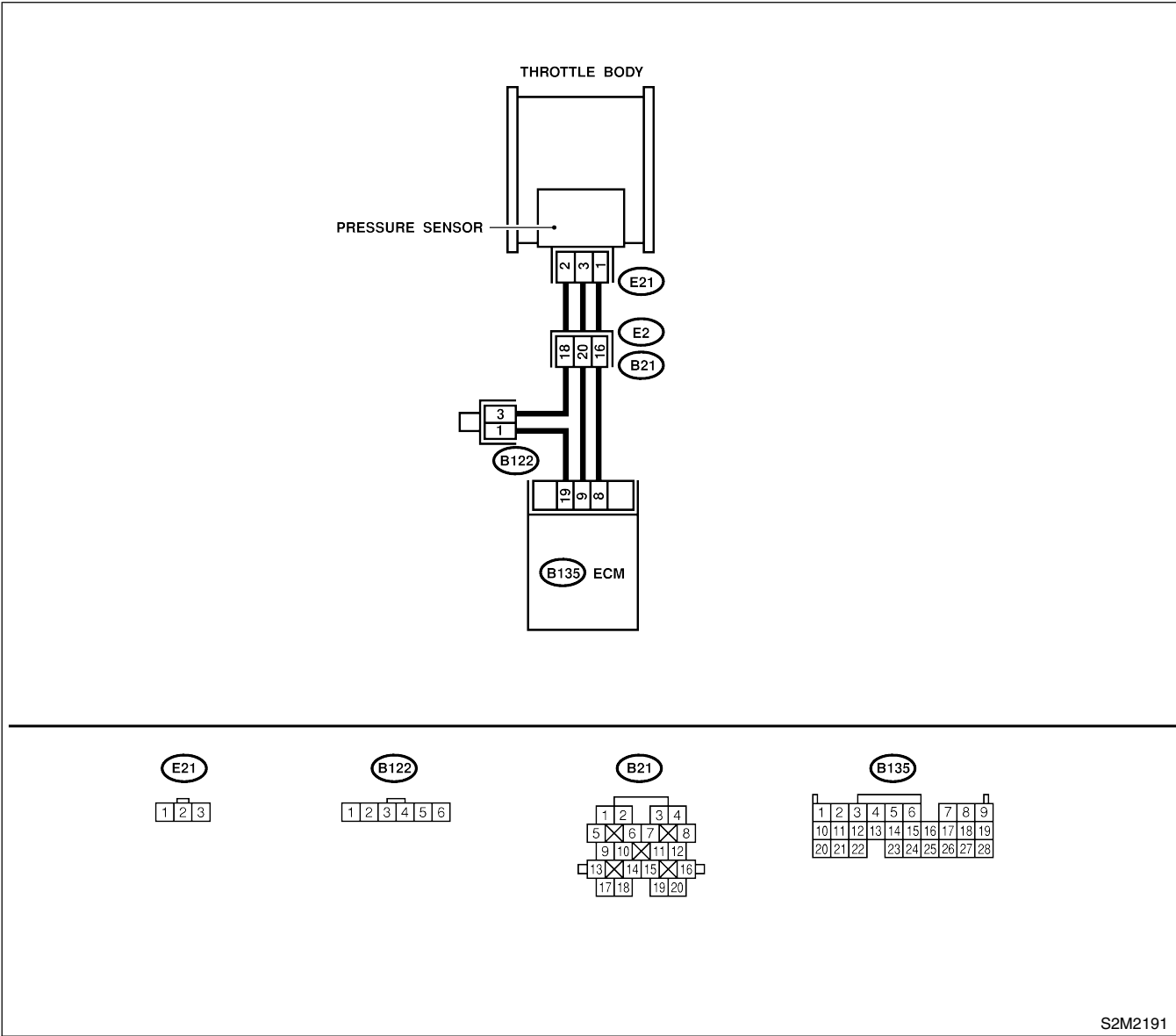


S2M2190

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than -7.2 kPa (-54 mmHg, -2.1 inHg)?	Go to step 3.	Go to step 2.
2	CHECK POOR CONTACT. Check poor contact in ECM and pressure sensor connector.	Is there poor contact in ECM or pressure sensor connector?	Repair poor contact in ECM or pressure sensor connector.	Even if MIL lights up, the circuit has returned to a normal condition at this time.
3	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 5.	Go to step 4.
4	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
5	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM and chassis ground. Connector & terminal (B135) No. 8 (+) — Chassis ground (-):	Is the voltage less than 0.7 V?	Go to step 6.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
6	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from pressure sensor. 3) Turn ignition switch to ON. 4) Measure voltage between pressure sensor connector and engine ground. Connector & terminal (E21) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 7.	Repair open circuit in harness between ECM and intake manifold pressure sensor connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
7	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM and intake manifold pressure sensor connector. Connector & terminal (B135) No. 19 — (E21) No. 2:	Is the resistance less than 1 Ω ?	Go to step 8.	Repair open circuit in harness between ECM and intake manifold pressure sensor connector.
8	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR. Measure resistance of harness between intake manifold pressure sensor connector and engine ground. Connector & terminal (E21) No. 1 — Engine ground:	Is the resistance more than 1 M Ω ?	Go to step 9.	Repair ground short circuit in harness between ECM and intake manifold pressure sensor connector.
9	CHECK POOR CONTACT. Check poor contact in pressure sensor connector.	Is there poor contact in pressure sensor connector?	Repair poor contact in pressure sensor connector.	Replace pressure sensor. <Ref. to FU(DOHC TURBO)-35, Pressure Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

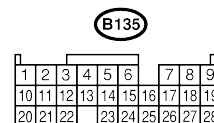
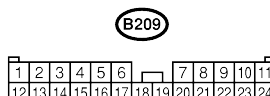
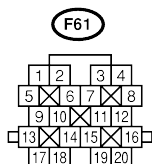
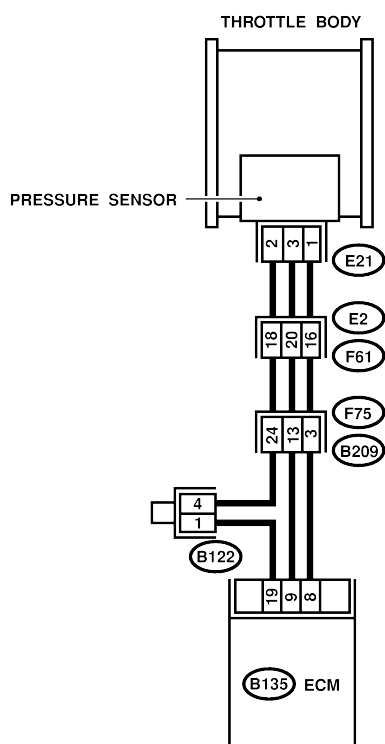
J: DTC P0108 — PRESSURE SENSOR CIRCUIT HIGH INPUT — S088521B13

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

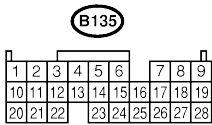
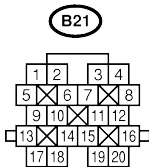
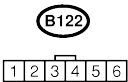
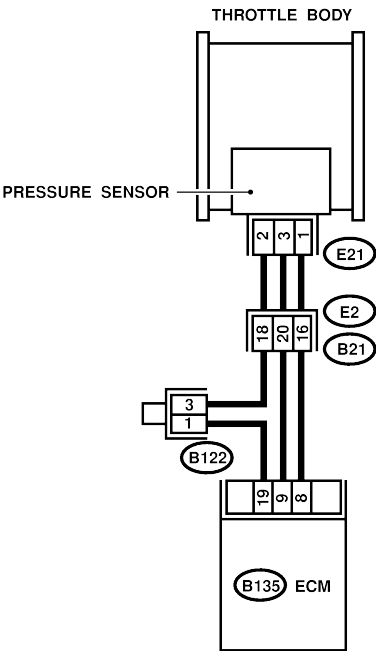


S2M2190

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



S2M2191

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 282 kPa (2,121 mmHg, 83.50 inHg)?	Go to step 9.	Go to step 2.
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 8 (+) — Chassis ground (-):	Is the voltage less than 0.7 V?	Go to step 5.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
5	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from pressure sensor. 3) Turn ignition switch to ON. 4) Measure voltage between pressure sensor connector and engine ground. Connector & terminal (E21) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 6.	Repair open circuit in harness between ECM and pressure sensor connector.
6	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM and pressure sensor connector. Connector & terminal (B135) No. 8 — (E21) No. 1:	Is the resistance less than 1 Ω?	Go to step 7.	Repair open circuit in harness between ECM and pressure sensor connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
7	CHECK HARNESS BETWEEN ECM AND INTAKE MANIFOLD PRESSURE SENSOR CONNECTOR. Measure resistance of harness between ECM and pressure sensor connector. Connector & terminal (B135) No. 19 — (E21) No. 2:	Is the resistance less than 1 Ω ?	Go to step 8.	Repair open circuit in harness between ECM and pressure sensor connector.
8	CHECK POOR CONTACT. Check poor contact in pressure sensor connector.	Is there poor contact in pressure sensor connector?	Repair poor contact in pressure sensor connector.	Replace intake manifold pressure sensor. <Ref. to FU(DOHC TURBO)-35, Pressure Sensor.>
9	CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR. 1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF. 2) Disconnect connector from pressure sensor. 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON. 4) Read data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 282 kPa (2,121 mmHg, 83.50 inHg)?	Repair battery short circuit in harness between ECM and pressure sensor connector.	Replace pressure sensor. <Ref. to FU(DOHC TURBO)-35, Pressure Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

K: DTC P0111 — INTAKE AIR TEMPERATURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

S088521B14

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

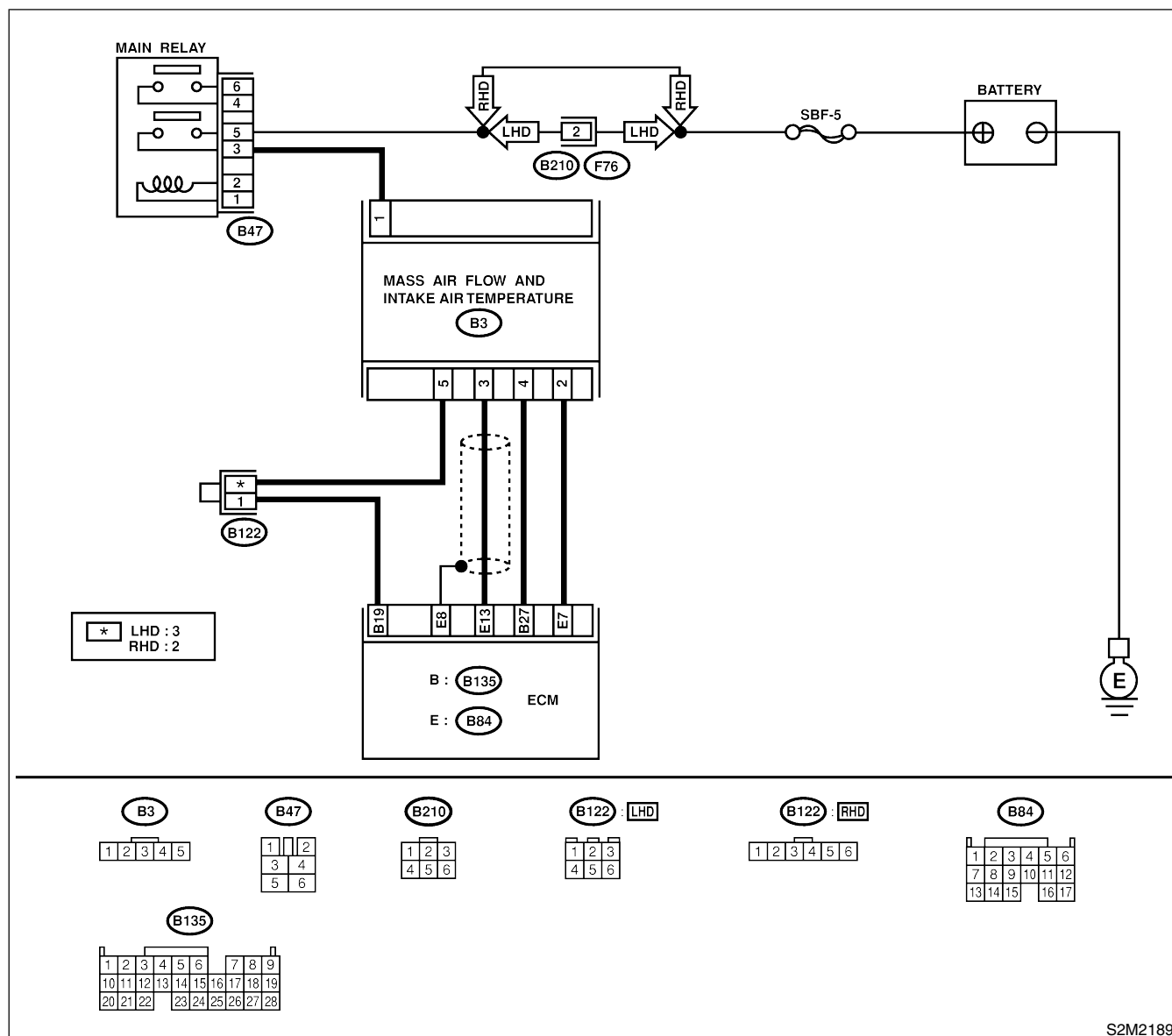
• TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0112, P0113, P0117, P0118 or P0125?	Inspect DTC P0112, P0113, P0117, P0118 or P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0111.	Go to step 2.
2	CHECK ENGINE COOLANT TEMPERATURE. 1) Start the engine and warm it up completely. 2) Measure engine coolant temperature using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the engine coolant temperature between 75°C (167°F) and 95°C (203°F)?	Replace mass air flow and intake air temperature sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>	Inspect DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

L: DTC P0112 — INTAKE AIR TEMPERATURE SENSOR CIRCUIT LOW INPUT

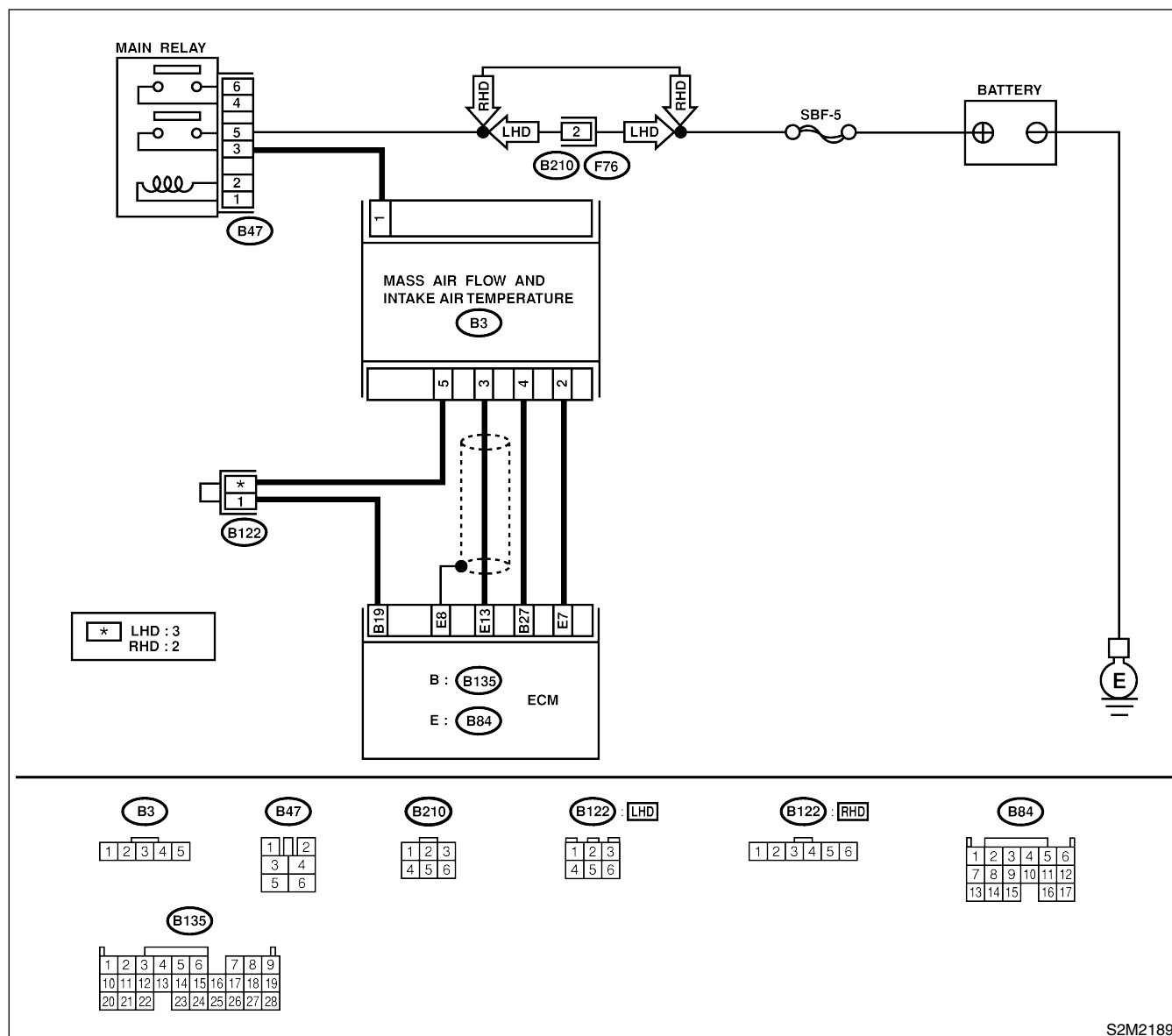
S088521B15

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value greater than 55°C (131°F)?	Go to step 2.	Repair poor contact. NOTE: In this case, repair the following: ● Poor contact mass air flow and intake air temperature sensor ● Poor contact in ECM ● Poor contact in joint connector
2	CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from mass air flow and intake air temperature sensor. 3) Turn ignition switch to ON. 4) Read data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than -36°C (-33°F)?	Replace mass air flow and intake air temperature sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>	Repair ground short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

M: DTC P0113 — INTAKE AIR TEMPERATURE SENSOR CIRCUIT HIGH INPUT —

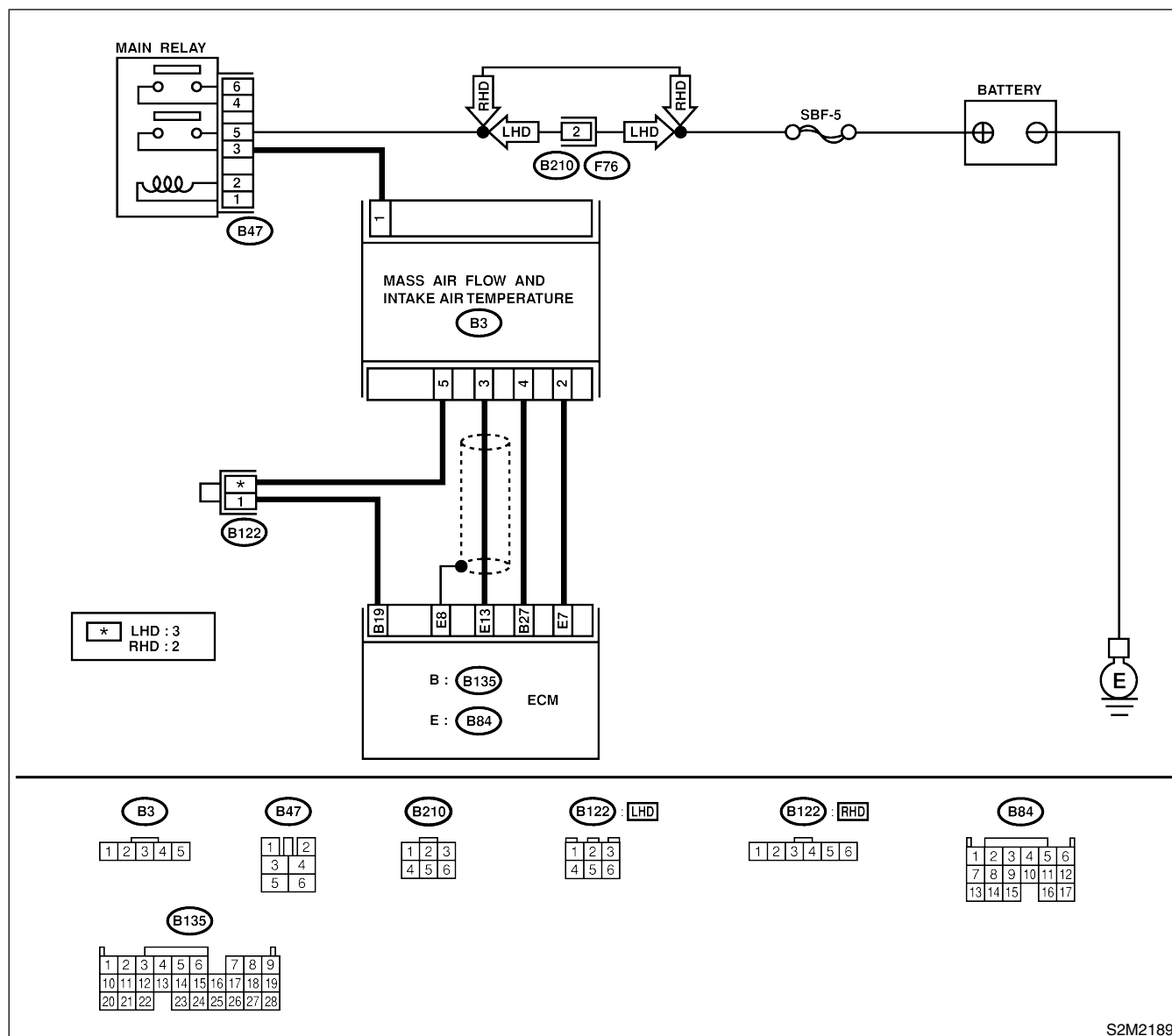
S088521B16

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than -36°C (-33°F)?	Go to step 2.	Repair poor contact. NOTE: In this case, repair the following: ● Poor contact in mass air flow and intake air temperature sensor ● Poor contact in ECM ● Poor contact in joint connector
2	CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from mass air flow and intake air temperature sensor. 3) Measure voltage between mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B3) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.	Go to step 3.
3	CHECK HARNESS BETWEEN INTAKE AIR TEMPERATURE AND PRESSURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B3) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.	Go to step 4.
4	CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. Measure voltage between mass air flow and intake air temperature sensor and pressure sensor connector and engine ground. Connector & terminal (B3) No. 2 (+) — Engine ground (-):	Is the voltage more than 3 V?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector ● Poor contact in mass air flow and intake air temperature sensor ● Poor contact in ECM ● Poor contact in joint connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between mass air flow and intake air temperature sensor and engine ground. Connector & terminal (B3) No. 5 — Engine ground:	Is the resistance less than 5 Ω ?	Replace mass air flow and intake air temperature sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector ● Poor contact in mass air flow and intake air temperature sensor ● Poor contact in ECM ● Poor contact in joint connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

N: DTC P0117 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT —

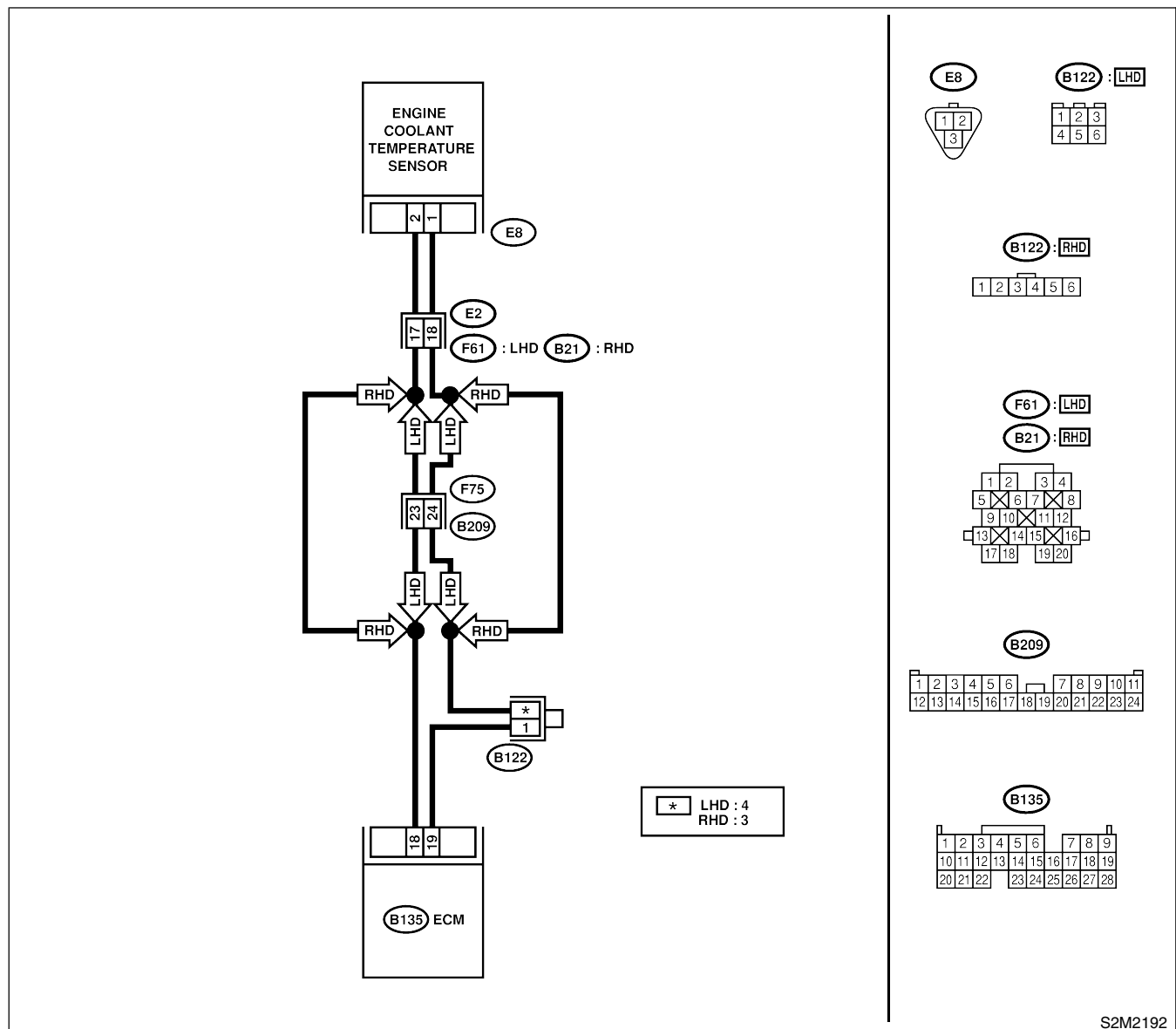
S088521F91

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Hard to start
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2192

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value greater than 150°C (302°F)?	Go to step 2.	Repair poor contact. NOTE: In this case, repair the following: - Poor contact in engine coolant temperature sensor - Poor contact in ECM - Poor contact in coupling connector - Poor contact in joint connector
2	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from engine coolant temperature sensor. 3) Turn ignition switch to ON. 4) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than -40°C (-40°F)?	Replace engine coolant temperature sensor. <Ref. to FU(DOHC TURBO)-29, Engine Coolant Temperature Sensor.>	Repair ground short circuit in harness between engine coolant temperature sensor and ECM connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

O: DTC P0118 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH INPUT —

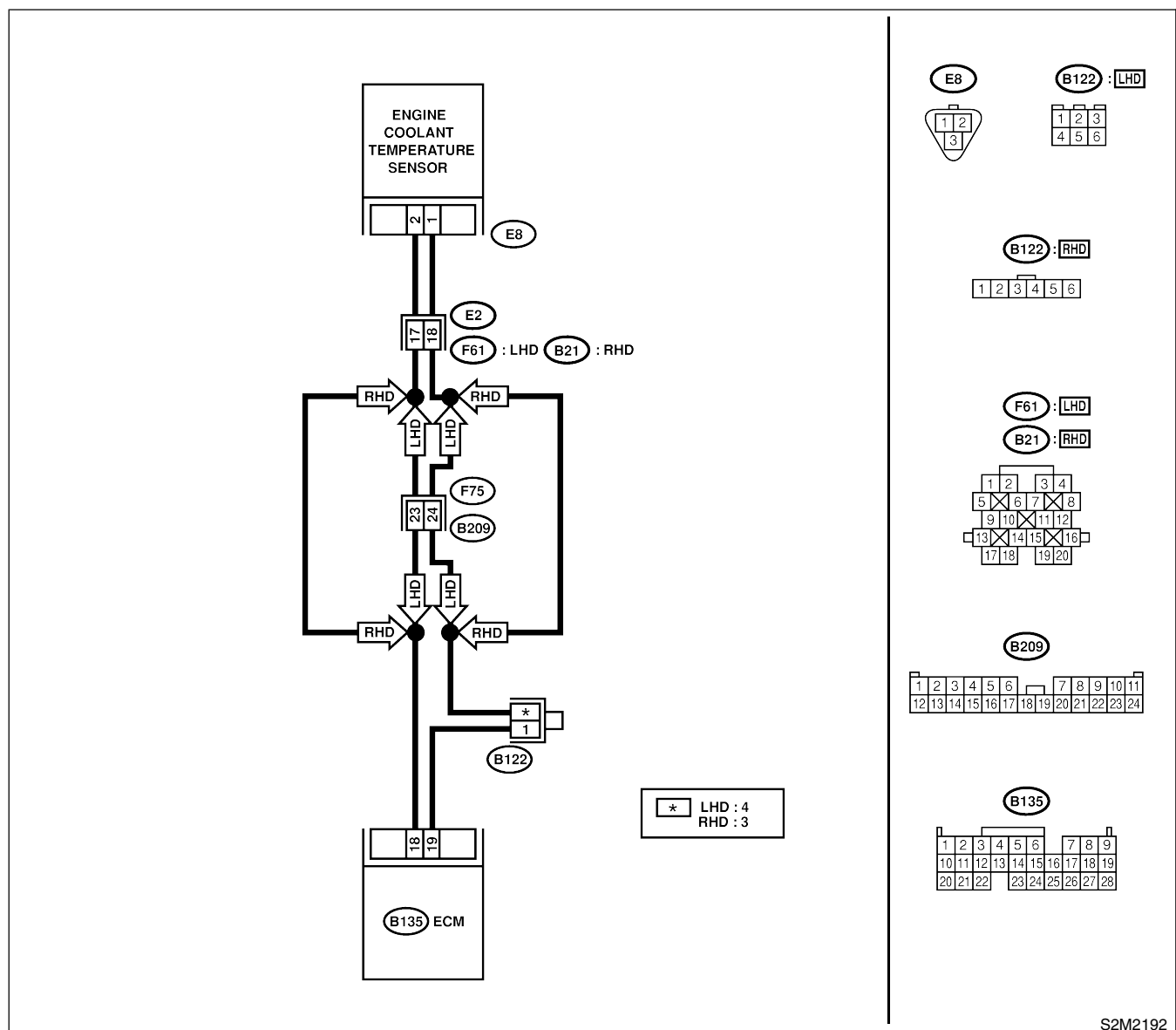
S088521F92

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Hard to start
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2192

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than -40°C (-40°F)?	Go to step 2.	Repair poor contact. NOTE: In this case, repair the following: ● Poor contact in engine coolant temperature sensor ● Poor contact in ECM ● Poor contact in coupling connector ● Poor contact in joint connector
2	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from engine coolant temperature sensor. 3) Measure voltage between engine coolant temperature sensor connector and engine ground. Connector & terminal (E8) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.	Go to step 3.
3	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between engine coolant temperature sensor connector and engine ground. Connector & terminal (E8) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.	Go to step 4.
4	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. Measure voltage between engine coolant temperature sensor connector and engine ground. Connector & terminal (E8) No. 2 (+) — Engine ground (-):	Is the voltage more than 4 V?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and engine coolant temperature sensor connector ● Poor contact in engine coolant temperature sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector ● Poor contact in joint connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between engine coolant temperature sensor connector and engine ground. Connector & terminal (E8) No. 1 — Engine ground:	Is the resistance less than 5 Ω ?	Replace engine coolant temperature sensor. <Ref. to FU(DOHC TURBO)-29, Engine Coolant Temperature Sensor.>	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and engine coolant temperature sensor connector ● Poor contact in engine coolant temperature sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector ● Poor contact in joint connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

P: DTC P0121 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) — S088521B19

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

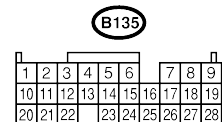
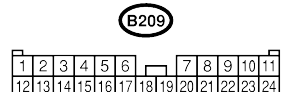
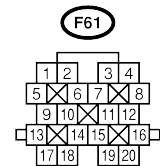
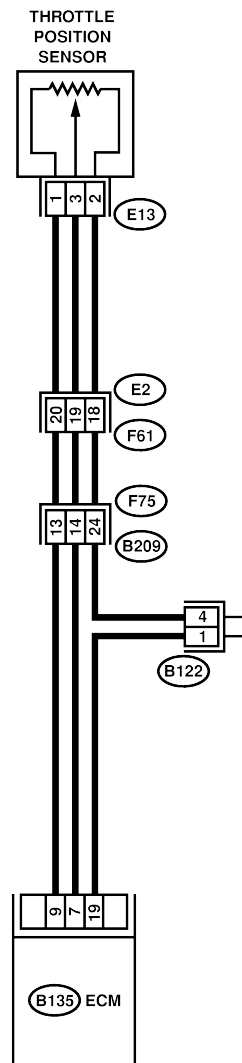
- Erroneous idling
- Engine stalls.
- Poor driving performance
- Fuel is cut.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:

● LHD MODEL

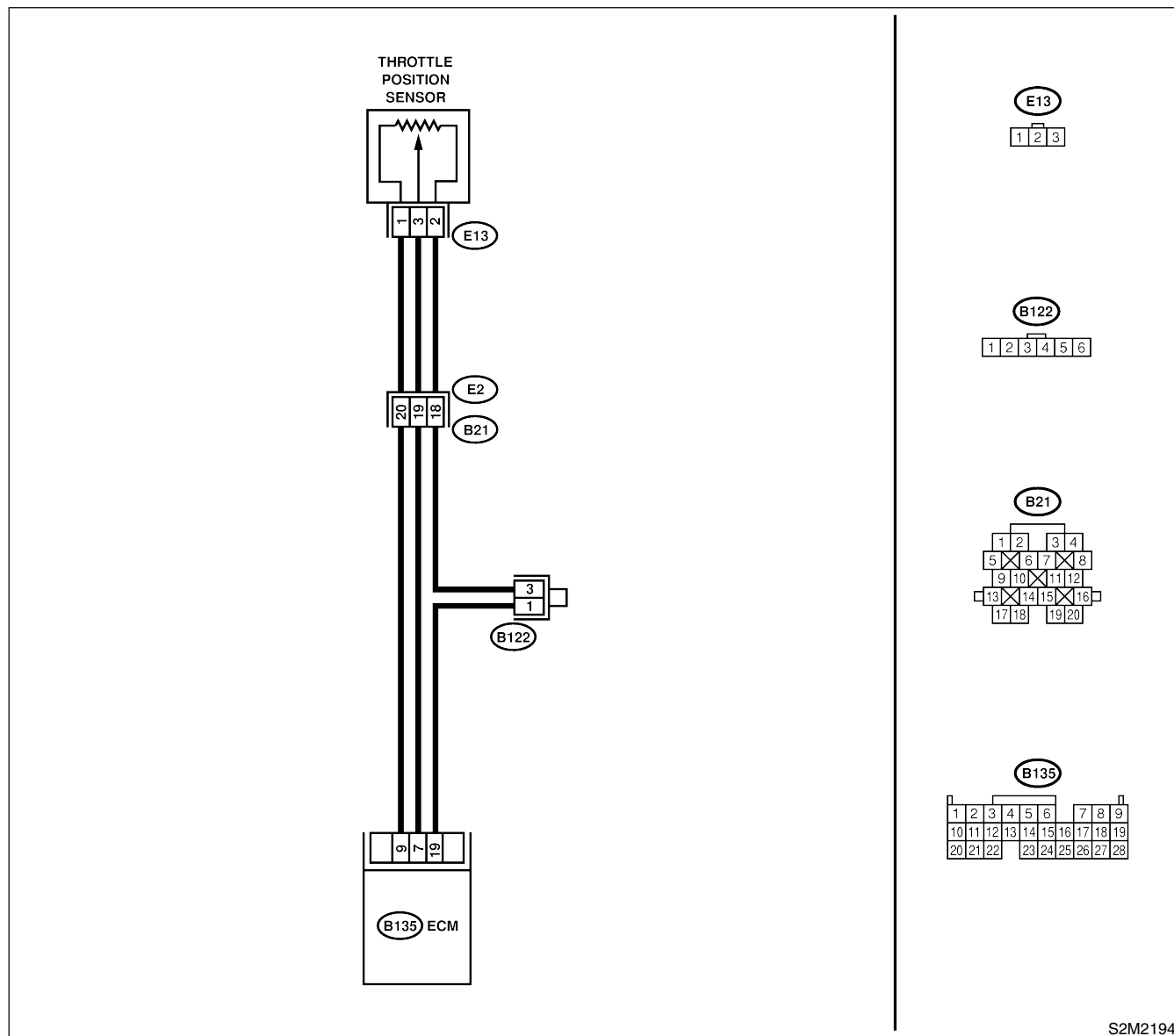


S2M2193

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0122, P0123 or P1507?	Inspect DTC P0122, P0123 or P1507 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0121.	Replace throttle position sensor. <Ref. to FU(DOHC TURBO)-33, Throttle Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

Q: DTC P0122 — THROTTLE POSITION SENSOR CIRCUIT LOW INPUT —

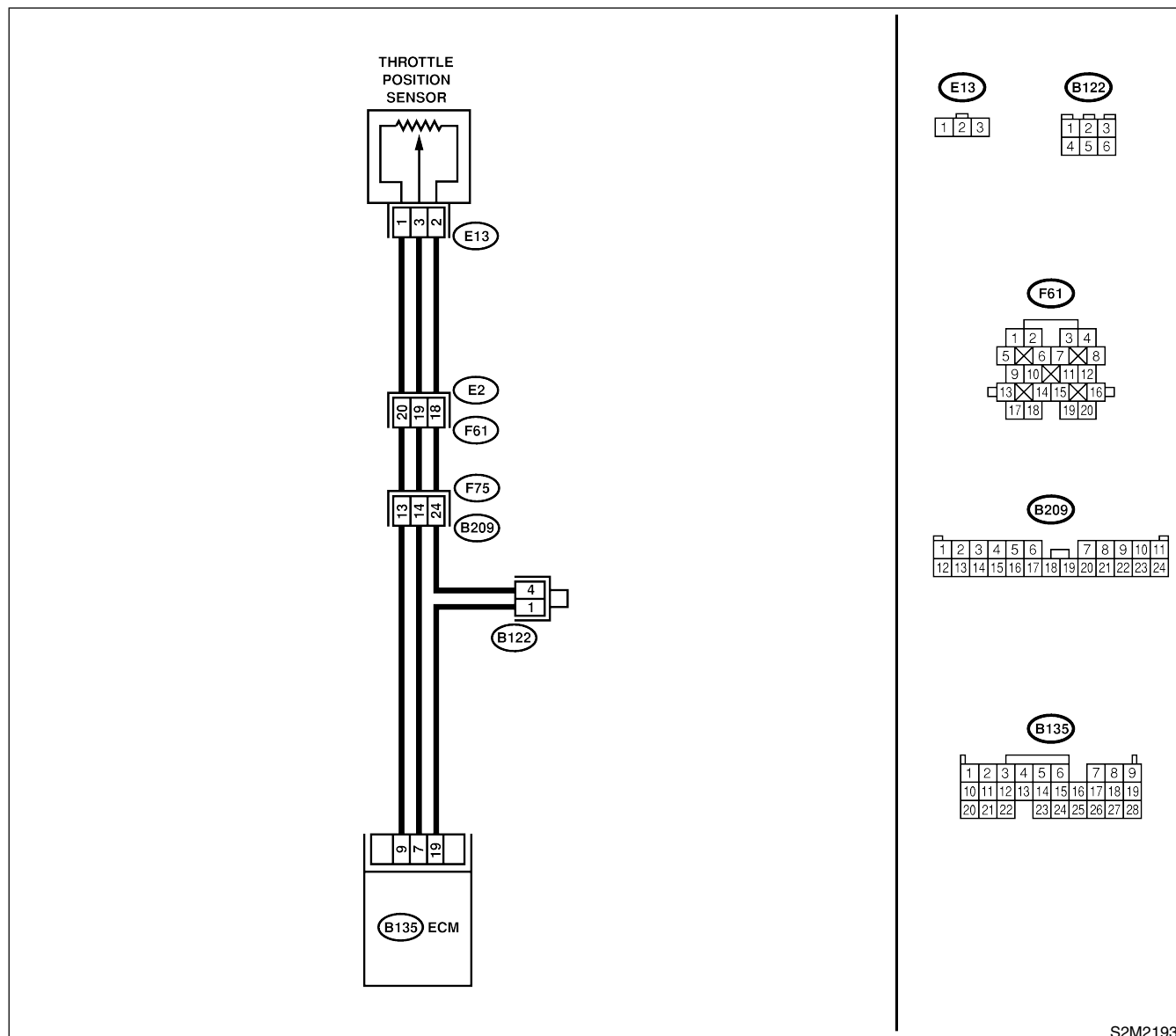
S088521B20

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

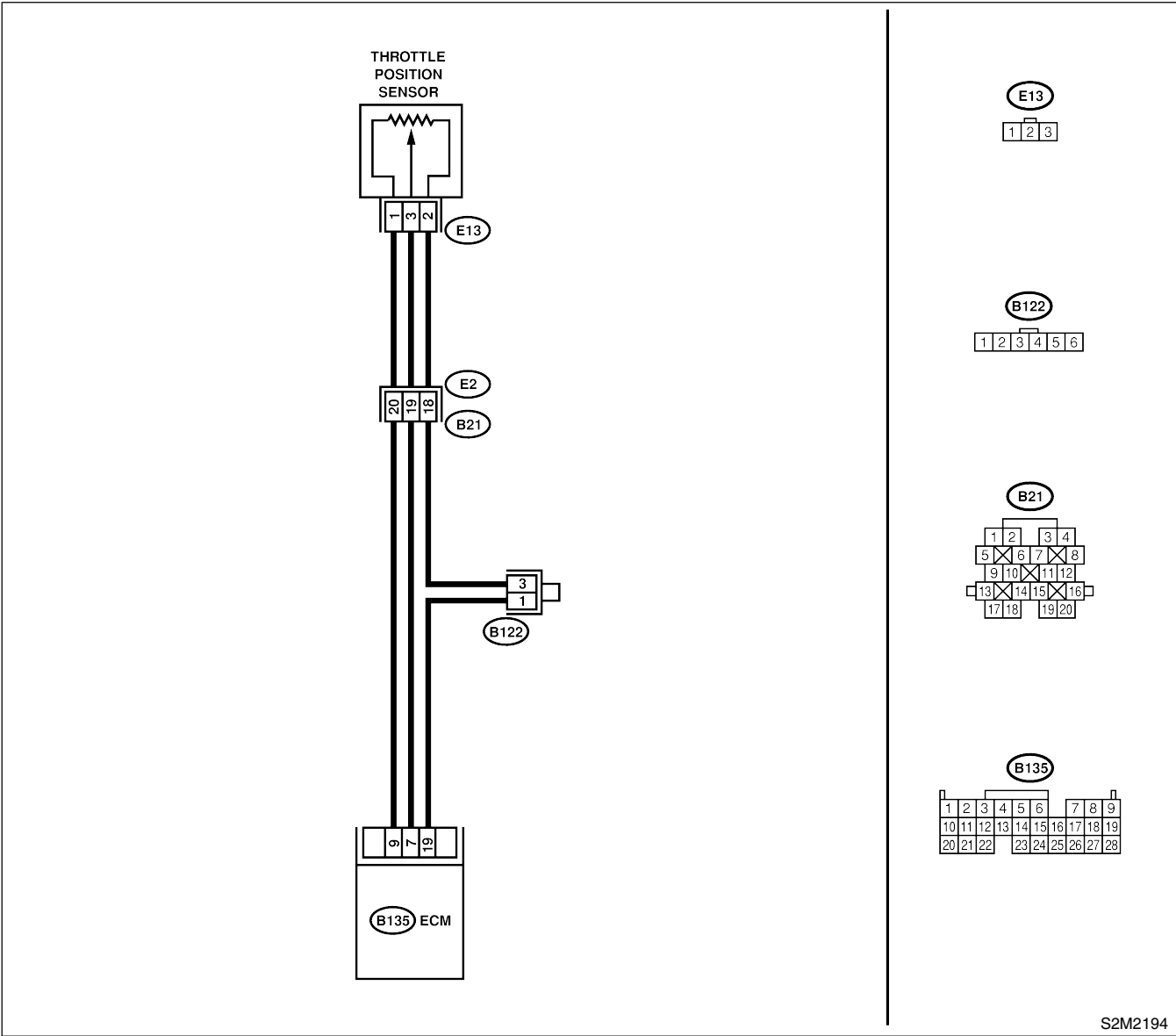


S2M2193

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



S2M2194

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than 0.1 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: ● Poor contact in throttle position sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground while throttle valve is fully closed. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 7 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
5	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.) Measure voltage between ECM connector and chassis ground.	Does the voltage change more than 0.1 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair poor contact in ECM connector.	Go to step 6.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from throttle position sensor. 3) Turn ignition switch to ON. 4) Measure voltage between throttle position sensor connector and engine ground. Connector & terminal (E13) No. 1 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 7.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between throttle position sensor and ECM connector ● Poor contact in throttle position sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector ● Poor contact in joint connector
7	CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between ECM connector and throttle position sensor connector. Connector & terminal (B135) No. 7 — (E13) No. 3:	Is the resistance less than 1 Ω ?	Go to step 8.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between throttle position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in throttle position sensor connector ● Poor contact in coupling connector
8	CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR. Measure resistance of harness between throttle position sensor connector and engine ground. Connector & terminal (E13) No. 3 — Engine ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between throttle position sensor and ECM connector.	Go to step 9.
9	CHECK POOR CONTACT. Check poor contact in throttle position sensor connector.	Is there poor contact in throttle position sensor connector?	Repair poor contact in throttle position sensor connector.	Replace throttle position sensor. <Ref. to FU(DOHC TURBO)-33, Throttle Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

R: DTC P0123 — THROTTLE POSITION SENSOR CIRCUIT HIGH INPUT —

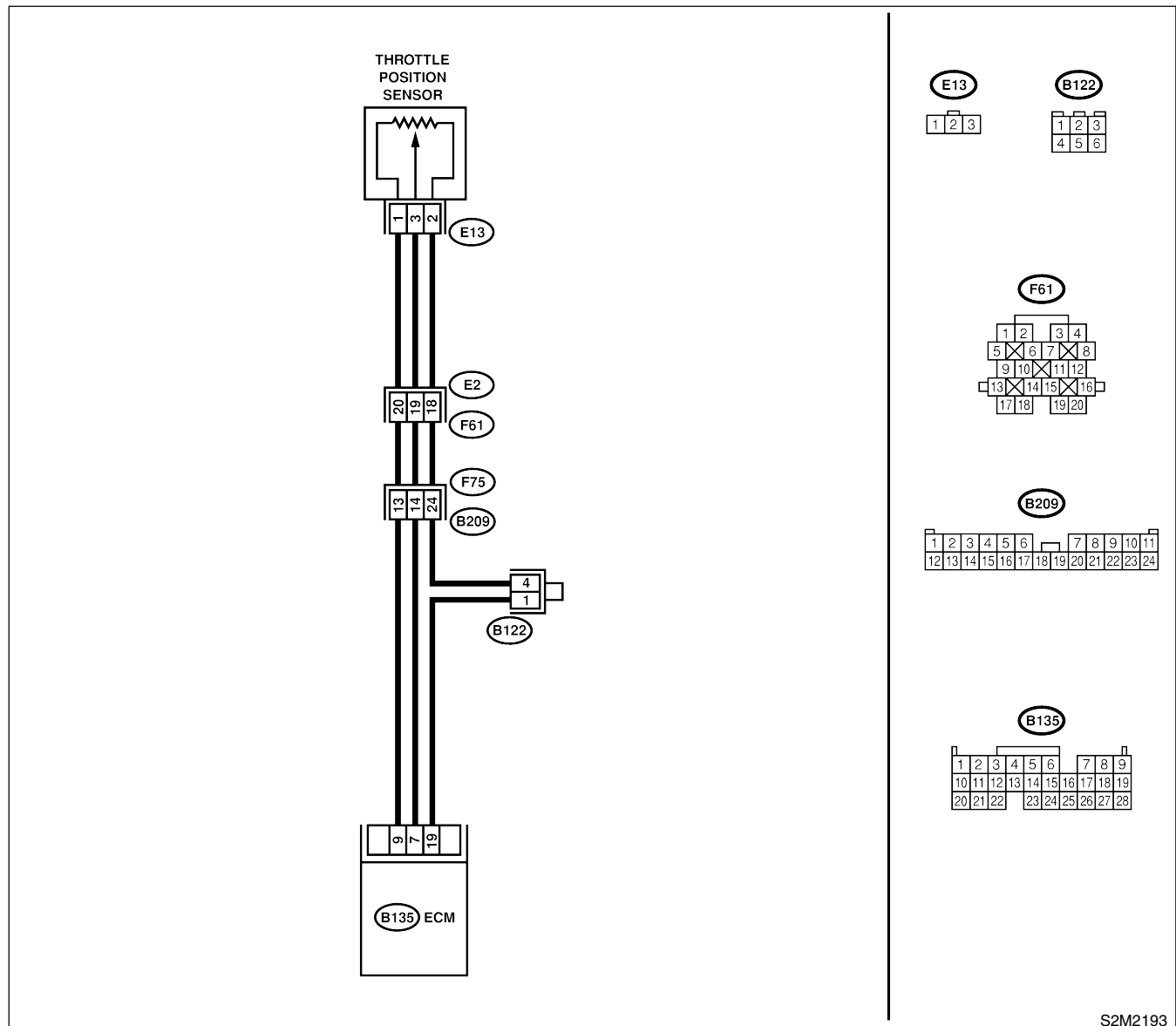
S088521B21

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

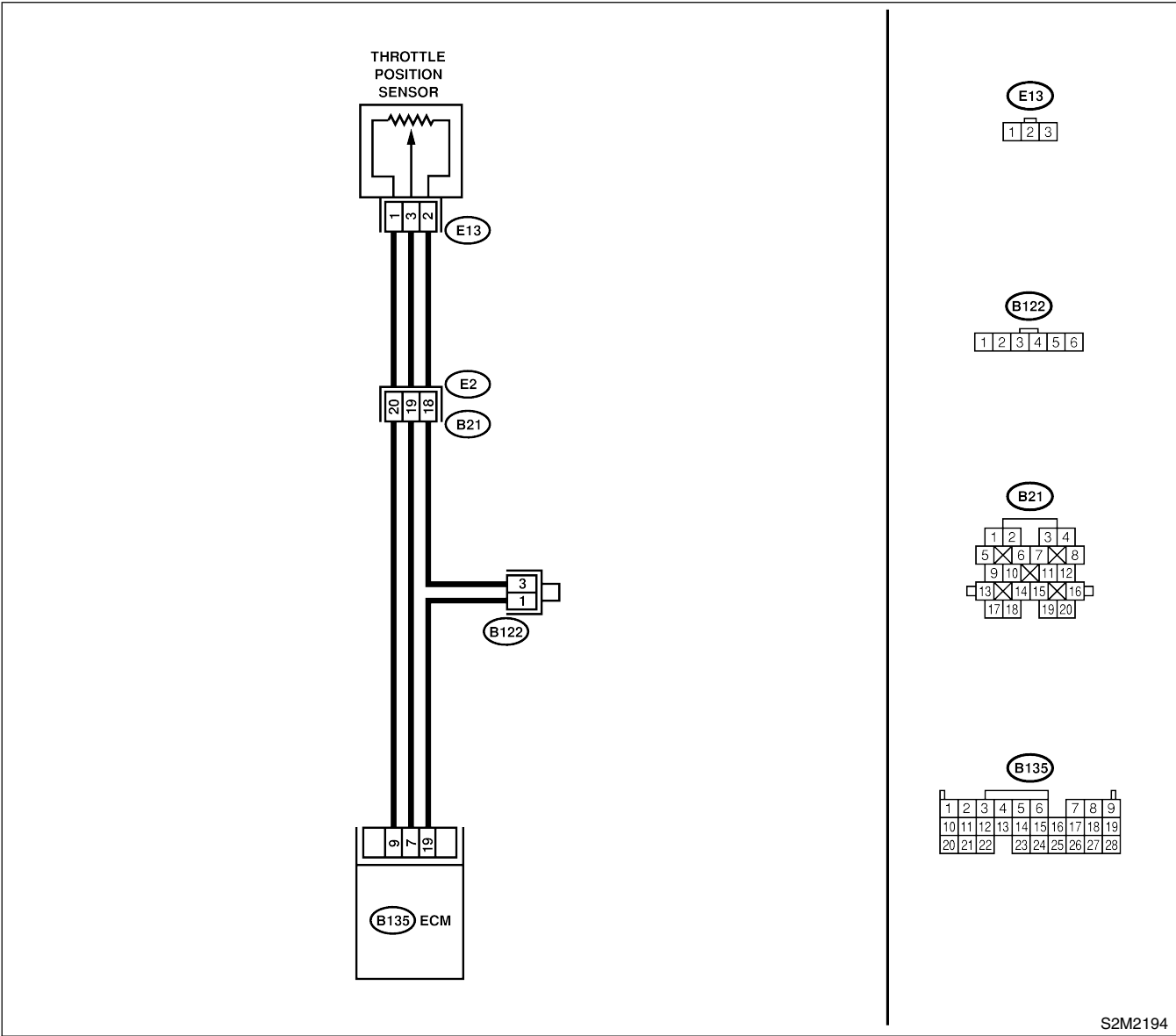
- **WIRING DIAGRAM:**
- **LHD MODEL**



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



S2M2194

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 4.9 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: ● Poor contact in throttle position sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector
2	CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from throttle position sensor. 3) Measure resistance of harness between throttle position sensor connector and engine ground. Connector & terminal (E13) No. 2 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 3.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between throttle position sensor and ECM connector ● Poor contact in coupling connector ● Poor contact in joint connector
3	CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between throttle position sensor connector and engine ground. Connector & terminal (E13) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.9 V?	Repair battery short circuit in harness between throttle position sensor and ECM connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Replace throttle position sensor. <Ref. to FU(DOHC TURBO)-33, Throttle Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

S: DTC P0125 — INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL — S088521B22

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

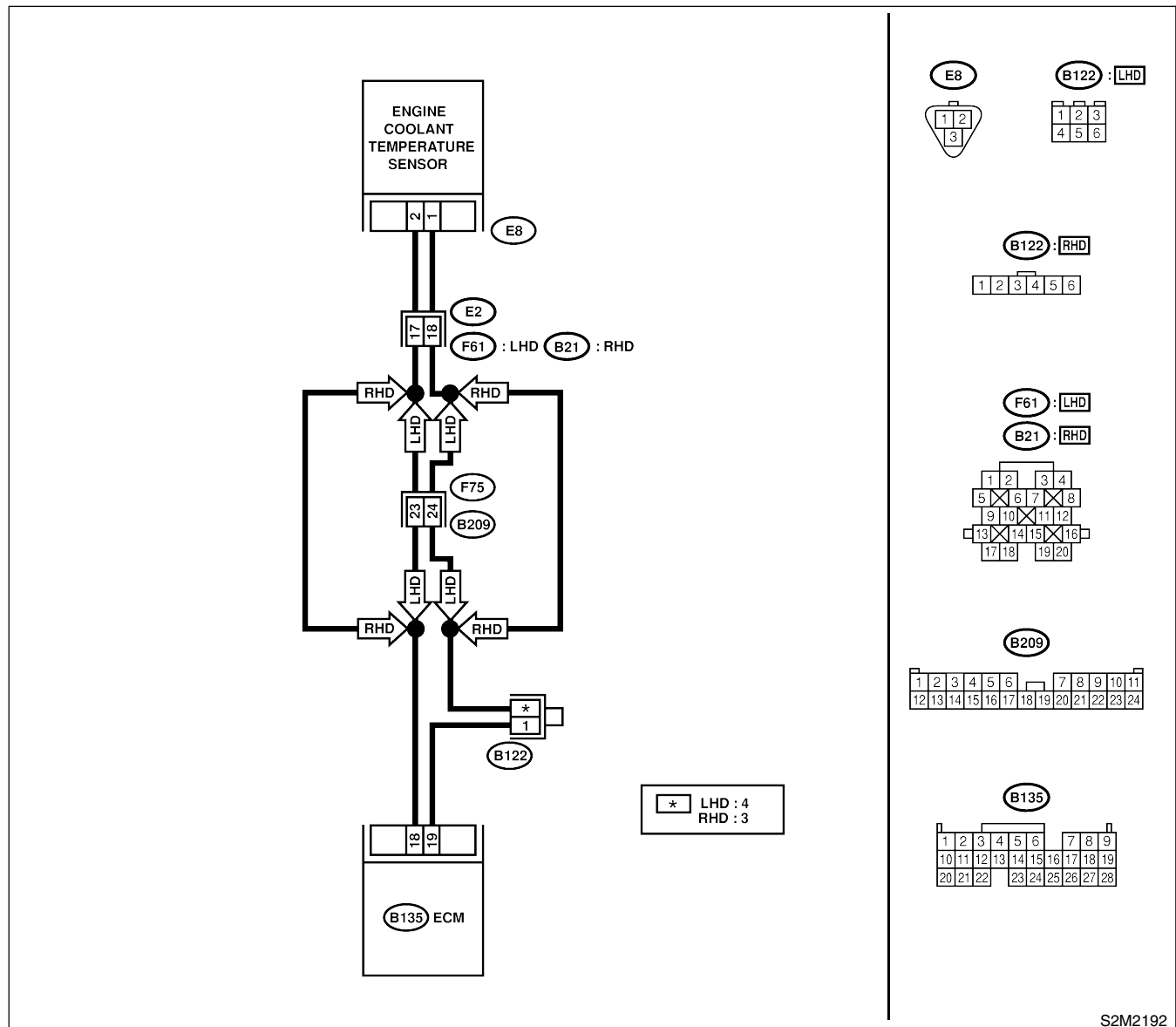
• TROUBLE SYMPTOM:

- Engine would not return to idling.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2192

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0117 or P0118?	Inspect DTC P0117 or P0118 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0125.	Go to step 2.
2	CHECK ENGINE COOLING SYSTEM. NOTE: Check the following items. • Thermostat open stuck • Coolant level • Coolant freeze • Tire diameter	Is there a fault in engine cooling system?	Replace thermostat. <Ref. to CO-23, Thermostat.>	Replace engine coolant temperature sensor. <Ref. to FU(DOHC TURBO)-29, Engine Coolant Temperature Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

T: DTC P0131 — FRONT OXYGEN (A/F) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

S088521B24

NOTE:

For the diagnostic procedure, refer to DTC P0132. <Ref. to EN(DOHC TURBO)-150, DTC P0132 — FRONT OXYGEN (A/F) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

U: DTC P0132 — FRONT OXYGEN (A/F) SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) — S088521B25

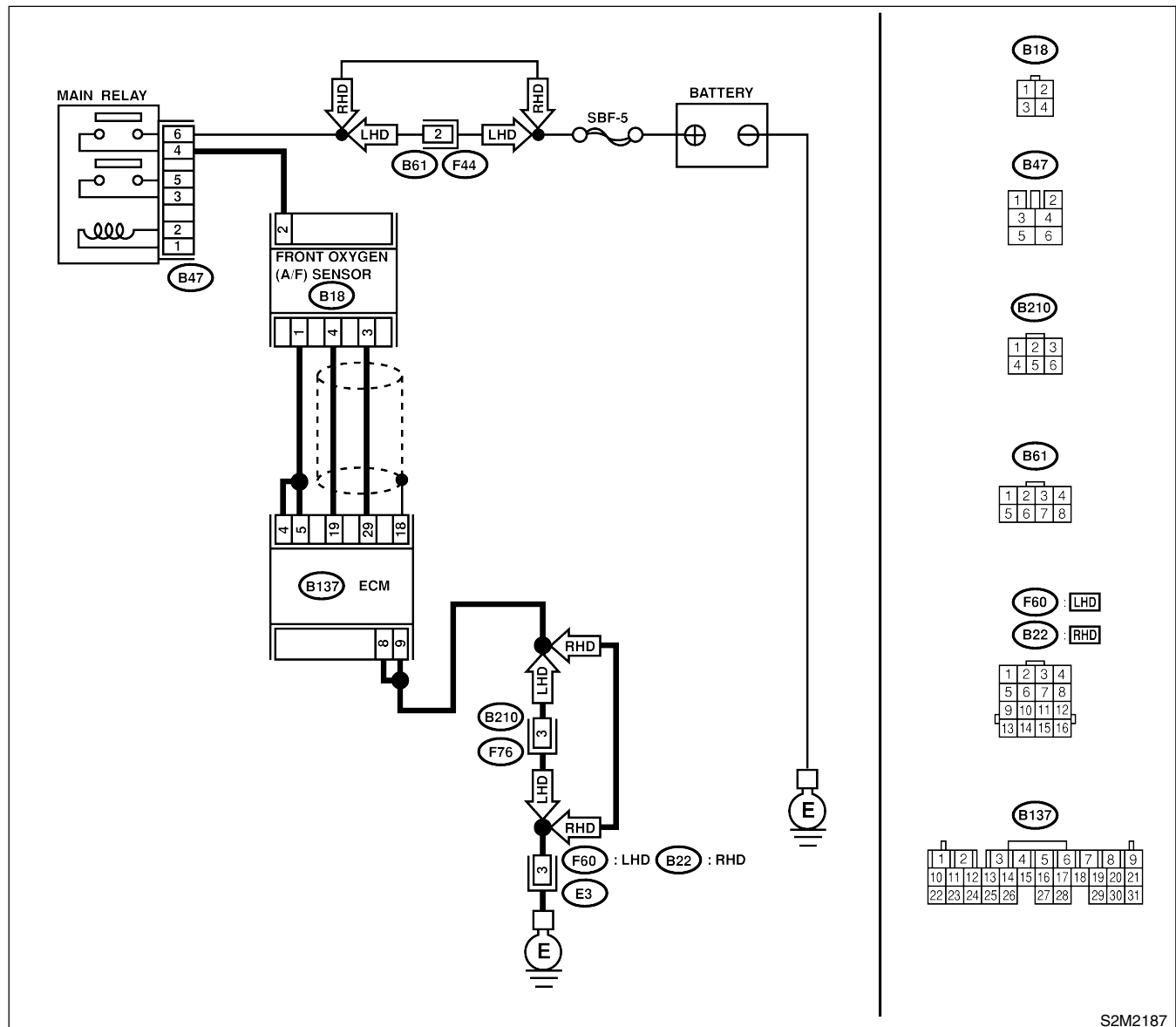
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0031, P0032, P1131, P1134 or P1139?	Inspect DTC P0031, P0032, P1131, P1134 or P1139 using "List of Diagnostic Trouble Code (DTC)".<Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK FRONT (A/F) OXYGEN SENSOR DATA. 1) Start engine. 2) While observing the Subaru Select Monitor or OBD-II general scan tool screen, warm-up the engine until coolant temperature is above 70°C (158°F). If the engine is already warmed-up, operate at idle speed for at least 1 minute. 3) Read data of front oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE".<Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value equal to or more than 0.85 and equal to less than 1.15 in idling?	Go to step 3.	Go to step 4.
3	CHECK REAR OXYGEN SENSOR SIGNAL. 1) Race engine at speeds from idling to 5,000 rpm for a total of 5 cycles. NOTE: To increase engine speed to 5,000 rpm, slowly depress accelerator pedal, taking approximately 5 seconds, and quickly release accelerator pedal to decrease engine speed. 2) Operate the LED operation mode for engine. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "LED OPERATION MODE FOR ENGINE".<Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.>	Does the LED of {Rear O2 Rich Signal} blink?	Repair poor contact in front oxygen (A/F) sensor and rear oxygen sensor connector.	Check rear oxygen sensor circuit.<Ref. to FU(DOHC TURBO)-44, Rear Oxygen Sensor.>
4	CHECK EXHAUST SYSTEM. Check exhaust system parts. NOTE: Check the following items. ● Loose installation of portions ● Damage (crack, hole etc.) of parts ● Looseness of front oxygen (A/F) sensor ● Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace faulty parts.	Replace front oxygen (A/F) sensor.<Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

V: DTC P0133 — FRONT OXYGEN (A/F) SENSOR CIRCUIT SLOW RESPONSE —

S088521B26

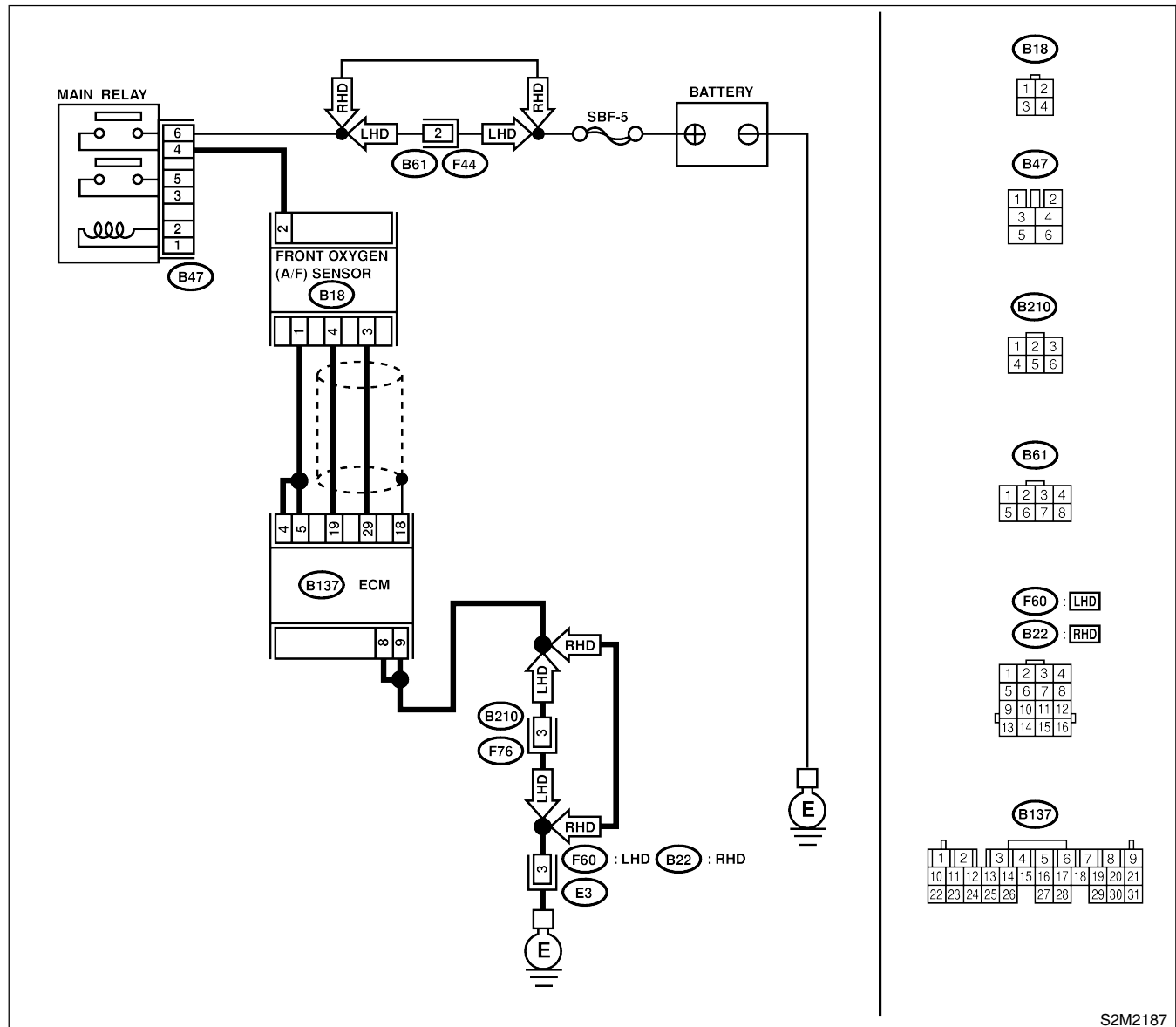
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0031, P0032, P0131, P0132, P1130, P1131, P1132, P1130, P1131, P1134 or P1139?	Inspect DTC P0031, P0032, P0131, P0132, P1130, P1131, P1134 or P1139 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0133.	Go to step 2.
2	CHECK EXHAUST SYSTEM. NOTE: Check the following items. ● Loose installation of front portion of exhaust pipe onto cylinder heads ● Loose connection between front exhaust pipe and front catalytic converter ● Damage of exhaust pipe resulting in a hole	Is there a fault in exhaust system?	Repair exhaust system.	Replace front oxygen (A/F) sensor. <Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

W: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —

S088521B28

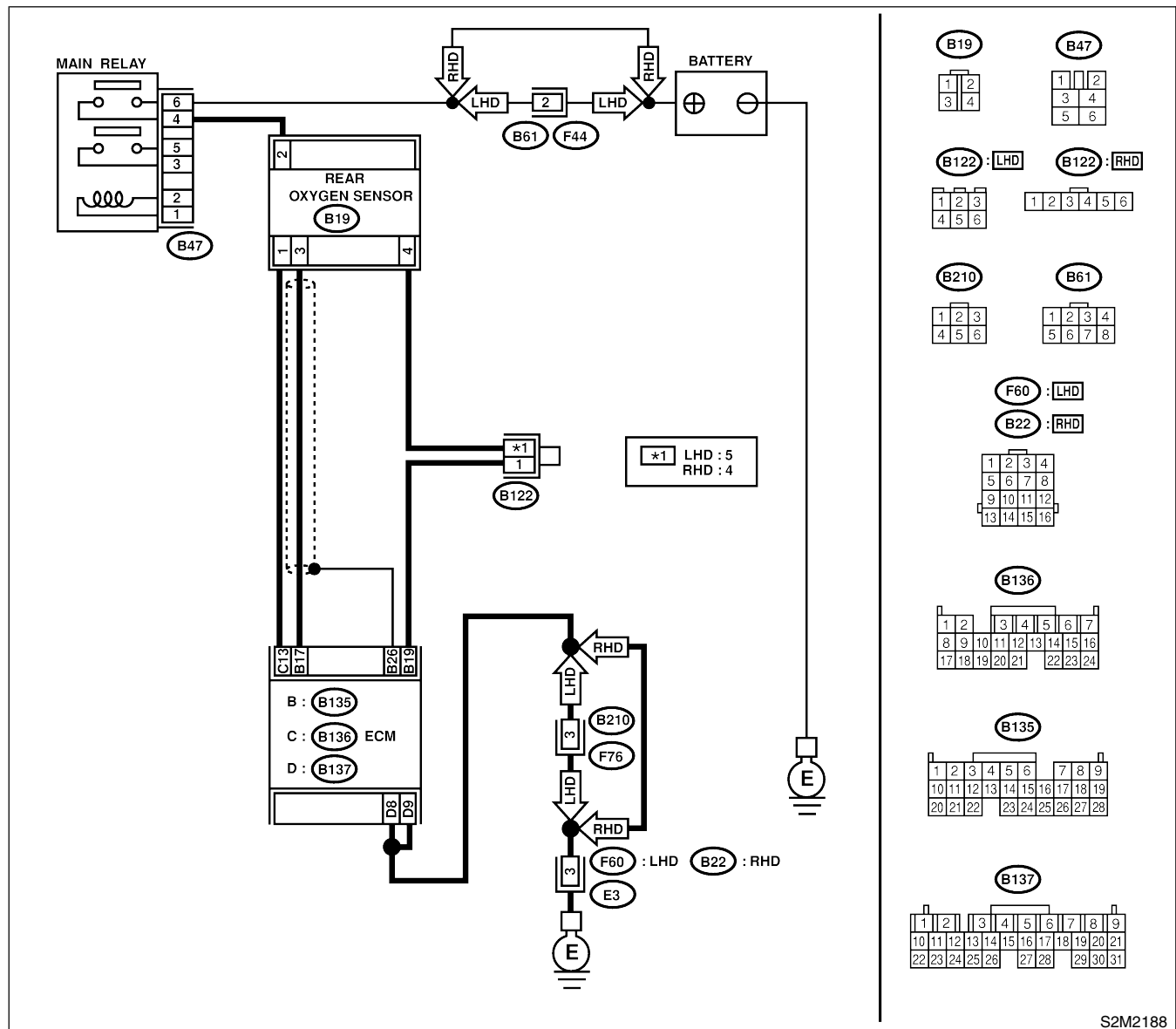
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2188

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0131 or P0132?	Go to step 2.	Go to step 3.
2	CHECK FAILURE CAUSE OF P0131 or P0132. Inspect DTC P0131 or P0132 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Is the failure cause of P0131 or P0132 in the fuel system?	Check fuel system. NOTE: In this case, it is not necessary to inspect DTC P0136.	Go to step 3.
3	CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for two minutes. 2) Read data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Does the value fluctuate?	Go to step 7.	Go to step 4.
4	CHECK REAR OXYGEN SENSOR DATA. Read data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II General Scan Tool.	Is the value fixed between 0.2 and 0.4 V?	Go to step 5.	Replace rear oxygen sensor. <Ref. to FU(DOHC TURBO)-44, Rear Oxygen Sensor.>
5	CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM and rear oxygen sensor. 3) Measure resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 26 — (B19) No. 4:	Is the resistance more than 3 Ω?	Repair open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 6.
6	CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from rear oxygen sensor. 3) Turn ignition switch to ON. 4) Measure voltage between rear oxygen sensor harness connector and engine ground or chassis ground. Connector & terminal (B19) No. 3 (+) — Engine ground (-):	Is the voltage more than 0.2 V?	Replace rear oxygen sensor. <Ref. to FU(DOHC TURBO)-44, Rear Oxygen Sensor.>	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between rear oxygen sensor and ECM connector ● Poor contact in rear oxygen sensor connector ● Poor contact in ECM connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
7	CHECK EXHAUST SYSTEM. Check exhaust system parts. NOTE: Check the following items. ● Loose installation of portions ● Damage (crack, hole etc.) of parts ● Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor	Is there a fault in exhaust system?	Repair or replace faulty parts.	Replace rear oxygen sensor. <Ref. to FU(DOHC TURBO)-44, Rear Oxygen Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

X: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —

S088521B29

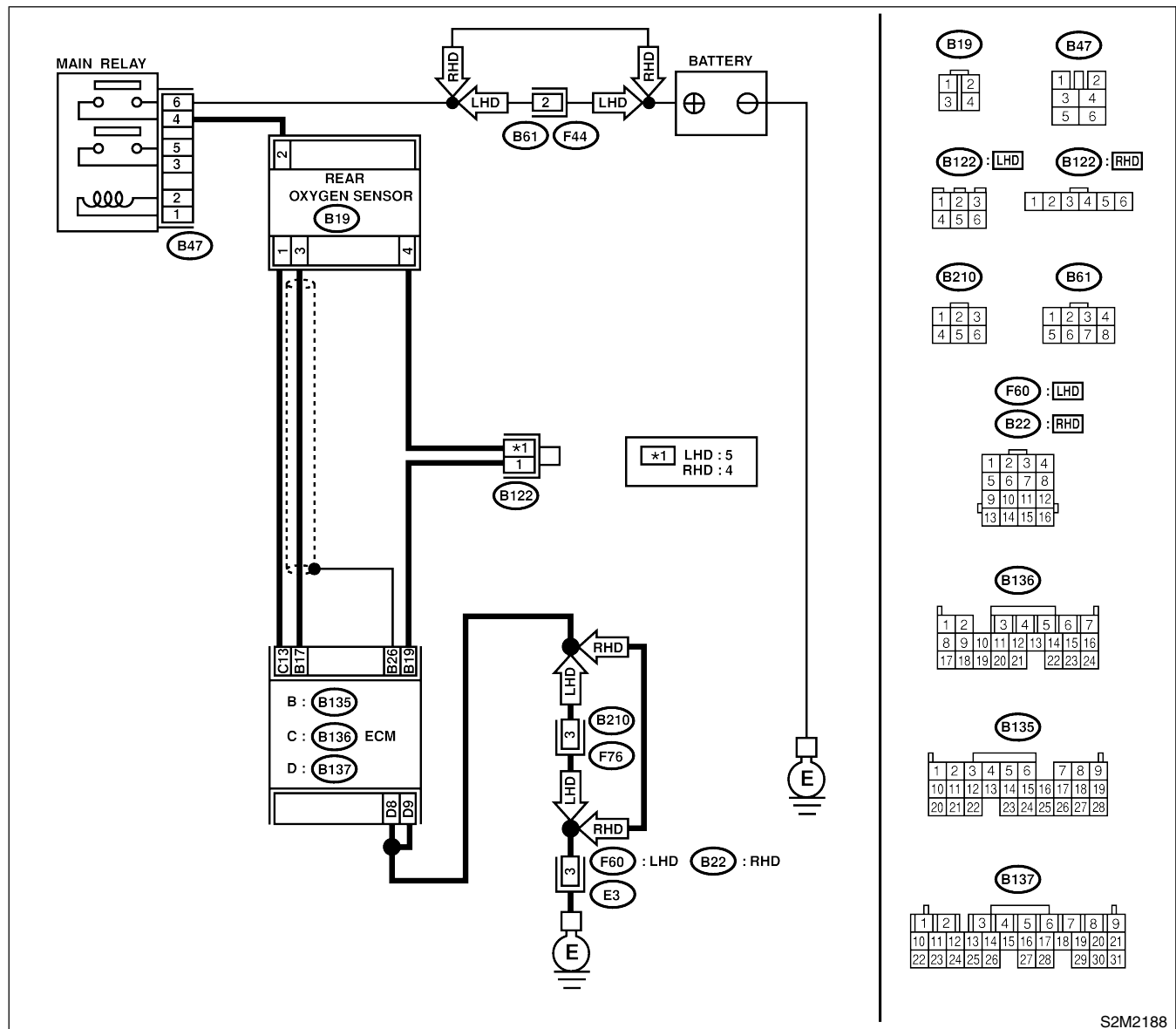
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2188

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0136?	Inspect DTC P0136 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0139.	Replace rear oxygen sensor. <Ref. to FU(DOHC TURBO)-44, Rear Oxygen Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

Y: DTC P0171 — FUEL TRIM MALFUNCTION (A/F TOO LEAN) — S088521B33

NOTE:

For the diagnostic procedure, refer to DTC P0172. <Ref. to EN(DOHC TURBO)-161, DTC P0172 — FUEL TRIM MALFUNCTION (A/F TOO RICH) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

Z: DTC P0172 — FUEL TRIM MALFUNCTION (A/F TOO RICH) — S088521B32

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK EXHAUST SYSTEM.	Are there holes or loose bolts on exhaust system?	Repair exhaust system.	Go to step 2.
2	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair air intake system.	Go to step 3.
3	CHECK FUEL PRESSURE. WARNING: ● Place “NO FIRE” signs near the working area. ● Be careful not to spill fuel on the floor. 1) Release fuel pressure. (1) Disconnect connector from fuel pump relay. (2) Start the engine and run it until it stalls. (3) After the engine stalls, crank it for five more seconds. (4) Turn ignition switch to OFF. 2) Connect connector to fuel pump relay. 3) Disconnect fuel delivery hose from fuel filter, and connect fuel pressure gauge. 4) Install fuel filler cap. 5) Start the engine and idle while gear position is neutral. 6) Measure fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. WARNING: Before removing fuel pressure gauge, release fuel pressure. NOTE: If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.	Is fuel pressure between 284 and 314 kPa (2.9 — 3.2 kg/cm ² , 41 — 46 psi)?	Go to step 4.	Repair the following items. Fuel pressure too high ● Clogged fuel return line or bent hose Fuel pressure too low ● Improper fuel pump discharge ● Clogged fuel supply line

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
4	CHECK FUEL PRESSURE. After connecting pressure regulator vacuum hose, measure fuel pressure. WARNING: Before removing fuel pressure gauge, release fuel pressure. NOTE: ● If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again. ● If out of specification as measured at this step, check or replace pressure regulator and pressure regulator vacuum hose.	Is fuel pressure between 206 and 235 kPa (2.1 — 2.4 kg/cm ² , 30 — 34 psi)?	Go to step 5.	Repair the following items. Fuel pressure too high ● Faulty pressure regulator ● Clogged fuel return line or bent hose Fuel pressure too low ● Faulty pressure regulator ● Improper fuel pump discharge ● Clogged fuel supply line
5	CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is temperature greater than 60°C (140°F)?	Go to step 6.	Replace engine coolant temperature sensor. <Ref. to FU(DOHC TURBO)-29, Engine Coolant Temperature Sensor.>
6	CHECK INTAKE MANIFOLD PRESSURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in neutral position. 3) Turn A/C switch to OFF. 4) Turn all accessory switches to OFF. 5) Read data of intake manifold pressure sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual. Specification: ● Intake manifold absolute pressure Ignition ON 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg)	Is the value within the specifications?	Go to step 7.	Replace mass air flow and intake manifold pressure sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
7	CHECK INTAKE AIR TEMPERATURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in neutral position. 3) Turn A/C switch to OFF. 4) Turn all accessory switches to OFF. 5) Open front hood. 6) Measure ambient temperature. 7) Read data of intake manifold pressure sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is value obtained when ambient temperature is subtracted from intake air temperature greater than -10°C (14°F) and less than 50°C (122°F)?	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.	Check mass air flow and intake air temperature sensor. <Ref. to FU(DOHC TURBO)-34, Mass Air Flow and Intake Air Temperature Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AA: DTC P0244 — WASTEGATE CONTROL SOLENOID VALVE MALFUNCTION (HIGH INPUT) — S088521H65

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

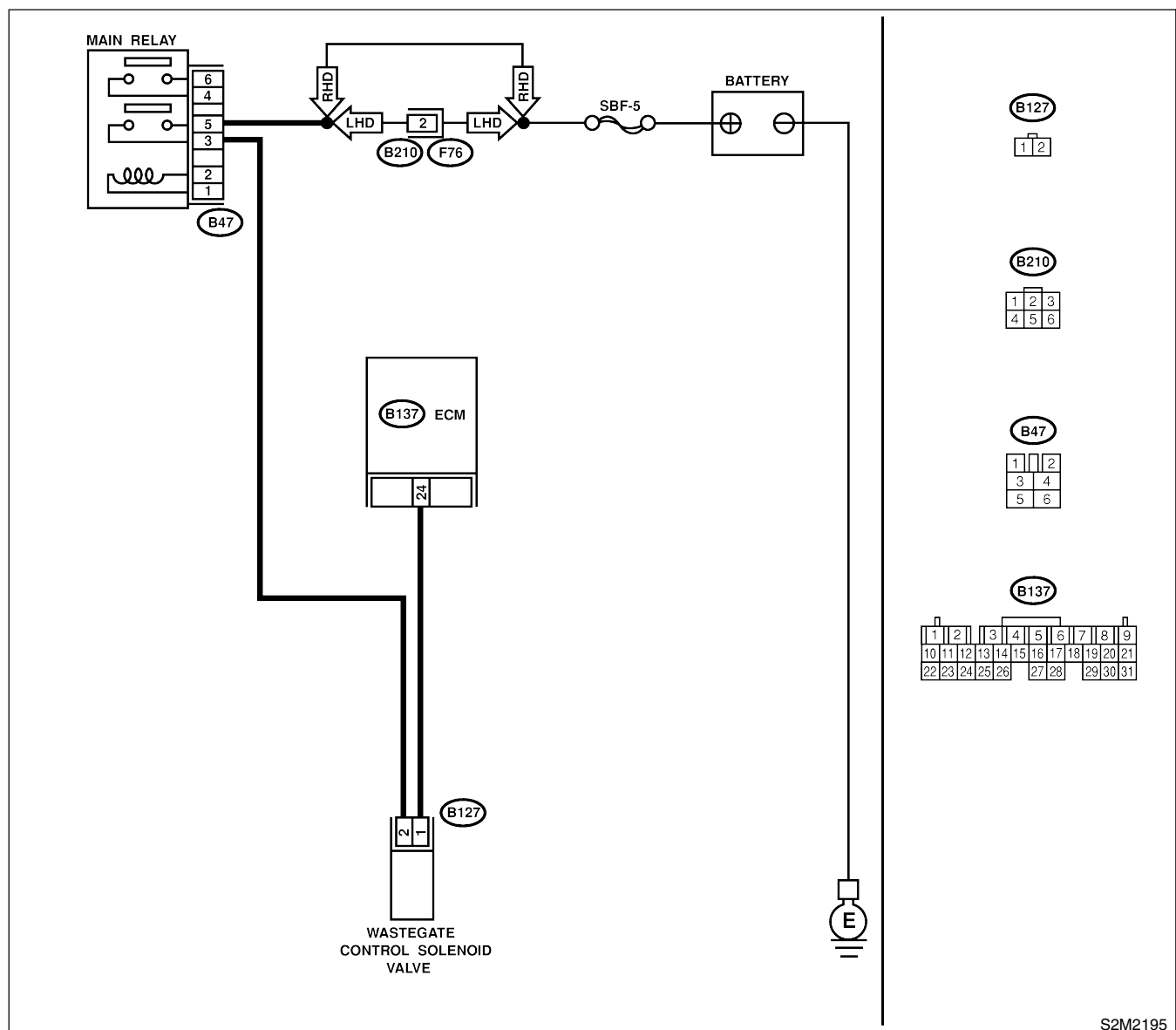
• TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2195

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0245 or P0246?	Inspect DTC P0245 or P0246 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0121.	Replace wastegate control solenoid valve. <Ref. to FU(DOHC TURBO)-41, Wastegate Control Solenoid Valve.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AB: DTC P0245 — WASTEGATE CONTROL SOLENOID VALVE CIRCUIT LOW INPUT —

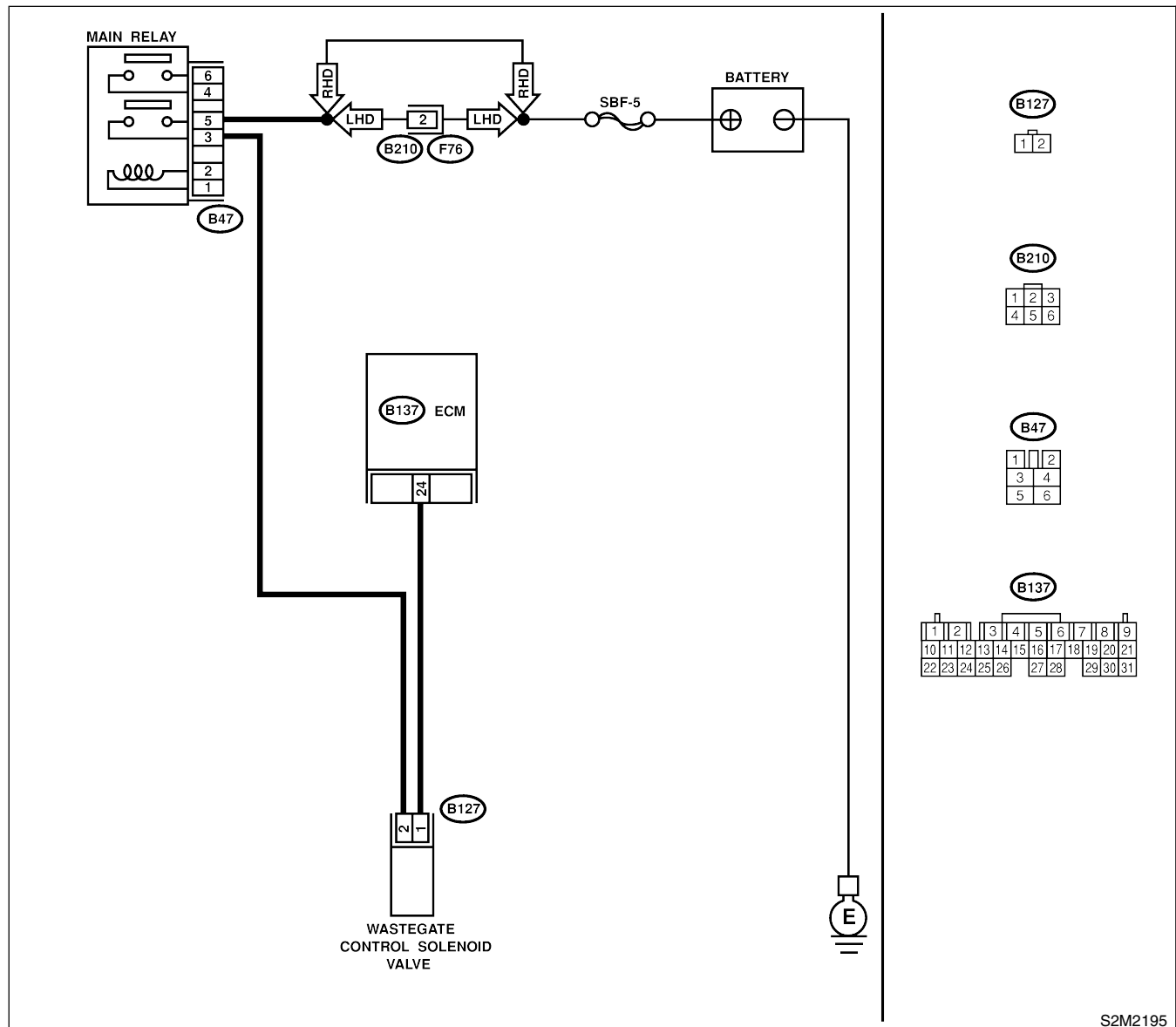
S088521H66

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2195

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 24 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.	Go to step 2.
2	CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from wastegate control solenoid valve and ECM. 3) Measure resistance of harness between wastegate control solenoid valve connector and engine ground. Connector & terminal (B127) No. 1 — Engine ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between ECM and wastegate control solenoid valve connector.	Go to step 3.
3	CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR. Measure resistance of harness between ECM and wastegate control solenoid valve of harness connector. Connector & terminal (B137) No. 24 — (B127) No. 1:	Is the resistance less than 1 Ω ?	Go to step 4.	Repair open circuit in harness between ECM and wastegate control solenoid valve connector. NOTE: In this case, repair the following: Open circuit in harness between ECM and wastegate control solenoid valve connector
4	CHECK WASTEGATE CONTROL SOLENOID VALVE. 1) Remove wastegate control solenoid valve. 2) Measure resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance between 30 and 34 Ω ?	Go to step 5.	Replace wastegate control solenoid valve. <Ref. to FU(DOHC TURBO)-41, Wastegate Control Solenoid Valve.>
5	CHECK POWER SUPPLY TO WASTEGATE CONTROL SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between wastegate control solenoid valve and engine ground. Connector & terminal (B127) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit in harness between main relay and wastegate control solenoid valve connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK POOR CONTACT. Check poor contact in wastegate control solenoid valve connector.	Is there poor contact in wastegate control solenoid valve connector?	Repair poor contact in wastegate control solenoid valve connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AC: DTC P0246 — WASTEGATE CONTROL SOLENOID VALVE CIRCUIT HIGH INPUT —

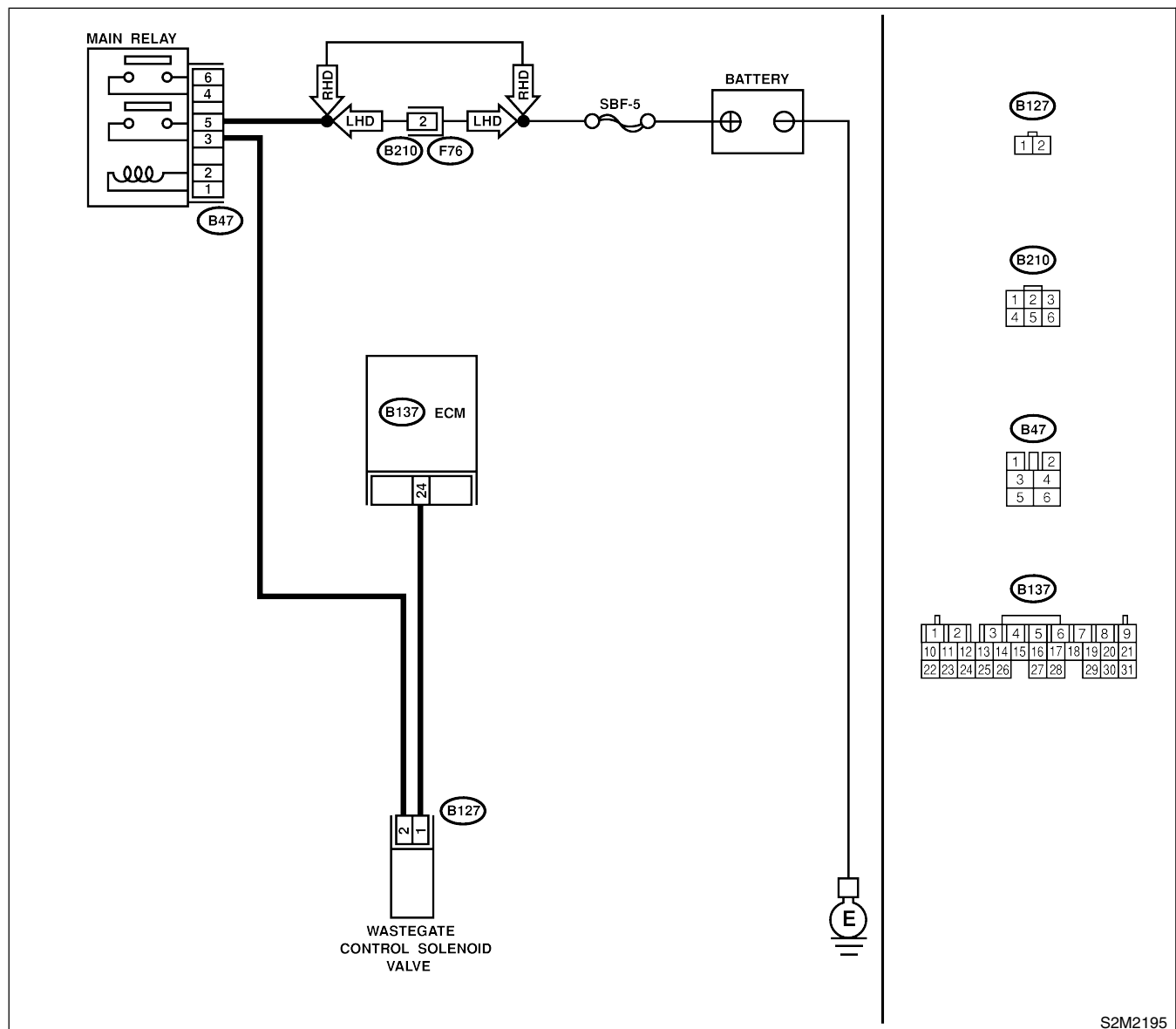
S088521H67

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2195

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 24 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 3.	Go to step 2.
2	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>
3	CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from wastegate control solenoid valve. 3) Turn ignition switch to ON. 4) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 24 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and wastegate control solenoid valve connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 4.
4	CHECK WASTEGATE CONTROL SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Measure resistance between wastegate control solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Replace wastegate control solenoid valve <Ref. to FU(DOHC TURBO)-41, Wastegate Control Solenoid Valve.> and ECM <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 5.
5	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AD: DTC P0301 — CYLINDER 1 MISFIRE DETECTED — S088521B37

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(DOHC TURBO)-172, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AE: DTC P0302 — CYLINDER 2 MISFIRE DETECTED — S088521B38

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(DOHC TURBO)-172, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AF: DTC P0303 — CYLINDER 3 MISFIRE DETECTED — S088521B39

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(DOHC TURBO)-172, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AG: DTC P0304 — CYLINDER 4 MISFIRE DETECTED — S088521B40

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

● TROUBLE SYMPTOM:

- Engine stalls.
- Erroneous idling
- Rough driving

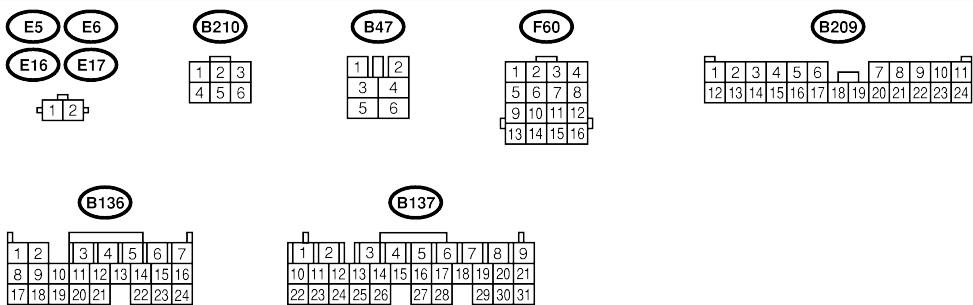
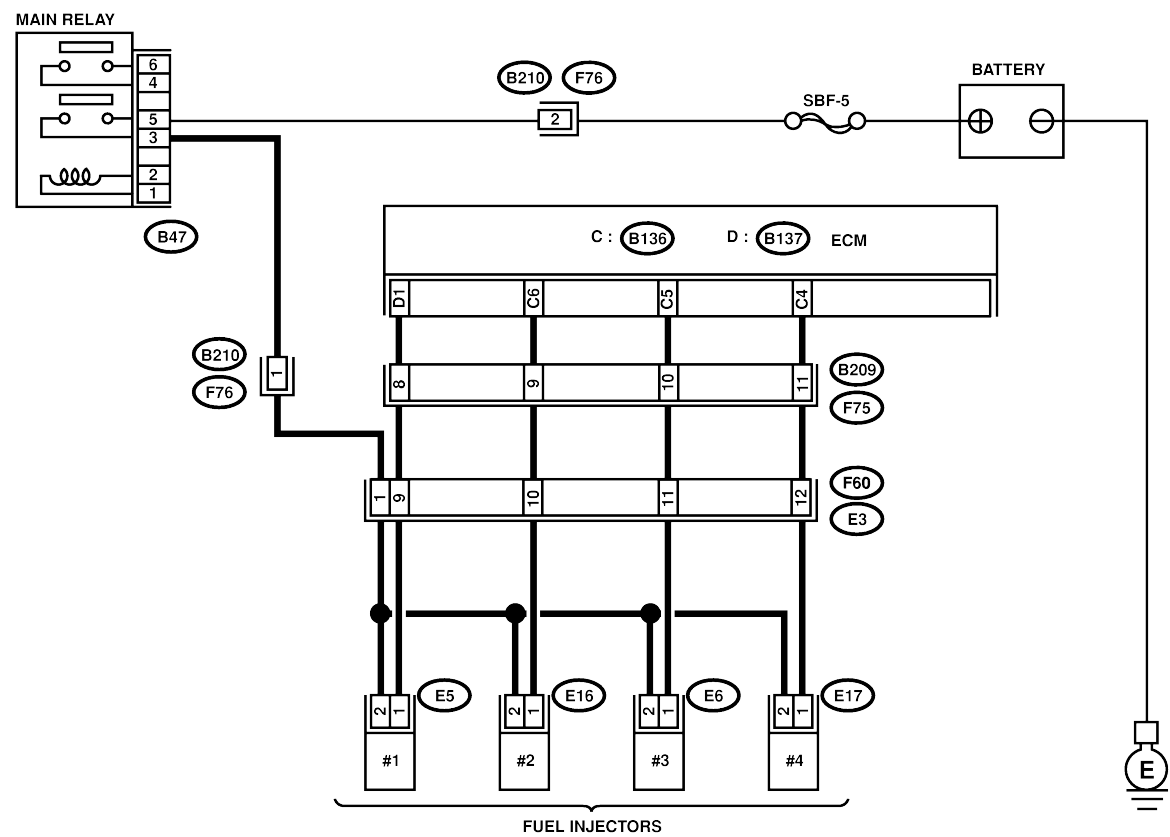
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

- WIRING DIAGRAM:
- LHD MODEL



S2M2186

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

- RHD MODEL

en0965

EN0965

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P0117, P0118 or P0125?	Inspect DTC P0106, P0107, P0108, P0117, P0118 or P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0301, P0302, P0303 and P0304.	Go to step 2.
2	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM connector and chassis ground on faulty cylinders. Connector & terminal #1 (B137) No. 1 (+) — Chassis ground (-): #2 (B136) No. 6 (+) — Chassis ground (-): #3 (B136) No. 5 (+) — Chassis ground (-): #4 (B136) No. 4 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 7.	Go to step 3.
3	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from fuel injector on faulty cylinders. 3) Disconnect connector from ECM. 4) Measure voltage between ECM connector and engine ground on faulty cylinders. Connector & terminal #1 (E5) No. 1 — Engine ground: #2 (E16) No. 1 — Engine ground: #3 (E6) No. 1 — Engine ground: #4 (E17) No. 1 — Engine ground:	Is the resistance less than 10 Ω?	Repair ground short circuit in harness between fuel injector and ECM connector.	Go to step 4.
4	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR. Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders. Connector & terminal #1 (B137) No. 1 — (E5) No. 1: #2 (B136) No. 6 — (E16) No. 1: #3 (B136) No. 5 — (E6) No. 1: #4 (B136) No. 4 — (E17) No. 1:	Is the resistance less than 1 Ω?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and fuel injector connector ● Poor contact in coupling connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK FUEL INJECTOR. Measure resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:	Is the resistance between 5 and 20 Ω ?	Go to step 6.	Replace faulty fuel injector. <Ref. to FU(DOHC TURBO)-37, Fuel Injector.>
6	CHECK POWER SUPPLY LINE. 1) Turn ignition switch to ON. 2) Measure voltage between fuel injector and engine ground on faulty cylinders. Connector & terminal #1 (E5) No. 2 (+) — Engine ground (-): #2 (E16) No. 2 (+) — Engine ground (-): #3 (E6) No. 2 (+) — Engine ground (-): #4 (E17) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair poor contact in all connectors in fuel injector circuit.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between main relay and fuel injector connector on faulty cylinders ● Poor contact in coupling connector ● Poor contact in main relay connector ● Poor contact in fuel injector connector on faulty cylinders
7	CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from fuel injector on faulty cylinder. 3) Turn ignition switch to ON. 4) Measure voltage between ECM connector and chassis ground on faulty cylinders. Connector & terminal #1 (B137) No. 1 (+) — Chassis ground (-): #2 (B136) No. 6 (+) — Chassis ground (-): #3 (B136) No. 5 (+) — Chassis ground (-): #4 (B136) No. 4 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and fuel injector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 8.
8	CHECK FUEL INJECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Replace faulty fuel injector <Ref. to FU(DOHC TURBO)-37, Fuel Injector.> and ECM <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 9.
9	CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.	Is camshaft position sensor or crankshaft position sensor loosely installed?	Tighten camshaft position sensor or crankshaft position sensor.	Go to step 10.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
10	CHECK CRANKSHAFT SPROCKET. Remove timing belt cover.	Is crankshaft sprocket rusted or does it have broken teeth?	Replace crankshaft sprocket. <Ref. to ME(DOHC TURBO)-57, Crankshaft Sprocket.>	Go to step 11.
11	CHECK INSTALLATION CONDITION OF TIMING BELT. Turn crankshaft using ST, and align alignment mark on crankshaft sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is timing belt dislocated from its proper position?	Repair installation condition of timing belt. <Ref. to ME(DOHC TURBO)-48, Timing Belt Assembly.>	Go to step 12.
12	CHECK FUEL LEVEL.	Is the fuel meter indication higher than the "Lower" level?	Go to step 13.	Replenish fuel so fuel meter indication is higher than the "Lower" level. After replenishing fuel, Go to step 13.
13	CHECK STATUS OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL). 1) Clear memory using Subaru Select Monitor. <Ref. to EN(DOHC TURBO)-47, Clear Memory Mode.> 2) Start engine, and drive the vehicle more than 10 minutes.	Is the MIL coming on or blinking?	Go to step 15.	Go to step 14.
14	CHECK CAUSE OF MISFIRE DIAGNOSED.	Was the cause of misfire diagnosed when the engine is running?	Finish diagnostics operation, if the engine has no abnormality. NOTE: Ex. Remove spark plug cord, etc.	Repair poor contact. NOTE: In this case, repair the following: ● Poor contact in ignitor connector ● Poor contact in ignition coil connector ● Poor contact in fuel injector connector on faulty cylinders ● Poor contact in ECM connector ● Poor contact in coupling connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
15	CHECK AIR INTAKE SYSTEM.	Is there a fault in air intake system?	Repair air intake system. NOTE: Check the following items: ● Are there air leaks or air suction caused by loose or dislocated nuts and bolts? ● Are there cracks or any disconnection of hoses?	Go to step 16.
16	CHECK MISFIRE SYMPTOM. 1) Turn ignition switch to ON. 2) Read diagnostic trouble code (DTC). ● Subaru Select Monitor <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual. NOTE: Perform diagnosis according to the items listed below.	Does the Subaru Select Monitor or OBD-II general scan tool indicate only one DTC?	Go to step 21.	Go to step 17.
17	CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0301 and P0302?	Go to step 22.	Go to step 18.
18	CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0303 and P0304?	Go to step 23.	Go to step 19.
19	CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0301 and P0303?	Go to step 24.	Go to step 20.
20	CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0302 and P0304?	Go to step 25.	Go to step 26.
21	ONLY ONE CYLINDER	Is there a fault in that cylinder?	Repair or replace faulty parts. NOTE: Check the following items. ● Spark plug ● Fuel injector ● Compression ratio	Go to DTC P0171 and P0172. <Ref. to EN(DOHC TURBO)-160, DTC P0171 - FUEL TRIM MALFUNCTION (A/F TOO LEAN) -, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
22	GROUP OF #1 AND #2 CYLINDERS	Are there faults in #1 and #2 cylinders?	Repair or replace faulty parts. NOTE: ● Check the following items. Spark plugs Fuel injectors Ignition coil Compression ratio ● If no abnormal is discovered, check for "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <Ref. to EN(DOHC TURBO)-72, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171 and P0172. <Ref. to EN(DOHC TURBO)-160, DTC P0171 - FUEL TRIM MALFUNCTION (A/F TOO LEAN) -, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
23	GROUP OF #3 AND #4 CYLINDERS	Are there faults in #3 and #4 cylinders?	Repair or replace faulty parts. NOTE: ● Check the following items. Spark plugs Fuel injectors Ignition coil ● If no abnormal is discovered, check for "16. D: IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to EN(DOHC TURBO)-72, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171 and P0172. <Ref. to EN(DOHC TURBO)-160, DTC P0171 - FUEL TRIM MALFUNCTION (A/F TOO LEAN) -, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
24	GROUP OF #1 AND #3 CYLINDERS	Are there faults in #1 and #3 cylinders?	Repair or replace faulty parts. NOTE: Check the following items. ● Spark plugs ● Fuel injectors ● Skipping timing belt teeth	Go to DTC P0171 and P0172. <Ref. to EN(DOHC TURBO)-160, DTC P0171 — FUEL TRIM MALFUNCTION (A/F TOO LEAN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
25	GROUP OF #2 AND #4 CYLINDERS	Are there faults in #2 and #4 cylinders?	Repair or replace faulty parts. NOTE: Check the following items. • Spark plugs • Fuel injectors • Compression ratio • Skipping timing belt teeth	Go to DTC P0171 and P0172. <Ref. to EN(DOHC TURBO)-160, DTC P0171 — FUEL TRIM MALFUNCTION (A/F TOO LEAN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
26	CYLINDER AT RANDOM	Is the engine idle rough?	Go to DTC P0171 and P0172. <Ref. to EN(DOHC TURBO)-160, DTC P0171 — FUEL TRIM MALFUNCTION (A/F TOO LEAN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Repair or replace faulty parts. NOTE: Check the following items. • Spark plugs • Fuel injectors • Compression ratio

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AH: DTC P0327 — KNOCK SENSOR CIRCUIT LOW INPUT — S088521F94

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Poor driving performance
 - Knocking occurs.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● **WIRING DIAGRAM:**

en0975

EN0975

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance between ECM harness connector and chassis ground. Connector & terminal (B135) No. 4 — Chassis ground:	Is the resistance more than 700 kΩ?	Go to step 2.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between knock sensor and ECM connector ● Poor contact in knock sensor connector ● Poor contact in coupling connector
2	CHECK KNOCK SENSOR. 1) Disconnect connector from knock sensor. 2) Measure resistance between knock sensor connector terminal and engine ground. Terminal No. 2 — Engine ground:	Is the resistance more than 700 kΩ?	Go to step 3.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between knock sensor and ECM connector ● Poor contact in knock sensor connector ● Poor contact in coupling connector
3	CHECK CONDITION OF KNOCK SENSOR INSTALLATION.	Is the knock sensor installation bolt tightened securely?	Replace knock sensor. <Ref. to FU(DOHC TURBO)-32, Knock Sensor.>	Tighten knock sensor installation bolt securely.

AI: DTC P0328 — KNOCK SENSOR CIRCUIT HIGH INPUT — S088521F95

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Poor driving performance
 - Knocking occurs.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● **WIRING DIAGRAM:**

en0975

EN0975

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR. Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B135) No. 4 — Chassis ground:	Is the resistance less than 400 k Ω ?	Go to step 2.	Go to step 3.
2	CHECK KNOCK SENSOR. 1) Disconnect connector from knock sensor. 2) Measure resistance between knock sensor connector terminal and engine ground. Terminal No. 2 — Engine ground:	Is the resistance less than 400 k Ω ?	Replace knock sensor. <Ref. to FU(DOHC TURBO)-32, Knock Sensor.>	Repair ground short circuit in harness between knock sensor connector and ECM connector. NOTE: The harness between both connectors is shielded. Repair short circuit of harness together with shield.
3	CHECK INPUT SIGNAL FOR ECM. 1) Connect connectors to ECM and knock sensor. 2) Turn ignition switch to ON. 3) Measure voltage between ECM and chassis ground. Connector & terminal (B135) No. 4 (+) — Chassis ground (-):	Is the voltage more than 2 V?	Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.) NOTE: In this case, repair the following: ● Poor contact in knock sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector	Repair poor contact in ECM connector.

**AJ: DTC P0335 — CRANKSHAFT POSITION SENSOR CIRCUIT
MALFUNCTION —** S088521B42

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● **WIRING DIAGRAM:**

en0976

EN0976

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from crankshaft position sensor. 3) Measure resistance of harness between crankshaft position sensor connector and engine ground. Connector & terminal (E10) No. 1 — Engine ground:	Is the resistance more than 100 k Ω ?	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between crankshaft position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in coupling connector	Go to step 2.
2	CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure resistance of harness between crankshaft position sensor connector and engine ground. Connector & terminal (E10) No. 1 — Engine ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between crankshaft position sensor and ECM connector. NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.	Go to step 3.
3	CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure resistance of harness between crankshaft position sensor connector and engine ground. Connector & terminal (E10) No. 2 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between crankshaft position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in coupling connector
4	CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 5.	Tighten crankshaft position sensor installation bolt securely.
5	CHECK CRANKSHAFT POSITION SENSOR. 1) Remove crankshaft position sensor. 2) Measure resistance between connector terminals of crankshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance between 1 and 4 k Ω ?	Repair poor contact in crankshaft position sensor connector.	Replace crankshaft position sensor. <Ref. to FU(DOHC TURBO)-30, Crankshaft Position Sensor.>

**AK: DTC P0336 — CRANKSHAFT POSITION SENSOR CIRCUIT
RANGE/PERFORMANCE PROBLEM —** S088521B43

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● **WIRING DIAGRAM:**

en0976

EN0976

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0335?	Inspect DTC P0335 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK CONDITION OF CRANKSHAFT POSITION SENSOR. Turn ignition switch to OFF.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 3.	Tighten crankshaft position sensor installation bolt securely.
3	CHECK CRANKSHAFT SPROCKET. Remove front belt cover.	Are crankshaft sprocket teeth cracked or damaged?	Replace crankshaft sprocket. <Ref. to FU(DOHC TURBO)-30, Crankshaft Position Sensor.>	Go to step 4.
4	CHECK INSTALLATION CONDITION OF TIMING BELT. Turn crankshaft using ST, and align alignment mark on crankshaft sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is timing belt dislocated from its proper position?	Repair installation condition of timing belt. <Ref. to ME(DOHC TURBO)-48, Timing Belt Assembly.>	Replace crankshaft position sensor. <Ref. to FU(DOHC TURBO)-30, Crankshaft Position Sensor.>

AL: DTC P0340 — CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION

— S088521B44

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● **WIRING DIAGRAM:**

en0977

EN0977

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from camshaft position sensor. 3) Measure resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 1 — Engine ground:	Is the resistance more than 100 k Ω ?	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between camshaft position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in coupling connector	Go to step 2.
2	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 1 — Engine ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between camshaft position sensor and ECM connector. NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.	Go to step 3.
3	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 2 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between camshaft position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in coupling connector
4	CHECK CONDITION OF CAMSHAFT POSITION SENSOR.	Is the camshaft position sensor installation bolt tightened securely?	Go to step 5.	Tighten camshaft position sensor installation bolt securely.
5	CHECK CAMSHAFT POSITION SENSOR. 1) Remove camshaft position sensor. 2) Measure resistance between connector terminals of camshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance between 1 and 4 k Ω ?	Repair poor contact in camshaft position sensor connector.	Replace camshaft position sensor. <Ref. to FU(DOHC TURBO)-31, Camshaft Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AM: DTC P0341 — CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM — S088521B45

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● **WIRING DIAGRAM:**

en0977

EN0977

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0340?	Inspect DTC P0340 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from camshaft position sensor. 3) Measure resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 1 — Engine ground:	Is the resistance more than 100 kΩ?	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between camshaft position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in coupling connector	Go to step 3.
3	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 1 — Engine ground:	Is the resistance less than 10 Ω?	Repair ground short circuit in harness between camshaft position sensor and ECM connector. NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.	Go to step 4.
4	CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR. Measure resistance of harness between camshaft position sensor connector and engine ground. Connector & terminal (E15) No. 2 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between camshaft position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in coupling connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK CONDITION OF CAMSHAFT POSITION SENSOR.	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten camshaft position sensor installation bolt securely.
6	CHECK CAMSHAFT POSITION SENSOR. 1) Remove camshaft position sensor. 2) Measure resistance between connector terminals of camshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance between 1 and 4 kΩ?	Go to step 7.	Replace camshaft position sensor. <Ref. to FU(DOHC TURBO)-31, Camshaft Position Sensor.>
7	CHECK CONDITION OF CAMSHAFT POSITION SENSOR. Turn ignition switch to OFF.	Is the camshaft position sensor installation bolt tightened securely?	Go to step 8.	Tighten camshaft position sensor installation bolt securely.
8	CHECK CAMSHAFT SPROCKET. Remove front belt cover. <Ref. to ME(DOHC TURBO)-47, Belt Cover.>	Are camshaft sprocket teeth cracked or damaged?	Replace camshaft sprocket. <Ref. to ME(DOHC TURBO)-56, Camshaft Sprocket.>	Go to step 9.
9	CHECK INSTALLATION CONDITION OF TIMING BELT. Turn camshaft using ST, and align alignment mark on camshaft sprocket with alignment mark on timing belt cover LH. ST 499207400 CAMSHAFT SPROCKET WRENCH	Is timing belt dislocated from its proper position?	Repair installation condition of timing belt. <Ref. to ME(DOHC TURBO)-48, Timing Belt Assembly.>	Replace camshaft position sensor. <Ref. to FU(DOHC TURBO)-31, Camshaft Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AN: DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD

S088521B46

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

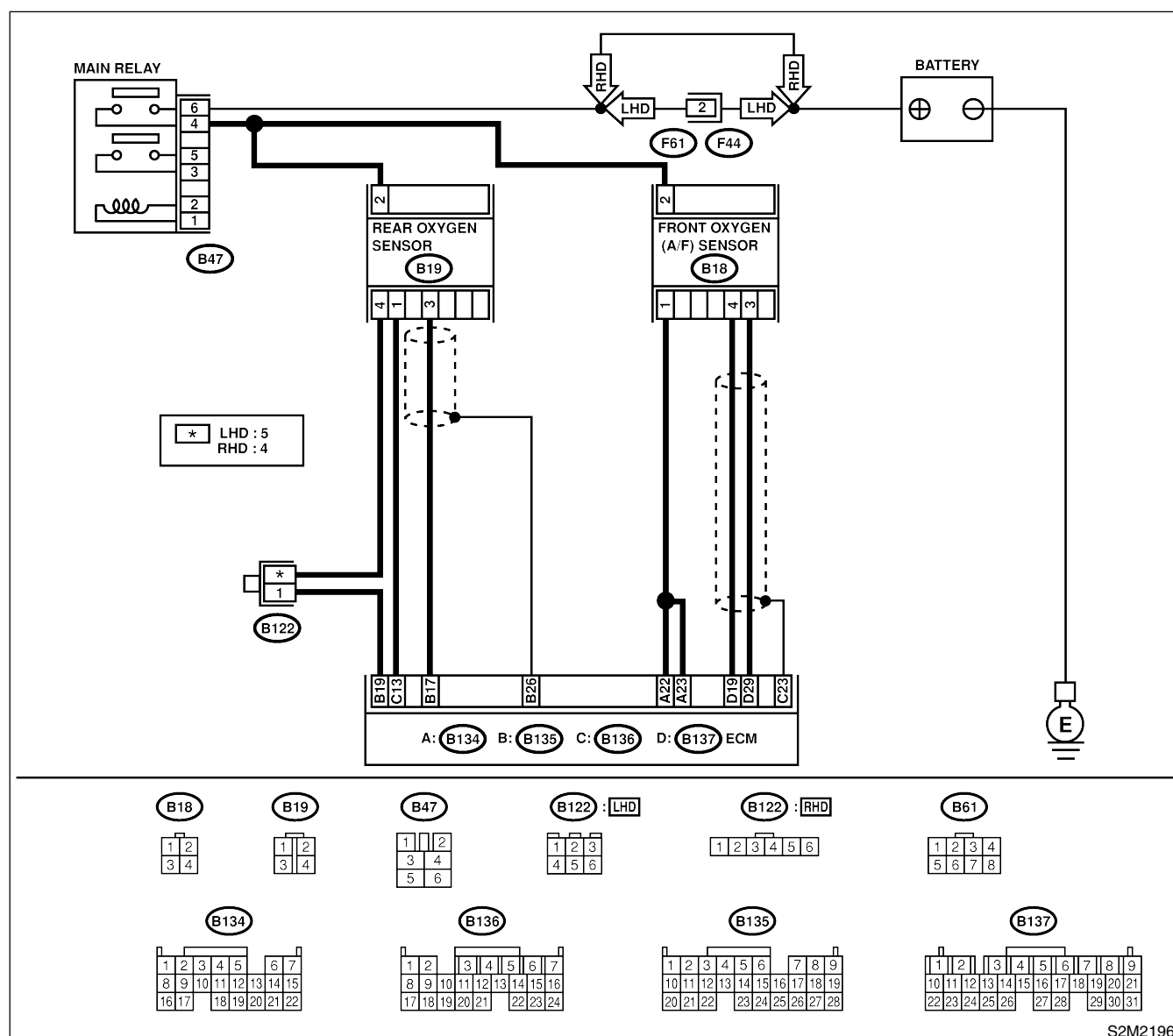
• TROUBLE SYMPTOM:

- Engine stalls.
- Idle mixture is out of specifications.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2196

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0031, P0032, P0131, P0132, P0133, P1130, P1131, P1134, P1139, P0037, P0038, P0136 and P0139?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0420.	Go to step 2.
2	CHECK EXHAUST SYSTEM. Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes. NOTE: Check the following positions. ● Between cylinder head and front exhaust pipe ● Between front exhaust pipe and front catalytic converter ● Between front catalytic converter and rear catalytic converter	Is there a fault in exhaust system?	Repair or replace exhaust system. <Ref. to EX(DOHC TURBO)-2, General Description.>	Go to step 3.
3	CHECK REAR CATALYTIC CONVERTER. Separate rear catalytic converter from rear exhaust pipe.	Is there damage at rear face of rear catalyst?	Replace front catalytic converter <Ref. to EC(DOHC TURBO)-3, Front Catalytic Converter.> and rear catalytic converter. <Ref. to EC(DOHC TURBO)-4, Rear Catalytic Converter.>	Go to step 4.
4	CHECK FRONT CATALYTIC CONVERTER. Remove front catalytic converter.	Is there damage at rear face or front face of front catalyst?	Replace front catalytic converter. <Ref. to EC(DOHC TURBO)-3, Front Catalytic Converter.>	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AO: DTC P0444 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —

S088521G47

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

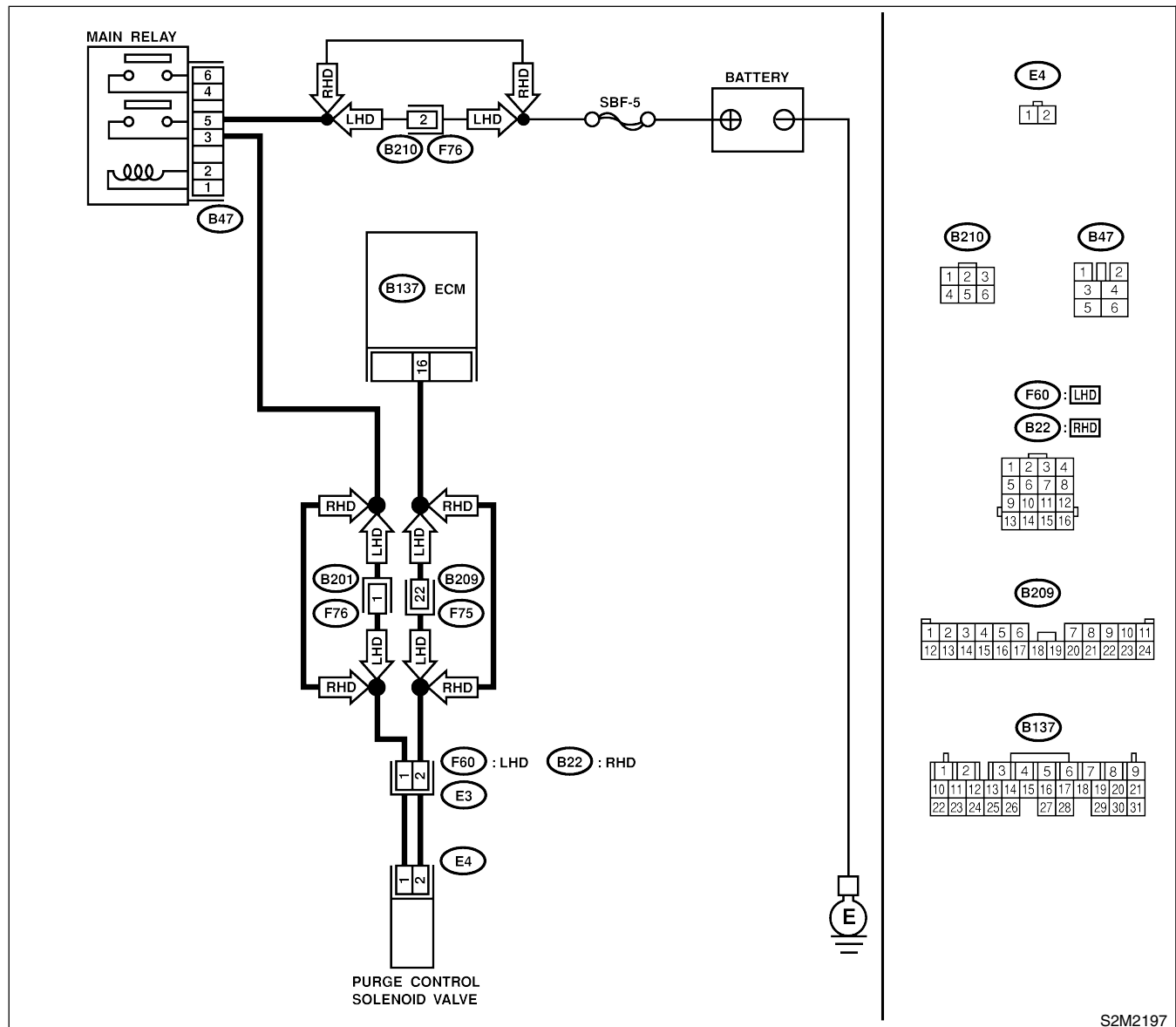
• TROUBLE SYMPTOM:

- Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2197

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 16 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.	Go to step 2.
2	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from purge control solenoid valve and ECM. 3) Measure resistance of harness between purge control solenoid valve connector and engine ground. Connector & terminal (E4) No. 2 — Engine ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between ECM and purge control solenoid valve connector.	Go to step 3.
3	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR. Measure resistance of harness between ECM and purge control solenoid valve of harness connector. Connector & terminal (B137) No. 16 — (E4) No. 2:	Is the resistance less than 1 Ω ?	Go to step 4.	Repair open circuit in harness between ECM and purge control solenoid valve connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and purge control solenoid valve connector ● Poor contact in coupling connector
4	CHECK PURGE CONTROL SOLENOID VALVE. 1) Remove purge control solenoid valve. 2) Measure resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance between 10 and 100 Ω ?	Go to step 5.	Replace purge control solenoid valve. <Ref. to EC(DOHC TURBO)-7, Purge Control Solenoid Valve.>
5	CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE. 1) Turn ignition switch to ON. 2) Measure voltage between purge control solenoid valve and engine ground. Connector & terminal (E4) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit in harness between main relay and purge control solenoid valve connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK POOR CONTACT. Check poor contact in purge control solenoid valve connector.	Is there poor contact in purge control solenoid valve connector?	Repair poor contact in purge control solenoid valve connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

Engine (Diagnostics)

S088521G48

- Two consecutive driving cycles with fault

- Erroneous idling

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to OFF. 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box. 3) Turn ignition switch to ON. 4) While operating purge control solenoid valve, measure voltage between ECM and chassis ground. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(DOHC TURBO)-48, Compulsory Valve Operation Check Mode.> Connector & terminal (B137) No. 16 (+) — Chassis ground (-):	Does voltage change between 0 and 10 V?	Go to step 2.	Even if MIL light up, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.
2	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 16 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
3	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>
4	CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from purge control solenoid valve. 3) Turn ignition switch to ON. 4) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 16 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 5.
5	CHECK PURGE CONTROL SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Measure resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Replace purge control solenoid valve <Ref. to EC(DOHC TURBO)-7, Purge Control Solenoid Valve.> and ECM <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 6.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AQ: DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM — S088521B54

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0462 or P0463?	Inspect DTC P0462 or P0463 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect this trouble.	Replace fuel level sensor <Ref. to FU(DOHC TURBO)-62, Fuel Level Sensor.> and fuel sub level sensor <Ref. to FU(DOHC TURBO)-63, Fuel Sub Level Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AR: DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT — S088521B55

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

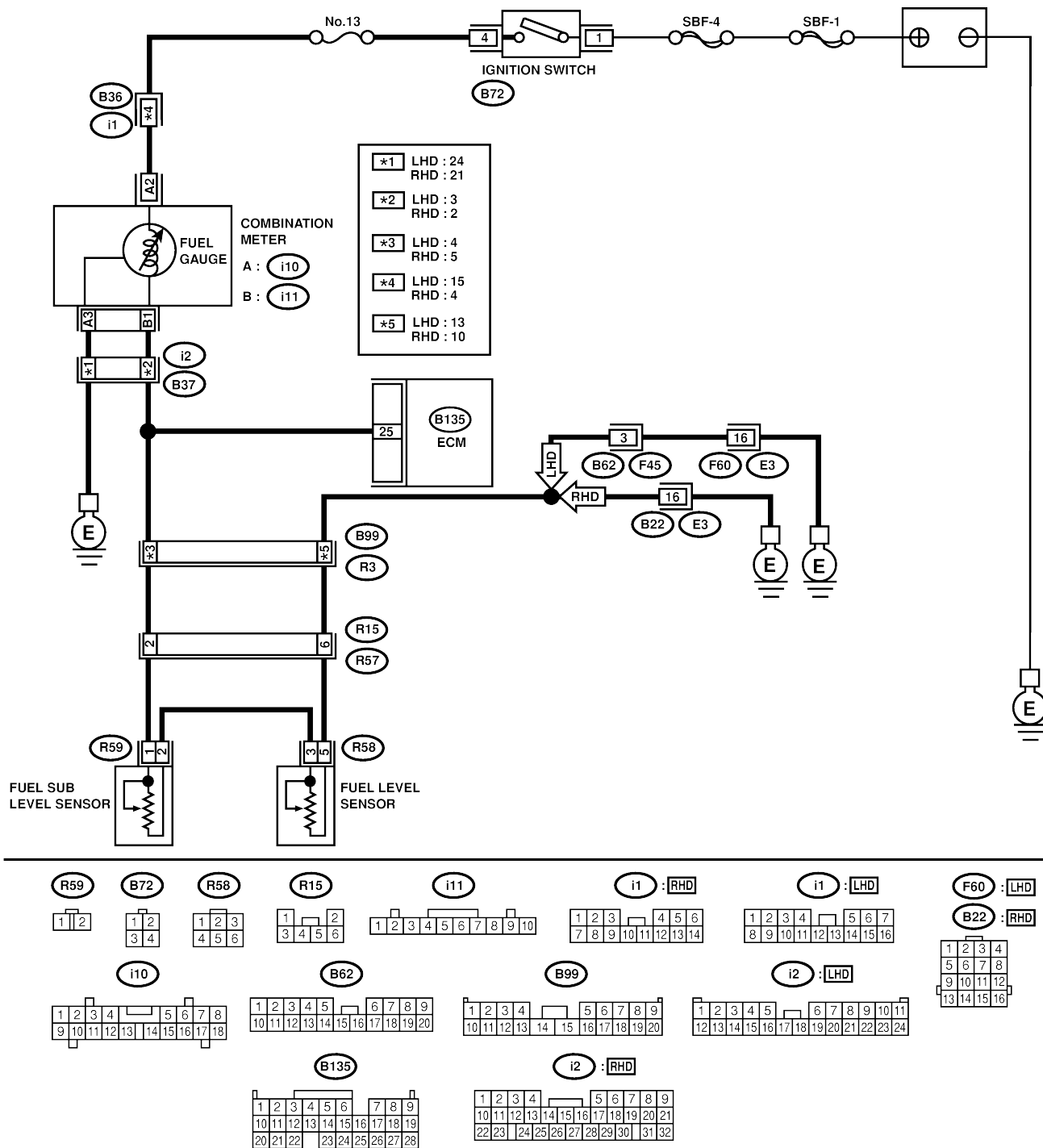
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● WIRING DIAGRAM:



S2M2198

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.	Does speedometer and tachometer operate normally?	Go to step 2.	Repair or replace combination meter. <Ref. to IDI-4, Combination Meter System.>
2	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to ON. (Engine OFF) 2) Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 25 (+) — Chassis ground (-):	Is the voltage less than 0.12 V?	Go to step 6.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.) Read data of fuel level sensor signal using Subaru Select Monitor. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.>	Does the value change less than 0.12 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair poor contact in ECM connector.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: ● Poor contact in combination meter connector ● Poor contact in ECM connector ● Poor contact in coupling connectors
4	CHECK INPUT VOLTAGE OF ECM. 1) Turn ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Turn ignition switch to ON. 4) Measure voltage of harness between ECM connector and chassis ground. Connector & terminal (B135) No. 25 (+) — Chassis ground (-):	Is the voltage more than 0.12 V?	Go to step 4.	Go to step 7.
5	CHECK HARNESS BETWEEN ECM AND COMBINATION METER. 1) Turn ignition switch to OFF. 2) Disconnect connector from connector (i10), (i12) and ECM connector. 3) Measure resistance between ECM and chassis ground. Connector & terminal (B135) No. 25 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 6.	Repair ground short circuit in harness between ECM and combination meter connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND COMBINATION METER. Measure resistance between ECM and combination meter connector. Connector & terminal (B135) No. 25 — (i11) No. 1:	Is the resistance less than 10 Ω?	Repair or replace combination meter. <Ref. to IDI-4, Combination Meter System.>	Repair open circuit between ECM and combination meter connector. NOTE: In this case, repair the following: Poor contact in coupling connector
7	CHECK FUEL TANK CORD. 1) Turn ignition switch to OFF. 2) Disconnect connector from fuel sub level sensor. 3) Measure resistance between fuel sub level sensor and chassis ground. Connector & terminal (R59) No. 1 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 8.	Repair ground short circuit in fuel tank cord.
8	CHECK FUEL TANK CORD. 1) Disconnect connector from fuel pump assembly. 2) Measure resistance between fuel pump assembly and chassis ground. Connector & terminal (R59) No. 2 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 9.	Repair ground short circuit in fuel tank cord.
9	CHECK FUEL LEVEL SENSOR. 1) Remove fuel pump assembly. <Ref. to FU(DOHC TURBO)-60, Fuel Pump.> 2) Measure resistance between fuel level sensor and terminals with its float set to the full position. Terminals No. 3 — No. 5:	Is the resistance between 0.5 and 2.5 Ω?	Go to step 10.	Replace fuel level sensor.
10	CHECK FUEL SUB LEVEL SENSOR. 1) Remove fuel sub level sensor. <Ref. to FU(DOHC TURBO)-63, Fuel Sub Level Sensor.> 2) Measure resistance between fuel sub level sensor and terminals with its float set to the full position. Terminals No. 1 — No. 2:	Is the resistance between 0.5 and 2.5 Ω?	Repair poor contact in harness between ECM and combination meter connector.	Replace fuel sub level sensor.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AS: DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT — S088521B56

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

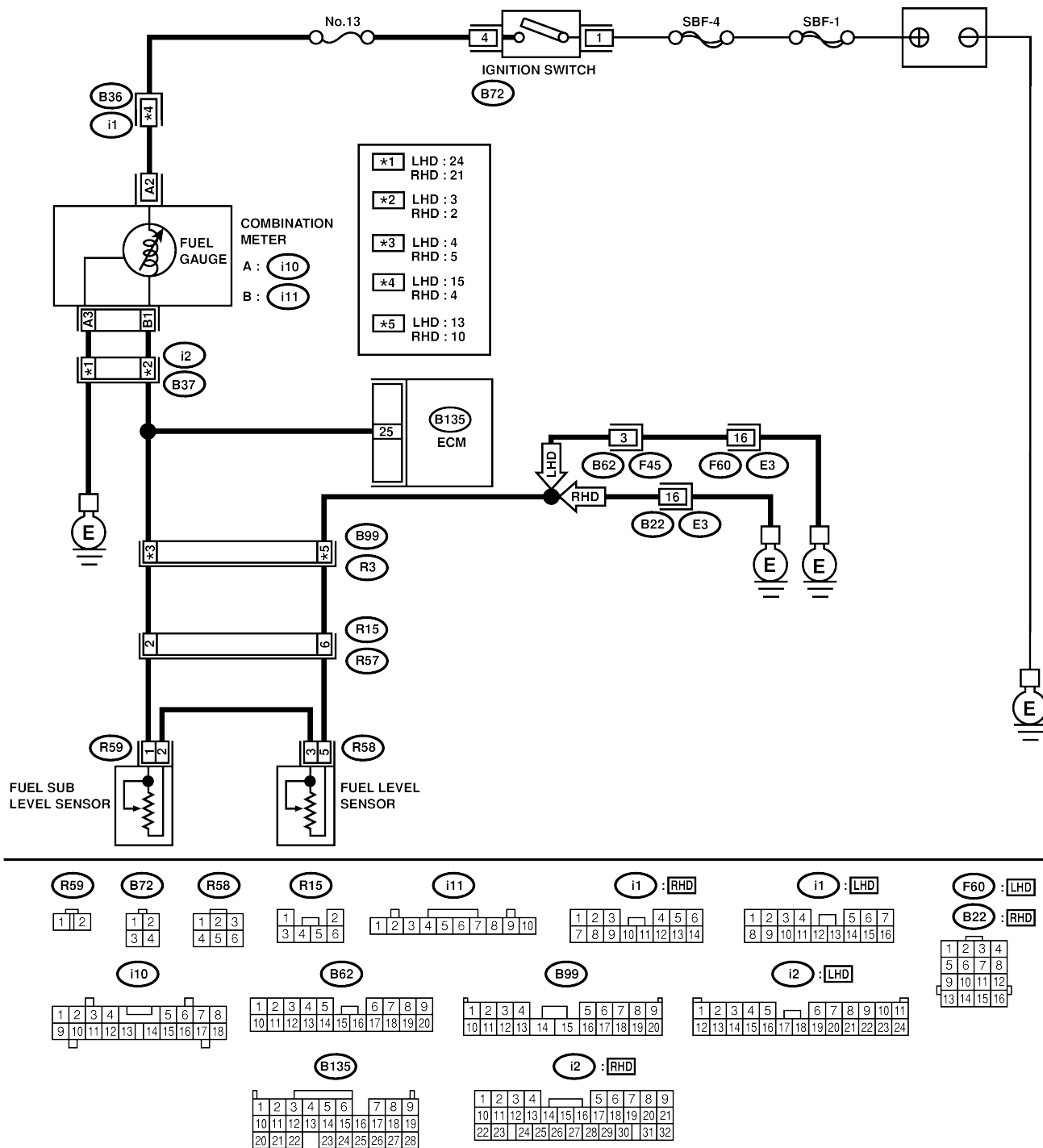
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode<Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● WIRING DIAGRAM:



S2M2198

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.	Does speedometer and tachometer operate normally?	Go to step 2.	Repair or replace combination meter. <Ref. to IDI-4, Combination Meter System.>
2	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to ON. (Engine OFF) 2) Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 25 (+) — Chassis ground (-):	Is the voltage more than 4.75 V?	Go to step 3.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: ● Poor contact in fuel pump connector ● Poor contact in coupling connector
3	CHECK INPUT VOLTAGE OF ECM. 1) Turn ignition switch to OFF. 2) Disconnect combination meter connector (i10) and ECM connector. 3) Turn ignition switch to ON. 4) Measure voltage of harness between ECM and chassis ground. Connector & terminal (B135) No. 25 (+) — Chassis ground (-):	Is the voltage more than 4.75 V?	Go to step 4.	Repair battery short circuit between ECM and combination meter connector.
4	CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD. 1) Turn ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Measure resistance between ECM and fuel tank cord. Connector & terminal (B135) No. 25 — (R15) No. 2:	Is the resistance less than 5 Ω?	Go to step 5.	Repair open circuit between ECM and fuel tank cord.
5	CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND. Measure resistance between fuel tank cord and chassis ground. Connector & terminal (R15) No. 6 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 6.	Repair open circuit between fuel tank cord and chassis ground. NOTE: In this case, repair the following: Poor contact in coupling connectors

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK FUEL TANK CORD. 1) Disconnect connector from fuel level sensor. 2) Measure resistance between fuel level sensor and coupling connector. Connector & terminal (R57) No. 6 — (R58) No. 5:	Is the resistance less than 10 Ω ?	Go to step 7.	Repair open circuit between coupling connector and fuel level sensor.
7	CHECK FUEL TANK CORD. 1) Disconnect connector from fuel sub level sensor. 2) Measure resistance between fuel level sensor and fuel sub level sensor. Connector & terminal (R58) No. 3 — (R59) No. 2:	Is the resistance less than 10 Ω ?	Go to step 8.	Repair open circuit between fuel level sensor and fuel sub level sensor.
8	CHECK FUEL TANK CORD. Measure resistance between fuel sub level sensor and coupling connector. Connector & terminal (R57) No. 2 — (R59) No. 1:	Is the resistance less than 10 Ω ?	Go to step 9.	Repair open circuit between coupling connector and fuel sub level sensor.
9	CHECK FUEL LEVEL SENSOR. 1) Remove fuel pump assembly. <Ref. to FU(DOHC TURBO)-60, Fuel Pump.> 2) While moving fuel level sensor float up and down, measure resistance between fuel level sensor terminals. Terminals No. 3 — No. 5:	Is the resistance more than 53 Ω ?	Replace fuel level sensor. <Ref. to FU(DOHC TURBO)-62, Fuel Level Sensor.>	Go to step 10.
10	CHECK FUEL SUB LEVEL SENSOR. 1) Remove fuel sub level sensor. <Ref. to FU(DOHC TURBO)-63, Fuel Sub Level Sensor.> 2) While moving fuel sub level sensor float up and down, measure resistance between fuel sub level sensor terminals. Terminals No. 1 — No. 2:	Is the resistance more than 45 Ω ?	Replace fuel sub level sensor. <Ref. to FU(DOHC TURBO)-63, Fuel Sub Level Sensor.>	Replace combination meter. <Ref. to IDI-15, Combination Meter Assembly.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AT: DTC P0464 — FUEL LEVEL SENSOR INTERMITTENT INPUT— S088521G01

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0462 or P0463?	Inspect DTC P0462 or P0463 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK FUEL LEVEL SENSOR. 1) Remove fuel pump assembly. <Ref. to FU(DOHC TURBO)-60, Fuel Pump.> 2) While moving fuel level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly. Terminals No. 3 — No. 5:	Does the resistance change smoothly between approx. 0.5 Ω and approx. 52 Ω ?	Go to step 3.	Replace fuel level sensor. <Ref. to FU(DOHC TURBO)-62, Fuel Level Sensor.>
3	CHECK FUEL SUB LEVEL SENSOR. 1) Remove fuel sub level sensor. <Ref. to FU(DOHC TURBO)-63, Fuel Sub Level Sensor.> 2) While moving fuel sub level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly. Terminals No. 1 — No. 2:	Does the resistance change smoothly between approx. 0.5 Ω and approx. 44 Ω ?	Repair poor contact in ECM, combination meter and coupling connectors.	Replace fuel sub level sensor. <Ref. to FU(DOHC TURBO)-63, Fuel Sub Level Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AU: DTC P0480 — COOLING FAN RELAY 1 CIRCUIT LOW INPUT — S088521B57

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Radiator fan does not operate properly.
 - Overheating

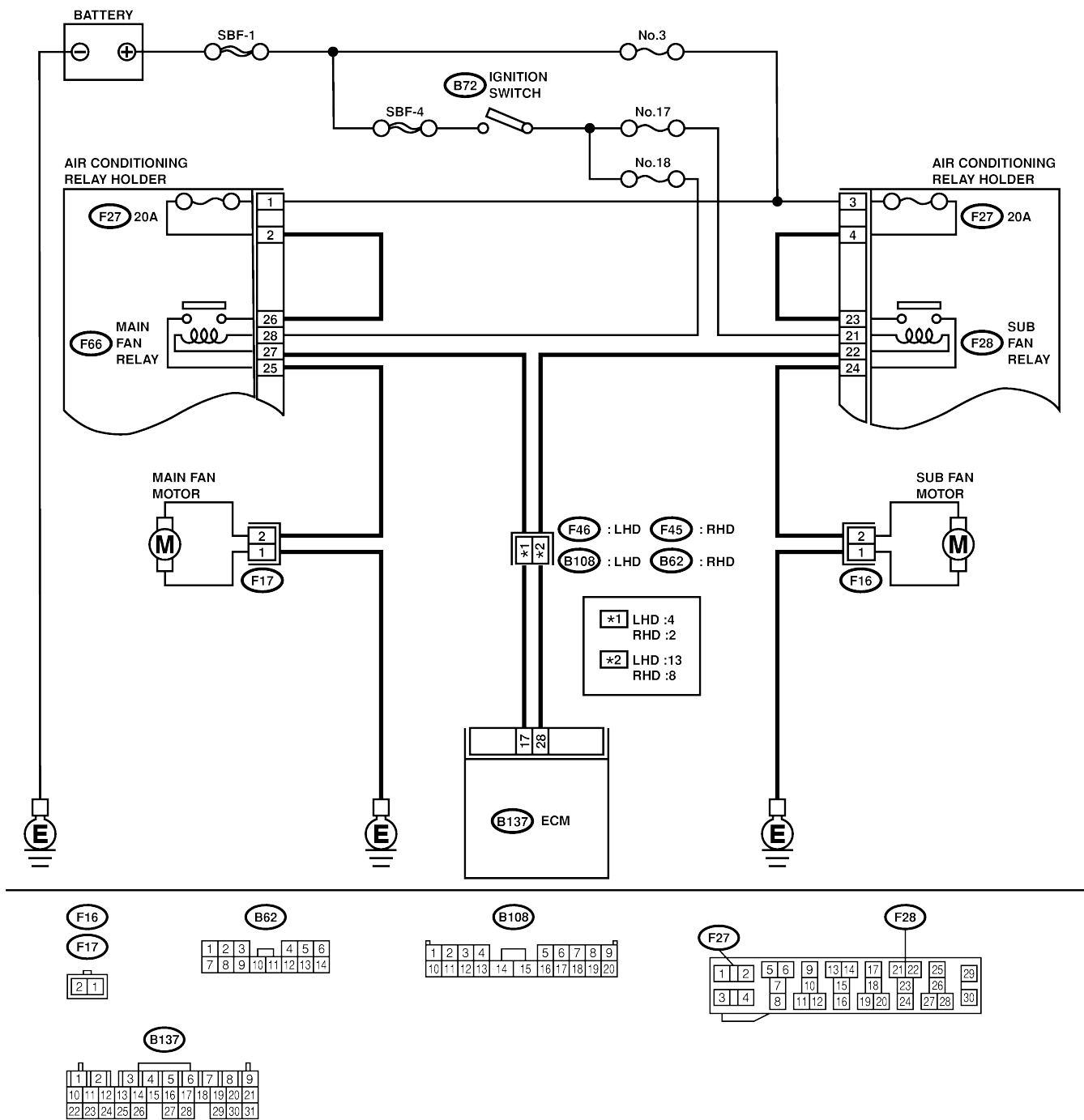
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● WIRING DIAGRAM:



S2M2199

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to OFF. 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box. 3) Turn ignition switch to ON. 4) While operating radiator fan relay, measure voltage between ECM terminal and ground. NOTE: Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". < Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> Connector & terminal (B137) No. 17 (+) — Chassis ground (-):	Does voltage change between 0 and 10 V?	Repair poor contact in ECM connector.	Go to step 2.
2	CHECK GROUND SHORT CIRCUIT IN RADIATOR MAIN FAN RELAY CONTROL CIRCUIT. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM. 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B137) No. 17 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in radiator fan relay control circuit.	Go to step 3.
3	CHECK POWER SUPPLY FOR RELAY. 1) Remove main fan relay from A/C relay holder. 2) Turn ignition switch to ON. 3) Measure voltage between fuse and relay box (F/B) connector and chassis ground. Connector & terminal (F66) No. 27 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair open circuit in harness between ignition switch and fuse and relay box (F/B) connector.
4	CHECK MAIN FAN RELAY. 1) Turn ignition switch to OFF. 2) Remove main fan relay. 3) Measure resistance of main fan relay. Terminal No. 26 — No. 25:	Is the resistance more than 1 M Ω ?	Go to step 5.	Replace main fan relay.
5	CHECK MAIN FAN RELAY. 1) Connect battery to terminals No. 27 and No. 28 of main fan relay. 2) Measure resistance of main fan relay. Terminal No. 26 — No. 25:	Is the resistance less than 1 Ω ?	Go to step 6.	Replace main fan relay.
6	CHECK OPEN CIRCUIT IN MAIN FAN RELAY CONTROL CIRCUIT. Measure resistance of harness between ECM and main fan relay connector. Connector & terminal (B137) No. 17 — (F66) No. 27:	Is the resistance less than 1 Ω ?	Go to step 7.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and main fan relay connector ● Poor contact in coupling connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
7	CHECK POOR CONTACT. Check poor contact in ECM or main fan relay connector.	Is there poor contact in ECM or main fan relay connector?	Repair poor contact in ECM or main fan relay connector.	Contact your Subaru distributor.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AV: DTC P0483 — COOLING FAN FUNCTION PROBLEM — S088521B58

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Occurrence of noise
 - Overheating

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

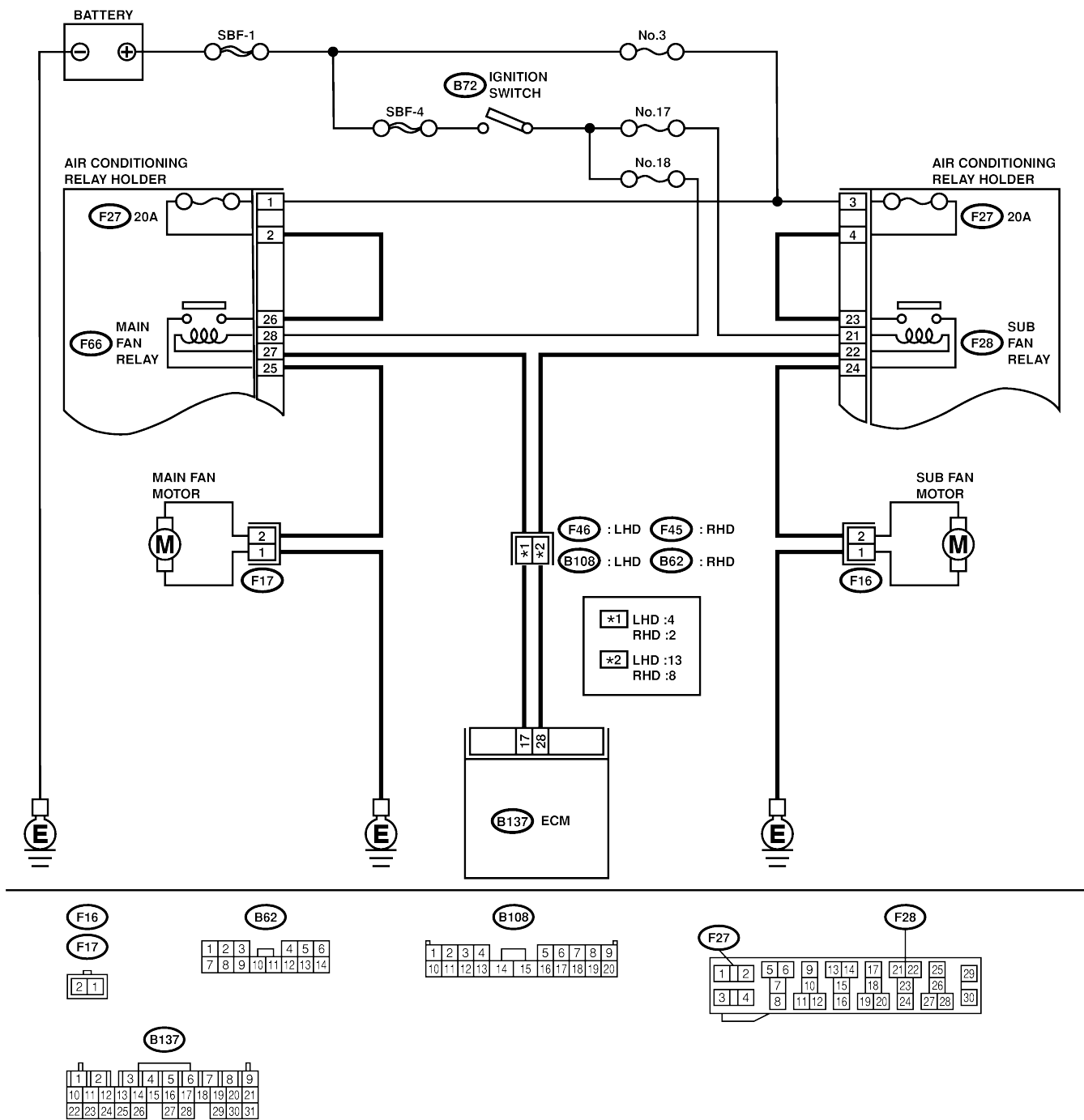
NOTE:

If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● WIRING DIAGRAM:



S2M2199

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is there any other DTC on display?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Check radiator fan, fan motor and thermostat. <Ref. to CO-8, Radiator Main Fan System.> and <Ref. to CO-11, Radiator Sub Fan System.> If thermostat is stuck, replace thermostat.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AW: DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION — S088521B59

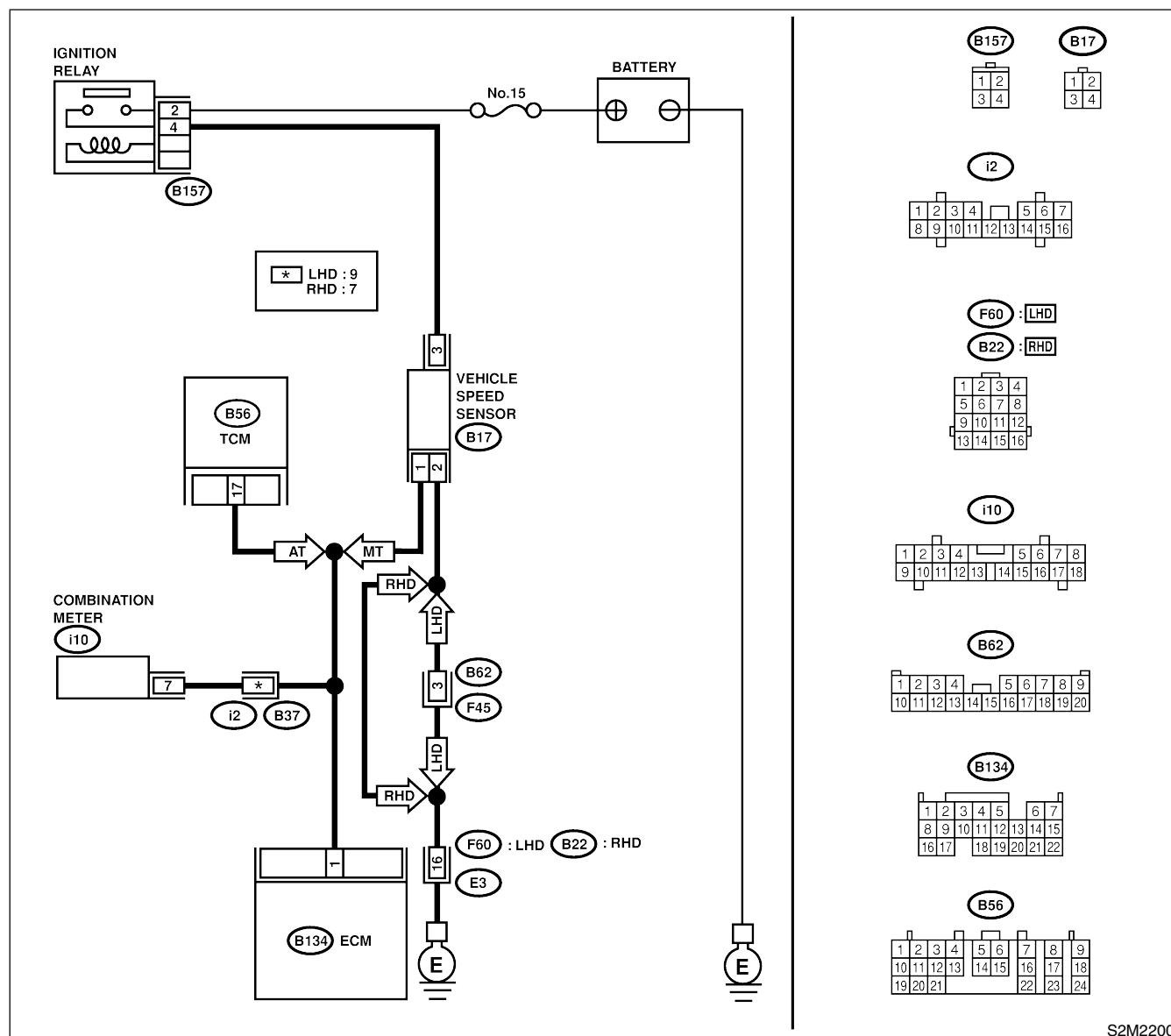
• DTC DETECTING CONDITION:

- Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2200

No.	Step	Check	Yes	No
1	CHECK TRANSMISSION TYPE.	Is the transmission type AT?	Go to step 2.	Go to step 3.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
2	CHECK DTC P0720 ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0720?	Check front vehicle speed sensor signal circuit. <Ref. to AT-58, TROUBLE CODE 33 — FRONT VEHICLE SPEED SENSOR —, Diagnostic Procedure with Trouble Code.>	Go to step 3.
3	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.	Does speedometer operate normally?	Go to step 4.	Check speedometer and vehicle speed sensor. <Ref. to IDI-17, Speedometer.> and <Ref. to AT-32, Front Vehicle Speed Sensor.> and <Ref. to AT-36, Rear Vehicle Speed Sensor.> and <Ref. to AT-37, Torque Converter Turbine Speed Sensor.>
4	CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from combination meter. 3) Measure resistance between ECM and combination meter. Connector & terminal (B135) No. 24 — (i10) No. 7:	Is the resistance less than 10 Ω ?	Repair poor contact in ECM connector.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and combination meter connector ● Poor contact in ECM connector ● Poor contact in combination meter connector ● Poor contact in coupling connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AX: DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED

S088521B61

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

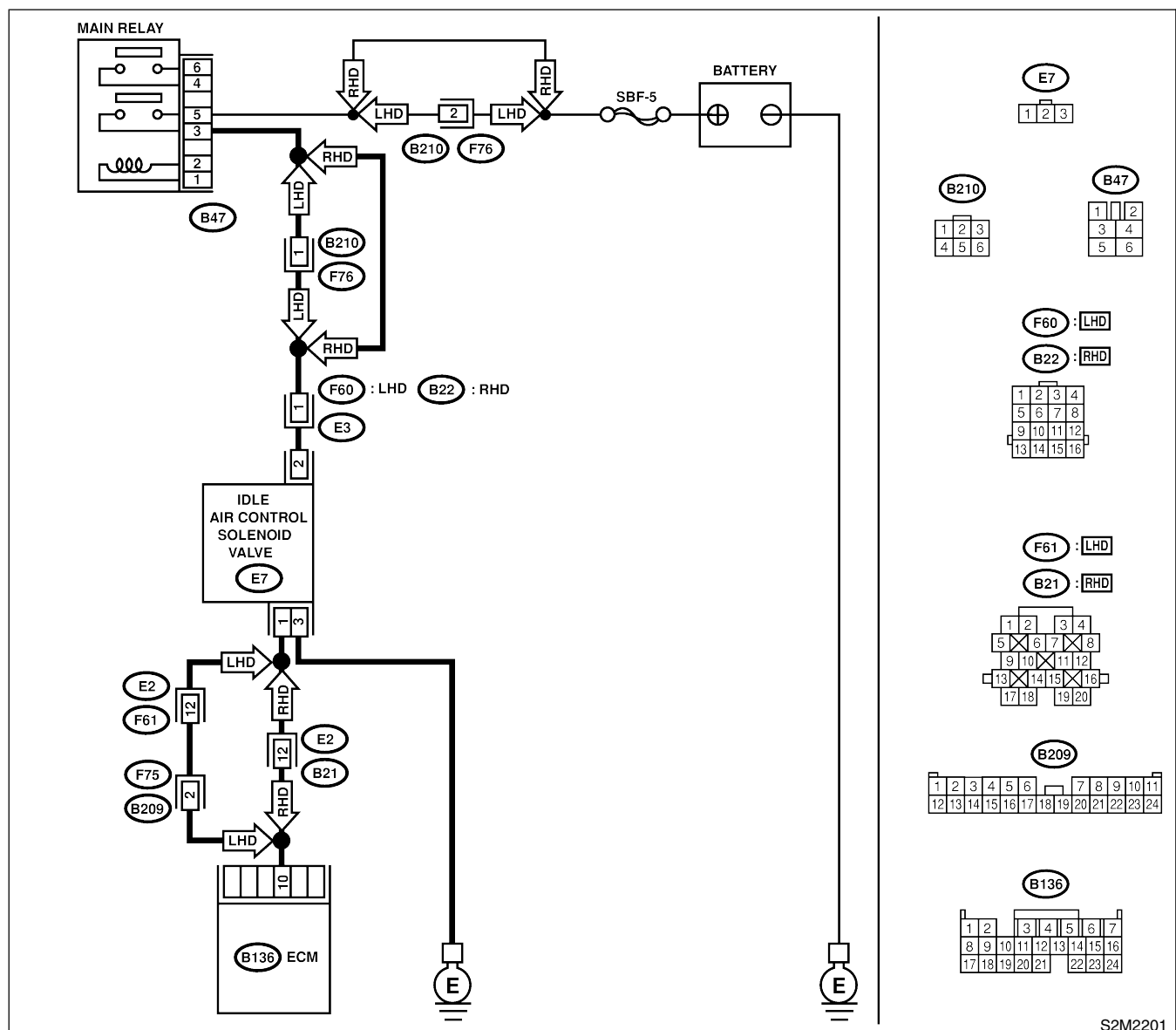
• TROUBLE SYMPTOM:

- Engine is difficult to start.
- Engine does not start.
- Erroneous idling
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2201

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0508 or P509?	Inspect DTC P0505 or P1505 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0506.	Go to step 2.
2	CHECK IDLE AIR CONTROL SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Remove idle air control solenoid valve from throttle body. <Ref. to FU(DOHC TURBO)-36, REMOVAL, Idle Air Control Solenoid Valve.> 3) Using an air gun, force air into idle air control solenoid valve by-pass air inlet. Confirm that forced air subsequently escapes from both main air passage and assist air passage.	Does air flow out?	Go to step 4.	Replace idle air control solenoid valve. <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.> After replace, Go to step 3.
3	CHECK IDLE AIR CONTROL SOLENOID VALVE DUTY RATIO. 1) Turn ignition switch to ON. 2) Start engine, and warm-up the engine. 3) Turn all accessory switches to OFF. 4) Read data of idle air control solenoid valve duty ratio using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedures, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 60%?	Go to step 4.	END.
4	CHECK BY-PASS AIR LINE. 1) Turn ignition switch to OFF. 2) Remove idle air control solenoid valve from throttle body. <Ref. to FU(DOHC TURBO)-36, REMOVAL, Idle Air Control Solenoid Valve.> 3) Remove throttle body to intake manifold. <Ref. to FU(DOHC TURBO)-14, REMOVAL, Throttle Body.> 4) Using an air gun, force air into solenoid valve installation area and throttle valve interior. Confirm that forced air subsequently escapes from both these areas.	Does air flow out?	Replace idle air control solenoid valve. <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.>	Replace throttle body. <Ref. to FU(DOHC TURBO)-14, Throttle Body.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

AY: DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED

S088521B62

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

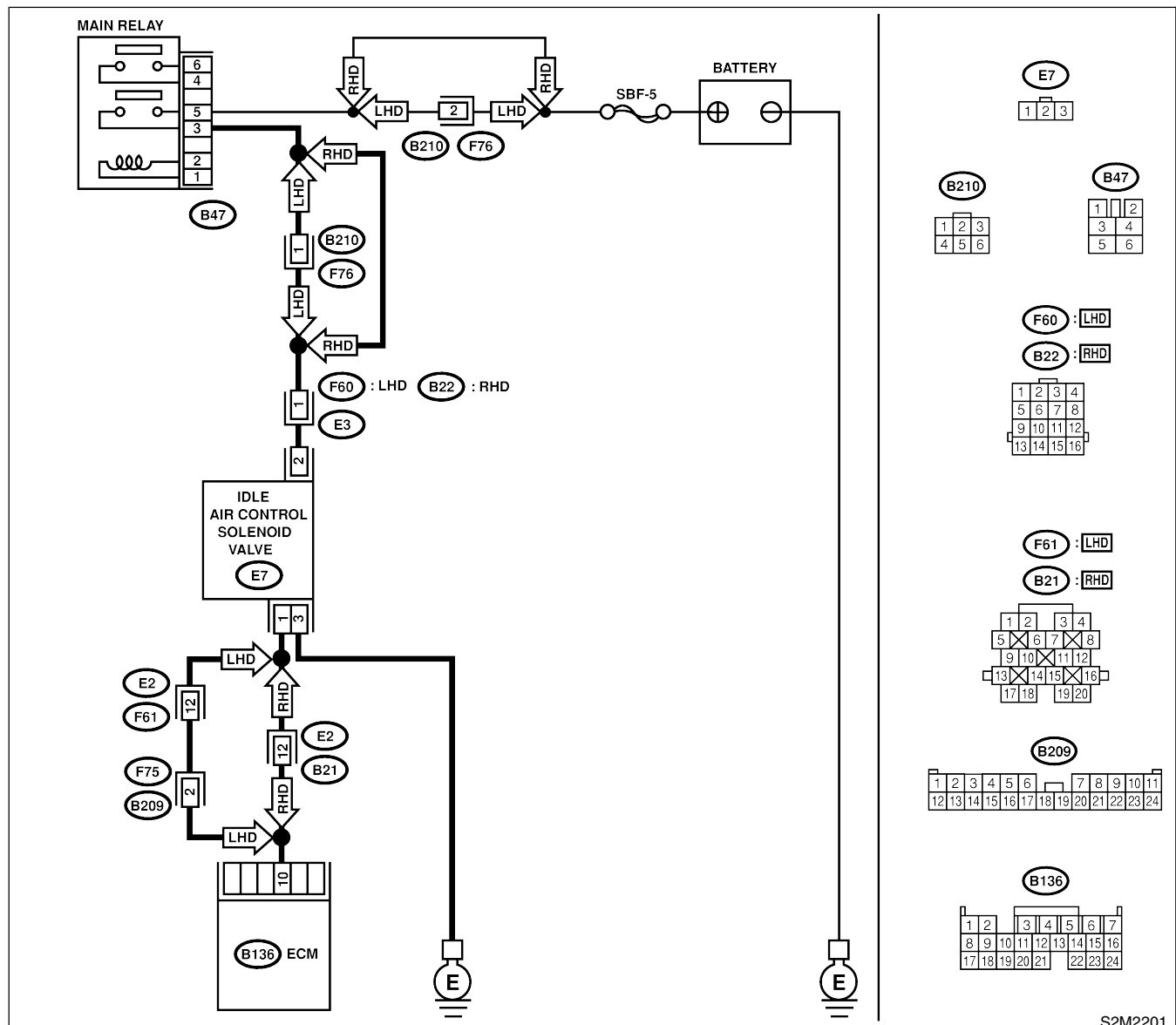
• TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode < Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0508 or P509?	Inspect DTC P0505 or P1505 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0507.	Go to step 2.
2	CHECK THROTTLE CABLE.	Does throttle cable have play for adjustment?	Go to step 3.	Adjust throttle cable. <Ref. to SP-12, INSTALLATION, Accelerator Control Cable.>
3	CHECK AIR INTAKE SYSTEM. 1) Turn ignition switch to ON. 2) Start engine, and idle it. 3) Check the following items. ● Loose installation of intake manifold, idle air control solenoid valve and throttle body ● Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket ● Disconnections of vacuum hoses	Is there a fault in air intake system?	Repair air suction and leaks.	Replace idle air control solenoid valve. <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.>

Engine (Diagnostics)

S088521H68

- Immediately at fault recognition

- Erroneous idling
- Engine stalls.
- Engine breathing

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

MAIN RELAY

BATTERY

IDLE AIR CONTROL SOLENOID VALVE

ECM

Terminal Block Layout:

- MAIN RELAY:** 1, 2, 3, 4, 5, 6
- BATTERY:** 1, 2, 3
- ECM:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24

Component Legend:

- B47:** Solenoid
- B210:** Solenoid
- F76:** Sensor
- F60:** Sensor
- E3:** Sensor
- E7:** Solenoid
- B21:** Solenoid
- F75:** Sensor
- E2:** Sensor
- B209:** Solenoid
- B136:** ECM

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B136) No. 10 (+) — Chassis ground (-):	Is the voltage more than 3 V?	Repair poor contact in ECM connector.	Go to step 2.
2	CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE. 1) Turn ignition switch to OFF. 2) Disconnect connector from idle air control solenoid valve. 3) Turn ignition switch to ON. 4) Measure voltage between idle air control solenoid valve and engine ground. Connector & terminal (E7) No. 2 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 3.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between idle air control solenoid valve and main relay connector ● Poor contact in coupling connector
3	CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM and idle air control solenoid valve connector. Connector & terminal (B136) No. 10 — (E7) No. 1:	Is the resistance less than 1 Ω ?	Go to step 4.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and idle air control solenoid valve connector ● Poor contact in coupling connector
4	CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR. Measure resistance of harness between ECM and chassis ground. Connector & terminal (B136) No. 10 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between ECM and idle air control solenoid valve connector.	Go to step 5.
5	CHECK GROUND CIRCUIT OF IDLE AIR CONTROL SOLENOID VALVE. Measure resistance of harness between idle air control solenoid valve connector and engine ground. Connector & terminal (E7) No. 3 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 6.	Repair open circuit in harness between idle air control solenoid valve connector and engine ground terminal.
6	CHECK POOR CONTACT. Check poor contact in ECM and idle air control solenoid valve connectors.	Is there poor contact in ECM and idle air control solenoid valve connectors?	Repair poor contact in ECM and idle air control solenoid valve connectors.	Replace idle air control solenoid valve. <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

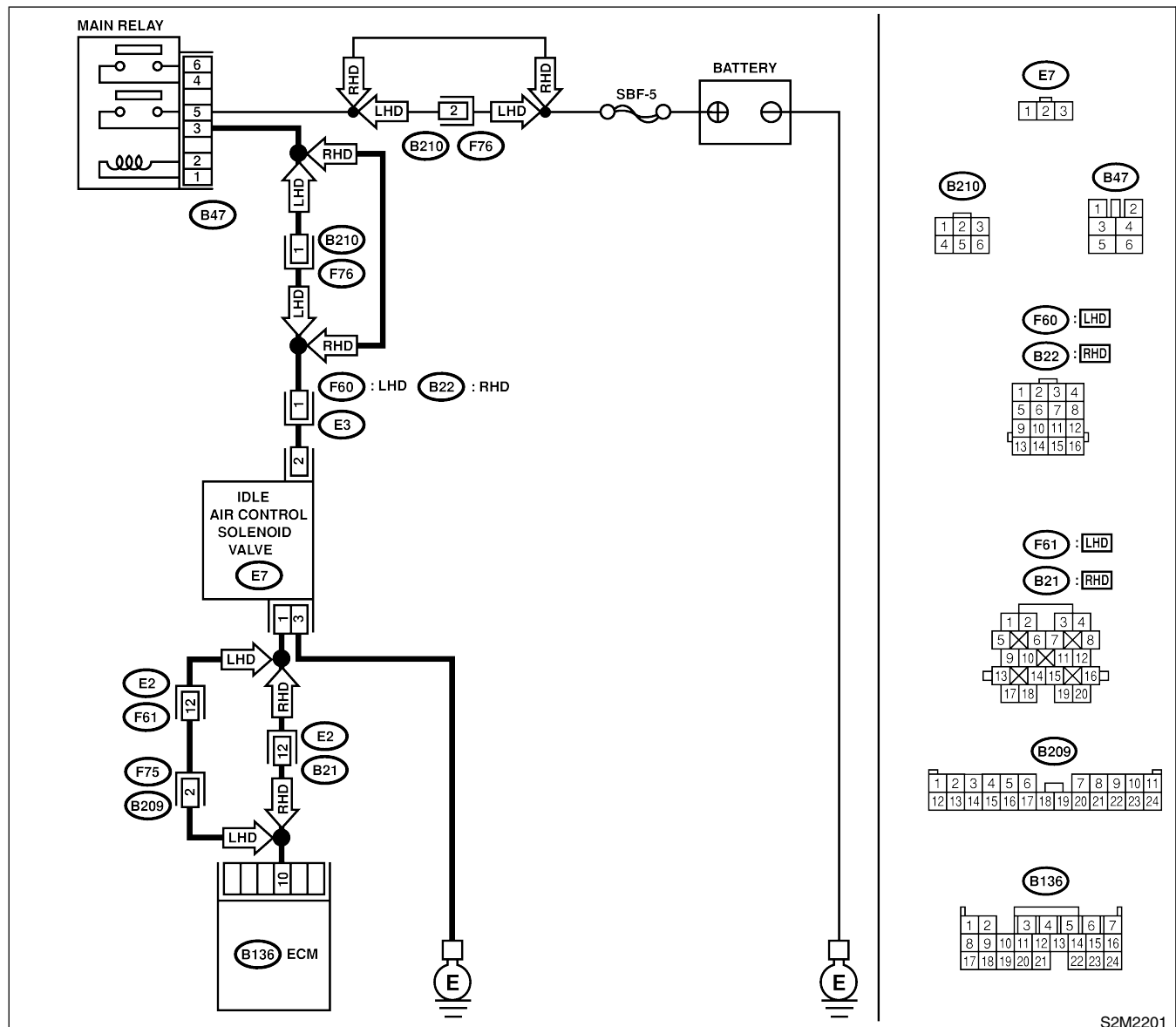
BA: DTC P0509 — IDLE CONTROL SYSTEM CIRCUIT HIGH INPUT — S088521H10

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Engine breathing

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2201

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK THROTTLE CABLE.	Does throttle cable have play for adjustment?	Go to step 2.	Adjust throttle cable. <Ref. to SP-12, INSTALLATION, Accelerator Control Cable.>
2	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B136) No. 10 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 3.	Go to step 4.
3	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to OFF. 2) Disconnect connector from idle air control solenoid valve. 3) Turn ignition switch to ON. 4) Measure voltage between ECM and chassis ground. Connector & terminal (B136) No. 10 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and idle air control solenoid valve connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Replace idle air control solenoid valve <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.> and ECM <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>.
4	CHECK OUTPUT SIGNAL FROM ECM. Measure voltage between ECM and chassis ground. Connector & terminal (B136) No. 10 (+) — Chassis ground (-):	Does the voltage change more than 10 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair battery short circuit in harness between ECM and idle air control solenoid valve connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BB: DTC P0512 — STARTER SWITCH CIRCUIT HIGH INPUT — S088521G02

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

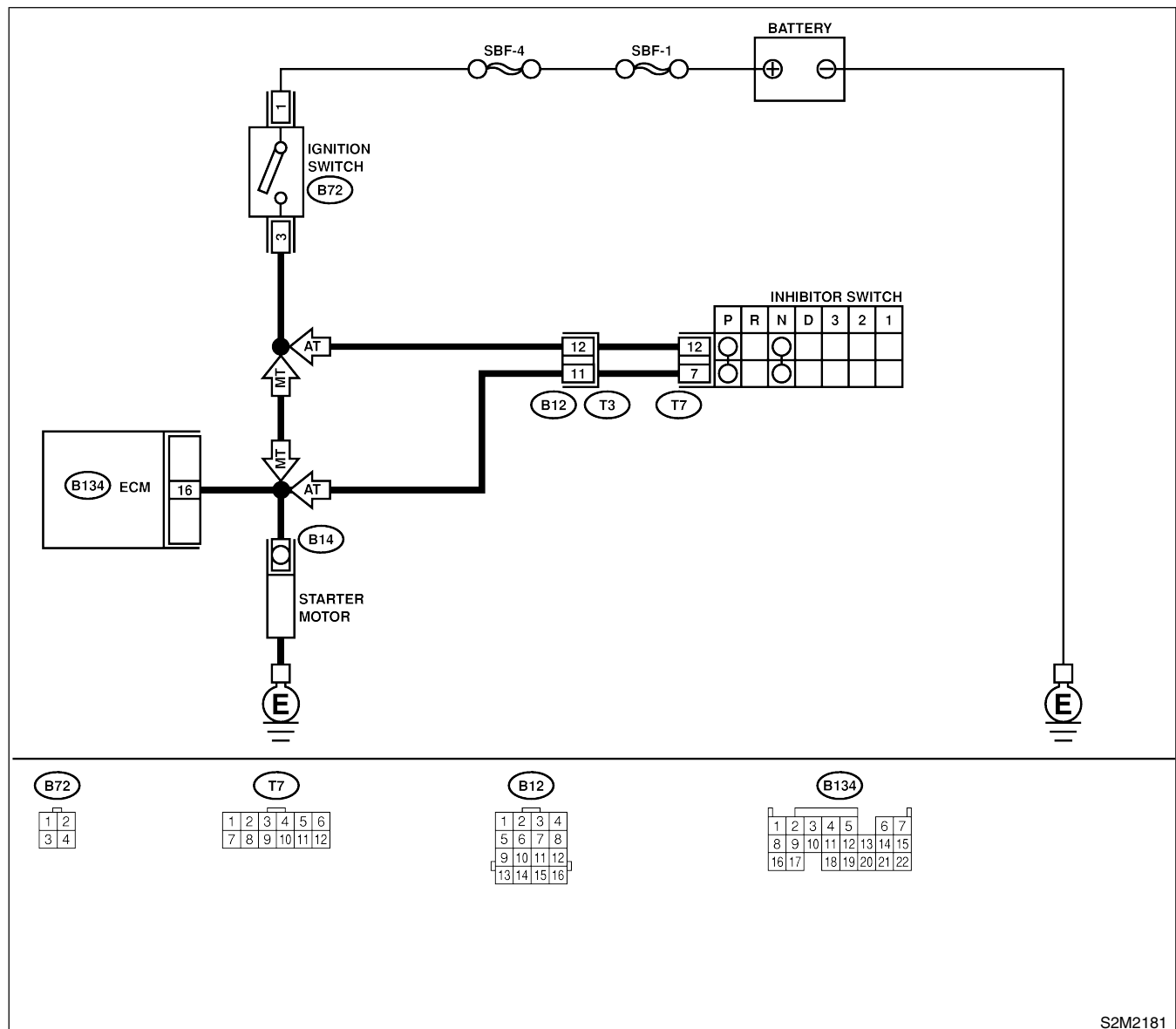
• TROUBLE SYMPTOM:

- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2181

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OPERATION OF STARTER MOTOR. NOTE: Place the inhibitor switch in each position. (AT model)	Does starter motor operate when ignition switch to "ON"?	Repair battery short circuit in starter motor circuit.	Check starter motor circuit. <Ref. to EN(DOHC TURBO)-64, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BC: DTC P0545 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW INPUT —

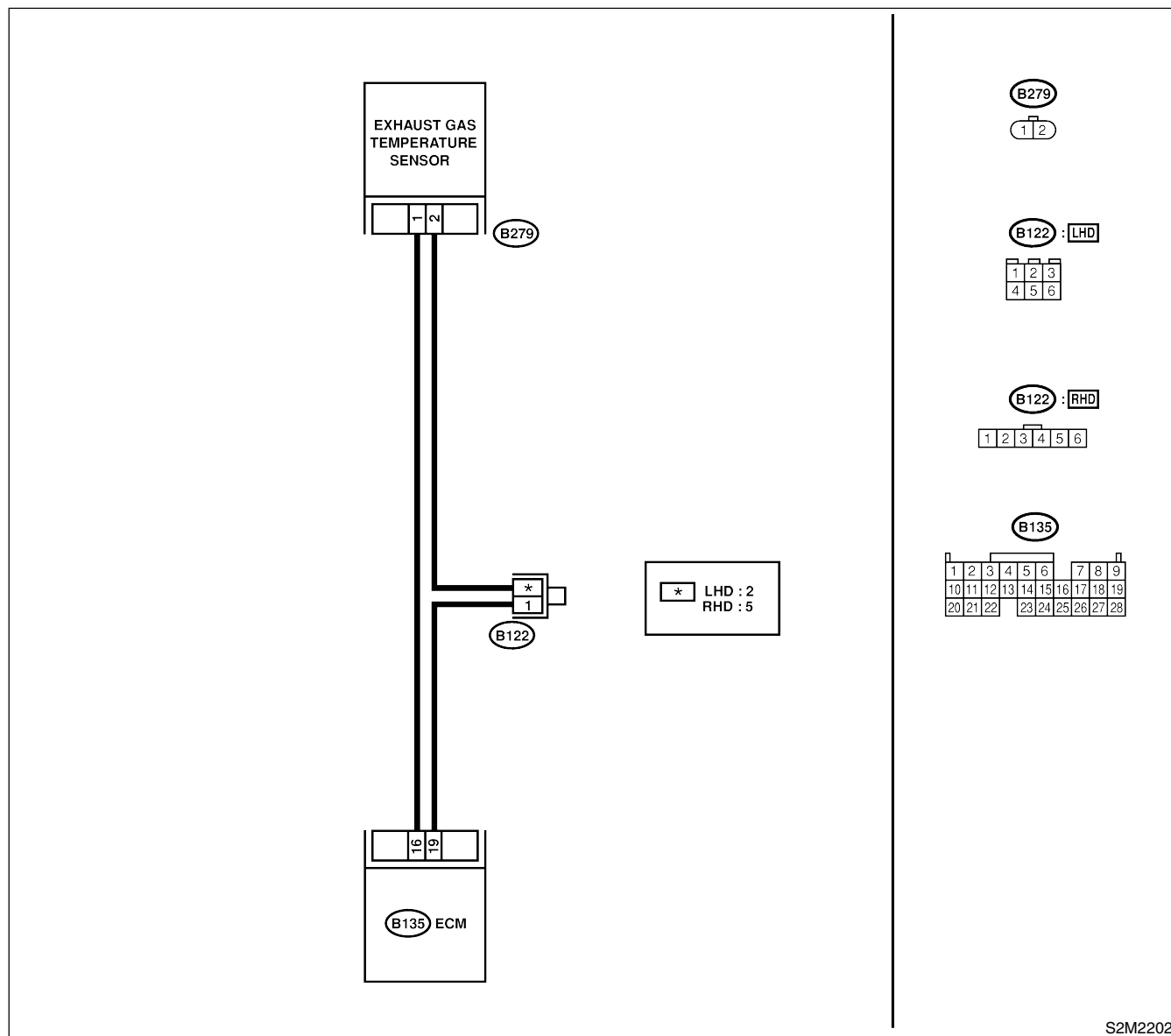
S088521H69

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Hard to start
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2202

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of exhaust gas temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value greater than 1200°C (2192°F)?	Go to step 2.	Repair poor contact. NOTE: In this case, repair the following: ● Poor contact in exhaust gas temperature sensor ● Poor contact in ECM ● Poor contact in joint connector
2	CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from exhaust gas temperature sensor. 3) Turn ignition switch to ON. 4) Read data of exhaust gas temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than 372°C (702°F)?	Replace exhaust gas temperature sensor. <Ref. to FU(DOHC TURBO)-46, Exhaust Temperature Sensor.>	Repair ground short circuit in harness between exhaust gas temperature sensor and ECM connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

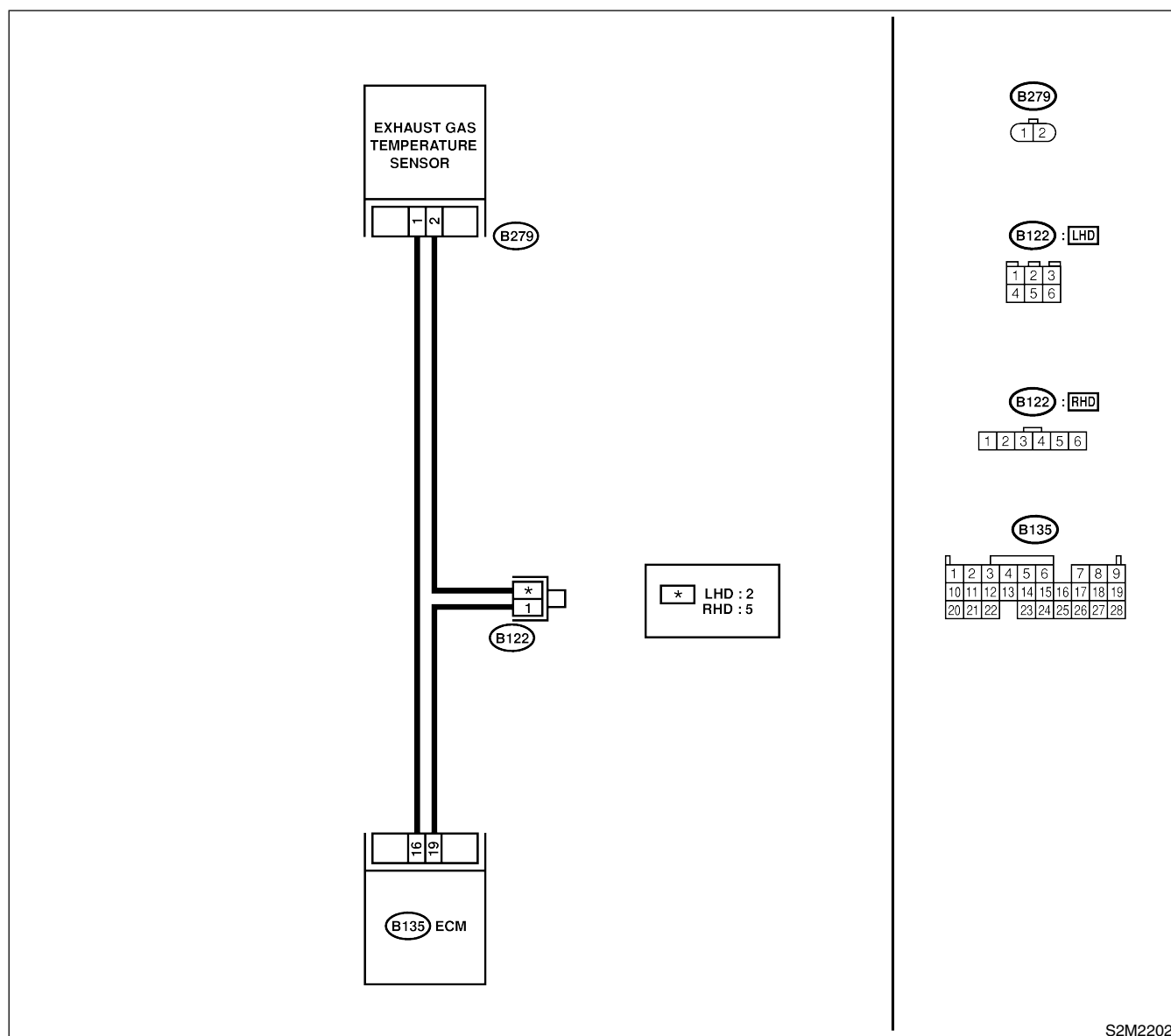
BD: DTC P0546 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH INPUT — S088521H70

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Hard to start
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2202

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of exhaust gas temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than 372°C (702°F)?	Go to step 2.	Repair poor contact. NOTE: In this case, repair the following: ● Poor contact in exhaust gas temperature sensor ● Poor contact in ECM ● Poor contact in joint connector
2	CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from exhaust gas temperature sensor. 3) Measure voltage between exhaust gas temperature sensor connector and engine ground. Connector & terminal (B279) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and exhaust gas temperature sensor connector.	Go to step 3.
3	CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between exhaust gas temperature sensor connector and engine ground. Connector & terminal (B279) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and exhaust gas temperature sensor connector.	Go to step 4.
4	CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR. Measure voltage between exhaust gas temperature sensor connector and engine ground. Connector & terminal (B279) No. 1 (+) — Engine ground (-):	Is the voltage more than 4 V?	Go to step 5.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and exhaust gas temperature sensor connector ● Poor contact in exhaust gas temperature sensor connector ● Poor contact in ECM connector ● Poor contact in joint connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
5	CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between exhaust gas temperature sensor connector and engine ground. Connector & terminal (B279) No. 2 — Engine ground:	Is the resistance less than 5 Ω ?	Replace exhaust gas temperature sensor. <Ref. to FU(DOHC TURBO)-46, Exhaust Temperature Sensor.>	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and exhaust gas temperature sensor connector ● Poor contact in exhaust gas temperature sensor connector ● Poor contact in ECM connector ● Poor contact in joint connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BE: DTC P0604 — INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR — S088521G03

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine does not start.
 - Engine stalls.

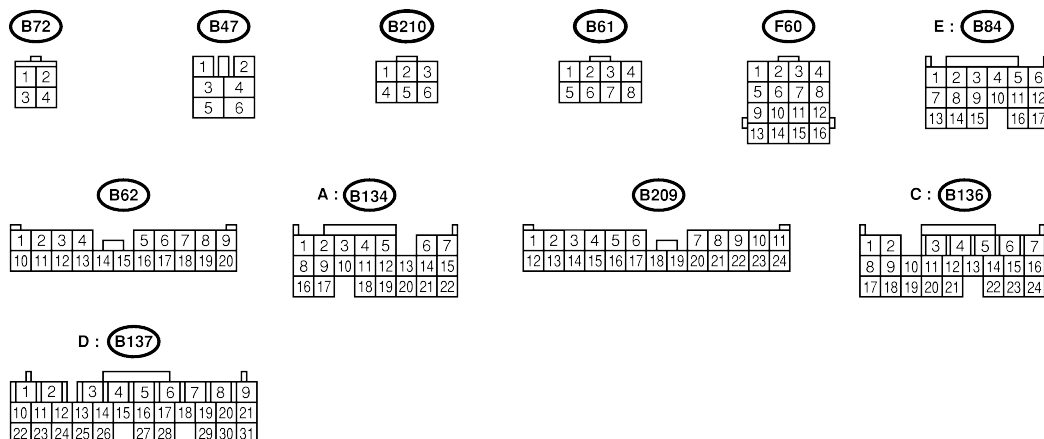
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

Engine (Diagnostics)

Engine (Diagnostics)

- **LHD MODEL**



EN(DOHC TURBO)-249

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0604?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	It is not necessary to inspect DTC P0604.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BF: DTC P0703 — BRAKE SWITCH INPUT MALFUNCTION — S088521B64

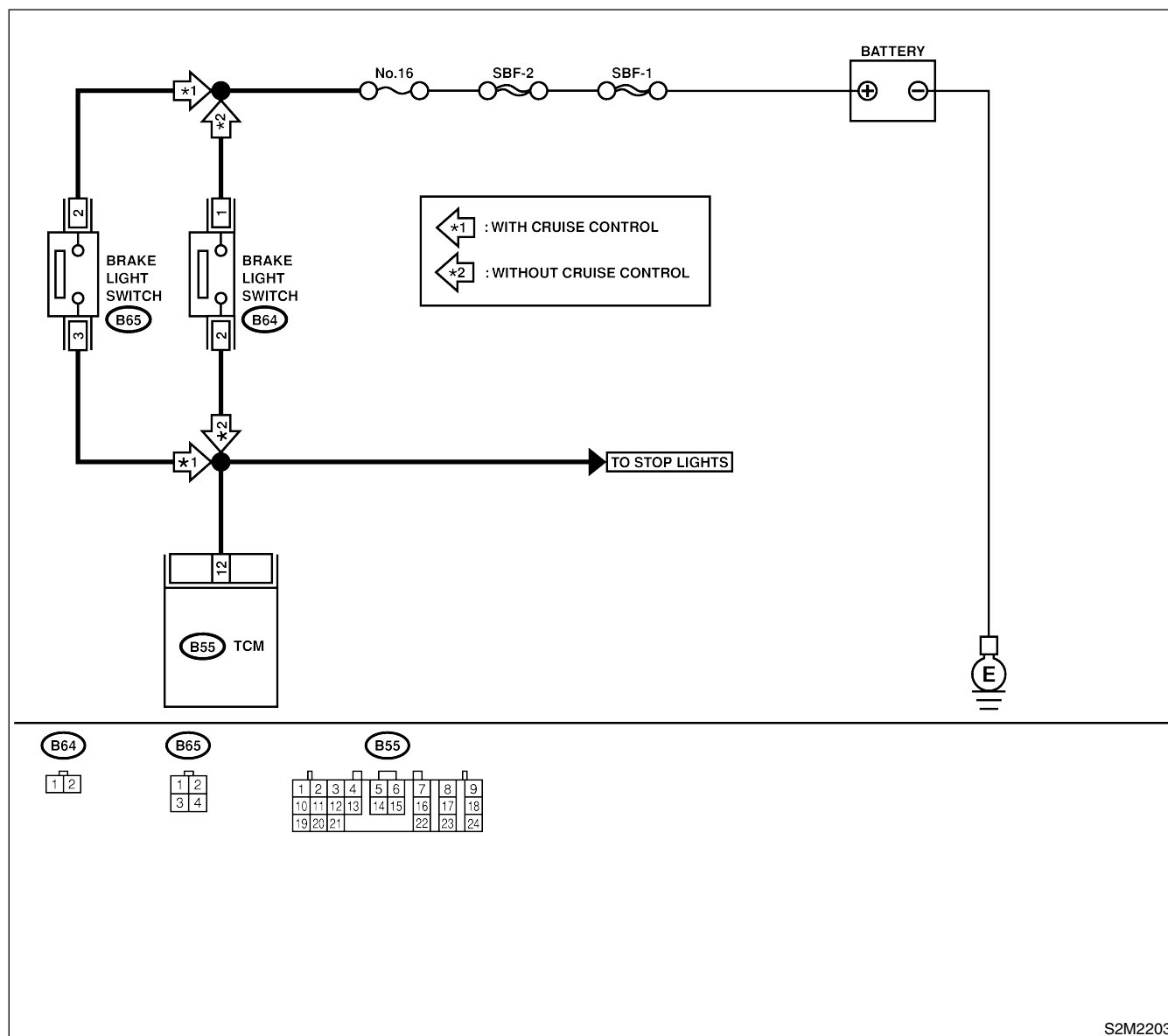
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, OPERATION, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2203

No.	Step	Check	Yes	No
1	CHECK OPERATION OF BRAKE LIGHT.	Does brake light come on when depressing the brake pedal?	Go to step 2.	Repair or replace brake light circuit.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
2	CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR. 1) Disconnect connectors from TCM and brake light switch. 2) Measure resistance of harness between TCM and brake light switch connector. Connector & terminal Without cruise control (B55) No. 12 — (B64) No. 2: With cruise control (B55) No. 12 — (B65) No. 3:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair or replace harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between TCM and brake light switch connector ● Poor contact in TCM connector ● Poor contact in brake light switch connector
3	CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR. Measure resistance of harness between TCM and chassis ground. Connector & terminal (B55) No. 12 — Chassis ground:	Is the resistance more than 1 M Ω ?	Go to step 4.	Repair ground short circuit in harness between TCM and brake light switch connector.
4	CHECK INPUT SIGNAL FOR TCM. 1) Connect connectors to TCM and brake light switch. 2) Measure voltage between TCM and chassis ground. Connector & terminal (B55) No. 12 (+) — Chassis ground (-):	Is the voltage less than 1 V when releasing the brake pedal?	Go to step 5.	Adjust or replace brake light switch. <Ref. to LI-31, STOP LIGHT SWITCH, INSPECTION, Stop Light System.>
5	CHECK INPUT SIGNAL FOR TCM. Measure voltage between TCM and chassis ground. Connector & terminal (B55) No. 12 (+) — Chassis ground (-):	Is the voltage more than 10 V when depressing the brake pedal?	Go to step 6.	Adjust or replace brake light switch. <Ref. to LI-31, STOP LIGHT SWITCH, INSPECTION, Stop Light System.>
6	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BG: DTC P0731 — GEAR 1 INCORRECT RATIO — S088521B70

NOTE:

For the diagnostic procedure, refer to DTC P0734. <Ref. to EN(DOHC TURBO)-255, DTC P0734 — GEAR 4 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BH: DTC P0732 — GEAR 2 INCORRECT RATIO — S088521B71

NOTE:

For the diagnostic procedure, refer to DTC P0734. <Ref. to EN(DOHC TURBO)-255, DTC P0734 — GEAR 4 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BI: DTC P0733 — GEAR 3 INCORRECT RATIO — S088521B72

NOTE:

For the diagnostic procedure, refer to DTC P0734. <Ref. to EN(DOHC TURBO)-255, DTC P0734 — GEAR 4 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BJ: DTC P0734 — GEAR 4 INCORRECT RATIO — S088521B73

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

- Shift point too high or too low; engine brake not effected in “3” range; excessive shift shock; excessive tight corner “braking”

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, OPERATION, Inspection Mode.>.

● WIRING DIAGRAM:

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is there any other DTC on display?	Inspect relevant DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK THROTTLE POSITION SENSOR CIRCUIT. Check throttle position sensor circuit. <Ref. to AT-50, TROUBLE CODE 31 — THROTTLE POSITION SENSOR —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in throttle position sensor circuit?	Repair or replace throttle position sensor circuit.	Go to step 3.
3	CHECK FRONT VEHICLE SPEED SENSOR CIRCUIT. Check front vehicle speed sensor circuit. <Ref. to AT-58, TROUBLE CODE 33 — FRONT VEHICLE SPEED SENSOR —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in vehicle speed sensor 2 circuit?	Repair or replace vehicle speed sensor 2 circuit.	Go to step 4.
4	CHECK TORQUE CONVERTER TURBINE SPEED SENSOR CIRCUIT. Check torque converter turbine speed sensor circuit. <Ref. to AT-64, TROUBLE CODE 36 — TORQUE CONVERTER TURBINE SPEED SENSOR —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in torque converter turbine speed sensor circuit?	Repair or replace torque converter turbine speed sensor circuit.	Go to step 5.
5	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Go to step 6.
6	CHECK MECHANICAL TROUBLE. Check mechanical trouble in automatic transmission.	Is there any mechanical trouble in automatic transmission?	Repair or replace automatic transmission. <Ref. to AT-12, INSPECTION, Road Test.>	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BK: DTC P0741 — TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION

S088521 G04

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - No lock-up (after engine warm-up)
 - No shift or excessive tight corner “braking”

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, OPERATION, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is there any other DTC on display?	Inspect the relevant DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK LOCK-UP DUTY SOLENOID CIRCUIT. Check lock-up duty solenoid circuit. <Ref. to AT-96, TROUBLE CODE 77 — LOCK-UP DUTY SOLENOID —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in lock-up duty solenoid circuit?	Repair or replace lock-up duty solenoid circuit.	Go to step 3.
3	CHECK THROTTLE POSITION SENSOR CIRCUIT. Check throttle position sensor circuit. <Ref. to AT-50, TROUBLE CODE 31 — THROTTLE POSITION SENSOR —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in throttle position sensor circuit?	Repair or replace throttle position sensor circuit.	Go to step 4.
4	CHECK TORQUE CONVERTER TURBINE SPEED SENSOR CIRCUIT. Check torque converter turbine speed sensor circuit. <Ref. to AT-64, TROUBLE CODE 36 — TORQUE CONVERTER TURBINE SPEED SENSOR —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in torque converter turbine speed sensor circuit?	Repair or replace torque converter turbine speed sensor circuit.	Go to step 5.
5	CHECK ENGINE SPEED INPUT CIRCUIT. Check engine speed input circuit. <Ref. to AT-42, TROUBLE CODE 11 — ENGINE SPEED SIGNAL —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in engine speed input circuit?	Repair or replace engine speed input circuit.	Go to step 6.
6	CHECK INHIBITOR SWITCH CIRCUIT. Check inhibitor switch circuit. <Ref. to AT-122, CHECK INHIBITOR SWITCH., Diagnostic Procedure for No-trouble Code.>	Is there any trouble in inhibitor switch circuit?	Repair or replace inhibitor switch circuit.	Go to step 7.
7	CHECK BRAKE LIGHT SWITCH CIRCUIT. Check brake light switch circuit. <Ref. to AT-111, CHECK BRAKE SWITCH., Diagnostic Procedure for No-trouble Code.>	Is there any trouble in brake light switch circuit?	Repair or replace brake light switch circuit.	Go to step 8.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
8	CHECK ATF TEMPERATURE SENSOR CIRCUIT. Check ATF temperature sensor circuit. <Ref. to AT-46, TROUBLE CODE 27 - ATF TEMPERATURE SENSOR —, Diagnostic Procedure with Trouble Code.>	Is there any trouble in ATF temperature sensor circuit?	Repair or replace ATF temperature sensor circuit.	Go to step 9.
9	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Go to step 10.
10	CHECK MECHANICAL TROUBLE. Check mechanical trouble in automatic transmission.	Is there any mechanical trouble in automatic transmission?	Repair or replace automatic transmission. <Ref. to AT-12, INSPECTION, Road Test.>	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BL: DTC P1086 — TUMBLE GENERATOR VALVE #2 (LH) POSITION SENSOR CIRCUIT LOW INPUT —

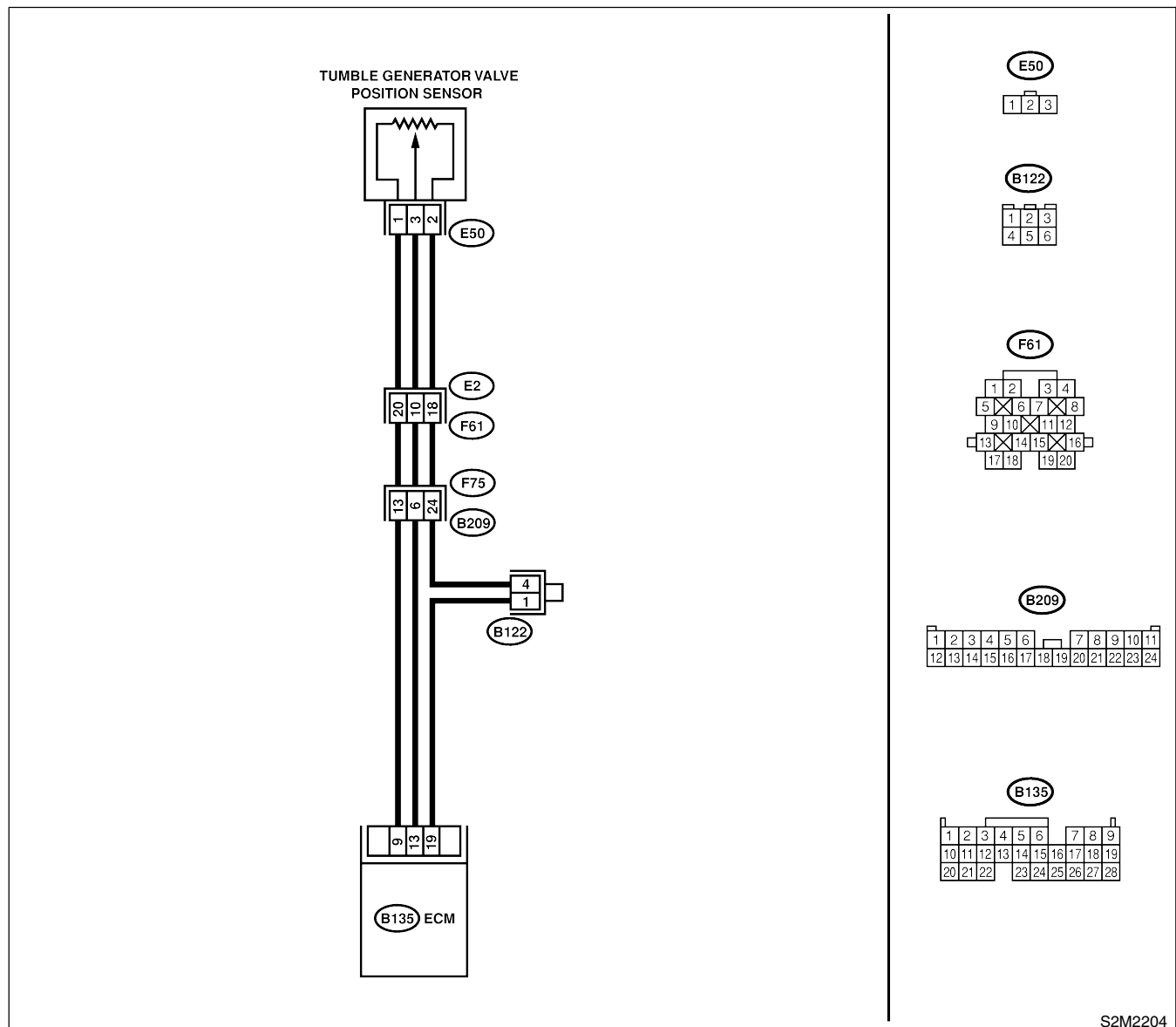
S088521H71

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

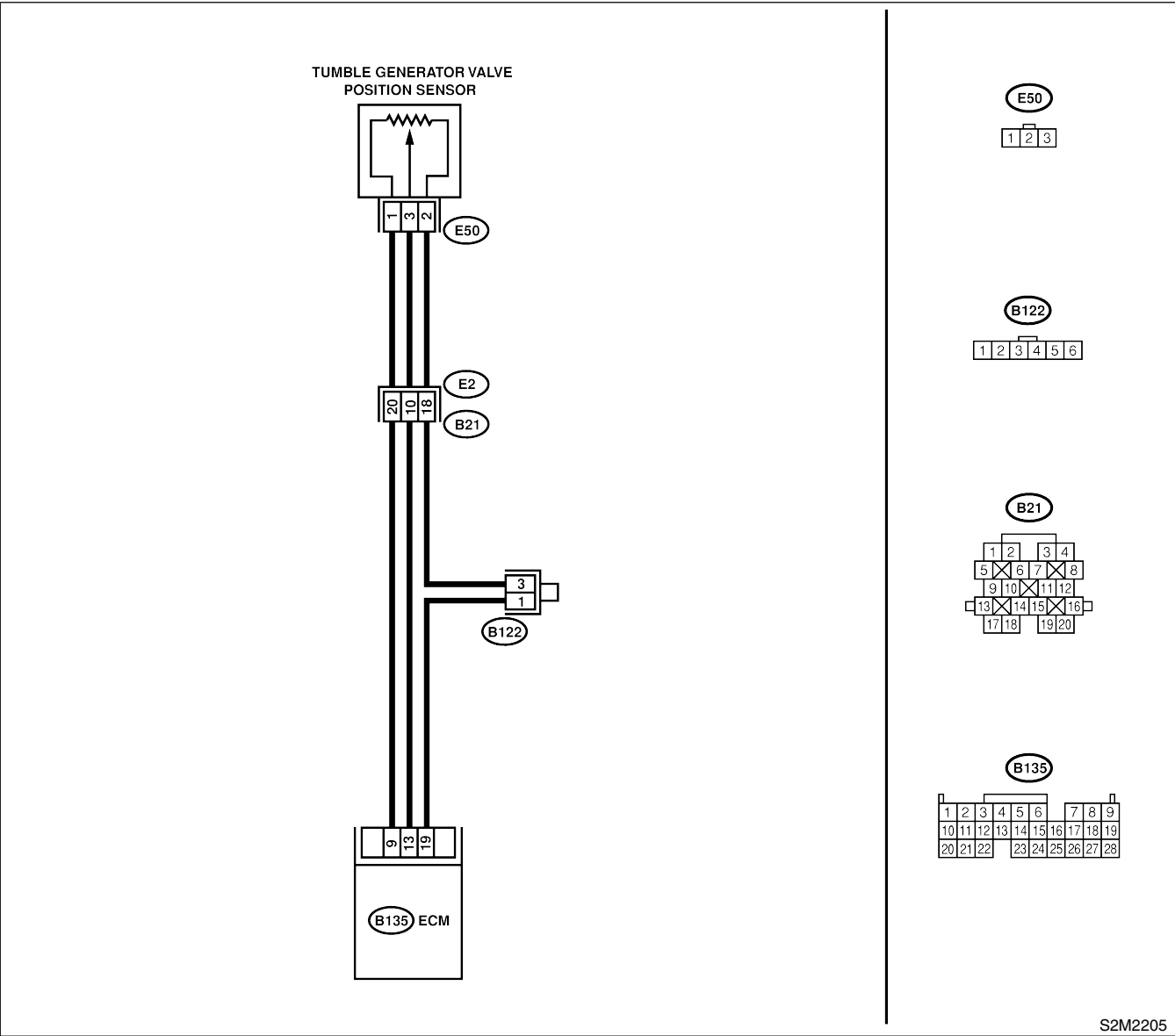
- **WIRING DIAGRAM:**
- **LHD MODEL**



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



S2M2205

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: ● Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> ● OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than 0.1 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: ● Poor contact in throttle position sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground while tumble generator valve is fully closed. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 13 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
5	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.) Measure voltage between ECM connector and chassis ground.	Does the voltage change more than 0.1 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair poor contact in ECM connector.	Go to step 6.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from tumble generator valve position sensor. 3) Turn ignition switch to ON. 4) Measure voltage between tumble generator valve position sensor connector and engine ground. Connector & terminal (E50) No. 1 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 7.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between tumble generator valve position sensor and ECM connector ● Poor contact in tumble generator valve position sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector ● Poor contact in joint connector
7	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between ECM connector and tumble generator valve position sensor connector. Connector & terminal (B135) No. 13 — (E50) No. 3:	Is the resistance less than 1 Ω?	Go to step 8.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between tumble generator valve position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in tumble generator valve position sensor connector ● Poor contact in coupling connector
8	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. Measure resistance of harness between tumble generator valve position sensor connector and engine ground. Connector & terminal (E50) No. 3 — Engine ground:	Is the resistance less than 10 Ω?	Repair ground short circuit in harness between tumble generator valve position sensor and ECM connector.	Go to step 9.
9	CHECK POOR CONTACT. Check poor contact in tumble generator valve position sensor connector.	Is there poor contact in tumble generator valve position sensor connector?	Repair poor contact in tumble generator valve position sensor connector.	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BM: DTC P1087 — TUMBLE GENERATOR VALVE #2 (LH) POSITION SENSOR CIRCUIT HIGH INPUT —

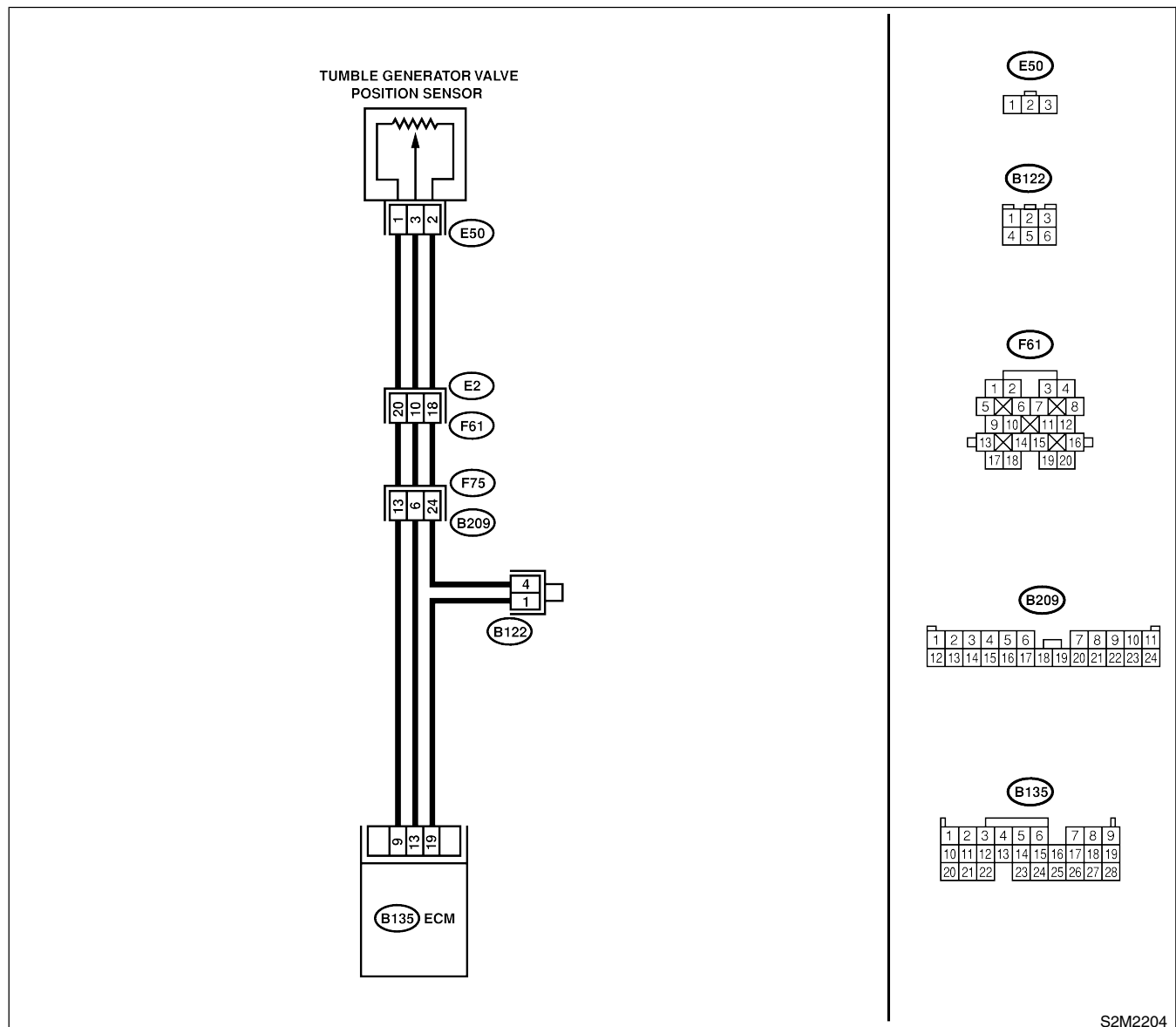
S088521H72

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

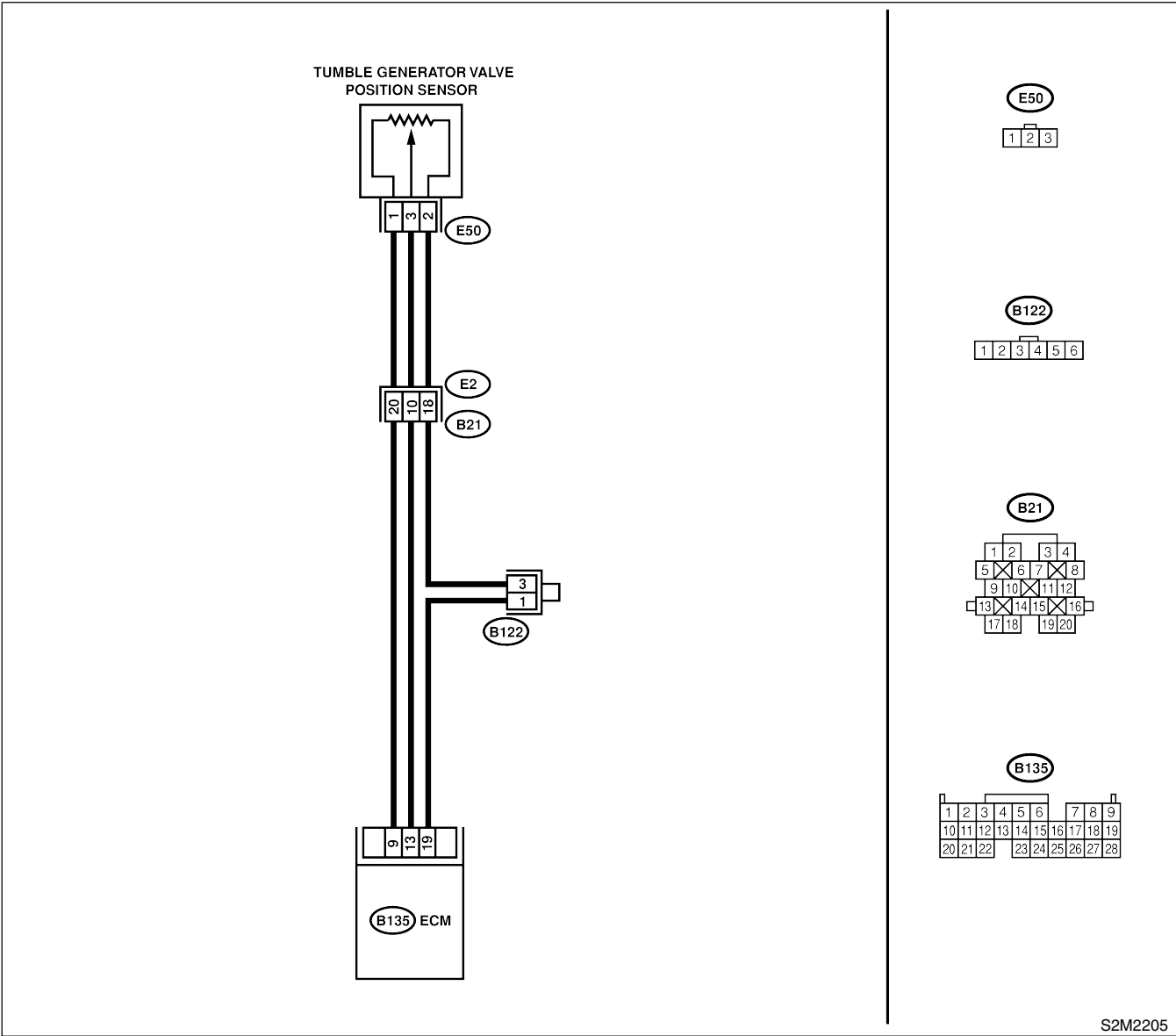


S2M2204

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



S2M2205

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 4.9 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: - Poor contact in tumble generator valve position sensor connector - Poor contact in ECM connector - Poor contact in coupling connector
2	CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from tumble generator valve position sensor. 3) Measure resistance of harness between tumble generator valve position sensor connector and engine ground. Connector & terminal (E50) No. 2 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 3.	Repair harness and connector. NOTE: In this case, repair the following: - Open circuit in harness between tumble generator valve position sensor and ECM connector - Poor contact in coupling connector - Poor contact in joint connector
3	CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between tumble generator valve position sensor connector and engine ground. Connector & terminal (E50) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.9 V?	Repair battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

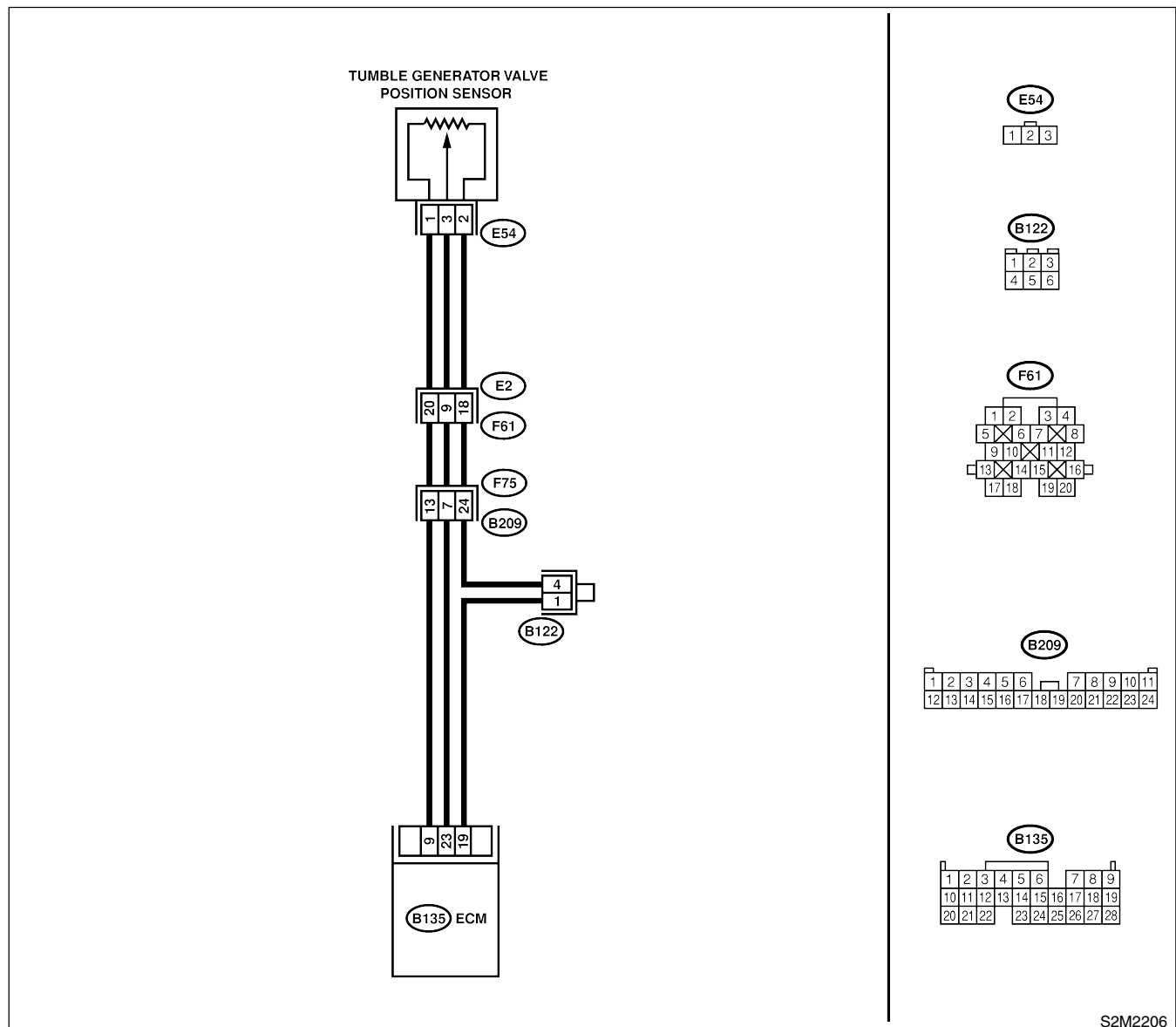
BN: DTC P1088 — TUMBLE GENERATOR VALVE #1 (RH) POSITION SENSOR CIRCUIT LOW INPUT — S088521H75

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

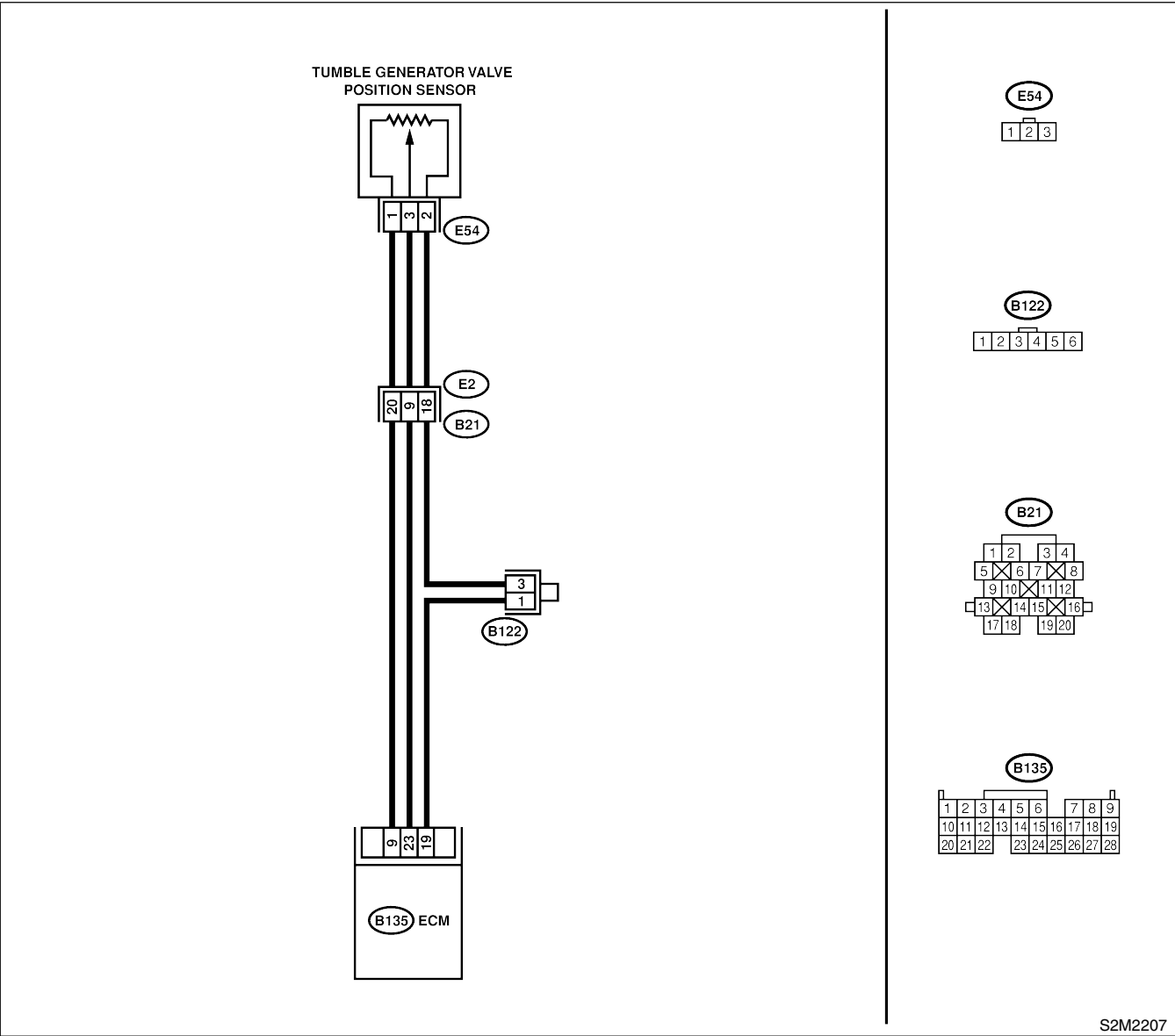


S2M2206

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value less than 0.1 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: - Poor contact in tumble generator valve position sensor connector - Poor contact in ECM connector - Poor contact in coupling connector
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground while throttle valve is fully closed. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
4	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 23 (+) — Chassis ground (-):	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
5	CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.) Measure voltage between ECM connector and chassis ground.	Does the voltage change more than 0.1 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair poor contact in ECM connector.	Go to step 6.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from tumble generator valve position sensor. 3) Turn ignition switch to ON. 4) Measure voltage between tumble generator valve position sensor connector and engine ground. Connector & terminal (E54) No. 1 (+) — Engine ground (-):	Is the voltage more than 4.5 V?	Go to step 7.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between tumble generator valve position sensor and ECM connector ● Poor contact in throttle position sensor connector ● Poor contact in ECM connector ● Poor contact in coupling connector ● Poor contact in joint connector
7	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Measure resistance of harness between ECM connector and tumble generator valve position sensor connector. Connector & terminal (B135) No. 23 — (E54) No. 3:	Is the resistance less than 1 Ω?	Go to step 8.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between tumble generator valve position sensor and ECM connector ● Poor contact in ECM connector ● Poor contact in tumble generator valve position sensor connector ● Poor contact in coupling connector
8	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. Measure resistance of harness between tumble generator valve position sensor connector and engine ground. Connector & terminal (E54) No. 3 — Engine ground:	Is the resistance less than 10 Ω?	Repair ground short circuit in harness between tumble generator valve position sensor and ECM connector.	Go to step 9.
9	CHECK POOR CONTACT. Check poor contact in tumble generator valve position sensor connector.	Is there poor contact in tumble generator valve position sensor connector?	Repair poor contact in tumble generator valve position sensor connector.	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BO: DTC P1089 — TUMBLE GENERATOR VALVE #1 (RH) POSITION SENSOR CIRCUIT HIGH INPUT —

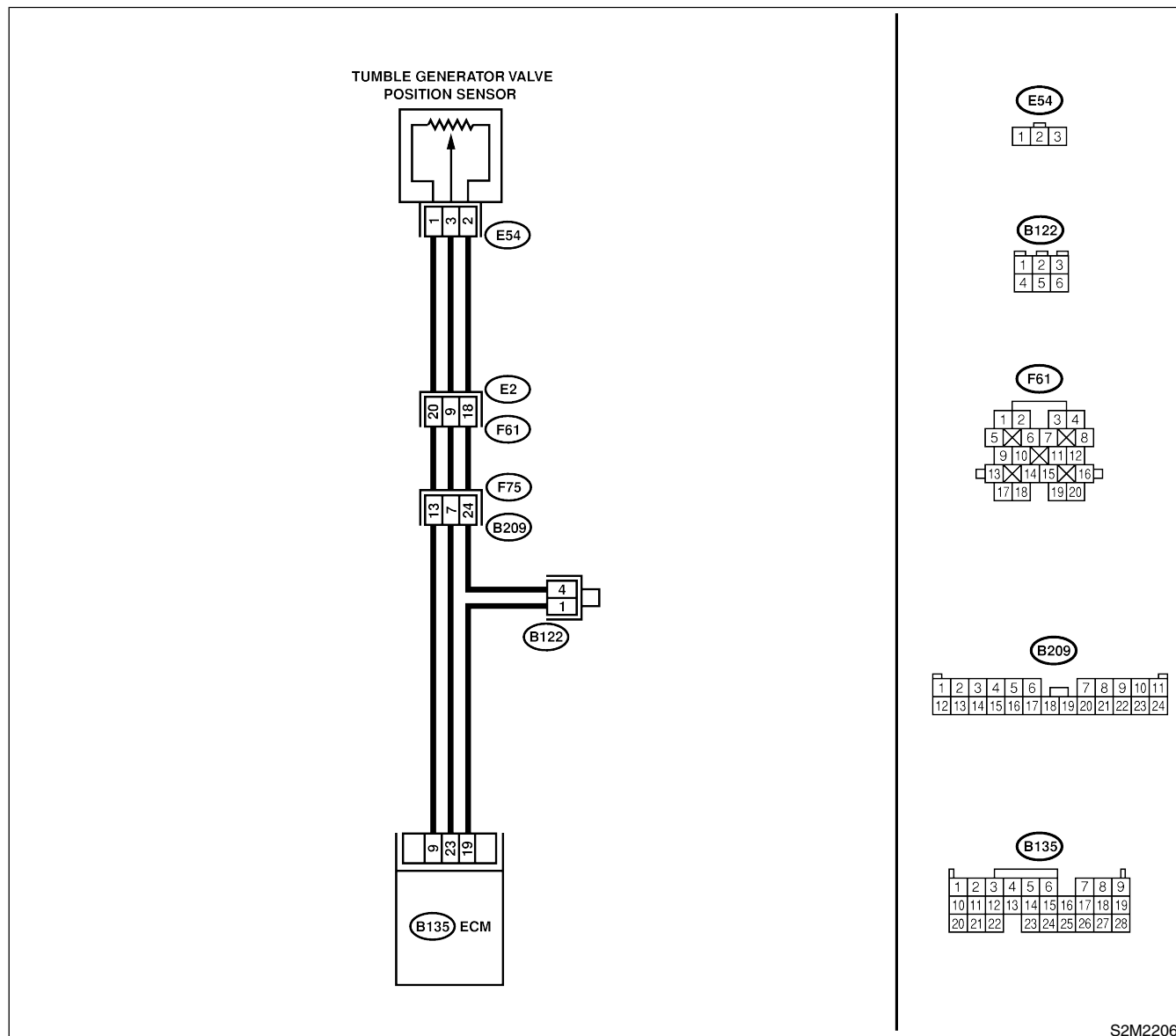
S088521H76

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

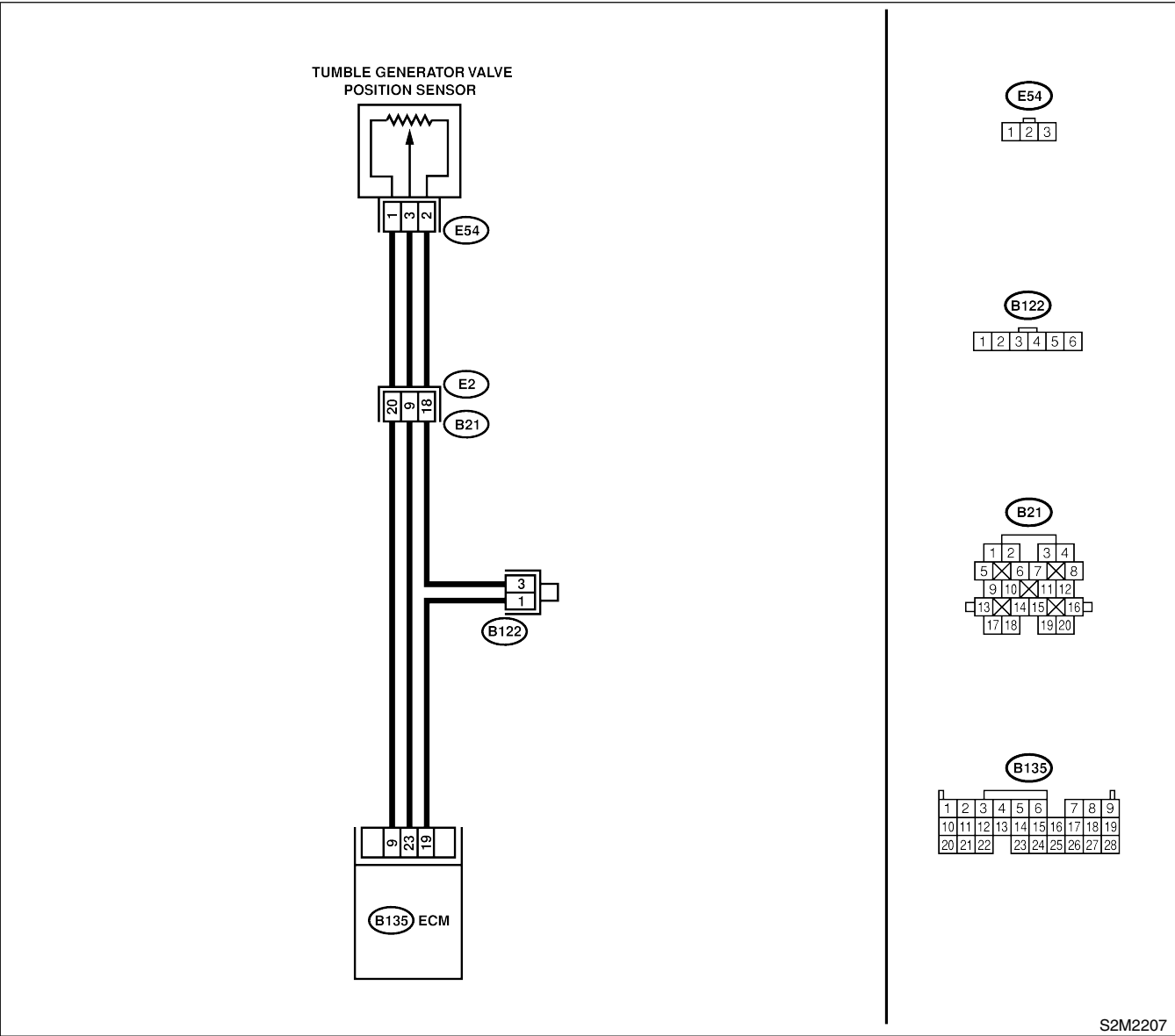


S2M2206

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start engine. 2) Read data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.	Is the value more than 4.9 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause. NOTE: In this case, repair the following: - Poor contact in tumble generator valve position sensor connector - Poor contact in ECM connector - Poor contact in coupling connector
2	CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from tumble generator valve position sensor. 3) Measure resistance of harness between tumble generator valve position sensor connector and engine ground. Connector & terminal (E54) No. 2 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 3.	Repair harness and connector. NOTE: In this case, repair the following: - Open circuit in harness between tumble generator valve position sensor and ECM connector - Poor contact in coupling connector - Poor contact in joint connector
3	CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between tumble generator valve position sensor connector and engine ground. Connector & terminal (E54) No. 3 (+) — Engine ground (-):	Is the voltage more than 4.9 V?	Repair battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BP: DTC P1090 — TUMBLE GENERATOR VALVE SYSTEM #1 (RH) MALFUNCTION (STUCK OPEN) — S088521H77

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate P1088, P1089, P1094 or P1095?	Inspect DTC P1088, P1089, P1094 or P1095 using List of Diagnostic Trouble Code (DTC) <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH 1) Remove tumble generator valve assembly. 2) Check tumble generator valve body.	Does tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BQ: DTC P1091 — TUMBLE GENERATOR VALVE SYSTEM #1 (RH) MALFUNCTION (STUCK CLOSE) — S088521H78

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate P1088, P1089, P1094 or P1095?	Inspect DTC P1088, P1089, P1094 or P1095 using List of Diagnostic Trouble Code (DTC) <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH 1) Remove tumble generator valve assembly. 2) Check tumble generator valve body.	Does tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BR: DTC P1092 — TUMBLE GENERATOR VALVE SYSTEM #2 (LH) MALFUNCTION (STUCK OPEN) — S088521H79

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate P1086, P1087, P1096 or P1097?	Inspect DTC P1086, P1087, P1096 or P1097 using List of Diagnostic Trouble Code (DTC) <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH 1) Remove tumble generator valve assembly. 2) Check tumble generator valve body.	Does tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BS: DTC P1093 — TUMBLE GENERATOR VALVE SYSTEM #2 (LH) MALFUNCTION (STUCK CLOSE) — S088521H80

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate P1086, P1087, P1096 or P1097?	Inspect DTC P1086, P1087, P1096 or P1097 using List of Diagnostic Trouble Code (DTC) <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK TUMBLE GENERATOR VALVE RH 1) Remove tumble generator valve assembly. 2) Check tumble generator valve body.	Does tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

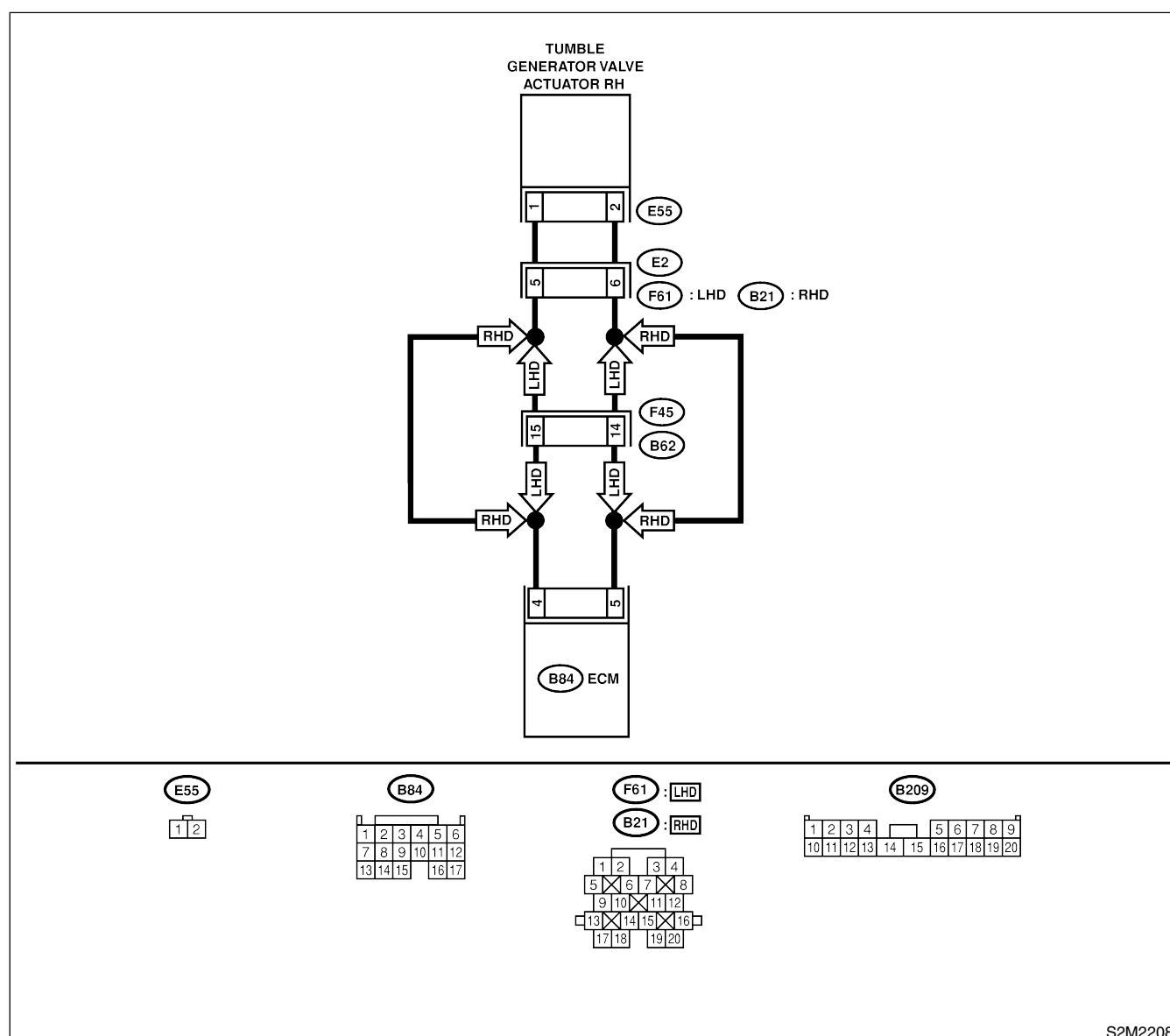
BT: DTC P1094 — TUMBLE GENERATOR VALVE CIRCUIT #1 (OPEN CIRCUIT) — S088521H81

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2208

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from tumble generator valve actuator and ECM connector. 3) Measure resistance between tumble generator valve actuator and ECM connector. Connector & terminal (E55) No. 1 — (B84) No. 4: (E55) No. 2 — (B84) No. 5:	Is the resistance less than 1Ω?	Go to step 2.	Repair open circuit between ECM and tumble generator valve connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and tumble generator valve actuator connector. ● Poor contact in coupling connector.
2	CHECK POOR CONTACT. Check poor contact in tumble generator valve actuator connector.	Is there poor contact in tumble generator valve actuator connector.	Repair poor contact in tumble generator valve actuator connector.	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

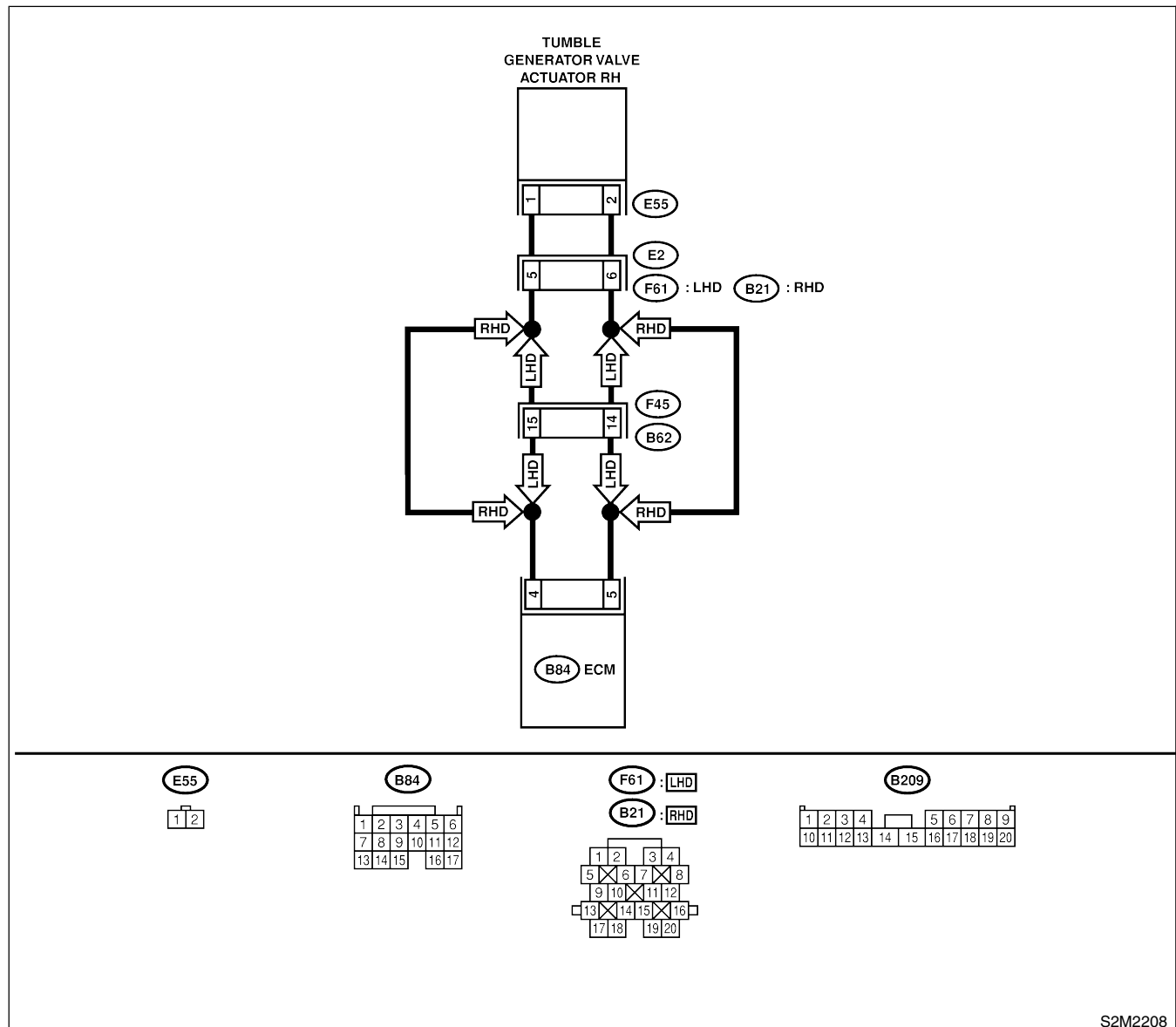
BU: DTC P1095 — TUMBLE GENERATOR VALVE CIRCUIT #1 (OVERCURRENT) — S088521H82

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2208

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from tumble generator valve connector. 3) Measure voltage between tumble generator valve actuator and chassis ground. Connector & terminal (E55) No. 1 (+) — Chassis ground (-): (E55) No. 2 (+) — Chassis ground (-):	Is the voltage less than 5V?	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>	Repair battery short circuit between ECM and tumble generator valve actuator.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

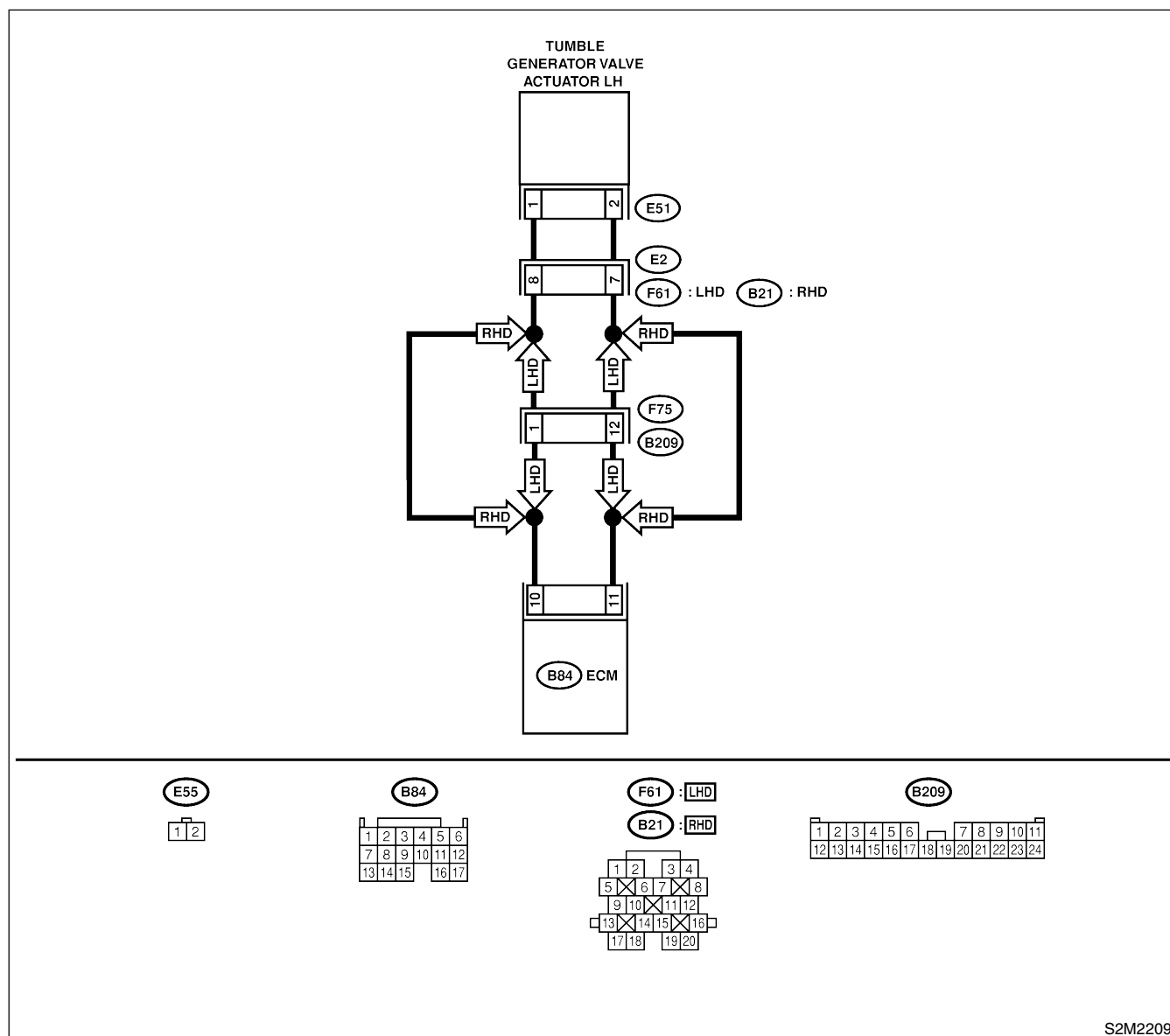
BV: DTC P1096 — TUMBLE GENERATOR VALVE CIRCUIT #2 (OPEN CIRCUIT) — S088521H83

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

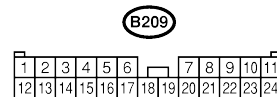
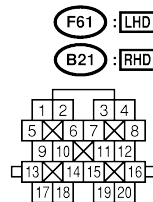
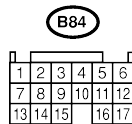
No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from tumble generator valve and ECM connector. 3) Measure resistance between tumble generator valve actuator and ECM connector. Connector & terminal (E51) No. 1 — (B84) No. 10: (E51) No. 2 — (B84) No. 11:	Is the resistance less than 1Ω?	Go to step 2.	Repair open circuit between ECM and tumble generator valve connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and tumble generator valve actuator connector. ● Poor contact in coupling connector.
2	CHECK POOR CONTACT. Check poor contact in tumble generator valve actuator connector.	Is there poor contact in tumble generator valve actuator connector.	Repair poor contact in tumble generator valve actuator connector.	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>

Engine (Diagnostics)

S088521H84

- Immediately at fault recognition

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

[illegible]

EN(DOHC TURBO)-284

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from tumble generator valve connector. 3) Measure voltage between tumble generator valve actuator and chassis ground. Connector & terminal (E51) No. 1 (+) — Chassis ground (-): (E51) No. 2 (+) — Chassis ground (-):	Is the voltage less than 5V?	Replace tumble generator valve assembly. <Ref. to FU(DOHC TURBO)-40, Tumble Generator Valve Assembly.>	Repair battery short circuit between ECM and tumble generator valve actuator.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BX: DTC P1110 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT LOW INPUT — S088521B84

● **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1110?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.> NOTE: Atmospheric pressure sensor is built into ECM.	It is not necessary to inspect DTC P1110.

BY: DTC P1111 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT HIGH INPUT — S088521B85

● **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1111?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.> NOTE: Atmospheric pressure sensor is built into ECM.	It is not necessary to inspect DTC P1111.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

BZ: DTC P1112 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM — S088521B86

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P1110 or P1111?	Inspect DTC P0106, P0107, P0108, P1110 or P1111 using "List of Diagnostic Trouble Code (DTC)".<Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.> NOTE: Atmospheric pressure sensor is built into ECM.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

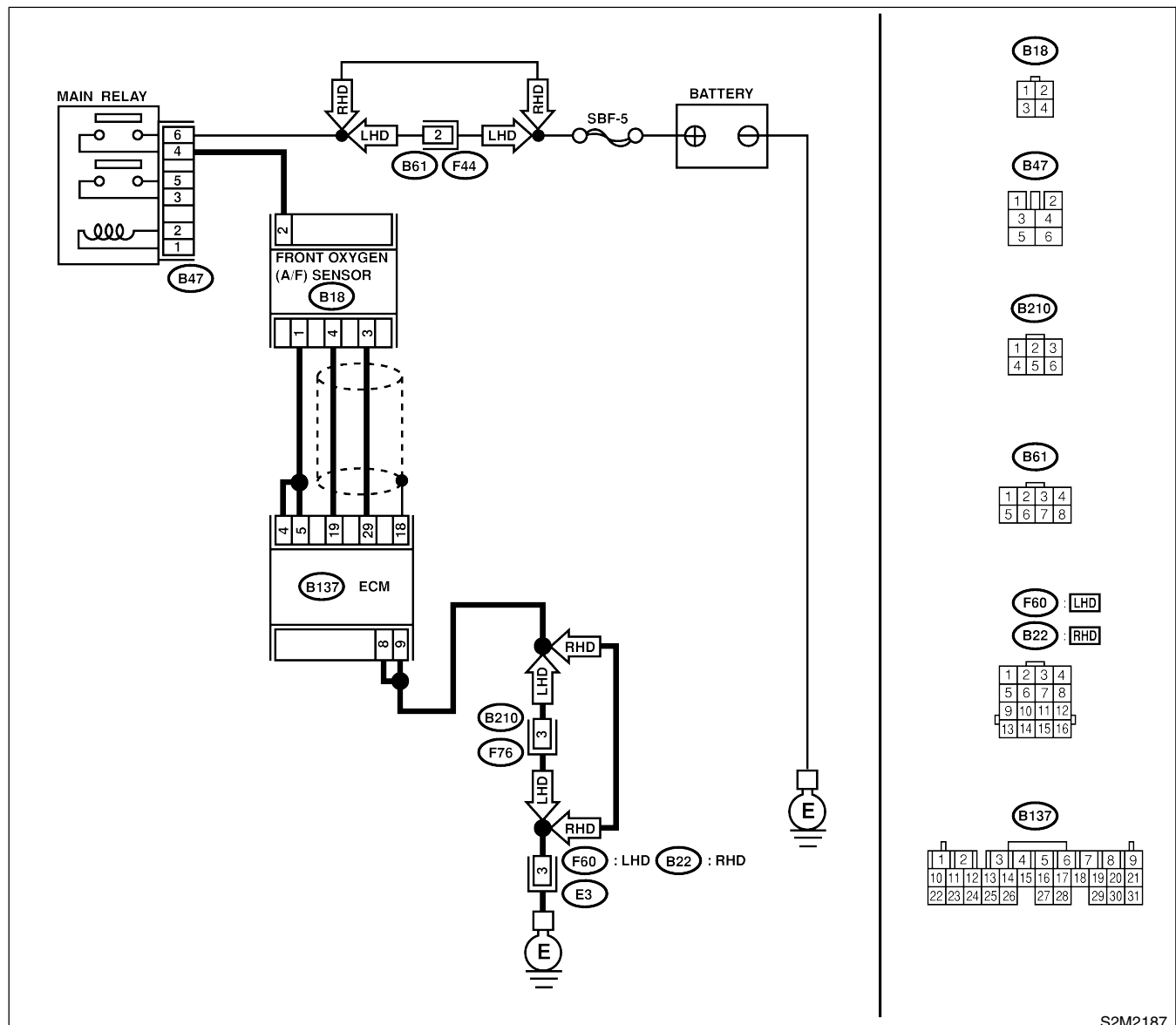
CA: DTC P1130 — FRONT OXYGEN (A/F) SENSOR CIRCUIT MALFUNCTION (OPEN CIRCUIT) — S088521B92

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM and front oxygen (A/F) sensor connector. 3) Measure resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B137) No. 29 — (B18) No. 3: (B137) No. 19 — (B18) No. 4:	Is the resistance less than 1 Ω?	Go to step 2.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and front oxygen (A/F) sensor connector ● Poor contact in front oxygen (A/F) sensor connector ● Poor contact in ECM connector
2	CHECK POOR CONTACT. Check poor contact in front oxygen (A/F) sensor connector.	Is there poor contact in front oxygen (A/F) sensor connector?	Repair poor contact in front oxygen (A/F) sensor connector.	Replace front oxygen (A/F) sensor. <Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

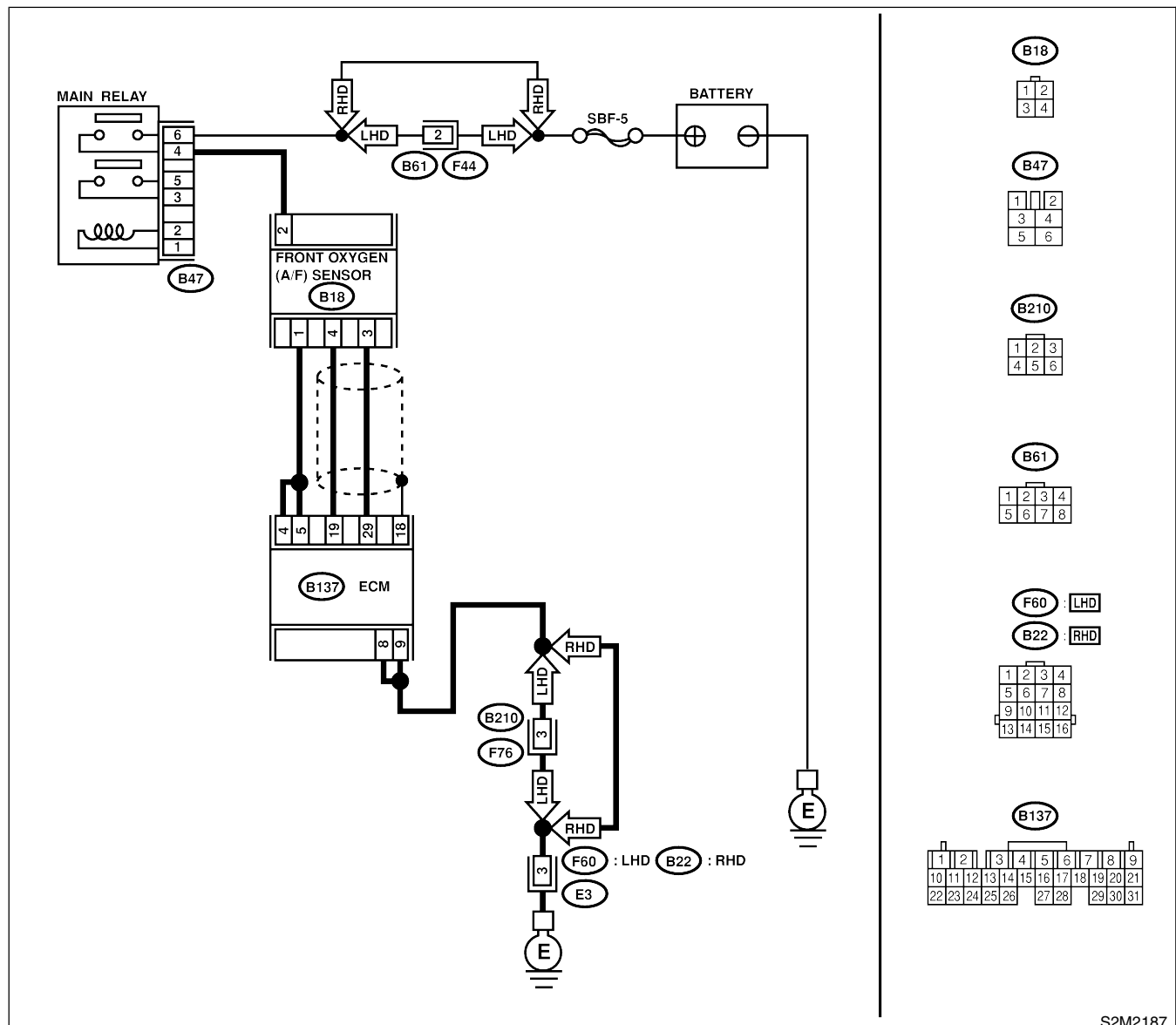
CB: DTC P1131 — FRONT OXYGEN (A/F) SENSOR CIRCUIT MALFUNCTION (SHORT CIRCUIT) — S088521B93

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B137) No. 19 — Chassis ground:	Is the resistance more than 10 Ω ?	Go to step 2.	Repair ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B137) No. 29 — Chassis ground:	Is the resistance more than 10 Ω ?	Go to step 3.	Repair ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.
3	CHECK OUTPUT SIGNAL FOR ECM. 1) Connect connector to ECM. 2) Turn ignition switch to ON. 3) Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 19 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 5.
4	CHECK OUTPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 19 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Repair poor contact in ECM connector.
5	CHECK OUTPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 29 (+) — Chassis ground (-):	Is the voltage more than 4.95 V?	Go to step 6.	Replace front oxygen (A/F) sensor. <Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>
6	CHECK OUTPUT SIGNAL FOR ECM. Measure voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 29 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Repair poor contact in ECM connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CC: DTC P1134 — FRONT OXYGEN (A/F) SENSOR MICRO-COMPUTER PROBLEM —

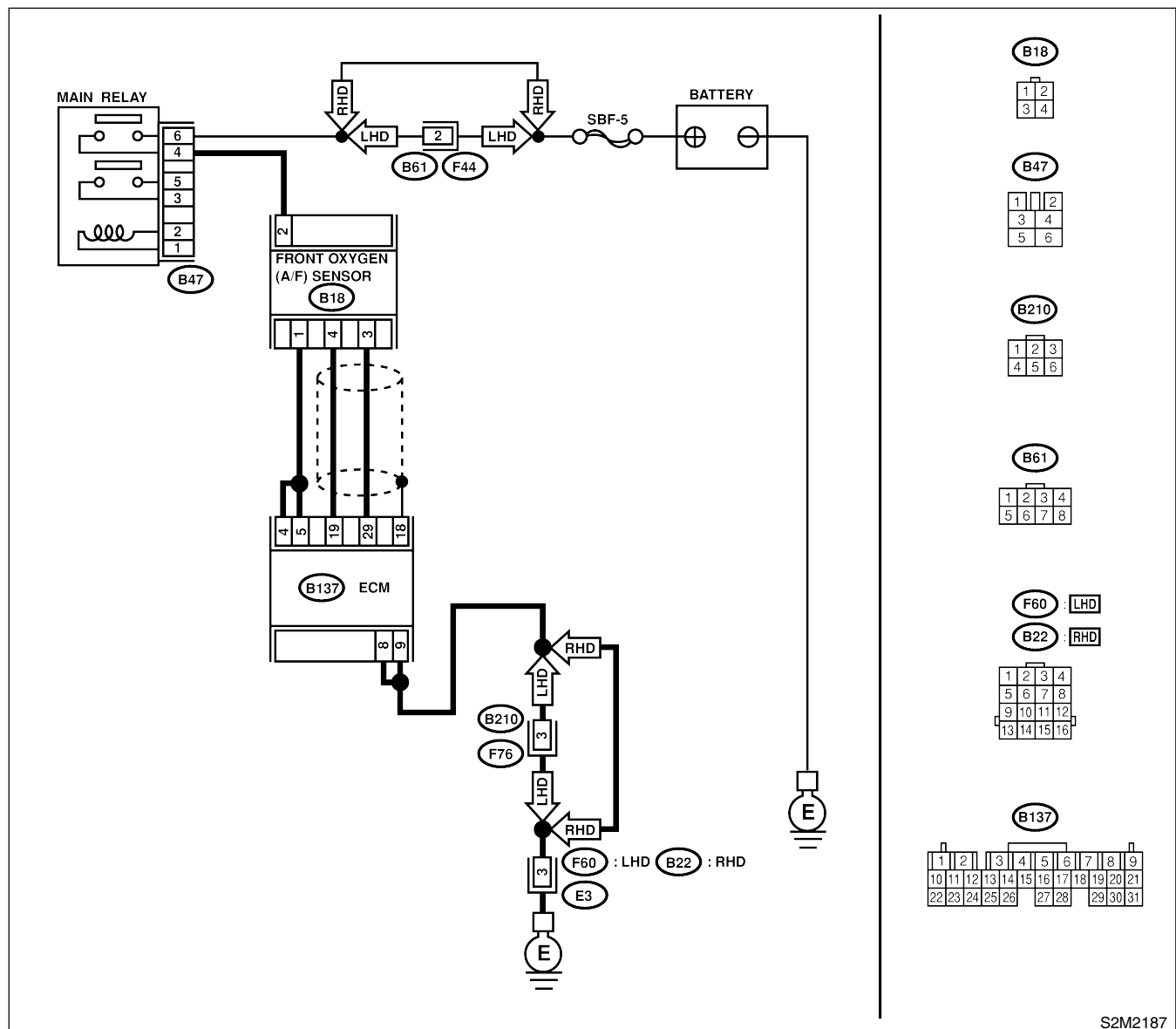
S088521B96

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1134?	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	It is not necessary to inspect DTC P1134.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CD: DTC P1139 — FRONT OXYGEN (A/F) SENSOR #1 HEATER CIRCUIT RANGE/PERFORMANCE PROBLEM —

S088521B97

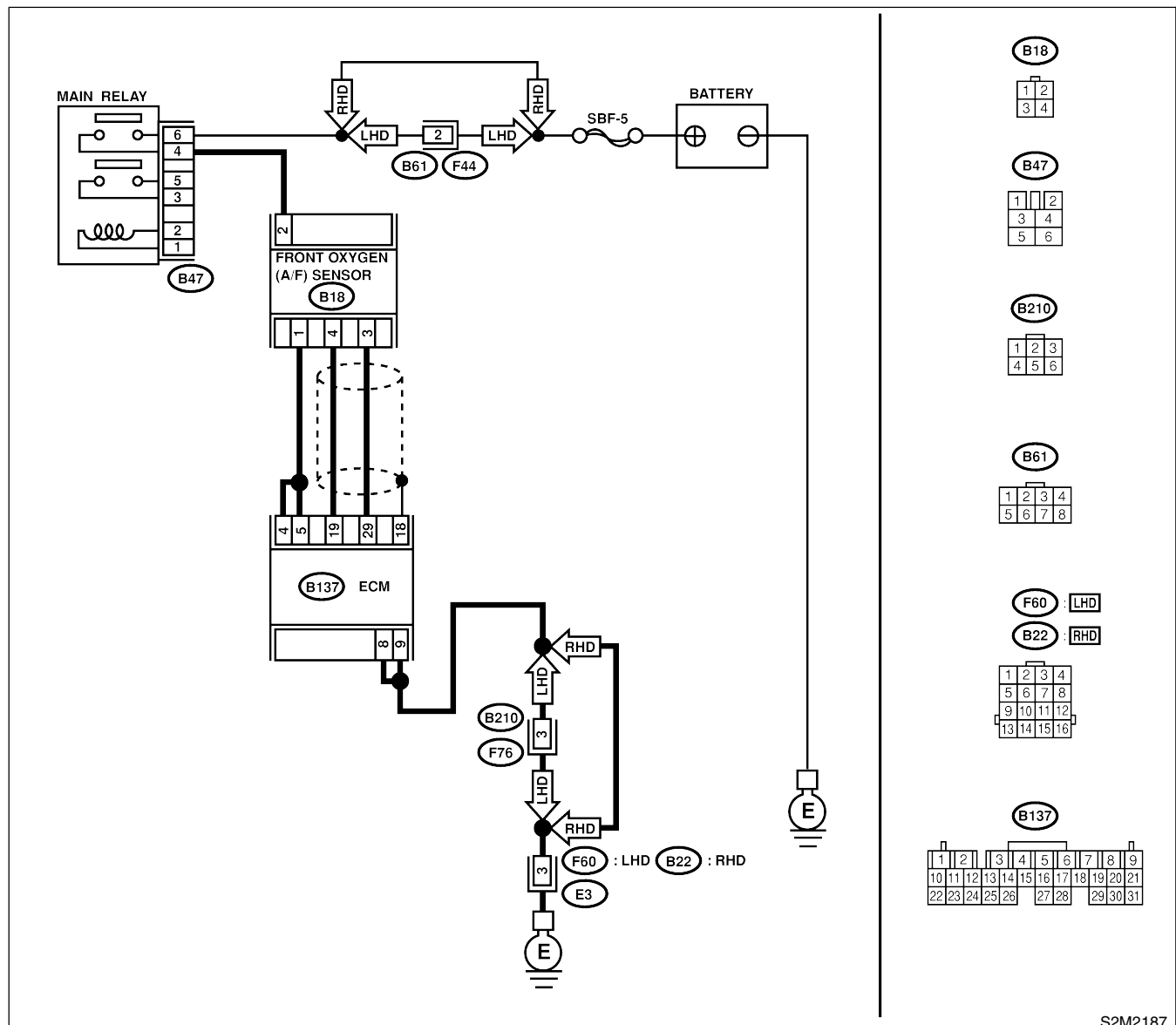
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2187

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Start engine, and warm-up the engine. 2) Turn ignition switch to OFF. 3) Disconnect connectors from ECM and front oxygen (A/F) sensor. 4) Measure resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B137) No. 5 — (B18) No. 1: (B137) No. 4 — (B18) No. 1:	Is the resistance less than 1 Ω?	Go to step 2.	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B137) No. 19 — (B18) No. 4: (B137) No. 29 — (B18) No. 3:	Is the resistance less than 1 Ω?	Go to step 3.	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.
3	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure resistance of harness between main relay and front oxygen (A/F) sensor connector. Connector & terminal (B47) No. 4 — (B18) No. 2:	Is the resistance less than 1 Ω?	Go to step 4.	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.
4	CHECK FRONT OXYGEN (A/F) SENSOR. Measure resistance between front oxygen (A/F) sensor connector terminals. Terminals No. 2 — No. 1:	Is the resistance less than 5 Ω?	Go to step 5.	Replace front oxygen (A/F) sensor. <Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>
5	CHECK POOR CONTACT. Check poor contact in ECM and front oxygen (A/F) sensor connector.	Is there poor contact in ECM or front oxygen (A/F) sensor connector?	Repair poor contact in ECM or front oxygen (A/F) sensor connector.	Replace front oxygen (A/F) sensor. <Ref. to FU(DOHC TURBO)-42, Front Oxygen (A/F) Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CE: DTC P1141 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

S088521B98

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

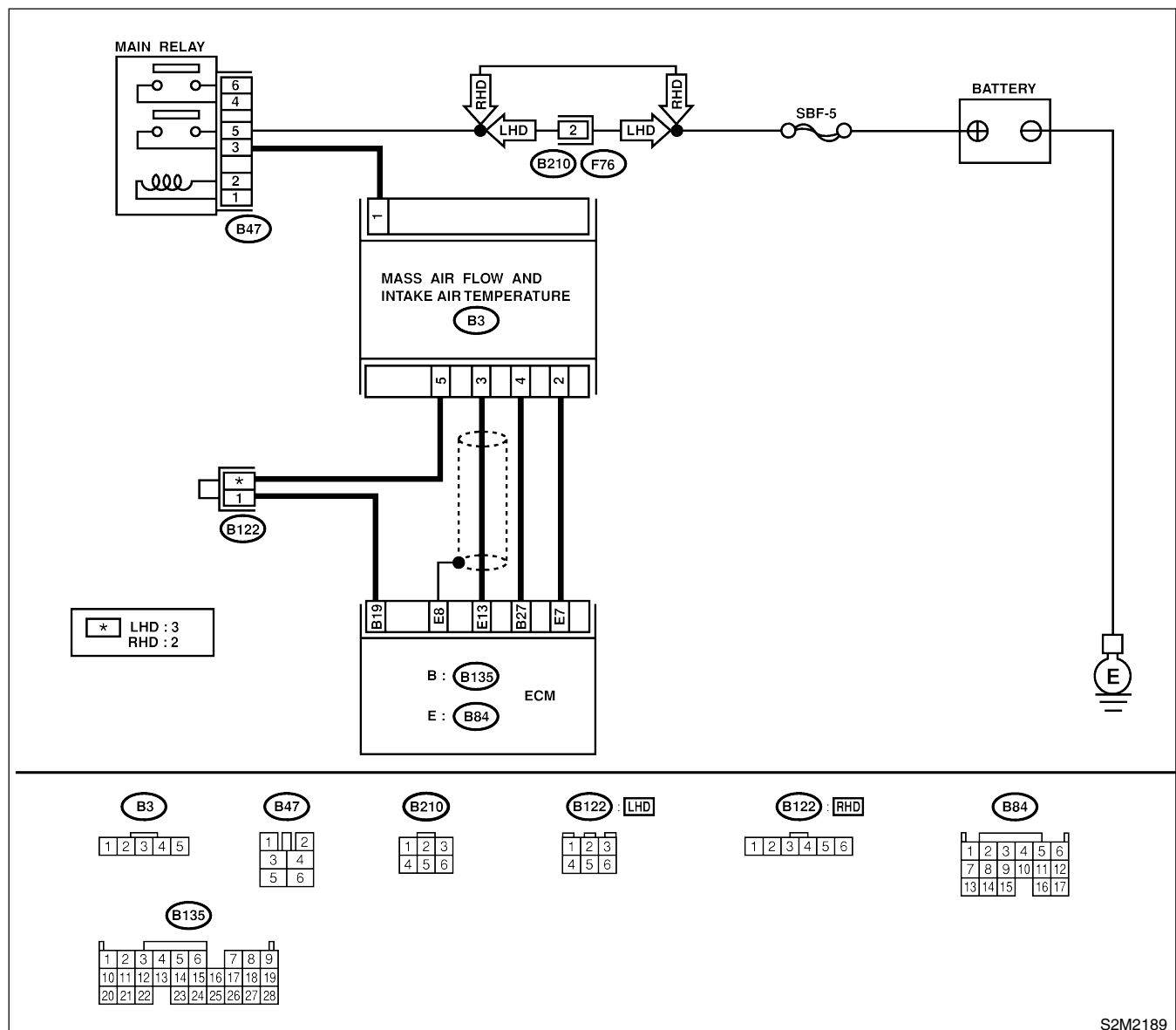
• TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2189

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does Subaru select monitor or OBD-II general scan tool indicate DTC P0102 or P0103?	Inspect DTC P0102 or P0103 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P1141.	Replace mass air flow and intake air temperature sensor.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CF: DTC P1142 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) — S088521B99

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

- **TROUBLE SYMPTOM:**

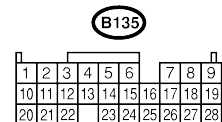
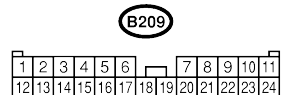
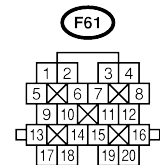
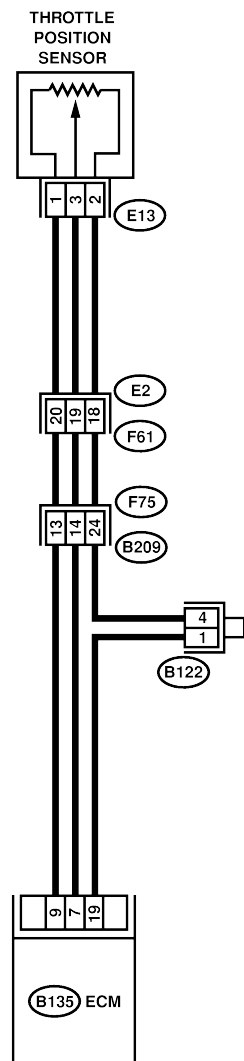
- Erroneous idling
- Engine stalls.
- Poor driving performance

- **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**

- **LHD MODEL**

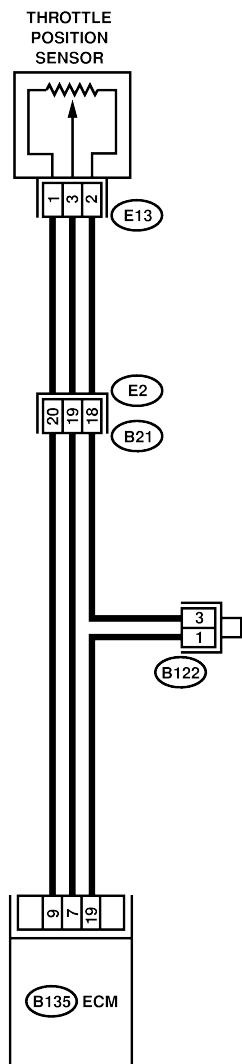


S2M2193

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



E13

1 2 3

B122

1 2 3 4 5 6

B21

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

B135

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28								

S2M2194

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0122 or P0123?	Inspect DTC P0122 or P0123 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P1142.	Replace throttle position sensor. <Ref. to FU(DOHC TURBO)-33, Throttle Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

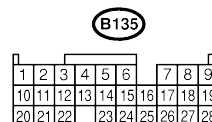
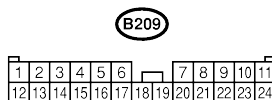
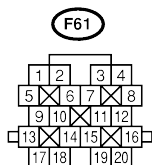
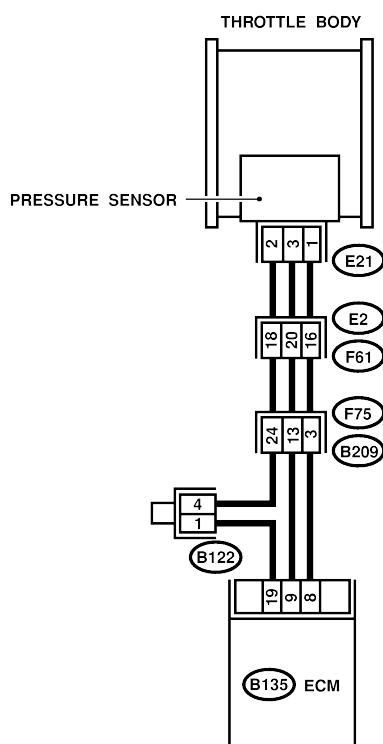
CG: DTC P1146 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) — S088521G07

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**
- **LHD MODEL**

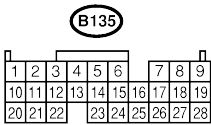
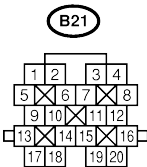
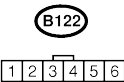
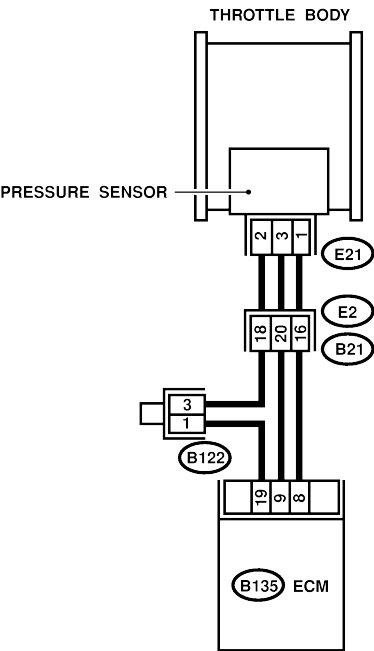


S2M2190

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● RHD MODEL



S2M2191

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY. NOTE: In this case, it is not necessary to inspect DTC P0106.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0107, P0108 or P1112?	Inspect DTC P0107, P0108 or P1112 using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair air intake system.	Go to step 3.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
3	CHECK PRESSURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F). 2) Place the shift lever in the selector lever in "N" or "P" position. 3) Turn A/C switch to OFF. 4) Turn all accessory switches to OFF. 5) Read data of intake manifold pressure sensor signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual. Specification: - Intake manifold absolute pressure Ignition ON 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling 20.0 — 46.7 kPa (150 — 350 mmHg, 5.91 — 13.78 inHg)	Is the value within the specifications?	Go to step 4.	Replace pressure sensor. <Ref. to FU(DOHC TURBO)-35, Pressure Sensor.>
4	CHECK THROTTLE POSITION. Read data of throttle position signal using Subaru Select Monitor or OBD-II general scan tool. NOTE: - Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(DOHC TURBO)-36, Subaru Select Monitor.> - OBD-II general scan tool For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.	Is throttle positioning ratio equal to or less than 5% when throttle is fully closed?	Go to step 5.	Replace throttle position sensor. <Ref. to FU(DOHC TURBO)-33, Throttle Position Sensor.>
5	CHECK THROTTLE POSITION.	Is throttle positioning ratio equal to or more than 85% when throttle is fully open?	Replace pressure sensor. <Ref. to FU(DOHC TURBO)-35, Pressure Sensor.>	Replace throttle position sensor. <Ref. to FU(DOHC TURBO)-33, Throttle Position Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CH: DTC P1244 — WASTEGATE CONTROL SOLENOID VALVE RANGE/PERFORMANCE PROBLEM (LOW INPUT) — S088521H06

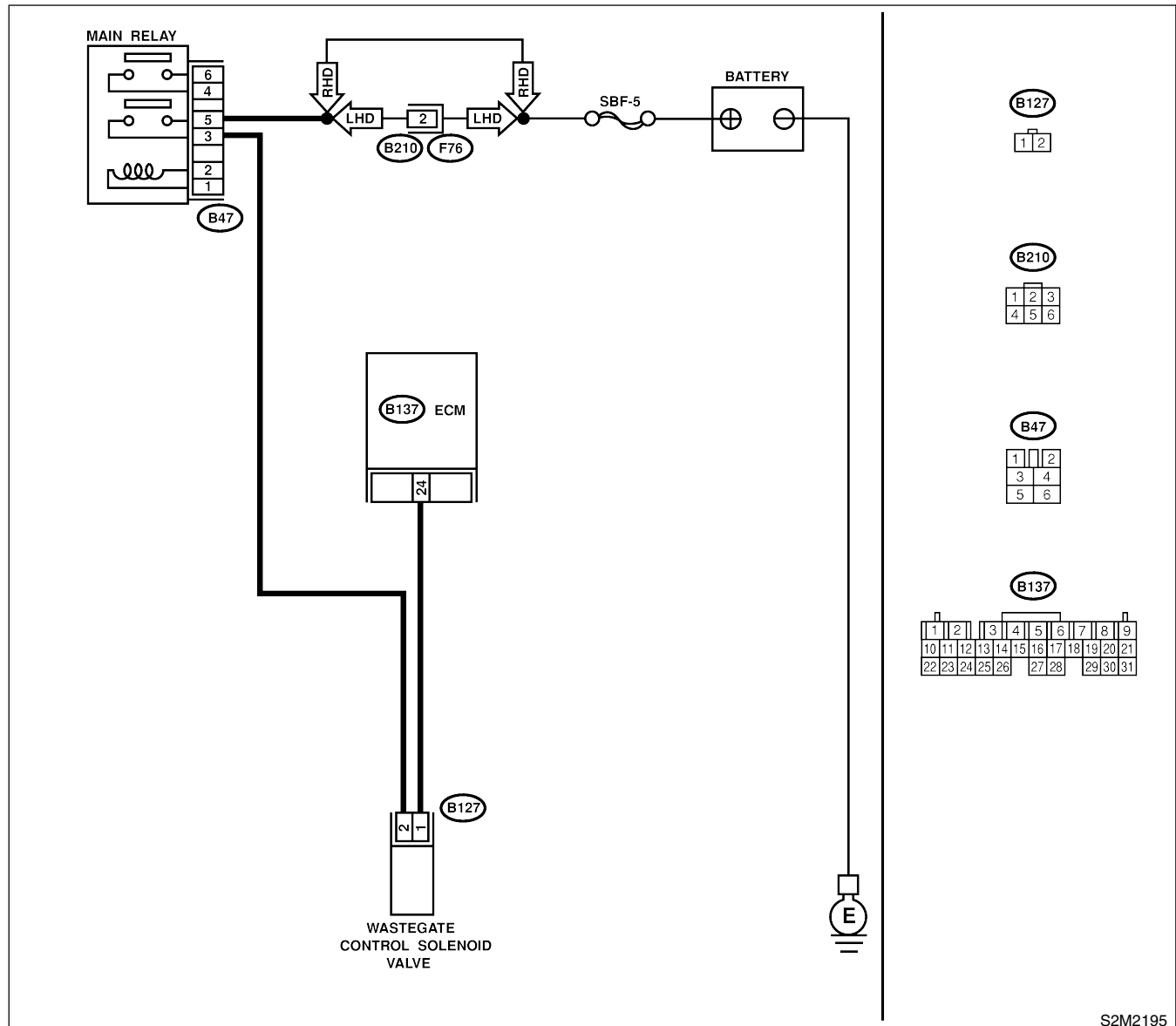
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2195

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0245 or P0246?	Inspect DTC P0245 or P0246 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P1142.	Replace wastegate control solenoid valve. <Ref. to FU(DOHC TURBO)-41, Wastegate Control Solenoid Valve.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CI: DTC P1245 — WASTEGATE CONTROL SOLENOID VALVE MALFUNCTION (FAIL-SAFE) —

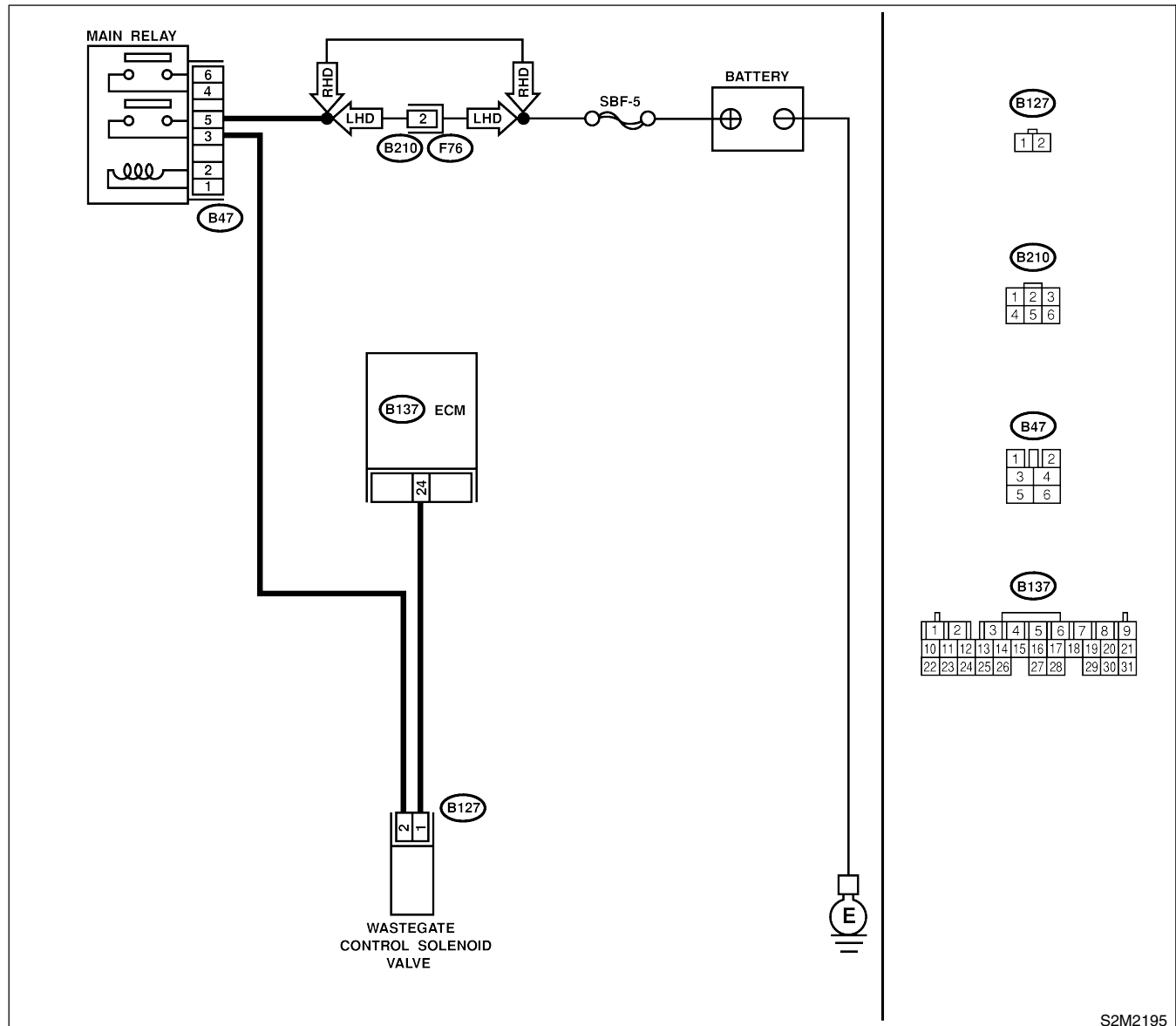
S088521H87

- DTC DETECTING CONDITION:
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- WIRING DIAGRAM:



S2M2195

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0244, P0245, P0246 or P1244?	Inspect DTC P0244, P0245, P0246 or P1244 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0507.	Replace wastegate control solenoid valve. <Ref. to FU(DOHC TURBO)-41, Wastegate Control Solenoid Valve.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CJ: DTC P1301 — FIRE DUE TO INCREASED EXHAUST TEMPERATURE —

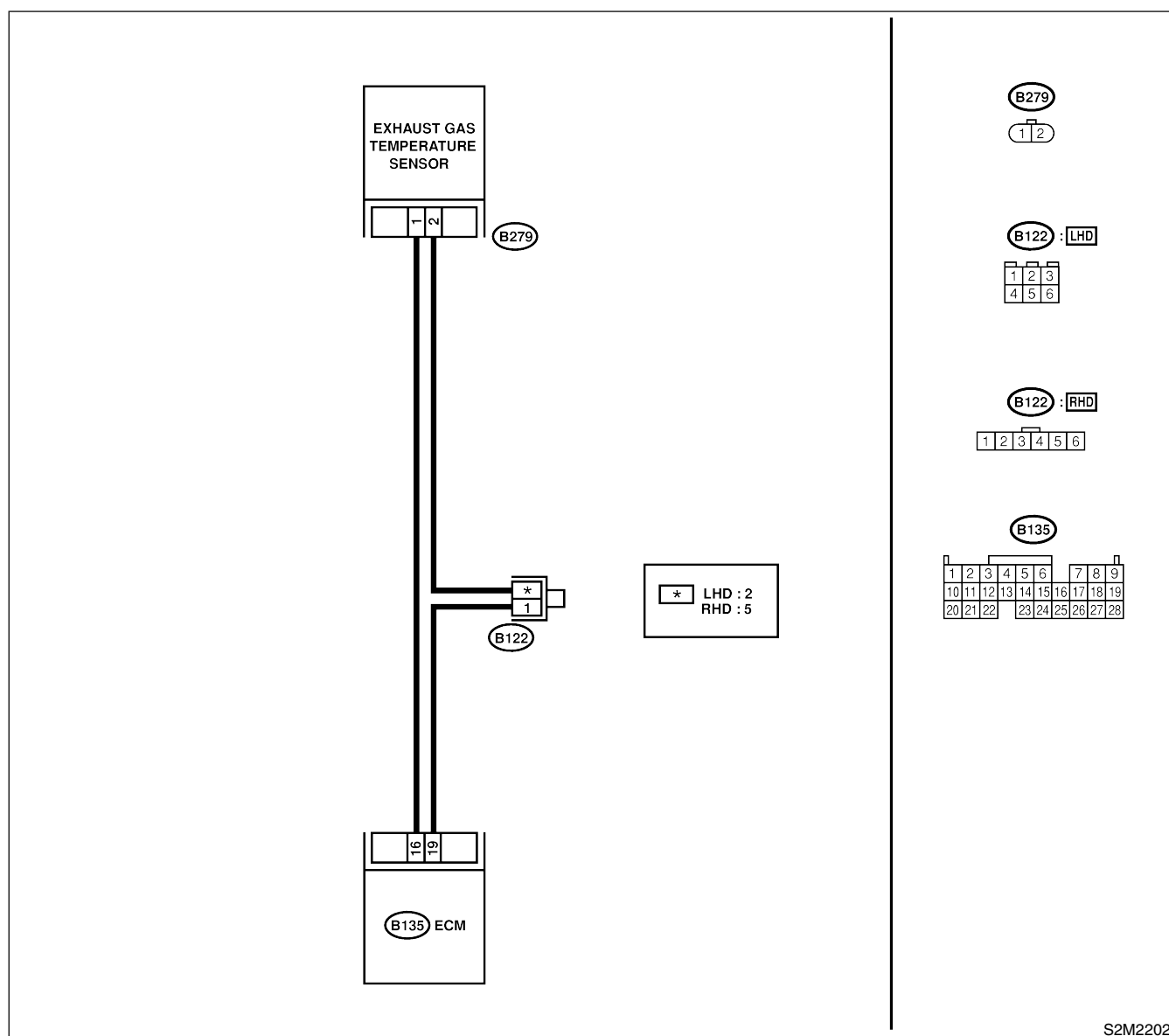
S088521H88

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2202

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC. Conduct troubleshooting for all DTC P0301, P0302, P0303 and P0304. <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).>	Does failure for repair or replacement exist?	Repair or replace failure, then replace precat- alytic converter.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterio- ration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CK: DTC P1312 — EXHAUST GAS TEMPERATURE CIRCUIT MALFUNCTION

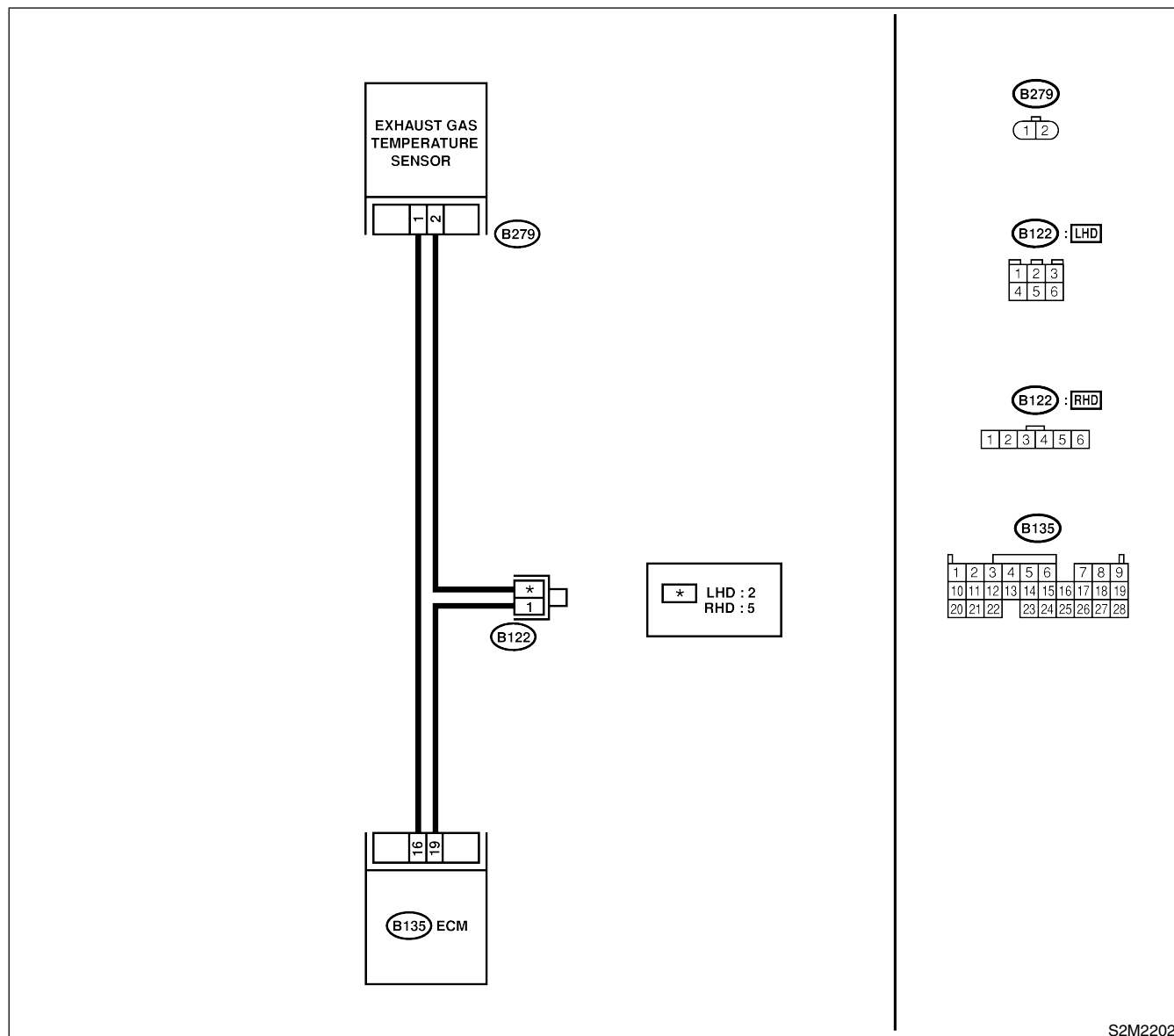
S088521H89

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2202

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0545, P0546 or P1544?	Inspect DTC P0545, P0546 or P1544 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P1312.	Replace exhaust gas temperature sensor. <Ref. to FU(DOHC TURBO)-46, Exhaust Temperature Sensor.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CL: DTC P1480 — COOLING FAN RELAY 1 CIRCUIT HIGH INPUT — S088521 G08

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Radiator fan does not operate properly.
 - Overheating

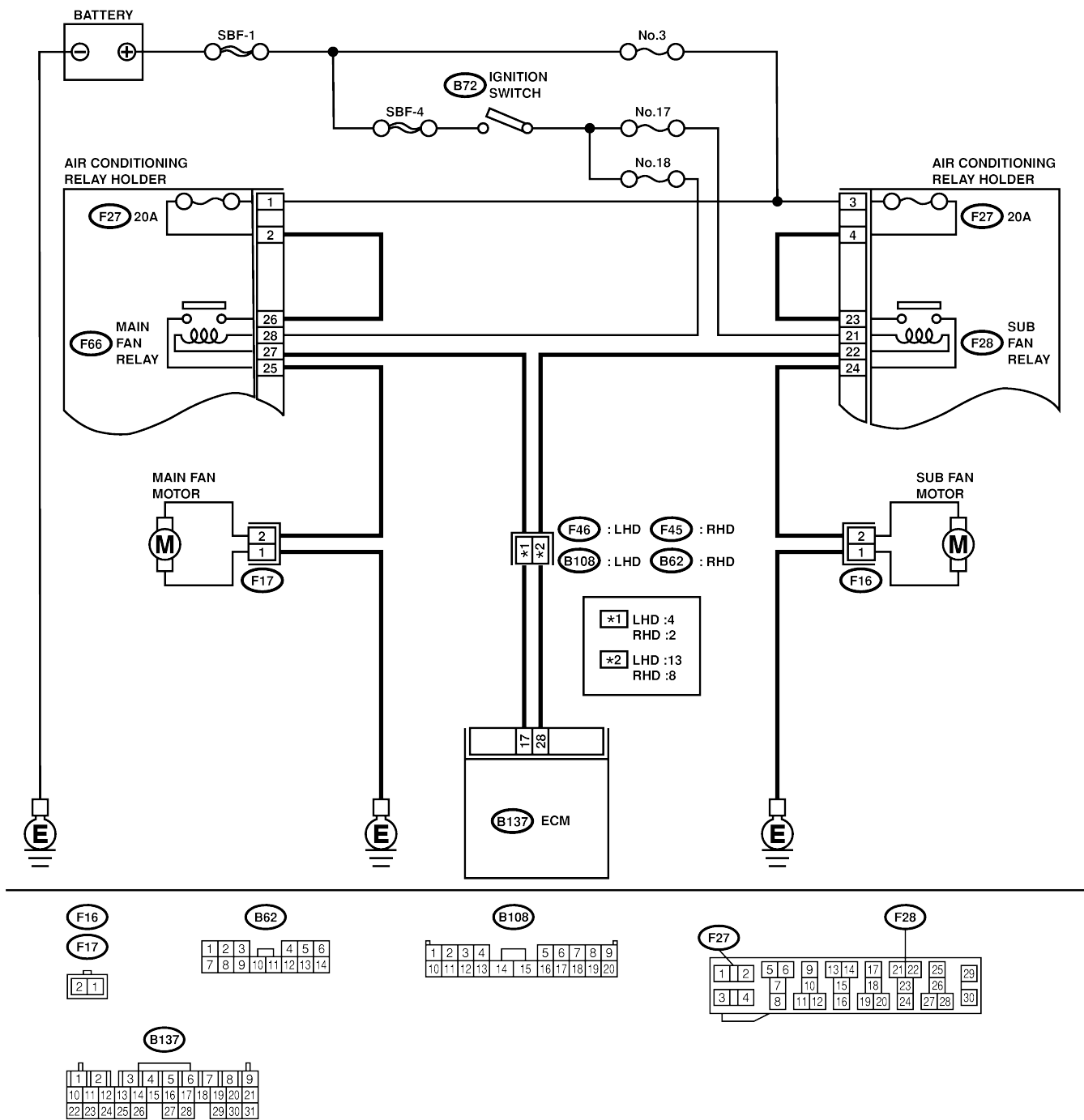
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

● WIRING DIAGRAM:



S2M2199

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL FROM ECM. 1) Turn ignition switch to OFF. 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box. 3) Turn ignition switch to ON. 4) While operating radiator fan relay, measure voltage between ECM and chassis ground. NOTE: Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode".<Ref. to EN(DOHC TURBO)-48, Compulsory Valve Operation Check Mode.> Connector & terminal (B137) No. 17 (+) — Chassis ground (-): (B137) No. 28 (+) — Chassis ground (-):	Does voltage change between 0 and 10 V?	Even if MIL lights up, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.	Go to step 2.
2	CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY CONTROL CIRCUIT. 1) Turn ignition switch to OFF. 2) Remove main fan relay and sub fan relay. (with A/C models) 3) Disconnect test mode connector. 4) Turn ignition switch to ON. 5) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 17 (+) — Chassis ground (-): (B137) No. 28 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in radiator fan relay control circuit. After repair, replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>	Go to step 3.
3	CHECK MAIN FAN RELAY. 1) Turn ignition switch to OFF. 2) Remove main fan relay. 3) Measure resistance of main fan relay. Terminal No. 26 — No. 25:	Is the resistance more than 1 MΩ?	Go to step 4.	Replace main fan relay and ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>
4	CHECK MAIN FAN RELAY. 1) Connect battery to terminals No. 27 and No. 28 of main fan relay. 2) Measure resistance of main fan relay. Terminal No. 26 — No. 25:	Is the resistance less than 1 Ω?	Go to step 5.	Replace main fan relay and ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>
5	CHECK SUB FAN RELAY. 1) Turn ignition switch to OFF. 2) Measure resistance of main fan relay. Terminal No. 17 — No. 18:	Is the resistance more than 1 MΩ?	Go to step 6.	Replace sub fan relay and ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
6	CHECK SUB FAN RELAY. 1) Connect battery to terminals No. 20 and No. 19 of sub fan relay. 2) Measure resistance of main fan relay. Terminal No. 17— No. 18:	Is the resistance less than 1 Ω ?	Go to step 7.	Replace sub fan relay and ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>
7	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-47, Engine Control Module.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CM: DTC P1507 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) —

S088521C16

• DTC DETECTING CONDITION:

- Immediately at fault recognition

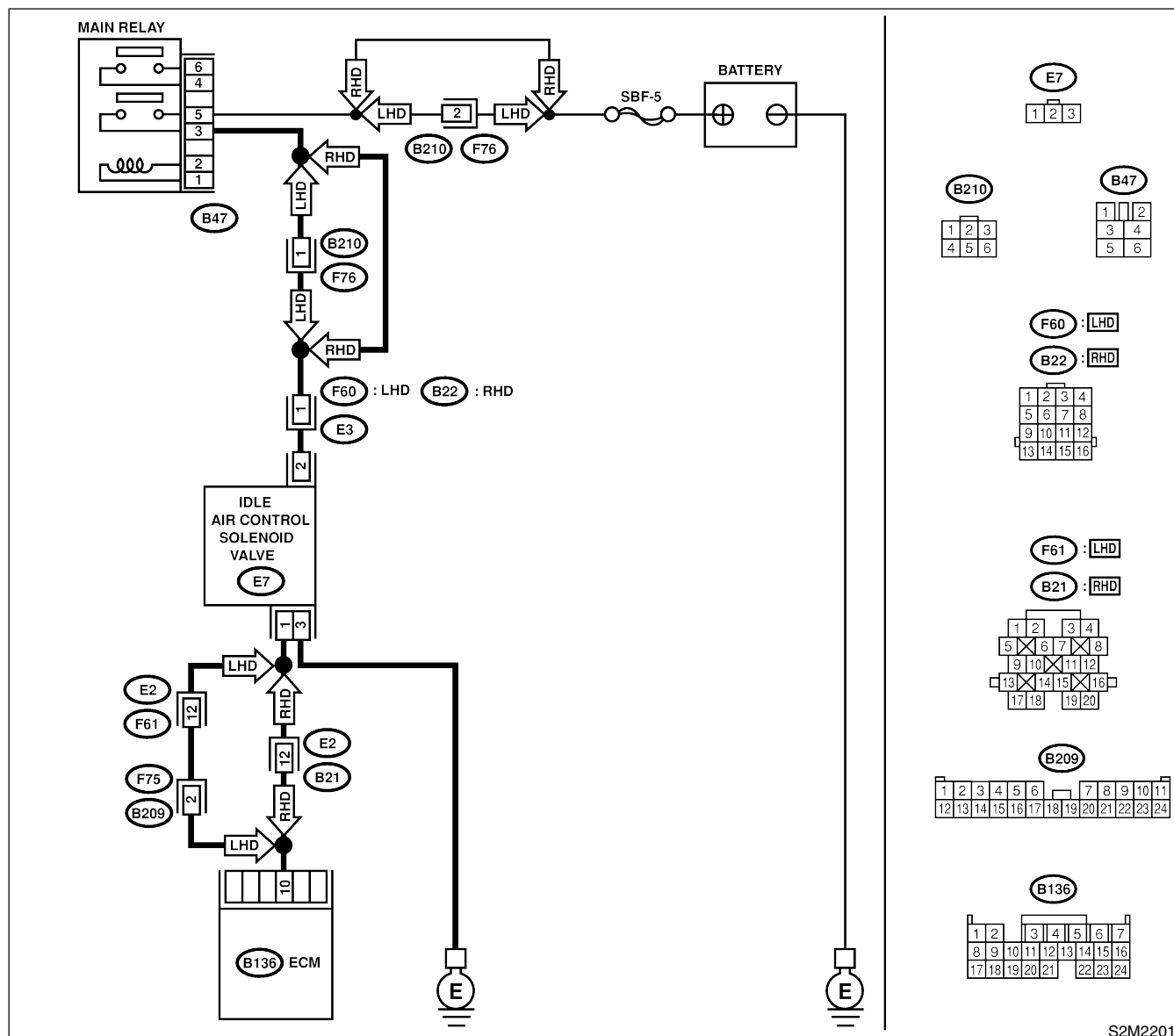
• TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.
- Fuel is cut according to fail-safe function.

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

• WIRING DIAGRAM:



S2M2201

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0506, P0507, P0508, P0509 or P1142?	Inspect DTC P0506, P0507, P0508, P0509 or P1142 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0507.	Go to step 2.
2	CHECK AIR INTAKE SYSTEM. 1) Turn ignition switch to ON. 2) Start engine, and idle it. 3) Check the following items. ● Loose installation of intake manifold, idle air control solenoid valve and throttle body ● Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket ● Disconnections of vacuum hoses	Is there a fault in air intake system?	Repair air suction and leaks.	Go to step 3.
3	CHECK THROTTLE CABLE.	Does throttle cable have play for adjustment?	Go to step 4.	Adjust throttle cable. <Ref. to SP-12, Accelerator Control Cable.>
4	CHECK AIR BY-PASS LINE. 1) Turn ignition switch to OFF. 2) Remove idle air control solenoid valve from throttle body. <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.> 3) Confirm that there are no foreign particles in by-pass air line.	Are foreign particles in by-pass air line?	Remove foreign particles from by-pass air line.	Replace idle air control solenoid valve. <Ref. to FU(DOHC TURBO)-36, Idle Air Control Solenoid Valve.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CN: DTC P1518 — STARTER SWITCH CIRCUIT LOW INPUT — S088521G09

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

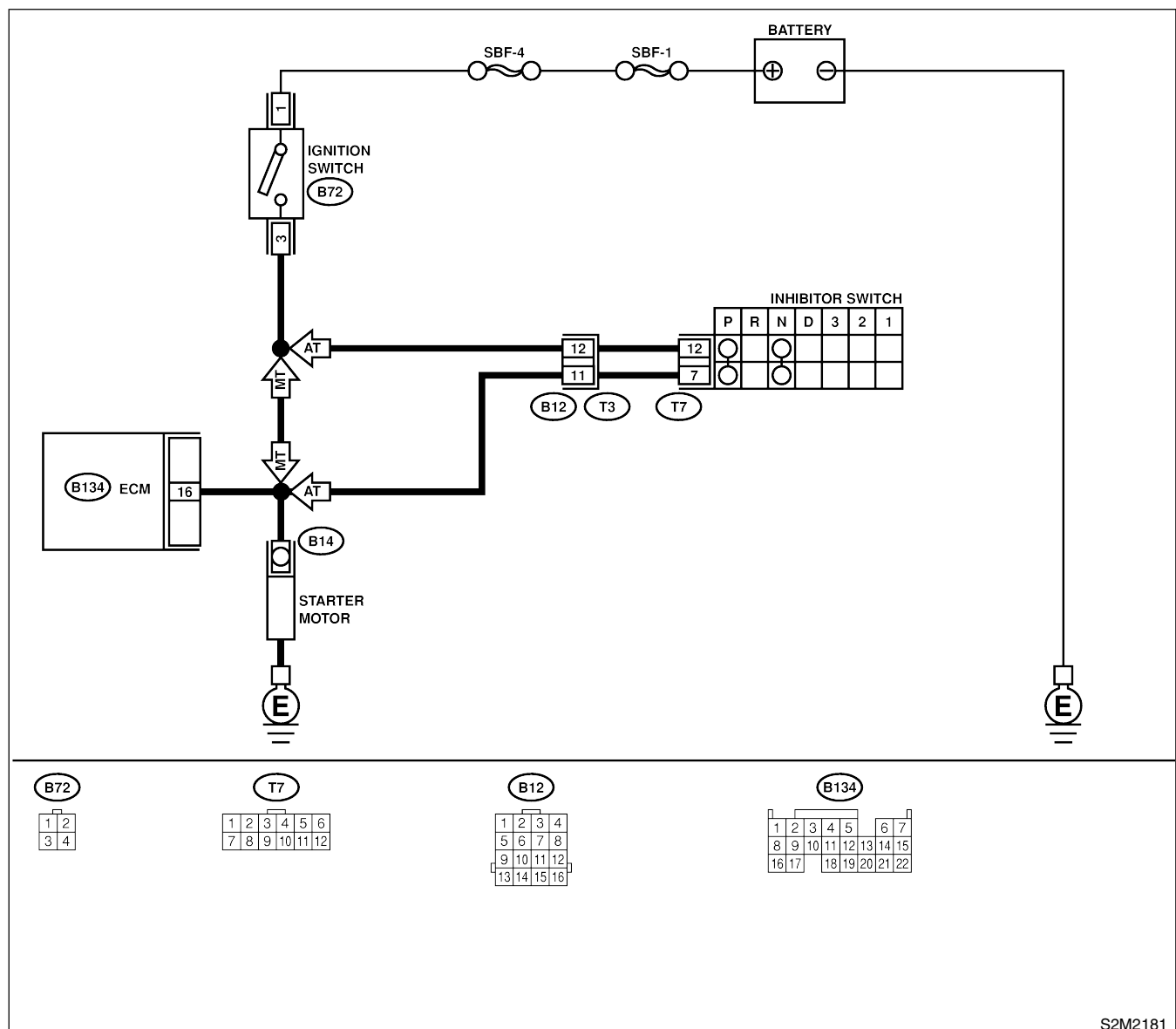
- **TROUBLE SYMPTOM:**

- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2181

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK OPERATION OF STARTER MOTOR. NOTE: Place the inhibitor switch in the "P" or "N" position (AT model).	Does starter motor operate when ignition switch to "ST"?	Repair harness and connector. NOTE: In this case, repair the following: ● Open or ground short circuit in harness between ECM and starter motor connector. ● Poor contact in ECM connector.	Check starter motor circuit. <Ref. to EN(DOHC TURBO)-64, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

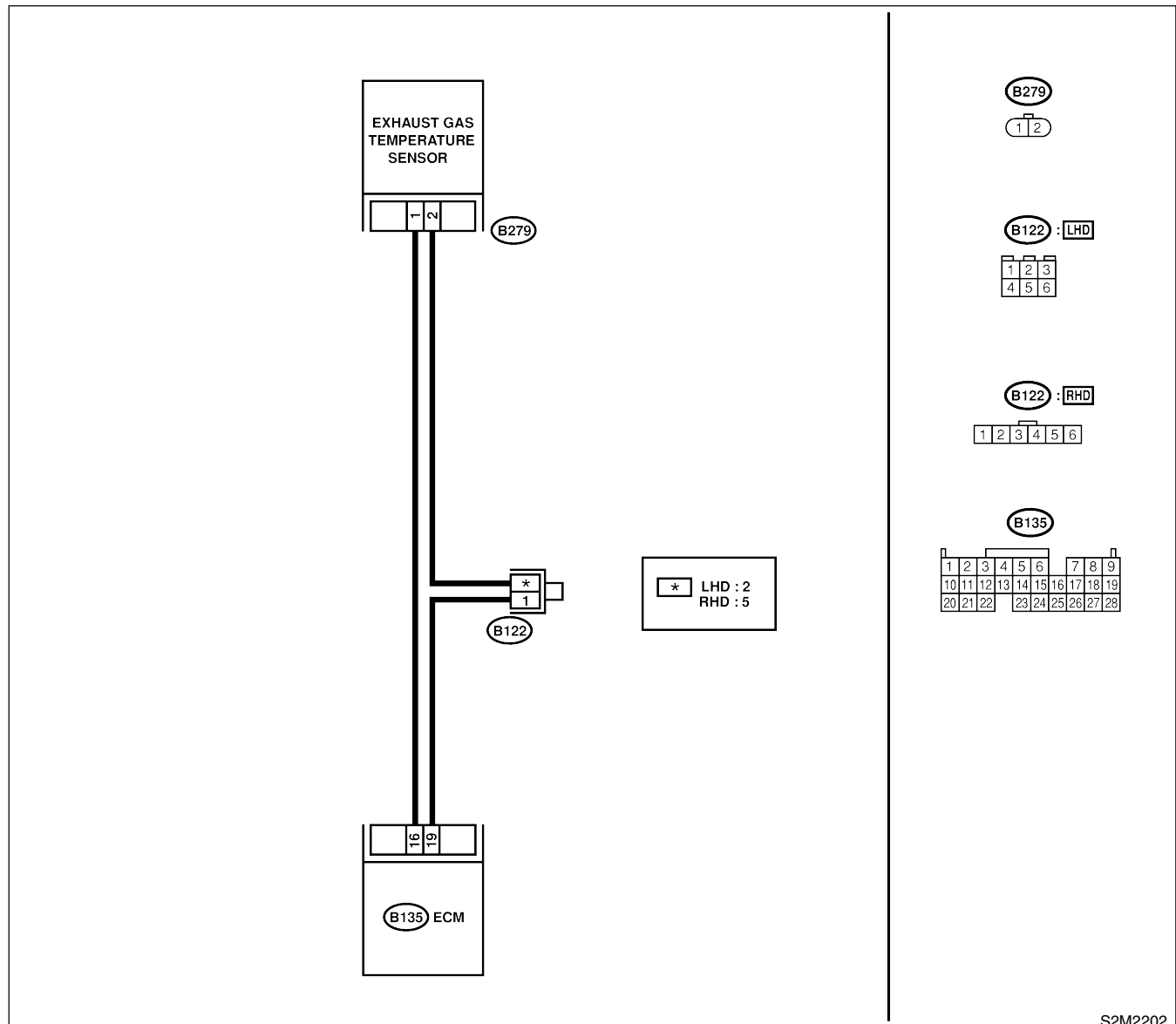
CO: DTC P1544 — HIGH EXHAUST TEMPERATURE DETECTED — S088521H90

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2202

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0335, P0336, P0340, P0341, P0545, P0546, P1312, P0102, P0103, P0101, P1141, P0301, P0302, P0303, P0304, P1301, P0171, P0133, P1134, P0131, P0132, P1130, P1131, P1139, P0031, P0032, P0139, P0136, P0039 or P0037?	Inspect DTC P0335, P0336, P0340, P0341, P0545, P0546, P1312, P0102, P0103, P0101, P1141, P0301, P0302, P0303, P0304, P1301, P0171, P0133, P1134, P0131, P0132, P1130, P1131, P1139, P0031, P0032, P0139, P0136, P0039 or P0037 using List of Diagnostic Trouble Code (DTC). <Ref. to EN(DOHC TURBO)-82, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P1544.	Go to step 2.
2	CHECK EXHAUST SYSTEM. Check exhaust system parts. NOTE: Check the following items. ● Loose installation of exhaust manifold ● Cracks or hole of exhaust manifold ● Loose installation of front oxygen (A/F) sensor	Is there a fault in exhaust system?	Repair or replace failure, then replace precat-alytic converter.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CP: DTC P1560 — BACK-UP VOLTAGE CIRCUIT MALFUNCTION — S088521C27

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

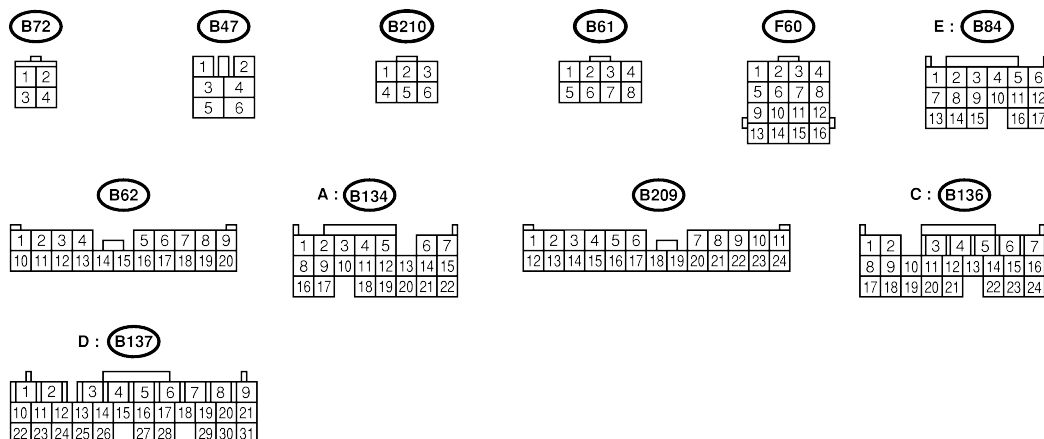
CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(DOHC TURBO)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(DOHC TURBO)-44, Inspection Mode.>.

Engine (Diagnostics)

Engine (Diagnostics)

- **LHD MODEL**



EN(DOHC TURBO)-323

Engine (Diagnostics)

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to OFF. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B137) No. 10 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair poor contact in ECM connector.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR. 1) Disconnect connector from ECM. 2) Measure resistance of harness between ECM and chassis ground. Connector & terminal (B137) No. 10 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between ECM connector and battery terminal.	Go to step 3.
3	CHECK FUSE SBF-5.	Is fuse blown?	Replace fuse.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and battery ● Poor contact in ECM connector ● Poor contact in battery terminal

Engine (Diagnostics)

S088521G83

- Two consecutive driving cycles with fault

- Erroneous idling

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

The diagram illustrates the electrical system for the ignition and starting of a vehicle. The components and their connections are as follows:

- BATTERY:** The power source, connected to the ignition switch through fuses SBF-4 and SBF-1.
- IGNITION SWITCH:** Controls the ignition system. It is connected to the battery through fuses SBF-4 and SBF-1. The switch is connected to the ECM (B134) and the inhibitor switch.
- ECM (B134):** The Engine Control Module, which receives input from the ignition switch and controls the starter switch.
- INHIBITOR SWITCH:** A switch that prevents the engine from starting in certain gears. It has positions for P, R, N, D, 3, 2, and 1. The switch is connected to the ECM and the starter switch.
- STARTER SWITCH:** Controls the starter motor (M) and the starter solenoid (B14). It is connected to the ECM and the inhibitor switch.
- Terminal Blocks:** B72, T7, B12, and B134 are terminal blocks used for connecting the various components.
- Ground:** The system is grounded to the chassis (E).

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK DTC P0705 ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0705?	Inspect DTC P0705 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(SOHC)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground in selector lever "N" and "P" positions. Connector & terminal (B134) No. 8 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 3.	Go to step 5.
3	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM and chassis ground in selector lever except for "N" and "P" positions. Connector & terminal (B134) No. 8 (+) — Chassis ground (-):	Is the voltage between 4.5 and 5.5 V?	Go to step 4.	Go to step 5.
4	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
5	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM and chassis ground. Connector & terminal (B134) No. 8 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and inhibitor switch connector.	Go to step 6.
6	CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM and inhibitor switch. 3) Measure resistance of harness between ECM and inhibitor switch connector. Connector & terminal (B134) No. 8 — (T7) No. 12:	Is the resistance less than 1 Ω?	Go to step 7.	Repair harness and connector. NOTE: In this case, repair the following: ● Open circuit in harness between ECM and inhibitor switch connector ● Poor contact in coupling connector ● Poor contact in inhibitor switch connector ● Poor contact in ECM connector

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
7	CHECK INHIBITOR SWITCH GROUND LINE. Measure resistance of harness between inhibitor switch connector and engine ground. Connector & terminal (T7) No. 7 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 8.	Repair open circuit in harness between inhibitor switch connector and starter motor ground line. NOTE: In this case, repair the following: ● Open circuit in harness between inhibitor switch connector and starter motor ground line ● Poor contact in starter motor connector ● Poor contact in starter motor ground ● Starter motor
8	CHECK INHIBITOR SWITCH. Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "N" and "P" positions. Terminals No. 7 — No. 12:	Is the resistance less than 1 Ω ?	Go to step 9.	Replace inhibitor switch. <Ref. to AT-28, Inhibitor Switch.>
9	CHECK SELECTOR CABLE CONNECTION.	Is there any fault in selector cable connection to inhibitor switch?	Repair selector cable connection. <Ref. to CS-10, Select Cable.>	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

MEMO:

Engine (Diagnostics)

S088521G84

- Two consecutive driving cycles with fault

- Erroneous idling

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

The diagram illustrates the electrical system for the ignition and starting of a vehicle. The components and their connections are as follows:

- BATTERY:** The power source, connected to the ignition switch through fuses SBF-4 and SBF-1.
- IGNITION SWITCH:** Controls the flow of current from the battery to the ECM and the inhibitor switch.
- ECM (B134):** The Engine Control Module, which receives input from the ignition switch and controls the starter motor.
- INHIBITOR SWITCH:** A switch with positions for P, R, N, D, 3, 2, and 1. It is connected to the ECM and the starter switch.
- STARTER SWITCH:** Controls the flow of current from the ECM to the starter motor.
- STARTER MOTOR (M):** The component that starts the engine.
- Terminal Blocks:** B72, T7, B12, and B134 are used to connect the various components.
- Ground:** The system is grounded at the battery and the starter motor.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK DTC P0705 ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0705?	Inspect DTC P0705 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(SOHC)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B134) No. 8 (+) — Chassis ground (-):	Is the voltage between 4.5 and 5.5 V at except "N" and "P" positions?	Even if MIL lights up, the circuit has returned to a normal condition at this time.	Go to step 3.
3	CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM and transmission harness connector (T3). 3) Measure resistance of harness between ECM connector and chassis ground. Connector & terminal (B134) No. 8 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between ECM and transmission harness connector.	Go to step 4.
4	CHECK TRANSMISSION HARNESS CONNECTOR. 1) Disconnect connector from inhibitor switch. 2) Measure resistance of harness between transmission harness connector and engine ground. Connector & terminal (T3) No. 12 — Engine ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between transmission harness and inhibitor switch connector.	Go to step 5.
5	CHECK INHIBITOR SWITCH. Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "N" position. Terminals No. 7 — No. 12:	Is the resistance more than 1 M Ω at except "N" and "P" positions?	Go to step 6.	Replace inhibitor switch. <Ref. to AT-28, Inhibitor Switch.>
6	CHECK SELECTOR CABLE CONNECTION.	Is there any fault in selector cable connection to inhibitor switch?	Repair selector cable connection. <Ref. to CS-10, Select Cable.>	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

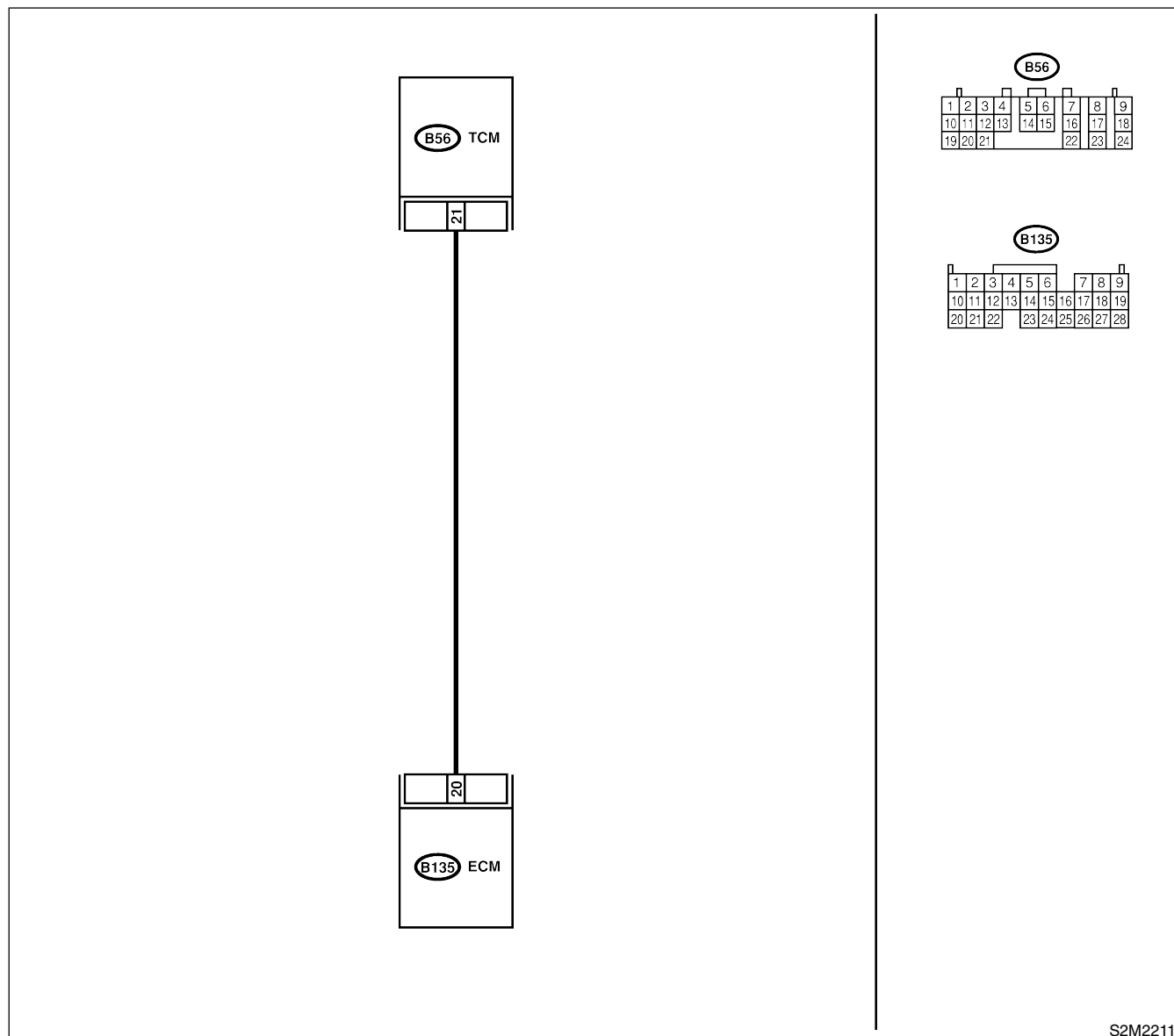
CS: DTC P1594 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT MALFUNCTION — S088521G12

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2211

No.	Step	Check	Yes	No
1	CHECK DRIVING CONDITION. 1) Start and warm-up the engine until the radiator fan makes one complete rotation. 2) Drive the vehicle.	Is AT shift control functioning properly?	Go to step 2.	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
2	CHECK ACCESSORY.	Are car phone and/or CB installed on vehicle?	Repair grounding line of car phone or CB system.	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CT: DTC P1595 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT LOW INPUT — S088521G13

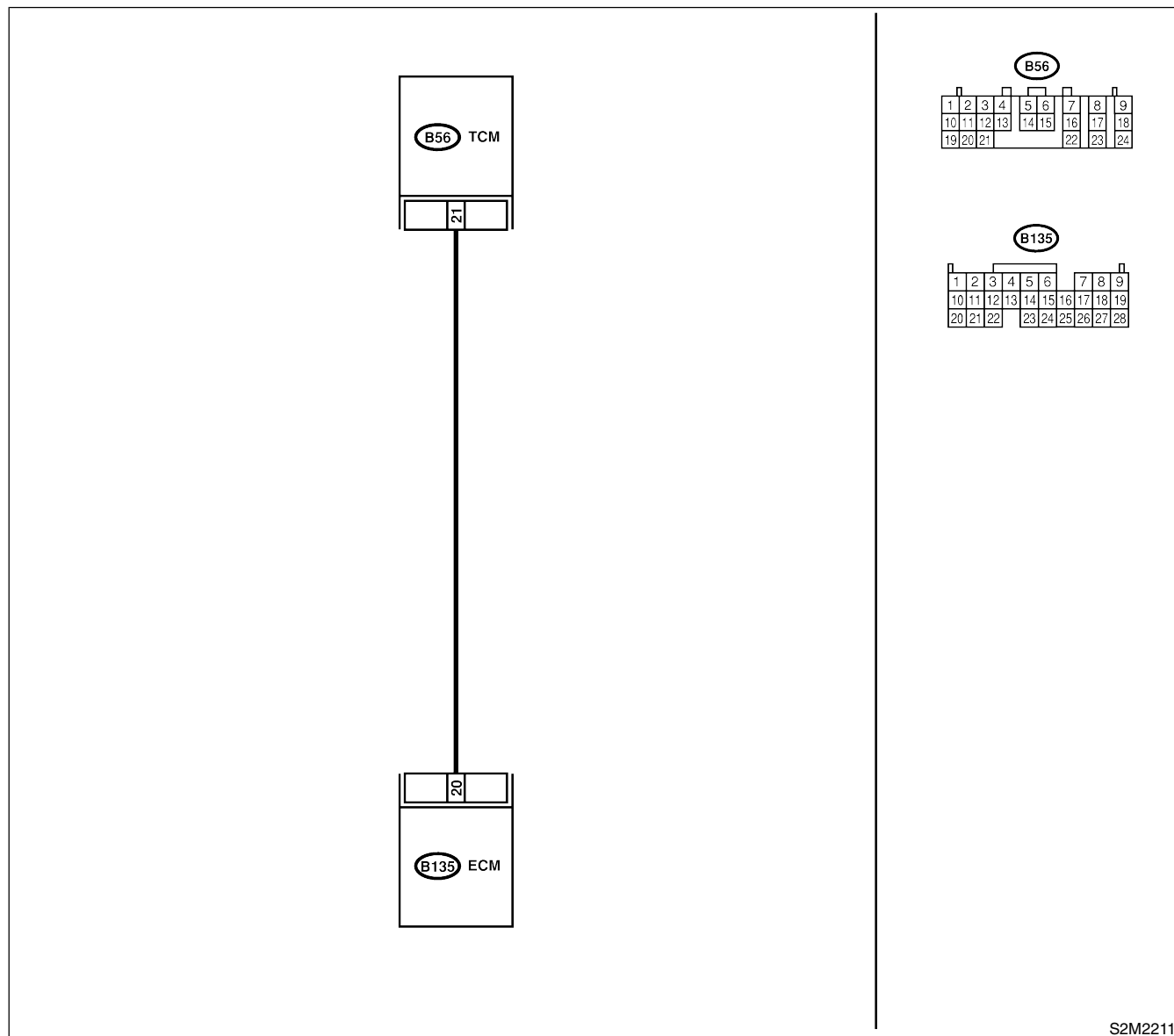
- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2211

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B135) No. 20 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 2.	Even if MIL lights up, the circuit has returned to a normal condition at this time. NOTE: In this case, repair the following: ● Poor contact in ECM connector ● Poor contact in TCM connector
2	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM and TCM. 3) Measure resistance of harness between ECM and chassis ground. Connector & terminal (B135) No. 20 — Chassis ground:	Is the resistance less than 10 Ω?	Repair ground short circuit in harness between ECM and TCM connector.	Go to step 3.
3	CHECK OUTPUT SIGNAL FOR ECM. 1) Connect connector to ECM. 2) Turn ignition switch to ON. 3) Measure voltage between ECM and chassis ground. Connector & terminal (B135) No. 20 (+) — Chassis ground (-):	Is the voltage more than 5 V?	Go to step 4.	Repair poor contact in ECM connector.
4	CHECK TROUBLE CODE FOR AUTOMATIC TRANSMISSION. Read trouble code for automatic transmission. <Ref. to AT-22, Read Diagnostic Trouble Code.>	Does trouble code appear for automatic transmission?	Inspect trouble code for automatic transmission. <Ref. to AT-42, Diagnostic Procedure with Trouble Code.>	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CU: DTC P1596 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT HIGH INPUT — S088521G14

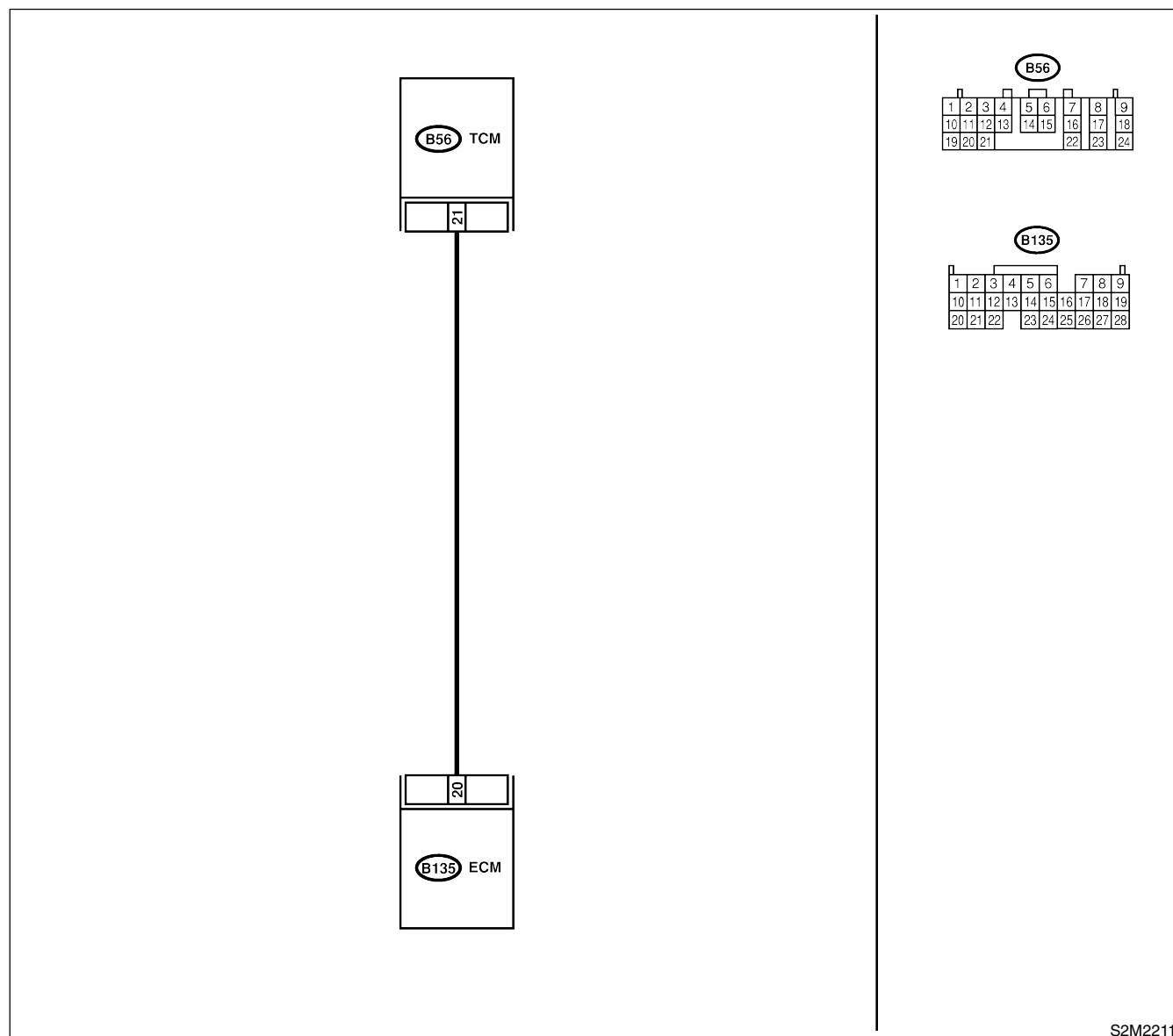
- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2211

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B135) No. 20 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and TCM connector.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 20 (+) — Chassis ground (-):	Is the voltage more than 4 V?	Go to step 5.	Go to step 3.
3	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. Measure voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 20 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Repair poor contact in ECM connector.	Go to step 4.
4	CHECK OUTPUT SIGNAL FROM ECM. Measure voltage between ECM and chassis ground. Connector & terminal (B135) No. 20 (+) — Chassis ground (-):	Does the voltage change from 1 V to 4 V while monitoring the value with voltage meter?	Even if MIL lights up, the circuit has returned to a normal condition at this time. NOTE: In this case, repair the following: ● Poor contact in ECM connector ● Poor contact in TCM connector	Contact your Subaru distributor. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
5	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. Measure voltage between TCM and chassis ground. Connector & terminal (B56) No. 21 (+) — Chassis ground (-):	Is the voltage more than 4 V?	Go to step 6.	Repair open circuit in harness between ECM and TCM connector.
6	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Check TCM power supply line and grounding line.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CV: DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION — S088521C29

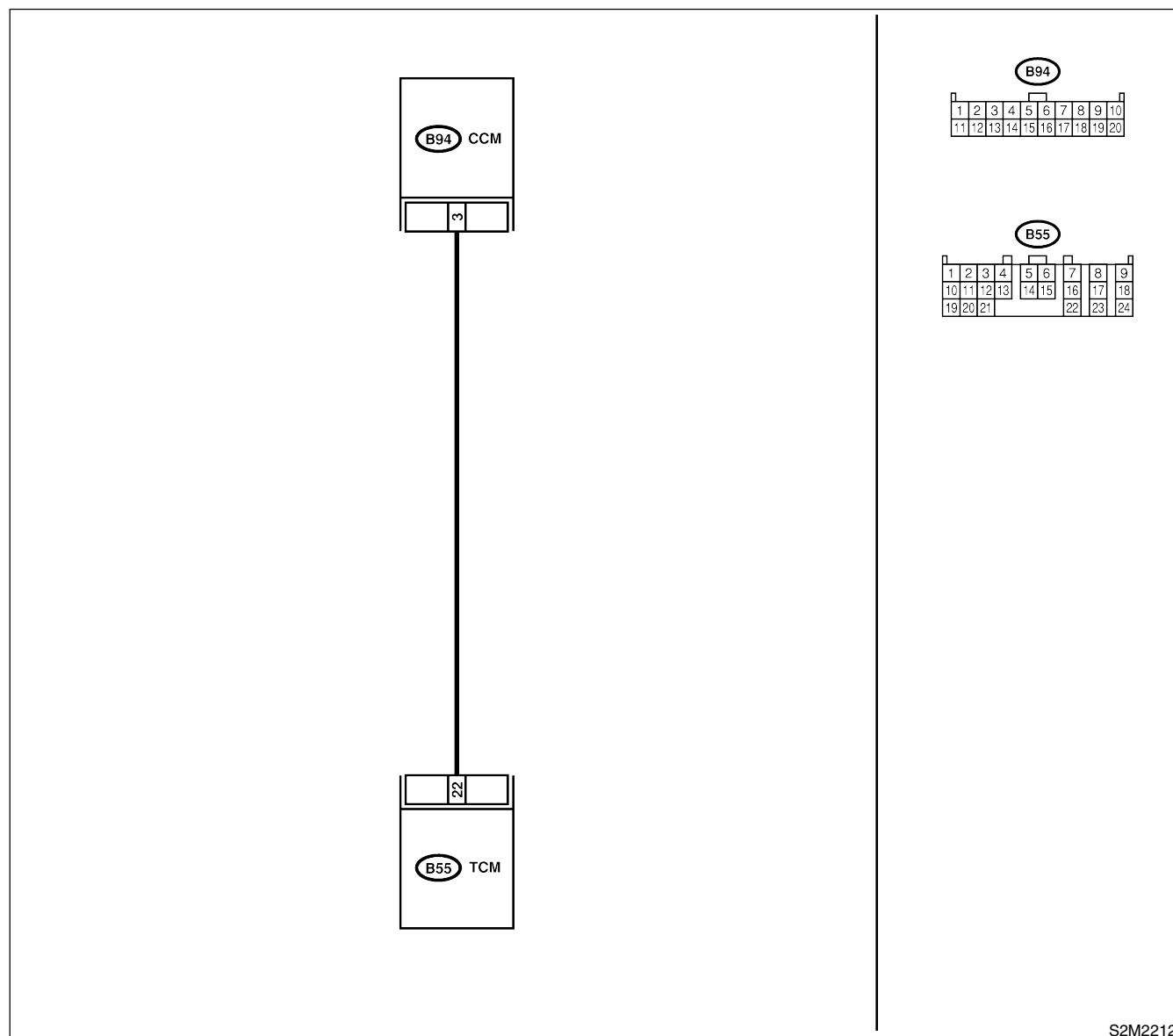
- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2212

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN TCM AND CCM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and CCM. 3) Measure resistance of harness between TCM and CCM connector. Connector & terminal (B55) No. 22 — (B94) No. 3:	Is the resistance less than 1 Ω ?	Go to step 2.	Repair open circuit in harness between TCM and CCM connector.
2	CHECK HARNESS BETWEEN TCM AND CCM CONNECTOR. Measure resistance of harness between TCM and chassis ground. Connector & terminal (B55) No. 22 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair short circuit in harness between TCM and CCM connector.	Go to step 3.
3	CHECK INPUT SIGNAL FOR TCM. 1) Connect connector to TCM and CCM. 2) Lift-up the vehicle or set the vehicle on free rollers. CAUTION: On AWD models, raise all wheels off ground. 3) Start the engine. 4) Cruise control main switch to ON. 5) Move selector lever to "D" and slowly increase vehicle speed to 50 km/h (31 MPH). 6) Cruise control command switch to ON. 7) Measure voltage between TCM and chassis ground. Connector & terminal (B55) No. 22 (+) — Chassis ground (-):	Is the resistance less than 1 V?	Go to step 4.	Check cruise control command switch circuit. <Ref. to CC-10, Cruise Control Command Switch.>
4	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

CW: DTC P1711 — ENGINE TORQUE CONTROL SIGNAL 1 CIRCUIT MALFUNCTION — S088521G17

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

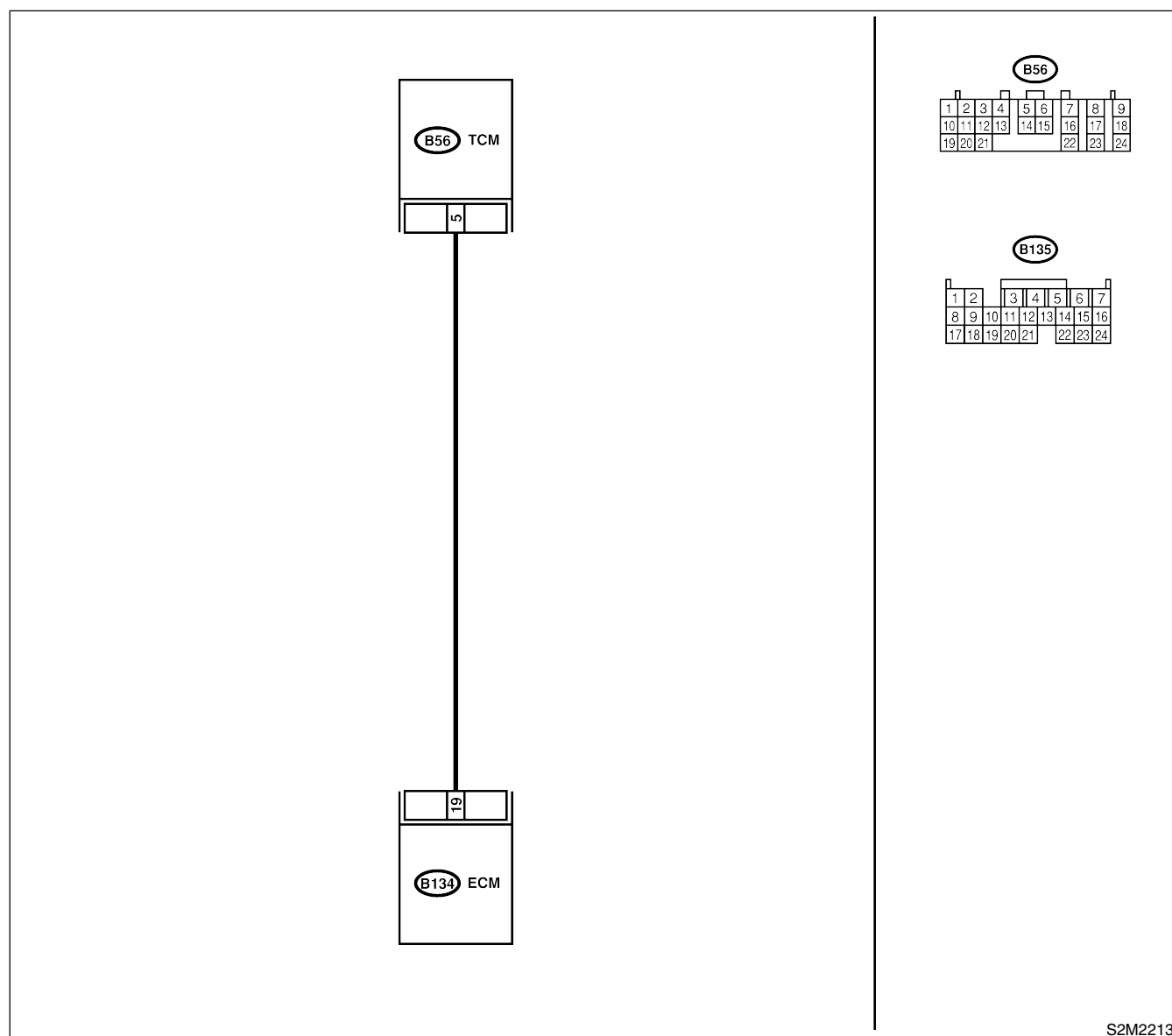
- **TROUBLE SYMPTOM:**

- Excessive shift shock

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

- **WIRING DIAGRAM:**



S2M2213

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B134) No. 19 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 2.	Go to step 4.
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM and chassis ground. Connector & terminal (B134) No. 19 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and TCM connector.	Go to step 3.
3	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-49, Engine Control Module.>
4	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM and TCM. 3) Measure resistance of harness between ECM and TCM connector. Connector & terminal (B134) No. 19 — (B56) No. 5:	Is the resistance less than 1 Ω?	Go to step 5.	Repair open circuit in harness between ECM and TCM connector.
5	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. Measure resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 19 — Chassis ground:	Is the resistance less than 10 Ω?	Repair ground short circuit in harness between ECM and TCM connector.	Go to step 6.
6	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

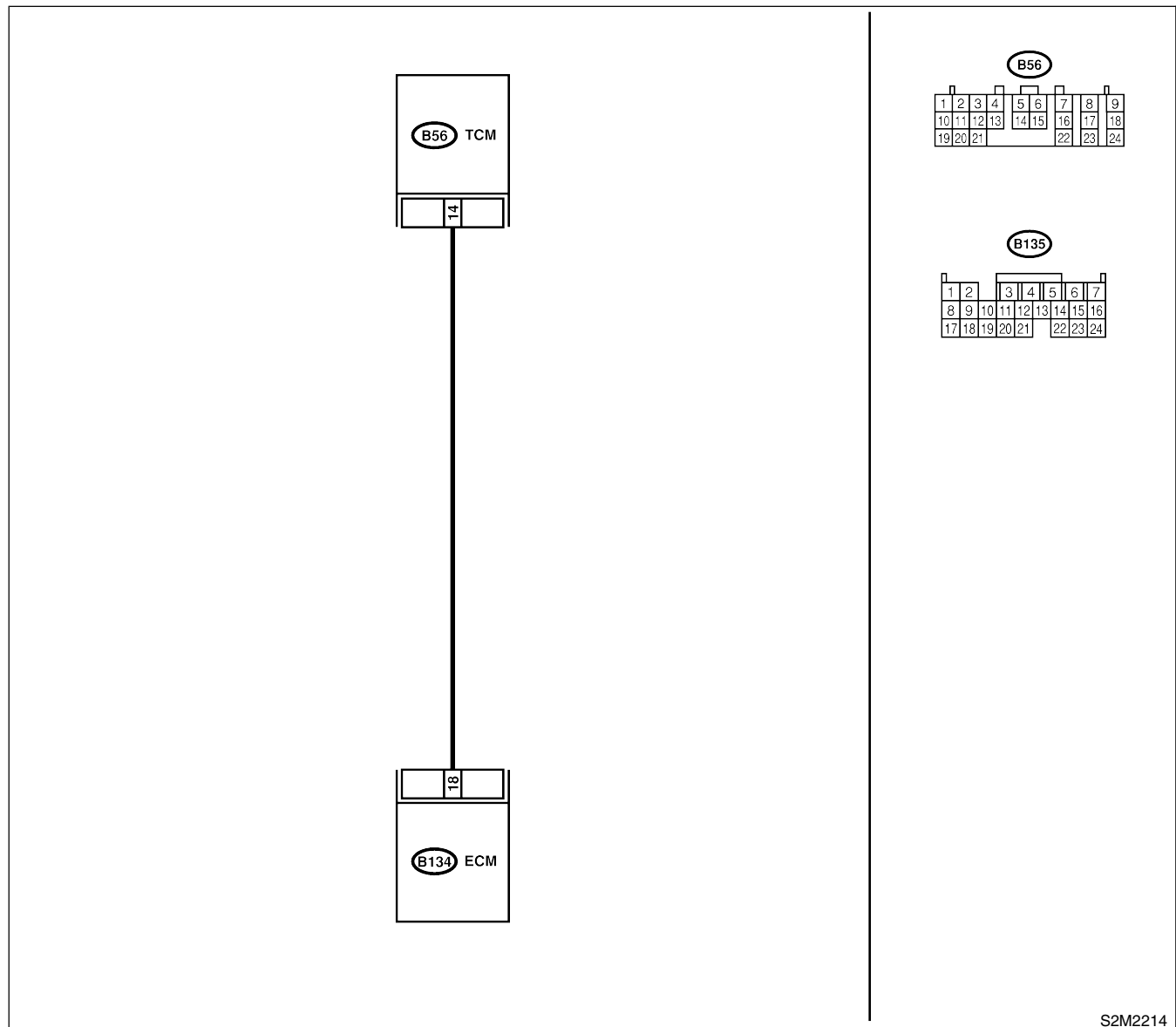
CX: DTC P1712 — ENGINE TORQUE CONTROL SIGNAL 2 CIRCUIT MALFUNCTION — S088521G18

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Excessive shift shock

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(SOHC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(SOHC)-44, OPERATION, Inspection Mode.>.

● WIRING DIAGRAM:



S2M2214

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

Engine (Diagnostics)

No.	Step	Check	Yes	No
1	CHECK INPUT SIGNAL FOR ECM. 1) Turn ignition switch to ON. 2) Measure voltage between ECM and chassis ground. Connector & terminal (B134) No. 18 (+) — Chassis ground (-):	Is the voltage more than 4.5 V?	Go to step 2.	Go to step 4.
2	CHECK INPUT SIGNAL FOR ECM. Measure voltage between ECM and chassis ground. Connector & terminal (B134) No. 18 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and TCM connector.	Go to step 3.
3	CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair poor contact in ECM connector.	Replace ECM. <Ref. to FU(DOHC TURBO)-49, Engine Control Module.>
4	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn ignition switch to OFF. 2) Disconnect connectors from ECM and TCM. 3) Measure resistance of harness between ECM and TCM connector. Connector & terminal (B134) No. 18 — (B56) No. 14:	Is the resistance less than 1 Ω ?	Go to step 5.	Repair open circuit in harness between ECM and TCM connector.
5	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. Measure resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 18 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair ground short circuit in harness between ECM and TCM connector.	Go to step 6.
6	CHECK POOR CONTACT. Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Replace TCM. <Ref. to AT-48, Transmission Control Module (TCM).>

GENERAL DIAGNOSTIC TABLE

Engine (Diagnostics)

19. General Diagnostic Table S088257

A: INSPECTION S088257A10

1. ENGINE S088257A1001

NOTE:

Malfunction of parts other than those listed is also possible. <Ref. to ME(DOHC TURBO)-91, Engine Trouble in General.>

Symptom	Problem parts
1. Engine stalls during idling.	1) Idle air control solenoid valve 2) Pressure sensor 3) Mass air flow and intake temperature sensor 4) Ignition parts (*1) 5) Engine coolant temperature sensor (*2) 6) Crankshaft position sensor (*3) 7) Camshaft position sensor (*3) 8) Fuel injection parts (*4)
2. Rough idling	1) Idle air control solenoid valve 2) Pressure sensor 3) Mass air flow and intake temperature sensor 4) Engine coolant temperature sensor (*2) 5) Ignition parts (*1) 6) Air intake system (*5) 7) Fuel injection parts (*4) 8) Throttle position sensor 9) Crankshaft position sensor (*3) 10) Camshaft position sensor (*3) 11) Oxygen sensor 12) Fuel pump and fuel pump relay
3. Engine does not return to idle.	1) Idle air control solenoid valve 2) Engine coolant temperature sensor 3) Accelerator cable (*6) 4) Throttle position sensor 5) Pressure sensor 6) Mass air flow and intake air temperature sensor
4. Poor acceleration	1) Pressure sensor 2) Mass air flow and intake temperature sensor 3) Throttle position sensor 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay 6) Engine coolant temperature sensor (*2) 7) Crankshaft position sensor (*3) 8) Camshaft position sensor (*3) 9) A/C switch and A/C cut relay 10) Engine torque control signal circuit 11) Ignition parts (*1)
5. Engine stalls or engine sags or hesitates at acceleration.	1) Pressure sensor 2) Mass air flow and intake temperature sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Purge control solenoid valve 7) Fuel injection parts (*4) 8) Throttle position sensor 9) Fuel pump and fuel pump relay