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NOT FOR RESALE

ENGINE (DIAGNOSTICS)

Basic Diagnostic Procedure

ENGINE (DIAGNOSTICS)

1. Basic Diagnostic Procedure

A: PROCEDURE

1. ENGINE

	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(H4SO)(diag)-3, 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(H4SO)(diag)-58, Diagnostics for Engine Starting Failure.>
2	CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.	Does the malfunction indicator light illuminate?	Go to step 3.	Inspection using "General Diagnostic Table". <Ref. to EN(H4SO)(diag)-310, INSPECTION, General Diagnostic Table.>
3	CHECK INDICATION OF DTC ON DISPLAY. 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or general scan tool to data link connector. 3) Turn the ignition switch to ON, and run the Subaru Select Monitor or general scan tool. 4) Read the DTC on Subaru Select Monitor or general scan tool.	Is DTC displayed on the Subaru Select Monitor or general scan tool?	Record the DTC. Repair the trouble cause. <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).> Go to step 4.	Repair the related parts. NOTE: If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnosis of malfunction indicator light circuit or combination meter. <Ref. to EN(H4SO)(diag)-49, Malfunction Indicator Light.>
4	PERFORM DIAGNOSIS. 1) Perform the Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.> 2) Perform the Inspection Mode. <Ref. to EN(H4SO)(diag)-38, Inspection Mode.>	Is DTC displayed on the Subaru Select Monitor or general scan tool?	Inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-78, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Finish the diagnosis.

Check List for Interview

ENGINE (DIAGNOSTICS)

2. Check List for Interview

A: CHECK

1. CHECK LIST NO. 1

Check the following item when problem has occurred.

NOTE:

Use copies of this page for interviewing customers.

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

Check List for Interview

ENGINE (DIAGNOSTICS)

2. CHECK LIST NO. 2

Check the following item about the vehicle's state when malfunction indicator light illuminates.

NOTE:

Use copies of this page for interviewing customers.

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

3. General Description

A: CAUTION

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

CAUTION:

- Airbag system wiring harnesses and connectors are yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage the airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.

2) Never connect the battery in reverse polarity. Failure to do so will damage the ECM instantly, and the fuel injector and other parts will also be damaged.

3) Do not disconnect the battery terminals while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM etc.

4) Before disconnecting the connectors of each sensor and ECM, be sure to turn the ignition switch to OFF. Perform the Clear Memory Mode after connecting the connectors. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>

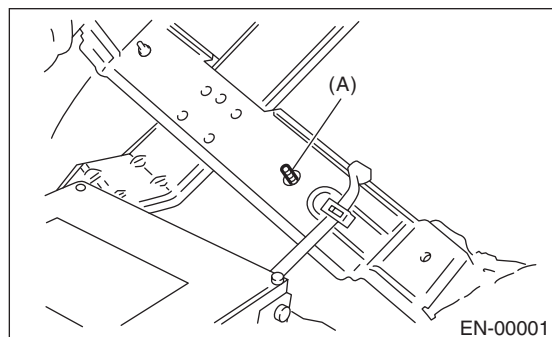
5) Measure the voltage or resistance of individual sensor or all electrical control modules using a tapered pin with a diameter of less than 0.6 mm (0.024 in). Do not insert the pin 4 mm (0.16 in) or more into the part.

CAUTION:

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

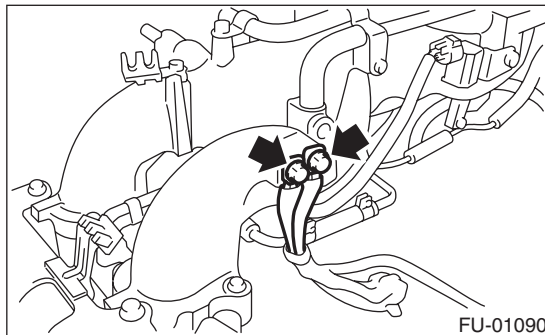
6) Connectors of each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. Even if the connectors are waterproof, take care not to allow water to get into them when washing the vehicle, or when servicing the vehicle in rainy weather.

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



(A) Stud bolt

8) Use the engine ground terminal or engine assembly as a grounding point to chassis when measuring the voltage and resistance in engine compartment.



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

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

CAUTION:

- The antenna must be kept as far apart as possible from control unit.
- 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 mentioned above.
- Incorrect installation of the radio may affect the operation of ECM.

11) Release the fuel pressure before disconnecting the fuel hose. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>

12) For the model with ABS, the ABS warning light may illuminate when performing driving test with jacked-up or lifted-up condition, but this is not a system malfunction. The reason for this is the speed difference between the front and rear wheels. When diagnosis of engine control system is finished, perform the ABS memory clearance procedure of self-diagnosis system.

B: INSPECTION

Before performing diagnostics, check the following item which might affect engine problems.

1. BATTERY

1) Measure the battery voltage and specific gravity of the electrolyte.

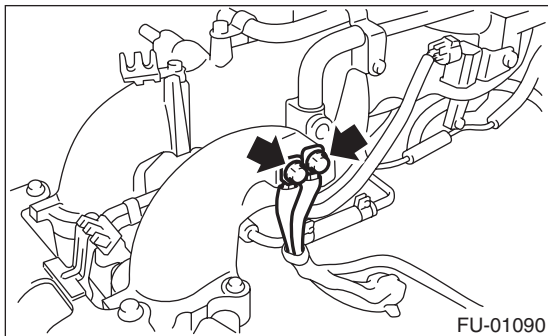
Standard voltage: 12 V

Specific gravity: 1.260 or more

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

2. ENGINE GROUND

Check if the engine ground terminal is properly connected to engine.



C: NOTE

1. GENERAL DESCRIPTION

- The on-board diagnostic (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. Malfunction indicator light 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 type of engine complies with OBD-II regulations. 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, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a 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 first when it detects a malfunction.
- If the OBD system detects malfunctions such as 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, malfunction indicator light is turned off, but DTC remains at on-board computer.
- When troubleshooting the vehicle which complies with OBD-II regulations, connect the Subaru Select Monitor or general scan tool to the vehicle.

2. ENGINE AND EMISSION CONTROL SYSTEM

- 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.

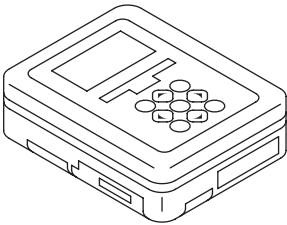
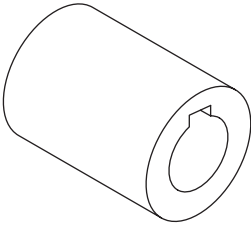
With this system, the fuel which is pressurized at a constant pressure is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system, where the electro-magnetic injection valve (fuel injector) opens for a short period of 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.

- Furthermore, all operating conditions of the engine are converted into electronic signals, and this enables additional system features with greatly improved adaptability, making it easier to add compensation features.

The MFI system also has the following features:

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

D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST1B020XU0</p>	<p>1B020XU0</p>	<p>SUBARU SELECT MONITOR KIT</p>	<p>Used for troubleshooting the electrical system.</p>
 <p>ST-499987500</p>	<p>499987500</p>	<p>CRANKSHAFT SOCKET</p>	<p>Used for rotating the crankshaft.</p>

Electrical Component Location

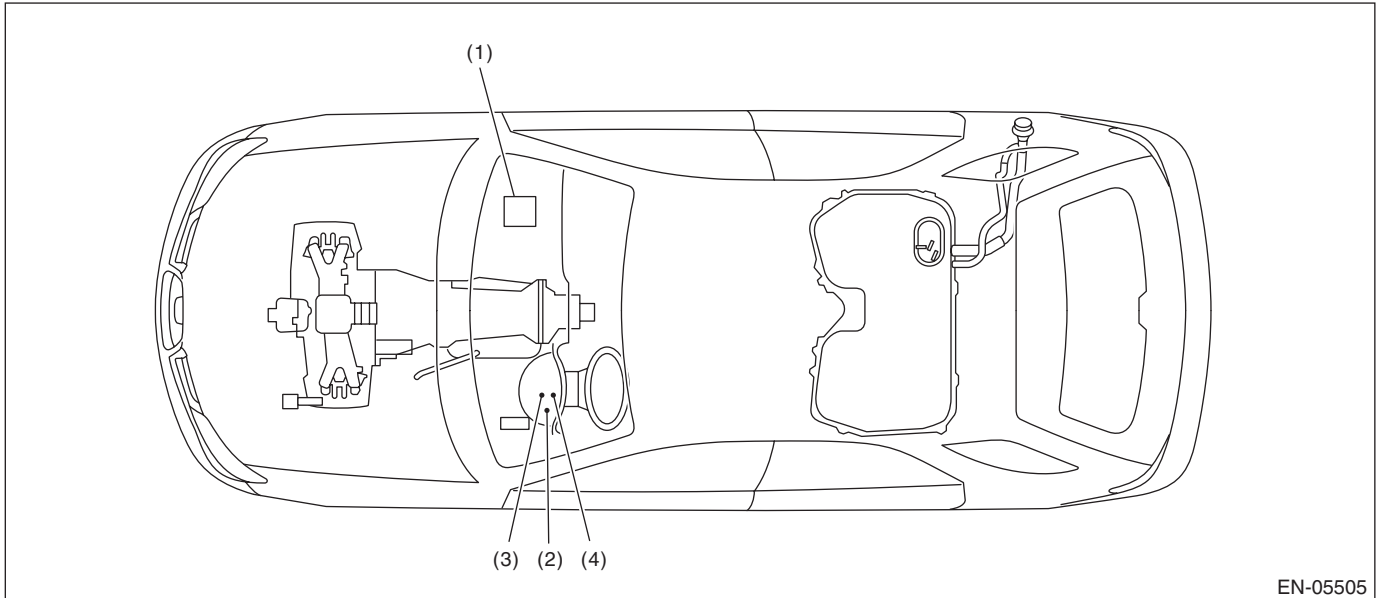
ENGINE (DIAGNOSTICS)

4. Electrical Component Location

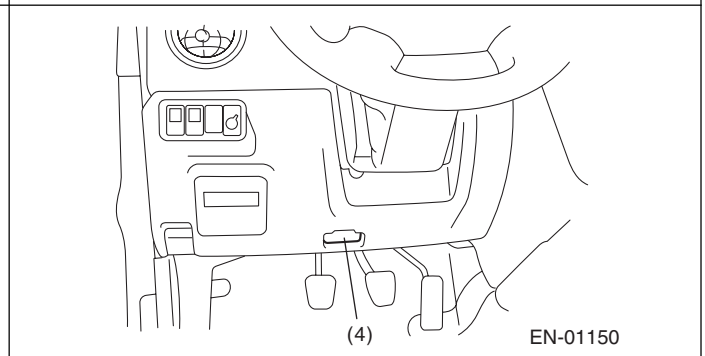
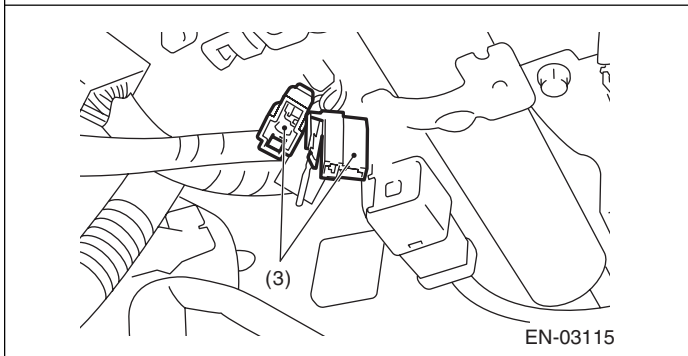
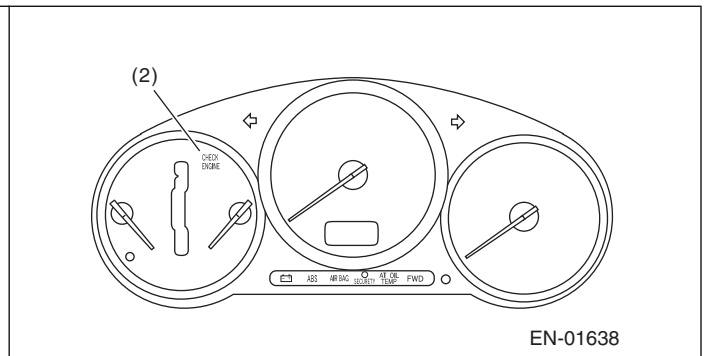
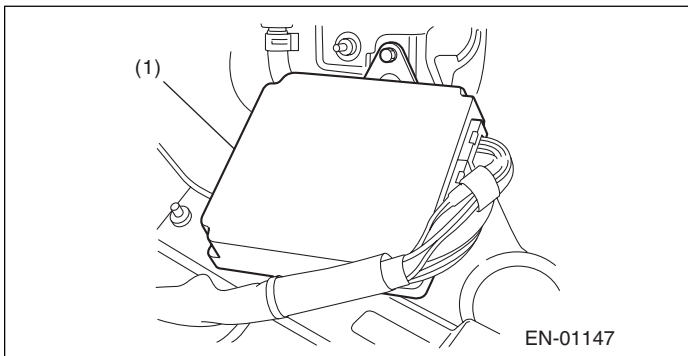
A: LOCATION

1. ENGINE

Control module



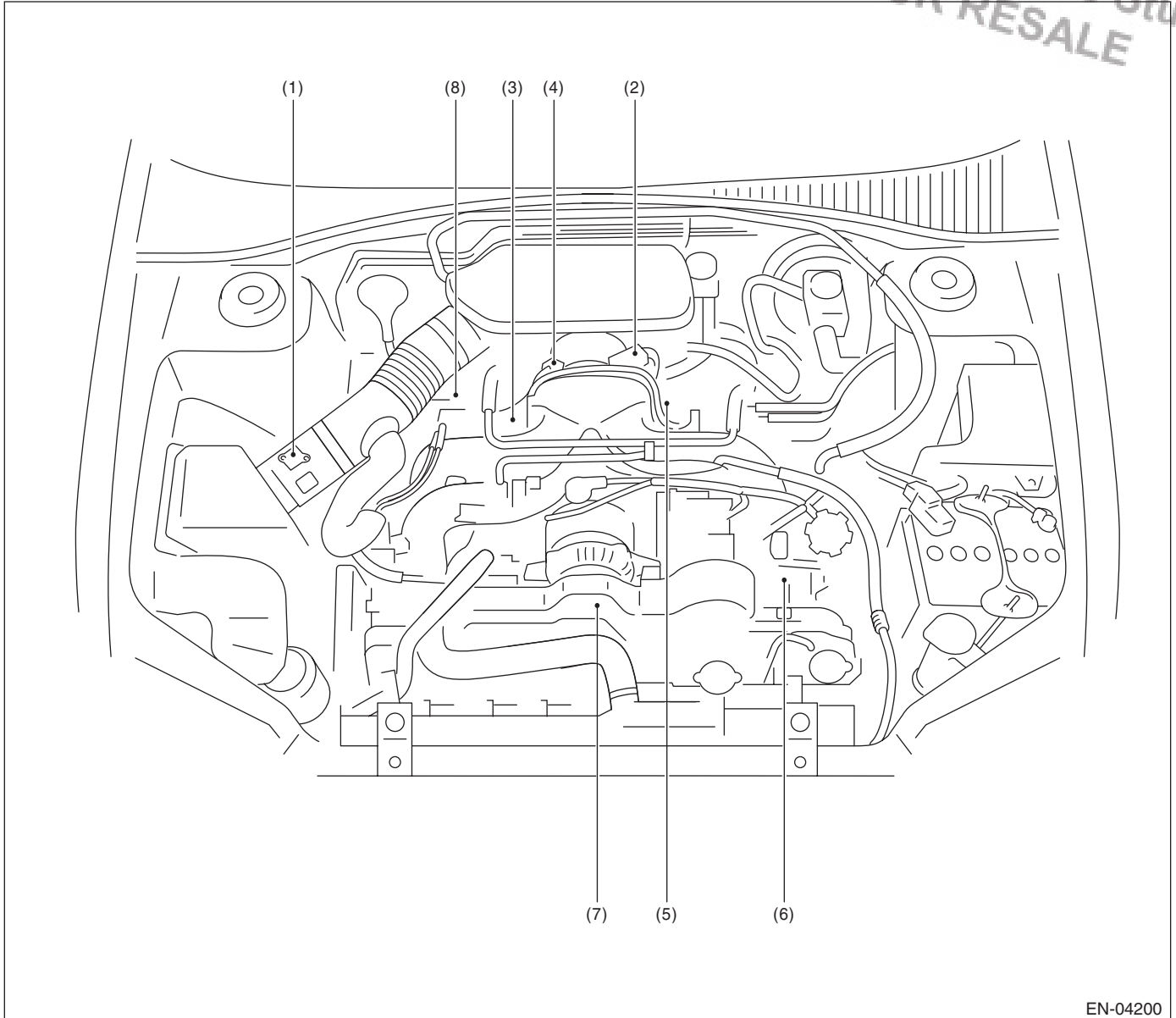
- (1) Engine control module (ECM)
- (2) Malfunction indicator light
- (3) Test mode connector
- (4) Data link connector



Electrical Component Location

ENGINE (DIAGNOSTICS)

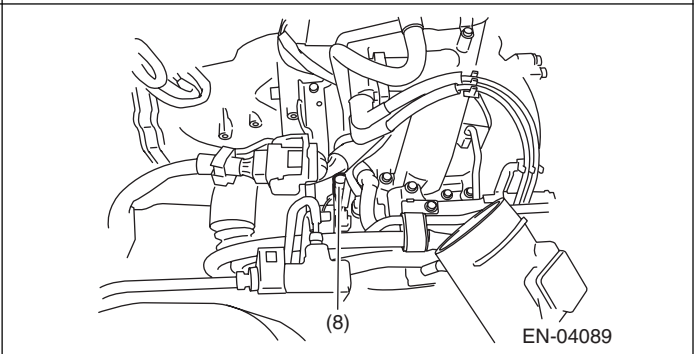
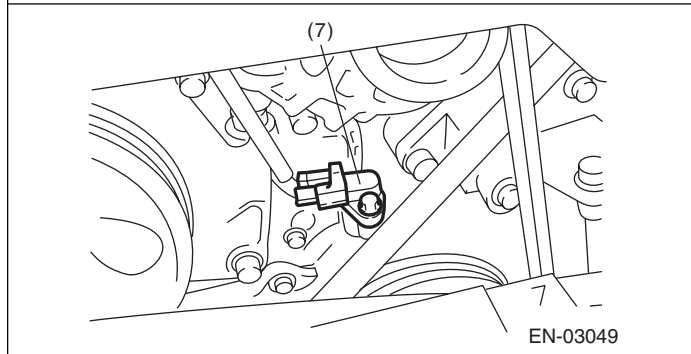
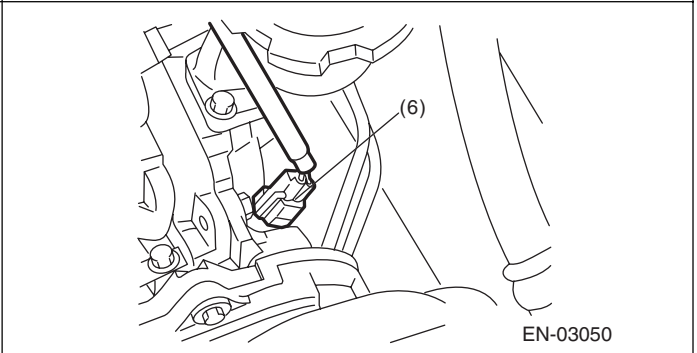
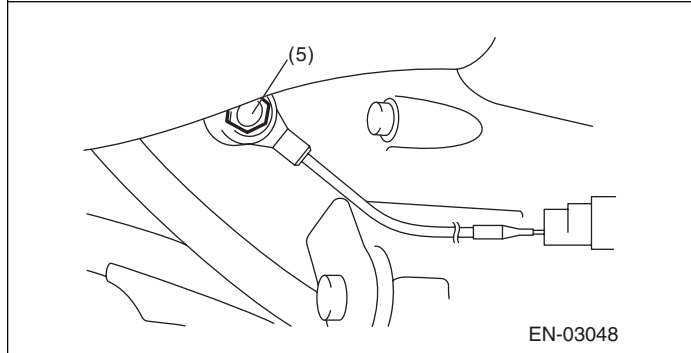
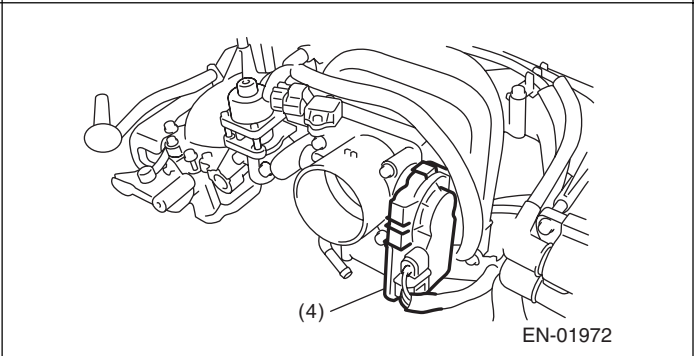
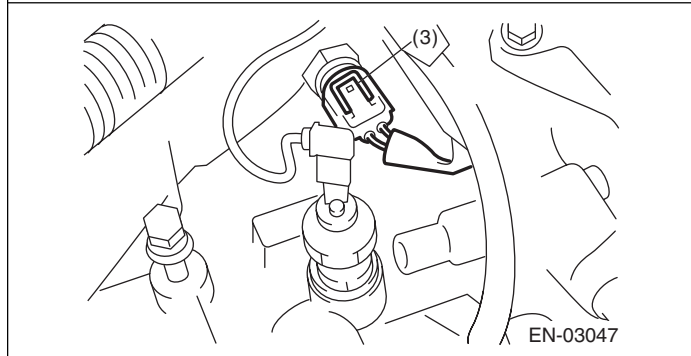
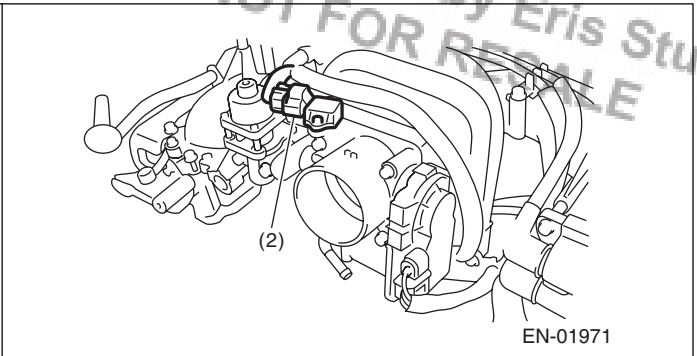
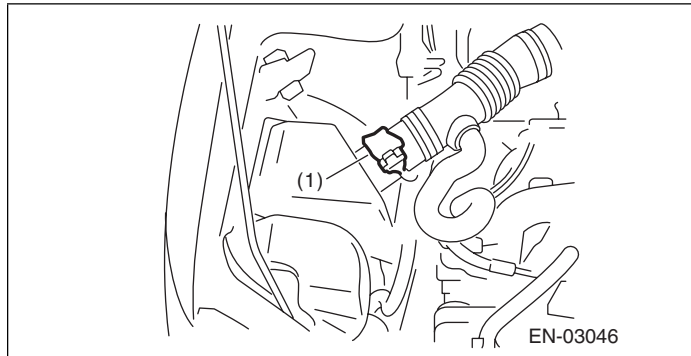
Sensor



- | | | |
|---|------------------------------|--------------------------------|
| (1) Mass air flow and intake air temperature sensor | (4) Throttle position sensor | (7) Crankshaft position sensor |
| (2) Manifold absolute pressure sensor | (5) Knock sensor | (8) Oil temperature sensor |
| (3) Engine coolant temperature sensor | (6) Camshaft position sensor | |

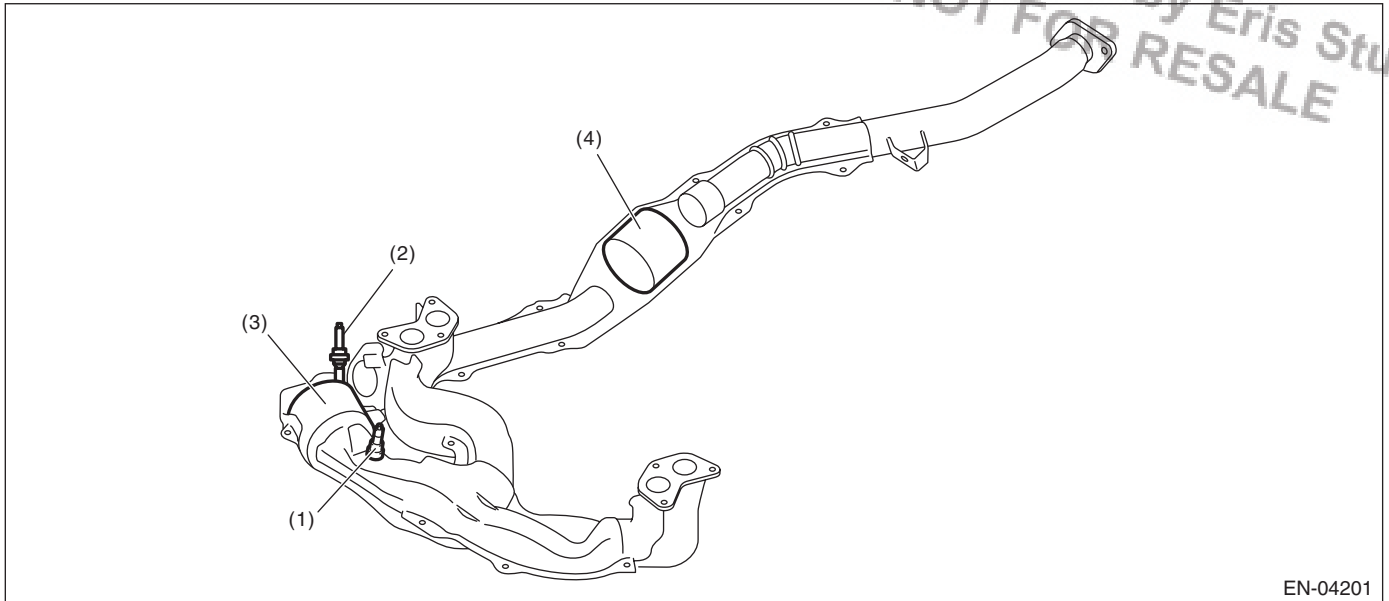
Electrical Component Location

ENGINE (DIAGNOSTICS)



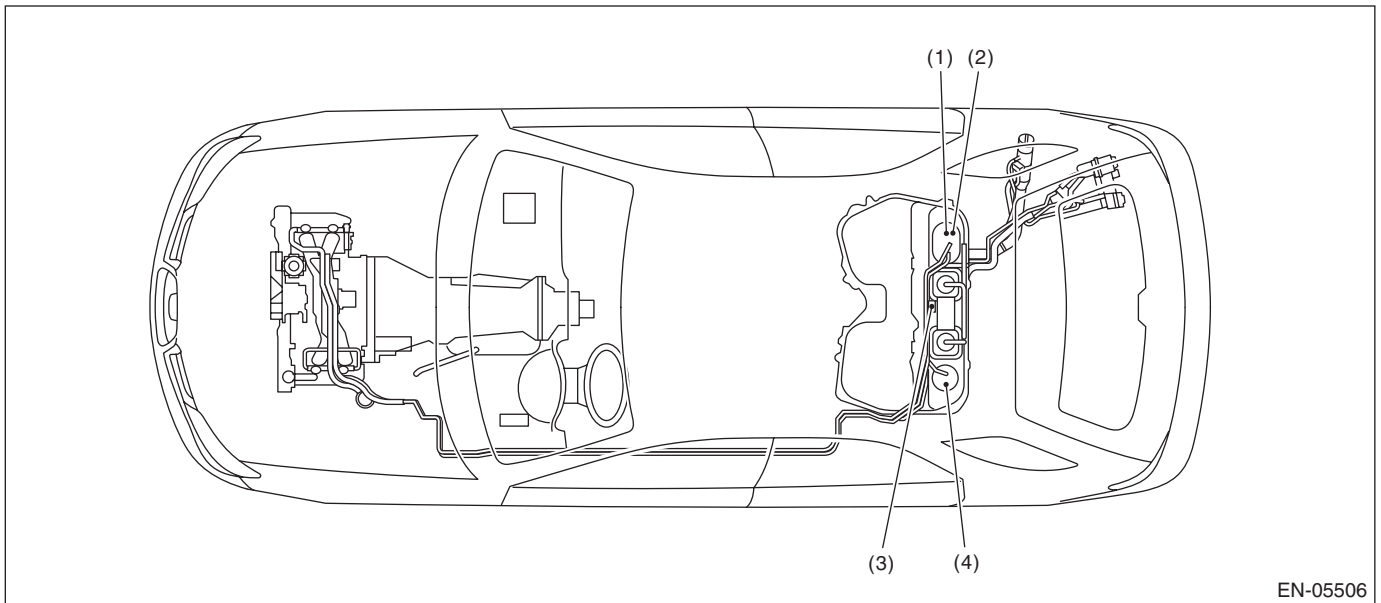
Electrical Component Location

ENGINE (DIAGNOSTICS)



EN-04201

- (1) Front oxygen (A/F) sensor
- (2) Rear oxygen sensor
- (3) Front catalytic converter
- (4) Rear catalytic converter

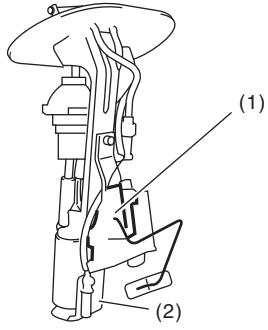


EN-05506

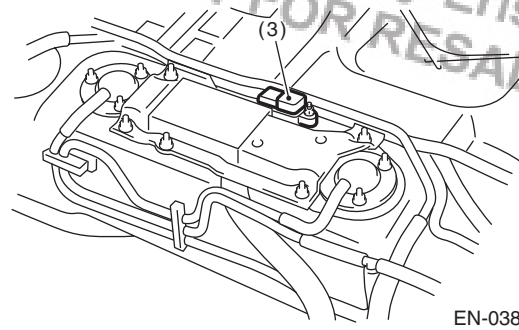
- (1) Fuel level sensor
- (2) Fuel temperature sensor
- (3) Fuel tank pressure sensor
- (4) Fuel sub level sensor

Electrical Component Location

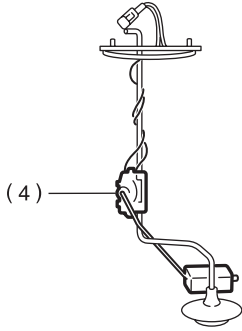
ENGINE (DIAGNOSTICS)



EN-03852



EN-03853



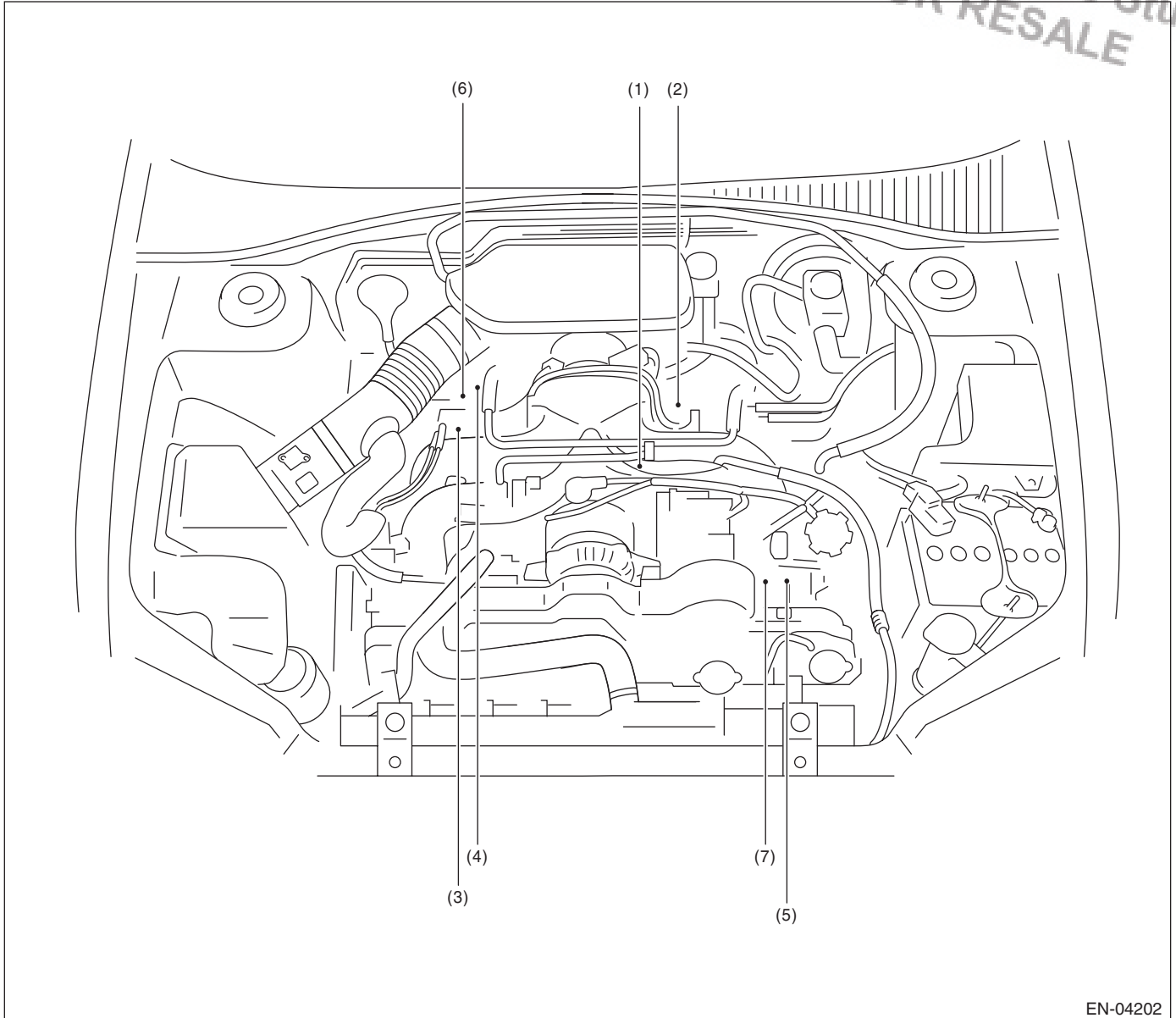
EN-00168

SUBARU.

Electrical Component Location

ENGINE (DIAGNOSTICS)

Solenoid valve, emission control system parts, ignition system parts



EN-04202

- (1) Purge control solenoid valve
- (2) EGR valve
- (3) Ignition coil and ignitor ASSY
- (4) Oil switching solenoid valve RH

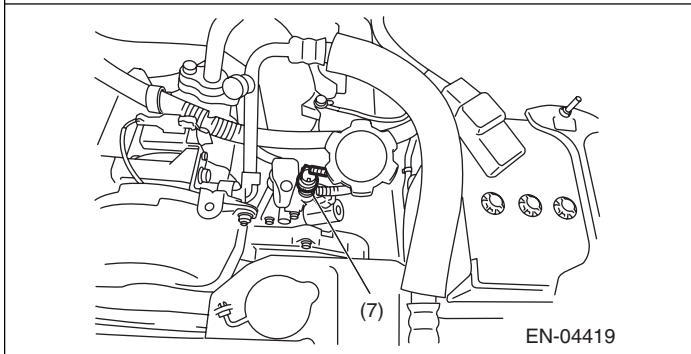
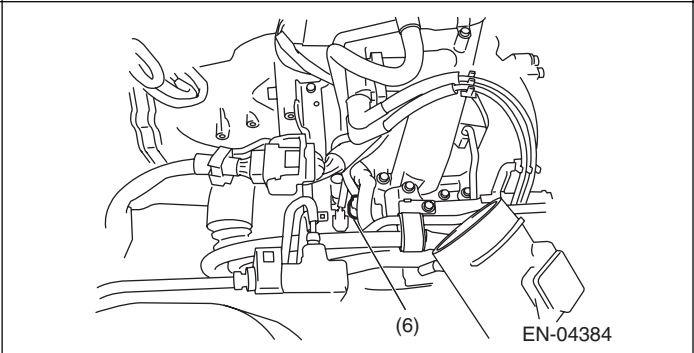
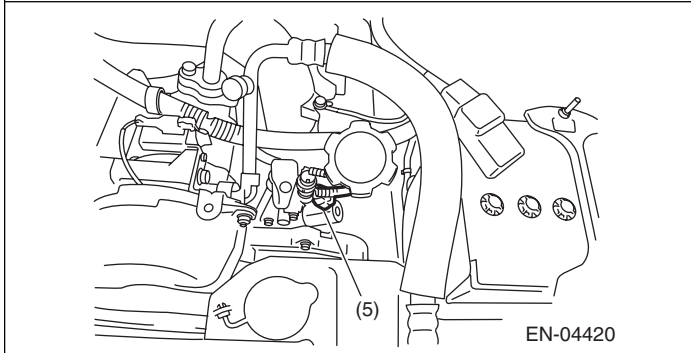
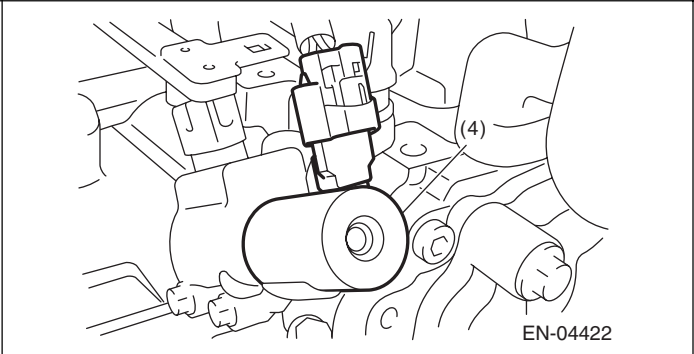
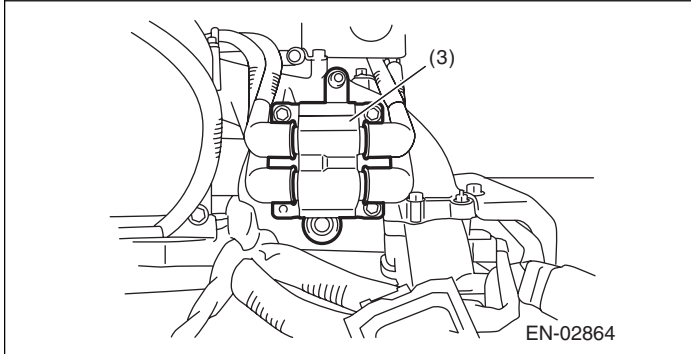
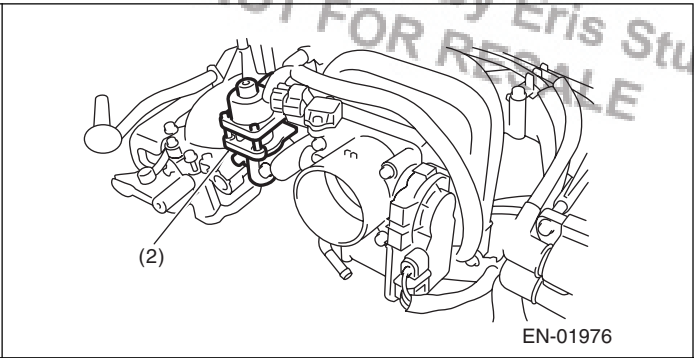
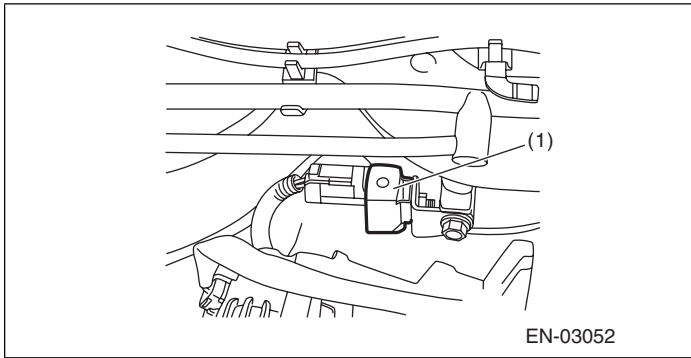
- (5) Oil switching solenoid valve LH
- (6) Variable valve lift diagnosis oil pressure switch RH

- (7) Variable valve lift diagnosis oil pressure switch LH

Electrical Component Location

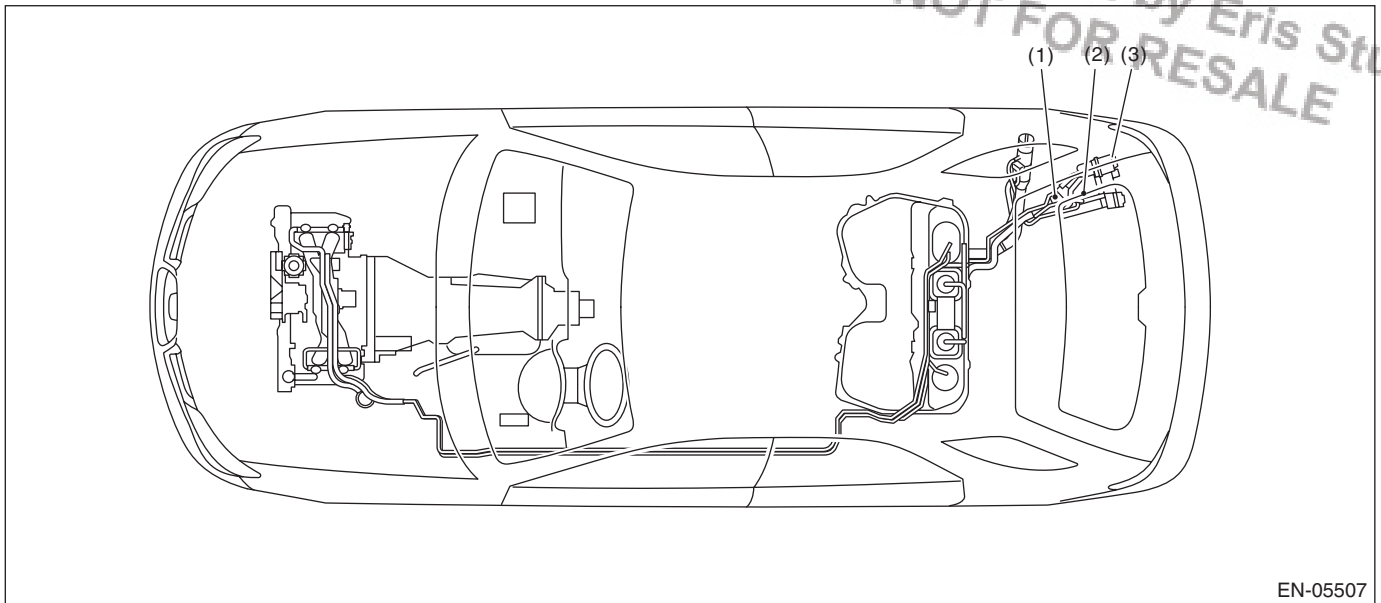
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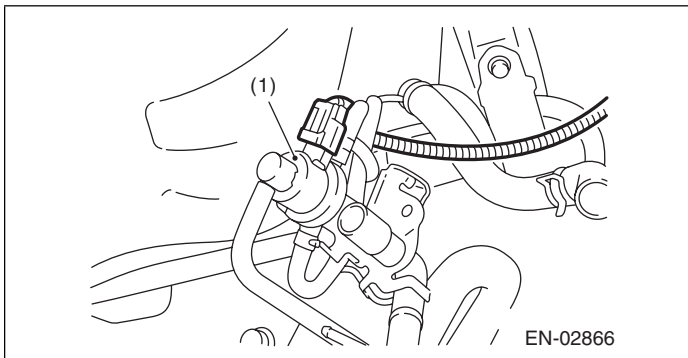
Electrical Component Location

ENGINE (DIAGNOSTICS)

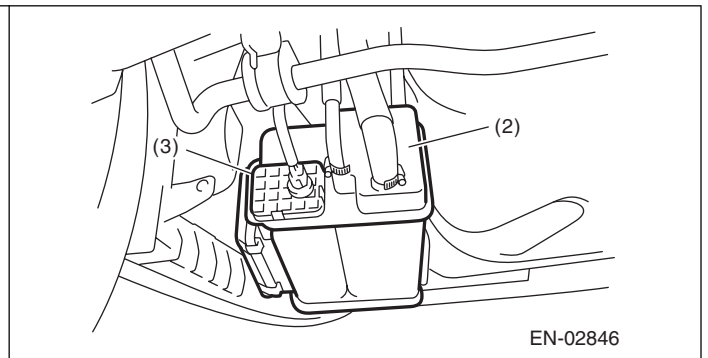


EN-05507

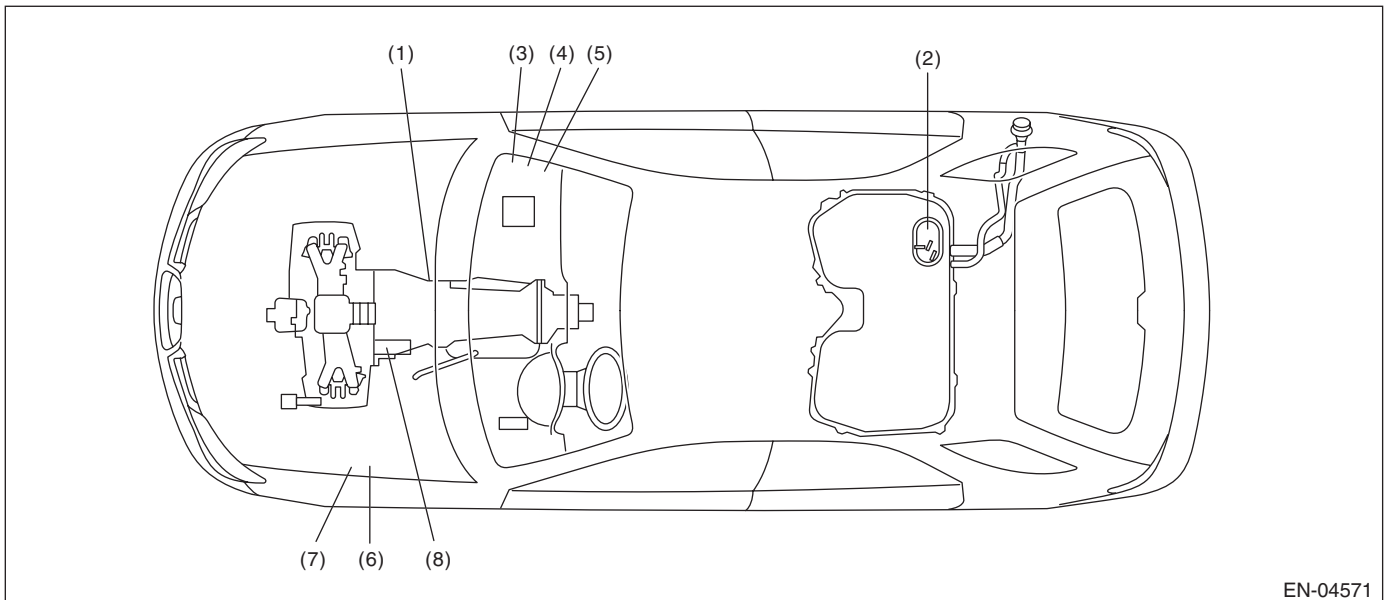
- (1) Pressure control solenoid valve (2) Canister (3) Drain valve



EN-02866



EN-02846



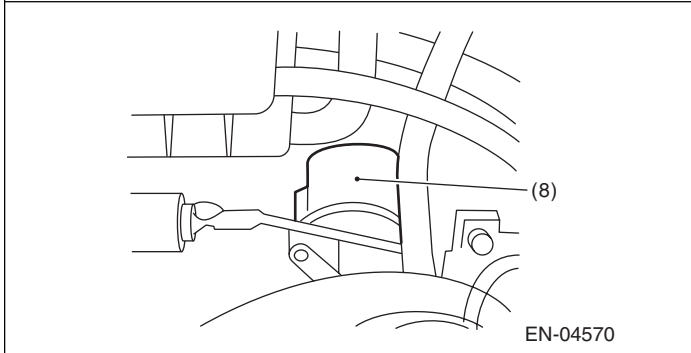
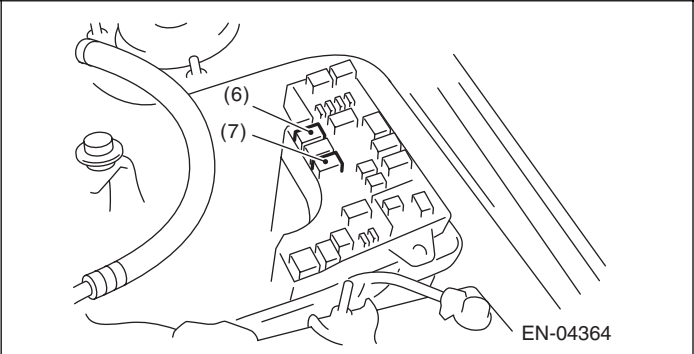
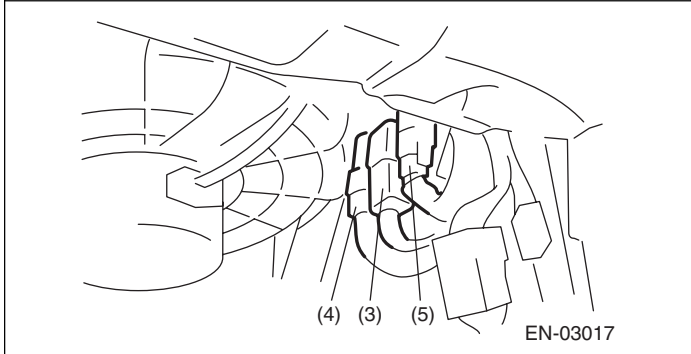
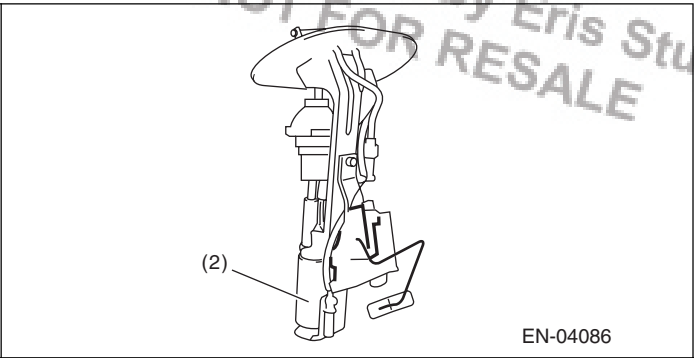
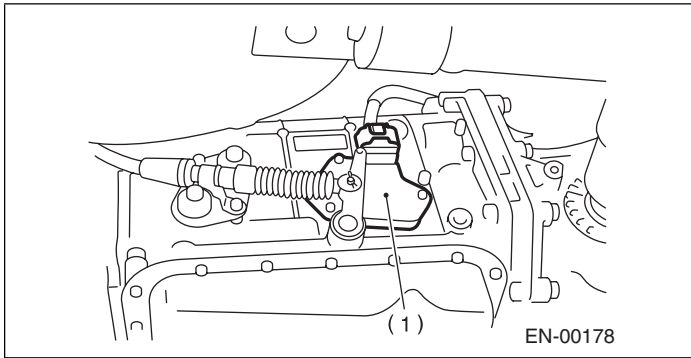
EN-04571

- (1) Inhibitor switch (4) Fuel pump relay (7) Radiator sub fan relay
 (2) Fuel pump (5) Electronic throttle control relay (8) Starter
 (3) Main relay (6) Radiator main fan relay

Electrical Component Location

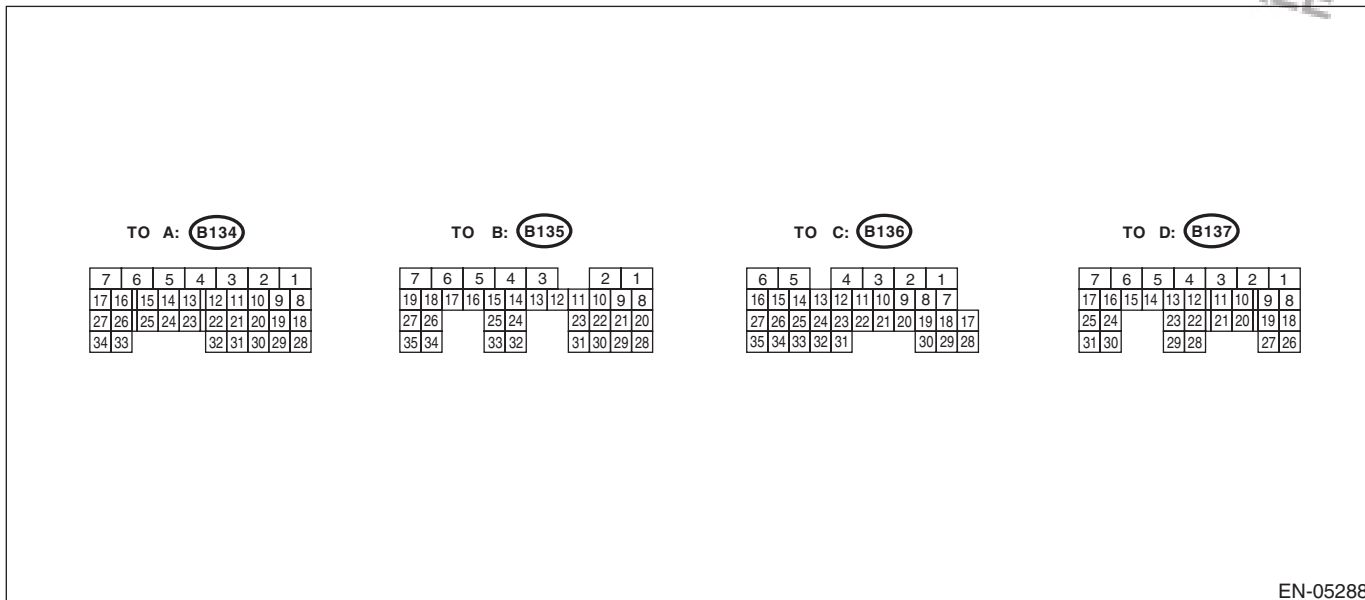
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5. Engine Control Module (ECM) I/O Signal

A: ELECTRICAL SPECIFICATION



EN-05288

Description	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Crankshaft position sensor	Signal (+)	B134	13	0	-7 — +7	Sensor output waveform
	Signal (-)	B134	14	0	0	—
	Shield	B134	24	0	0	—
Rear oxygen sensor	Signal	B135	4	0	0 — 0.9	—
	Shield	B135	1	0	0	—
	GND (sensor)	B134	29	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B136	3	10 — 13	1 — 14	Waveform
	Signal 2	B136	2	10 — 13	1 — 14	Waveform
Rear oxygen sensor heater signal	B136	4	10 — 13	1 — 14	Waveform	
Engine coolant temperature sensor	Signal	B134	34	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.
	GND (sensor)	B134	29	0	0	After engine is warmed-up.
Vehicle speed signal	B136	12	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.	
Air flow sensor	Signal	B135	26	—	0.3 — 4.5	—
	Shield	B135	35	0	0	—
	GND	B135	34	0	0	—
Intake air temperature sensor signal	B135	18	0.3 — 4.6	0.3 — 4.6	—	
Camshaft position sensor	Signal (+)	B134	12	0	-7 — +7	Sensor output waveform
	Signal (-)	B134	22	0	0	—
	Shield	B134	24	0	0	—
Starter switch	B136	32	0	0	Cranking: 8 — 14	
A/C switch	B136	23	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—	
Ignition switch	B135	27	10 — 13	12 — 14	—	

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Description	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Neutral position switch	B136	31	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	
Test mode connector	B135	19	10 — 13	12 — 14	When connected: 0	
Knock sensor	Signal	B134	15	2.5	—	
	Shield	B134	25	0	—	
Back-up power supply	B135	5	10 — 13	12 — 14	Ignition switch "OFF": 10 — 13	
Control module power supply	B134	7	10 — 13	12 — 14	—	
	B135	2	10 — 13	12 — 14	—	
Ignition control	1	B137	18	0	1 — 3.4	Waveform
	2	B137	19	0	1 — 3.4	Waveform
Fuel injector	#1	B137	8	10 — 13	1 — 14	Waveform
	#2	B137	9	10 — 13	1 — 14	Waveform
	#3	B137	10	10 — 13	1 — 14	Waveform
	#4	B137	11	10 — 13	1 — 14	Waveform
Fuel pump control relay	B136	13	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
A/C relay control	B136	9	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Radiator fan relay 1 control	B136	18	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Radiator fan relay 2 control	B136	29	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	Model with A/C only	
Starter relay control	B136	20	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Self-shut relay control	B136	24	0.5 or less	0.5 or less	—	
Malfunction indicator light	B136	11	—	—	Light "ON": 1 or less Light "OFF": 10 — 14	
Engine speed output	B136	22	—	0 — 13	Waveform	
Purge control solenoid valve	B137	29	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	Sensor output waveform	
Manifold absolute pressure sensor	Signal	B134	6	3.4 — 3.8	1.4 — 1.8	—
	GND (sensor)	B134	29	0	0	
Fuel tank pressure sensor	Signal	B135	32	2.3 — 2.7	2.3 — 2.7	When the fuel filler cap is reinstalled after removing it, the valve will operate.
	GND (sensor)	B135	30	0	0	—
Pressure control solenoid valve	B136	28	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—	
Drain valve	B136	17	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—	
Fuel level sensor	B135	10	0.3 — 4.5	0.3 — 4.5	—	
Fuel temperature sensor signal	B135	17	1 — 4	1 — 4	—	
Small light switch	B135	15	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	
Blower fan switch	B135	16	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	
Rear defogger switch	B135	14	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Description	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Power steering oil pressure switch	B134	33	ON: 1 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Front oxygen (A/F) sensor signal (+)	B135	9	—	2.7 — 2.9	—	
Front oxygen (A/F) sensor signal (-)	B135	8	—	2.35 — 2.55	—	
Front oxygen (A/F) sensor shield	B135	1	0	0	—	
SSM/GST communication line	B136	16	1 or less ↔ 4 or more	1 or less ↔ 4 or more	—	
Ground	Engine 1	B134	5	0	0	—
	Engine 2	B137	7	0	0	—
	Engine 3	B137	2	0	0	—
	Engine 4	B137	1	0	0	—
	Engine 5	B137	3	0	0	—
	Ignition 1	B137	26	0	0	—
	Ignition 2	B137	6	0	0	—
Electronic throttle control	Body	B136	6	0	0	—
	Main	B134	18	0.64 — 0.72 Fully opened: 3.96	0.64 — 0.72 (After engine is warmed-up.)	Fully closed: 0.6 Fully opened: 3.96
	Sub	B134	28	1.51 — 1.58 Fully opened: 4.17	1.51 — 1.58 (after engine is warmed-up.)	Fully closed: 1.48 Fully opened: 4.17
	Power supply	B134	19	5	5	—
	GND (sensor)	B134	29	0	0	—
Electronic throttle control motor (+)	B137	5	Duty waveform	Duty waveform	Drive frequency: 500 Hz	
Electronic throttle control motor (-)	B137	4	Duty waveform	Duty waveform	Drive frequency: 500 Hz	
Electronic throttle control motor power supply	B136	1	10 — 13	12 — 14	—	
Electronic throttle control motor relay	B136	21	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	When ignition switch is turned to ON: ON	
Accelerator pedal position sensor	Main sensor signal	B135	23	Fully closed: 0.7 Fully opened: 3.0	Fully closed: 0.7 Fully opened: 3.0	—
	Main power supply	B135	21	5	5	—
	GND (Main sensor)	B135	29	0	0	—
	Sub sensor signal	B135	31	Fully closed: 0.7 Fully opened: 3.0	Fully closed: 0.7 Fully opened: 3.0	—
	Sub power supply	B135	22	5	5	—
	GND (Sub sensor)	B135	30	0	0	—
Cruise control set light	B135	3	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	
Main light	B135	6	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	

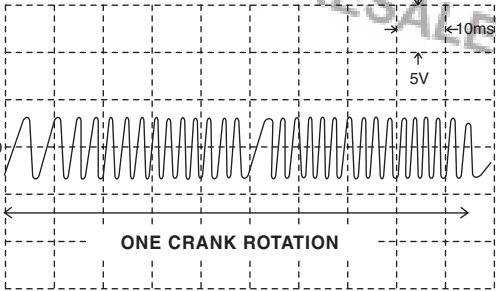
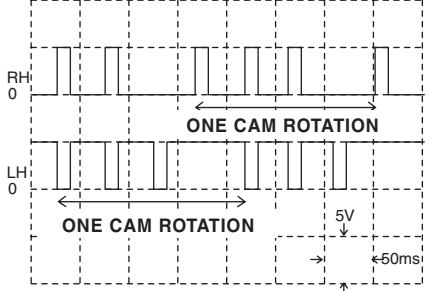
Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Description	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Clutch switch	B136	25	When clutch pedal is depressed: 0 When brake pedal is released: 10 — 13	When clutch pedal is depressed: 0 When brake pedal is released: 12 — 14	—	
SET/COAST switch	B135	24	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—	
Brake switch 1	B135	20	When brake pedal is depressed: 0 When brake pedal is released: 10 — 13	When brake pedal is depressed: 0 When brake pedal is released: 12 — 14	—	
Brake switch 2	B135	28	When brake pedal is depressed: 10 — 13 When brake pedal is released: 0	When brake pedal is depressed: 12 — 14 When brake pedal is released: 0	—	
RESUME/ACC switch	B135	13	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—	
Main switch	B135	12	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—	
CAN communication	Signal (+)	B136	27	Pulse signal		—
	Signal (-)	B136	35	Pulse signal		—
EGR solenoid valve	Signal 1	B134	8	0 or 10 — 13	0 or 12 — 14	—
	Signal 2	B134	9	0 or 10 — 13	0 or 12 — 14	—
	Signal 3	B134	10	0 or 10 — 13	0 or 12 — 14	—
	Signal 4	B134	20	0 or 10 — 13	0 or 12 — 14	—
Oil switching solenoid valve RH	Signal (+)	B137	25	0	Duty waveform	Drive frequency: 300 Hz
	Signal (-)	B137	24	0	0	—
Oil switching solenoid valve LH	Signal (+)	B137	31	0	Duty waveform	Drive frequency: 300 Hz
	Signal (-)	B137	30	0	0	—
Oil temperature sensor signal	B134	23	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.	
Variable valve lift diagnosis oil pressure switch RH	B134	31	0	0	—	
Variable valve lift diagnosis oil pressure switch LH	B134	32	0	0	—	
PCV diagnosis connector	B134	30	0	0	—	

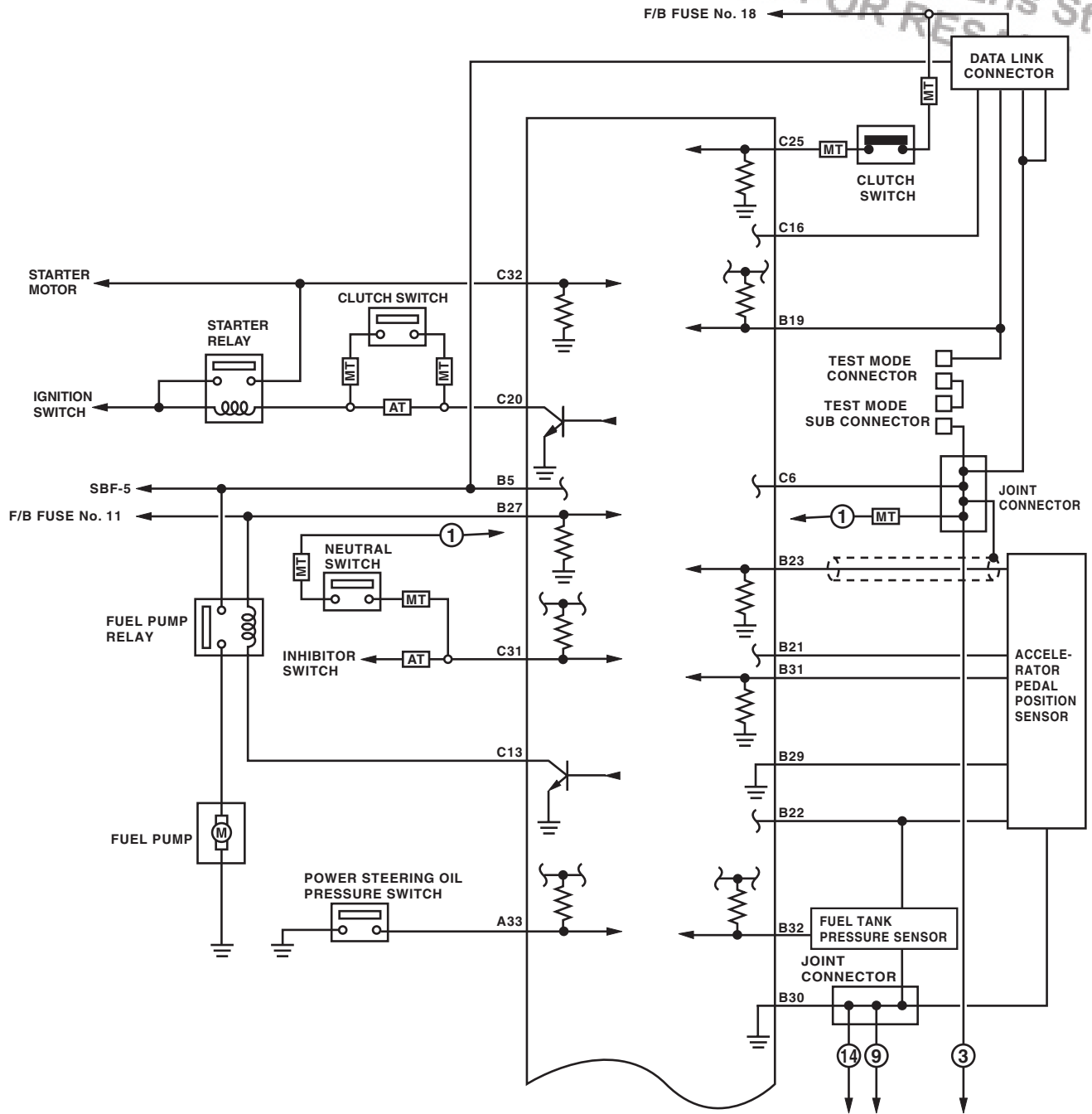
Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Input/output name	Measuring condition	Waveform
1. Crankshaft position sensor	During idling	 <p>EN-05322</p>
2. Camshaft position sensor	During idling	 <p>EN-05359</p>

Engine Control Module (ECM) I/O Signal

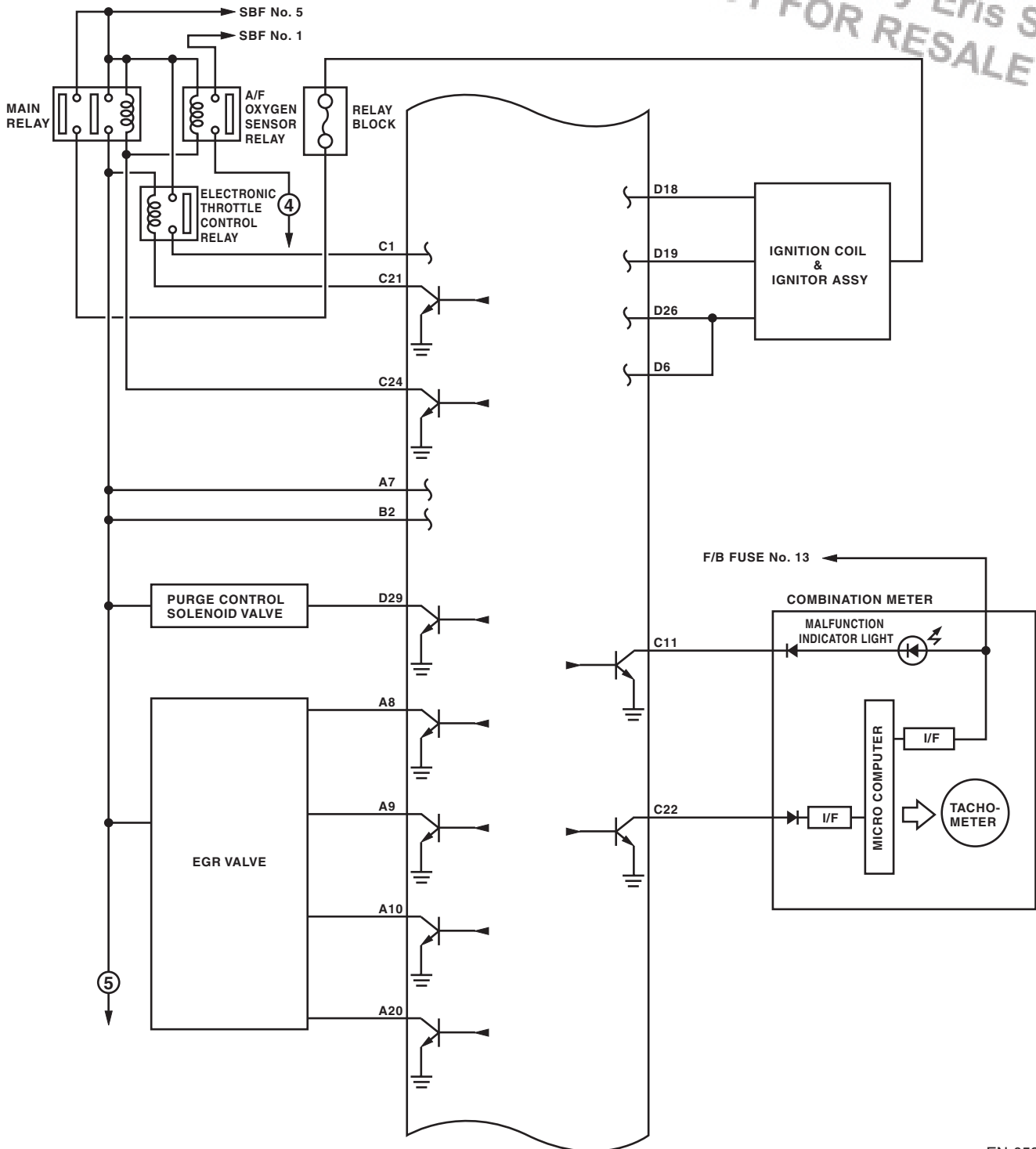
ENGINE (DIAGNOSTICS)



EN-05380

Engine Control Module (ECM) I/O Signal

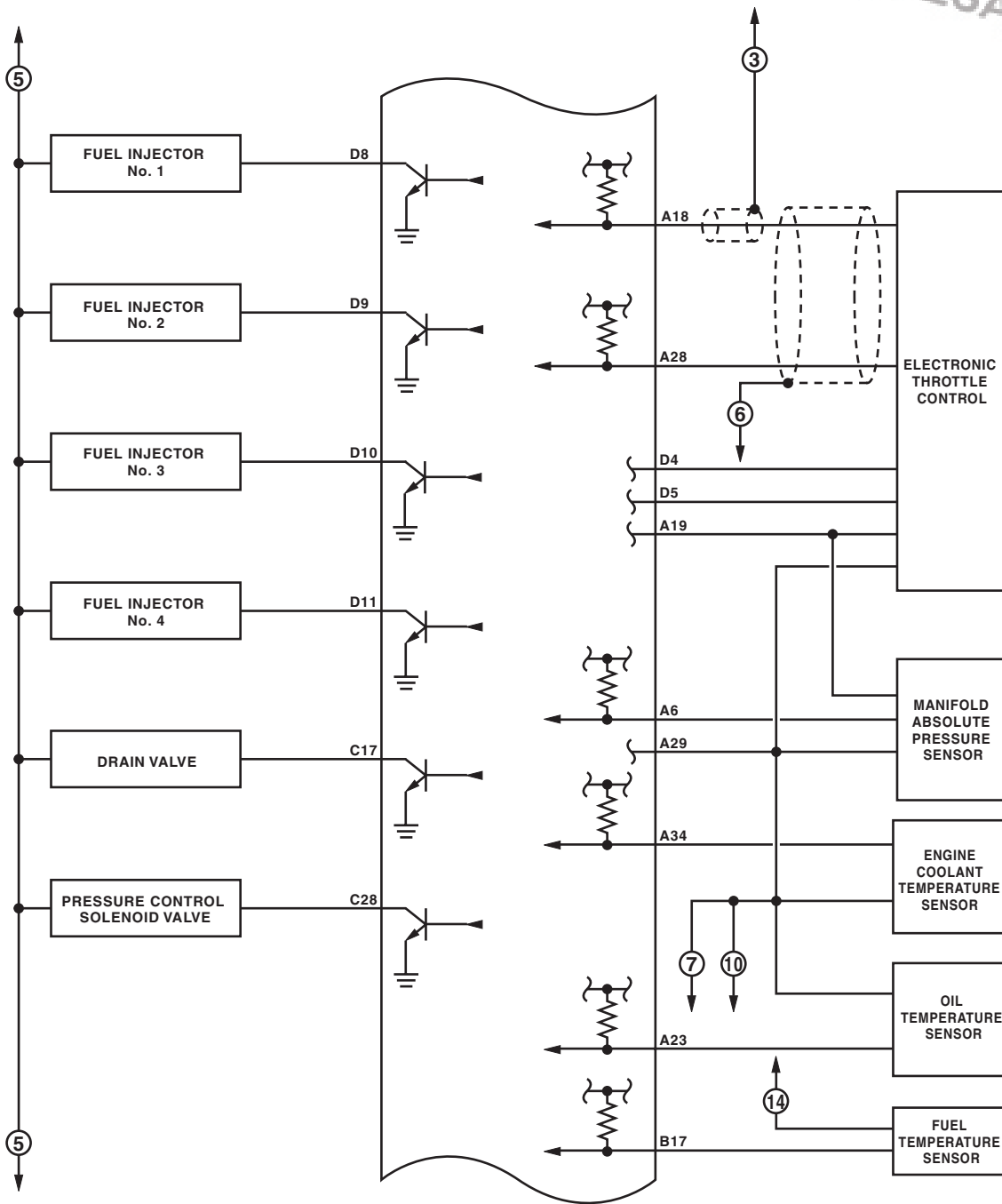
ENGINE (DIAGNOSTICS)



EN-05381

Engine Control Module (ECM) I/O Signal

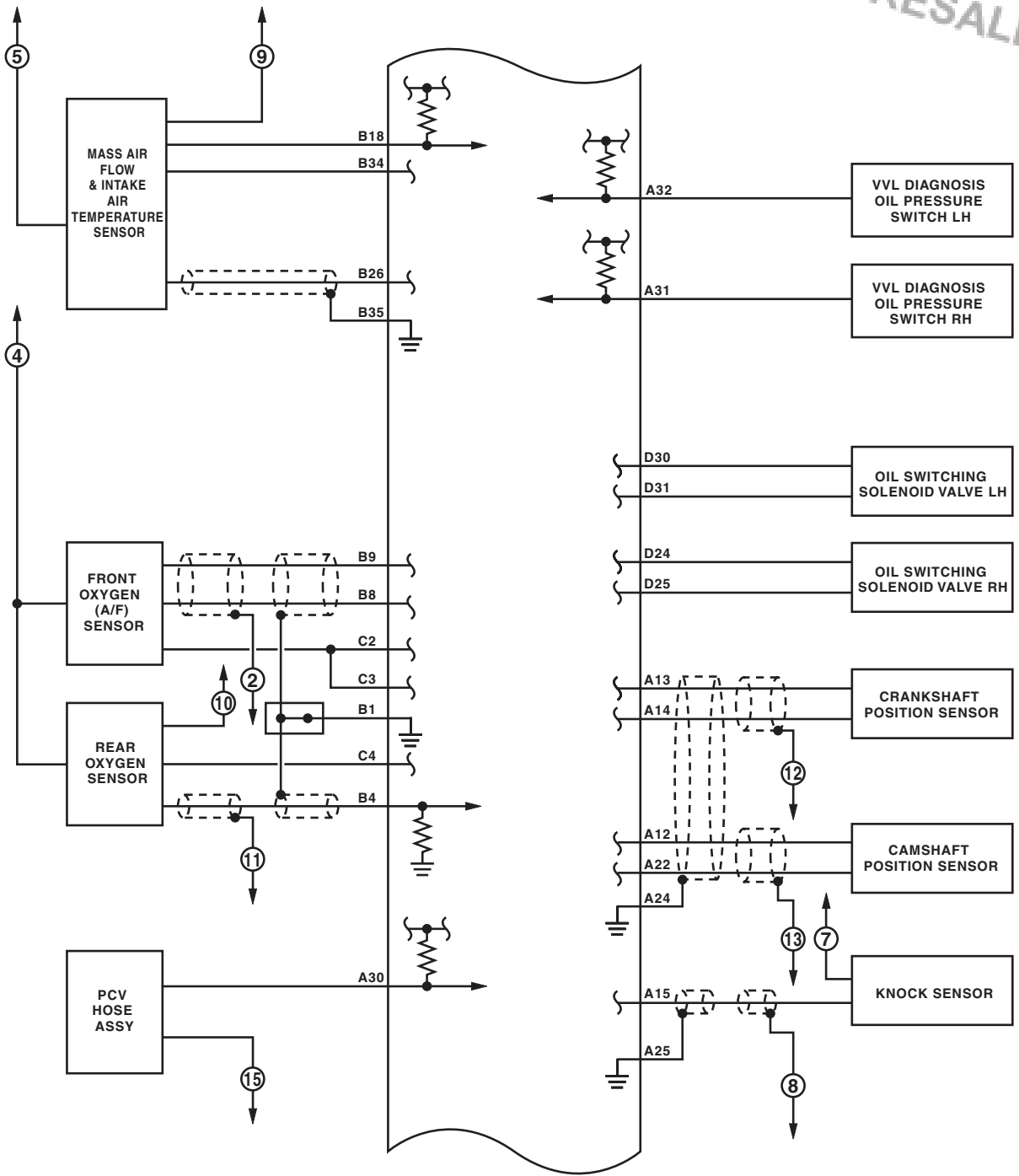
ENGINE (DIAGNOSTICS)



EN-05382

Engine Control Module (ECM) I/O Signal

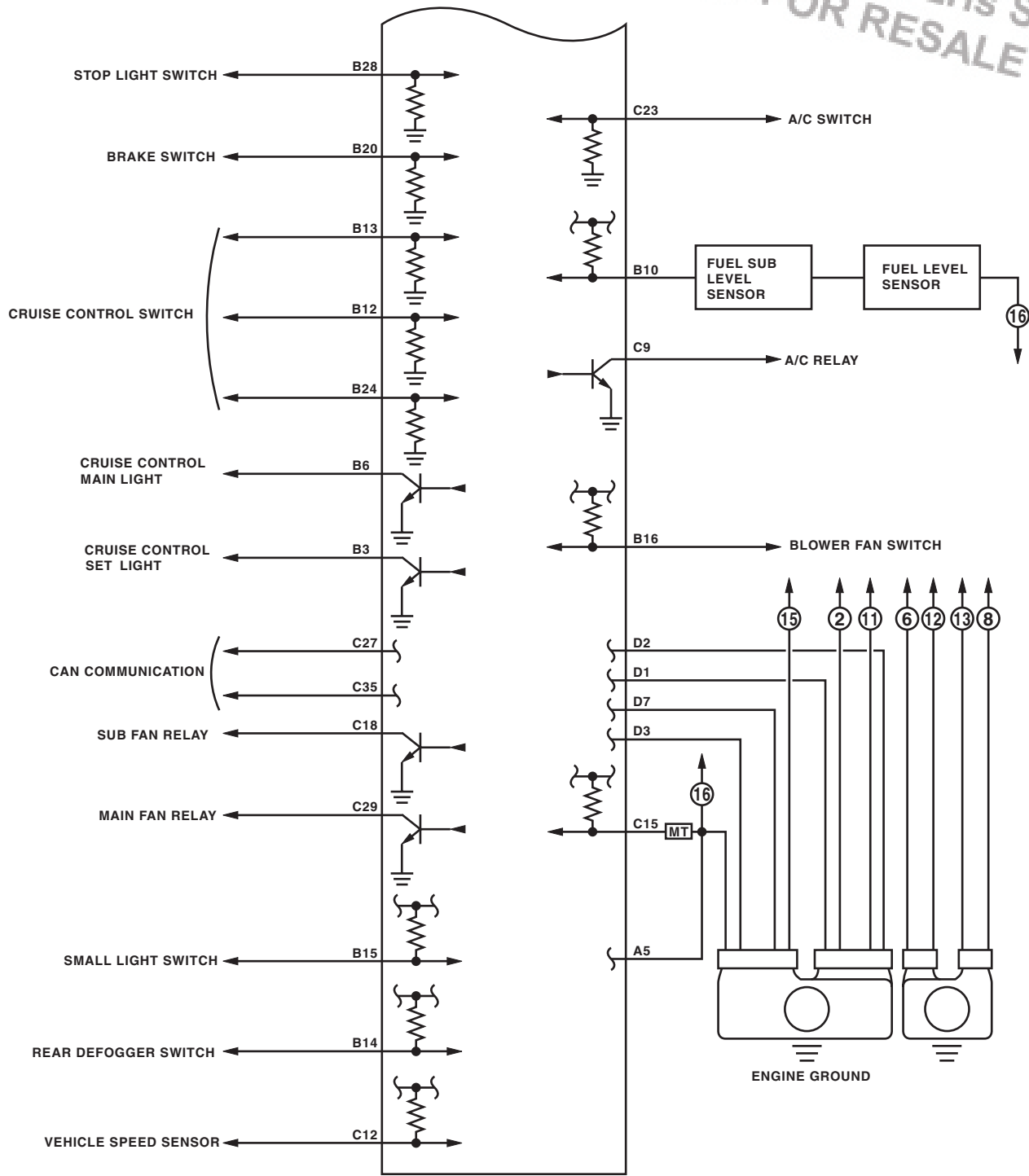
ENGINE (DIAGNOSTICS)



EN-05383

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)



EN-05384

6. Engine Condition Data

A: ELECTRICAL SPECIFICATION

Contents	Specification
Engine load	17.6 — 40.5 (%): Idling
	14.72 — 29.8 (%): 2,500 rpm racing

Measuring condition:

- After engine is warmed-up.
- Gear position is in “N” or “P” range.
- Turn the A/C to OFF.
- Turn all the accessory switches to OFF.

Data Link Connector

ENGINE (DIAGNOSTICS)

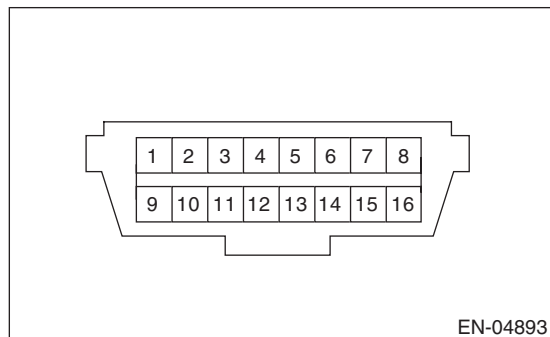
7. Data Link Connector

A: NOTE

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

CAUTION:

Do not connect any scan tools except general scan tool or Subaru Select Monitor because the circuit for Subaru Select Monitor may be damaged.



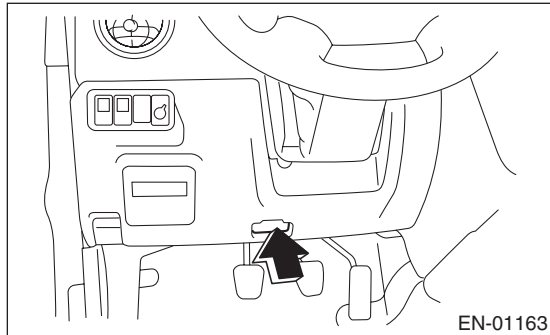
Terminal No.	Contents	Terminal No.	Contents
1	Blank	9	Blank
2	Blank	10	Blank
3	Blank	11	Blank
4	Ground	12	Blank
5	Ground	13	Blank
6	Blank	14	Blank
7	Subaru Select Monitor signal	15	Blank
8	Blank	16	Power supply

8. General Scan Tool

A: OPERATION

1. HOW TO USE GENERAL SCAN TOOL

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



- 3) Using the general scan tool, call up DTC and freeze frame data.

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 DTC
- (4) MODE \$04: Clear/Reset emission-related diagnostic information
- (5) MODE \$06: Request on-board monitoring test results for intermittently monitored systems
- (6) MODE \$07: Request on-board monitoring test results for continuously monitored systems
- (7) MODE \$09: Request vehicle information

Read out the data according to repair procedures.
(For detailed operation procedure, refer to the general scan tool instruction manual.)

NOTE:

For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".

<Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

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

Refer to data denoting the current operating condition of analog input/output, digital input/output 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 DTCs, and malfunction indicator light status and diagnosis support information	—
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 speed	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate from mass air flow sensor	g/sec
11	Throttle valve absolute opening angle	%
13	Check whether oxygen sensor is installed.	—
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor	V and %
1C	Supporting OBD system	—
24	A/F value and A/F sensor output voltage	— and V
34	A/F value and A/F sensor current	— and mA

NOTE:

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

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

Refer to data denoting the operating condition when trouble is detected by 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	DTC 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 speed	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate from mass air flow sensor	g/sec
11	Throttle valve absolute opening angle	%
13	Air fuel ratio sensor	—
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor	V and %
1C	Supporting OBD system	—

NOTE:

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

4. MODE \$03 (EMISSION-RELATED POWERTRAIN DTC)

Refer to "Read Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

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

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

NOTE:

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

6. MODE \$06

Refer to test value of troubleshooting and data of test limit indicated on the support data bit sequence table. A list of the support data is shown in the following table.

TID	CID	Diagnostic value and trouble standard value
\$41	\$81	Rear oxygen sensor circuit (Bank 1 Sensor 2)
	\$02	
\$81	\$01	Catalytic converter system
\$82	\$81	EGR system
	\$02	
\$83	\$01	Evaporative emission control system (0.04 inch leak)
	\$02	Evaporative emission control system (0.04 inch leak)
	\$03	Evaporative emission control system (0.04 inch leak)
	\$04	Evaporative emission control system (0.04 inch leak)
	\$05	Evaporative emission control system (0.02 inch leak)
	\$86	Evaporative emission control system (0.02 inch leak)
\$84	\$01	Front oxygen (A/F) sensor response (Bank 1 Sensor 1)
\$85	\$01	Rear oxygen sensor response (Bank 1 Sensor 2) rich → lean
	\$02	Rear oxygen sensor response (Bank 1 Sensor 2) lean → rich

7. MODE \$07

Refer to the data of DTC (pending code) for troubleshooting result about emission in the first time.

8. MODE \$09

Refer to data of vehicle specification (V.I.N., calibration ID, diagnosis frequency etc.).

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9. Subaru Select Monitor

A: OPERATION

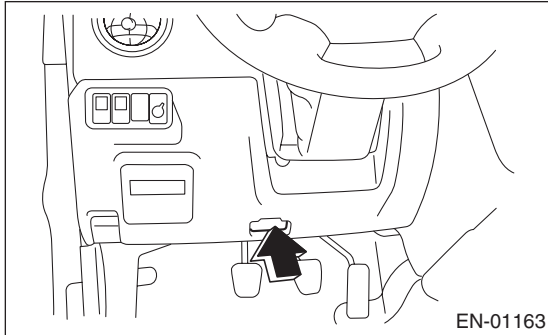
1. HOW TO USE THE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)(diag)-7, PREPARATION TOOL, General Description.>

2) Connect the diagnosis cable to the Subaru Select Monitor.

3) Connect the Subaru Select Monitor to the data link connector.

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



(2) Connect the diagnosis cable to the data link connector.

CAUTION:

Do not connect anything other than the Subaru Select Monitor and general scan tool.

4) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.

5) Using the Subaru Select Monitor, call up DTC and data, then record them.

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

Refer to "Read Diagnostic Trouble Code" for information about how to display a DTC.

<Ref. to EN(H4SO)(diag)-37, Read Diagnostic Trouble Code (DTC).>

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

Refer to "Read Diagnostic Trouble Code" for information about how to display a DTC.

<Ref. to EN(H4SO)(diag)-37, Read Diagnostic Trouble Code (DTC).>

4. READ CURRENT DATA FOR ENGINE (NORMAL MODE)

- 1) On the «Main Menu» display screen, select {Each System Check}.
 - 2) On the «System Selection Menu» display screen, select {Engine Control System}.
 - 3) Select the [OK] after the information of engine type has been displayed.
 - 4) On the «Engine Diagnosis» display screen, select {Current Data Display/Save}.
 - 5) On the «Data Display Menu» display screen, select {Data Display}.
 - 6) Using the scroll key, scroll 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	Note (at idling)
Engine load	Engine Load	%	21.0 %
Engine coolant temperature signal	Coolant Temp.	°C or °F	92°C or 198°F (after warm-up)
A/F correction 1	A/F Correction #1	%	-0.8 %
A/F learning 1	A/F Learning #1	%	0.0 %
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	200— 300 mmHg, 26.7 — 40 kPa, 7.8 — 11.8 inHg or 3.8 — 5.8 psig
Engine speed signal	Engine speed	rpm	600— 800 rpm (agree with the tachometer indication)
Meter vehicle speed signal	Vehicle Speed	km/h or MPH	0 km/h or 0 MPH (at parking)
Ignition timing signal	Ignition Timing	deg	14 — 16 deg
Intake air temperature signal	Intake Air Temp.	°C or °F	(Ambient air temperature)
Amount of intake air	Mass Air Flow	g/s or lb/m	2.8— 3.2 g/s or 0.37 — 0.42 lb/m
Throttle opening angle signal	Throttle Opening Angle	%	2.0 %
Rear oxygen sensor voltage	Rear O2 Sensor	V	0.1— 0.7 V
Battery voltage	Battery Voltage	V	12— 14 V
Mass air flow voltage	Air Flow Sensor Voltage	V	1.26 V
Injection 1 pulse width	Fuel Injection #1 Pulse	ms	2.82 ms
Knock sensor correction	Knocking Correction	deg	0.0 deg
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psig	(Atmospheric pressure)
Intake manifold relative pressure	Mani. Relative Pressure	mmHg, kPa, inHg or psig	(Air intake absolute pressure – atmosphere pressure)
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	+7.9 mmHg, +1.1 kPa, +0.31 inHg or +0.15 psig
Fuel temperature signal	Fuel Temp.	°C or °F	+20°C or +68°F
Fuel level signal	Fuel Level	V	0— 5 V
Acceleration opening angle signal	Accel. Opening Angle	%	0.0 %
Purge control solenoid duty ratio	CPC Valve Duty Ratio	%	0 — 3 %
No. of EGR steps	No. of EGR Steps	STEP	0 STEP
A/F sensor current value 1	A/F Sensor #1 Current	mA	-0.2 — 0.2 mA
A/F sensor resistance value 1	A/F Sensor #1 Resistance	Ω	32 Ω
A/F sensor output lambda 1	A/F sensor output lambda 1	—	1.0
A/F correction 3	A/F Correction #3	%	0.3 %
A/F learning 3	A/F Learning #3	%	0.00 %
Throttle motor duty	Throttle Motor Duty	%	-15 %
Throttle power supply voltage	Throttle Motor Voltage	V	(Battery voltage)
Sub throttle sensor voltage	Sub-throttle Sensor	V	1.52 V
Main throttle sensor voltage	Main-throttle Sensor	V	0.66 V
Sub accelerator sensor voltage	Sub-accelerator Sensor	V	0.68 V
Main accelerator sensor voltage	Main-accelerator Sensor	V	0.68 V
Memory vehicle speed	Memorized Cruise Speed	km/h or MPH	0 km/h or 0 MPH
Engine oil temperature	Engine Oil Temperature	°C	≥ 85°C (After engine is warmed-up.)
Oil switching solenoid valve duty R	OSV Duty R	%	16.9 %

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Contents	Display	Unit of measure	Note (at idling)
Oil switching solenoid valve duty L	OSV Duty L	%	16.9 %
Oil switching solenoid valve current R	OSV Current R	mA	192 mA
Oil switching solenoid valve current L	OSV Current L	mA	192 mA
Variable valve lift mode	VVL Lift Mode	—	1
#1 cylinder roughness monitor	Roughness Monitor #1	—	0
#2 cylinder roughness monitor	Roughness Monitor #2	—	0
#3 cylinder roughness monitor	Roughness Monitor #3	—	0
#4 cylinder roughness monitor	Roughness Monitor #4	—	0
AT/MT identification terminal	AT Vehicle ID Signal	—	AT vehicle/MT vehicle
Test mode terminal	Test Mode Terminal	—	U check
Neutral position switch signal	Neutral Position Switch	—	Neutral
Soft idle switch signal	Idle Switch Signal	—	At idle
Ignition switch signal	Ignition Switch	—	ON input
Power steering switch signal	P/S Switch	—	OFF input (when OFF)
Air conditioning switch signal	A/C Switch	—	OFF input (when OFF)
Starter switch signal	Starter Switch	—	OFF input
Rear oxygen monitor	Rear O2 Rich Signal	—	Rich/Lean
Knocking signal	Knocking Signal	—	None
Crankshaft position sensor signal	Crankshaft Position Signal	—	Provided
Camshaft position sensor signal	Camshaft Position Signal	—	Provided
Rear defogger switch signal	Rear Defogger Switch	—	OFF input (when OFF)
Blower fan switch signal	Blower Fan Switch	—	OFF input (when OFF)
Light switch signal	Light Switch	—	OFF input (when OFF)
Air conditioner compressor relay output signal	A/C Compressor Signal	—	OFF output (when OFF)
Radiator fan relay 1 signal	Radiator Fan Relay #1	—	OFF output (when OFF)
Radiator fan relay 2 signal	Radiator Fan Relay #2	—	OFF output (when OFF)
Fuel pump relay signal	Fuel Pump Relay	—	ON output
Pressure control solenoid valve signal	PCV Solenoid	—	OFF output
PCV hose assembly diagnosis signal	Blow-by Leak Diagnosis Connector	—	Connected
Drain valve signal	Vent Control Solenoid	—	OFF output
Variable valve lift diagnosis oil pressure switch signal 1	Eng. Oil Press. SW 1	—	ON
Variable valve lift diagnosis oil pressure switch signal 2	Eng. Oil Press. SW 2	—	ON
AT coordinate retard angle demand signal	Retard Signal from AT	—	None
AT coordinate fuel cut demand signal	Fuel Cut Signal from AT	—	None
AT coordinate permission signal	Torque Control Permission Signal	—	Permission
Electronic throttle control motor relay signal	ETC Motor Relay	—	ON
Clutch switch signal	Clutch Switch	—	OFF (when OFF)
Stop light switch signal	Stop Light Switch	—	OFF (when OFF)
SET/COAST switch signal	SET/COAST Switch	—	OFF (when OFF)
RES/ACC switch signal	RESUME/ACCEL Switch	—	OFF (when OFF)
Brake switch signal	Brake Switch	—	OFF (when OFF)
Main switch signal	Main Switch	—	OFF (when OFF)
Ignition learning value	Learned Ignition Timing	deg	0 deg
Malfunction indicator light signal	MIL On Flag	—	Off (when unlit)

NOTE:

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

5. READ CURRENT DATA FOR ENGINE (OBD MODE)

- 1) On the «Main Menu» display screen, select {Each System Check}.
 - 2) On the «System Selection Menu» display screen, select {Engine Control System}.
 - 3) Select the [OK] after the information of engine type has been displayed.
 - 4) On the «Engine Diagnosis» display screen, select {OBD System}.
 - 5) On the «OBD Menu» display screen, select {Current Data Display/Save}.
 - 6) On the «Data Display Menu» display screen, select {Data Display}.
 - 7) Using the scroll key, scroll 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	Note (at idling)
Number of diagnosis code	Number of Diag. Code:	—	0
Condition of malfunction indicator light	MI (MIL)	—	OFF
Monitoring test of misfire	Misfire monitoring	—	Supp YES or NO
Monitoring test of misfire	Misfire monitoring	—	Rdy YES or NO
Monitoring test of fuel system	Fuel system monitoring	—	Supp YES or NO
Monitoring test of fuel system	Fuel system monitoring	—	Rdy YES or NO
Monitoring test of comprehensive component	Component monitoring	—	Supp YES or NO
Monitoring test of comprehensive component	Component monitoring	—	Rdy YES or NO
Test of catalyst	Catalyst Diagnosis	—	Supp YES or NO
Test of catalyst	Catalyst Diagnosis	—	Rdy YES or NO
Test of heating-type catalyst	Heated catalyst	—	Supp N/A
Test of heating-type catalyst	Heated catalyst	—	Rdy N/A
Test of evaporative emission purge control system	Evaporative purge system	—	Supp YES or NO
Test of evaporative emission purge control system	Evaporative purge system	—	Rdy YES or NO
Secondary air system test	Secondary air system	—	Supp N/A
Secondary air system test	Secondary air system	—	Rdy N/A
Test of air conditioning system	A/C system refrigerant	—	Supp N/A
Test of air conditioning system	A/C system refrigerant	—	Rdy N/A
Test of oxygen sensor	O2 Sensor Diagnosis	—	Supp YES or NO
Test of oxygen sensor	O2 Sensor Diagnosis	—	Rdy YES or NO
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Supp YES or NO
Test of oxygen sensor heater	O2 Heater Diagnosis	—	Rdy YES or NO
Test of EGR system	EGR system	—	Supp YES or NO
Test of EGR system	EGR system	—	Rdy YES or NO
A/F control #1	Fuel system for Bank 1	—	Normal CLOSE
Engine load data	Calculated load valve	%	23.0 %
Engine coolant temperature signal	Coolant Temp.	°C or °F	92°C or 198°F
A/F correction value #1	A/F Correction Value #1	%	-0.8 %
A/F learning #1	A/F Learning Value #1	%	+0.0 %
Intake manifold absolute pressure	Mani. Absolute Pressure	mmHg, kPa, inHg or psig	211 mmHg, 28.1 kPa, 8.31 inHg or 4.08 psig
Engine speed signal	Engine Speed	rpm	700 rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH	0 km/h or 0 MPH
Ignition timing advance for #1 cylinder	Ignition timing adv.#1	°	+16.0°
Intake air temperature signal	Intake Air Temp.	°C or °F	36°C or 97°F
Amount of intake air	Mass Air Flow	g/s or lb/m	2.7 g/s or 0.36 lb/m
Throttle opening angle signal	Throttle Opening Angle	%	13 %
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	—	Support
Oxygen sensor (Bank 1 Sensor 1)	Oxygen sensor #12	—	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V	0.7 V
A/F correction (Bank 1 Sensor 2)	A/F Correction #12	%	0.0 %

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Contents	Display	Unit of measure	Note (at idling)
OBD system	OBD system	—	CARB — OBD2
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	—	1.001
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	V	2.79 V
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	—	1.001
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	A/F sensor #11	mA	0.00 mA

NOTE:

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

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

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

Contents	Display	Unit of measure
Freeze frame data DTC code	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	Normal CLOSE or OPEN early period
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, kPa, inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing signal	Ignition Timing	°
Intake air temperature signal	Intake Air Temp	°C
Amount of intake air	Mass Air Flow	g/sec
Throttle position signal	Throttle Opening Angle	%
Oxygen sensor (Bank 1 Sensor 1)	Oxygen sensor #11	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V
A/F support #12	A/F Correction #12	%
OBD system	OBD system	—

NOTE:

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

7. V.I.N REGISTRATION

- 1) On the «Main Menu» display screen, select {Each System Check}.
- 2) On the «System Selection Menu» display screen, select {Engine Control System}.
- 3) Select the [OK] after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select {V.I.N. Registration}.
- 5) Perform the procedures shown on the display screen.

NOTE:

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

10. Read Diagnostic Trouble Code (DTC)

A: OPERATION

1. SUBARU SELECT MONITOR (NORMAL MODE)

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

NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
<Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

2. SUBARU SELECT MONITOR (OBD MODE)

- 1) On the «Main Menu» display screen, select {Each System Check}.
- 2) On the «System Selection Menu» display screen, select {Engine Control System}.
- 3) Select the [OK] after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select {OBD System}.
- 5) On the «OBD Menu» display screen, select {Diagnostic Code(s) Display}.
- 6) Make sure DTC is shown on the screen.

NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
<Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

3. GENERAL SCAN TOOL

Refer to data denoting emission-related powertrain DTC.

For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.

<Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

NOTE:

Refer to general scan tool manufacturer’s instruction manual to access powertrain DTC (MODE \$03).

11. Inspection Mode

A: PROCEDURE

Perform the diagnosis shown in the following DTC table.

When performing the diagnosis not listed in "List of Diagnostic Trouble Code (DTC)", refer to the item on the drive cycle. <Ref. to EN(H4SO)(diag)-42, Drive Cycle.>

DTC	Item
P0031	HO2S Heater Control Circuit Low (Bank 1 Sensor 1)
P0032	HO2S Heater Control Circuit High (Bank 1 Sensor 1)
P0037	HO2S Heater Control Circuit Low (Bank 1 Sensor 2)
P0038	HO2S Heater Control Circuit High (Bank 1 Sensor 2)
P0077	Intake Valve Control Solenoid Circuit High (Bank 1)
P0083	Intake Valve Control Solenoid Circuit High (Bank 2)
P0102	Mass or Volume Air Flow Circuit Low Input
P0103	Mass or Volume Air Flow Circuit High Input
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input
P0112	Intake Air Temperature Sensor 1 Circuit Low
P0113	Intake Air Temperature Sensor 1 Circuit High
P0117	Engine Coolant Temperature Circuit Low
P0118	Engine Coolant Temperature Circuit High
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High
P0131	O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1)
P0132	O2 Sensor Circuit High Voltage (Bank 1 Sensor 1)
P0137	O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2)
P0138	O2 Sensor Circuit High Voltage (Bank 1 Sensor 2)
P0140	O2 Sensor Circuit No Activity Detected (Bank1 Sensor2)
P0182	Fuel Temperature Sensor "A" Circuit Low Input
P0183	Fuel Temperature Sensor "A" Circuit High Input
P0197	Engine Oil Temperature Sensor Low
P0198	Engine Oil Temperature Sensor High
P0222	Throttle/Pedal Position Sensor/Switch "B" Circuit Low
P0223	Throttle/Pedal Position Sensor/Switch "B" Circuit High
P0327	Knock Sensor 1 Circuit Low (Bank 1 or Single Sensor)
P0328	Knock Sensor 1 Circuit High (Bank 1 or Single Sensor)
P0335	Crankshaft Position Sensor "A" Circuit
P0336	Crankshaft Position Sensor "A" Circuit Range/Performance
P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)
P0341	Camshaft Position Sensor "A" Circuit Range/Performance (Bank 1 or Single Sensor)
P0447	Evaporative Emission Control System Vent Control Circuit Open
P0448	Evaporative Emission Control System Vent Control Circuit Shorted
P0452	Evaporative Emission Control System Pressure Sensor Low Input
P0453	Evaporative Emission Control System Pressure Sensor High Input
P0458	Evaporative Emission System Purge Control Valve Circuit Low
P0462	Fuel Level Sensor "A" Circuit Low
P0463	Fuel Level Sensor "A" Circuit High
P0502	Vehicle Speed Sensor "A" Circuit Low Input
P0503	Vehicle Speed Sensor "A" Intermittent/Erratic/High
P0512	Starter Request Circuit
P0519	Idle Air Control System Performance

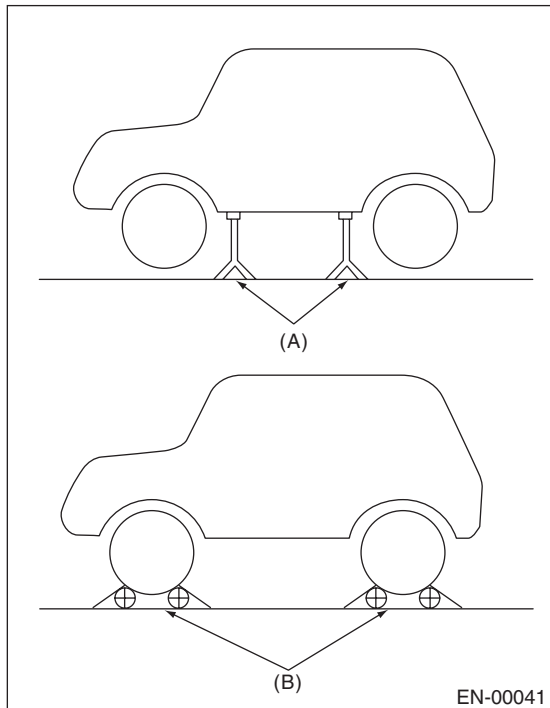
DTC	Item
P0600	Serial Communication Link
P0604	Internal Control Module Random Access Memory (RAM) Error
P0605	Internal Control Module Read Only Memory (ROM) Error
P0607	Control Module Performance
P0638	Throttle Actuator Control Range/Performance (Bank 1)
P0691	Fan 1 Control Circuit Low
P0692	Fan 1 Control Circuit High
P0700	Transmission Control System (MIL Request)
P0851	Neutral Switch Input Circuit Low
P0852	Neutral Switch Input Circuit High
P1152	O ₂ Sensor Circuit Range/Performance (Low) (Bank 1 Sensor 1)
P1153	O ₂ Sensor Circuit Range/Performance (High) (Bank 1 Sensor 1)
P1160	Return Spring Failure
P1400	Fuel Tank Pressure Control Solenoid Valve Circuit Low
P1420	Fuel Tank Pressure Control Sol. Valve Circuit High
P1491	Positive Crankcase Ventilation (Blow-by) Function Problem
P1518	Starter Switch Circuit Low Input
P1560	Back-up Voltage Circuit Malfunction
P2101	Throttle Actuator Control Motor Circuit Range/Performance
P2102	Throttle Actuator Control Motor Circuit Low
P2109	Throttle/Pedal Position Sensor "A" Minimum Stop Performance
P2122	Throttle/Pedal Position Sensor/Switch "D" Circuit Low Input
P2123	Throttle/Pedal Position Sensor/Switch "D" Circuit High Input
P2127	Throttle/Pedal Position Sensor/Switch "E" Circuit Low Input
P2128	Throttle/Pedal Position Sensor/Switch "E" Circuit High Input
P2135	Throttle/Pedal Position Sensor/Switch "A"/"B" Voltage Correlation
P2138	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation
P2227	Barometric Pressure Circuit Range/Performance
P2228	Barometric Pressure Circuit Malfunction (Low Input)
P2229	Barometric Pressure Circuit Malfunction (High Input)

1. PREPARATION FOR THE INSPECTION MODE

- 1) Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 ℓ (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
- 2) Lift up the vehicle using a garage jack and place it on rigid racks, or drive the vehicle onto free rollers.

WARNING:

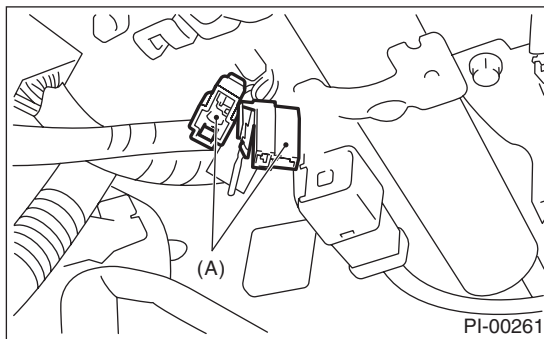
- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a rigid rack.
- Secure a rope or wire to the front or rear towing hooks to prevent the lateral runout of front wheels.
- Do not abruptly depress/release clutch pedal or accelerator pedal during works even when the 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 rigid racks and 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.



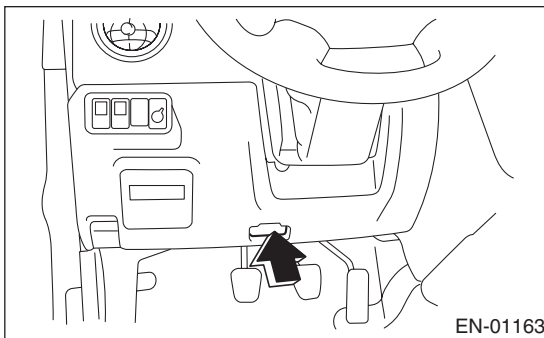
(A) Rigid rack
(B) Free roller

2. SUBARU SELECT MONITOR

- 1) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>
- 2) Warm-up the engine.
- 3) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)(diag)-7, PREPARATION TOOL, General Description.>
- 4) Connect the diagnosis cable to the Subaru Select Monitor.
- 5) Connect the test mode connector (A) located in the lower portion of the instrument panel (on the driver's side).



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



- (2) Connect the diagnosis cable to the data link connector.

CAUTION:

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

- 7) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
- 8) On the «Main Menu» display screen, select {Each System Check}.
- 9) On the «System Selection Menu» display screen, select {Engine Control System}.
- 10) Select the [OK] after the information of engine type has been displayed.
- 11) On the «Engine Diagnosis» display screen, select {D Check}.
- 12) When the “Perform D Check?” is shown on the screen, select the [OK].

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

- If trouble still remains in the memory, the corresponding DTC appears on the display screen.

NOTE:

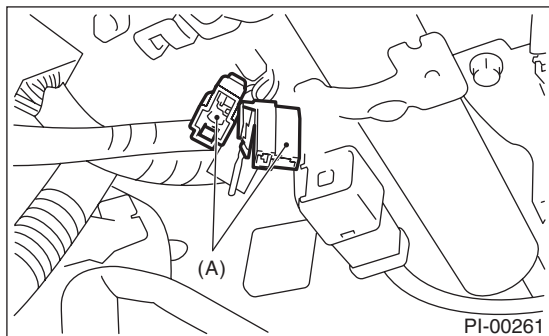
- For detailed operation procedure, refer to the "SUBARU SELECT MONITOR OPERATION MANUAL".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
<Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>
- Release the parking brake.
- The speed difference between front and rear wheels may illuminate 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. GENERAL SCAN TOOL

1) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>

2) Warm-up the engine.

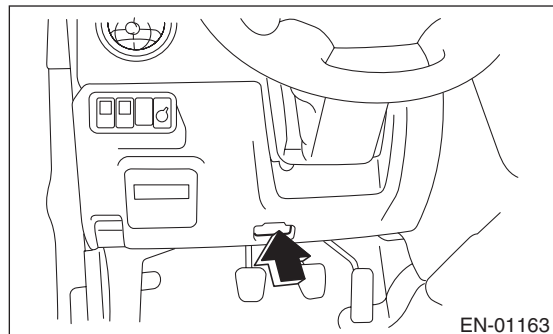
3) Connect the test mode connector (A) located in the lower portion of the instrument panel (on the driver's side).



4) Connect the general scan tool to the data link connector.

CAUTION:

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



5) Start the engine.

NOTE:

- Ensure the selector lever is placed in "P" range before starting. (AT model)
 - Depress the clutch pedal when starting engine. (MT model)
- 6) Using the selector lever or shift lever, turn the "P" position switch and "N" position switch to ON.
- 7) Depress the brake pedal to turn the brake switch ON. (AT model)
- 8) Keep the engine speed in 2,500 — 3,000 rpm range for 40 seconds.
- 9) Place the select lever or shift lever in "D" range (AT model) or 1st gear (MT model) and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

NOTE:

- For AWD model, release the parking brake.
 - The speed difference between front and rear wheels may illuminate 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.
- 10) Using the general scan tool, check for DTC and record the result(s).

NOTE:

- For detailed operation procedure, refer to the general scan tool operation manual.
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
<Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

12. Drive Cycle

A: PROCEDURE

For the troubleshooting, there are drive patterns as described in the following. Driving in the specified pattern allows to diagnose malfunctioning items listed below. After the repair of the following trouble items, be sure to drive the vehicle with the specified drive patterns to check whether the function is resumed correctly.

1. PREPARATION FOR DRIVE CYCLE

- 1) Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 ℓ (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
- 2) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>
- 3) Disconnect the test mode connector.

NOTE:

- Perform the diagnosis after warming up the engine except when the engine coolant temperature at starting is specified.
- Perform the diagnosis twice when the DTC is marked with *. After the completion of the first diagnostic, stop the engine and perform the second diagnostic on same condition.

2. DRIVE CYCLE A (AFTER RUNNING 20 MINUTES AT 80 KM/H (50 MPH), IDLE THE ENGINE FOR 1 MINUTE.)

DTC	Item	Condition
*P0125	Insufficient Coolant Temperature For Closed Loop Fuel Control	Coolant temperature at start is less than 20°C (68°F).
*P0128	Coolant Thermostat (Engine Coolant Temperature Below Thermostat Regulating Temperature)	—
*P0133	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 1)	—
*P0171	System Too Lean (Bank 1)	Diagnosis completes in drive cycle B or C as well.
*P0172	System Too Rich (Bank 1)	Diagnosis completes in drive cycle B or C as well.
*P0196	Engine Oil Temperature Sensor Circuit Range/Performance	—
*P0301	Cylinder 1 Misfire Detected	Diagnosis completes in drive cycle B or C as well.
*P0302	Cylinder 2 Misfire Detected	Diagnosis completes in drive cycle B or C as well.
*P0303	Cylinder 3 Misfire Detected	Diagnosis completes in drive cycle B or C as well.
*P0304	Cylinder 4 Misfire Detected	Diagnosis completes in drive cycle B or C as well.
*P0420	Catalyst System Efficiency Below Threshold (Bank 1)	—
*P0442	Evaporative Emission Control System Leak Detected (Small Leak)	Engine coolant temperature at engine start is less than 25°C (77°F).
*P0451	Evaporative Emission Control System Pressure Sensor Range/Performance	—
*P0456	Evaporative Emission Control System Leak Detected (Very Small Leak)	Engine coolant temperature at engine start is less than 25°C (77°F).
*P0457	Evaporative Emission Control System Leak Detected (Fuel Cap Loose/Off)	Engine coolant temperature at engine start is less than 25°C (77°F).
*P0459	Evaporative Emission System Purge Control Valve Circuit High	—
P1443	Vent Control Solenoid Valve Function Problem	—
*P2096	Post Catalyst Fuel Trim System Too Lean Bank 1	Diagnosis completes in drive cycle B or C as well.
*P2097	Post Catalyst Fuel Trim System Too Rich Bank 1	Diagnosis completes in drive cycle B or C as well.
P2103	Throttle Actuator Control Motor Circuit High	Diagnosis completes in drive cycle B or C as well.

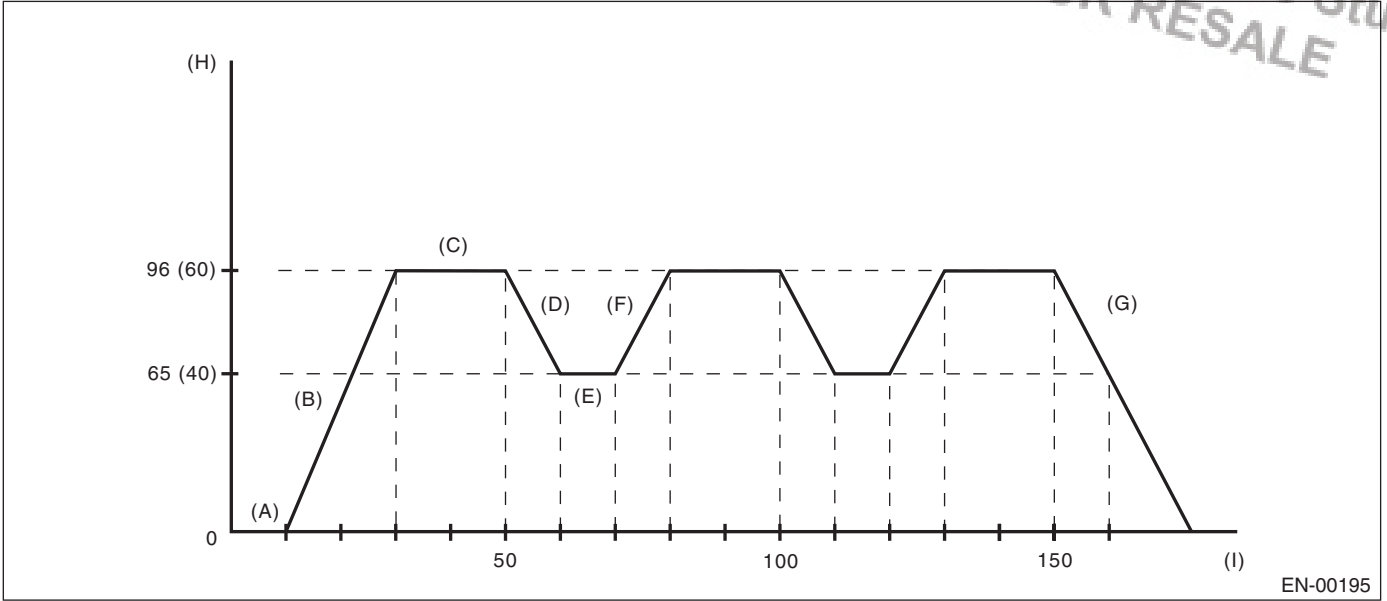
3. DRIVE CYCLE B — 10 MINUTES IDLING

NOTE:

Drive the vehicle at 10 km/h (6 MPH) or faster before diagnosis.

DTC	Item	Condition
*P0126	Insufficient Engine Coolant Temperature for Stable Operation	—
*P0171	System Too Lean (Bank 1)	Diagnosis completes in drive cycle A or C as well.
*P0172	System Too Rich (Bank 1)	Diagnosis completes in drive cycle A or C as well.
*P0301	Cylinder 1 Misfire Detected	Diagnosis completes in drive cycle A or C as well.
*P0302	Cylinder 2 Misfire Detected	Diagnosis completes in drive cycle A or C as well.
*P0303	Cylinder 3 Misfire Detected	Diagnosis completes in drive cycle A or C as well.
*P0304	Cylinder 4 Misfire Detected	Diagnosis completes in drive cycle A or C as well.
*P0464	Fuel Level Sensor Circuit Intermittent	—
*P0483	Fan Rationality Check	—
*P0506	Idle Air Control System RPM Lower Than Expected	—
*P0507	Idle Air Control System RPM Higher Than Expected	—
*P2096	Post Catalyst Fuel Trim System Too Lean Bank 1	Diagnosis completes in drive cycle A or C as well.
*P2097	Post Catalyst Fuel Trim System Too Rich Bank 1	Diagnosis completes in drive cycle A or C as well.
P2103	Throttle Actuator Control Motor Circuit High	Diagnosis completes in drive cycle A or C as well.

4. DRIVE CYCLE C — DRIVE THE VEHICLE WITH FOLLOWING DRIVE PATTERNS



- | | | |
|--|---|--|
| (A) Idle the engine for 1 minute. | (E) Drive the vehicle at 65 km/h (40 MPH) for 10 seconds. | (G) Stop vehicle with the throttle fully closed. |
| (B) Accelerate the vehicle to 96 km/h (60 MPH) within 20 seconds. | (F) Accelerate the vehicle to 96 km/h (60 MPH) within 10 seconds. | (H) Vehicle speed km/h (MPH) |
| (C) Drive the vehicle at 96 km/h (60 MPH) for 20 seconds. | | (I) Sec. |
| (D) Decelerate the vehicle to 65 km/h (40 MPH) with throttle fully closed. | | |

DTC	Item	Condition
*P0026	Intake Valve Control Solenoid Circuit Range/Performance (Bank 1)	—
*P0028	Intake Valve Control Solenoid Circuit Range/Performance (Bank 2)	—
*P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	—
*P0068	MAP/MAF - Throttle Position Correlation	—
*P0076	Intake Valve Control Solenoid Circuit Low (Bank 1)	—
*P0082	Intake Valve Control Solenoid Circuit Low (Bank 2)	—
*P0101	Mass or Volume Air Flow Circuit Range/Performance	—
P0134	O ₂ Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	—
*P0139	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 2)	—
*P0171	System Too Lean (Bank 1)	Diagnosis completes in drive cycle A or B as well.
*P0172	System Too Rich (Bank 1)	Diagnosis completes in drive cycle A or B as well.
*P0301	Cylinder 1 Misfire Detected	Diagnosis completes in drive cycle A or B as well.
*P0302	Cylinder 2 Misfire Detected	Diagnosis completes in drive cycle A or B as well.
*P0303	Cylinder 3 Misfire Detected	Diagnosis completes in drive cycle A or B as well.
*P0304	Cylinder 4 Misfire Detected	Diagnosis completes in drive cycle A or B as well.
*P0400	Exhaust Gas Recirculation Flow	—
P1492	EGR Solenoid Valve Signal #1 Circuit Malfunction (Low Input)	—
P1493	EGR Solenoid Valve Signal #1 Circuit Malfunction (High Input)	—
P1494	EGR Solenoid Valve Signal #2 Circuit Malfunction (Low Input)	—
P1495	EGR Solenoid Valve Signal #2 Circuit Malfunction (High Input)	—
P1496	EGR Solenoid Valve Signal #3 Circuit Malfunction (Low Input)	—
P1497	EGR Solenoid Valve Signal #3 Circuit Malfunction (High Input)	—
P1498	EGR Solenoid Valve Signal #4 Circuit Malfunction (Low Input)	—
P1499	EGR Solenoid Valve Signal #4 Circuit Malfunction (High Input)	—
*P2096	Post Catalyst Fuel Trim System Too Lean Bank 1	Diagnosis completes in drive cycle A or B as well.
*P2097	Post Catalyst Fuel Trim System Too Rich Bank 1	Diagnosis completes in drive cycle A or B as well.
P2103	Throttle Actuator Control Motor Circuit High	Diagnosis completes in drive cycle A or B as well.

5. DRIVE CYCLE D

DRIFT DIAGNOSIS

- 1) Check that the engine coolant temperature at engine start is less than 30°C (86°F).
- 2) Make sure that fuel remains 9.0 ℓ (2.4 US gal, 2.0 Imp gal) or more and the battery voltage is 10.9 V or more.
- 3) Start the engine, and check that the engine coolant temperature increases by 10°C (50°F) or more, and reaches 75°C (167°F) or more, when the engine is warmed up.
- 4) Idle the engine for 120 seconds or more in the condition of step 3.

STUCK DIAGNOSIS

- 1) Make sure that the battery voltage is 10.9 V or more.
- 2) Perform the Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>
- 3) Drive the vehicle for the distance equal to the fuel of 50 ℓ (13.2 US gal, 11 Imp gal).

NOTE:

- It is acceptable to drive the vehicle intermittently.
- Do not disconnect the battery terminals while diagnosing. (Data will be cleared by disconnecting the battery terminals.)

DTC	Item	Condition
P0181	Fuel Temperature Sensor "A" Circuit Range/Performance	—

6. DRIVE CYCLE E

- 1) Make sure that the battery voltage is 10.9 V or more.
- 2) Perform the Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>
- 3) Drive the vehicle for the distance equal to the fuel of 30 ℓ (7.9 US gal, 6.6 Imp gal).

NOTE:

- It is acceptable to drive the vehicle intermittently.
- Do not disconnect the battery terminals while diagnosing. (Data will be cleared by disconnecting the battery terminals.)

DTC	Item	Condition
P0461	Fuel Level Sensor "A" Circuit Range/Performance	—

7. DRIVE CYCLE F

- 1) Check that the engine coolant temperature at engine start is less than 30°C (86°F).
- 2) Start the engine, and warm it up until engine coolant temperature increases over 95°C (203°F).
- 3) After the engine has reached the state of procedure 2), idle the engine for 10 minutes or more.

NOTE:

Do not disconnect the battery terminals while diagnosing. (Data will be cleared by disconnecting the battery terminals.)

DTC	Item	Condition
P0111	Intake Air Temperature Sensor 1 Circuit Range/Performance	—

8. DRIVE CYCLE H

- 1) Perform the Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.>
- 2) With the ignition switch ON, read the engine coolant temperature, intake air temperature and fuel temperature. <Ref. to EN(H4SO)(diag)-33, READ CURRENT DATA FOR ENGINE (NORMAL MODE), OPERATION, Subaru Select Monitor.>
- 3) If the values from step 2) satisfy the following two conditions, start the engine.

Condition:

$$|\text{Engine coolant temperature} - \text{intake air temperature}| \leq 5^{\circ}\text{C} (41^{\circ}\text{F})$$

$$|\text{Engine coolant temperature} - \text{fuel temperature}| \leq 2^{\circ}\text{C} (36^{\circ}\text{F})$$

NOTE:

- If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.
 - Start AT vehicles in the P range, and MT vehicles in the N position.
- 4) Idle the engine for 1 minute under the conditions in step 3).

DTC	Item	Condition
*P1602	Control Module Programming Error	—

13. Clear Memory Mode

A: OPERATION

1. SUBARU SELECT MONITOR (NORMAL MODE)

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

NOTE:

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

2. SUBARU SELECT MONITOR (OBD MODE)

- 1) On the «Main Menu» display screen, select {Each System Check}.
- 2) On the «System Selection Menu» display screen, select {Engine Control System}.
- 3) Select the [OK] after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select {OBD System}.
- 5) On the «OBD Menu» display screen, select {DTC Clear}.
- 6) When the “Clear Diagnostic Code?” is shown on the screen, select the [OK].
- 7) Turn the ignition switch to OFF and then close the Subaru Select Monitor.

NOTE:

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

3. GENERAL SCAN TOOL

For clear memory procedures using the general scan tool, refer to “General Scan Tool Instruction Manual”.

After the memory has been cleared, the idle air control solenoid valve must be initialized. To do this, turn the ignition switch to the ON position. Wait for three seconds before starting the engine.

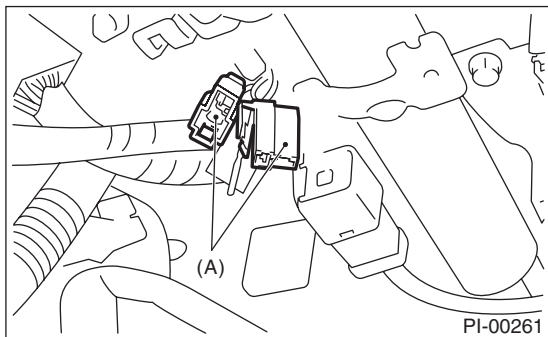
Compulsory Valve Operation Check Mode

ENGINE (DIAGNOSTICS)

14. Compulsory Valve Operation Check Mode

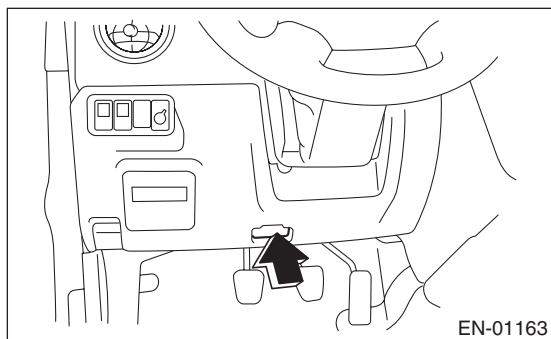
A: OPERATION

- 1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)(diag)-7, PREPARATION TOOL, General Description.>
- 2) Connect the diagnosis cable to the Subaru Select Monitor.
- 3) Connect the test mode connector (A) located in the lower portion of the instrument panel (on the driver's side).



- 4) Connect the Subaru Select Monitor to the data link connector.

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



(2) Connect the diagnosis cable to the data link connector.

CAUTION:

Do not connect anything other than the Subaru Select Monitor and general scan tool.

- 5) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
- 6) On the «Main Menu» display screen, select {Each System Check}.
- 7) On the «System Selection Menu» display screen, select {Engine Control System}.
- 8) Select the [OK] after the information of engine type has been displayed.
- 9) On the «Engine Diagnosis» display screen, select the {System Operation Check Mode}.

10) On the «System Operation Check Mode» display screen, select the {Actuator ON/OFF Operation}.

11) Select the desired compulsory actuator on the «Actuator ON/OFF Operation» display screen.

12) Select the [NO] key to complete the compulsory valve operation check mode. The display will then return to the «Actuator ON/OFF Operation» screen.

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

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

NOTE:

- The following parts will be displayed but not functional.

Display
EGR Solenoid Valve
ASV Solenoid Valve
FICD Solenoid
Pressure Switching Sol. 1
Pressure Switching Sol. 2
AAI Solenoid
Turbocharger Wastegate Solenoid
Exhaust Bypass Valve Control Permit Flag
Secondary Air Combination Valve 1

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

15. Malfunction Indicator Light

A: PROCEDURE

1. Activation of malfunction indicator light. <Ref. to EN(H4SO)(diag)-50, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.>
↓
2. Malfunction indicator light does not come on. <Ref. to EN(H4SO)(diag)-51, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
↓
3. Malfunction indicator light does not go off. <Ref. to EN(H4SO)(diag)-53, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF, Malfunction Indicator Light.>
↓
4. Malfunction indicator light does not blink. <Ref. to EN(H4SO)(diag)-54, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK, Malfunction Indicator Light.>
↓
5. Malfunction indicator light remains blinking. <Ref. to EN(H4SO)(diag)-56, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING, Malfunction Indicator Light.>

Malfunction Indicator Light

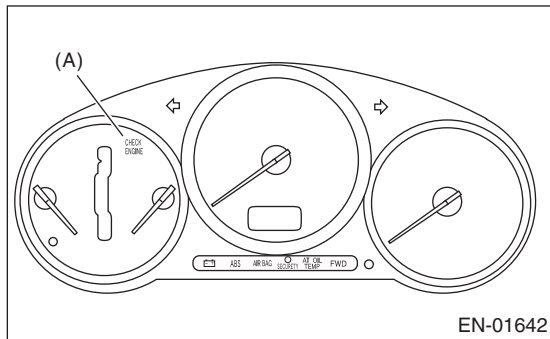
ENGINE (DIAGNOSTICS)

B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

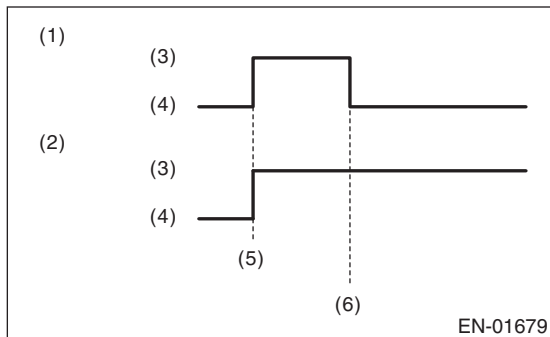
1) When the ignition switch is turned to ON (engine OFF), the malfunction indicator light (A) in the combination meter illuminates.

NOTE:

If the malfunction indicator light does not illuminate, perform diagnostics of the malfunction indicator light circuit or the combination meter circuit. <Ref. to EN(H4SO)(diag)-51, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>

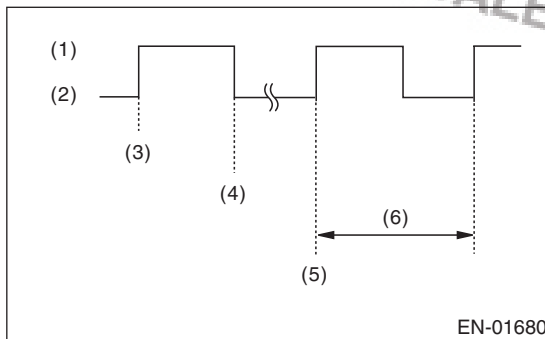


2) After starting the engine, the malfunction indicator light goes out. If it does not go off, either the engine or emission control system has malfunction.



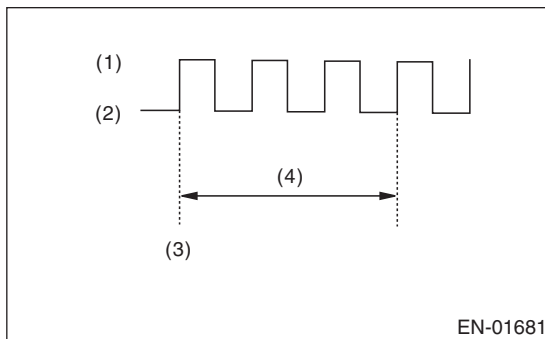
- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

3) If the diagnostic system detects a misfire which could damage the catalyst, the malfunction indicator light will blink at a cycle of 1 Hz.



- (1) ON
- (2) OFF
- (3) Ignition switch ON
- (4) Engine start
- (5) Misfire start
- (6) 1 second

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



- (1) ON
- (2) OFF
- (3) Ignition switch ON
- (4) 1 second

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

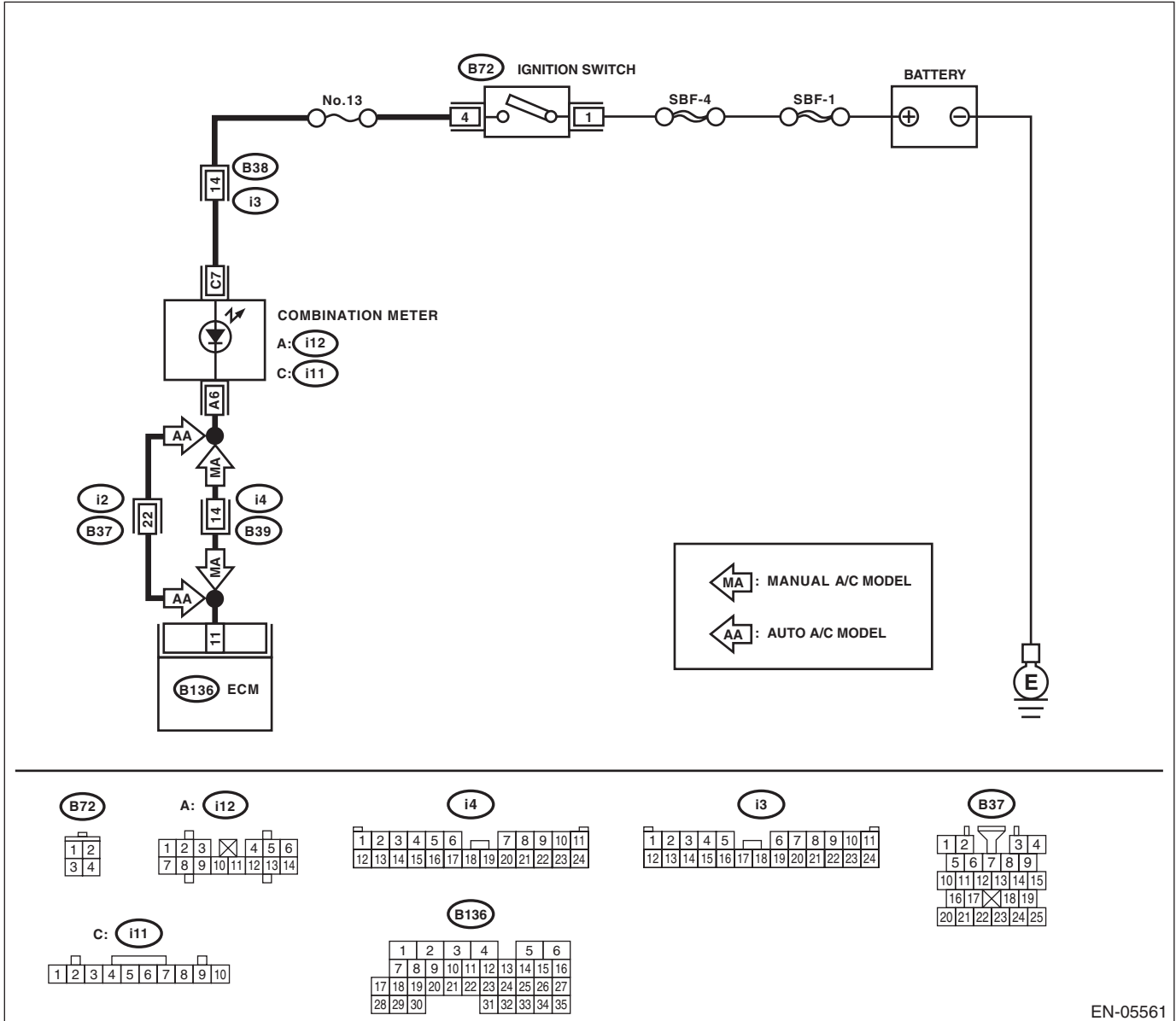
DIAGNOSIS:

The malfunction indicator light circuit is open or shorted.

TROUBLE SYMPTOM:

When the ignition switch is turned to ON (engine OFF), malfunction indicator light does not come on.

WIRING DIAGRAM:



Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <i>Connector & terminal</i> <i>(B136) No. 11 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 4.	Go to step 2.
2	CHECK POOR CONTACT. Check for poor connection by shaking or pulling ECM connector and harness.	Does the malfunction indicator light illuminate?	Repair poor contact of the ECM connector.	Go to step 3.
3	CHECK ECM CONNECTOR. Check the connection of ECM connector.	Is the ECM connector correctly connected?	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>	Repair the connection of ECM connector.
4	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Remove the combination meter. <Ref. to IDI-11, Combination Meter.> 3) Disconnect the connector from ECM and combination meter. 4) Measure the resistance of harness between ECM and combination meter connector. <i>Connector & terminal</i> <i>(B136) No. 11 — (i12) No. 6:</i>	Is the resistance less than 1 Ω ?	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and combination meter connector • Poor contact of coupling connector
5	CHECK POOR CONTACT. Check poor contact of combination meter connector.	Is there poor contact in combination meter connector?	Repair the poor contact of combination meter connector.	Go to step 6.
6	CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between combination meter connector and chassis ground. <i>Connector & terminal</i> <i>(i11) No. 7 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Replace the combination meter circuit board. <Ref. to IDI-11, Combination Meter.>	Check the following item and repair if necessary. NOTE: <ul style="list-style-type: none"> • Blown out of fuse (No. 13) • Open or short circuit of harness between fuse (No. 13) and battery terminal • Poor contact of ignition switch connector

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

D: MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

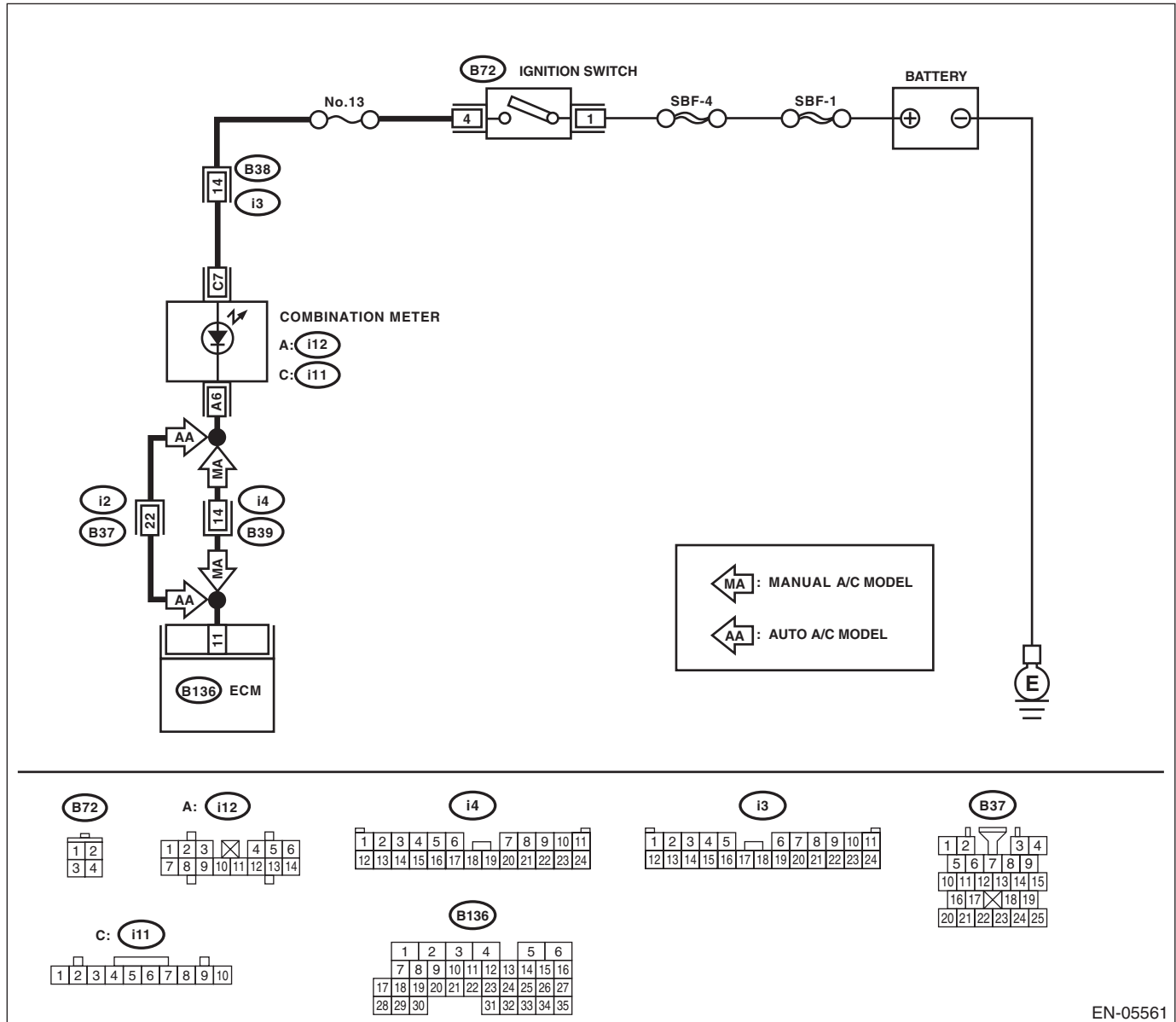
DIAGNOSIS:

The malfunction indicator light circuit is shorted.

TROUBLE SYMPTOM:

Although malfunction indicator light illuminates when the engine runs, DTC is not shown on the Subaru Select Monitor or general scan tool display.

WIRING DIAGRAM:



EN-05561

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Turn the ignition switch to ON.	Does the malfunction indicator light illuminate?	Repair the short circuit of harness between combination meter and ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK

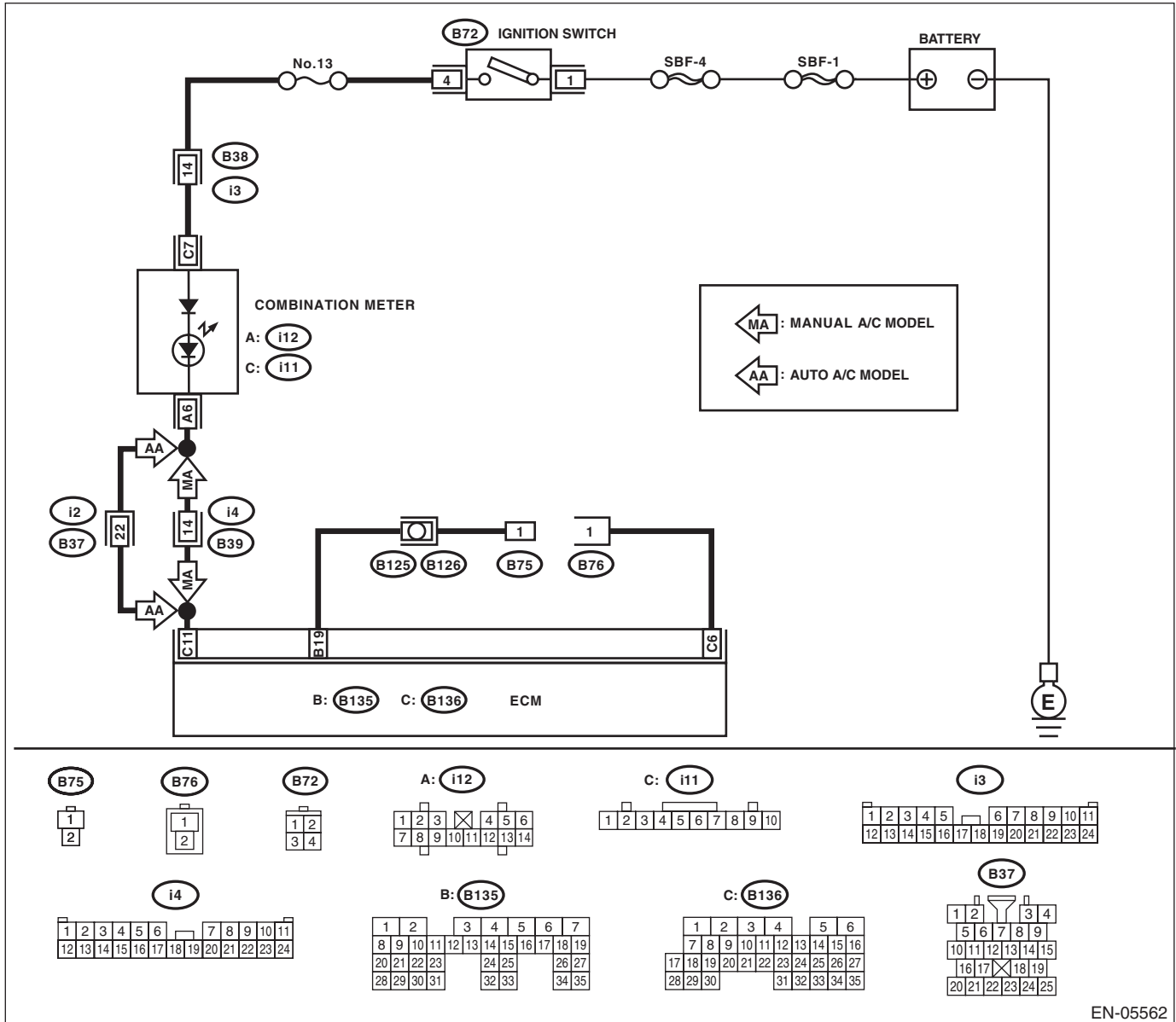
DIAGNOSIS:

- The malfunction indicator light circuit is open or shorted.
- Test mode connector circuit is open.

TROUBLE SYMPTOM:

During the Inspection Mode, the engine malfunction indicator light does not blink at a cycle of 3 Hz.

WIRING DIAGRAM:



EN-05562

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector. 3) Turn the ignition switch to ON. (engine OFF)	Does the malfunction indicator light illuminate?	Go to step 2.	Repair the malfunction indicator light circuit. <Ref. to EN(H4SO)(diag)-51, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
2 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Turn the ignition switch to ON.	Does the malfunction indicator light illuminate?	Repair the short circuit of harness between combination meter and ECM connector.	Go to step 3.
3 CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between test mode connector and ECM. <i>Connector & terminal (B76) No. 1 — (B136) No. 6:</i>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of harness between test mode connector and ECM.
4 CHECK POOR CONTACT. Check for poor contact of the ECM connector.	Is there poor contact in ECM connector?	Repair poor contact of the ECM connector.	Go to step 5.
5 CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR. Measure the resistance of harness between ECM and test mode connector. <i>Connector & terminal (B135) No. 19 — (B75) No. 1:</i>	Is the resistance less than 1 Ω?	Go to step 6.	Repair the open circuit of harness between ECM and test mode connector.
6 CHECK POOR CONTACT. Check for poor contact of the ECM connector.	Is there poor contact in ECM connector?	Repair poor contact of the ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

F: MALFUNCTION INDICATOR LIGHT REMAINS BLINKING

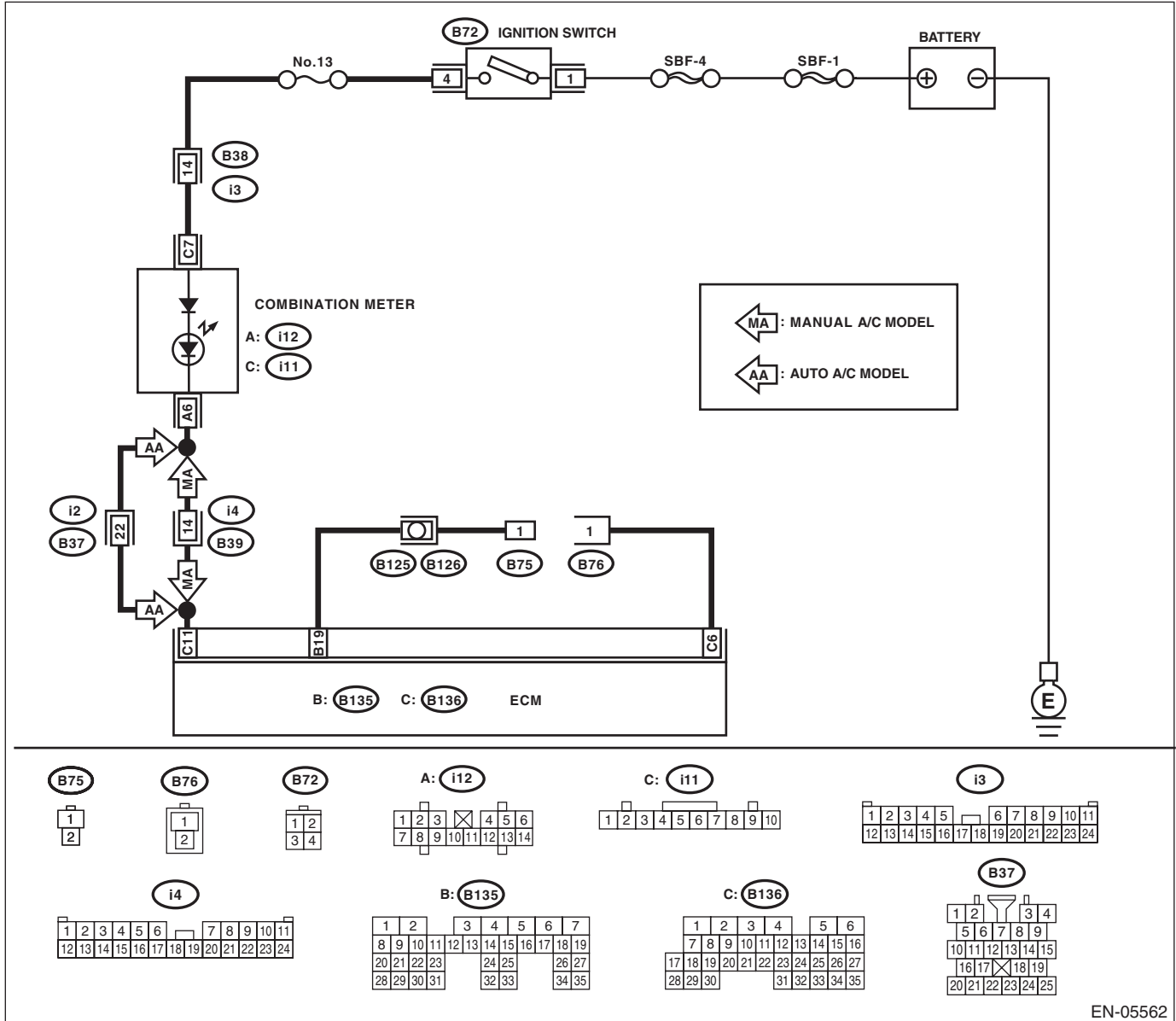
DIAGNOSIS:

Test mode connector circuit is shorted.

TROUBLE SYMPTOM:

When the ignition switch is turned to ON, malfunction indicator light blinks at a cycle of 3 Hz.

WIRING DIAGRAM:



Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1 CHECK TEST MODE CONNECTOR. 1) Disconnect the test mode connector. 2) Turn the ignition switch to ON.	Does the malfunction indicator light blink?	Go to step 2.	System is normal. NOTE: Malfunction indicator light blinks at a cycle of 3 Hz when test mode connector is connected.	
2 CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUND TERMINAL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. Connector & terminal (B135) No. 19 — Chassis ground:	Is the resistance less than 5 Ω?	Repair the short circuit of harness between ECM and test mode connector.	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>	

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

16. Diagnostics for Engine Starting Failure

A: PROCEDURE

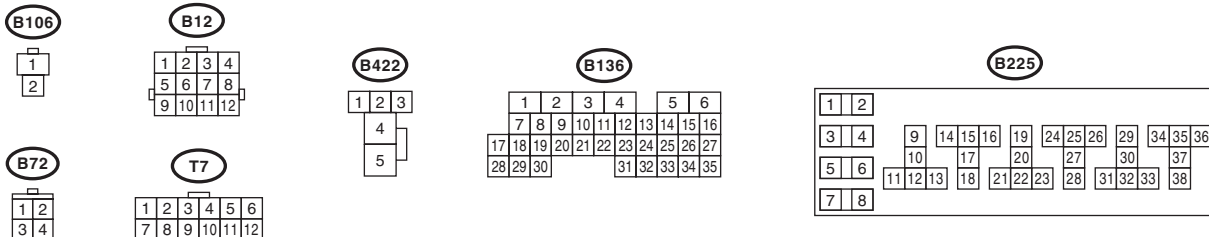
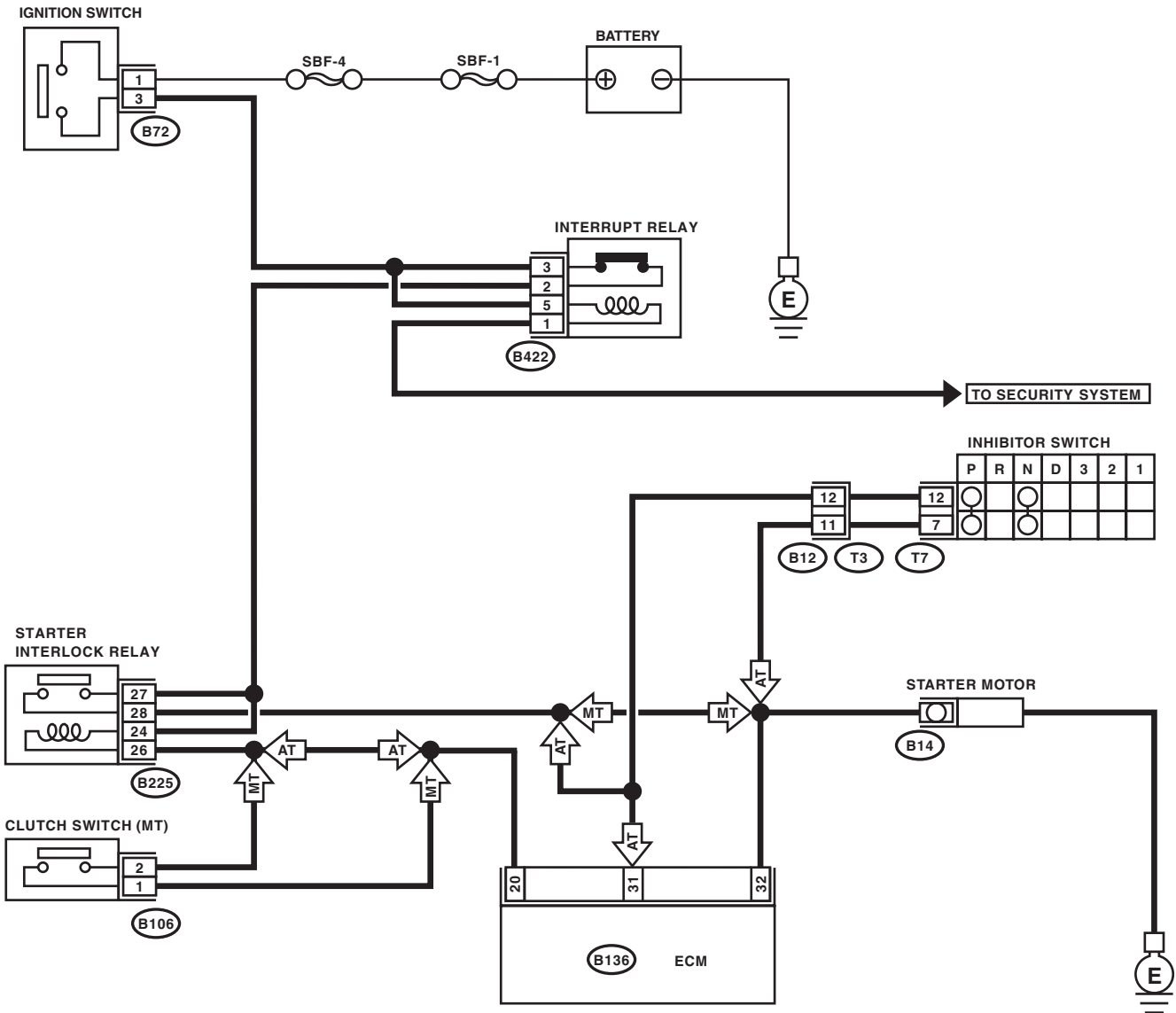
1. Check of the fuel amount
↓
2. Inspection of starter motor circuit <Ref. to EN(H4SO)(diag)-59, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ECM power supply and ground line <Ref. to EN(H4SO)(diag)-62, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>
↓
4. Inspection of ignition control system <Ref. to EN(H4SO)(diag)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel pump circuit <Ref. to EN(H4SO)(diag)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
6. Inspection of fuel indicator circuit <Ref. to EN(H4SO)(diag)-70, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

B: STARTER MOTOR CIRCUIT

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	CHECK BATTERY. Check the battery voltage.	Is the voltage 12 V or more?	Go to step 2.	Charge or replace the battery.
2	CHECK OPERATION OF STARTER MOTOR.	Does the starter motor operate?	Go to step 3.	Go to step 4.
3	CHECK DTC.	Is DTC displayed? <Ref. to EN(H4SO)(diag)-37, OPERATION, Read Diagnostic Trouble Code (DTC).>	Check the appropriate DTC using the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Repair poor contact of the ECM connector.
4	CHECK INPUT SIGNAL FOR STARTER MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter motor. 3) Turn the ignition switch to START. 4) Measure the power supply voltage between starter motor connector terminal and engine ground. Connector & terminal (B14) No. 1 (+) — Engine ground (-): NOTE: • For AT model, place the select lever in “P” or “N” range. • For MT model, depress the clutch pedal.	Is the voltage 10 V or more?	Check the starter motor. <Ref. to SC(H4SO)-8, Starter.>	Go to step 5.
5	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR. 1) Disconnect the connector from ignition switch. 2) Measure the power supply voltage between ignition switch connector and chassis ground. Connector & terminal (B72) No. 1 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 6.	Repair the open circuit of harness between ignition switch and battery, and check fuse SBF No. 4 and SBF No. 1.
6	CHECK IGNITION SWITCH. 1) Disconnect the connector from ignition switch. 2) Measure the resistance between ignition switch terminals after turning the ignition switch to START position. Terminals (B72) No. 1 — No. 3:	Is the resistance less than 5 Ω?	Go to step 7.	Replace the ignition switch.
7	CHECK INPUT VOLTAGE OF STARTER INTERLOCK RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter interlock relay. 3) Connect the connector to ignition switch. 4) Measure the input voltage between starter interlock relay connector and chassis ground after turning the ignition switch to START position. Connector & terminal (B225) No. 24 (+) — Chassis ground (-): (B225) No. 27 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 8.	Repair open or ground short circuit of harness between starter interlock relay and ignition switch. NOTE: Check the security system. (if equipped) <Ref. to SL-21, Security System.>

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK STARTER INTERLOCK RELAY. 1) Using the lead wire, connect the battery (+) to the terminal No. 24 of starter interlock relay, and the battery (-) to the terminal No. 26. 2) Measure the resistance between starter interlock relay terminals. <i>Terminals</i> <i>No. 27 — No. 28:</i>	Is the resistance less than 1 Ω ?	Go to step 9.	Replace the starter interlock relay.
9 CHECK TRANSMISSION TYPE.	Is the transmission type AT?	Go to step 10.	Go to step 13.
10 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to OFF. 2) Connect the starter interlock relay. 3) Disconnect the connectors from the ECM. 4) Measure the input voltage between ECM and chassis ground after turning the ignition switch to START position. <i>Connector & terminal</i> <i>(B136) No. 20 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Go to step 11.	Repair the open or ground short circuit of harness between ECM and starter relay.
11 CHECK INPUT VOLTAGE OF INHIBITOR SWITCH. 1) Turn the ignition switch to OFF. 2) Connect the connector to ECM. 3) Disconnect the connector from inhibitor switch. 4) Connect the connector to ignition switch. 5) Measure the input voltage between inhibitor switch connector terminal and engine ground after turning the ignition switch to START position. <i>Connector & terminal</i> <i>(B12) No. 12 (+) — Engine ground (-):</i>	Is the voltage 10 V or more?	Go to step 12.	Repair the open or ground short circuit of harness between inhibitor switch and starter interlock relay. NOTE: Check the security system. (if equipped) <Ref. to SL-21, Security System.>
12 CHECK INHIBITOR SWITCH. 1) Place the select lever in "P" or "N" range. 2) Measure the resistance between inhibitor switch terminals. <i>Connector & terminal</i> <i>(T3) No. 11 — No. 12:</i>	Is the resistance less than 1 Ω ?	Repair the open or ground short circuit of harness between inhibitor switch and starter motor.	Replace the inhibitor switch. <Ref. to 4AT-46, Inhibitor Switch.>
13 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to OFF. 2) Connect the starter interlock relay. 3) Disconnect the connectors from the ECM. 4) Measure the voltage between ECM and chassis ground with ignition switch in START depressing the clutch pedal. <i>Connector & terminal</i> <i>(B136) No. 20 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Repair the open circuit of the harness between starter interlock relay and starter motor.	Go to step 14.
14 CHECK HARNESS BETWEEN STARTER INTERLOCK RELAY AND CLUTCH SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter interlock relay and connector. 3) Measure the resistance of harness between starter interlock relay and clutch switch. <i>Connector & terminal</i> <i>(B225) No. 26 — (B106) No. 2:</i>	Is the resistance less than 1 Ω ?	Go to step 15.	Repair the open circuit of the harness between starter interlock relay and clutch switch.
15 CHECK CLUTCH SWITCH. Measure the resistance between clutch switch terminals while depressing the clutch pedal. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance less than 1 Ω ?	Repair the open circuit of harness between the ECM and clutch switch.	Replace the clutch switch. <Ref. to CL-34, Clutch Switch.>

Diagnostics for Engine Starting Failure

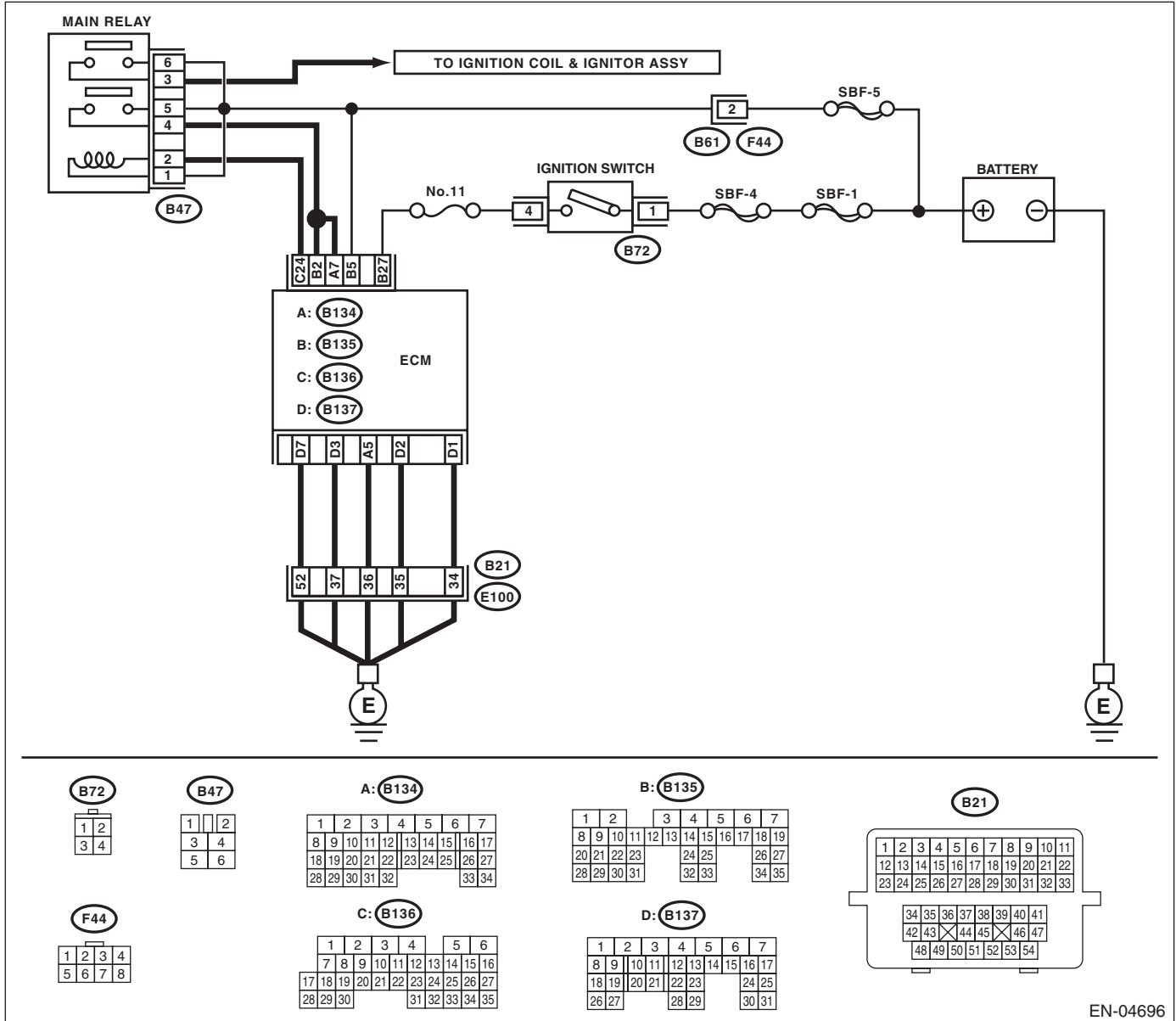
ENGINE (DIAGNOSTICS)

C: CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04696

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK MAIN RELAY. 1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Using the lead wire, connect the battery (+) to the terminal No. 1 of main relay, and the battery (-) to the terminal No. 2. 4) Measure the resistance between main relay terminals. Terminals No. 3 — No. 6: No. 4 — No. 5:	Is the resistance less than 10 Ω?	Go to step 2.	Replace the main relay.
2 CHECK GROUND CIRCUIT FOR ECM. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 3.	Repair the open circuit of harness or poor contact in the connector between ECM connector and engine grounding terminal.
3 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): (B135) No. 27 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 4.	Repair the open or ground short circuit of power supply circuit.
4 CHECK INPUT VOLTAGE OF MAIN RELAY. Measure the voltage between main relay connector and chassis ground. Connector & terminal (B47) No. 1 (+) — Chassis ground (-): (B47) No. 5 (+) — Chassis ground (-): (B47) No. 6 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 5.	Repair the open or ground short circuit of harness of power supply circuit.
5 CHECK INPUT VOLTAGE OF ECM. 1) Connect the main relay connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 2 (+) — Chassis ground (-): (B134) No. 7 (+) — Chassis ground (-): (B136) No. 24 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Check the ignition control system. <Ref. to EN(H4SO)(diag)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair the open or ground short circuit of harness between ECM connector and main relay connector.

Diagnostics for Engine Starting Failure

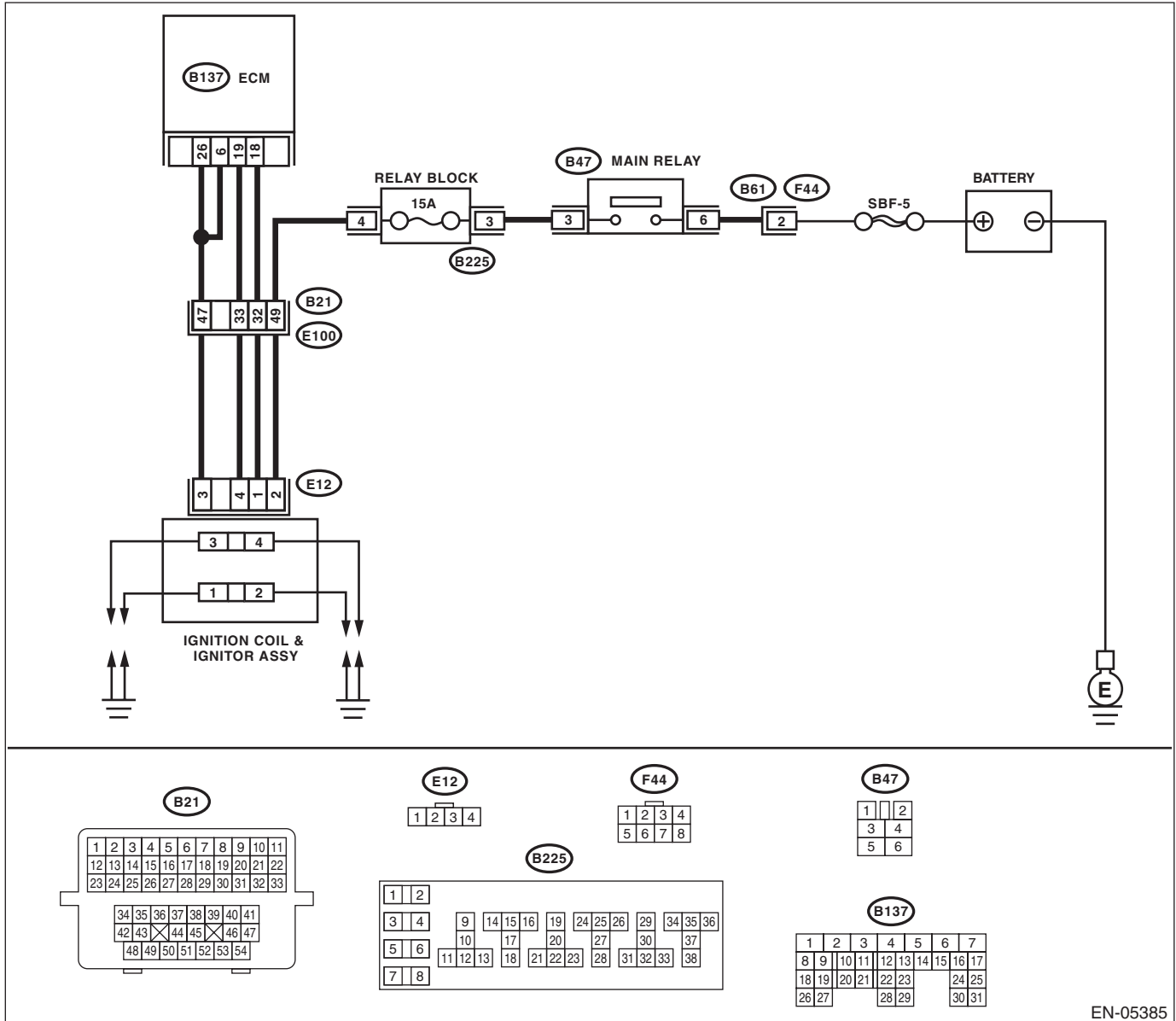
ENGINE (DIAGNOSTICS)

D: IGNITION CONTROL SYSTEM

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05385

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK IGNITION SYSTEM FOR SPARKS. 1) Remove the plug cord cap from each spark plug. 2) Install a new spark plug on plug cord cap. CAUTION: Do not remove the spark plug from engine. 3) Contact the spark plug thread portion to engine. 4) While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.	Does spark occur at each cylinder?	Check the fuel pump system. <Ref. to EN(H4SO)(diag)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 2.
2 CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL AND IGNITOR ASSEMBLY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ignition coil and ignitor assembly. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between ignition coil and ignitor assembly connector and engine ground. Connector & terminal (E12) No. 2 (+) — Engine ground (-):	Is the voltage 10 V or more?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ignition coil and ignitor assembly, and main relay connector • Poor contact of coupling connector
3 CHECK HARNESS BETWEEN ECM AND IGNITION COIL AND IGNITOR ASSEMBLY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and ignition coil and ignitor assembly connector. Connector & terminal (E12) No. 3 — (B137) No. 6: (E12) No. 3 — (B137) No. 26:	Is the resistance less than 5 Ω?	Go to step 4.	Repair the open circuit of harness between ECM and ignition coil and ignitor assembly connector.
4 CHECK IGNITION COIL AND IGNITOR ASSEMBLY. 1) Remove the spark plug cords. 2) Measure the resistance between spark plug cord contact portions to check secondary coil. Terminals No. 1 — No. 2: No. 3 — No. 4:	Is the resistance between 10 — 15 kΩ?	Go to step 5.	Replace the ignition coil and ignitor assembly. <Ref. to IG(H4SO)-6, Ignition Coil and Ignitor Assembly.>
5 CHECK INPUT SIGNAL FOR IGNITION COIL AND IGNITOR ASSEMBLY. 1) Connect the connector to the Ignition coil and ignitor assembly. 2) Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignition coil and ignitor assembly connector and engine ground. Connector & terminal (E12) No. 1 (+) — Engine ground (-): (E12) No. 4 (+) — Engine ground (-):	Does the voltage vary 10 V or more?	Go to step 6.	Replace the ignition coil and ignitor assembly. <Ref. to IG(H4SO)-6, Ignition Coil and Ignitor Assembly.>

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

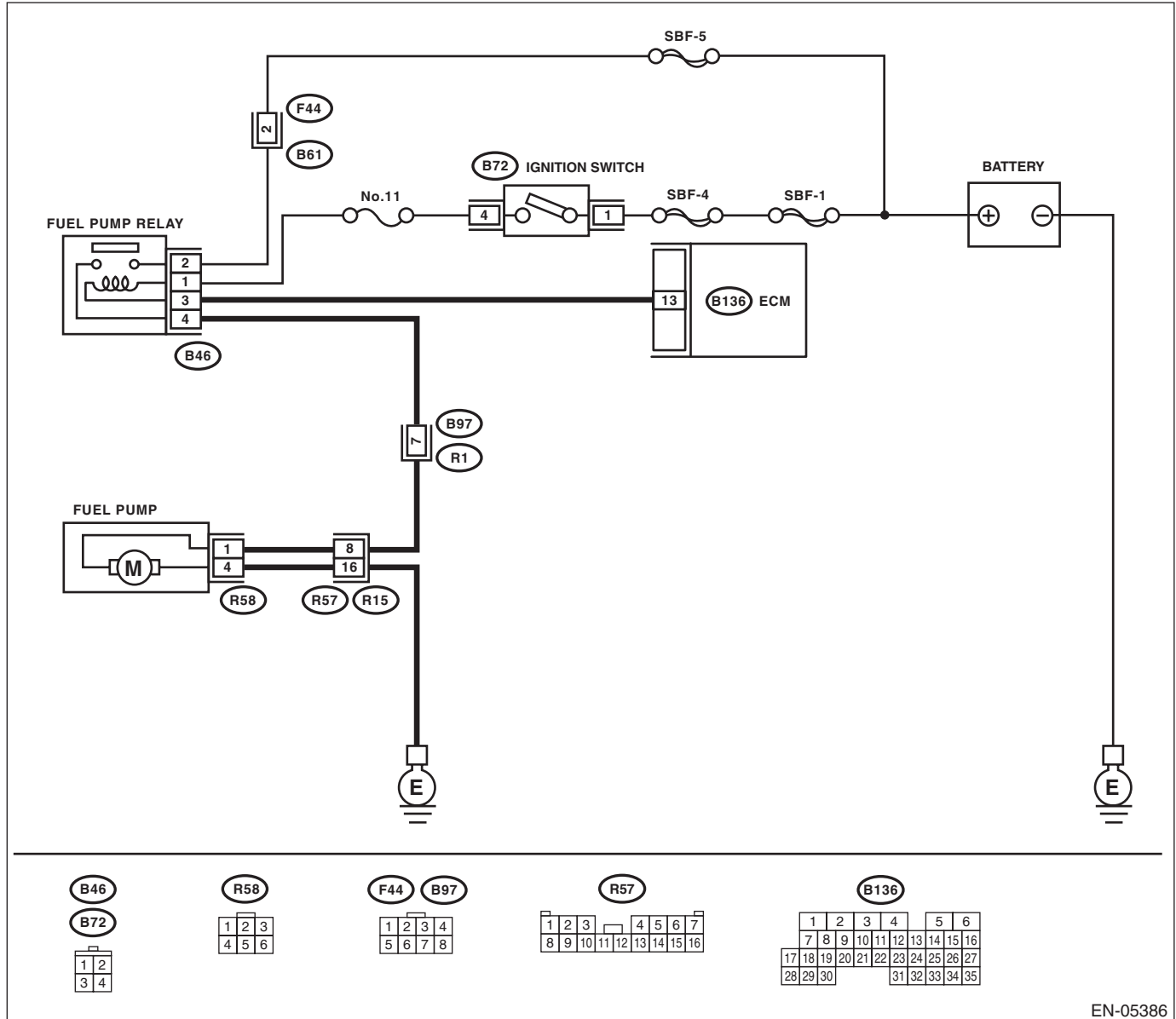
Step	Check	Yes	No
6 CHECK HARNESS BETWEEN ECM AND IGNITION COIL AND IGNITOR ASSEMBLY CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Disconnect the connector from the ignition coil and ignitor assembly. 4) Measure the resistance of harness between ECM and ignition coil and ignitor assembly connector. Connector & terminal (B137) No. 18 — (E12) No. 1: (B137) No. 19 — (E12) No. 4:	Is the resistance less than 1 Ω ?	Go to step 7.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit in harness between ECM and ignition coil and ignitor assembly connector • Poor contact of coupling connector
7 CHECK HARNESS BETWEEN ECM AND IGNITION COIL AND IGNITOR ASSEMBLY CONNECTOR. Measure the resistance of harness between ECM and engine ground. Connector & terminal: (B137) No. 18 — Engine ground: (B137) No. 19 — Engine ground:	Is the resistance 1 M Ω or more?	Go to step 8.	Repair short circuit of the harness to ground between ECM and ignition coil and ignitor assembly connector.
8 CHECK POOR CONTACT. Check for poor contact of the ECM connector.	Is there poor contact in ECM connector?	Repair poor contact of the ECM connector.	Check the fuel pump circuit. <Ref. to EN(H4SO)(diag)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>

E: FUEL PUMP CIRCUIT

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05386

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPERATING SOUND OF FUEL PUMP. Make sure that the fuel pump operates for two seconds when turning the ignition switch to ON. NOTE: Fuel pump operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the fuel pump emit operating sound?	Check the fuel injector circuit. <Ref. to EN(H4SO)(diag)-70, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 2.
2 CHECK GROUND CIRCUIT OF FUEL PUMP. 1) Turn the ignition switch to OFF. 2) Remove the fuel pump access hole lid. 3) Disconnect the connector from fuel pump. 4) Measure the resistance of harness connector between fuel pump and chassis ground. Connector & terminal (R58) No. 4 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between fuel pump connector and chassis grounding terminal • Poor contact of coupling connector
3 CHECK POWER SUPPLY TO FUEL PUMP. 1) Turn the ignition switch to ON. 2) Measure the voltage of power supply circuit between fuel pump connector and chassis ground. Connector & terminal (R58) No. 1 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Replace the fuel pump. <Ref. to FU(H4SO)-51, Fuel Pump.>	Go to step 4.
4 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness connector between fuel pump and fuel pump relay. Connector & terminal (R58) No. 1 — (B46) No. 4:	Is the resistance less than 1 Ω?	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following item: • OPEN CIRCUIT OF HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR. • Poor contact of coupling connector
5 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR. Measure the resistance of harness between fuel pump and fuel pump relay connector. Connector & terminal (R58) No. 1 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 6.	Repair the short circuit of harness between fuel pump and fuel pump relay connector.

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
6 CHECK FUEL PUMP RELAY. 1) Disconnect the connectors from fuel pump relay and main relay. 2) Remove the fuel pump relay and main relay with bracket. 3) Using the lead wire, connect the battery (+) to the terminal No. 1 of fuel pump relay, and the battery (-) to the terminal No. 3. 4) Measure the resistance between connector terminals of fuel pump relay. <i>Terminals</i> <i>No. 2 — No. 4:</i>	Is the resistance less than 10 Ω?	Go to step 7.	Replace the fuel pump relay. <Ref. to FU(H4SO)-41, Fuel Pump Relay.>
7 CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and fuel pump relay connector. <i>Connector & terminal</i> <i>(B136) No. 13 — (B46) No. 3:</i>	Is the resistance less than 1 Ω?	Go to step 8.	Repair the open circuit of harness between ECM and fuel pump relay connector.
8 CHECK POOR CONTACT. Check for poor contact of the ECM connector.	Is there poor contact in ECM connector?	Repair poor contact of the ECM connector.	Check the fuel injector circuit. <Ref. to EN(H4SO)(diag)-70, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

Diagnostics for Engine Starting Failure

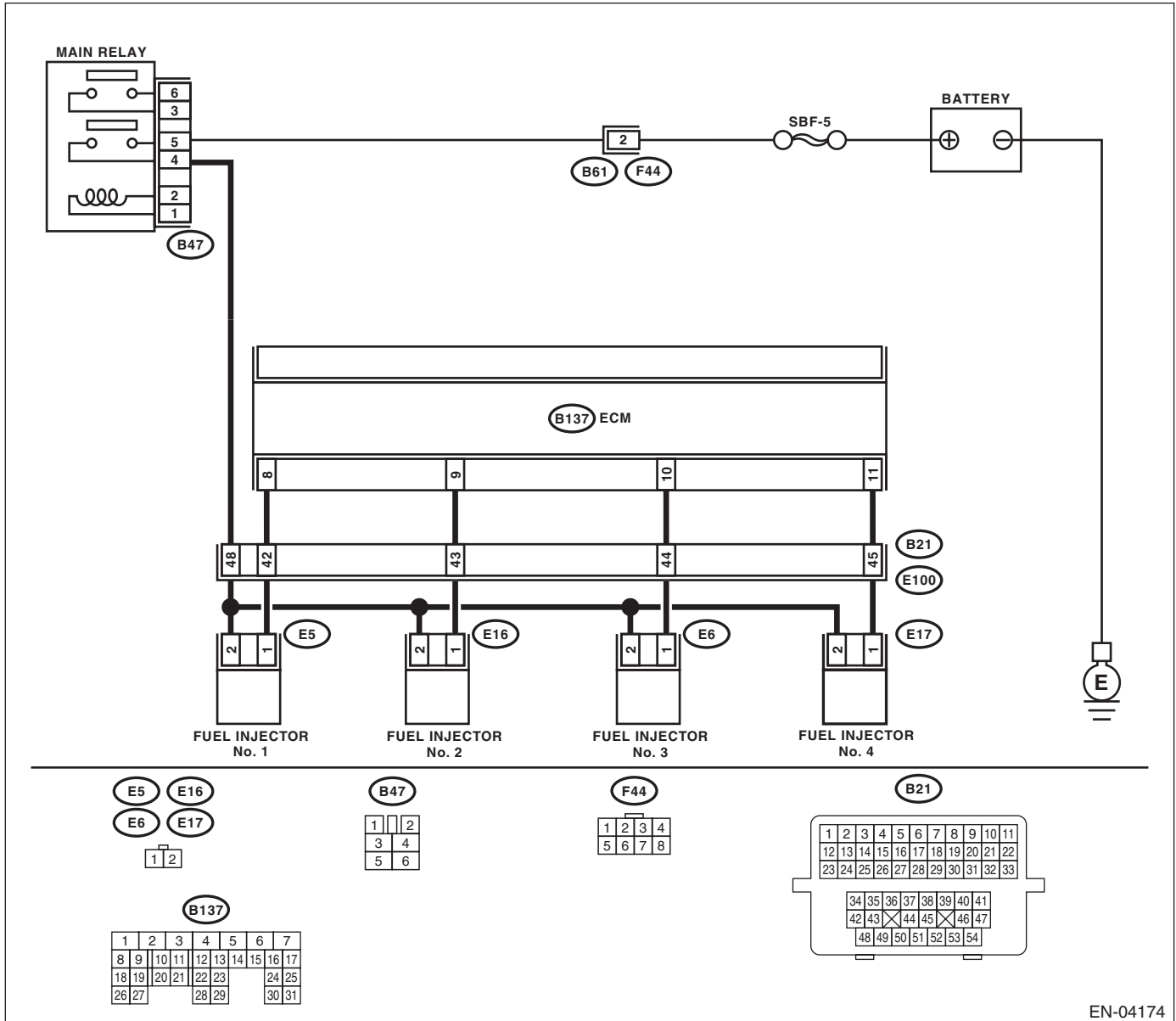
ENGINE (DIAGNOSTICS)

F: FUEL INJECTOR CIRCUIT

CAUTION:

- Check or repair only faulty parts.
- After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04174

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No	
1	<p>CHECK OPERATION OF EACH FUEL INJECTOR. While cranking the engine, check each fuel injector emits operating sound. Use a sound scope or attach a screwdriver to the injector for this check.</p>	Does the fuel injector operate?	Check the fuel pressure. <Ref. to ME(H4SO)-28, INSPECTION, Fuel Pressure.>	Go to step 2.
2	<p>CHECK POWER SUPPLY TO EACH FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between 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 (-):</p>	Is the voltage 10 V or more?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between main relay and fuel injector connector • Poor contact of main relay connector • Poor contact of coupling connector • Poor contact of fuel injector connector
3	<p>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and fuel injector connector. Connector & terminal #1 (B137) No. 8 — (E5) No. 1: #2 (B137) No. 9 — (E16) No. 1: #3 (B137) No. 10 — (E6) No. 1: #4 (B137) No. 11 — (E17) No. 1:</p>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and fuel injector connector • Poor contact of coupling connector
4	<p>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. Measure the resistance of harness between ECM and fuel injector connector. Connector & terminal #1 (B137) No. 8 — Chassis ground: #2 (B137) No. 9 — Chassis ground: #3 (B137) No. 10 — Chassis ground: #4 (B137) No. 11 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 5.	Repair short circuit of the harness to ground between ECM and fuel injector connector.
5	<p>CHECK EACH FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between each fuel injector terminals. Terminals No. 1 — No. 2:</p>	Is the resistance between 5 — 20 Ω?	Go to step 6.	Replace the faulty fuel injector.
6	<p>CHECK POOR CONTACT. Check for poor contact of the ECM connector.</p>	Is there poor contact in ECM connector?	Repair poor contact of the ECM connector.	Inspection using "General Diagnostic Table". <Ref. to EN(H4SO)(diag)-310, INSPECTION, General Diagnostic Table.>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

17. List of Diagnostic Trouble Code (DTC)

A: LIST

DTC	Item	Index
P0026	Intake Valve Control Solenoid Circuit Range/Performance (Bank 1)	<Ref. to EN(H4SO)(diag)-78, DTC P0026 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0028	Intake Valve Control Solenoid Circuit Range/Performance (Bank 2)	<Ref. to EN(H4SO)(diag)-80, DTC P0028 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-82, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0031	HO2S Heater Control Circuit Low (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-84, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0032	HO2S Heater Control Circuit High (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-86, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0037	HO2S Heater Control Circuit Low (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-88, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0038	HO2S Heater Control Circuit High (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-90, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0068	MAP/MAF - Throttle Position Correlation	<Ref. to EN(H4SO)(diag)-92, DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0076	Intake Valve Control Solenoid Circuit Low (Bank 1)	<Ref. to EN(H4SO)(diag)-94, DTC P0076 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0077	Intake Valve Control Solenoid Circuit High (Bank 1)	<Ref. to EN(H4SO)(diag)-96, DTC P0077 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0082	Intake Valve Control Solenoid Circuit Low (Bank 2)	<Ref. to EN(H4SO)(diag)-98, DTC P0082 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0083	Intake Valve Control Solenoid Circuit High (Bank 2)	<Ref. to EN(H4SO)(diag)-100, DTC P0083 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0101	Mass or Volume Air Flow Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-102, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0102	Mass or Volume Air Flow Circuit Low Input	<Ref. to EN(H4SO)(diag)-104, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0103	Mass or Volume Air Flow Circuit High Input	<Ref. to EN(H4SO)(diag)-106, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input	<Ref. to EN(H4SO)(diag)-108, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input	<Ref. to EN(H4SO)(diag)-110, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0111	Intake Air Temperature Sensor 1 Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-112, DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0112	Intake Air Temperature Sensor 1 Circuit Low	<Ref. to EN(H4SO)(diag)-114, DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0113	Intake Air Temperature Sensor 1 Circuit High	<Ref. to EN(H4SO)(diag)-116, DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0117	Engine Coolant Temperature Circuit Low	<Ref. to EN(H4SO)(diag)-118, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DTC	Item	Index
P0118	Engine Coolant Temperature Circuit High	<Ref. to EN(H4SO)(diag)-120, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low	<Ref. to EN(H4SO)(diag)-122, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High	<Ref. to EN(H4SO)(diag)-124, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0125	Insufficient Coolant Temperature for Closed Loop Fuel Control	<Ref. to EN(H4SO)(diag)-126, DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0126	Insufficient Engine Coolant Temperature for Stable Operation	<Ref. to EN(H4SO)(diag)-127, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0128	Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature)	<Ref. to EN(H4SO)(diag)-129, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0131	O ₂ Sensor Circuit Low Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-130, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0132	O ₂ Sensor Circuit High Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-132, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0133	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-134, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0134	O ₂ Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-136, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0137	O ₂ Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-138, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0138	O ₂ Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-140, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0139	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-142, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0140	O ₂ Sensor Circuit No Activity Detected (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-144, DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0171	System too Lean (Bank 1)	<Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0172	System too Rich (Bank 1)	<Ref. to EN(H4SO)(diag)-147, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0181	Fuel Temperature Sensor "A" Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-149, DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0182	Fuel Temperature Sensor "A" Circuit Low Input	<Ref. to EN(H4SO)(diag)-151, DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0183	Fuel Temperature Sensor "A" Circuit High Input	<Ref. to EN(H4SO)(diag)-153, DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0196	Engine Oil Temperature Sensor Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-155, DTC P0196 ENGINE OIL TEMPERATURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0197	Engine Oil Temperature Sensor Low	<Ref. to EN(H4SO)(diag)-157, DTC P0197 ENGINE OIL TEMPERATURE SENSOR LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0198	Engine Oil Temperature Sensor High	<Ref. to EN(H4SO)(diag)-159, DTC P0198 ENGINE OIL TEMPERATURE SENSOR HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DTC	Item	Index
P0222	Throttle/Pedal Position Sensor/Switch "B" Circuit Low	<Ref. to EN(H4SO)(diag)-161, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0223	Throttle/Pedal Position Sensor/Switch "B" Circuit High	<Ref. to EN(H4SO)(diag)-163, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0301	Cylinder 1 Misfire Detected	<Ref. to EN(H4SO)(diag)-164, DTC P0301 CYLINDER 1 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0302	Cylinder 2 Misfire Detected	<Ref. to EN(H4SO)(diag)-164, DTC P0302 CYLINDER 2 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0303	Cylinder 3 Misfire Detected	<Ref. to EN(H4SO)(diag)-164, DTC P0303 CYLINDER 3 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0304	Cylinder 4 Misfire Detected	<Ref. to EN(H4SO)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)(diag)-171, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0328	Knock Sensor 1 Circuit High (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)(diag)-173, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0335	Crankshaft Position Sensor "A" Circuit	<Ref. to EN(H4SO)(diag)-175, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0336	Crankshaft Position Sensor "A" Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-177, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)(diag)-179, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0341	Camshaft Position Sensor "A" Circuit Range/Performance (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)(diag)-181, DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0400	Exhaust Gas Recirculation Flow	<Ref. to EN(H4SO)(diag)-183, DTC P0400 EXHAUST GAS RECIRCULATION FLOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0420	Catalyst System Efficiency Below Threshold (Bank 1)	<Ref. to EN(H4SO)(diag)-185, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0442	Evaporative Emission Control System Leak Detected (Small Leak)	<Ref. to EN(H4SO)(diag)-189, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0447	Evaporative Emission Control System Vent Control Circuit Open	<Ref. to EN(H4SO)(diag)-192, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0448	Evaporative Emission Control System Vent Control Circuit Shorted	<Ref. to EN(H4SO)(diag)-194, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0451	Evaporative Emission Control System Pressure Sensor Range/Performance	<Ref. to EN(H4SO)(diag)-196, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0452	Evaporative Emission Control System Pressure Sensor Low Input	<Ref. to EN(H4SO)(diag)-198, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0453	Evaporative Emission Control System Pressure Sensor High Input	<Ref. to EN(H4SO)(diag)-200, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DTC	Item	Index
P0456	Evaporative Emission Control System Leak Detected (Very Small Leak)	<Ref. to EN(H4SO)(diag)-202, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0457	Evaporative Emission Control System Leak Detected (Fuel Cap Loose/Off)	<Ref. to EN(H4SO)(diag)-205, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0458	Evaporative Emission System Purge Control Valve Circuit Low	<Ref. to EN(H4SO)(diag)-208, DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0459	Evaporative Emission System Purge Control Valve Circuit High	<Ref. to EN(H4SO)(diag)-210, DTC P0459 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0461	Fuel Level Sensor "A" Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-212, DTC P0461 FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel Level Sensor "A" Circuit Low	<Ref. to EN(H4SO)(diag)-213, DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel Level Sensor "A" Circuit High	<Ref. to EN(H4SO)(diag)-216, DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0464	Fuel Level Sensor Circuit Intermittent	<Ref. to EN(H4SO)(diag)-219, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0483	Fan Rationality Check	<Ref. to EN(H4SO)(diag)-221, DTC P0483 FAN RATIONALITY CHECK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0502	Vehicle Speed Sensor "A" Circuit Low Input	<Ref. to EN(H4SO)(diag)-221, DTC P0502 VEHICLE SPEED SENSOR "A" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0503	Vehicle Speed Sensor "A" Intermittent/Erratic/High	<Ref. to EN(H4SO)(diag)-222, DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0506	Idle Air Control System RPM Lower Than Expected	<Ref. to EN(H4SO)(diag)-225, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0507	Idle Air Control System RPM Higher Than Expected	<Ref. to EN(H4SO)(diag)-227, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0512	Starter Request Circuit	<Ref. to EN(H4SO)(diag)-229, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0519	Idle Air Control System Performance	<Ref. to EN(H4SO)(diag)-232, DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0600	Serial Communication Link	<Ref. to EN(H4SO)(diag)-233, DTC P0600 SERIAL COMMUNICATION LINK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0604	Internal Control Module Random Access Memory (RAM) Error	<Ref. to EN(H4SO)(diag)-235, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0605	Internal Control Module Read Only Memory (ROM) Error	<Ref. to EN(H4SO)(diag)-236, DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0607	Control Module Performance	<Ref. to EN(H4SO)(diag)-237, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0638	Throttle Actuator Control Range/Performance (Bank 1)	<Ref. to EN(H4SO)(diag)-238, DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0691	Fan 1 Control Circuit Low	<Ref. to EN(H4SO)(diag)-239, DTC P0691 FAN 1 CONTROL CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0692	Fan 1 Control Circuit High	<Ref. to EN(H4SO)(diag)-239, DTC P0692 FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DTC	Item	Index
P0700	Transmission Control System (MIL Request)	<Ref. to EN(H4SO)(diag)-239, DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0851	Park/Neutral Switch Input Circuit Low (AT Model)	<Ref. to EN(H4SO)(diag)-240, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0851	Neutral Switch Input Circuit Low (MT Model)	<Ref. to EN(H4SO)(diag)-242, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0852	Park/Neutral Switch Input Circuit High (AT Model)	<Ref. to EN(H4SO)(diag)-244, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0852	Neutral Switch Input Circuit High (MT Model)	<Ref. to EN(H4SO)(diag)-246, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1152	O ₂ Sensor Circuit Range/Performance (Low) (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-248, DTC P1152 O ₂ SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1153	O ₂ Sensor Circuit Range/Performance (High) (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-250, DTC P1153 O ₂ SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1160	Return Spring Failure	<Ref. to EN(H4SO)(diag)-251, DTC P1160 RETURN SPRING FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1400	Fuel Tank Pressure Control Solenoid Valve Circuit Low	<Ref. to EN(H4SO)(diag)-252, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1420	Fuel Tank Pressure Control Sol. Valve Circuit High	<Ref. to EN(H4SO)(diag)-254, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1443	Vent Control Solenoid Valve Function Problem	<Ref. to EN(H4SO)(diag)-256, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1491	Positive Crankcase Ventilation (Blow-by) Function Problem	<Ref. to EN(H4SO)(diag)-258, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1492	EGR Solenoid Valve Signal #1 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)(diag)-260, DTC P1492 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1493	EGR Solenoid Valve Signal #1 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)(diag)-260, DTC P1493 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1494	EGR Solenoid Valve Signal #2 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)(diag)-260, DTC P1494 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1495	EGR Solenoid Valve Signal #2 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)(diag)-260, DTC P1495 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1496	EGR Solenoid Valve Signal #3 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)(diag)-260, DTC P1496 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1497	EGR Solenoid Valve Signal #3 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)(diag)-260, DTC P1497 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1498	EGR Solenoid Valve Signal #4 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)(diag)-261, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1499	EGR Solenoid Valve Signal #4 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)(diag)-264, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1518	Starter Switch Circuit Low input	<Ref. to EN(H4SO)(diag)-266, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DTC	Item	Index
P1560	Back-up Voltage Circuit Malfunction	<Ref. to EN(H4SO)(diag)-269, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1602	Control Module Programming Error	<Ref. to EN(H4SO)(diag)-271, DTC P1602 CONTROL MODULE PROGRAMMING ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2096	Post Catalyst Fuel Trim System Too Lean Bank 1	<Ref. to EN(H4SO)(diag)-279, DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2097	Post Catalyst Fuel Trim System Too Rich Bank 1	<Ref. to EN(H4SO)(diag)-280, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2101	Throttle Actuator Control Motor Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2102	Throttle Actuator Control Motor Circuit Low	<Ref. to EN(H4SO)(diag)-291, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2103	Throttle Actuator Control Motor Circuit High	<Ref. to EN(H4SO)(diag)-293, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2109	Throttle/Pedal Position Sensor "A" Minimum Stop Performance	<Ref. to EN(H4SO)(diag)-294, DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2122	Throttle/Pedal Position Sensor/Switch "D" Circuit Low Input	<Ref. to EN(H4SO)(diag)-295, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2123	Throttle/Pedal Position Sensor/Switch "D" Circuit High Input	<Ref. to EN(H4SO)(diag)-297, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2127	Throttle/Pedal Position Sensor/Switch "E" Circuit Low Input	<Ref. to EN(H4SO)(diag)-299, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2128	Throttle/Pedal Position Sensor/Switch "E" Circuit High Input	<Ref. to EN(H4SO)(diag)-301, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2135	Throttle/Pedal Position Sensor/Switch "A"/"B" Voltage Correlation	<Ref. to EN(H4SO)(diag)-303, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2138	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Correlation	<Ref. to EN(H4SO)(diag)-306, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2227	Barometric Pressure Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-308, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2228	Barometric Pressure Circuit Low	<Ref. to EN(H4SO)(diag)-308, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2229	Barometric Pressure Circuit High	<Ref. to EN(H4SO)(diag)-309, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

18. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

A: DTC P0026 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 1)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-8, DTC P0026 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

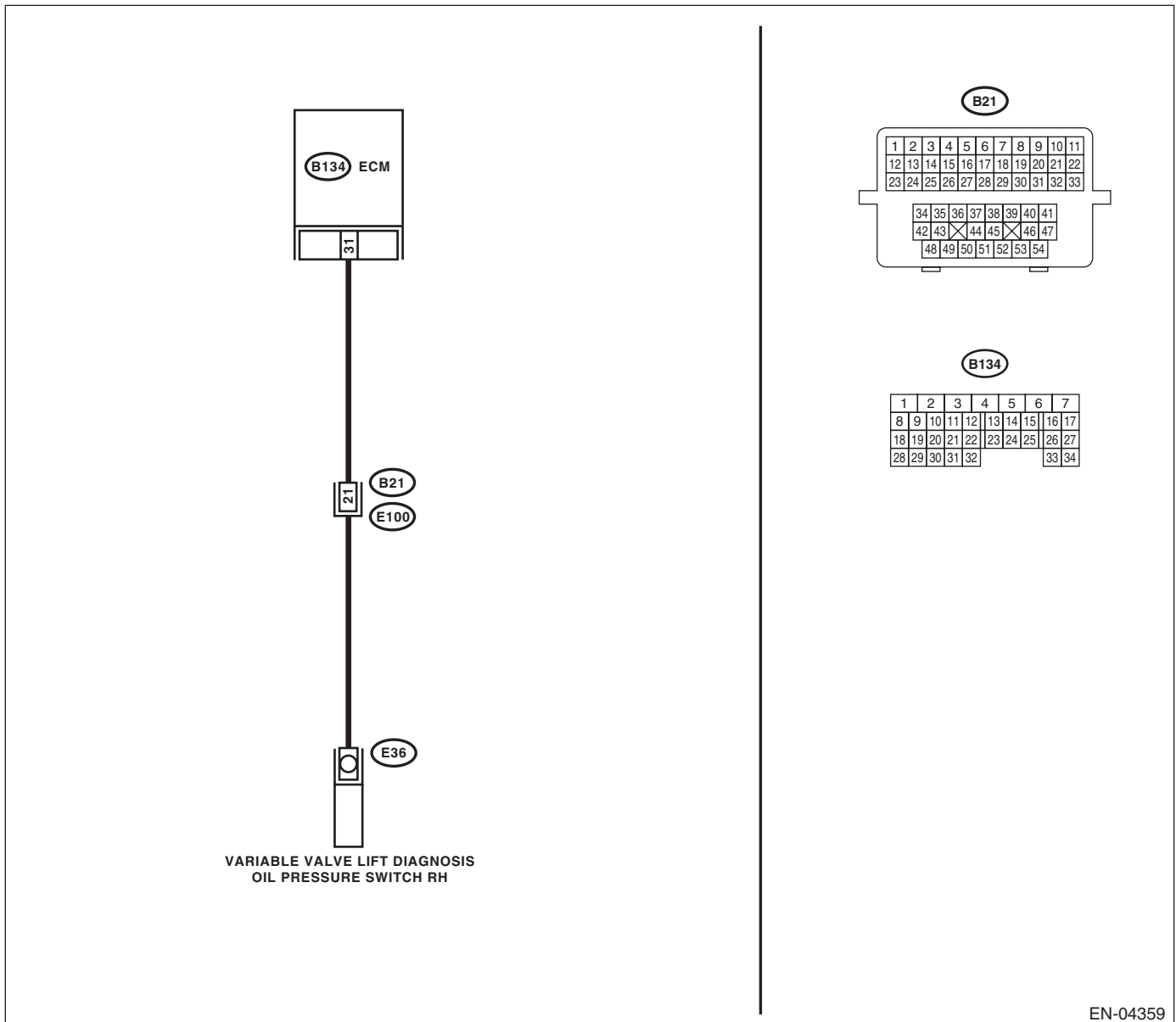
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04359

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH.</p> <p>1) Warm-up the engine. 2) Turn the ignition switch to OFF. 3) Disconnect the connectors from the ECM and variable valve lift diagnosis oil pressure switch. 4) Measure the resistance of harness between ECM and variable valve lift diagnosis oil pressure switch connector.</p> <p>Connector & terminal (B134) No. 31 — (E36) No. 1:</p>	Is the resistance less than 1 Ω?	Go to step 2.	Repair the open circuit of harness between ECM and variable valve lift diagnosis oil pressure switch connector.
2	<p>CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH.</p> <p>Measure the resistance between the variable valve lift diagnosis oil pressure switch connector and engine ground.</p> <p>Connector & terminal (E36) No. 1 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and variable valve lift diagnosis oil pressure switch connector.
3	<p>CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between the variable valve lift diagnosis oil pressure switch connector and engine ground.</p> <p>Connector & terminal (E36) No. 1 (+) — Engine ground (-):</p>	Is the voltage 10 V or more?	Repair the short circuit to power of the harness between the ECM and variable valve lift diagnosis oil pressure switch connector.	Go to step 4.
4	<p>CHECK DTC.</p> <p>1) Perform the Clear Memory Mode. 2) After idling the engine, check the DTC.</p> <p>NOTE: For detailed procedures, refer to Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.></p>	Is DTC displayed?	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-88, Oil Switching Solenoid Valve.> Go to step 5.	END.
5	<p>CHECK DTC.</p> <p>1) Perform the Clear Memory Mode. 2) After idling the engine, check the DTC.</p> <p>NOTE: For detailed procedures, refer to Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.></p>	Is DTC displayed?	Check for oil routing.	END.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

B: DTC P0028 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 2)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-9, DTC P0028 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

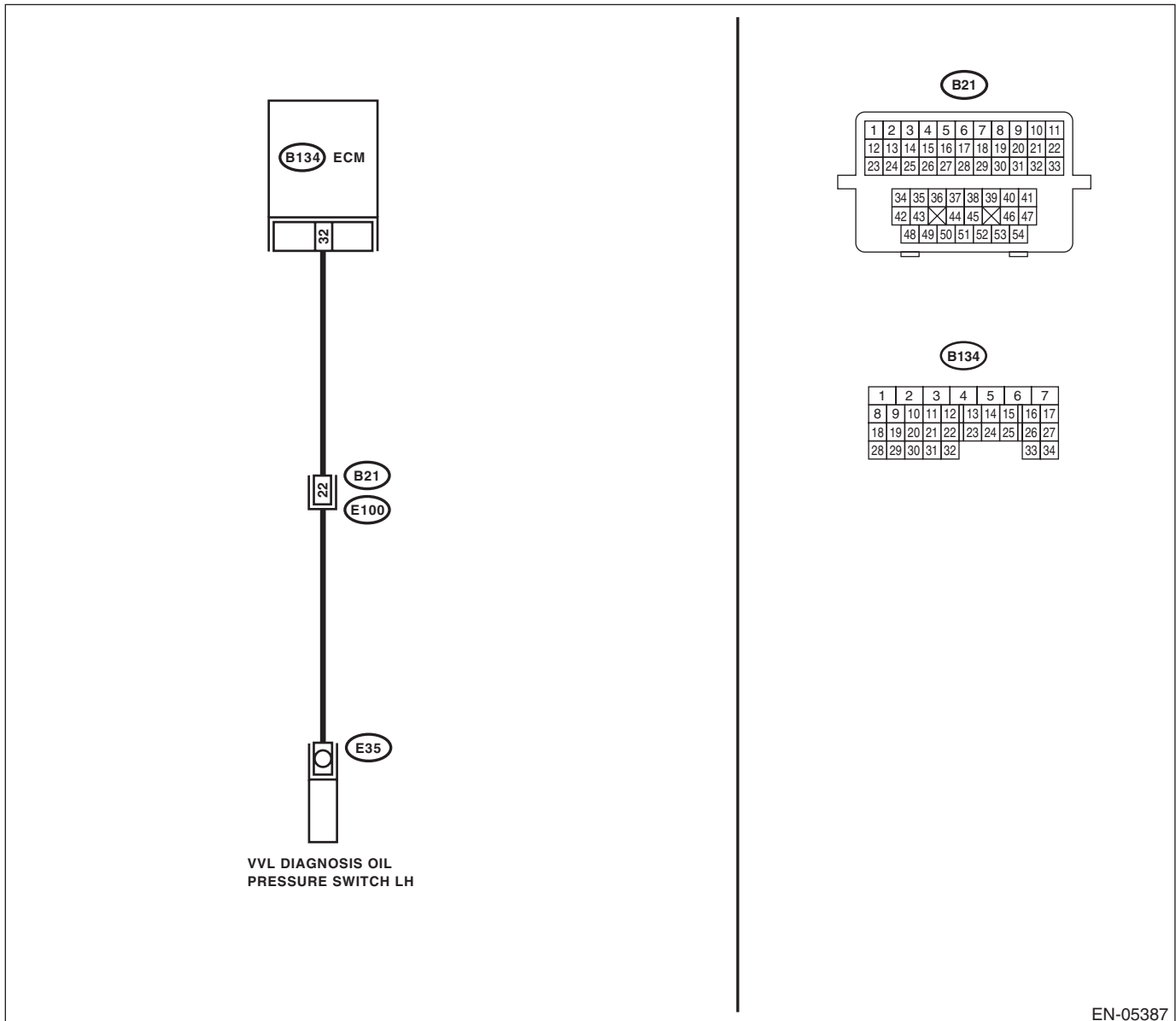
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH.</p> <p>1) Warm-up the engine. 2) Turn the ignition switch to OFF. 3) Disconnect the connectors from the ECM and variable valve lift diagnosis oil pressure switch. 4) Measure the resistance of harness between ECM and variable valve lift diagnosis oil pressure switch connector.</p> <p>Connector & terminal (B134) No. 32 — (E35) No. 1:</p>	Is the resistance less than 1 Ω?	Go to step 2.	Repair the open circuit of harness between ECM and variable valve lift diagnosis oil pressure switch connector.
2	<p>CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH.</p> <p>Measure the resistance between the variable valve lift diagnosis oil pressure switch connector and engine ground.</p> <p>Connector & terminal (E35) No. 1 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and variable valve lift diagnosis oil pressure switch connector.
3	<p>CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between the variable valve lift diagnosis oil pressure switch connector and engine ground.</p> <p>Connector & terminal (E35) No. 1 (+) — Engine ground (-):</p>	Is the voltage 10 V or more?	Repair the short circuit to power of the harness between the ECM and variable valve lift diagnosis oil pressure switch connector.	Go to step 4.
4	<p>CHECK DTC.</p> <p>1) Perform the Clear Memory Mode. 2) After idling the engine, check the DTC.</p> <p>NOTE: For detailed procedures, refer to Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.></p>	Is DTC displayed?	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-88, Oil Switching Solenoid Valve.> Go to step 5.	END.
5	<p>CHECK DTC.</p> <p>1) Perform the Clear Memory Mode. 2) After idling the engine, check the DTC.</p> <p>NOTE: For detailed procedures, refer to Clear Memory Mode. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.></p>	Is DTC displayed?	Check for oil routing.	END.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

C: DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1)

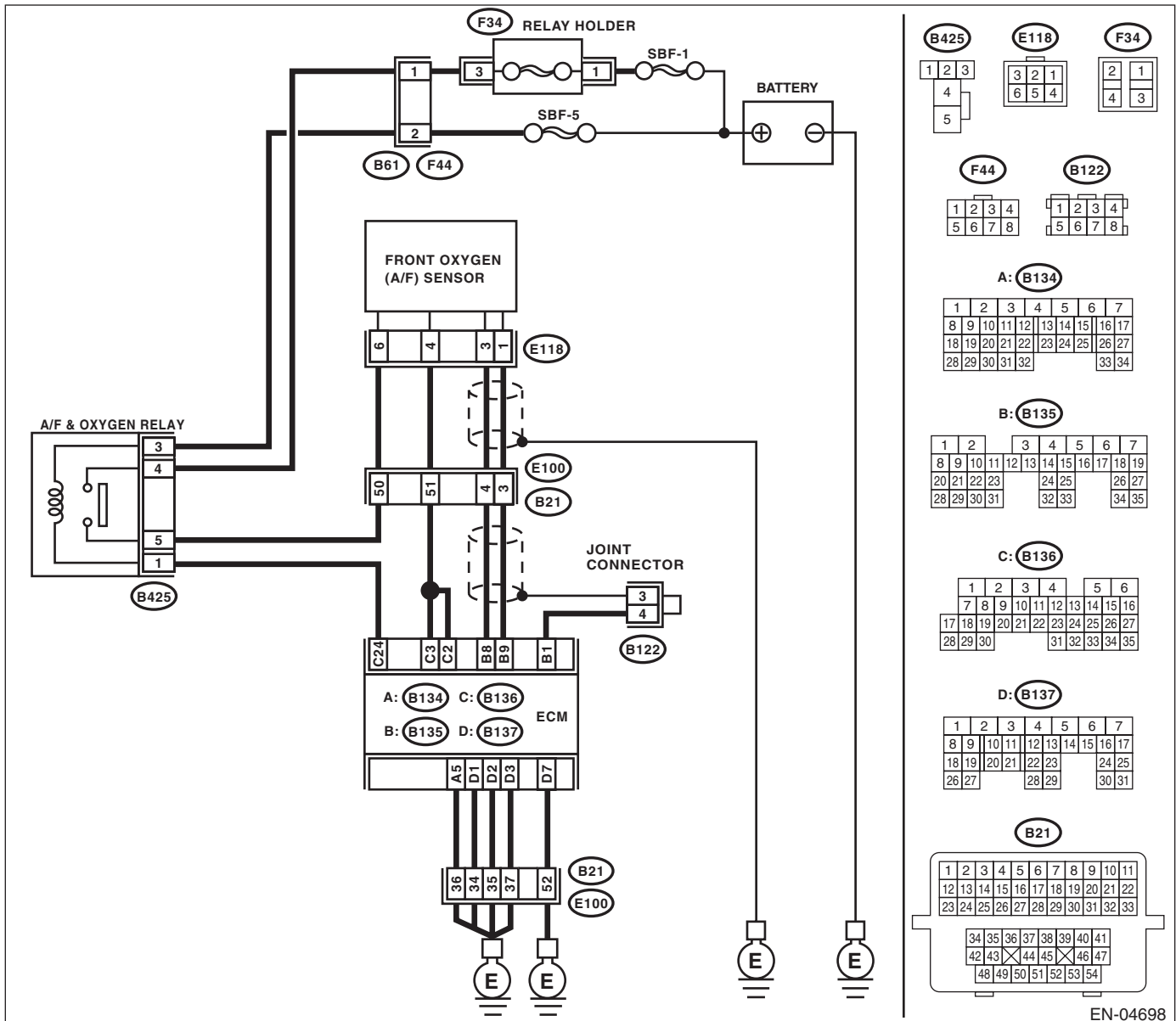
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-10, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</p> <p>1) Start and warm-up the engine. 2) Turn the ignition switch to OFF. 3) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 4) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p>Connector & terminal (B136) No. 2 — (E118) No. 4: (B136) No. 3 — (E118) No. 4:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector.</p>
<p>2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</p> <p>Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p>Connector & terminal (B135) No. 9 — (E118) No. 1: (B135) No. 8 — (E118) No. 3:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 3.</p>	<p>Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector.</p>
<p>3 CHECK FRONT OXYGEN (A/F) SENSOR.</p> <p>Measure the resistance between front oxygen (A/F) sensor connector terminals.</p> <p>Terminals No. 6 — No. 4:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Go to step 4.</p>	<p>Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.></p>
<p>4 CHECK POOR CONTACT.</p> <p>Check poor contact of ECM and front oxygen (A/F) sensor connector.</p>	<p>Is there poor contact in ECM or front oxygen (A/F) sensor connector?</p>	<p>Repair the poor contact of ECM or front oxygen (A/F) sensor connector.</p>	<p>Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

D: DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1)

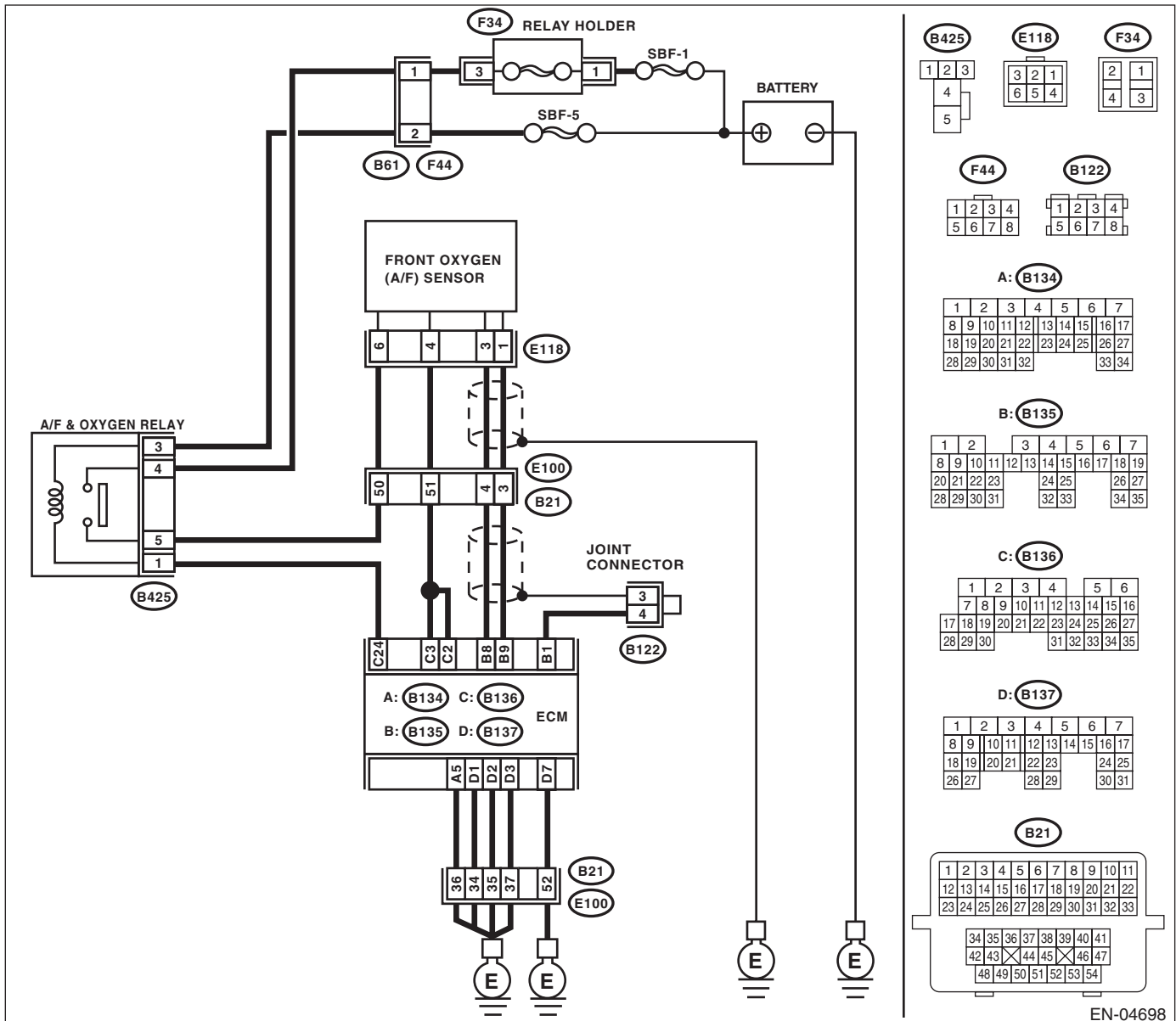
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-12, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from front oxygen (A/F) sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between front oxygen (A/F) sensor connector and engine ground. Connector & terminal (E118) No. 6 (+) — engine ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Go to step 2.</p>	<p>Repair the power supply line. NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of the harness between A/F oxygen sensor relay and front oxygen (A/F) sensor. • Poor contact in front oxygen (A/F) sensor connector • Poor contact of A/F & oxygen sensor relay connector
<p>2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B136) No. 2 — (E118) No. 4: (B136) No. 3 — (E118) No. 4:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 3.</p>	<p>Repair the open circuit of harness between ECM and front oxygen (A/F) sensor.</p>
<p>3 CHECK GROUND CIRCUIT FOR ECM. Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Go to step 4.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
<p>4 CHECK FRONT OXYGEN (A/F) SENSOR. Measure the resistance between front oxygen (A/F) sensor connector terminals. Terminals No. 6 — No. 4:</p>	<p>Is the resistance between 2 — 3 Ω?</p>	<p>Repair poor contact of the ECM connector.</p>	<p>Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

E: DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1)

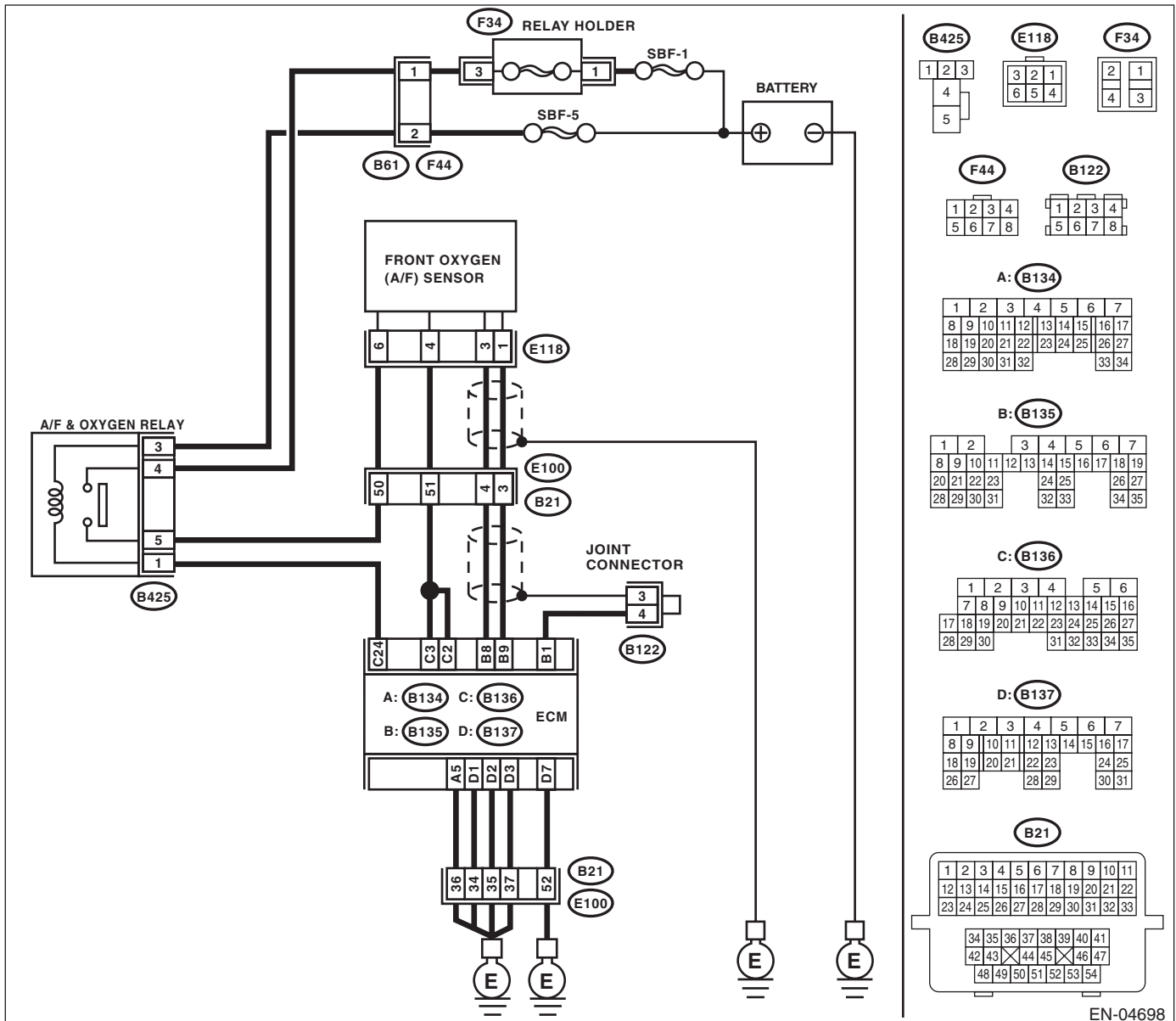
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-14, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04698

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal</p> <p>(B136) No. 2 (+) — Chassis ground (-):</p> <p>(B136) No. 3 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector.</p>	<p>Go to step 2.</p>
<p>2</p> <p>CHECK GROUND CIRCUIT FOR ECM.</p> <p>1) Disconnect the connectors from the ECM.</p> <p>2) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal</p> <p>(B134) No. 5 — Chassis ground:</p> <p>(B137) No. 1 — Chassis ground:</p> <p>(B137) No. 2 — Chassis ground:</p> <p>(B137) No. 3 — Chassis ground:</p> <p>(B137) No. 7 — Chassis ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Repair poor contact of the ECM connector.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

F: DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2)

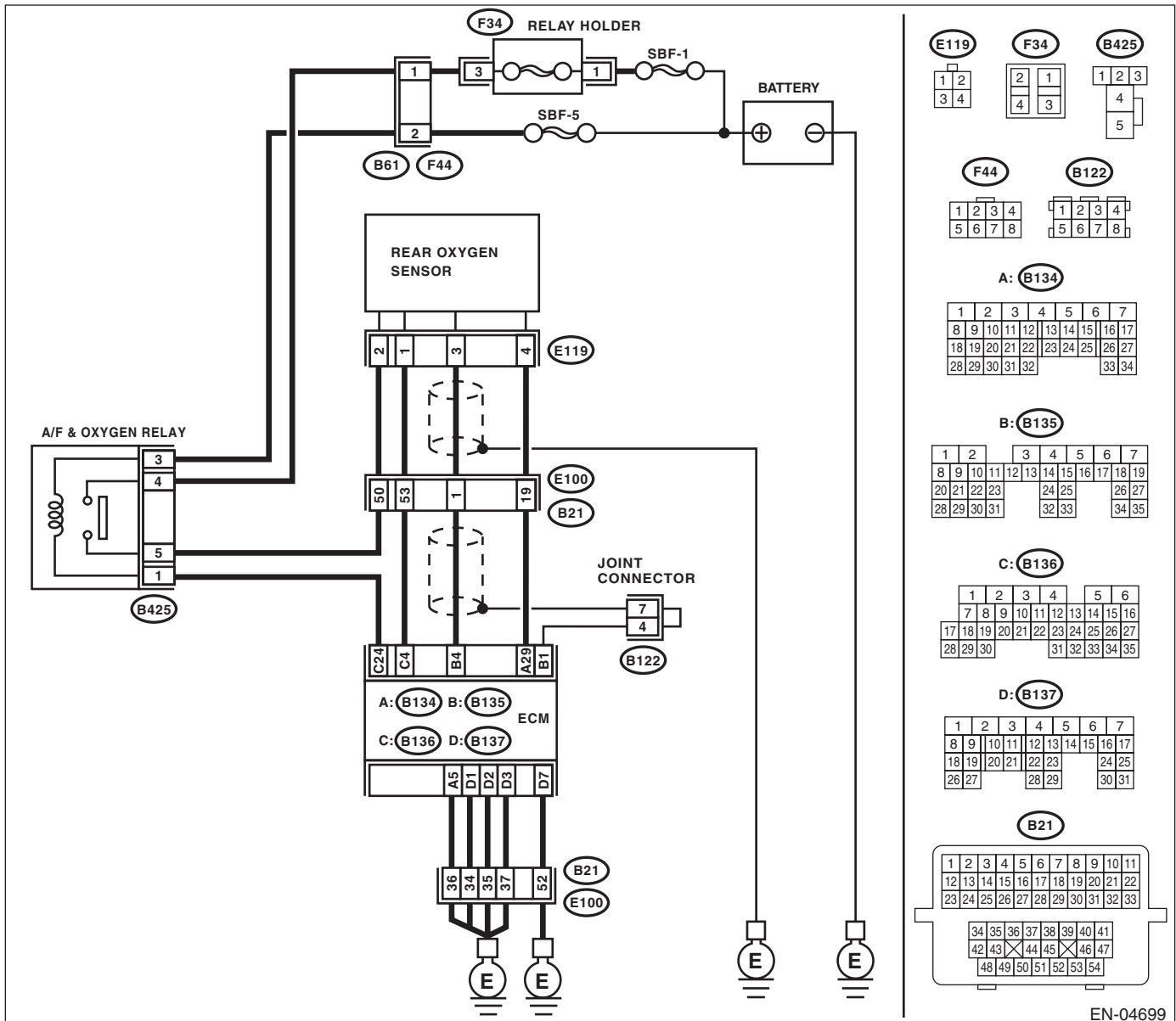
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-16, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04699

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and engine ground.</p> <p>Connector & terminal (E119) No. 2 (+) — engine ground (-):</p>	Is the voltage 10 V or more?	Go to step 2.	<p>Repair the power supply line.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of the harness between A/F oxygen sensor relay and rear oxygen sensor. • Poor contact of the rear oxygen sensor • Poor contact of A/F & oxygen sensor relay connector
2	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and rear oxygen sensor connector.</p> <p>Connector & terminal (B136) No. 4 — (E119) No. 1:</p>	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit of the harness between ECM and rear oxygen sensor.
3	<p>CHECK GROUND CIRCUIT FOR ECM.</p> <p>Measure the resistance of harness between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground:</p>	Is the resistance less than 5 Ω ?	Go to step 4.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
4	<p>CHECK REAR OXYGEN SENSOR.</p> <p>Measure the resistance between rear oxygen sensor connector terminals.</p> <p>Terminals No. 2 — No. 1:</p>	Is the resistance between 5 — 7 Ω ?	Repair poor contact of the ECM connector.	<p>Replace the rear oxygen sensor.</p> <p><Ref. to FU(H4SO)-37, Rear Oxygen Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

G: DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2)

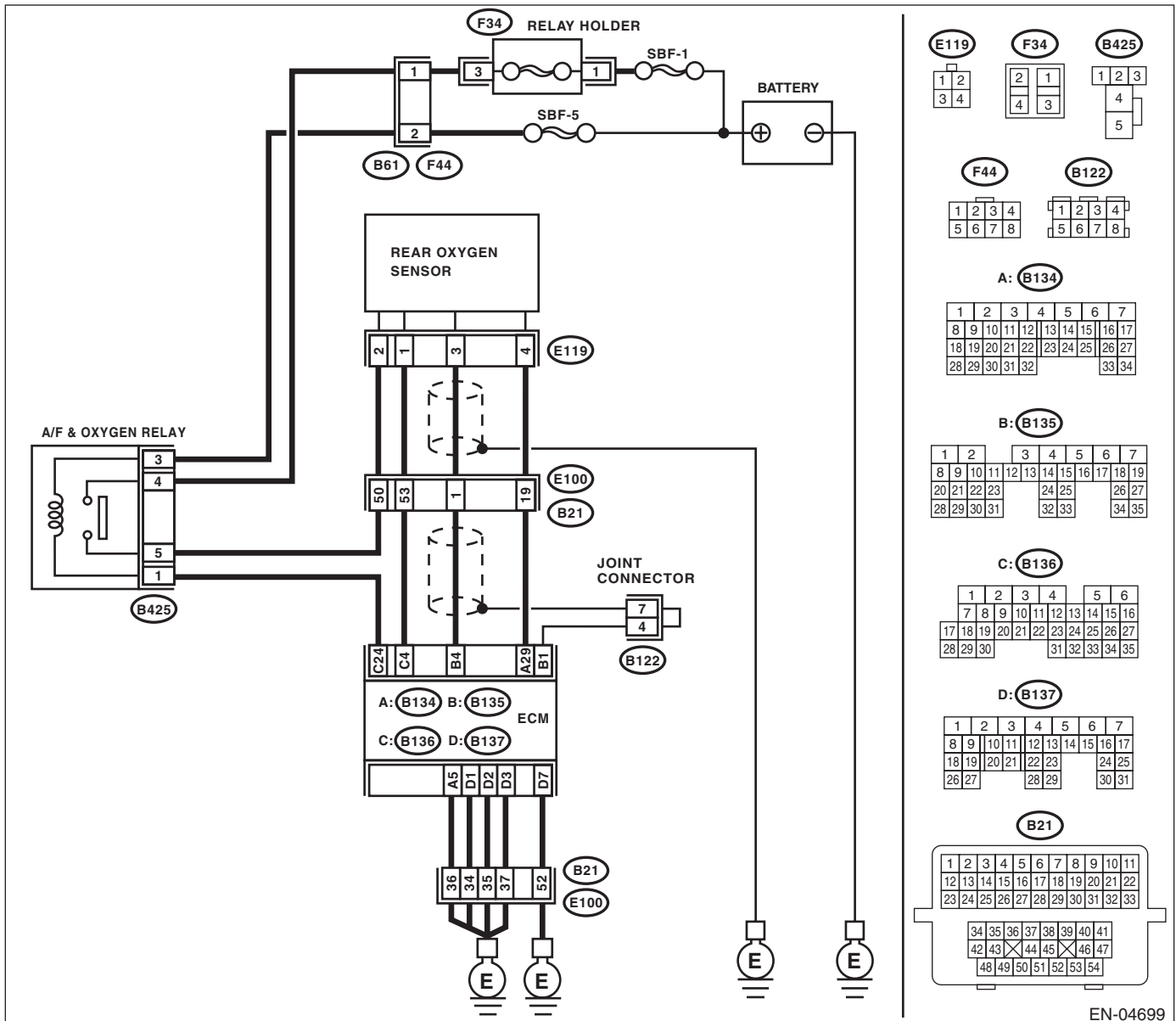
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-18, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04699

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 4 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and rear oxygen sensor connector.	Go to step 2.
2	CHECK GROUND CIRCUIT FOR ECM. 1) Disconnect the connectors from the ECM. 2) Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground:	Is the resistance less than 5 Ω?	Repair poor contact of the ECM connector.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

H: DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

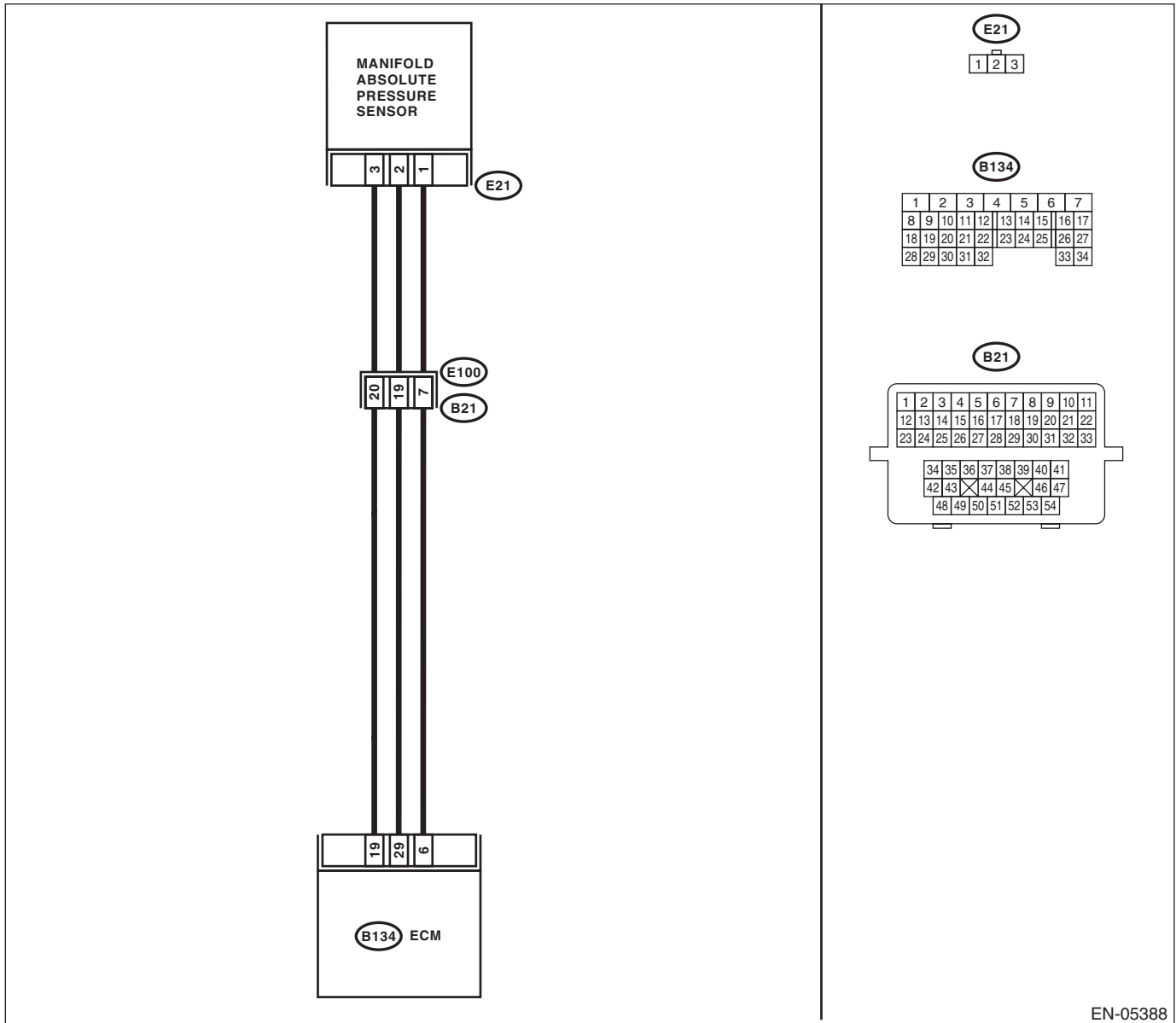
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-20, DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05388

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 2.
2	CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Read the data of intake manifold pressure sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".	Is the measured value 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) when the ignition is turned ON, and 20.0 — 46.7 kPa (150 — 350 mmHg, 5.91 — 13.78 inHg) during idling?	Go to step 3.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-27, Manifold Absolute Pressure Sensor.>
3	CHECK THROTTLE OPENING ANGLE. Read the data of throttle position signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".	Is the measured value less than 5% when throttle is fully closed?	Go to step 4.	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>
4	CHECK THROTTLE OPENING ANGLE.	Is the measured value 85% or more when throttle is fully open?	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-27, Manifold Absolute Pressure Sensor.>	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

I: DTC P0076 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 1)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-22, DTC P0076 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

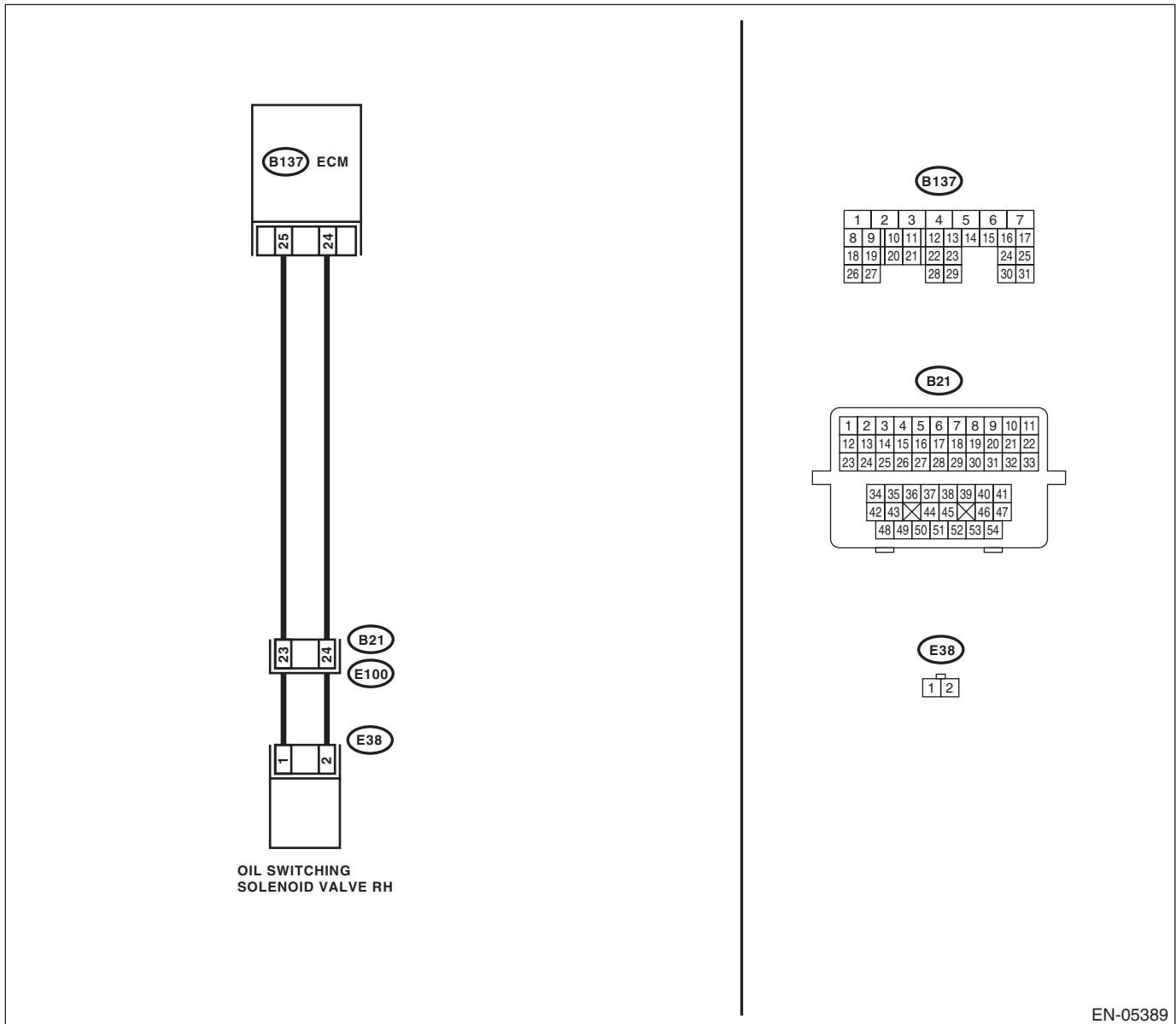
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and oil switching solenoid valve. 3) Measure the resistance of harness between ECM and oil switching solenoid valve. Connector & terminal (B137) No. 25 — (E38) No. 1: (B137) No. 24 — (E38) No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and oil switching solenoid valve connector • Poor contact of coupling connector</p>
<p>2 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. Measure the resistance between ECM and chassis ground. Connector & terminal (B137) No. 25 — Chassis ground: (B137) No. 24 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 3.</p>	<p>Repair short circuit of the harness to ground between ECM and oil switching solenoid valve connector.</p>
<p>3 CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals. Terminals No. 1 — No. 2:</p>	<p>Is the resistance between 6 — 12 Ω?</p>	<p>Repair the poor contact of ECM and oil switching solenoid valve connector.</p>	<p>Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-88, Oil Switching Solenoid Valve.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

J: DTC P0077 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 1)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-23, DTC P0077 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

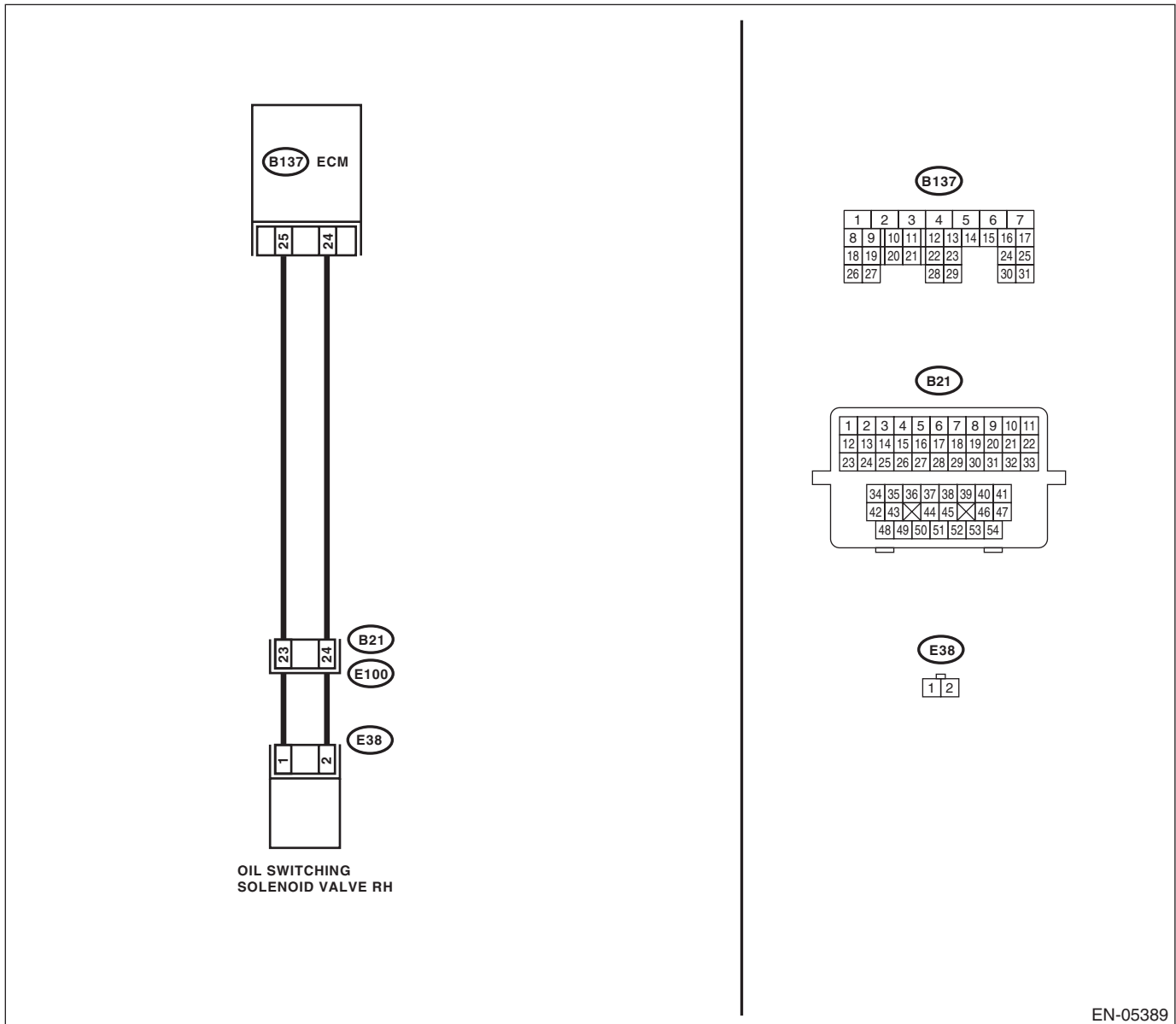
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and oil switching solenoid valve. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B137) No. 25 (+) — Chassis ground (-): (B137) No. 24 (+) — Chassis ground (-):</p>	<p>Is the voltage less than 1 V?</p>	<p>Go to step 2.</p>	<p>Repair the short circuit to power in the harness between ECM and oil switching solenoid valve connector.</p>
<p>2 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. Measure the resistance of harness between ECM and oil switching solenoid valve connector. Connector & terminal (B137) No. 25 — (E38) No. 1: (B137) No. 24 — (E38) No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and oil switching solenoid valve connector • Poor contact of coupling connector</p>
<p>3 CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals. Terminals No. 1 — No. 2:</p>	<p>Is the resistance between 6 — 12 Ω?</p>	<p>Repair the poor contact of ECM and oil switching solenoid valve connector.</p>	<p>Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-88, Oil Switching Solenoid Valve.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

K: DTC P0082 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 2)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-22, DTC P0076 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

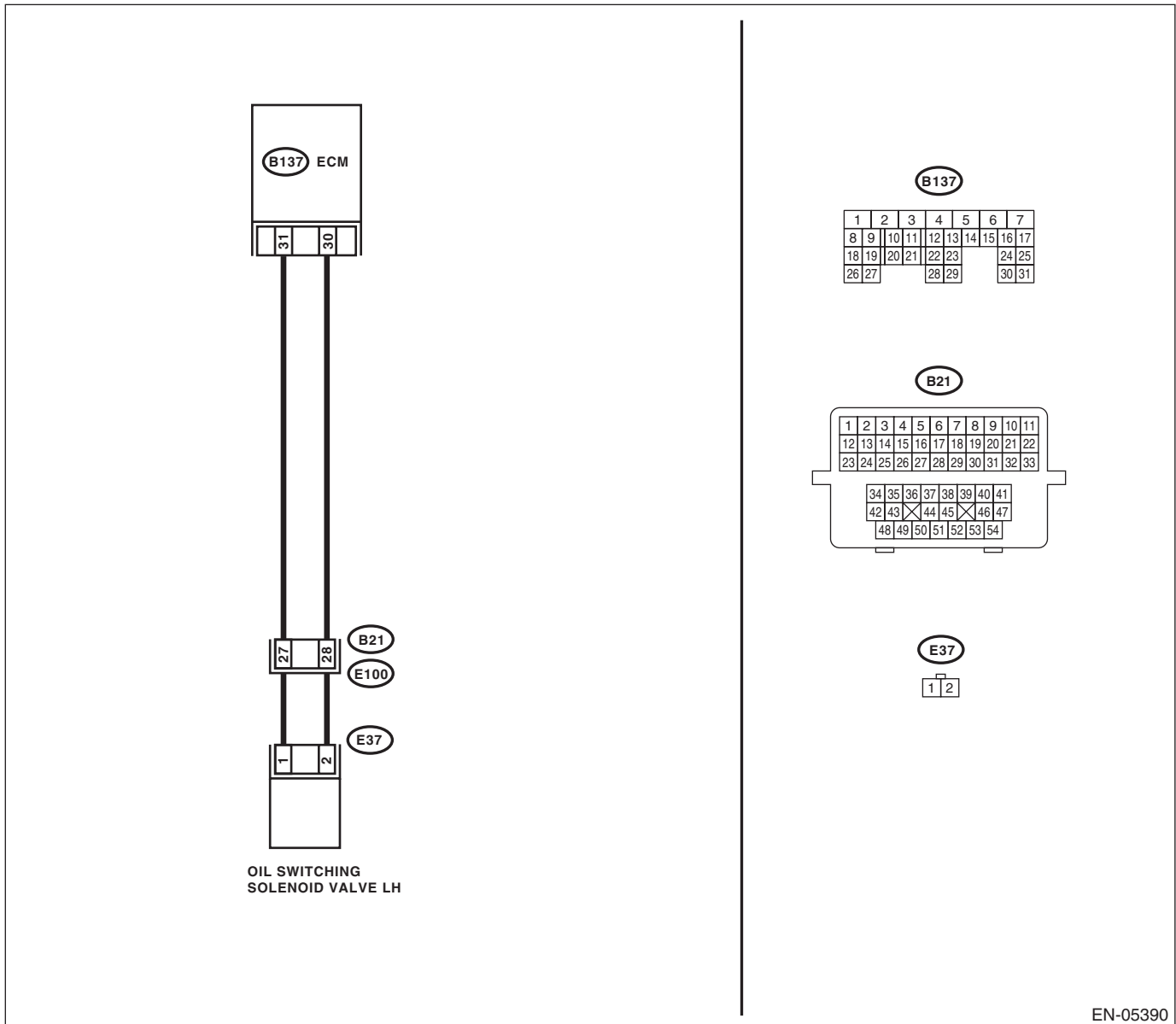
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and oil switching solenoid valve. 3) Measure the resistance between ECM and oil switching solenoid valve. Connector & terminal (B137) No. 31 — (E37) No. 1: (B137) No. 30 — (E37) No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and oil switching solenoid valve connector • Poor contact of coupling connector</p>
<p>2 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. Measure the resistance between ECM and chassis ground. Connector & terminal (B137) No. 31 — Chassis ground: (B137) No. 30 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 3.</p>	<p>Repair short circuit of the harness to ground between ECM and oil switching solenoid valve connector.</p>
<p>3 CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals. Terminals No. 1 — No. 2:</p>	<p>Is the resistance between 6 — 12 Ω?</p>	<p>Repair the poor contact of ECM and oil switching solenoid valve connector.</p>	<p>Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-88, Oil Switching Solenoid Valve.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

L: DTC P0083 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 2)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-23, DTC P0077 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

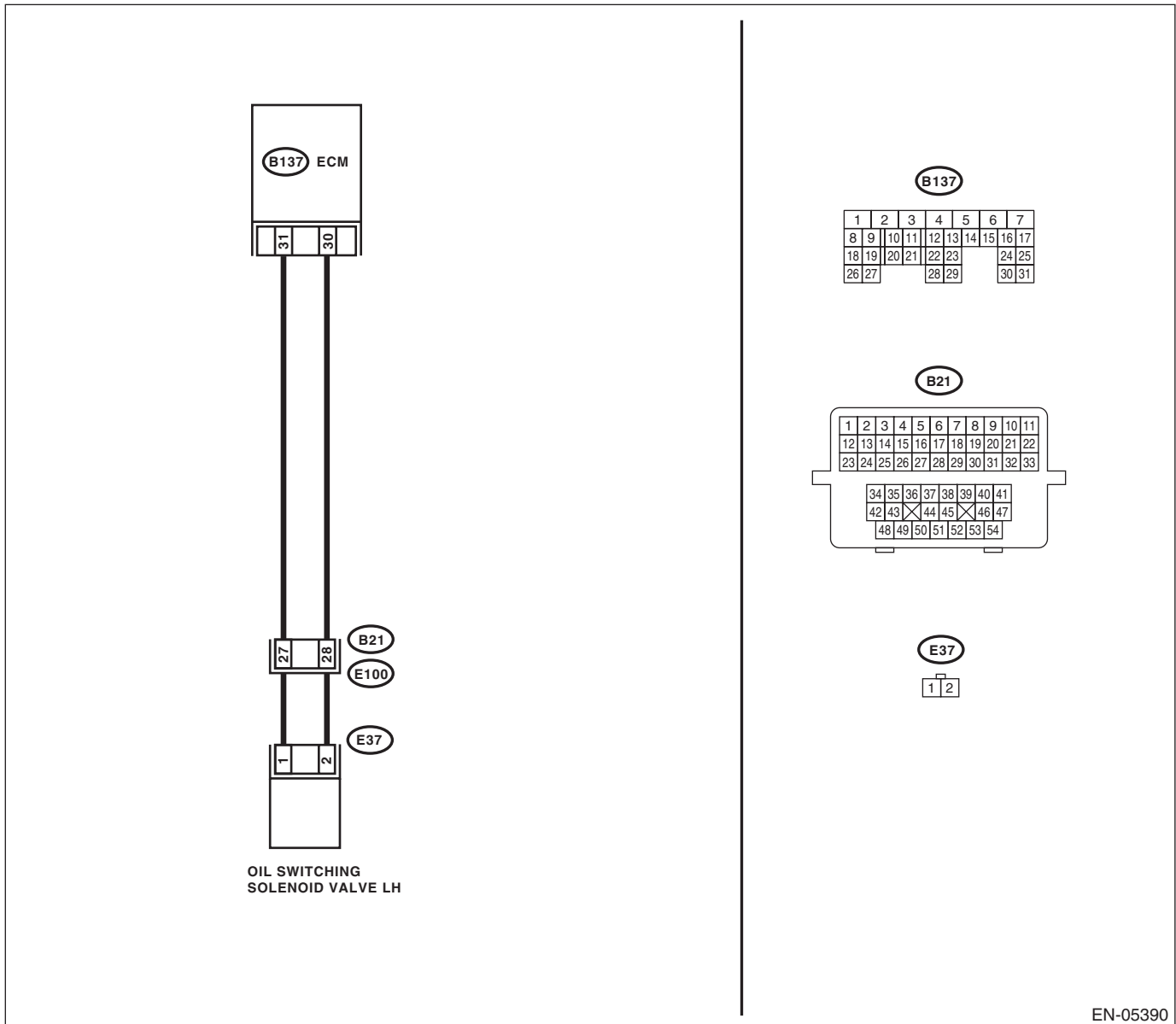
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and oil switching solenoid valve. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B137) No. 31 (+) — Chassis ground (-): (B137) No. 30 (+) — Chassis ground (-):</p>	<p>Is the voltage less than 1 V?</p>	<p>Go to step 2.</p>	<p>Repair the short circuit to power in the harness between ECM and oil switching solenoid valve connector.</p>
<p>2 CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. Measure the resistance between the ECM and oil switching solenoid valve connector. Connector & terminal (B137) No. 31 — (E37) No. 1: (B137) No. 30 — (E37) No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and oil switching solenoid valve connector • Poor contact of coupling connector</p>
<p>3 CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals. Terminals No. 1 — No. 2:</p>	<p>Is the resistance between 6 — 12 Ω?</p>	<p>Repair the poor contact of ECM and oil switching solenoid valve connector.</p>	<p>Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-88, Oil Switching Solenoid Valve.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

M: DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-25, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

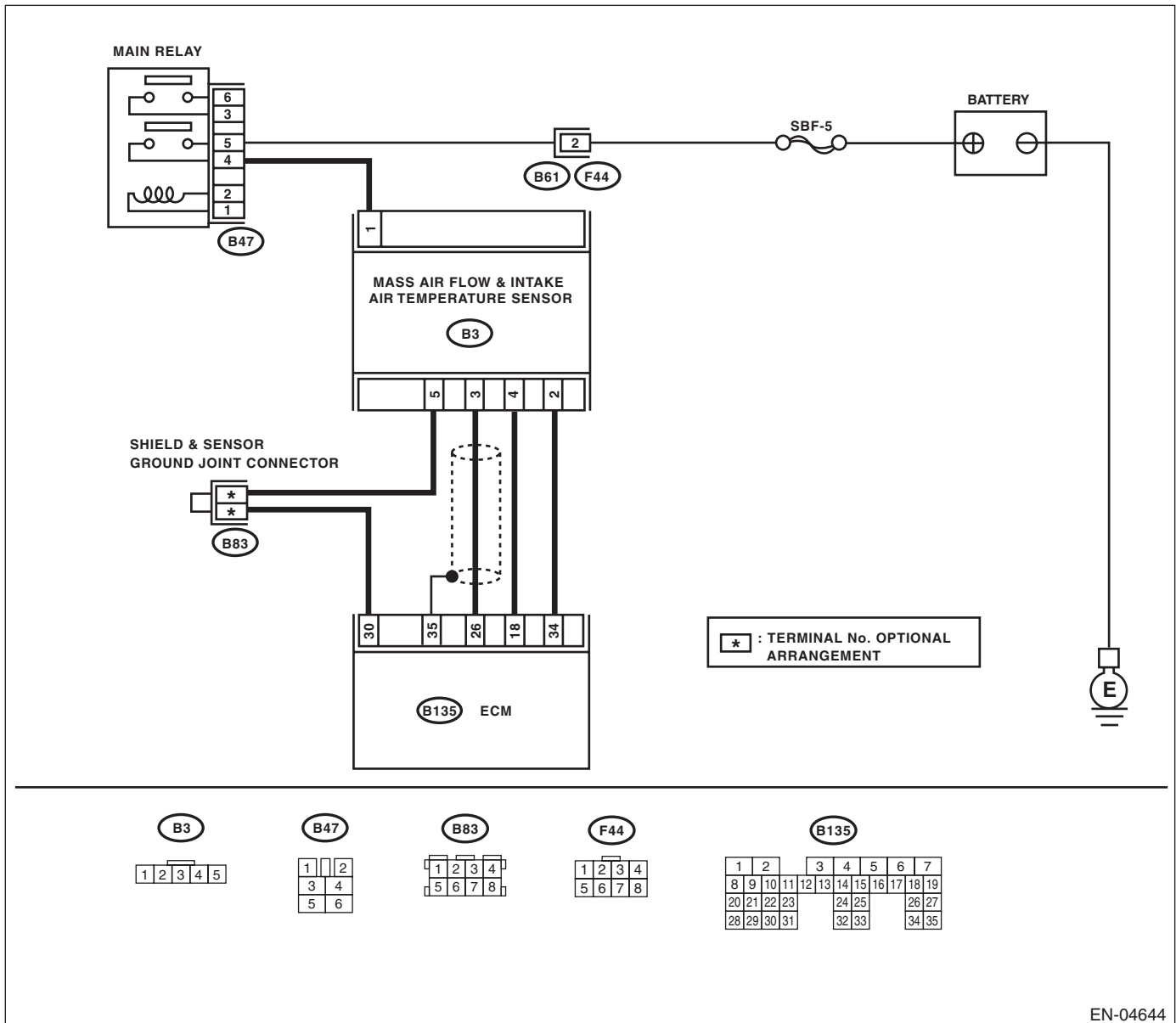
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04644

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

N: DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-28, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

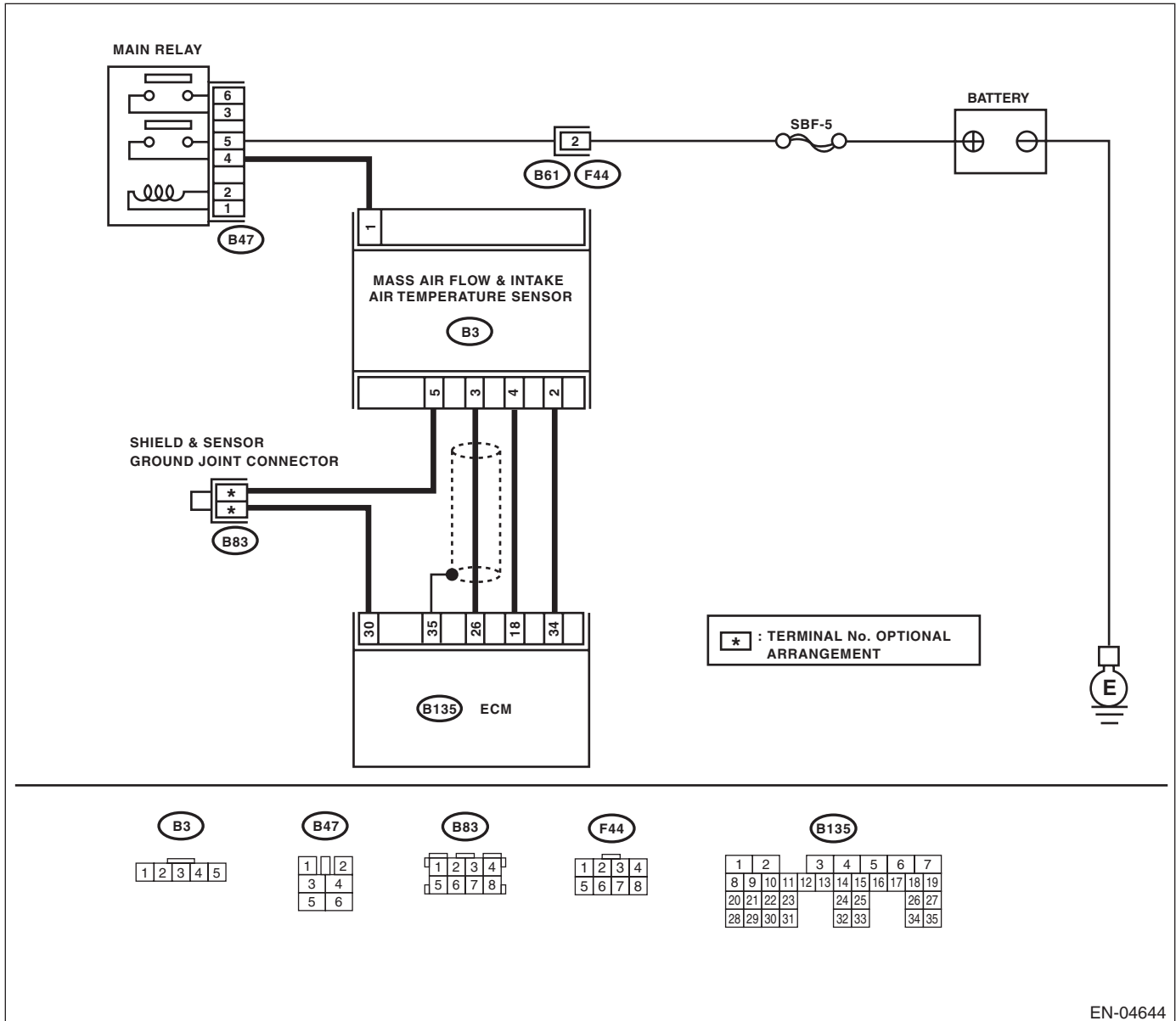
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04644

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the voltage less than 0.2 V?	Go to step 2.	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE:</p> <p>In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the mass air flow and intake air temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.</p> <p>Connector & terminal (B3) No. 1 (+) — Engine ground (-):</p>	Is the voltage 10 V or more?	Go to step 3.	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> Open circuit of harness between main relay and mass air flow and intake air temperature sensor connectors. Poor contact of main relay connector
3	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the ECM.</p> <p>3) Measure the resistance of harness between ECM and mass air flow and intake air temperature sensor connectors.</p> <p>Connector & terminal (B135) No. 26 — (B3) No. 3:</p>	Is the resistance less than 1 Ω?	Go to step 4.	<p>Repair the open circuit of harness between the ECM and mass air flow and intake air temperature sensor connectors.</p>
4	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B135) No. 26 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 5.	<p>Repair short circuit of the harness to ground between the ECM and the mass air flow and intake air temperature sensor connectors.</p>
5	<p>CHECK POOR CONTACT.</p> <p>Check for any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors.</p>	Is there poor contact in the ECM or the mass air flow and intake air temperature sensor connectors?	Repair any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors.	<p>Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

O: DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-30, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

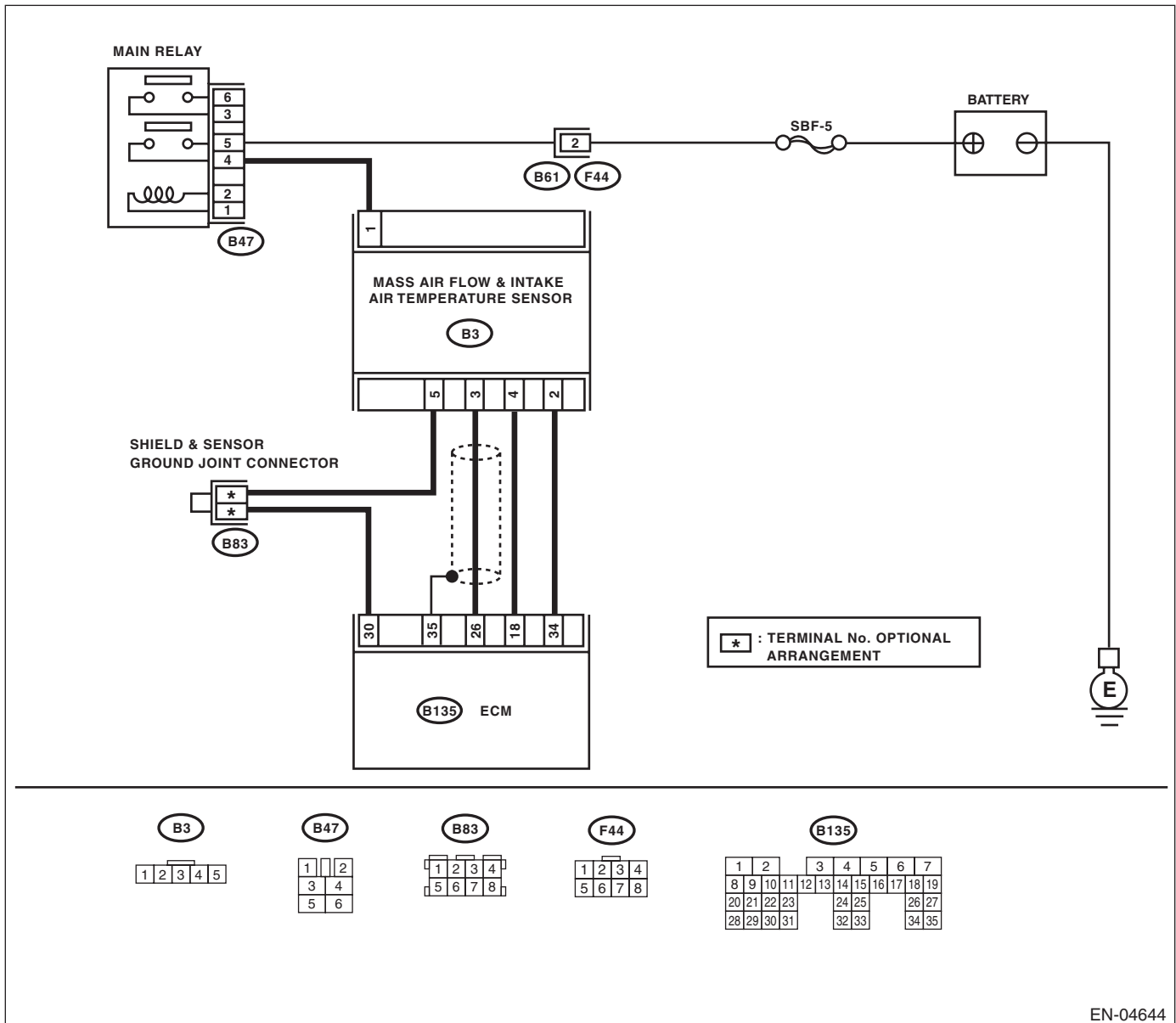
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04644

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the voltage 5 V or more?	Go to step 2.	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE:</p> <p>In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the mass air flow and intake air temperature sensor.</p> <p>3) Start the engine.</p> <p>4) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between the ECM and the mass air flow and intake air temperature sensor connectors.	Go to step 3.
3	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground.</p> <p>Connector & terminal (B3) No. 2 — Engine ground:</p>	Is the resistance less than 5 Ω?	Go to step 4.	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> Open circuit of harness between the ECM and the mass air flow and intake air temperature sensor connectors Poor contact in ECM connector
4	<p>CHECK POOR CONTACT.</p> <p>Check for any poor contact between the mass air flow and intake air temperature sensor connectors.</p>	Is there poor contact in the mass air flow and intake air temperature sensor connectors?	Repair any poor contact of the mass air flow and intake air temperature sensor connectors.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

P: DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT

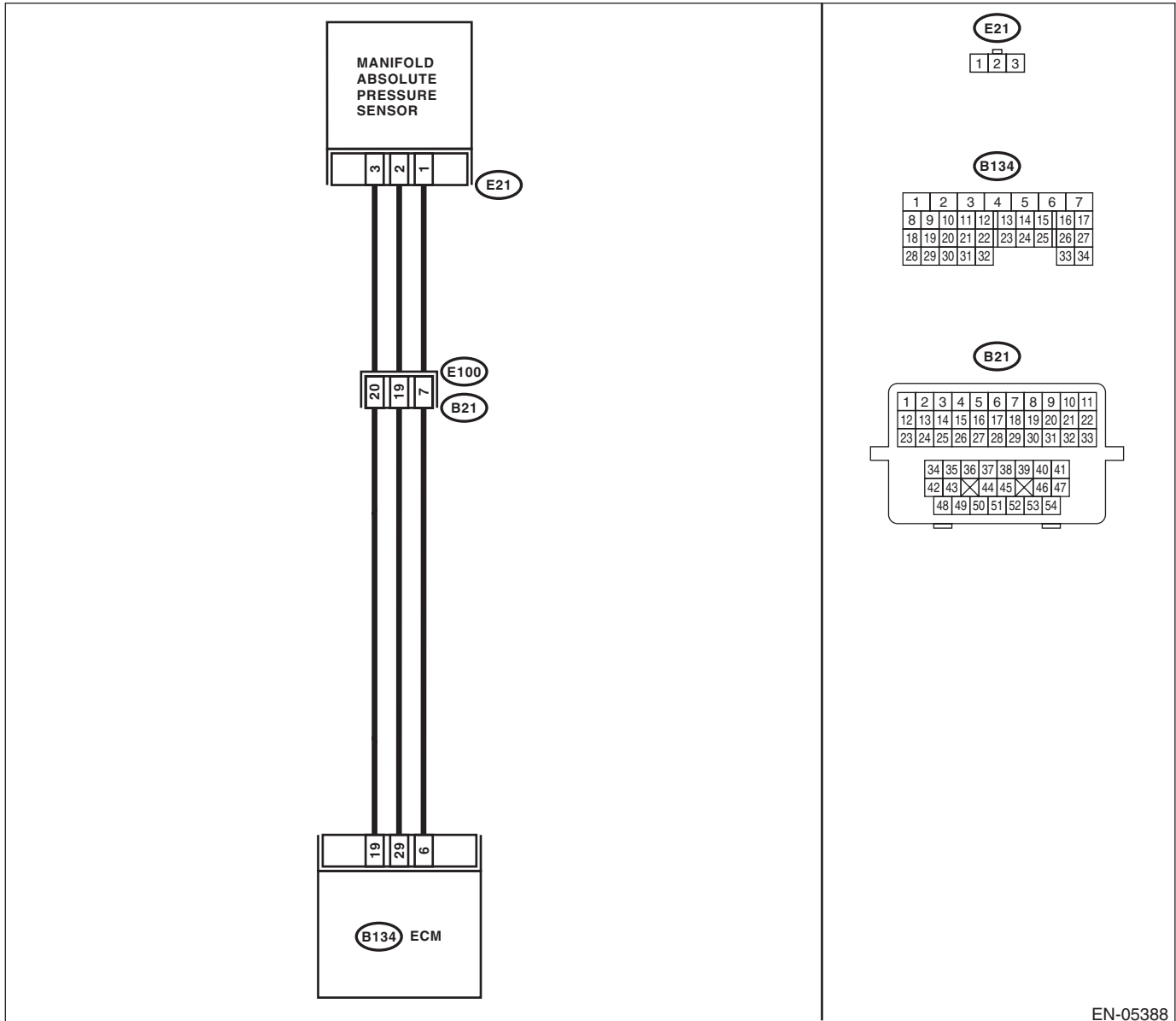
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-32, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-05388

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value less than 13.3 kPa (100 mmHg, 3.94 inHg) ?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE:</p> <p>In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK POWER SUPPLY OF THE MANIFOLD ABSOLUTE PRESSURE SENSOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from manifold absolute pressure sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between manifold absolute pressure sensor connector and engine ground.</p> <p>Connector & terminal (E21) No. 3 (+) — Engine ground (-):</p>	<p>Is the voltage 4.5 V or more?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> Open circuit of harness between ECM and manifold absolute pressure sensor connector. Poor contact in ECM connector Poor contact of coupling connector
3	<p>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the ECM.</p> <p>3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.</p> <p>Connector & terminal (B134) No. 6 — (E21) No. 1:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 4.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> Open circuit of harness between ECM and manifold absolute pressure sensor connector. Poor contact of coupling connector
4	<p>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</p> <p>Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 6 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 5.</p>	<p>Repair short circuit of the harness to ground between ECM and manifold absolute pressure sensor connector.</p>
5	<p>CHECK POOR CONTACT.</p> <p>Check for poor contact between the ECM and manifold pressure sensor connector.</p>	<p>Is there poor contact in the ECM or manifold absolute pressure sensor connector?</p>	<p>Repair the poor contact in the ECM or manifold absolute pressure sensor connector.</p>	<p>Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-27, Manifold Absolute Pressure Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Q: DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT

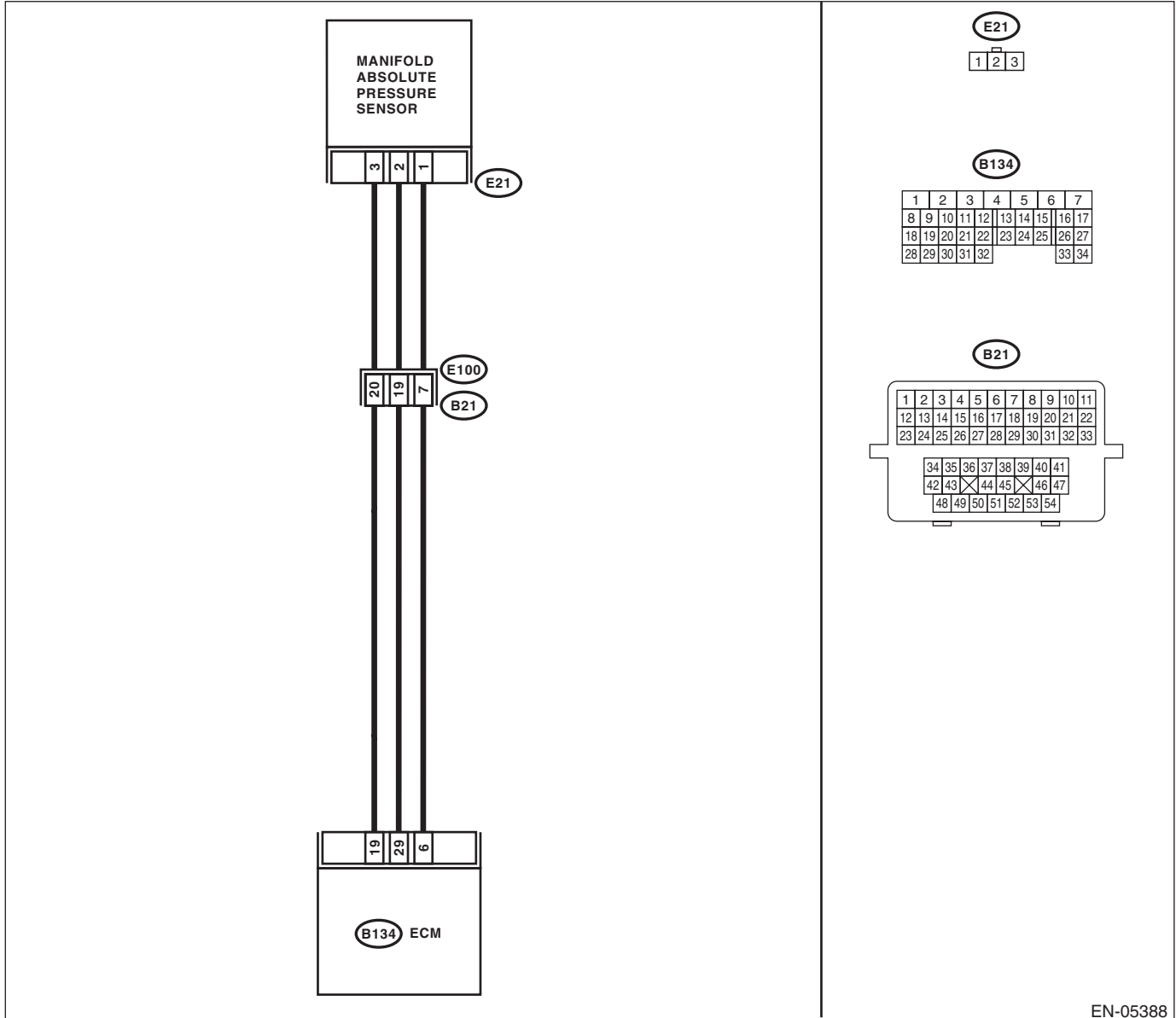
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-34, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-05388

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 119.5 kPa (896.5 mmHg, 35.29 inHg) or more?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE:</p> <p>In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from manifold absolute pressure sensor.</p> <p>3) Start the engine.</p> <p>4) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 119.5 kPa (896.5 mmHg, 35.29 inHg) or more?</p>	<p>Repair the short circuit to power in the harness between ECM and manifold absolute pressure sensor connector.</p>	<p>Go to step 3.</p>
3	<p>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground.</p> <p>Connector & terminal (E21) No. 2 — Engine ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Go to step 4.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> Open circuit of harness between ECM and manifold absolute pressure sensor connector. Poor contact in ECM connector Poor contact of coupling connector
4	<p>CHECK POOR CONTACT.</p> <p>Check for poor contact of the manifold absolute pressure sensor connector.</p>	<p>Is there poor contact in manifold absolute pressure sensor connector?</p>	<p>Repair the poor contact of manifold absolute pressure sensor connector.</p>	<p>Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-27, Manifold Absolute Pressure Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

R: DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-36, DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

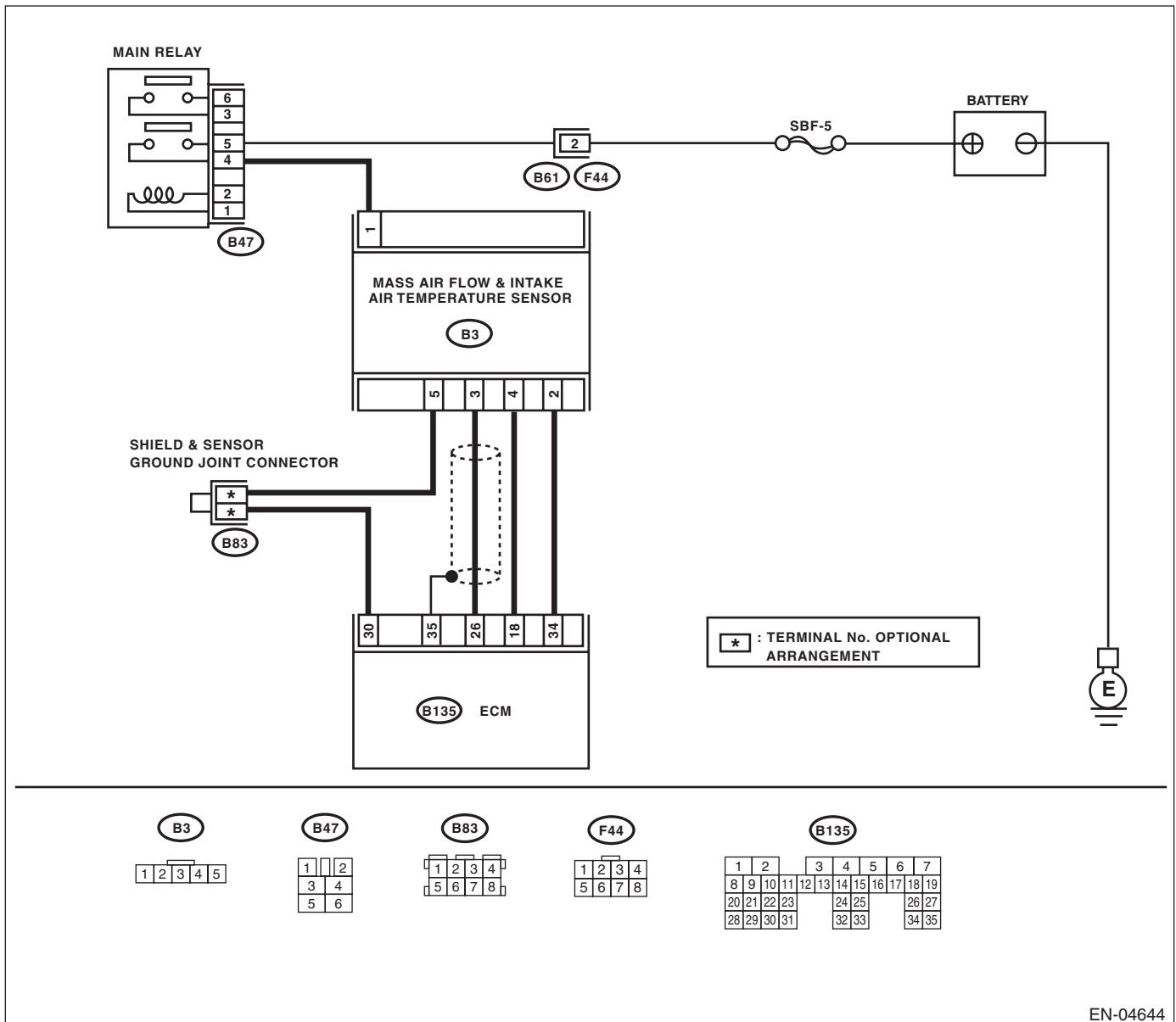
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04644

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK ENGINE COOLANT TEMPERATURE. 1) Start the engine and warm-up completely. 2) Measure the engine coolant temperature using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the engine coolant temperature 75°C (167°F) or higher?	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>	Check DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

S: DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-38, DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

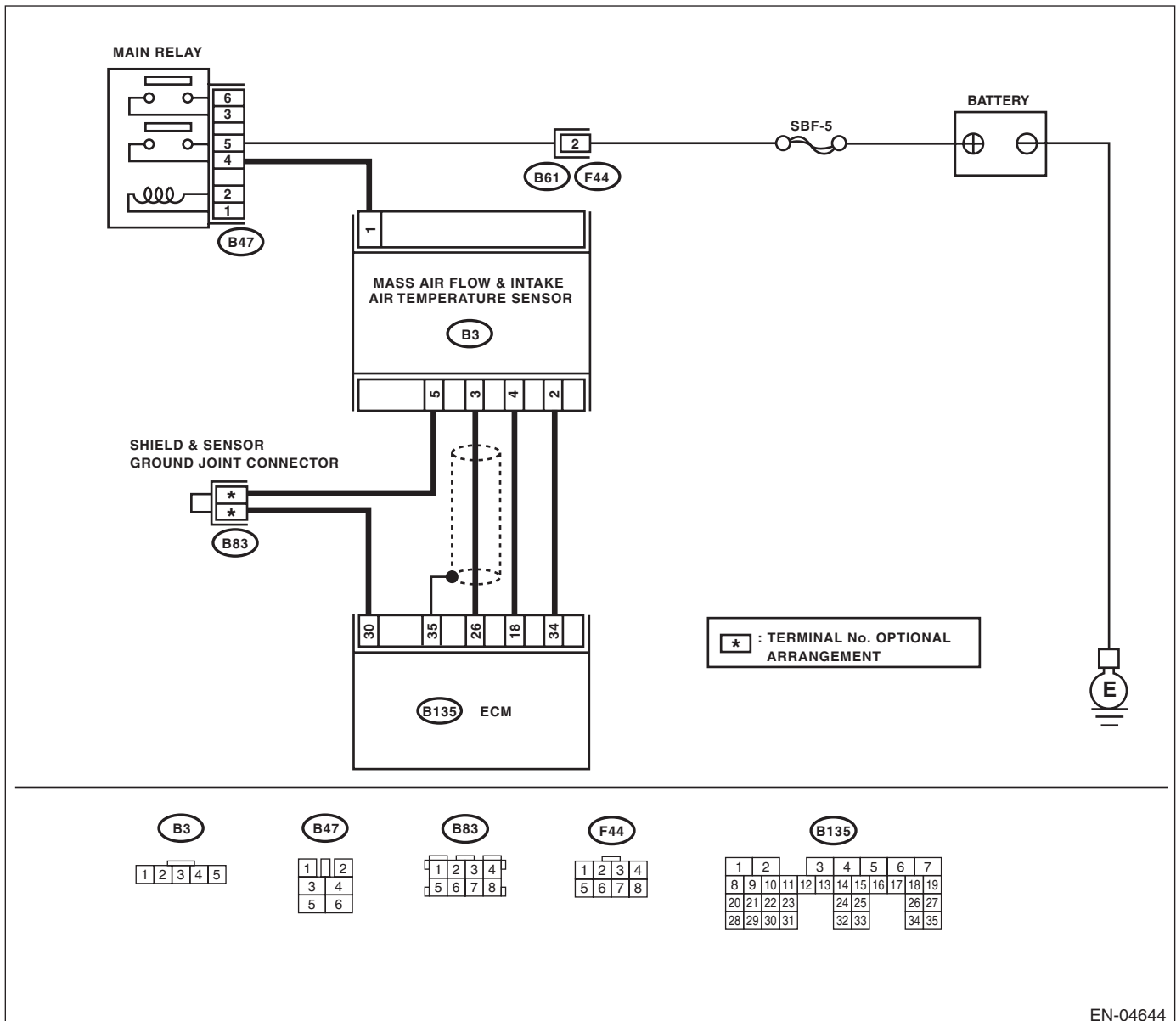
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04644

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the intake air temperature 120°C (248°F) or higher?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE:</p> <p>In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the ECM and the mass air flow and intake air temperature sensor.</p> <p>3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B135) No. 18 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>	<p>Repair short circuit of the harness to ground between the ECM and the mass air flow and intake air temperature sensor.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

T: DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-40, DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

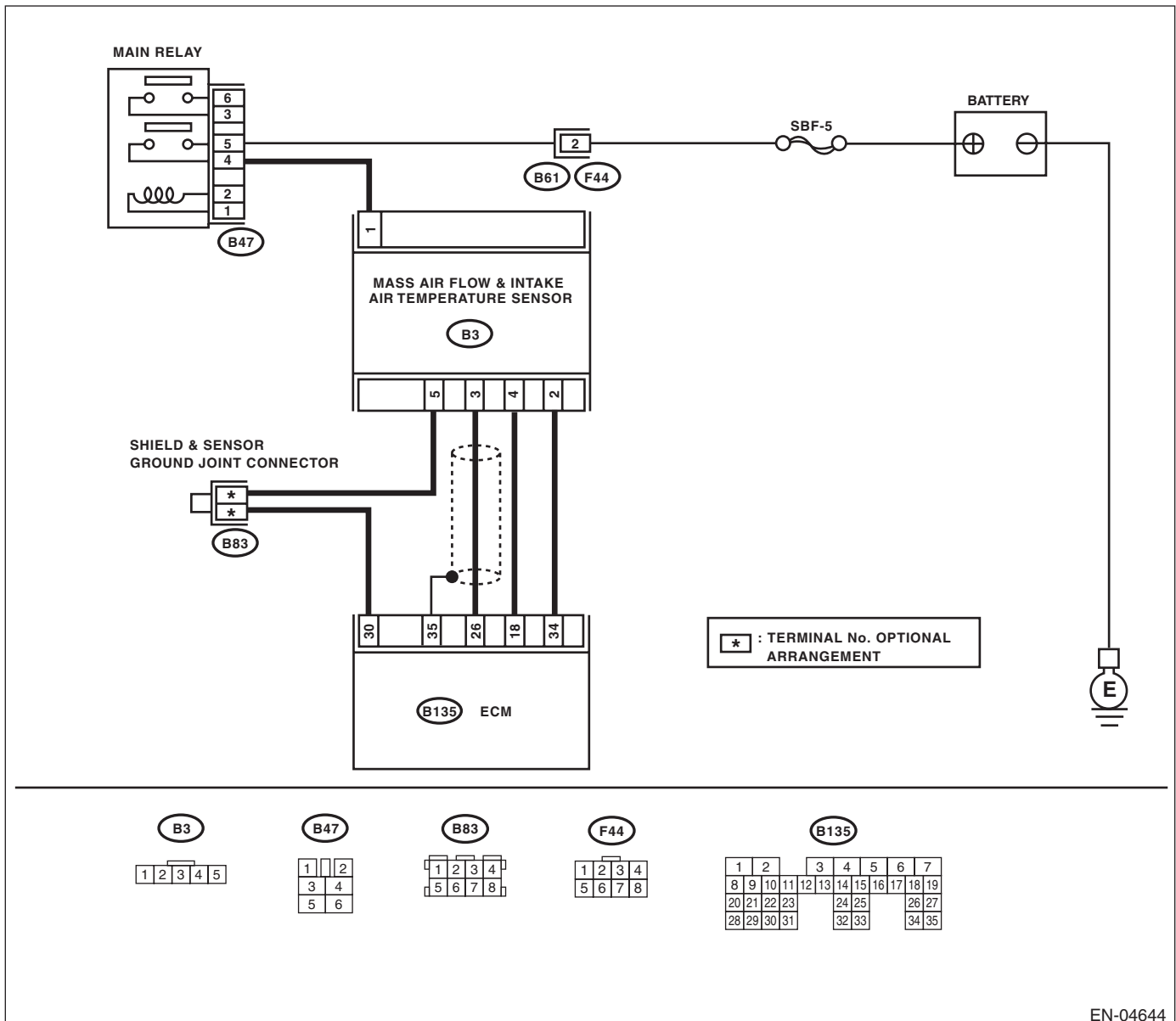
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04644

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the intake air temperature less than -40°C (-40°F) ?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.
2	<p>CHECK POOR CONTACT.</p> <p>Repair any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors.</p>	Is there poor contact in the ECM or the mass air flow and intake air temperature sensor connectors?	Repair any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors.	Go to step 3.
3	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the ECM and the mass air flow and intake air temperature sensor.</p> <p>3) Measure the resistance of harness between ECM and the mass air flow and intake air temperature sensor connectors.</p> <p>Connector & terminal (B135) No. 30 — (B3) No. 5:</p>	Is the resistance less than $1\ \Omega$?	Go to step 4.	Repair the open circuit of harness between the ECM and mass air flow and intake air temperature sensor connectors.
4	<p>CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.</p> <p>1) Connect all connectors.</p> <p>2) Turn the ignition switch to ON.</p> <p>3) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B135) No. 18 (+) — Chassis ground (-):</p>	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between the ECM and the mass air flow and intake air temperature sensor connectors.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

U: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-42, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

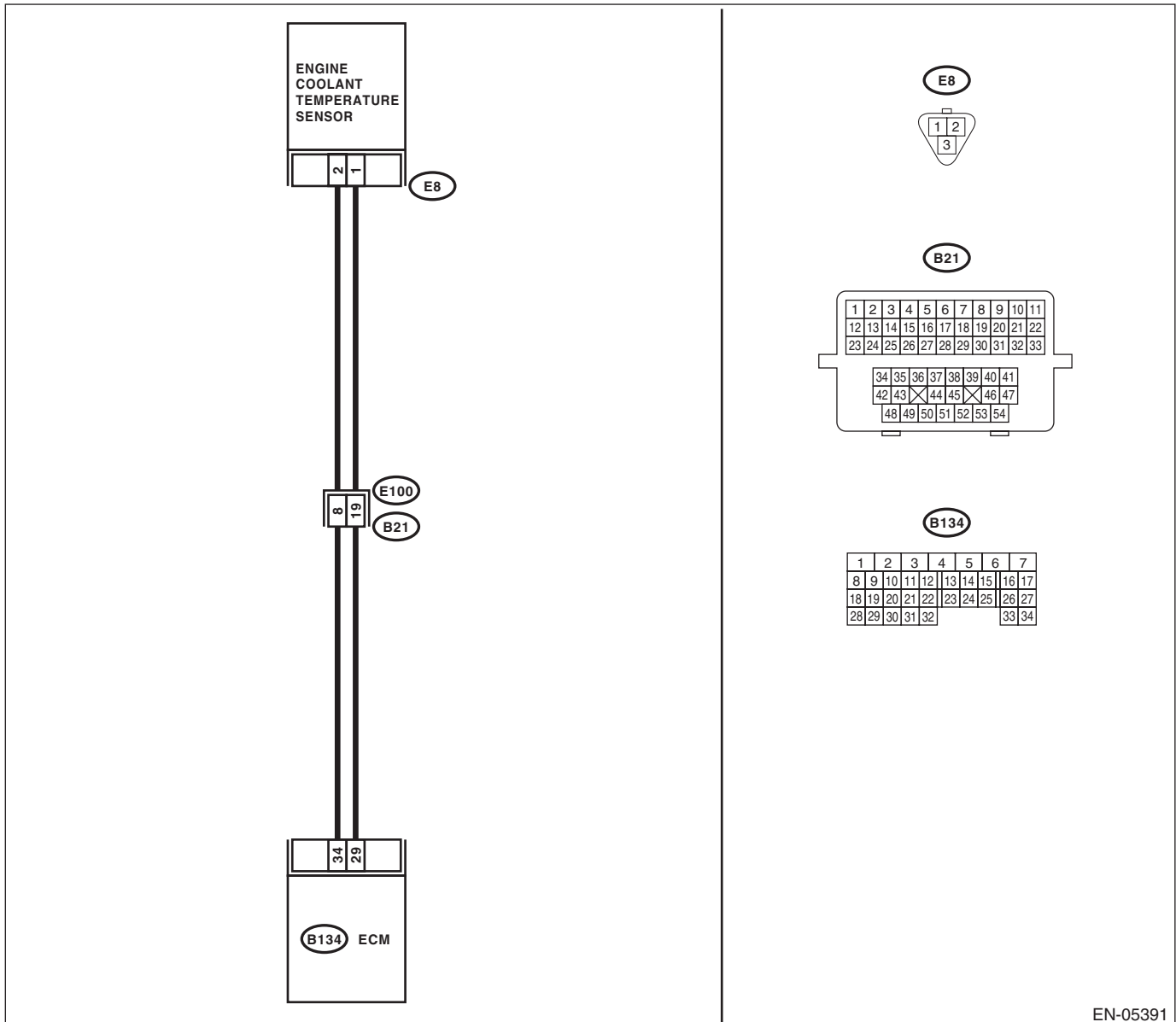
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05391

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the engine coolant temperature 150°C (302°F) or higher?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE: In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the ECM and engine coolant temperature sensor.</p> <p>3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 34 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.></p>	<p>Repair short circuit of the harness to ground between the ECM and engine coolant temperature sensor.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

V: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-44, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

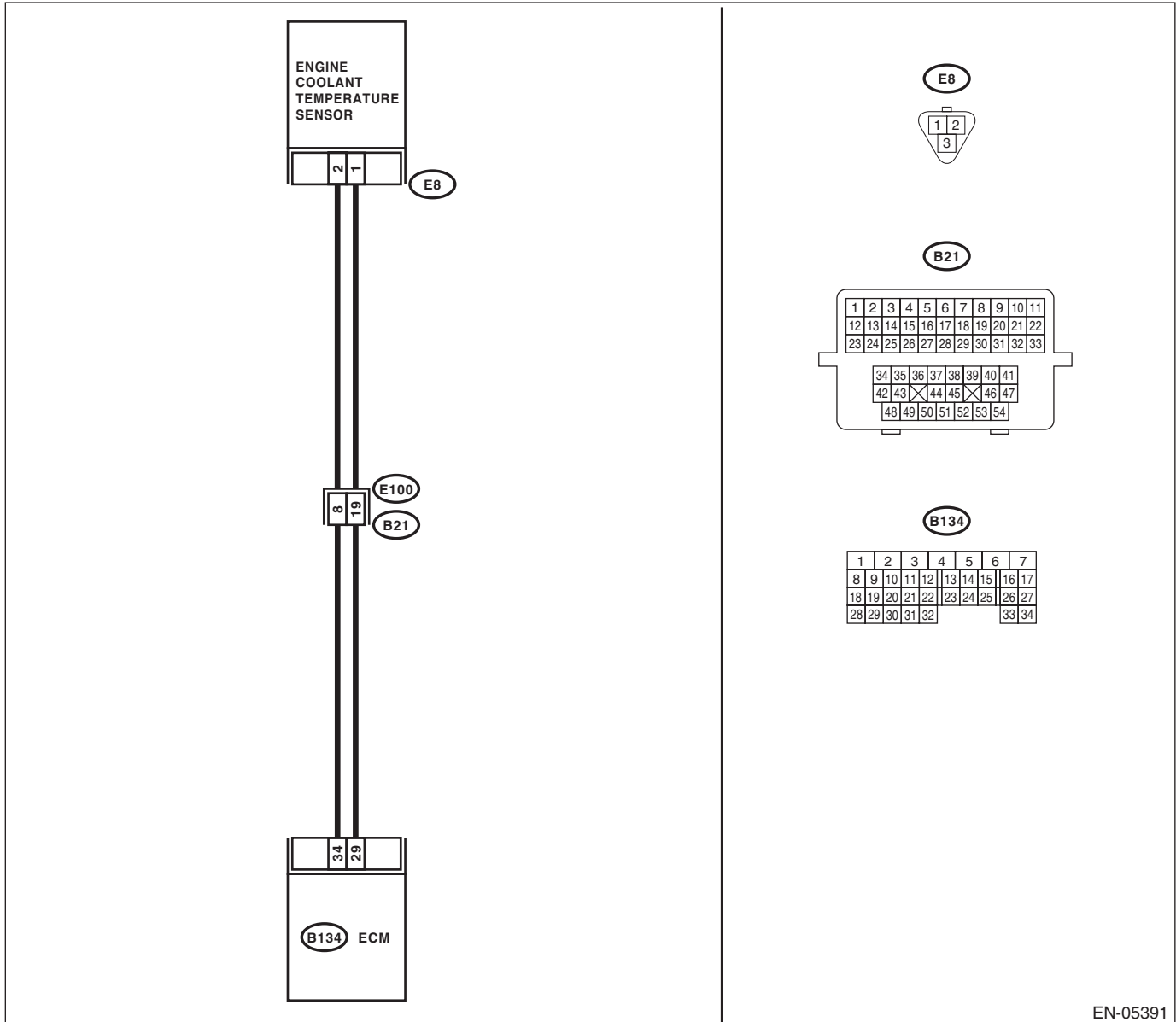
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05391

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the engine coolant temperature less than -40°C (-40°F) ?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.
2	<p>CHECK POOR CONTACT.</p> <p>Repair any poor contact between the ECM and engine coolant temperature sensor connectors.</p>	Is there poor contact in the ECM or engine coolant temperature sensor connectors?	Repair any poor contact between the ECM and engine coolant temperature sensor connectors.	Go to step 3.
3	<p>CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the ECM and engine coolant temperature sensor.</p> <p>3) Measure the resistance of the harness between the ECM and engine coolant temperature sensor connector.</p> <p>Connector & terminal (B134) No. 34 — (E8) No. 2: (B134) No. 29 — (E8) No. 1:</p>	Is the resistance less than 1 Ω ?	Go to step 4.	Repair the open circuit of the harness between the ECM and engine coolant temperature sensor connector.
4	<p>CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.</p> <p>1) Connect all connectors.</p> <p>2) Turn the ignition switch to ON.</p> <p>3) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 34 (+) — Chassis ground (-):</p>	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between the ECM and engine coolant temperature sensor connector.	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

W: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-46, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

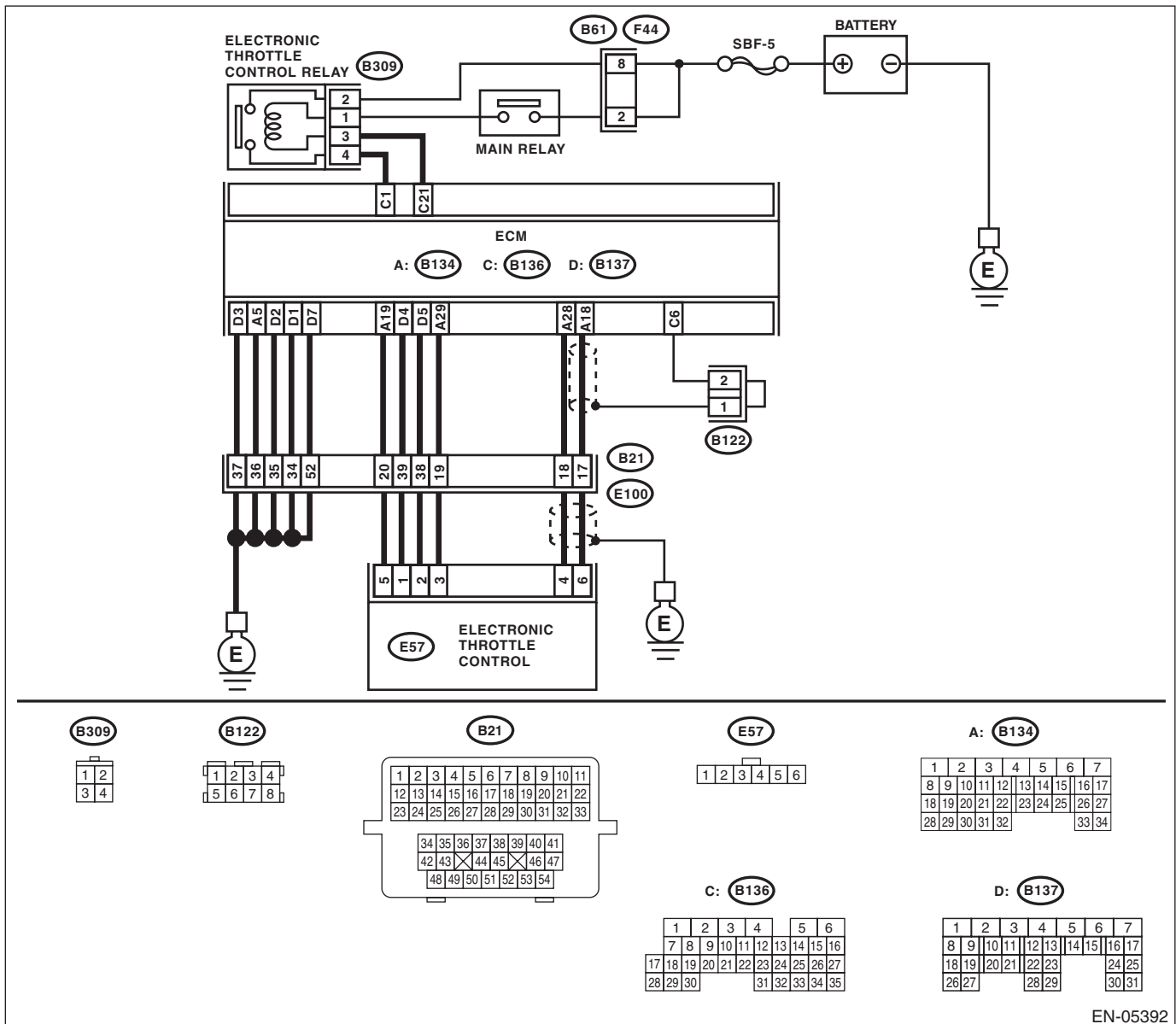
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 2.</p>	<p>Repair short circuit of the harness to ground between ECM and electronic throttle control connector.</p>	
<p>2</p> <p>CHECK SHORT CIRCUIT INSIDE THE ECM.</p> <p>1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground.</p> <p>Connector & terminal (E57) No. 6 — Engine ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.></p>	<p>Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).></p>	

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

X: DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-48, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

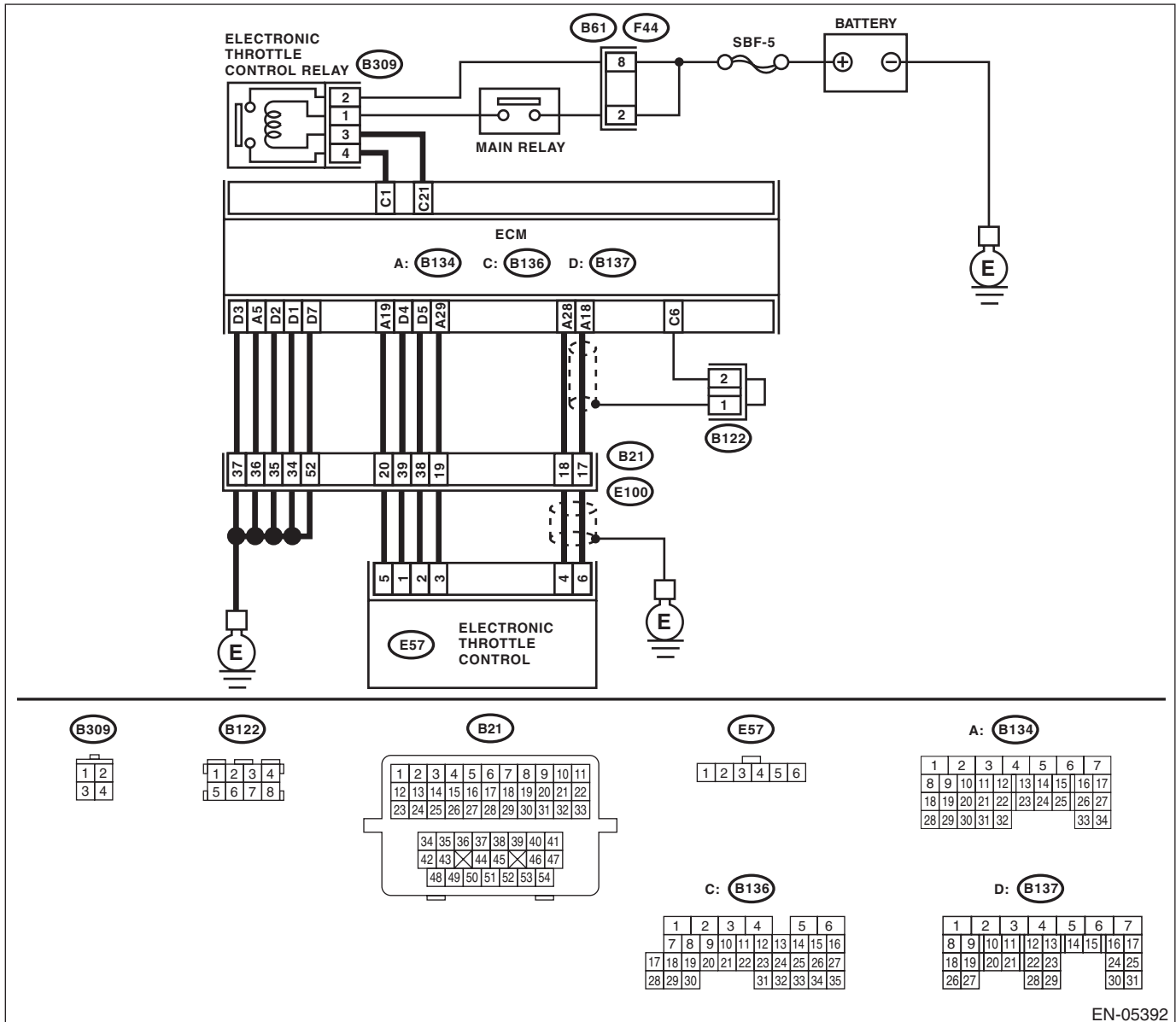
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance of harness between ECM and electronic throttle control connector.</p> <p>Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 29 — (E57) No. 3:</p>	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit of harness between ECM and electronic throttle control connector.
2	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground.</p> <p>Connector & terminal (E57) No. 3 — Engine ground:</p>	Is the resistance less than 5 Ω ?	Go to step 3.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
3	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground.</p> <p>Connector & terminal (E57) No. 6 (+) — Engine ground (-):</p>	Is the voltage 4.85 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 4.
4	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors.</p> <p>Connector & terminal (B134) No. 19 — (B134) No. 18:</p>	Is the resistance 1 M Ω or more?	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Y: DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-50, DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

Engine does not return to idle.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

	Step	Check	Yes	No
1	CHECK TIRE SIZE.	Is the tire size as specified? and the same size as other three wheels?	Go to step 2.	Replace the tire.
2	CHECK ENGINE COOLANT. Check the following items: <ul style="list-style-type: none">• Amount of engine coolant• Engine coolant freeze• Contamination of engine coolant	Is the engine coolant normal?	Go to step 3.	Fill or replace the engine coolant. <Ref. to CO(H4SO)-17, INSPECTION, Engine Coolant.>
3	CHECK THERMOSTAT.	Does the thermostat remain opened?	Replace the thermostat. <Ref. to CO(H4SO)-21, Thermostat.>	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Z: DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-52, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

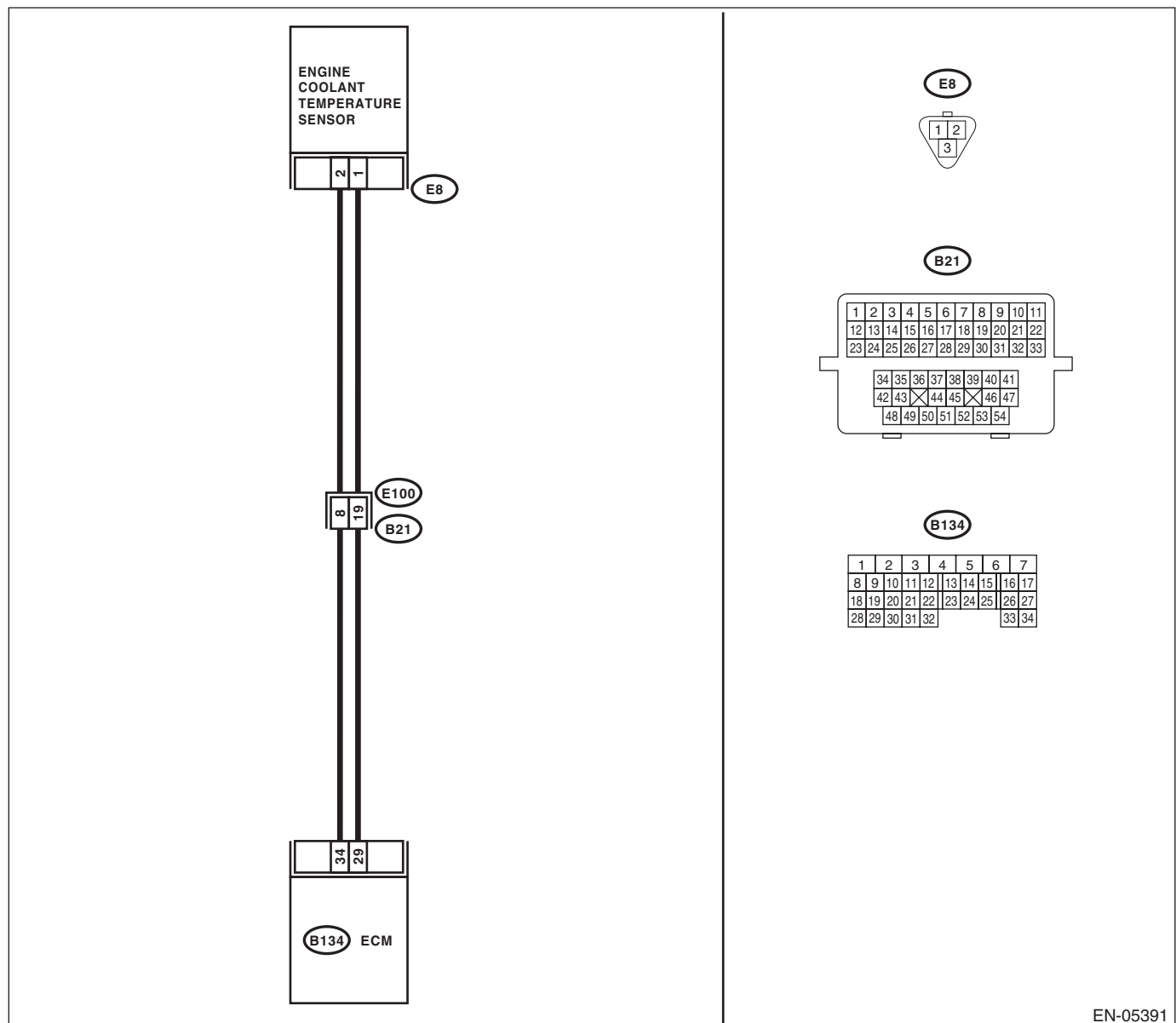
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05391

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK ENGINE COOLANT TEMPERATURE SENSOR. Measure the resistance between engine coolant temperature sensor terminals when the engine coolant is cold and after warmed-up. Terminals No. 1 — No. 2:	Is the resistance of engine coolant temperature sensor different between when engine coolant is cold and after warmed-up?	Repair poor contact of the ECM connector.	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AA:DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-54, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

Thermostat remains open.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ENGINE COOLANT.	Are the coolant level and mixture ratio of engine coolant to anti-freeze solution correct?	Go to step 2.	Replace the engine coolant. <Ref. to CO(H4SO)-16, REPLACEMENT, Engine Coolant.>
2 CHECK RADIATOR FAN. 1) Start the engine. 2) Check the radiator fan operation.	Does the radiator fan continuously rotate for 3 minutes or more during idling?	Repair radiator fan circuit. <Ref. to CO(H4SO)-27, Radiator Main Fan and Fan Motor.> and <Ref. to CO(H4SO)-29, Radiator Sub Fan and Fan Motor.>	Replace the thermostat. <Ref. to CO(H4SO)-21, Thermostat.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AB:DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1)

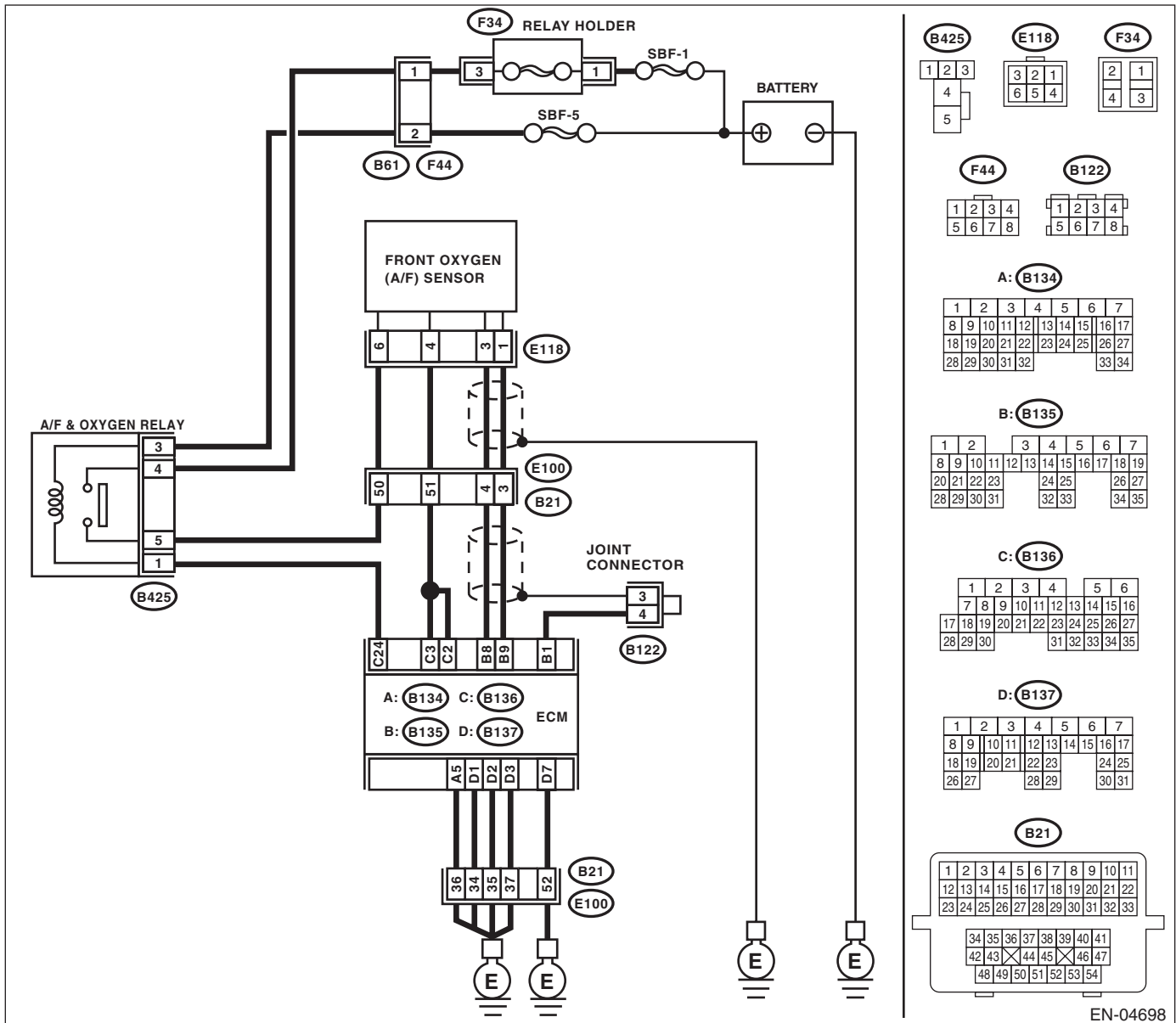
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-56, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.	Has water entered the connector?	Completely remove any water inside.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 9 — Chassis ground: (B135) No. 8 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector.
3	CHECK POOR CONTACT. Check poor contact of front oxygen (A/F) sensor connector.	Is there poor contact in front oxygen (A/F) sensor connector?	Repair the poor contact of the front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AC:DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1)

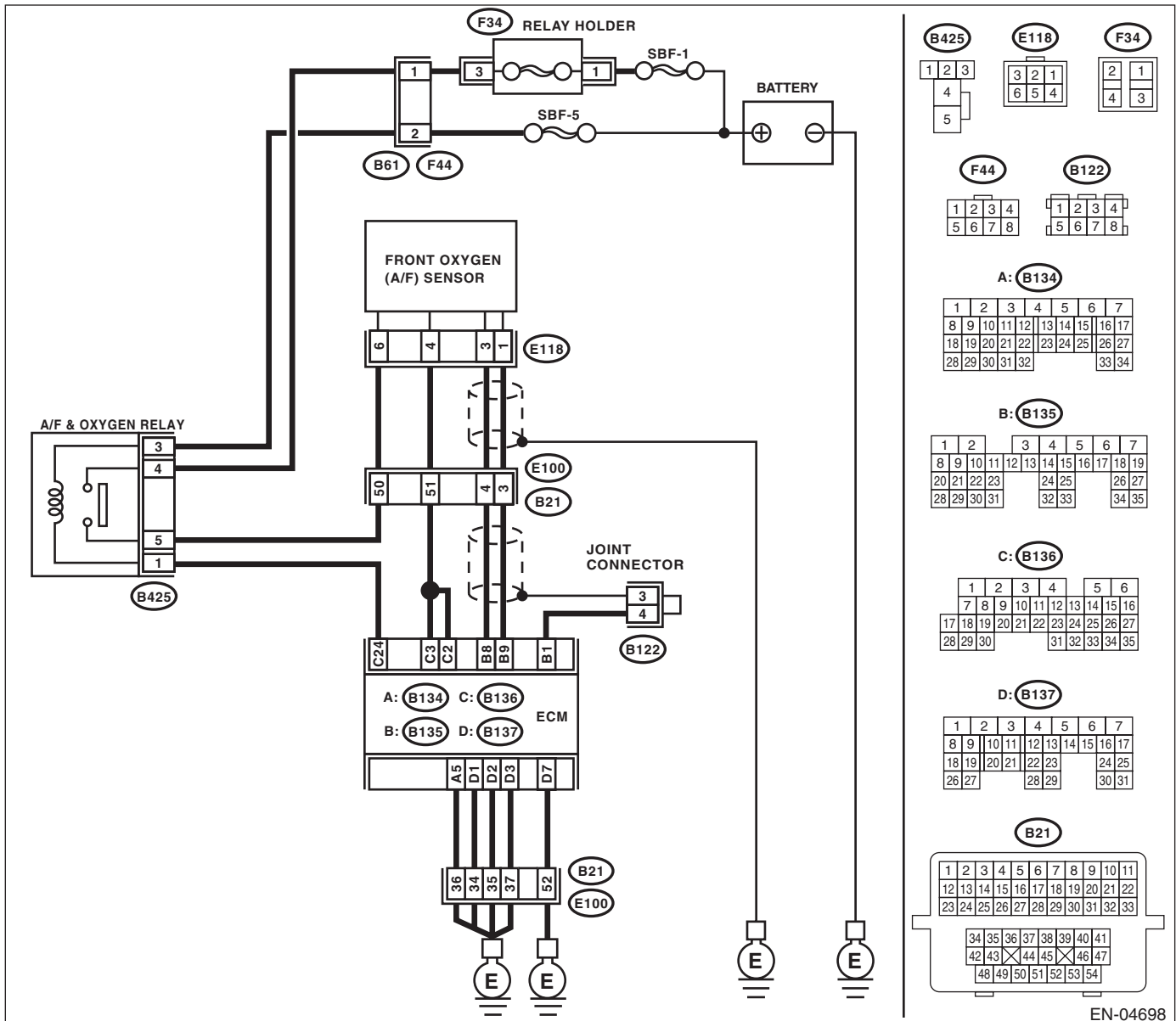
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-58, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.	Has water entered the connector?	Completely remove any water inside.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from front oxygen (A/F) sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-): (B135) No. 8 (+) — Chassis ground (-):	Is the voltage 8 V or more?	Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AD:DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1)

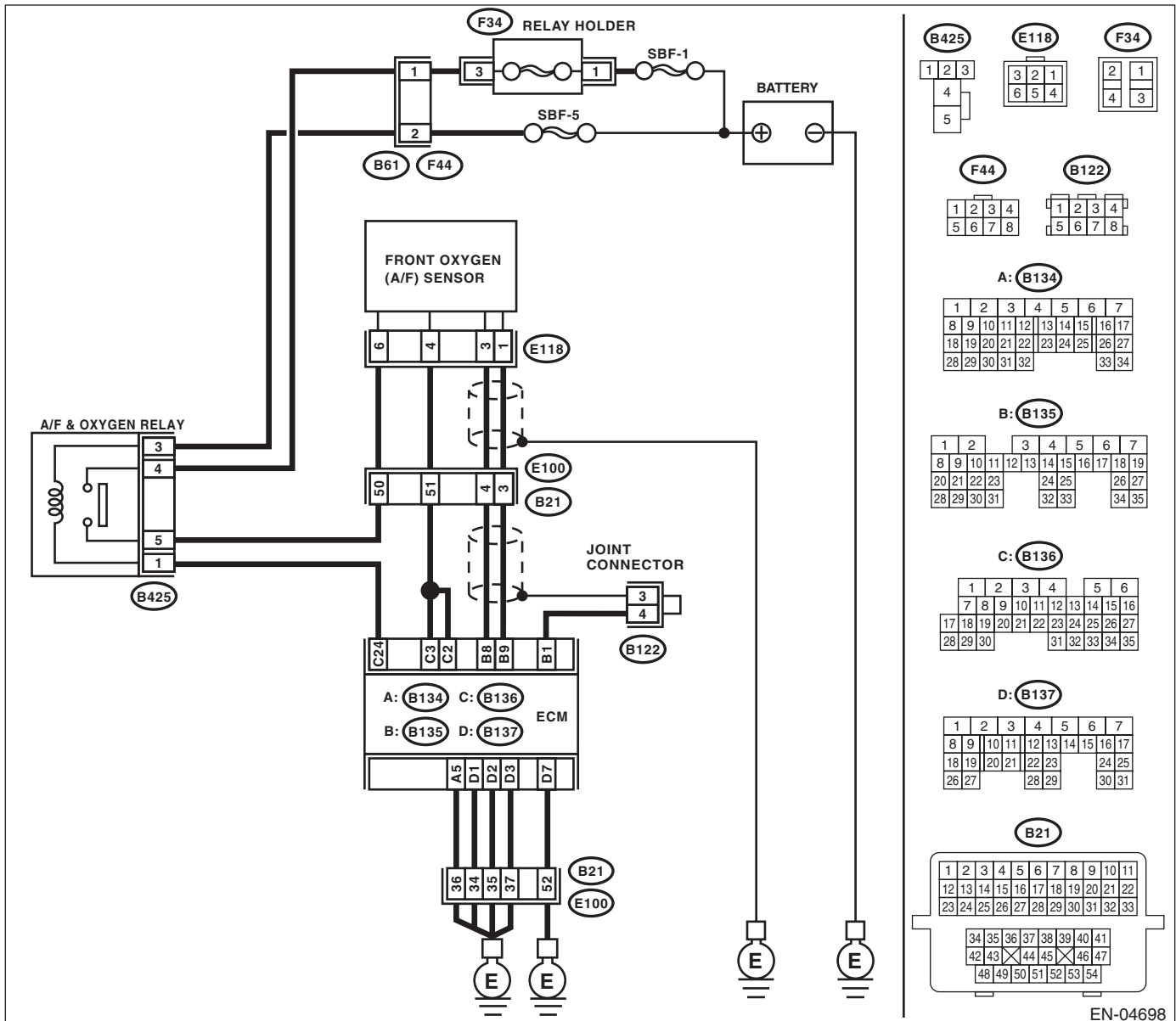
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-60, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04698

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK EXHAUST SYSTEM. NOTE: Check the following items. <ul style="list-style-type: none">• 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 any fault in exhaust system?	Repair the exhaust system.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AE:DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1)

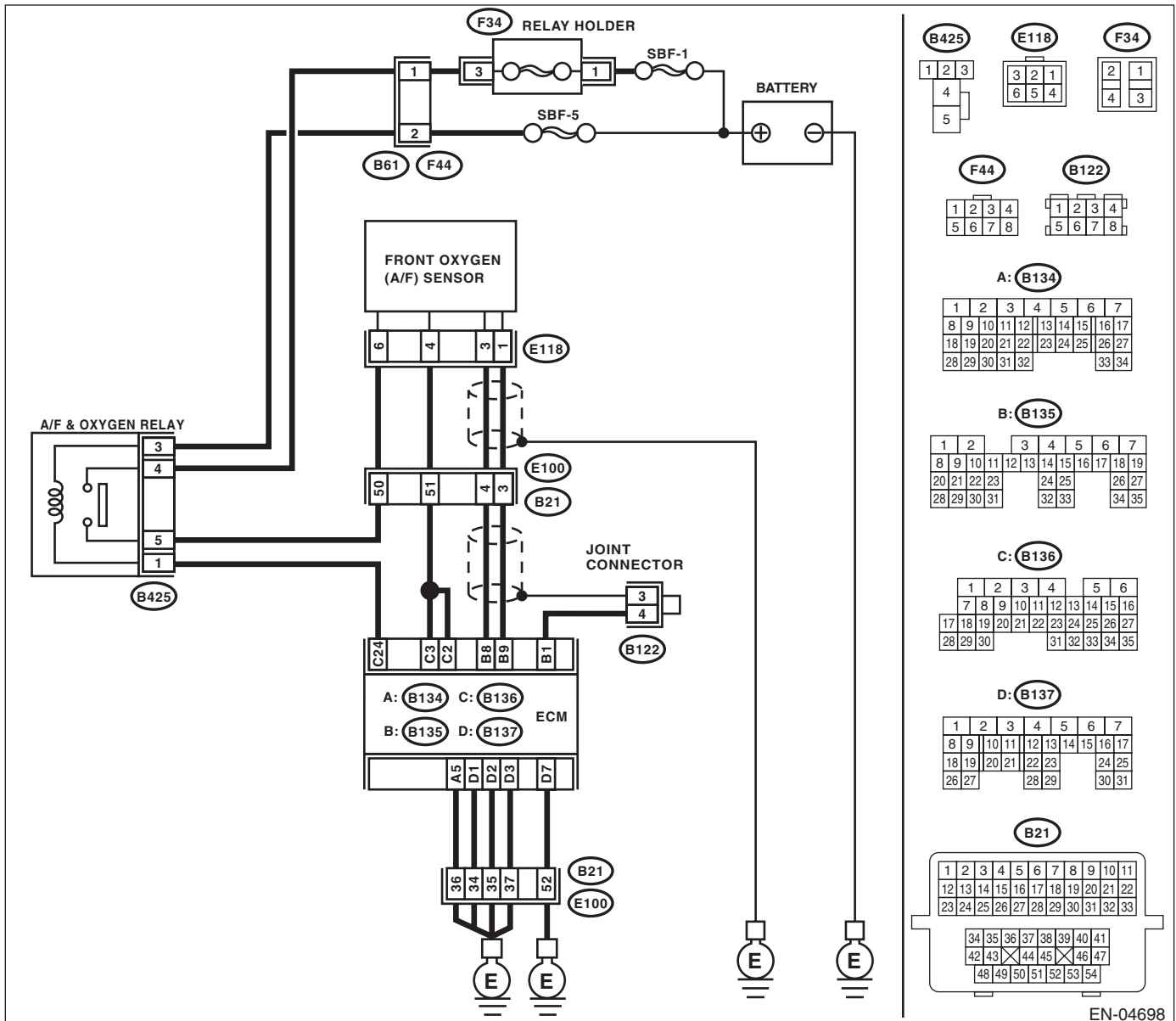
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-63, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p>Connector & terminal (B135) No. 9 — (E118) No. 1: (B135) No. 8 — (E118) No. 3:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector 	
<p>2</p> <p>CHECK POOR CONTACT. Check poor contact of front oxygen (A/F) sensor connector.</p>	<p>Is there poor contact in front oxygen (A/F) sensor connector?</p>	<p>Repair the poor contact of the front oxygen (A/F) sensor connector.</p>	<p>Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.></p>	

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AF:DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2)

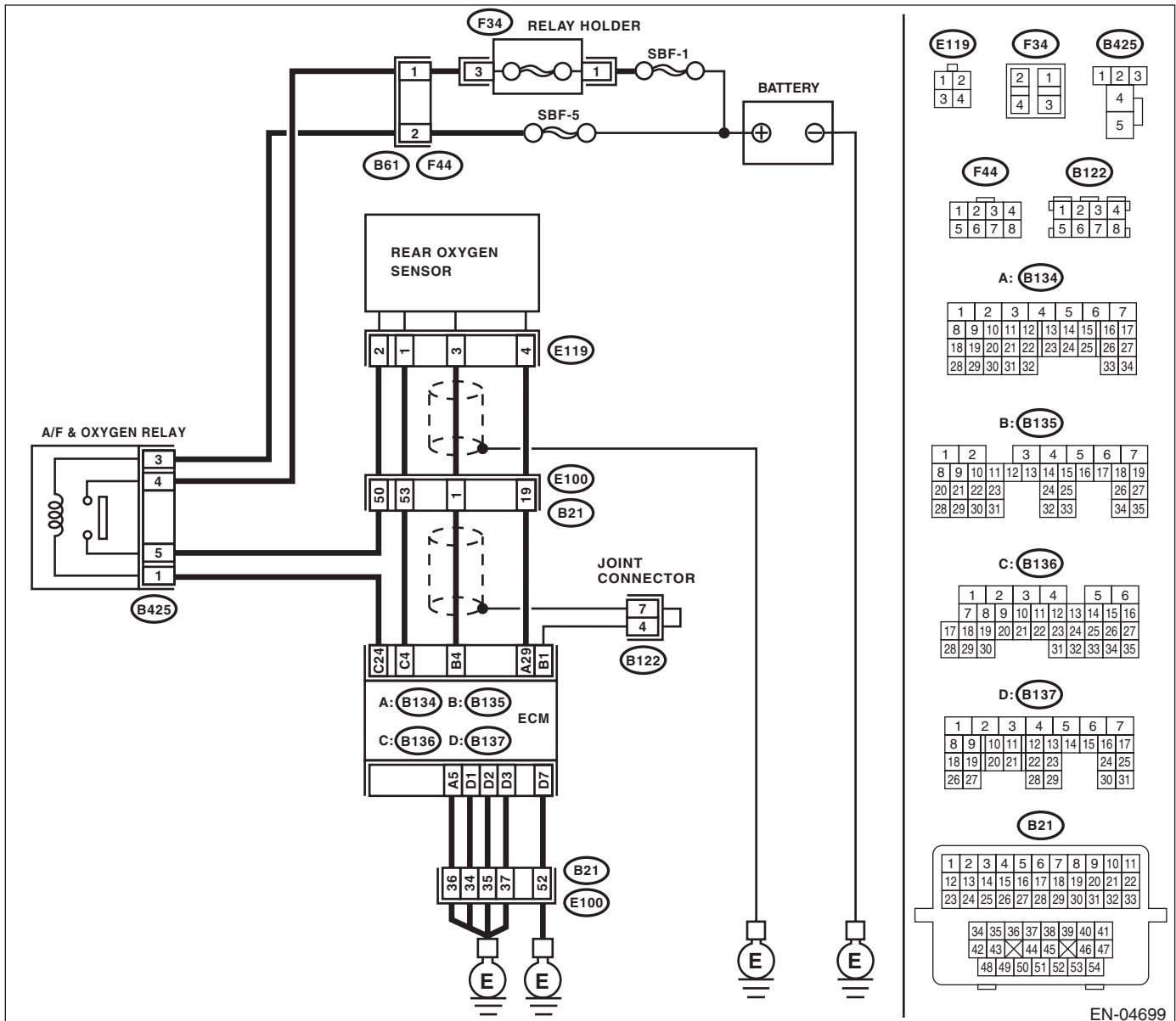
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-65, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK REAR OXYGEN SENSOR DATA.</p> <p>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)</p> <p>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the voltage 490 mV or more?	Go to step 5.	Go to step 2.
2	<p>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</p>	Has water entered the connector?	Completely remove any water inside.	Go to step 3.
3	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from ECM and rear oxygen sensor.</p> <p>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.</p> <p>Connector & terminal (B135) No. 4 — (E119) No. 3: (B134) No. 29 — (E119) No. 4:</p>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of harness between ECM and rear oxygen sensor connector.
4	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the rear oxygen sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between rear oxygen sensor connector and chassis ground.</p> <p>Connector & terminal (E119) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> Open circuit of harness between the ECM and rear oxygen sensor Poor contact of the rear oxygen sensor connector Poor contact in ECM connector
5	<p>CHECK EXHAUST SYSTEM.</p> <p>Check exhaust system parts.</p> <p>NOTE: Check the following items.</p> <ul style="list-style-type: none"> Loose part and incomplete installation of exhaust system Damage (crack, hole etc.) of parts Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor 	Is there any fault in exhaust system?	Repair or replace faulty parts.	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AG:DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2)

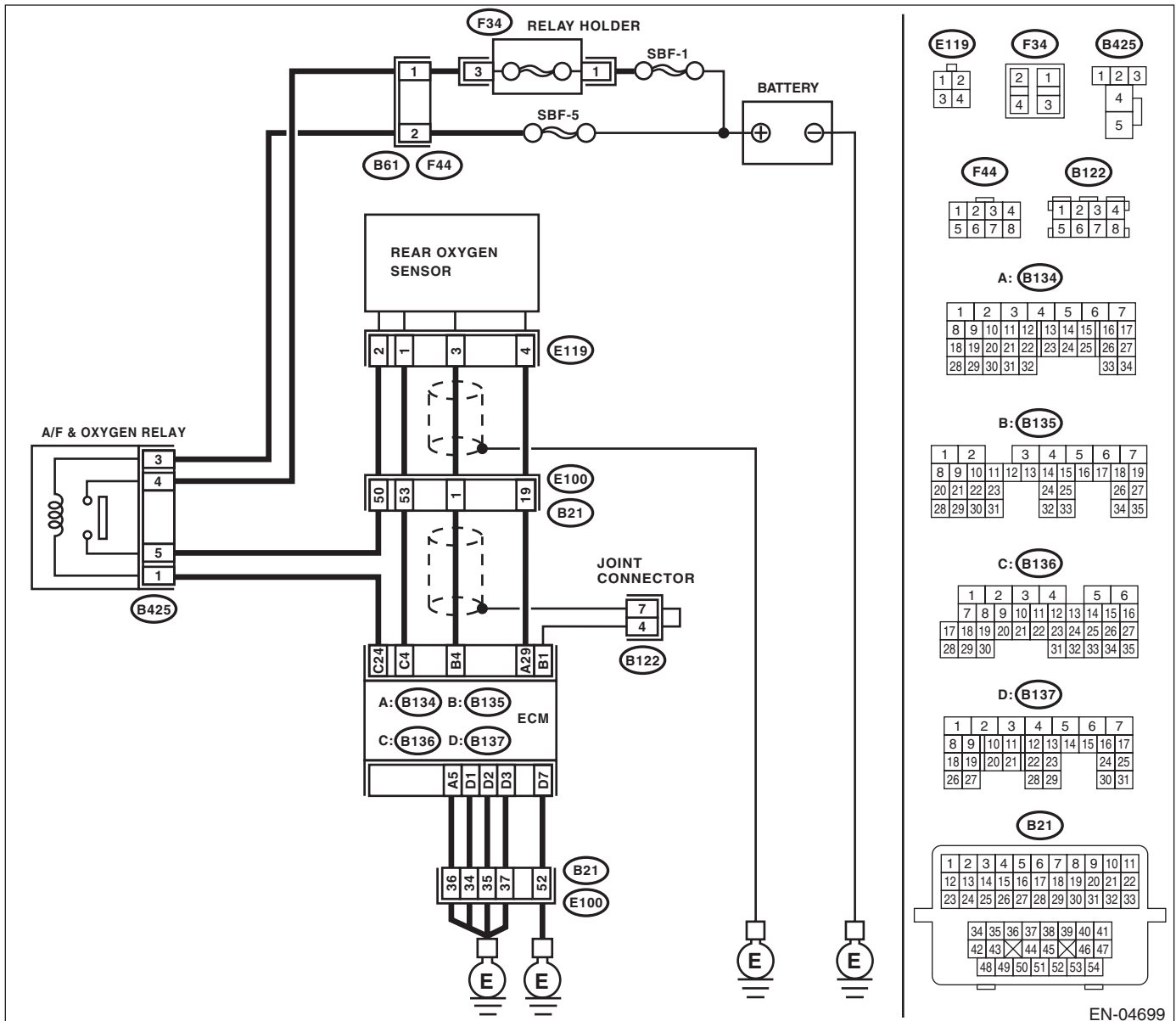
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-67, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04699

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK REAR OXYGEN SENSOR DATA.</p> <p>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.</p> <p>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the voltage 250 mV or less?	Go to step 5.	Go to step 2.
2	<p>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</p>	Has water entered the connector?	Completely remove any water inside.	Go to step 3.
3	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from ECM and rear oxygen sensor.</p> <p>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.</p> <p>Connector & terminal (B135) No. 4 — (E119) No. 3: (B134) No. 29 — (E119) No. 4:</p>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of harness between ECM and rear oxygen sensor connector.
4	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the rear oxygen sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between rear oxygen sensor connector and chassis ground.</p> <p>Connector & terminal (E119) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> Open circuit of harness between the ECM and rear oxygen sensor Poor contact of the rear oxygen sensor connector Poor contact in ECM connector
5	<p>CHECK EXHAUST SYSTEM.</p> <p>Check exhaust system parts.</p> <p>NOTE: Check the following items.</p> <ul style="list-style-type: none"> Loose part and incomplete installation of exhaust system Damage (crack, hole etc.) of parts Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor 	Is there any fault in exhaust system?	Repair or replace faulty parts.	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AH:DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2)

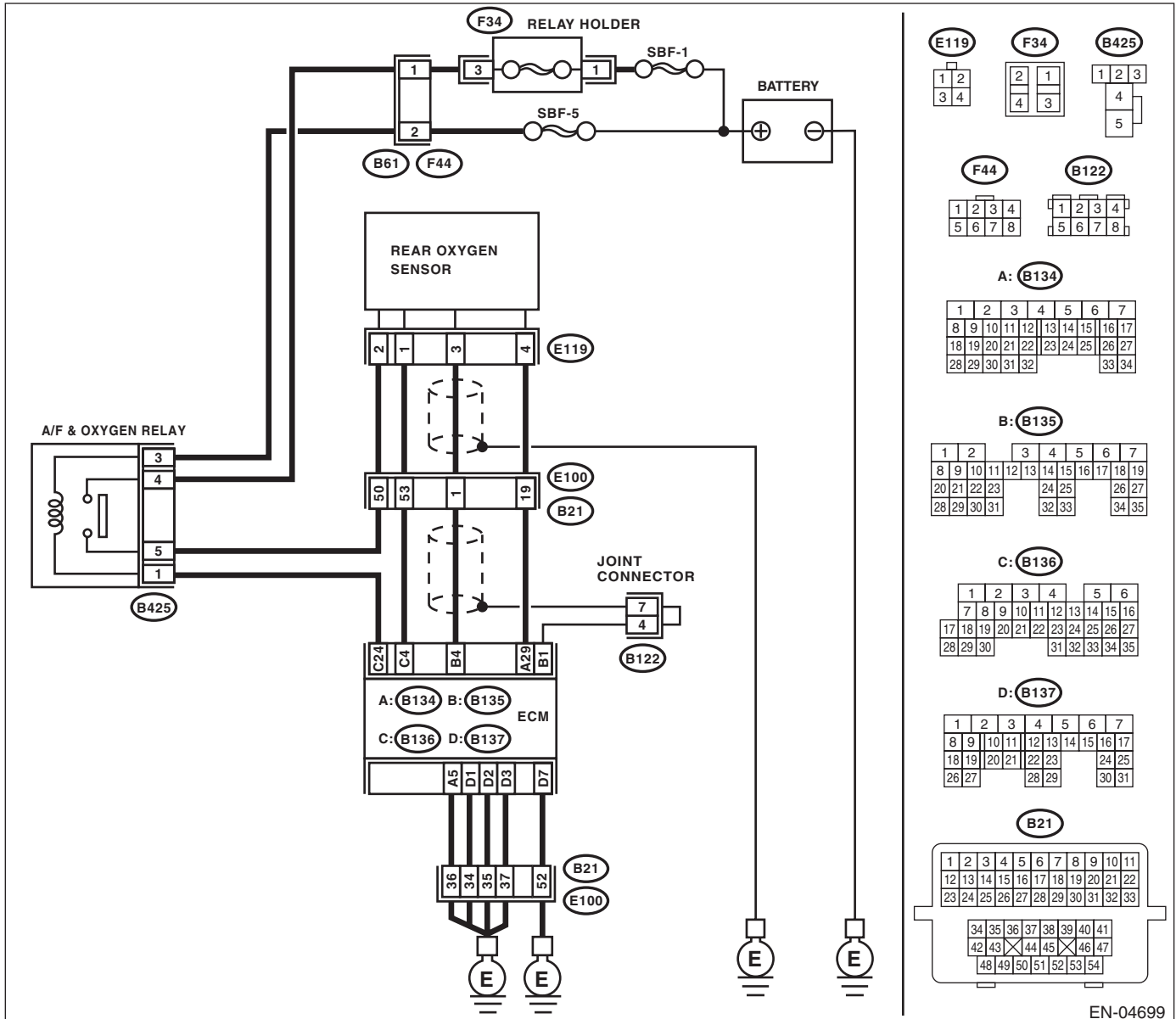
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-68, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04699

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector.</p> <p>Connector & terminal (B135) No. 4 — (E119) No. 3:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of harness between ECM and rear oxygen sensor connector.</p>
<p>2</p> <p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</p> <p>Measure the resistance between rear oxygen sensor connector and chassis ground.</p> <p>Connector & terminal (E119) No. 3 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 3.</p>	<p>Repair short circuit of the harness to ground between ECM and rear oxygen sensor connector.</p>
<p>3</p> <p>CHECK REAR OXYGEN SENSOR.</p> <p>Measure the resistance between rear oxygen sensor terminals.</p> <p>Terminals No. 3 — No. 4</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.></p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE: In this case, there may be a temporary connector contact failure.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AI: DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2)

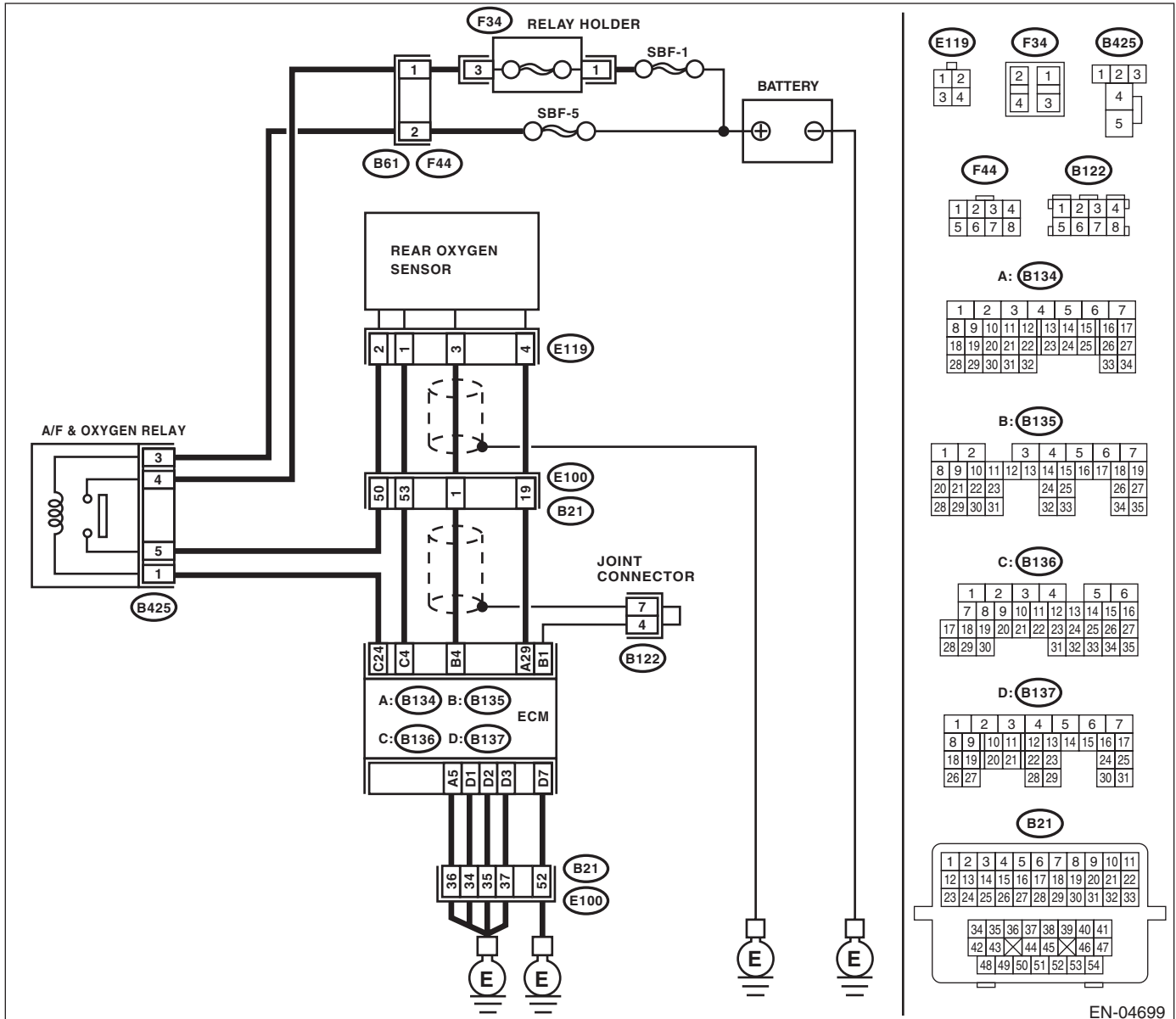
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-74, DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04699

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage 490 mV or more?	Go to step 6.	Go to step 2.
2 CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the voltage 250 mV or less?	Go to step 6.	Go to step 3.
3 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.	Has water entered the connector?	Completely remove any water inside.	Go to step 4.
4 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (E119) No. 3: (B134) No. 29 — (E119) No. 4:	Is the resistance less than 1 Ω?	Go to step 5.	Repair the open circuit of harness between ECM and rear oxygen sensor connector.
5 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (E119) No. 3 (+) — Chassis ground (-):	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ECM and rear oxygen sensor • Poor contact of the rear oxygen sensor connector • Poor contact in ECM connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
6	CHECK EXHAUST SYSTEM. Check exhaust system parts. NOTE: Check the following items. <ul style="list-style-type: none">• Loose part and incomplete installation of exhaust system• Damage (crack, hole etc.) of parts• Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor	Is there any fault in exhaust system?	Repair or replace faulty parts.	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>

AJ:DTC P0171 SYSTEM TOO LEAN (BANK 1)

Refer to DTC P0172 for diagnostic procedure. <Ref. to EN(H4SO)(diag)-147, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AK:DTC P0172 SYSTEM TOO RICH (BANK 1)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-78, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1	CHECK EXHAUST SYSTEM.	Are there holes or loose bolts on exhaust system?	Repair the 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 the air intake system. Go to step 3.
3	CHECK FUEL PRESSURE. WARNING: Place "NO OPEN FLAMES" signs near the working area. CAUTION: Be careful not to spill fuel. Measure the fuel pressure. <Ref. to ME(H4SO)-28, INSPECTION, Fuel Pressure.> CAUTION: Release fuel pressure before removing the fuel pressure gauge.	Is the measured value 339.5 — 360.5 kPa (3.5 — 3.7 kgf/cm ² , 49 — 52 psi)?	Go to step 4. Repair the following item. Fuel pressure is too high: • Clogged fuel line or bent hose Fuel pressure is too low: • Improper fuel pump discharge • Clogged fuel line
4	CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the engine coolant temperature 75°C (167°F) or higher?	Go to step 5. Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>5</p> <p>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).</p> <p>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all the accessory switches to OFF.</p> <p>5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.0 — 5.0 g/s (0.2 — 0.53 lb/m)?</p>	<p>Go to step 6.</p>	<p>Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>
<p>6</p> <p>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).</p> <p>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all the accessory switches to OFF.</p> <p>5) Open the front hood.</p> <p>6) Measure the ambient temperature.</p> <p>7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?</p>	<p>Repair poor contact of the ECM connector.</p>	<p>Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AL:DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE

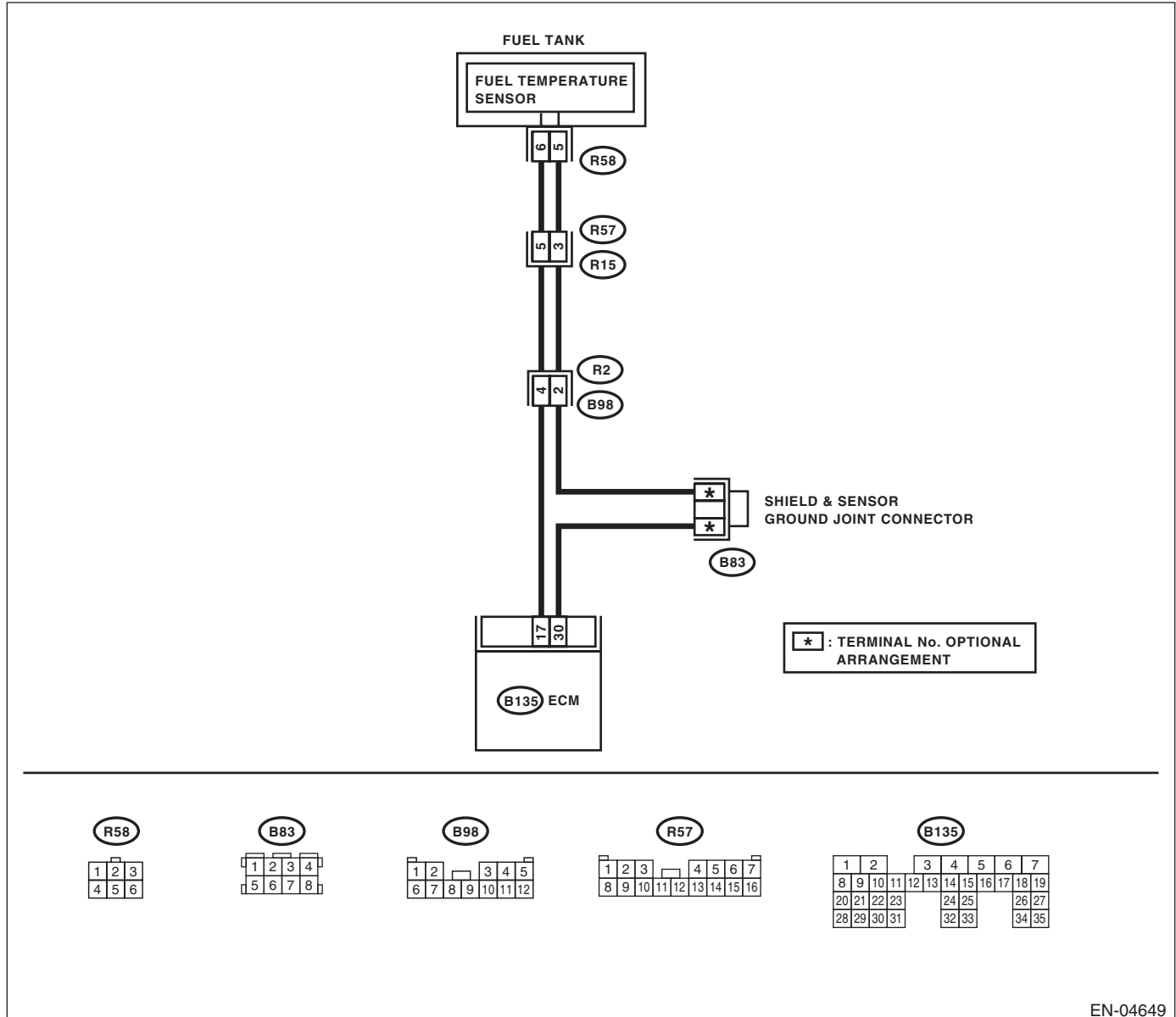
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-80, DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04649

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the fuel temperature sensor. <Ref. to EC(H4SO)-9, Fuel Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AM:DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT

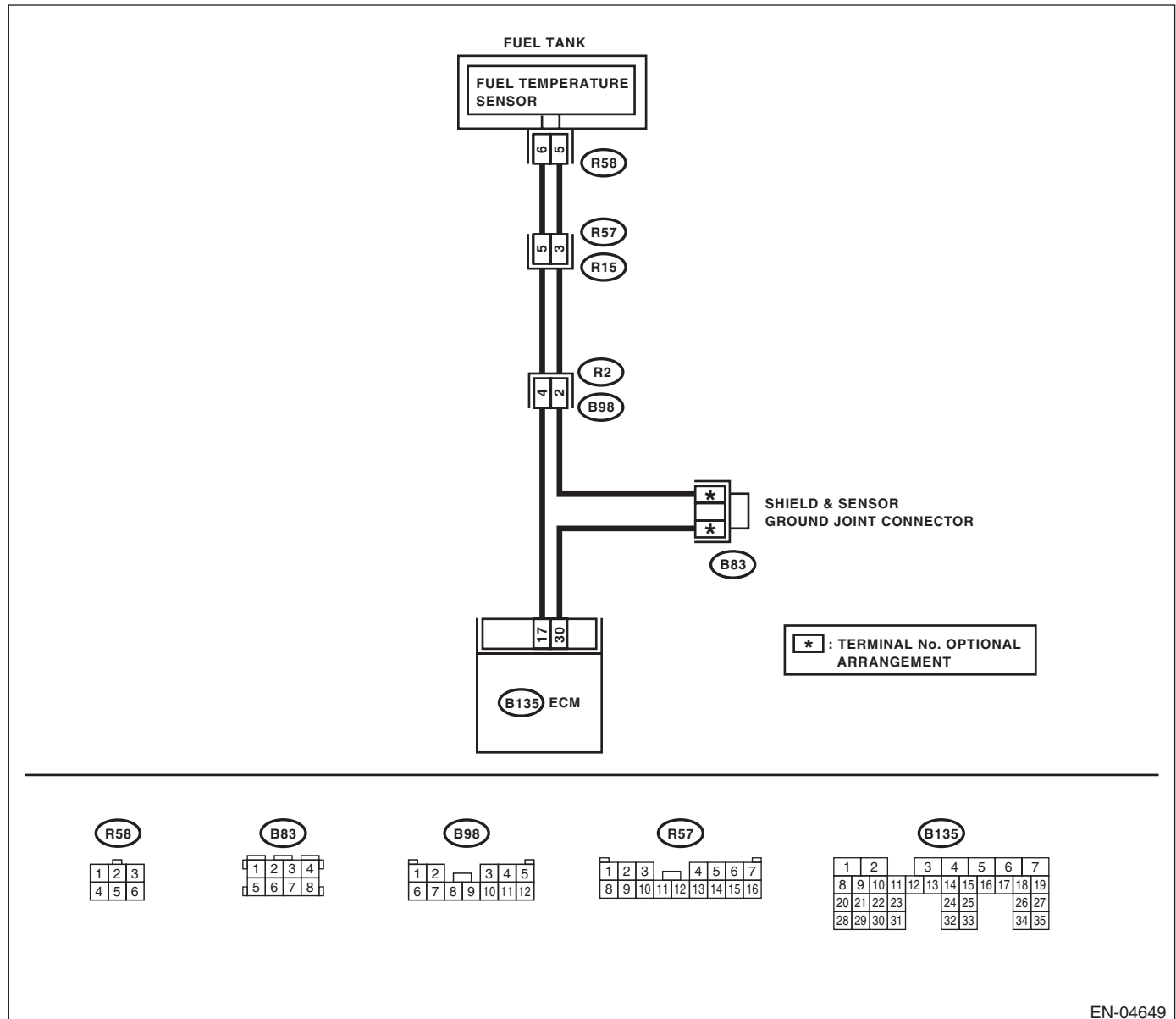
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-83, DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of fuel temperature sensor signal using Subaru Select Monitor.</p> <p>NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p>	<p>Is the temperature 120°C (248°F) or higher?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE: In this case, there may be a temporary connector contact failure.</p>
<p>2</p> <p>CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the ECM and fuel temperature sensor.</p> <p>3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B135) No. 17 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Replace the fuel temperature sensor. <Ref. to EC(H4SO)-9, Fuel Temperature Sensor.></p>	<p>Repair short circuit of the harness to ground between ECM and fuel pump.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AN:DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT

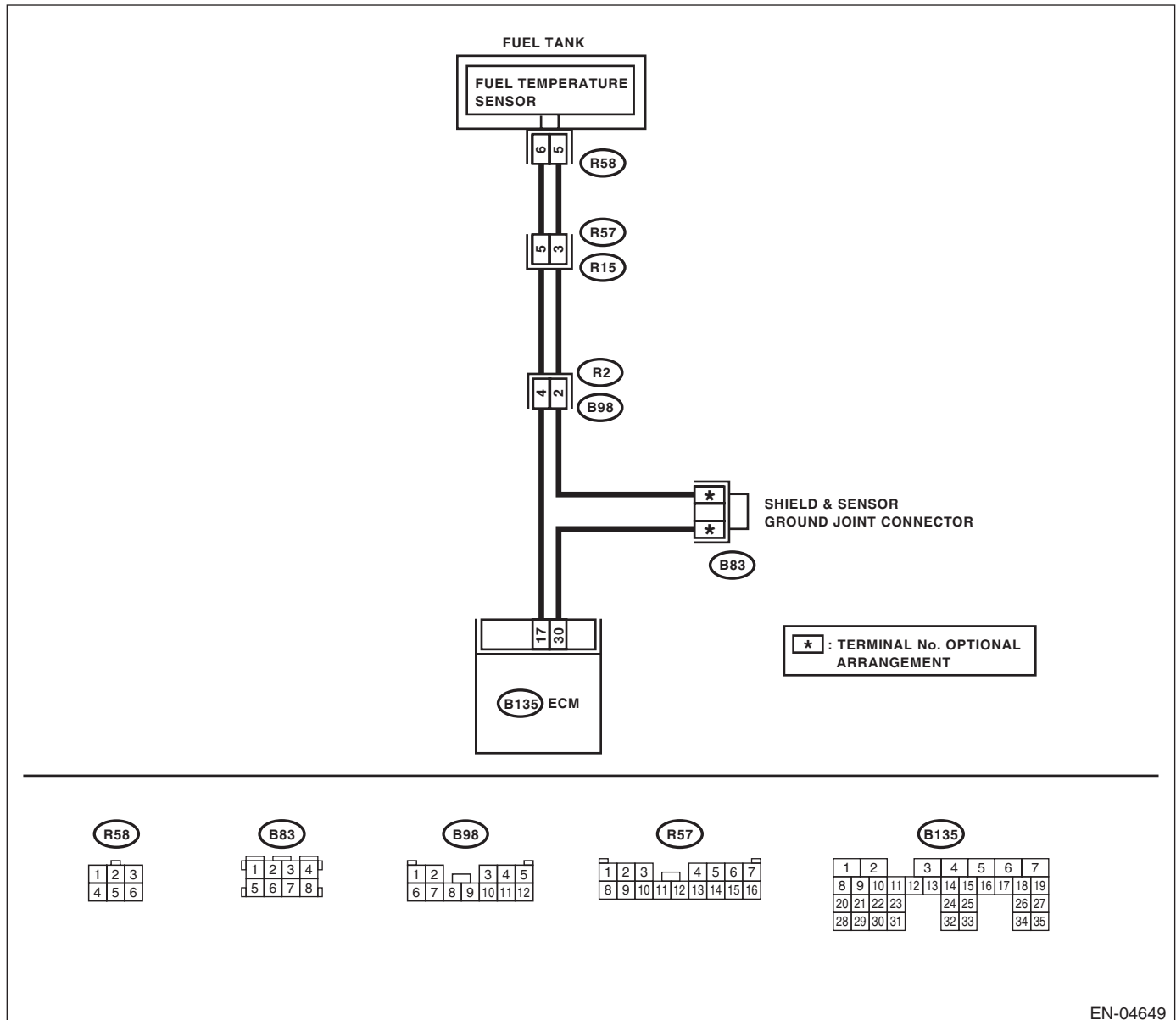
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-85, DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04649

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of fuel temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.>	Is the temperature less than –40°C (–40°F)?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.
2 CHECK POOR CONTACT. Repair any poor contact between the ECM and fuel temperature sensor connectors.	Is there poor contact in the ECM or fuel temperature sensor connectors?	Repair any poor contact between the ECM and fuel temperature sensor connectors.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and fuel temperature sensor. 3) Measure the resistance of the harness between the ECM and fuel temperature sensor connector. <i>Connector & terminal</i> <i>(B135) No. 17 — (R58) No. 6:</i> <i>(B135) No. 30 — (R58) No. 5:</i>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of the harness between the ECM and fuel temperature sensor connector.
4 CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B135) No. 17 (+) — Chassis ground (-):</i>	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between the ECM and fuel temperature sensor connector.	Replace the fuel temperature sensor. <Ref. to EC(H4SO)-9, Fuel Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AO:DTC P0196 ENGINE OIL TEMPERATURE SENSOR CIRCUIT RANGE/PERFORMANCE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-87, DTC P0196 ENGINE OIL TEMPERATURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

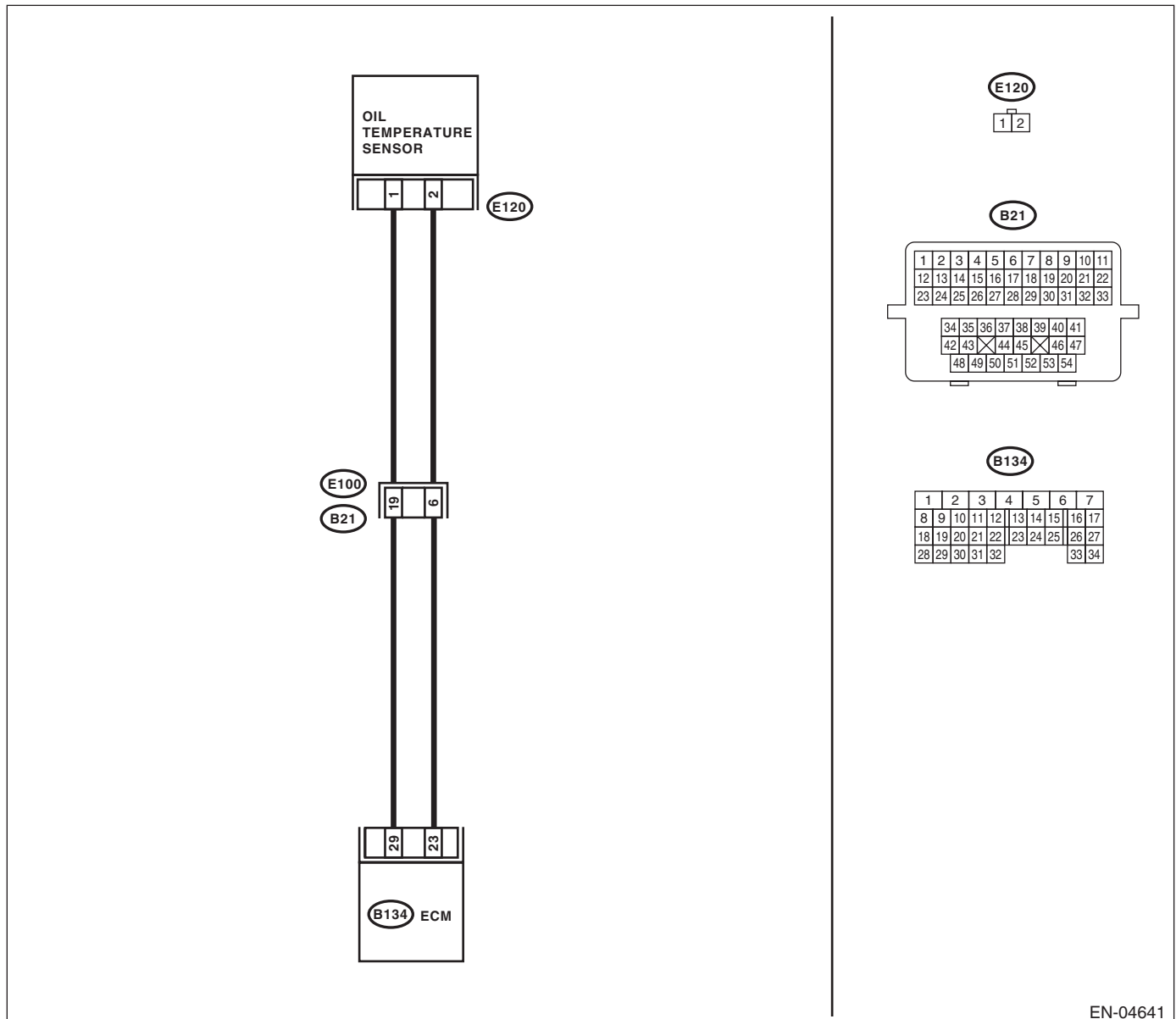
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04641

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the oil temperature sensor. <Ref. to FU(H4SO)-35, Oil Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AP:DTC P0197 ENGINE OIL TEMPERATURE SENSOR LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-89, DTC P0197 ENGINE OIL TEMPERATURE SENSOR LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

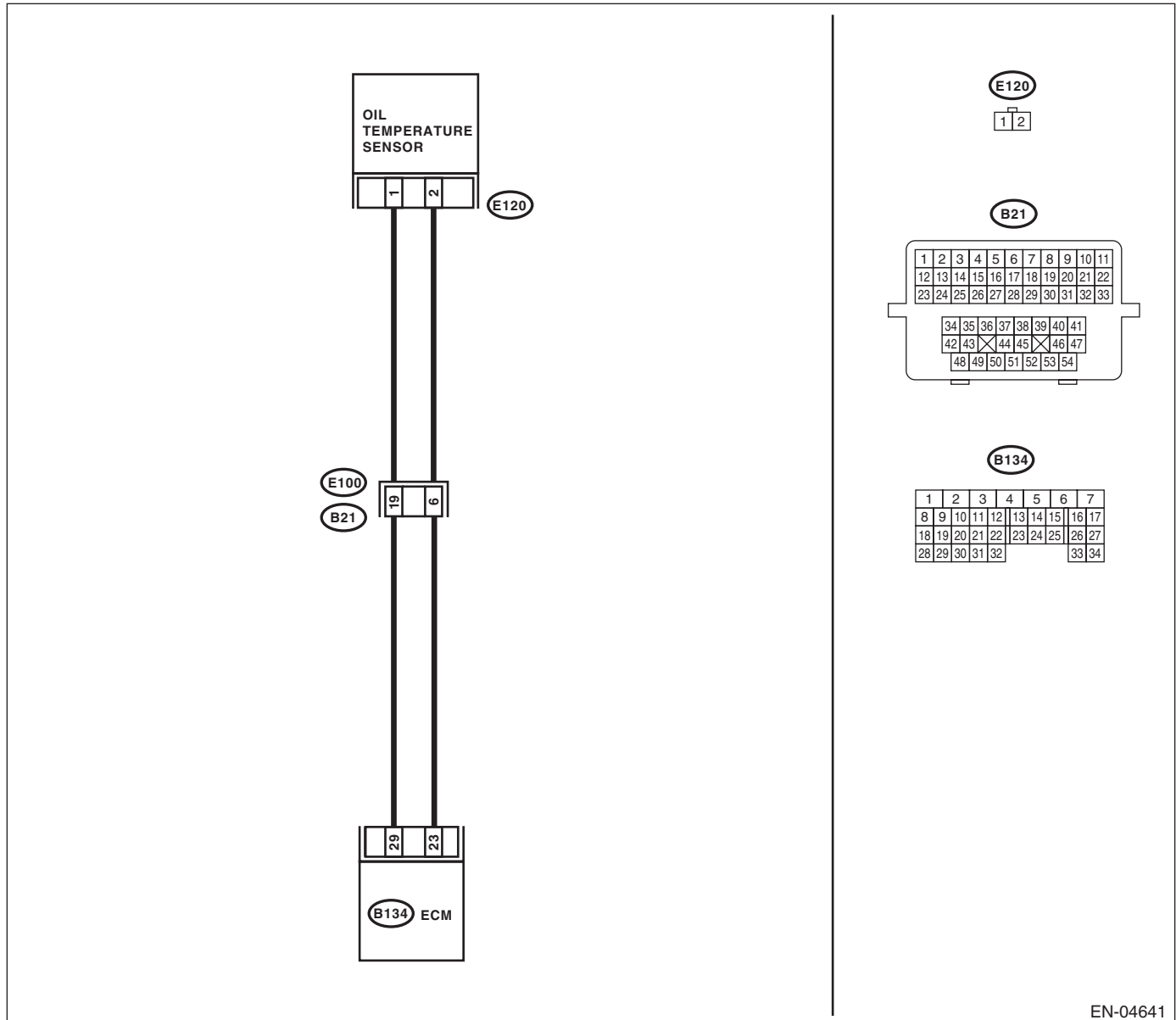
TRUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04641

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read the data of the oil temperature sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the oil temperature 215°C (419°F) or more?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE: In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK HARNESS BETWEEN ECM AND OIL TEMPERATURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the ECM and oil temperature sensor.</p> <p>3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 23 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Replace the oil temperature sensor. <Ref. to FU(H4SO)-35, Oil Temperature Sensor.></p>	<p>Repair the ground short circuit of harness between ECM and oil temperature sensor.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AQ:DTC P0198 ENGINE OIL TEMPERATURE SENSOR HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-90, DTC P0198 ENGINE OIL TEMPERATURE SENSOR HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

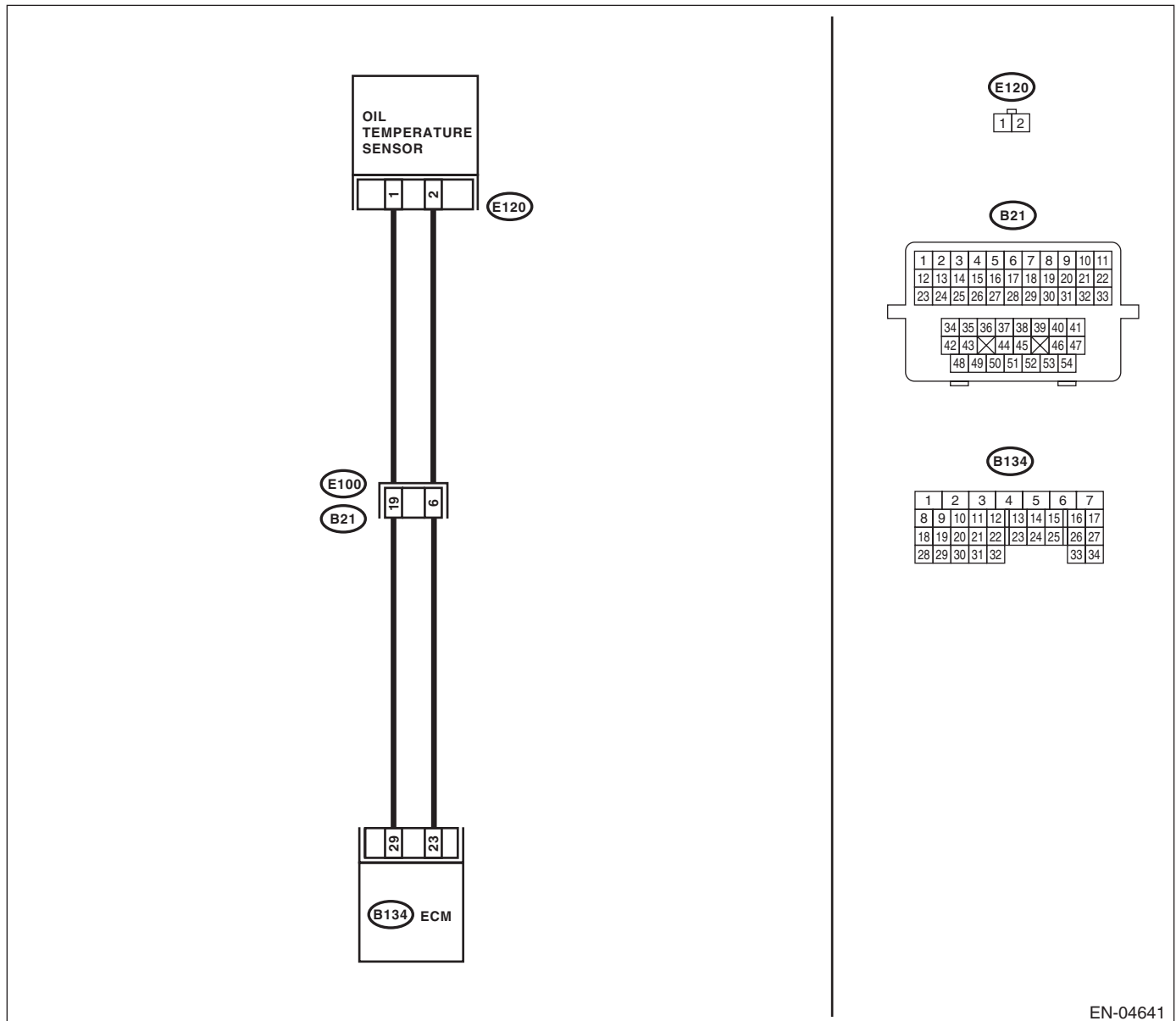
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04641

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of the oil temperature sensor signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the oil temperature less than -40°C (-40°F)?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.
2 CHECK POOR CONTACT. Check for poor contact of the ECM and oil temperature sensor connector.	Is there poor contact in the ECM or oil temperature sensor connector?	Repair the poor contact in the ECM or the oil temperature sensor connector.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND OIL TEMPERATURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and oil temperature sensor. 3) Measure the resistance of the harness between the ECM and oil temperature sensor connector. <i>Connector & terminal</i> (B134) No. 23 — (E120) No. 2: (B134) No. 29 — (E120) No. 1:	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of harness between ECM and oil temperature sensor connector.
4 CHECK HARNESS BETWEEN ECM AND OIL TEMPERATURE SENSOR CONNECTOR. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> (B134) No. 23 (+) — Chassis ground (-):	Is the voltage 5 V or more?	Repair the short circuit to power supply in the harness between the ECM and oil temperature sensor connector.	Replace the oil temperature sensor. <Ref. to FU(H4SO)-35, Oil Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AR:DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-91, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

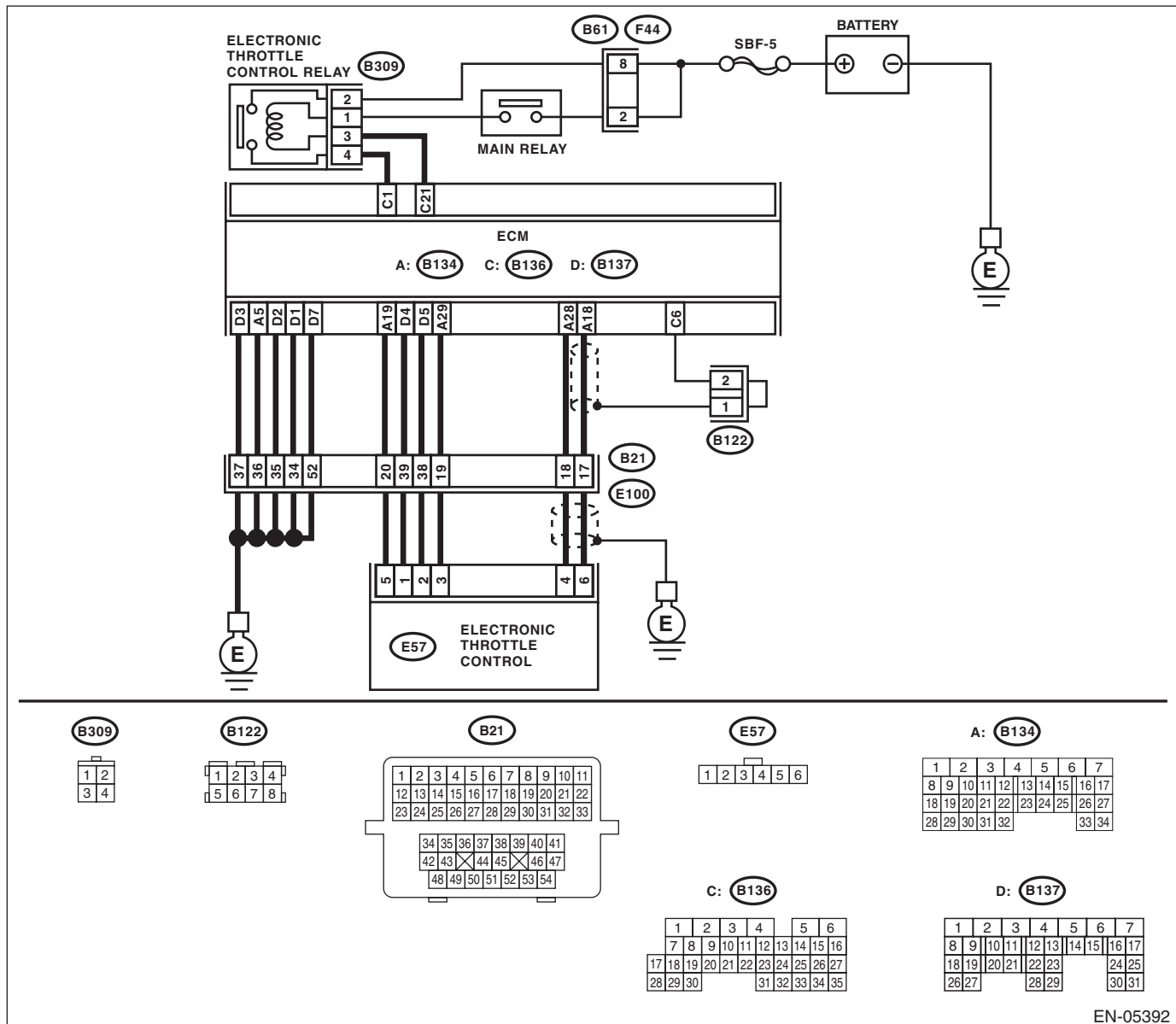
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground. <i>Connector & terminal</i> <i>(B134) No. 19 — Chassis ground:</i> <i>(B134) No. 28 — Chassis ground:</i>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair short circuit of the harness to ground between ECM and electronic throttle control connector.
2 CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector & terminal</i> <i>(E57) No. 4 — Engine ground:</i>	Is the resistance 1 MΩ or more?	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>	Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AS:DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-93, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

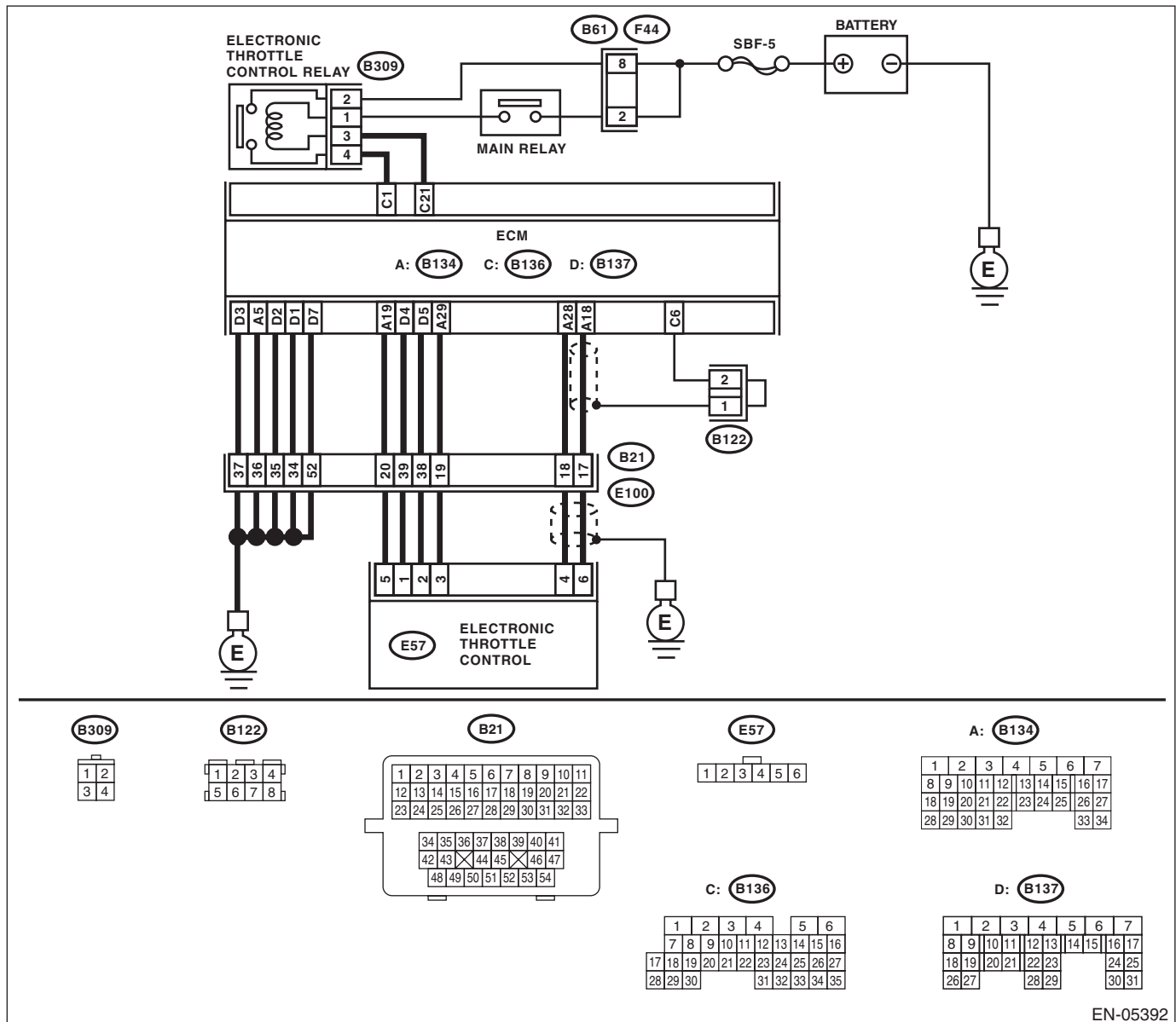
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3:	Is the resistance less than 1 Ω?	Go to step 2.	Repair the open circuit of harness between ECM and electronic throttle control connector.
2 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 4 (+) — Engine ground (-):	Is the voltage 4.85 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 4.
4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 28:	Is the resistance 1 MΩ or more?	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.

AT:DTC P0301 CYLINDER 1 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AU:DTC P0302 CYLINDER 2 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

AV:DTC P0303 CYLINDER 3 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AW:DTC P0304 CYLINDER 4 MISFIRE DETECTED

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-100, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

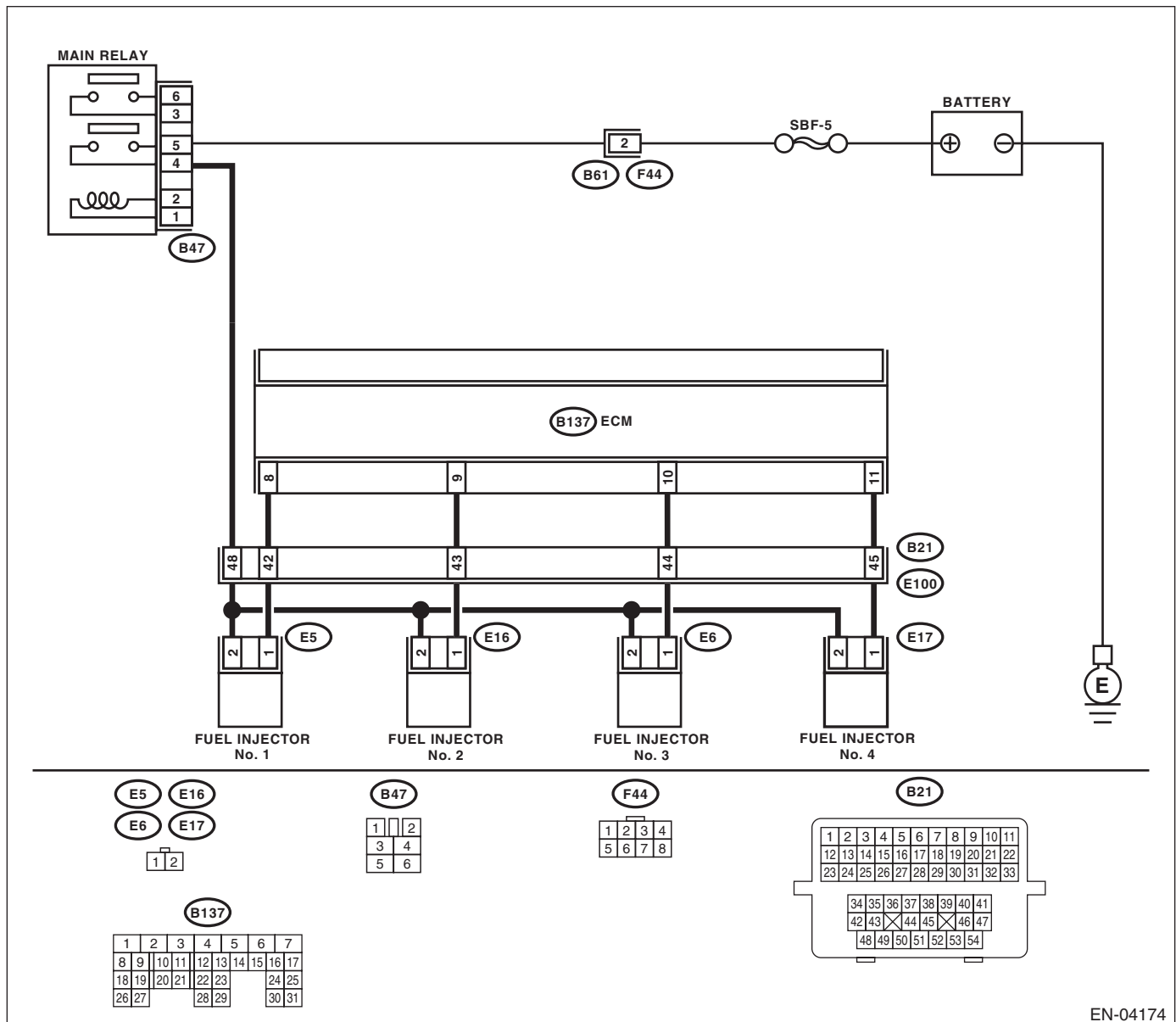
TROUBLE SYMPTOM:

- Engine stalls.
- Erroneous idling
- Rough driving

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04174

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between the ECM and chassis ground for faulty cylinders. Connector & terminal #1 (B137) No. 8 (+) — Chassis ground (-): #2 (B137) No. 9 (+) — Chassis ground (-): #3 (B137) No. 10 (+) — Chassis ground (-): #4 (B137) No. 11 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 6.	Go to step 2.
2 CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Measure the resistance between the fuel injector 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 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and fuel injector.
3 CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. Measure the resistance of harness between the ECM and fuel injector on faulty cylinders. Connector & terminal #1 (B137) No. 8 — (E5) No. 1: #2 (B137) No. 9 — (E16) No. 1: #3 (B137) No. 10 — (E6) No. 1: #4 (B137) No. 11 — (E17) No. 1:	Is the resistance less than 1 Ω?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and fuel injector connector • Poor contact of coupling connector
4 CHECK FUEL INJECTOR. Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:	Is the resistance between 5 — 20 Ω?	Go to step 5.	Replace the faulty fuel injector. <Ref. to FU(H4SO)-30, Fuel Injector.>
5 CHECK POWER SUPPLY LINE. 1) Turn the ignition switch to ON. 2) Measure the 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 10 V or more?	Repair the poor contact of all connectors in fuel injector circuit.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the main relay and fuel injector connector on faulty cylinders • Poor contact of coupling connector • Poor contact of main relay connector • Poor contact of fuel injector connector on faulty cylinders

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
6 CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Turn the ignition switch to ON. 4) Measure the voltage between the ECM and chassis ground for faulty cylinders. Connector & terminal #1 (B137) No. 8 (+) — Chassis ground (-): #2 (B137) No. 9 (+) — Chassis ground (-): #3 (B137) No. 10 (+) — Chassis ground (-): #4 (B137) No. 11 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between the ECM and fuel injector.	Go to step 7.
7 CHECK FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Replace the faulty fuel injector. <Ref. to FU(H4SO)-30, Fuel Injector.>	Go to step 8.
8 CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.	Is the camshaft position sensor or crankshaft position sensor loosely installed?	Tighten the camshaft position sensor or crankshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.> <Ref. to FU(H4SO)-23, Crankshaft Position Sensor.>	Go to step 9.
9 CHECK CRANK SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-42, REMOVAL, Timing Belt Cover.>	Is the crank sprocket rusted or does it have damaged teeth?	Replace the crank sprocket. <Ref. to ME(H4SO)-50, Crank Sprocket.>	Go to step 10.
10 CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft using ST, and align alignment mark on crank sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO)-43, Timing Belt.>	Go to step 11.
11 CHECK FUEL LEVEL.	Is the fuel meter indication higher than the "Lower" level?	Go to step 12.	Replenish fuel so that fuel meter indication is higher than the "Lower" level. After replenishing fuel, Go to step 12.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
12 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT. 1) Clear the memory using the Subaru Select Monitor or general scan tool. <Ref. to EN(H4SO)(diag)-47, Clear Memory Mode.> NOTE: • Subaru Select Monitor <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool Refer to operating manuals for the general scan tool. 2) Start the engine, and drive the vehicle 10 minutes or more.	Does the malfunction indicator light illuminate or blink?	Go to step 14.	Go to step 13.
13 CHECK CAUSE OF MISFIRE.	Has the cause of misfire been detected while running the engine?	Finish diagnostics operation, if the engine has no abnormality.	Repair the poor contact of connector. NOTE: In this case, repair the following item: • Poor contact of ignition coil connector • Poor contact of fuel injector connector on faulty cylinders • Poor contact in ECM connector • Poor contact of coupling connector
14 CHECK AIR INTAKE SYSTEM.	Is there any fault in air intake system?	Repair the 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 15.
15 CHECK MISFIRE SYMPTOM. 1) Turn the ignition switch to ON. 2) Read the DTC. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Does the Subaru Select Monitor or general scan tool indicate only one DTC?	Go to step 20.	Go to step 16.
16 CHECK DTC.	Are DTCs P0301 and P0302 displayed on the Subaru Select Monitor or general scan tool?	Go to step 21.	Go to step 17.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
17	CHECK DTC.	Are DTCs P0303 and P0304 displayed on the Subaru Select Monitor or general scan tool?	Go to step 22.	Go to step 18.
18	CHECK DTC.	Are DTCs P0301 and P0303 displayed on the Subaru Select Monitor or general scan tool?	Go to step 23.	Go to step 19.
19	CHECK DTC.	Are DTCs P0302 and P0304 displayed on the Subaru Select Monitor or general scan tool?	Go to step 24.	Go to step 25.
20	ONLY ONE CYLINDER.	Is there any fault in the cylinder?	Repair or replace faulty parts. NOTE: Check the following items. • Spark plug • Spark plug cord • Fuel injector • Compression ratio	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
21	GROUP OF #1 AND #2 CYLINDERS.	Are there any faults in #1 and #2 cylinders?	Repair or replace faulty parts. NOTE: • Check the following items. • Spark plug • Fuel injector • Ignition coil • Compression ratio • If no fault is found, check the "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <Ref. to EN(H4SO)(diag)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
22 GROUP OF #3 AND #4 CYLINDERS.	Are there any faults in #3 and #4 cylinders?	Repair or replace faulty parts. NOTE: • Check the following items. • Spark plug • Fuel injector • Ignition coil • Compression ratio • If no fault is found, check the "IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to EN(H4SO)(diag)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
23 GROUP OF #1 AND #3 CYLINDERS.	Are there any faults in #1 and #3 cylinders?	Repair or replace faulty parts. NOTE: Check the following items. • Spark plug • Fuel injector • Compression ratio • Skipping timing belt teeth	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
24 GROUP OF #2 AND #4 CYLINDERS.	Are there any faults in #2 and #4 cylinders?	Repair or replace faulty parts. NOTE: Check the following items. • Spark plug • Fuel injector • Compression ratio • Skipping timing belt teeth	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
25 CYLINDER AT RANDOM.	Is the engine idle rough?	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-146, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Repair or replace faulty parts. NOTE: Check the following items. • Spark plug • Fuel injector • Compression ratio

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AX:DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-101, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

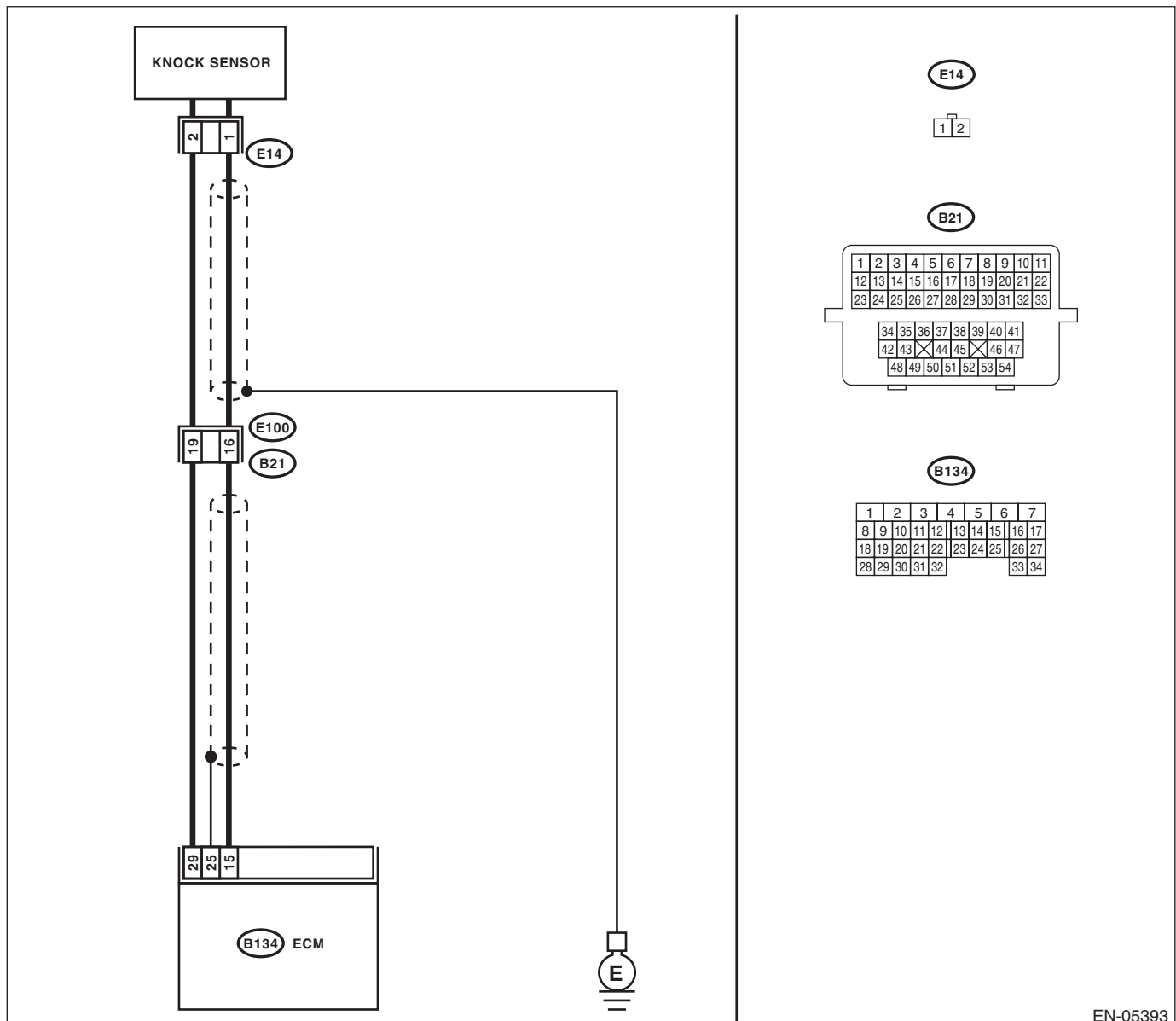
TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05393

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. <i>Connector & terminal</i> <i>(B134) No. 15 — (B134) No. 29:</i>	Is the resistance 600 kΩ or more?	Go to step 2.	Repair poor contact of the ECM connector.
2 CHECK KNOCK SENSOR. 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor terminals. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance 600 kΩ or more?	Replace the knock sensor. <Ref. to FU(H4SO)-25, Knock Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and knock sensor • Poor contact of knock sensor connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AY:DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-103, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

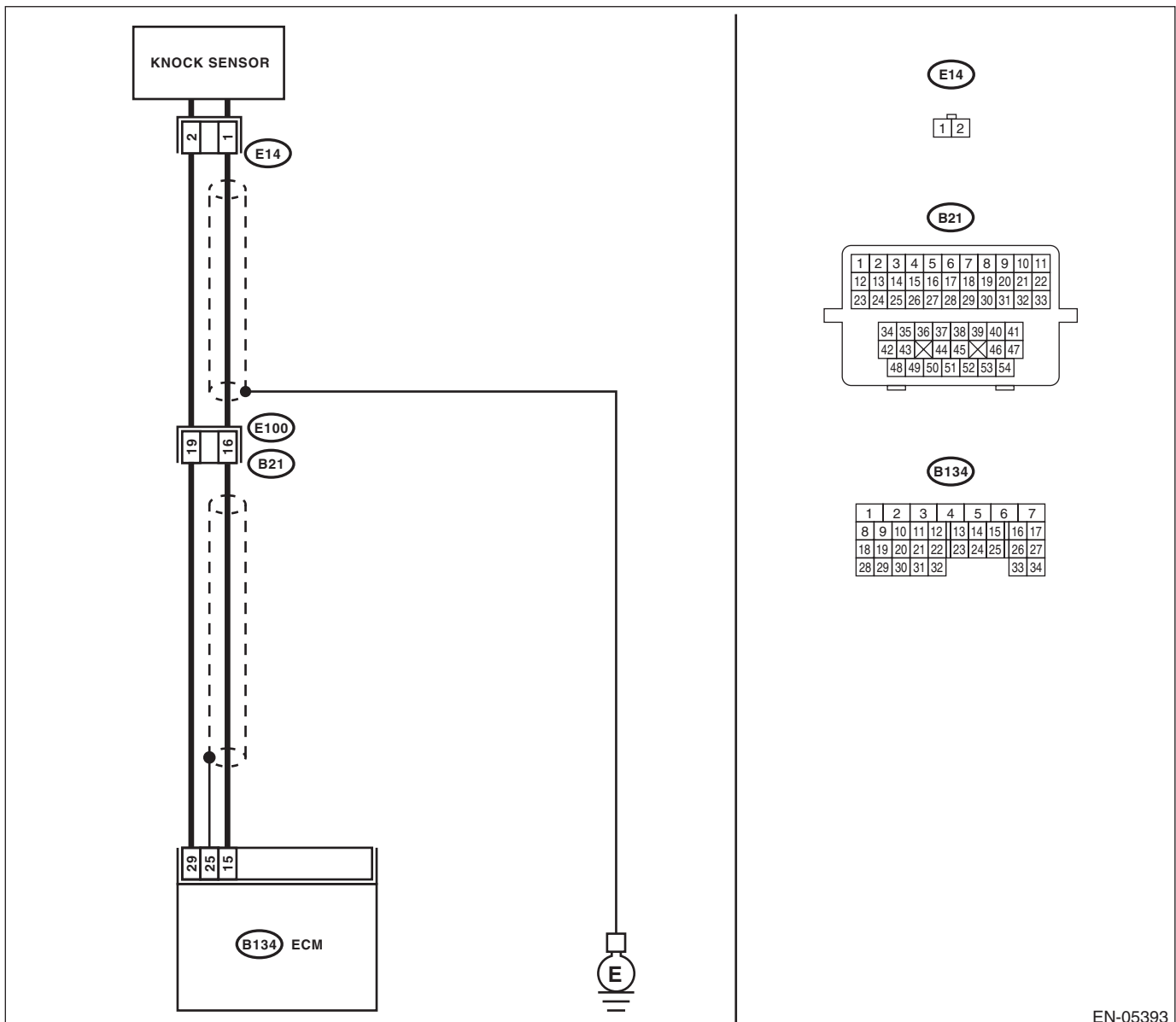
TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05393

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. <i>Connector & terminal</i> <i>(B134) No. 15 — (B134) No. 29:</i>	Is the resistance less than 500 kΩ?	Go to step 2.	Go to step 3.
2 CHECK KNOCK SENSOR. 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminals. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance less than 500 kΩ?	Replace the knock sensor. <Ref. to FU(H4SO)-25, Knock Sensor.>	Repair short circuit of the harness to ground between the ECM and knock sensor connector. NOTE: The harness between both connectors are shielded. Remove the shield and repair the short circuit of the harness circuit.
3 CHECK INPUT SIGNAL OF ECM. 1) Connect the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B134) No. 15 (+) — Chassis ground (-):</i>	Is the voltage 2 V or more?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

AZ:DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-105, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

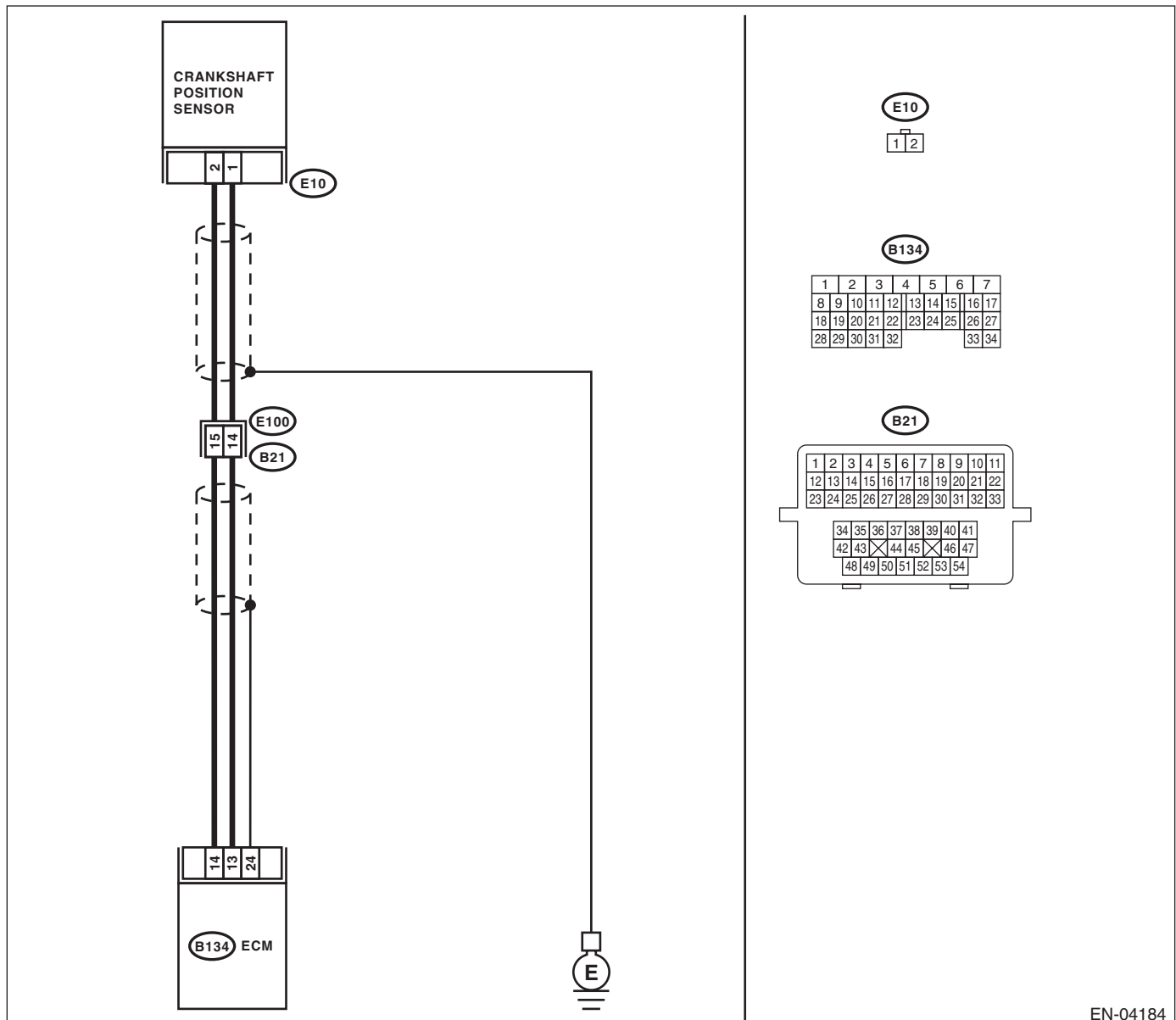
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04184

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 2.	Tighten the crankshaft position sensor installation bolt securely.
2 CHECK CRANKSHAFT POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Remove the crankshaft position sensor. 3) Measure the resistance between connector terminals of crankshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance between 1 — 4 k Ω ?	Go to step 3.	Replace the crankshaft position sensor. <Ref. to FU(H4SO)-23, Crankshaft Position Sensor.>
3 CHECK HARNESS BETWEEN ECM AND CRANK SHAFT POSITION SENSOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between the ECM and crankshaft position sensor connector. Connector & terminal (B134) No. 13 — (E10) No. 1: (B134) No. 14 — (E10) No. 2:	Is the resistance less than 1 Ω ?	Repair the poor contact of the ECM and crankshaft position sensor connector.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and crankshaft position sensor connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BA:DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-107, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

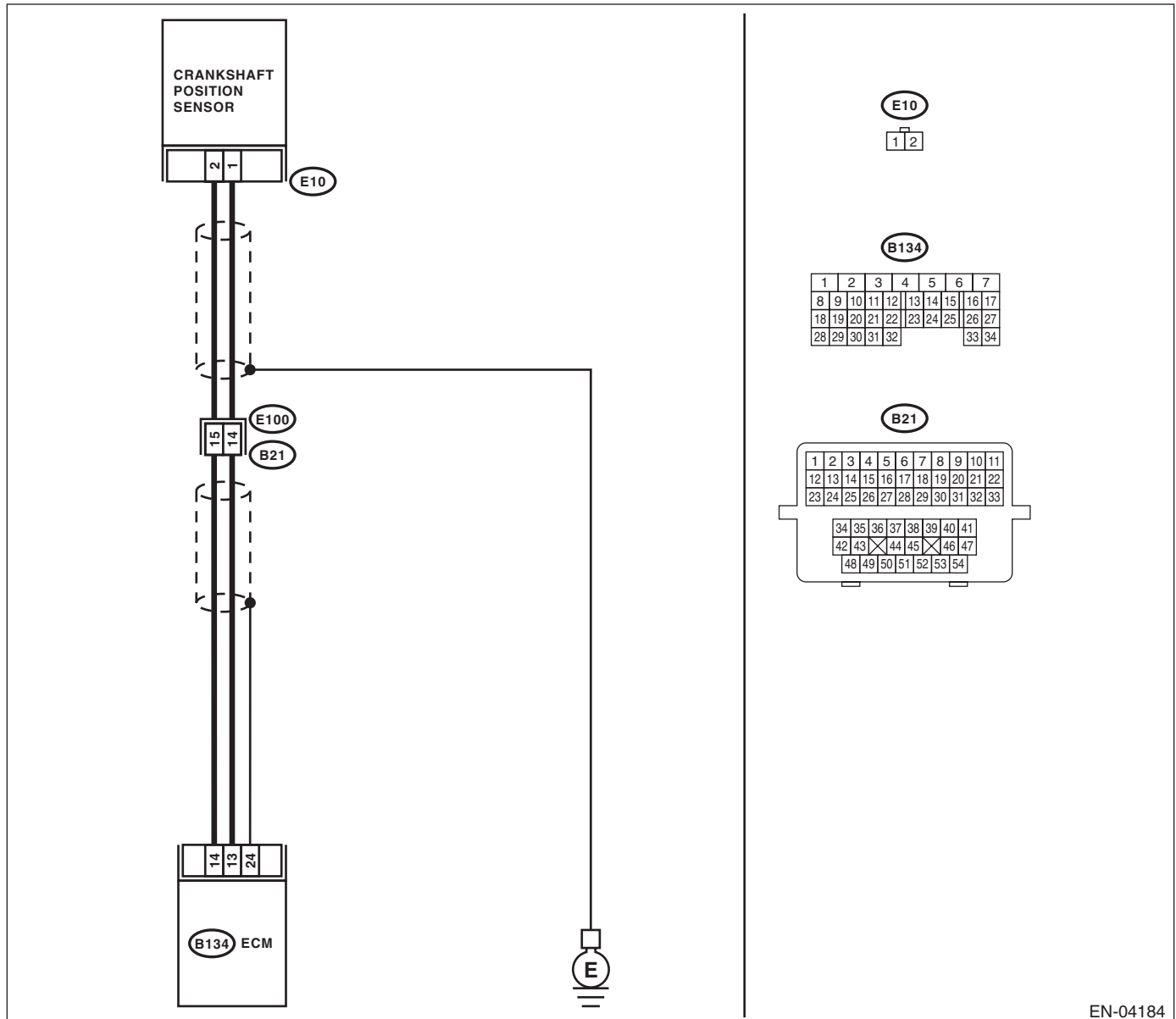
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04184

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR. Turn the ignition switch to OFF.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step 2.	Tighten the crankshaft position sensor installation bolt securely.
2 CHECK CRANK SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-42, REMOVAL, Timing Belt Cover.>	Are crank sprocket teeth cracked or damaged?	Replace the crank sprocket. <Ref. to ME(H4SO)-50, Crank Sprocket.>	Go to step 3.
3 CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft using ST, and align alignment mark on crank sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO)-43, Timing Belt.>	Replace the crankshaft position sensor. <Ref. to FU(H4SO)-23, Crankshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BB:DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-109, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

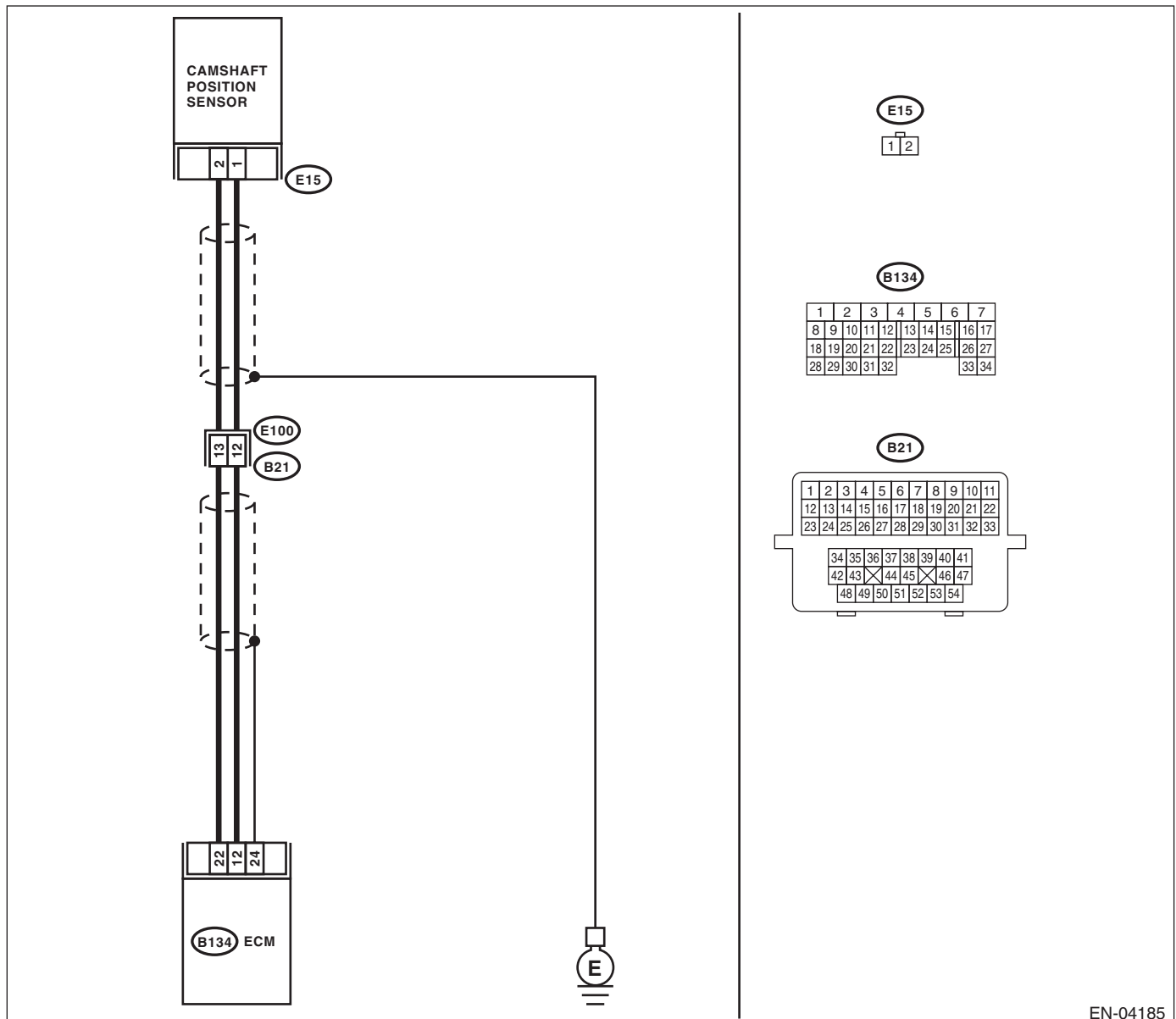
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04185

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and camshaft position sensor. 3) Measure the resistance of harness between the ECM and camshaft position sensor connector. <i>Connector & terminal</i> (B134) No. 12 — (E15) No. 1: (B134) No. 22 — (E15) No. 2:	Is the resistance less than 1 Ω?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of the harness between the ECM and camshaft position sensor • Poor contact in ECM connector • Poor contact of coupling connector
2 CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR. Measure the resistance between camshaft position sensor connector and engine ground. <i>Connector & terminal</i> (E15) No. 1 — Engine ground:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between the ECM and camshaft position sensor. NOTE: The harness between both connectors are shielded. Repair short circuit of the harness to ground with shield.
3 CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.	Is the camshaft position sensor installation bolt tightened securely?	Go to step 4.	Tighten the camshaft position sensor installation bolt securely.
4 CHECK CAMSHAFT POSITION SENSOR. 1) Remove the camshaft position sensor. 2) Measure the resistance between connector terminals of camshaft position sensor. <i>Terminals</i> No. 1 — No. 2:	Is the resistance between 1 — 4 kΩ?	Repair the poor contact of the ECM or camshaft position sensor connector.	Replace the camshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BC:DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-111, DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

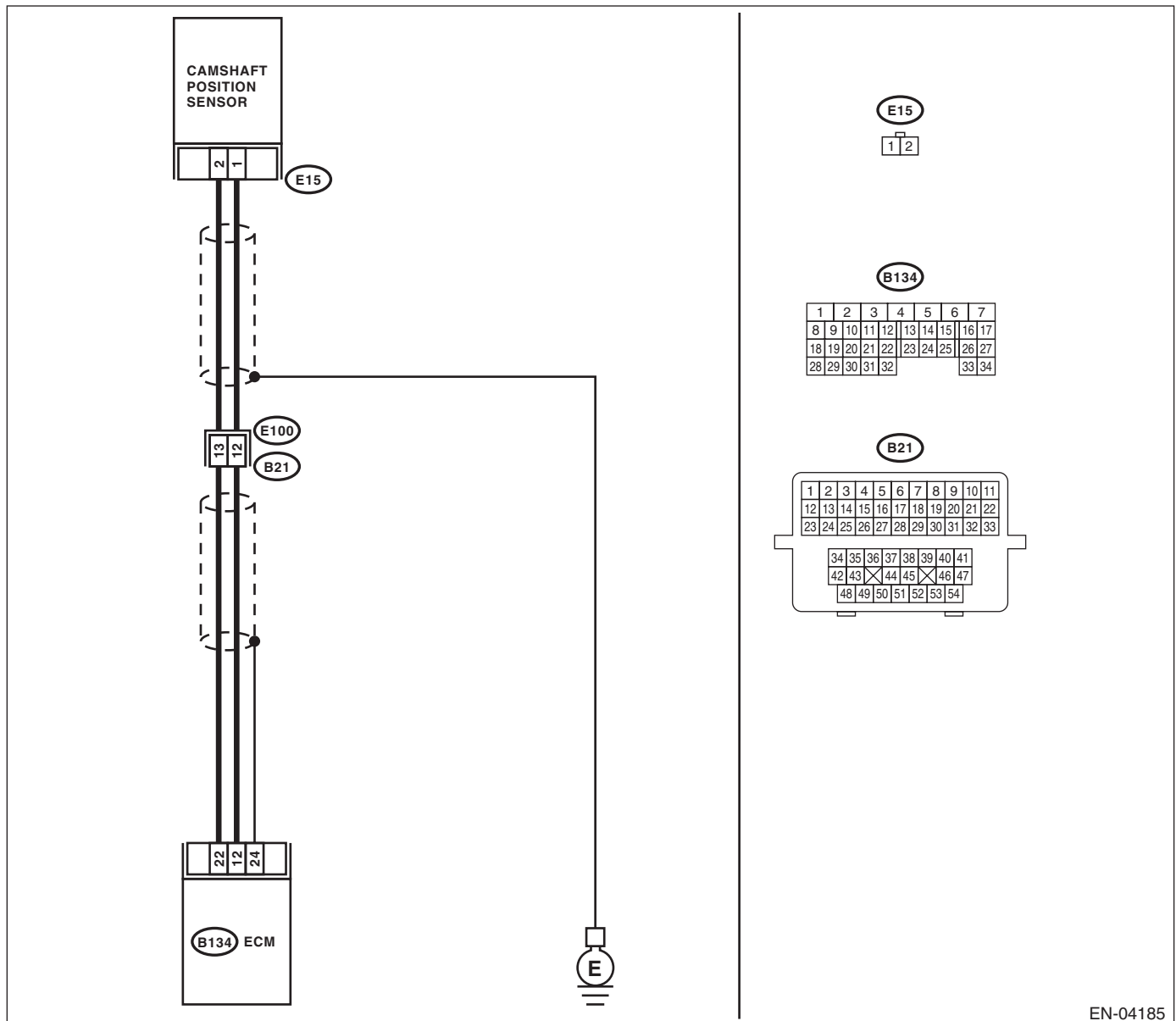
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04185

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and camshaft position sensor. 3) Measure the resistance of harness between the ECM and camshaft position sensor connector.</p> <p>Connector & terminal (B134) No. 12 — (E15) No. 1: (B134) No. 22 — (E15) No. 2:</p>	Is the resistance less than 1 Ω?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of the harness between the ECM and camshaft position sensor • Poor contact in ECM connector • Poor contact of coupling connector
<p>2 CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR. Measure the resistance between camshaft position sensor connector and engine ground.</p> <p>Connector & terminal (E15) No. 1 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between the ECM and camshaft position sensor. NOTE: The harness between both connectors are shielded. Repair short circuit of the harness to ground with shield.
<p>3 CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.</p>	Is the camshaft position sensor installation bolt tightened securely?	Go to step 4.	Tighten the camshaft position sensor installation bolt securely.
<p>4 CHECK CAMSHAFT POSITION SENSOR. 1) Remove the camshaft position sensor. 2) Measure the resistance between connector terminals of camshaft position sensor.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance between 1 — 4 kΩ?	Go to step 5.	Replace the camshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.>
<p>5 CHECK CAM SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-42, Timing Belt Cover.></p>	Are cam sprocket teeth cracked or damaged?	Replace the cam sprocket. <Ref. to ME(H4SO)-48, Cam Sprocket.>	Go to step 6.
<p>6 CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft using the ST, and align the alignment mark on the cam sprocket with the alignment mark on the timing belt cover LH.</p> <p>ST 499987500 CRANKSHAFT SOCKET</p>	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO)-43, Timing Belt.>	Replace the camshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BD:DTC P0400 EXHAUST GAS RECIRCULATION FLOW

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-113, DTC P0400 EXHAUST GAS RECIRCULATION FLOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

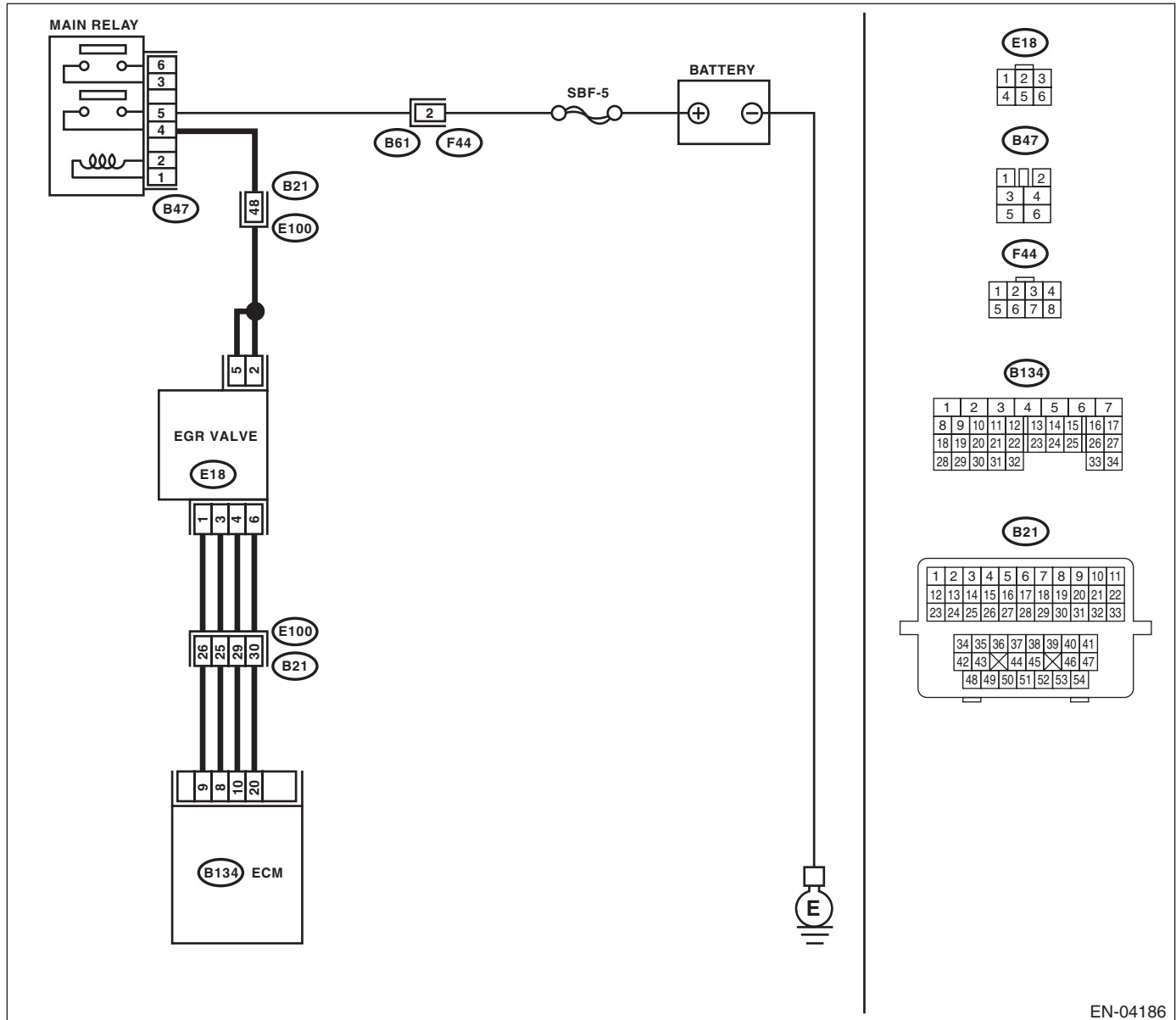
TROUBLE SYMPTOM:

- Movement performance problem when engine is low speed.
- Erroneous idling
- Movement performance problem

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04186

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Start the engine.</p> <p>2) Read data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 53.3 kPa (400 mmHg, 15.75 inHg) or more?</p>	<p>Make sure that the EGR valve, manifold absolute pressure sensor and throttle body are installed securely.</p>	<p>Go to step 2.</p>
2	<p>CHECK EGR SOLENOID VALVE.</p> <p>Remove the EGR valve.</p>	<p>Are there holes, plugged piping or foreign objects caught in the EGR system?</p>	<p>Repair the EGR system.</p>	<p>Replace the EGR valve. <Ref. to FU(H4SO)-29, EGR Valve.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BE:DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-117, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

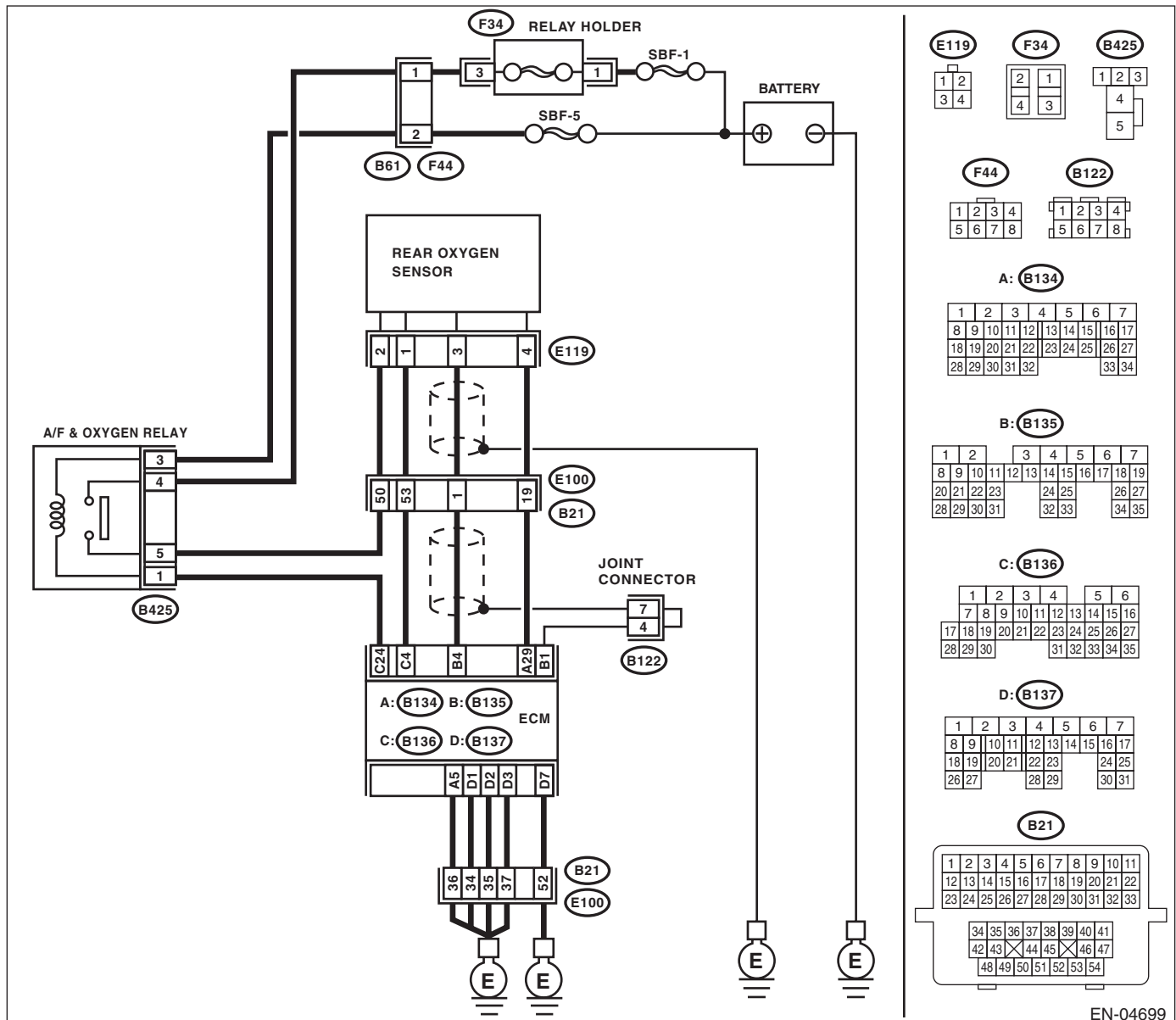
TROUBLE SYMPTOM:

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

CAUTION:

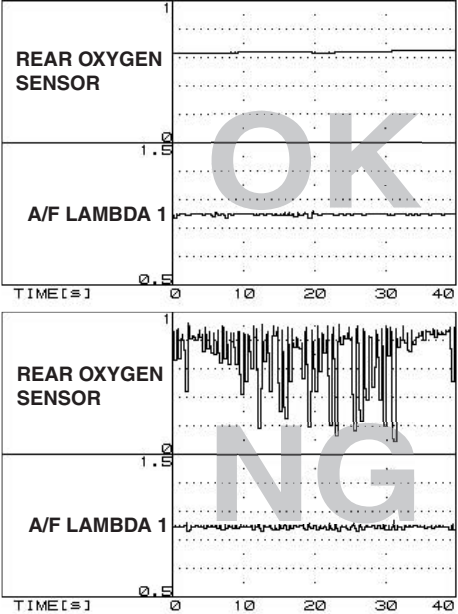
After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK EXHAUST SYSTEM. Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.</p> <p>NOTE: Check the following positions.</p> <ul style="list-style-type: none"> • Between cylinder head and front exhaust pipe • Between front exhaust pipe and front catalytic converter • Between front catalytic converter and rear catalytic converter • Loose or improperly attached front oxygen (A/F) sensor or rear oxygen sensor 	<p>Is there any fault in exhaust system?</p>	<p>Repair or replace the exhaust system. <Ref. to EX(H4SO)-2, General Description.></p>	<p>Go to step 2.</p>
<p>2</p> <p>CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE DRIVING). 1) Drive at a constant speed between 80 — 112 km/h (50 — 70 MPH). 2) After 5 minutes have elapsed in the condition of step 1), use the Subaru Select Monitor while still driving to read the waveform data.</p> <div style="display: flex; flex-direction: column; align-items: center;">  <p style="margin-top: 10px;">EN-04895</p> </div>	<p>Is a normal waveform displayed?</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE: In this case, there may be a temporary connector contact failure.</p>	<p>Go to step 3.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>3 CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE IDLING).</p> <p>1) Run the engine at idle. 2) In the condition of step 1), use the Subaru Select Monitor to read the waveform data.</p> <div> <p>REAR OXYGEN SENSOR</p> <p>TIME[=] 0 10 20 30 40</p> </div> <div> <p>REAR OXYGEN SENSOR</p> <p>TIME[=] 0 10 20 30 40</p> </div> <p style="text-align: right;">EN-04896</p>	<p>Is a normal waveform displayed?</p>	<p>Go to step 4.</p>	<p>Go to step 5.</p>
<p>4 CHECK CATALYTIC CONVERTER.</p>	<p>Is the catalytic converter damaged?</p>	<p>Replace the catalytic converter. <Ref. to EC(H4SO)-3, Front Catalytic Converter.></p>	<p>Go to step 5.</p>
<p>5 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</p>	<p>Has water entered the connector?</p>	<p>Completely remove any water inside.</p>	<p>Go to step 6.</p>
<p>6 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector.</p> <p>Connector & terminal (B135) No. 4 — (E119) No. 3: (B134) No. 29 — (E119) No. 4:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 7.</p>	<p>Repair the open circuit of harness between ECM and rear oxygen sensor connector.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (E119) No. 3 (+) — Chassis ground (-):	Is the voltage 0.2 — 0.5 V?	Go to step 8.	Repair the harness and connector. NOTE: Repair the following locations. <ul style="list-style-type: none"> • Open circuit of harness between the ECM and rear oxygen sensor • Poor contact of the ECM and rear oxygen sensor • Poor contact in ECM connector
8 CHECK REAR OXYGEN SENSOR SHIELD. 1) Turn the ignition switch to OFF. 2) Expose the rear oxygen sensor connector body side harness sensor shield. 3) Measure the resistance between the sensor shield and chassis ground.	Is the resistance less than 1 Ω ?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>	Repair the open circuit in the rear oxygen sensor harness.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BF:DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-119, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

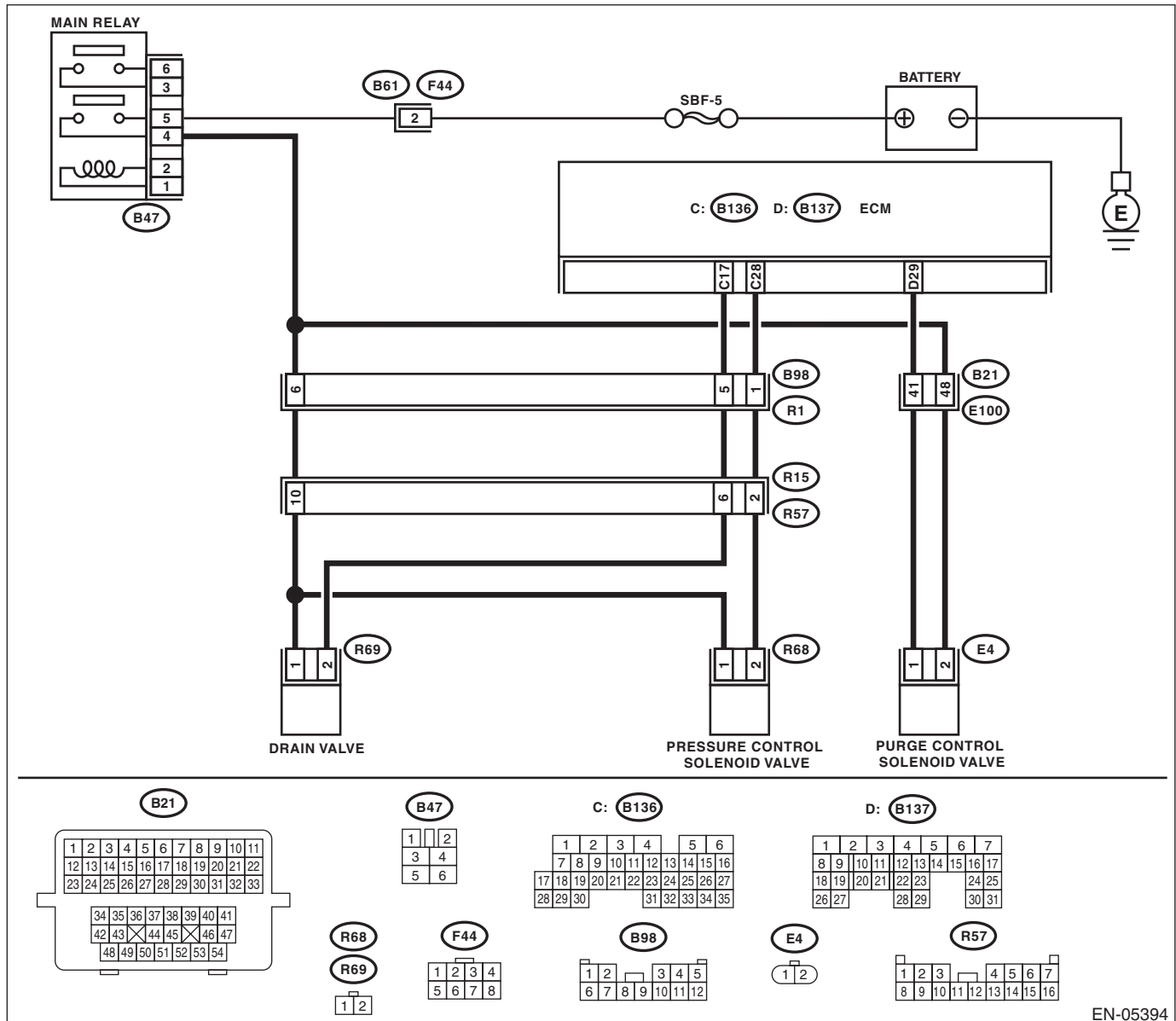
TROUBLE SYMPTOM:

- Fuel odor
- There is a hole of more than 1.0 mm (0.04 in) dia. in evaporation system or fuel tank.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05394

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 2.	Tighten fuel filler cap securely.
2 CHECK FUEL FILLER CAP.	Is the fuel filler cap genuine?	Go to step 3.	Replace with a genuine fuel filler cap.
3 CHECK FUEL FILLER PIPE GASKET.	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4SO)-47, Fuel Filler Pipe.>	Go to step 4.
4 CHECK DRAIN VALVE. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve using the Subaru Select Monitor. NOTE: Drain valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-16, Drain Valve.>
5 CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve using the Subaru Select Monitor. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the purge control solenoid valve operate?	Go to step 6.	Replace the purge control solenoid valve. <Ref. to EC(H4SO)-7, Purge Control Solenoid Valve.>
6 CHECK PRESSURE CONTROL SOLENOID VALVE. Operate the pressure control solenoid valve using the Subaru Select Monitor. NOTE: The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the pressure control solenoid valve operate?	Go to step 7.	Replace the pressure control solenoid valve. <Ref. to EC(H4SO)-12, Pressure Control Solenoid Valve.>
7 CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector.	Is there any hole of more than 1.0 mm (0.04 in) dia. on evaporation line?	Repair or replace the evaporation line. <Ref. to FU(H4SO)-58, Fuel Delivery and Evaporation Lines.>	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
8	CHECK CANISTER.	Is the canister damaged or is there a hole of more than 1.0 mm (0.04 in) dia. in it?	Repair or replace the canister. <Ref. to EC(H4SO)-6, Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H4SO)-44, Fuel Tank.>	Is the fuel tank damaged or is there any hole of more than 1.0 mm (0.04 in) dia. in it?	Repair or replace the fuel tank. <Ref. to FU(H4SO)-44, Fuel Tank.>	Go to step 10.
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Is there any hole of more than 1.0 mm (0.04 in) dia., crack, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BG:DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN

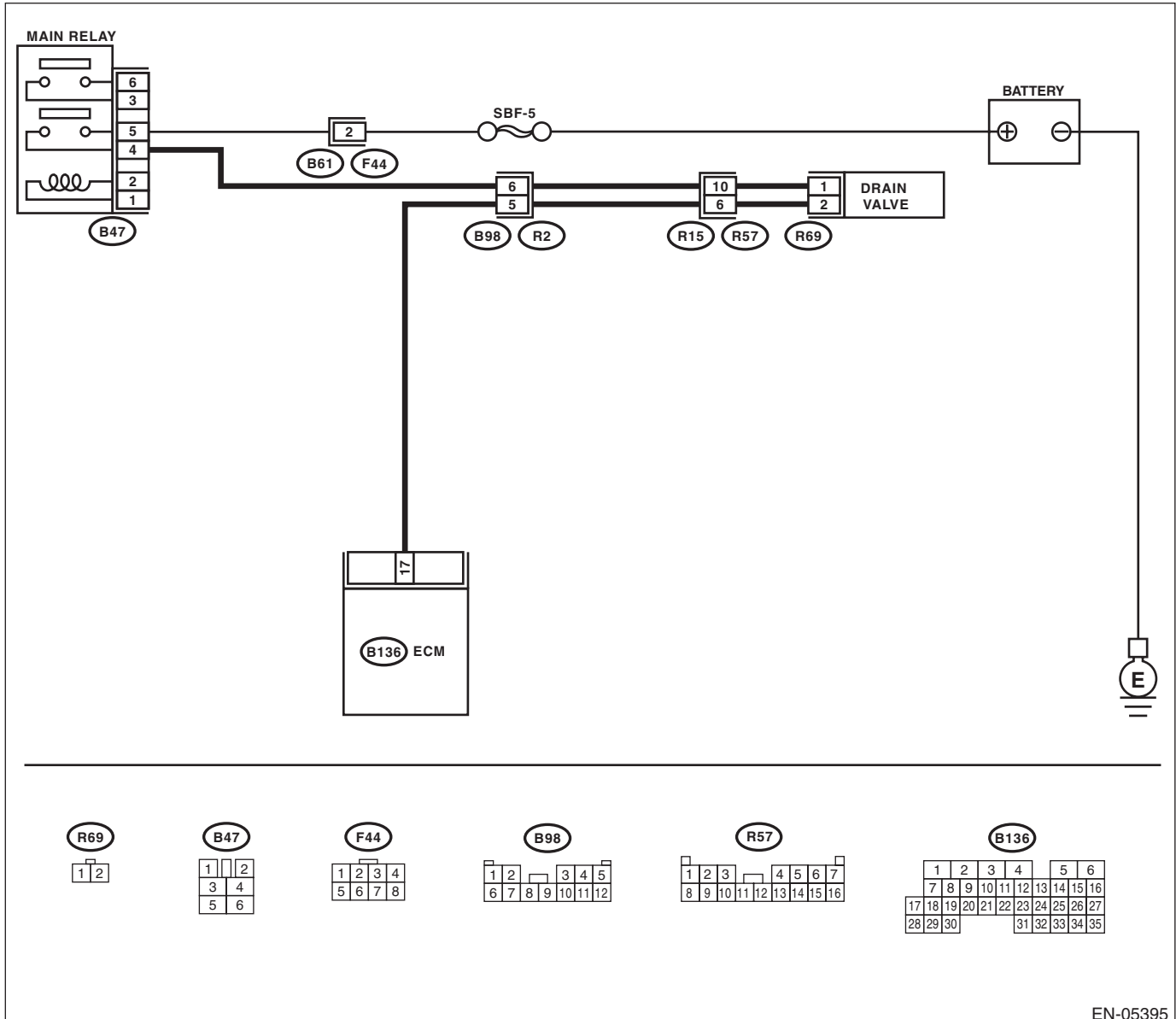
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-134, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05395

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> (B136) No. 17 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair poor contact of the ECM connector.	Go to step 2.
2	<p>CHECK HARNESS BETWEEN ECM AND DRAIN VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and drain valve. 3) Measure the resistance between the drain valve connector and chassis ground. <i>Connector & terminal</i> (R69) No. 2 — Chassis ground:</p>	Is the resistance 1 M Ω or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and drain valve connector.
3	<p>CHECK HARNESS BETWEEN ECM AND DRAIN VALVE. Measure the resistance of harness between ECM and drain valve connector. <i>Connector & terminal</i> (B136) No. 17 — (R69) No. 2:</p>	Is the resistance less than 1 Ω ?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and drain valve connector • Poor contact of coupling connector
4	<p>CHECK DRAIN VALVE. Measure the resistance between drain valve terminals. <i>Terminals</i> No. 1 — No. 2:</p>	Is the resistance between 10 — 100 Ω ?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-16, Drain Valve.>
5	<p>CHECK POWER SUPPLY TO DRAIN VALVE. 1) Turn the ignition switch to ON. 2) Measure the voltage between drain valve and chassis ground. <i>Connector & terminal</i> (R69) No. 1 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair the poor contact of drain valve connector.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between main relay and drain valve • Poor contact of coupling connector • Poor contact of main relay connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BH:DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED

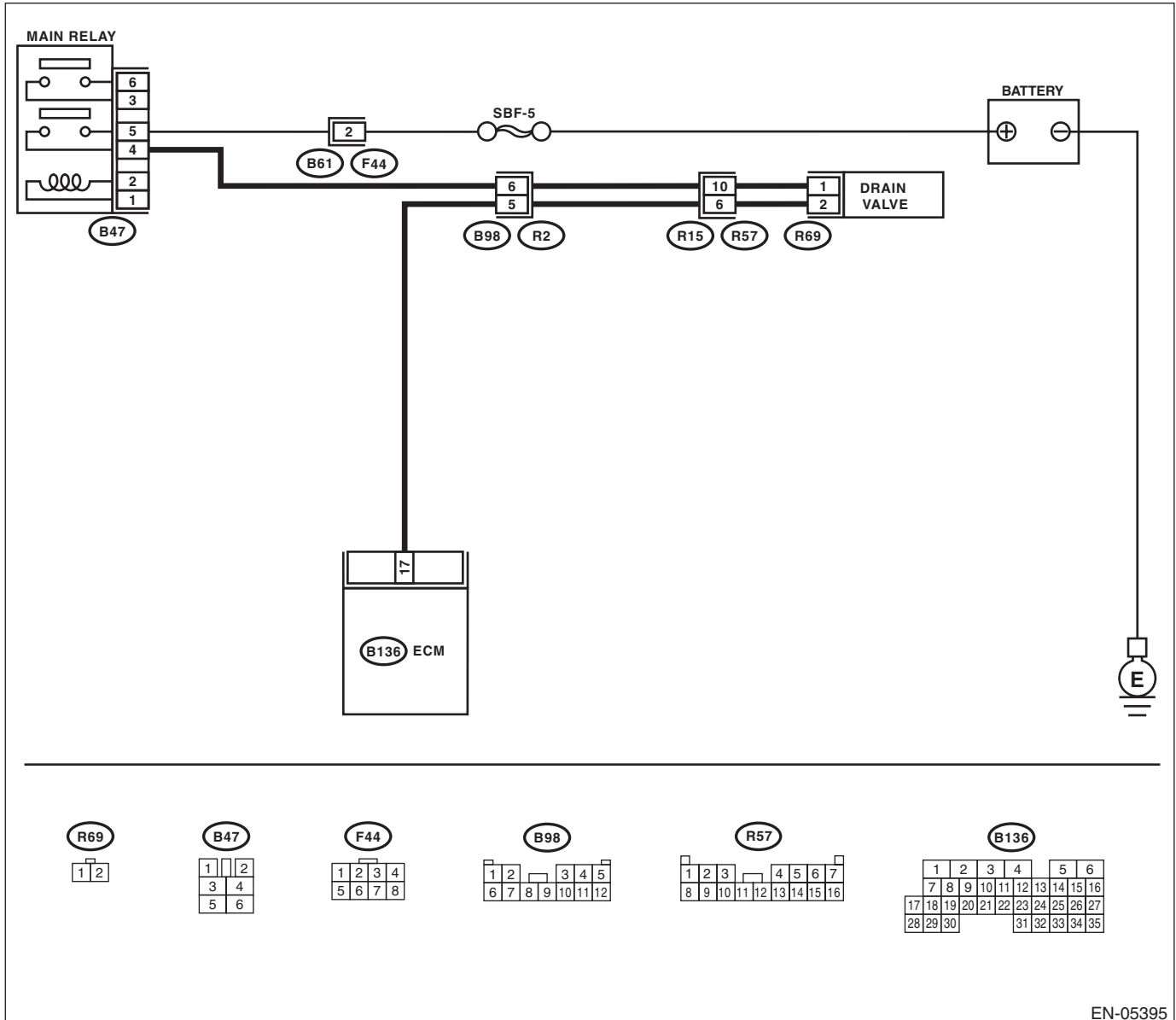
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-136, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05395

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND DRAIN VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and drain valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 17 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and drain valve connector.	Go to step 2.	
2 CHECK DRAIN VALVE. 1) Turn the ignition switch to OFF. 2) Measure the resistance between drain valve terminals. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω?	Replace the drain valve. <Ref. to EC(H4SO)-16, Drain Valve.>	Repair poor contact of the ECM connector.	

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BI: DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR

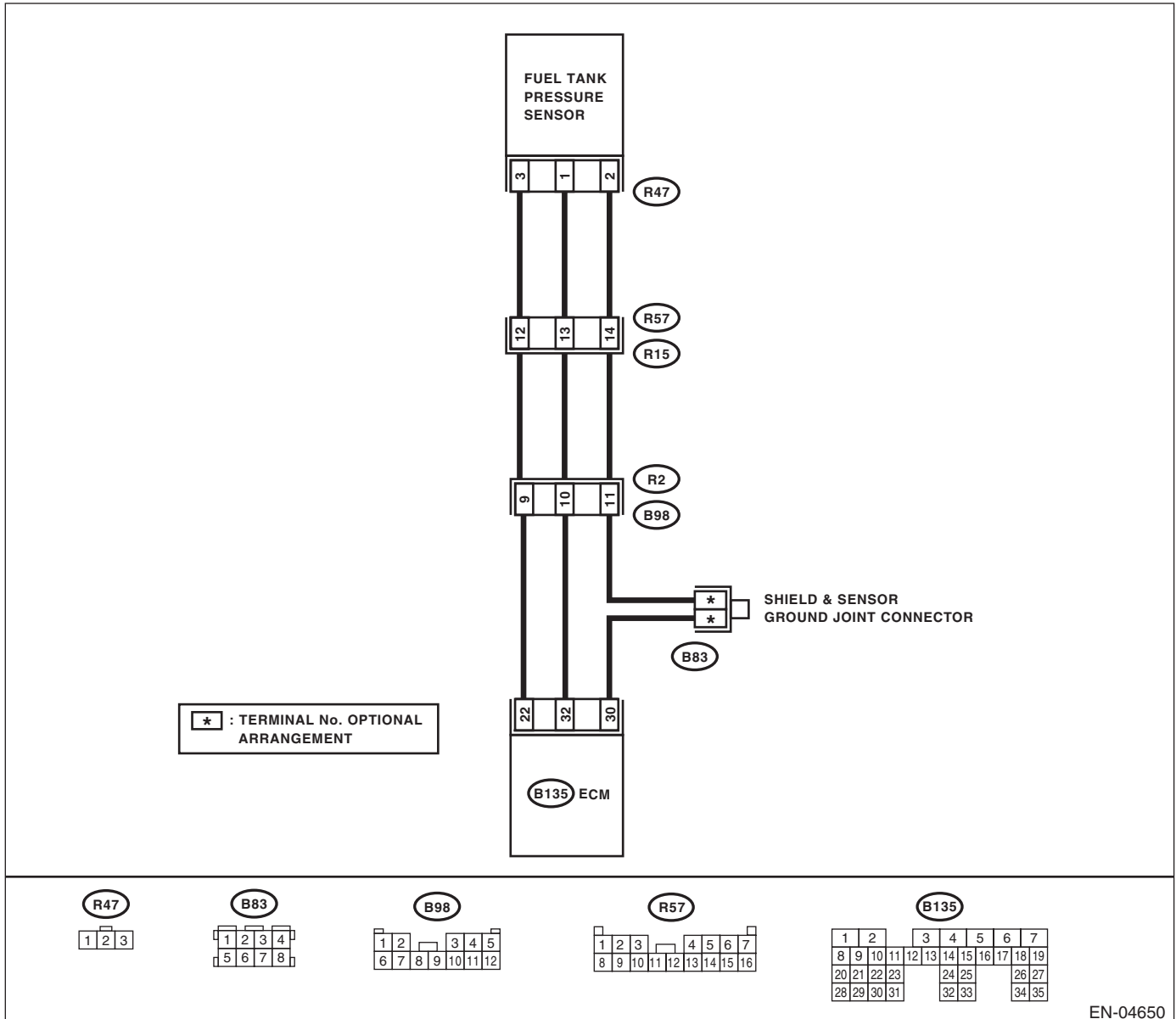
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-138, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04650

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Open the fuel flap.	Is the fuel filler cap tightened securely?	Go to step 2.	Tighten fuel filler cap securely.
2	CHECK PRESSURE VACUUM LINE. NOTE: Check the following items. <ul style="list-style-type: none">• Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank• Disconnection, leakage and clogging of air ventilation hoses and pipes between fuel filler pipe and fuel tank	Is there any fault in pressure/vacuum line?	Repair or replace the hoses and pipes.	Replace the fuel tank pressure sensor. <Ref. to EC(H4SO)-11, Fuel Tank Pressure Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BJ:DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT

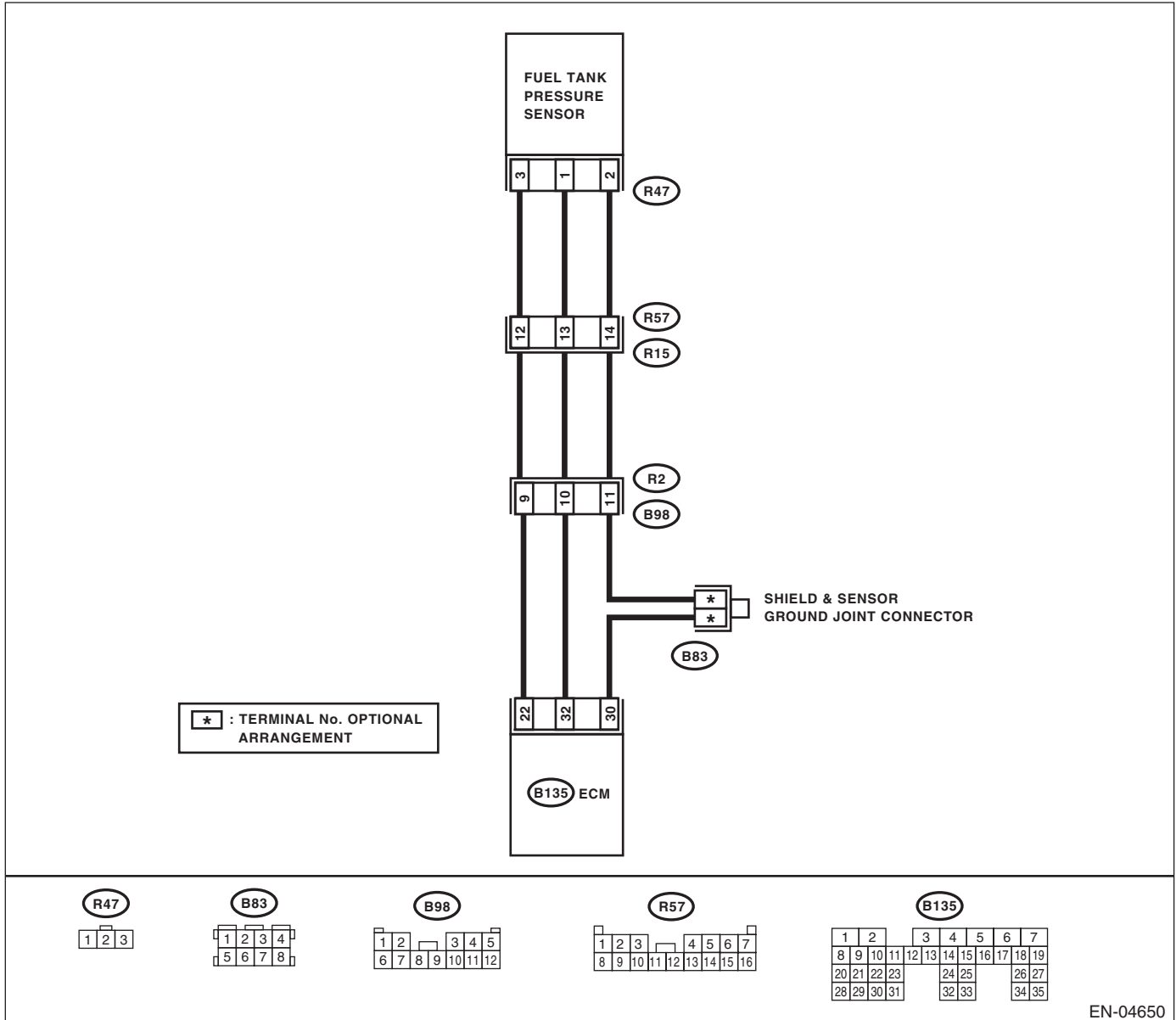
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-140, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04650

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Turn the ignition switch to ON.</p> <p>2) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the measured value less than -7.49 kPa (-56.19 mmHg, -2.212 inHg) ?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.
2	<p>CHECK FUEL TANK PRESSURE SENSOR POWER SUPPLY.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the fuel tank pressure sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between the fuel tank pressure sensor connector and chassis ground.</p> <p>Connector & terminal (R47) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 4.5 V or more?	Go to step 3.	Repair the harness and connector.
3	<p>CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the ECM.</p> <p>3) Measure the resistance of harness between the ECM and fuel tank pressure sensor connector.</p> <p>Connector & terminal (B135) No. 32 — (R47) No. 1:</p>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the harness and connector.
4	<p>CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.</p> <p>Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B135) No. 32 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 5.	Repair short circuit of the harness to ground between ECM and fuel tank pressure sensor connector.
5	<p>CHECK POOR CONTACT.</p> <p>Check for poor contact between the ECM and fuel tank pressure sensor connector.</p>	Is there poor contact in the ECM or fuel tank pressure sensor connector?	Repair the poor contact in the ECM or fuel tank pressure sensor connector.	Replace the fuel tank pressure sensor. <Ref. to EC(H4SO)-11, Fuel Tank Pressure Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BK:DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT

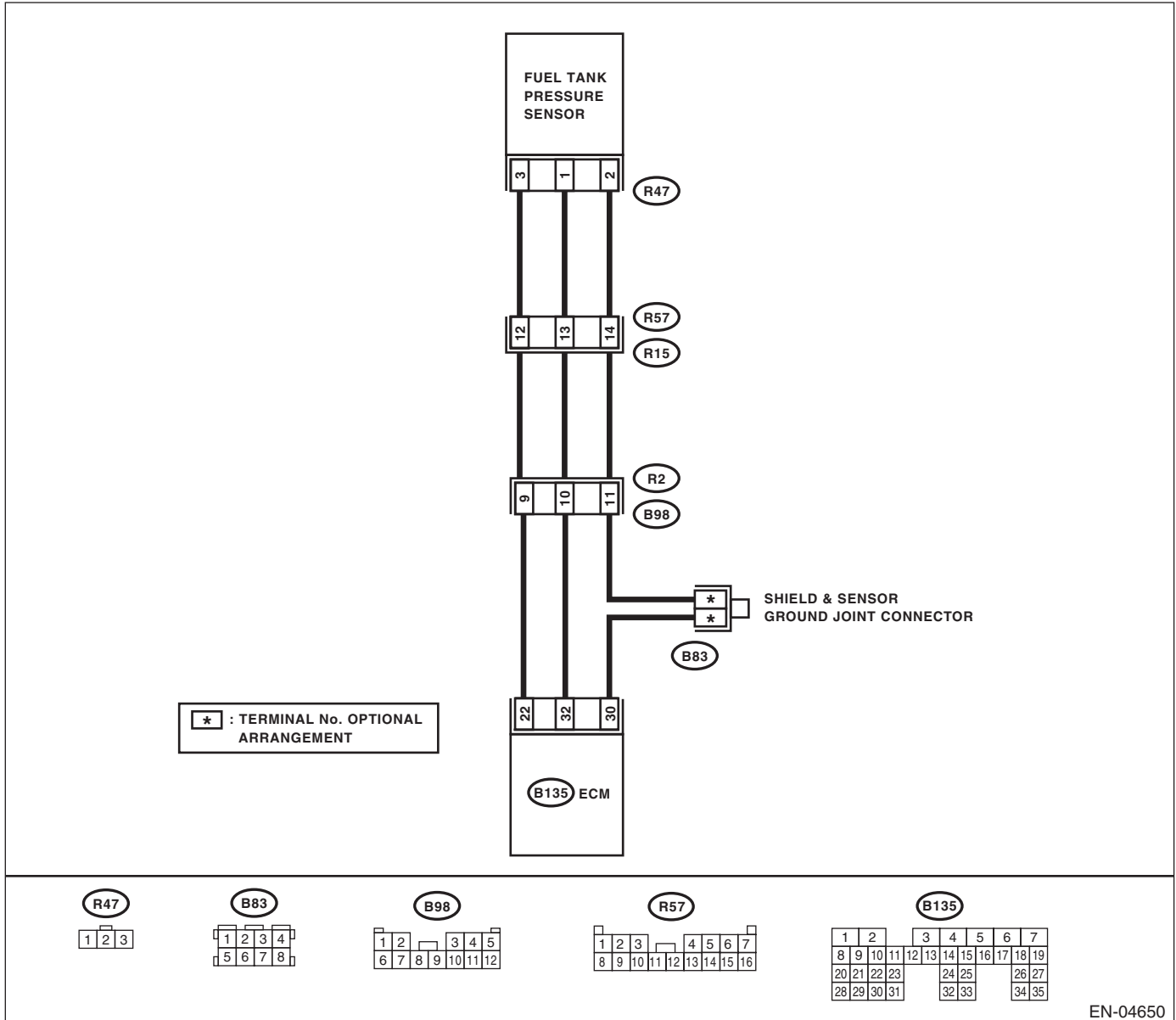
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-142, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04650

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK CURRENT DATA.</p> <p>1) Turn the ignition switch to ON.</p> <p>2) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 7.98 kPa (59.86 mmHg, 2.357 inHg) or more?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.</p> <p>NOTE:</p> <p>In this case, there may be a temporary connector contact failure.</p>
2	<p>CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from the fuel tank pressure sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 7.98 kPa (59.86 mmHg, 2.357 inHg) or more?</p>	<p>Repair the short circuit to power in the harness between ECM and fuel tank pressure sensor connector.</p>	<p>Go to step 3.</p>
3	<p>CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between fuel tank pressure sensor connector and engine ground.</p> <p>Connector & terminal (R47) No. 2 — Engine ground:</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Go to step 4.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case, repair the following item:</p> <ul style="list-style-type: none"> Open circuit of harness between ECM and fuel tank pressure sensor connector Poor contact in ECM connector Poor contact of coupling connector
4	<p>CHECK POOR CONTACT.</p> <p>Check for poor contact of the fuel tank pressure sensor connector.</p>	<p>Is there poor contact in fuel tank pressure sensor connector?</p>	<p>Repair the poor contact in the fuel tank pressure sensor connector.</p>	<p>Replace the fuel tank pressure sensor. <Ref. to EC(H4SO)-11, Fuel Tank Pressure Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BL:DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-143, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

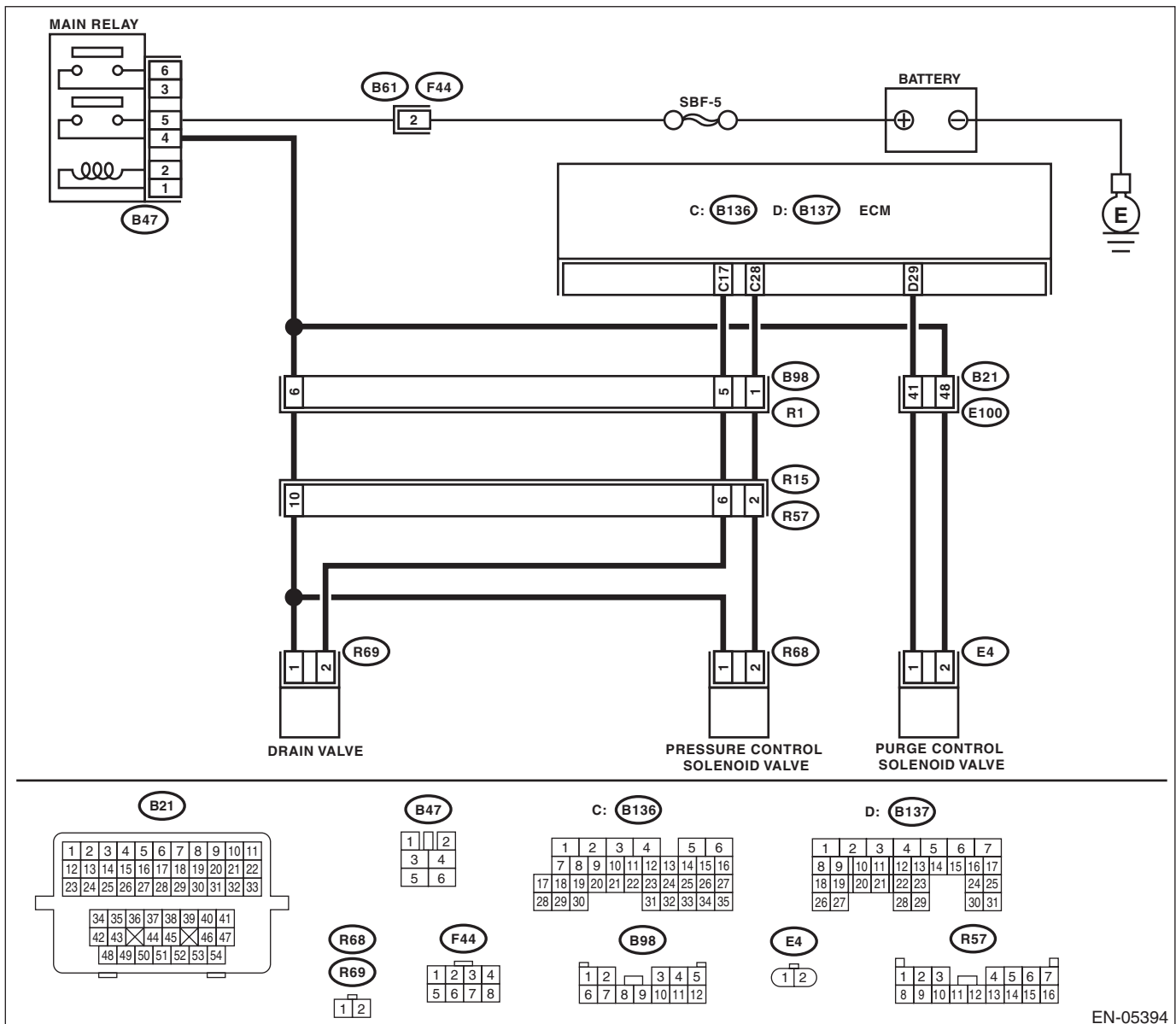
TROUBLE SYMPTOM:

- Fuel odor
- There is a hole of more than 0.5 mm (0.020 in) dia. in evaporation system or fuel tank.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05394

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 2.	Tighten fuel filler cap securely.
2	CHECK FUEL FILLER CAP.	Is the fuel filler cap genuine?	Go to step 3.	Replace with a genuine fuel filler cap.
3	CHECK FUEL FILLER PIPE GASKET.	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4SO)-47, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve using the Subaru Select Monitor. NOTE: Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-16, Drain Valve.>
5	CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve using the Subaru Select Monitor. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the purge control solenoid valve operate?	Go to step 6.	Replace the purge control solenoid valve. <Ref. to EC(H4SO)-7, Purge Control Solenoid Valve.>
6	CHECK PRESSURE CONTROL SOLENOID VALVE. Operate the pressure control solenoid valve using the Subaru Select Monitor. NOTE: The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the pressure control solenoid valve operate?	Go to step 7.	Replace the pressure control solenoid valve. <Ref. to EC(H4SO)-12, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector.	Is there any hole of more than 0.5 mm (0.020 in) dia. on evaporation line?	Repair or replace the evaporation line. <Ref. to FU(H4SO)-58, Fuel Delivery and Evaporation Lines.>	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
8	CHECK CANISTER.	Is the canister damaged or is there a hole of more than 0.5 mm (0.020 in) dia. in it?	Repair or replace the canister. <Ref. to EC(H4SO)-6, Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H4SO)-44, Fuel Tank.>	Is the fuel tank damaged or is there any hole of more than 0.5 mm (0.020 in) dia. in it?	Repair or replace the fuel tank. <Ref. to FU(H4SO)-44, Fuel Tank.>	Go to step 10.
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Is there any hole of more than 0.5 mm (0.020 in) dia., crack, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BM:DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-143, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Trouble Code (DTC) Detecting Criteria.>

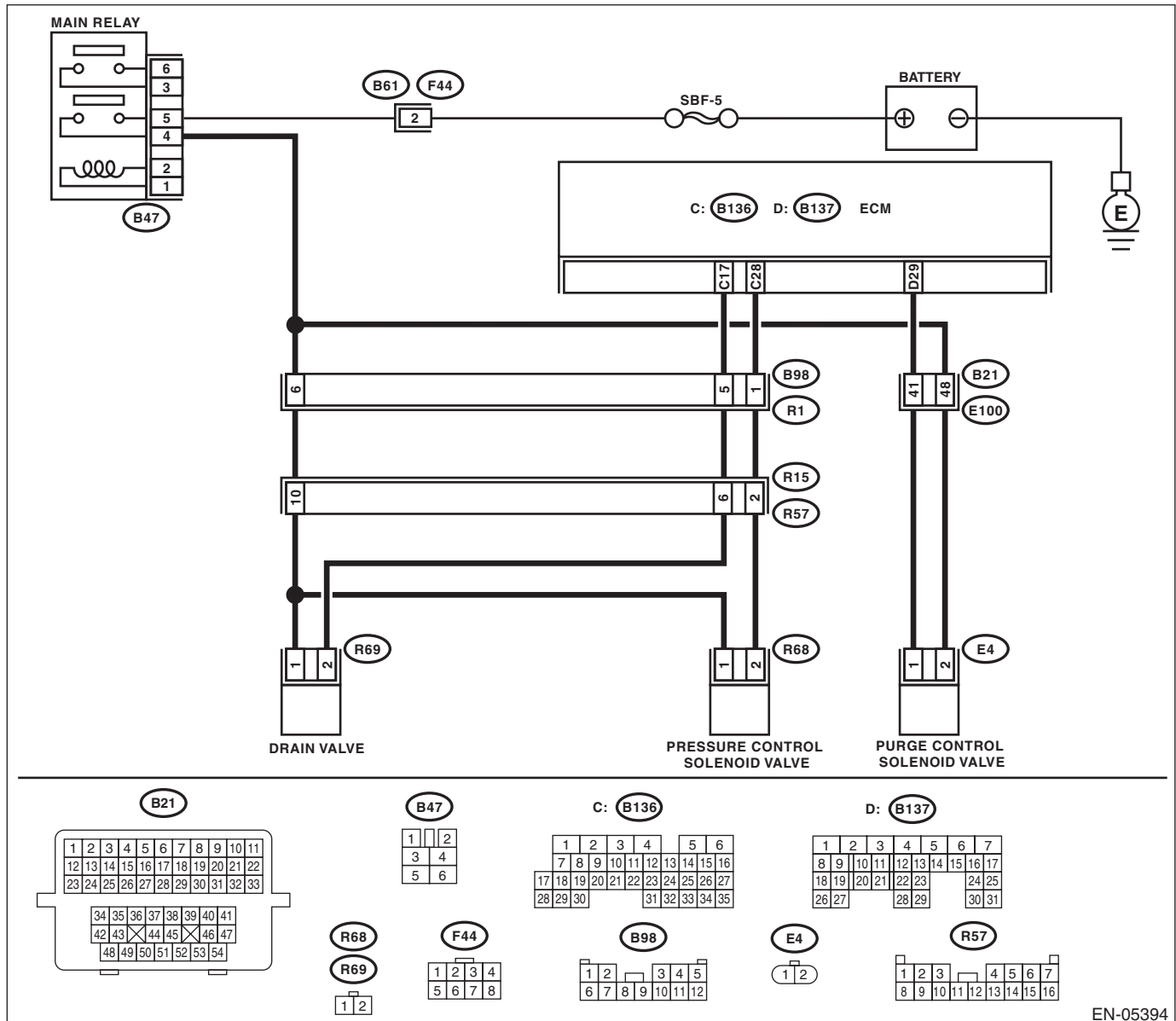
TROUBLE SYMPTOM:

- Fuel odor
- Fuel filler cap loose or lost

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05394

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.	Is the fuel filler cap tightened securely?	Go to step 2.	Tighten fuel filler cap securely.
2	CHECK FUEL FILLER CAP.	Is the fuel filler cap genuine?	Go to step 3.	Replace with a genuine fuel filler cap.
3	CHECK FUEL FILLER PIPE GASKET.	Is there any damage to the seal between fuel filler cap and fuel filler pipe?	Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4SO)-47, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve using the Subaru Select Monitor. NOTE: Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-16, Drain Valve.>
5	CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve using the Subaru Select Monitor. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the purge control solenoid valve operate?	Go to step 6.	Replace the purge control solenoid valve. <Ref. to EC(H4SO)-7, Purge Control Solenoid Valve.>
6	CHECK PRESSURE CONTROL SOLENOID VALVE. Operate the pressure control solenoid valve using the Subaru Select Monitor. NOTE: The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the pressure control solenoid valve operate?	Go to step 7.	Replace the pressure control solenoid valve. <Ref. to EC(H4SO)-12, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector.	Is there any disconnection, damage or clogging on the evaporation line?	Repair or replace the evaporation line. <Ref. to FU(H4SO)-58, Fuel Delivery and Evaporation Lines.>	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
8	CHECK CANISTER.	Is the canister damaged?	Repair or replace the canister. <Ref. to EC(H4SO)-6, Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H4SO)-44, Fuel Tank.>	Is the fuel tank damaged?	Repair or replace the fuel tank. <Ref. to FU(H4SO)-44, Fuel Tank.>	Go to step 10.
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Are there holes, cracks, clogging, or disconnections, misconnection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BN:DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-144, DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

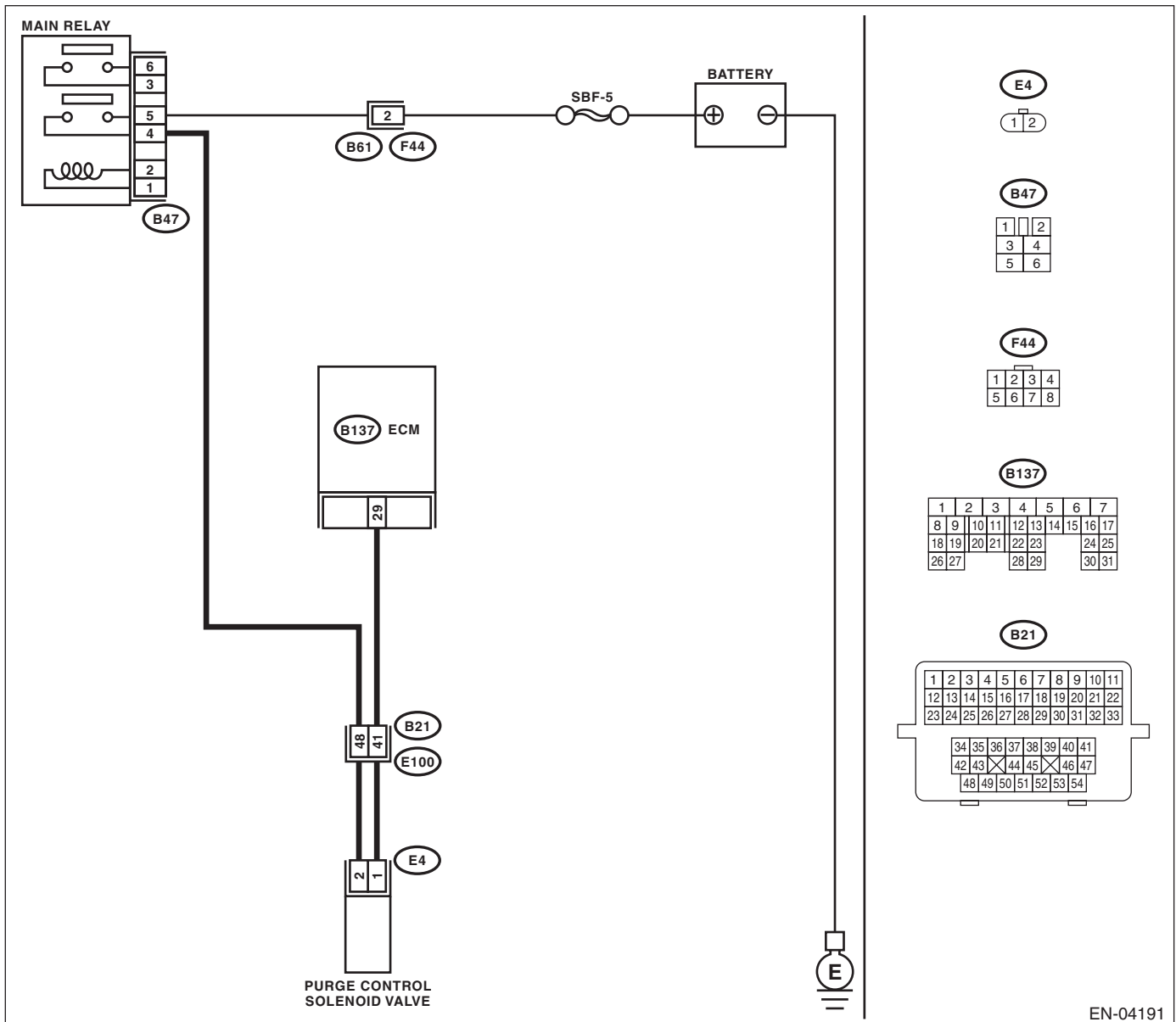
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04191

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK OUTPUT SIGNAL OF ECM.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B137) No. 29 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair poor contact of the ECM connector.	Go to step 2.
2	<p>CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and purge control solenoid valve. 3) Measure the resistance between the purge control solenoid valve connector and engine ground.</p> <p>Connector & terminal (E4) No. 1 — Engine ground:</p>	Is the resistance 1 M Ω or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and purge control solenoid valve connector.
3	<p>CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE.</p> <p>Measure the resistance of harness between ECM and purge control solenoid valve.</p> <p>Connector & terminal (B137) No. 29 — (E4) No. 1:</p>	Is the resistance less than 1 Ω ?	Go to step 4.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and purge control solenoid valve connector • Poor contact of coupling connector
4	<p>CHECK PURGE CONTROL SOLENOID VALVE.</p> <p>1) Remove the purge control solenoid valve. 2) Measure the resistance between purge control solenoid valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance between 10 — 100 Ω ?	Go to step 5.	Replace the purge control solenoid valve. <Ref. to EC(H4SO)-7, Purge Control Solenoid Valve.>
5	<p>CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between purge control solenoid valve and engine ground.</p> <p>Connector & terminal (E4) No. 2 (+) — Engine ground (-):</p>	Is the voltage 10 V or more?	Repair the poor contact of purge control solenoid valve connector.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between the main relay and purge control solenoid valve • Poor contact of coupling connector • Poor contact of main relay connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BO:DTC P0459 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-146, DTC P0459 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

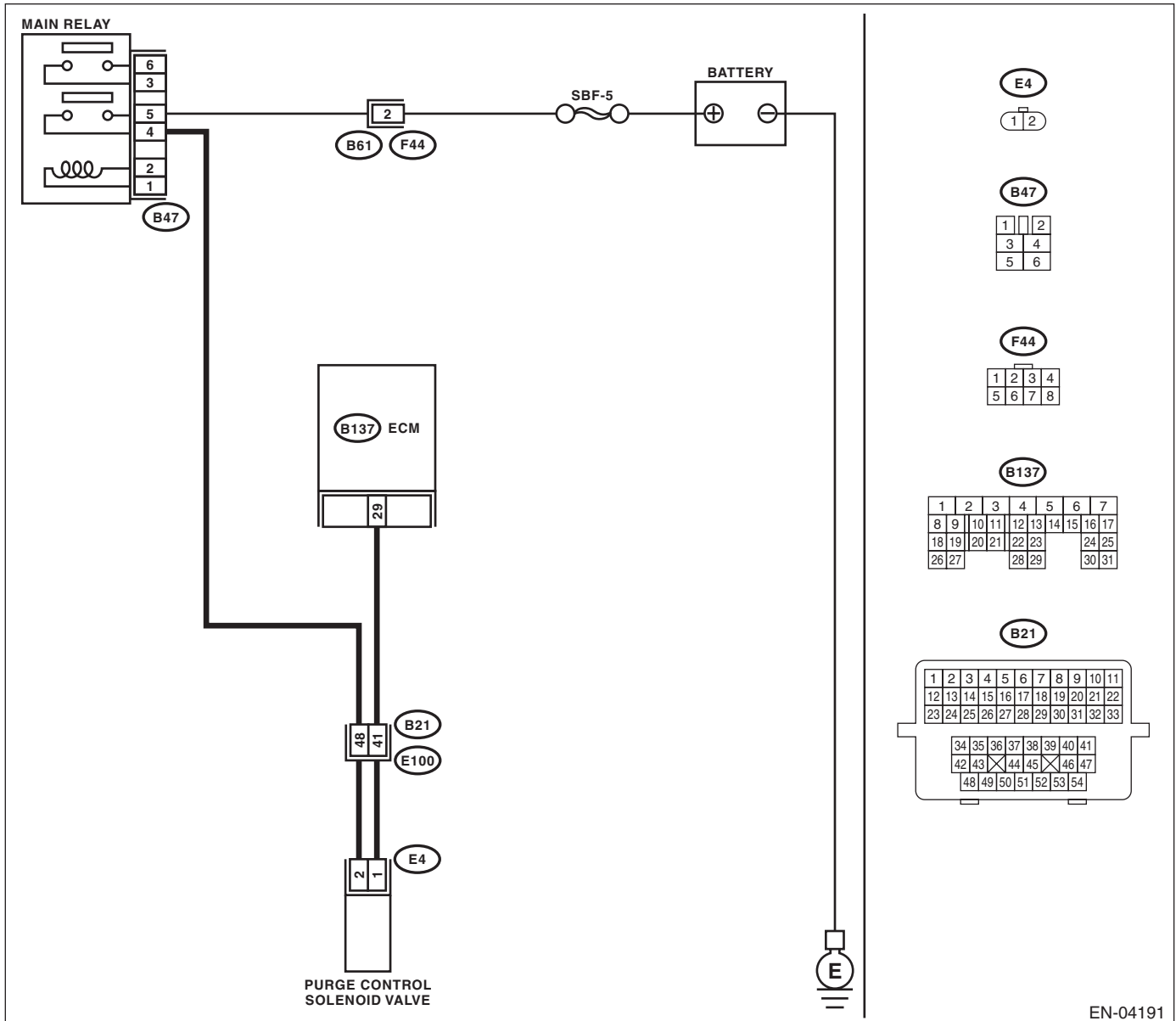
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04191

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and purge control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B137) No. 29 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair the short circuit to power in the harness between the ECM and purge control solenoid valve connector.</p>	<p>Go to step 2.</p>
<p>2</p> <p>CHECK PURGE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between purge control solenoid valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Replace the purge control solenoid valve. <Ref. to EC(H4SO)-7, Purge Control Solenoid Valve.></p>	<p>Repair poor contact of the ECM connector.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BP:DTC P0461 FUEL LEVEL SENSOR “A” CIRCUIT RANGE/PERFORMANCE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-148, DTC P0461 FUEL LEVEL SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the fuel level sensor and fuel sub level sensor. <Ref. to FU(H4SO)-53, Fuel Level Sensor.> <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BQ:DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW

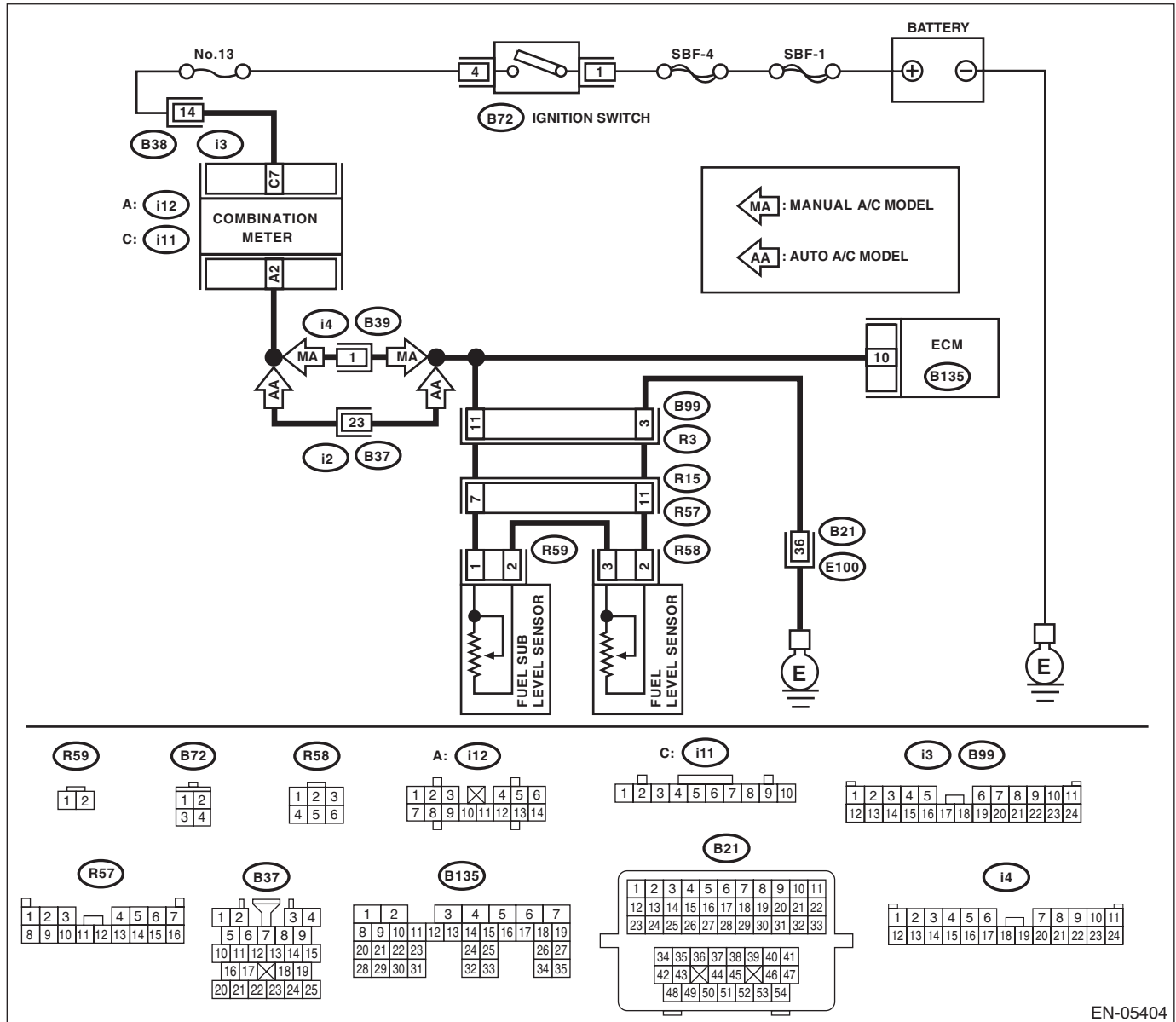
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-150, DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05404

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK OPERATION OF SPEEDOMETER AND TACHOMETER.	Are speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>
2 CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-):	Is the voltage less than 0.04 V?	Go to step 4.	Go to step 3.
3 CHECK INPUT SIGNAL OF ECM (USING SUBARU SELECT MONITOR). Read the data of fuel level sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.>	Does the voltage change by shaking the harness and connector of ECM?	Repair poor contact of the ECM connector.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.
4 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the fuel tank cord connector (R57) from the rear wiring harness connector (R15). 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-):	Is the voltage less than 0.04 V?	Go to step 5.	Go to step 6.
5 CHECK HARNESS BETWEEN ECM AND COMBINATION METER. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and combination meter connector (i12). 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 10 — Chassis ground:	Is the resistance 1 MΩ or more?	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>	Repair the harness. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Short circuit of the harness to ground between the ECM and combination meter connector. • Short circuit of the harness to ground between the ECM and fuel tank cord connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>6 CHECK FUEL TANK CORD. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the fuel sub level sensor. 3) Measure the resistance between the fuel sub level sensor and chassis ground. Connector & terminal (R59) No. 1 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 7.</p>	<p>Repair short circuit of the harness to ground of the fuel tank cord.</p>
<p>7 CHECK FUEL TANK CORD. 1) Disconnect the connector from fuel pump assembly. 2) Measure the resistance between fuel pump assembly and chassis ground. Connector & terminal (R58) No. 3 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 8.</p>	<p>Repair short circuit of the harness to ground of the fuel tank cord.</p>
<p>8 CHECK FUEL LEVEL SENSOR. 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-51, Fuel Pump.> 2) Measure the resistance between fuel level sensor terminals with float set at full position. Terminals No. 3 — No. 2:</p>	<p>Is the resistance between 0.5 — 2.5 Ω?</p>	<p>Go to step 9.</p>	<p>Replace the fuel level sensor. <Ref. to FU(H4SO)-53, Fuel Level Sensor.></p>
<p>9 CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.> 2) Measure the resistance between fuel sub level sensor terminals with float set at full position. Terminals No. 1 — No. 2:</p>	<p>Is the resistance between 0.5 — 2.5 Ω?</p>	<p>Repair the poor contact of harness between ECM and combination meter connector.</p>	<p>Replace the fuel sub level sensor. <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BR:DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH

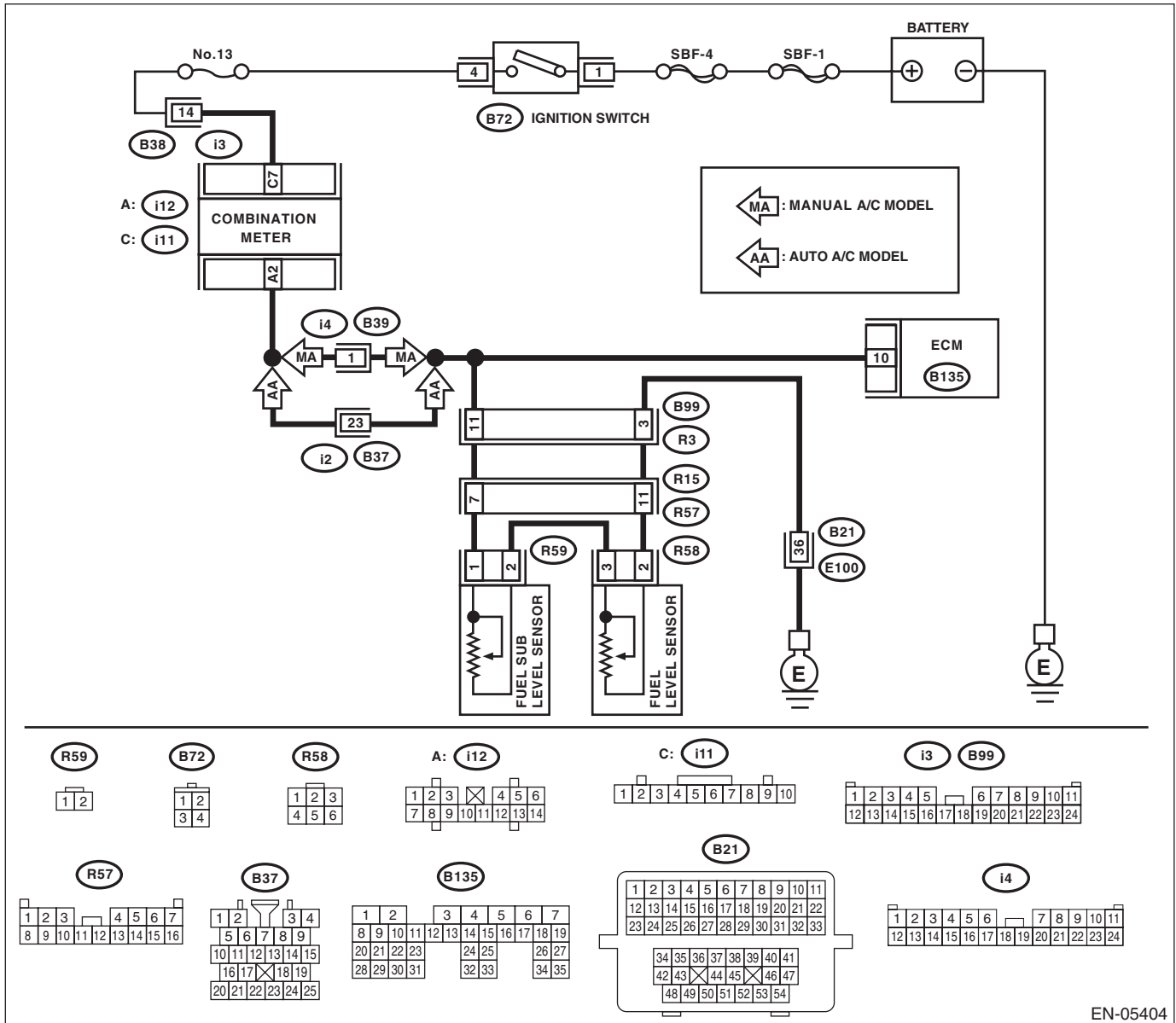
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-152, DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05404

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK OPERATION OF SPEEDOMETER AND TACHOMETER.	Are speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>
2	CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-):	Is the voltage 4.9 V or more?	Go to step 4.	Go to step 3.
3	CHECK INPUT SIGNAL OF ECM (USING SUBARU SELECT MONITOR). Read the data of fuel level sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.>	Does the voltage change by shaking the harness and connector of ECM?	Repair poor contact of the ECM connector.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.
4	CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the ECM and combination meter connector (i12). 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-):	Is the voltage 4.9 V or more?	Repair the short circuit to power of harness between ECM and combination meter connector.	Go to step 5.
5	CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD. 1) Turn the ignition switch to OFF. 2) Disconnect the fuel tank cord connector (R57) from the rear wiring harness connector (R15). 3) Measure the resistance between ECM and fuel tank cord. Connector & terminal (B135) No. 10 — (R15) No. 7:	Is the resistance less than 1 Ω ?	Go to step 6.	Repair the open circuit between ECM and fuel tank cord.
6	CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND. Measure the resistance between fuel tank cord and chassis ground. Connector & terminal (R15) No. 11 — Chassis ground:	Is the resistance less than 5 Ω ?	Go to step 7.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between fuel tank cord and chassis ground • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 CHECK FUEL TANK CORD. 1) Disconnect the connector from the fuel level sensor. 2) Measure the resistance between the fuel level sensor and coupling connector. Connector & terminal (R57) No. 11 — (R58) No. 2:	Is the resistance less than 1 Ω ?	Go to step 8.	Repair the open circuit between the coupling connector and fuel level sensor.
8 CHECK FUEL TANK CORD. 1) Disconnect the connector from the fuel sub level sensor. 2) Measure the resistance between the fuel level sensor and fuel sub level sensor. Connector & terminal (R58) No. 3 — (R59) No. 2:	Is the resistance less than 1 Ω ?	Go to step 9.	Repair the open circuit between the fuel level sensor and fuel sub level sensor.
9 CHECK FUEL TANK CORD. Measure the resistance between the fuel sub level sensor and coupling connector. Connector & terminal (R57) No. 7 — (R59) No. 1:	Is the resistance less than 1 Ω ?	Go to step 10.	Repair the open circuit of harness between the coupling connector and fuel sub level sensor.
10 CHECK FUEL LEVEL SENSOR. 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-51, Fuel Pump.> 2) Measure the resistance between fuel level sensor terminals moving the fuel level sensor float up and down. Terminals No. 3 — No. 2:	Is the resistance between 0.5 — 52 Ω ?	Replace the fuel level sensor. <Ref. to FU(H4SO)-53, Fuel Level Sensor.>	Go to step 11.
11 CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.> 2) Measure the resistance between fuel sub level sensor terminals moving the fuel sub level sensor float up and down. Terminals No. 1 — No. 2:	Is the resistance between 0.5 — 44 Ω ?	Replace the fuel sub level sensor. <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.>	Check the combination meter. <Ref. to IDI-11, Combination Meter.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BS:DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT

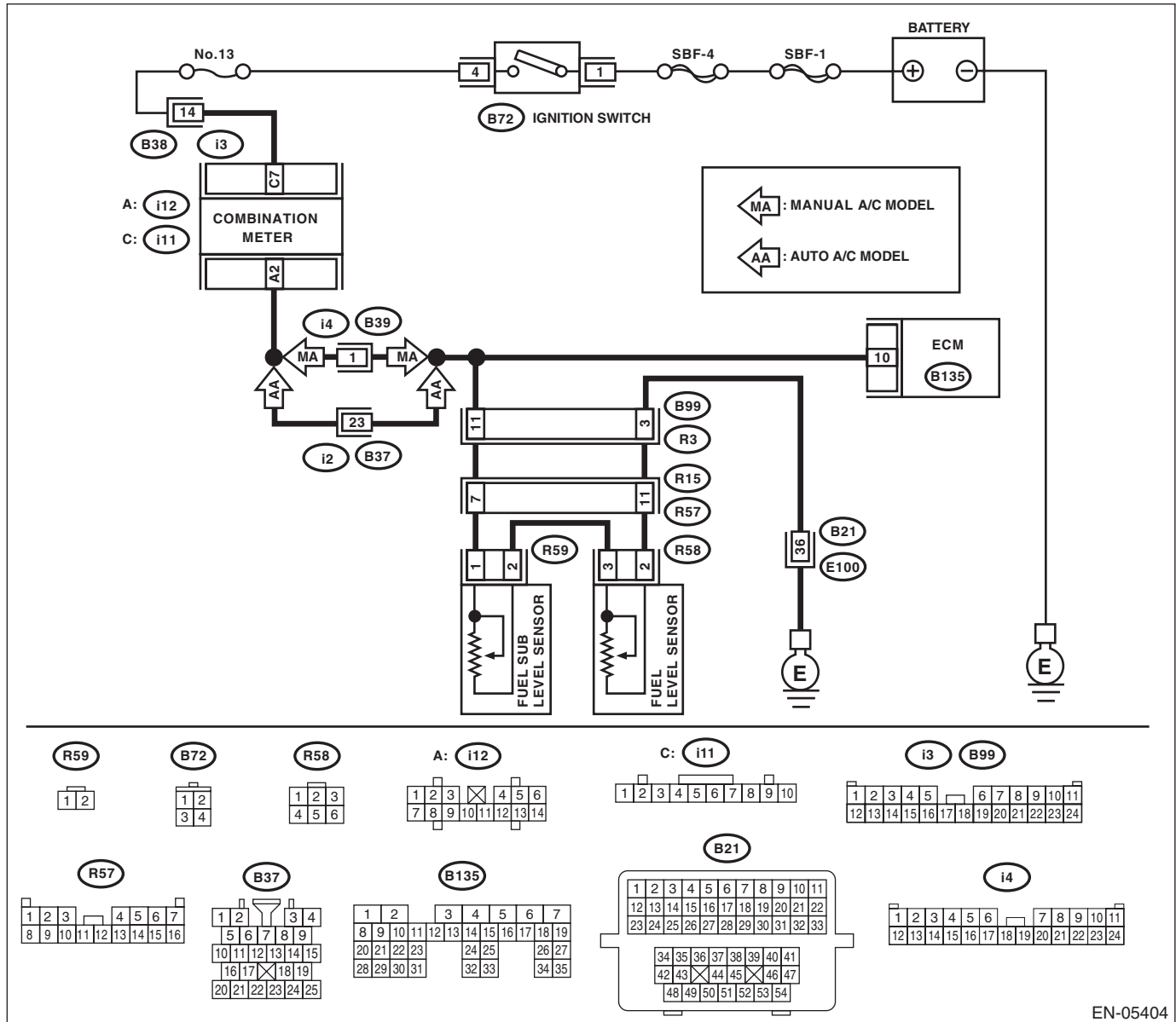
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-154, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05404

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK FUEL LEVEL SENSOR. 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-51, Fuel Pump.> 2) Check if the resistance between fuel level sensor terminals changes smoothly when moving the fuel level sensor float up and down. Terminals No. 3 — No. 2:	Does the resistance change smoothly?	Go to step 2.	Replace the fuel level sensor. <Ref. to FU(H4SO)-53, Fuel Level Sensor.>
2 CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.> 2) Check if the resistance between fuel level sensor terminals changes smoothly when moving the fuel sub level sensor float up and down. Terminals No. 1 — No. 2:	Does the resistance change smoothly?	Repair the connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Poor contact in ECM connector • Poor contact in combination meter connector • Poor contact of coupling connector 	Replace the fuel sub level sensor. <Ref. to FU(H4SO)-54, Fuel Sub Level Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BT:DTC P0483 FAN RATIONALITY CHECK

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-157, DTC P0483 FAN RATIONALITY CHECK, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Occurrence of noise
- Overheat

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, 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.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Check radiator fan, fan motor and thermostat and if thermostat is stuck, replace thermostat. <Ref. to CO(H4SO)-27, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4SO)-29, Radiator Sub Fan and Fan Motor.>

BU:DTC P0502 VEHICLE SPEED SENSOR "A" CIRCUIT LOW INPUT

NOTE:

For the diagnostic procedure, refer to DTC P0503. <Ref. to EN(H4SO)(diag)-222, DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

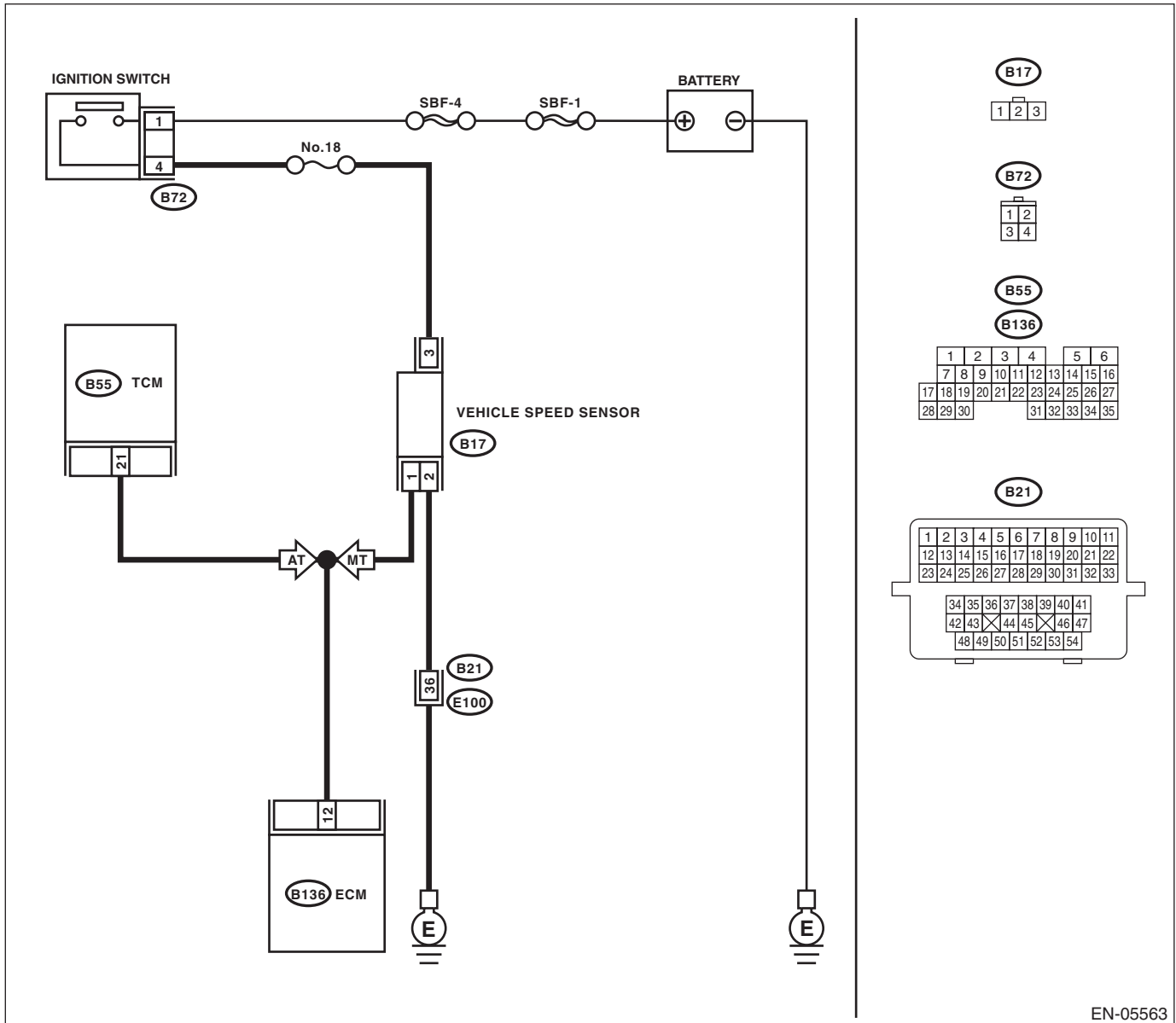
BV:DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-159, DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05563

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK TRANSMISSION TYPE.	Is the transmission type AT?	Go to step 2.	Go to step 6.
2	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance of harness between ECM and TCM connector. Connector & terminal (B136) No. 12 — (B55) No. 21:	Is the resistance less than 1 Ω?	Go to step 3.	Repair the open circuit of harness between ECM and TCM connector.
3	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. Measure the resistance between TCM connector and chassis ground. Connector & terminal (B55) No. 21 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 4.	Repair short circuit of the harness to ground between ECM and TCM connector.
4	CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 21 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power of harness between ECM and TCM connector.	Go to step 5.
5	CHECK POOR CONTACT. Check for poor contact of the TCM connector.	Is there poor contact of TCM connector?	Repair the poor contact of TCM connector.	Repair poor contact of the ECM connector.
6	CHECK POWER OF VEHICLE SPEED SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between vehicle speed sensor connector and chassis ground. Connector & terminal (B17) No. 3 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 7.	Repair the open or ground short circuit of power supply circuit.
7	CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and vehicle speed sensor. 3) Measure the resistance of the harness between the ECM and vehicle speed sensor connector. Connector & terminal (B136) No. 12 — (B17) No. 1:	Is the resistance less than 1 Ω?	Go to step 8.	Repair the open circuit of harness between ECM and vehicle speed sensor connector.
8	CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR. Measure the resistance between vehicle speed sensor connector and chassis ground. Connector & terminal (B17) No. 1 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 9.	Repair short circuit of the harness to ground between ECM and vehicle speed sensor.
9	CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between vehicle speed sensor connector and chassis ground. Connector & terminal (B17) No. 1 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power of harness between ECM and vehicle speed sensor.	Go to step 10.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
10 CHECK POOR CONTACT. Check poor contact of vehicle speed sensor connector.	Is there poor contact of vehicle speed sensor connector?	Repair the poor contact of vehicle speed sensor connector.	Replace the vehicle speed sensor. <Ref. to 5MT-37, Vehicle Speed Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BW:DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-160, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

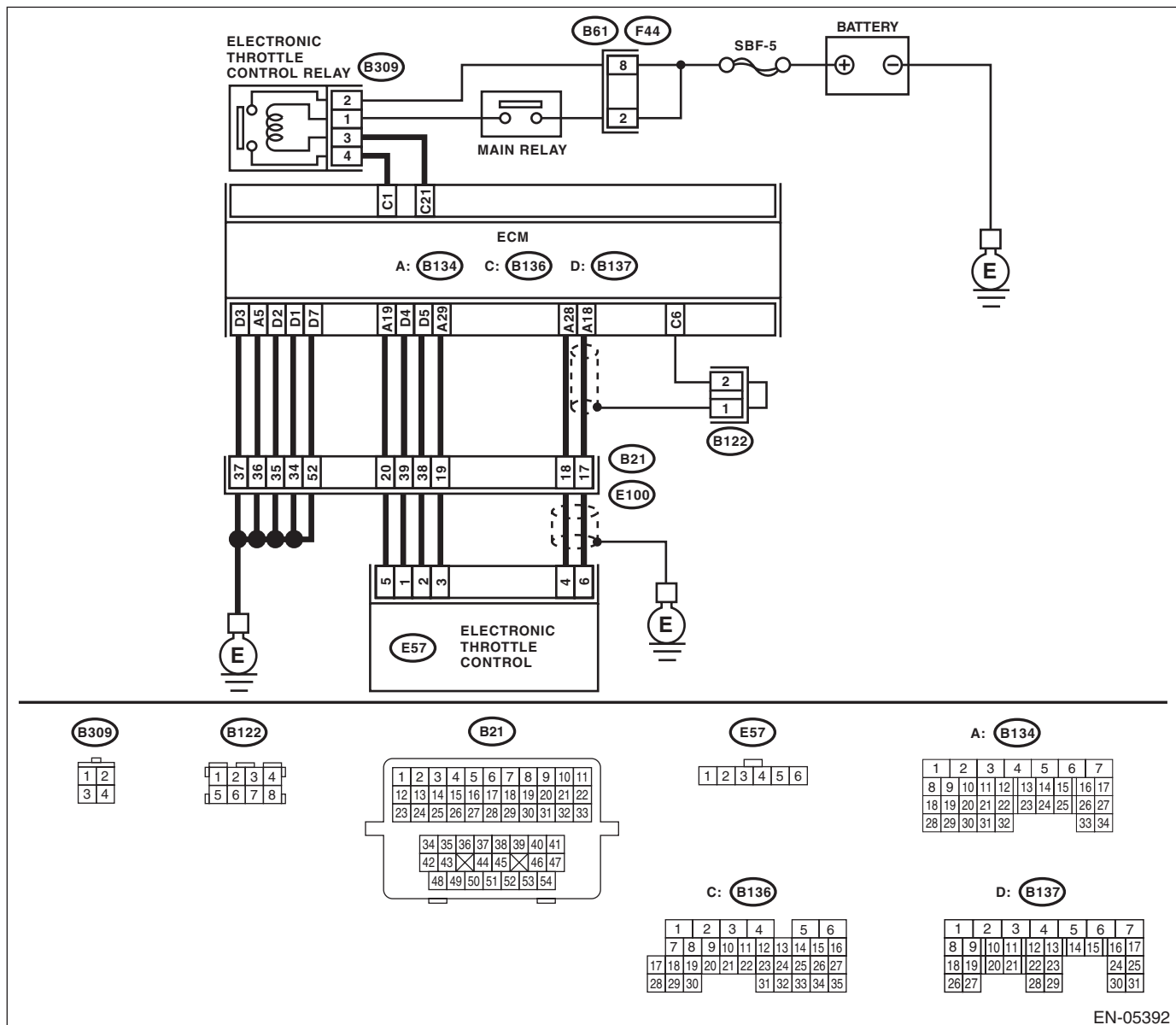
TROUBLE SYMPTOM:

- Hard to start the engine.
- Engine does not start.
- Erroneous idling
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK AIR CLEANER ELEMENT. 1) Turn the ignition switch to OFF. 2) Check the air cleaner element.	Is there excessive clogging on air cleaner element?	Replace the air cleaner element. <Ref. to IN(H4SO)-4, Air Cleaner Element.>	Go to step 3.
3	CHECK ELECTRONIC THROTTLE CONTROL. 1) Remove the electronic throttle control. 2) Check the electronic throttle control.	Are foreign matter found inside electronic throttle control?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101. <Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BX:DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-162, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

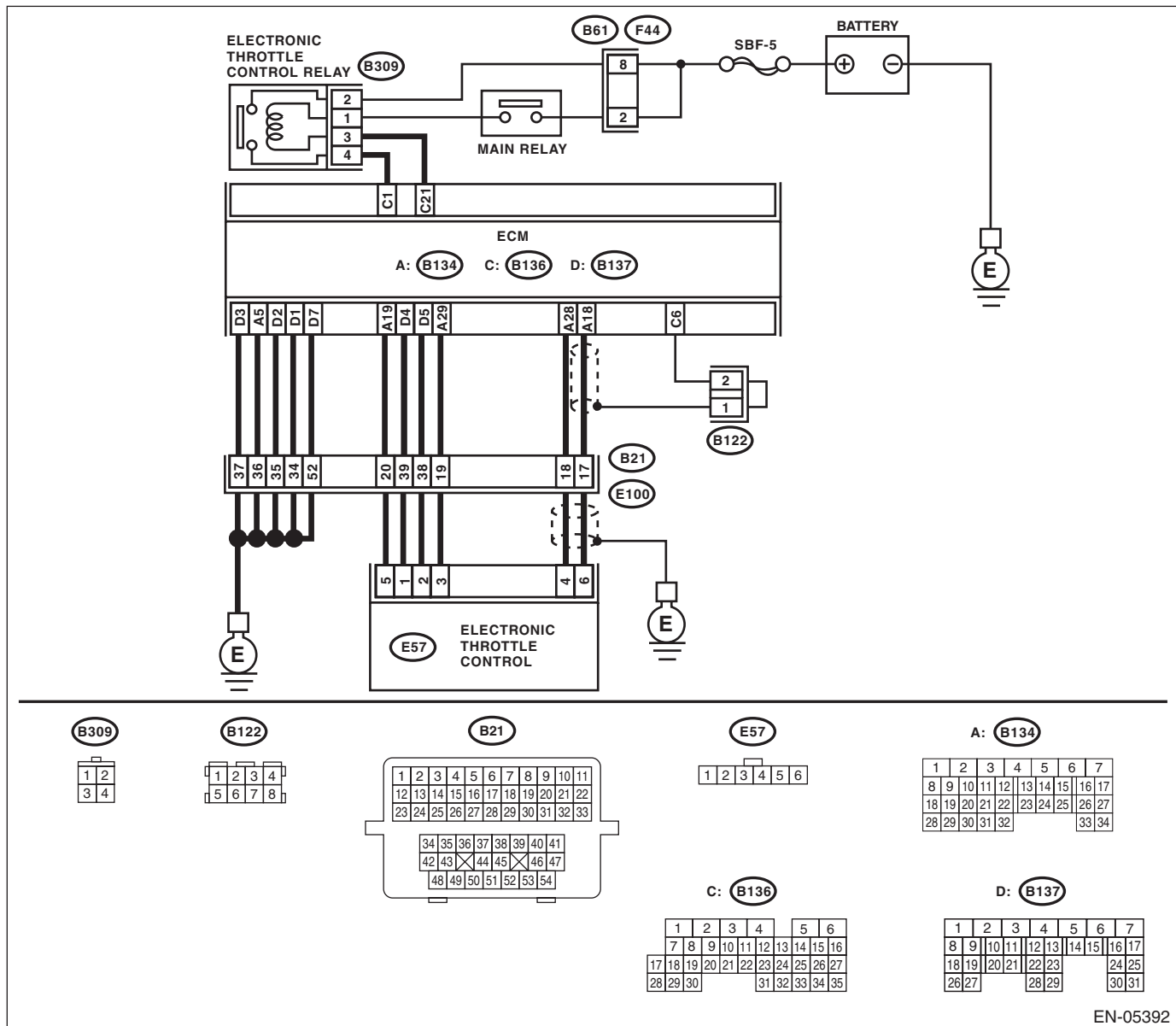
TROUBLE SYMPTOM:

Engine keeps running at higher speed than specified idle speed.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK AIR INTAKE SYSTEM. 1) Start and idle the engine. 2) Check the following items. <ul style="list-style-type: none"> • Loose installation of intake manifold and throttle body • Cracks of intake manifold gasket and throttle body gasket • Disconnection of vacuum hoses 	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
3 CHECK ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matter found inside electronic throttle control?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101. <Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/ PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BY:DTC P0512 STARTER REQUEST CIRCUIT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-164, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

Failure of engine to start

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND STARTER INTERLOCK RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 32 (+) — Chassis ground (-): NOTE: For AT model, measure the voltage with select lever in "P" or "N".	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and starter interlock relay.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

BZ:DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-165, DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

Engine keeps running at higher speed than specified idle speed.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK AIR INTAKE SYSTEM. 1) Start and idle the engine. 2) Check the following items. <ul style="list-style-type: none">• Loose installation of intake manifold and throttle body• Cracks of intake manifold gasket and throttle body gasket• Disconnection of vacuum hoses	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
3 CHECK ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matter found inside electronic throttle control?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101. <Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CA:DTC P0600 SERIAL COMMUNICATION LINK

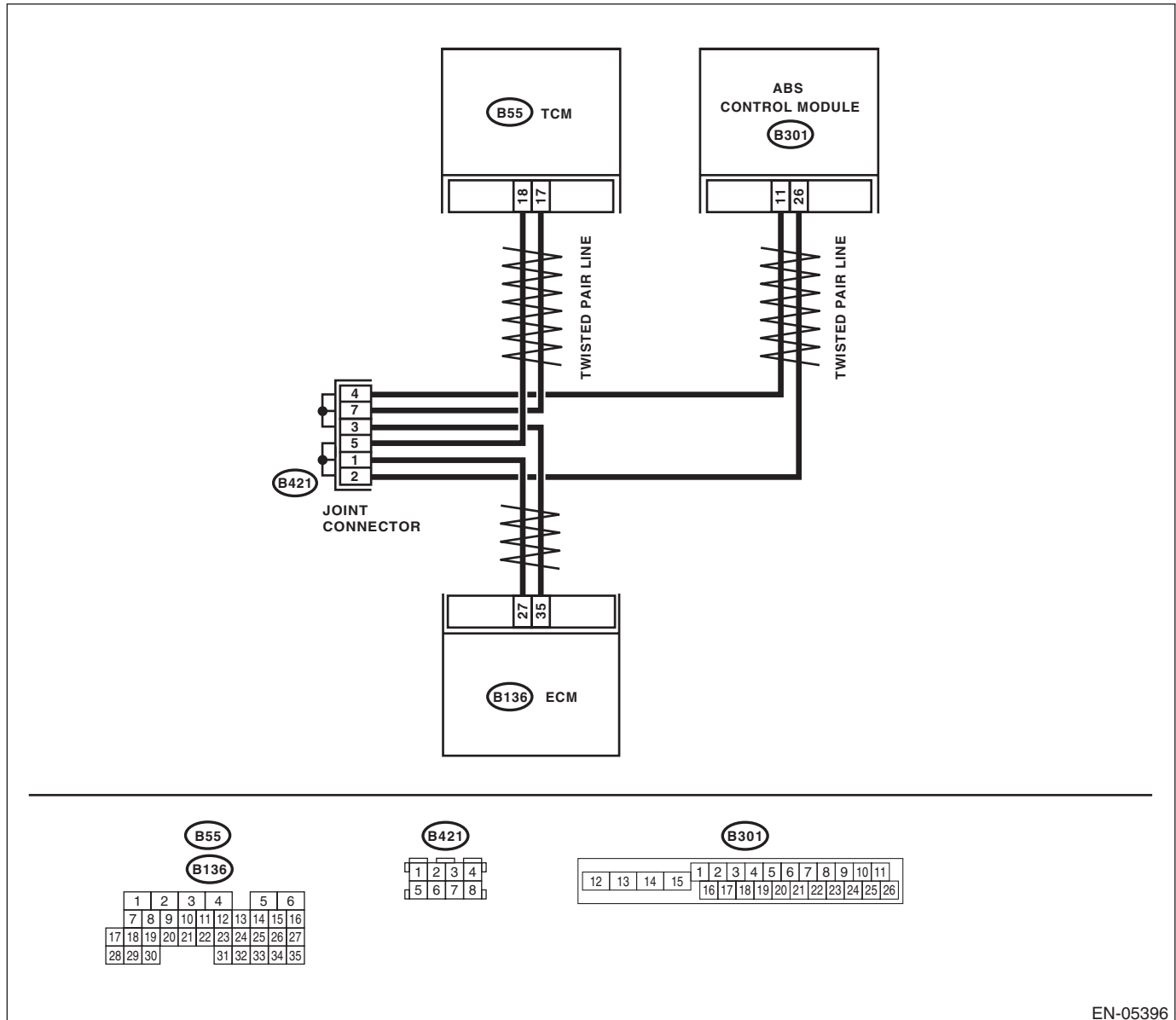
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-166, DTC P0600 SERIAL COMMUNICATION LINK, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05396

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND TCM.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from ECM and TCM.</p> <p>3) Measure the resistance between ECM and TCM connector.</p> <p>Connector & terminal (B136) No. 27 — (B55) No. 18: (B136) No. 35 — (B55) No. 17:</p>	Is the resistance less than 1 Ω?	Go to step 2.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and TCM connector • Poor contact of joint connector
2	<p>CHECK HARNESS BETWEEN ECM AND AB-SCM&H/U.</p> <p>1) Disconnect the connector from the ABSCM&H/U.</p> <p>2) Measure the resistance between ECM and ABSCM&H/U.</p> <p>Connector & terminal (B136) No. 27 — (B301) No. 26: (B136) No. 35 — (B301) No. 11:</p>	Is the resistance less than 1 Ω?	Go to step 3.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and AB-SCM&H/U • Poor contact of joint connector
3	<p>CHECK HARNESS BETWEEN ECM, TCM AND ABSCM&H/U.</p> <p>Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 27 — Chassis ground: (B136) No. 35 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 4.	Repair short circuit of the harness to ground between ECM, TCM AND ABSCM&H/U.
4	<p>CHECK HARNESS BETWEEN ECM, TCM AND ABSCM&H/U.</p> <p>Measure the resistance between ECM connectors.</p> <p>Connector & terminal (B136) No. 27 — (B136) No. 35:</p>	Is the resistance 1 MΩ or more?	Go to step 5.	Repair the short circuit of harness between ECM, TCM AND ABSCM&H/U.
5	<p>CHECK AT SYSTEM CONDITION.</p> <p>Perform the diagnosis of AT using the Subaru Select Monitor.</p>	Is DTC P1718 displayed?	Check the AT system.	Go to step 6.
6	<p>CHECK ABS SYSTEM CONDITION.</p> <p>Perform the diagnosis of ABS using the Subaru Select Monitor.</p>	Is DTC 47 displayed?	Check the ABS system.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CB:DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-167, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

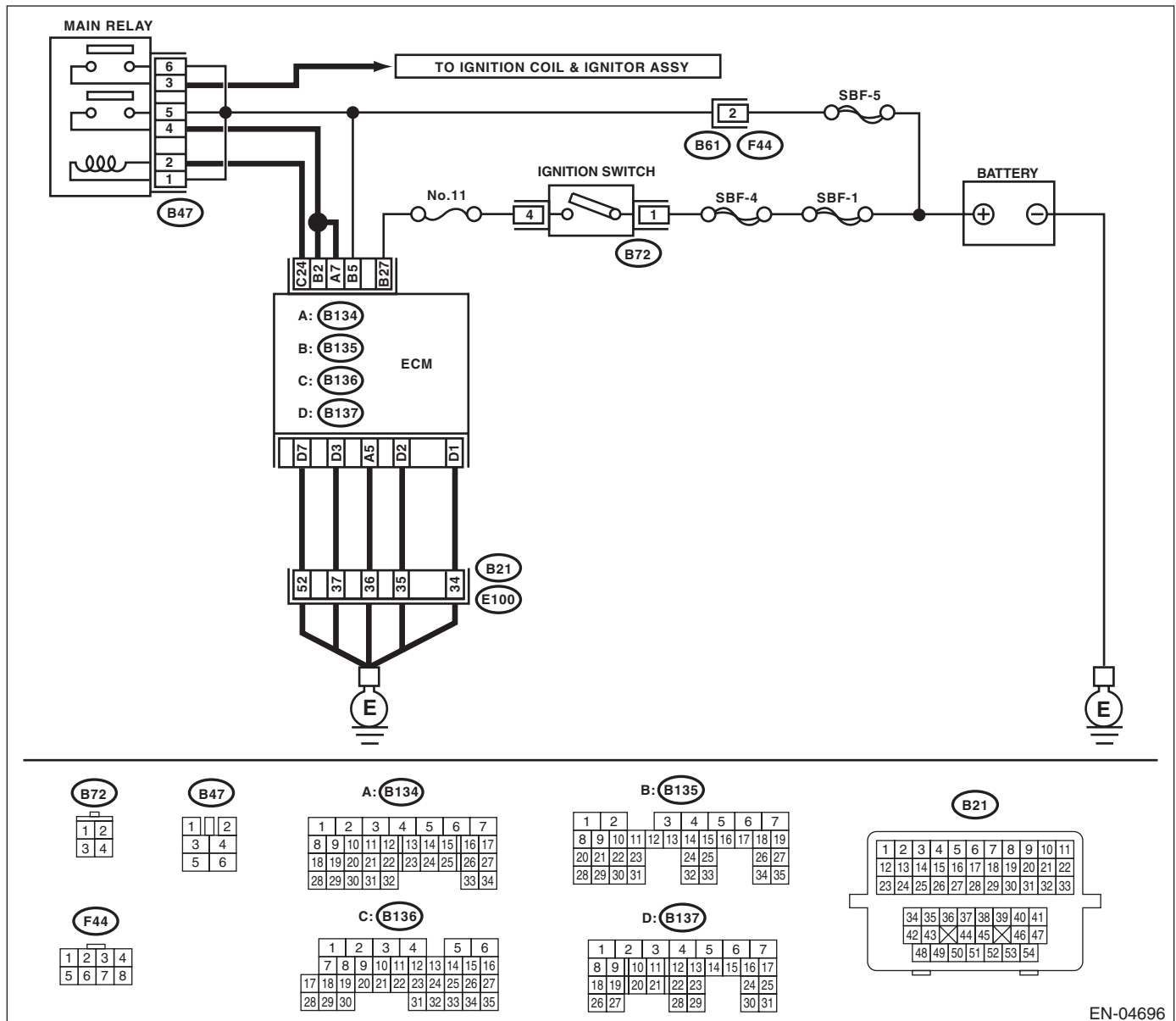
TROUBLE SYMPTOM:

- Engine does not start.
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04696

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.

CC:DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

NOTE:

For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4SO)(diag)-237, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CD:DTC P0607 CONTROL MODULE PERFORMANCE

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-170, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

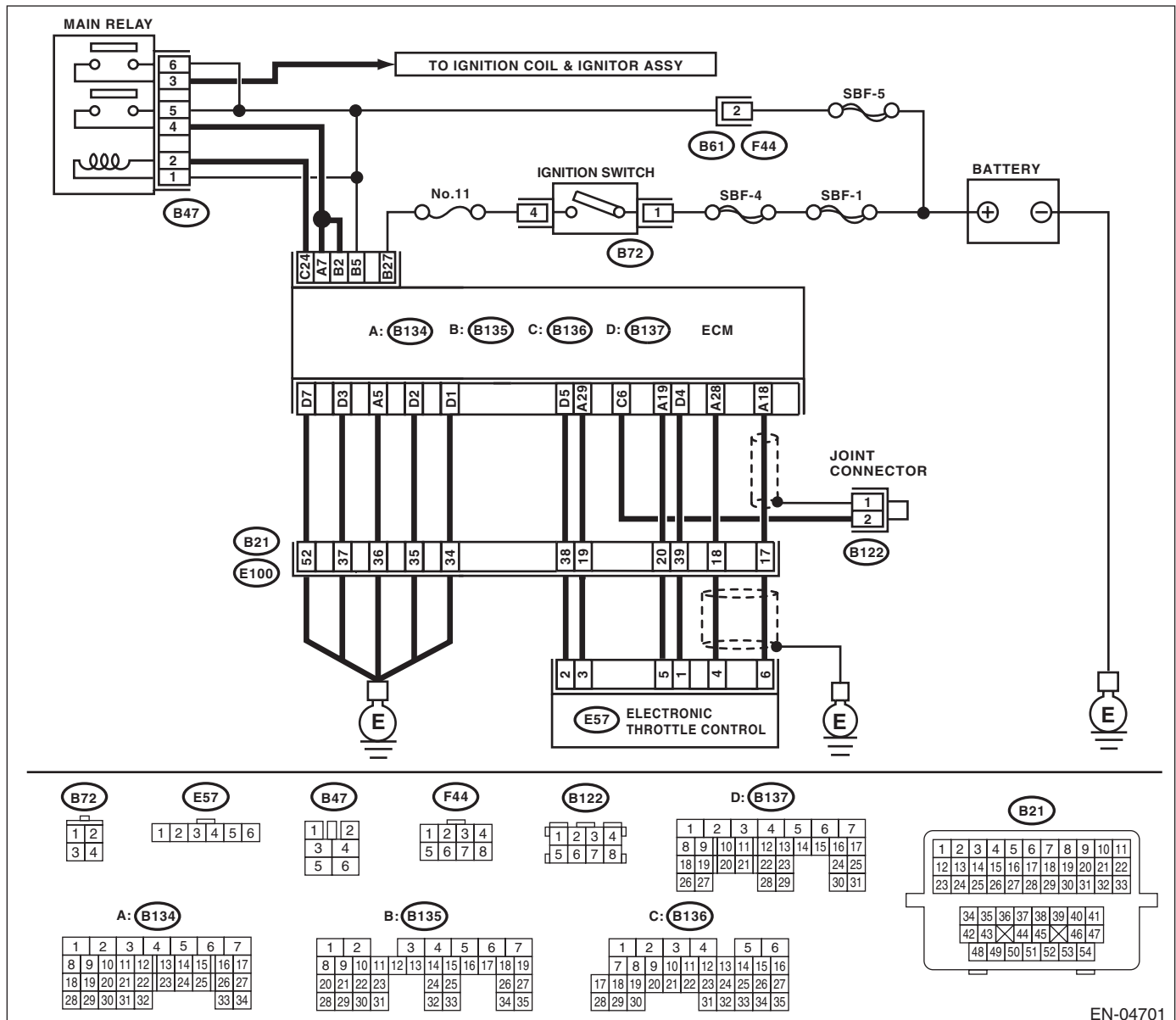
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04701

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B134) No. 7 (+) — Chassis ground (-):</i> <i>(B135) No. 2 (+) — Chassis ground (-):</i>	Is the voltage 10 — 13 V?	Go to step 2.	Repair the open or ground short circuit of power supply circuit.
2 CHECK INPUT VOLTAGE OF ECM. 1) Start the engine. 2) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B134) No. 7 (+) — Chassis ground (-):</i> <i>(B135) No. 2 (+) — Chassis ground (-):</i>	Is the voltage 13 — 15 V?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance of harness between ECM and electronic throttle control connector. <i>Connector & terminal</i> <i>(B134) No. 19 — (E57) No. 5:</i> <i>(B134) No. 29 — (E57) No. 3:</i>	Is the resistance less than 1 Ω ?	Go to step 4.	Repair the open circuit of harness between ECM and electronic throttle control connector.
4 CHECK ECM GROUND HARNESS. Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B134) No. 5 (+) — Chassis ground (-):</i> <i>(B137) No. 1 (+) — Chassis ground (-):</i> <i>(B137) No. 2 (+) — Chassis ground (-):</i> <i>(B137) No. 3 (+) — Chassis ground (-):</i> <i>(B137) No. 7 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Repair poor contact of the ECM connector.	Repair the following item. <ul style="list-style-type: none"> • Retightening of engine ground terminals • Poor contact of coupling connector

CE:DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1)

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CF:DTC P0691 FAN 1 CONTROL CIRCUIT LOW

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-176, DTC P0691 FAN 1 CONTROL CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheat

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Check the radiator fan system. <Ref. to CO(H4SO)-6, Radiator Main Fan System.>

CG:DTC P0692 FAN 1 CONTROL CIRCUIT HIGH

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-177, DTC P0692 FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheat

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Check the radiator fan system. <Ref. to CO(H4SO)-6, Radiator Main Fan System.>

CH:DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

NOTE:

For the diagnostic procedure, refer to AT section. <Ref. to 4AT(D)(diag)-2, Basic Diagnostic Procedure.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CI: DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-179, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

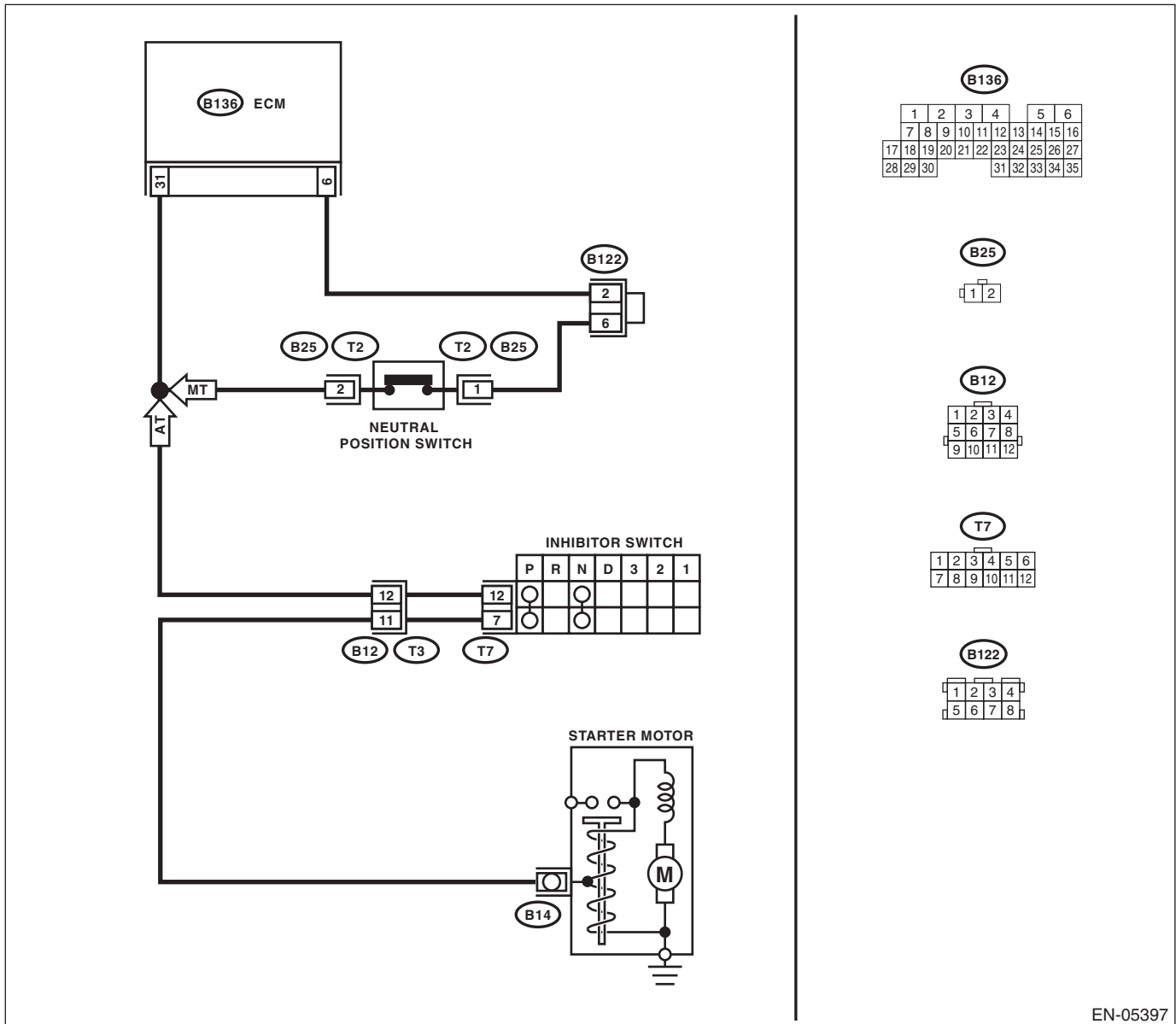
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05397

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK SELECT CABLE.	Are there any faults in the select cable?	Repair or adjust the select cable. <Ref. to CS-27, Select Cable.>	Go to step 2.
2 CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Place the select lever other than "N" and "P" range. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 31 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair poor contact of the ECM connector.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T3). 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 31 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 4.	Repair short circuit of the harness to ground between ECM and transmission harness connector.
4 CHECK TRANSMISSION HARNESS CONNECTOR. 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance between the transmission harness connector and engine ground. Connector & terminal (T3) No. 12 — Engine ground:	Is the resistance 1 MΩ or more?	Replace the inhibitor switch. <Ref. to 4AT-46, Inhibitor Switch.>	Repair short circuit of the harness to ground between transmission harness connector and inhibitor switch connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CJ:DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-180, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

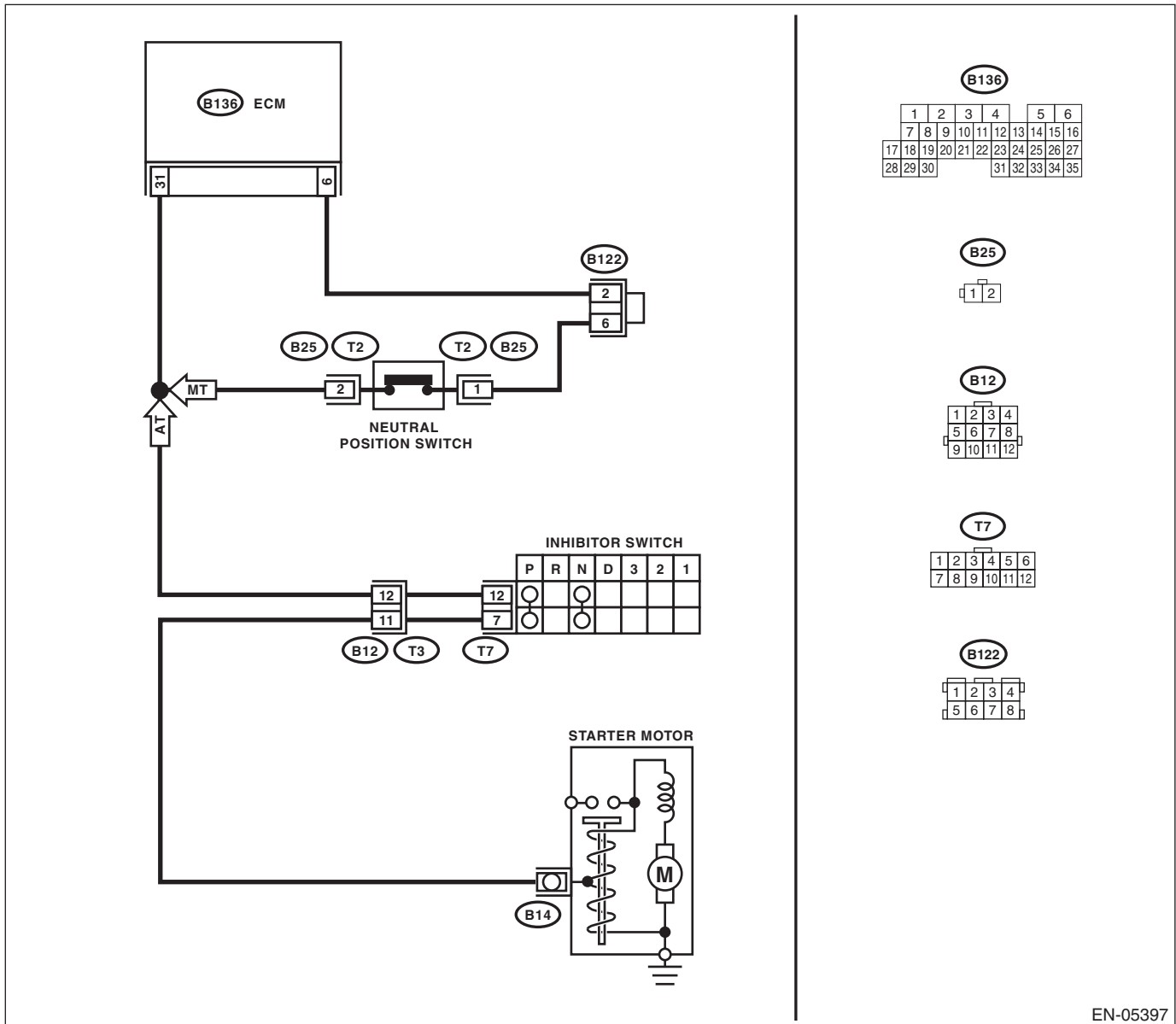
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05397

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK INPUT SIGNAL OF ECM.</p> <p>1) Turn the ignition switch to ON.</p> <p>2) Place the shift lever in a position except for neutral.</p> <p>3) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 31 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair poor contact of the ECM connector.</p>	<p>Go to step 2.</p>
<p>2</p> <p>CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from ECM and transmission harness connector (T2).</p> <p>3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 31 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Repair the short circuit of transmission harness, or replace the neutral position switch.</p>	<p>Repair short circuit of the harness to ground between ECM and transmission harness connector.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CK:DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-181, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

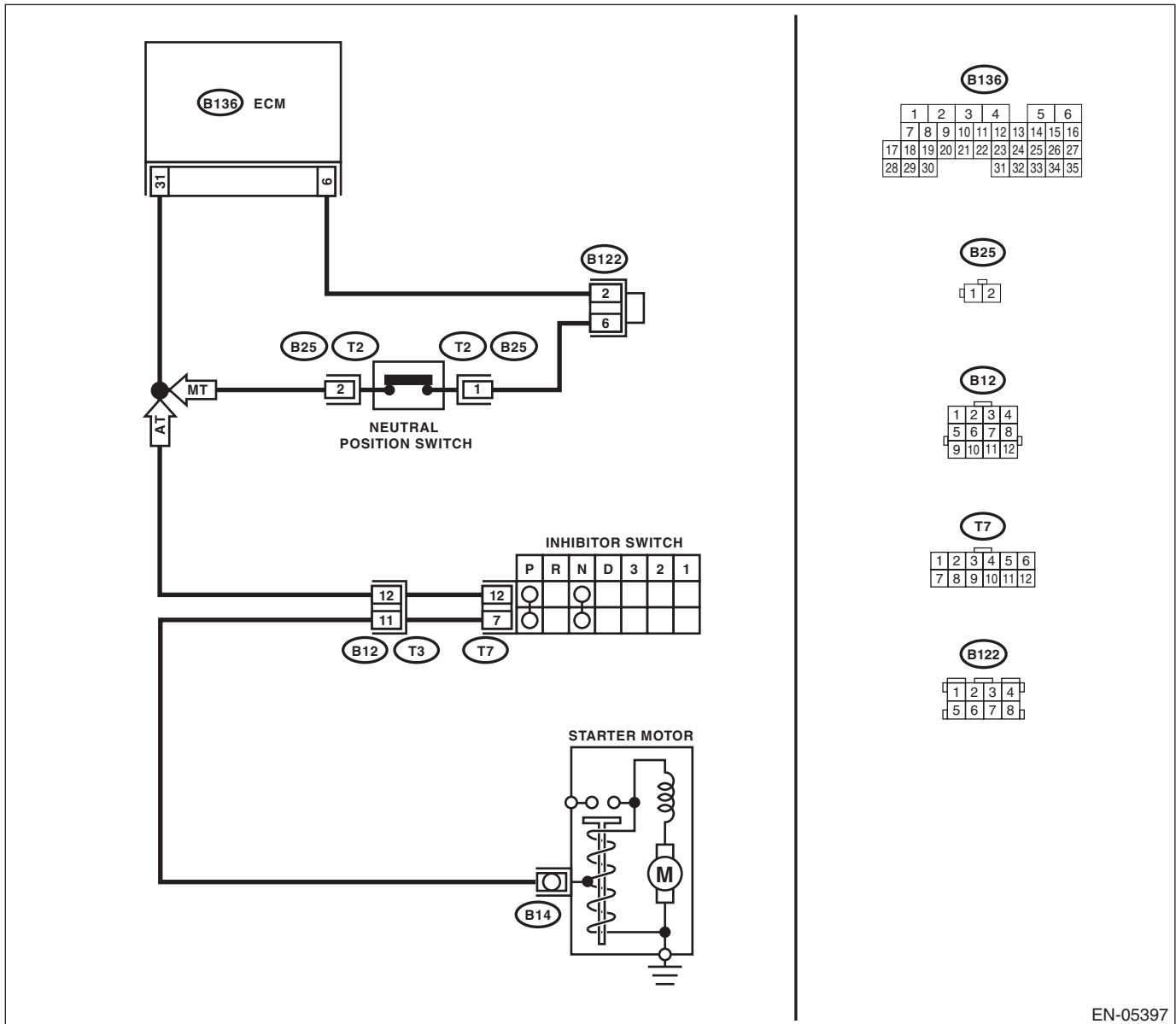
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05397

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK SELECT CABLE.	Are there any faults in the select cable?	Repair or adjust the select cable. <Ref. to CS-27, Select Cable.>	Go to step 2.
2 CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground with select lever at "N" and "P" range. <i>Connector & terminal</i> <i>(B136) No. 31 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Repair poor contact of the ECM connector.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and inhibitor switch. 3) Measure the resistance of harness between ECM and inhibitor switch connector. <i>Connector & terminal</i> <i>(B136) No. 31 — (T7) No. 12:</i>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and inhibitor switch connector • Poor contact of coupling connector
4 CHECK INHIBITOR SWITCH GROUND LINE. Measure the resistance of harness between inhibitor switch connector and engine ground. <i>Connector & terminal</i> <i>(T7) No. 7 — Engine ground:</i>	Is the resistance less than 5 Ω?	Replace the inhibitor switch. <Ref. to 4AT-46, Inhibitor Switch.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between inhibitor switch connector and starter motor ground line • Poor contact of coupling connector • Poor contact in starter motor connector • Poor contact in starter motor ground • Starter motor

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CL:DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL)

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-182, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

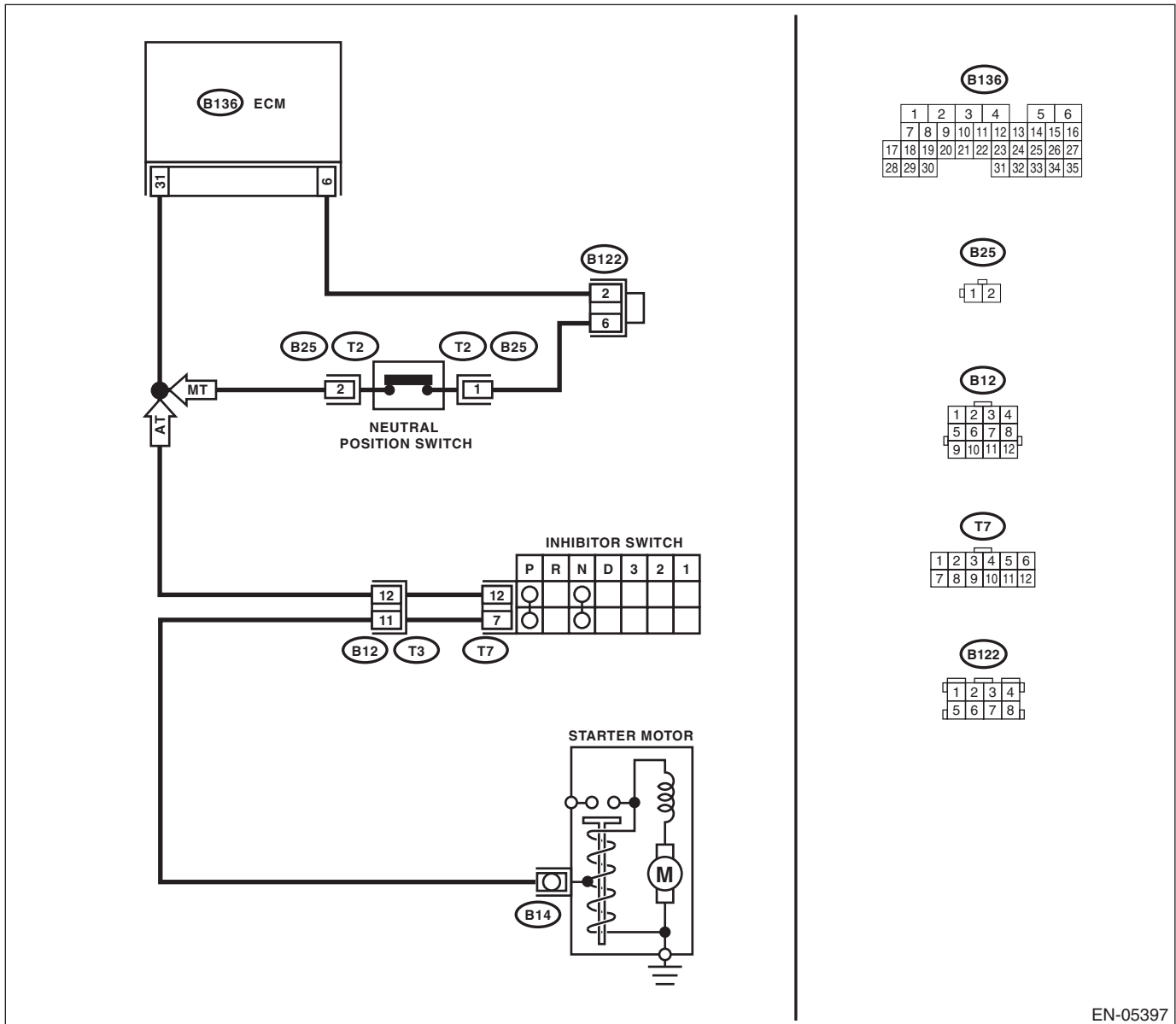
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05397

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK INPUT SIGNAL OF ECM.</p> <p>1) Turn the ignition switch to ON. 2) Place the shift lever in neutral. 3) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 31 (+) — Chassis ground (-):</p>	Is the voltage less than 1 V?	Repair poor contact of the ECM connector.	Go to step 2.
2	<p>CHECK HARNESS BETWEEN ECM AND NEUTRAL SWITCH CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect connectors from the ECM and transmission harness. 3) Measure the resistance of harness between ECM and transmission harness connector.</p> <p>Connector & terminal (E136) No. 31 — (B25) No. 2:</p>	Is the resistance less than 1 Ω?	Go to step 3.	Repair the open circuit of harness between ECM and transmission harness connector.
3	<p>CHECK HARNESS BETWEEN ECM AND NEUTRAL SWITCH CONNECTOR.</p> <p>Measure the resistance of harness between ECM and transmission harness connector.</p> <p>Connector & terminal (E136) No. 6 — (B25) No. 1:</p>	Is the resistance less than 5 Ω?	Go to step 4.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit of harness between ECM and transmission harness connector • Poor contact of coupling connector
4	<p>CHECK NEUTRAL SWITCH.</p> <p>1) Place the shift lever in neutral. 2) Measure the resistance between transmission harness connector terminals.</p> <p>Connector & terminal (T2) No. 1 — No. 2:</p>	Is the resistance less than 1 Ω?	Repair the poor contact of transmission harness connector.	Repair the open circuit of transmission harness, or replace the neutral switch.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.	Has water entered the connector?	Completely remove any water inside.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B135) No. 9 — (E118) No. 1: (B135) No. 8 — (E118) No. 3:	Is the resistance less than 1 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • 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 • Poor contact of coupling connector
3	CHECK POOR CONTACT. Check poor contact of front oxygen (A/F) sensor connector.	Is there poor contact in front oxygen (A/F) sensor connector?	Repair the poor contact of the front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.	Has water entered the connector?	Completely remove any water inside.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 9 — Chassis ground: (B135) No. 8 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector.
3	CHECK OUTPUT SIGNAL FOR ECM. 1) Connect the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-):	Is the voltage 4.5 V or more?	Go to step 5.	Go to step 4.
4	CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 8 (+) — Chassis ground (-):	Is the voltage 4.95 V or more?	Go to step 5.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.>
5	CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-): (B135) No. 8 (+) — Chassis ground (-):	Is the voltage 8 V or more?	Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>	Repair poor contact of the ECM connector.

CO:DTC P1160 RETURN SPRING FAILURE

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CP:DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW

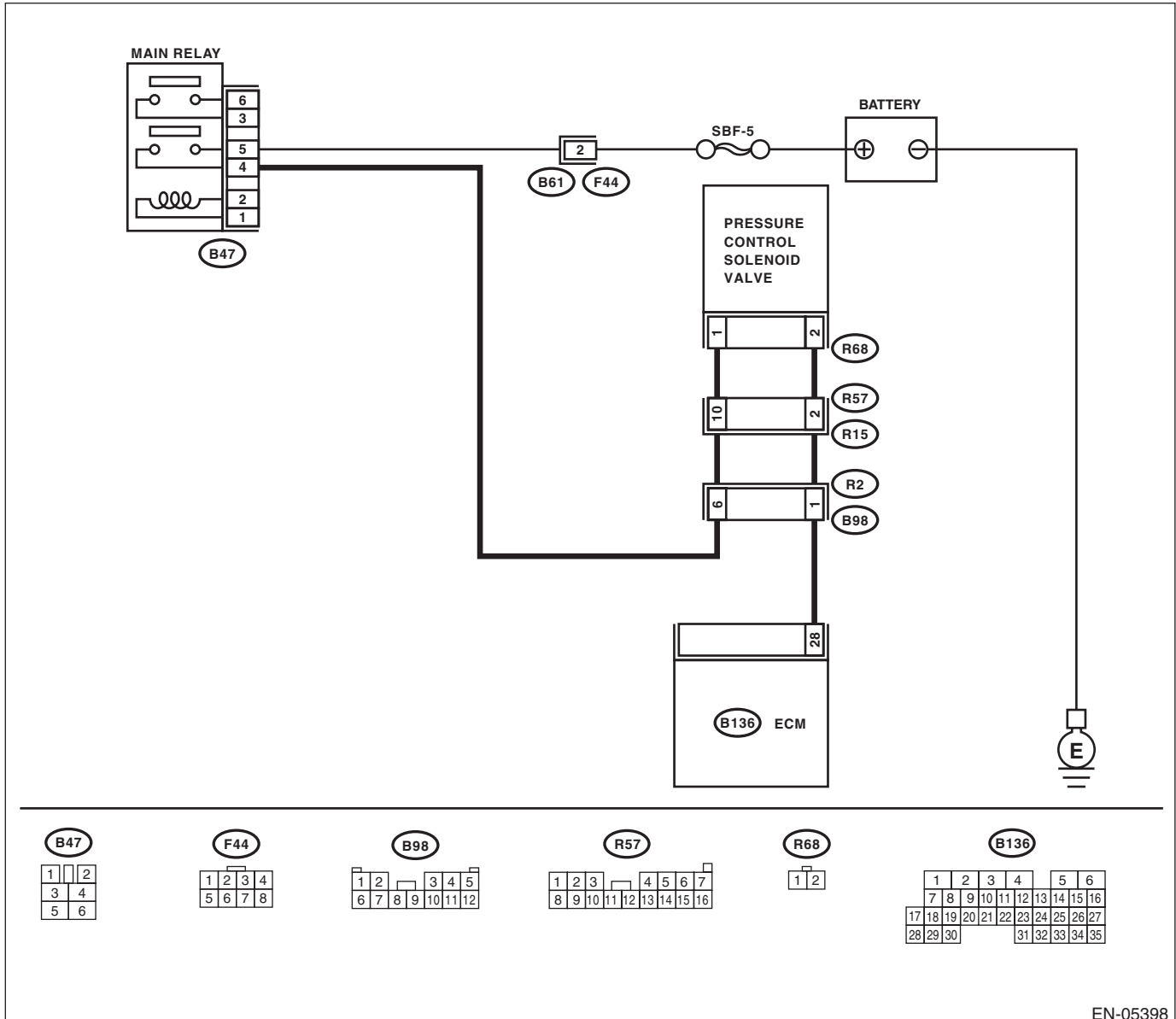
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-191, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05398

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK OUTPUT SIGNAL OF ECM.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 28 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair poor contact of the ECM connector.	Go to step 2.
2	<p>CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and pressure control solenoid valve. 3) Measure the resistance between pressure control solenoid valve and chassis ground.</p> <p>Connector & terminal (R68) No. 2 — Chassis ground:</p>	Is the resistance 1 M Ω or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and pressure control solenoid valve connector.
3	<p>CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE.</p> <p>Measure the resistance of harness between ECM and pressure control solenoid valve connector.</p> <p>Connector & terminal (B136) No. 28 — (R68) No. 2:</p>	Is the resistance less than 1 Ω ?	Go to step 4.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit in harness between ECM and pressure control solenoid valve connector • Poor contact of coupling connector
4	<p>CHECK PRESSURE CONTROL SOLENOID VALVE.</p> <p>Measure the resistance between pressure control solenoid valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance between 10 — 100 Ω ?	Go to step 5.	Replace the pressure control solenoid valve. <Ref. to EC(H4SO)-12, Pressure Control Solenoid Valve.>
5	<p>CHECK POWER SUPPLY TO THE PRESSURE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between pressure control solenoid valve and chassis ground.</p> <p>Connector & terminal (R68) No. 1 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair the poor contact of pressure control solenoid valve connector.	<p>Repair the harness and connector.</p> <p>NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit in harness between main relay and pressure control solenoid valve connector • Poor contact of coupling connector • Poor contact of main relay connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CQ:DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH

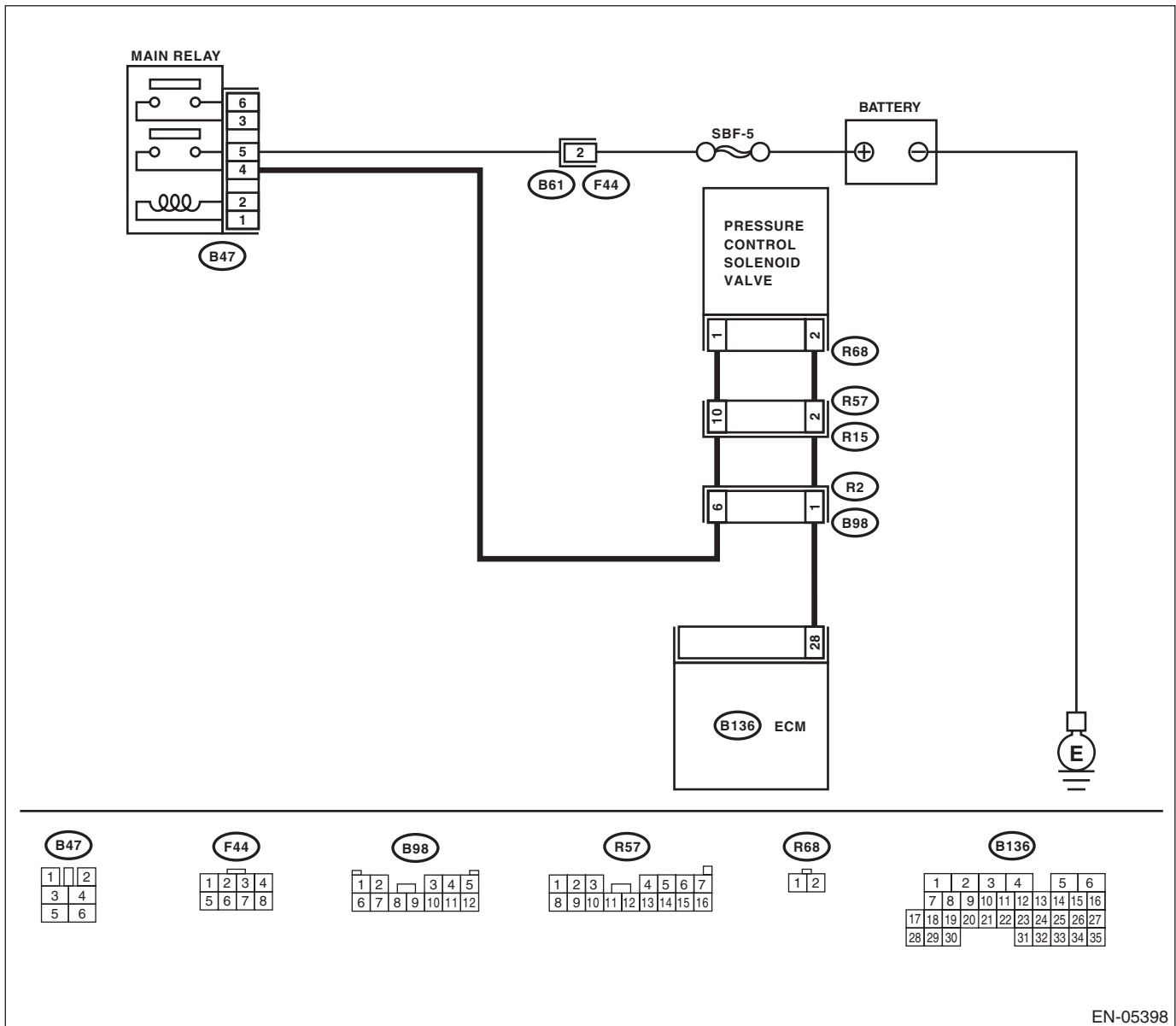
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-193, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05398

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and pressure control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 28 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair the short circuit to power in the harness between ECM and pressure control solenoid valve connector.</p>	<p>Go to step 2.</p>
<p>2</p> <p>CHECK PRESSURE CONTROL SOLENOID VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between pressure control solenoid valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Replace the pressure control solenoid valve. <Ref. to EC(H4SO)-12, Pressure Control Solenoid Valve.></p>	<p>Repair poor contact of the ECM connector.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK DRAIN VALVE OPERATION. 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side). 3) Turn the ignition switch to ON. 4) Operate the drain valve. NOTE: Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4SO)(diag)-48, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Repair poor contact of the ECM connector.	Replace the drain valve. <Ref. to EC(H4SO)-16, Drain Valve.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CS:DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-197, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

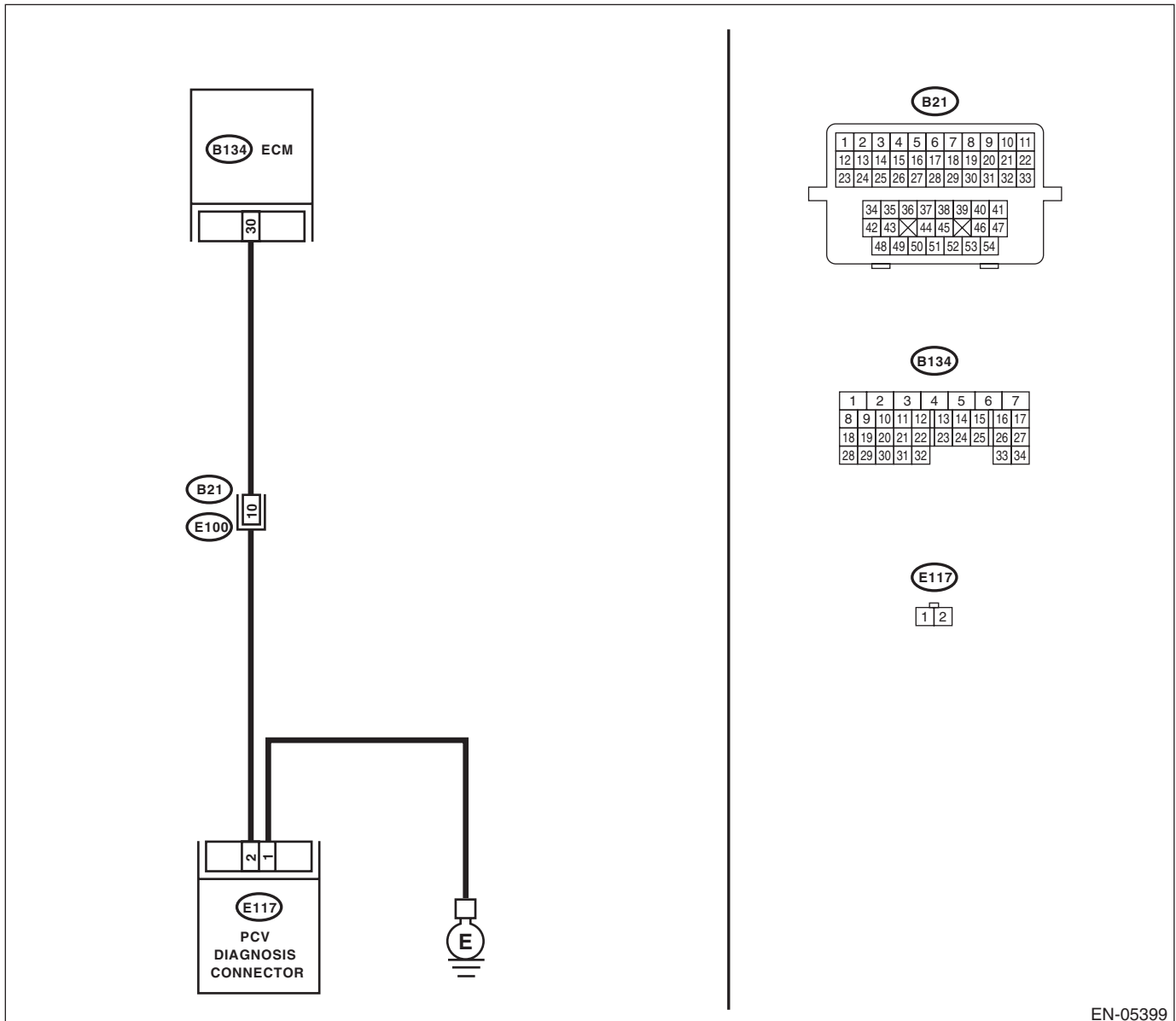
TROUBLE SYMPTOM:

Erroneous idling

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK BLOW-BY HOSE. Check the blow-by hose condition.	Is there any disconnection or crack in blow-by hose?	Repair or replace the blow-by hose.	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and PCV hose assembly. 3) Measure the resistance of harness between ECM and PCV hose assembly. Connector & terminal (B134) No. 30 — (E117) No. 2:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit of harness between ECM and PCV hose assembly.
3	CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY. Measure the resistance between PCV hose assembly and chassis ground. Connector & terminal (B134) No. 30 — Chassis ground:	Is the resistance 1 $M\Omega$ or more?	Go to step 4.	Repair short circuit of the harness to ground between ECM and PCV hose assembly.
4	CHECK GROUND CIRCUIT OF PCV HOSE ASSEMBLY. Measure the resistance of harness between PCV hose assembly and engine ground. Connector & terminal (E117) No. 1 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 5.	Repair the open circuit of harness between PCV hose assembly and engine ground.
5	CHECK THE PCV HOSE ASSEMBLY. Measure the resistance between the PCV hose assembly terminals. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Repair the poor contact in ECM and PCV hose assembly connector.	Replace the PCV hose assembly.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

CT:DTC P1492 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO)(diag)-261, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CU:DTC P1493 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO)(diag)-264, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CV:DTC P1494 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO)(diag)-261, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CW:DTC P1495 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO)(diag)-264, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CX:DTC P1496 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO)(diag)-261, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CY:DTC P1497 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT)

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO)(diag)-264, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CZ:DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-199, DTC P1492 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-203, DTC P1494 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-203, DTC P1496 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-203, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine breathing

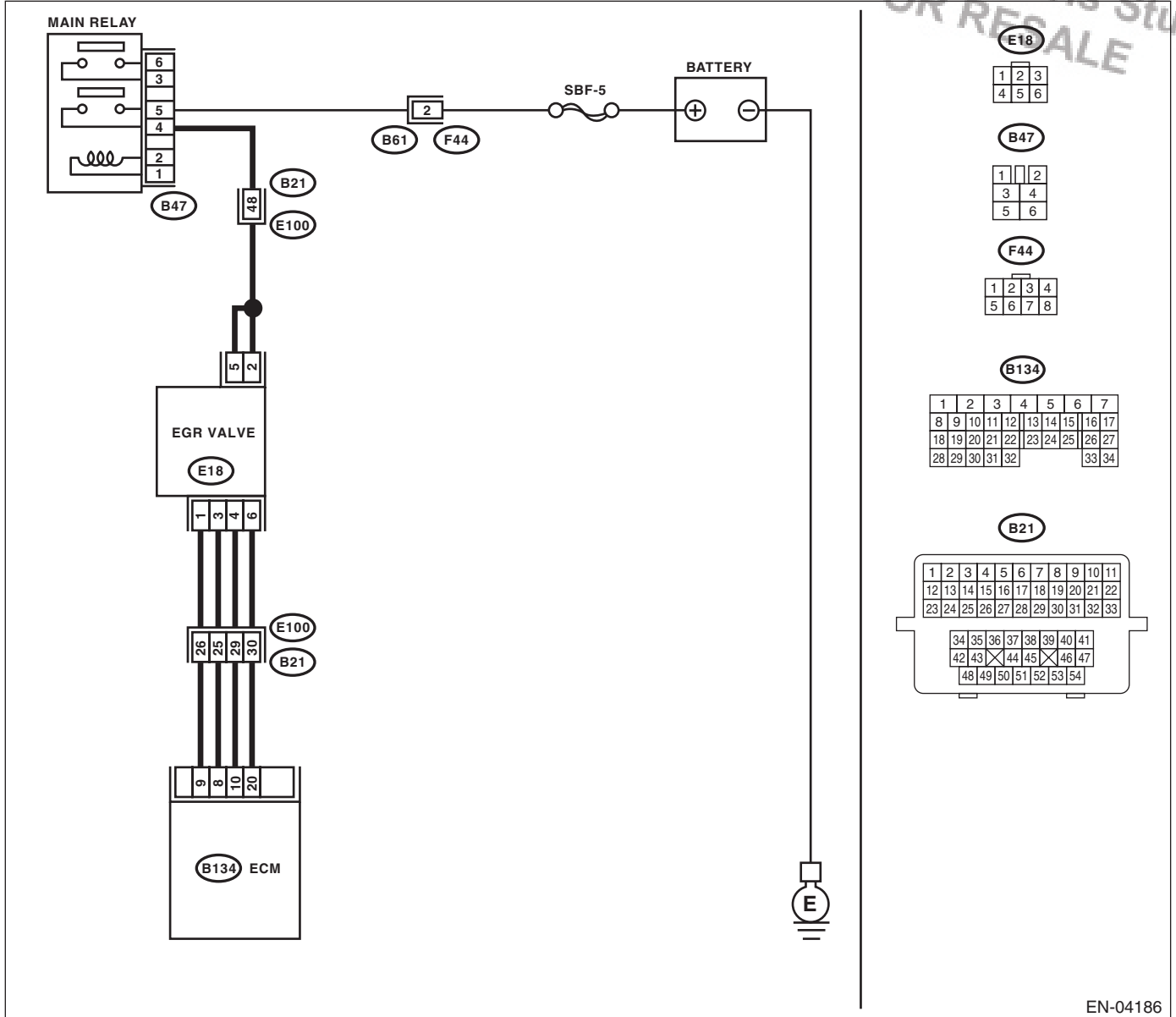
CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:



EN-04186

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK POWER SUPPLY TO EGR VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from EGR valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between EGR valve connector and engine ground.</p> <p>Connector & terminal (E18) No. 2 (+) — Engine ground (-): (E18) No. 5 (+) — Engine ground (-):</p>	Is the voltage 10 V or more?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between EGR valve and main relay connector • Poor contact of coupling connector
2	<p>CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and EGR valve connector.</p> <p>Connector & terminal DTC P1492; (B134) No. 8 — (E18) No. 3: DTC P1494; (B134) No. 9 — (E18) No. 1: DTC P1496; (B134) No. 10 — (E18) No. 4: DTC P1498; (B134) No. 20 — (E18) No. 6:</p>	Is the resistance less than 1 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and EGR valve connector • Poor contact of coupling connector
3	<p>CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR.</p> <p>1) Disconnect the connectors from the ECM. 2) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal DTC P1492; (B134) No. 8 — Chassis ground: DTC P1494; (B134) No. 9 — Chassis ground: DTC P1496; (B134) No. 10 — Chassis ground: DTC P1498; (B134) No. 20 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 4.	Repair short circuit of the harness to ground between ECM and EGR valve connector.
4	<p>CHECK POOR CONTACT.</p> <p>Check the poor contact in ECM and EGR valve connector.</p>	Is there poor contact in ECM or EGR valve connector?	Repair the poor contact in ECM or EGR valve connector.	Replace the EGR valve. <Ref. to FU(H4SO)-29, EGR Valve.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DA:DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT)

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-201, DTC P1493 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-203, DTC P1495 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-203, DTC P1497 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-203, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine breathing

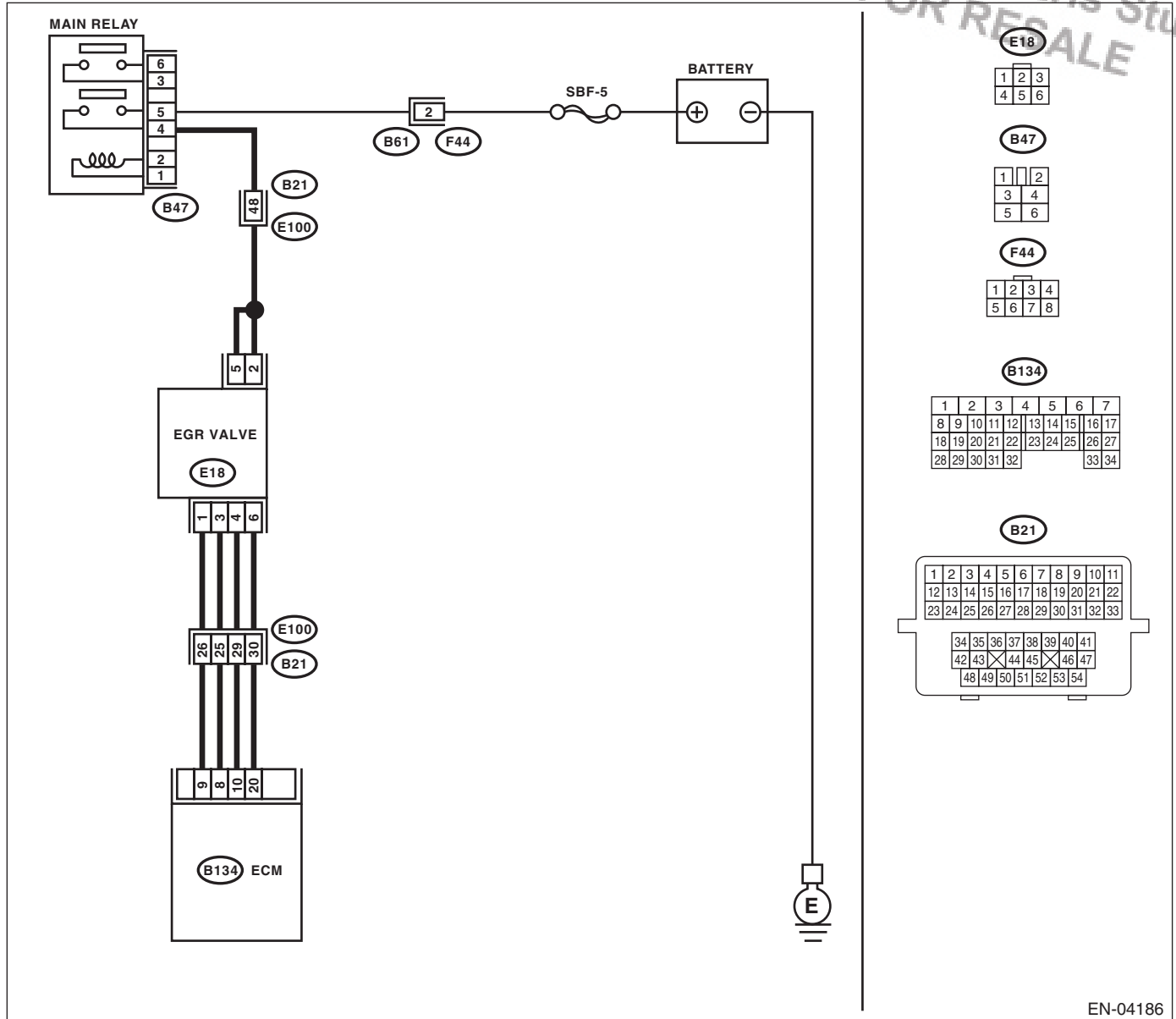
CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:



EN-04186

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from EGR valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal DTC P1493; (B134) No. 8 (+) — Chassis ground (-): DTC P1495; (B134) No. 9 (+) — Chassis ground (-): DTC P1497; (B134) No. 10 (+) — Chassis ground (-): DTC P1499; (B134) No. 20 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair the short circuit to power in the harness between the ECM and EGR solenoid valve connectors.</p>	<p>Repair poor contact of the ECM connector.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DB:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-204, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

Failure of engine to start

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 CHECK HARNESS BETWEEN ECM AND STARTER INTERLOCK RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and starter interlock relay. 3) Measure the resistance of harness between ECM and starter interlock relay connector. Connector & terminal (B136) No. 32 — (B225) No. 28: NOTE: For AT model, measure the voltage with select lever in "P" or "N".	Is the resistance less than 1 Ω?	Go to step 3.	NOTE: Check the following item and repair or replace if necessary. <ul style="list-style-type: none"> • Open circuit of harness between ECM and starter interlock relay connector • Poor contact of the inhibitor switch connector (AT model) • Poor contact of the inhibitor switch (AT model)
3 CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH. Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 32 — Chassis ground: NOTE: For AT model, measure the voltage with select lever in "P" or "N".	Is the resistance 1 MΩ or more?	Repair short circuit of the harness to ground between the ECM and ignition switch connector.	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DC:DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION

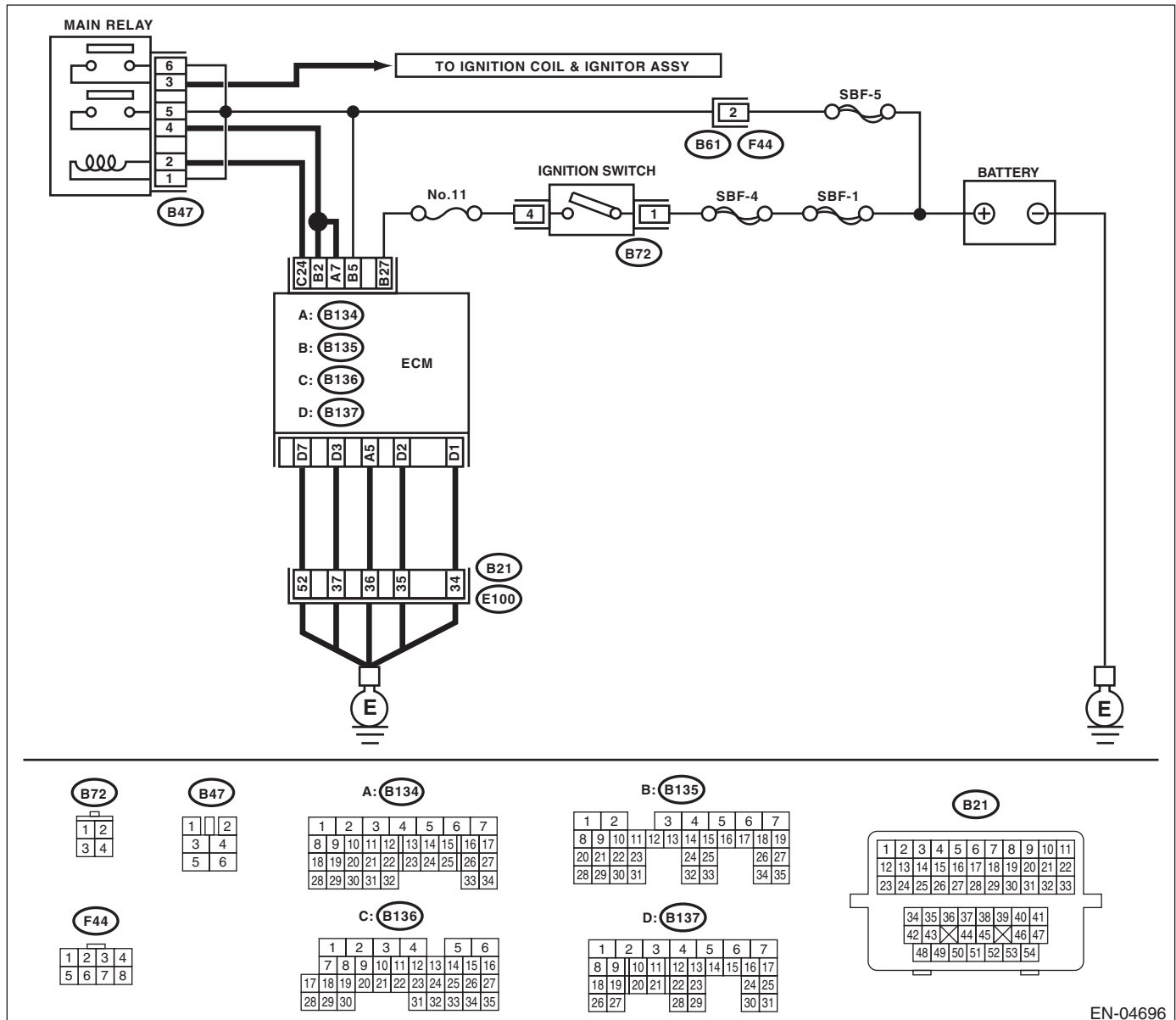
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-205, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-04696

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. <i>Connector & terminal</i> <i>(B135) No. 5 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Repair poor contact of the ECM connector.	Go to step 2.
2 CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance between ECM and chassis ground. <i>Connector & terminal</i> <i>(B135) No. 5 — Chassis ground:</i>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and battery terminal.
3 CHECK FUSE SBF-5.	Is the fuse blown out?	Replace the fuse.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and battery • Poor contact of coupling connector • Poor contact in ECM connector • Poor contact of battery terminal

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DD:DTC P1602 CONTROL MODULE PROGRAMMING ERROR

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-206, DTC P1602 CONTROL MODULE PROGRAMMING ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

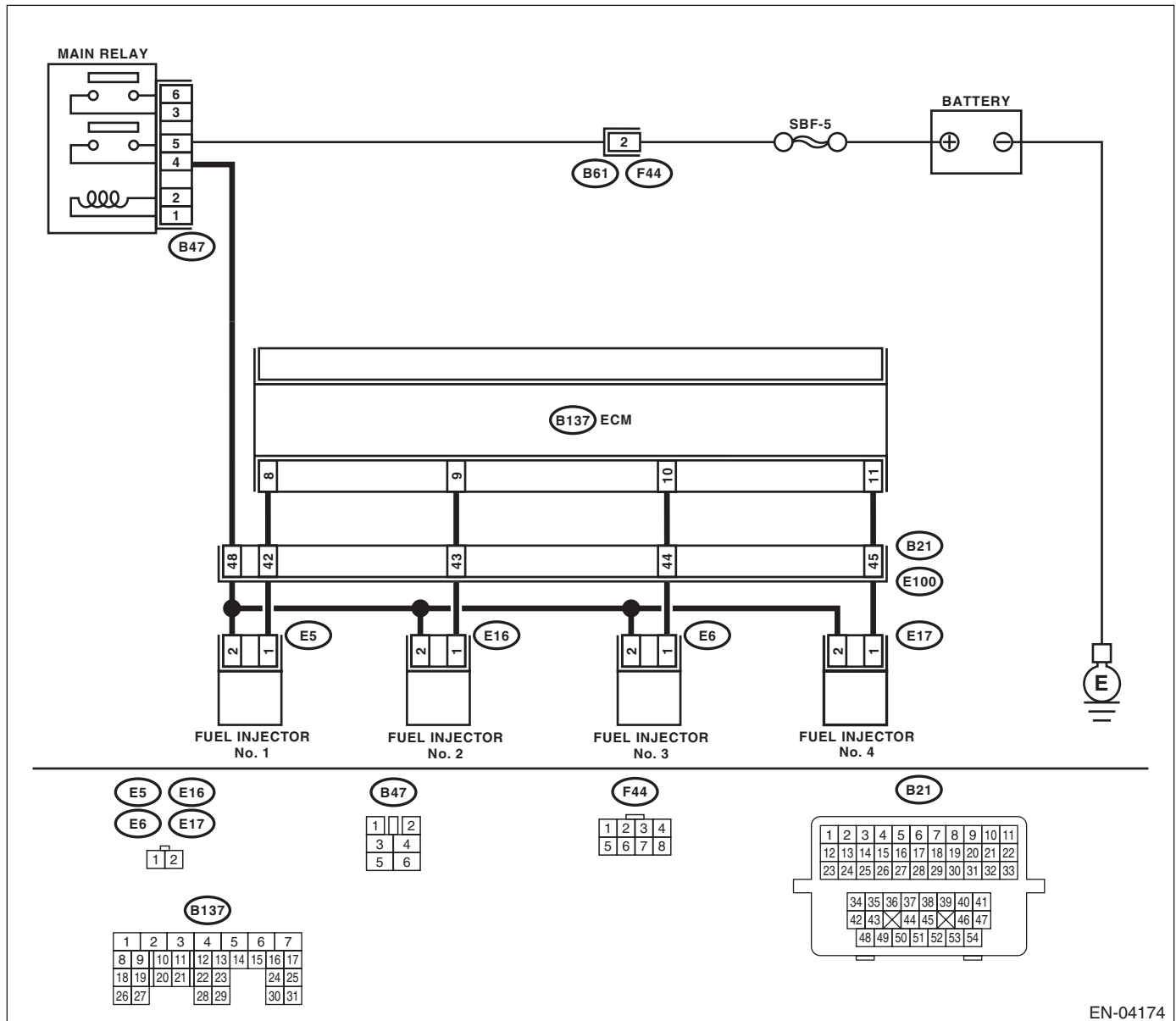
TROUBLE SYMPTOM:

- Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

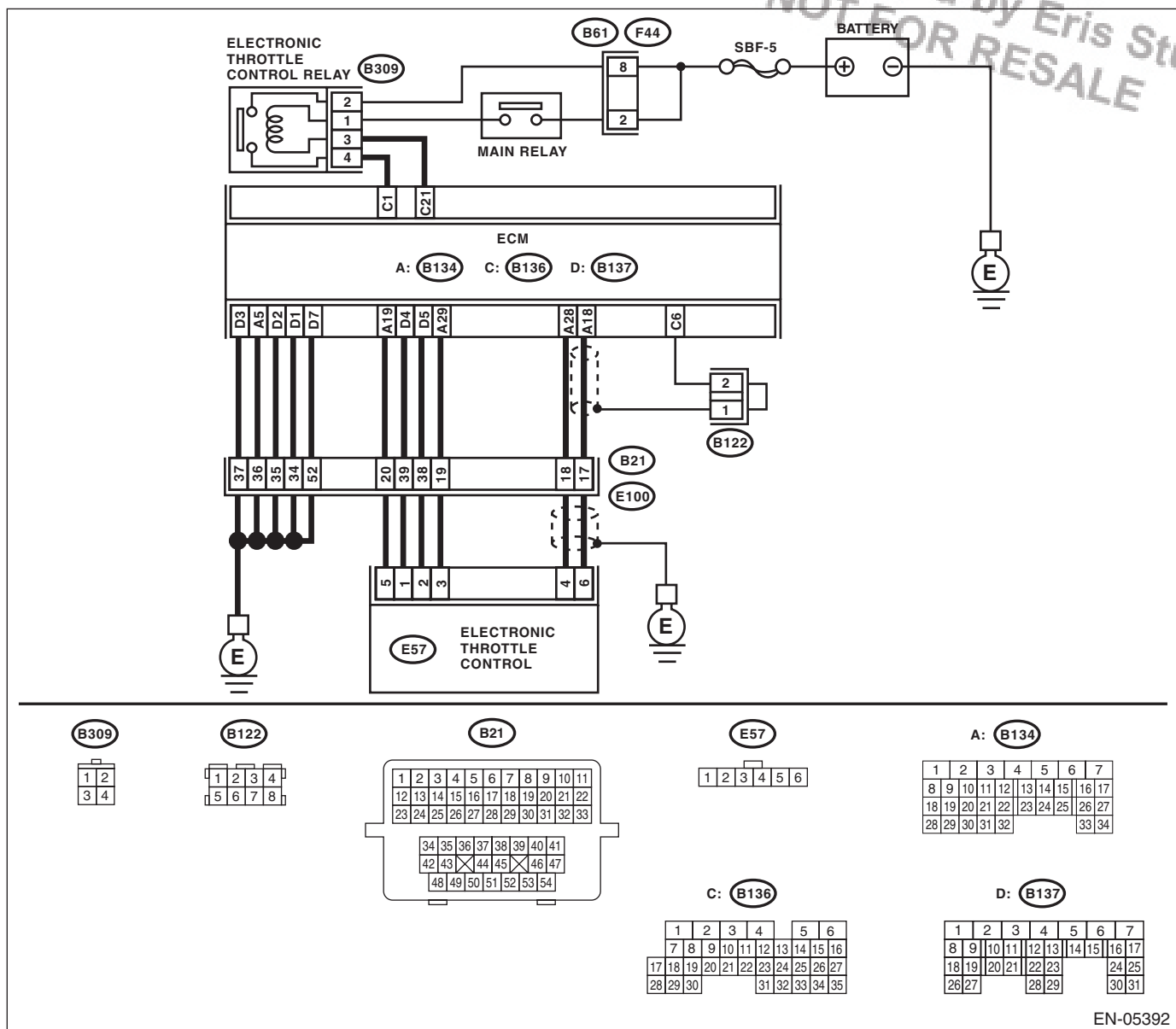
WIRING DIAGRAM:



EN-04174

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK ENGINE OIL.	Is there a proper amount of engine oil?	Go to step 3.	Replace the engine oil. <Ref. to LU(H4SO)-8, REPLACEMENT, Engine Oil.>
3	CHECK EXHAUST SYSTEM.	Are there holes or loose bolts on exhaust system?	Repair the exhaust system.	Go to step 4.
4	CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 5.
5	CHECK FUEL PRESSURE. WARNING: Place "NO OPEN FLAMES" signs near the working area. CAUTION: Be careful not to spill fuel. Measure the fuel pressure. <Ref. to ME(H4SO)-28, INSPECTION, Fuel Pressure.> CAUTION: Release fuel pressure before removing the fuel pressure gauge.	Is the measured value 339.5 — 360.5 kPa (3.5 — 3.7 kgf/cm ² , 49 — 52 psi)?	Go to step 6.	Repair the following item. Fuel pressure is too high: • Clogged fuel line or bent hose Fuel pressure is too low: • Improper fuel pump discharge • Clogged fuel line
6	CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the engine coolant temperature 75°C (167°F) or higher?	Go to step 7.	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>7</p> <p>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).</p> <p>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all the accessory switches to OFF.</p> <p>5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.0 — 5.0 g/s (0.2 — 0.53 lb/m)?</p>	<p>Go to step 8.</p>	<p>Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>
<p>8</p> <p>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).</p> <p>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all the accessory switches to OFF.</p> <p>5) Open the front hood.</p> <p>6) Measure the ambient temperature.</p> <p>7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> • Subaru Select Monitor <p>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?</p>	<p>Go to step 9.</p>	<p>Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>
<p>9</p> <p>CHECK OUTPUT SIGNAL OF ECM.</p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between the ECM and chassis ground for faulty cylinders.</p> <p>Connector & terminal</p> <p>#1 (B137) No. 8 (+) — Chassis ground (-):</p> <p>#2 (B137) No. 9 (+) — Chassis ground (-):</p> <p>#3 (B137) No. 10 (+) — Chassis ground (-):</p> <p>#4 (B137) No. 11 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Go to step 14.</p>	<p>Go to step 10.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>10 CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Measure the resistance between the fuel injector 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:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 11.</p>	<p>Repair short circuit of the harness to ground between ECM and fuel injector.</p>
<p>11 CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. Measure the resistance of harness between the ECM and fuel injector on faulty cylinders. Connector & terminal #1 (B137) No. 8 — (E5) No. 1: #2 (B137) No. 9 — (E16) No. 1: #3 (B137) No. 10 — (E6) No. 1: #4 (B137) No. 11 — (E17) No. 1:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 12.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and fuel injector connector • Poor contact of coupling connector</p>
<p>12 CHECK FUEL INJECTOR. Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:</p>	<p>Is the resistance between 5 — 20 Ω?</p>	<p>Go to step 13.</p>	<p>Replace the faulty fuel injector. <Ref. to FU(H4SO)-30, Fuel Injector.></p>
<p>13 CHECK POWER SUPPLY LINE. 1) Turn the ignition switch to ON. 2) Measure the 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 (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair the poor contact of all connectors in fuel injector circuit.</p>	<p>Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the main relay and fuel injector connector on faulty cylinders • Poor contact of coupling connector • Poor contact of main relay connector • Poor contact of fuel injector connector on faulty cylinders</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
14 CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Turn the ignition switch to ON. 4) Measure the voltage between the ECM and chassis ground for faulty cylinders. Connector & terminal #1 (B137) No. 8 (+) — Chassis ground (-): #2 (B137) No. 9 (+) — Chassis ground (-): #3 (B137) No. 10 (+) — Chassis ground (-): #4 (B137) No. 11 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between the ECM and fuel injector.	Go to step 15.
15 CHECK FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2:	Is the resistance less than 1 Ω ?	Replace the faulty fuel injector. <Ref. to FU(H4SO)-30, Fuel Injector.>	Go to step 16.
16 CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.	Is the camshaft position sensor or crankshaft position sensor loosely installed?	Tighten the camshaft position sensor or crankshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.> <Ref. to FU(H4SO)-23, Crankshaft Position Sensor.>	Go to step 17.
17 CHECK CRANK SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-42, REMOVAL, Timing Belt Cover.>	Is the crank sprocket rusted or does it have damaged teeth?	Replace the crank sprocket. <Ref. to ME(H4SO)-50, Crank Sprocket.>	Go to step 18.
18 CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft using ST, and align alignment mark on crank sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO)-43, Timing Belt.>	Go to step 19.
19 CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals. Terminals No. 2 — No. 4:	Is the resistance less than 1 Ω ?	Go to step 20.	Replace the electronic throttle control relay.
20 CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY. Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (B309) No. 2 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 21.	Repair the open or ground short circuit of power supply circuit.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>21 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>1) Disconnect the connectors from the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground.</p> <p>Connector & terminal (B309) No. 3 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Repair the short circuit to power in the harness between ECM and electronic throttle control relay.</p>	<p>Go to step 22.</p>
<p>22 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground.</p> <p>Connector & terminal (B309) No. 3 — Chassis ground: (B309) No. 4 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 23.</p>	<p>Repair short circuit of the harness to ground between ECM and electronic throttle control relay.</p>
<p>23 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>Measure the resistance between the ECM and electronic throttle control relay connector.</p> <p>Connector & terminal (B136) No. 21 — (B309) No. 3: (B136) No. 1 — (B309) No. 4:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 24.</p>	<p>Repair the open circuit of harness between ECM and electronic throttle control relay.</p>
<p>24 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6: (B134) No. 28 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 25.</p>	<p>Repair short circuit of the harness to ground between ECM and electronic throttle control connector.</p>
<p>25 CHECK SHORT CIRCUIT INSIDE THE ECM.</p> <p>1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground.</p> <p>Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 26.</p>	<p>Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).></p>
<p>26 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and electronic throttle control connector.</p> <p>Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 27.</p>	<p>Repair the open circuit of harness between ECM and electronic throttle control connector.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
27 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 28.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
28 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-):	Is the voltage 4.85 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 29.
29 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 18: (B134) No. 19 — (B134) No. 28:	Is the resistance 1 MΩ or more?	Go to step 30.	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.
30 CHECK SENSOR OUTPUT. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.>	Is the voltage 0.81 — 0.87 V?	Go to step 31.	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>
31 CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.>	Is the voltage 1.64 — 1.70 V?	Go to step 32.	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>
32 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and electronic throttle control connector. Connector & terminal (B137) No. 5 — (E57) No. 2: (B137) No. 4 — (E57) No. 1:	Is the resistance less than 1 Ω?	Go to step 33.	Repair the open circuit of harness between ECM and electronic throttle control.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
33 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Connect the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector & terminal</i> (E57) No. 2 (+) — Engine ground (-): (E57) No. 1 (+) — Engine ground (-):	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between the ECM and electronic throttle control.	Go to step 34.
34 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector & terminal</i> (E57) No. 2 — Engine ground: (E57) No. 1 — Engine ground:	Is the resistance 1 MΩ or more?	Go to step 35.	Repair short circuit of the harness to ground between the ECM and electronic throttle control.
35 CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS. Measure the resistance between the electronic throttle control connector terminals. <i>Connector & terminal</i> (E57) No. 2 — (E57) No. 1:	Is the resistance 1 MΩ or more?	Go to step 36.	Repair the short circuit of harness between ECM and electronic throttle control.
36 CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT. Measure the resistance between ECM and chassis ground. <i>Connector & terminal</i> (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground:	Is the resistance less than 5 Ω?	Go to step 37.	Repair the open circuit of the harness between the ECM and engine ground.
37 CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle control terminals. <i>Terminals</i> No. 2 — No. 1:	Is the resistance 50 Ω or less?	Go to step 38.	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>
38 CHECK ELECTRONIC THROTTLE CONTROL. Move the throttle valve to the fully open and fully closed positions with fingers. Check that the valve returns to the specified position when releasing fingers.	Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position	Repair poor contact of the ECM connector.	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>

DE:DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

Refer to DTC P2097 for diagnostic procedure. <Ref. to EN(H4SO)(diag)-280, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DF:DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-210, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

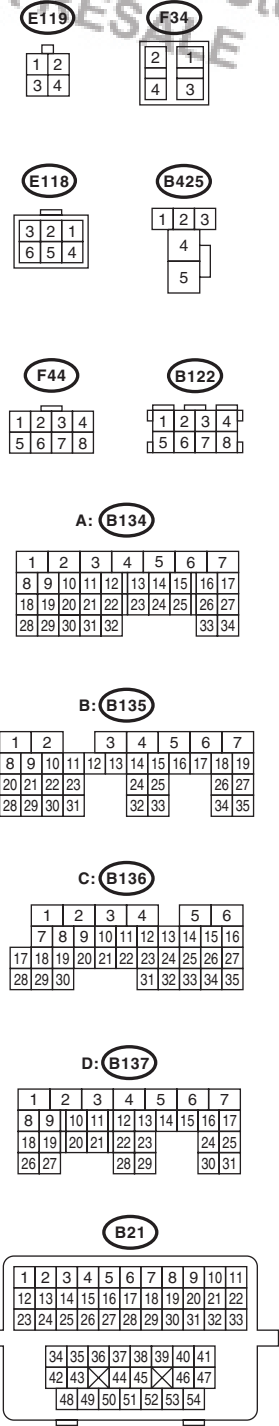
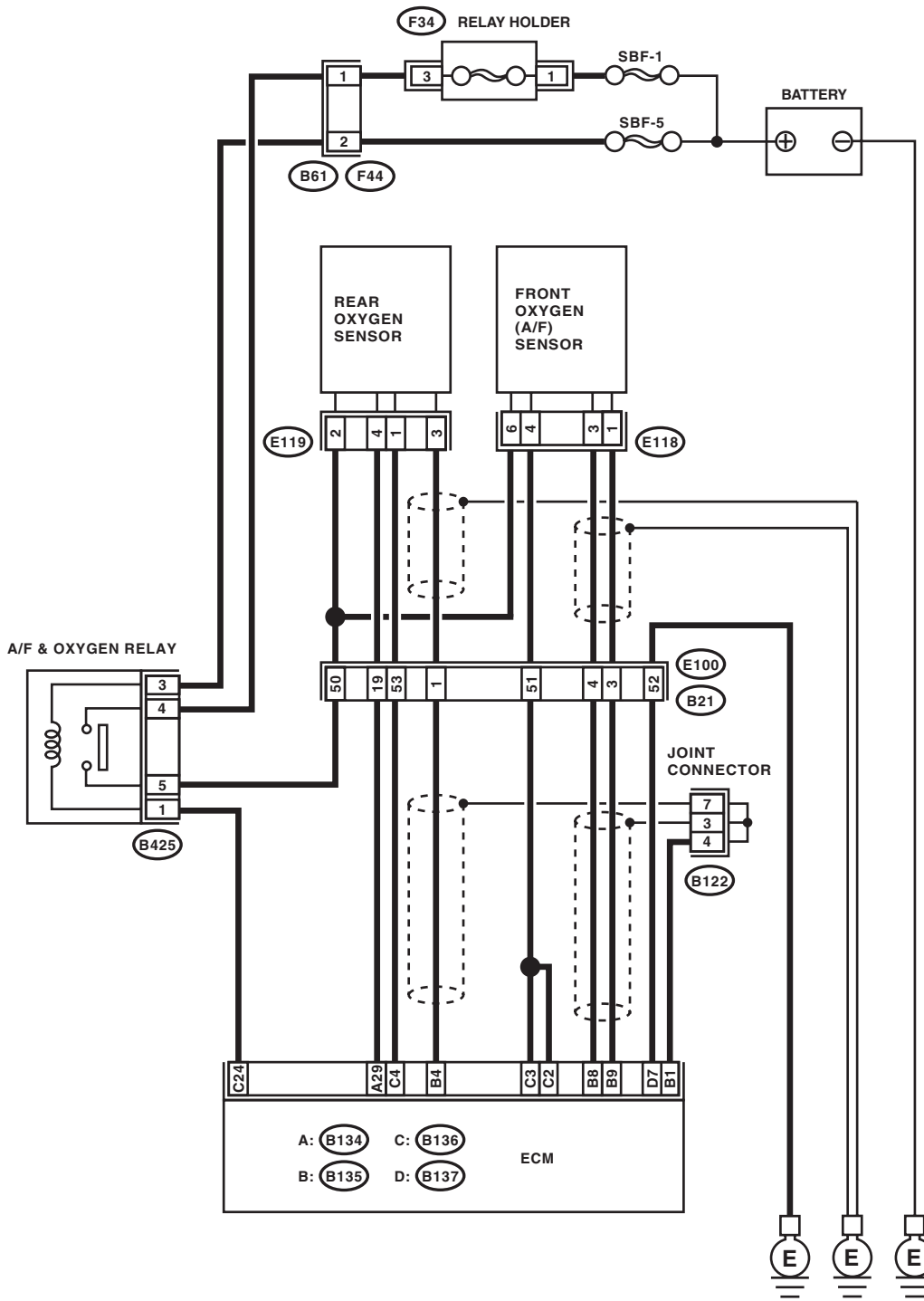
CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

WIRING DIAGRAM:



EN-04626

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY. Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR. Has water entered the connector?	Completely remove any water inside.	Go to step 3.
3	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B135) No. 9 — (E118) No. 1: (B135) No. 8 — (E118) No. 3:	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following item: • 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 • Poor contact of coupling connector
4	CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 9 — Chassis ground: (B135) No. 8 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 5.
5	CHECK OUTPUT SIGNAL FOR ECM. 1) Connect the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. Connector & terminal (E118) No. 1 (+) — Chassis ground (-):	Is the voltage 4.5 V or more?	Go to step 6.
6	CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. Connector & terminal (E118) No. 3 (+) — Chassis ground (-):	Is the voltage 4.95 V or more?	Go to step 7.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. Connector & terminal (E118) No. 1 (+) — Chassis ground (-): (E118) No. 3 (+) — Chassis ground (-):	Is the voltage 8 V or more?	Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>	Repair poor contact of the ECM connector.
8 CHECK EXHAUST SYSTEM.	Are there holes or loose bolts on exhaust system?	Repair the exhaust system.	Go to step 9.
9 CHECK AIR INTAKE SYSTEM.	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair the air intake system.	Go to step 10.
10 CHECK FUEL PRESSURE. WARNING: Place "NO OPEN FLAMES" signs near the working area. CAUTION: Be careful not to spill fuel. 1) Connect the front oxygen (A/F) sensor connector. 2) Measure the fuel pressure. <Ref. to ME(H4SO)-28, INSPECTION, Fuel Pressure.> CAUTION: Release fuel pressure before removing the fuel pressure gauge.	Is the measured value 339.5 — 360.5 kPa (3.5 — 3.7 kgf/cm ² , 49 — 52 psi)?	Go to step 11.	Repair the following item. Fuel pressure is too high: • Clogged fuel line or bent hose Fuel pressure is too low: • Improper fuel pump discharge • Clogged fuel line
11 CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.	Is the engine coolant temperature 75°C (167°F) or higher?	Go to step 12.	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>12 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.0 — 5.0 g/s (0.2 — .053 lb/m)?</p>	<p>Go to step 13.</p>	<p>Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>
<p>13 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.</p> <p>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Open the front hood. 6) Measure the ambient temperature. 7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?</p>	<p>Go to step 14.</p>	<p>Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.></p>
<p>14 CHECK REAR OXYGEN SENSOR DATA.</p> <p>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.</p> <p>NOTE: • Depress the clutch pedal. (MT model) • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	<p>Is the voltage 490 mV or more?</p>	<p>Go to step 15.</p>	<p>Go to step 16.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>15 CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Depress the clutch pedal. (MT model) • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is the voltage 250 mV or less?	Go to step 17.	Go to step 16.
<p>16 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</p>	Has water entered the connector?	Completely remove any water inside.	Go to step 18.
<p>17 CHECK FRONT OXYGEN (A/F) SENSOR AND REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</p>	Is a voltage of 0.8 V or more maintained for 5 minutes or more?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-36, Front Oxygen (A/F) Sensor.>	Go to step 18.
<p>18 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (E119) No. 3: (B134) No. 29 — (E119) No. 4:</p>	Is the resistance less than 1 Ω?	Go to step 19.	Repair the open circuit of harness between ECM and rear oxygen sensor connector.
<p>19 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Connect the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (E119) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ECM and rear oxygen sensor • Poor contact in ECM connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DG:DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/ PERFORMANCE

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-212, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

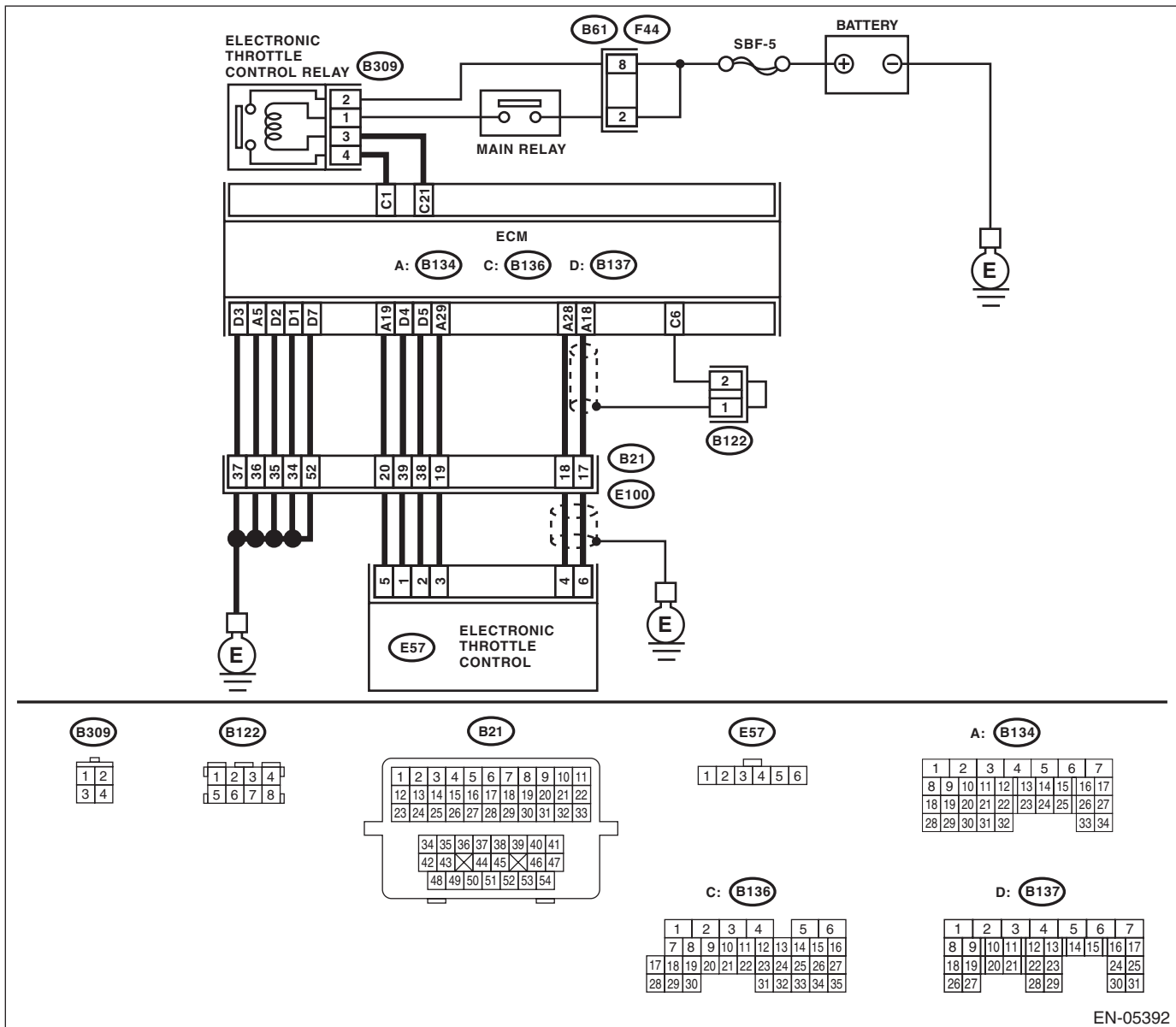
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals.</p> <p>Terminals No. 2 — No. 4:</p>	Is the resistance less than 1 Ω?	Go to step 2.	Replace the electronic throttle control relay.
2	<p>CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>Measure the voltage between electronic throttle control relay connector and chassis ground.</p> <p>Connector & terminal (B309) No. 2 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
3	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>1) Disconnect the connectors from the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground.</p> <p>Connector & terminal (B309) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control relay.	Go to step 4.
4	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground.</p> <p>Connector & terminal (B309) No. 3 — Chassis ground: (B309) No. 4 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 5.	Repair short circuit of the harness to ground between ECM and electronic throttle control relay.
5	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</p> <p>Measure the resistance between the ECM and electronic throttle control relay connector.</p> <p>Connector & terminal (B136) No. 21 — (B309) No. 3: (B136) No. 1 — (B309) No. 4:</p>	Is the resistance less than 1 Ω?	Go to step 6.	Repair the open circuit of harness between ECM and electronic throttle control relay.
6	<p>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from electronic throttle control. 3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6: (B134) No. 28 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 7.	Repair short circuit of the harness to ground between ECM and electronic throttle control connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
7 CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground:	Is the resistance 1 M Ω or more?	Go to step 8.	Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>
8 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3:	Is the resistance less than 1 Ω ?	Go to step 9.	Repair the open circuit of harness between ECM and electronic throttle control connector.
9 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 10.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
10 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-):	Is the voltage 4.85 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 11.
11 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 18: (B134) No. 19 — (B134) No. 28:	Is the resistance 1 M Ω or more?	Go to step 12.	Repair the short circuit of harness between ECM and electronic throttle control connector.
12 CHECK SENSOR OUTPUT. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.>	Is the voltage 0.81 — 0.87 V?	Go to step 13.	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>13 CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-32, Subaru Select Monitor.></p>	Is the voltage 1.64 — 1.70 V?	Go to step 14.	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>
<p>14 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and electronic throttle control connector. Connector & terminal (B137) No. 5 — (E57) No. 2: (B137) No. 4 — (E57) No. 1:</p>	Is the resistance less than 1 Ω?	Go to step 15.	Repair the open circuit of harness between ECM and electronic throttle control.
<p>15 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Connect the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 2 (+) — Engine ground (-): (E57) No. 1 (+) — Engine ground (-):</p>	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between the ECM and electronic throttle control.	Go to step 16.
<p>16 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 2 — Engine ground: (E57) No. 1 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Go to step 17.	Repair short circuit of the harness to ground between the ECM and electronic throttle control.
<p>17 CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS. Measure the resistance between the electronic throttle control connector terminals. Connector & terminal (E57) No. 2 — (E57) No. 1:</p>	Is the resistance 1 MΩ or more?	Go to step 18.	Repair the short circuit of harness between ECM and electronic throttle control.
<p>18 CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground:</p>	Is the resistance less than 5 Ω?	Go to step 19.	Repair the open circuit of the harness between the ECM and engine ground.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
19 CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle control terminals. <i>Terminals</i> <i>No. 2 — No. 1:</i>	Is the resistance 50 Ω or less?	Go to step 20 .	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>
20 CHECK ELECTRONIC THROTTLE CONTROL. Move the throttle valve to the fully open and fully closed positions with fingers. Check that the valve returns to the specified position when releasing fingers.	Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position	Repair poor contact of the ECM connector.	Replace the electronic throttle control. <Ref. to FU(H4SO)-12, Throttle Body.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DH:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-214, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

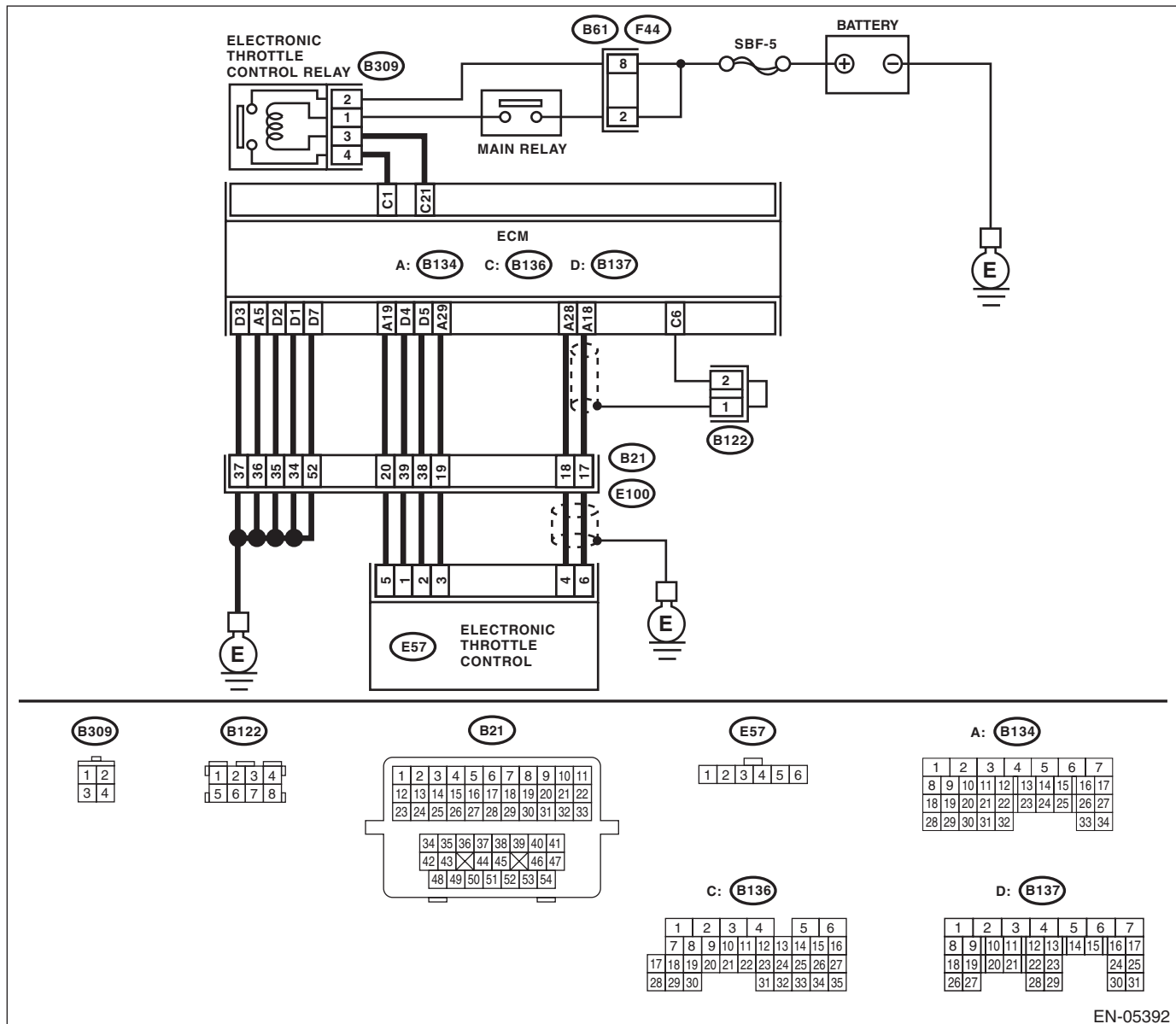
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals. <i>Terminals</i> <i>No. 2 — No. 4:</i>	Is the resistance less than 1 Ω ?	Go to step 2.	Replace the electronic throttle control relay.
2 CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY. Measure the voltage between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> <i>(B309) No. 2 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Go to step 3.	Repair the open or ground short circuit of power supply circuit.
3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Disconnect the connectors from the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> <i>(B309) No. 3 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control relay.	Go to step 4.
4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> <i>(B309) No. 3 — Chassis ground:</i> <i>(B309) No. 4 — Chassis ground:</i>	Is the resistance 1 M Ω or more?	Go to step 5.	Repair short circuit of the harness to ground between ECM and electronic throttle control relay.
5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. Measure the resistance between the ECM and electronic throttle control relay connector. <i>Connector & terminal</i> <i>(B136) No. 21 — (B309) No. 3:</i> <i>(B136) No. 1 — (B309) No. 4:</i>	Is the resistance less than 1 Ω ?	Repair poor contact of the ECM connector.	Repair the open circuit of harness between ECM and electronic throttle control relay.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DI: DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH

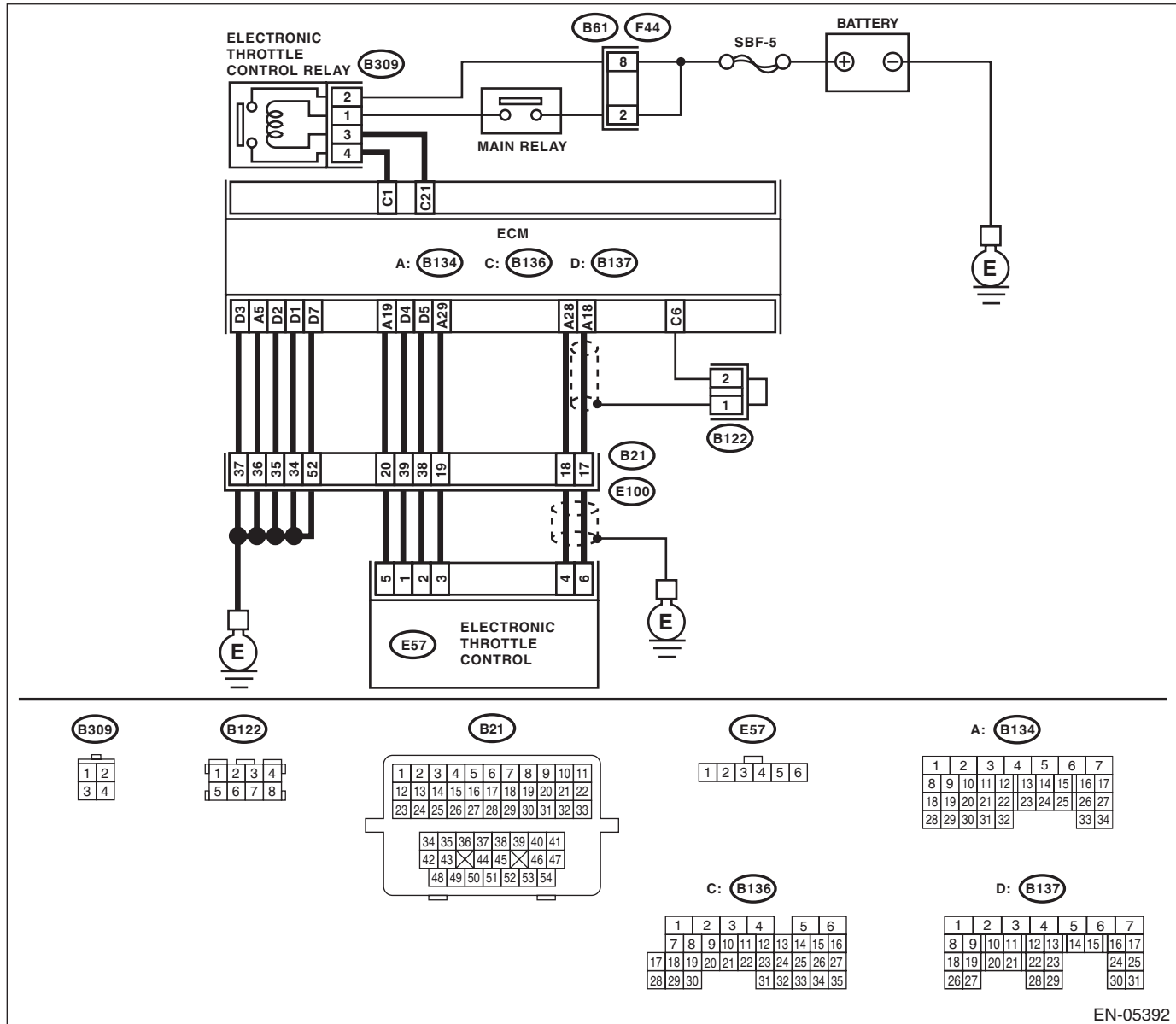
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-216, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Measure the resistance between electronic throttle control relay terminals. <i>Terminals</i> <i>No. 2 — No. 4:</i>	Is the resistance 1 MΩ or more?	Go to step 2.	Replace the electronic throttle control relay.
2 CHECK SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY POWER SUPPLY. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control relay connector and chassis ground. <i>Connector & terminal</i> <i>(B309) No. 4 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control relay.	Go to step 3.
3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and chassis ground. <i>Connector & terminal</i> <i>(B136) No. 21 — Chassis ground:</i>	Is the resistance 1 MΩ or more?	Repair poor contact of the ECM connector.	Repair short circuit of the harness to ground between ECM and electronic throttle control relay.

DJ:DTC P2109 THROTTLE/PEDAL POSITION SENSOR “A” MINIMUM STOP PERFORMANCE

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO)(diag)-286, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DK:DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-220, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

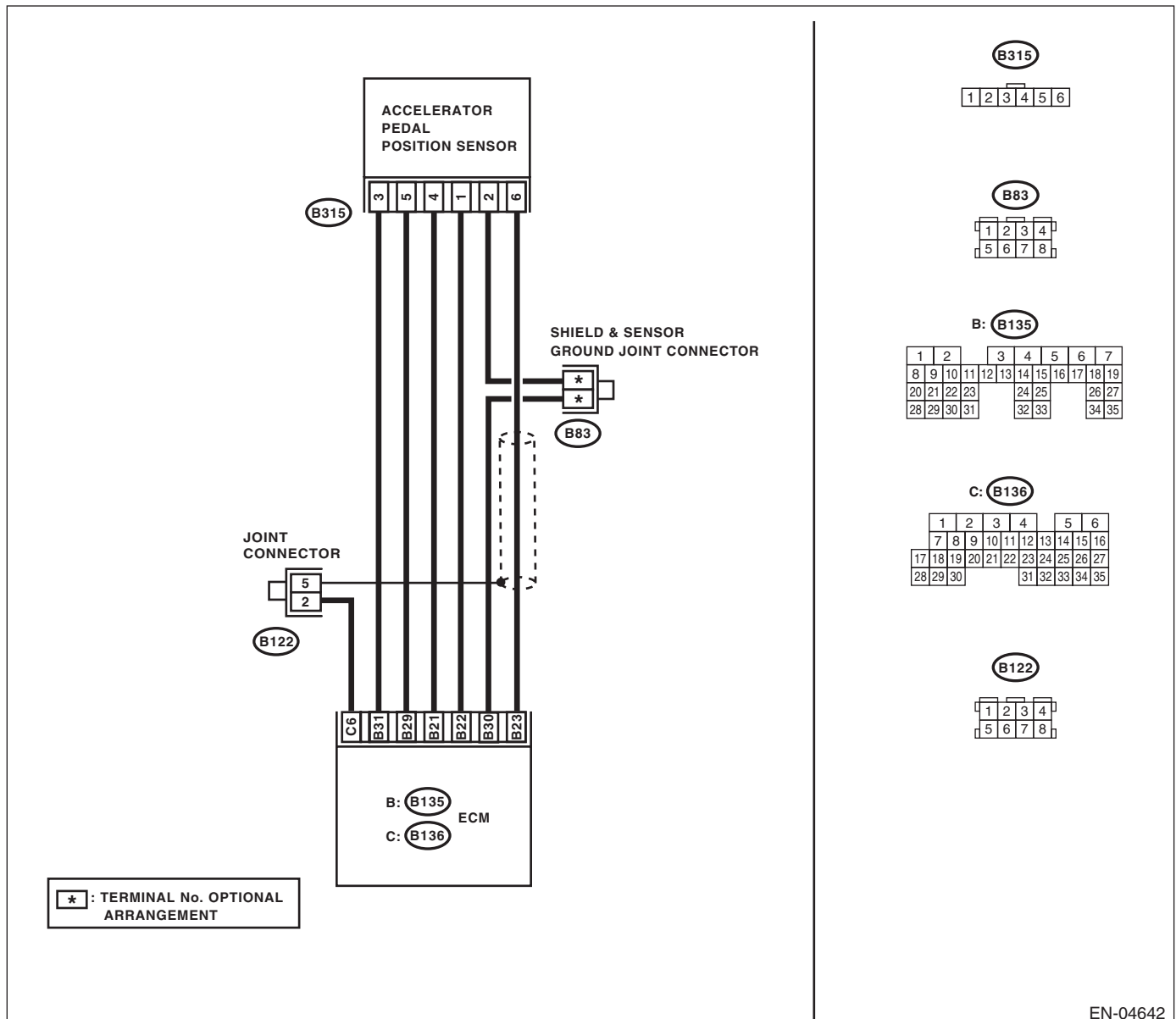
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04642

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1</p> <p>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance between ECM and chassis ground.</p> <p>Connector & terminal (B135) No. 21 — Chassis ground: (B135) No. 23 — Chassis ground: (B135) No. 23 — (B136) No. 6:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 2.</p>	<p>Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector.</p>
<p>2</p> <p>CHECK SHORT CIRCUIT INSIDE THE ECM.</p> <p>1) Connect the ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground.</p> <p>Connector & terminal (B315) No. 6 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.></p>	<p>Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DL:DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-222, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

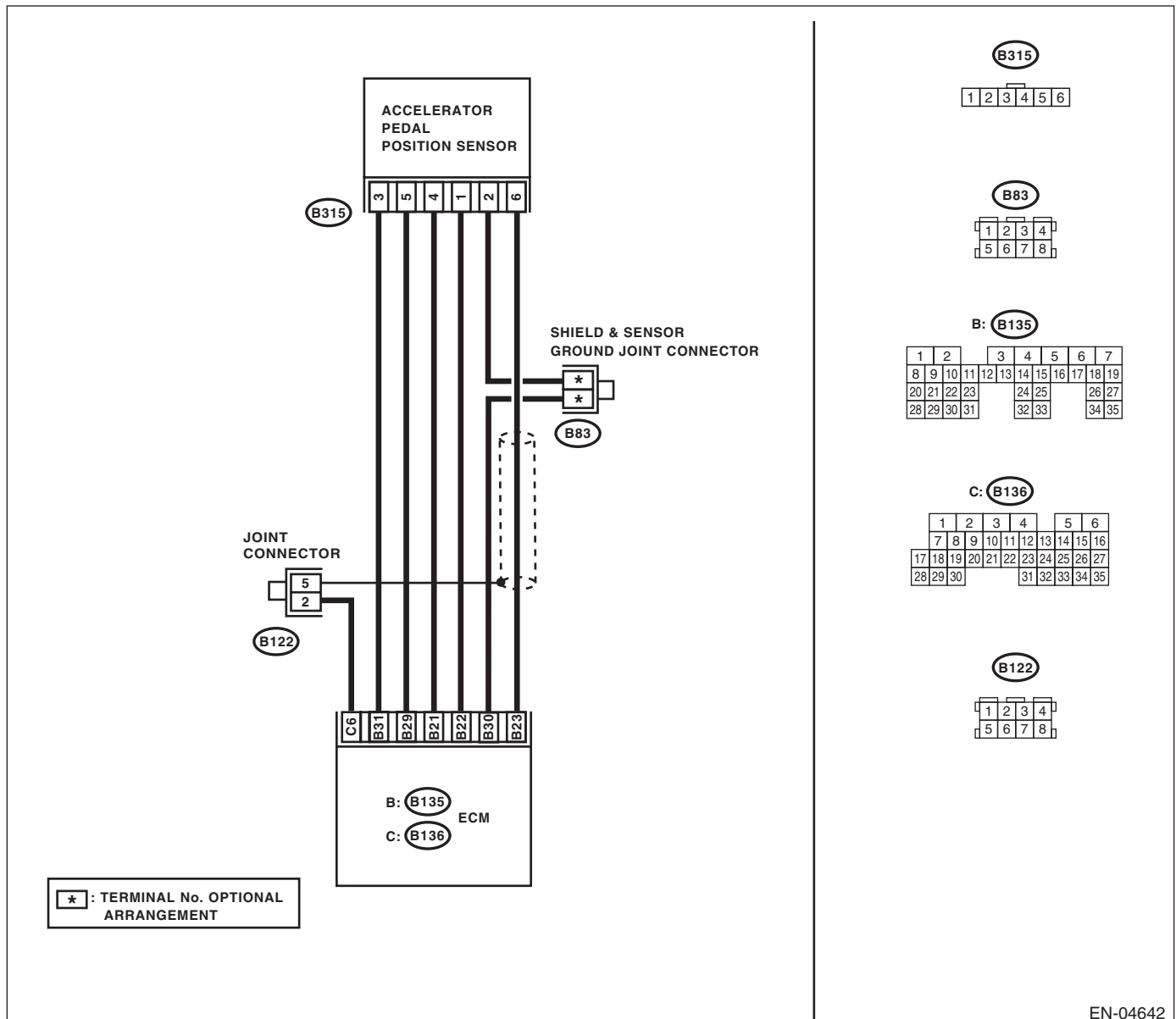
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04642

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance of harness between ECM and accelerator pedal position sensor connector. <i>Connector & terminal</i> <i>(B135) No. 23 — (B315) No. 6:</i> <i>(B135) No. 29 — (B315) No. 5:</i></p>	Is the resistance less than 1 Ω?	Go to step 2.	Repair the open circuit of the harness between the ECM and accelerator pedal position sensor connector.
<p>2 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Connect the ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. <i>Connector & terminal</i> <i>(B315) No. 5 — Chassis ground:</i></p>	Is the resistance less than 5 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
<p>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground. <i>Connector & terminal</i> <i>(B315) No. 6 (+) — Chassis ground (-):</i></p>	Is the voltage 4.85 V or more?	Repair the short circuit to power source in the harness between the ECM and accelerator pedal position sensor connector.	Go to step 4.
<p>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. <i>Connector & terminal</i> <i>(B135) No. 21 — (B135) No. 23:</i></p>	Is the resistance 1 MΩ or more?	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair the short of the harness between the ECM and accelerator pedal position sensor connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DM:DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-224, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

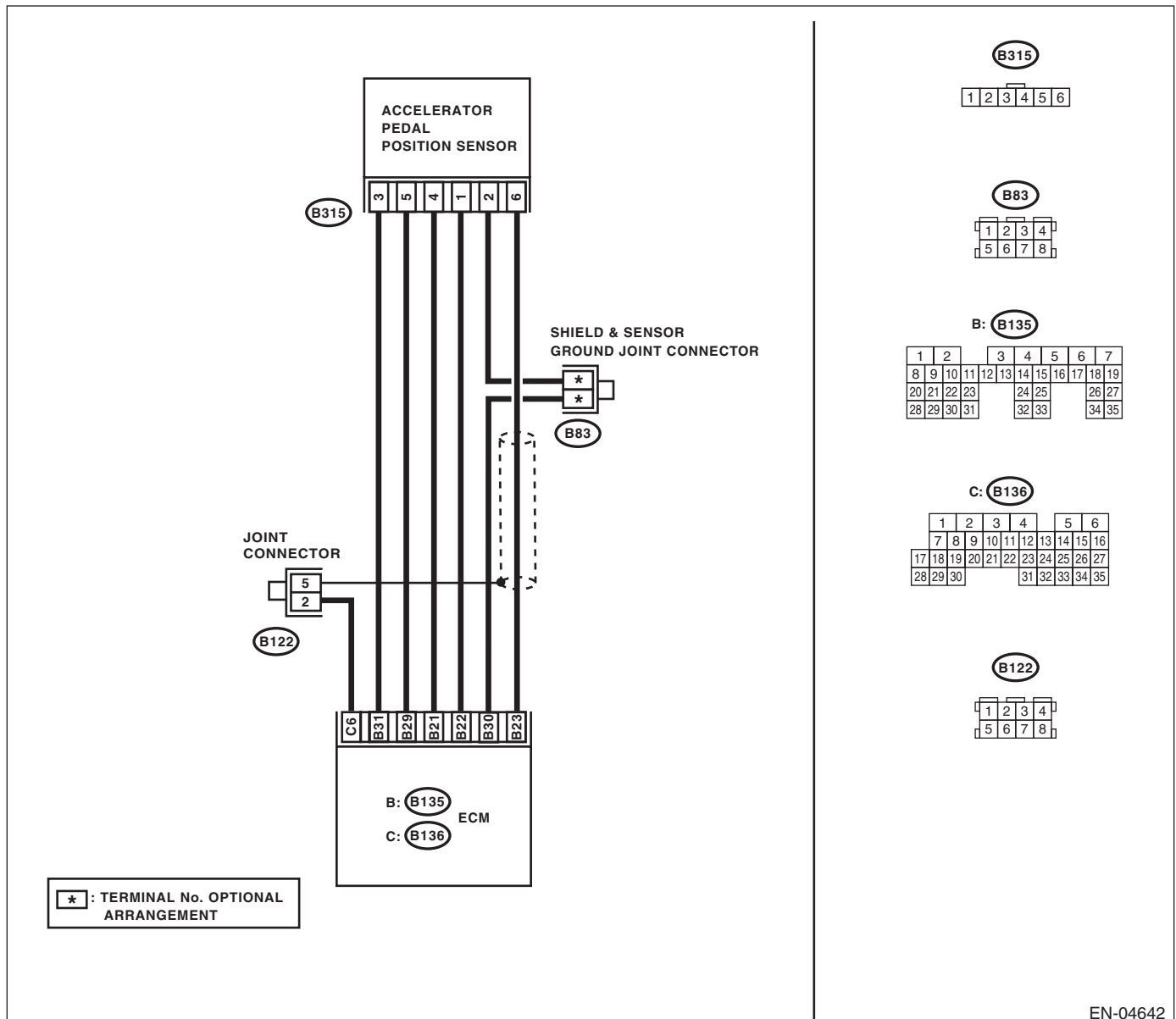
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04642

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance between ECM and chassis ground. <i>Connector & terminal</i> <i>(B135) No. 22 — Chassis ground:</i> <i>(B135) No. 31 — Chassis ground:</i>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector.
2 CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. <i>Connector & terminal</i> <i>(B315) No. 3 — Chassis ground:</i>	Is the resistance 1 MΩ or more?	Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DN:DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-226, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

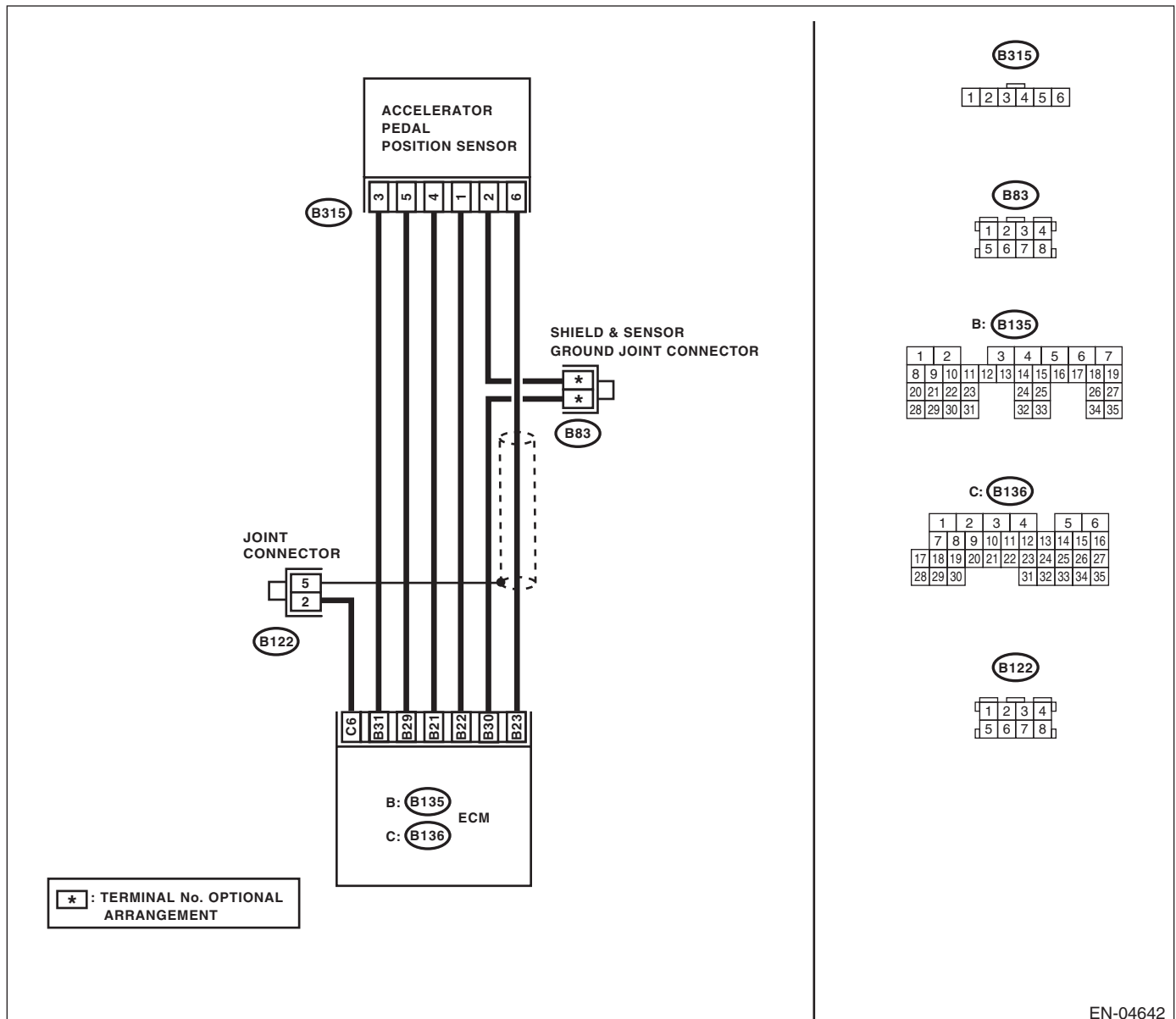
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04642

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance of harness between ECM and accelerator pedal position sensor connector. <i>Connector & terminal</i> <i>(B135) No. 31 — (B315) No. 3:</i> <i>(B135) No. 30 — (B315) No. 2:</i></p>	Is the resistance less than 1 Ω?	Go to step 2.	Repair the open circuit of the harness between the ECM and accelerator pedal position sensor connector.
<p>2 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Connect the ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. <i>Connector & terminal</i> <i>(B315) No. 2 — Chassis ground:</i></p>	Is the resistance less than 1 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
<p>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground. <i>Connector & terminal</i> <i>(B315) No. 3 (+) — Chassis ground (-):</i></p>	Is the voltage 4.85 V or more?	Repair the short circuit to power source in the harness between the ECM and accelerator pedal position sensor connector.	Go to step 4.
<p>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. <i>Connector & terminal</i> <i>(B135) No. 22 — (B135) No. 31:</i></p>	Is the resistance 1 MΩ or more?	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair the short of the harness between the ECM and accelerator pedal position sensor connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DO:DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-228, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

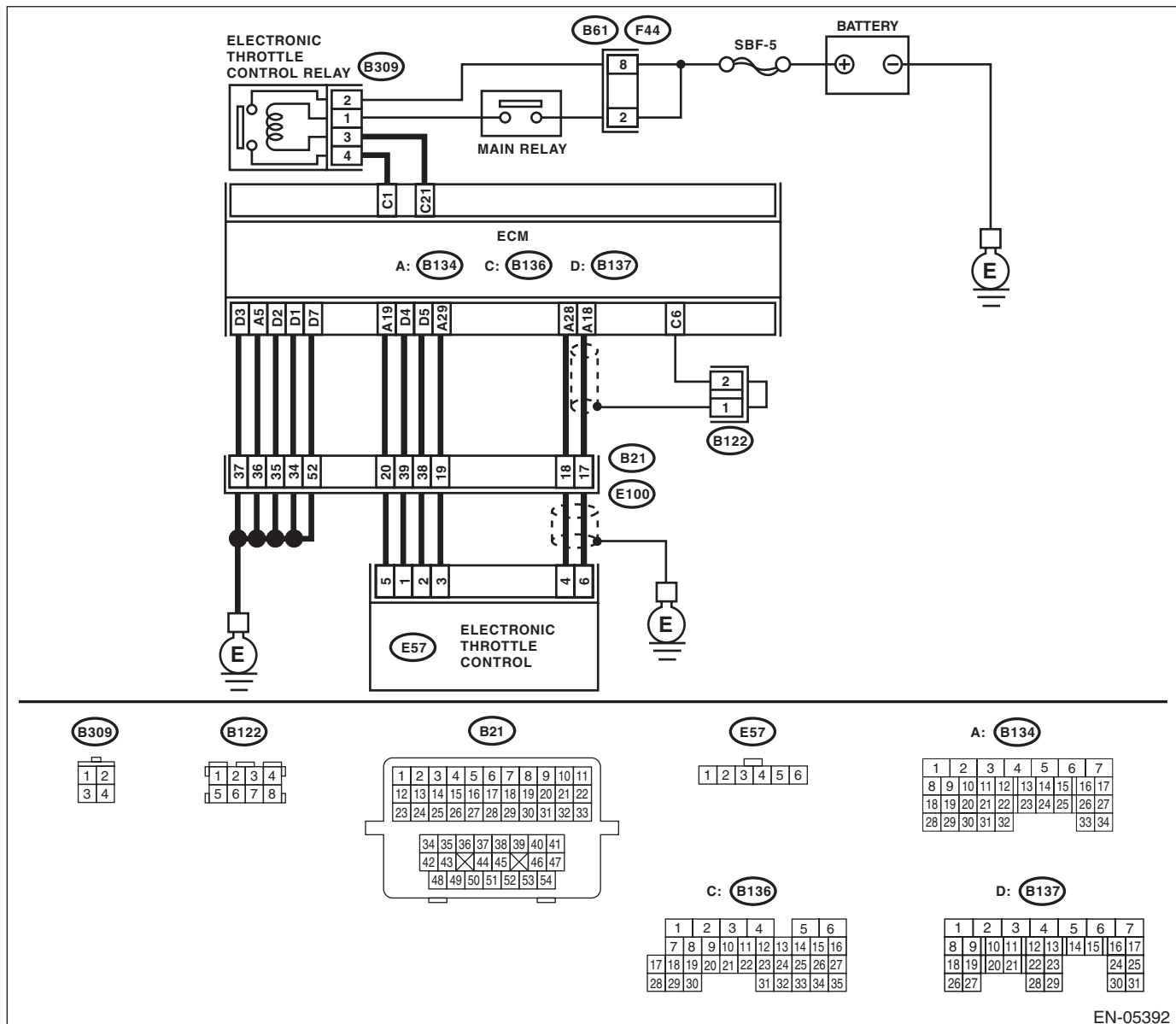
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-05392

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground. <i>Connector & terminal</i> <i>(B134) No. 19 — Chassis ground:</i> <i>(B134) No. 18 — Chassis ground:</i> <i>(B134) No. 18 — (B136) No. 6:</i> <i>(B134) No. 28 — Chassis ground:</i>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair short circuit of the harness to ground between ECM and electronic throttle control connector.
2 CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector & terminal</i> <i>(E57) No. 6 — Engine ground:</i> <i>(E57) No. 4 — Engine ground:</i>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>
3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and electronic throttle control connector. <i>Connector & terminal</i> <i>(B134) No. 18 — (E57) No. 6:</i> <i>(B134) No. 28 — (E57) No. 4:</i> <i>(B134) No. 29 — (E57) No. 3:</i>	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of harness between ECM and electronic throttle control connector.
4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector & terminal</i> <i>(E57) No. 3 — Engine ground:</i>	Is the resistance less than 5 Ω?	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector
5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector & terminal</i> <i>(E57) No. 6 (+) — Engine ground (-):</i> <i>(E57) No. 4 (+) — Engine ground (-):</i>	Is the voltage 4.85 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 6.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
6	CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 18: (B134) No. 19 — (B134) No. 28:	Is the resistance 1 MΩ or more?	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-12, Throttle Body.>	Repair the short circuit of harness between ECM and electronic throttle control connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DP:DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-230, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

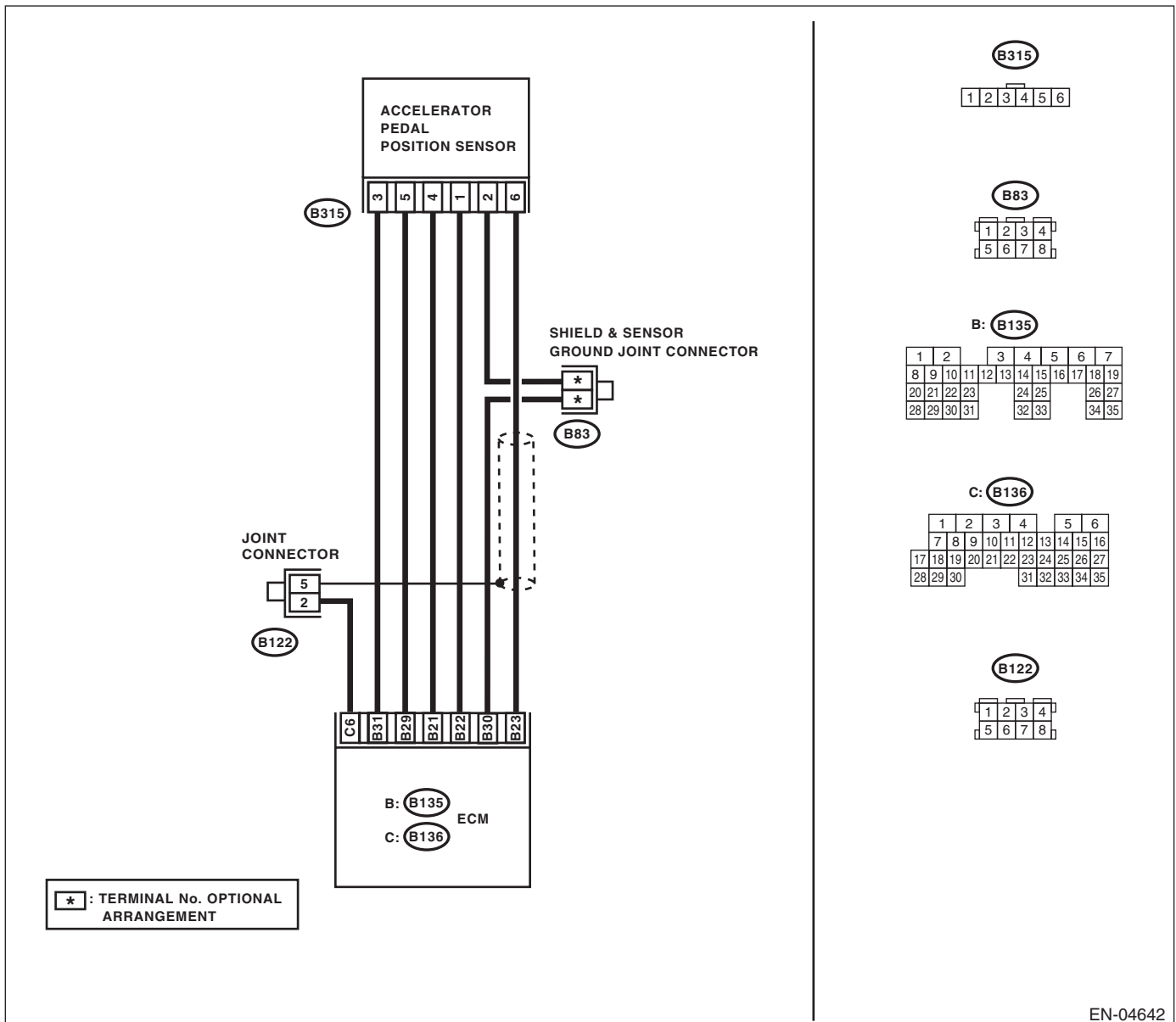
TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-04642

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal Main accelerator pedal position sensor signal (B135) No. 23 (+) — Chassis ground (-): Sub accelerator pedal position sensor signal (B135) No. 31 (+) — Chassis ground (-):</p>	Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?	Go to step 3.	Go to step 2.
2	<p>CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</p> <p>1) Measure the voltage between accelerator pedal position sensor connector and chassis ground.</p> <p>Connector & terminal (B315) No. 6 (+) — Chassis ground (-): (B315) No. 3 (+) — Chassis ground (-):</p>	Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?	Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ECM and accelerator pedal position sensor connector • Short circuit of the harness to ground between the ECM and accelerator pedal position sensor connectors
3	<p>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.</p> <p>Check the resistance of harness between the accelerator pedal position sensor connector and chassis ground.</p> <p>Connector & terminal (B315) No. 5 — Chassis ground: (B315) No. 2 — Chassis ground:</p>	Is the resistance less than 5 Ω?	Repair poor contact of the ECM connector.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ECM and accelerator pedal position sensor connector. • Open circuit of harness between ECM and engine ground • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DQ:DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-232, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).> NOTE: The barometric pressure sensor is built into the ECM.

DR:DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-233, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).> NOTE: The barometric pressure sensor is built into the ECM.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

DS:DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-234, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4SO)(diag)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-38, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)(diag)-72, List of Diagnostic Trouble Code (DTC).>	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).> NOTE: The barometric pressure sensor is built into the ECM.

General Diagnostic Table

ENGINE (DIAGNOSTICS)

19. General Diagnostic Table

A: INSPECTION

1. ENGINE

NOTE:

Malfunction of parts other than those listed is also possible. <Ref. to ME(H4SO)-94, Engine Trouble in General.>

Symptom	Problem parts
1. Engine stalls during idling.	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Ignition parts (*1) 4) Engine coolant temperature sensor (*2) 5) Crankshaft position sensor (*3) 6) Camshaft position sensor (*3) 7) Fuel injection parts (*4)
2. Rough idling	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Ignition parts (*1) 5) Air intake system (*5) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Crankshaft position sensor (*3) 9) Camshaft position sensor (*3) 10) Oxygen sensor 11) Fuel pump and fuel pump relay 12) EGR valve
3. Engine does not return to idle.	1) Engine coolant temperature sensor 2) Throttle position sensor 3) Manifold absolute pressure sensor 4) Mass air flow and intake air temperature sensor 5) EGR valve
4. Poor acceleration	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Electronic throttle control 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) 12) EGR valve 13) Tumble generator valve
5. Engine stalls, hesitates, or sputters at acceleration.	1) Manifold absolute pressure sensor 2) Mass air flow and intake air 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) Electronic throttle control 9) Fuel pump and fuel pump relay 10) EGR valve 11) Tumble generator valve

General Diagnostic Table

ENGINE (DIAGNOSTICS)

Symptom	Problem parts
6. Surging	1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Fuel pump and fuel pump relay 9) EGR valve 10) Tumble generator valve
7. Spark knock	1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor 4) Knock sensor 5) Fuel injection parts (*4) 6) Fuel pump and fuel pump relay 7) EGR valve 8) Tumble generator valve
8. After burning in exhaust system	1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor (*2) 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay

*1: Check ignition coil and ignitor assembly and spark plug.

*2: Indicate the symptom occurring only in cold temperatures.

*3: Ensure the secure installation.

*4: Check fuel injector, fuel pressure regulator and fuel filter.

*5: Inspect air leak in air intake system.

2. AUTOMATIC TRANSMISSION

NOTE:

Check general diagnostics table with non-conformity symptom for automatic transmission. <Ref. to 4AT(D)(diag)-2, Basic Diagnostic Procedure.>

General Diagnostic Table

ENGINE (DIAGNOSTICS)

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GENERAL DESCRIPTION

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GD(H4SO)

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1. List of Diagnostic Trouble Code (DTC)	2
2. Diagnostic Trouble Code (DTC) Detecting Criteria	8

