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ENGINE (DIAGNOSTICS)

Basic Diagnostic Procedure

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1. Basic Diagnostic Procedure

A: PROCEDURE

1. ENGINE

	Step	Check	Yes	No
1	<p>CHECK ENGINE START FAILURE.</p> <p>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.></p> <p>2) Start the engine.</p>	Does the engine start?	Go to step 2.	Inspection using "Diagnostics for Engine Start Failure". <Ref. to EN(H4SO)(diag)-67, Diagnostics for Engine Starting Failure.>
2	<p>CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.</p>	Does the malfunction indicator light illuminate?	Go to step 3.	Inspection using "General Diagnostic Table" <Ref. to EN(H4SO)(diag)-302, INSPECTION, General Diagnostic Table.>
3	<p>CHECK INDICATION OF DTC ON DISPLAY.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Connect the Subaru Select Monitor or general scan tool to data link connector.</p> <p>3) Turn the ignition switch to ON, and run the Subaru Select Monitor or general scan tool.</p> <p>4) Read DTC using Subaru Select Monitor or general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> Subaru Select Monitor <p>Refer to "Read Diagnostic Trouble Code" for detailed operation procedure. <Ref. to EN(H4SO)(diag)-41, Read Diagnostic Trouble Code (DTC).></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	Is DTC displayed on the Subaru Select Monitor or general scan tool?	Record the DTC. Repair the trouble cause. <Ref. to EN(H4SO)(diag)-82, List of Diagnostic Trouble Code (DTC).> Go to step 4.	Repair the related parts. NOTE: If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnosis of malfunction indicator light circuit or combination meter. <Ref. to EN(H4SO)(diag)-58, Malfunction Indicator Light.>
4	<p>PERFORM DIAGNOSIS.</p> <p>1) Perform the Clear Memory Mode. <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.></p> <p>2) Perform the Inspection Mode. <Ref. to EN(H4SO)(diag)-42, Inspection Mode.></p>	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)-89, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Finish the diagnosis.

Check List for Interview

ENGINE (DIAGNOSTICS)

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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 type	
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	km/h (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	Audio	<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	Wireless device	<input type="checkbox"/> ON/ <input type="checkbox"/> OFF
Rear wiper	<input type="checkbox"/> ON/ <input type="checkbox"/> OFF		

Check List for Interview

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2. CHECK LIST NO. 2

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

NOTE:

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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

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3. General Description

A: CAUTION

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

CAUTION:

- All airbag system wiring harnesses and connectors are yellow. Do not use the 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. Doing 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)-52, 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:

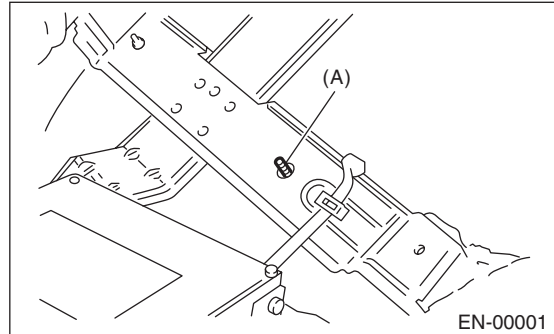
When replacing the ECM, be careful not to use the wrong spec. ECM to avoid any damage on the fuel injection system.

NOTE:

When replacing the ECM of the models with Immobilizer, immobilizer system must be registered. To do so, all ignition keys and ID cards need to be prepared. Refer to the "IMMOBILIZER TEACHING OPERATION MANUAL".

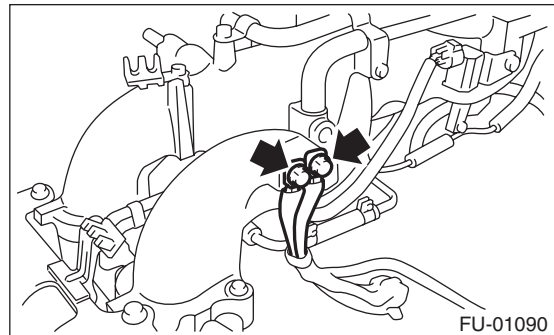
6) Take care not to allow water to get into the connectors when servicing or washing the vehicle in rainy weather. Avoid exposure to water even if the connectors are waterproof.

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 for the 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 module. (ECM is installed under the passenger's side floor mat.)
- 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) When disconnecting the fuel hose, release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>

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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. After diagnosis of engine control system, perform the ABS memory clear procedure of self-diagnosis function.

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.

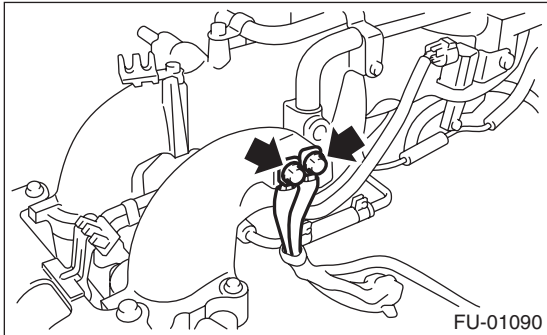
Standard voltage: 12 V

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 throttle 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.

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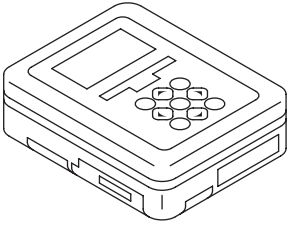
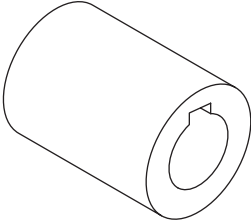
2. ENGINE AND EMISSION CONTROL SYSTEM

- 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
 ST1B021XU0	1B021XU0	SUBARU SELECT MONITOR III KIT	Used for troubleshooting the electrical system.
 ST-499987500	499987500	CRANKSHAFT SOCKET	Used for rotating crankshaft.

Electrical Component Location

ENGINE (DIAGNOSTICS)

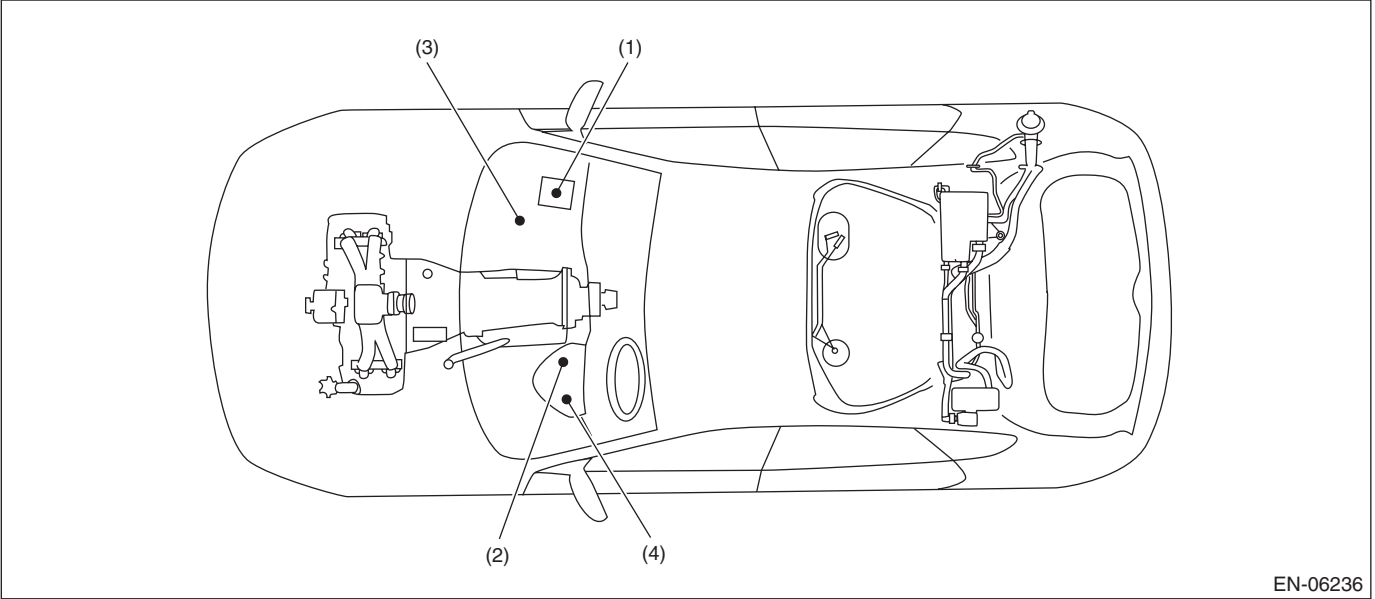
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4. Electrical Component Location

A: LOCATION

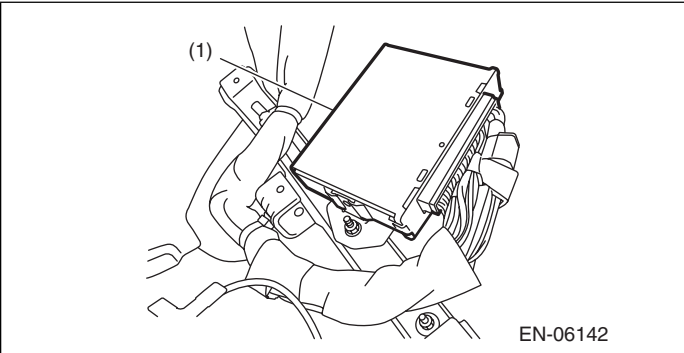
1. ENGINE

- Control module

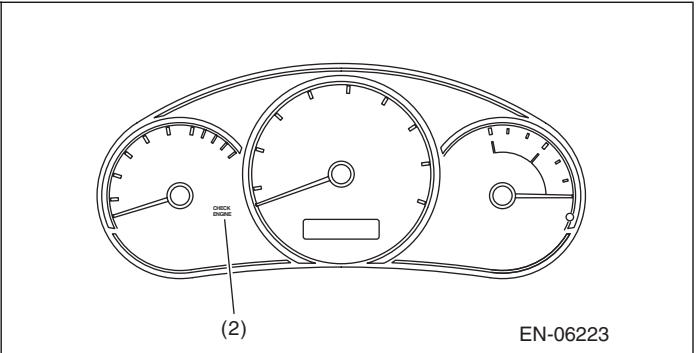


EN-06236

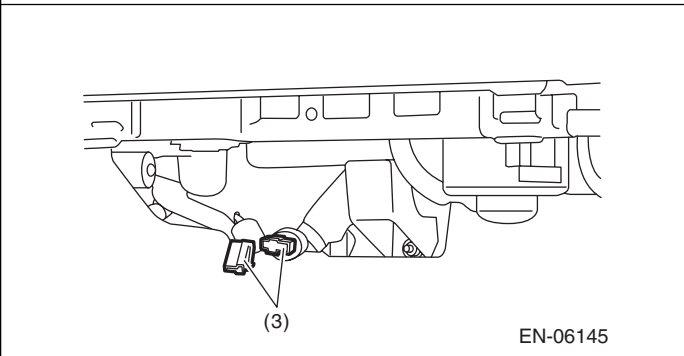
- (1) Engine control module (ECM) (3) Delivery (test) mode connector (4) Data link connector
(2) Malfunction indicator light



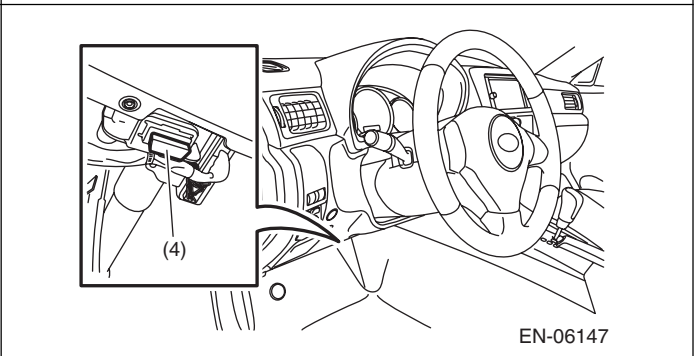
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EN-06223



EN-06145



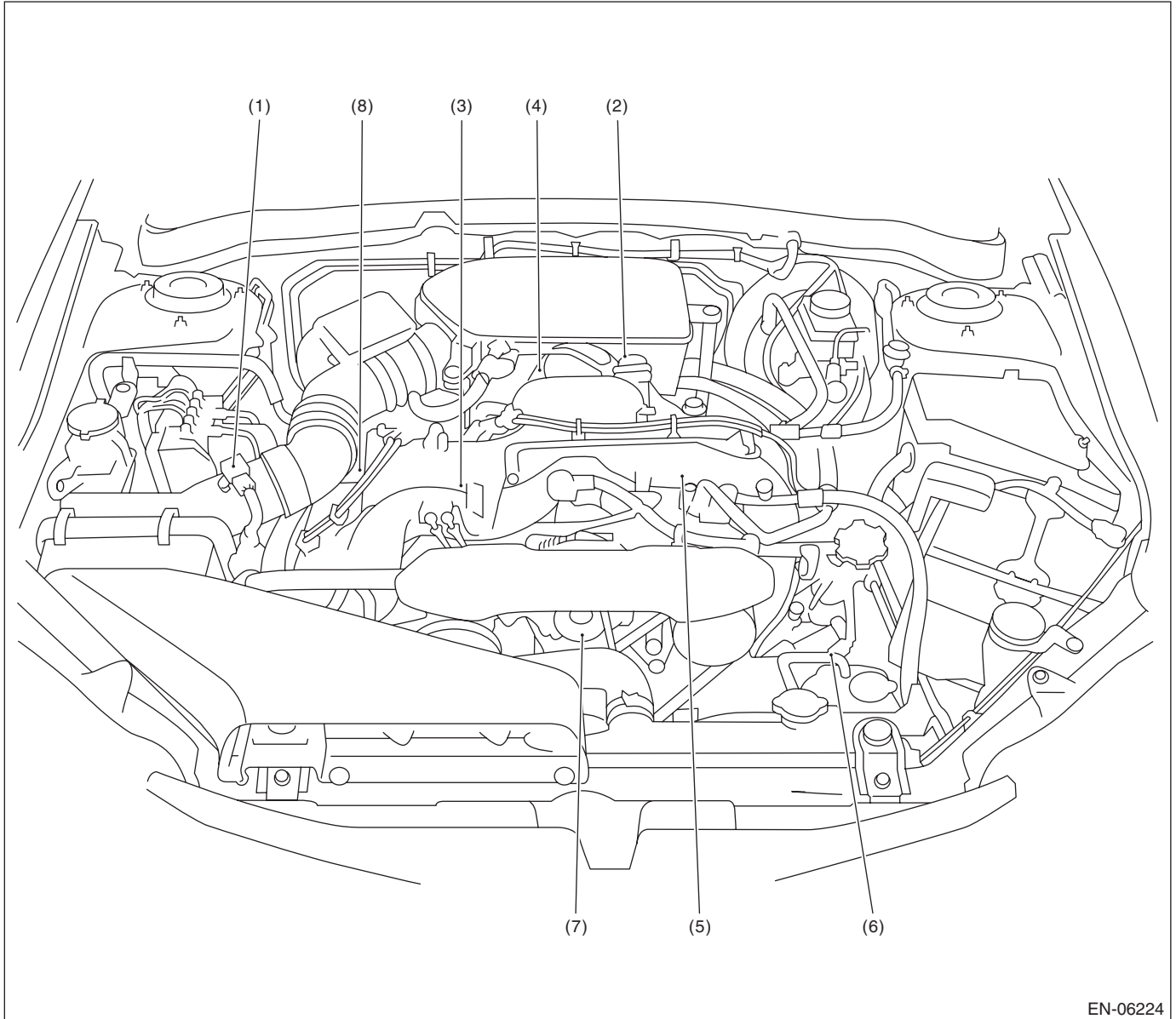
EN-06147

Electrical Component Location

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- Sensor



EN-06224

(1) Mass air flow and intake air temperature sensor

(3) Engine coolant temperature sensor

(6) Camshaft position sensor

(2) Manifold absolute pressure sensor

(4) Electronic throttle control

(7) Crankshaft position sensor

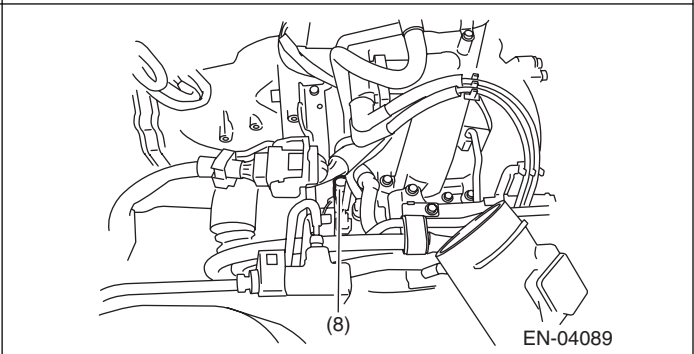
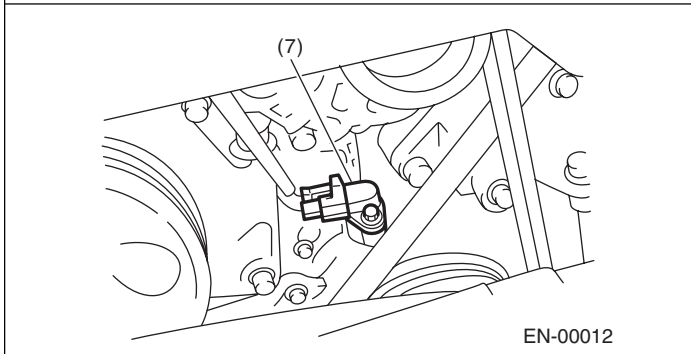
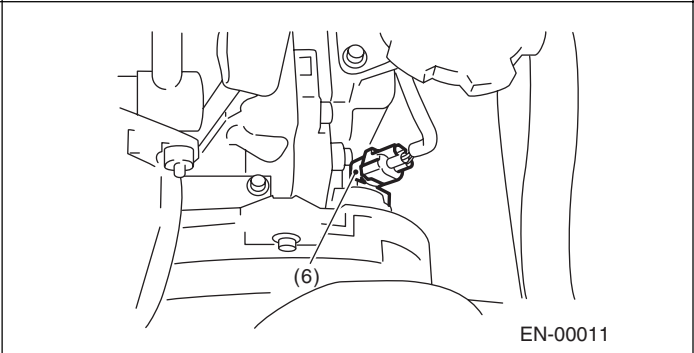
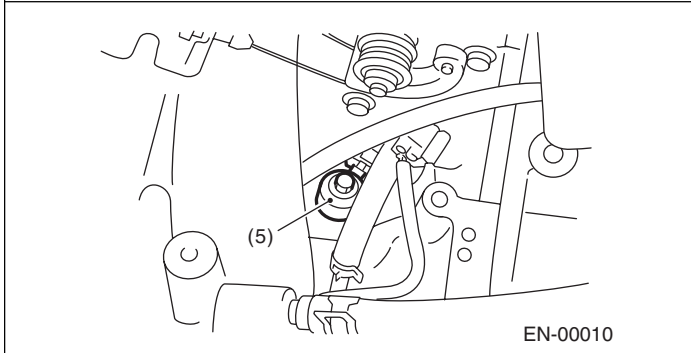
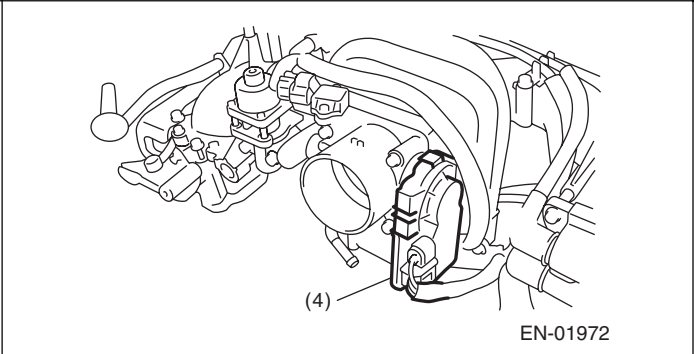
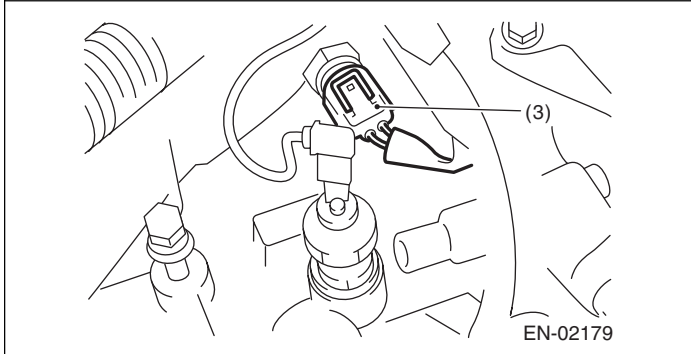
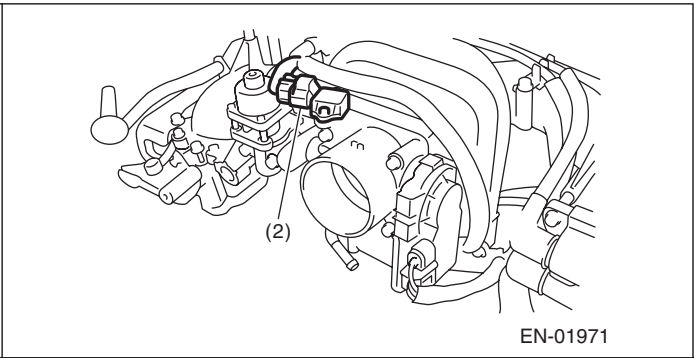
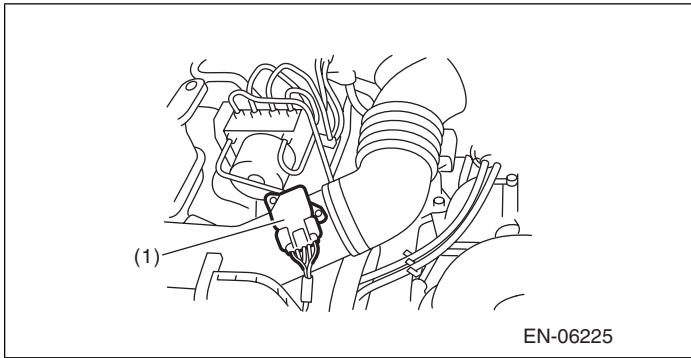
(5) Knock sensor

(8) Oil temperature sensor

Electrical Component Location

ENGINE (DIAGNOSTICS)

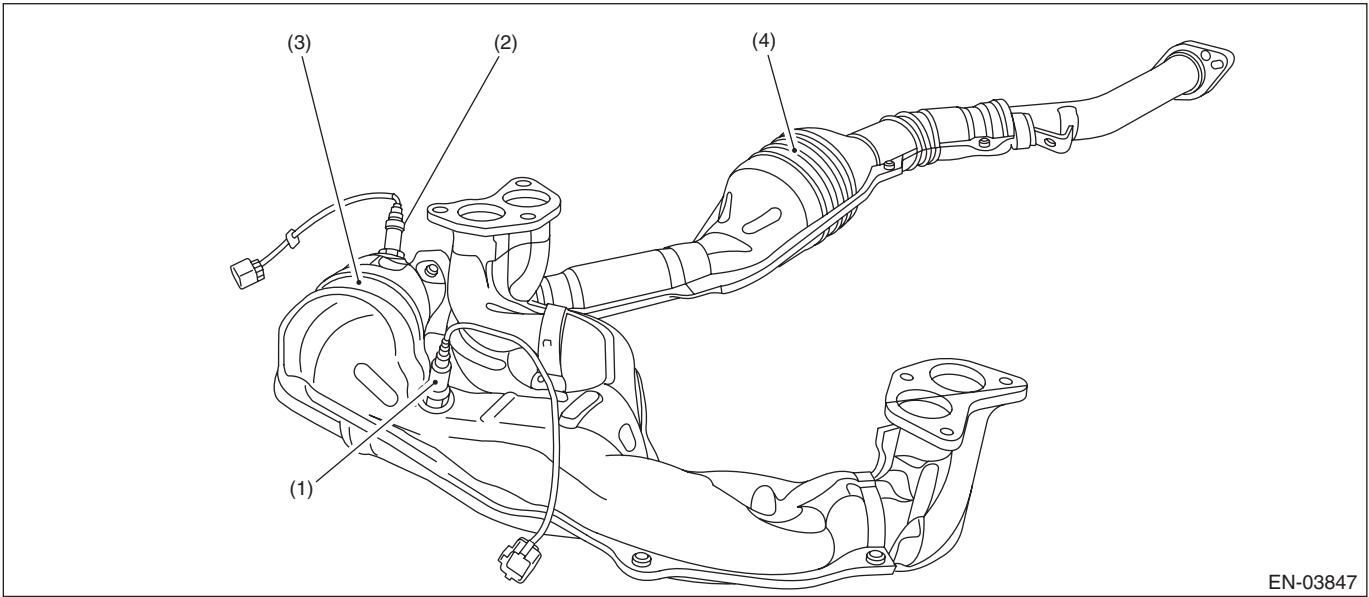
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Electrical Component Location

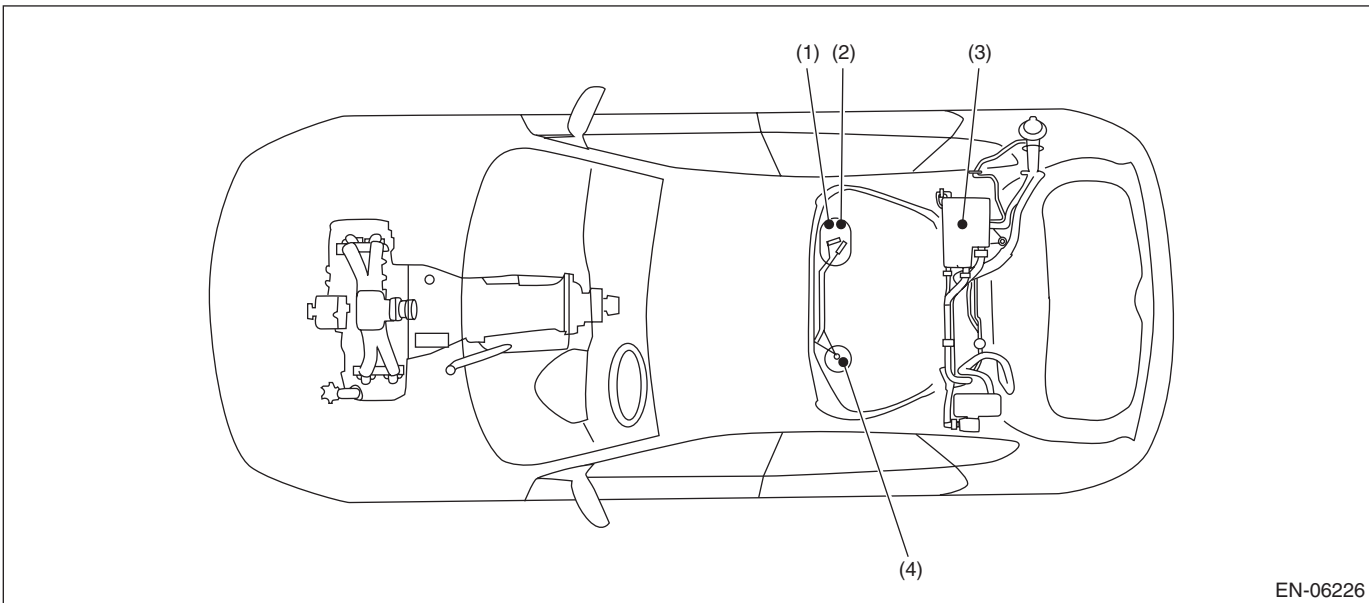
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EN-03847

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



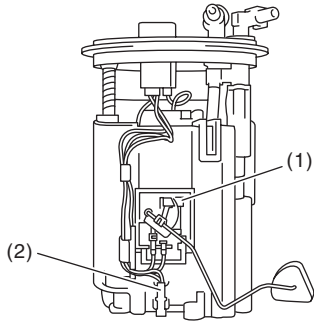
EN-06226

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

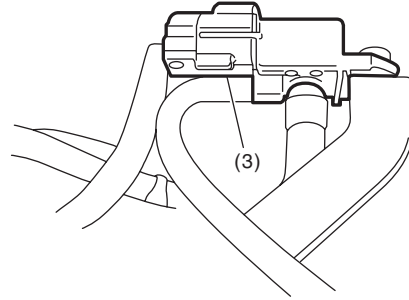
Electrical Component Location

ENGINE (DIAGNOSTICS)

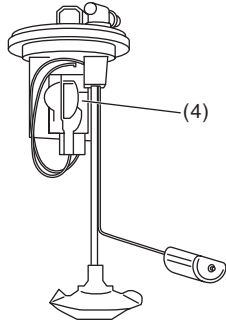
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EN-05725



EN-06168



EN-03132

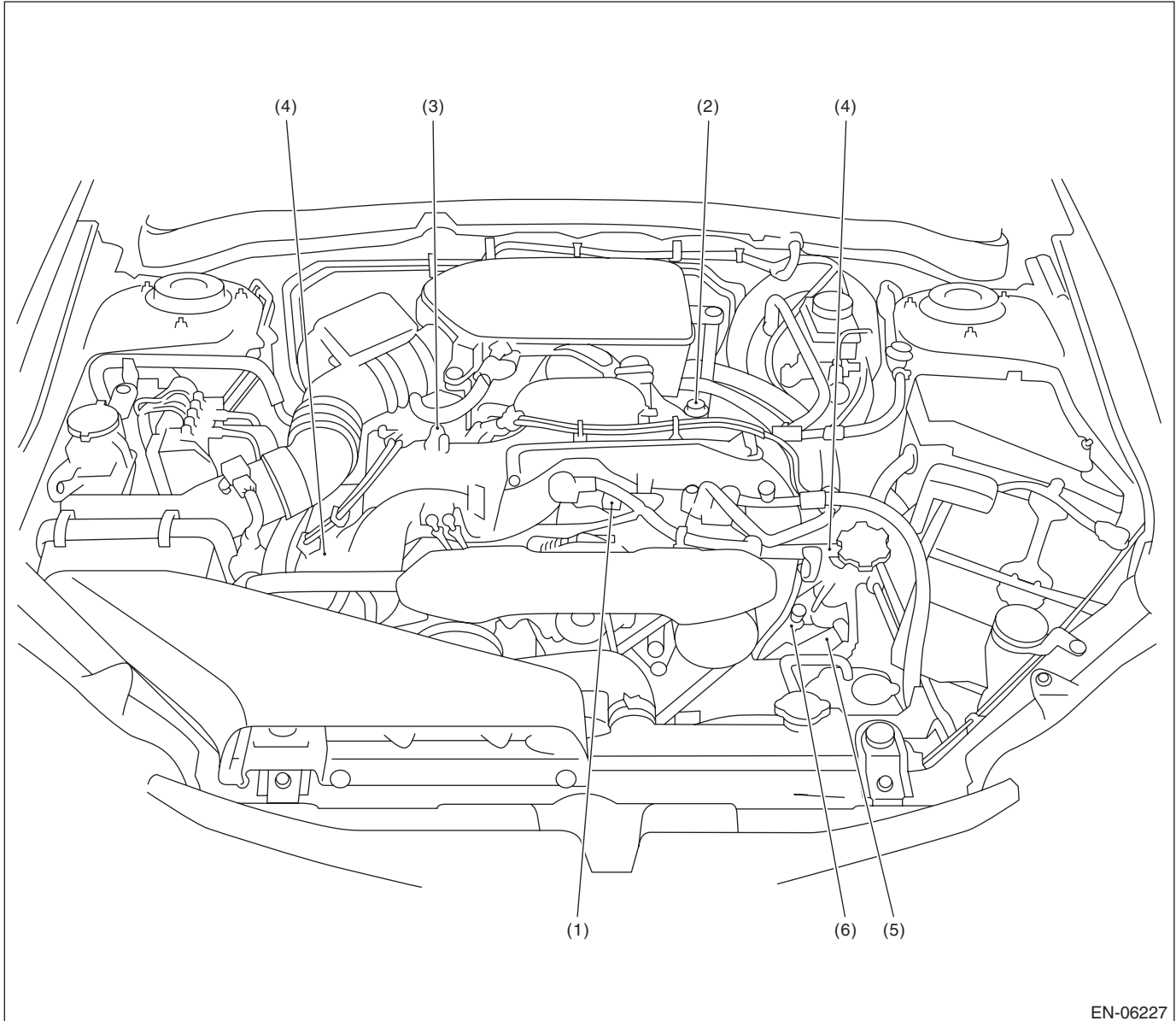
SUBARU.

Electrical Component Location

ENGINE (DIAGNOSTICS)

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- Solenoid valve, actuator, emission control system parts and ignition system parts



EN-06227

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

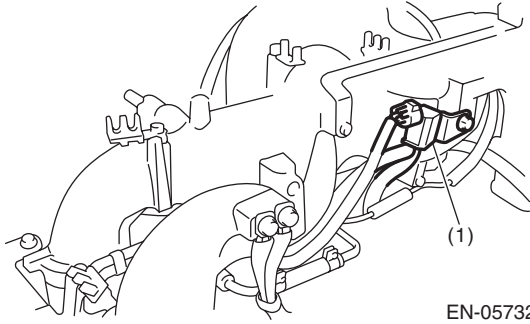
- (4) Fuel injector
- (5) Oil switching solenoid valve

- (6) Variable valve lift diagnosis oil pressure switch

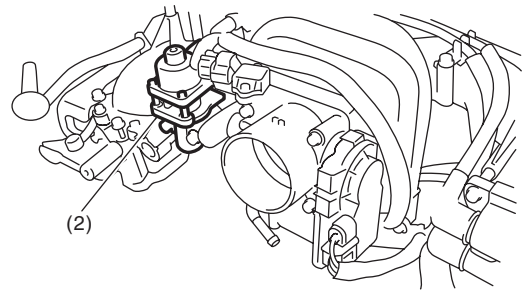
Electrical Component Location

ENGINE (DIAGNOSTICS)

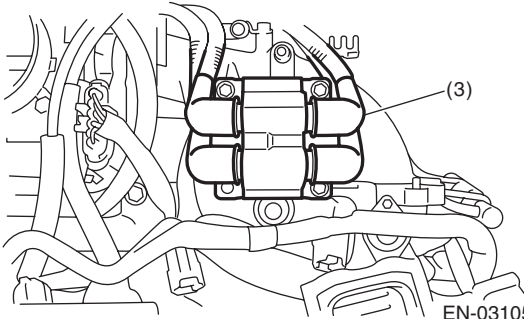
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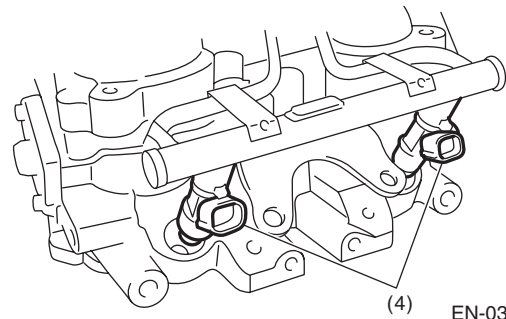
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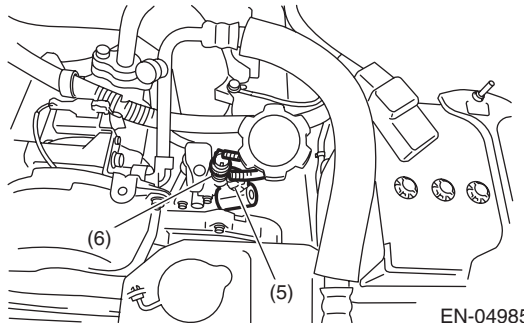
EN-01976



EN-03105



(4) EN-03106



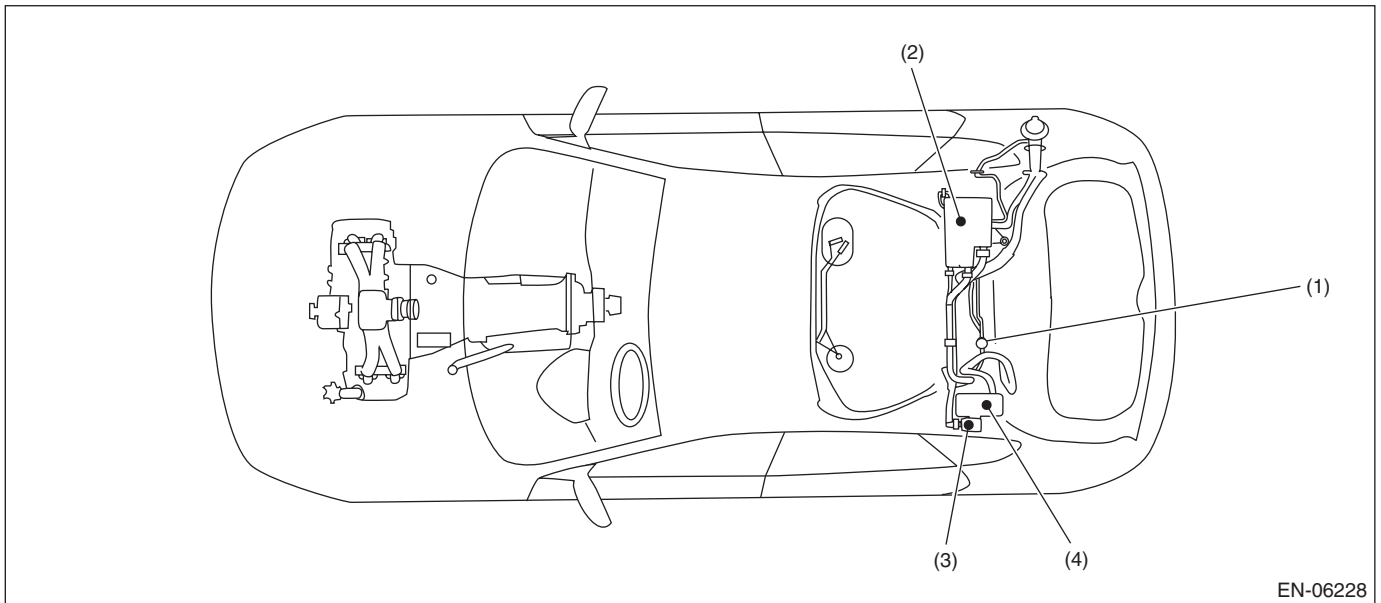
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SUBARU.

Electrical Component Location

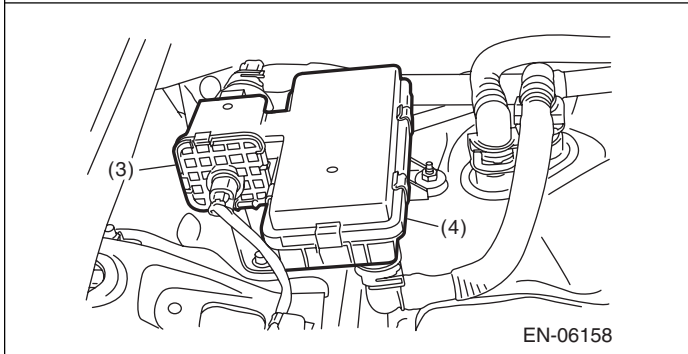
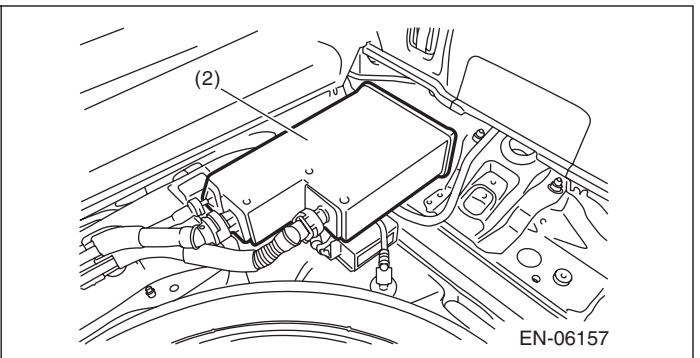
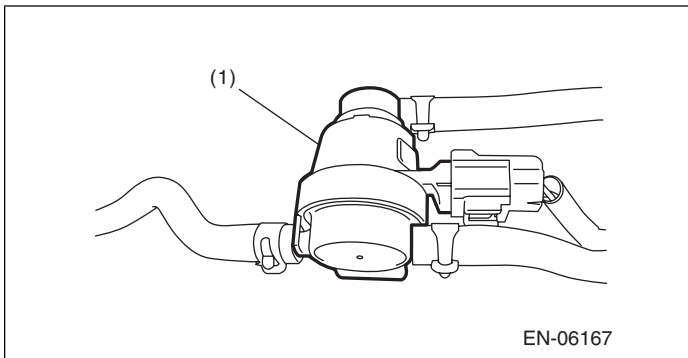
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EN-06228

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

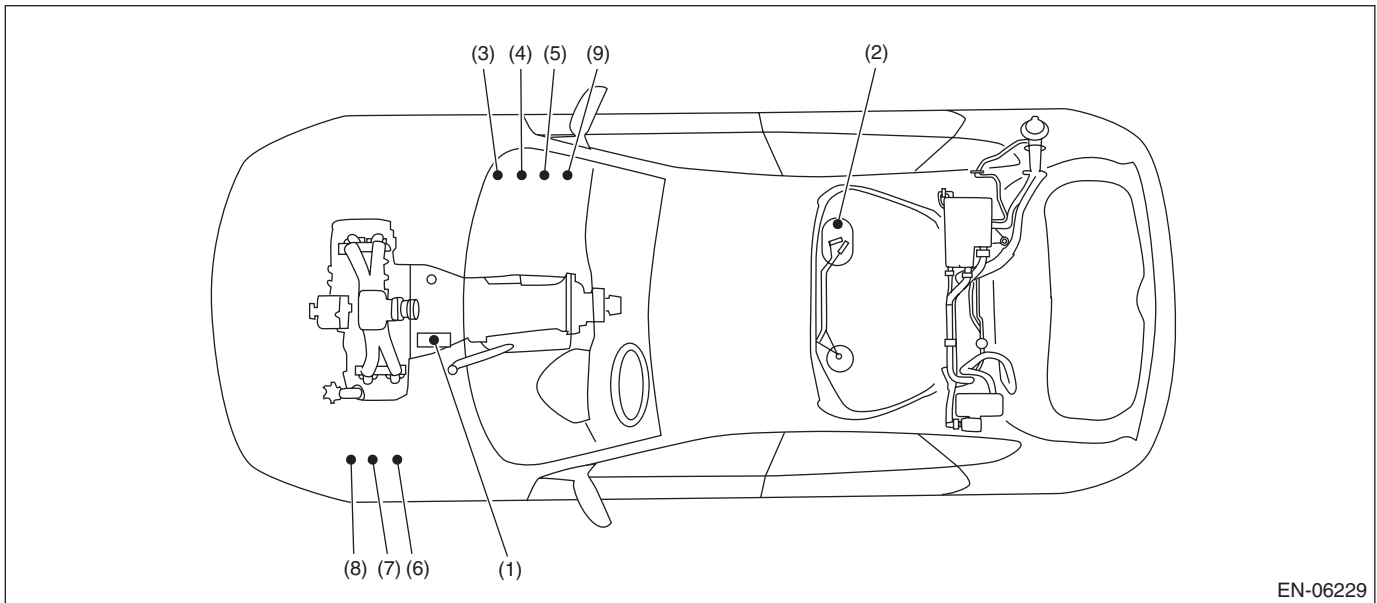


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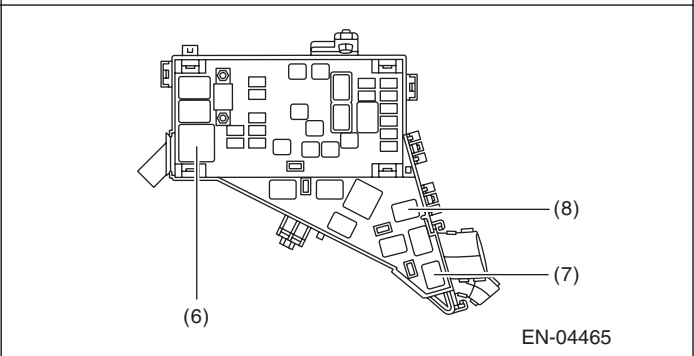
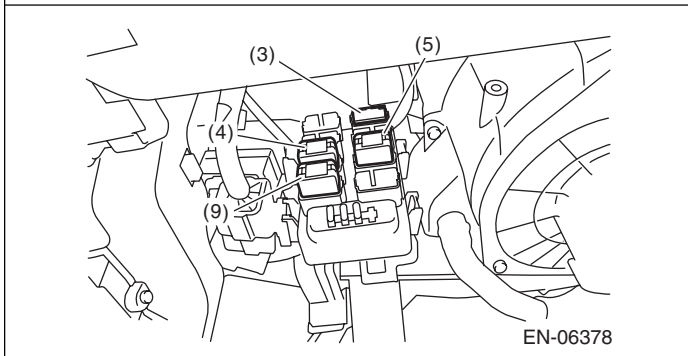
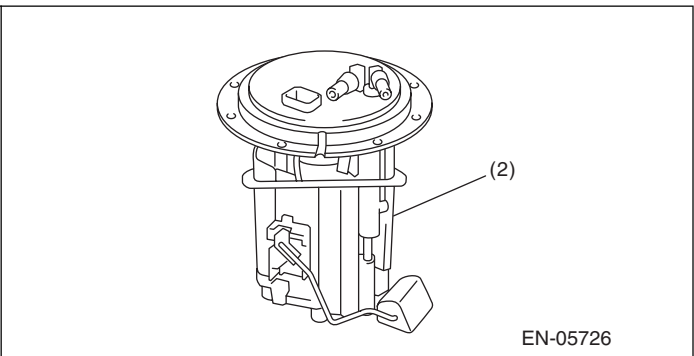
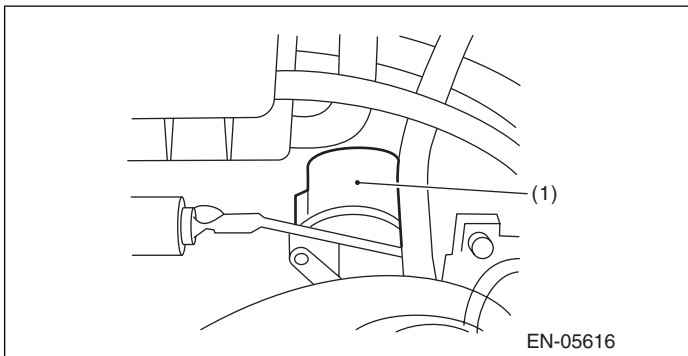
Electrical Component Location

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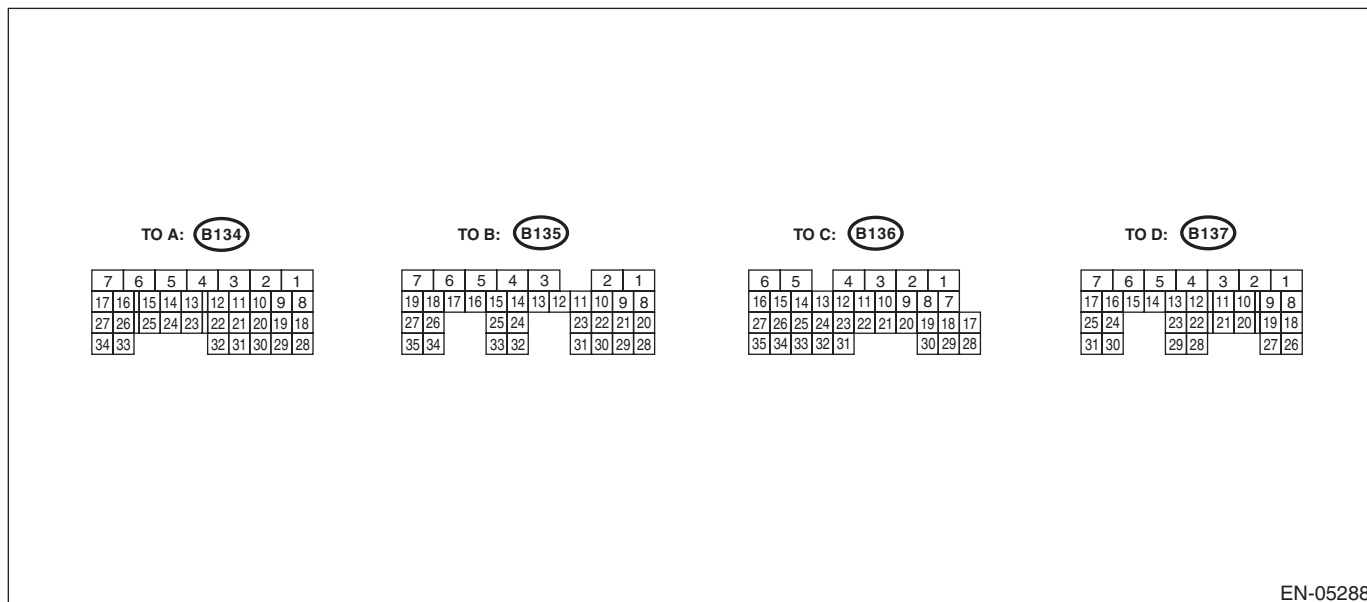
- | | | |
|----------------|---------------------------------------|-------------------------------|
| (1) Starter | (4) Fuel pump relay | (7) Radiator sub fan relay |
| (2) Fuel pump | (5) Electronic throttle control relay | (8) Radiator main fan relay 2 |
| (3) Main relay | (6) Radiator main fan relay 1 | (9) A/F, oxygen sensor relay |



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

A: ELECTRICAL SPECIFICATION



EN-05288

Contents		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (engine OFF)	Engine ON (idling)	
Crankshaft position sensor	Signal (+)	B134	13	0	-7 — +7	Waveform
	Signal (-)	B134	14	0	0	—
	Shield	B134	24	0	0	—
Camshaft position sensor	Signal (+)	B134	12	0	-7 — +7	Waveform
	Signal (-)	B134	22	0	0	—
	Shield	B134	24	0	0	—
Electronic throttle control	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

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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Contents		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (engine OFF)	Engine ON (idling)	
Accelerator pedal position sensor	Main sensor signal	B135	23	Fully closed: 1.0 Fully opened: 3.5	Fully closed: 1.0 Fully opened: 3.5	—
	Main power supply	B135	21	5	5	—
	GND (Main sensor)	B135	29	0	0	—
	Sub sensor signal	B135	31	Fully closed: 1.0 Fully opened: 3.5	Fully closed: 1.0 Fully opened: 3.5	—
	Sub power supply	B135	22	5	5	—
	GND (Sub sensor)	B135	30	0	0	—
Rear oxygen sensor	Signal	B135	4	0	0 — 0.9	—
	Shield	B135	1	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B136	3	10 — 13	1 — 14	Duty waveform
	Signal 2	B136	2	10 — 13	1 — 14	Duty waveform
Rear oxygen sensor heater signal		B136	4	10 — 13	1 — 14	Duty waveform
Engine coolant temperature sensor		B134	34	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.
Starter switch		B136	32	0	0	AT model Cranking: 8 — 14 MT model Cranking with the clutch pedal pressed: 8 — 14
Starter relay control		B136	20	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
A/C switch		B136	24	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Ignition switch		B135	19	10 — 13	12 — 14	—
Neutral position switch	AT	B136	31	ON: 0 OFF: 12±0.5		For AT model, switch is ON when shift is in "P" range or "N" range.
	MT			ON: 0 OFF: 12±0.5		For MT model, switch is ON when shift is in "N" range.
Delivery (test) mode connector		B135	27	10 — 13	13 — 14	When connected: 0
Knock sensor	Signal	B134	15	2.5	2.5	—
	Shield	B134	25	0	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, #2	B137	18	0	1 — 3.4	Waveform
	#3, #4	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

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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Contents	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Fuel pump relay control	B136	12	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	—	
Self-shutoff control	B136	23	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 or more	Waveform	
Oil temperature sensor signal	B134	23	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.	
Blow-by leak diagnosis	B134	30	0	0	—	
Purge control solenoid valve	B137	29	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	Duty waveform	
EGR valve	Signal 1	B134	8	0 or 10 — 13	0 or 12 — 14	Waveform
	Signal 2	B134	9	0 or 10 — 13	0 or 12 — 14	Waveform
	Signal 3	B134	10	0 or 10 — 13	0 or 12 — 14	Waveform
	Signal 4	B134	20	0 or 10 — 13	0 or 12 — 14	Waveform
Power steering oil pressure switch	B134	33	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—	
Blower fan switch	B135	11	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	Manual A/C model	
A/C middle pressure switch	B136	33	ON: 0 OFF: 10 — 13	ON: 0 OFF: 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	—
Variable valve lift diagnosis oil pressure switch RH	B134	31	0	0	—	
Variable valve lift diagnosis oil pressure switch LH	B134	32	0	0	—	
Front oxygen (A/F) sensor	Signal (+)	B135	9	—	2.7 — 2.9	—
	Signal (-)	B135	8	—	2.35 — 2.25	—
	Shield	B135	1	0	0	—
Manifold absolute pressure sensor	B134	6	3.4 — 3.8	1.4 — 1.8	—	
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	—	
Immobilizer communication 1	B136	26	1 or less ↔ 4 or more	1 or less ↔ 4 or more	—	
Immobilizer communication 2	B136	34	1 or less ↔ 4 or more	1 or less ↔ 4 or more	—	

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

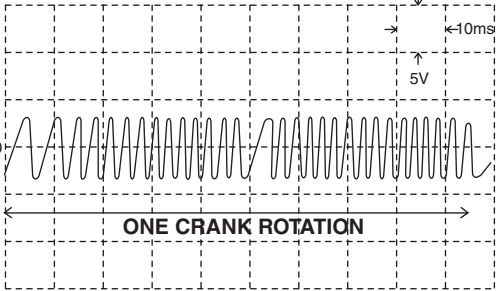
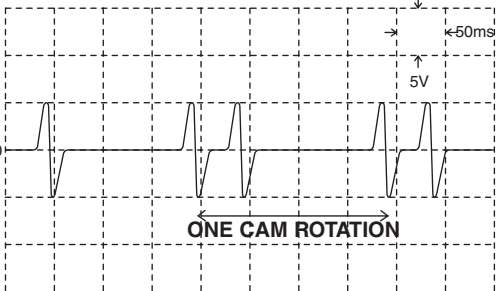
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Contents	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
SSM/GST communication line	B136	16	1 or less ↔ 4 or more	1 or less ↔ 4 or more	—	
Sensor power supply	B134	19	5	5	—	
	B135	22	5	5	—	
GND (sensor)	B134	29	0	0	—	
	B135	30	0	0	—	
GND	(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	—
	(Body)	B136	6	0	0	—
Clutch switch	B136	25	When clutch pedal is depressed: 0 When clutch pedal is released: 10 — 13	When clutch pedal is depressed: 0 When clutch pedal is released: 12 — 14	—	
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	—	
Cruise control main switch	B135	12	ON: 0 OFF: 5	ON: 0 OFF: 5	—	
Cruise control command switch	B135	24	When operating nothing: 3.5 — 4.5 When operating RES/ACC: 2.5 — 3.5 When operating SET/COAST: 0.5 — 1.5 When operating cancel: 0 — 0.5	When operating nothing: 3.5 — 4.5 When operating RES/ACC: 2.5 — 3.5 When operating SET/COAST: 0.5 — 1.5 When operating cancel: 0 — 0.5	—	
Fuel temperature sensor	B135	17	2.5 — 3.8	2.5 — 3.8	Ambient temperature: 25°C (77°F)	
Fuel tank pressure sensor	B135	32	2.3 — 2.7	2.3 — 2.7	Value after removing fuel filler cap and installing again	
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	—	
CAN communication line (+)	B136	27	2.5 — 3.5	2.5 — 3.5	Waveform	
CAN communication line (-)	B136	35	1.5 — 2.5	1.5 — 2.5	Waveform	
AT/MT identification line	B136	15	—	—	MT model: 1 or less	

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

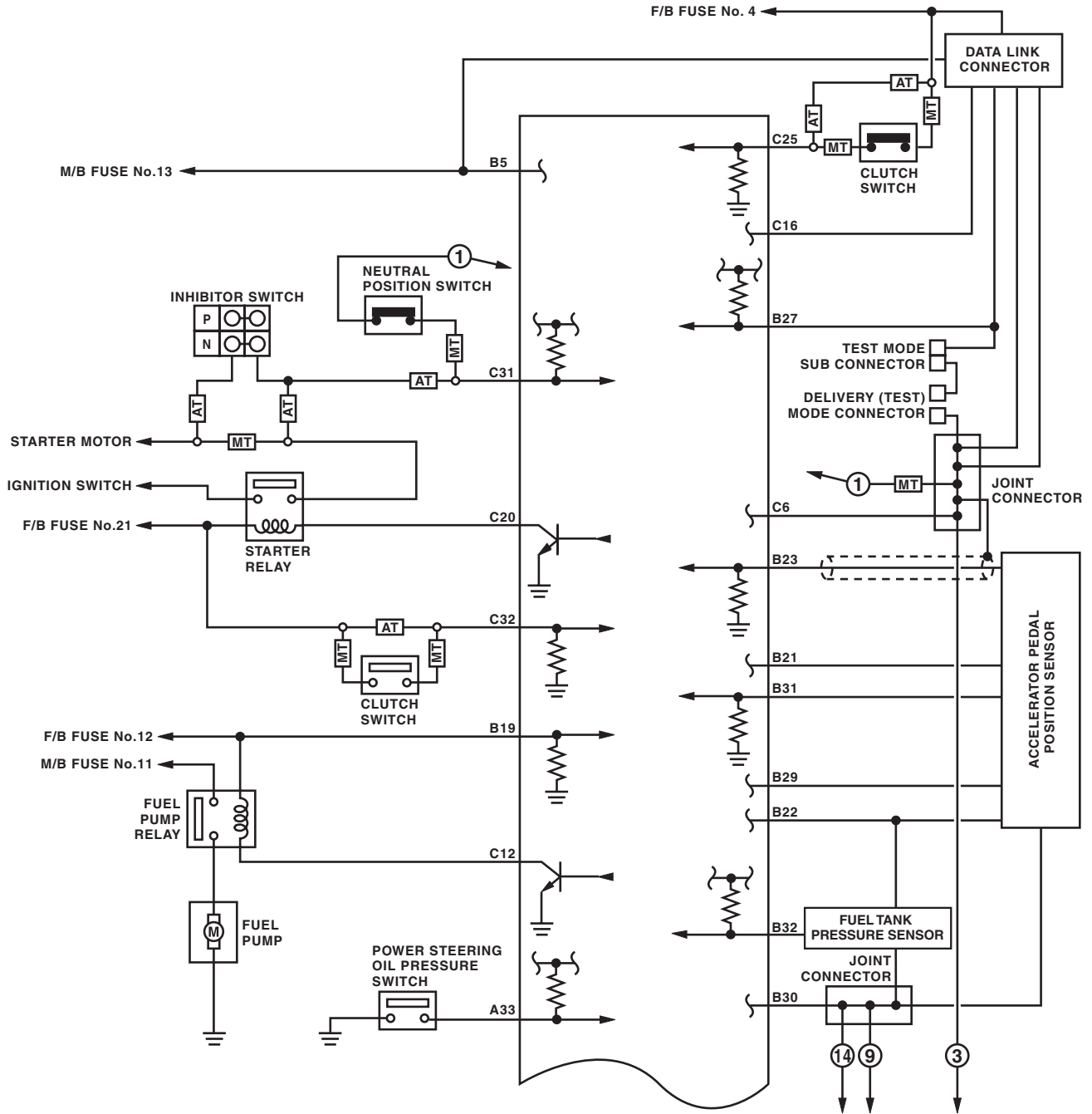
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Input/output name	Measuring condition	Waveform
1. Crankshaft position sensor	During idling	 <p style="text-align: right;">EN-05322</p>
2. Camshaft position sensor	During idling	 <p style="text-align: right;">EN-05323</p>

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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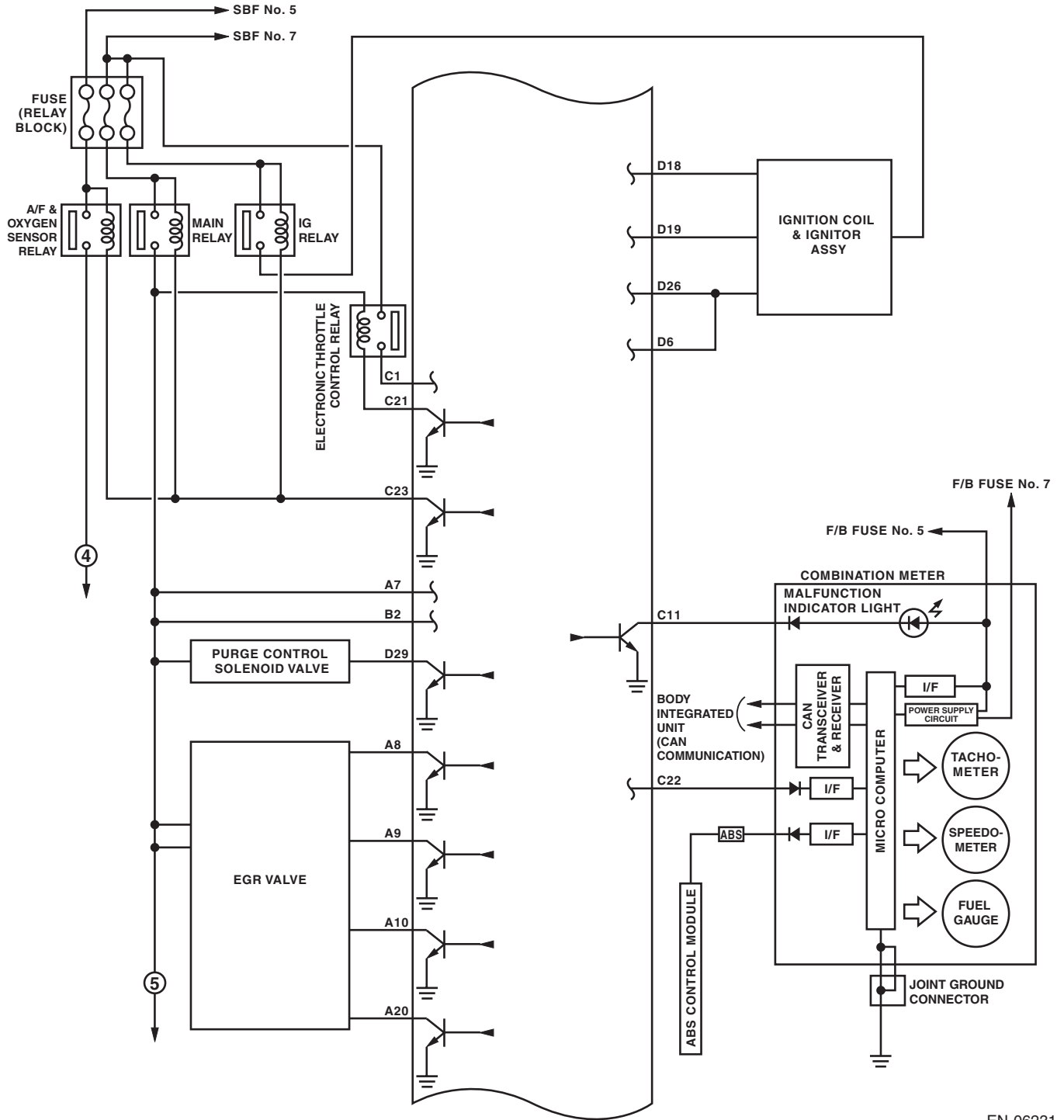


EN-06230

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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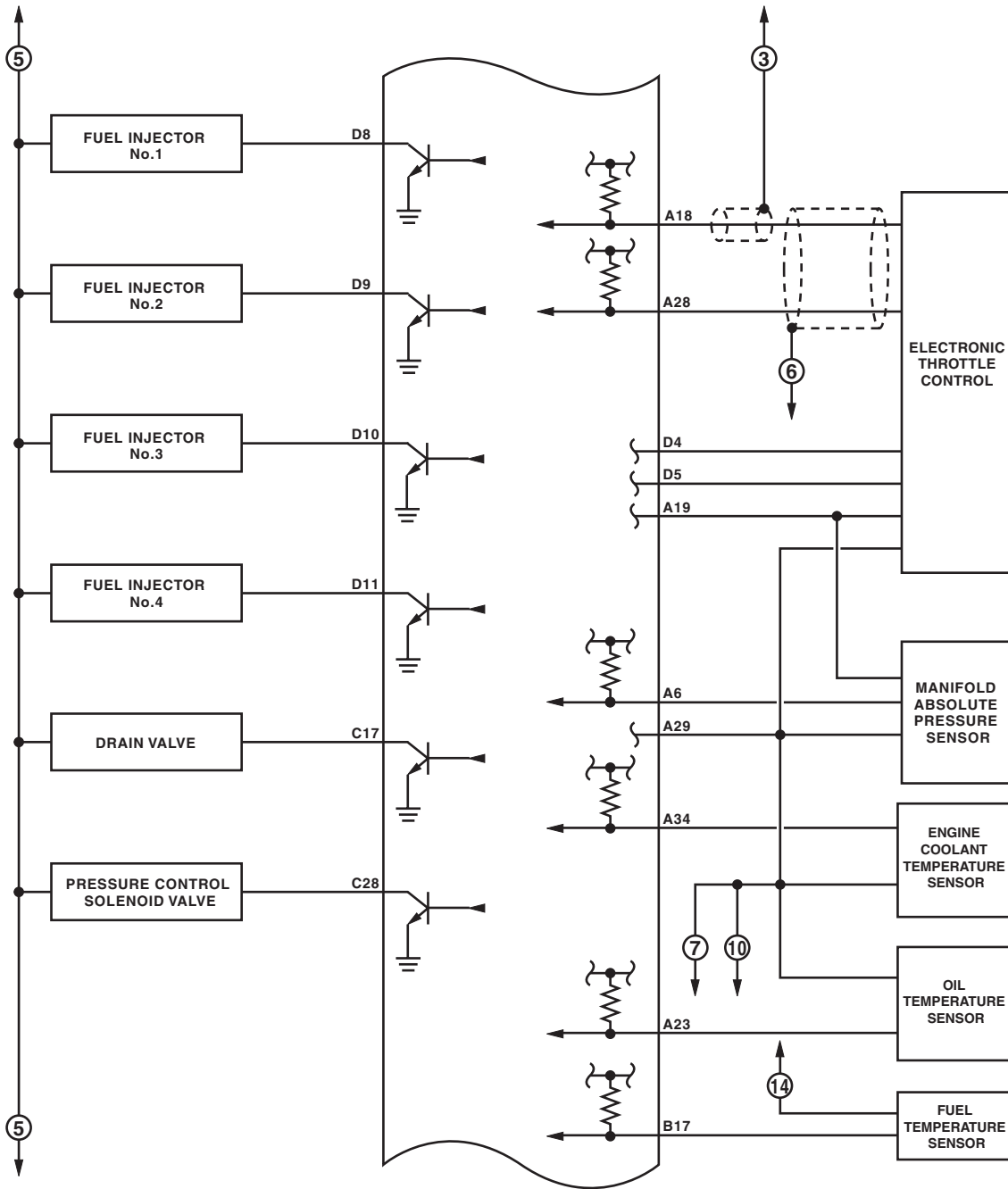


EN-06231

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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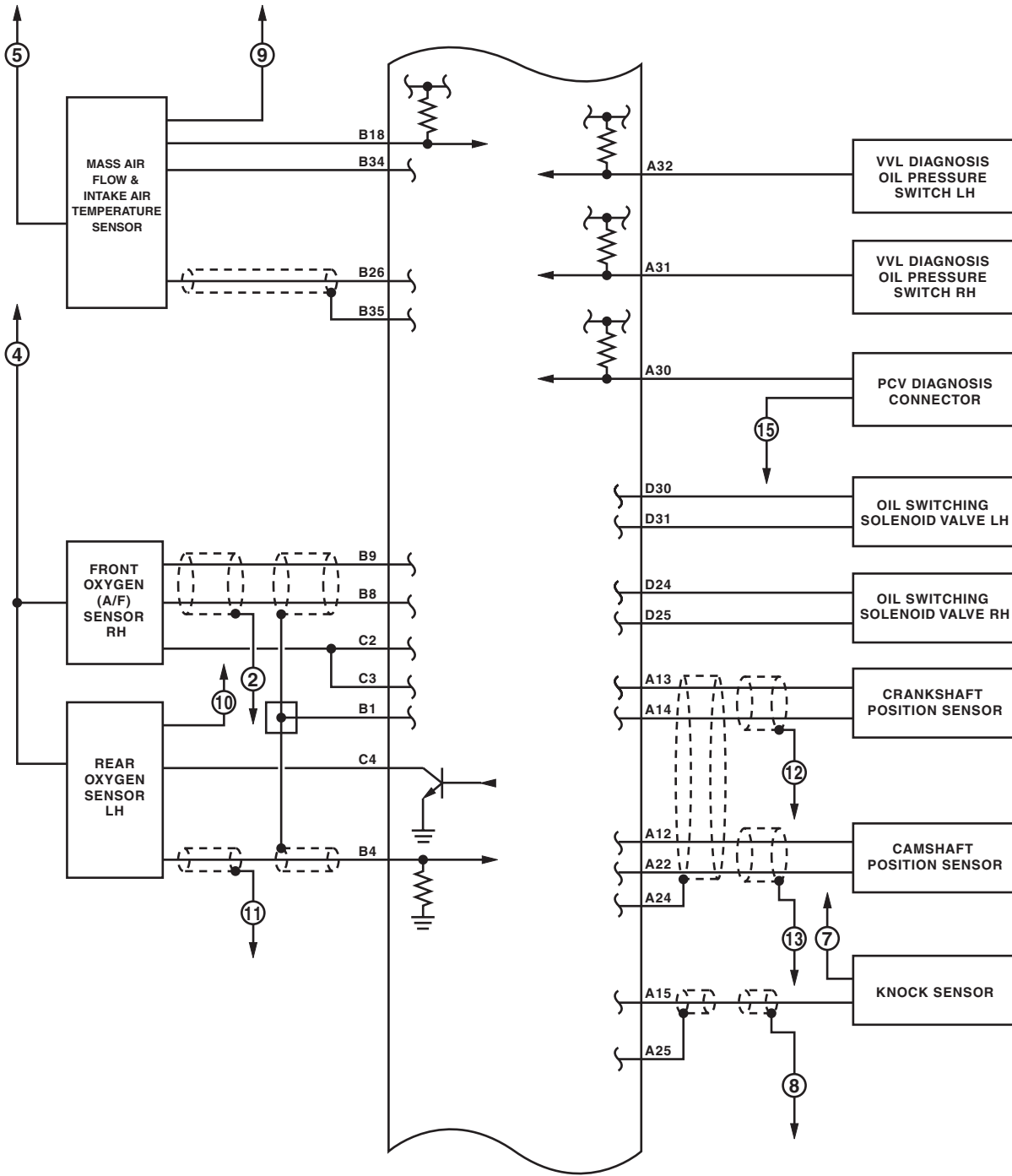


EN-06232

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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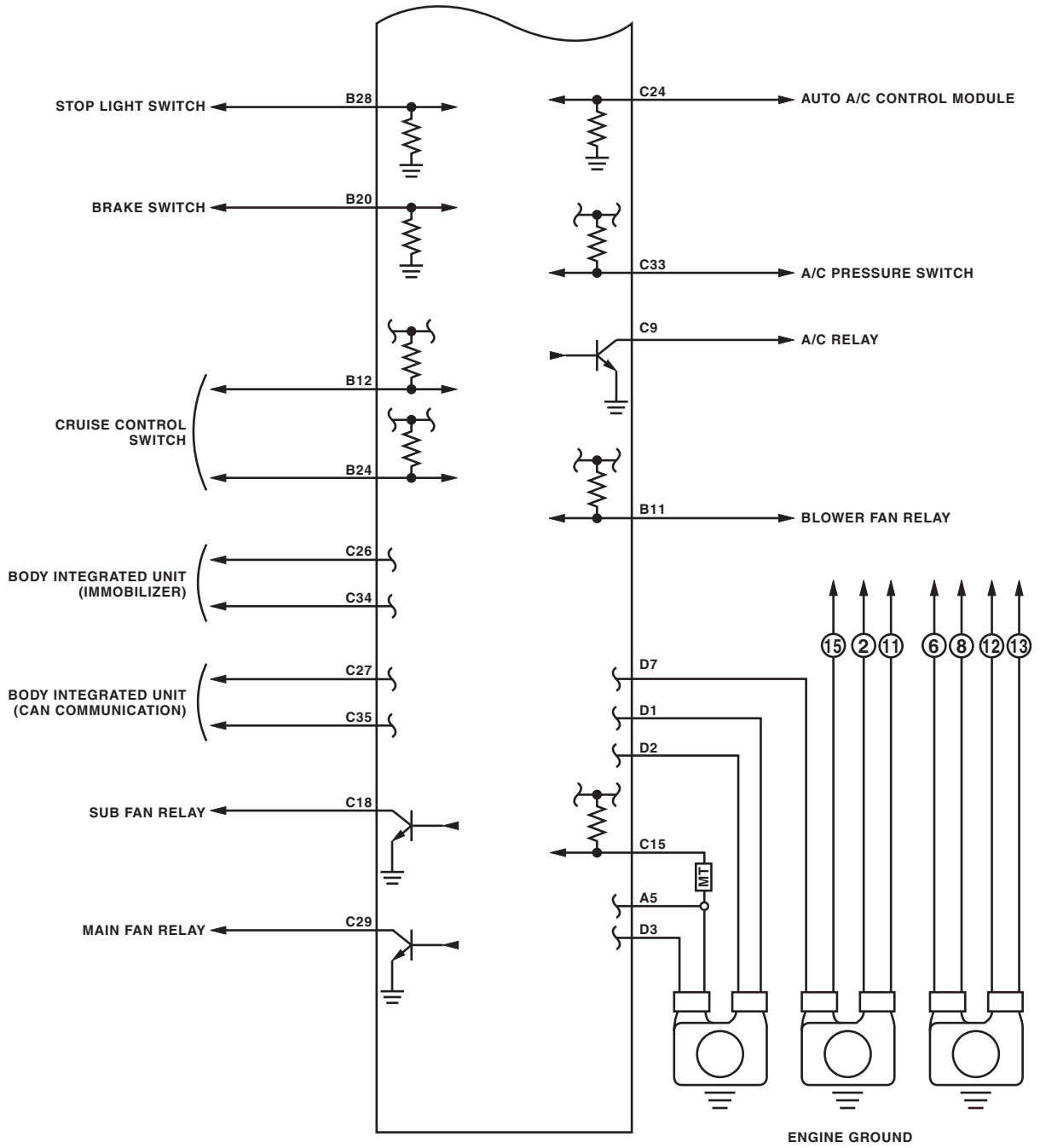


EN-06233

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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EN-06234

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6. Engine Condition Data

A: ELECTRICAL SPECIFICATION

Contents	Specification
Engine load	17.6 — 40.5 (%): Idling
	14.7 — 29.8 (%): 2,500 rpm racing

Measuring condition:

- After engine is warmed-up.
- Set the select lever in “P” range or “N” range, or the shift lever in neutral.
- Turn the A/C to OFF.
- Turn all the accessory switches to OFF.

Data Link Connector

ENGINE (DIAGNOSTICS)

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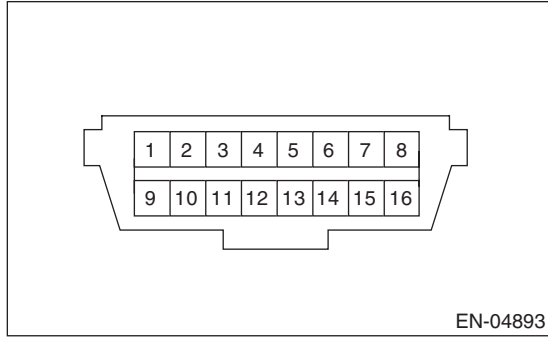
7. Data Link Connector

A: NOTE

This connector is used for Subaru Select Monitor.

CAUTION:

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



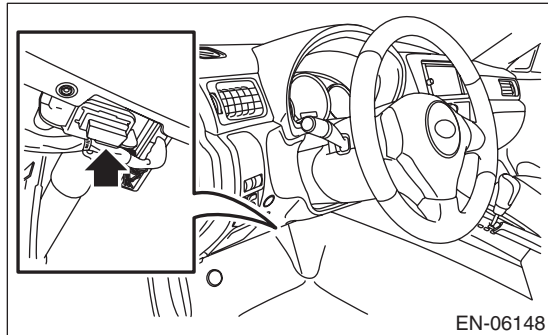
Terminal No.	Contents	Terminal No.	Contents
1	Blank	9	Blank
2	Blank	10	Blank
3	Blank	11	Blank
4	Ground	12	Blank
5	Ground	13	Blank
6	CAN communication (+)	14	CAN communication (-)
7	Subaru Select Monitor signal	15	Blank
8	Blank	16	Power supply

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) Connect the general scan tool to data link connector located in the lower portion of the 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)-82, List of Diagnostic Trouble Code (DTC).>

General Scan Tool

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ENGINE (DIAGNOSTICS)

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 DTC, 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, MPH
\$0E	Ignition timing advance	°
\$0F	Intake air temperature	°C or °F
\$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 (Bank 1 Sensor 2)	V and %
\$1C	Supporting OBD system	—
\$1F	Elapsed time after starting the engine	sec
\$21	Travel distance after the malfunction indicator light illuminates	km
\$24	A/F value and A/F sensor output voltage (Bank 1 Sensor 1)	— and V
\$2C	Target EGR	%
\$2D	EGR deviation	%
\$2E	Evaporative purge	%
\$2F	Fuel level	%
\$30	Number of warm ups after DTC clear	—
\$31	Travel distance after DTC clear	km
\$32	Fuel tank pressure	Pa
\$33	Barometric pressure	kPa
\$34	A/F value and A/F sensor current (Bank 1 Sensor 1)	— and mA
\$3C	Catalyst temperature #1	°C
\$41	Diagnostic monitor of each drive cycle	—
\$42	ECM power voltage	V
\$43	Absolute load	%
\$44	A/F target lambda	—
\$45	Relative throttle opening angle	%
\$46	Ambient temperature	°C
\$47	Absolute throttle opening angle 2	%
\$49	Absolute accelerator opening angle 1	%
\$4A	Absolute accelerator opening angle 2	%
\$4C	Target throttle opening angle	%
\$4D	Engine operating time while malfunction indicator lit	min
\$4E	Elapsed time after DTC clear	min
\$51	Fuel used	—
\$5A	Relative accelerator opening angle	%

NOTE:

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

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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 the freeze frame data storage required by CARB	—
\$03	Fuel system control status	—
\$04	Calculated engine load value	%
\$05	Engine coolant temperature	°C
\$06	Short term fuel trim (Bank 1 Sensor 1)	%
\$07	Long term fuel trim (Bank 1 Sensor 1)	%
\$0B	Intake manifold absolute pressure	kPa
\$0C	Engine speed	rpm
\$0D	Vehicle speed	km/h, MPH
\$0E	Ignition timing advance	°
\$0F	Intake air temperature	°C or °F
\$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 (Bank 1 Sensor 2)	V and %
\$1C	Supporting OBD system	—
\$1F	Elapsed time after starting the engine	sec
\$2C	Target EGR	%
\$2D	EGR deviation	%
\$2E	Evaporative purge	%
\$2F	Fuel level	%
\$32	Fuel tank pressure	Pa
\$33	Barometric pressure	kPa
\$42	ECM power voltage	V
\$43	Absolute load	%
\$44	A/F target lambda	—
\$45	Relative throttle opening angle	%
\$46	Ambient temperature	°C
\$47	Absolute throttle opening angle 2	%
\$49	Absolute accelerator opening angle 1	%
\$4A	Absolute accelerator opening angle 2	%
\$4C	Target throttle opening angle	%

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 "List of Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. <Ref. to EN(H4SO)(diag)-82, 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).

General Scan Tool

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ENGINE (DIAGNOSTICS)

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.

OBDMID	TID	SID	Diagnostic item
\$01	\$81	\$0A	A/F sensor continuity abnormal (Bank 1 Sensor 1)
	\$82	\$8D	
	\$83	\$14	
	\$84	\$1E	A/F sensor range abnormal (Bank 1 Sensor 1)
	\$85	\$1E	
	\$86	\$20	A/F sensor response abnormal (Bank 1 Sensor 1)
\$02	\$87	\$0B	Oxygen sensor circuit abnormal (Bank 1 Sensor 2)
	\$88	\$0B	
	\$07	\$0B	Oxygen sensor drop abnormal (Bank 1 Sensor 2)
	\$08	\$0B	
	\$A5	\$0B	
	\$05	\$10	Oxygen sensor response abnormal (Bank 1 Sensor 2)
	\$06	\$10	
\$21	\$89	\$20	Catalyst deterioration diagnosis (Bank 1)
\$31	\$8A	\$FD	EGR system diagnosis
\$39	\$93	\$FE	Evaporative emission control system (Cap off)
\$3B	\$94	\$FE	Evaporative emission control system (0.04 inch leak)
	\$95	\$FE	
\$3C	\$96	\$FE	Evaporative emission control system (0.02 inch leak)
	\$97	\$FE	
\$3D	\$98	\$FE	Evaporative emission control system (Purge flow)
\$41	\$99	\$24	A/F sensor heater abnormal (Bank 1 Sensor 1)
	\$9A	\$24	
	\$9B	\$14	A/F sensor heater characteristics abnormal (Bank 1 Sensor 1)
\$42	\$9C	\$24	Oxygen sensor heater abnormal (Bank 1 Sensor 1)
	\$9D	\$24	
\$A1	\$0B	\$24	Misfire monitoring (All cylinders)
	\$0C	\$24	
\$A2	\$0B	\$24	Misfire monitoring (#1 cylinder)
	\$0C	\$24	
\$A3	\$0B	\$24	Misfire monitoring (#2 cylinder)
	\$0C	\$24	
\$A4	\$0B	\$24	Misfire monitoring (#3 cylinder)
	\$0C	\$24	
\$A5	\$0B	\$24	Misfire monitoring (#4 cylinder)
	\$0C	\$24	

7. MODE \$07

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

8. MODE \$09

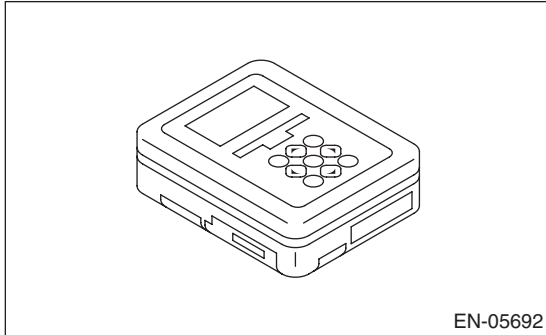
Refer to data of vehicle specification (V.I.N., calibration ID, diagnosis frequency etc.).

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) Prepare the personal computer which has been installed the Subaru Select Monitor.

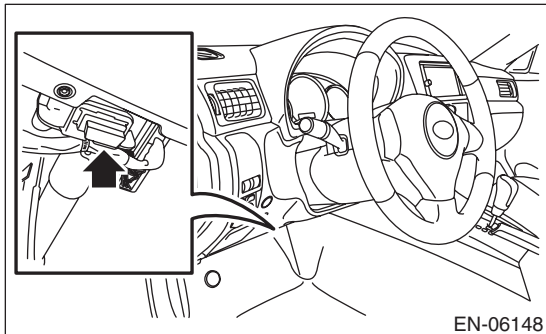
3) Connect the USB cable between SDI (Subaru Diagnosis Interface) and USB port on the personal computer (dedicated port for the Subaru Select Monitor).

NOTE:

The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4) Connect the diagnosis cable to the SDI.

5) Connect the SDI to data link connector located in the lower portion of the instrument panel (on the driver's side).



CAUTION:

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

6) Start up the personal computer.

7) Turn the ignition switch to ON (engine OFF), and run the "PC application for Subaru Select Monitor".

8) Call up DTC and data, then record them.

NOTE:

For detailed operation procedure, refer to the "PC application help for Subaru Select Monitor".

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)-41, 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)-41, Read Diagnostic Trouble Code (DTC).>

Subaru Select Monitor

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ENGINE (DIAGNOSTICS)

4. READ CURRENT DATA FOR ENGINE (NORMAL MODE)

- 1) On the «Main Menu» display screen, select the {Each System Check}.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System}.
- 3) Click the [OK] button after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select the {Current Data Display & Save}.
- 5) On the «Current Data Display & Save» display screen, select the {Normal Measurement}.
- 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	85°C or 185°F or more (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	700 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	2.5 g/s or 0.33 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
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psig	(Atmosphere pressure)
Intake manifold relative pressure	Mani. Relative Pressure	mmHg, kPa, inHg or psig	(Air intake absolute pressure – atmosphere pressure)
Ignition learning value	Learned Ignition Timing	deg	0 deg
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 #1	—	1.0
A/F correction 3	A/F Correction #3	%	0.3%
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
Fuel level sensor signal	Fuel Level Resistance	Ω	2 — 96 Ω

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Contents	Display	Unit of measure	Note (at idling)
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%
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
Knock sensor compensation	Knock Correction	deg	0.0 deg
AT/MT identification terminal	AT Vehicle ID Signal	—	AT vehicle/MT vehicle
Delivery (test) mode terminal	Test Mode Signal	—	U check
D check request flag	D Check Request	—	OFF
Delivery (test) mode terminal	Delivery Mode Connector (Test Mode Connector)	—	OFF
Neutral position switch signal	Neutral SW	—	Neutral
Soft idle switch signal	Soft Idle SW	—	At idle
Ignition switch signal	Ignition SW	—	ON input
Power steering switch signal	P/S Switch	—	OFF input (At OFF)
Air conditioning switch signal	A/C SW	—	OFF input (At OFF)
Starter switch signal	Starter Switch	—	OFF input
Rear oxygen monitor	Rear O2 Rich Signal	—	Rich/Lean
Knocking signal	Knock Signal	—	None
Crankshaft position sensor signal	Crankshaft angle signal	—	Provided
Camshaft position sensor signal	Camshaft angle signal	—	Provided
Rear defogger switch signal	Rear Defogger Switch	—	OFF input (At OFF)
Blower fan switch signal	Blower Fan Switch	—	OFF input (At OFF)
Light switch signal	Light Switch	—	OFF input (At OFF)
A/C middle pressure switch signal	A/C Mid Pressure 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
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 Permission Signal	—	Allowed (prohibited on MT vehicles)
Electronic throttle control motor relay signal	ETC Motor Relay	—	ON
Stop light switch signal	Stop Light SW	—	OFF (when OFF)
SET/COAST switch signal	SET/CST SW	—	OFF (when OFF)
RES/ACC switch signal	RES/ACC SW	—	OFF (when OFF)
Brake switch signal	Brake SW	—	OFF input (When OFF)
Main switch signal	Main SW	—	OFF input (When OFF)
Body integrated unit data reception	Body Int. Unit Data	—	ON
Body integrated unit counter update	Body Int. Unit Count	—	ON

Subaru Select Monitor

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ENGINE (DIAGNOSTICS)

Contents	Display	Unit of measure	Note (at idling)
Cruise control cancel switch signal	CC Cancel SW	—	OFF input (When OFF)
Malfunction indicator light signal	MIL On Flag	—	Off (when unlit)
Vehicle dynamics control (VDC) torque down prohibition output	Ban of Torque Down	—	Permission
Vehicle dynamics control (VDC) torque down demand	Request Torque Down VDC	—	None
Clutch switch signal	Clutch SW	—	OFF (when OFF)
Fuel temperature signal	Fuel Temp.	°C or °F	+20°C or +68°F
A/F learning 3	A/F Learning #3	%	0.00%
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig	+7.7 mmHg, +1.1 kPa, +0.31 inHg or +0.15 psig
PCV hose assembly diagnosis signal	Blow-by Leak Diagnosis Connector	—	Connected
Pressure control solenoid valve signal	PCV Solenoid Valve	—	OFF output
Drain valve signal	Vent. Solenoid Valve	—	OFF output

NOTE:

For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

5. READ CURRENT DATA FOR ENGINE (OBD MODE)

- 1) On the «Main Menu» display screen, select the {Each System Check}.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System}.
 - 3) Click the [OK] button after the information of engine type has been displayed.
 - 4) On the «Engine Diagnosis» display screen, select the {OBD System}.
 - 5) On the «OBD Menu» display screen, select the {Current Data Display & Save}.
 - 6) On the «Current Data Display & Save» display screen, select the {All 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	Referential value (at idling)	Unit of measure
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	—
Monitoring test of misfire	Misfire monitoring (Rdy)	YES	—
Monitoring test of fuel system	Fuel system monitoring (Supp)	YES	—
Monitoring test of fuel system	Fuel system monitoring (Rdy)	YES	—
Monitoring test of comprehensive component	Component monitoring (Supp)	YES	—
Monitoring test of comprehensive component	Component monitoring (Rdy)	YES	—
Test of catalyst	Catalyst Diagnosis (Supp)	YES	—
Test of catalyst	Catalyst Diagnosis (Rdy)	NO	—
Test of heating-type catalyst	Heated catalyst (Supp)	NO	—
Test of heating-type catalyst	Heated catalyst (Rdy)	N/A	—
Test of evaporative emission purge control system	Evaporative purge system (Supp)	YES	—
Test of evaporative emission purge control system	Evaporative purge system (Rdy)	NO	—
Secondary air system test	Secondary air system (Supp)	NO	—
Secondary air system test	Secondary air system (Rdy)	N/A	—
Test of air conditioning system refrigerant	A/C system refrigerant (Supp)	NO	—
Test of air conditioning system refrigerant	A/C system refrigerant (Rdy)	N/A	—
Test of oxygen sensor	Oxygen sensor (Supp)	YES	—
Test of oxygen sensor	Oxygen sensor (Rdy)	NO	—
Test of oxygen sensor heater	O2 Heater Diagnosis (Supp)	YES	—
Test of oxygen sensor heater	O2 Heater Diagnosis (Rdy)	NO	—
Test of EGR system	EGR system (Supp)	YES	—
Test of EGR system	EGR system (Rdy)	NO	—
Air fuel ratio control system for bank 1	Fuel system for Bank1	Normal CLOSE	—
Engine load data	Calculated load value	23.0	%
Engine coolant temperature signal	Coolant Temp.	92	°C
Short term fuel trim by front oxygen (A/F) sensor (Bank 1)	Short term fuel trim B1	-0.8	%
Long term fuel trim by front oxygen (A/F) sensor (Bank 1)	Long term fuel trim B1	0.0	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	211	mmHg
Engine speed signal	Engine speed	700	rpm
Vehicle speed signal	Vehicle Speed	0	km/h
#1 Cylinder ignition timing	Ignition Timing adv. #1	16.0	°
Intake air temperature signal	Intake Air Temp.	36	°C
Amount of intake air	Mass Air Flow	2.7	g/s
Throttle position signal	Throttle Opening Angle	13	%
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	0.7	V
A/F correction (Bank 1 Sensor 2)	A/F Correction #12	0.0	%
On-board diagnostic system	OBD system	OBD/OBD2	—
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	Support	—

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ENGINE (DIAGNOSTICS)

Contents	Display	Referential value (at idling)	Unit of measure
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	Support	—
Time elapsed after engine start	Time Since Engine Start	—	sec
Driving distance after the malfunction indicator light illuminates	Lighted MI lamp history	—	km
A/F lambda signal (Bank 1 Sensor 1)	A/F sensor #11	1.001	—
A/F sensor output signal (Bank 1 Sensor 1)	A/F sensor #11	2.79	V
Target EGR	Target EGR	—	%
EGR error	EGR deviation	—	%
Evaporative purge	Commanded Evap Purge	0	%
Fuel level signal	Fuel Level	—	%
Number of warm ups after DTC clear	Number of warm-ups	—	—
Driving distance after DTC clear	Meter since DTC cleared	—	km
Fuel tank pressure signal	Fuel Tank Pressure	8.8	mmHg
Atmospheric pressure signal	Atmosphere Pressure	Atmospheric pressure	mmHg
A/F lambda signal (Bank 1 Sensor 1)	A/F sensor #11	1.001	—
A/F sensor current (Bank 1 Sensor 1)	A/F sensor #11	0.00	mA
Catalyst temperature #1	Catalyst Temperature #11	—	°C
Monitoring test of misfire	Misfire monitoring (Enable)	YES	—
Monitoring test of misfire	Misfire monitoring (Comp)	NO	—
Monitoring test of fuel system	Fuel system monitoring (Enable)	YES	—
Monitoring test of fuel system	Fuel system monitoring (Comp)	NO	—
Monitoring test of comprehensive component	Component monitoring (Enable)	YES	—
Monitoring test of comprehensive component	Component monitoring (Comp)	NO	—
Test of catalyst	Catalyst Diagnosis (Enable)	YES	—
Test of catalyst	Catalyst Diagnosis (Comp)	NO	—
Test of heating-type catalyst	Heated catalyst (Enable)	N/A	—
Test of heating-type catalyst	Heated catalyst (Comp)	N/A	—
Test of evaporative emission purge control system	Evaporative purge system (Enable)	NO	—
Test of evaporative emission purge control system	Evaporative purge system (Comp)	NO	—
Secondary air system test	Secondary air system (Enable)	N/A	—
Secondary air system test	Secondary air system (Comp)	N/A	—
Test of air conditioning system refrigerant	A/C system refrigerant (Enable)	N/A	—
Test of air conditioning system refrigerant	A/C system refrigerant (Comp)	N/A	—
Test of oxygen sensor	Oxygen sensor (Enable)	YES	—
Test of oxygen sensor	Oxygen sensor (Comp)	NO	—
Test of oxygen sensor heater	O2 Heater Diagnosis (Enable)	YES	—
Test of oxygen sensor heater	O2 Heater Diagnosis (Comp)	NO	—
Test of EGR system	EGR system (Enable)	YES	—
Test of EGR system	EGR system (Comp)	NO	—
ECM power voltage	Control module voltage	13.789	V
Absolute load	Absolute Load Value	22	%
A/F ratio target lambda	Target Equivalence Ratio	0.976	—
Relative throttle opening angle	Relative Throttle Pos.	2	%
Ambient temperature	Ambient Temperature	Ambient air temperature	°C
Absolute throttle opening angle 2	Absolute Throttle Pos. #2	32	%
Absolute accelerator opening angle 1	Accelerator Pedal Pos. #1	13	%
Absolute accelerator opening angle 2	Accelerator Pedal Pos. #2	13	%

Subaru Select Monitor

ENGINE (DIAGNOSTICS)

Contents	Display	Referential value (at idling)	Unit of measure
Target throttle opening angle	Target Throt. Act. Cont.	0	%
Engine operating time while malfunction indicator lit	Time while MIL lighted	—	min
Time elapsed after DTC clear	Time since DTC cleared	—	min
Fuel used	Type of fuel	GAS	—
Relative accelerator opening angle	Relative Accelera. Pos.	0	%

NOTE:

For detailed operation procedure, refer to the "PC application help for Subaru Select Monitor".

Subaru Select Monitor

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ENGINE (DIAGNOSTICS)

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

- 1) On the «Main Menu» display screen, select the {Each System Check}.
 - 2) On the «System Selection Menu» display screen, select the {Engine Control System}.
 - 3) Click the [OK] button after the information of engine type has been displayed.
 - 4) On the «Engine Diagnosis» display screen, select the {OBD System}.
 - 5) On the «OBD Menu» display screen, select the {Freeze Frame Data Display}.
- 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	Calculated load value	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	A/F Correction Value #1	%
Long term fuel trim by front oxygen (A/F) sensor	A/F Learning Value #1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psig
Engine speed signal	Engine speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition Timing adv. #1	°
Intake air temperature signal	Intake Air Temp.	°C or °F
Amount of intake air	Mass Air Flow	g/s or lb/m
Throttle position signal	Throttle Opening Angle	%
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	V
A/F correction (Bank 1 Sensor 2)	A/F Correction #12	%
On-board diagnostic system	OBD system	—
Front oxygen (A/F) sensor (Bank 1 Sensor 1)	Oxygen sensor #11	Support
Oxygen sensor (Bank 1 Sensor 2)	Oxygen sensor #12	Support
Time elapsed after engine start	Time Since Engine Start	sec
Target EGR	Target EGR	%
EGR error	EGR deviation	%
Evaporative purge	Commanded Evap Purge	%
Fuel level signal	Fuel Level	%
Fuel tank pressure signal	Fuel Tank Pressure	mmHg, kPa, inHg or psig
Atmospheric pressure	Atmosphere Pressure	mmHg, kPa, inHg or psig
ECM power voltage	Control module voltage	V
Absolute load	Absolute Load Value	%
A/F ratio target lambda	Target Equivalence Ratio	—
Relative throttle opening angle	Relative Throttle Pos.	%
Ambient temperature	Ambient Temperature	°C or °F
Absolute throttle opening angle 2	Absolute Throttle Pos. #2	%
Absolute accelerator opening angle 1	Accelerator Pedal Pos.#1	%
Absolute accelerator opening angle 2	Accelerator Pedal Pos.#2	%
Target throttle opening angle	Target Throt. Act. Cont.	%

NOTE:

For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

7. V.I.N REGISTRATION

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

NOTE:

For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

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10. Read Diagnostic Trouble Code (DTC)

A: OPERATION

1. SUBARU SELECT MONITOR (NORMAL MODE)

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

NOTE:

- For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.
- For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4SO)(diag)-82, List of Diagnostic Trouble Code (DTC).>

2. SUBARU SELECT MONITOR (OBD MODE)

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

NOTE:

- For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.
- For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4SO)(diag)-82, 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)-82, 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)-47, Drive Cycle.>

DTC	Item	Condition
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	—
P0500	Vehicle Speed Sensor “A”	—
P0512	Starter Request Circuit	—
P0513	Incorrect Immobilizer Key	—
P0600	Serial Communication Link	—

Inspection Mode

ENGINE (DIAGNOSTICS)

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DTC	Item	Condition
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)	—
P0700	Transmission Control System (MIL Request)	—
P0851	Park/Neutral Switch Input Circuit Low	—
P0852	Park/Neutral Switch Input Circuit High	—
P1152	O2 Sensor Circuit Range/Performance (Low) (Bank1 Sensor1)	—
P1153	O2 Sensor Circuit Range/Performance (High) (Bank1 Sensor1)	—
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	—
P1560	Back-up Voltage Circuit Malfunction	—
P1570	Antenna	—
P1571	Reference Code Incompatibility	—
P1572	IMM Circuit Failure (Except Antenna Circuit)	—
P1574	KEY Communication Failure	—
P1576	EGI Control Module EEPROM	—
P1577	IMM Control Module EEPROM	—
P1578	Meter Failure	—
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 Low	—
P2229	Barometric Pressure Circuit High	—

ENGINE (DIAGNOSTICS)

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:

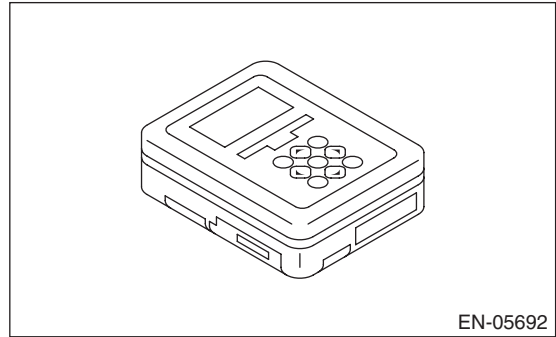
- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a rigid rack.
- Secure a rope or wire to the front or rear towing hooks to prevent the lateral runout of front wheels.
- Before rotating the wheels, make sure that there is no one in front of the vehicle. Besides while the wheels are rotating, make sure that no one approaches the vehicle front side.
- Make sure that there is nothing around the wheels. For AWD model, pay special attention to all four wheels.
- While servicing, do not depress or release the clutch pedal or accelerator pedal quickly regardless of the engine speed. Quick operation may cause the vehicle to drop off the free roller.
- To prevent the vehicle from slipping due to vibration, do not place anything between rigid rack and the vehicle.

2. SUBARU SELECT MONITOR

1) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)(diag)-52, 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) Prepare the personal computer which has been installed the Subaru Select Monitor.

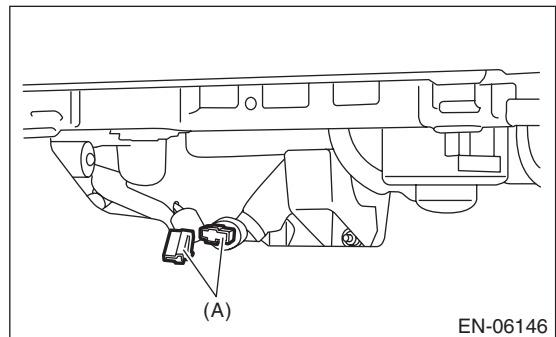
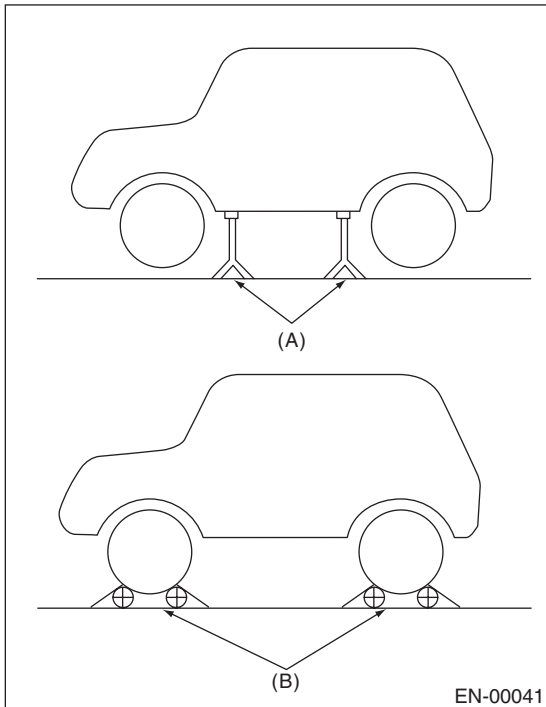
5) Connect the USB cable between SDI (Subaru Diagnosis Interface) and USB port on the personal computer (dedicated port for the Subaru Select Monitor).

NOTE:

The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

6) Connect the diagnosis cable to the SDI.

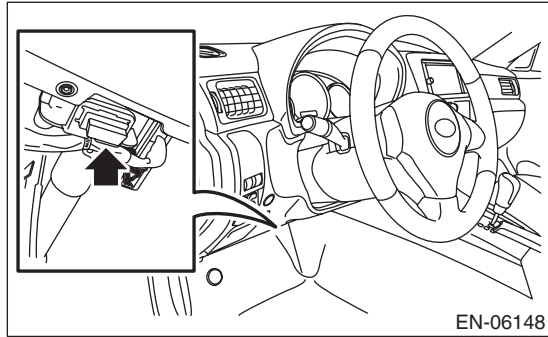
7) Connect the delivery (test) mode connector (A) located under the glove box.



- (A) Rigid racks
- (B) Free rollers

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8) Connect the SDI to data link connector located in the lower portion of the instrument panel (on the driver's side).



CAUTION:

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

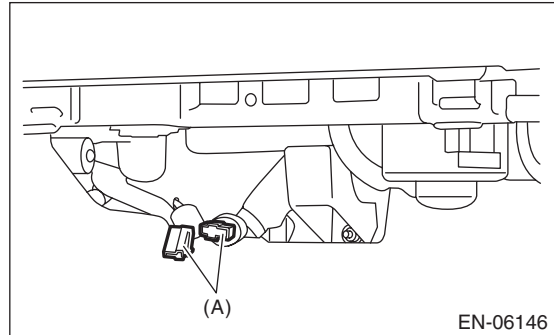
- 9) Start up the personal computer.
- 10) Turn the ignition switch to ON (engine OFF), and run the "PC application for Subaru Select Monitor".
- 11) On the «Main Menu» display screen, select the {Each System Check}.
- 12) On the «System Selection Menu» display screen, select the {Engine Control System}.
- 13) Click the [OK] button after the information of engine type has been displayed.
- 14) On the «Engine Diagnosis» display screen, select the {D Check}.
- 15) When the «Perform Inspection (Dealer Check) Mode» is shown on the screen, click the [Next] button.
- 16) 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 "PC application help for Subaru Select Monitor".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
 <Ref. to EN(H4SO)(diag)-82, 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 does not indicate a malfunction. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function. <Ref. to ABS(diag)-23, Clear Memory Mode.>

3. GENERAL SCAN TOOL

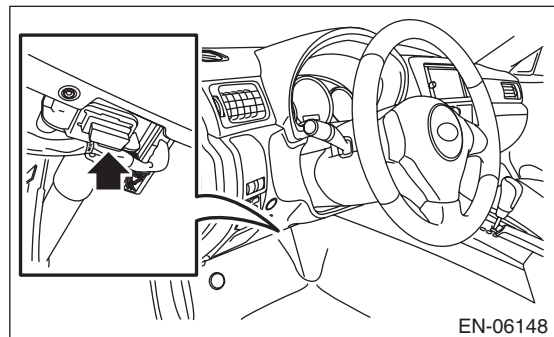
- 1) After performing the diagnostics and clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.>
- 2) Warm-up the engine.
- 3) Connect the delivery (test) mode connector (A) located under the glove box.



4) Connect the general scan tool to data link connector located in the lower portion of the instrument panel (on the driver's side).

CAUTION:

Do not connect the scan tools except for Subaru Select Monitor and 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) Turn the neutral position switch to ON using select lever or shift lever.
 - 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.

ENGINE (DIAGNOSTICS)

9) Place the select lever or shift lever in D position (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. <Ref. to ABS(diag)-23, Clear Memory Mode.>

10) Using the general scan tool, check DTC and record the result(s).

NOTE:

- For detailed operation procedures, 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)-82, List of Diagnostic Trouble Code (DTC).>

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12. Drive Cycle

A: PROCEDURE

For the troubleshooting, there are driving patterns described below. 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 performing the diagnostics and clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.>
- 3) Disconnect the delivery (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 if the DTC marked with *. After completing the first diagnosis, stop the engine and perform second diagnosis in same condition.

2. DRIVE CYCLE A — DRIVE THE VEHICLE WITH 80 KM/H (50 MPH) FOR 20 MINUTES, AND THEN IDLE THE ENGINE FOR A 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	O2 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 30°C (86°F).
*P0451	Evaporative Emission Control System Pressure Sensor	—
*P0456	Evaporative Emission Control System Leak Detected (Very Small Leak)	Engine coolant temperature at engine start is less than 30°C (86°F).
*P0457	Evaporative Emission Control System Leak Detected (Fuel Cap Loose/Off)	Engine coolant temperature at engine start is less than 30°C (86°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.

Drive Cycle

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ENGINE (DIAGNOSTICS)

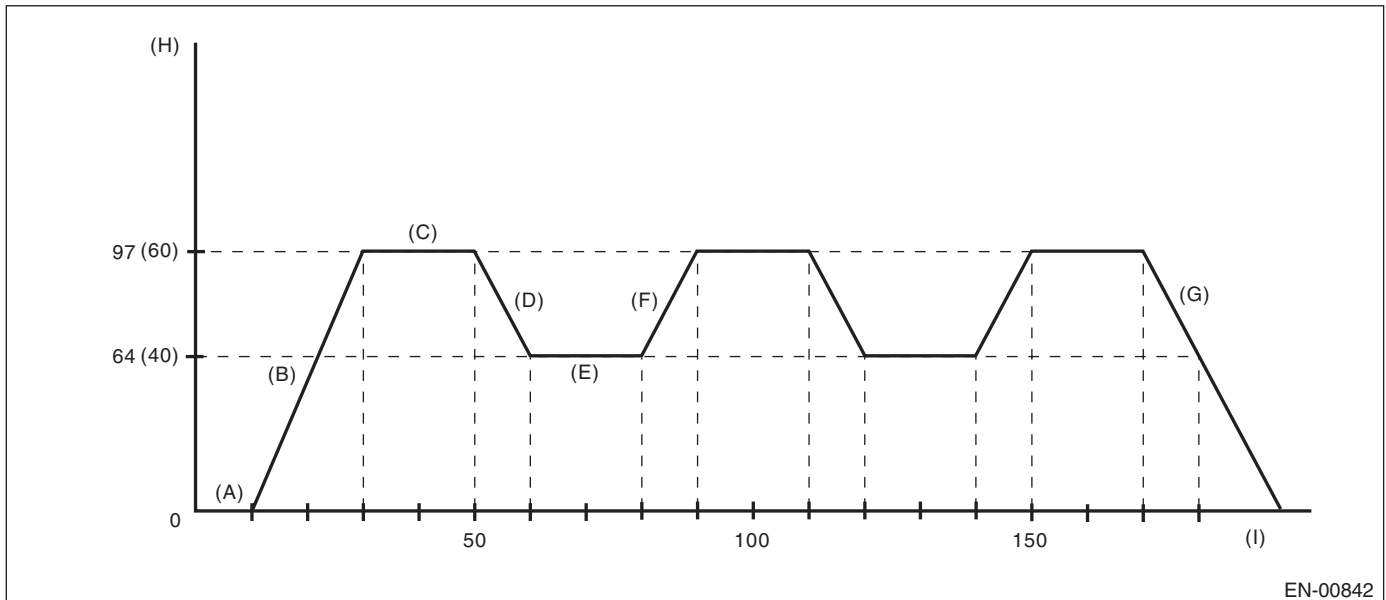
3. DRIVE CYCLE B — 10 MINUTES IDLING

NOTE:

Drive the vehicle at 10 km/h (6 MPH) or more 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	—
*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



EN-00842

- | | | |
|---|--|--|
| (A) Idle the engine for 10 seconds or more. | (D) Decelerate with fully closed throttle to 64 km/h (40 MPH). | (G) Stop vehicle with the throttle fully closed. |
| (B) Accelerate to 97 km/h (60 MPH) within 20 seconds. | (E) Drive the vehicle at 64 km/h (40 MPH) for 20 seconds. | (H) Vehicle speed km/h (MPH) |
| (C) Drive the vehicle at 97 km/h (60 MPH) for 20 seconds. | (F) Accelerate to 97 km/h (60 MPH) within 10 seconds. | (I) Sec. |

Drive Cycle

ENGINE (DIAGNOSTICS)

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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	O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	—
*P0139	O2 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.

Drive Cycle

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ENGINE (DIAGNOSTICS)

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 10 ℓ (2.6 US gal, 2.2 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)-52, 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)-52, 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	—

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8. DRIVE CYCLE H

- 1) Perform the Clear Memory Mode. <Ref. to EN(H4SO)(diag)-52, 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)-34, 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:

- |Engine coolant temperature — Intake air temperature| ≤ 5°C (41°F)***
- |Engine coolant temperature — Fuel temperature| ≤ 2°C (36°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 the {Each System Check}.
- 2) On the «System Selection Menu» display screen, select the {Engine Control System}.
- 3) Click the [OK] button after the information of engine type has been displayed.
- 4) On the «Engine Diagnosis» display screen, select the {Clear Memory}.
- 5) When the “Clear Memory?” is shown on the screen, click the [Yes] button.
- 6) When “Done” and “Turn ignition switch to OFF” is shown on the display screen, turn the ignition switch to OFF.

NOTE:

- Initial diagnosis of electronic throttle control is performed after memory clearance. Therefore, start the engine 10 seconds or more after turning the ignition switch to ON.
- For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

2. SUBARU SELECT MONITOR (OBD MODE)

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

NOTE:

- Initial diagnosis of electronic throttle control is performed after memory clearance. Therefore, start the engine 10 seconds or more after turning the ignition switch to ON.
- For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

3. GENERAL SCAN TOOL

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

NOTE:

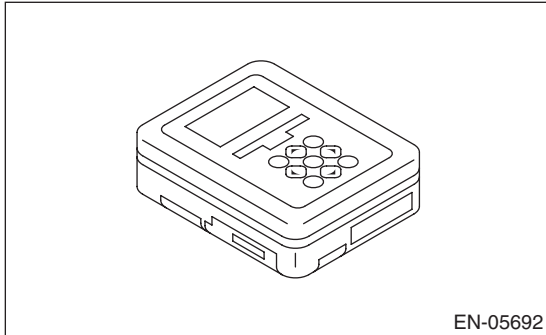
Initial diagnosis of electronic throttle control is performed after memory clearance. For this reason, start the engine after 10 seconds or more have elapsed since the ignition switch was turned to ON.

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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) Prepare the personal computer which has been installed the Subaru Select Monitor.

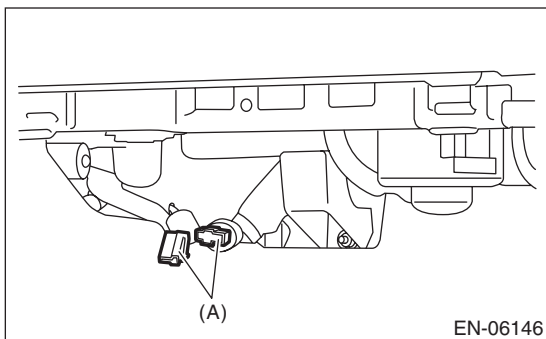
3) Connect the USB cable between SDI (Subaru Diagnosis Interface) and USB port on the personal computer (dedicated port for the Subaru Select Monitor).

NOTE:

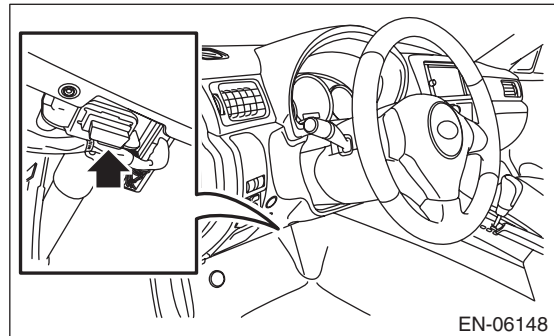
The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4) Connect the diagnosis cable to the SDI.

5) Connect the delivery (test) mode connector (A) located under the glove box.



6) Connect the SDI to data link connector located in the lower portion of the instrument panel (on the driver's side).



CAUTION:

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

7) Start up the personal computer.

8) Turn the ignition switch to ON (engine OFF), and run the "PC application for Subaru Select Monitor".

9) On the «Main Menu» display screen, select the {Each System Check}.

10) On the «System Selection Menu» display screen, select the {Engine Control System}.

11) Click the [OK] button after the information of engine type has been displayed.

12) On the «Engine Diagnosis» display screen, select the {System Operation Check Mode}.

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

14) Select the desired compulsory actuator on the «Actuator ON/OFF Operation» display screen and click the [Next] button.

Compulsory Valve Operation Check Mode

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ENGINE (DIAGNOSTICS)

15) Clicking the [End] button completes 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.

Description	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 drain 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 Valve
Tank Sensor Cntl Valve
Turbocharger Wastegate Solenoid
EXH. Bypass Control Permit Flag
Secondary Air Combination Valve 1

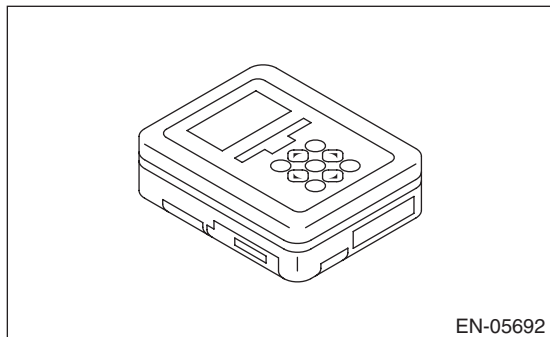
- For detailed operation procedure, refer to the “PC application help for Subaru Select Monitor”.

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15. System Operation Check Mode

A: OPERATION

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



EN-05692

2) Prepare the personal computer which has been installed the Subaru Select Monitor.

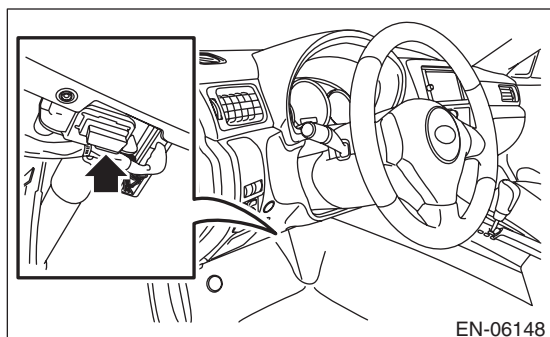
3) Connect the USB cable between SDI (Subaru Diagnosis Interface) and USB port on the personal computer (dedicated port for the Subaru Select Monitor).

NOTE:

The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4) Connect the diagnosis cable to the SDI.

5) Connect the SDI to data link connector located in the lower portion of the instrument panel (on the driver's side).



EN-06148

CAUTION:

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

6) Start up the personal computer.

7) Turn the ignition switch to ON (engine OFF), and run the "PC application for Subaru Select Monitor".

8) On the «Main Menu» display screen, select the {Each System Check}.

9) On the «System Selection Menu» display screen, select the {Engine Control System}.

10) Click the [OK] button after the information of engine type has been displayed.

11) On the «Engine Diagnosis» display screen, select the {System Operation Check Mode}.

12) The following items will be displayed on screen.

Display
Actuator ON/OFF Operation
Immobilizer System
Fuel Pump Control
Fixed Idle Ignition Timing
Idle Speed Control
Injector Control
EGR Valve Control

1. FUEL PUMP CONTROL (OFF DRIVE)

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>

1) On the «System Operation Check Mode» display, select the {Fuel Pump Control}.

2) On the «Fuel Pump Control» display screen, select the {OFF Operation}.

3) On the «Start the Engine» display screen, start the engine and click the [OK] button.

4) Click the [Cancel] button to end the OFF drive. The screen will return to the «Fuel Pump Control» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

2. FUEL PUMP CONTROL (ON/OFF DRIVE)

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>

1) On the «System Operation Check Mode» display, select the {Fuel Pump Control}.

2) On the «Fuel Pump Control» display screen, select the {ON/OFF Operation}.

3) On the «Turn Ignition Switch ON with Engine Stalled» display screen, turn the ignition switch to ON and click the [OK] button.

4) Click the [Cancel] button to end the ON/OFF drive. The screen will return to the «Fuel Pump Control» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

3. IDLING IGNITION TIMING FIXED

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>.

- 1) On the «System Operation Check Mode» display screen, select the {Idling Ignition Timing Fixed}.
- 2) On the «Start the Engine» display screen, start the engine and click the [OK] button.
- 3) Click the [Cancel] button to end the idle ignition timing fixed. The screen will return to the «System Operation Check Mode» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

4. IDLE SPEED CONTROL

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>.

- 1) On the «System Operation Check Mode» display screen, select the {Idle Speed Control}.
- 2) On the «Start the Engine» display screen, start the engine and click the [OK] button.
- 3) In the «Idle Engine Speed Control» screen, click the [△] button or the [▽] button to change the setting values, then click the [OK] button.
Setting is possible in a range between 500 rpm — 2,000 rpm, in increments of 50 rpm. However, the engine speed that can actually be controlled will vary depending on the vehicle.
- 4) Click the [Cancel] button to end the idle speed control. The screen will return to the «System Operation Check Mode» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

5. INJECTOR CONTROL. (INJECTION STOP MODE)

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>.

- 1) On the «System Operation Check Mode» display, select the {Injector Control}.
- 2) On the «Injector Control» display screen, select the {Injection Stop Mode}.
- 3) Select the desired injector number on the «Injection Stop Mode» screen, and click the [OK] button.
- 4) On the «Start the Engine» display screen, start the engine and click the [OK] button.
- 5) Click the [Cancel] button to return the «Injection Stop Mode» display screen.
- 6) On the «Injection Stop Mode» display screen, click the [Return] button to end the «Injection Stop Mode». The screen will return to the «Injector Control» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

6. INJECTOR CONTROL. (INJECTION QUANTITY CONTROL)

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>.

- 1) On the «System Operation Check Mode» display, select the {Injector Control}.
- 2) On the «Injector Control» display screen, select the {Injection Quantity Control}.
- 3) On the «Start the Engine» display screen, start the engine and click the [OK] button.
- 4) In the «Injection Quantity Control» screen, click the [△] button or the [▽] button to change the setting values, then click the [OK] button.
Setting is possible in a range between 0 — 20%, in increments of 1%.
- 5) Click the [Cancel] button to end the injection quantity control. The screen will return to the «Injector Control» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

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7. EGR VALVE CONTROL

CAUTION:

After executing the operation check mode, execute the Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.>.

- 1) On the «System Operation Check Mode» display, select the {EGR Valve Control}.
- 2) On the «Start the Engine» display screen, start the engine and click the [OK] button.
- 3) In the «EGR Valve Control» screen, click the [△] button or the [▽] button to change the setting values, then click the [OK] button.

Setting is possible in 1 STEP increments. However, the number of STEPs that can actually be controlled will vary depending on the vehicle.

- 4) Click the [Cancel] button to end the EGR valve control. The screen will return to the «System Operation Check Mode» screen.

NOTE:

For detailed operation procedure, refer to the «PC application help for Subaru Select Monitor».

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

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16. Malfunction Indicator Light

A: PROCEDURE

1. Activation of malfunction indicator light. <Ref. to EN(H4SO)(diag)-59, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.>
↓
2. Malfunction indicator light does not come on. <Ref. to EN(H4SO)(diag)-60, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
↓
3. Malfunction indicator light does not go off. <Ref. to EN(H4SO)(diag)-62, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF, Malfunction Indicator Light.>
↓
4. Malfunction indicator light does not blink. <Ref. to EN(H4SO)(diag)-63, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK, Malfunction Indicator Light.>
↓
5. Malfunction indicator light remains blinking. <Ref. to EN(H4SO)(diag)-65, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING, Malfunction Indicator Light.>

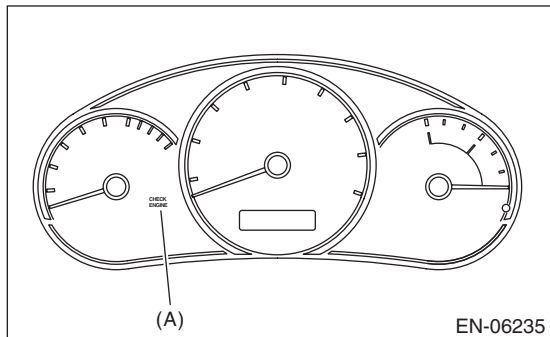
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B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

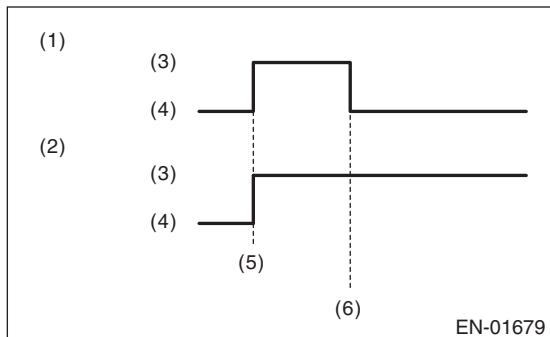
1) When the ignition switch is turned to ON (engine OFF), the malfunction indicator light (A) in the combination meter illuminates.

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)-60, 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.



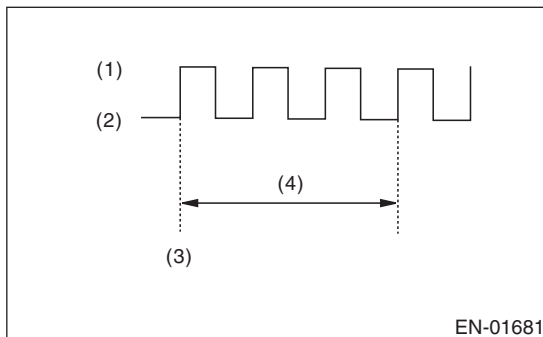
- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

3) Turn the ignition switch to OFF and connect the delivery (test) mode connector.

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

(2) After the engine starts, malfunction indicator light blinks in a cycle of 0.5 Hz. (During diagnosis)

(3) Malfunction indicator light blinks at a cycle of 3 Hz after diagnosis if there is no trouble. Malfunction indicator light illuminates if faulty.



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

Malfunction Indicator Light

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ENGINE (DIAGNOSTICS)

C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

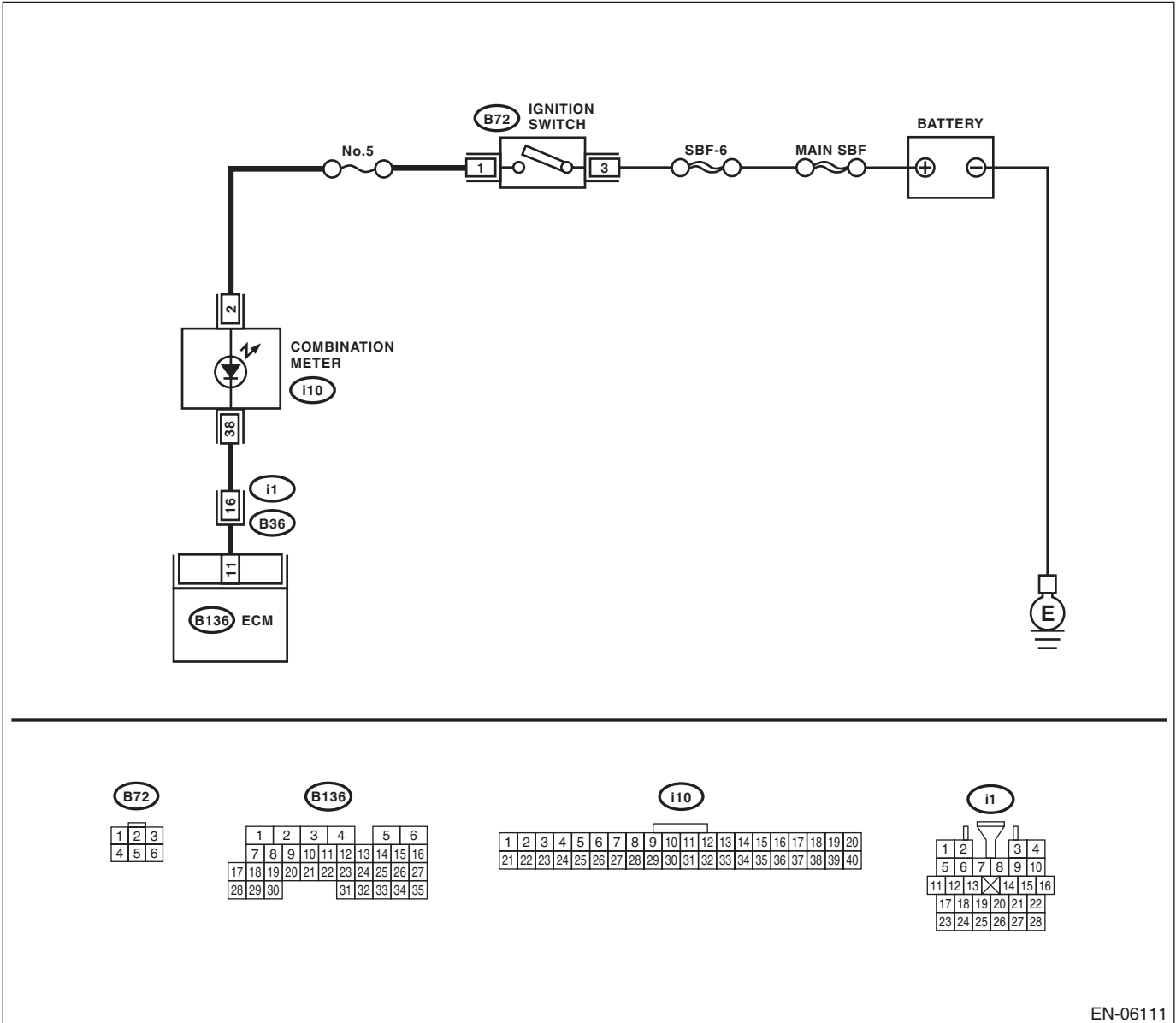
DIAGNOSIS:

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)

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	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. Connector & terminal (B136) No. 11 (+) — Chassis ground (-):	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-14, Combination Meter.> 3) Disconnect the connector from ECM and combination meter. 4) Measure the resistance of harness between ECM and combination meter connector. Connector & terminal (B136) No. 11 — (i10) No. 38:	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 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. Connector & terminal (i10) No. 2 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Replace the combination meter circuit board. <Ref. to IDI-14, Combination Meter.>	Check the following item and repair if necessary. NOTE: • Blown out of fuse (No. 5) • Open or short circuit in harness between fuse (No. 5) and battery terminal • Poor contact of ignition switch connector

Malfunction Indicator Light

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ENGINE (DIAGNOSTICS)

D: MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

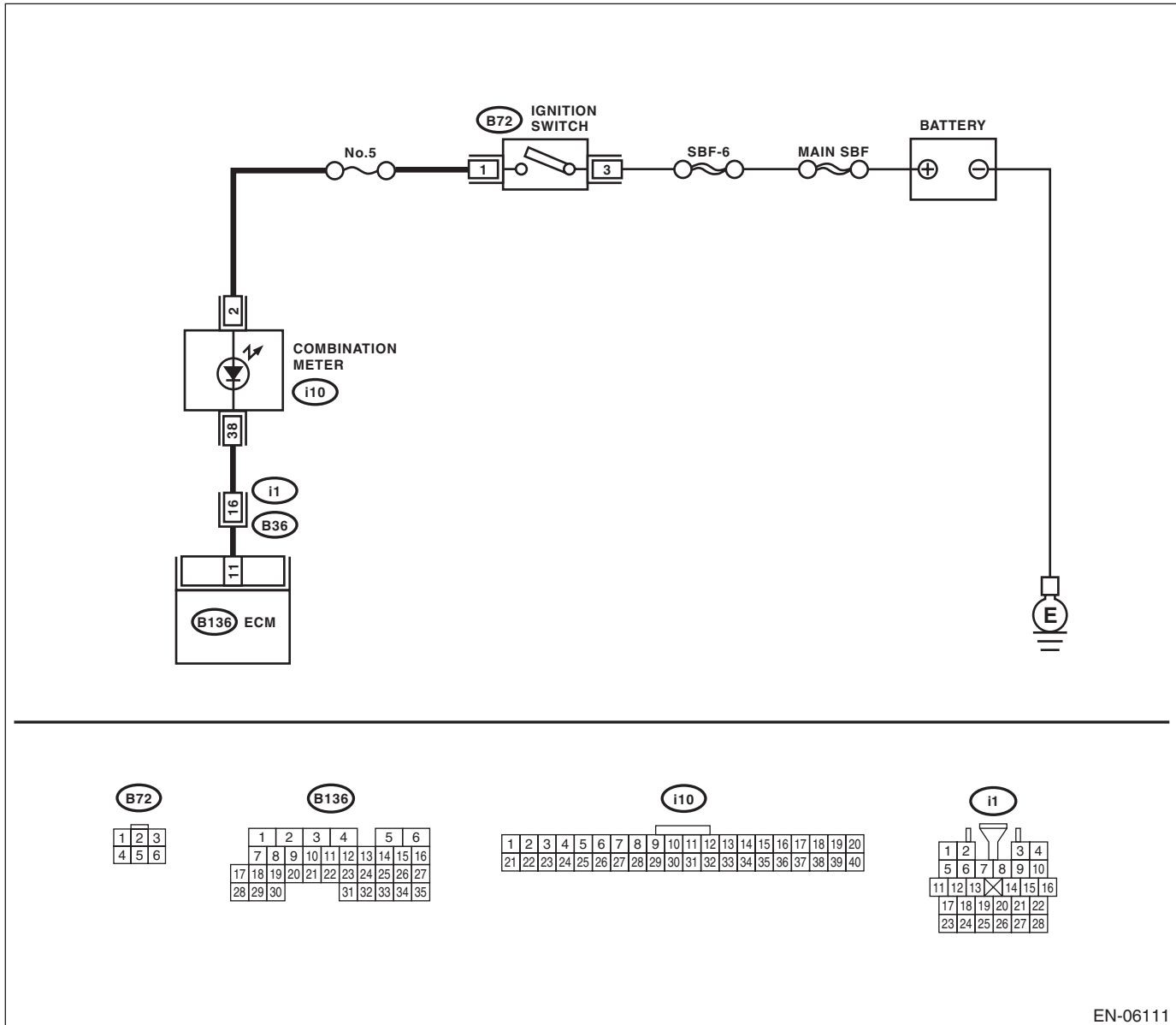
DIAGNOSIS:

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 display.

WIRING DIAGRAM:



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 ground 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

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E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK

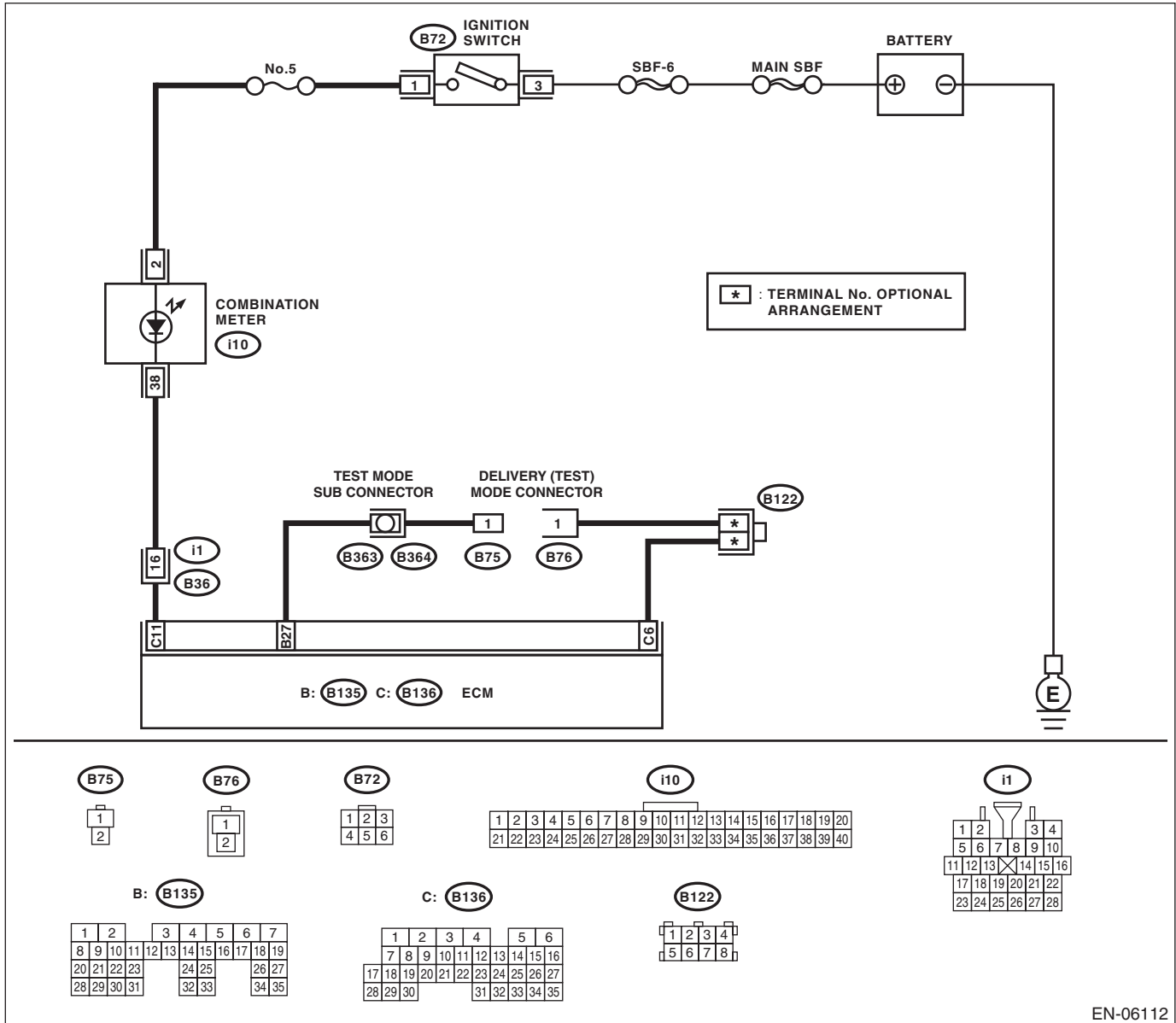
DIAGNOSIS:

- The malfunction indicator light circuit is open or shorted.
- The delivery (test) mode connector circuit is open.

TROUBLE SYMPTOM:

Malfunction indicator light does not blink during Inspection Mode.

WIRING DIAGRAM:



EN-06112

Malfunction Indicator Light

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT. 1) Turn the ignition switch to OFF. 2) Disconnect the delivery (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)-60, 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 ground short circuit of harness between ECM and combination meter connector.	Go to step 3.
3 CHECK HARNESS BETWEEN DELIVERY (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 delivery (test) mode connector and ECM. Connector & terminal (B76) No. 1 — (B136) No. 6:	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 delivery (test) mode connector • Poor contact of joint connector
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 DELIVERY (TEST) MODE CONNECTOR. 1) Connect the delivery (test) mode connector. 2) Measure the resistance of harness between ECM terminals. Connector & terminal (B135) No. 27 — (B136) No. 6:	Is the resistance less than 1 Ω?	Go to step 6.	Repair the open circuit of harness between ECM and delivery (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).>

F: MALFUNCTION INDICATOR LIGHT REMAINS BLINKING

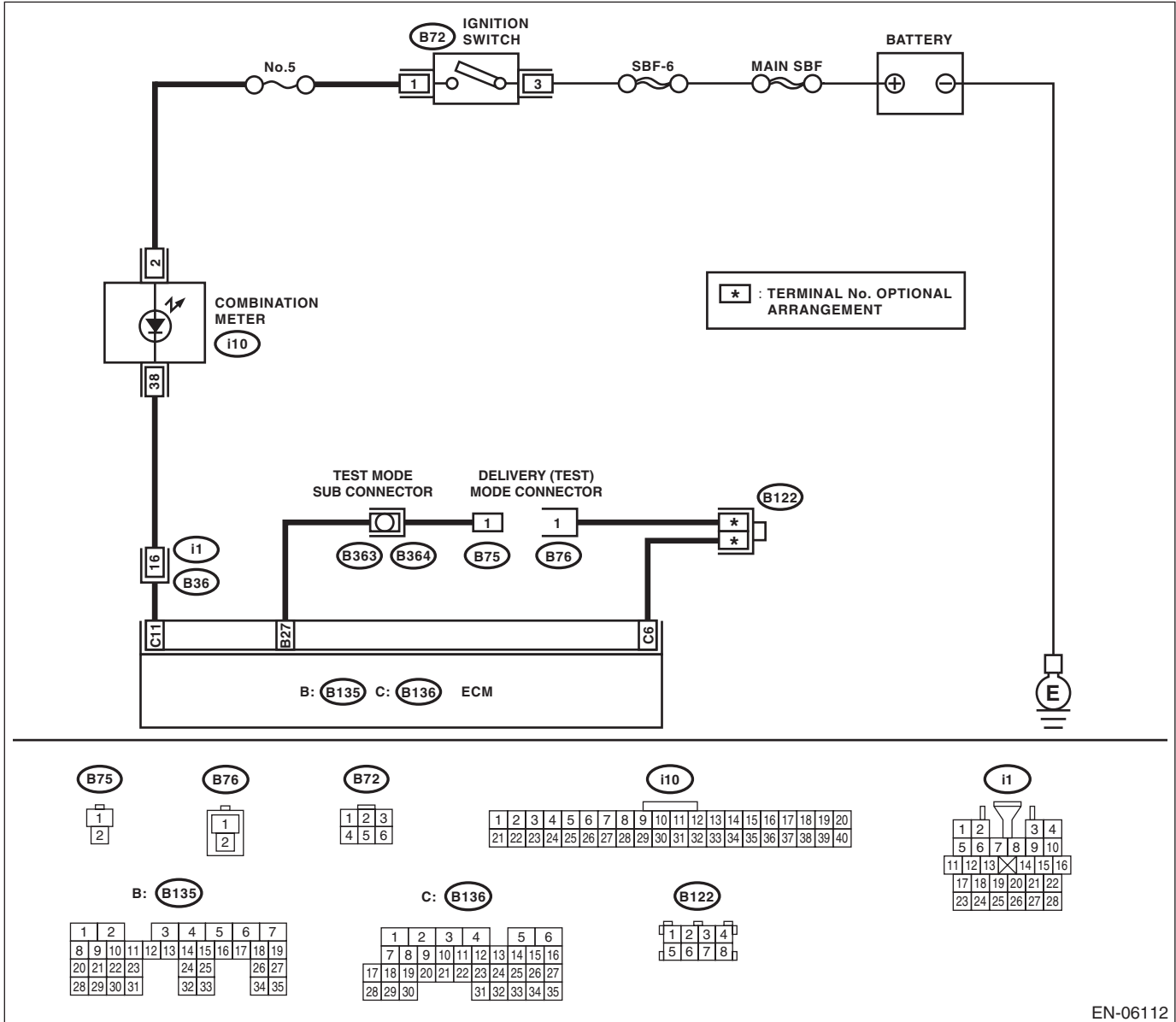
DIAGNOSIS:

The delivery (test) mode connector circuit is shorted.

TROUBLE SYMPTOM:

Malfunction indicator light blinks when delivery (test) mode connector is not connected.

WIRING DIAGRAM:



Malfunction Indicator Light

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ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	CHECK DELIVERY (TEST) MODE CONNECTOR. 1) Disconnect the delivery (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 when delivery (test) mode connector is connected.
2	CHECK HARNESS BETWEEN ECM AND CHASSIS GROUND. 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. 27 — Chassis ground:	Is the resistance less than 5 Ω?	Repair the short circuit to ground in harness between ECM and delivery (test) mode connector.	Replace the ECM. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

17. Diagnostics for Engine Starting Failure

A: PROCEDURE

1. Check of the fuel amount
↓
2. Inspection of starter motor circuit. <Ref. to EN(H4SO)(diag)-68, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ECM power supply and ground line. <Ref. to EN(H4SO)(diag)-72, 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)-74, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel pump circuit. <Ref. to EN(H4SO)(diag)-77, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
6. Inspection of fuel injector circuit. <Ref. to EN(H4SO)(diag)-80, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

Diagnostics for Engine Starting Failure

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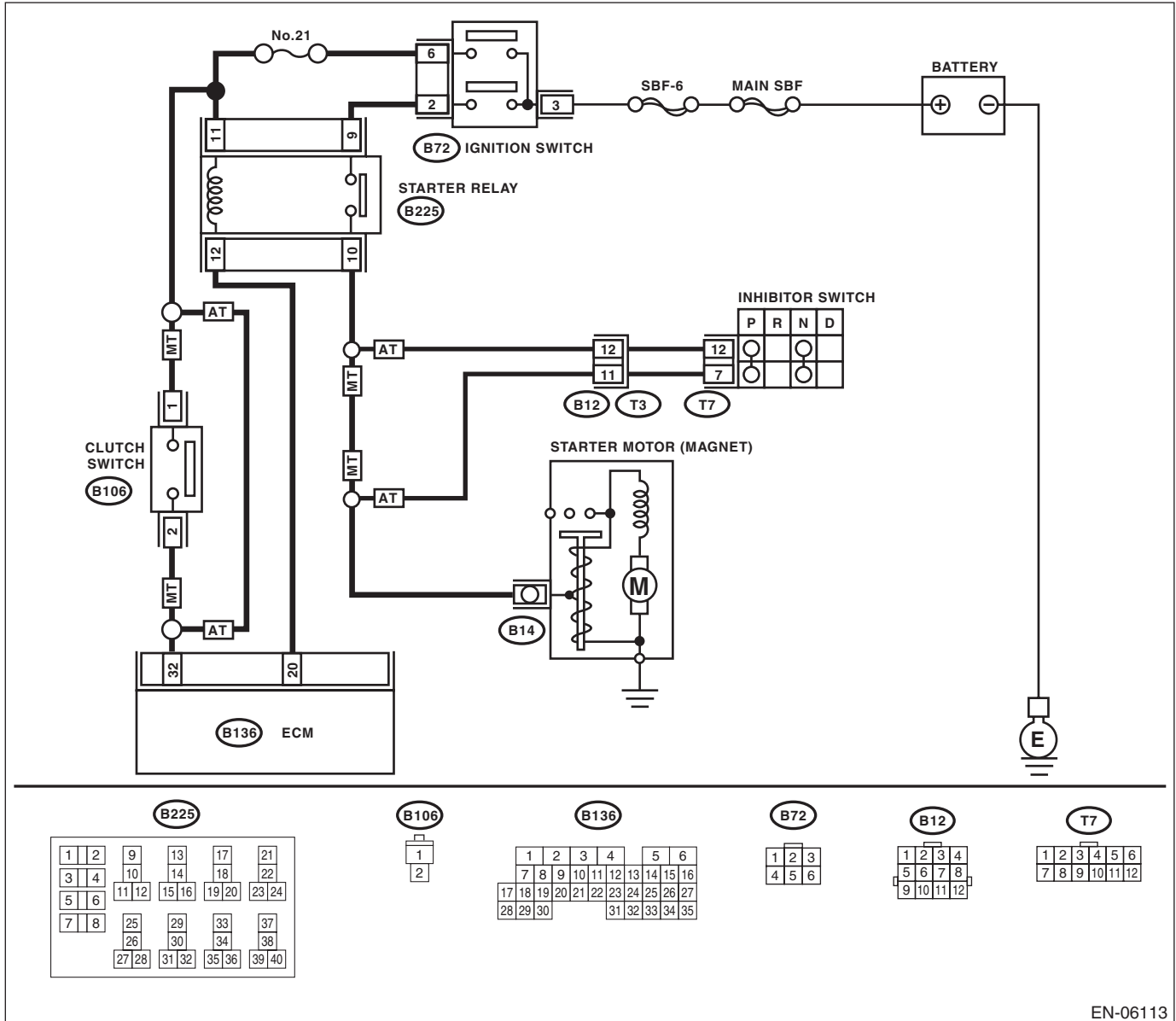
ENGINE (DIAGNOSTICS)

B: STARTER MOTOR CIRCUIT

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, Inspection Mode.>.

WIRING DIAGRAM:



EN-06113

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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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)-41, OPERATION, Read Diagnostic Trouble Code (DTC).>	Check the appropriate DTC using the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)(diag)-82, List of Diagnostic Trouble Code (DTC).>	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. NOTE: In this case, there may be a temporary connector contact failure.
4	CHECK INPUT SIGNAL FOR STARTER MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter motor. 3) On AT models, set the select lever to the "P" range or "N" range, and on MT models, depress the clutch pedal. 4) Turn the ignition switch to START. 5) Measure the voltage between the starter motor connector and the engine ground. Connector & terminal (B14) No. 1 (+) — Engine ground (-):	Is the voltage 10 V or more?	Check the starter motor. <Ref. to SC(H4SO)-6, Starter.>	Go to step 5.
5	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition switch. 3) Measure the voltage between ignition switch connector and chassis ground. Connector & terminal (B72) No. 3 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 6.	Check the following item and repair if necessary. • Blown out of fuse • Open or ground short circuit of harness between ignition switch connector and battery
6	CHECK IGNITION SWITCH. Measure the resistance between ignition switch terminals after turning the ignition switch to START position. Terminals No. 3 — No. 2: No. 3 — No. 6:	Is the resistance less than 1 Ω?	Go to step 7.	Replace the ignition switch. <Ref. to SL-45, REPLACEMENT, Ignition Key Lock.>
7	CHECK INPUT VOLTAGE OF STARTER RELAY. 1) Remove the starter relay. 2) Connect the connector to ignition switch. 3) Measure the voltage between starter relay connector and chassis ground after turning the ignition switch to START position. Connector & terminal (B225) No. 9 (+) — Chassis ground (-): (B225) No. 11 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Go to step 8.	Repair open circuit or short circuit to ground in harness between starter relay connector and ignition switch.

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
8 CHECK STARTER RELAY. 1) Connect the battery to starter relay terminals No. 11 and No. 12. 2) Measure the resistance between starter relay terminals. <i>Terminals</i> <i>No. 9 — No. 10:</i>	Is the resistance less than 1 Ω ?	Go to step 9.	Replace the starter relay.
9 CHECK HARNESS BETWEEN ECM AND STARTER RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and starter relay connector. <i>Connector & terminal</i> <i>(B136) No. 20 — (B225) No. 12:</i>	Is the resistance less than 1 Ω ?	Go to step 10.	Repair the open circuit of harness between ECM and starter relay connector.
10 CHECK TRANSMISSION TYPE.	Is the transmission type AT?	Go to step 11.	Go to step 15.
11 CHECK ECM INPUT VOLTAGE. 1) Turn the ignition switch to START. 2) Measure the input voltage between ECM connector and chassis ground. <i>Connector & terminal</i> <i>(B136) No. 32 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Go to step 12.	Repair the open circuit in harness between ECM and ignition switch connector.
12 CHECK HARNESS BETWEEN STARTER RELAY AND INHIBITOR SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from inhibitor switch. 3) Measure the resistance of harness between starter relay connector and inhibitor relay connector. <i>Connector & terminal</i> <i>(B225) No. 10 — (T7) No. 12:</i>	Is the resistance less than 1 Ω ?	Go to step 13.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between starter relay connector and inhibitor switch connector • Poor contact of coupling connector
13 CHECK HARNESS BETWEEN INHIBITOR SWITCH AND STARTER MOTOR. Measure the resistance of harness between the inhibitor switch connector and starter motor. <i>Connector & terminal</i> <i>(T7) No. 7 — (B14) No. 1:</i>	Is the resistance less than 1 Ω ?	Go to step 14.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between inhibitor switch connector and starter motor • Poor contact of coupling connector
14 CHECK INHIBITOR SWITCH. 1) Place the select lever in other than "P" range and "N" range. 2) Measure the resistance between inhibitor switch terminals. <i>Terminals</i> <i>No. 7 — No. 12:</i>	Is the resistance 1 M Ω or more?	Check the ECM power supply and ground line. <Ref. to EN(H4SO)(diag)-72, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Replace the inhibitor switch. <Ref. to 4AT-47, Inhibitor Switch.>

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
15 CHECK HARNESS BETWEEN IGNITION SWITCH AND CLUTCH SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from clutch switch. 3) Turn the ignition switch to START. 4) Measure the voltage between the clutch switch connector and chassis ground. <i>Connector & terminal</i> <i>(B106) No. 1 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Go to step 16.	Repair the open circuit in harness between ignition switch connector and clutch switch connector.
16 CHECK CLUTCH SWITCH. Measure the resistance between clutch switch terminals while depressing the clutch. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance less than 1 Ω ?	Go to step 17.	Replace the clutch switch. <Ref. to CL-26, Clutch Switch.>
17 CHECK HARNESS BETWEEN ECM AND CLUTCH SWITCH. Measure the resistance of harness between ECM and clutch switch connector. <i>Connector & terminal</i> <i>(B136) No. 32 — (B106) No. 2:</i>	Is the resistance less than 1 Ω ?	Go to step 18.	Repair the open circuit of harness between ECM and clutch switch connector.
18 CHECK HARNESS BETWEEN STARTER RELAY AND STARTER MOTOR. Measure the resistance of harness between starter relay connector and starter motor. <i>Connector & terminal</i> <i>(B225) No. 10 — (B14) No. 1:</i>	Is the resistance less than 1 Ω ?	Check the ECM power supply and ground line. <Ref. to EN(H4SO)(diag)-72, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Repair the open circuit of the harness between starter relay connector and starter motor.

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

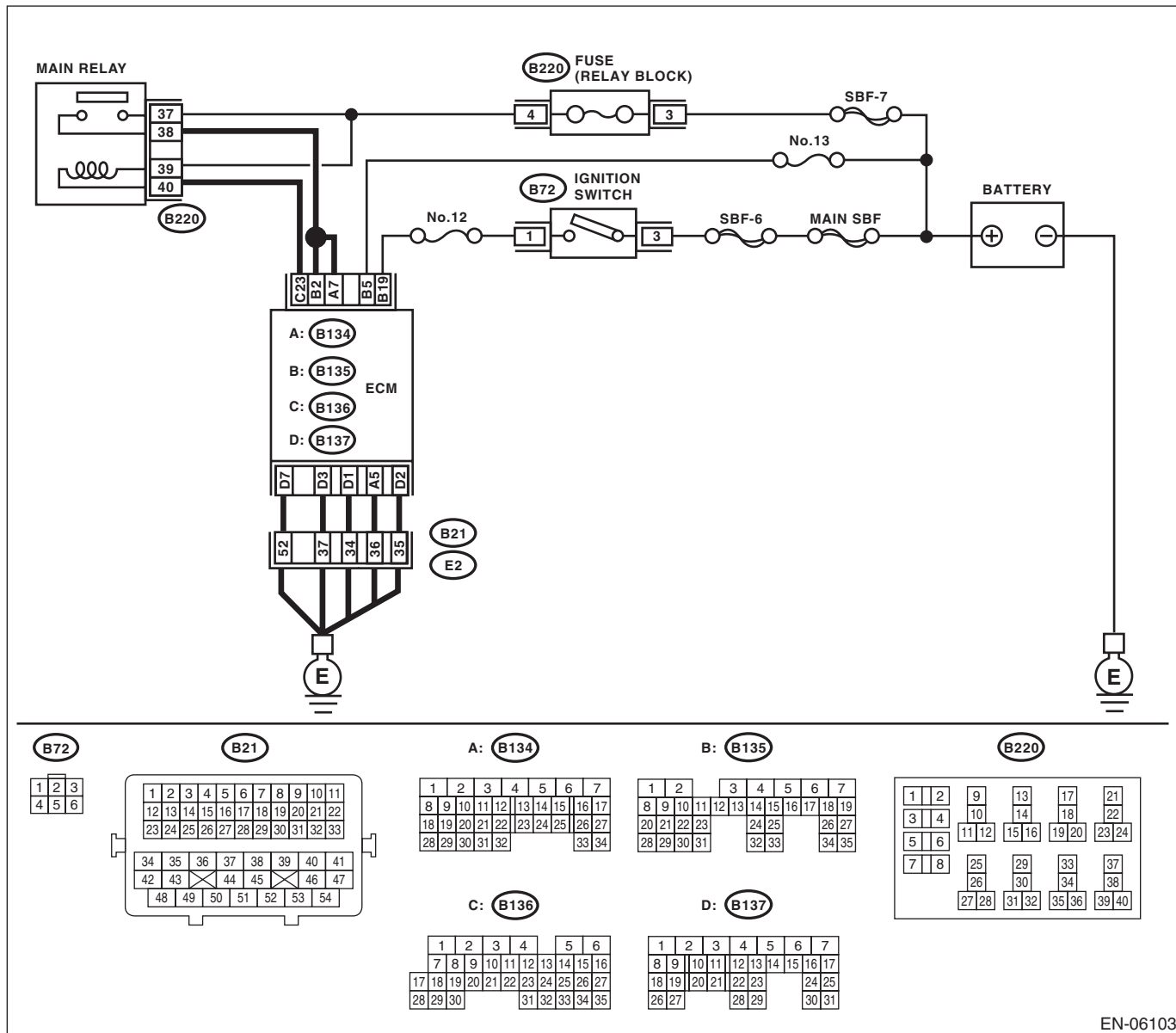
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C: CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06103

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>CHECK MAIN RELAY.</p> <p>1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Connect the battery to main relay terminals No. 39 and No. 40. 4) Measure the resistance between main relay terminals.</p> <p>Terminals No. 37 — No. 38:</p>	Is the resistance less than 1 Ω?	Go to step 2.	Replace the main relay.
2	<p>CHECK GROUND CIRCUIT FOR ECM.</p> <p>1) Disconnect the connectors from the ECM. 2) 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 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 in harness between ECM connector and engine ground • Poor contact of coupling connector
3	<p>CHECK INPUT VOLTAGE OF ECM.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground.</p> <p>Connector & terminal (B135) No. 5 (+) — Chassis ground (-): (B135) No. 19 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Go to step 4.	Repair the open or ground short circuit of power supply circuit.
4	<p>CHECK INPUT VOLTAGE OF MAIN RELAY.</p> <p>Measure the voltage between main relay connector and chassis ground.</p> <p>Connector & terminal (B220) No. 37 (+) — Chassis ground (-): (B220) No. 39 (+) — Chassis ground (-):</p>	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	<p>CHECK INPUT VOLTAGE OF ECM.</p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground.</p> <p>Connector & terminal (B134) No. 7 (+) — Chassis ground (-): (B135) No. 2 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Check ignition control system. <Ref. to EN(H4SO)(diag)-74, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair the open circuit of harness between ECM connector and main relay connector.

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

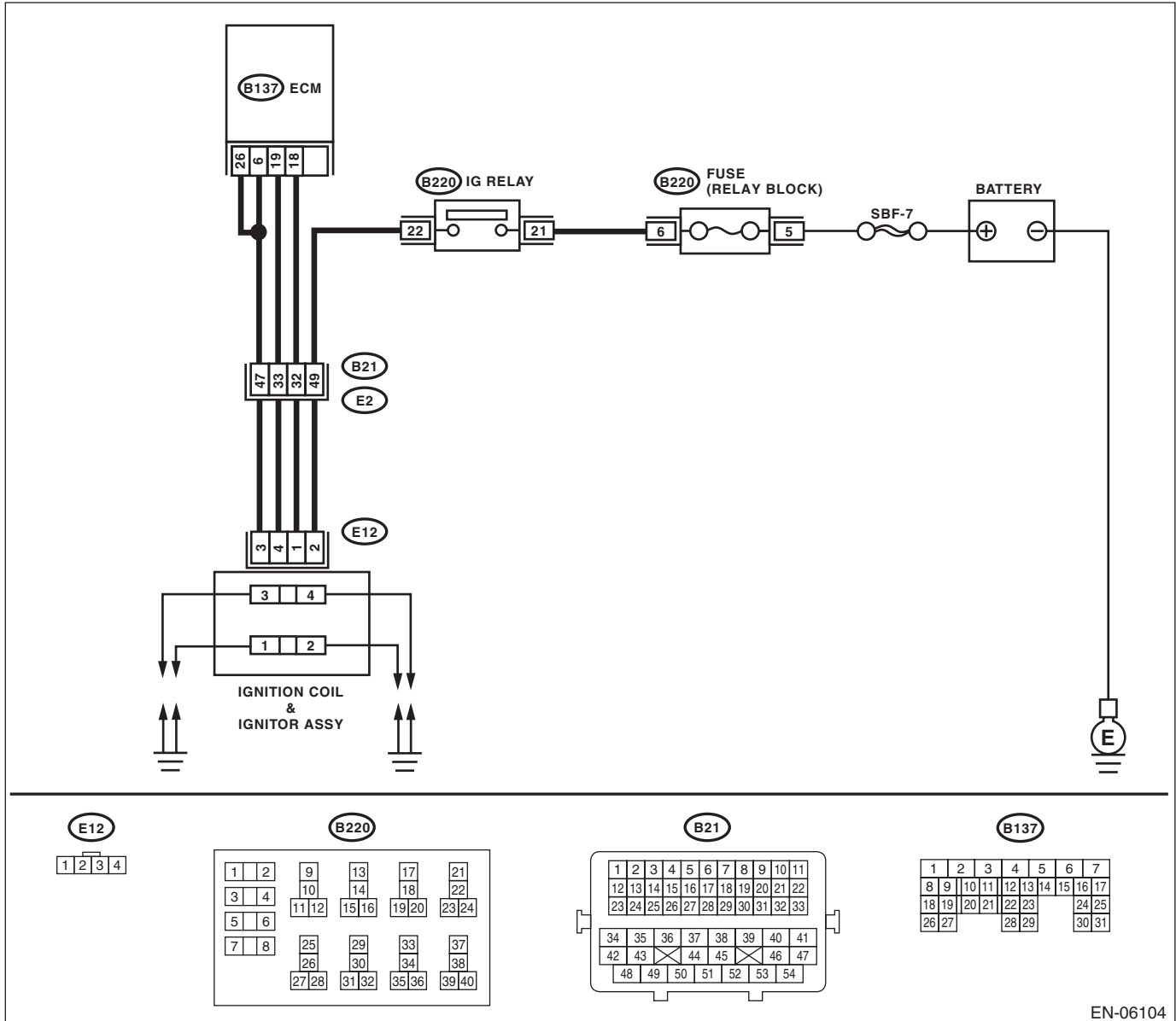
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D: IGNITION CONTROL SYSTEM

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, Inspection Mode.>.

WIRING DIAGRAM:



EN-06104

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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NO REPAIR, NO RESALE

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 fuel pump system. <Ref. to EN(H4SO)(diag)-77, 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 in harness between ignition coil and ignitor assembly and IG relay connector • Poor contact of coupling connector • Blown out of fuse
3 CHECK HARNESS BETWEEN IGNITION COIL AND IGNITOR ASSEMBLY, AND ECM. 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ignition coil and ignitor assembly connector, and ECM. Connector & terminal (E12) No. 3 — (B137) No. 6: (E12) No. 3 — (B137) No. 26:	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 ignition coil and ignitor assembly connector, and ECM • Poor contact of coupling 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 and 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)

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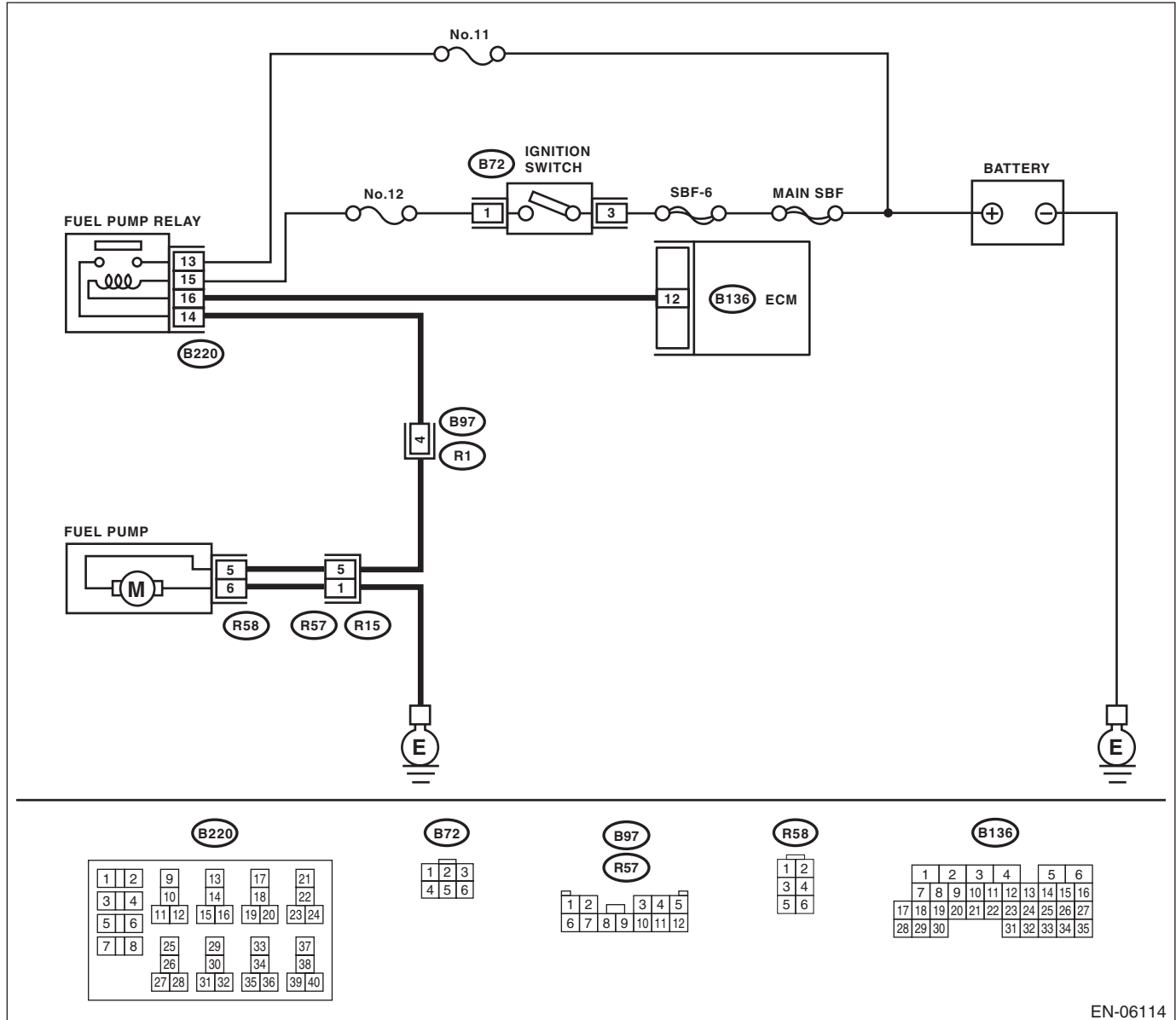
Step	Check	Yes	No
6 CHECK HARNESS BETWEEN ECM AND IGNITION COIL AND IGNITOR ASSEMBLY CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Disconnect the connector from the ignition coil and ignitor assembly. 4) Measure the resistance of harness between ECM and ignition coil and ignitor assembly connector. Connector & terminal <i>(B137) No. 18 — (E12) No. 1:</i> <i>(B137) No. 19 — (E12) No. 4:</i>	Is the resistance less than 1 Ω?	Go to step 7.	Repair the harness and connector. NOTE: In this case, repair the following item: • 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: <i>(B137) No. 18 — Engine ground:</i> <i>(B137) No. 19 — Engine ground:</i>	Is the resistance 1 MΩ or more?	Repair poor contact of the ECM connector.	Repair the ground short circuit of harness between ECM and ignition coil and ignitor assembly connector.

E: FUEL PUMP CIRCUIT

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06114

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
<p>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)-53, Compulsory Valve Operation Check Mode.></p>	Does the fuel pump emit operating sound?	Check the fuel injector circuit. <Ref. to EN(H4SO)(diag)-80, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 2.
<p>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 between fuel pump and chassis ground. Connector & terminal (R58) No. 6 — Chassis ground:</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 in harness between fuel pump connector and chassis grounding terminal • Poor contact of coupling connector
<p>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. 5 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Replace the fuel pump. <Ref. to FU(H4SO)-56, Fuel Pump.>	Go to step 4.
<p>4 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between fuel pump connector and fuel pump relay connector. Connector & terminal (R58) No. 5 — (B220) No. 14:</p>	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 in harness between fuel pump connector and fuel pump relay connector • Poor contact of coupling connector
<p>5 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR. Measure the resistance of harness between fuel pump connector and fuel pump relay connector. Connector & terminal (R58) No. 5 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 6.	Repair the short circuit to ground in harness between fuel pump connector and fuel pump relay connector.
<p>6 CHECK FUEL PUMP RELAY. 1) Remove the fuel pump relay. 2) Connect the battery to fuel pump relay terminals No. 15 and No. 16. 3) Measure the resistance between terminals of fuel pump relay. Terminals No. 13 — No. 14:</p>	Is the resistance less than 10 Ω?	Go to step 7.	Replace the fuel pump relay. <Ref. to FU(H4SO)-41, Fuel Pump Relay.>

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
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. Connector & terminal (B136) No. 12 — (B220) No. 16:	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)-80, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

Diagnostics for Engine Starting Failure

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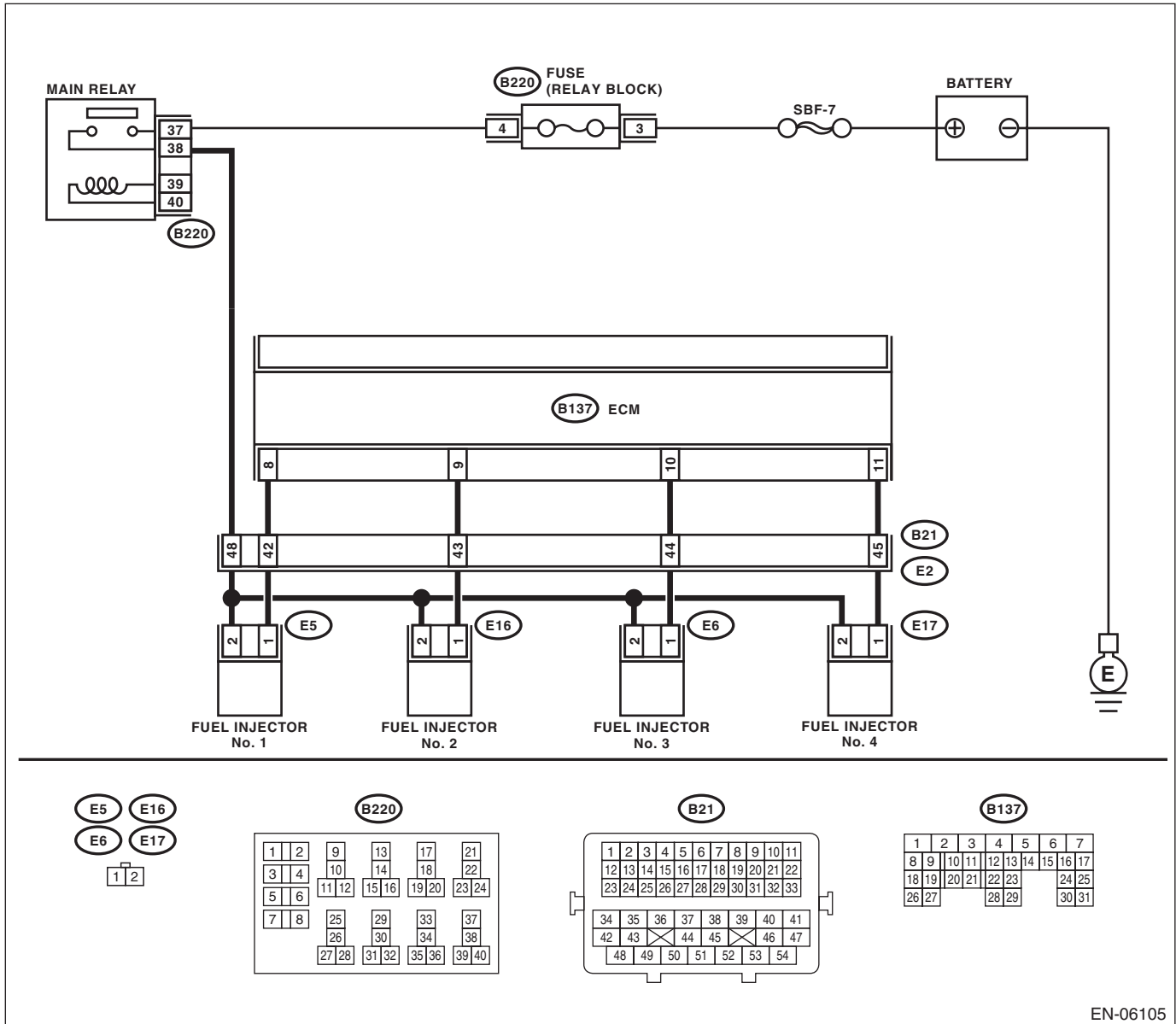
ENGINE (DIAGNOSTICS)

F: FUEL INJECTOR CIRCUIT

CAUTION:

- Check or repair only faulty parts.
- After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06105

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTICS)

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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 pump emit operating sound?	Check the fuel pressure. <Ref. to ME(H4SO)-27, 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.	<p>Repair the harness and connector. NOTE: In this case, repair the following item:</p> <ul style="list-style-type: none"> • Open circuit in harness between main relay connector and fuel injector connector • Poor contact of main relay connector • Poor contact of coupling 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.	<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 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 the ground short circuit of harness 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. <Ref. to FU(H4SO)-30, 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)-302, INSPECTION, General Diagnostic Table.>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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18. List of Diagnostic Trouble Code (DTC)

A: LIST

DTC	Item	Reference
P0026	Intake Valve Control Solenoid Circuit Range/Performance (Bank 1)	<Ref. to EN(H4SO)(diag)-89, 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)-91, 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)-93, 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)-95, 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)-97, 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)-99, 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)-101, 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)-103, 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)-105, 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)-107, 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)-109, 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)-111, 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)-113, 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)-115, 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)-117, 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)-119, 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)-121, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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DTC	Item	Reference
P0111	Intake Air Temperature Sensor 1 Circuit Range/Performance	<Ref. to EN(H4SO)(diag)-123, 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)-125, 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)-127, 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)-129, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0118	Engine Coolant Temperature Circuit High	<Ref. to EN(H4SO)(diag)-131, 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)-133, 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)-135, 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)-137, 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)-138, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0128	Coolant Thermostat (Engine Coolant Temperature Below Thermostat Regulating Temperature)	<Ref. to EN(H4SO)(diag)-139, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0131	O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-140, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0132	O2 Sensor Circuit High Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-142, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0133	O2 Sensor Circuit Slow Response (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-144, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0134	O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	<Ref. to EN(H4SO)(diag)-146, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0137	O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-148, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0138	O2 Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-150, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0139	O2 Sensor Circuit Slow Response (Bank 1 Sensor 2)	<Ref. to EN(H4SO)(diag)-152, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0140	O2 Sensor Circuit No Activity Detected (Bank1 Sensor2)	<Ref. to EN(H4SO)(diag)-154, 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)-156, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

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DTC	Item	Reference
P0172	System Too Rich (Bank 1)	<Ref. to EN(H4SO)(diag)-157, 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)-159, 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)-161, 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)-163, 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)-165, 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)-167, 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)-169, DTC P0198 ENGINE OIL TEMPERATURE SENSOR HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0222	Throttle/Pedal Position Sensor/Switch "B" Circuit Low	<Ref. to EN(H4SO)(diag)-171, 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)-173, 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)-175, DTC P0301 CYLINDER 1 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0302	Cylinder 2 Misfire Detected	<Ref. to EN(H4SO)(diag)-175, DTC P0302 CYLINDER 2 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0303	Cylinder 3 Misfire Detected	<Ref. to EN(H4SO)(diag)-175, DTC P0303 CYLINDER 3 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0304	Cylinder 4 Misfire Detected	<Ref. to EN(H4SO)(diag)-176, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0327	Knock Sensor 1 Circuit Low (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)(diag)-182, 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)-184, 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)-186, 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)-188, 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)-190, 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)-192, 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)-194, DTC P0400 EXHAUST GAS RECIRCULATION FLOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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DTC	Item	Reference
P0420	Catalyst System Efficiency Below Threshold (Bank 1)	<Ref. to EN(H4SO)(diag)-196, 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)-200, 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)-203, 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)-205, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0451	Evaporative Emission Control System Pressure Sensor	<Ref. to EN(H4SO)(diag)-207, 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)-209, 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)-211, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0456	Evaporative Emission Control System Leak Detected (Very Small Leak)	<Ref. to EN(H4SO)(diag)-213, 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)-216, 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)-219, 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)-221, 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)-223, 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)-223, 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)-223, 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)-224, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0500	Vehicle Speed Sensor "A"	<Ref. to EN(H4SO)(diag)-224, DTC P0500 VEHICLE SPEED SENSOR "A", 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).>
P0513	Incorrect Immobilizer Key	<Ref. to IM(diag)-16, DTC P0513 INCORRECT IMMOBILIZER KEY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

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DTC	Item	Reference
P0600	Serial Communication Link	<Ref. to EN(H4SO)(diag)-230, 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)-231, 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)-232, 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)-233, 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)-234, DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0700	Transmission Control System (MIL Request)	<Ref. to EN(H4SO)(diag)-234, 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)-235, 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)-237, 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)-239, 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)-241, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1152	O2 Sensor Circuit Range/Performance (Low) (Bank1 Sensor1)	<Ref. to EN(H4SO)(diag)-243, DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1153	O2 Sensor Circuit Range/Performance (High) (Bank1 Sensor1)	<Ref. to EN(H4SO)(diag)-245, DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1160	Return Spring Failure	<Ref. to EN(H4SO)(diag)-246, 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)-247, 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)-249, 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)-251, 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)-253, 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)-255, 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)-255, 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)-255, DTC P1494 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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DTC	Item	Reference
P1495	EGR Solenoid Valve Signal #2 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)(diag)-255, 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)-255, 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)-255, 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)-256, 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)-259, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1560	Back-up Voltage Circuit Malfunction	<Ref. to EN(H4SO)(diag)-261, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1570	Antenna	<Ref. to IM(diag)-17, DTC P1570 ANTENNA, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1571	Reference Code Incompatibility	<Ref. to IM(diag)-19, DTC P1571 REFERENCE CODE INCOMPATIBILITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1572	IMM Circuit Failure (Except Antenna Circuit)	<Ref. to IM(diag)-20, DTC P1572 IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1574	Key Communication Failure	<Ref. to IM(diag)-22, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1576	EGI Control Module EEPROM	<Ref. to IM(diag)-23, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1577	IMM Control Module EEPROM	<Ref. to IM(diag)-23, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1578	Meter Failure	<Ref. to IM(diag)-24, DTC P1578 METER FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1602	Control Module Programming Error	<Ref. to EN(H4SO)(diag)-263, 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)-272, 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)-273, 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)-278, 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)-283, 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)-285, 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)-286, DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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DTC	Item	Reference
P2122	Throttle/Pedal Position Sensor/Switch "D" Circuit Low Input	<Ref. to EN(H4SO)(diag)-287, 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)-289, 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)-291, 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)-293, 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)-295, 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)-298, 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)-300, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2228	Barometric Pressure Circuit Low	<Ref. to EN(H4SO)(diag)-300, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2229	Barometric Pressure Circuit High	<Ref. to EN(H4SO)(diag)-301, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

19. 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.>

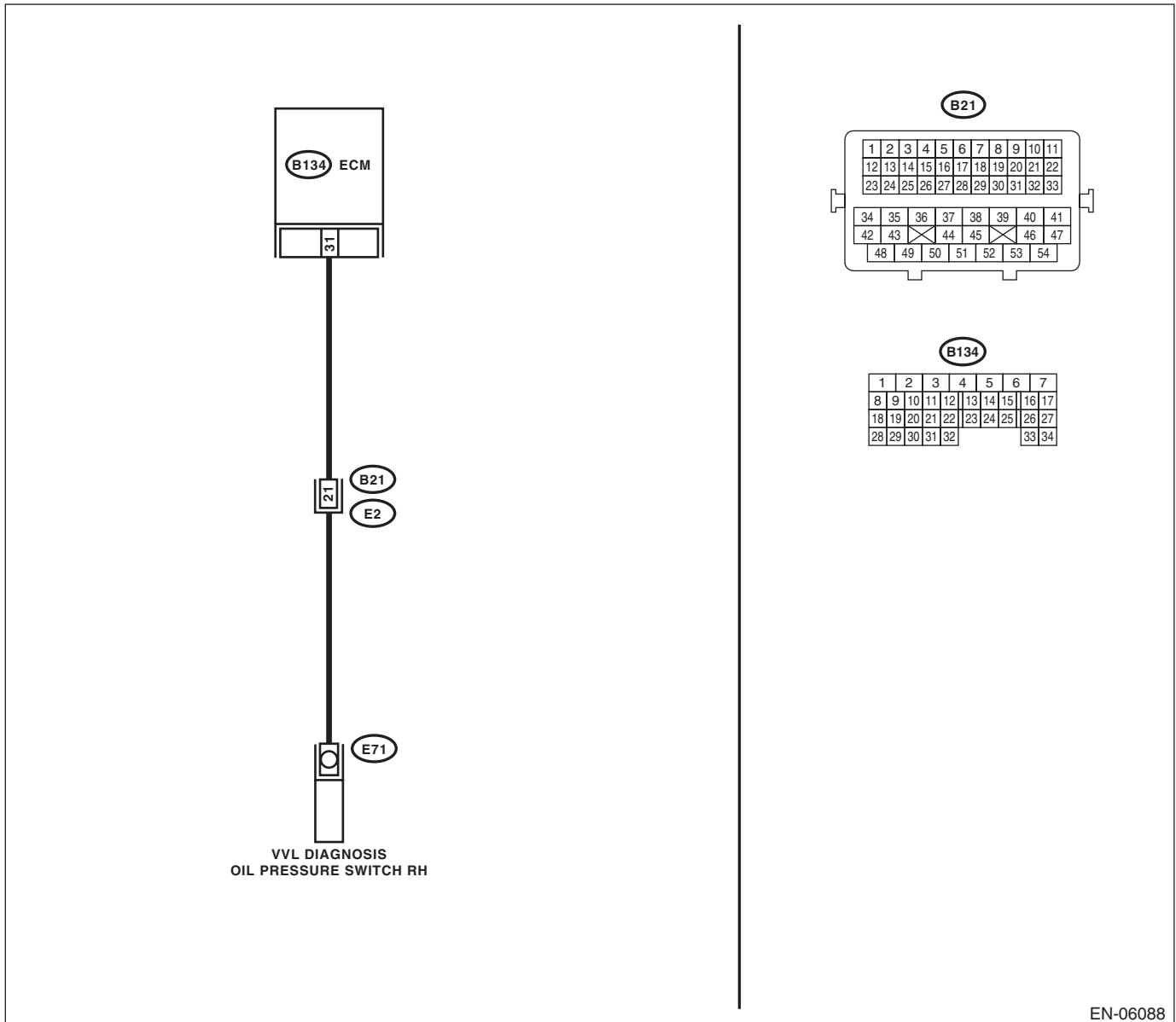
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06088

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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 — (E71) No. 1:</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 in harness between ECM and variable valve lift diagnosis oil pressure switch connector • Poor contact of coupling 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 (E71) No. 1 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness 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 (E71) 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)-52, Clear Memory Mode.></p>	Is DTC displayed?	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-96, 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)-52, Clear Memory Mode.></p>	Is DTC displayed?	Check for oil routing.	END.

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)-11, DTC P0028 INTAKE VALVE CONTROL SOLENOID CIRCUIT RANGE/PERFORMANCE (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

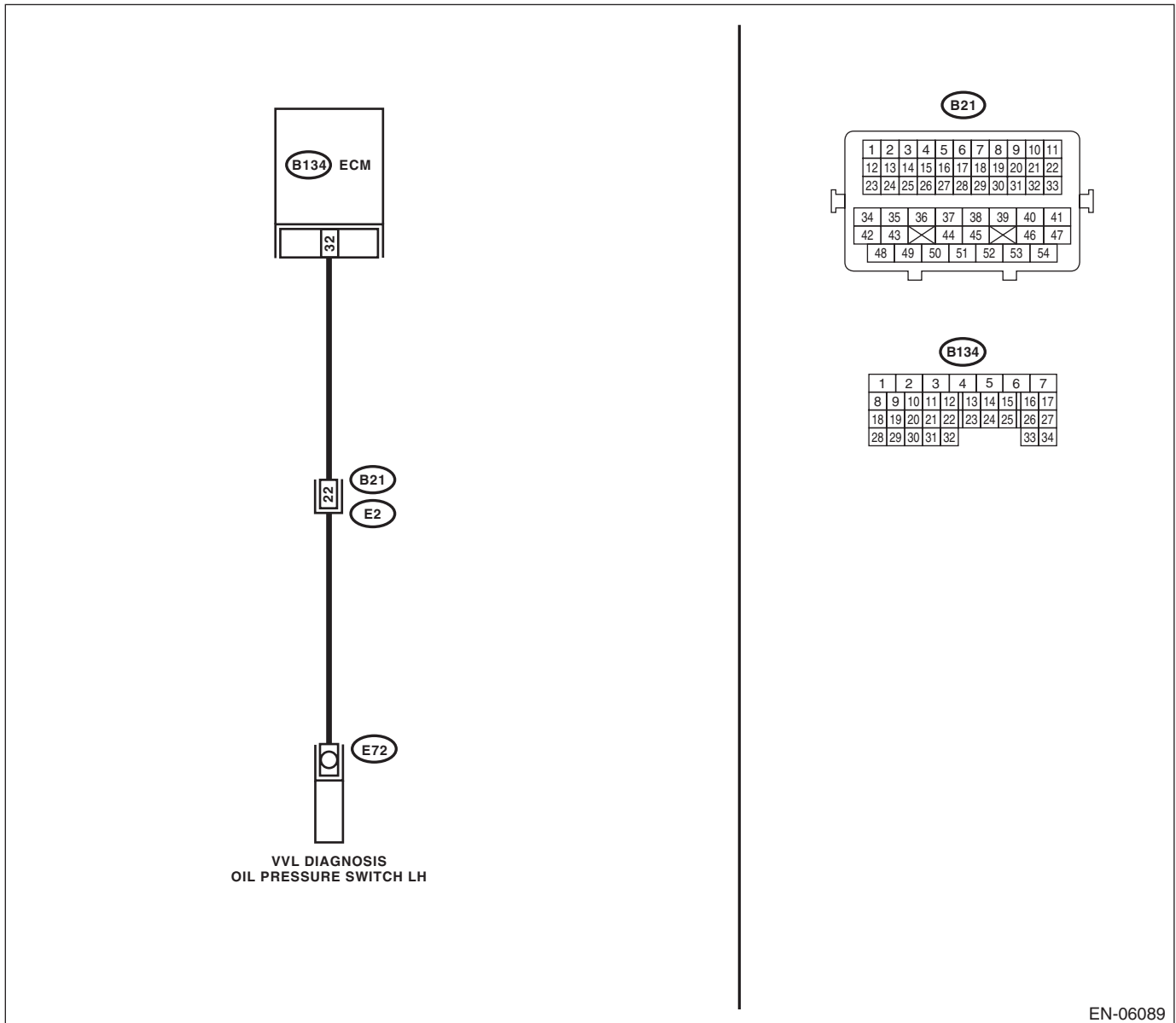
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH. 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. <i>Connector & terminal</i> <i>(B134) No. 32 — (E72) No. 1:</i>	Is the resistance less than 1 Ω?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and variable valve lift diagnosis oil pressure switch connector • Poor contact of coupling connector
2 CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH. Measure the resistance between the variable valve lift diagnosis oil pressure switch connector and engine ground. <i>Connector & terminal</i> <i>(E72) No. 1 — Engine ground:</i>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness between ECM and variable valve lift diagnosis oil pressure switch connector.
3 CHECK HARNESS BETWEEN ECM AND VARIABLE VALVE LIFT DIAGNOSIS OIL PRESSURE SWITCH. 1) Turn the ignition switch to ON. 2) Measure the voltage between the variable valve lift diagnosis oil pressure switch connector and engine ground. <i>Connector & terminal</i> <i>(E72) No. 1 (+) — Engine ground (-):</i>	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 CHECK DTC. 1) Perform the Clear Memory Mode. 2) After idling the engine, check the DTC. NOTE: For detailed procedures, refer to “Clear Memory Mode”. <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.>	Is DTC displayed?	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-96, Oil Switching Solenoid Valve.> Go to step 5.	END
5 CHECK DTC. 1) Perform the Clear Memory Mode. 2) After idling the engine, check the DTC. NOTE: For detailed procedures, refer to “Clear Memory Mode”. <Ref. to EN(H4SO)(diag)-52, Clear Memory Mode.>	Is DTC displayed?	Check for oil routing.	END.

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

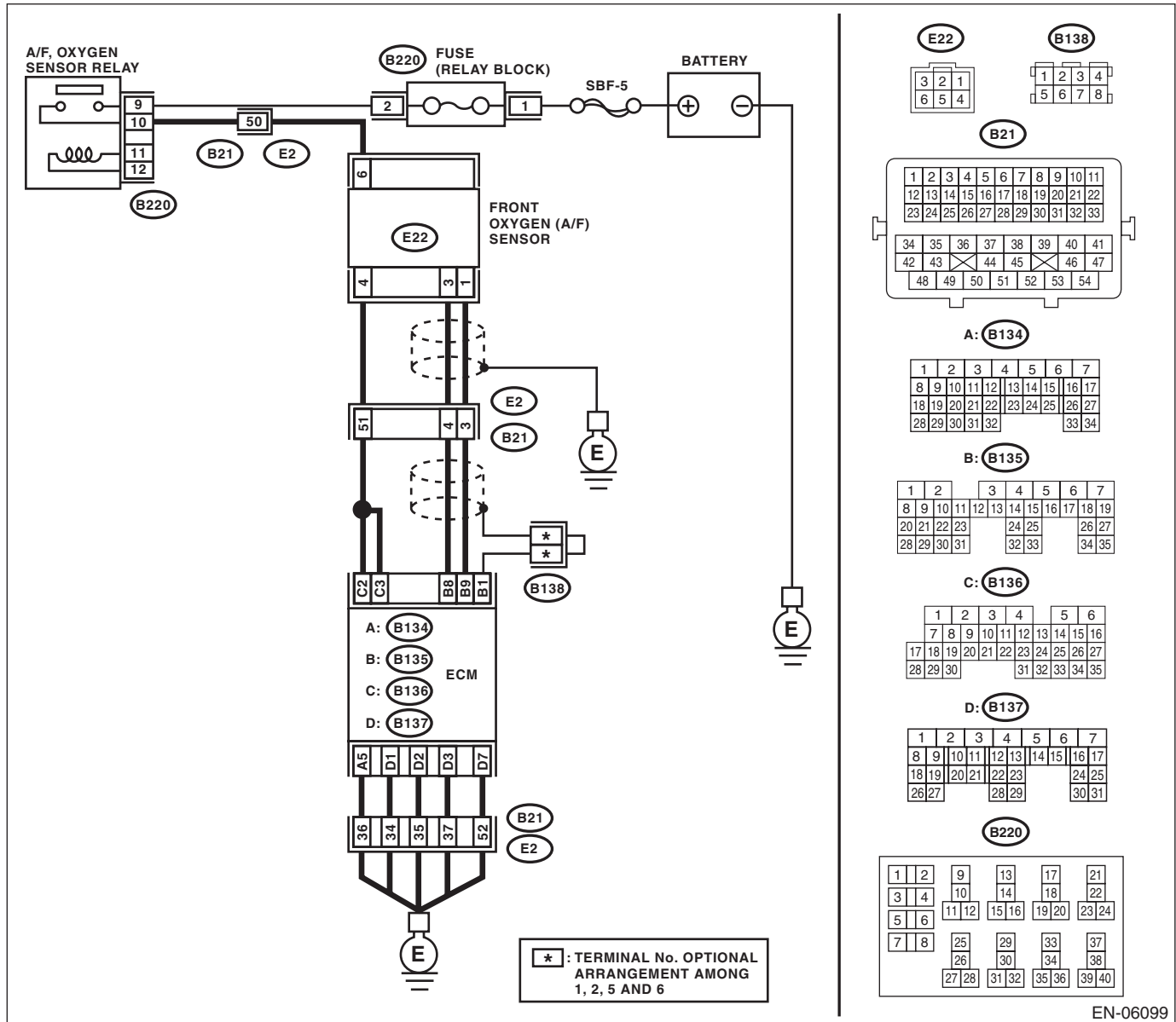
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-11, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
1 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 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. <i>Connector & terminal</i> <i>(B136) No. 2 — (E22) No. 4:</i> <i>(B136) No. 3 — (E22) No. 4:</i>	Is the resistance less than 1 Ω?	Go to step 2.	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 of coupling connector
2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. <i>Connector & terminal</i> <i>(B135) No. 9 — (E22) No. 1:</i> <i>(B135) No. 8 — (E22) No. 3:</i>	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 of coupling connector
3 CHECK FRONT OXYGEN (A/F) SENSOR. Measure the resistance between front oxygen (A/F) sensor terminals. <i>Terminals</i> <i>No. 6 — No. 4:</i>	Is the resistance between 2 — 3 Ω?	Go to step 4.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-35, Front Oxygen (A/F) Sensor.>
4 CHECK POOR CONTACT. Check poor contact of ECM and front oxygen (A/F) sensor connector.	Is there poor contact in ECM or front oxygen (A/F) sensor connector?	Repair the poor contact of ECM or front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-35, Front Oxygen (A/F) Sensor.>

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

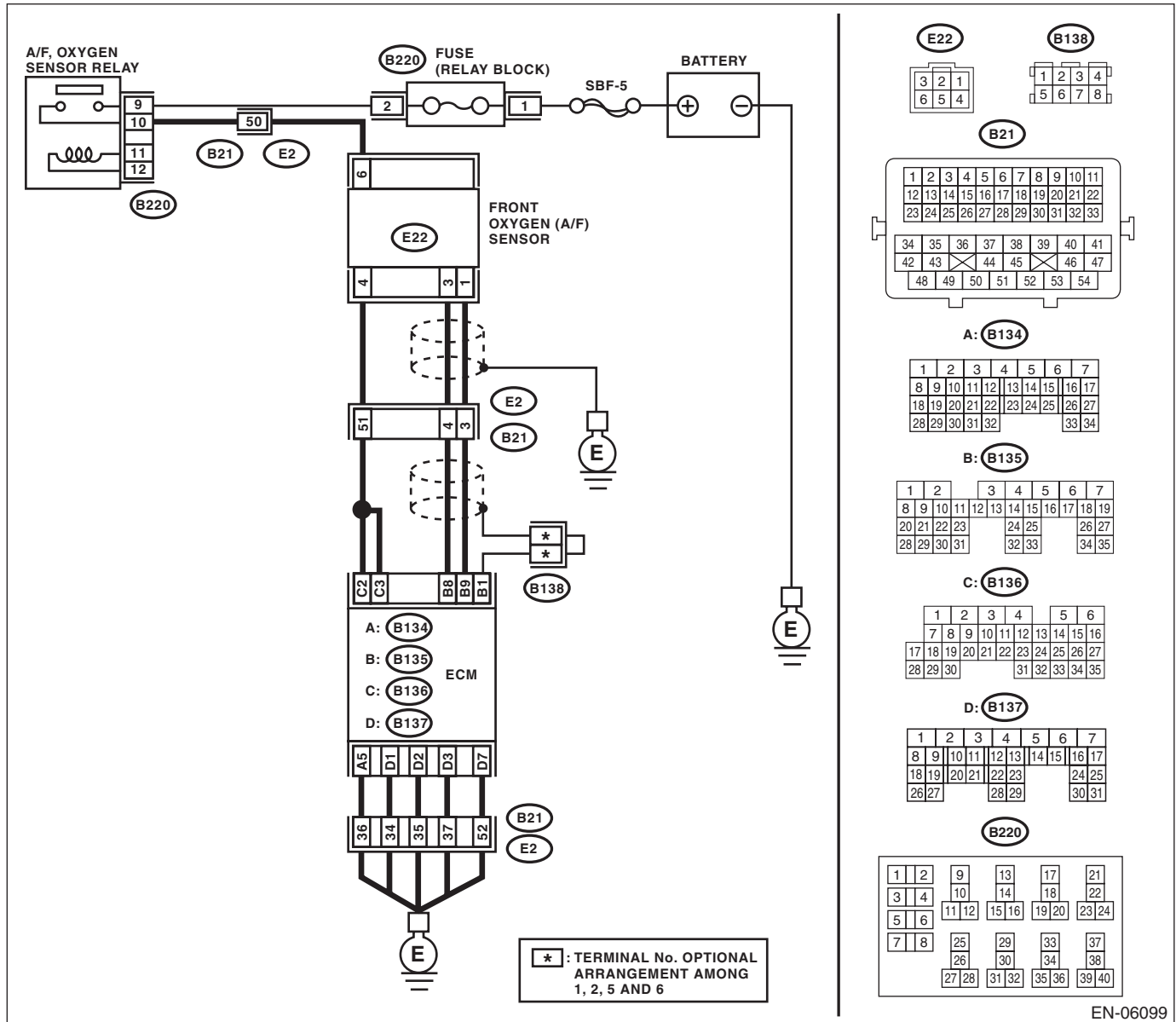
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-13, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.</p> <ol style="list-style-type: none"> 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. <p>Connector & terminal (E22) No. 6 (+) — 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 in harness between A/F, oxygen sensor relay connector and front oxygen (A/F) sensor connector • Poor contact of A/F, oxygen sensor relay connector • Poor contact of coupling connector
2	<p>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</p> <ol style="list-style-type: none"> 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. <p>Connector & terminal (B136) No. 2 — (E22) No. 4: (B136) No. 3 — (E22) No. 4:</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 in harness between ECM and front oxygen (A/F) sensor connector • Poor contact of coupling connector
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 of coupling connector
4	<p>CHECK FRONT OXYGEN (A/F) SENSOR.</p> <p>Measure the resistance between front oxygen (A/F) sensor terminals.</p> <p>Terminals No. 6 — No. 4:</p>	Is the resistance between 2 — 3 Ω ?	Repair poor contact of the ECM connector.	<p>Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-35, Front Oxygen (A/F) Sensor.></p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

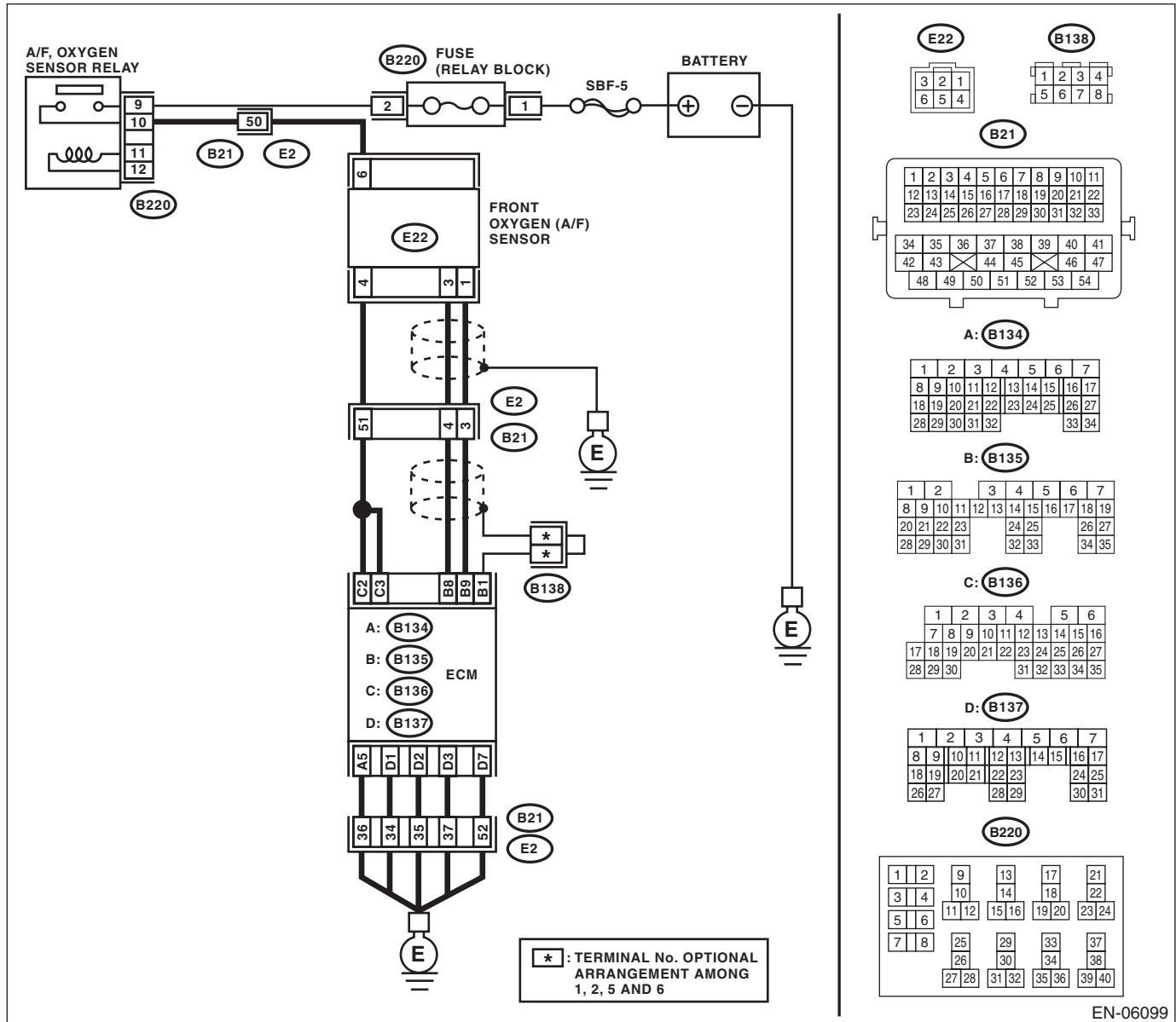
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-15, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground.</p> <p>Connector & terminal (B136) No. 2 (+) — Chassis ground (-): (B136) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector.	Go to step 2.
2	<p>CHECK GROUND CIRCUIT FOR ECM.</p> <p>1) Disconnect the connectors from the ECM. 2) Measure the resistance 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?	Repair the 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)

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

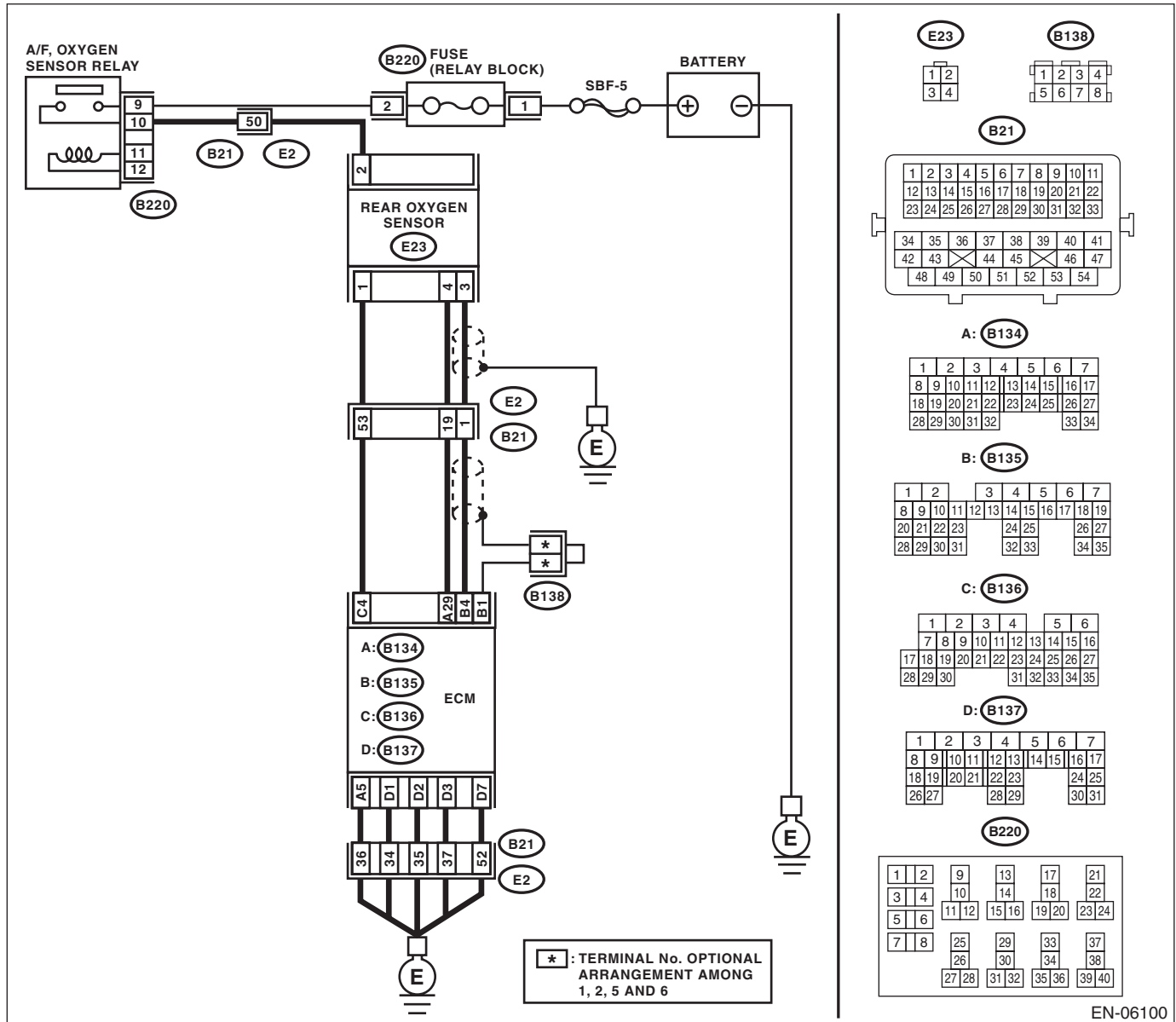
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-17, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06100

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.</p> <ol style="list-style-type: none"> 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>Connector & terminal (E23) 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 in harness between A/F, oxygen sensor relay connector and rear oxygen sensor connector • Poor contact of A/F, oxygen sensor relay connector • Poor contact of coupling connector
2	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.</p> <ol style="list-style-type: none"> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and oxygen sensor connector. <p>Connector & terminal (B136) No. 4 — (E23) No. 1:</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 in harness between ECM and rear oxygen sensor connector • Poor contact of coupling connector
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 of coupling connector
4	<p>CHECK REAR OXYGEN SENSOR.</p> <p>Measure the resistance between rear oxygen sensor 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)

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

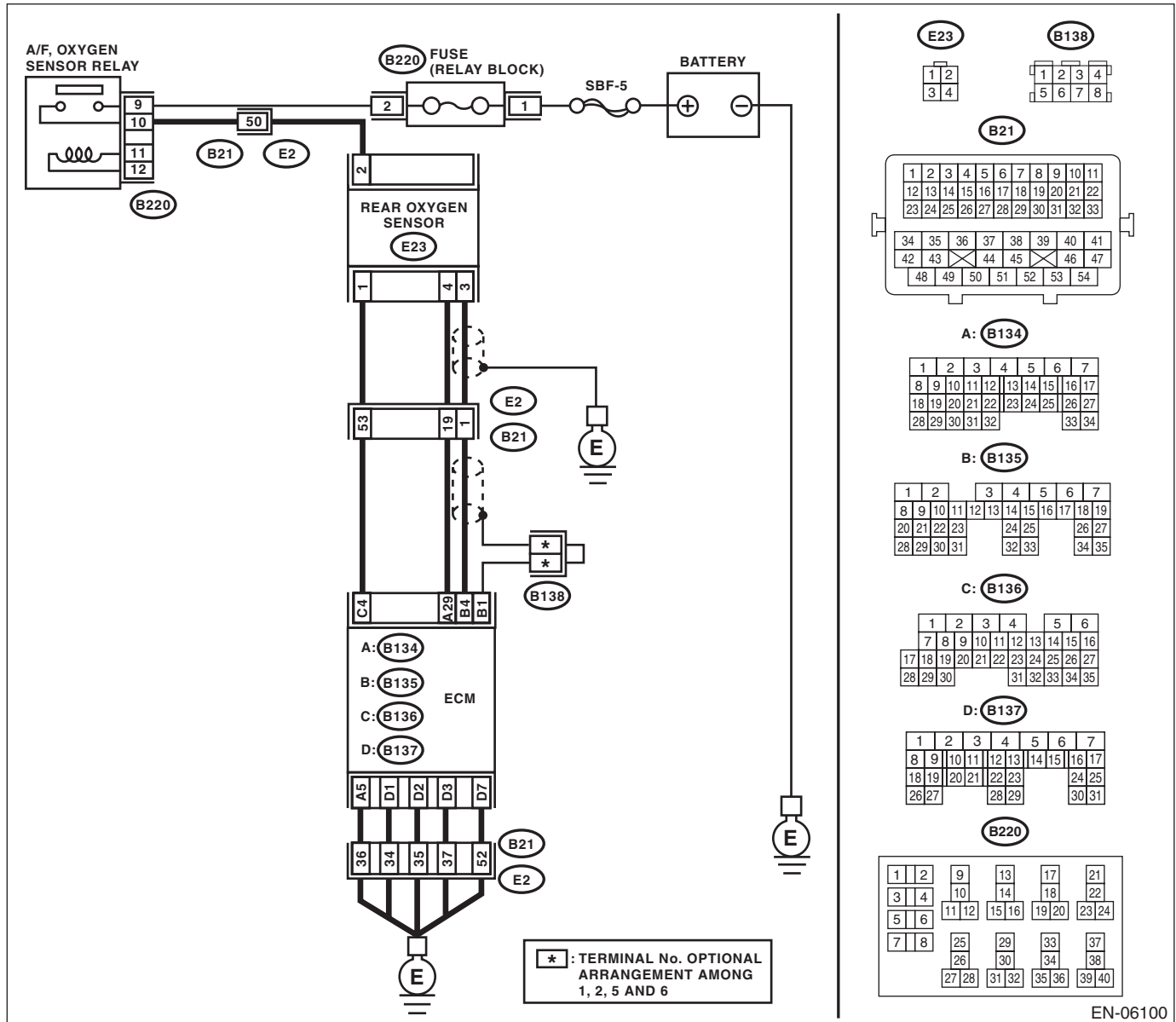
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-19, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN 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 (B136) No. 4 (+) — Chassis ground (-):</p>	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	<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 (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?	Repair the poor contact of the ECM 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 ECM and engine ground • Poor contact of coupling connector

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H: DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

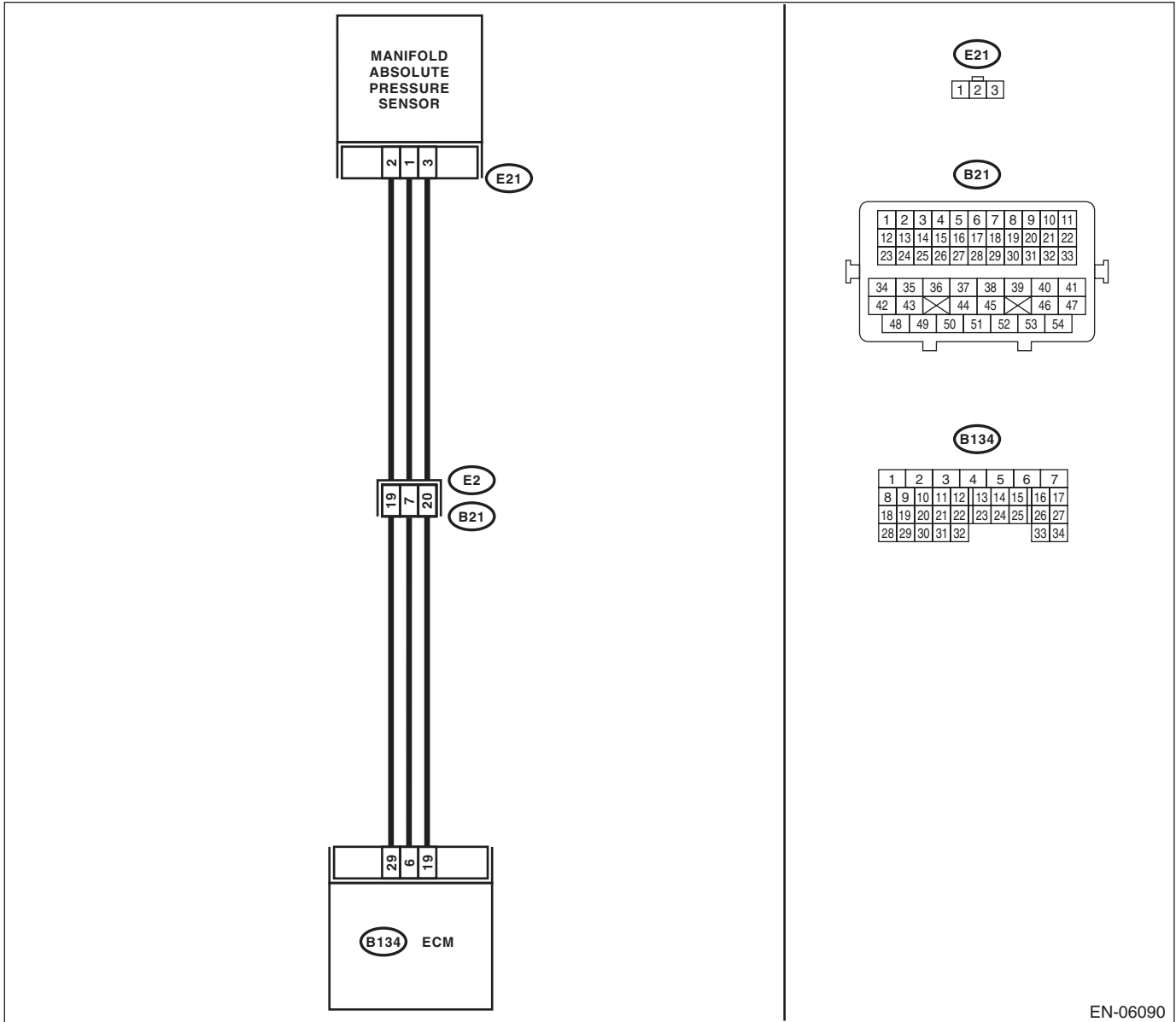
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-21, DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06090

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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 “P” range 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)-33, 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)-33, 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)-13, 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)-13, Throttle Body.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-24, DTC P0076 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

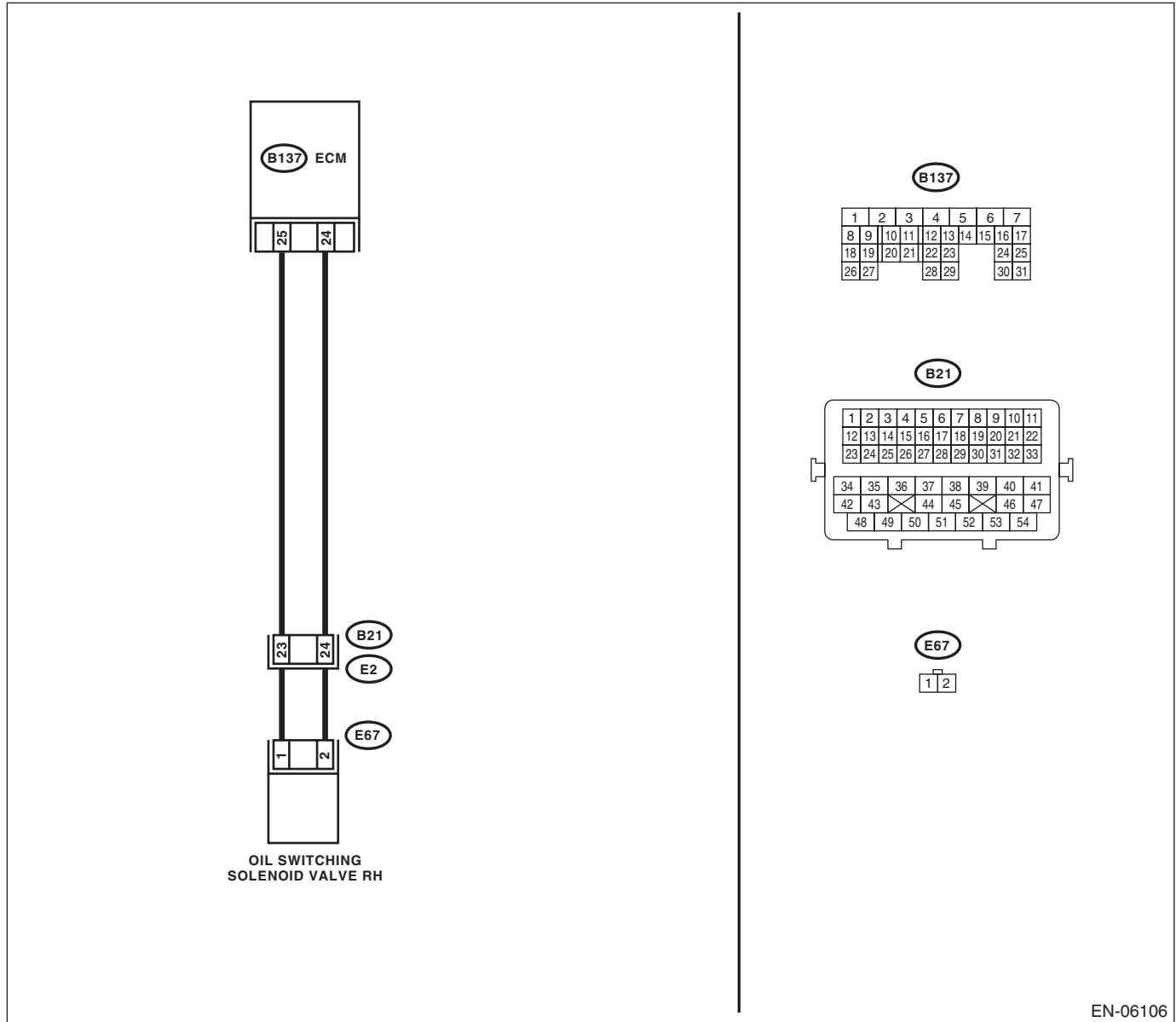
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06106

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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 — (E67) No. 1: (B137) No. 24 — (E67) 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: • Open circuit of harness between ECM and oil switching solenoid valve connector • Poor contact of coupling connector
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:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness between ECM and oil switching solenoid valve connector.
3 CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance between 6 — 12 Ω?	Repair the poor contact of ECM and oil switching solenoid valve connector.	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-96, Oil Switching Solenoid Valve.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-25, DTC P0077 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

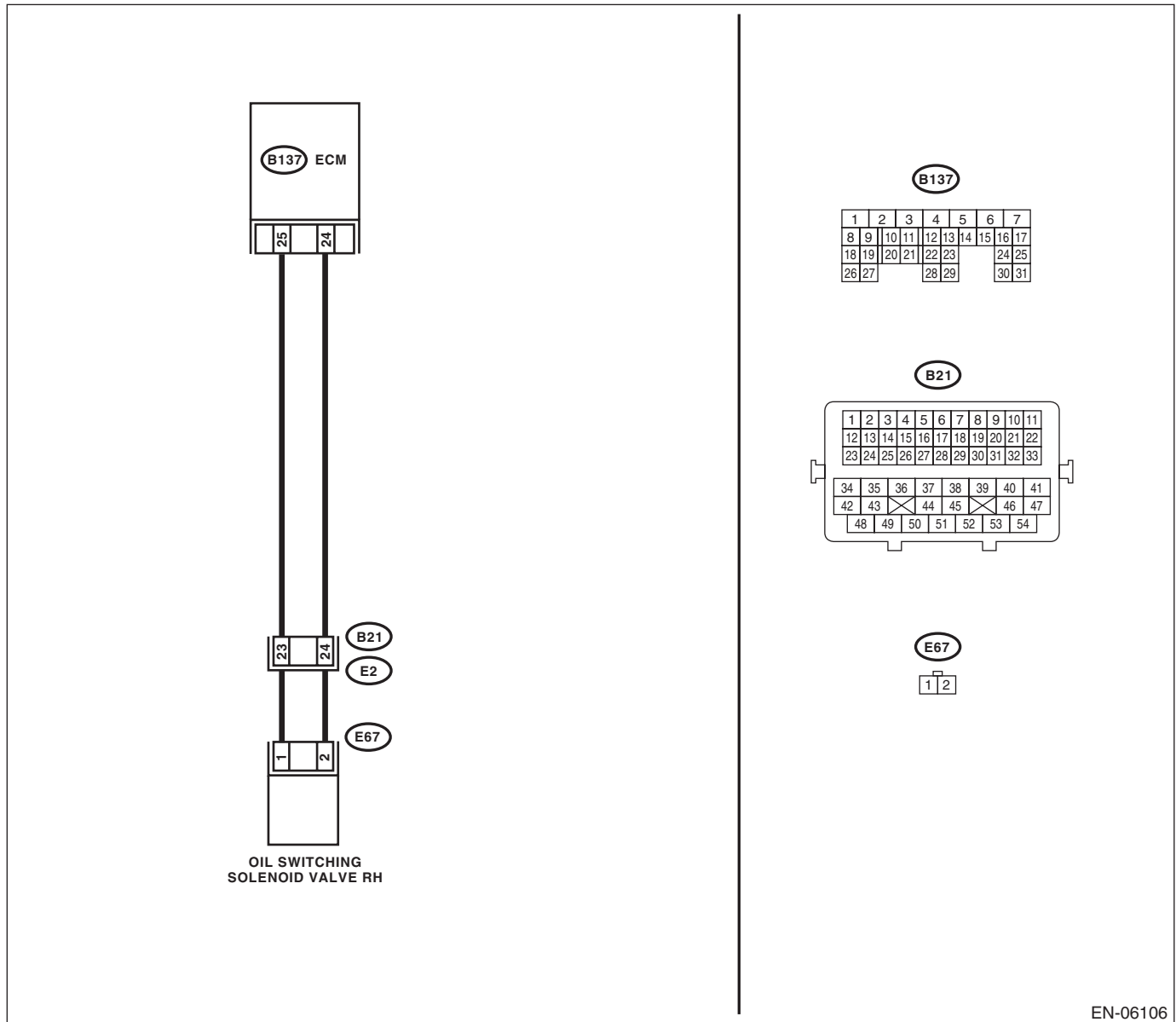
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06106

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>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.</p> <p>Connector & terminal (B137) No. 25 (+) — Chassis ground (-): (B137) No. 24 (+) — Chassis ground (-):</p>	Is the voltage less than 1 V?	Go to step 2.	Repair the short circuit to power in the harness between ECM and oil switching solenoid valve connector.
2	<p>CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. Measure the resistance of harness between ECM and oil switching solenoid valve connector.</p> <p>Connector & terminal (B137) No. 25 — (E67) No. 1: (B137) No. 24 — (E67) No. 2:</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 oil switching solenoid valve connector • Poor contact of coupling connector
3	<p>CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance between 6 — 12 Ω?	Repair the poor contact of ECM and oil switching solenoid valve connector.	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-96, Oil Switching Solenoid Valve.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-26, DTC P0082 INTAKE VALVE CONTROL SOLENOID CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

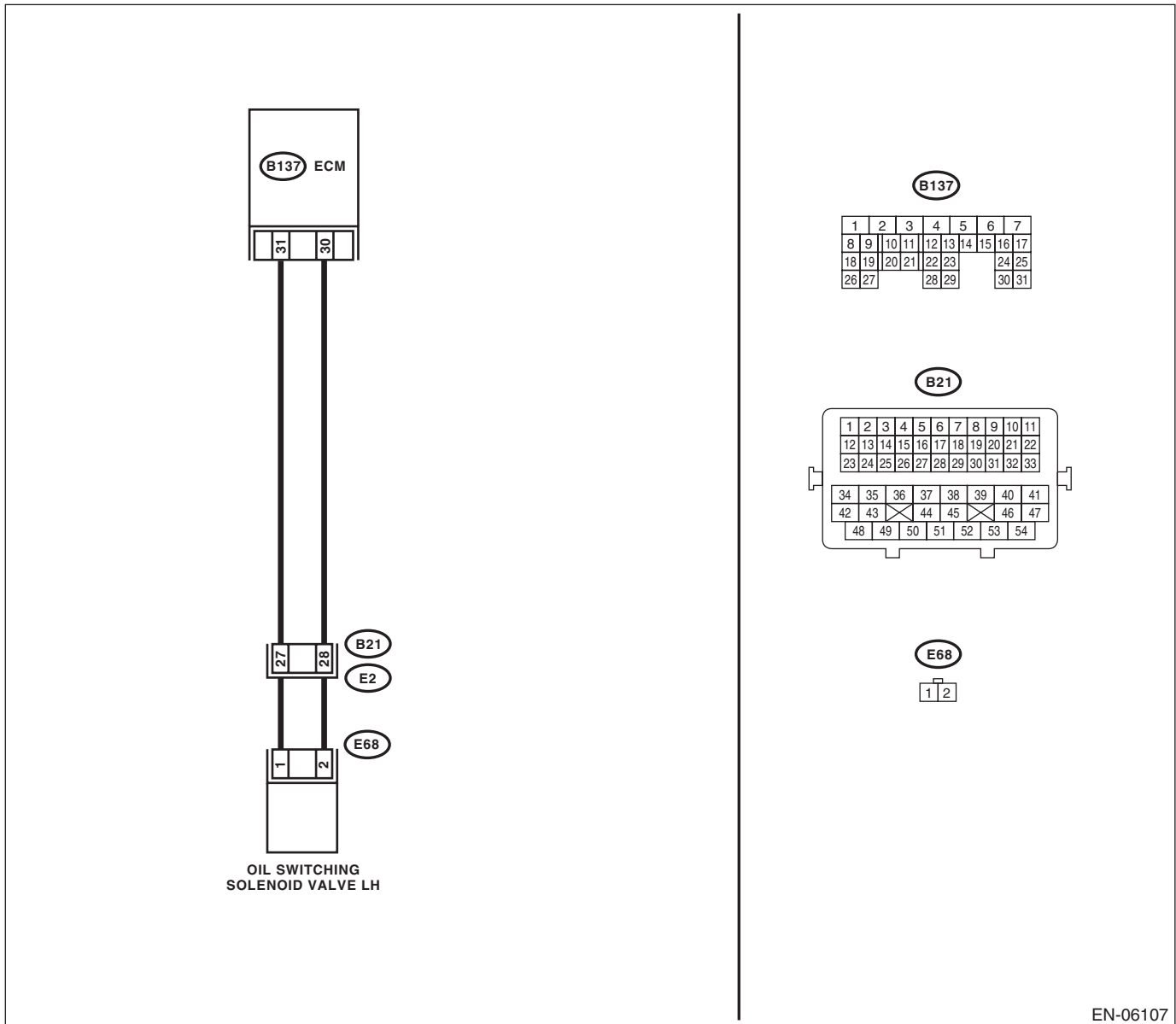
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06107

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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 — (E68) No. 1: (B137) No. 30 — (E68) 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: • Open circuit of harness between ECM and oil switching solenoid valve connector • Poor contact of coupling connector
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:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness between ECM and oil switching solenoid valve connector.
3 CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals. Terminals No. 1 — No. 2:	Is the resistance between 6 — 12 Ω?	Repair the poor contact of ECM and oil switching solenoid valve connector.	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-96, Oil Switching Solenoid Valve.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-26, DTC P0083 INTAKE VALVE CONTROL SOLENOID CIRCUIT HIGH (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

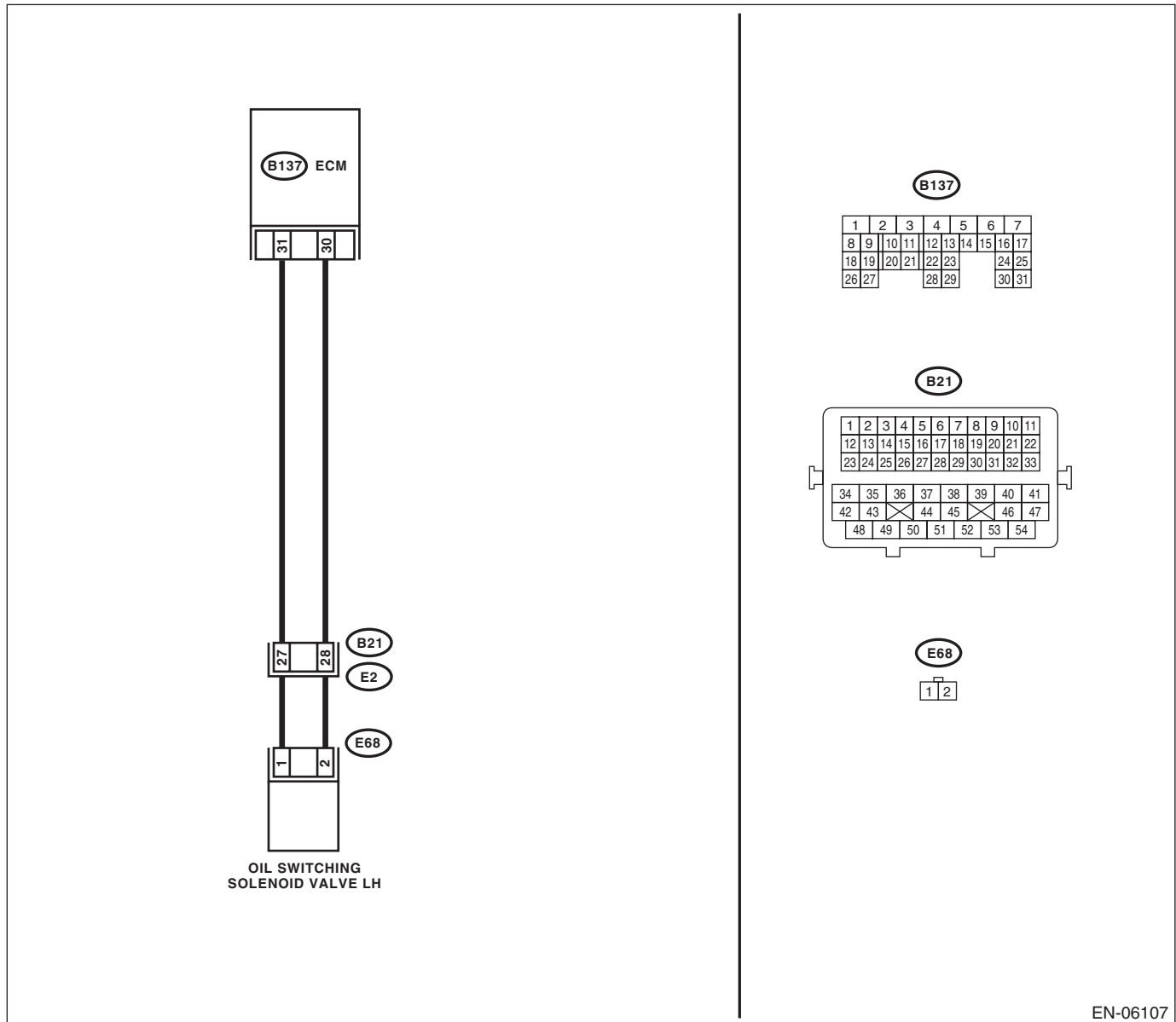
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06107

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>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.</p> <p>Connector & terminal (B137) No. 31 (+) — Chassis ground (-): (B137) No. 30 (+) — Chassis ground (-):</p>	Is the voltage less than 1 V?	Go to step 2.	Repair the short circuit to power in the harness between ECM and oil switching solenoid valve connector.
2	<p>CHECK HARNESS BETWEEN ECM AND OIL SWITCHING SOLENOID VALVE. Measure the resistance between the ECM and oil switching solenoid valve connector.</p> <p>Connector & terminal (B137) No. 31 — (E68) No. 1: (B137) No. 30 — (E68) No. 2:</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 oil switching solenoid valve connector • Poor contact of coupling connector
3	<p>CHECK OIL SWITCHING SOLENOID VALVE. Measure the resistance between oil switching solenoid valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance between 6 — 12 Ω?	Repair the poor contact of ECM and oil switching solenoid valve connector.	Replace the oil switching solenoid valve. <Ref. to ME(H4SO)-96, Oil Switching Solenoid Valve.>

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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)-27, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

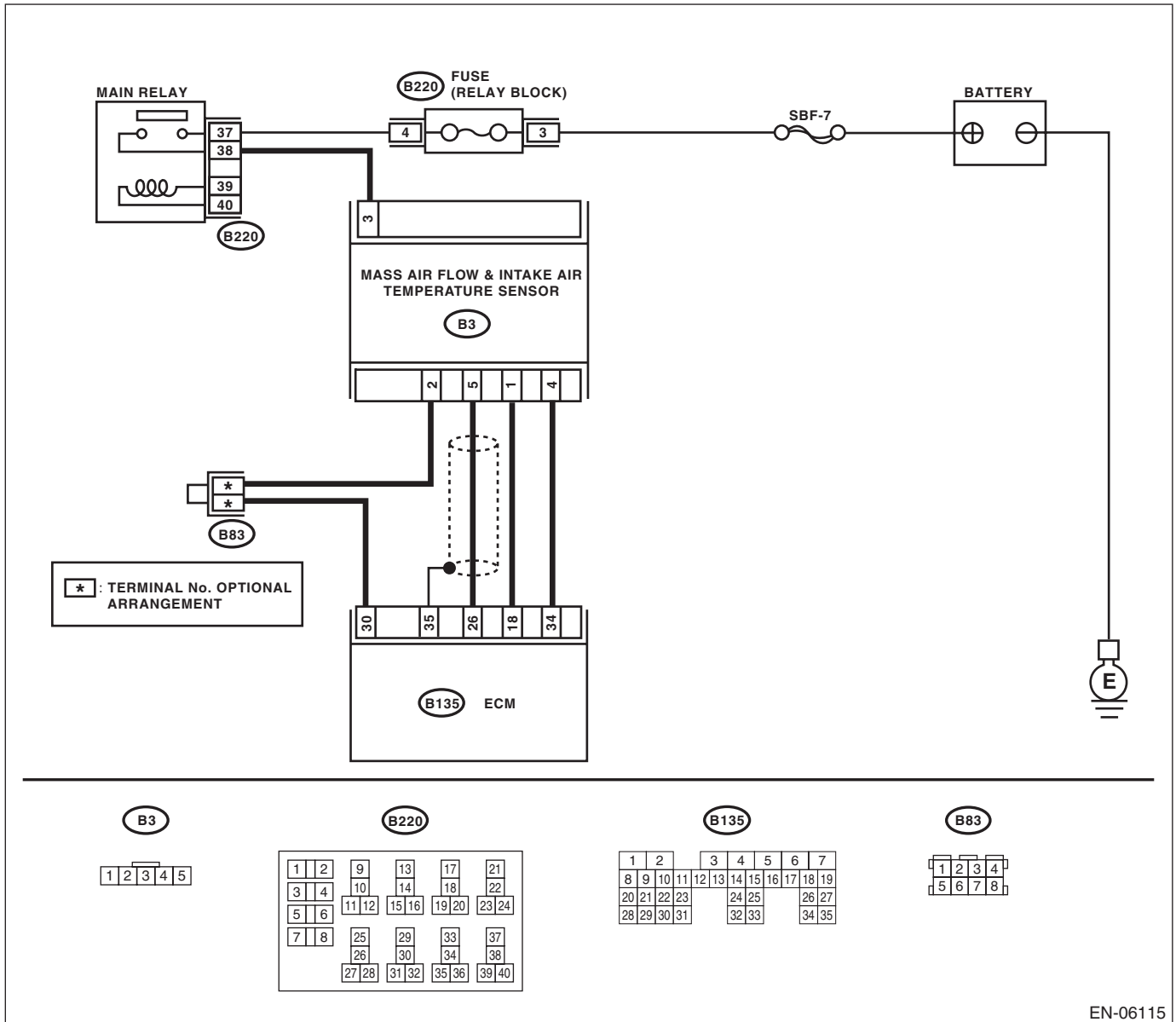
TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06115

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, 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.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-30, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

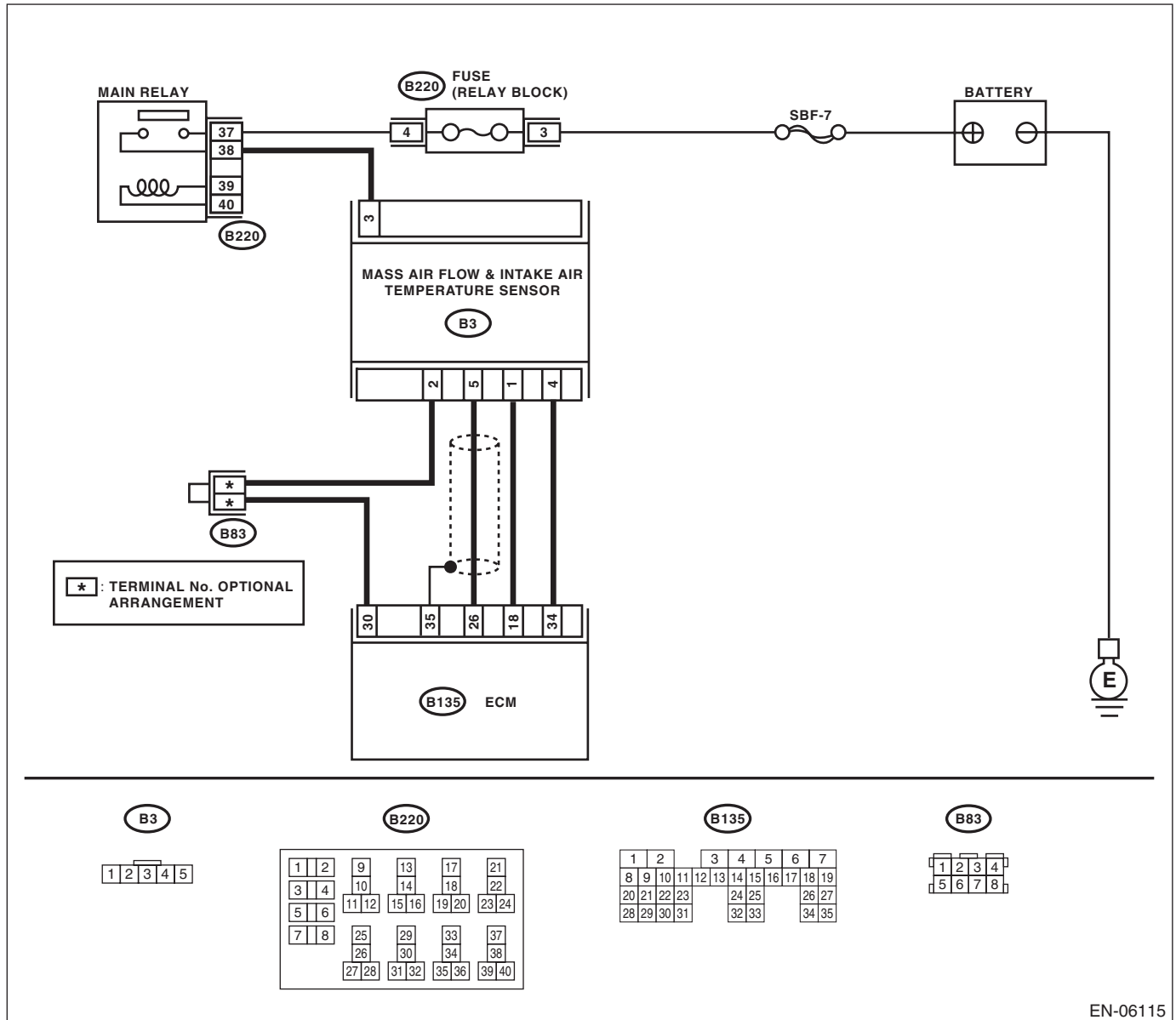
TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06115

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of air flow 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the voltage less than 0.2 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the failure, and then reperform the diagnosis again. NOTE: In this case, temporary poor contact of connector may be the cause.
2 CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the mass air flow and intake air temperature sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B3) No. 3 (+) — 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 main relay and the mass air flow and intake air temperature sensor connector. • Poor contact of main relay connector
3 CHECK HARNESS BETWEEN ECM, MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and the mass air flow and intake air temperature sensor connector. Connector & terminal (B135) No. 26 — (B3) No. 5:	Is the resistance less than 1 Ω?	Go to step 4.	Repair the open circuit of harness between the ECM and the mass air flow and intake air temperature sensor connector.
4 CHECK HARNESS BETWEEN ECM, MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 26 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 5.	Repair the ground short circuit of harness between the ECM and the mass air flow and intake air temperature sensor connector.
5 CHECK POOR CONTACT. Check for any poor contact in the ECM or the mass air flow or intake air temperature sensor connector.	Is there poor contact in the ECM or the mass air flow and intake air temperature sensor connector?	Repair any poor contact in the ECM or the mass air flow and intake air temperature sensor connector.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-32, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

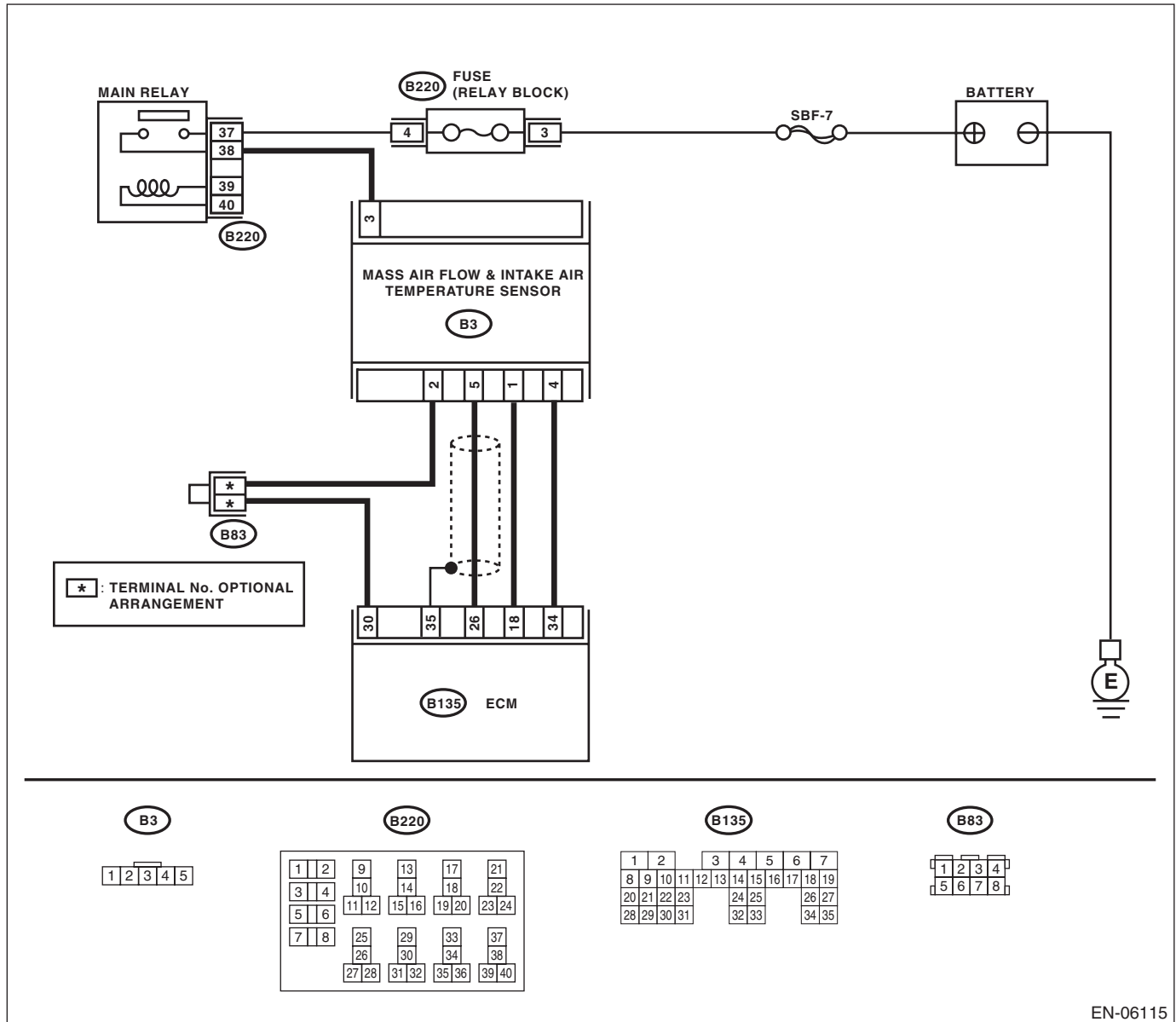
TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06115

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
<p>1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of air flow 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.</p>	<p>Is the voltage 5 V 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. NOTE: In this case, there may be a temporary connector contact failure.</p>
<p>2 CHECK HARNESS BETWEEN ECM, MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the mass air flow and intake air temperature sensor. 3) Start the engine. 4) Read the data of air flow 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.</p>	<p>Is the voltage 5 V or more?</p>	<p>Repair the short circuit to power in the harness between the ECM and the mass air flow & intake air temperature sensor connectors.</p>	<p>Go to step 3.</p>
<p>3 CHECK HARNESS BETWEEN ECM, MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground. <i>Connector & terminal</i> <i>(B3) No. 4 — Engine ground:</i></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: • OPEN CIRCUIT OF HARNESS BETWEEN ECM, MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. • Poor contact in ECM connector</p>
<p>4 CHECK POOR CONTACT. Check for any poor contact between the mass air flow and intake air temperature sensor connectors.</p>	<p>Is there poor contact in the mass air flow and intake air temperature sensor connectors?</p>	<p>Repair any poor contact of the mass air flow and intake air temperature sensor connectors.</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>

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

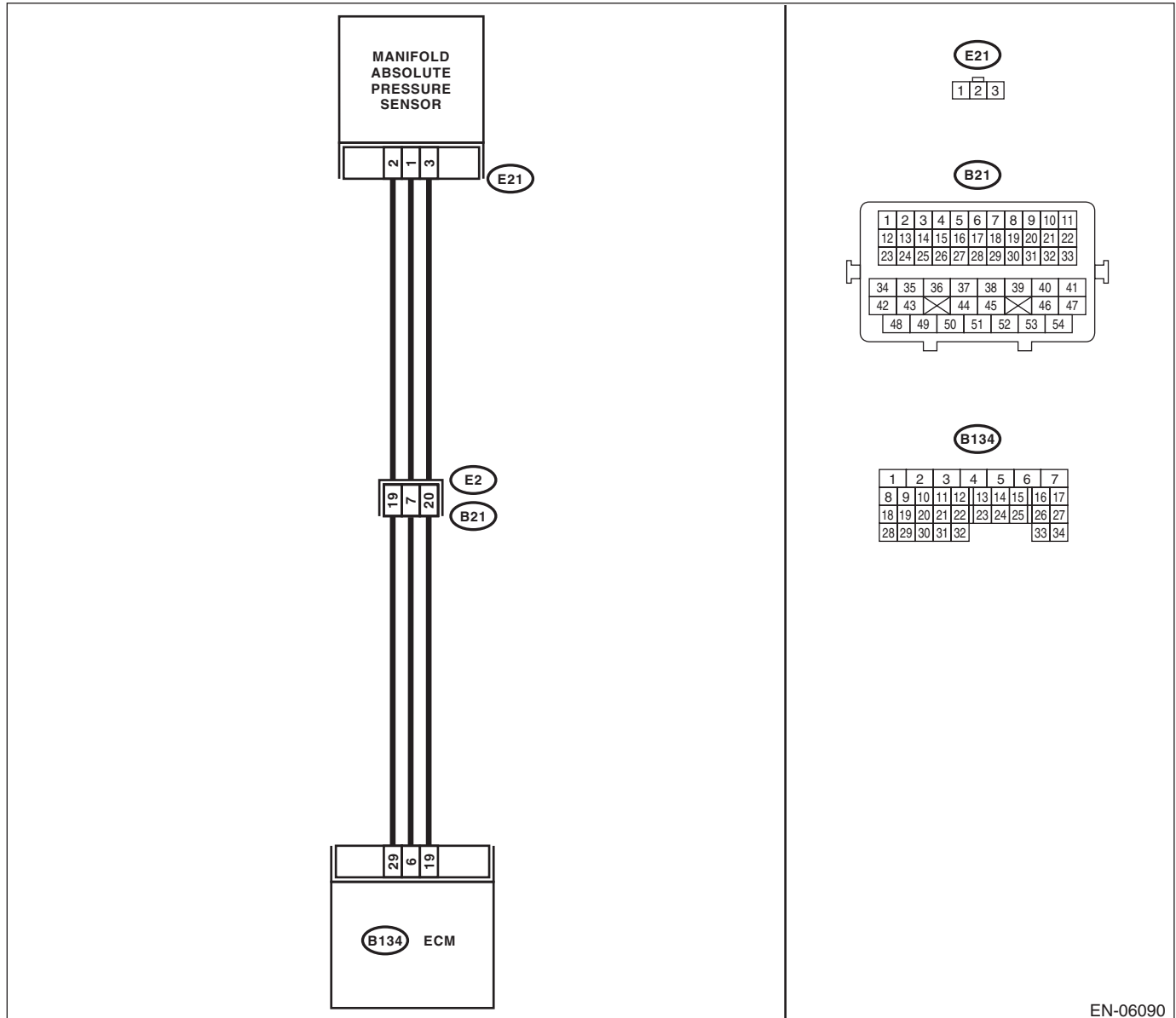
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-34, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06090

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake manifold absolute pressure 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the measured value less than 13.3 kPa (100 mmHg, 3.94 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. NOTE: In this case, there may be a temporary connector contact failure.
2 CHECK POWER SUPPLY OF THE MANIFOLD ABSOLUTE PRESSURE SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. Connector & terminal (E21) No. 3 (+) — Engine ground (-):	Is the voltage 4.5 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 ECM and manifold absolute pressure sensor connector. • Poor contact in ECM connector • Poor contact of coupling connector
3 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. Connector & terminal (B134) No. 6 — (E21) 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 manifold absolute pressure sensor connector. • Poor contact of coupling connector
4 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 6 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 5.	Repair ground short circuit of harness between ECM and manifold absolute pressure sensor connector.
5 CHECK POOR CONTACT. Check for poor contact between the ECM and manifold pressure sensor connector.	Is there poor contact in the ECM or manifold absolute pressure sensor connector?	Repair the poor contact in the ECM or manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-27, Manifold Absolute Pressure Sensor.>

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

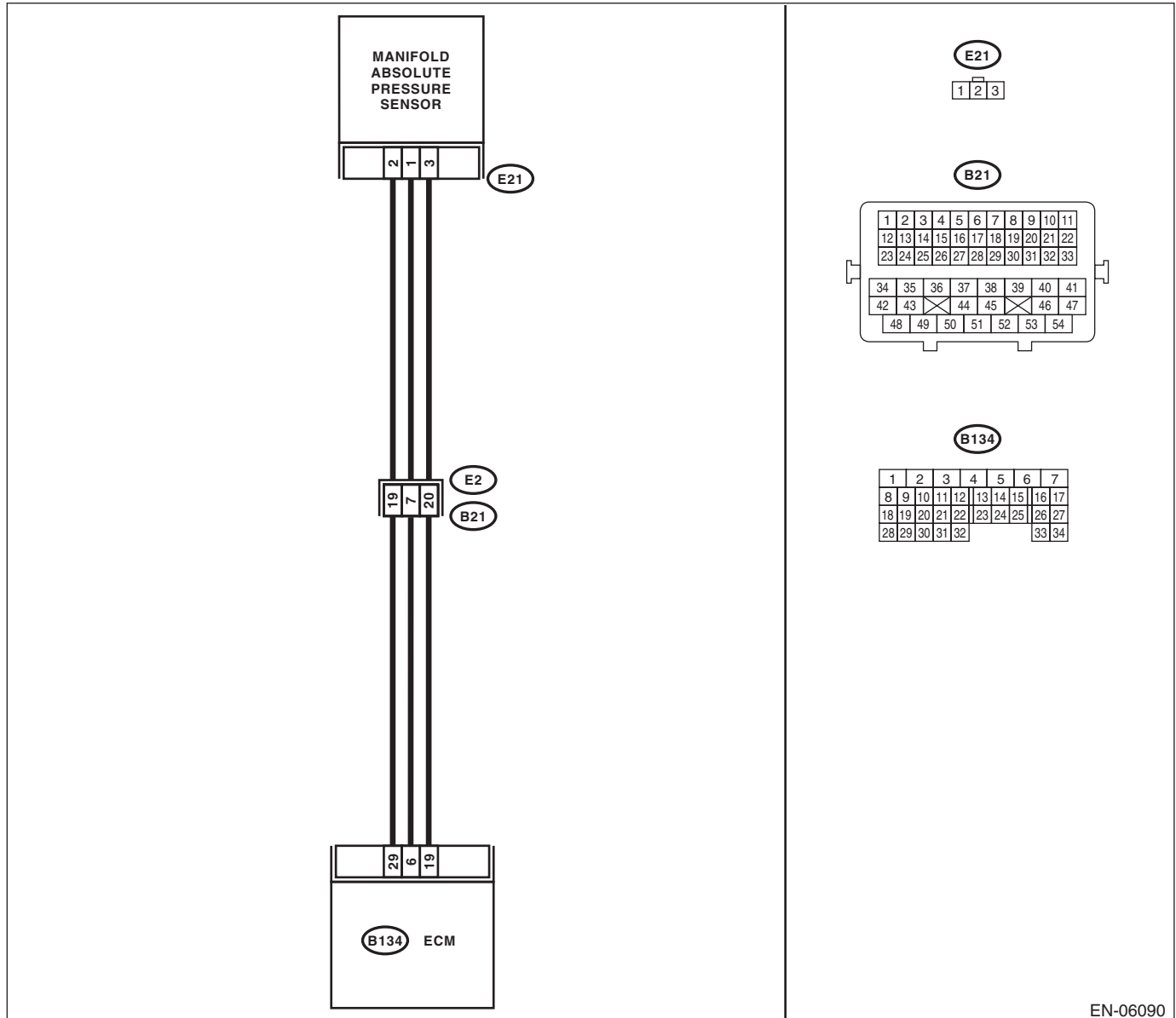
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-36, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06090

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, 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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, 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>

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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)-38, DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

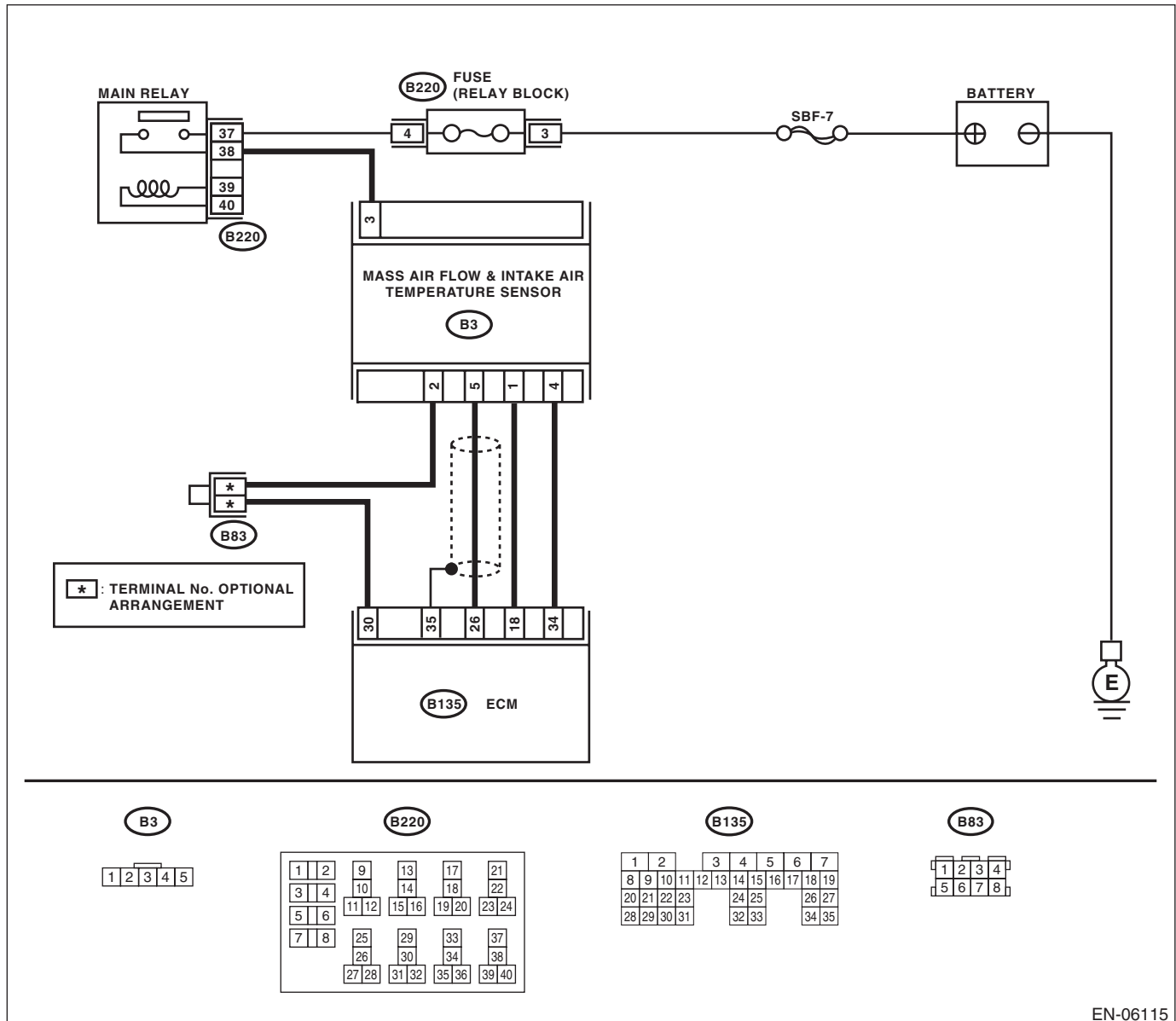
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06115

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>CHECK ENGINE COOLANT TEMPERATURE.</p> <p>1) Start the engine and warm-up completely. 2) Measure the engine coolant temperature 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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none">• General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	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)-82, List of Diagnostic Trouble Code (DTC).>

S: DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-40, DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

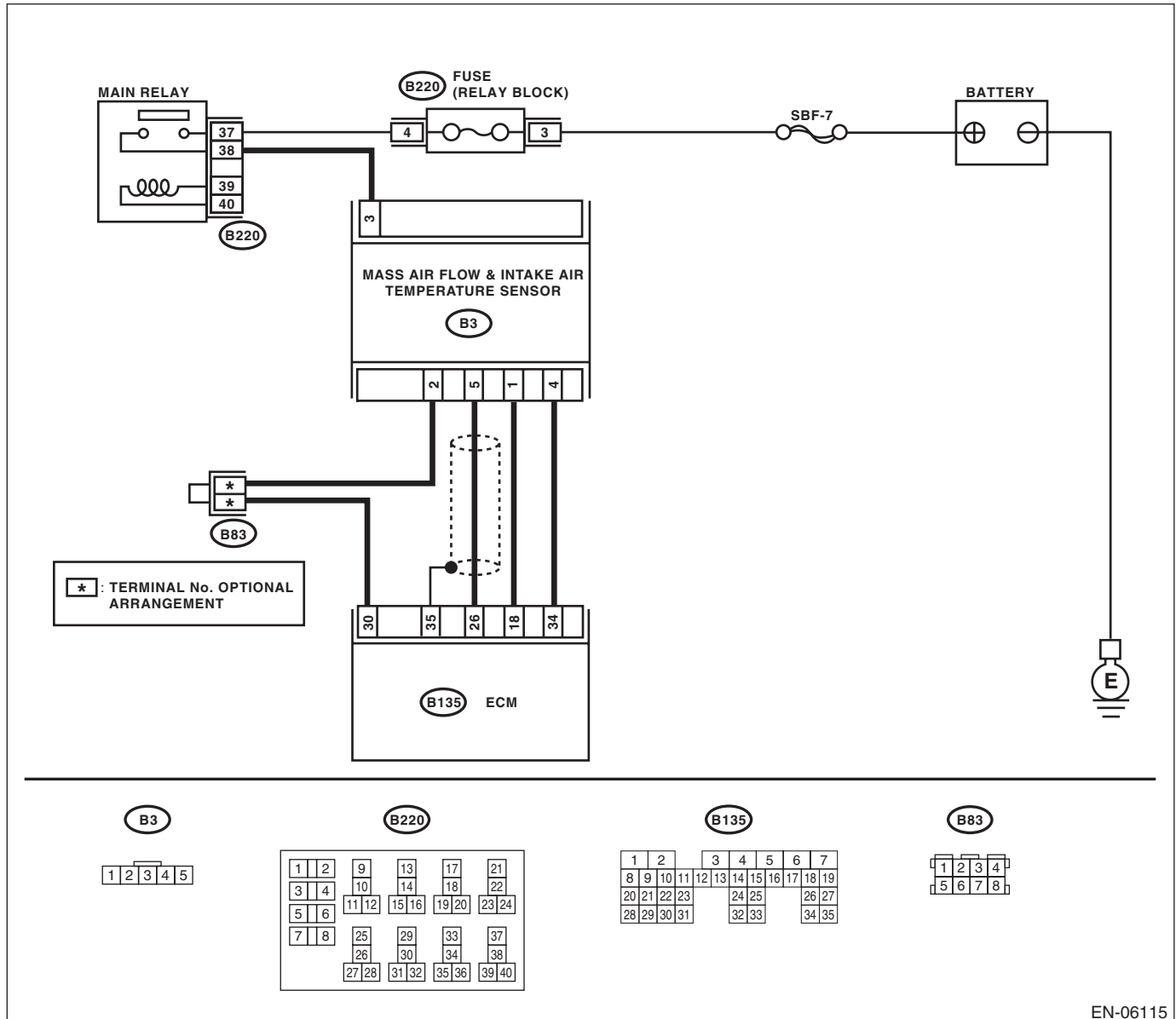
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06115

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedures, 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 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 the ground short circuit of harness between the ECM and the mass air flow and intake air temperature sensor connectors.</p>

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T: DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-42, DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

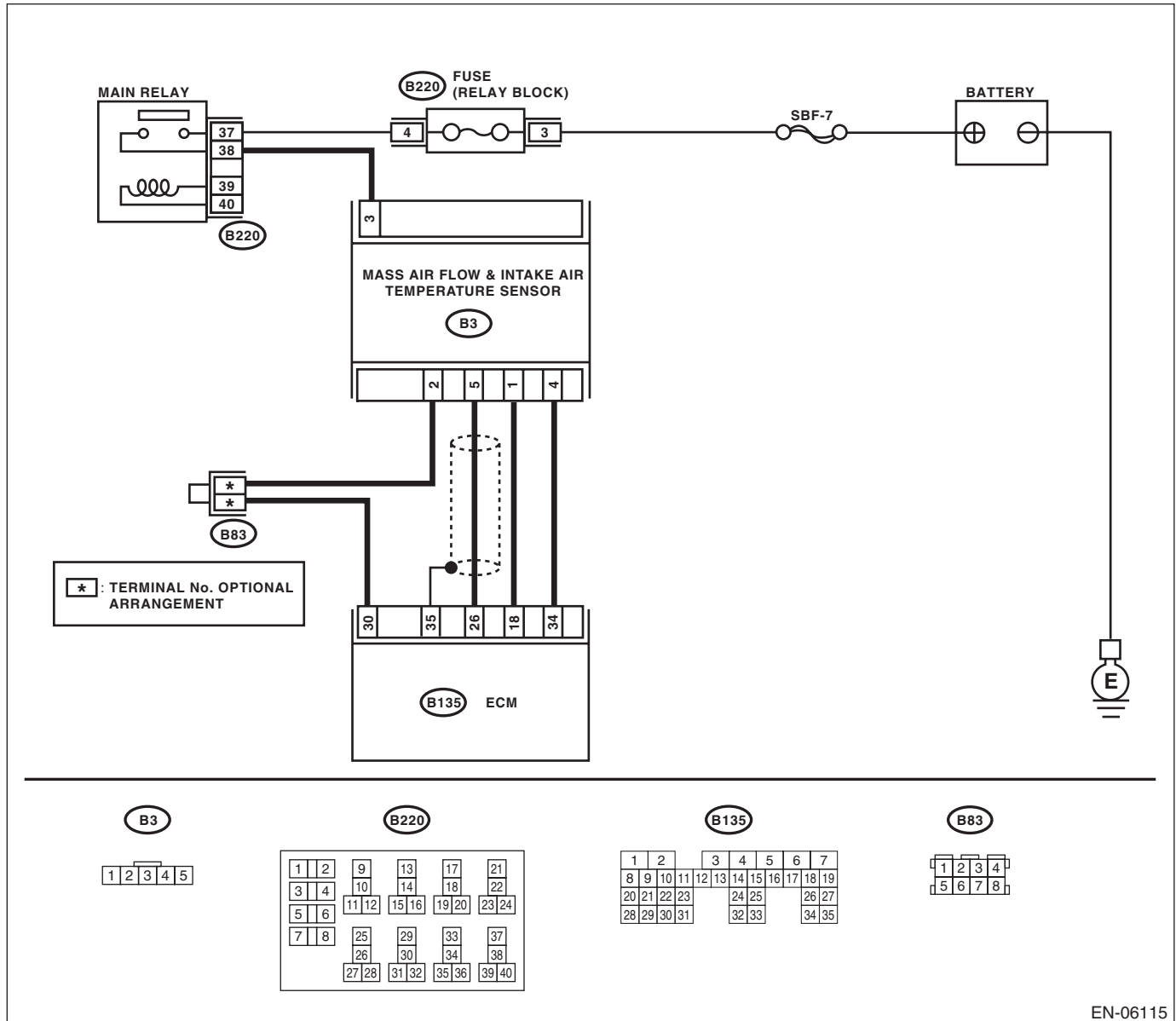
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06115

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	Is the intake air temperature less than -40°C (-40°F) ?	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 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, 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 mass air flow and intake air temperature sensor connectors.</p> <p>Connector & terminal</p> <p>(B135) No. 18 — (B3) No. 1:</p> <p>(B135) No. 30 — (B3) No. 2:</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, 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</p> <p>(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.>

U: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-44, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

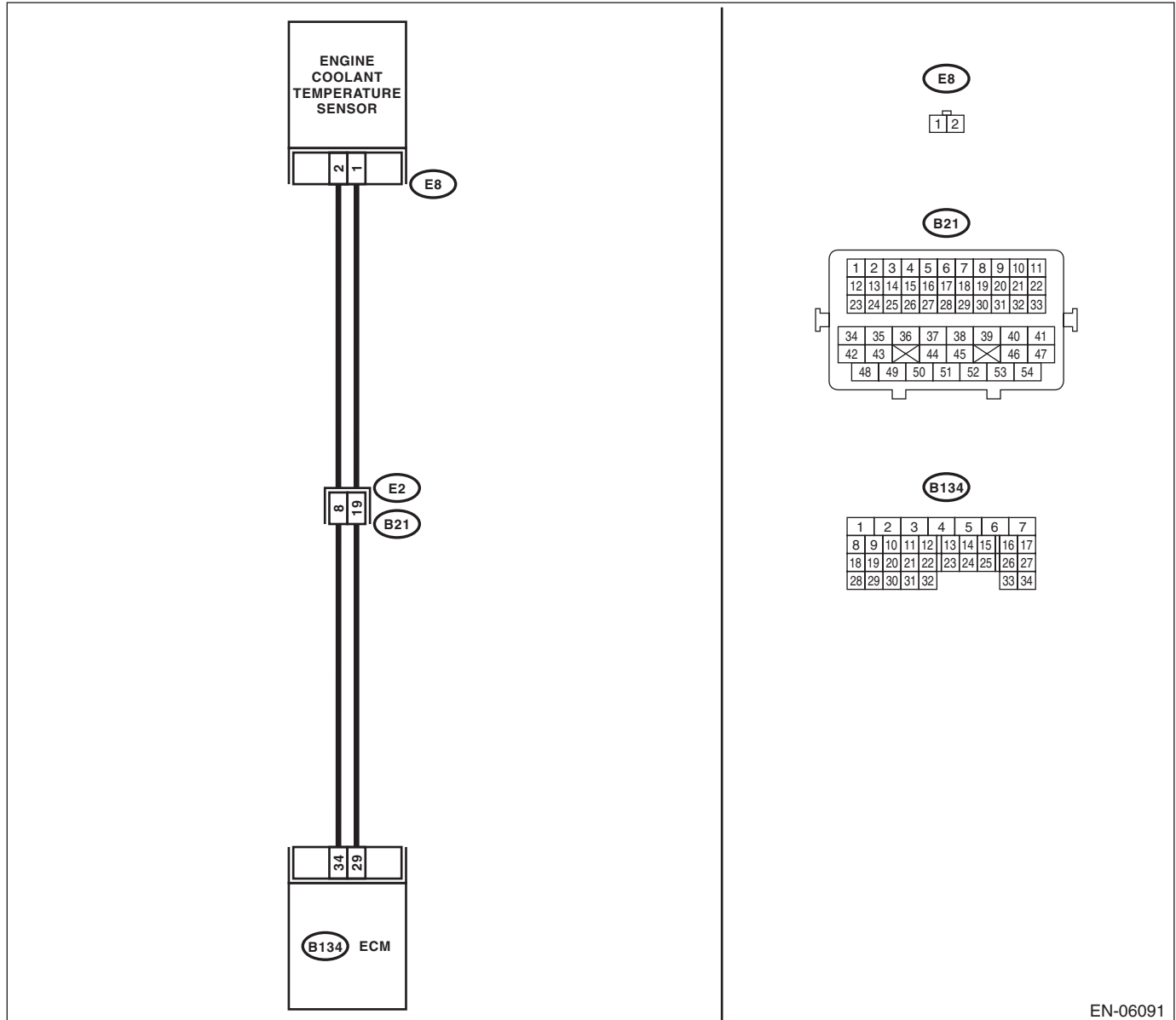
TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06091

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	Is the engine coolant temperature 150°C (302°F) or higher ?	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 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>	Is the resistance 1 MΩ or more?	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>	Repair short circuit in harness to ground between ECM and engine coolant temperature sensor connector.

V: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-46, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

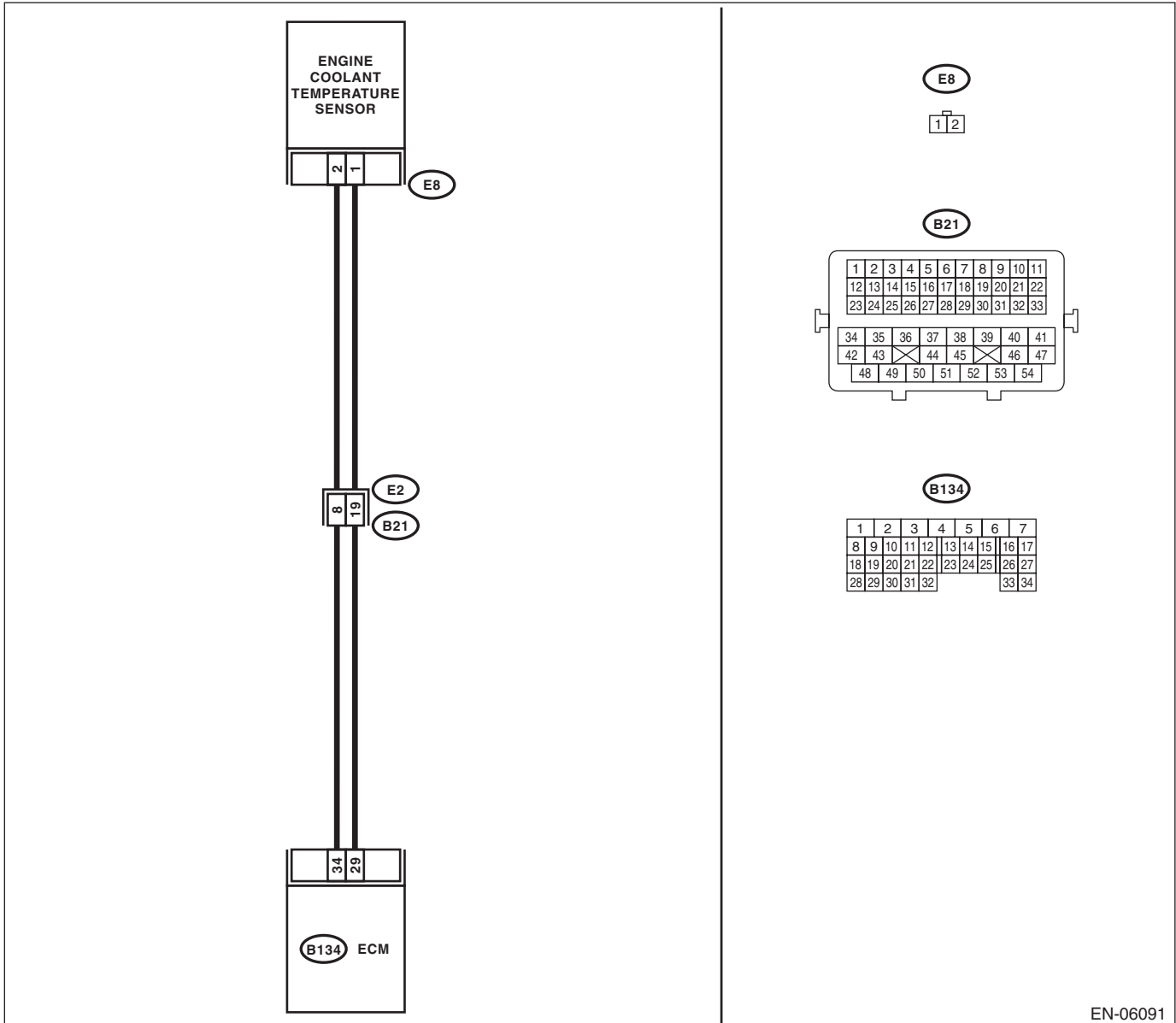
TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06091

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	Is the engine coolant temperature less than -40°C (-40°F) ?	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 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 $1\ \Omega$?	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 in harness between ECM and engine coolant temperature sensor connector Poor contact of coupling 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.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-48, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

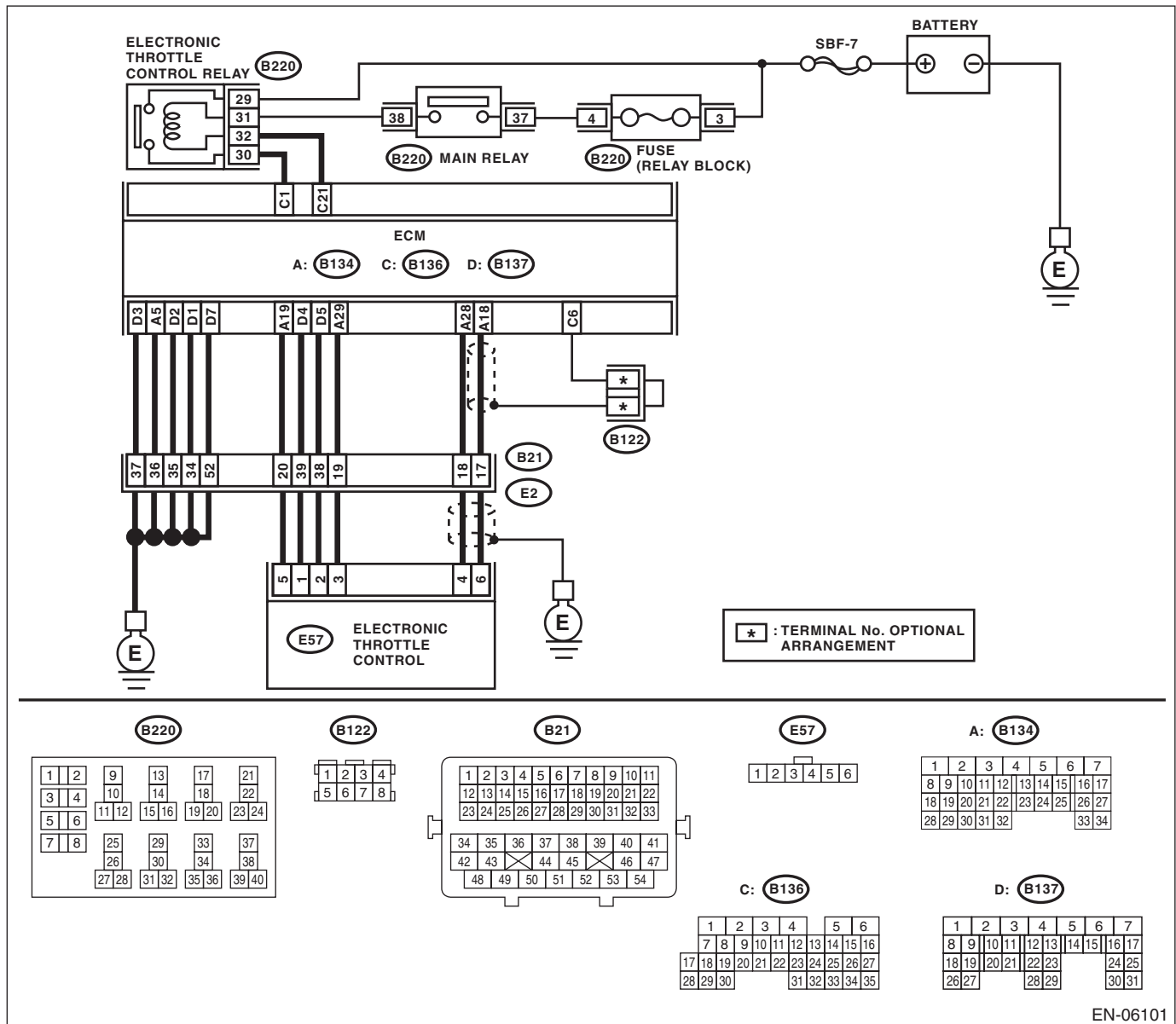
TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Brought to you by Eris Studios
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	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 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>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair the ground short circuit of harness between ECM and electronic throttle control connector.
2	<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 (B134) No. 18 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Replace the electronic throttle control. <Ref. to FU(H4SO)-13, Throttle Body.>	Repair the ground short circuit of harness between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-50, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

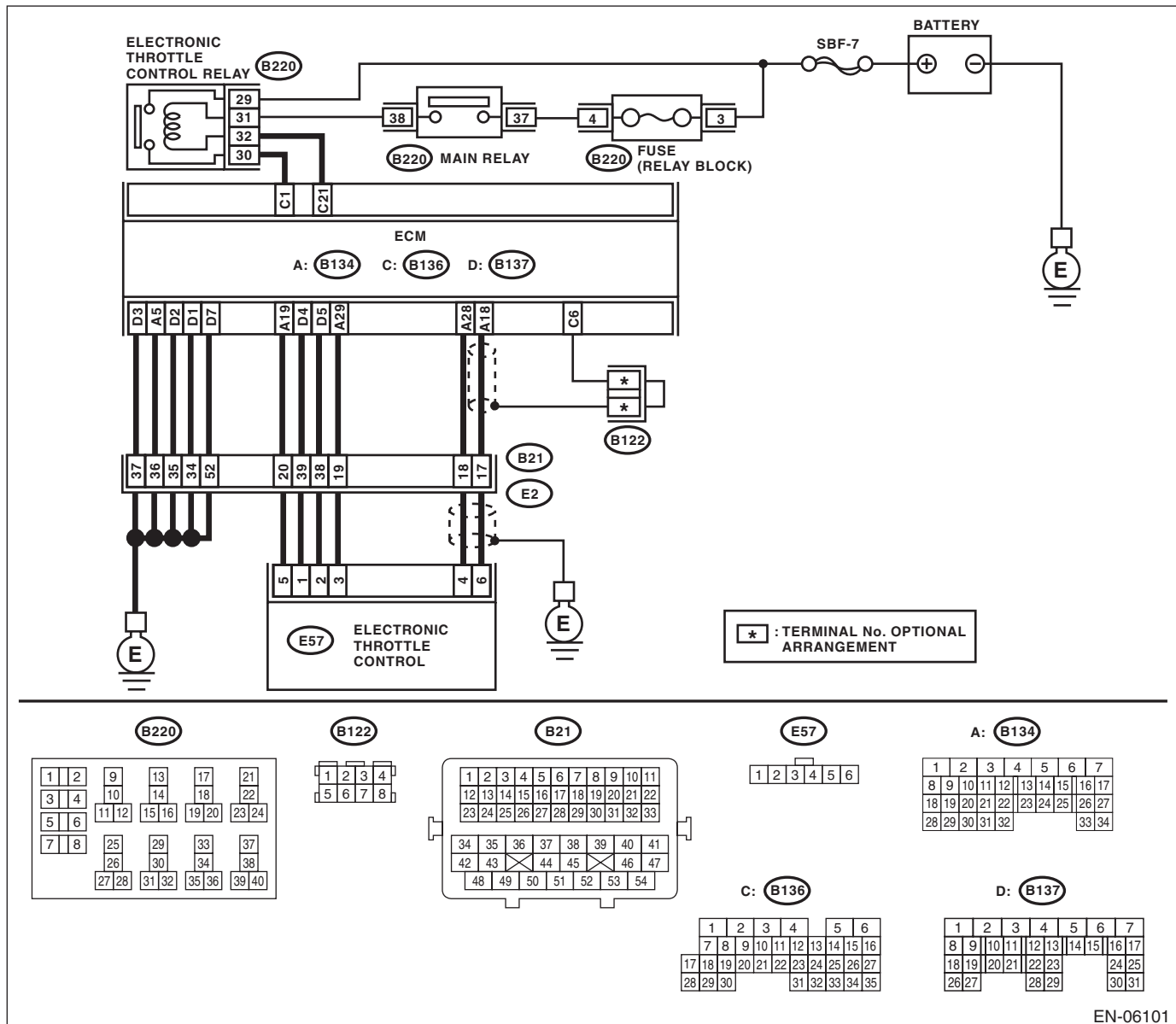
TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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 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.	<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 electronic throttle control connector • Poor contact of coupling connector
<p>2</p> <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
<p>3</p> <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.
<p>4</p> <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 MΩ or more?	Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4SO)-13, Throttle Body.>	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.

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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)-52, 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 repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-13, REPLACEMENT, Engine Coolant.>
3	CHECK THERMOSTAT.	Does the thermostat remain opened?	Replace the thermostat. <Ref. to CO(H4SO)-17, Thermostat.>	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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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)-54, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

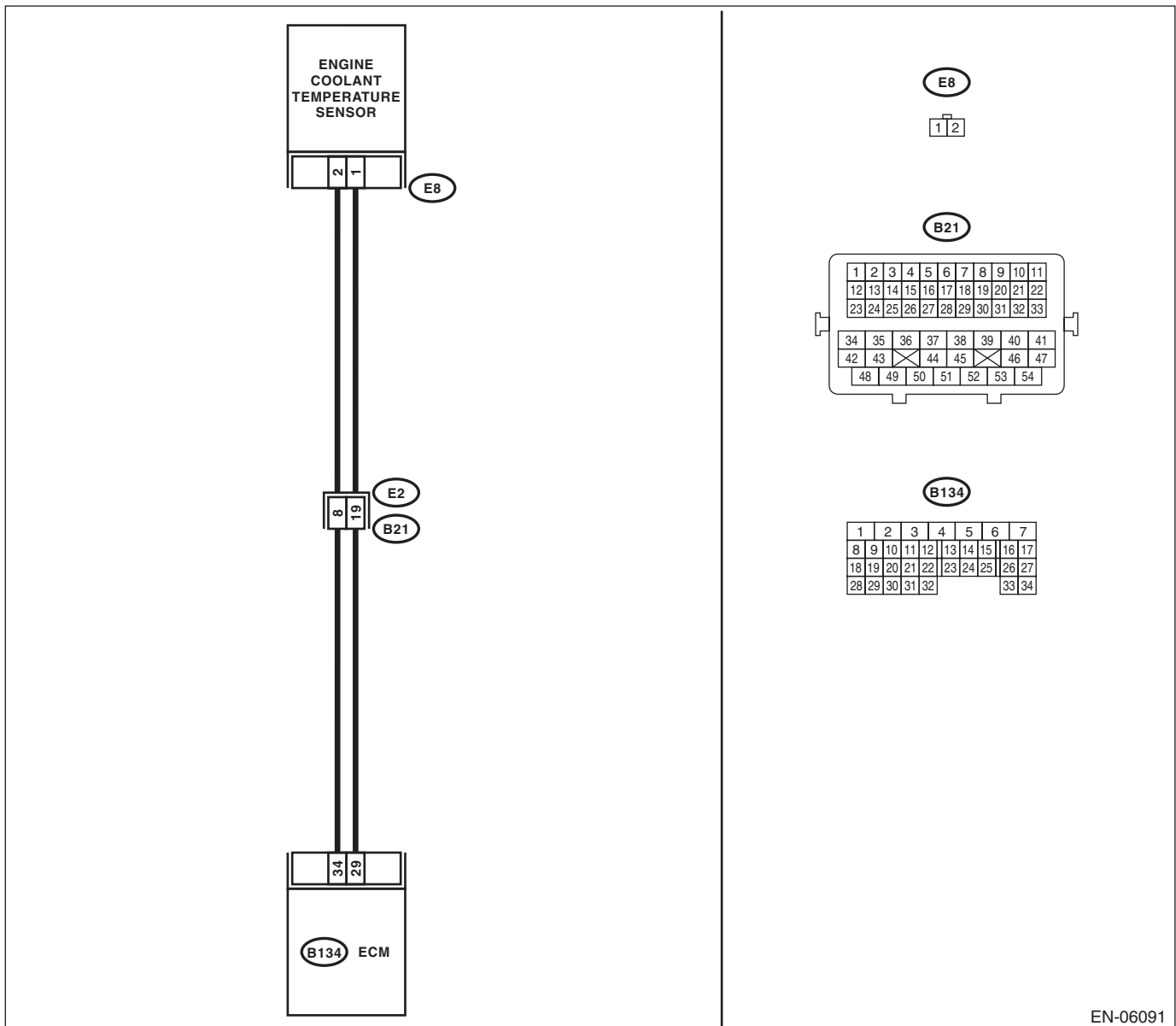
TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06091

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Brought to you by *Travis Studios*
 NOT FOR RESALE

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 the poor contact of the ECM connector.	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-22, Engine Coolant Temperature Sensor.>

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)-56, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

Thermostat remains open.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-13, 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)-23, Radiator Main Fan and Fan Motor.>and <Ref. to CO(H4SO)-25, Radiator Sub Fan and Fan Motor.>	Replace the thermostat. <Ref. to CO(H4SO)-17, Thermostat.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

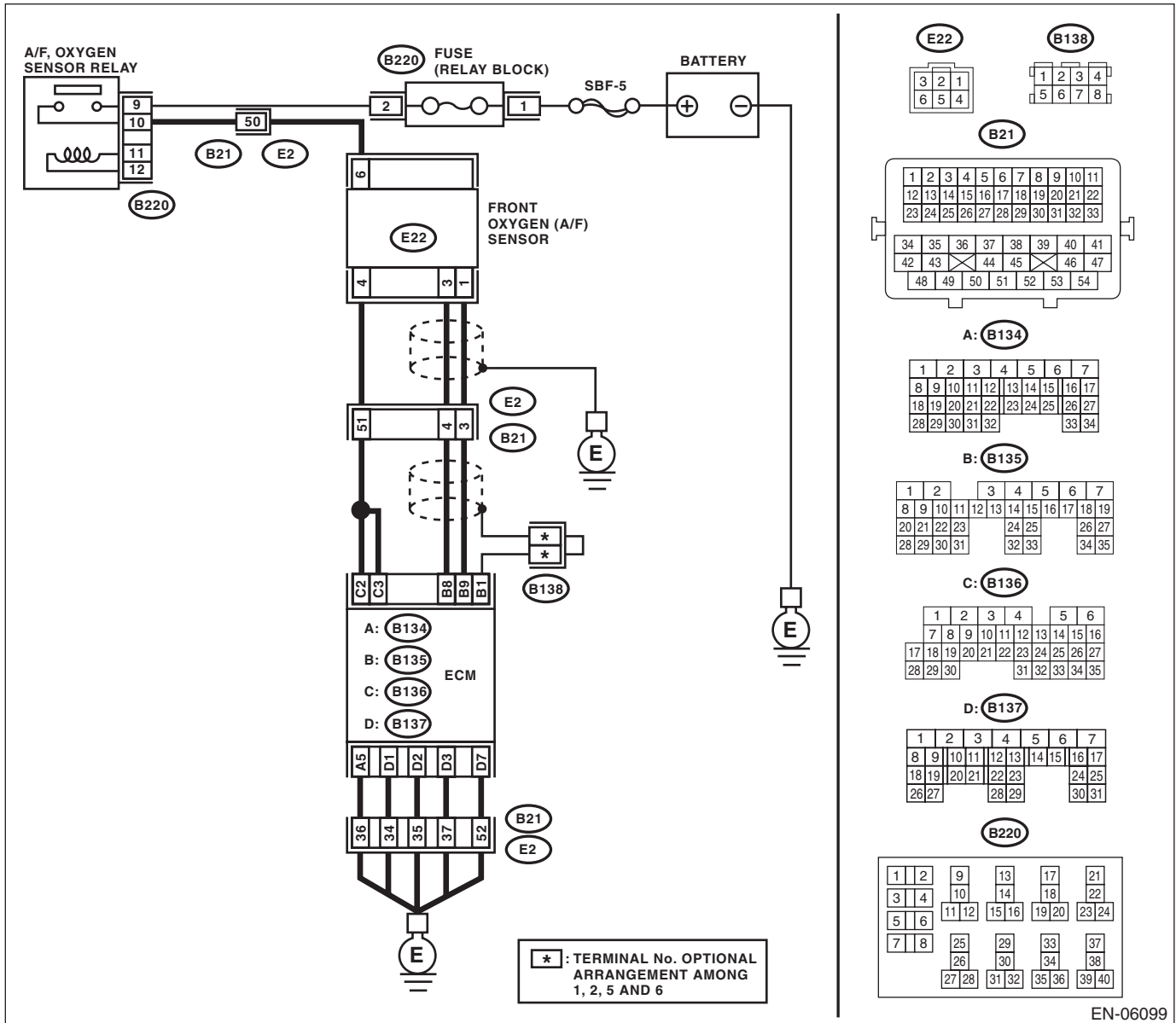
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-58, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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 the ground short circuit of harness 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)-35, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

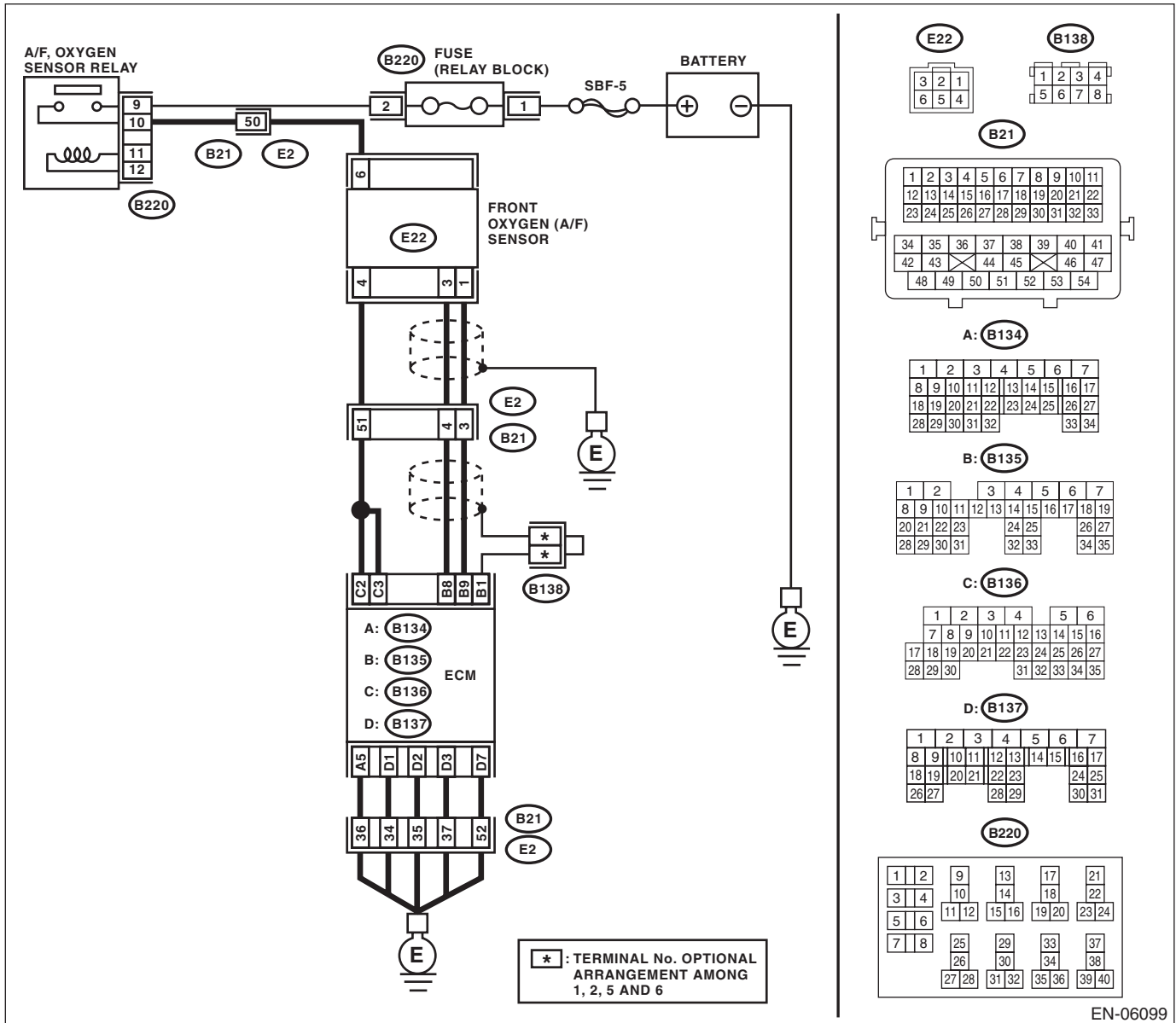
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-60, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-35, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

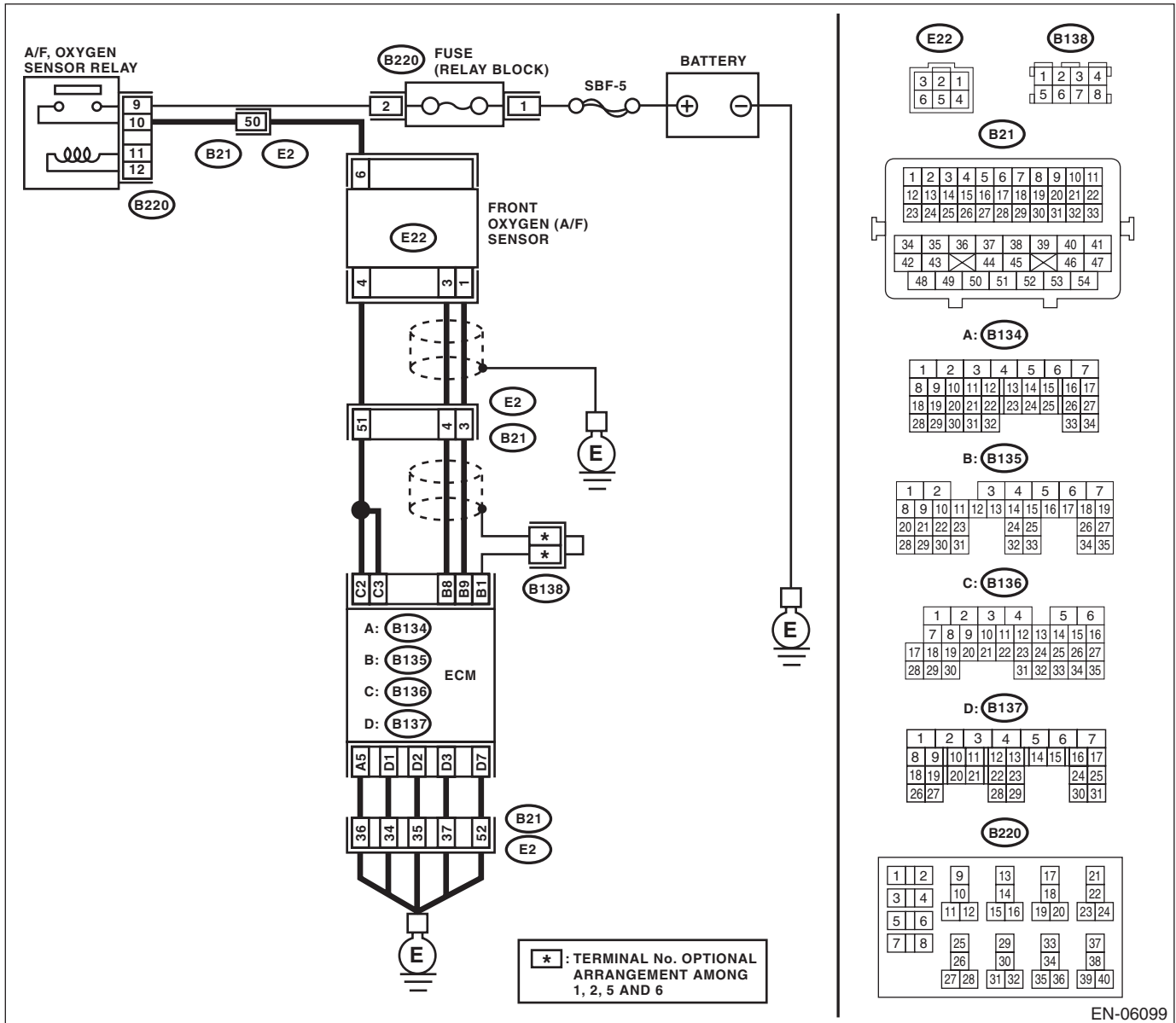
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-62, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-35, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

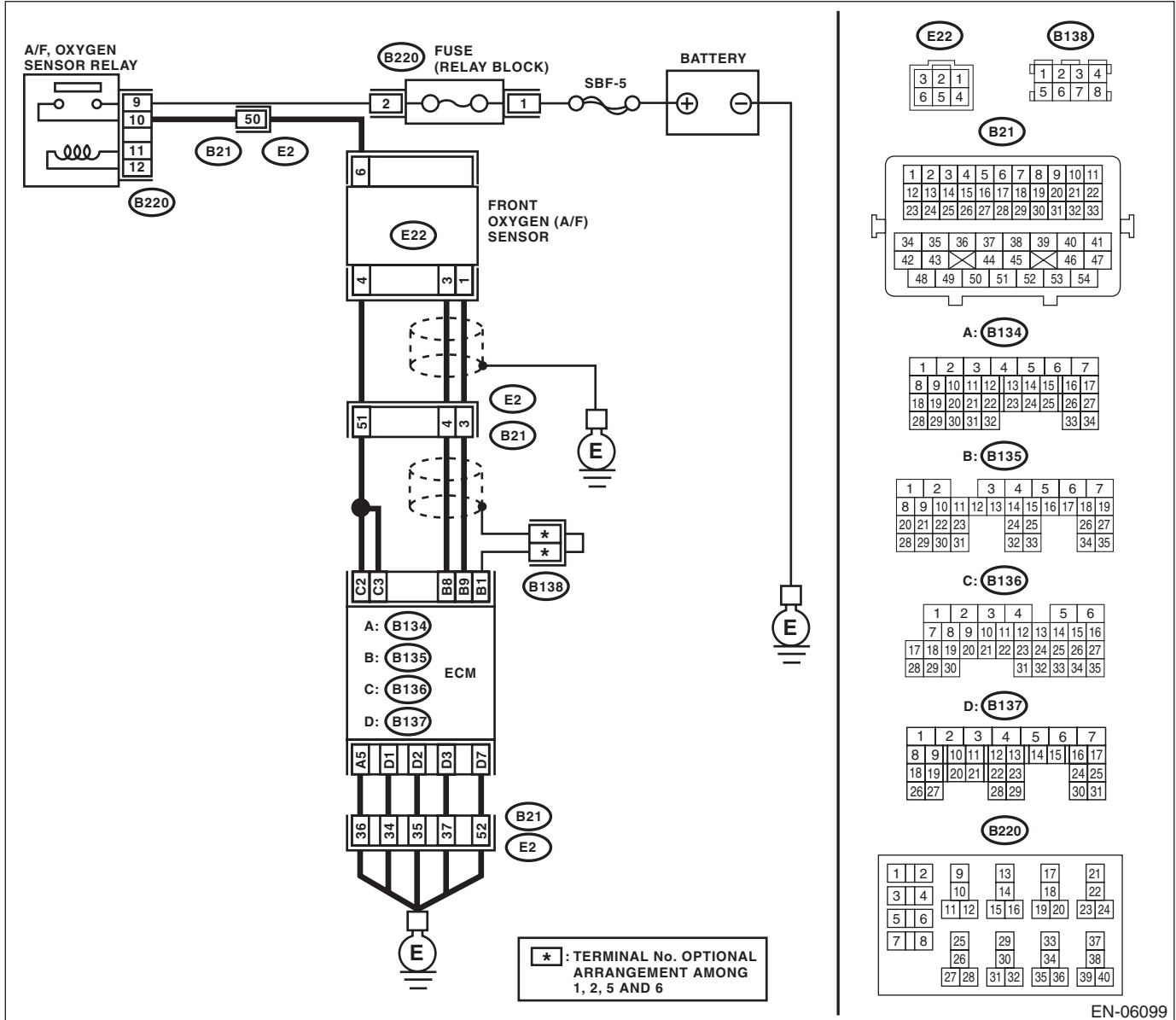
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-65, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<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 — (E22) No. 1: (B135) No. 8 — (E22) No. 3:</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 in harness between ECM and front oxygen (A/F) sensor connector • Poor contact of coupling connector
2	<p>CHECK POOR CONTACT.</p> <p>Check poor contact of ECM and front oxygen (A/F) sensor connector.</p>	Is there poor contact in ECM or front oxygen (A/F) sensor connector?	Repair the poor contact of ECM or front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-35, Front Oxygen (A/F) Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

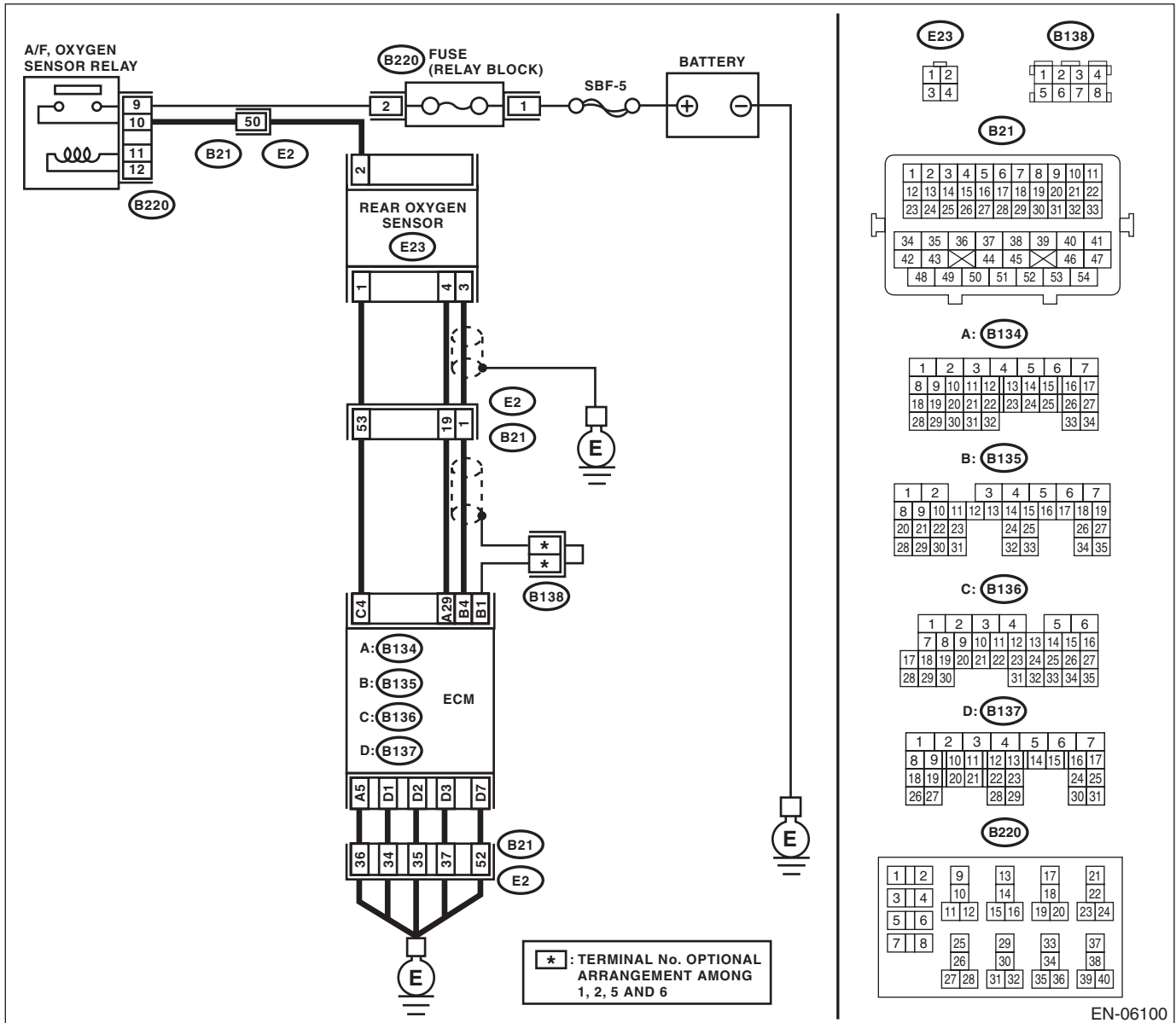
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-67, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06100

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Brought to you by *Tris Studios*
NOZOKI RESALE

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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the voltage 490 mV or more?	Go to step 5.	Go to step 2.
2 CHECK REAR OXYGEN 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 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 — (E23) No. 3: (B134) No. 29 — (E23) No. 4:	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 rear oxygen sensor connector • Poor contact of coupling connector
4 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (E23) 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 in harness between ECM and rear oxygen sensor connector • Poor contact in ECM connector • Poor contact of coupling connector
5 CHECK EXHAUST SYSTEM. Check exhaust system parts. NOTE: Check the following items. • 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)

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

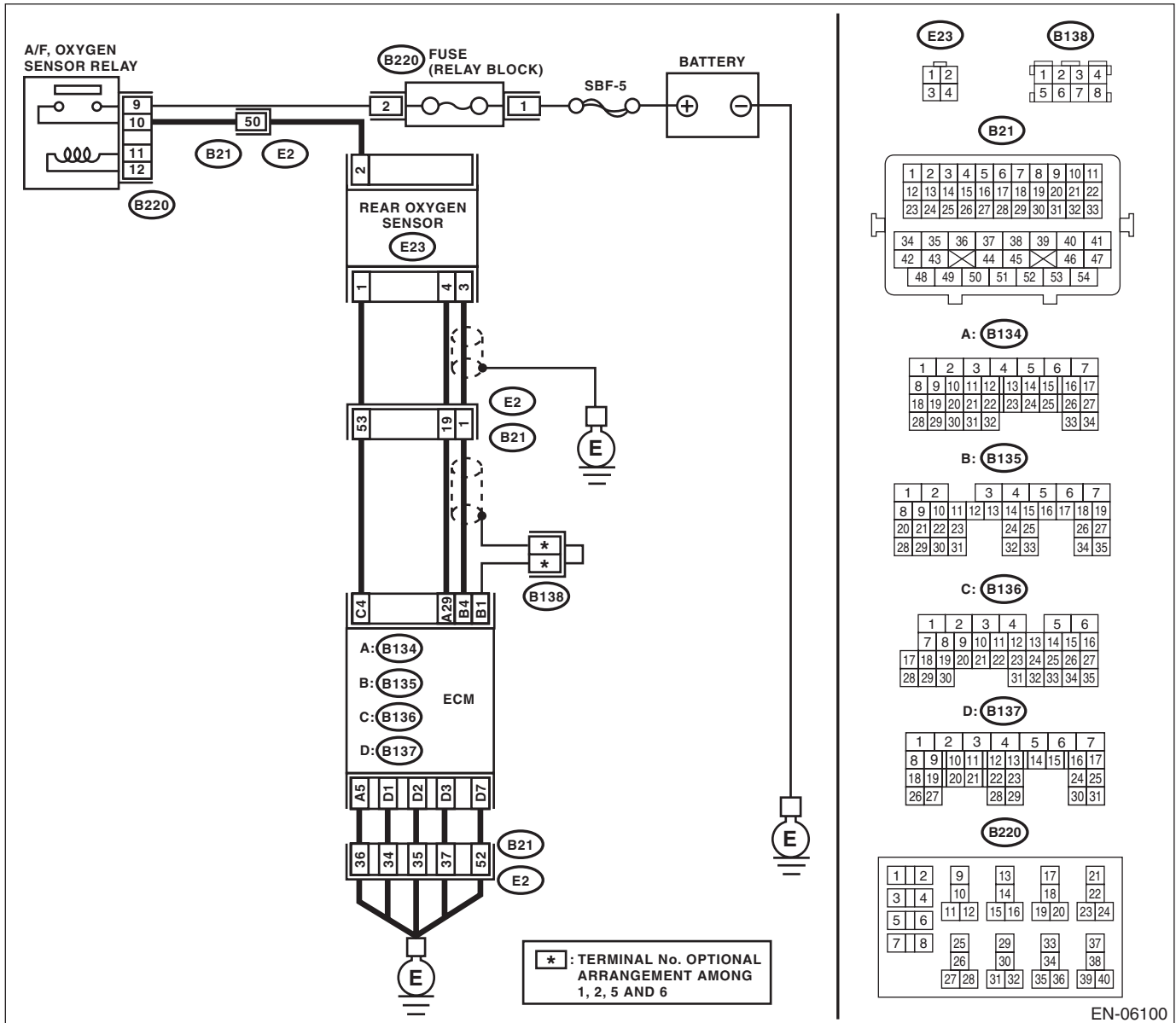
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-70, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.


WIRING DIAGRAM:



EN-06100

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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NOZOKI RESALE

	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, 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 — (E23) No. 3: (B134) No. 29 — (E23) No. 4:</p>	Is the resistance less than 1 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 in harness between ECM and rear oxygen sensor connector Poor contact of coupling 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 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 (E23) No. 3 (+) — Chassis ground (-):</p>	Is the voltage 0.2 — 0.5 V?	<p>Replace the rear oxygen sensor.</p> <p><Ref. to FU(H4SO)-37, Rear Oxygen Sensor.></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 in harness between ECM and rear oxygen sensor connector Poor contact in ECM connector Poor contact of coupling connector
5	<p>CHECK EXHAUST SYSTEM.</p> <p>Check exhaust system parts.</p> <p>NOTE:</p> <p>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.	<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)

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

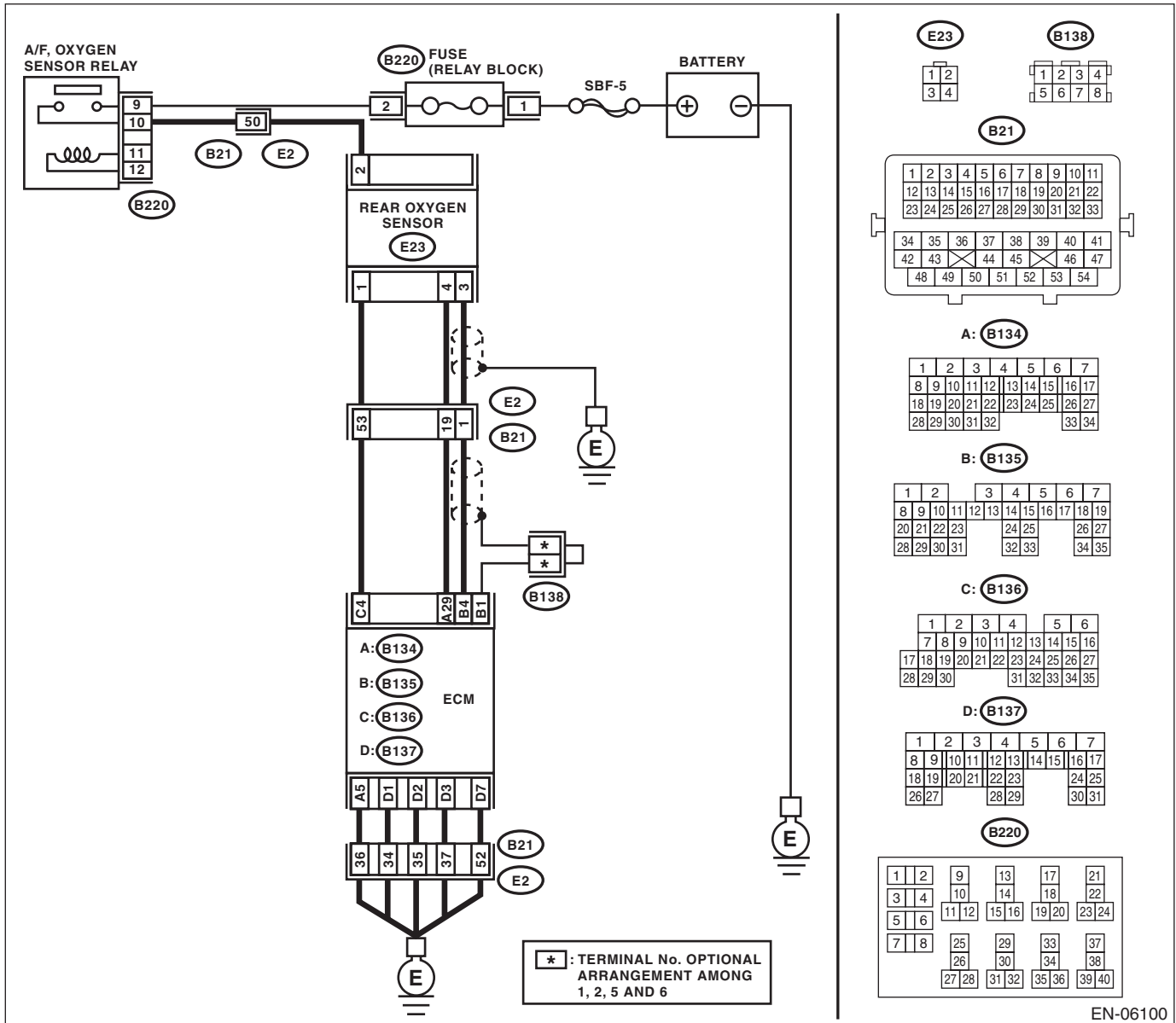
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-71, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	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 — (E23) No. 3:	Is the resistance less than 1 Ω?	Go to step 2.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and rear oxygen sensor connector • Poor contact of coupling connector
2	CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. Measure the resistance between rear oxygen sensor connector and chassis ground. Connector & terminal (E23) No. 3 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness between ECM and rear oxygen sensor connector.
3	CHECK REAR OXYGEN SENSOR. Measure the resistance between rear oxygen sensor terminals. Terminals No. 3 — No. 4	Is the resistance less than 1 Ω?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-37, Rear Oxygen Sensor.>	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.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

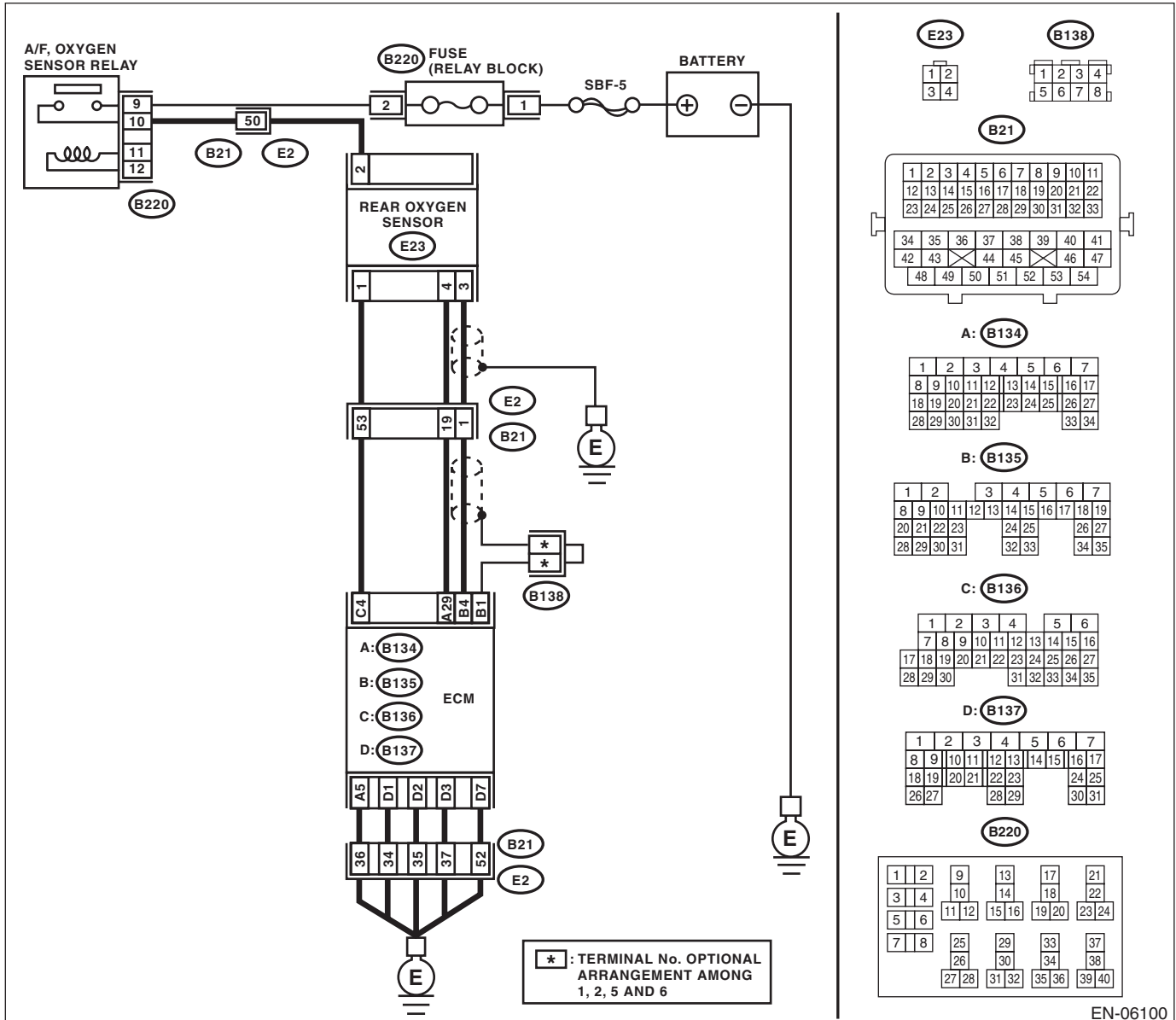
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-78, DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06100

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	Is the voltage 490 mV or more?	Go to step 6.	Go to step 2.
2	<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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	Is the voltage 250 mV or less?	Go to step 6.	Go to step 3.
3	<p>CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.</p>	Has water entered the connector?	Completely remove any water inside.	Go to step 4.
4	<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</p> <p>(B135) No. 4 — (E23) No. 3:</p> <p>(B134) No. 29 — (E23) No. 4:</p>	Is the resistance less than 1 Ω?	Go to step 5.	<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 in harness between ECM and rear oxygen sensor connector Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
5	<p>CHECK HARNESS BETWEEN ECM AND 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 chassis ground.</p> <p>Connector & terminal (E23) 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 in harness between ECM and rear oxygen sensor connector • Poor contact in ECM connector • Poor contact of coupling connector
6	<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.>

AJ:DTC P0171 SYSTEM TOO LEAN (BANK 1)

Refer to DTC P0172 for diagnostic procedure. <Ref. to EN(H4SO)(diag)-157, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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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)-82, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Improper idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-27, INSPECTION, Fuel Pressure.> CAUTION: Release fuel pressure before removing the fuel pressure gauge.	Is the measured value 333.4 — 360.5 kPa (3.4 — 3.7 kg/cm ² , 48.4 — 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, 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)

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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 “P” range 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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	<p>Is the measured value 2.0 — 5.0 g/s (0.26 — 0.66 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 “P” range 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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedures, 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 the 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>

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

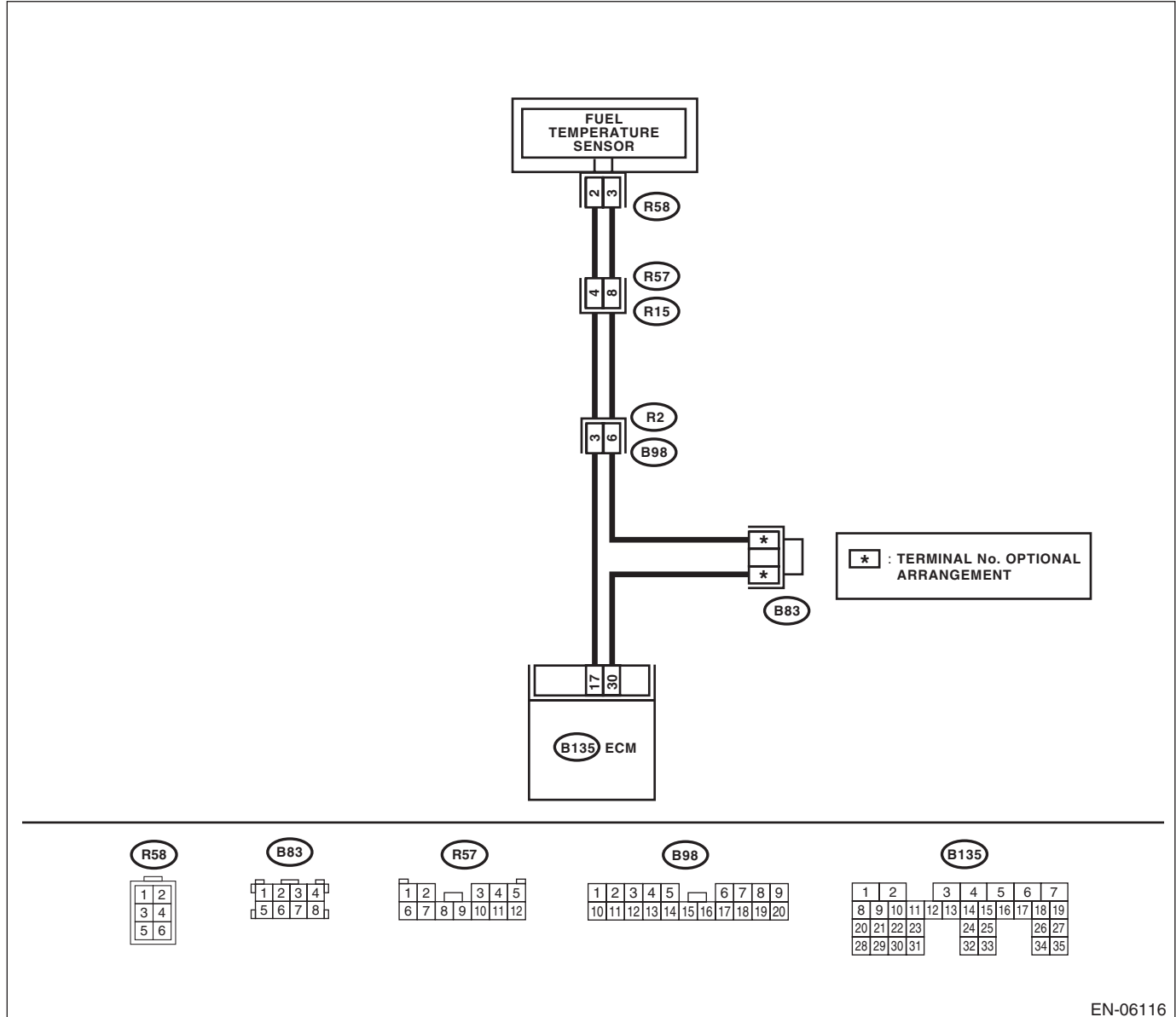
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-84, DTC P0181 FUEL TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, List of Diagnostic Trouble Code (DTC).>	Replace the fuel temperature sensor. <Ref. to EC(H4SO)-12, Fuel Temperature Sensor.>

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

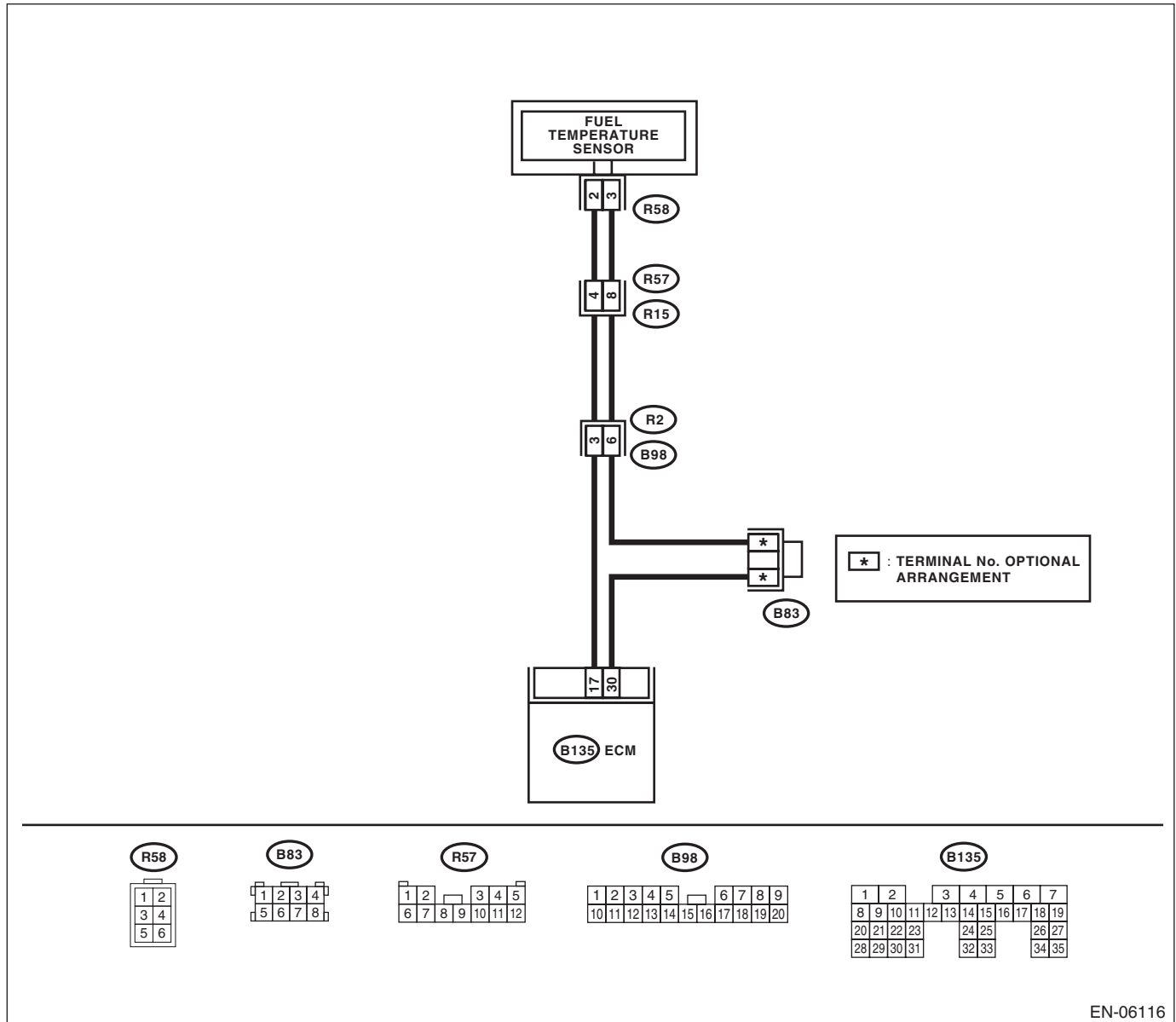
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-87, DTC P0182 FUEL TEMPERATURE SENSOR "A" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<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)-33, Subaru Select Monitor.></p>	Is the temperature 120°C (248°F) or higher?	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: In this case, there may be a temporary connector contact failure.</p>
2	<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>	Is the resistance 1 MΩ or more?	Replace the fuel temperature sensor. <Ref. to EC(H4SO)-12, Fuel Temperature Sensor.>	Repair the ground short circuit of harness between ECM and fuel pump connector.

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

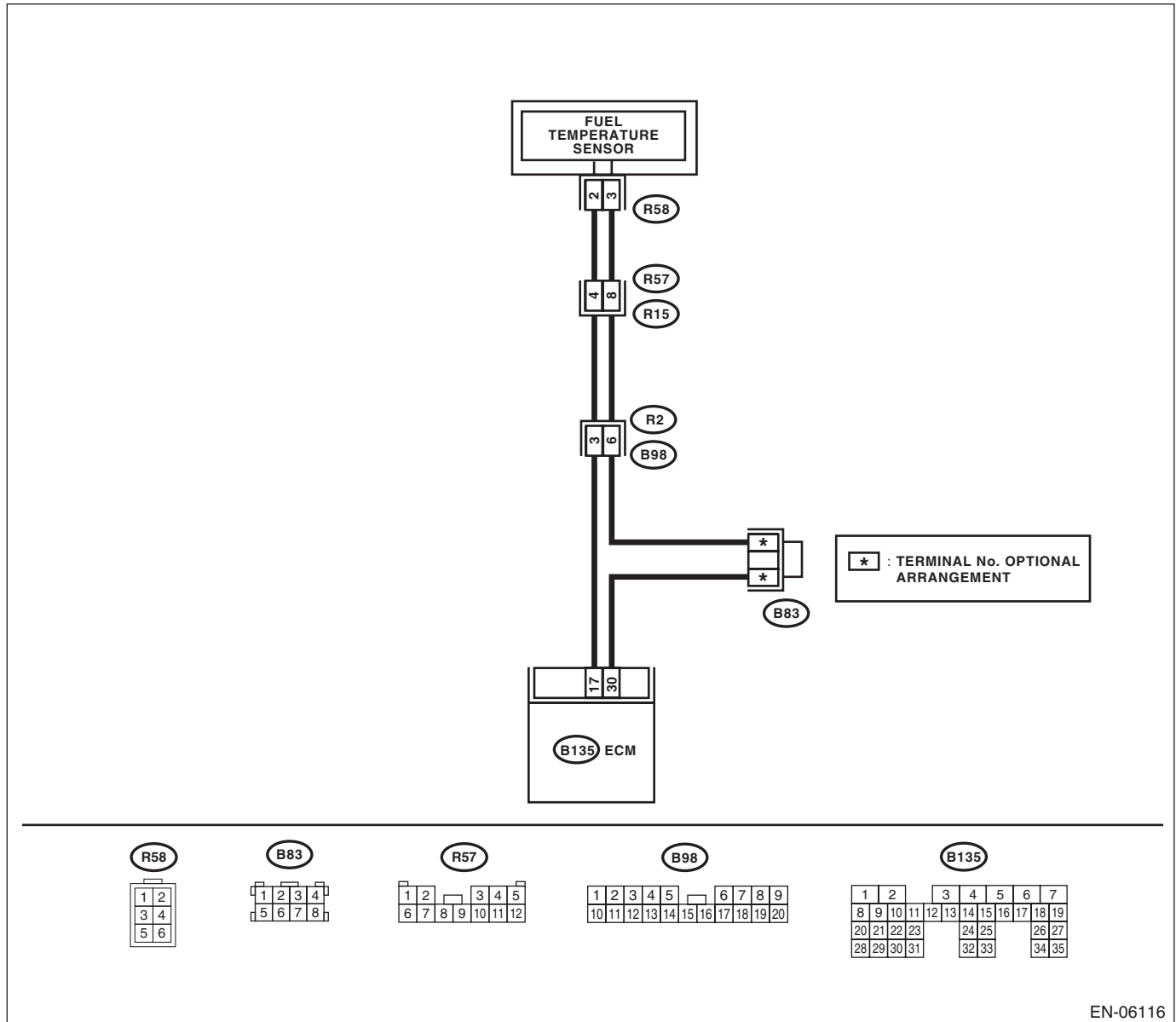
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-89, DTC P0183 FUEL TEMPERATURE SENSOR "A" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06116

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

Brought to you by Eris Studios
NOT FOR RESALE

	Step	Check	Yes	No
1	<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)-33, Subaru Select Monitor.></p>	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	<p>CHECK POOR CONTACT.</p> <p>Repair any poor contact between the ECM and fuel temperature sensor connectors.</p>	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	<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 of the harness between the ECM and fuel temperature sensor connector.</p> <p>Connector & terminal (B135) No. 17 — (R58) No. 2: (B135) No. 30 — (R58) No. 3:</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: • Open circuit in harness between ECM and fuel temperature sensor connector • Poor contact of coupling connector
4	<p>CHECK HARNESS BETWEEN ECM AND FUEL 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 (B135) No. 17 (+) — Chassis ground (-):</p>	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)-12, Fuel Temperature Sensor.>

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)-91, DTC P0196 ENGINE OIL TEMPERATURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

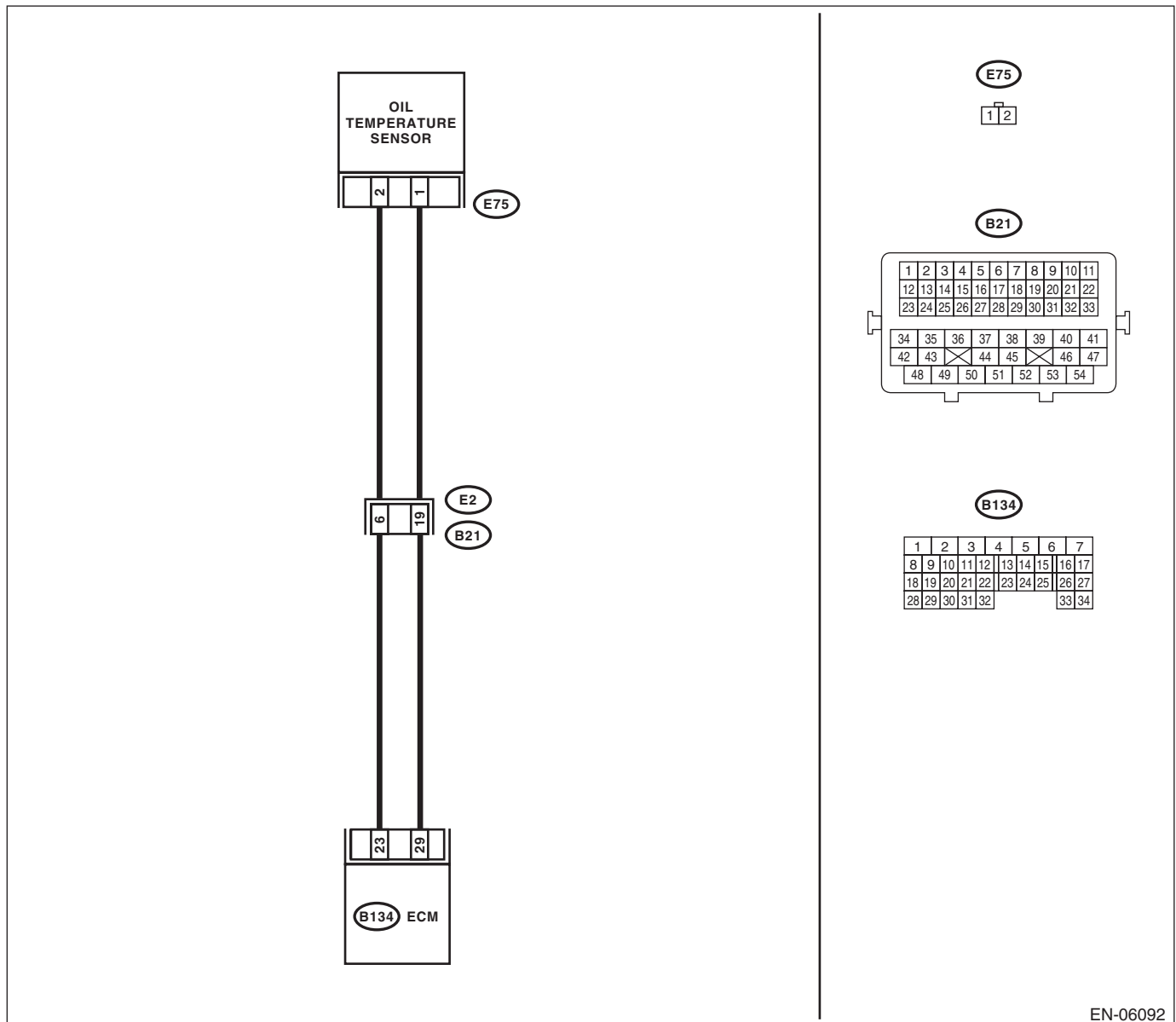
TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06092

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, List of Diagnostic Trouble Code (DTC).>	Replace the oil temperature sensor. <Ref. to FU(H4SO)-34, Oil Temperature Sensor.>

AP:DTC P0197 ENGINE OIL TEMPERATURE SENSOR LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-93, DTC P0197 ENGINE OIL TEMPERATURE SENSOR LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

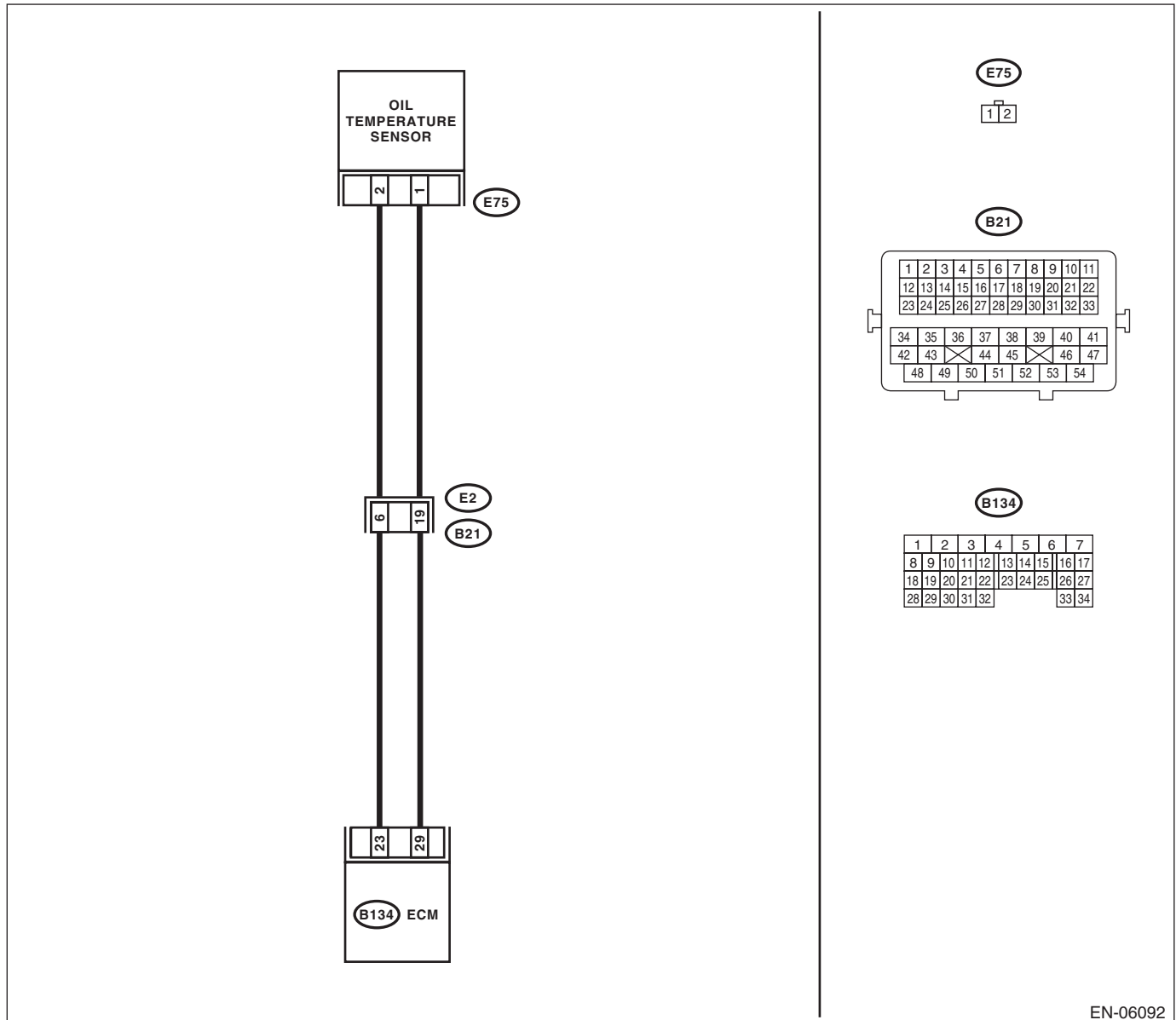
TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06092

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> • General scan tool <p>For detailed operation procedures, 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:</p> <p>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)-34, Oil Temperature Sensor.></p>	<p>Repair the short circuit to ground in harness between ECM and oil temperature sensor connector.</p>

AQ:DTC P0198 ENGINE OIL TEMPERATURE SENSOR HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-94, DTC P0198 ENGINE OIL TEMPERATURE SENSOR HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

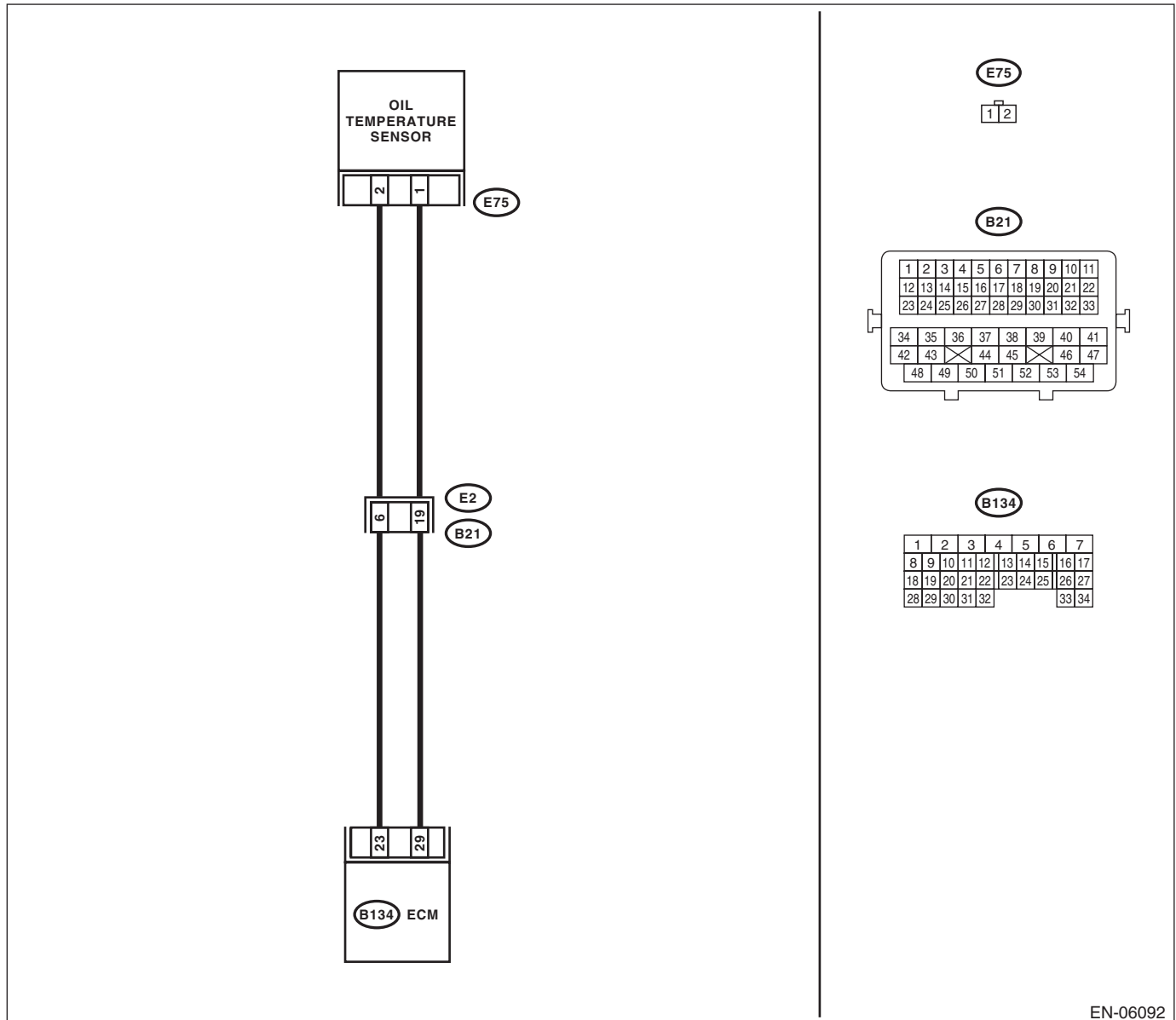
TROUBLE SYMPTOM:

- Hard to start
- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06092

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	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	<p>CHECK POOR CONTACT.</p> <p>Check for poor contact of the ECM and oil temperature sensor connector.</p>	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	<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 of the harness between the ECM and oil temperature sensor connector.</p> <p>Connector & terminal (B134) No. 23 — (E75) No. 2: (B134) No. 29 — (E75) 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: • Open circuit in harness between ECM and oil temperature sensor connector • Poor contact of coupling connector
4	<p>CHECK HARNESS BETWEEN ECM AND OIL 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. 23 (+) — Chassis ground (-):</p>	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)-34, Oil Temperature Sensor.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-95, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

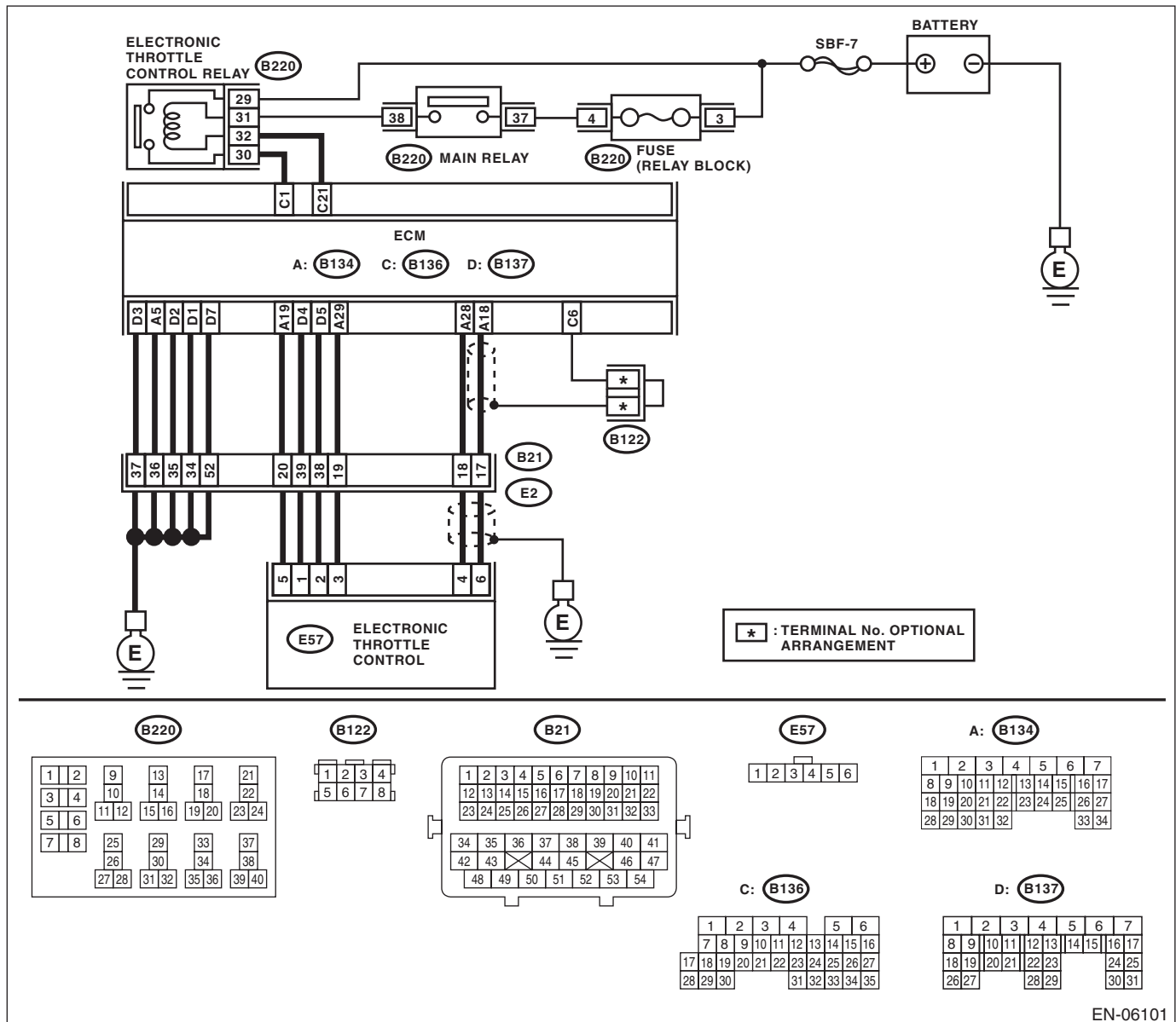
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06101

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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 between ECM and chassis ground.</p> <p>Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 28 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair the ground short circuit of harness between ECM and electronic throttle control connector.
2	<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. 4 — Engine ground:</p>	Is the resistance 1 MΩ or more?	Replace the electronic throttle control. <Ref. to FU(H4SO)-13, Throttle Body.>	Repair the ground short circuit of harness between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-97, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

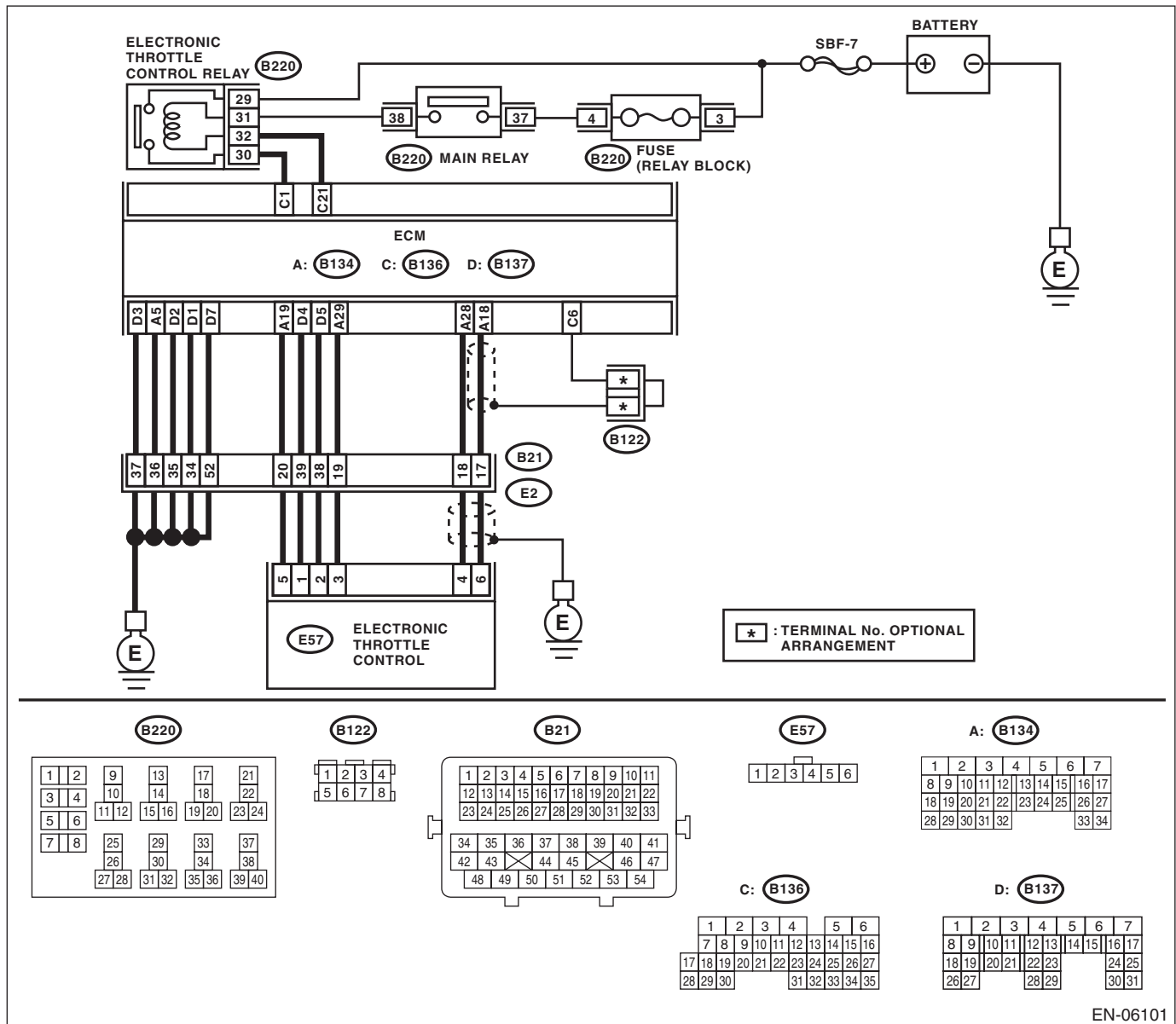
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3:</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 in harness between ECM and electronic throttle control connector • Poor contact of coupling 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. 4 (+) — 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. 28:</p>	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)-13, 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)

AT:DTC P0301 CYLINDER 1 MISFIRE DETECTED

NOTE:

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)(diag)-176, 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)-176, 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)-176, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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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)-105, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

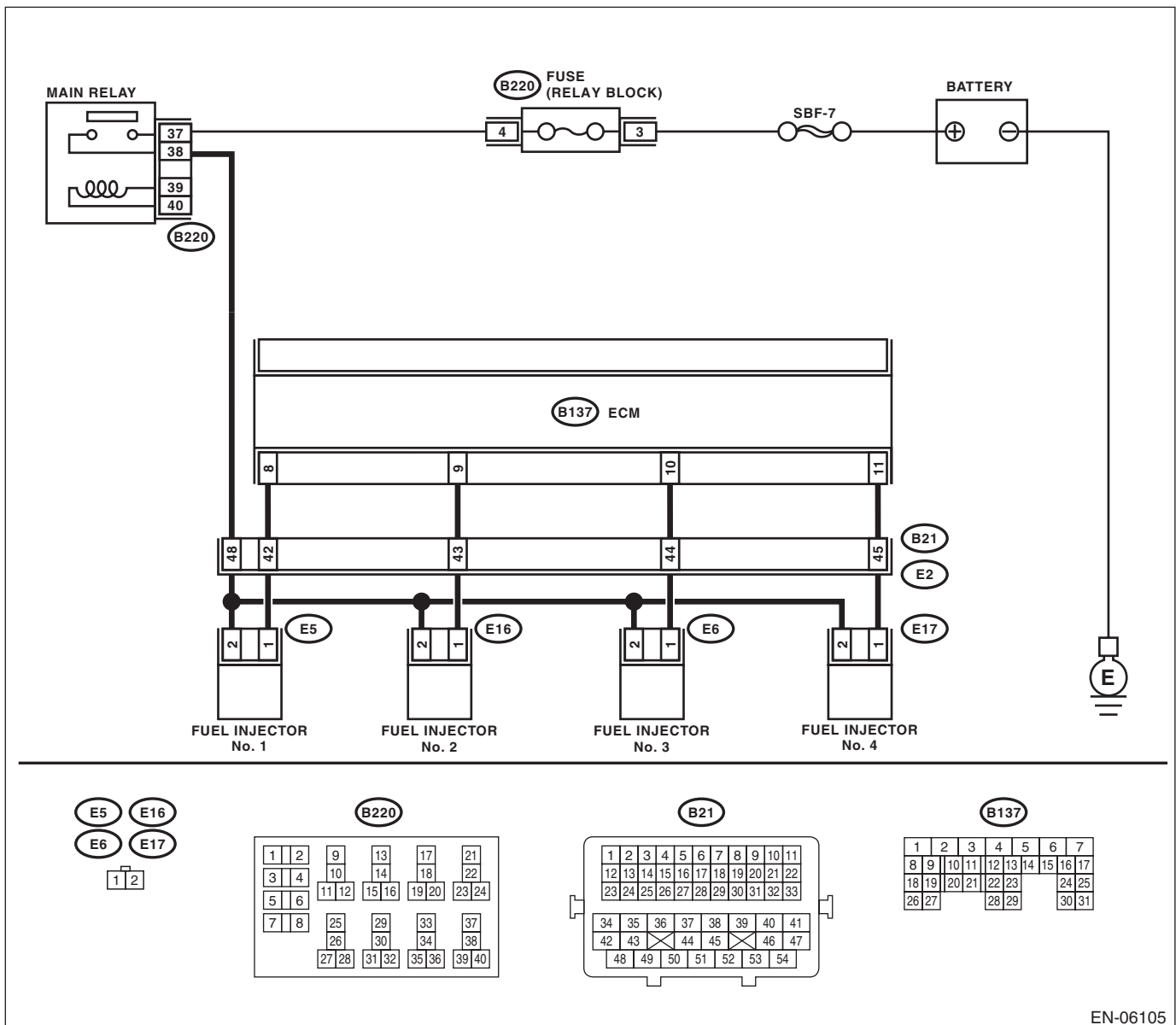
TROUBLE SYMPTOM:

- Engine stalls.
- Improper idling
- Rough driving

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06105

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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 NOT FOR RESALE

	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 the short circuit to ground in harness between ECM and fuel injector connector.
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 in harness between the main relay connector and fuel injector connector on faulty cylinders • Poor contact of coupling connector • Poor contact of main relay connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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 harness between ECM and fuel injector connector.	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 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.	Go to step 9.
9 CHECK CRANK SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-49, REMOVAL, Timing Belt Cover.>	Is the crank sprocket rusted or does it have damaged teeth?	Replace the crank sprocket. <Ref. to ME(H4SO)-56, 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)-50, 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.
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)-52, Clear Memory Mode.> 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.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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 DTC. NOTE: <ul style="list-style-type: none"> • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-33, Subaru Select Monitor.> <ul style="list-style-type: none"> • General scan tool For detailed operation procedures, 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.
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.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
20 ONLY ONE CYLINDER.	Is there any fault in the cylinder?	Repair or replace faulty parts. NOTE: Check the following items. <ul style="list-style-type: none"> • Spark plug • Spark plug cord • Fuel injector • Compression ratio 	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-156, 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. <ul style="list-style-type: none"> • Spark plug • Fuel injector • Ignition coil • Compression ratio • If any fault are not found, check the "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <Ref. to EN(H4SO)(diag)-74, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-156, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
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. <ul style="list-style-type: none"> • Spark plug • Fuel injector • Ignition coil • Compression ratio • If any fault are not found, check the "IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to EN(H4SO)(diag)-74, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-156, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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. <ul style="list-style-type: none"> • Spark plug • Fuel injector • Compression ratio • Skipping timing belt teeth 	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-156, 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. <ul style="list-style-type: none"> • Spark plug • Fuel injector • Compression ratio • Skipping timing belt teeth 	Go to DTC P0171. <Ref. to EN(H4SO)(diag)-156, 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)-156, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Repair or replace faulty parts. NOTE: Check the following items. <ul style="list-style-type: none"> • Spark plug • Fuel injector • Compression ratio

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-106, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

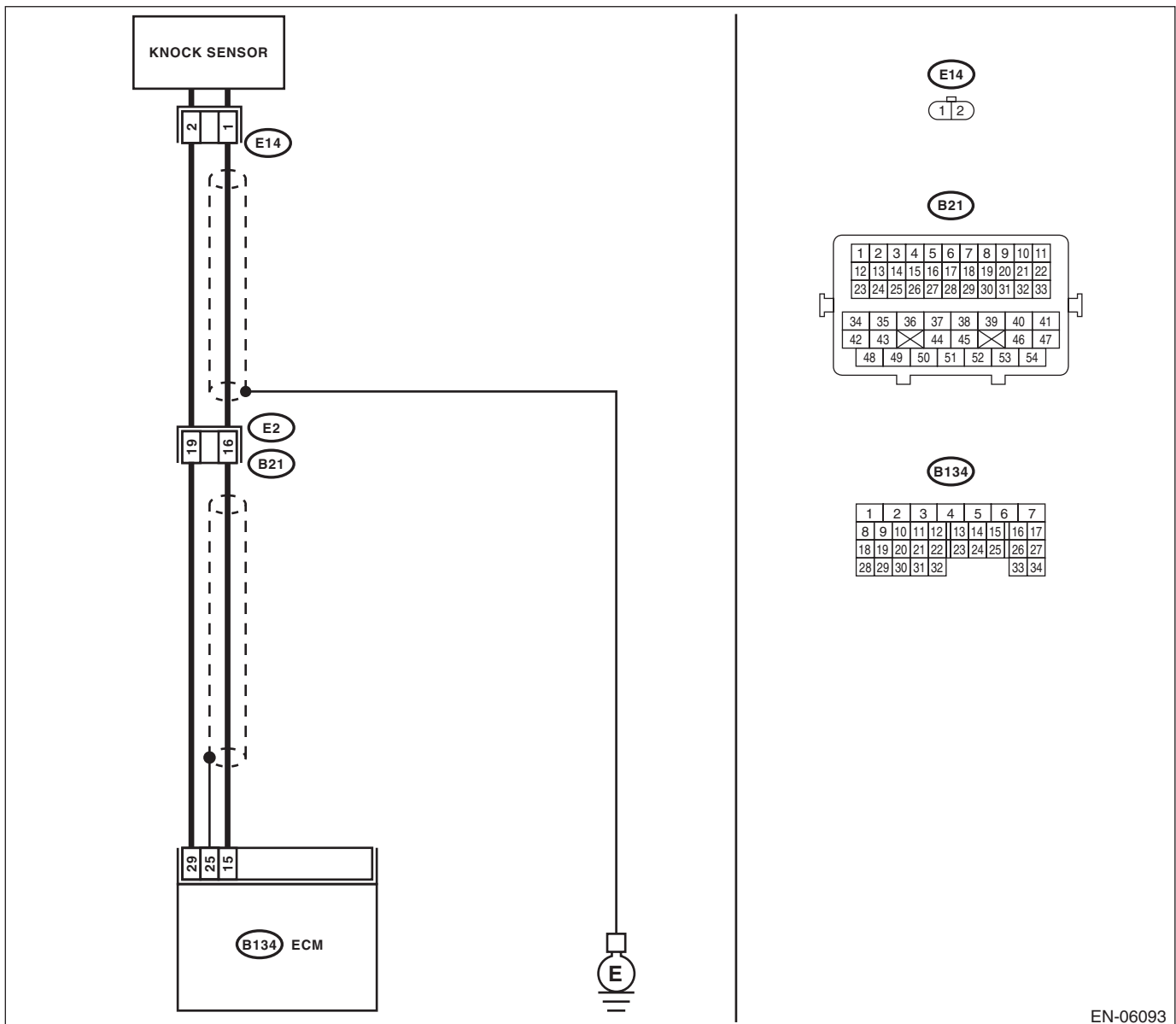
TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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. Connector & terminal (B134) No. 15 — (B134) No. 29:	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. Terminals No. 1 — No. 2:	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: • Open circuit in harness between ECM and knock sensor connector • Poor contact of the knock sensor connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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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)-108, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

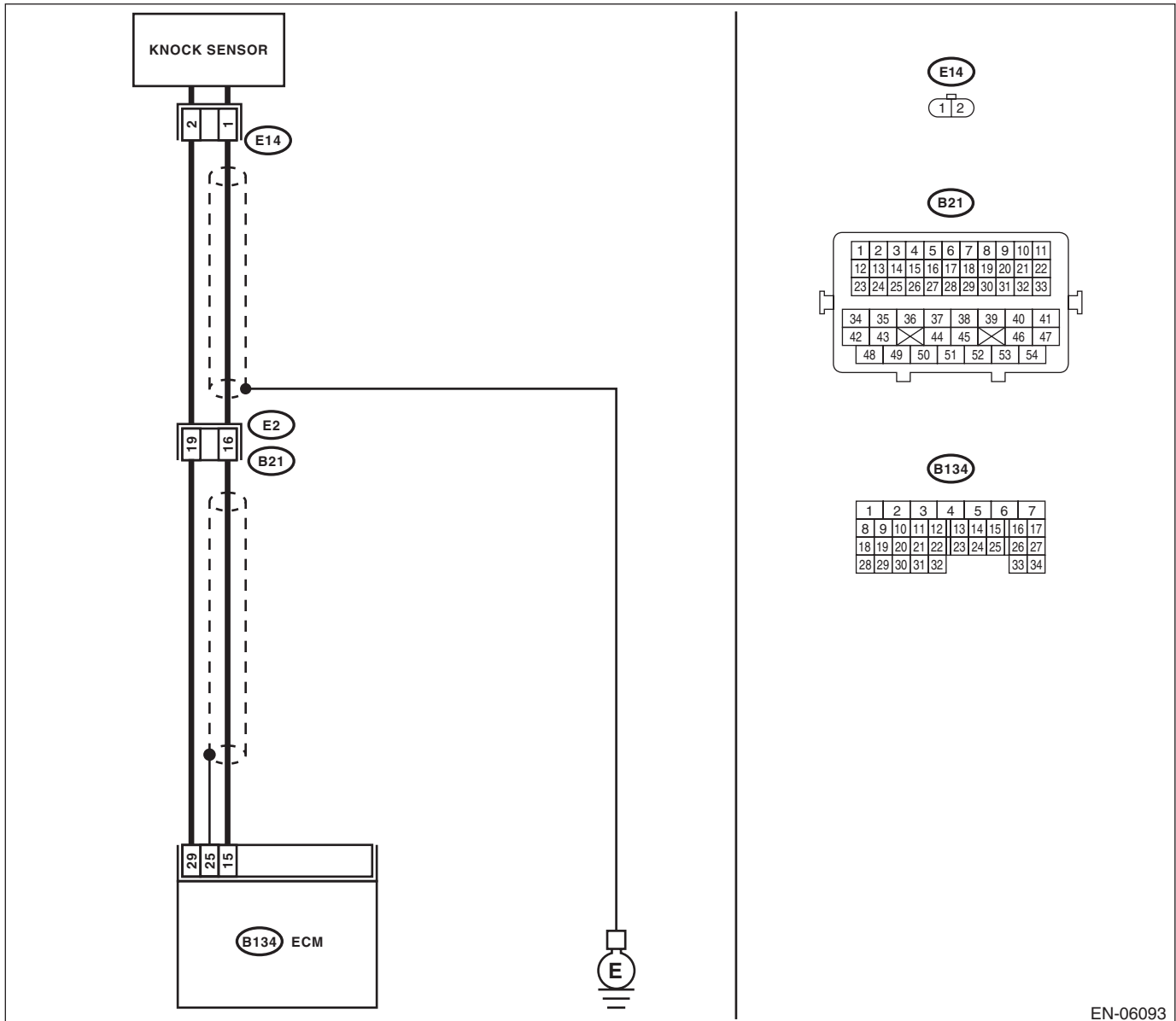
TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06093

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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. Connector & terminal (B134) No. 15 — (B134) No. 29:	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 terminals. Terminals No. 1 — No. 2:	Is the resistance less than 500 kΩ?	Replace the knock sensor. <Ref. to FU(H4SO)-25, Knock Sensor.>	Repair the ground short circuit of harness 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. Connector & terminal (B134) No. 15 (+) — Chassis ground (-):	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)

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ENGINE (DIAGNOSTICS)

AZ:DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-110, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

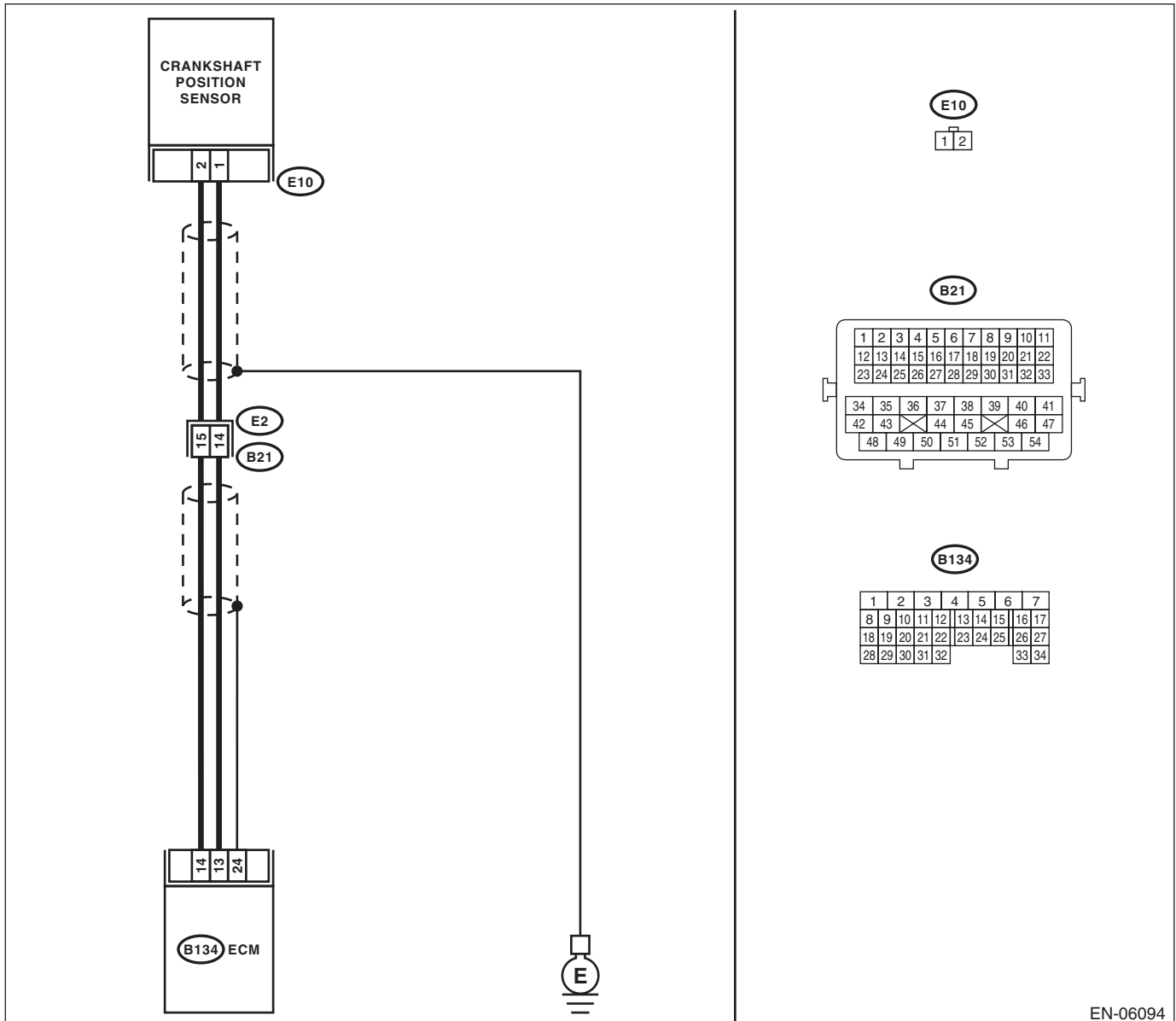
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06094

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK INSTALLATION 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 terminals of crankshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance between 1 and 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)

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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)-112, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

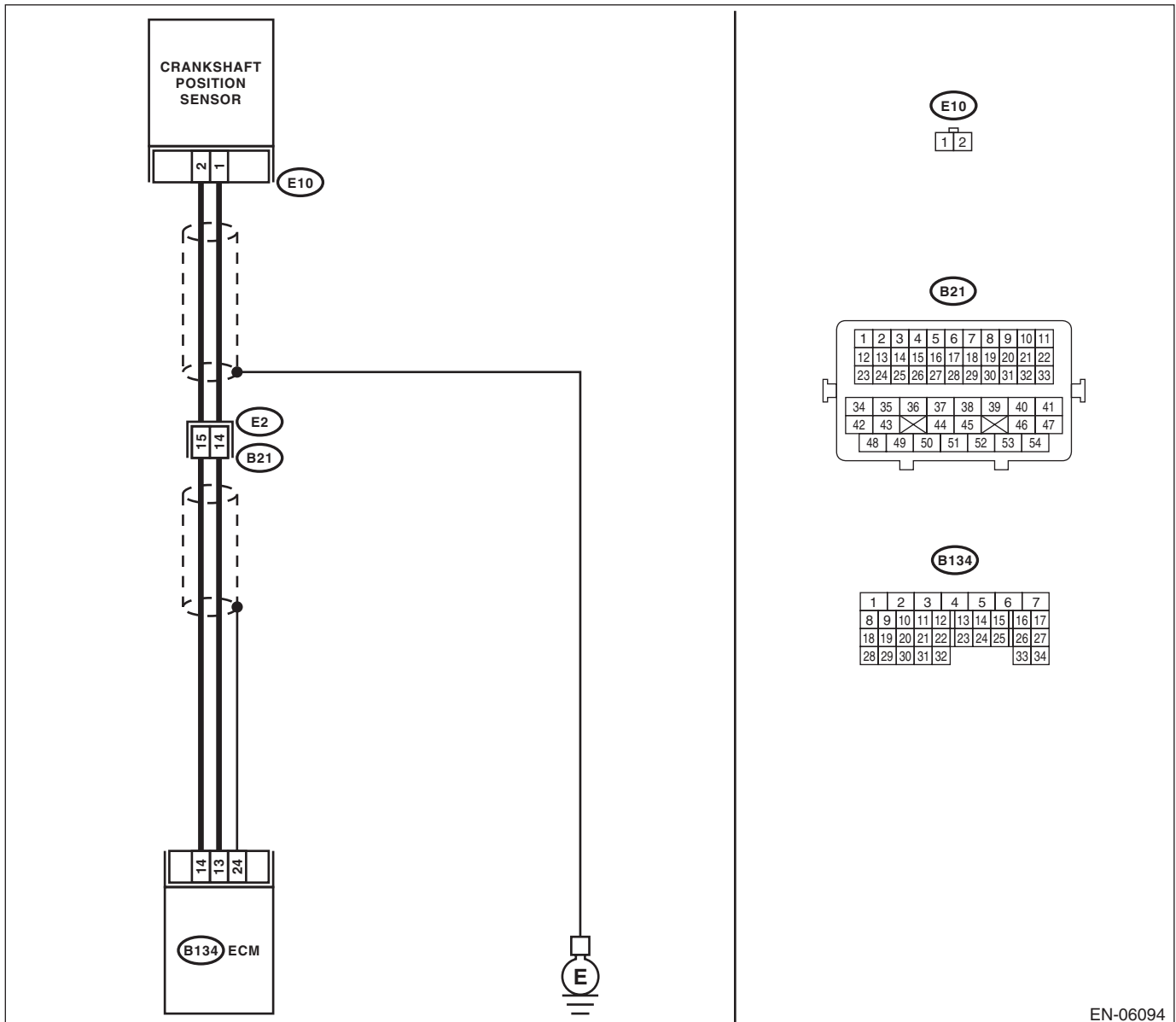
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06094

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	CHECK 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.	Are crank sprocket teeth cracked or damaged?	Replace the crank sprocket. <Ref. to ME(H4SO)-56, Crank Sprocket.>	Go to step 3.
3	CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO)-50, Timing Belt.>	Replace the crankshaft position sensor. <Ref. to FU(H4SO)-23, Crankshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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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)-114, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

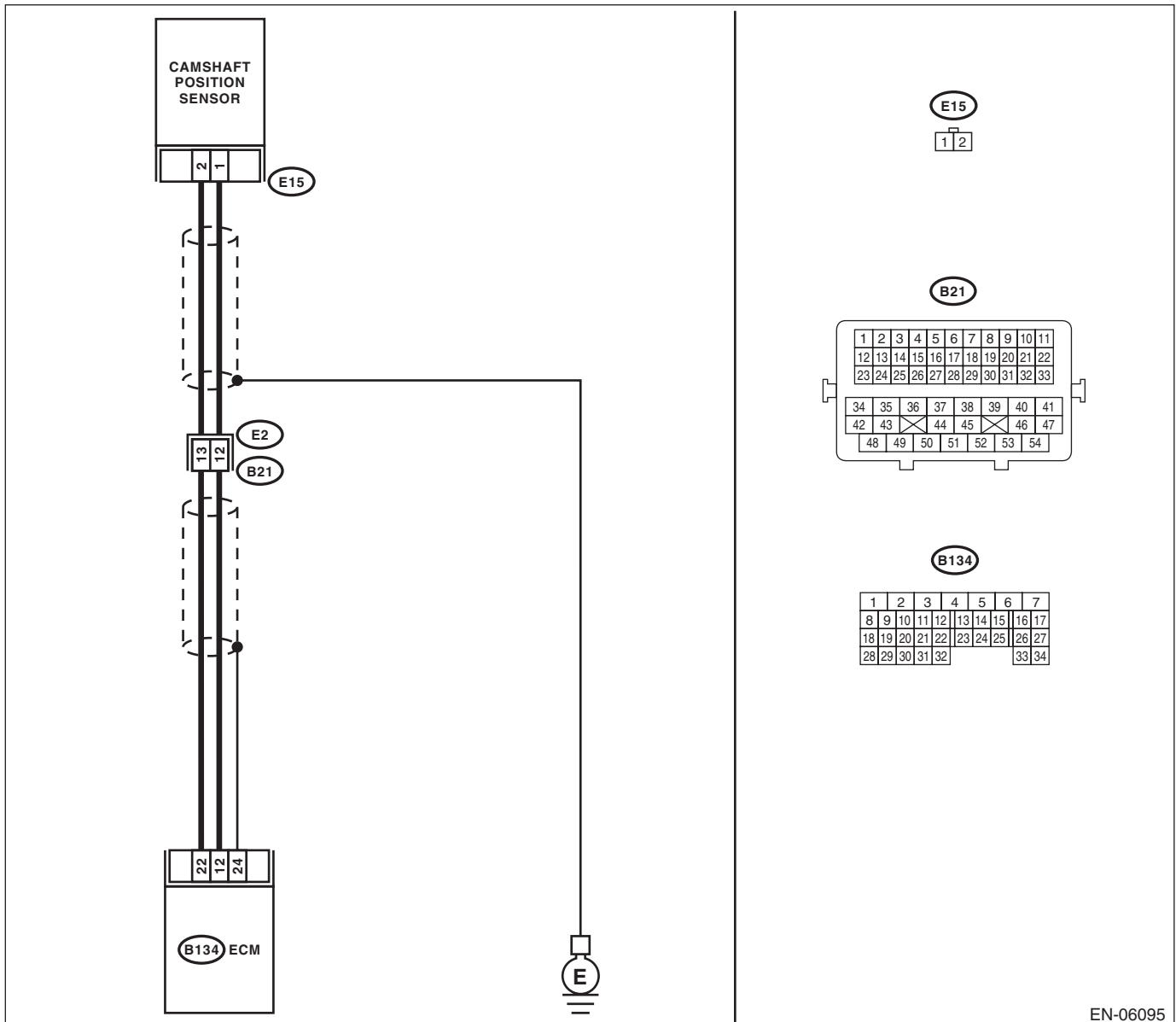
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06095

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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: • Open circuit in harness between the ECM and camshaft position sensor 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 the short circuit to ground of harness between the ECM and camshaft position sensor. NOTE: The harness between both connectors are shielded. Remove the shield and repair the ground short circuit of the harness circuit.
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 terminals of camshaft position sensor. <i>Terminals</i> No. 1 — No. 2:	Is the resistance between 1 and 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)

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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)-116, DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

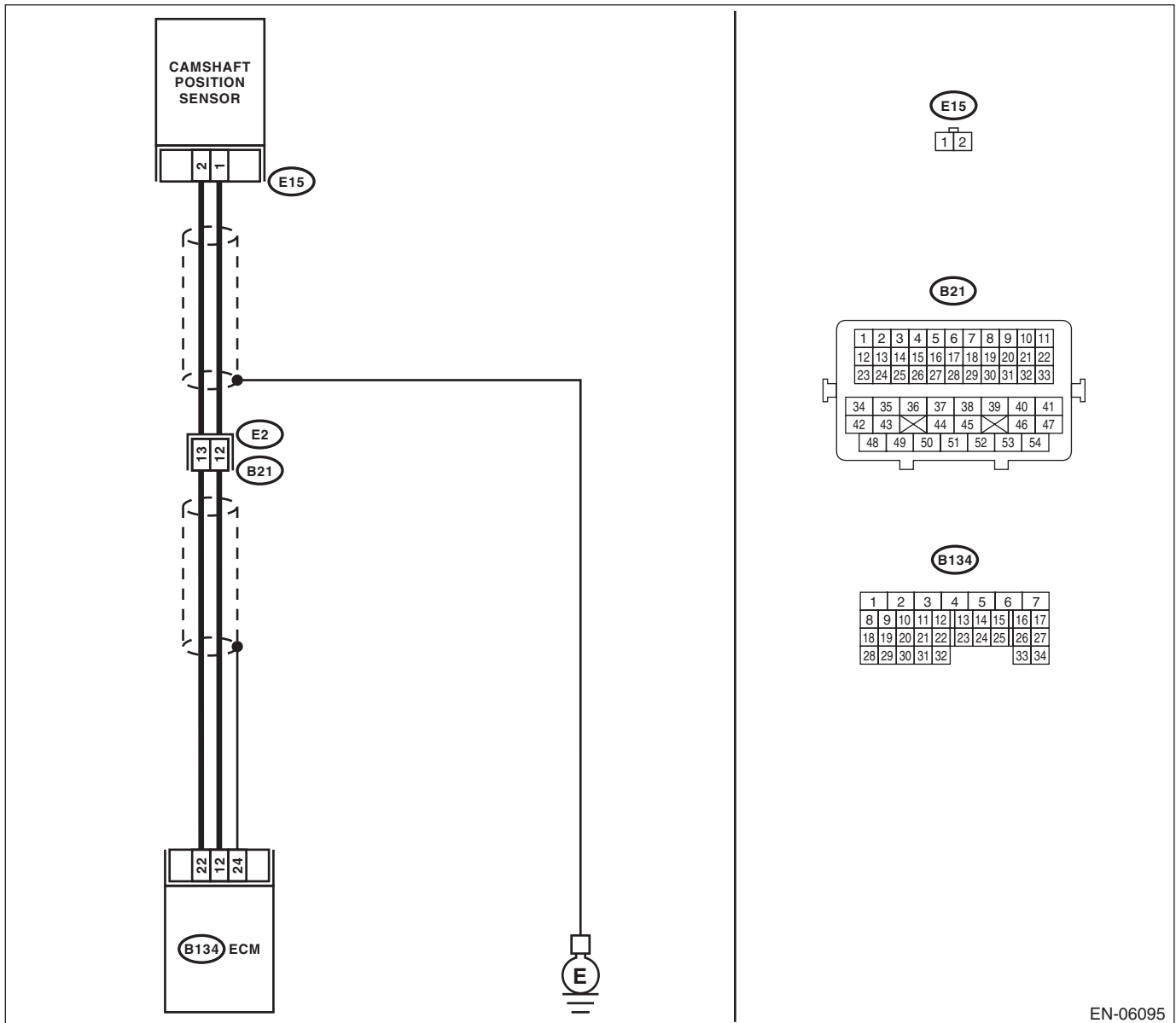
TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06095

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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. Connector & terminal (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: • Open circuit in harness between the ECM and camshaft position sensor 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. Connector & terminal (E15) No. 1 — Engine ground:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the short circuit to ground of harness between the ECM and camshaft position sensor. NOTE: The harness between both connectors are shielded. Remove the shield and repair the ground short circuit of the harness circuit.
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 terminals of camshaft position sensor. Terminals No. 1 — No. 2:	Is the resistance between 1 and 4 kΩ?	Go to step 5.	Replace the camshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.>
5 CHECK CAM SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-49, Timing Belt Cover.>	Are cam sprocket teeth cracked or damaged?	Replace the cam sprocket. <Ref. to ME(H4SO)-55, Cam Sprocket.>	Go to step 6.
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. ST 499987500 CRANKSHAFT SOCKET	Is the timing belt dislocated from its proper position?	Repair the installation condition of timing belt. <Ref. to ME(H4SO)-50, Timing Belt.>	Replace the camshaft position sensor. <Ref. to FU(H4SO)-24, Camshaft Position Sensor.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-118, DTC P0400 EXHAUST GAS RECIRCULATION FLOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

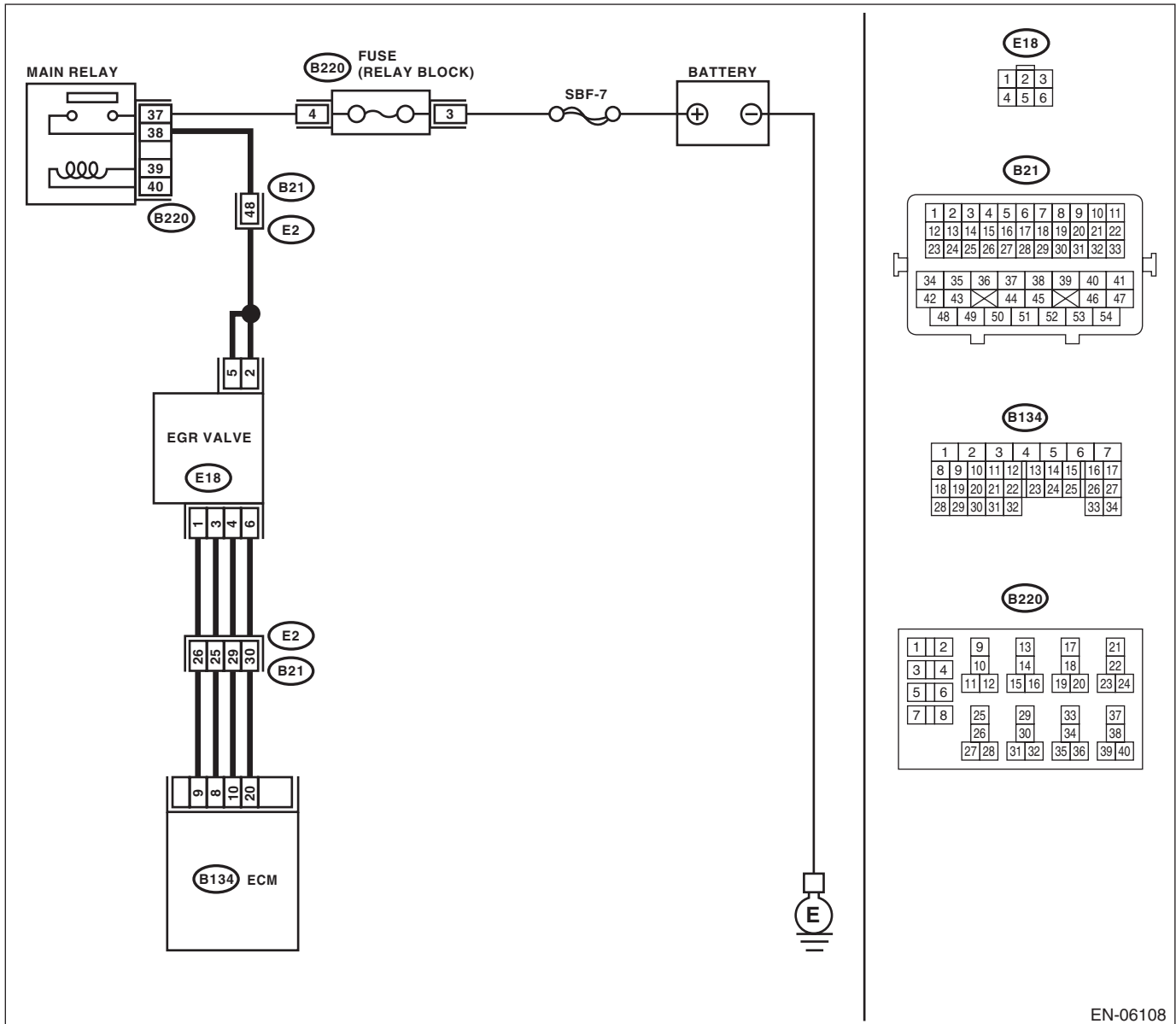
TROUBLE SYMPTOM:

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

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06108

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	CHECK CURRENT DATA. 1) Start the engine. 2) Read data of intake manifold absolute pressure 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the measured value 53.3 kPa (400 mmHg, 15.75 inHg) or more?	Make sure that the EGR valve, manifold absolute pressure sensor and throttle body are installed securely.	Go to step 2.
2	CHECK EGR SOLENOID VALVE. Remove the EGR valve.	Are there holes, plugged piping or foreign objects caught in the EGR system?	Repair the EGR system.	Replace the EGR valve. <Ref. to FU(H4SO)-29, EGR Valve.>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-122, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

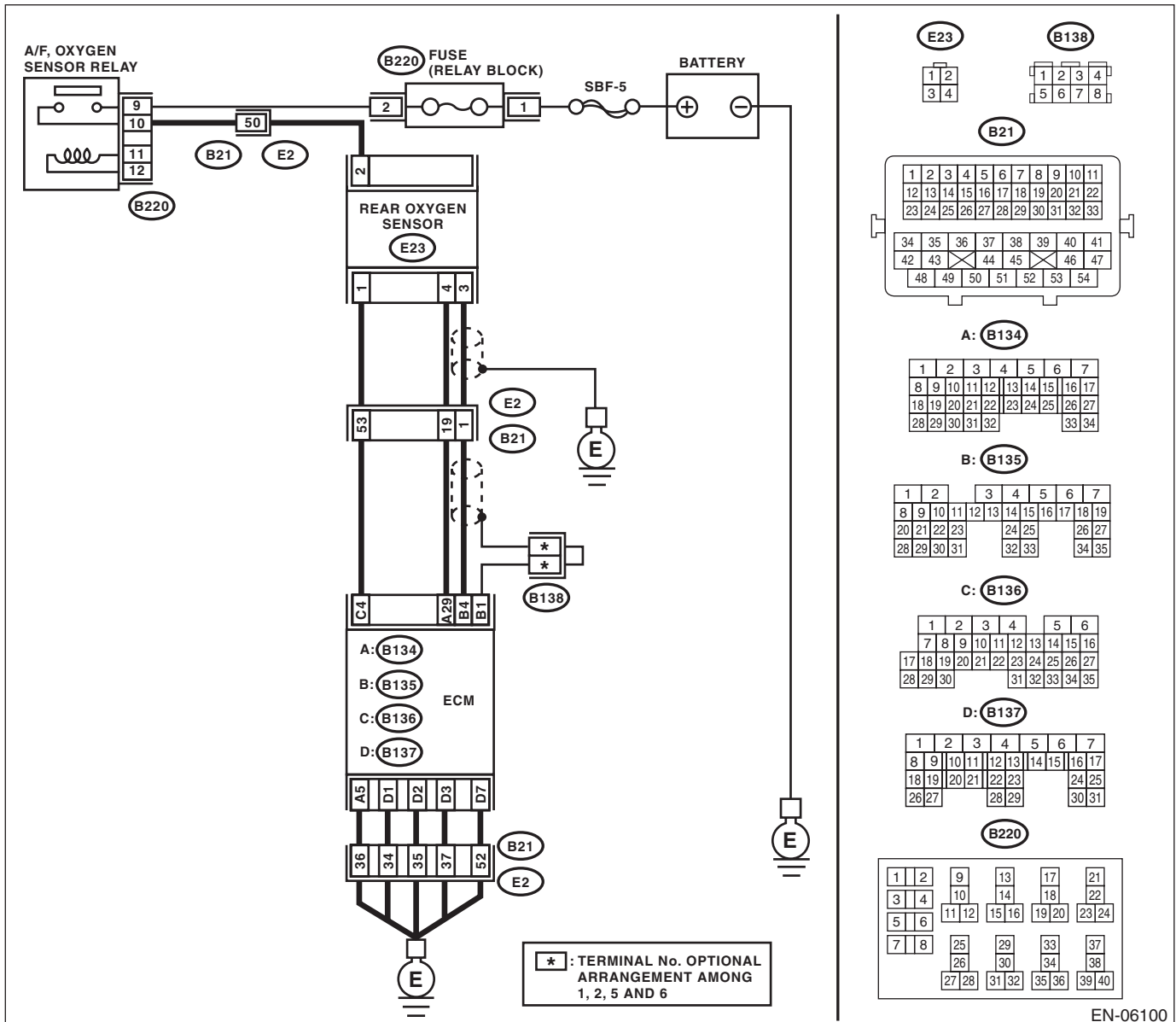
TROUBLE SYMPTOM:

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

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:

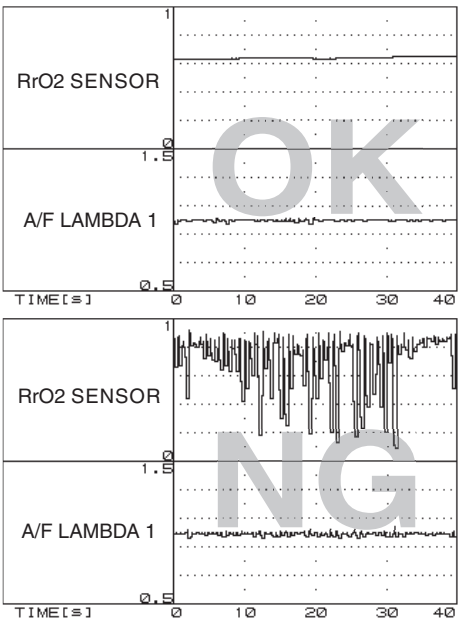


EN-06100

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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 failure, and then perform the diagnosis again.</p> <p>NOTE: In this case, temporary poor contact of connector may be the cause.</p>	<p>Go to step 3.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
<p>3</p> <p>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>RrO2 SENSOR</p> <p>TIME[=] 0 10 20 30 40</p> </div> <div> <p>RrO2 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</p> <p>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</p> <p>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</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 — (E23) No. 3: (B134) No. 29 — (E23) No. 4:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 7.</p>	<p>Repair the harness and connector.</p> <p>NOTE: Repair the following locations.</p> <ul style="list-style-type: none"> • Open circuit in harness between ECM and rear oxygen sensor connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
<p>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 (E23) No. 3 (+) — Chassis ground (-):</p>	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 in harness between ECM and rear oxygen sensor connector • Poor contact in ECM connector • Poor contact of coupling connector
<p>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.</p>	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)

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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)-125, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

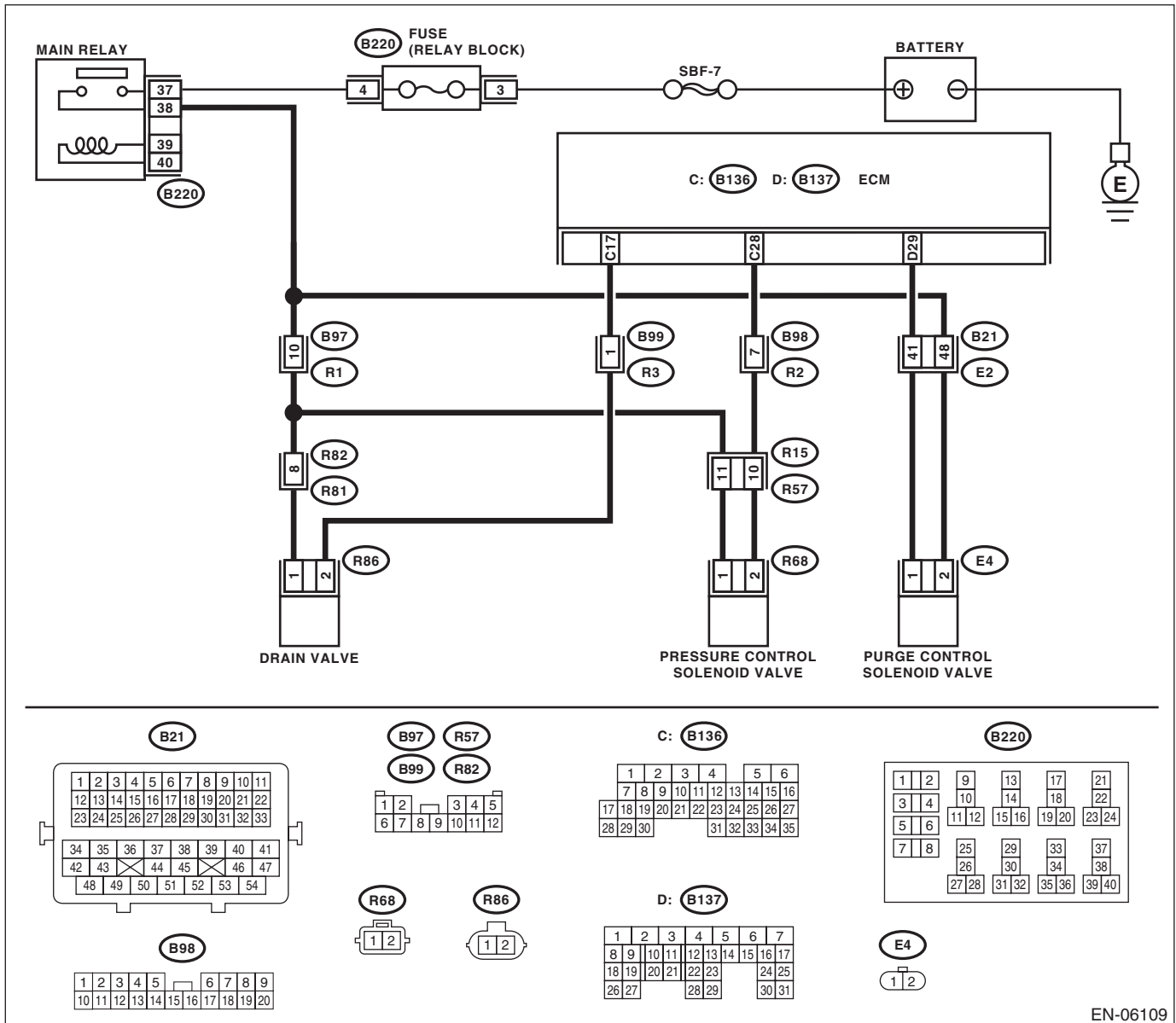
TROUBLE SYMPTOM:

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

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06109

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-52, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect the delivery (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)-53, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-18, 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)-53, 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)-9, 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)-53, 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)-15, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the delivery (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)-64, Fuel Delivery and Evaporation Lines.>	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-5, Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H4SO)-45, 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)-45, 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 the poor contact of the ECM connector.

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

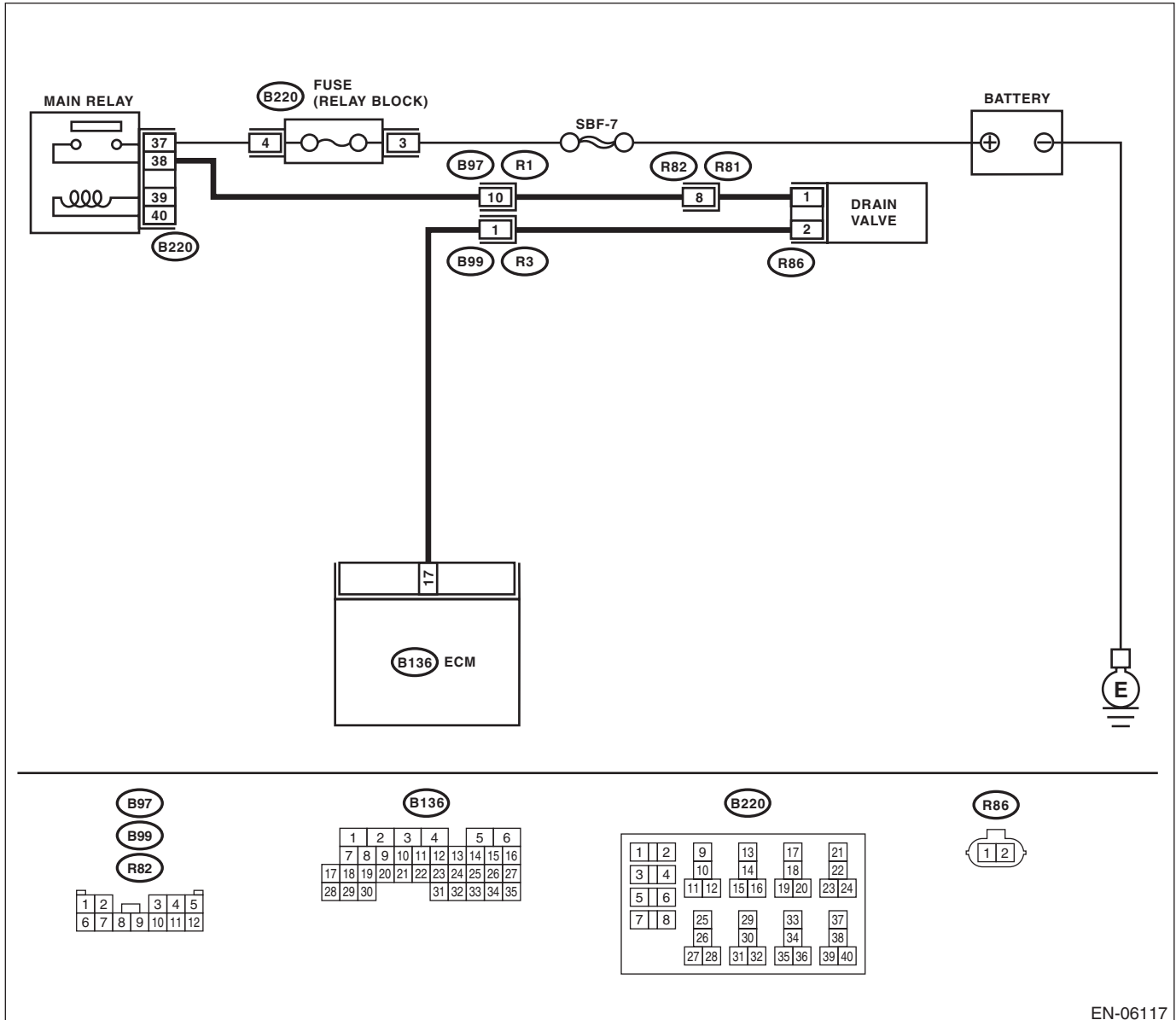
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-141, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06117

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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. Connector & terminal (B136) No. 17 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair the 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. Connector & terminal (R86) No. 2 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness 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. Connector & terminal (B136) No. 17 — (R86) 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: • 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. Terminals No. 1 — No. 2:</p>	Is the resistance between 10 — 100 Ω?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-18, 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. Connector & terminal (R86) No. 1 (+) — Chassis ground (-):</p>	Is the voltage 10 V or more?	Repair poor contact of the drain valve connector.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between main relay connector and drain valve connector • Poor contact of coupling connector • Poor contact of main relay connector

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

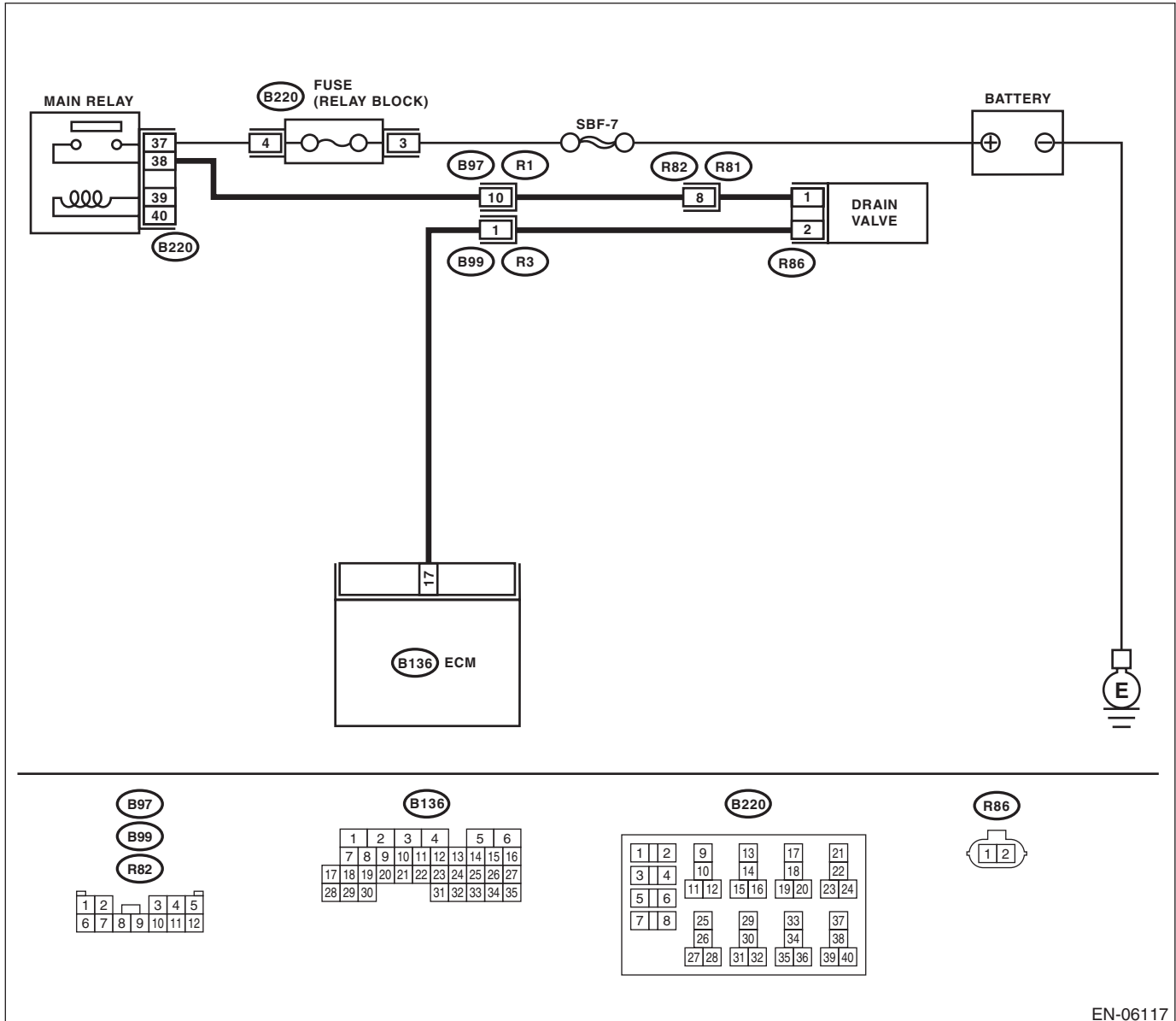
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-143, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06117

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<p>CHECK HARNESS BETWEEN ECM AND DRAIN VALVE.</p> <p>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.</p> <p>Connector & terminal (B136) No. 17 (+) — Chassis ground (-):</p>	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	<p>CHECK DRAIN VALVE.</p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between drain valve terminals.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance less than 1 Ω ?	Replace the drain valve. <Ref. to EC(H4SO)-18, Drain Valve.>	Repair the poor contact of the ECM connector.

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BI: DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR

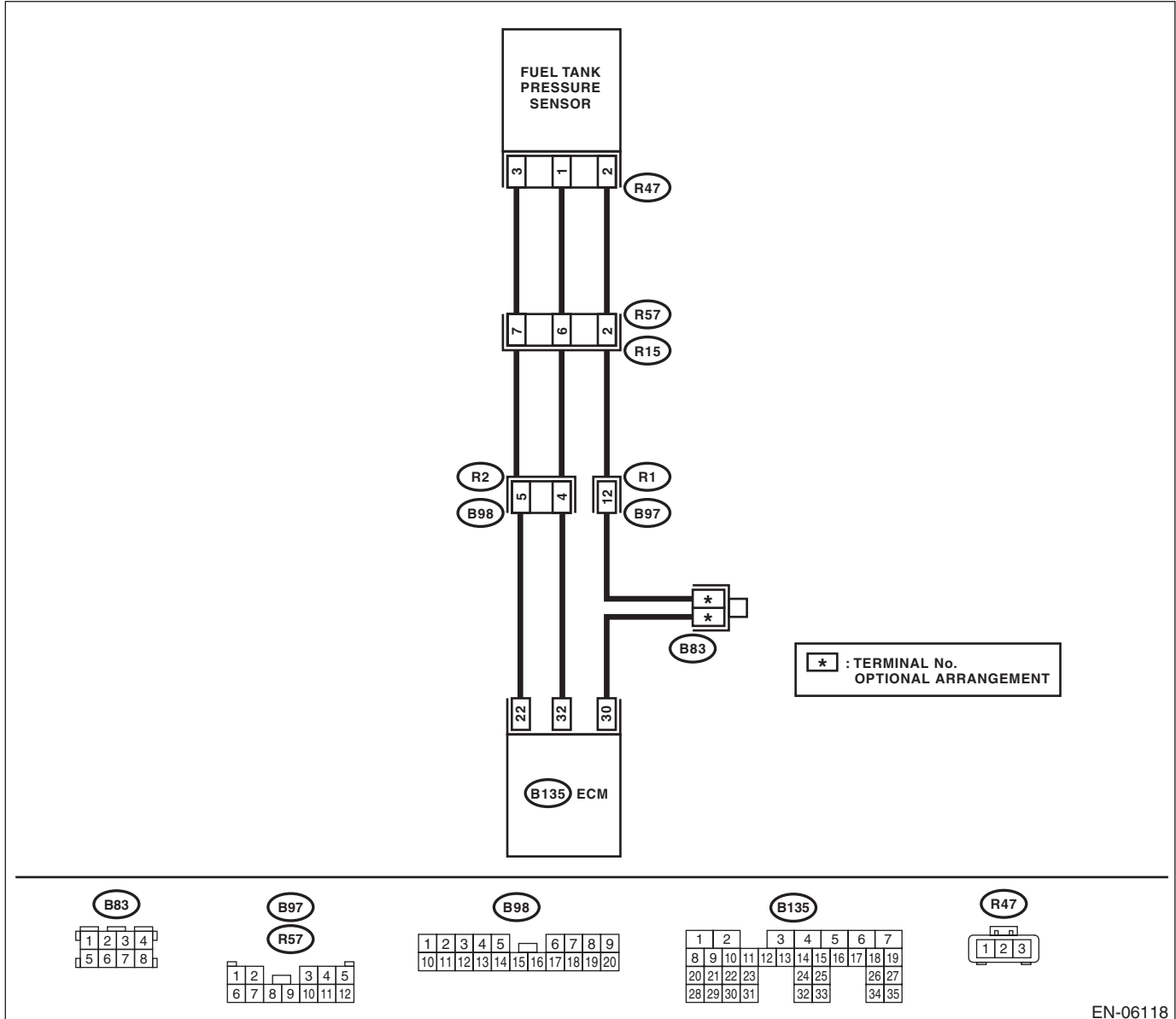
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-145, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06118

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-14, Fuel Tank Pressure Sensor.>

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

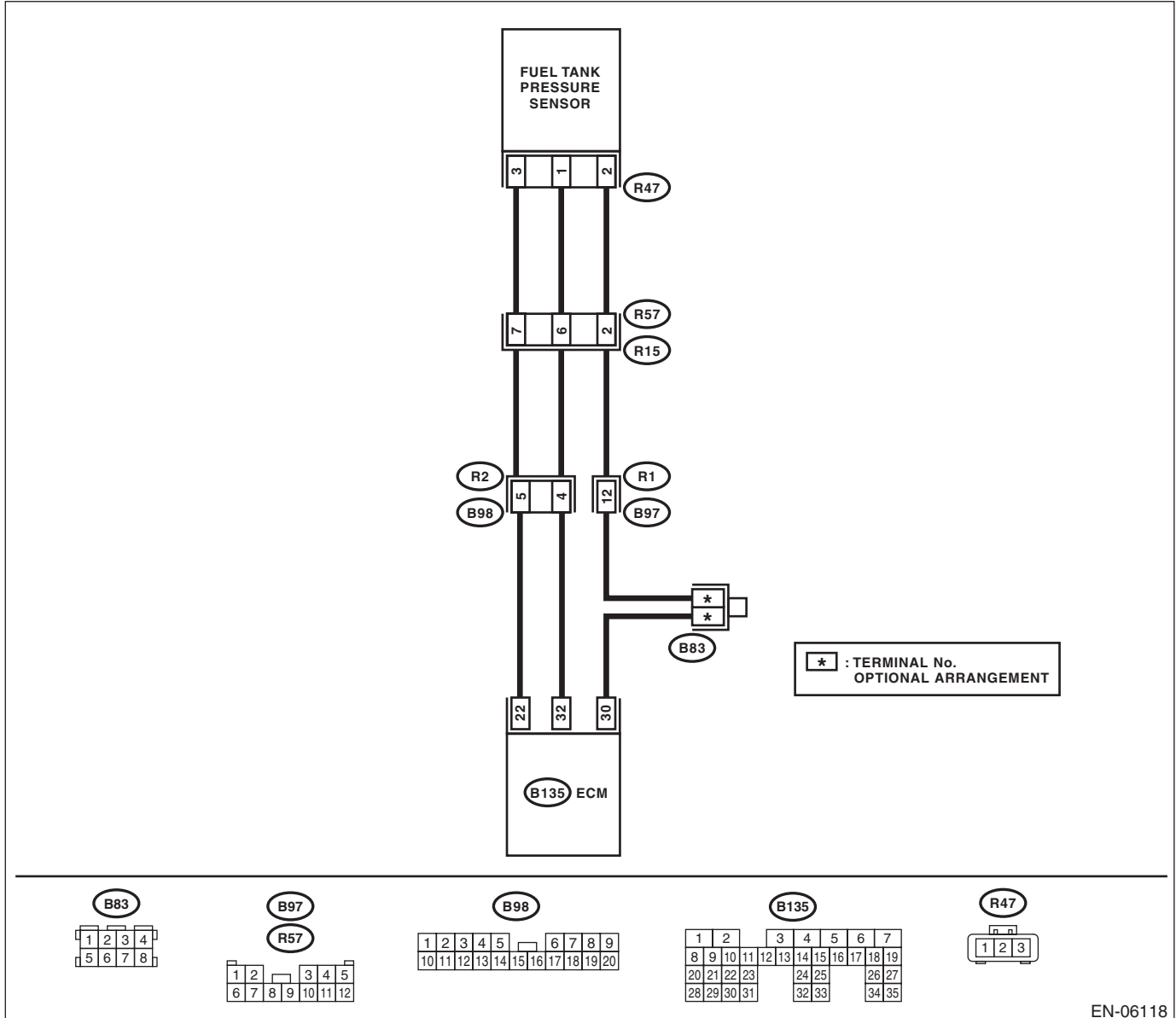
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-147, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06118

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK CURRENT DATA. 1) Turn the ignition switch to ON. 2) Read the data of fuel tank pressure 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the measured value less than -7.45 kPa (-55.9 mmHg, -2.2 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. NOTE: In this case, there may be a temporary connector contact failure.
2 CHECK FUEL TANK PRESSURE SENSOR POWER SOURCE. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the fuel tank pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between the fuel tank pressure sensor connector and chassis ground. Connector & terminal (R47) No. 3 (+) — Chassis ground (-):	Is the voltage 4.5 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 ECM and fuel tank pressure sensor connector • Poor contact in ECM connector • Poor contact of coupling connector
3 CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between the ECM and fuel tank pressure sensor connector. Connector & terminal (B135) No. 32 — (R47) 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 tank pressure sensor connector • Poor contact of coupling connector
4 CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 32 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 5.	Repair the ground short circuit of harness between ECM and fuel tank pressure sensor connector.
5 CHECK POOR CONTACT. Check for poor contact between the ECM and fuel tank pressure sensor connector.	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)-14, Fuel Tank Pressure Sensor.>

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

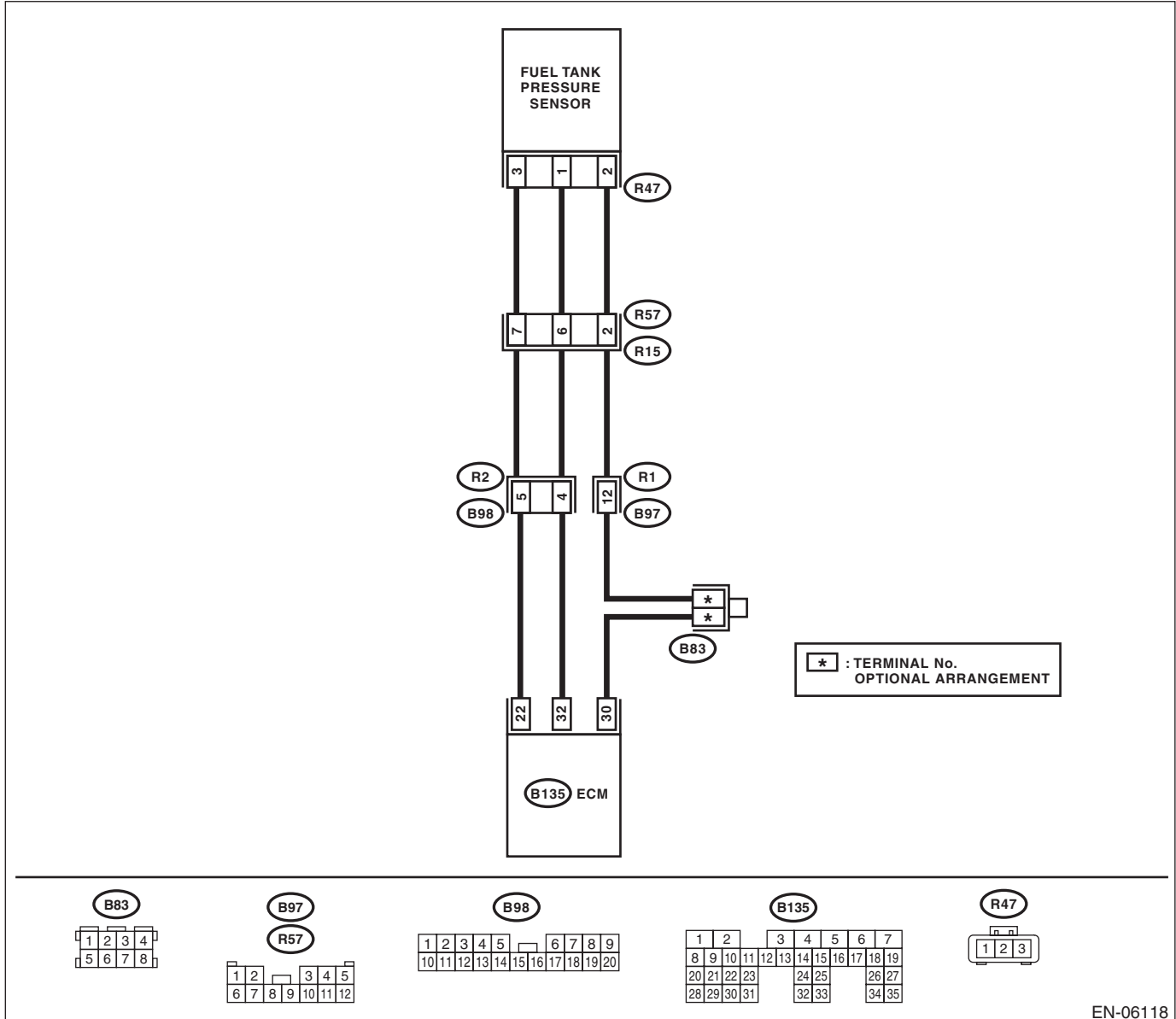
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-149, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06118

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	<p>Is the measured value 7.95 kPa (59.6 mmHg, 2.35 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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	<p>Is the measured value 7.95 kPa (59.6 mmHg, 2.35 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)-14, Fuel Tank Pressure Sensor.></p>

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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)-150, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

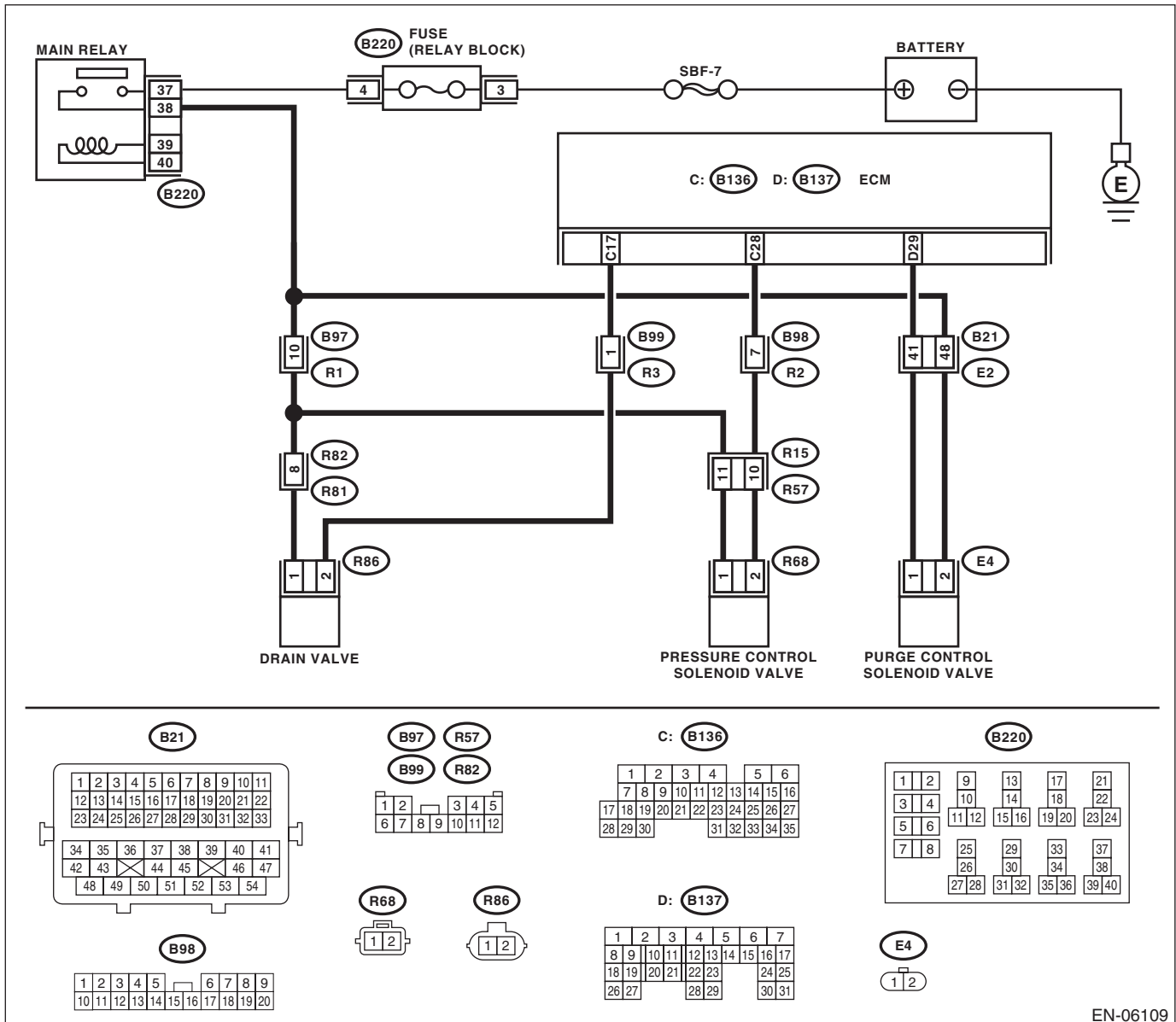
TROUBLE SYMPTOM:

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

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06109

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-52, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect the delivery (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)-53, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-18, 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)-53, 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)-9, 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)-53, 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)-15, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the delivery (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)-64, Fuel Delivery and Evaporation Lines.>	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-5, Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H4SO)-45, 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)-45, 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 the poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-150, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Trouble Code (DTC) Detecting Criteria.>

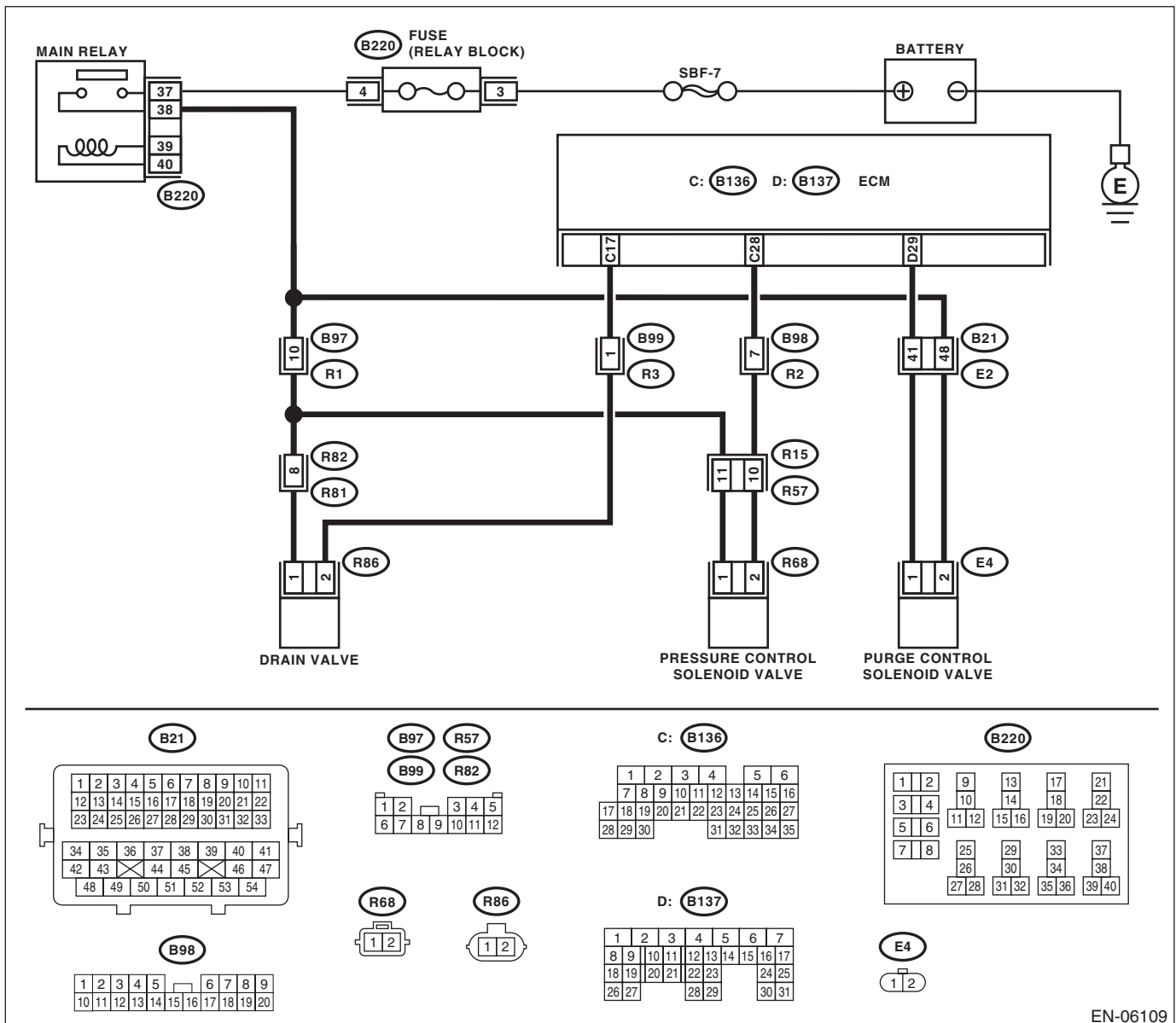
TROUBLE SYMPTOM:

- Fuel odor
- Fuel filler cap loose or lost

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06109

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-52, Fuel Filler Pipe.>	Go to step 4.
4	CHECK DRAIN VALVE. 1) Connect the delivery (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)-53, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Go to step 5.	Replace the drain valve. <Ref. to EC(H4SO)-18, 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)-53, 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)-9, 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)-53, 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)-15, Pressure Control Solenoid Valve.>
7	CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the delivery (test) mode connector.	Are there any disconnected, broken or clogged evaporation lines?	Repair or replace the evaporation line. <Ref. to FU(H4SO)-64, Fuel Delivery and Evaporation Lines.>	Go to step 8.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
8	CHECK CANISTER.	Is the canister damaged?	Repair or replace the canister. <Ref. to EC(H4SO)-5, Canister.>	Go to step 9.
9	CHECK FUEL TANK. Remove the fuel tank. <Ref. to FU(H4SO)-45, Fuel Tank.>	Is the fuel tank damaged?	Repair or replace the fuel tank. <Ref. to FU(H4SO)-45, Fuel Tank.>	Go to step 10.
10	CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.	Are there holes, cracks, clogging, or disconnections, mis-connection of hoses or pipes in evaporative emission control system?	Repair or replace the hoses or pipes.	Repair the poor contact of the ECM connector.

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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)-151, DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

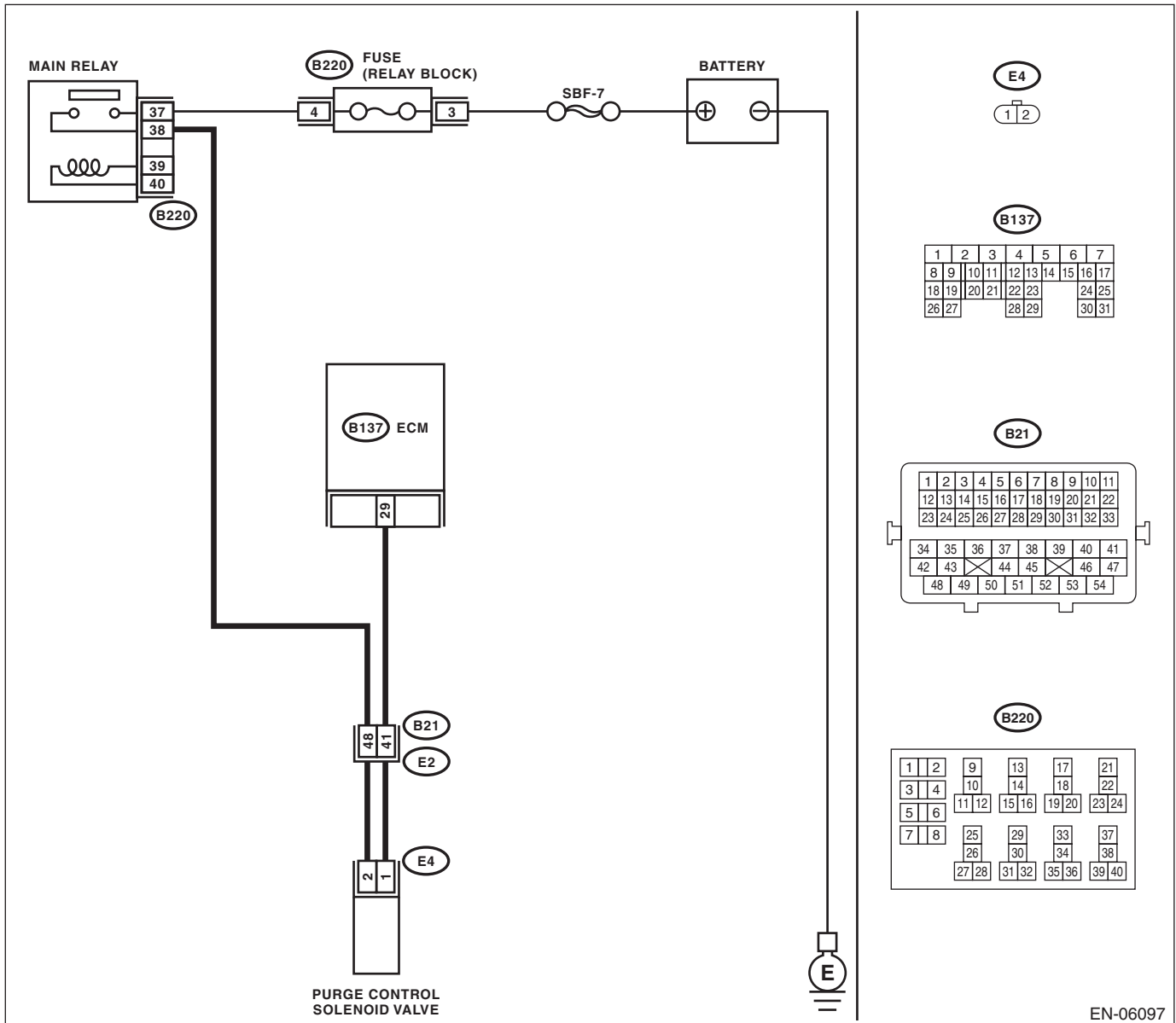
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06097

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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?	<p>Repair the poor contact of the ECM connector.</p> <p>Go to step 2.</p>
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?	<p>Go to step 3.</p> <p>Repair the ground short circuit of harness between ECM and purge control solenoid valve connector.</p>
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 ?	<p>Go to step 4.</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 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 ?	<p>Go to step 5.</p> <p>Replace the purge control solenoid valve. <Ref. to EC(H4SO)-9, Purge Control Solenoid Valve.></p>
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?	<p>Repair the poor contact of purge control solenoid valve connector.</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 in harness between main relay and purge control solenoid valve connector • Poor contact of coupling connector • Poor contact of main relay connector

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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)-153, DTC P0459 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

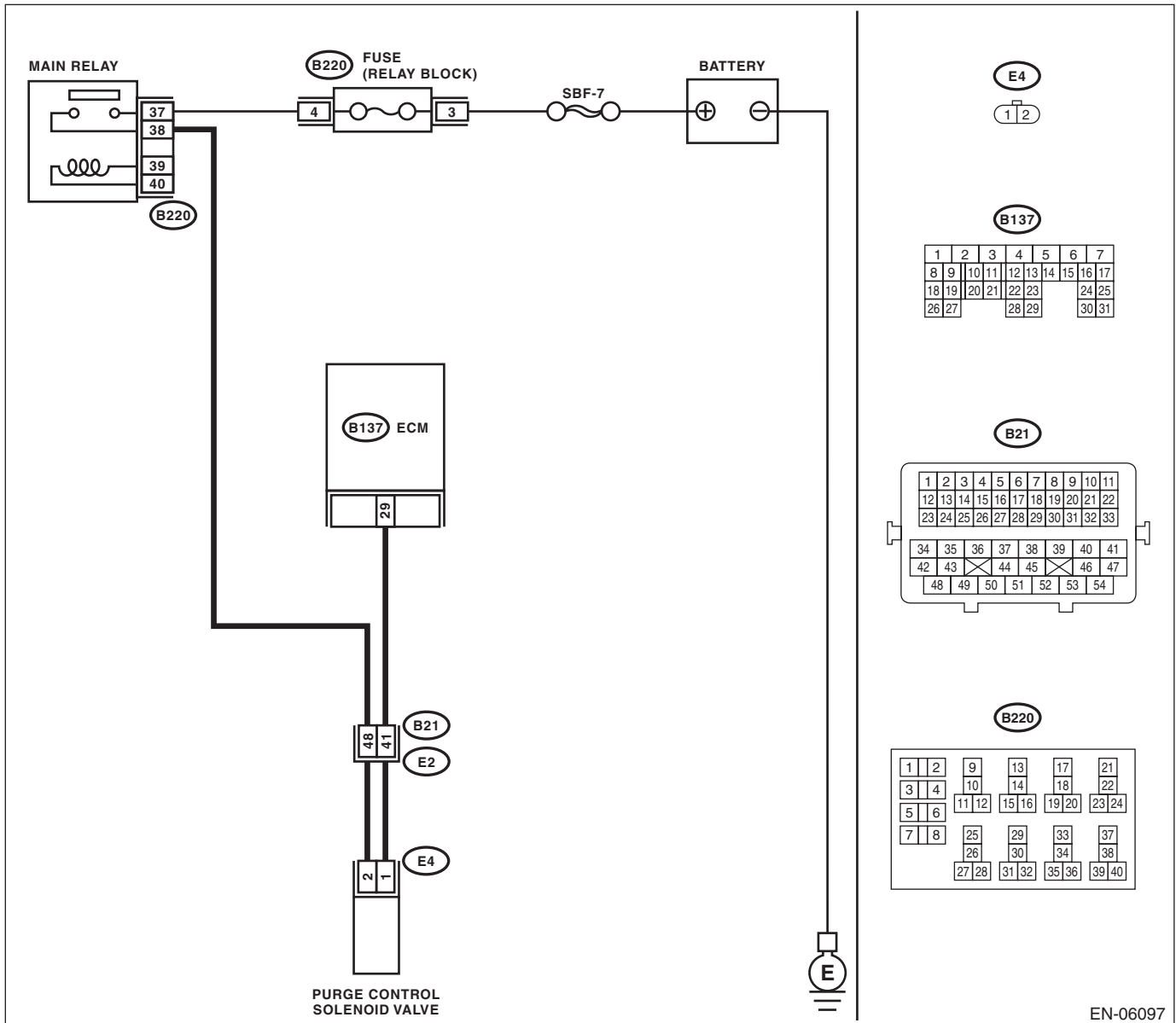
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06097

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<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>	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between the ECM and purge control solenoid valve connector.	Go to step 2.
2	<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>	Is the resistance less than 1 Ω?	Replace the purge control solenoid valve. <Ref. to EC(H4SO)-9, Purge Control Solenoid Valve.>	Repair the poor contact of the ECM connector.

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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)-155, DTC P0461 FUEL LEVEL SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-82, List of Diagnostic Trouble Code (DTC).>	Replace the fuel level sensor and fuel sub level sensor. <Ref. to FU(H4SO)-58, Fuel Level Sensor.> <Ref. to FU(H4SO)-59, Fuel Sub Level Sensor.>

BQ:DTC P0462 FUEL LEVEL SENSOR “A” CIRCUIT LOW

NOTE:

For the diagnostic procedure, refer to DTC P0463. <Ref. to EN(H4SO)(diag)-223, DTC P0463 FUEL LEVEL SENSOR “A” CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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)-159, DTC P0463 FUEL LEVEL SENSOR “A” CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1	CHECK FOR ANY OTHER DTC ON DISPLAY. Is DTC P0462 or P0463 displayed on the Subaru Select Monitor?	Check the combination meter. <Ref. to IDI-7, CHECK FUEL LEVEL SENSOR., INSPECTION, Combination Meter System.>	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.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-161, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK FOR ANY OTHER DTC ON DISPLAY.	Is DTC P0464 displayed on the display?	Check the combination meter. <Ref. to IDI-7, CHECK FUEL LEVEL SENSOR., INSPECTION, Combination Meter System.>	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.

BT:DTC P0500 VEHICLE SPEED SENSOR "A"

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-165, DTC P0500 VEHICLE SPEED SENSOR "A", Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK DTC OF ABS. Check DTC of ABS.	Is DTC of ABS displayed?	Perform the diagnosis according to DTC. <Ref. to ABS(diag)-29, List of Diagnostic Trouble Code (DTC).>	Repair poor contact of the ECM connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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BU: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)-167, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

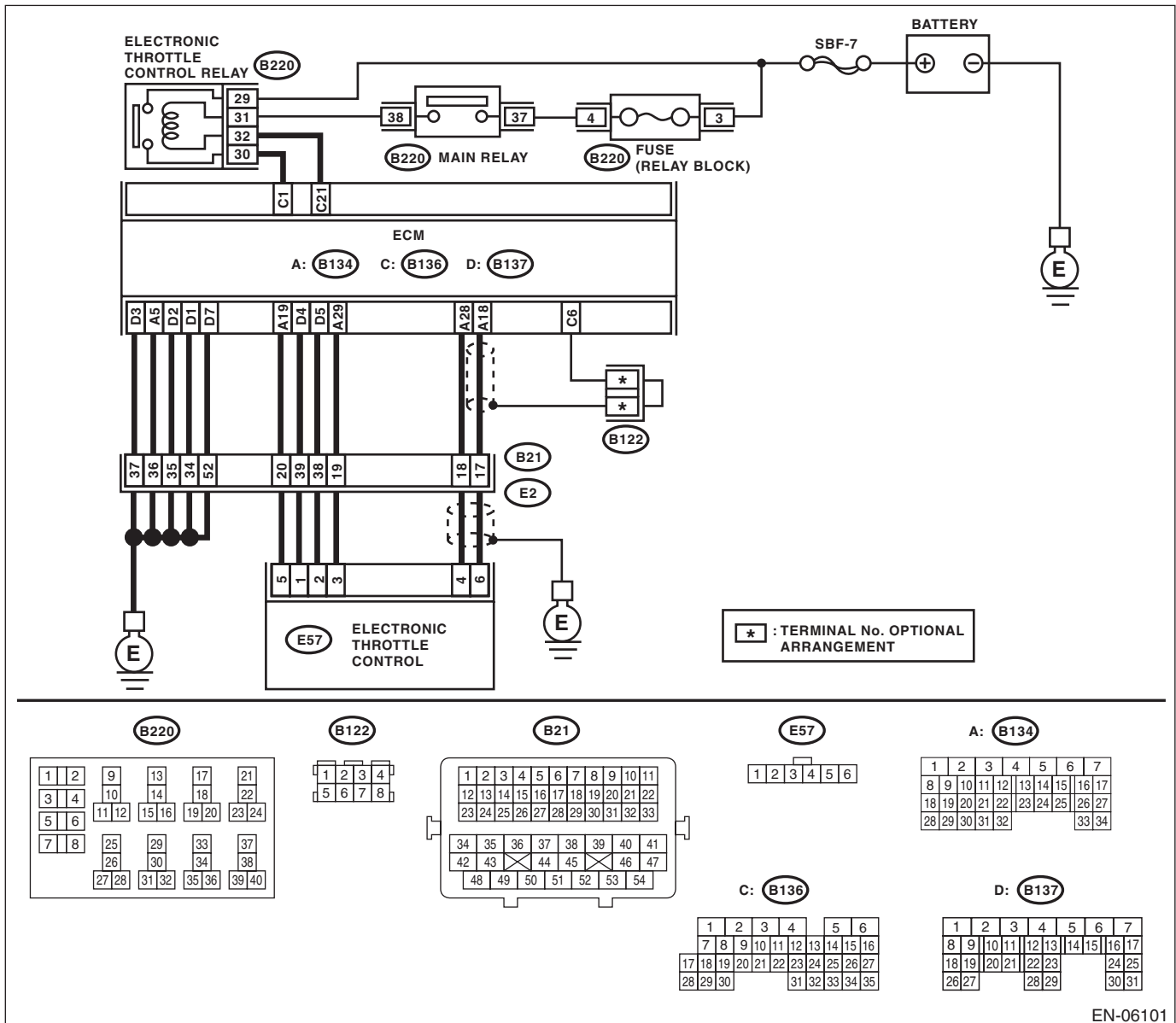
TROUBLE SYMPTOM:

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

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06101

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-82, 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?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101. <Ref. to EN(H4SO)(diag)-278, 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)

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BV: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)-169, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

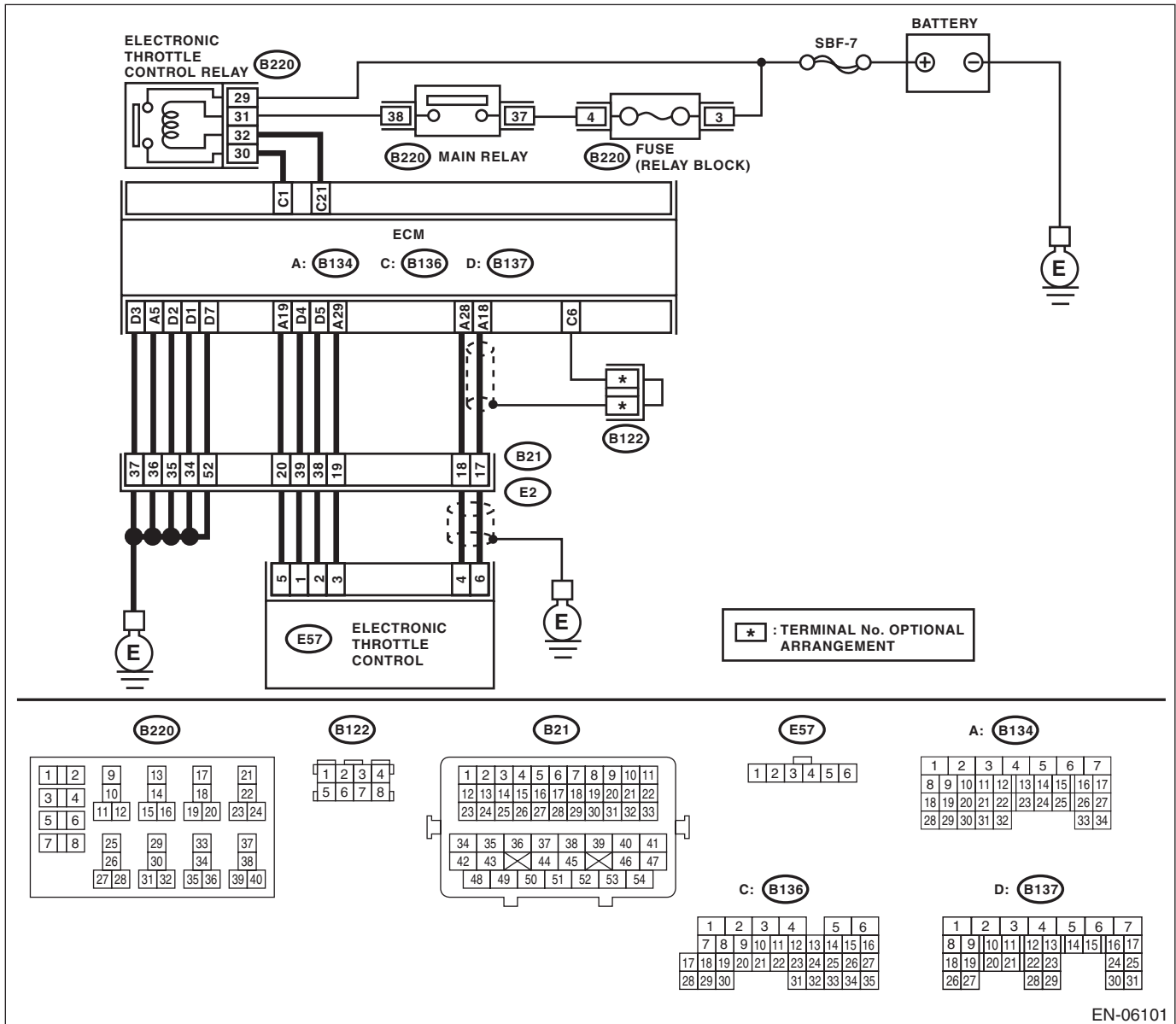
TROUBLE SYMPTOM:

Engine keeps running at higher speed than specified idle speed.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-82, 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?	Remove foreign matter from electronic throttle control.	Perform the diagnosis of DTC P2101. <Ref. to EN(H4SO)(diag)-278, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

BW:DTC P0512 STARTER REQUEST CIRCUIT

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-171, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

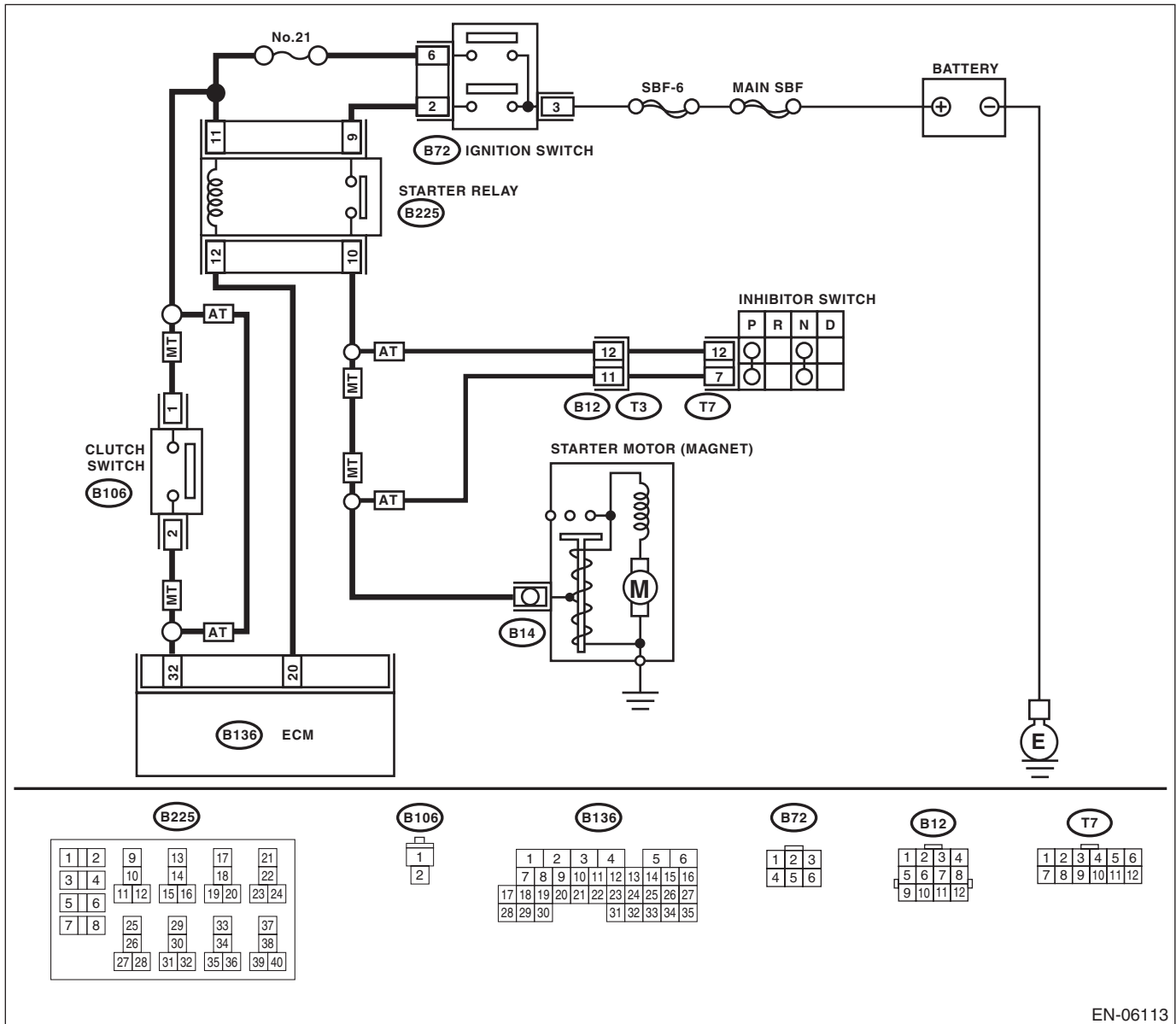
TROUBLE SYMPTOM:

Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH. 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 (-):	Is the voltage 10 V or more?	Repair the short circuit to power in harness between ECM and ignition switch connector.	Repair the poor contact of the ECM connector.

BX:DTC P0600 SERIAL COMMUNICATION LINK

NOTE:

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

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-175, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

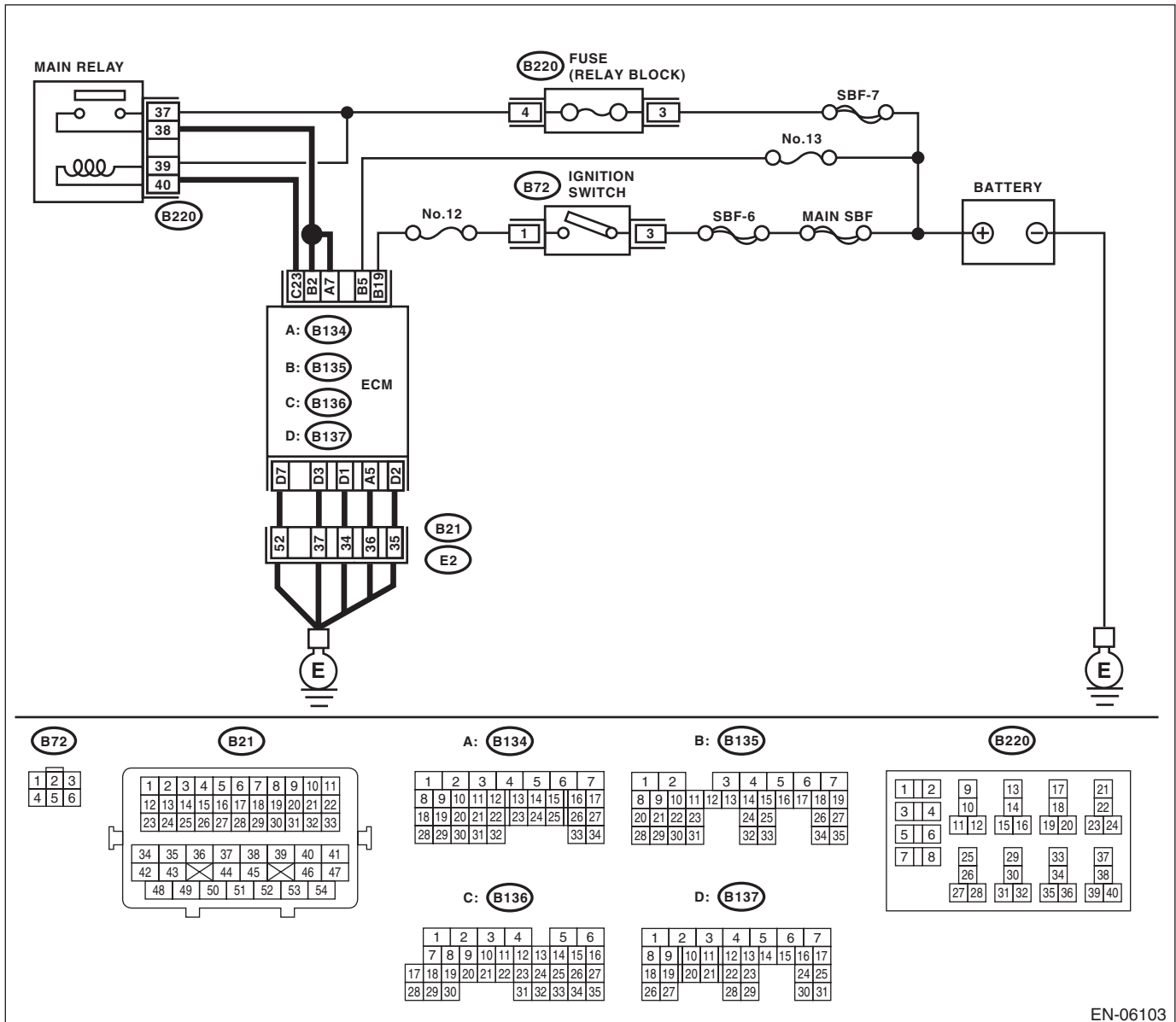
TROUBLE SYMPTOM:

- Engine does not start.
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06103

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, 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.

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

NOTE:

For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4SO)(diag)-233, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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CA:DTC P0607 CONTROL MODULE PERFORMANCE

DTC DETECTING CONDITION:

- Depending on the content of malfunction, adapt either of the followings.
 - Immediately at fault recognition
 - Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-178, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

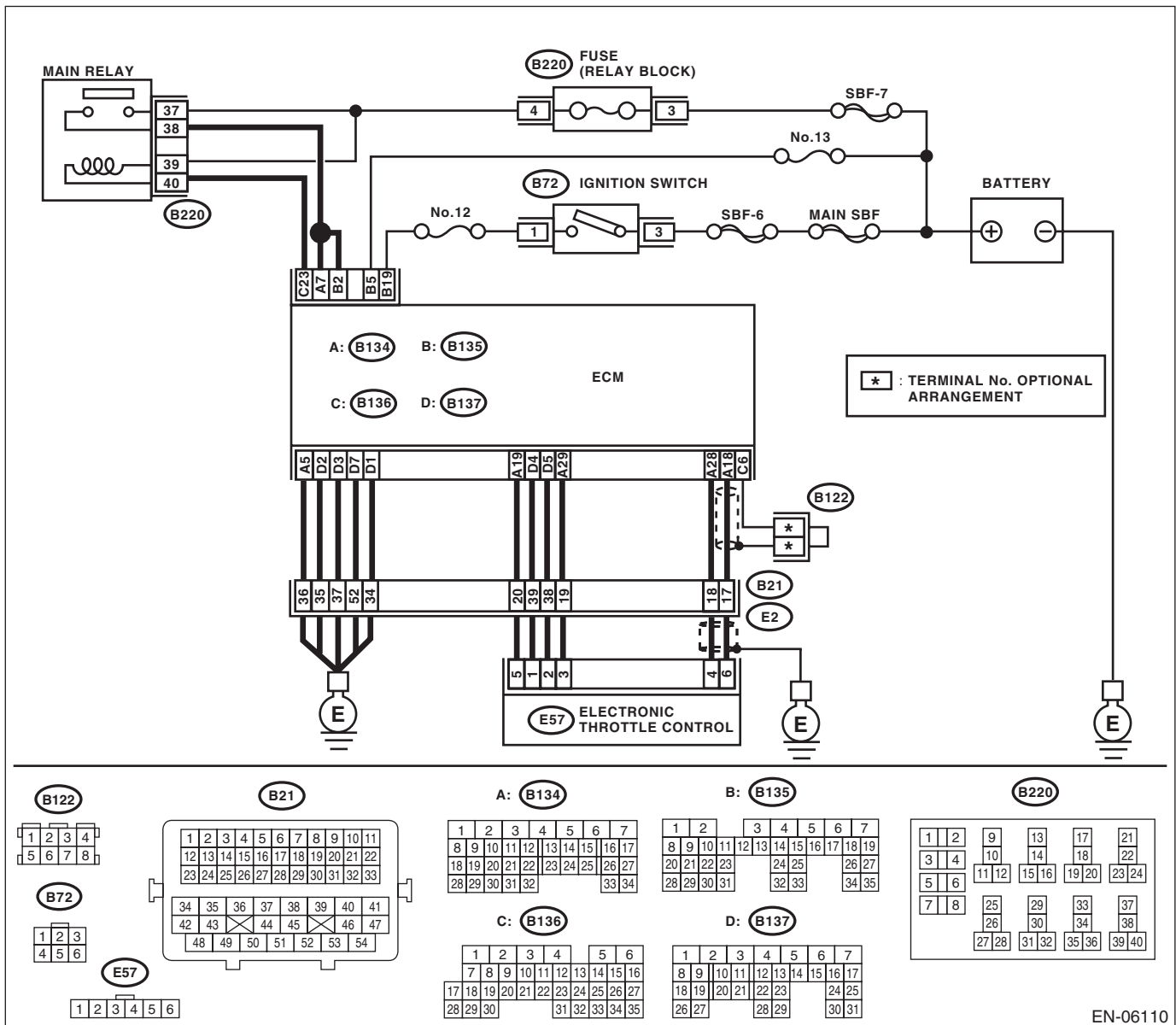
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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> (B134) No. 7 (+) — Chassis ground (-): (B135) No. 2 (+) — Chassis ground (-):	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> (B134) No. 7 (+) — Chassis ground (-): (B135) No. 2 (+) — Chassis ground (-):	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> (B134) No. 19 — (E57) No. 5: (B134) No. 29 — (E57) No. 3:	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> (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 voltage less than 1 V?	Repair the poor contact of the ECM connector.	Repair the following item. <ul style="list-style-type: none"> • Open circuit of ground circuit • Retightening of engine ground terminals • Poor contact in ECM connector • Poor contact of coupling connector

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

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO)(diag)-278, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CC:DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

NOTE:

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

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CD: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)-185, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

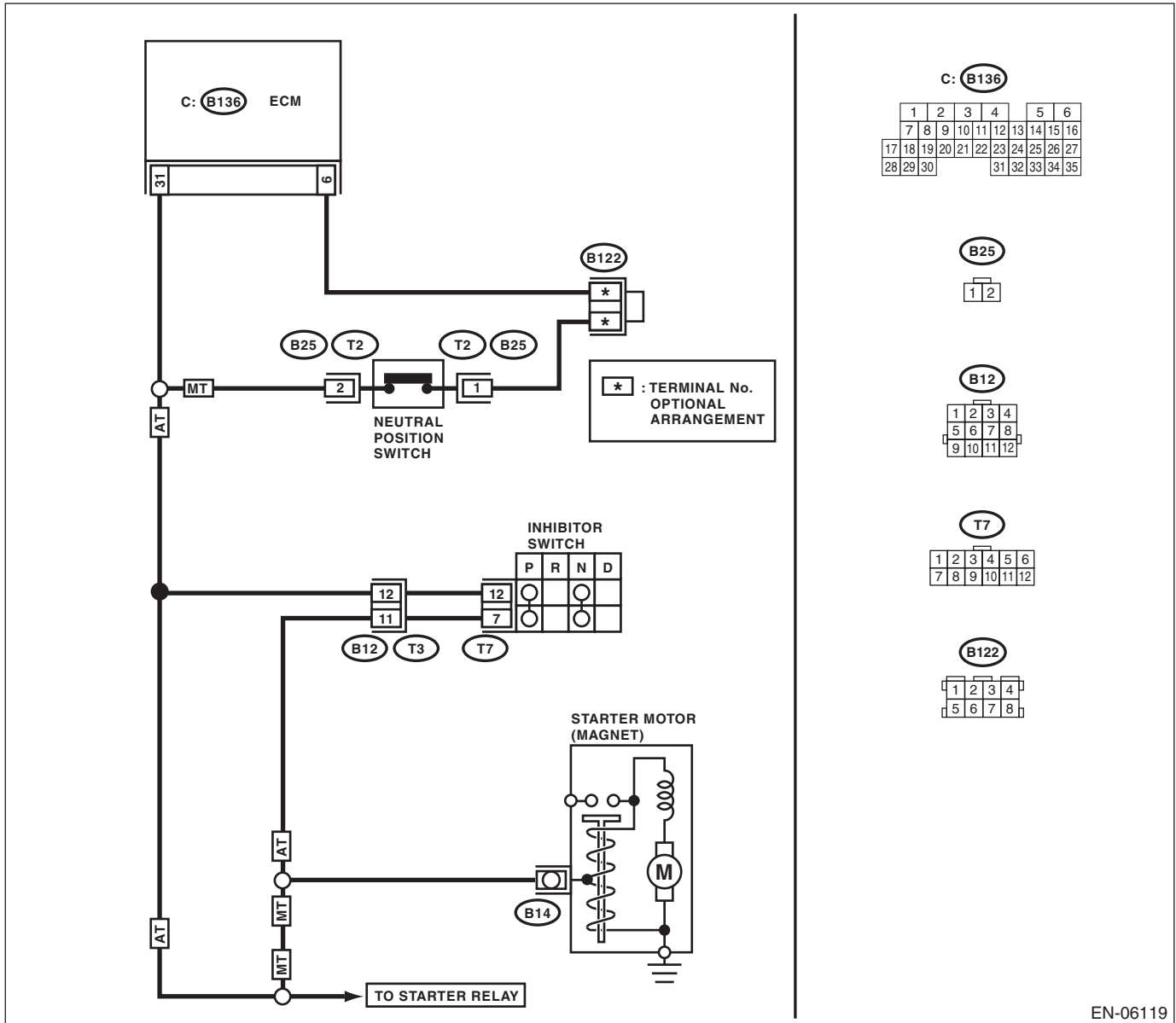
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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-29, Select Cable.>	Go to step 2.
2 CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Place the select lever in other than "P" range and "N" 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 the 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 the ground short circuit of harness 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-47, Inhibitor Switch.>	Repair the ground short circuit of harness between transmission harness connector and inhibitor switch connector.

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CE: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)-186, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

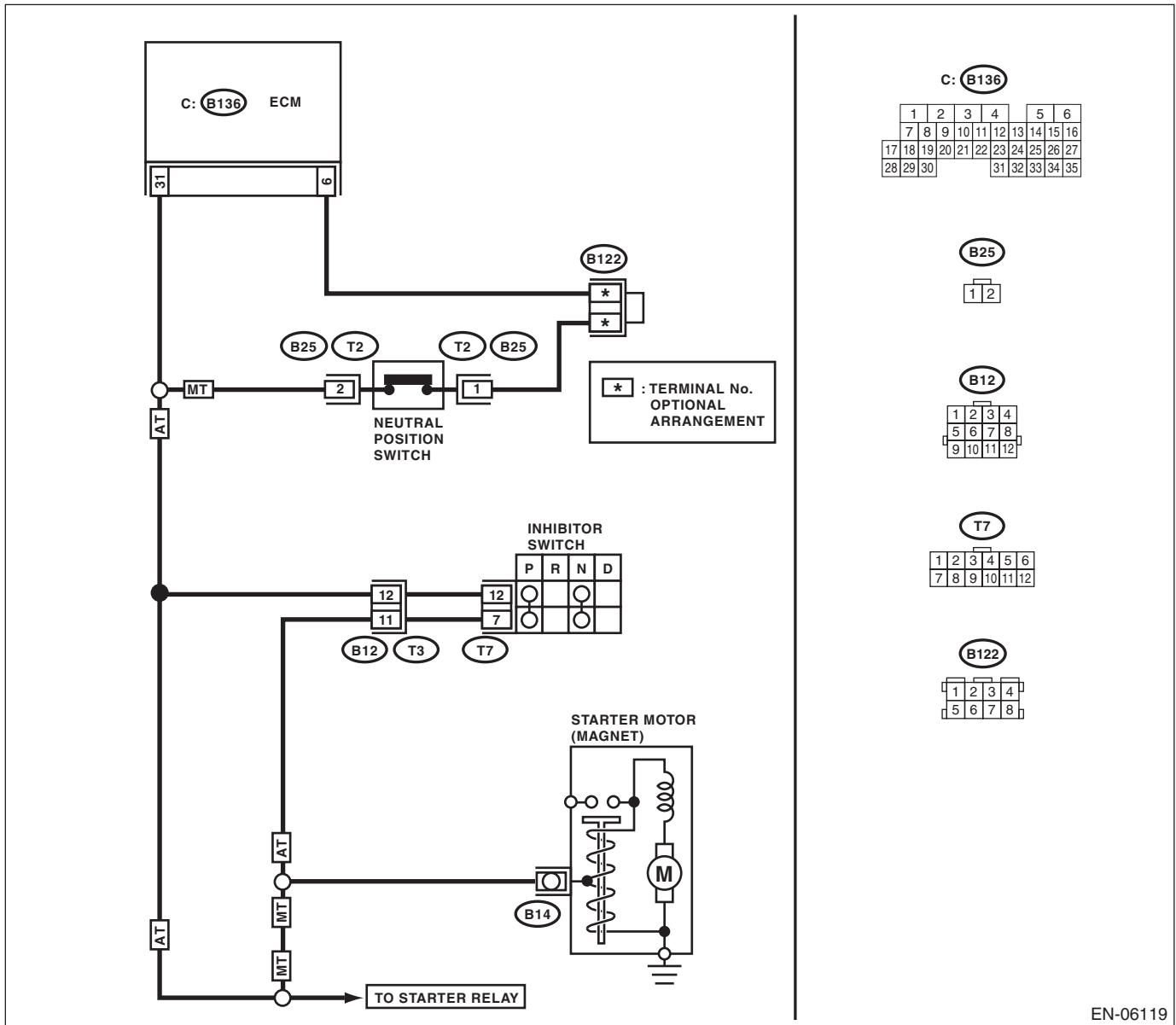
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06119

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

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CF: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)-188, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

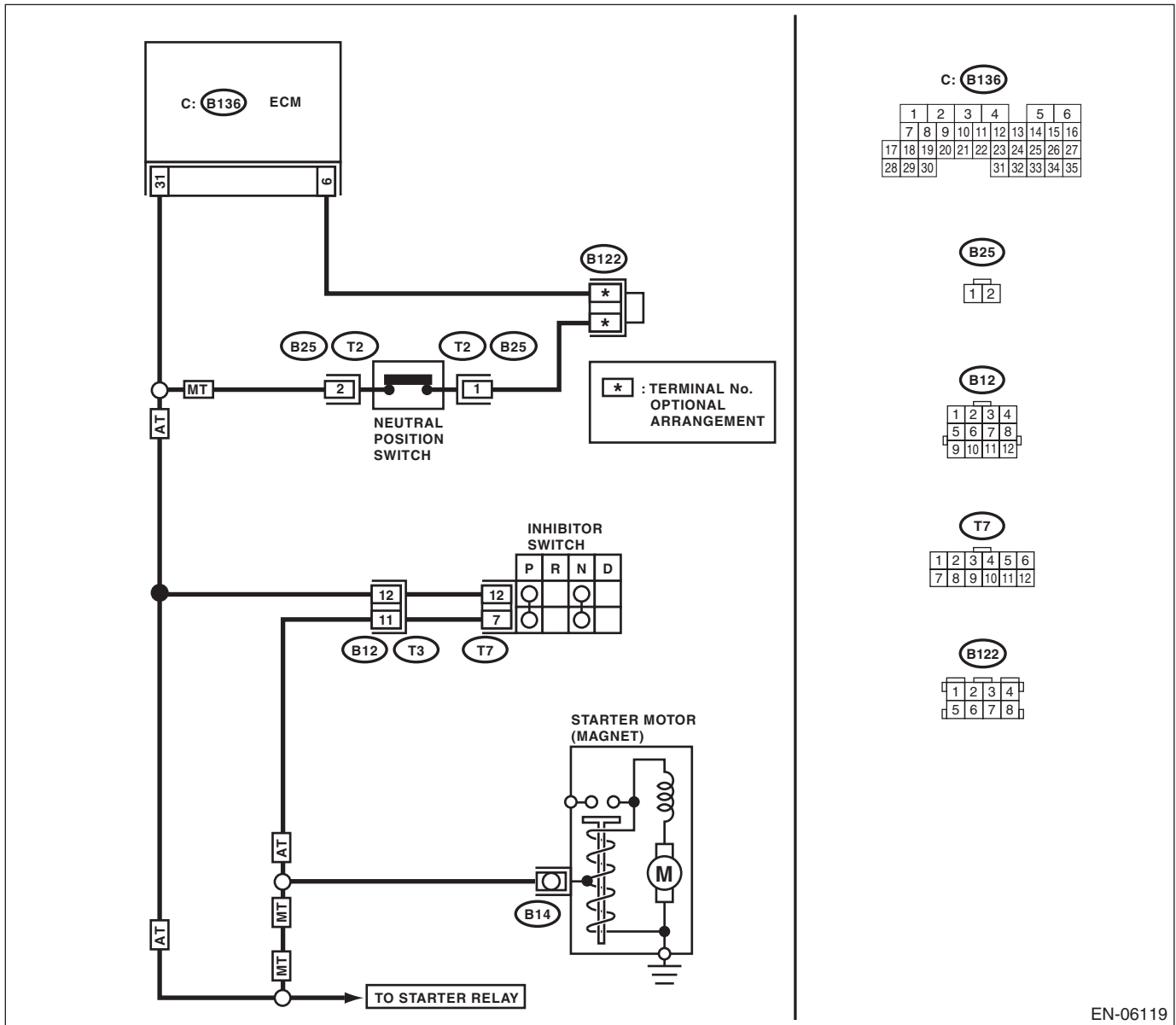
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06119

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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-29, 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 "P" range and "N" range. Connector & terminal (B136) No. 31 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Repair the 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. Connector & terminal (B136) No. 31 — (T7) No. 12:	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. Connector & terminal (T7) No. 7 — Engine ground:	Is the resistance less than 5 Ω?	Replace the inhibitor switch. <Ref. to 4AT-47, 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

CG: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)-189, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

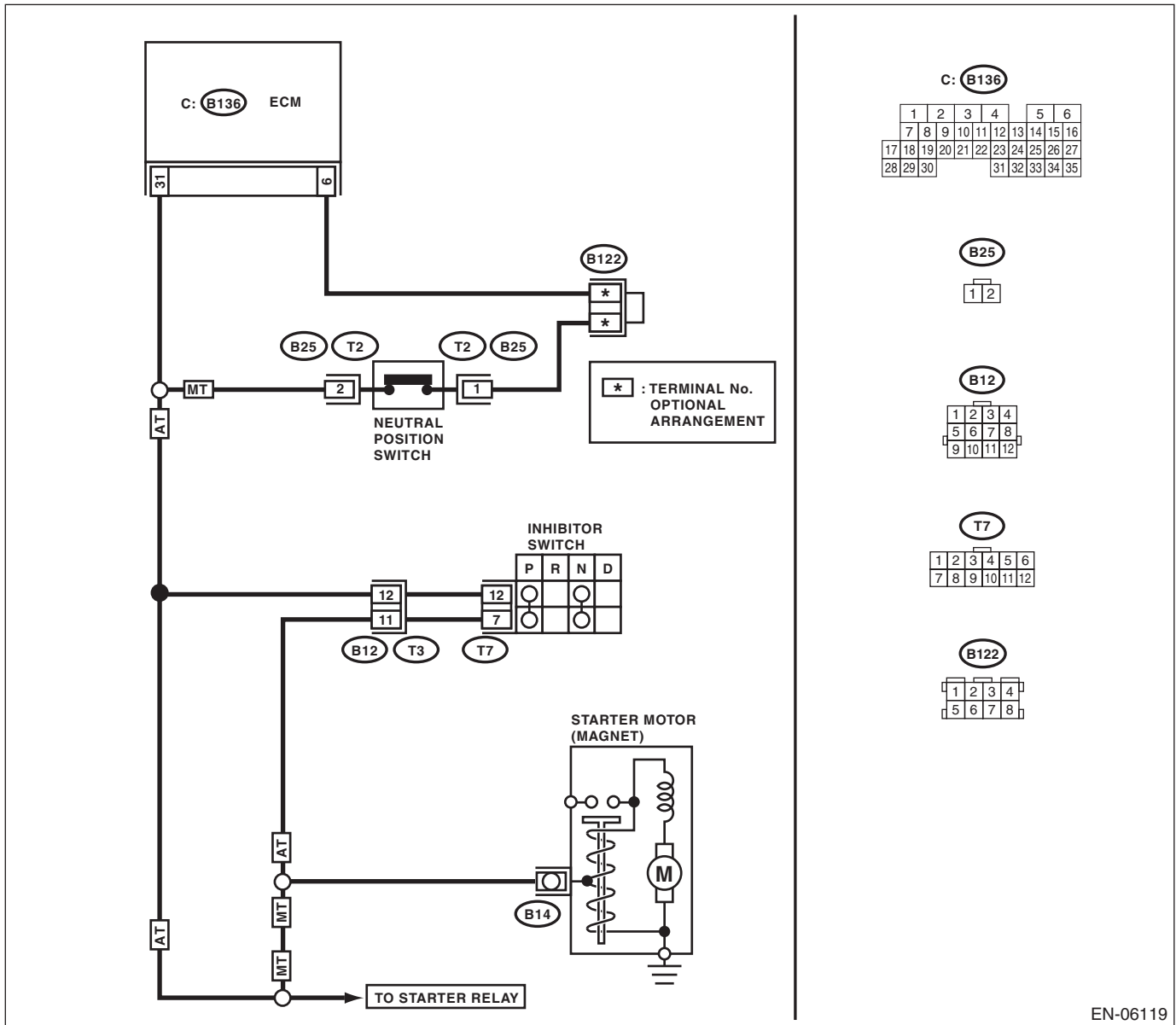
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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 the poor contact of the ECM connector.	Go to step 2.
2	<p>CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and neutral position switch. 3) Measure the resistance of harness between ECM and neutral position switch connector.</p> <p>Connector & terminal (B136) No. 31 — (T2) No. 2: (B136) No. 6 — (T2) No. 1:</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 in harness between ECM and neutral position switch connector • Poor contact of coupling connector
3	<p>CHECK NEUTRAL POSITION SWITCH.</p> <p>1) Place the shift lever in neutral. 2) Measure the resistance between neutral position switch terminals.</p> <p>Terminals No. 1 — No. 2:</p>	Is the resistance less than 1 Ω?	Repair poor contact of the ECM connector.	Replace the neutral position switch.

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CH:DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1)

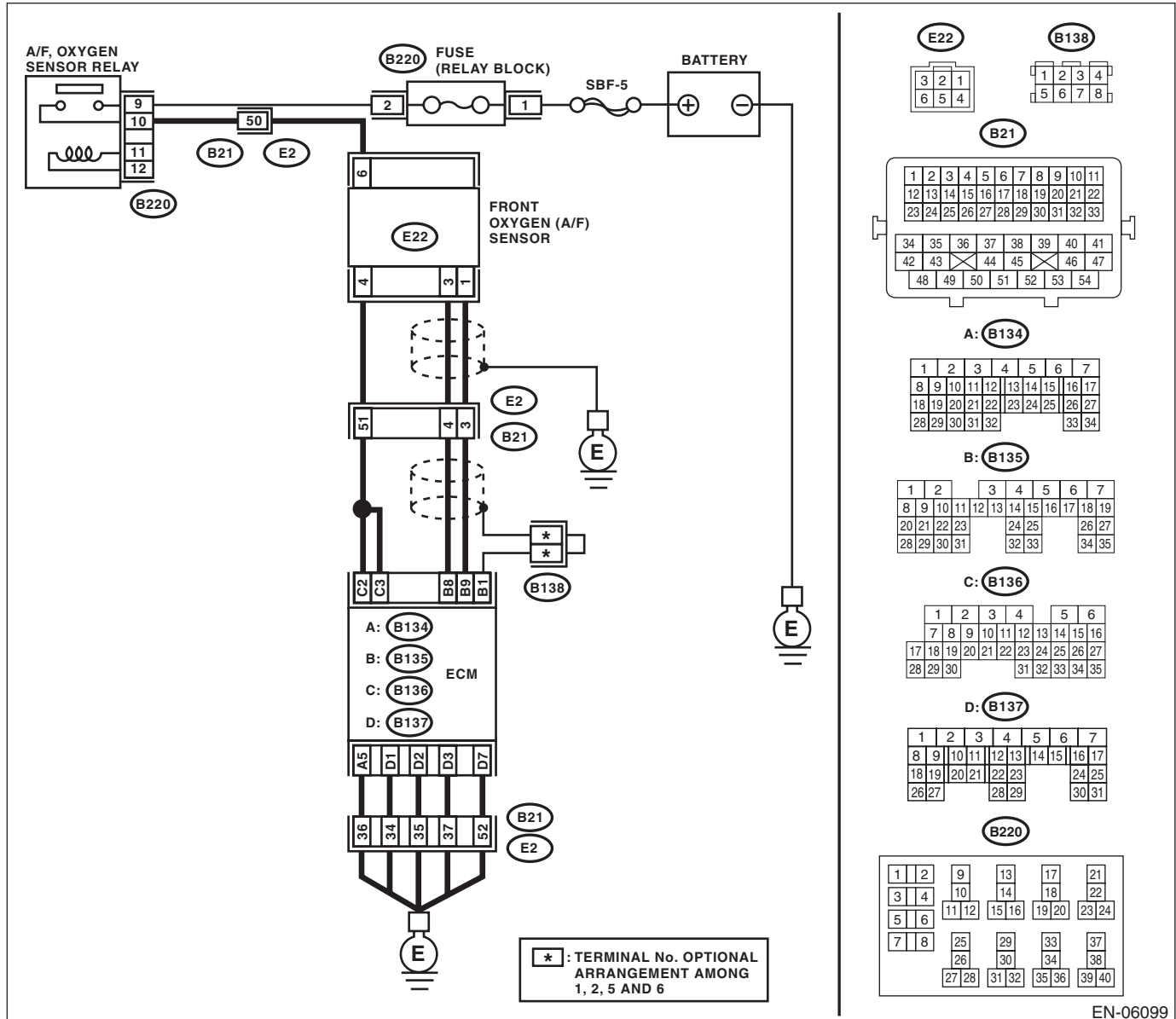
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-191, DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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 — (E22) No. 1: (B135) No. 8 — (E22) 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 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)-35, Front Oxygen (A/F) Sensor.>

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CI: DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1)

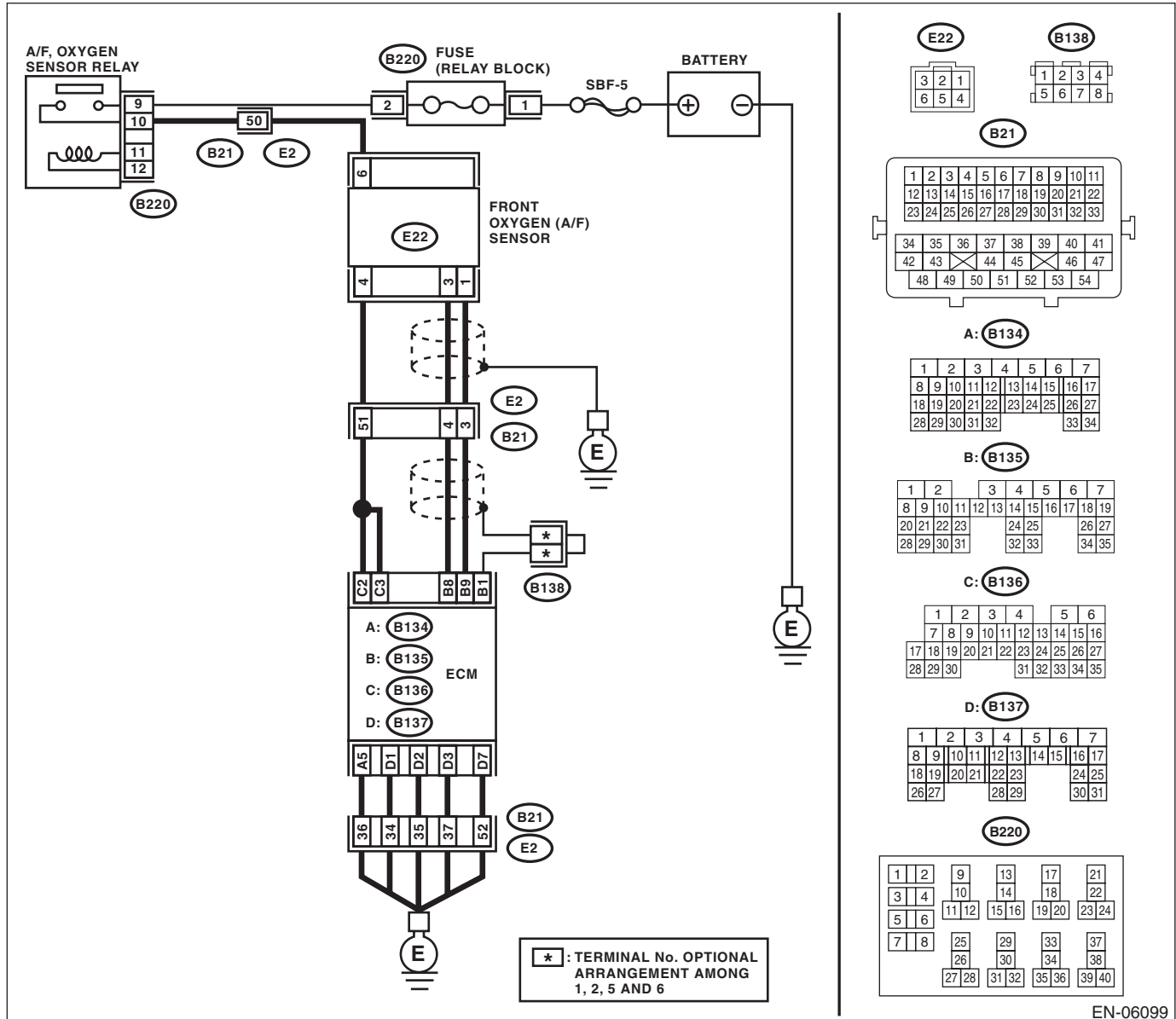
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-194, DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06099

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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 the ground short circuit of harness 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)-35, 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 the poor contact of the ECM connector.

CJ:DTC P1160 RETURN SPRING FAILURE

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO)(diag)-278, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

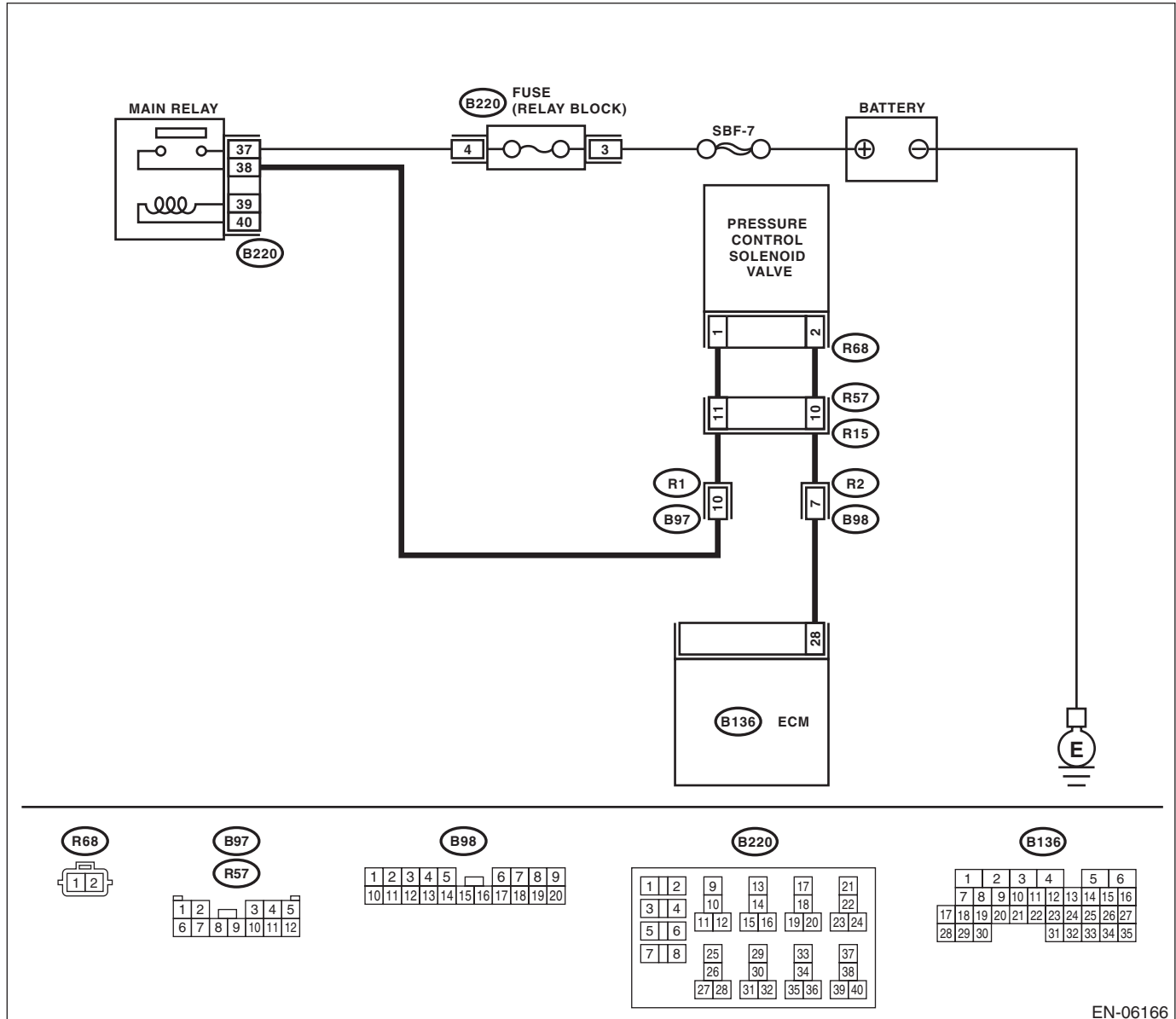
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-199, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06166

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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> <i>(B136) No. 28 (+) — Chassis ground (-):</i></p>	Is the voltage 10 V or more?	Repair the poor contact of the ECM connector.	Go to step 2.
2	<p>CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE. 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. <i>Connector & terminal</i> <i>(R68) No. 2 — Chassis ground:</i></p>	Is the resistance 1 M Ω or more?	Go to step 3.	Repair the ground short circuit of harness between ECM and pressure control solenoid valve connector.
3	<p>CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE. Measure the resistance of harness between ECM and pressure control solenoid valve connector. <i>Connector & terminal</i> <i>(B136) No. 28 — (R68) No. 2:</i></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. Measure the resistance between pressure control solenoid valve terminals. <i>Terminals</i> <i>No. 1 — No. 2:</i></p>	Is the resistance between 10 — 100 Ω ?	Go to step 5.	Replace the pressure control solenoid valve. <Ref. to EC(H4SO)-15, Pressure Control Solenoid Valve.>
5	<p>CHECK POWER SUPPLY TO THE PRESSURE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to ON. 2) Measure the voltage between pressure control solenoid valve and chassis ground. <i>Connector & terminal</i> <i>(R68) No. 1 (+) — Chassis ground (-):</i></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

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

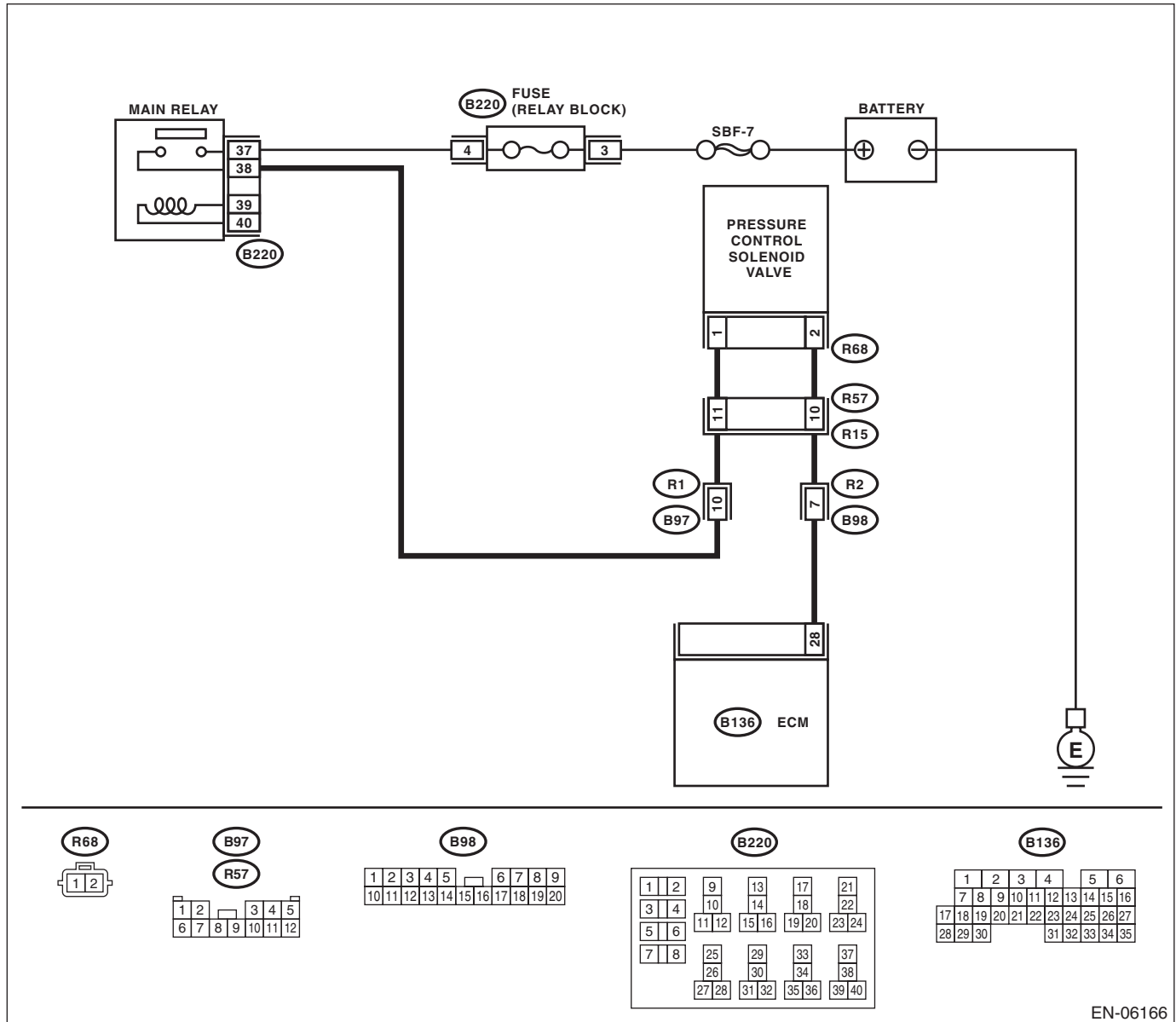
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-201, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06166

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-15, Pressure Control Solenoid Valve.></p>	<p>Repair the poor contact of the ECM connector.</p>

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CM:DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-203, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

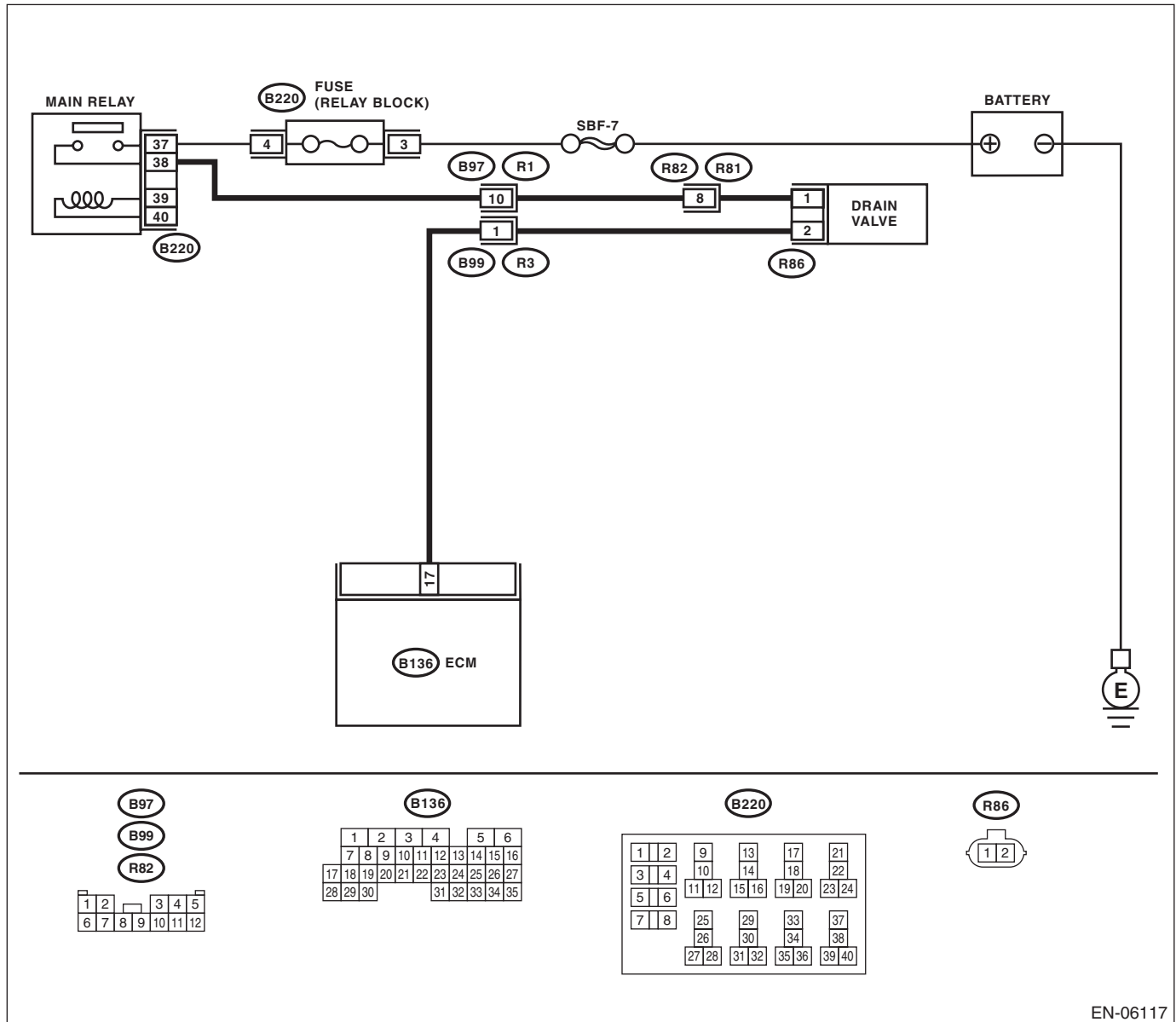
TROUBLE SYMPTOM:

Improper fuel supply

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06117

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK DRAIN HOSE. Check the drain hose for clogging.	Is there clogging in the drain hose?	Replace the drain hose.	Go to step 3.
3	CHECK DRAIN VALVE OPERATION. 1) Turn the ignition switch to OFF. 2) Connect the delivery (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)-53, Compulsory Valve Operation Check Mode.>	Does the drain valve operate?	Repair the poor contact of the ECM connector.	Replace the drain valve. <Ref. to EC(H4SO)-18, Drain Valve.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-205, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

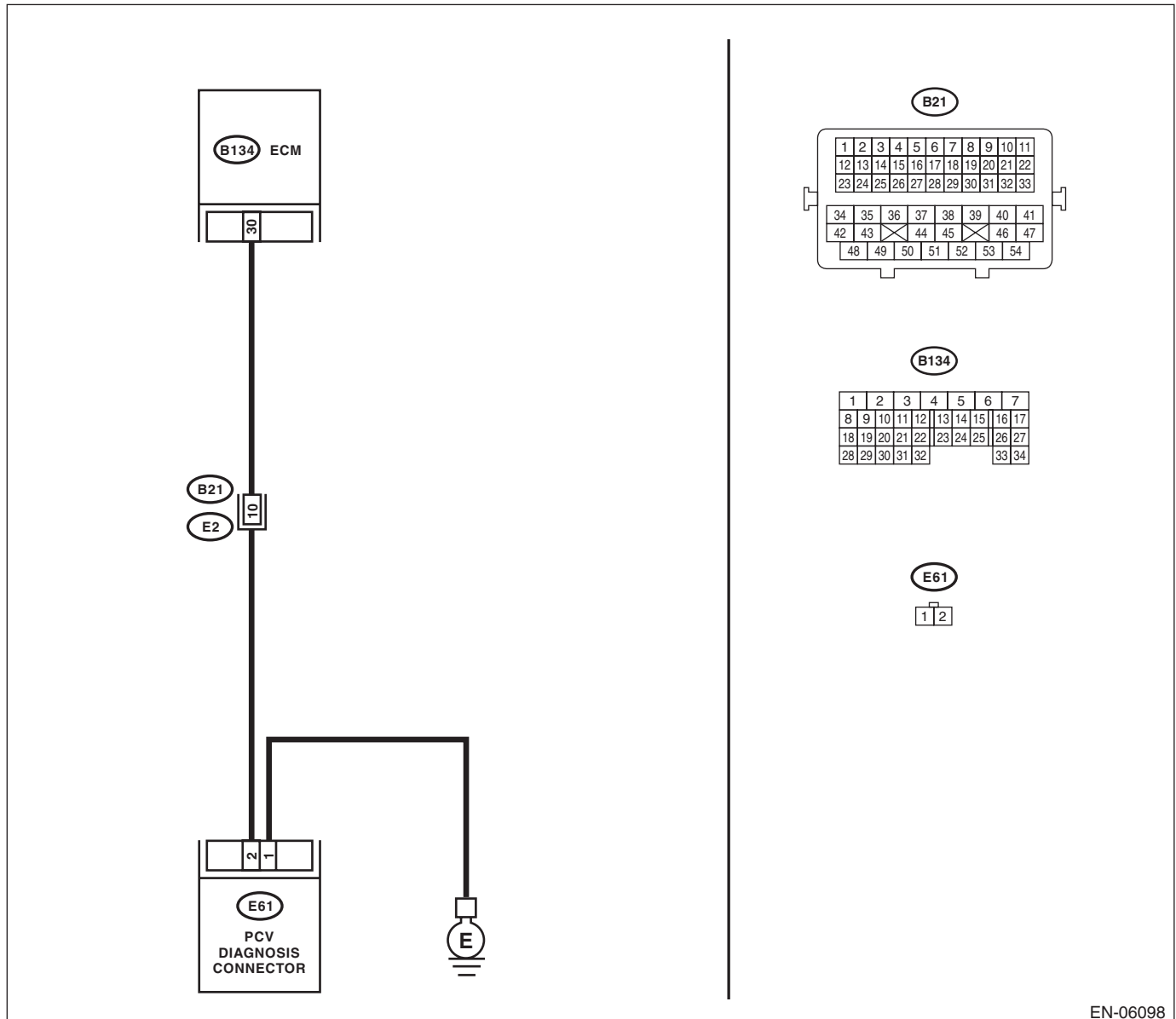
TROUBLE SYMPTOM:

Improper idling

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06098

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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. Connector & terminal (B134) No. 30 — (E61) No. 2:	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 PCV hose assembly connector • Poor contact of coupling connector
3	CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY. Measure the resistance between PCV hose assembly connector and chassis ground. Connector & terminal (B134) No. 30 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 4.	Repair the short circuit to ground in harness between ECM and PCV hose assembly connector.
4	CHECK GROUND CIRCUIT OF PCV HOSE ASSEMBLY. Measure the resistance of harness between PCV hose assembly connector and engine ground. Connector & terminal (E61) 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.

CO: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)-256, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CP: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)-259, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CQ: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)-256, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CR: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)-259, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CS: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)-256, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

CT: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)-259, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-207, DTC P1492 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-211, DTC P1494 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-211, DTC P1496 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-211, DTC P1498 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine breathing

CAUTION:

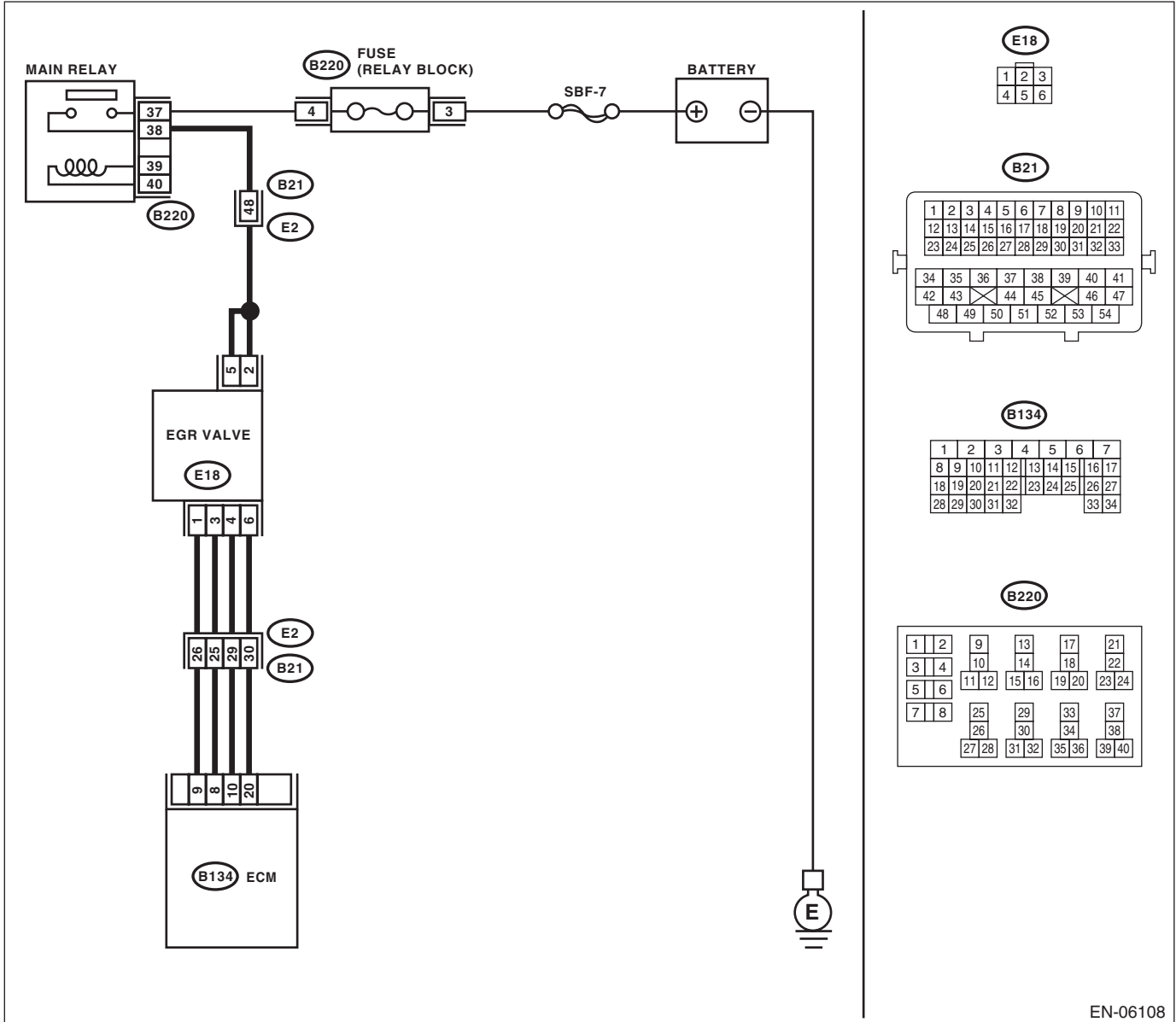
After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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WIRING DIAGRAM:



EN-06108

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
1 CHECK POWER SUPPLY TO EGR VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the EGR valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between EGR valve connector and engine ground. Connector & terminal (E18) No. 2 (+) — Engine ground (-): (E18) No. 5 (+) — Engine ground (-):	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 CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and EGR valve connector. 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:	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 CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance between ECM and chassis ground. 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:	Is the resistance 1 MΩ or more?	Go to step 4.	Repair the ground short in harness between ECM and EGR valve connector.
4 CHECK POOR CONTACT. Check poor contact in ECM and EGR valve connector.	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.>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-209, DTC P1493 EGR SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-211, DTC P1495 EGR SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-211, DTC P1497 EGR SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.> <Ref. to GD(H4SO)-211, DTC P1499 EGR SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine breathing

CAUTION:

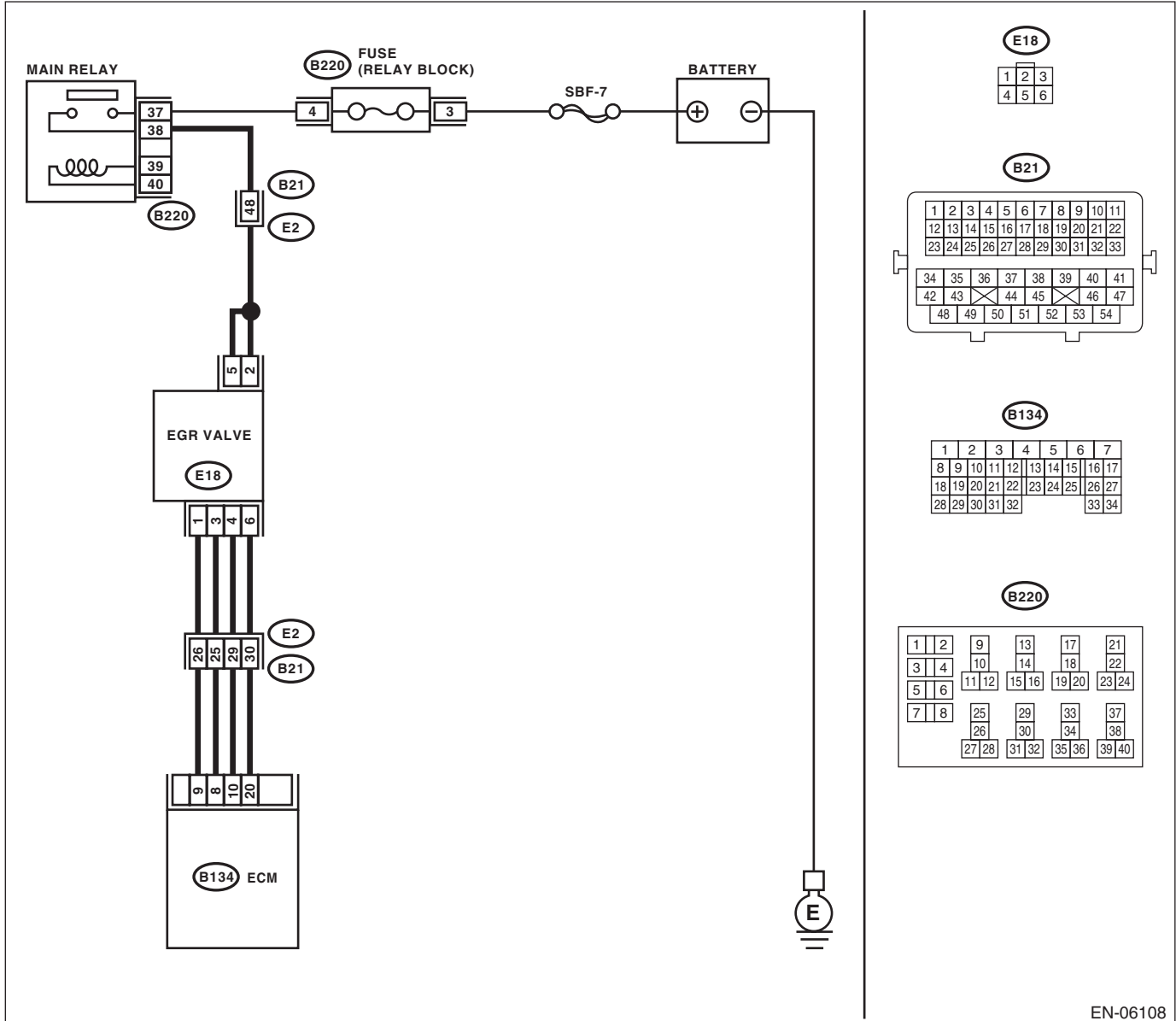
After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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WIRING DIAGRAM:



EN-06108

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 the 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 valve connectors.</p>	<p>Repair the poor contact of the ECM connector.</p>

CW:DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION

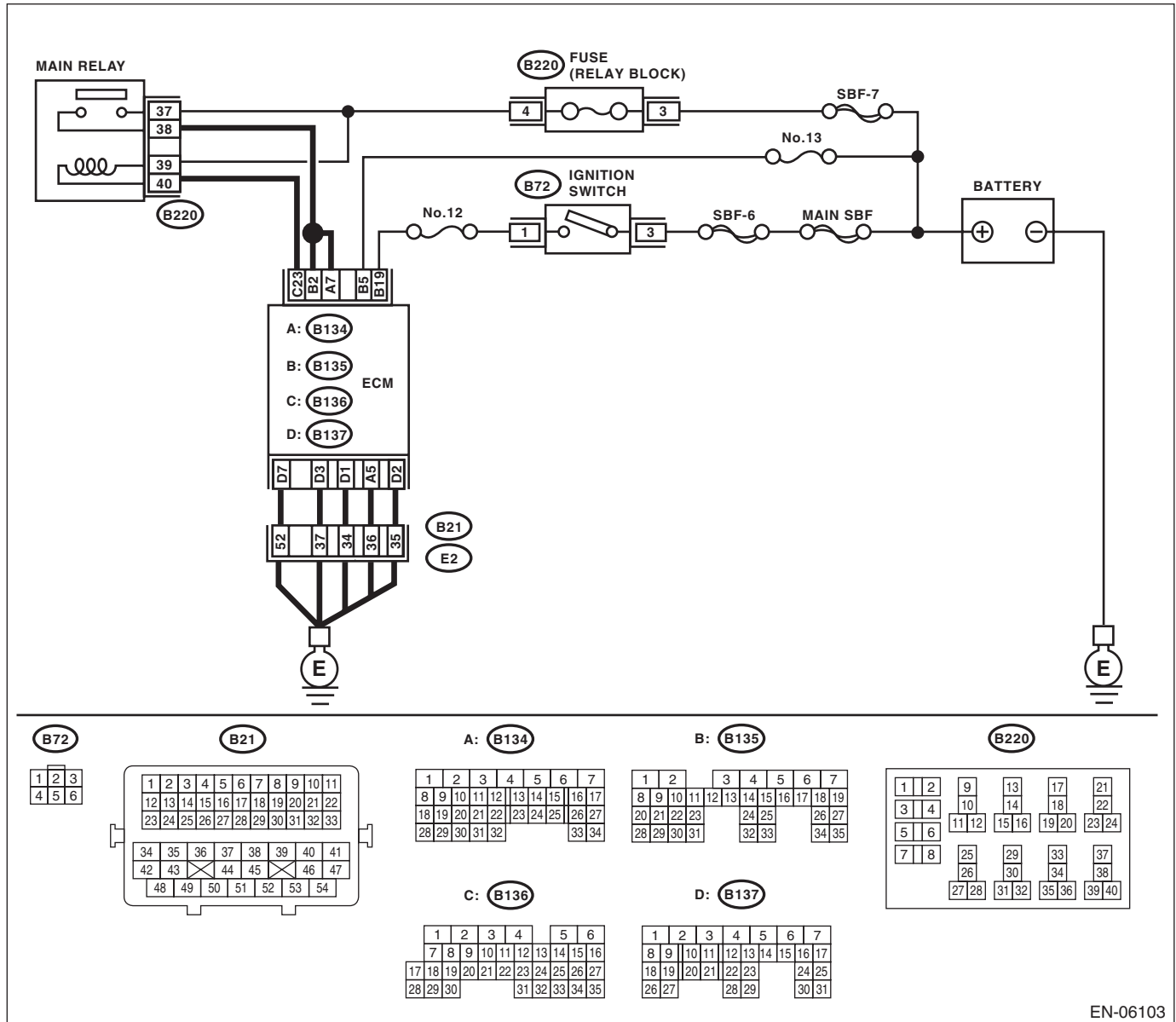
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-212, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>

WIRING DIAGRAM:



EN-06103

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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. Connector & terminal (B135) No. 5 (+) — Chassis ground (-):	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. Connector & terminal (B135) No. 5 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 3.	Repair the ground short circuit of harness between ECM and battery terminal.
3	CHECK FUSE NO. 13 (IN MAIN FUSE BOX).	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 in ECM connector • Poor contact of battery terminal

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CX:DTC P1602 CONTROL MODULE PROGRAMMING ERROR

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-214, 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:

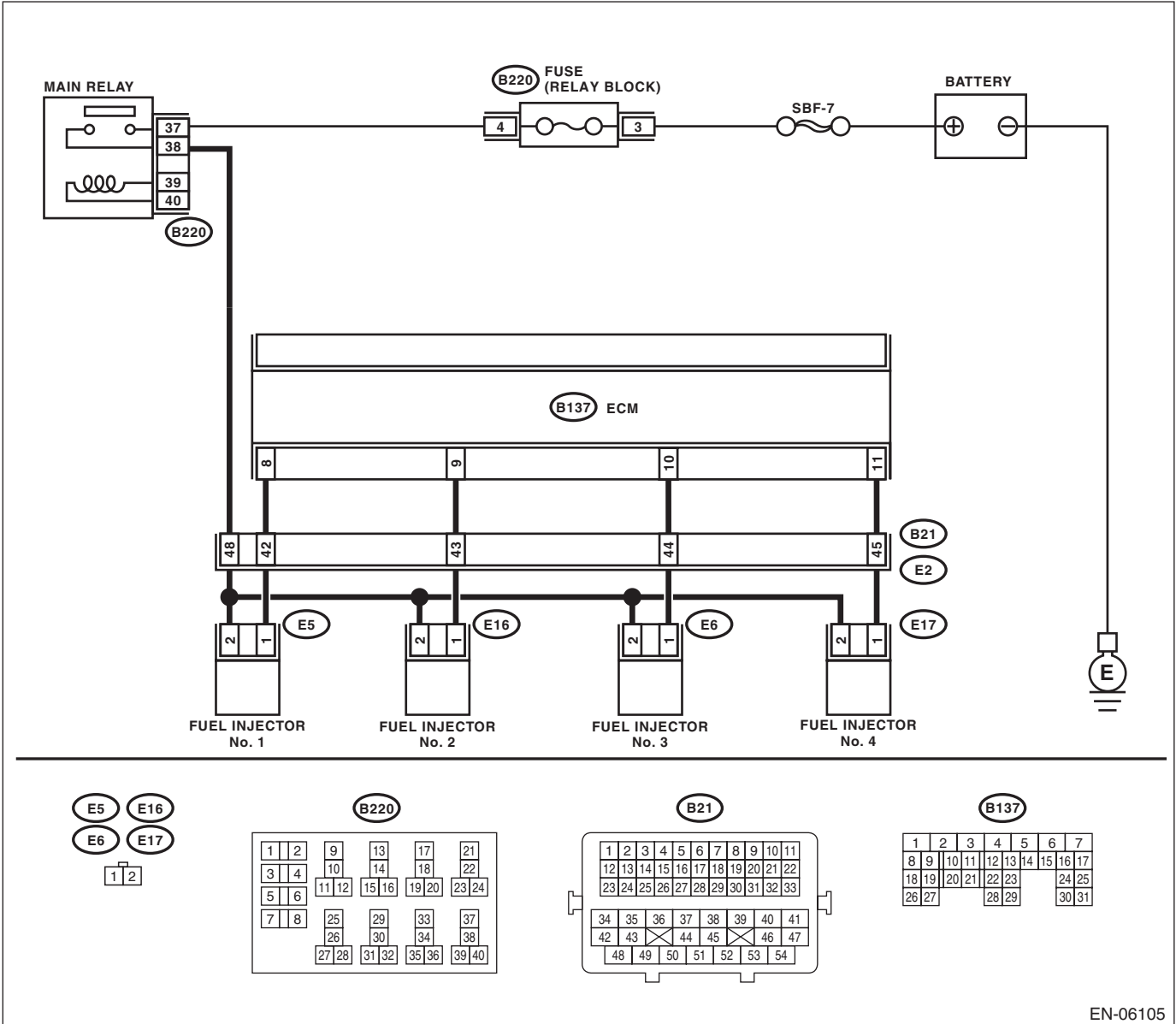
After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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WIRING DIAGRAM:

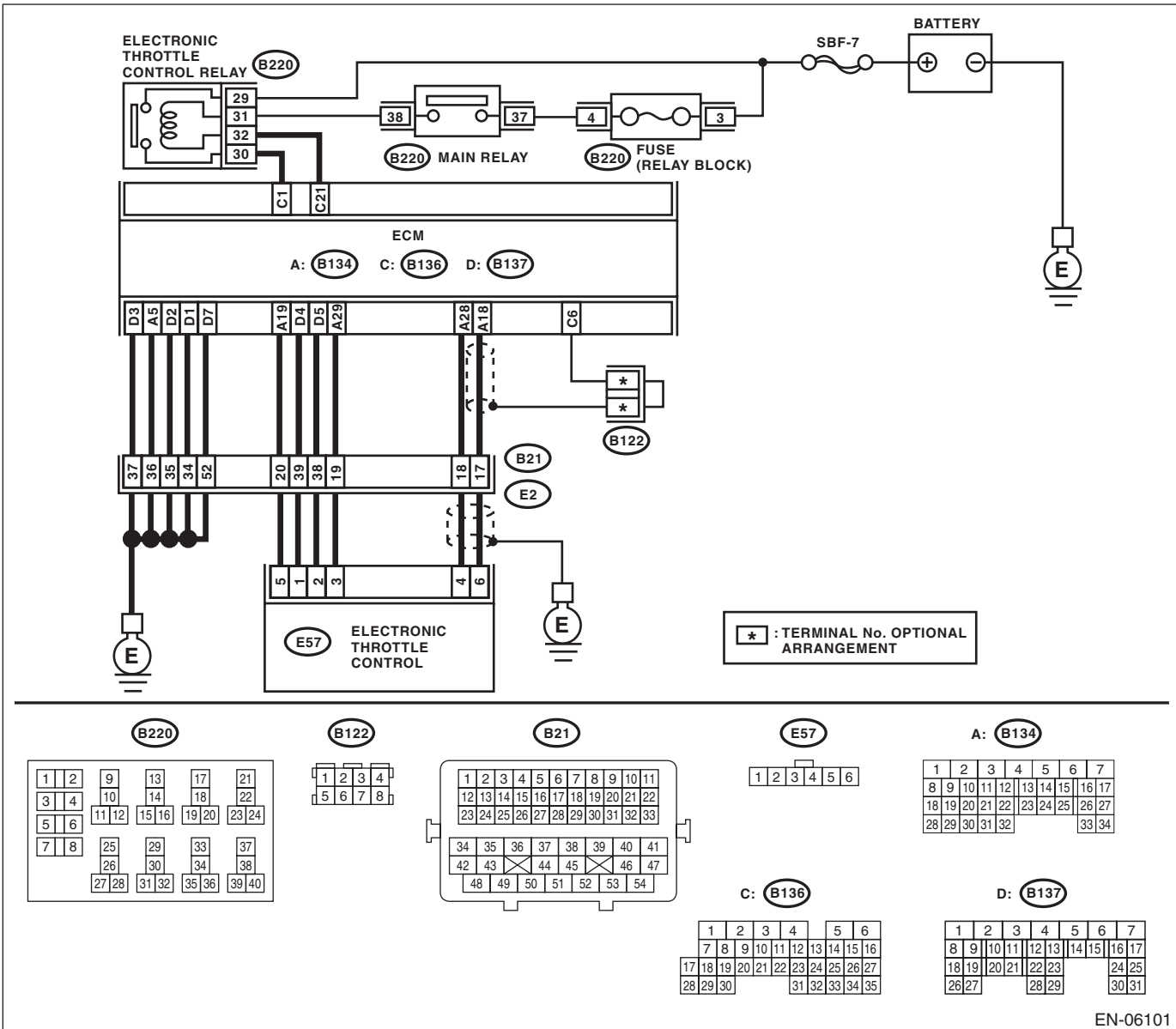


EN-06105

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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(B220)

1	2	9	13	17	21
3	4	10	14	18	22
5	6	11	15	19	23
7	8	25	29	33	37
		26	30	34	38
		27	31	32	35
			36	39	40

(B122)

1	2	3	4
5	6	7	8

(B21)

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41			
42	43	44	45	46	47					
48	49	50	51	52	53	54				

(E57)

1	2	3	4	5	6
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A: (B134)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	

C: (B136)

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	

D: (B137)

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	

EN-06101

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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)-82, 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 engine oil. <Ref. to LU(H4SO)-9, 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)-27, 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 kg/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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, 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)

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Step	Check	Yes	No
7 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE 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 “P” range 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. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4SO)(diag)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the measured value 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?	Go to step 8.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>
8 CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE 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 “P” range 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. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4SO)(diag)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Subtract ambient temperature from intake air temperature. Is the obtained value -10 — 50°C (-18 — 90°F)?	Go to step 9.	Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4SO)-28, Mass Air Flow and Intake Air Temperature Sensor.>
9 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 14.	Go to step 10.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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:	Is the resistance 1 M Ω or more?	Go to step 11.	Repair the short circuit to ground in harness between ECM and fuel injector connector.
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:	Is the resistance less than 1 Ω ?	Go to step 12.	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
12 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 13.	Replace the faulty fuel injector. <Ref. to FU(H4SO)-30, Fuel Injector.>
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 (-):	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 in harness between the main relay connector and fuel injector connector on faulty cylinders • Poor contact of coupling connector • Poor contact of main relay connector
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 harness between ECM and fuel injector connector.	Go to step 15.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
15 CHECK FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between fuel injector terminals on faulty cylinder. <i>Terminals</i> <i>No. 1 — No. 2:</i>	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.	Go to step 17.
17 CHECK CRANK SPROCKET. Remove the timing belt cover. <Ref. to ME(H4SO)-49, REMOVAL, Timing Belt Cover.>	Is the crank sprocket rusted or does it have damaged teeth?	Replace the crank sprocket. <Ref. to ME(H4SO)-56, 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)-50, 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. 31 and No. 32 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals. <i>Terminals</i> <i>No. 29 — No. 30:</i>	Is the resistance less than 1 Ω ?	Go to step 20.	Replace the electronic throttle control relay. <Ref. to FU(H4SO)-42, 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. <i>Connector & terminal</i> <i>(B220) No. 29 (+) — Chassis ground (-):</i>	Is the voltage 10 V or more?	Go to step 21.	Repair the open or ground short circuit of power supply circuit.
21 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>(B220) No. 32 (+) — 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 connector.	Go to step 22.
22 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>(B220) No. 32 — Chassis ground:</i> <i>(B220) No. 30 — Chassis ground:</i>	Is the resistance 1 M Ω or more?	Go to step 23.	Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
<p>23 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. Measure the resistance between the ECM and electronic throttle control relay connector. Connector & terminal (B136) No. 21 — (B220) No. 32: (B136) No. 1 — (B220) No. 30:</p>	Is the resistance less than 1 Ω?	Go to step 24.	Repair the open circuit in harness between ECM and electronic throttle control relay connector.
<p>24 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. 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 25.	Repair the ground short circuit of harness between ECM and electronic throttle control connector.
<p>25 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:</p>	Is the resistance 1 MΩ or more?	Go to step 26.	Repair the ground short circuit of harness between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>
<p>26 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:</p>	Is the resistance less than 1 Ω?	Go to step 27.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and electronic throttle control connector • Poor contact of coupling connector
<p>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:</p>	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

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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 <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 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 <i>(B134) No. 19 — (B134) No. 18:</i> <i>(B134) No. 19 — (B134) No. 28:</i>	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)-33, 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)-13, 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)-33, 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)-13, 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 <i>(B137) No. 5 — (E57) No. 2:</i> <i>(B137) No. 4 — (E57) No. 1:</i>	Is the resistance less than 1 Ω?	Go to step 33.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and electronic throttle control connector • Poor contact of coupling connector
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. Connector & terminal <i>(E57) No. 2 (+) — Engine ground (-):</i> <i>(E57) No. 1 (+) — Engine ground (-):</i>	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 34.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
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> <i>(E57) No. 2 — Engine ground:</i> <i>(E57) No. 1 — Engine ground:</i>	Is the resistance 1 MΩ or more?	Go to step 35.	Repair the short circuit to ground in harness between ECM and electronic throttle control connector.
35 CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS. Measure the resistance between the electronic throttle control connector terminals. <i>Connector & terminal</i> <i>(E57) No. 2 — (E57) No. 1:</i>	Is the resistance 1 MΩ or more?	Go to step 36.	Repair the short circuit of harness between ECM and electronic throttle control connector.
36 CHECK ELECTRONIC THROTTLE GROUND CIRCUIT. Measure the resistance 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 resistance less than 5 Ω?	Go to step 37.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact of coupling connector
37 CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle terminals. <i>Terminals</i> <i>No. 2 — No. 1:</i>	Is the resistance 50 Ω or less?	Go to step 38.	Replace the electronic throttle control. <Ref. to FU(H4SO)-13, 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 the poor contact of the ECM connector.	Replace the electronic throttle control. <Ref. to FU(H4SO)-13, Throttle Body.>

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

Refer to DTC P2097 for diagnostic procedure. <Ref. to EN(H4SO)(diag)-273, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

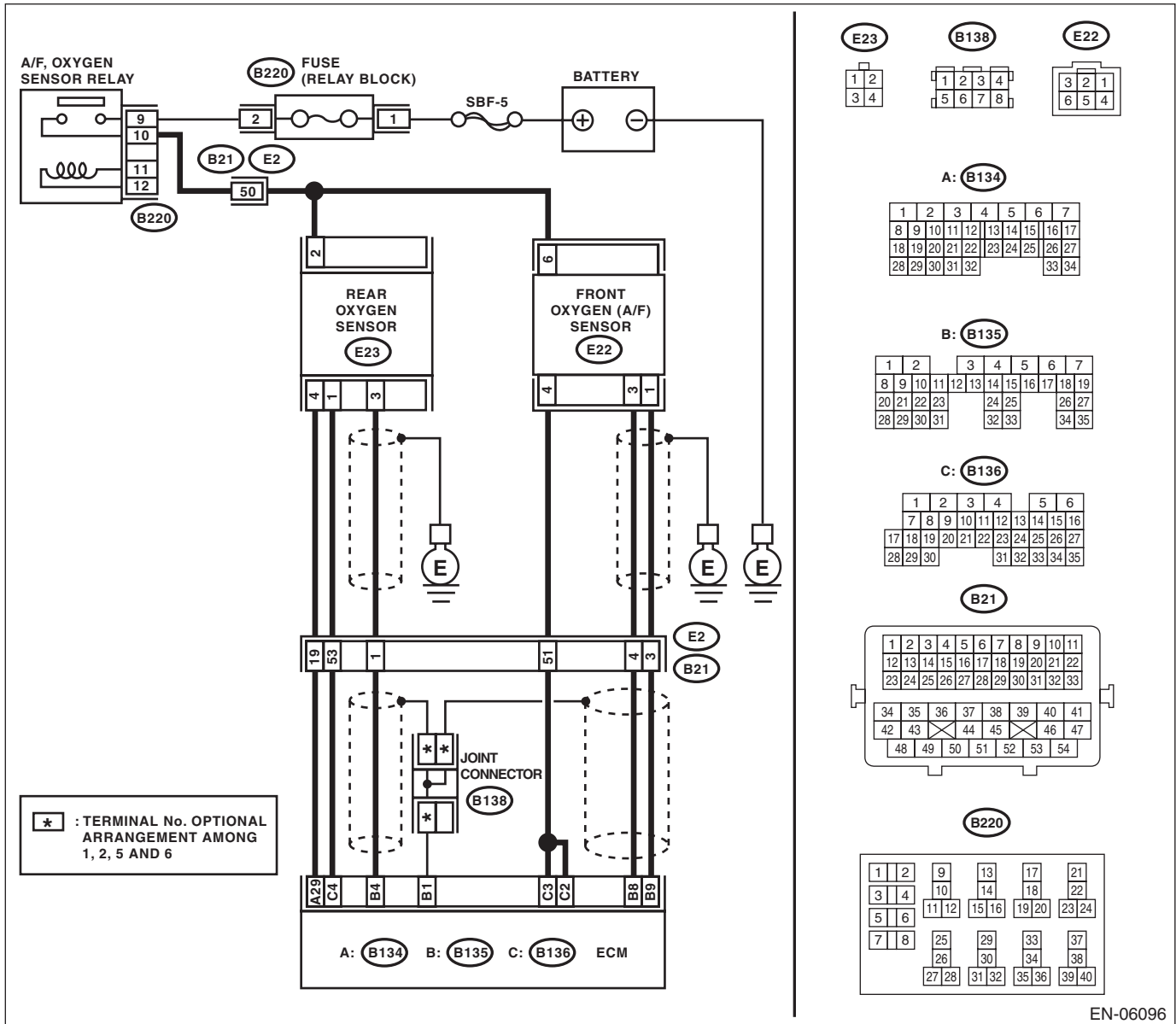
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-218, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06096

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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)-82, 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 — (E22) No. 1: (B135) No. 8 — (E22) No. 3:	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 front oxygen (A/F) sensor 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.	Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.
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 (E22) No. 1 (+) — Chassis ground (-):	Is the voltage 4.5 V or more?	Go to step 7.	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 (E22) No. 3 (+) — Chassis ground (-):	Is the voltage 4.95 V or more?	Go to step 7.	Go to step 8.
7	CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. Connector & terminal (E22) No. 1 (+) — Chassis ground (-): (E22) 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.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No	
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)-27, INSPECTION, Fuel Pressure.> CAUTION: Release fuel pressure before removing the fuel pressure gauge.	Is the measured value 333.4 — 360.5 kPa (3.4 — 3.7 kg/cm ² , 48.4 — 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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, 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.>
12	CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE 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 "P" range 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. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)(diag)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	Is the measured value 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?	Go to step 13 .	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)

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Step	Check	Yes	No
<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).</p> <p>2) For AT models, set the select lever to “P” range 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)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, 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)</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"> Depress the clutch pedal. (MT model) Subaru Select Monitor <p>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4SO)(diag)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, 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>
<p>15 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"> Depress the clutch pedal. (MT model) Subaru Select Monitor <p>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4SO)(diag)-33, Subaru Select Monitor.></p> <ul style="list-style-type: none"> General scan tool <p>For detailed operation procedures, refer to the general scan tool operation manual.</p>	<p>Is the voltage 250 mV or less?</p>	<p>Go to step 17.</p>	<p>Go to step 16.</p>

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
16 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.	Has water entered the connector?	Completely remove any water inside.	Go to step 18 .
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)-33, Subaru Select Monitor.> • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.	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)-35, Front Oxygen (A/F) Sensor.>	Go to step 18 .
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 — (E23) No. 3: (B134) No. 29 — (E23) No. 4:	Is the resistance less than 1 Ω?	Go to step 19 .	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and rear oxygen sensor connector • Poor contact of coupling connector
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 (E23) 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 in harness between ECM and rear oxygen sensor connector • Poor contact in ECM connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-220, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

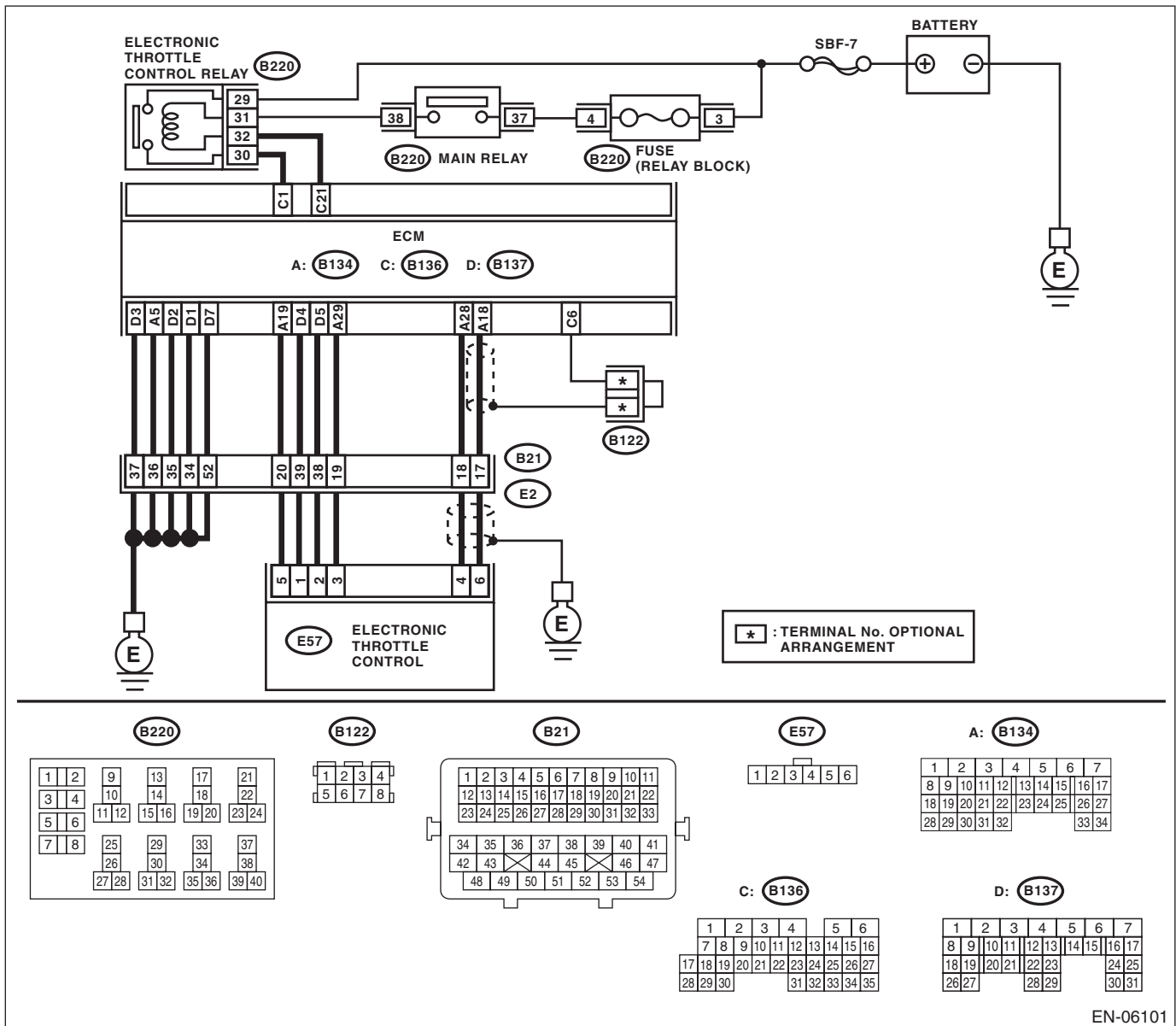
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06101

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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. 31 and No. 32 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals.</p> <p>Terminals No. 29 — No. 30:</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 (B220) No. 29 (+) — 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 (B220) No. 32 (+) — 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 connector.	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 (B220) No. 32 — Chassis ground: (B220) No. 30 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 5.	Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.
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 — (B220) No. 32: (B136) No. 1 — (B220) No. 30:</p>	Is the resistance less than 1 Ω?	Go to step 6.	Repair the open circuit in harness between ECM and electronic throttle control relay connector.
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 the ground short circuit of harness between ECM and electronic throttle control connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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 <i>(E57) No. 6 — Engine ground:</i> <i>(E57) No. 4 — Engine ground:</i>	Is the resistance 1 MΩ or more?	Go to step 8.	Repair the ground short circuit of harness 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 <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 9.	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 electronic throttle control connector • Poor contact of coupling 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 <i>(E57) No. 3 — Engine ground:</i>	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 <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 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 <i>(B134) No. 19 — (B134) No. 18:</i> <i>(B134) No. 19 — (B134) No. 28:</i>	Is the resistance 1 MΩ or more?	Go to step 12.	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)

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Step	Check	Yes	No
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)-33, 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)-13, Throttle Body.>
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)-33, Subaru Select Monitor.>	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)-13, Throttle Body.>
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:	Is the resistance less than 1 Ω?	Go to step 15.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and electronic throttle control connector • Poor contact of coupling connector
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 (-):	Is the voltage 5 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control connector.	Go to step 16.
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:	Is the resistance 1 MΩ or more?	Go to step 17.	Repair the short circuit to ground in harness between ECM and electronic throttle control connector.
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:	Is the resistance 1 MΩ or more?	Go to step 18.	Repair the short circuit of harness between ECM and electronic throttle control connector.

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
18 CHECK ELECTRONIC THROTTLE GROUND CIRCUIT. Measure the resistance 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 resistance less than 5 Ω?	Go to step 19.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact of coupling connector
19 CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle 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)-13, 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 the poor contact of the ECM connector.	Replace the electronic throttle control. <Ref. to FU(H4SO)-13, Throttle Body.>

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DB:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-222, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

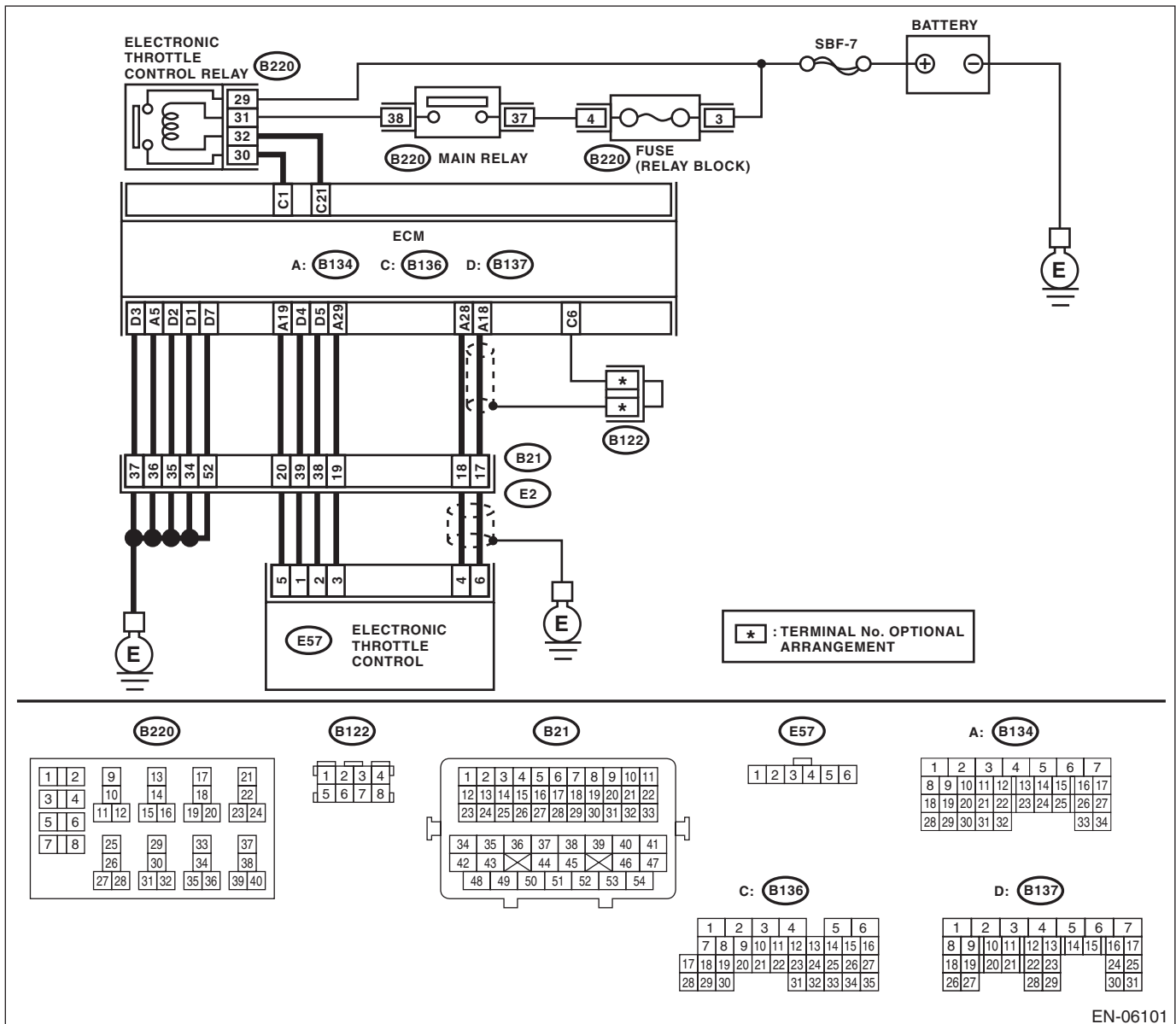
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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Step	Check	Yes	No
<p>1</p> <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. 31 and No. 32 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals.</p> <p>Terminals No. 29 — No. 30:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Replace the electronic throttle control relay.</p>
<p>2</p> <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 (B220) No. 29 (+) — Chassis ground (-):</p>	<p>Is the voltage 10 V or more?</p>	<p>Go to step 3.</p>	<p>Repair the open or ground short circuit of power supply circuit.</p>
<p>3</p> <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 (B220) No. 32 (+) — 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 connector.</p>	<p>Go to step 4.</p>
<p>4</p> <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 (B220) No. 32 — Chassis ground: (B220) No. 30 — Chassis ground:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Go to step 5.</p>	<p>Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.</p>
<p>5</p> <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 — (B220) No. 32: (B136) No. 1 — (B220) No. 30:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Repair the poor contact of the ECM connector.</p>	<p>Repair the open circuit in harness between ECM and electronic throttle control relay connector.</p>

DC:DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH

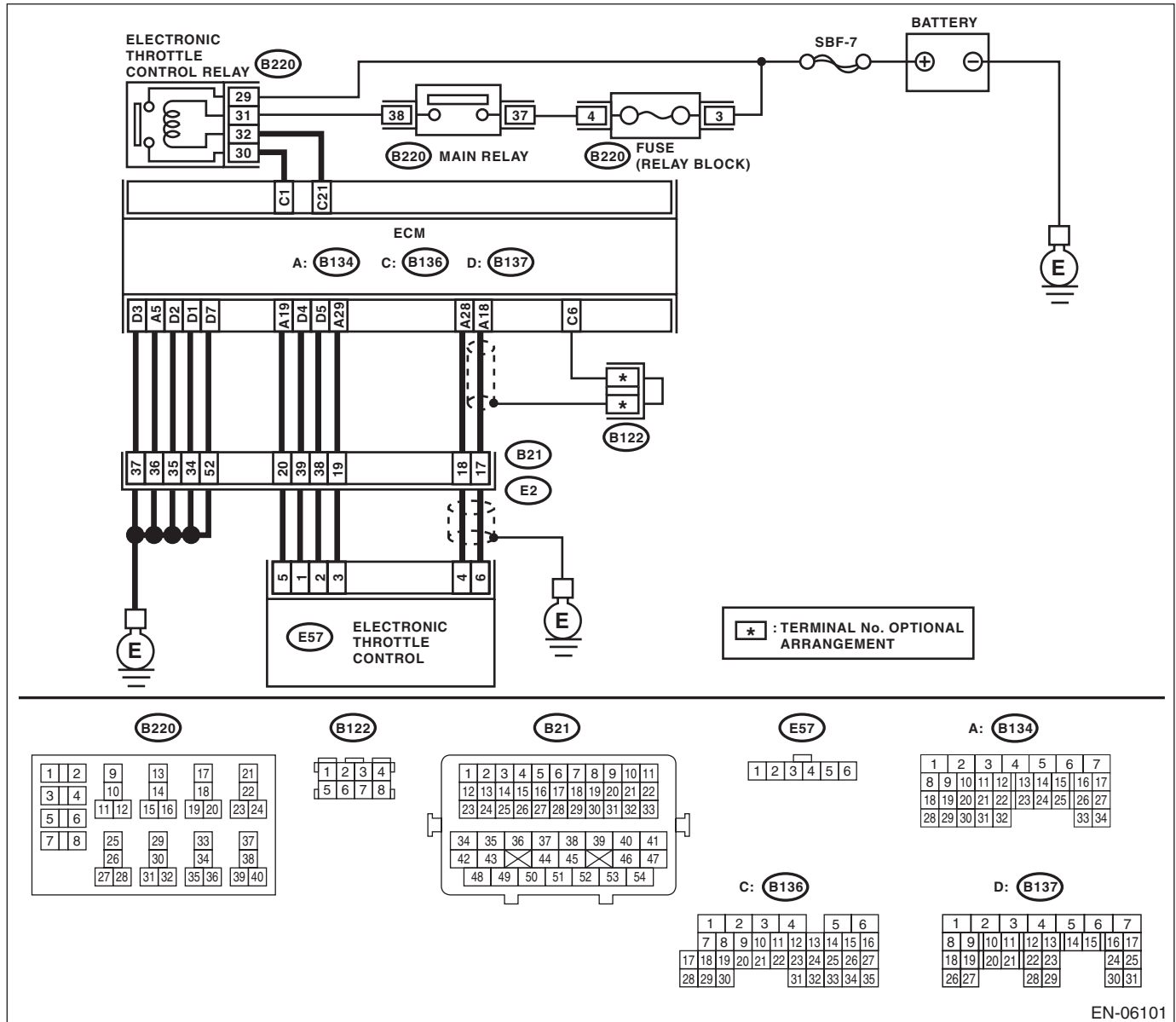
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-224, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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. Terminals No. 29 — No. 30:	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. Connector & terminal (B220) No. 30 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Repair the short circuit to power in the harness between ECM and electronic throttle control relay connector.	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. Connector & terminal (B136) No. 21 — Chassis ground:	Is the resistance 1 MΩ or more?	Repair the poor contact of the ECM connector.	Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.

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

NOTE:

For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4SO)(diag)-278, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-228, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

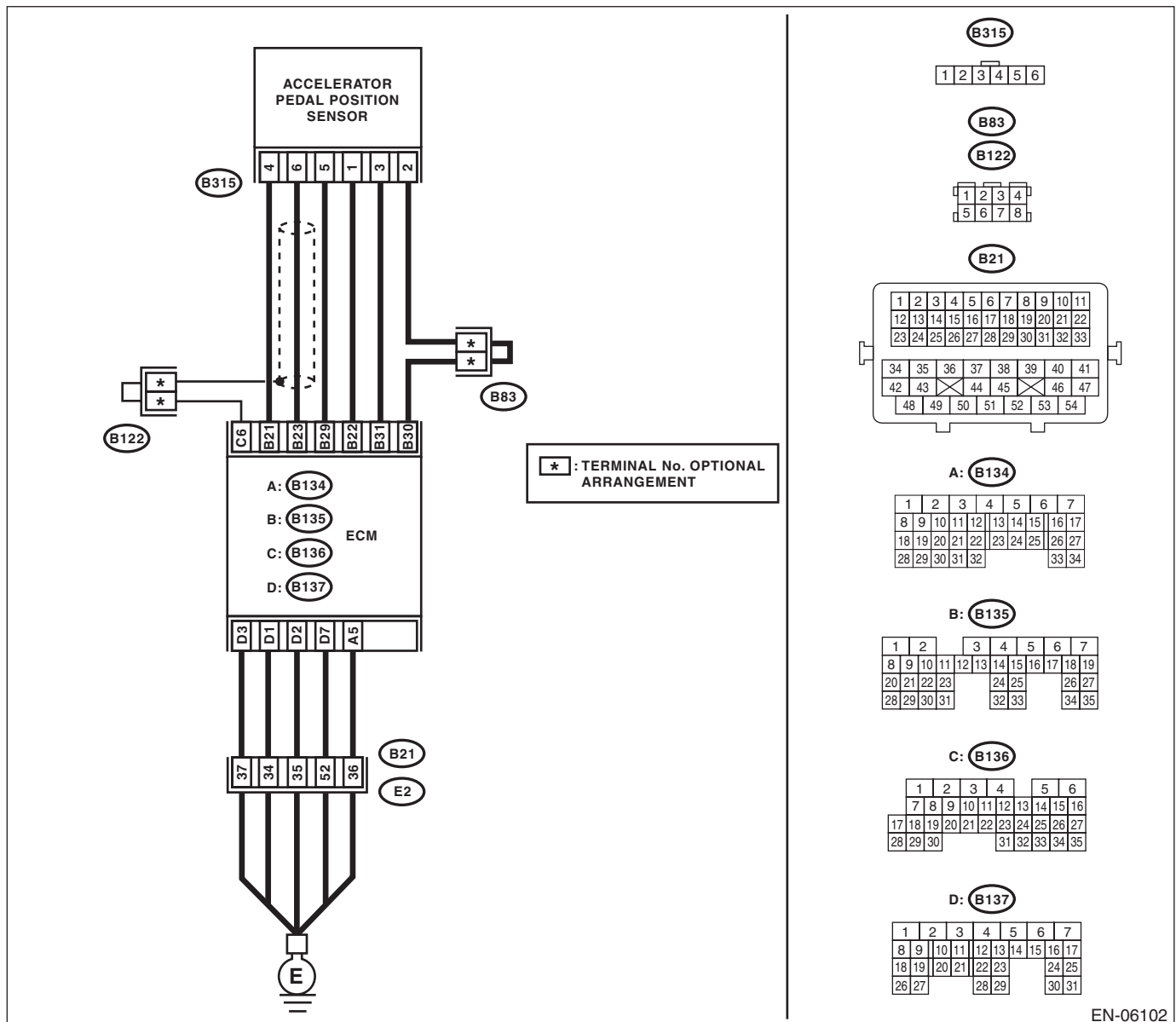
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06102

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<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>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair the ground short of the harness between the ECM and accelerator pedal position sensor connector.
2	<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>	Is the resistance 1 MΩ or more?	Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair the short circuit to ground in harness between ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-230, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

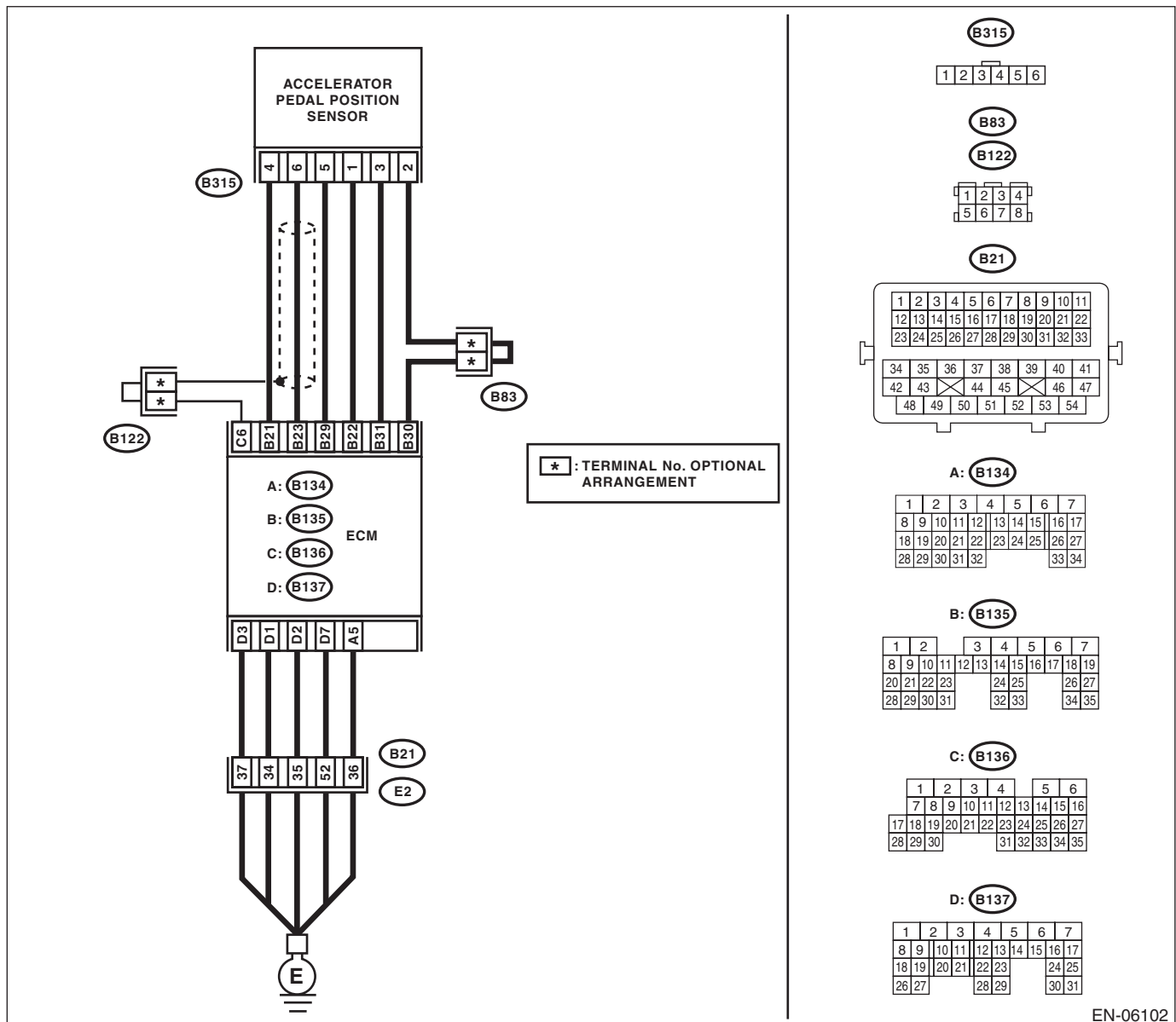
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06102

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-232, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

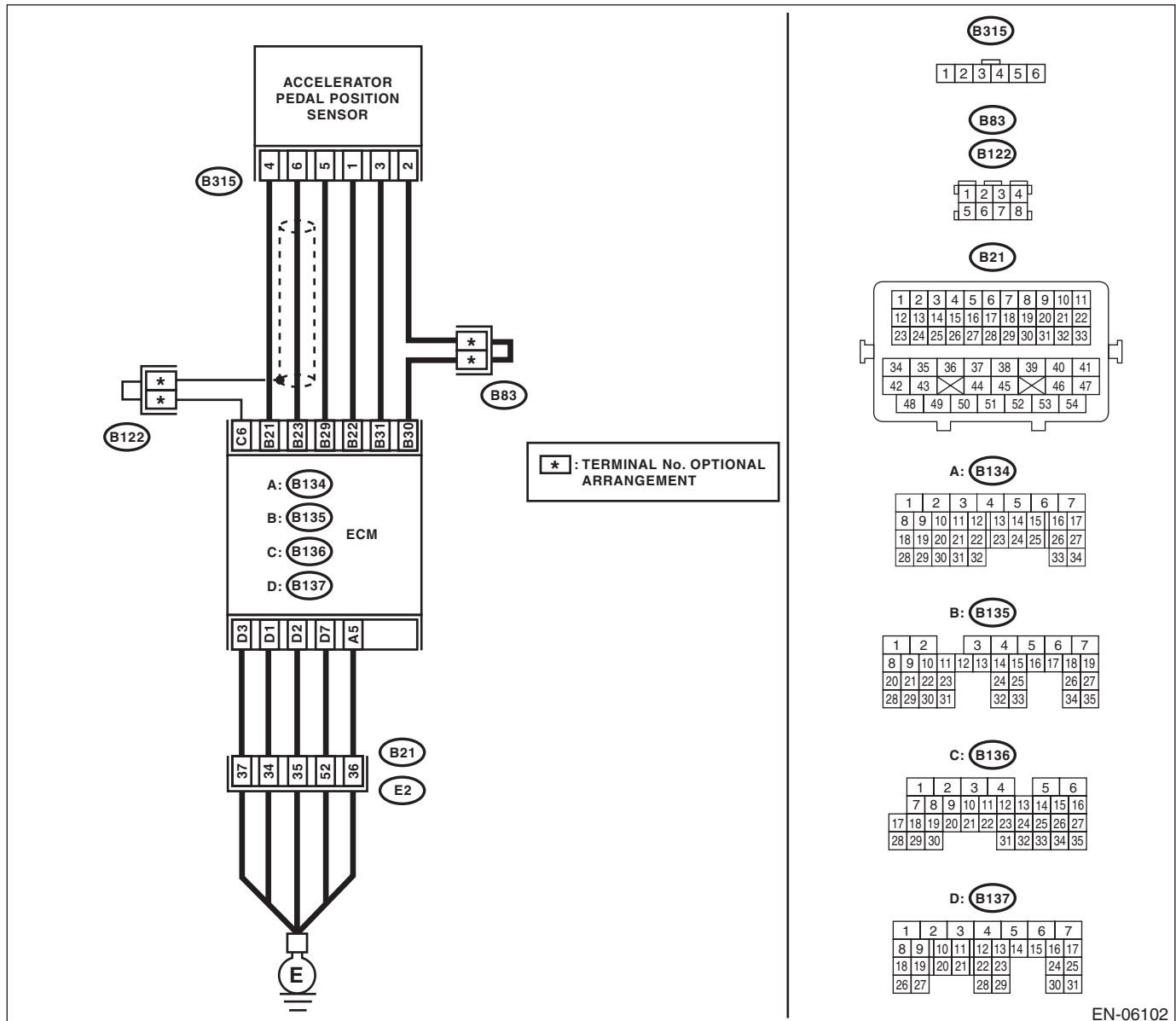
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06102

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	Step	Check	Yes	No
1	<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. 22 — Chassis ground: (B135) No. 31 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Go to step 2.	Repair the ground short of the harness between the ECM and accelerator pedal position sensor connector.
2	<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. 3 — Chassis ground:</p>	Is the resistance 1 MΩ or more?	Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.>	Repair the short circuit to ground in harness between ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4SO)-39, Engine Control Module (ECM).>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-234, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

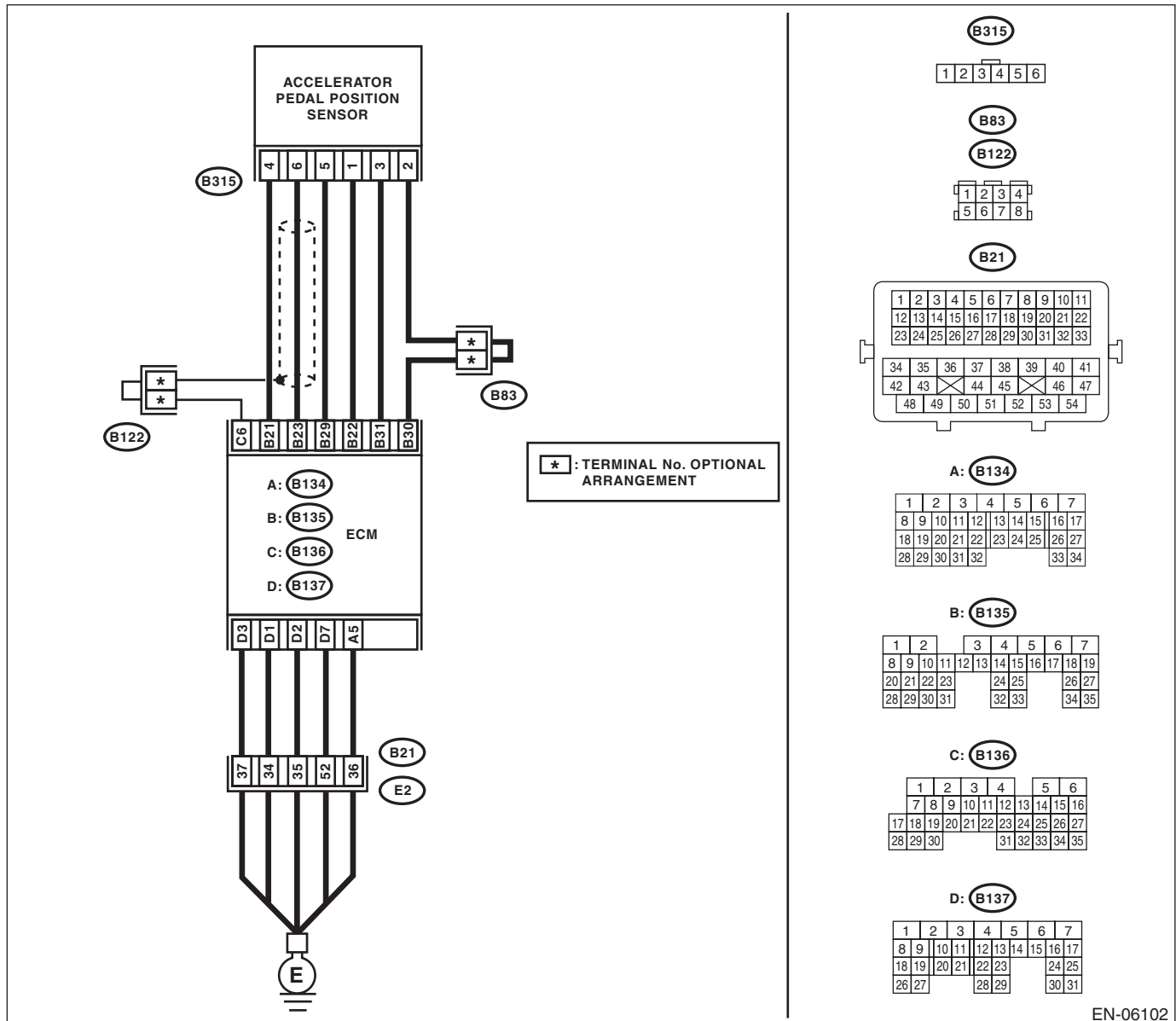
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06102

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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. Connector & terminal (B135) No. 31 — (B315) No. 3: (B135) No. 30 — (B315) No. 2:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit of the harness between the ECM and accelerator pedal position sensor connector.</p>
<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. Connector & terminal (B315) No. 2 — Chassis ground:</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 engine ground • Poor contact in ECM connector • Poor contact of coupling connector</p>
<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. Connector & terminal (B315) No. 3 (+) — Chassis ground (-):</p>	<p>Is the voltage 4.85 V or more?</p>	<p>Repair the short circuit to power source in the harness between the ECM and accelerator pedal position sensor connector.</p>	<p>Go to step 4.</p>
<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. Connector & terminal (B135) No. 22 — (B135) No. 31:</p>	<p>Is the resistance 1 MΩ or more?</p>	<p>Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. <Ref. to SP(H4SO)-3, Accelerator Pedal.></p>	<p>Repair the short circuit to power source in the harness between the ECM and accelerator pedal position sensor connector.</p>

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-236, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

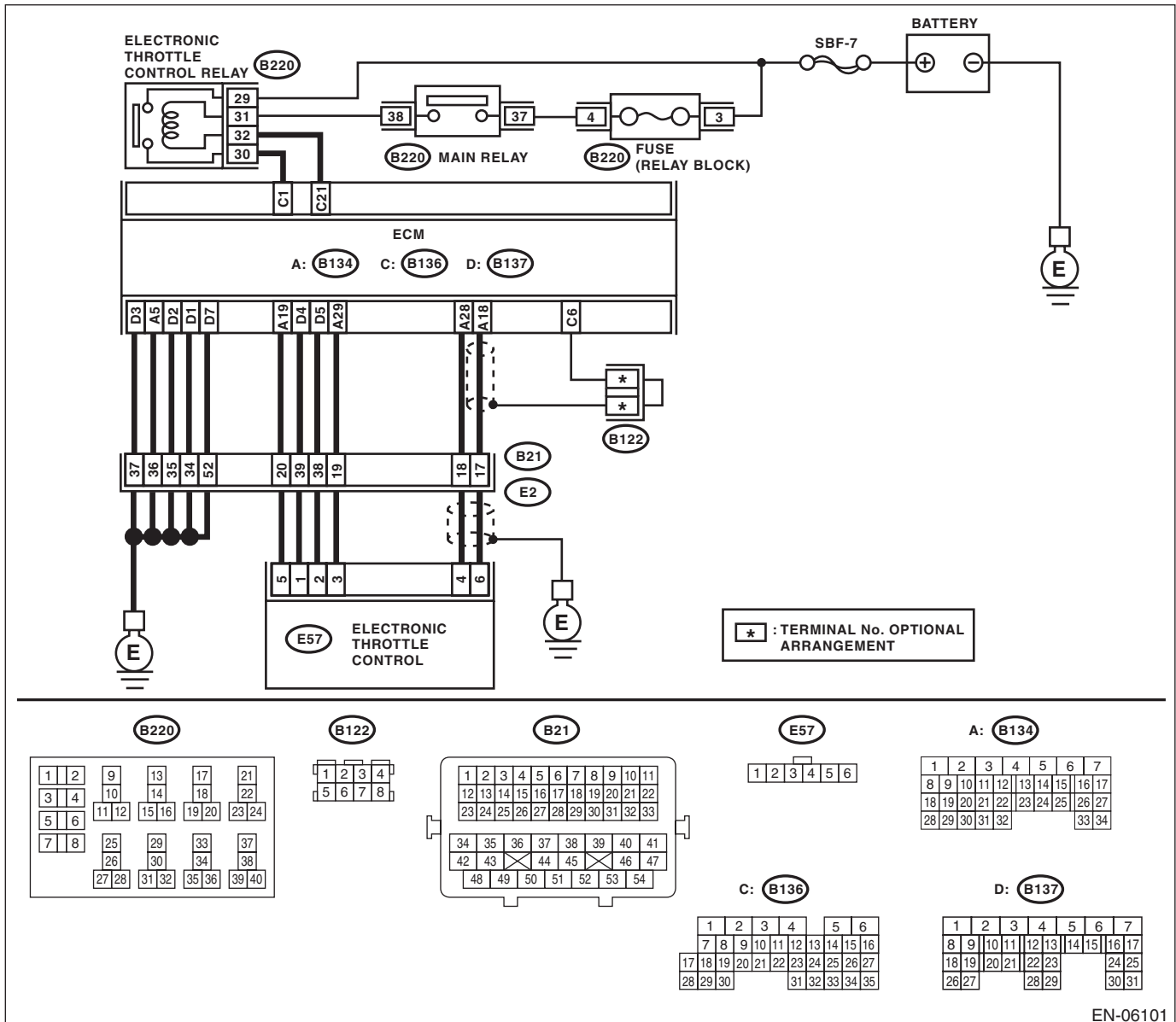
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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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. Connector & terminal <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 the ground short circuit of harness 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. Connector & terminal <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 the ground short circuit of harness 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. Connector & terminal <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 harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and electronic throttle control connector • Poor contact of coupling 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. Connector & terminal <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: • 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. Connector & terminal <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)

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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)-13, 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)

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

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-238, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

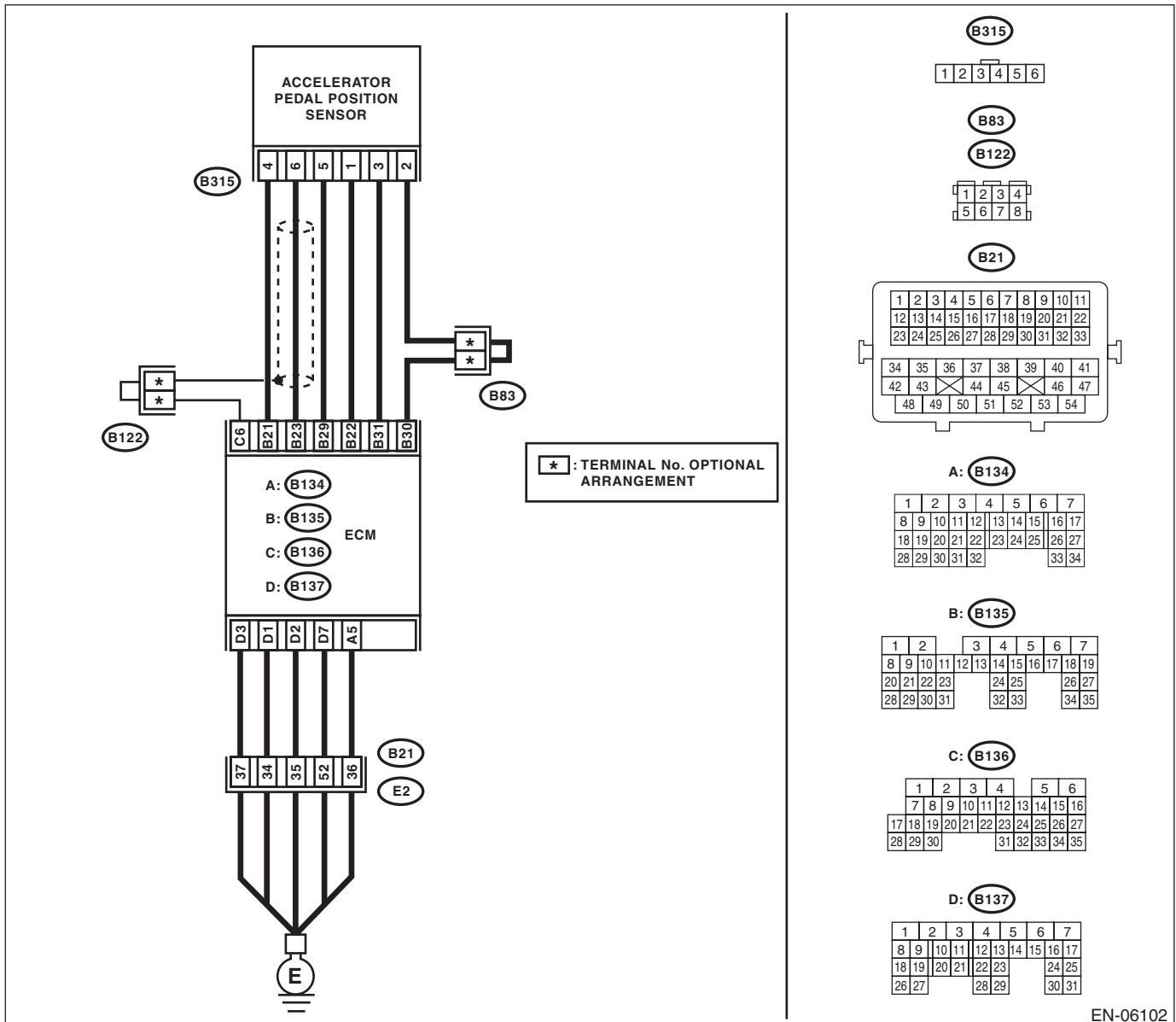
TROUBLE SYMPTOM:

- Improper idling
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, PROCEDURE, Inspection Mode.>.

WIRING DIAGRAM:



EN-06102

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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	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>	<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?</p>	<p>Go to step 3.</p>	<p>Go to step 2.</p>
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>	<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?</p>	<p>Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.></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 the ECM and accelerator pedal position sensor connector. • Ground short circuit of harness between the ECM and accelerator pedal position sensor connectors. • Poor contact of coupling connector
3	<p>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.</p> <p>Measure the resistance of harness between accelerator pedal position sensor connector and chassis ground.</p> <p>Connector & terminal (B315) No. 5 — Chassis ground; (B315) No. 2 — Chassis ground;</p>	<p>Is the resistance less than 5 Ω?</p>	<p>Repair the poor contact of the ECM connector.</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 the ECM and accelerator pedal position sensor connector. • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector

Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTICS)

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DK: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)-240, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-82, 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.

DL:DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-241, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-82, 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)

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DM:DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4SO)-242, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

After repair or replacement of faulty parts, perform Clear Memory Mode <Ref. to EN(H4SO)(diag)-52, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)(diag)-42, 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)-82, 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)

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20. General Diagnostic Table

A: INSPECTION

1. ENGINE

NOTE:

Malfunction of parts other than those listed is also possible. <Ref. to ME(H4SO)-103, 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) Electronic throttle control 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
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

General Diagnostic Table

ENGINE (DIAGNOSTICS)

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Symptom	Problem parts
6. Surging	<ol style="list-style-type: none">1) Mass air flow and intake air temperature sensor2) Manifold absolute pressure sensor3) Engine coolant temperature sensor (*2)4) Crankshaft position sensor (*3)5) Camshaft position sensor (*3)6) Fuel injection parts (*4)7) Electronic throttle control8) Fuel pump and fuel pump relay9) EGR valve
7. Spark knock	<ol style="list-style-type: none">1) Mass air flow and intake air temperature sensor2) Manifold absolute pressure sensor3) Engine coolant temperature sensor4) Knock sensor5) Fuel injection parts (*4)6) Fuel pump and fuel pump relay7) EGR valve
8. After burning in exhaust system	<ol style="list-style-type: none">1) Mass air flow and intake air temperature sensor2) Manifold absolute pressure sensor3) 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.

General Diagnostic Table

ENGINE (DIAGNOSTICS)

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