

## ENGINE SECTION 3

This service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicles.

This manual includes the procedures for maintenance, disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

**FUEL INJECTION (FUEL SYSTEM) FU(H4DOTC 2.5)**

**EMISSION CONTROL (AUX. EMISSION CONTROL DEVICE) EC(H4DOTC 2.5)**

**INTAKE (INDUCTION) IN(H4DOTC 2.5)**

**MECHANICAL ME(H4DOTC 2.5)**

**EXHAUST EX(H4DOTC 2.5)**

**COOLING CO(H4DOTC 2.5)**

**LUBRICATION LU(H4DOTC 2.5)**

**SPEED CONTROL SYSTEM SP(H4DOTC 2.5)**

**IGNITION IG(H4DOTC 2.5)**

**STARTING/CHARGING SYSTEM SC(H4DOTC 2.5)**

**ENGINE (DIAGNOSTIC) EN(H4DOTC 2.5)**

# ENGINE (DIAGNOSTIC)

# *EN(H4DOTC 2.5)*

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# Basic Diagnostics Procedure

ENGINE (DIAGNOSTIC)

## 1. Basic Diagnostics Procedure

### A: PROCEDURE

#### 1. ENGINE

Step	Check	Yes	No
<b>1 CHECK ENGINE START FAILURE.</b> 1) Ask the customer when and how the trouble occurred using the interview check list. <Ref. to EN(H4DOTC 2.5)-3, INSPECTION, Check List for Interview.> 2) Start the engine.	Does the engine start?	Go to step 2.	Inspection using "Diagnostics for Engine Start Failure". <Ref. to EN(H4DOTC 2.5)-54, Diagnostics for Engine Starting Failure.>
<b>2 CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.</b>	Does malfunction indicator light illuminate?	Go to step 3.	Inspection using "General Diagnostic Table". <Ref. to EN(H4DOTC 2.5)-258, General Diagnostic Table.>
<b>3 CHECK INDICATION OF DTC ON DISPLAY.</b> 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector. 3) Turn the ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON. 4) Read the DTC on the Subaru Select Monitor or OBD-II general scan tool.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Record the DTC. Repair the trouble cause. <Ref. to EN(H4DOTC 2.5)-65, 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 diagnostics for malfunction indicator light circuit or combination meter. <Ref. to EN(H4DOTC 2.5)-45, Malfunction Indicator Light.>
<b>4 PERFORM THE DIAGNOSIS.</b> 1) Perform clear memory mode. <Ref. to EN(H4DOTC 2.5)-42, Clear Memory Mode.> 2) Perform the "INSPECTION MODE". <Ref. to EN(H4DOTC 2.5)-35, Inspection Mode.>	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Check on "Diagnostic Chart with Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-70, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Finish the diagnosis.

# Check List for Interview

ENGINE (DIAGNOSTIC)

## 2. Check List for Interview

### A: INSPECTION

#### 1. CHECK LIST No. 1

Check the following items when problem has occurred.

NOTE:

Use copies of this page for interviewing customers.

Customer's name		Engine No.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km
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	Radio	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
A/C compressor	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	CD/Cassette	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Radiator fan	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Car phone	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Front wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	CB	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Rear Wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		

# Check List for Interview

ENGINE (DIAGNOSTIC)

## 2. CHECK LIST No. 2

Check the following items about the vehicle's state when malfunction indicator light turns on.

NOTE:

Use copies of this page for interviewing customers.

a) Other warning lights or indicators turn on. <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
<ul style="list-style-type: none"><li>• Lack of gasoline: <input type="checkbox"/> Yes / <input type="checkbox"/> No</li><li>• Indicator position of fuel gauge:</li><li>• Experienced running out of fuel: <input type="checkbox"/> Yes / <input type="checkbox"/> No</li></ul>
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• What:</li></ul>
d) Intentional connecting or disconnecting of hoses: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• What:</li></ul>
e) Installing of other parts except genuine parts: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• What:</li><li>• Where:</li></ul>
f) Occurrence of noise: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• From where:</li><li>• What kind:</li></ul>
g) Occurrence of smell: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• From where:</li><li>• What kind:</li></ul>
h) Intrusion of water into engine compartment or passenger compartment: <input type="checkbox"/> Yes / <input type="checkbox"/> No
i) Troubles occurred
<input type="checkbox"/> Engine does not start <input type="checkbox"/> Engine stalls during idling <input type="checkbox"/> Engine stalls while driving <input type="checkbox"/> Engine speed decreases <input type="checkbox"/> Engine speed does not decrease <input type="checkbox"/> Rough idling <input type="checkbox"/> Poor acceleration <input type="checkbox"/> Back fire <input type="checkbox"/> After fire <input type="checkbox"/> Does not shift <input type="checkbox"/> Excessive shift shock

## 3. General Description

### A: CAUTION

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

#### CAUTION:

- All airbag system wiring harness and connectors are all colored 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.

- The ECM will be destroyed immediately.
  - The fuel injector and other part will 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 the ECM, be sure to turn OFF the ignition switch.

5) Poor contact has been identified as a primary cause of this problem. Measure the voltage or resistance of individual sensor or all electrical control modules using a tapered pin with a diameter of less than 0.64 mm (0.025 in). Do not insert the pin more than 5 mm (0.20 in) into the part.

6) Remove the ECM from the located position after disconnecting two cables on battery.

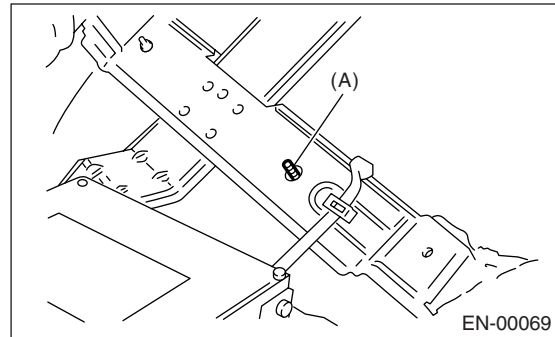
- Otherwise, the ECM may be damaged.

#### CAUTION:

**When replacing the ECM, be careful not to use the wrong spec. ECM to avoid damaging the fuel injection system.**

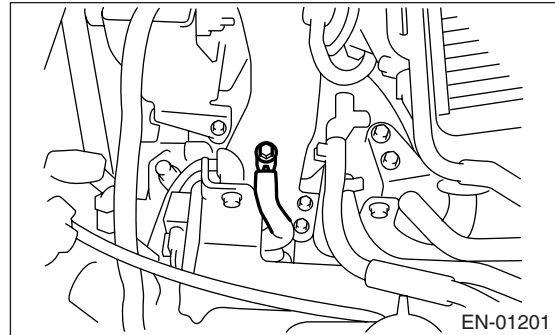
7) Connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.

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



(A) Stud bolt

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



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

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

#### CAUTION:

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

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

- The antenna feeder must be placed as far apart as possible from the ECM and MFI harness.

- Carefully adjust the antenna for correct matching.

- When mounting a large power type radio, pay special attention to the three items above mentioned.

- Incorrect installation of the radio may affect the operation of the ECM.

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

# General Description

## ENGINE (DIAGNOSTIC)

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

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

### B: INSPECTION

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

#### 1. BATTERY

1) Measure battery voltage and specific gravity of electrolyte.

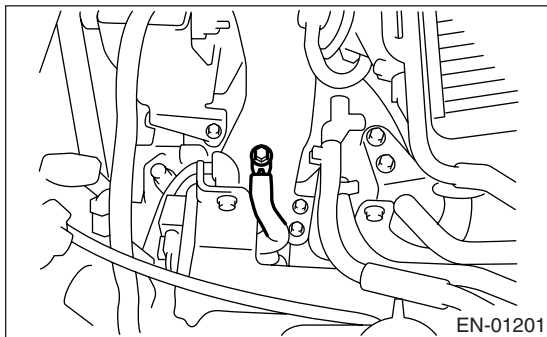
**Standard voltage: 12 V**

**Specific gravity: Above 1.260**

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

#### 2. ENGINE GROUND

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



### C: NOTE

#### 1. GENERAL DESCRIPTION

- On-board diagnosis (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. Malfunction indicator light in the combination meter indicates occurrence of a fault or trouble.
- Further, against such a failure or sensors as may disable the drive, the fail-safe function is provided to ensure the minimal driveability.
- The OBD system incorporated with the vehicles within this engine family complies with Section 1968.1, California Code of Regulations (OBD-II regulation). The OBD system monitors the components and the system malfunction listed in Engine Section which affects on emissions.
- When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, the DTC and a freeze frame engine conditions are stored into on-board computer.
- The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction first.
- If the OBD system detects the various malfunctions including the fault of fuel trim or misfire, the OBD system first stores freeze frame engine conditions about the fuel trim or misfire.
- When the malfunction does not occur again for three consecutive driving cycles, malfunction indicator light is turned off, but DTC remains at on-board computer.
- The OBD-II system is capable of communication with a general scan tool (OBD-II general scan tool) formed by ISO 9141 CARB.
- The OBD-II diagnostics procedure is different from the usual diagnosis procedure. When troubleshooting the OBD-II models, connect Subaru Select Monitor or the OBD-II general scan tool to the vehicle.

## 2. ENGINE AND EMISSION CONTROL SYSTEM

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

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

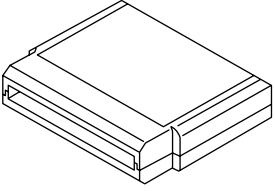

nal applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

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

The MFI system also has the following features:

- Reduced emission of harmful exhaust gases.
- Reduced in fuel consumption.
- Increased engine output.
- Superior acceleration and deceleration.
- Excellent engine start and warm-up performance by the correction of engine coolant temperature and intake air temperature.

## D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST24082AA230	24082AA230 (Newly adopted tool)	CARTRIDGE	Troubleshooting for electrical system.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical system. <ul style="list-style-type: none"> <li>• English: 22771AA030 (Without printer)</li> <li>• German: 22771AA070 (Without printer)</li> <li>• French: 22771AA080 (Without printer)</li> <li>• Spanish: 22771AA090 (Without printer)</li> </ul>



# Electrical Component Location

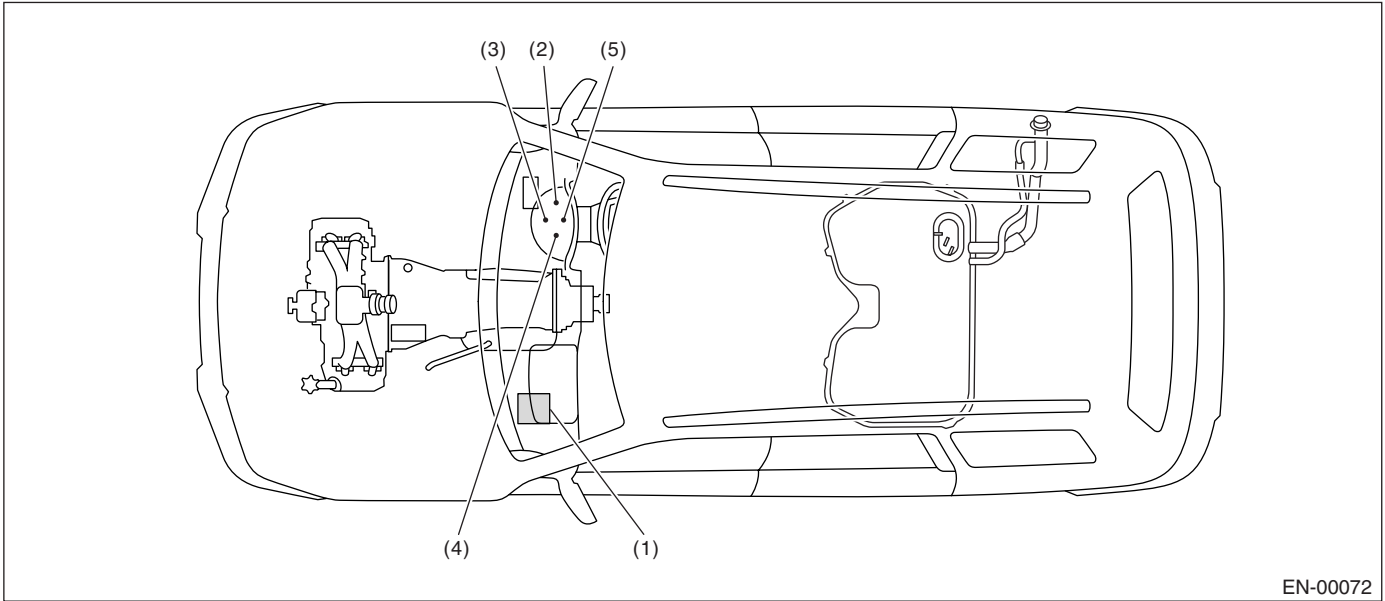
ENGINE (DIAGNOSTIC)

## 4. Electrical Component Location

### A: LOCATION

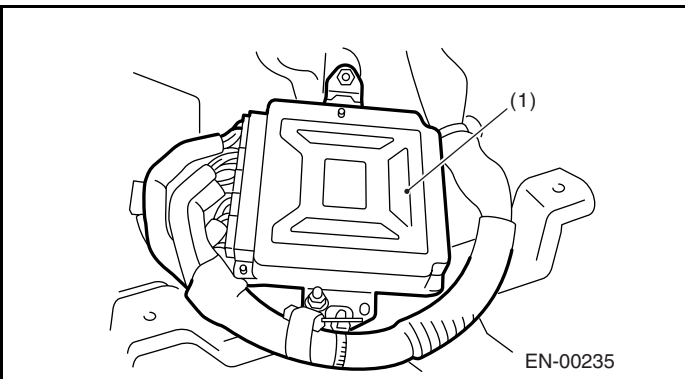
#### 1. ENGINE

##### • CONTROL MODULE

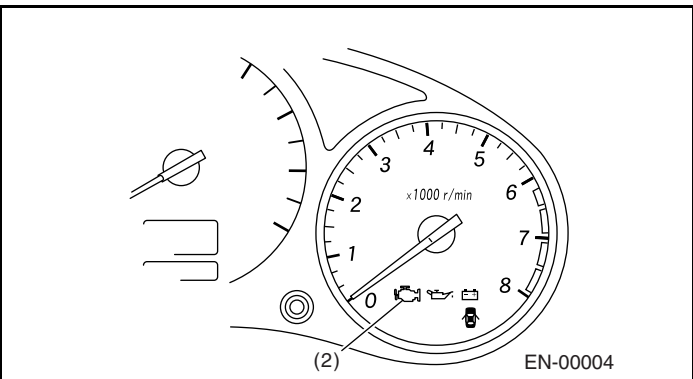


EN-00072

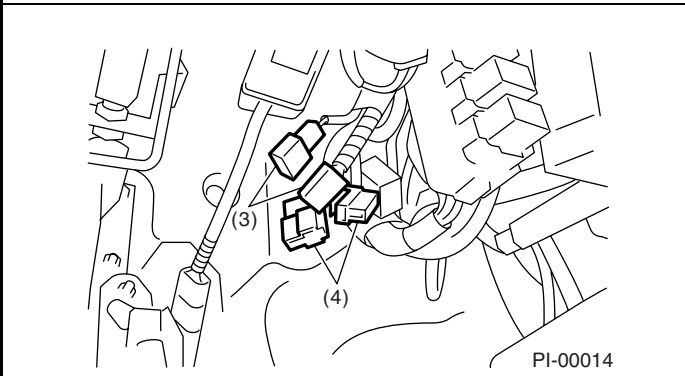
- |                                 |                         |                         |
|---------------------------------|-------------------------|-------------------------|
| (1) Engine control module (ECM) | (3) Test Mode Connector | (5) Data link connector |
| (2) Malfunction indicator light | (4) Diagnosis connector |                         |



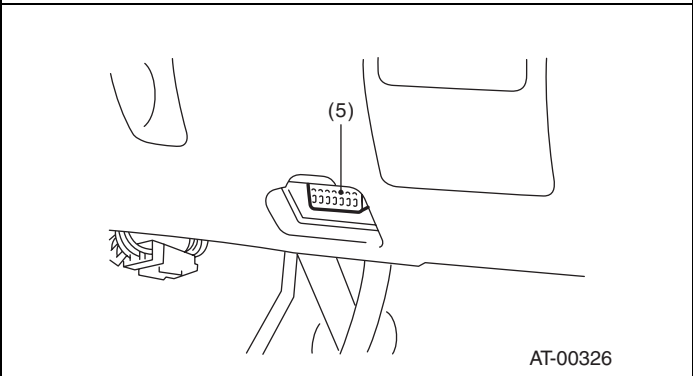
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EN-00004



PI-00014

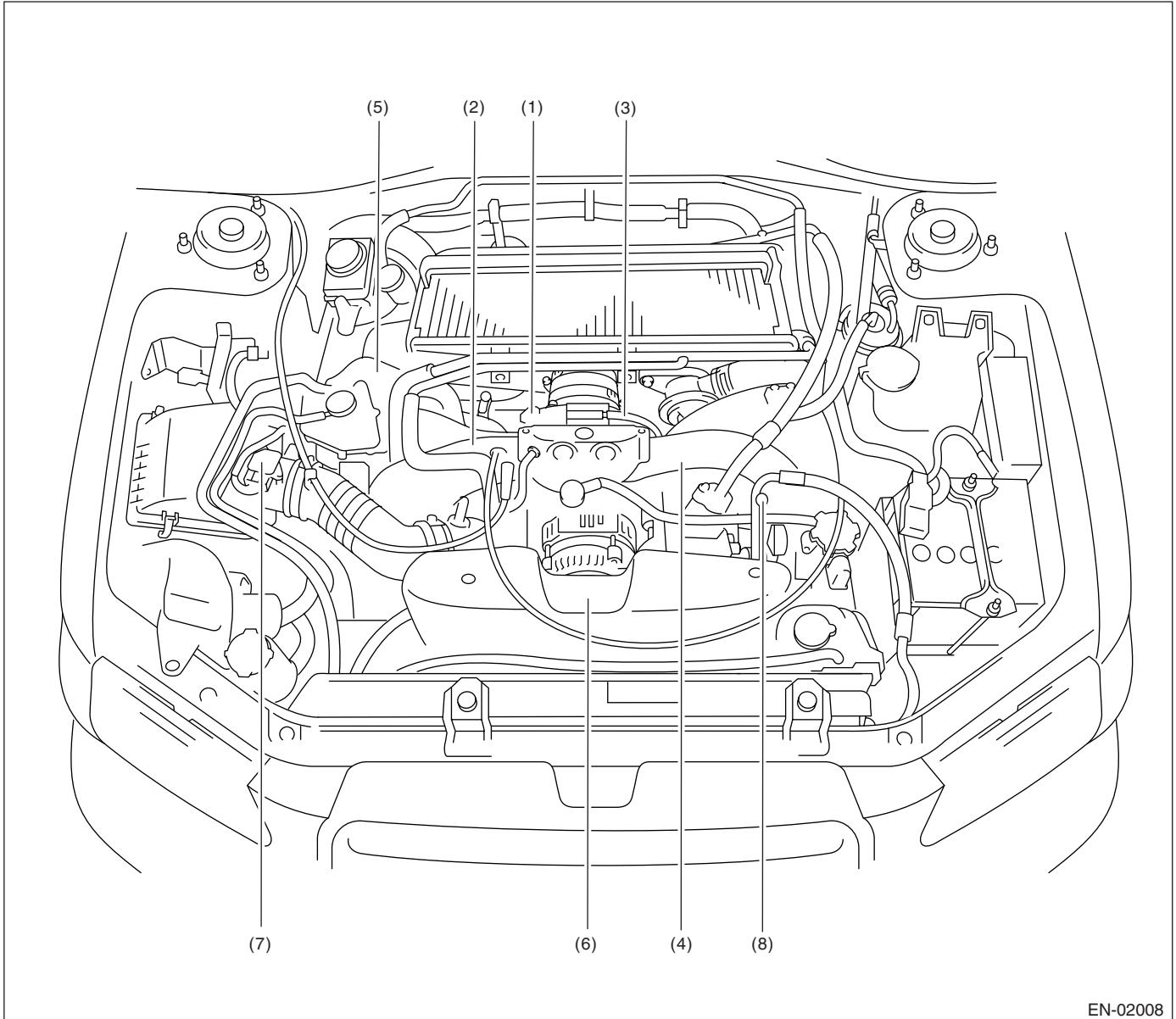


AT-00326

# Electrical Component Location

ENGINE (DIAGNOSTIC)

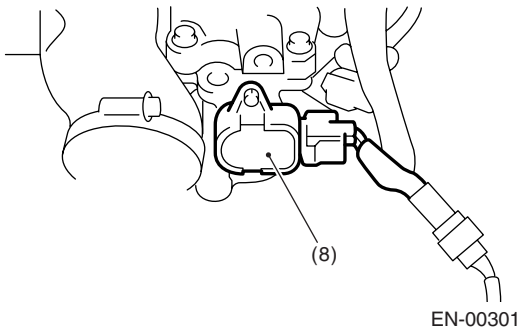
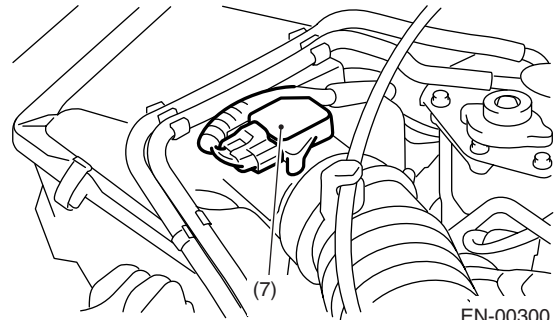
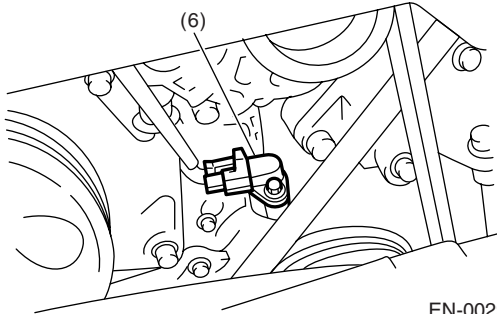
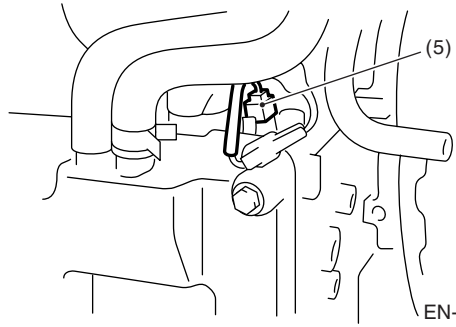
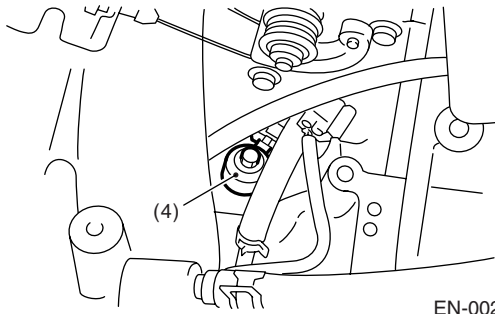
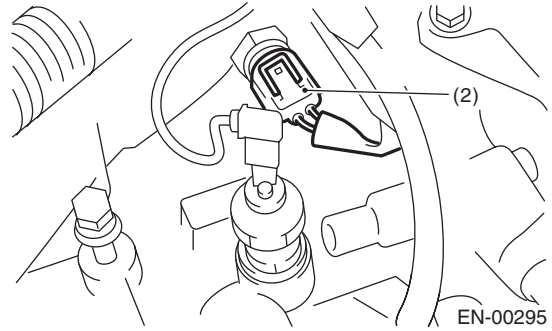
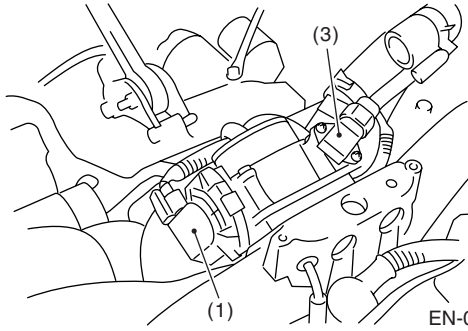
## • SENSOR



- |                                       |                                 |   |
|---------------------------------------|---------------------------------|---|
| (1) Manifold absolute pressure sensor | (3) Electronic throttle control | (7) Mass air flow and intake air temperature sensor |
| (2) Engine coolant temperature sensor | (4) Knock sensor                | (8) Tumble generator valve position sensor          |
| (5) Camshaft position sensor          | (6) Crankshaft position sensor  |   |

# Electrical Component Location

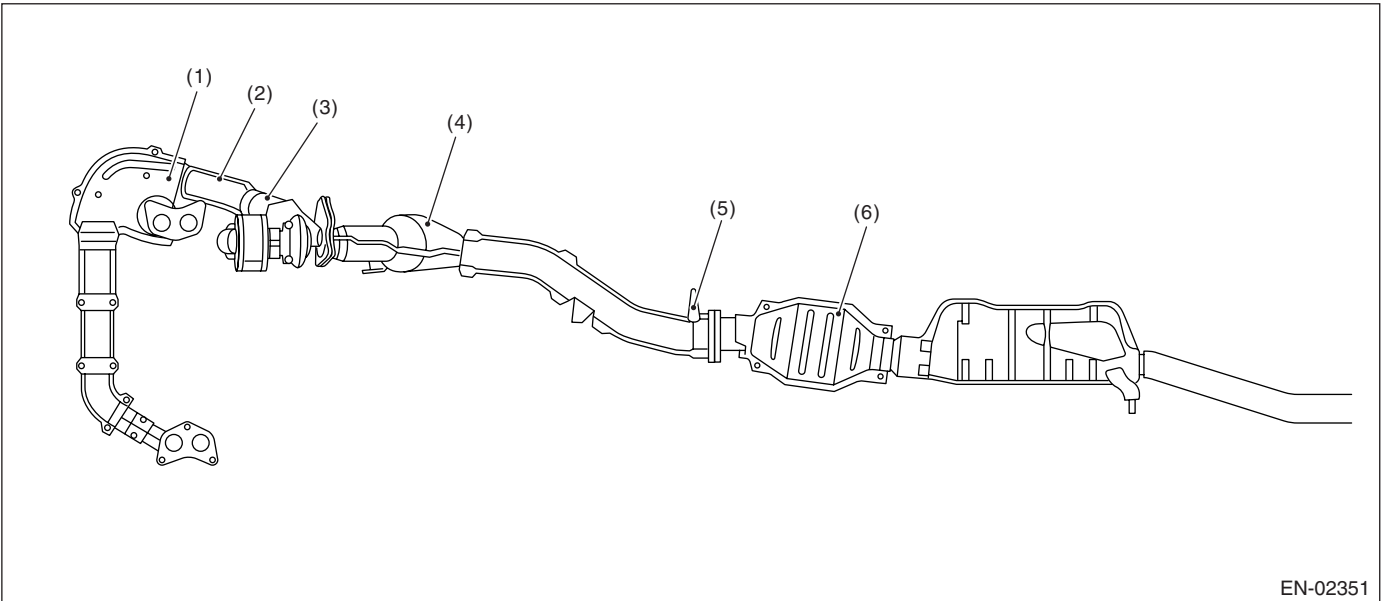
ENGINE (DIAGNOSTIC)



SUBARU.

# Electrical Component Location

ENGINE (DIAGNOSTIC)



EN-02351

(1) Front oxygen (A/F) sensor

(2) Precatytic converter

(3) Exhaust gas temperature sensor

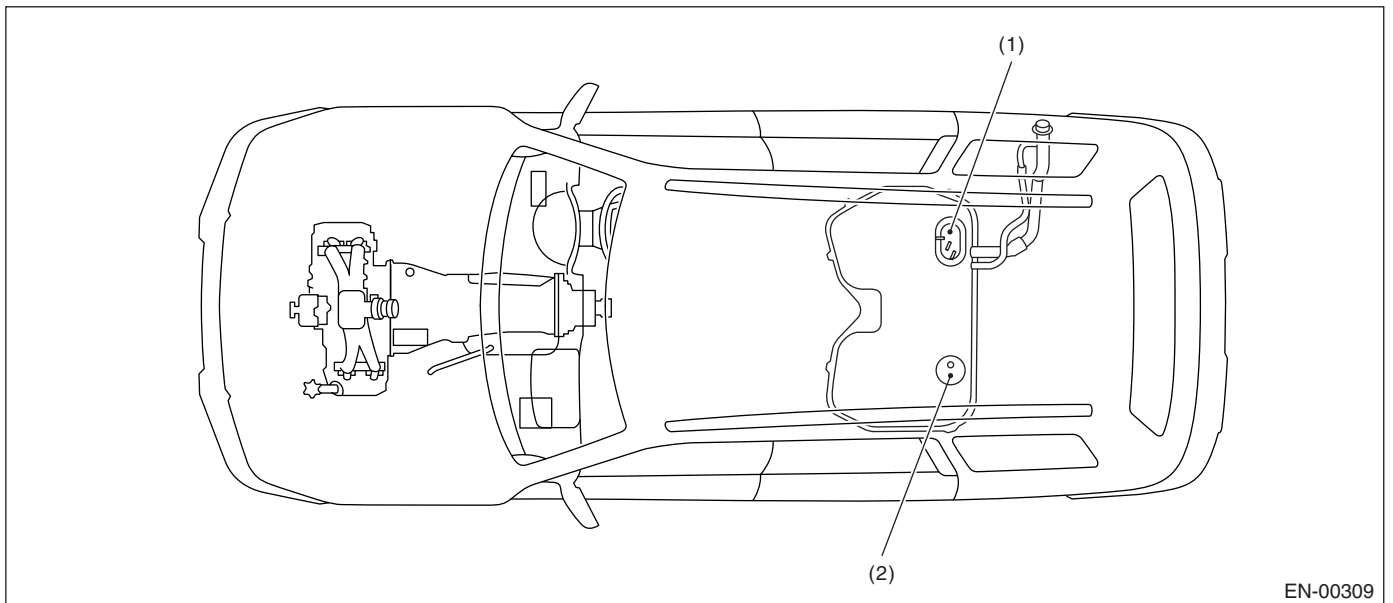
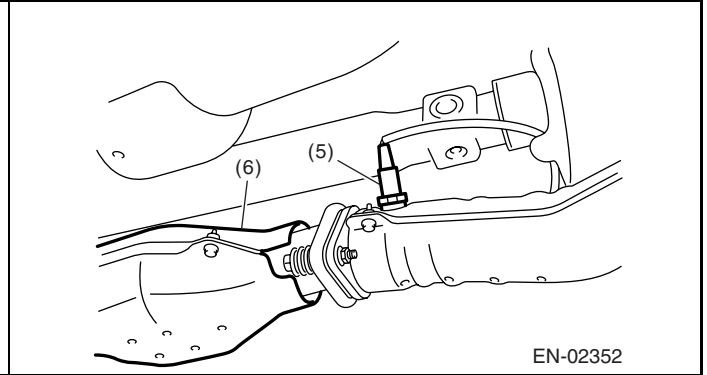
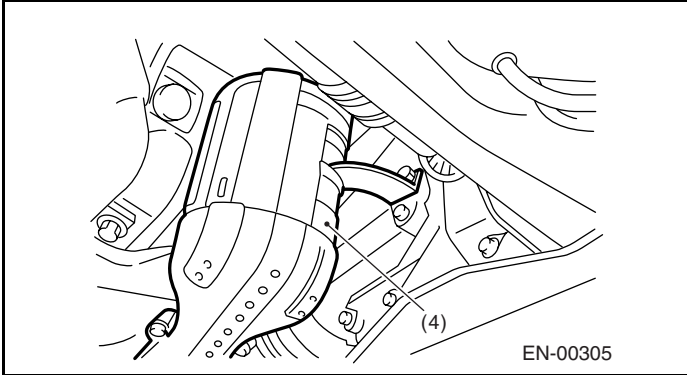
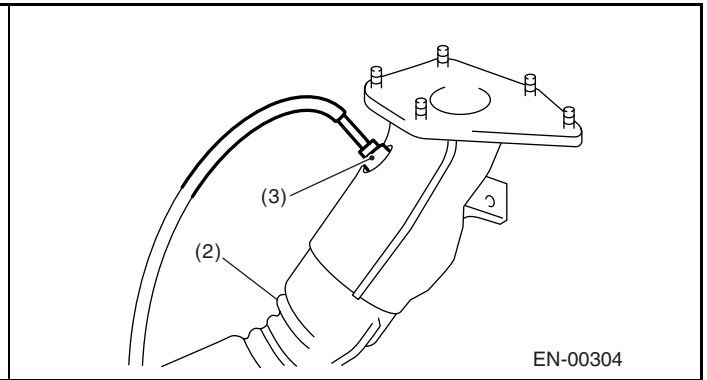
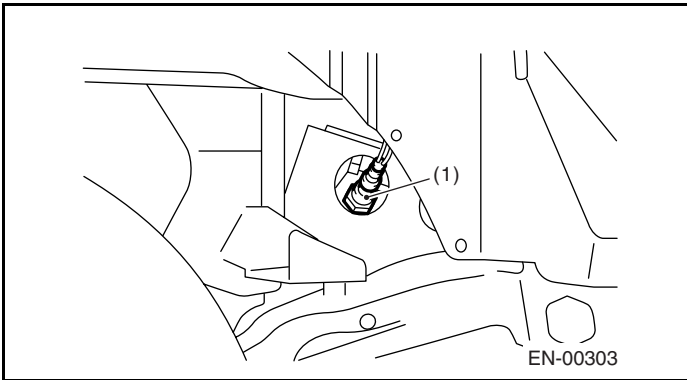
(4) Front catalytic converter

(5) Rear oxygen sensor

(6) Rear catalytic converter

# Electrical Component Location

ENGINE (DIAGNOSTIC)

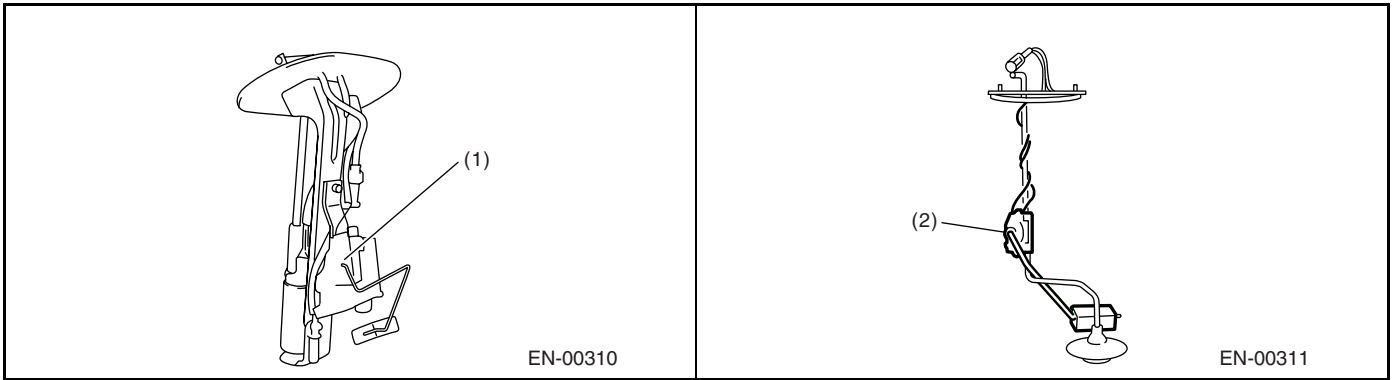


(1) Fuel level sensor

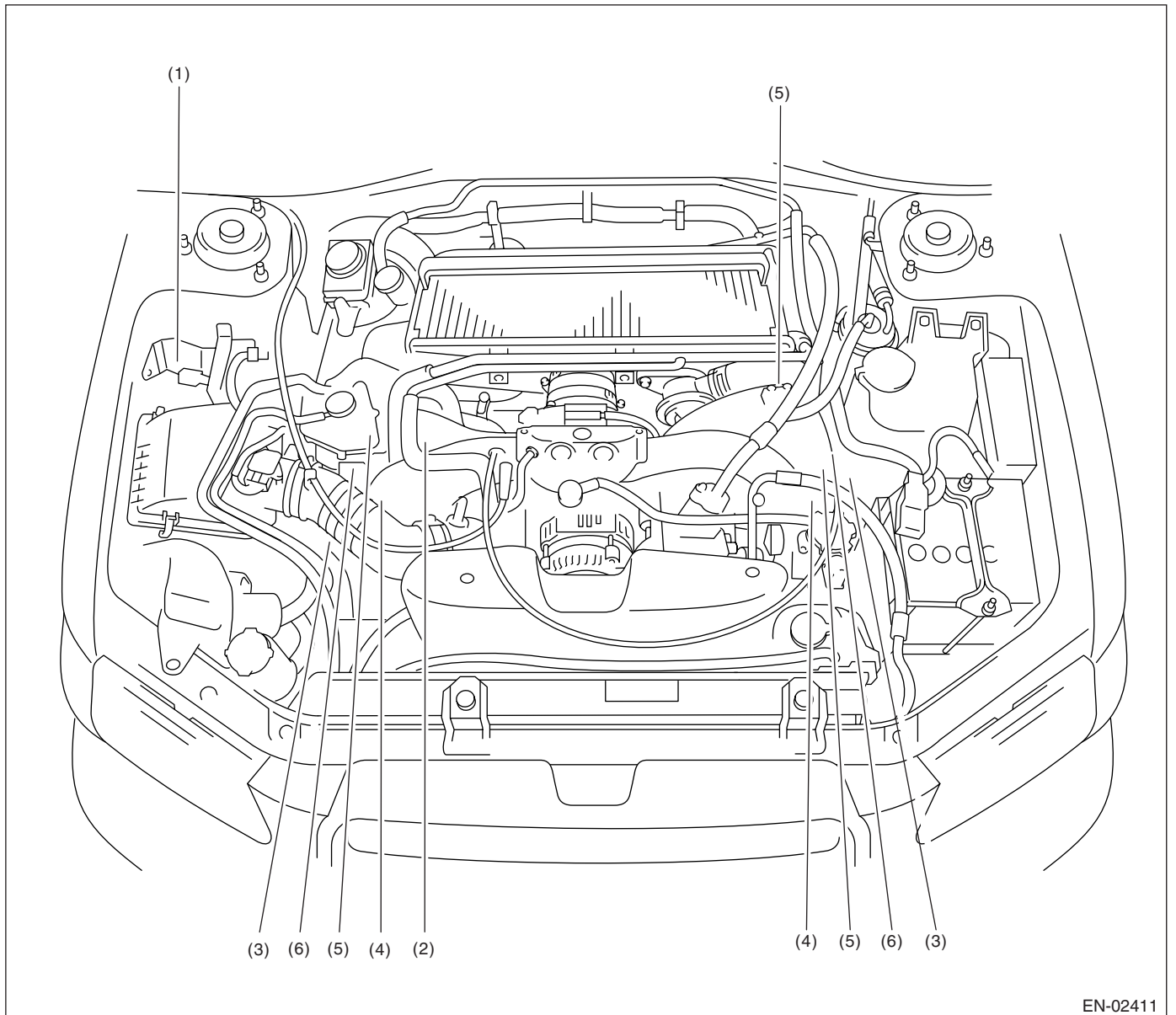
(2) Fuel sub level sensor

# Electrical Component Location

ENGINE (DIAGNOSTIC)



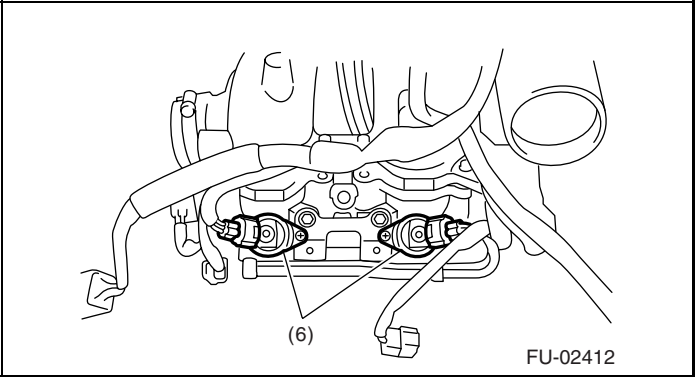
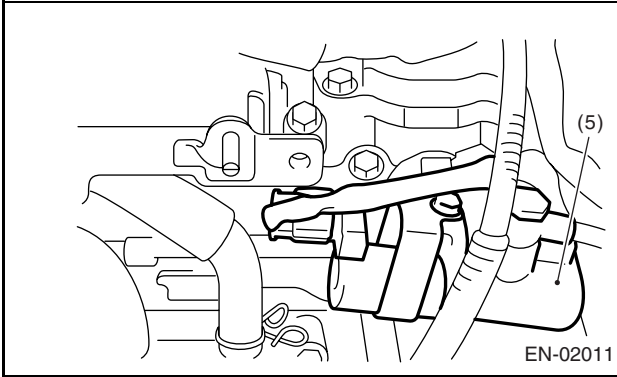
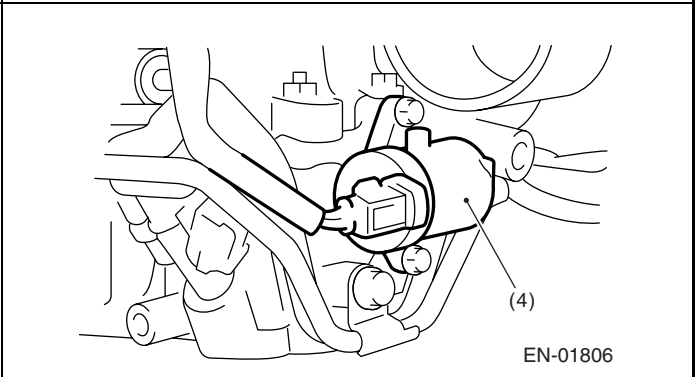
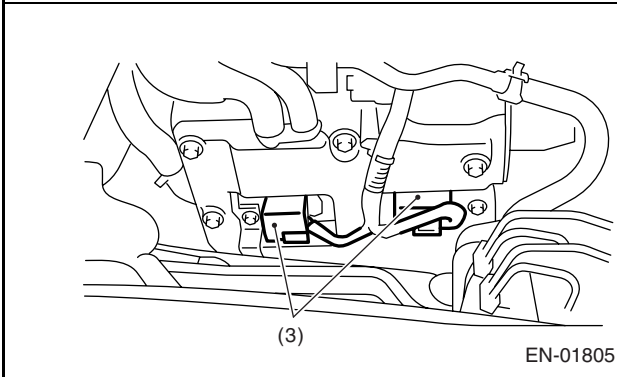
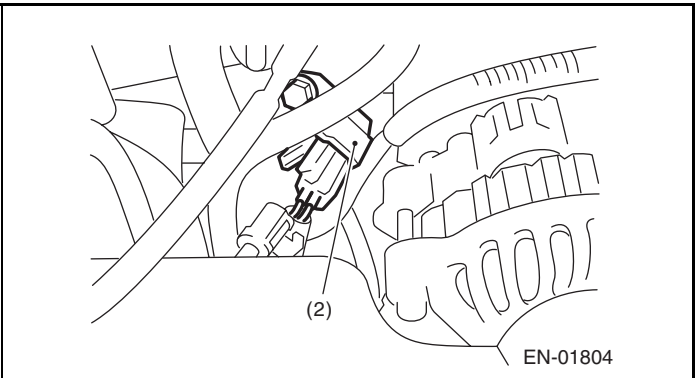
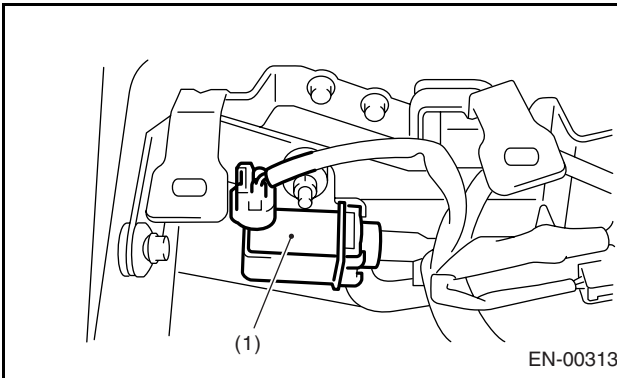
## • SOLENOID VALVE, ACTUATOR, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS



- |                                      |                                     |                                     |
|--------------------------------------|-------------------------------------|-------------------------------------|
| (1) Wastegate control solenoid valve | (3) Ignition coil                   | (5) Oil flow control solenoid valve |
| (2) Purge control solenoid valve     | (4) Tumble generator valve actuator | (6) Injector                        |

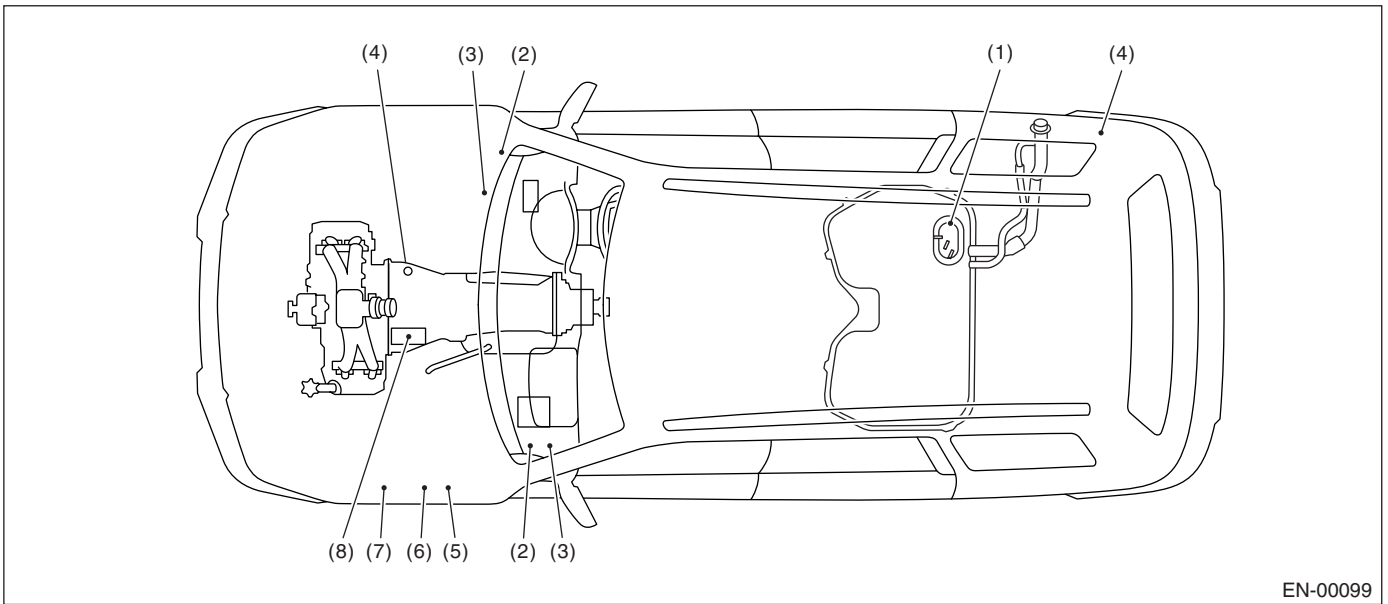
# Electrical Component Location

ENGINE (DIAGNOSTIC)

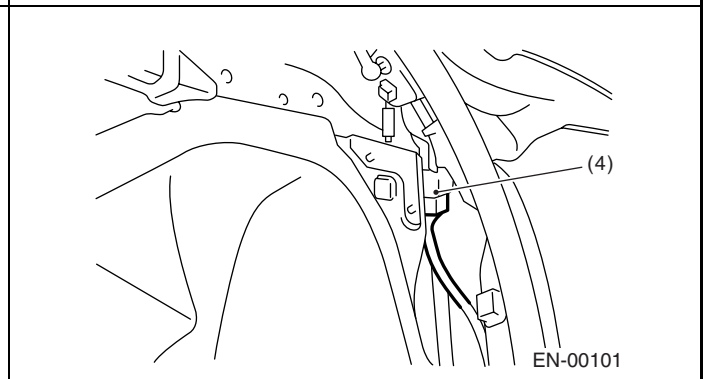
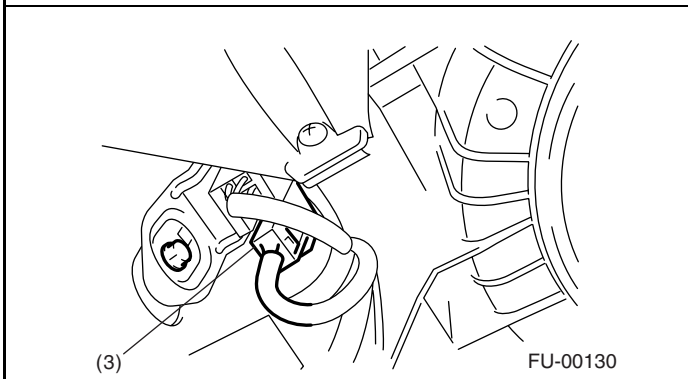
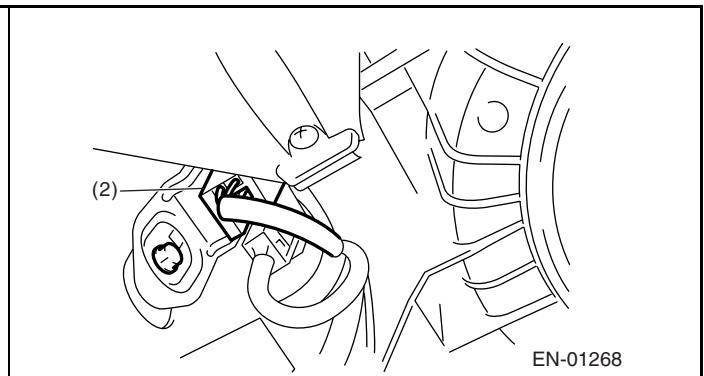
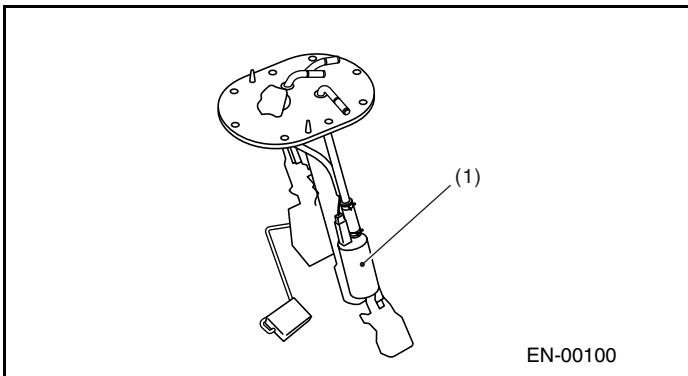


# Electrical Component Location

ENGINE (DIAGNOSTIC)



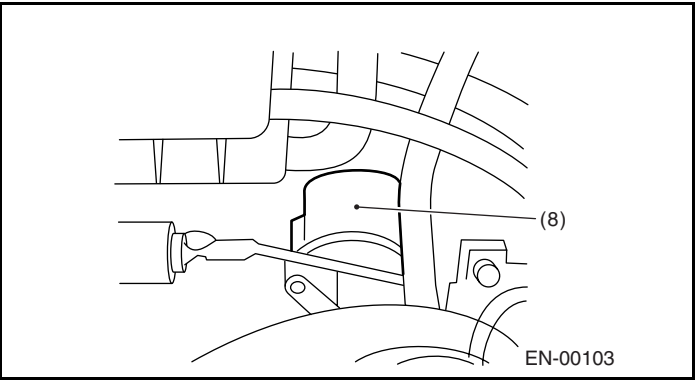
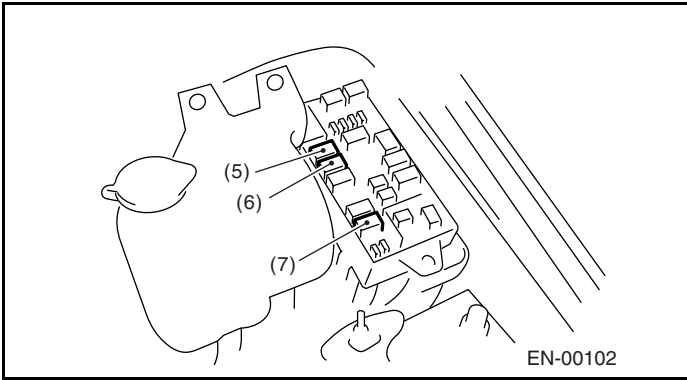
- |                     |                             |                    |
|---------------------|-----------------------------|--------------------|
| (1) Fuel pump       | (4) Fuel pump controller    | (7) Fan mode relay |
| (2) Main relay      | (5) Radiator main fan relay | (8) Starter        |
| (3) Fuel pump relay | (6) Radiator sub fan relay  |                    |





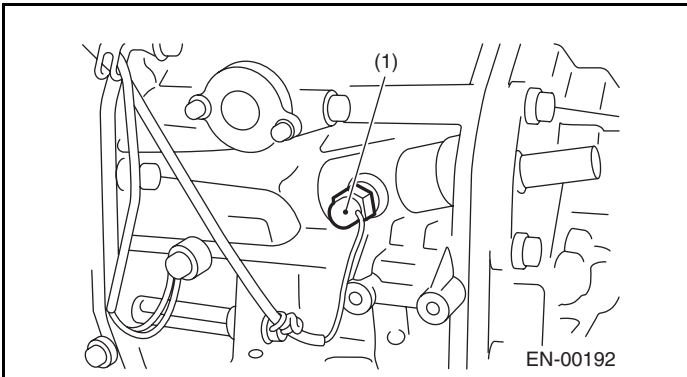
# Electrical Component Location

## ENGINE (DIAGNOSTIC)



## 2. TRANSMISSION

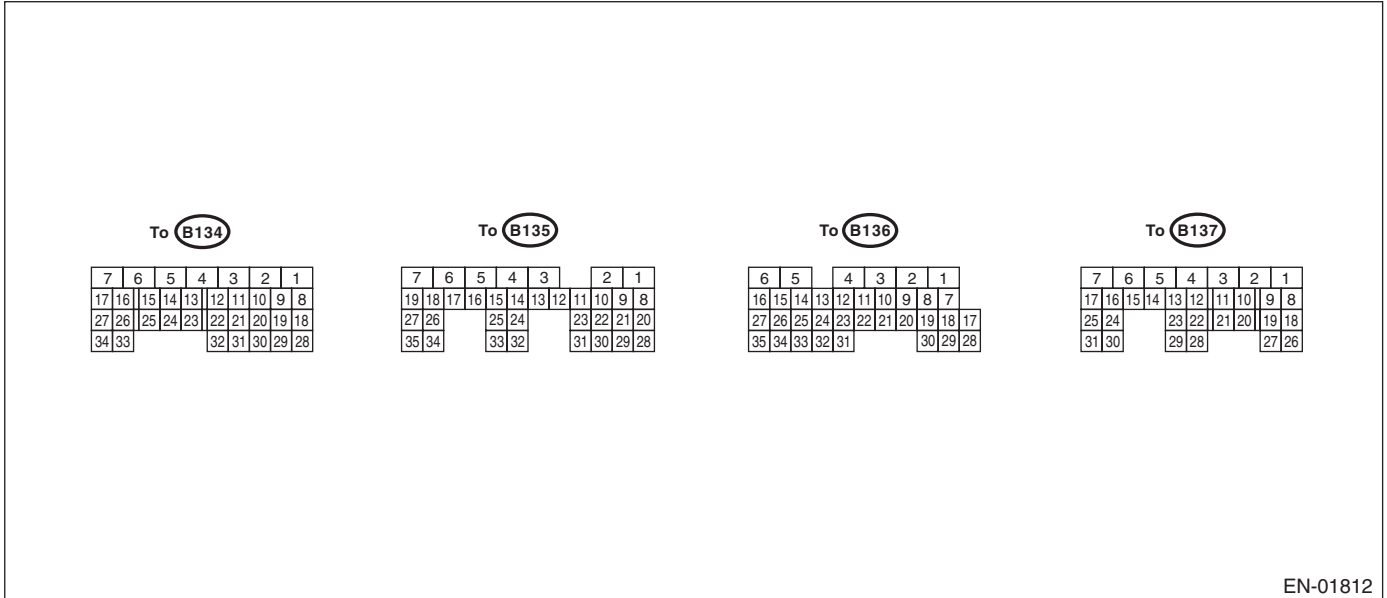
### • SOLENOID VALVE & SWITCH (MT MODEL)



(1) Neutral Position Switch

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

### A: ELECTRICAL SPECIFICATION



EN-01812

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE	
			Ignition SW ON (engine OFF)	Engine ON (Idling)		
Crank-shaft position sensor	Signal (+)	B135	10	0	-7 — +7	Waveform
	Signal (-)	B135	22	0	0	—
	Shield	B135	31	0	0	—
Rear oxygen sensor	Signal	B137	25	0	0 — 0.9	—
	Shield	B137	31	0	0	—
	GND (sensors)	B136	35	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B134	3	0 — 1.0	—	Waveform
	Signal 2	B134	2	0 — 1.0	—	Waveform
Rear oxygen sensor heater signal	B135	2	0 — 1.0	—	Waveform	
Engine coolant temperature sensor	Signal	B136	14	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.
	GND (sensors)	B136	35	0	0	After engine is warmed-up.
Vehicle speed signal	B135	26	0 or 5	0 or 5	“5” and “0” are repeatedly displayed when vehicle is driven.	
Air flow sensor	Signal	B136	23	—	0.3 — 4.5	—
	Shield	B136	32	0	0	—
	GND	B136	31	0	0	—
Intake air temperature sensor signal	B136	13	0.3 — 4.6	0.3 — 4.6	—	
Exhaust gas temperature sensor	Signal	B136	24	—	—	—
	GND (sensors)	B136	35	0	0	—

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTIC)

DESCRIPTION		Connector No.	Terminal No.	Signal (V)		NOTE
				Ignition SW ON (engine OFF)	Engine ON (Idling)	
Tumble generator valve position sensor RH	Signal	B136	27	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve position sensor LH	Signal	B136	26	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve RH (open)		B134	9	0 or 10 — 13	0 or 13 — 14	Waveform
Tumble generator valve RH (close)		B134	8	0 or 10 — 13	0 or 13 — 14	Waveform
Tumble generator valve LH (open)		B134	11	0 or 10 — 13	0 or 13 — 14	Waveform
Tumble generator valve LH (close)		B134	10	0 or 10 — 13	0 or 13 — 14	Waveform
Wastegate control solenoid valve		B134	32	0 or 10 — 13	0 or 13 — 14	Waveform
Starter switch		B137	8	0	0	Cranking: 8 — 14
A/C switch		B137	17	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B137	16	10 — 13	13 — 14	—
Neutral Position Switch		B137	9	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Test Mode Connector		B137	15	10 — 13	13 — 14	When connected: 0
Knock sensor	Signal	B136	25	2.8	2.8	—
	Shield	B136	33	0	0	—
Back-up power supply		B135	19	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control module power supply		B135	5	10 — 13	13 — 14	—
		B135	6	10 — 13	13 — 14	—
Sensor power supply		B136	16	5	5	—
Ignition control	#1	B135	18	0	13 — 14	Waveform
	#2	B135	17	0	13 — 14	Waveform
	#3	B135	16	0	13 — 14	Waveform
	#4	B135	15	0	13 — 14	Waveform
Fuel injector	#1	B136	6	10 — 13	1 — 14	Waveform
	#2	B136	5	10 — 13	1 — 14	Waveform
	#3	B136	4	10 — 13	1 — 14	Waveform
	#4	B136	3	10 — 13	1 — 14	Waveform
Fuel pump control unit	Diagnosis signal	B137	28	0 or 5	0 or 5	Waveform
	Control signal	B135	27	10 — 13	13 — 14	—
A/C relay control		B135	33	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		B135	25	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTIC)

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE	
			Ignition SW ON (engine OFF)	Engine ON (Idling)		
Radiator fan relay 2 control	B135	24	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	Model with A/C only	
Malfunction indicator light	B134	17	—	—	Light "ON": 1, or less Light "OFF": 10 — 14	
Engine speed output	B134	23	—	0 — 13, or more	Waveform	
Purge control solenoid valve	B134	14	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	Waveform	
Manifold absolute pressure sensor	Signal	B136	22	1.7 — 2.4	1.1 — 1.6	—
	Power supply	B136	16	5	5	
	GND (sensors)	B136	35	0	0	
Small light switch	B137	12	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Blower fan switch	B137	13	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Rear defogger switch	B137	11	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Power steering oil pressure switch	B137	10	10 — 13	ON: 0 OFF: 13 — 14	—	
Front oxygen (A/F) sensor signal (+)	B134	33	2.8 — 3.2	2.8 — 3.2	—	
Front oxygen (A/F) sensor signal (-)	B134	26	2.4 — 2.7	2.4 — 2.7	—	
Front oxygen (A/F) sensor shield	B134	25	0	0	—	
SSM/GST communication line	B137	20	1 ← → 4	1 ← → 4	—	
GND (injector)	B137	7	0	0	—	
GND (ignition system)	B135	12	0	0	—	
GND (power supply)	B135	4	0	0	—	
	B135	1	0	0	—	
GND (control system)	B137	1	0	0	—	
	B137	2	0	0	—	
GND (Front oxygen (A/F) sensor heater 1)	B134	7	0	0	—	
GND (Front oxygen (A/F) sensor heater 2)	B134	6	0	0	—	
Camshaft position sensor (LH)	B135	8	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Waveform	
Camshaft position sensor (RH)	B135	9	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Waveform	
Fuel level sensor	B136	20	0.12 — 4.75	0.12 — 4.75	—	
Electronic throttle control	Main	B136	18	0.64 — 0.72 Fully opens: 3.96	0.64 — 0.72 (After engine is warmed-up.) Fully closed: 0.6 Fully opens: 3.96	Fully closed: 0.6 Fully opens: 3.96
	Sub	B136	29	1.51 — 1.58 Fully opens: 4.17	1.51 — 1.58 (After engine is warmed-up.) Fully closed: 1.48 Fully opens: 4.17	Fully closed: 1.48 Fully opens: 4.17
	Power supply	B136	16	5	5	—
	GND (sensor)	B137	3	0	0	—

## Engine Control Module (ECM) I/O Signal

### ENGINE (DIAGNOSTIC)

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE	
			Ignition SW ON (engine OFF)	Engine ON (Idling)		
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	B137	6	10 — 13	13 — 14	—	
Electronic throttle control motor relay	B135	35	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	When ignition switch is turned to ON: ON	
Oil flow control solenoid (LH)	Signal (+)	B134	19	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
	Signal (-)	B134	29	0	0	—
Oil flow control solenoid (RH)	Signal (+)	B134	18	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
	Signal (-)	B134	28	0	0	—
Accelerator Pedal Position Sensor	Main	B136	17	Fully closed: 1 Fully opens: 3.5	Fully closed: 1 Fully opens: 3.5	—
	Power supply	B136	15	5	5	—
	GND (sensor)	B136	34	0	0	—
	Sub	B136	28	Fully closed: 1 Fully opens: 3.5	Fully closed: 1 Fully opens: 3.5	—
Main light	B134	15	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—	
Clutch switch	B134	1	When clutch pedal is depressed: 0 When clutch pedal is released: 10 — 13	When clutch pedal is depressed: 0 When clutch pedal is released: 13 — 14	—	
SET/COAST switch	B136	11	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Brake switch 1	B136	9	When brake pedal is depressed: 0 When brake pedal is released: 10 — 13	When brake pedal is depressed: 0 When brake pedal is released: 13 — 14	—	
Brake switch 2	B136	8	When brake pedal is depressed: 10 — 13 When brake pedal is released: 0	When brake pedal is depressed: 13 — 14 When brake pedal is released: 0	—	
RESUME/ACCEL switch	B136	10	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Main switch	B136	7	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
CAN Communication	Signal (+)	B137	18	Pulse signal		—
	Signal (-)	B137	26	Pulse signal		—

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTIC)

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE
			Ignition SW ON (engine OFF)	Engine ON (Idling)	
Immobilizer input/output	B137	19	1 or less ← → 4 or more	1 or less ← → 4 or more	—
Immobilizer input/output	B137	27	1 or less ← → 4 or more	1 or less ← → 4 or more	—
Generator control	B134	22	0 — 6.5	0 — 6.5	—

# Engine Condition Data

ENGINE (DIAGNOSTIC)

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## 6. Engine Condition Data

### A: ELECTRICAL SPECIFICATION

Remarks	Specification
Engine load	1.9 — 3.9 (%): Idling
	6.7 — 14.6 (%): 2,500 rpm Racing

Measuring condition:

- After engine is warmed-up.
- Gear position is in neutral.
- Turn the A/C to OFF.
- Turn all accessory switches to OFF.

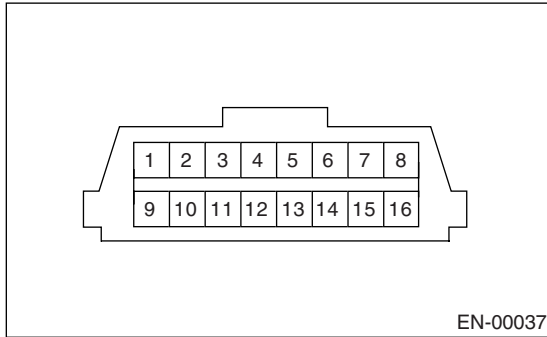
## 7. Data Link Connector

### A: NOTE

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

### CAUTION:

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



Terminal No.	Remarks	Terminal No.	Remarks
1	Power supply	9	Empty
2	Empty	10	Subaru Select Monitor/OBD-II general scan tool signal
3	Empty	11	Empty
4	Empty	12	Ground
5	Empty	13	Ground
6	Line end check signal 1	14	Empty
7	Empty	15	Empty
8	Empty	16	Empty

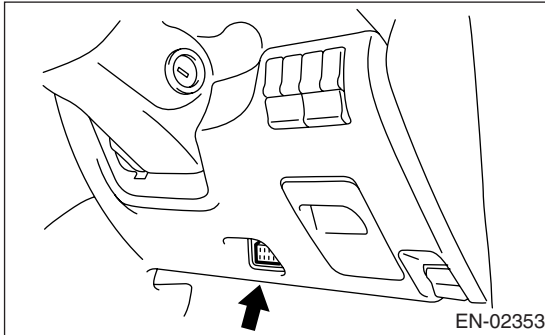


## 8. OBD-II General Scan Tool

### A: OPERATION

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

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



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

OBD-II general scan tool functions consist of:

- (1) MODE \$01: Current powertrain diagnostic data
- (2) MODE \$02: Powertrain freeze frame data
- (3) MODE \$03: Emission-related powertrain diagnostic trouble codes
- (4) MODE \$04: Clear/Reset emission-related diagnostic information
- (5) MODE \$06: Request of on-board monitoring test result for intermittent monitor system
- (6) MODE \$07: Request of on-board monitoring test result for continuous monitor system
- (7) MODE \$09: Request of vehicle information

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

#### NOTE:

For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>

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

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

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

PID	Data	Unit of measure
01	Number of emission-related powertrain DTC, 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 whole fuel trim	%
0B	Intake manifold absolute pressure	kPa, mmHg
0C	Engine revolution	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate of mass air flow sensor	g/sec
11	Throttle valve absolute opening angle	%
13	Check whether oxygen sensor is installed.	—
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor	V and %
1C	Available OBD system	—
24	A/F value and A/F sensor output voltage	— and V
34	A/F value and A/F sensor current	— and mA

**NOTE:**

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

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

Refers to data denoting the operating condition when trouble is sensed by the on-board diagnosis system.

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

PID	Data	Unit of measure
02	DTC that caused CARB required freeze frame data storage	—
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term whole fuel trim	%
0B	Intake manifold absolute pressure	mmHg
0C	Engine speed	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate of mass air flow sensor	g/sec
11	Throttle valve absolute opening angle	%

**NOTE:**

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

## OBD-II General Scan Tool

ENGINE (DIAGNOSTIC)

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### **4. MODE \$03 (EMISSION-RELATED POWERTRAIN DIAGNOSTIC TROUBLE CODES)**

Refer to “Read Diagnostic Trouble Code (DTC)” for information about data denoting emission-related powertrain diagnostic trouble codes. <Ref. to EN(H4DOTC 2.5)-34, Read Diagnostic Trouble Code (DTC).>

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

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

NOTE:

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

### **6. MODE \$07**

Refers to the data of DTC (pending code) that for the first diagnosis result related emission.

### **7. MODE \$09**

Refer to the data of vehicle specifications (V.I.N., calibration ID and etc.).

## 9. Subaru Select Monitor

### A: OPERATION

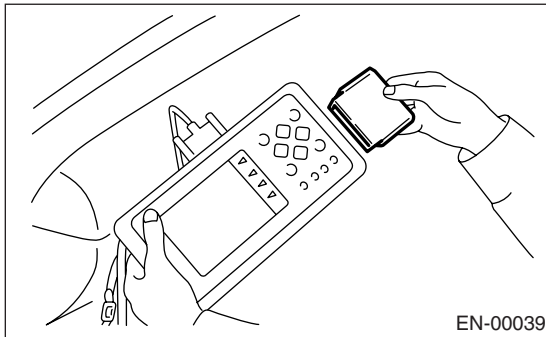
#### 1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC 2.5)-7, PREPARATION TOOL, General Description.>



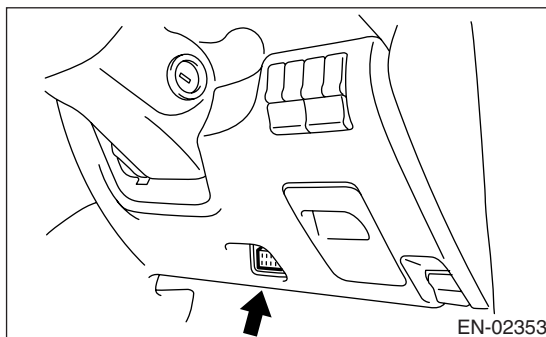
2) Connect the diagnosis cable to Subaru Select Monitor.

3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC 2.5)-7, PREPARATION TOOL, General Description.>



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

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

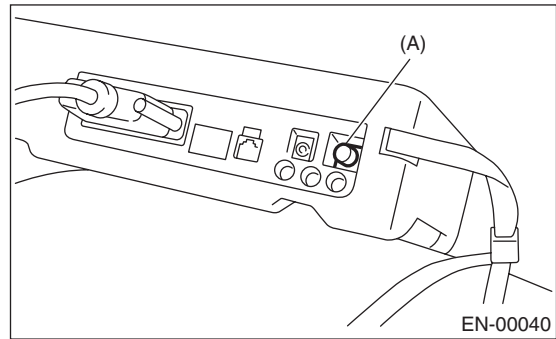


(2) Connect the diagnosis cable to data link connector.

#### CAUTION:

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

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



(A) Power switch

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

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to indicate DTC. <Ref. to EN(H4DOTC 2.5)-34, Read Diagnostic Trouble Code (DTC).>

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to indicate DTC. <Ref. to EN(H4DOTC 2.5)-34, Read Diagnostic Trouble Code (DTC).>

# Subaru Select Monitor

## ENGINE (DIAGNOSTIC)

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

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

Remarks	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed signal	Vehicle Speed	km/h or MPH
Engine speed signal	Engine Speed	rpm
Engine coolant temperature signal	Coolant Temp.	°C or °F
Ignition timing signal	Ignition Timing	deg
Throttle position signal	Throttle Opening Angle	%
Injection pulse width	Fuel Injection #1 Pulse	ms
Fuel pump duty control signal	Fuel Pump Duty	%
A/F sensor current	A/F Sensor #1 Current	mA
A/F sensor resistance	A/F Sensor #1 Resistance	Ω
Front oxygen (A/F) sensor lambda value	A/F Sensor #1	—
Rear oxygen sensor output signal	Rear O <sub>2</sub> Sensor	V
Short term fuel trim	A/F Correction #1	%
Knock sensor compensation	Knocking Correction	deg
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psi
Intake manifold relative pressure signal	Mani. Relative Pressure	mmHg, kPa, inHg or psi
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psi
A/F correction (short term fuel trim) by rear oxygen sensor	A/F Correction #3	%
Long term whole fuel trim	A/F Learning #1	%
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Primary supercharged pressure control signal	Primary Control	%
Tumble generated valve position sensor signal (RH side)	TGV Position Sensor R	V
Tumble generated valve position sensor signal (LH side)	TGV Position Sensor L	V
Acceleration opening angle	Accel Opening Angle	%
VVT advance angle amount (R)	VVT Adv. Amount R	deg
VVT advance angle amount (L)	VVT Adv. amount L	deg
OCV duty R	OCV Duty R	%
OCV duty L	OCV Duty L	%
OCV current R	OCV current R	mA
OCV current L	OCV Current L	mA
Throttle motor duty	Throttle Motor Duty	%
Throttle power supply voltage	Throttle Motor Voltage	V
Sub throttle sensor voltage	Sub-Throttle Sensor	V
Main throttle sensor voltage	Main-Throttle Sensor	V
Sub acceleration sensor voltage	Sub-Accelerator Sensor	V
Main acceleration sensor voltage	Main-Accelerator Sensor	V
Memory vehicle speed	Memorized Cruise Speed	km/h
Alternate duty ratio	ALT Duty	%
Exhaust gas temperature signal	Exhaust gas temperature	°C
Estimated cumulative driving distance	Odd Meter	Km
Fuel level signal	Fuel Level Voltage	V
Intake air temperature signal	Intake Air Temp.	°C or °F
Mass air flow sensor signal	Mass Air Flow	g/s

# Subaru Select Monitor

ENGINE (DIAGNOSTIC)

Remarks	Display	Unit of measure
Mass air flow sensor signal	Air Flow Sensor Voltage	V
AT/MT identification signal	AT Vehicle ID Signal	ON or OFF
ETC motor relay	ETC Motor Relay	ON or OFF
Clutch SW	Clutch Switch	ON or OFF
Stop Light SW	Stop Light Switch	ON or OFF
SET/COAST SW	SET/COAST Switch	ON or OFF
RESUME/ACCEL SW	RESUME/ACCEL Switch	ON or OFF
Brake SW	Brake Switch	ON or OFF
Main SW	Main Switch	ON or OFF
Ignition switch signal	Ignition Switch	ON or OFF
Test Mode Signal	Test Mode Signal	ON or OFF
Neutral position switch signal	Neutral Position Switch	ON or OFF
Air conditioning switch signal	A/C Switch	ON or OFF
Air conditioning signal	A/C Compressor Signal	ON or OFF
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF
Knocking signal	Knocking Signal	ON or OFF
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF
Power steering switch signal	P/S Switch	ON or OFF
Rear oxygen sensor rich signal	Rear O <sub>2</sub> Rich Signal	ON or OFF
Starter switch signal	Starter Switch	ON or OFF
Idle switch signal	Idle Switch Signal	ON or OFF
Crankshaft position sensor signal	Crankshaft Position Sig.	ON or OFF
Camshaft position sensor signal	Camshaft Position Sig.	ON or OFF
Rear defogger switch signal	Rear Defogger SW	ON or OFF
Blower fan switch signal	Blower Fan SW	ON or OFF
Small light switch signal	Light Switch	ON or OFF
Handle switch signal	Handle Switch	—
Wiper switch signal	Wiper Switch	ON or OFF
A/C mid pressure switch signal	A/C mid Pressure Switch	ON or OFF
AT coordinate retard angle demand	Retard Signal form AT	ON or OFF
AT coordinate fuel cut demand	Fuel Cut Signal from AT	ON or OFF
AT coordinate permission signal	Torque Permission Signal	ON or OFF
UDC not torque down output	Ban of Torque Down	ON or OFF
UDC torque down demand	Request Torque Down UDC	ON or OFF
Tumble generated valve output signal	TGV Output	ON or OFF
Tumble generated valve drive signal	TGV Drive	OPEN or CLOSE

**NOTE:**

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

# Subaru Select Monitor

## ENGINE (DIAGNOSTIC)

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

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

Description	Display	Unit of measure
Number of diagnosis code	Number of Diagnosis Code	—
Condition of malfunction indicator light	MI (MIL)	ON or OFF
Monitoring test of misfire	Misfire monitoring	No support
Monitoring test of fuel system	Fuel system monitoring	No support
Monitoring test of comprehensive component	Component monitoring	No support
Test of catalyst	Catalyst Diagnosis	No support
Test of heating-type catalyst	Heated catalyst	No support
Test of evaporative emission purge control system	Evaporative purge system	No support
Test of secondary air system	Secondary air system	No support
Test of air conditioning system refrigerant	A/C system refrigerant	No support
Test of oxygen sensor	Oxygen sensor	No support
Test of oxygen sensor heater	O <sub>2</sub> Heater Diagnosis	No support
Test of EGR system	EGR system	No support
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—
Engine load data	Calculated load value	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition timing adv. #1	°
Intake air temperature signal	Intake Air Temp.	°C or °F
Amount of intake air	Mass Air Flow	g/s
Throttle position signal	Throttle Opening Angle	%
Oxygen sensor #11	Oxygen Sensor #11	—
Oxygen sensor #12	Oxygen Sensor #12	—
Rear oxygen sensor output signal	Oxygen Sensor #12	V
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%
On-board diagnostic system	OBD System	others
A/F sensor output signal	A/F sensor #11	V
A/F lambda signal	A/F sensor #11	—
A/F lambda signal #11	A/F sensor #11	—
A/F sensor current #11	A/F sensor #11	mA

#### NOTE:

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

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

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

Description	Display	Unit of measure
Diagnostic code of freeze frame data	Freeze Frame Data	Diagnostic code
Air fuel ratio control system for bank 1	Fuel System for Bank 1	Closed loop or open loop
Air fuel ratio control system for bank 2	Fuel System for Bank 2	—
Engine load data	Calculated load valve	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing 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
Throttle position signal	Throttle Opening Angle	%

**NOTE:**

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



# Subaru Select Monitor

## ENGINE (DIAGNOSTIC)

### 7. LED OPERATION MODE FOR ENGINE

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

Description	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is ON.
Test Mode Signal	Test Mode Signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral Position Switch	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is ON.
Air conditioning relay signal	A/C Compressor Signal	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF	When radiator main fan relay is in function.
Knocking signal	Knocking Signal	ON or OFF	When knocking signal is input.
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF	When radiator sub fan relay is in function.
Rear oxygen sensor rich signal	Rear O <sub>2</sub> Rich Signal	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Starter switch signal	Starter Switch Signal	ON or OFF	When starter switch signal is entered.
Idle switch signal	Idle Switch Signal	ON or OFF	When idle switch signal is entered.
Crankshaft position sensor signal	Crankshaft Position Signal	ON or OFF	When crankshaft position sensor signal is input.
Camshaft position sensor signal	Camshaft Position Signal	ON or OFF	When camshaft position sensor signal is entered.
Power steering switch signal	P/S Switch	ON or OFF	When power steering switch is entered.
Rear defogger switch signal	Rear Defogger Switch	ON or OFF	When rear defogger switch is ON.
Blower fan switch signal	Blower Fan Switch	ON or OFF	When blower fan switch is ON.
Small light switch signal	Light Switch	ON or OFF	When small light switch is ON.
Tumble generated valve actuator signal	TGV Output	ON or OFF	When TGV actuator signal is entered.
Tumble generated valve drive signal	TGV Drive	Close or Open	When TGV moves and valve opens.
Handle switch signal	Handle SW	Low Input or High Input	Illuminates in Low Input.
AT/MT identification terminal	AT Vehicle ID Signal	ON or OFF	ON (AT model).
Wiper switch signal	Wiper Switch	ON or OFF	When wiper switch is turned to ON.
A/C mid pressure switch signal	A/C Mid Pressure Switch	ON or OFF	When A/C mid pressure switch is turned to ON.
AT coordinate retard angle demand	Retard Signal from AT	ON or OFF	When AT retard angle signal is exists.
AT coordinate fuel cut demand	Fuel Cut Signal from AT	ON or OFF	When AT coordinate fuel cut demand signal is exists.
AT coordinate permission signal	Torque Permission Signal	ON or OFF	When AT coordinate permission signal is exists.
VDC not torque down out put	Ban of Torque Down	ON or OFF	When VDC not torque down output signal is exists.
VDC torque down demand	Request Torque Down VDC	ON or OFF	When VDC torque down demand signal is exists.
ETC motor relay signal	ETC Motor Relay	ON or OFF	When electronic throttle control relay is in function.
Clutch switch signal	Clutch Switch	ON or OFF	When clutch switch is ON.
Stop switch signal	Stop Light Switch	ON or OFF	When stop light switch is ON.

# Subaru Select Monitor

ENGINE (DIAGNOSTIC)

Description	Display	Message	LED "ON" requirements
SET/CST switch signal	SET/COAST Switch	ON or OFF	When SET/COAST switch is ON.
RES/ACC switch signal	RESUME/ACCEL Switch	ON or OFF	When RESUME/ACCEL switch is ON.
Brake switch signal	Brake Switch	ON or OFF	When brake switch is ON.
Main switch signal	Main Switch	ON or OFF	When main switch is ON.

**NOTE:**

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

# Read Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

#### NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC).  
<Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>

#### 2. SUBARU SELECT MONITOR (OBD MODE)

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

#### NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC).  
<Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>

#### 3. OBD-II GENERAL SCAN TOOL

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

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

<Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>

#### NOTE:

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

## 11. Inspection Mode

### A: OPERATION

Perform the diagnosis on the “Diagnosis Trouble Codes (DTC) List” below.

Refer to the item of drive cycle when perform the diagnosis not on the “Diagnosis Trouble Codes (DTC) List” below. <Ref. to EN(H4DOTC 2.5)-40, Drive Cycle.>

DTC	Item	On 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)	—
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 Circuit Low Input	—
P0113	Intake Air Temperature Circuit High Input	—
P0117	Engine Coolant Temperature Circuit Low Input	—
P0118	Engine Coolant Temperature Circuit High Input	—
P0122	Throttle/Pedal Position Sensor/Switch “A” Circuit Low Input	—
P0123	Throttle/Pedal Position Sensor/Switch “A” Circuit High Input	—
P0131	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 1)	—
P0132	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 1)	—
P0137	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 2)	—
P0138	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 2)	—
P0222	Throttle/Pedal Position Sensor/Switch “B” Circuit Low Input	—
P0223	Throttle/Pedal Position Sensor/Switch “B” Circuit High Input	—
P0230	Fuel Pump Primary Circuit	—
P0245	Turbo/Super Charger Wastegate Solenoid “A” Low	—
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	—
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)	—
P0335	Crankshaft Position Sensor “A” Circuit	—
P0340	Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor)	—
P0345	Camshaft Position Sensor “A” Circuit (Bank 2)	—
P0458	Evaporative Emission Control System Purge Control Valve Circuit Low	—
P0459	Evaporative Emission Control System Purge Control Valve Circuit High	—
P0462	Fuel Level Sensor Circuit Low Input	—
P0463	Fuel Level Sensor Circuit High Input	—
P0502	Vehicle Speed Sensor Circuit Low Input	—
P0503	Vehicle Speed Sensor Intermittent/Erratic/High	—
P0512	Starter Request Circuit	—
P0513	Incorrect Immobilizer Key	—
P0519	Idle Control System Malfunction (Fail-Safe)	—
P0545	Exhaust Gas Temperature Sensor Circuit Low-Bank 1	—
P0600	Serial Communication Link	—
P0604	Internal Control Module Random Access Memory (RAM) Error	—
P0605	Internal Control Module Read Only Memory (ROM) Error	—
P0607	Control Module Performance	—
P0638	Throttle Actuator Control Range/Performance (Bank 1)	—
P0691	Cooling Fan 1 Control Circuit Low	—
P0700	Transmission Control System (MIL Request)	—
P0851	Neutral Switch Input Circuit Low	—

# Inspection Mode

## ENGINE (DIAGNOSTIC)

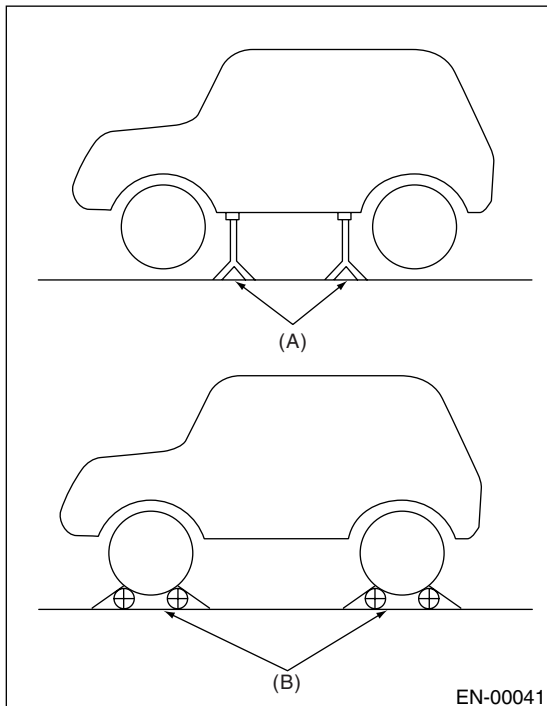
DTC	Item	On condition
P0852	Neutral Switch Input Circuit High	—
P1086	Tumble Generated Valve Position Sensor 2 Circuit Low	—
P1087	Tumble Generated Valve Position Sensor 2 Circuit High	—
P1088	Tumble Generated Valve Position Sensor 1 Circuit Low	—
P1089	Tumble Generated Valve Position Sensor 1 Circuit High	—
P1091	Tumble Generated Valve System 1 (Valve Close)	—
P1093	Tumble Generated Valve System 2 (Valve Close)	—
P1094	Tumble Generated Valve Signal 1 Circuit Malfunction (Open)	—
P1095	Tumble Generated Valve Signal 1 Circuit Malfunction (Short)	—
P1096	Tumble Generated Valve Signal 2 Circuit Malfunction (Open)	—
P1097	Tumble Generated Valve Signal 2 Circuit Malfunction (Short)	—
P1110	Atmospheric Pressure Sensor Circuit Malfunction (Low Input)	—
P1111	Atmospheric Pressure Sensor Circuit Malfunction (High Input)	—
P1160	Return Spring Failure	—
P1518	Starter Switch Circuit Low Input	—
P1544	High exhaust temperature detected	—
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	—
P2088	OCV Solenoid Valve Signal A Circuit Open (Bank 1)	—
P2089	OCV Solenoid Valve Signal A Circuit Short (Bank 1)	—
P2092	OCV Solenoid Valve Signal A Circuit Open (Bank 2)	—
P2093	OCV Solenoid Valve Signal A Circuit Short (Bank 2)	—
P2101	Throttle Actuator Control Motor Circuit Range/Performance	—
P2102	Throttle Actuator Control Motor Circuit Low	—
P2103	Throttle Actuator Control Motor Circuit High	—
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 Rationality	—
P2138	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Rationality	—

## 1. PREPARATION FOR THE INSPECTION MODE

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

### WARNING:

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



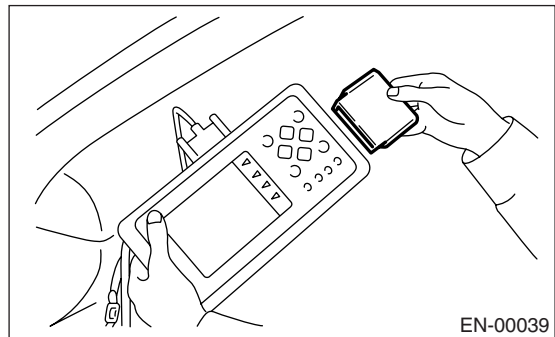
- (A) Rigid rack  
(B) Free rollers

## 2. SUBARU SELECT MONITOR

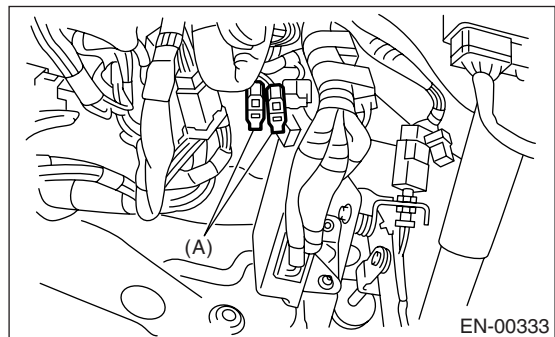
- 1) Idle the engine.
- 2) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC 2.5)-7, PREPARATION TOOL, General Description.>



- 3) Connect the diagnosis cable to Subaru Select Monitor.  
Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC 2.5)-7, PREPARATION TOOL, General Description.>



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

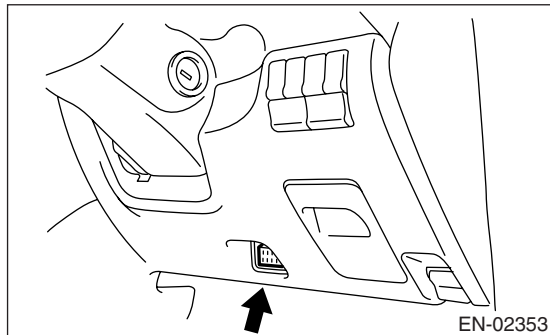


(A) Test Mode Connector

# Inspection Mode

## ENGINE (DIAGNOSTIC)

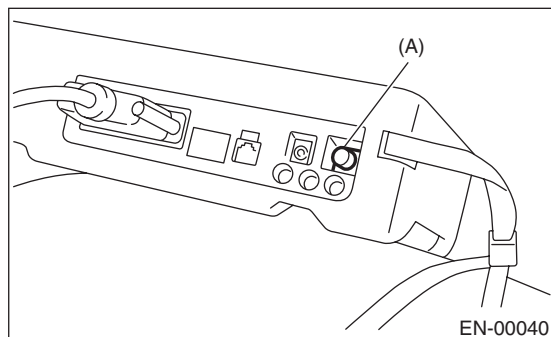
5) Connect the Subaru Select Monitor to data link connector located in the lower portion of the instrument panel (on the driver's side).



### CAUTION:

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

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



(A) Power switch

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

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

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

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

11) When the "Perform D Check?" is shown on the screen, press the [YES] key.

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

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

### NOTE:

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

• For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC).

<Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>

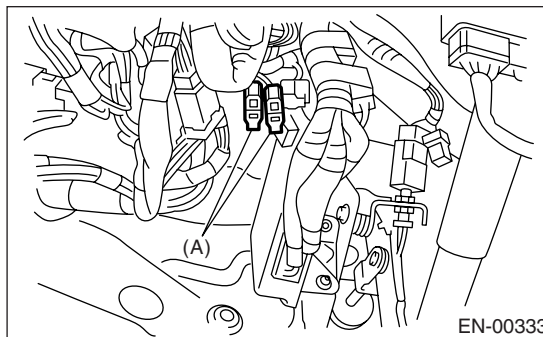
• Release the parking brake.

• The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function. <Ref. to ABS-23, Clear Memory Mode.>

### 3. OBD-II GENERAL SCAN TOOL

1) Idle the engine.

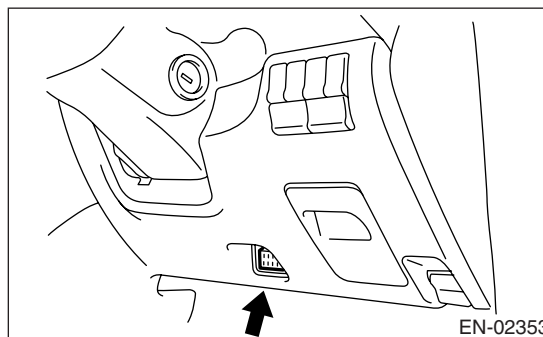
2) Connect the test mode connector (A) located at the lower portion of instrument panel (on the driver's side).



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

### CAUTION:

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



4) Start the engine.

### NOTE:

• Ensure the select lever is placed in the "P" range before starting. (AT model)

• Depress the clutch pedal when starting the engine. (MT model)

5) Using the select lever or shift lever, turn the "P" position switch and the "N" position switch to ON.

6) Depress the brake pedal to turn the brake switch ON. (AT model)

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

8) Place the select lever or shift lever in the "D" range (AT model) or "1st" gear (MT model) and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

**NOTE:**

- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function. <Ref. to ABS-23, Clear Memory Mode.>

9) Using the OBD-II general scan tool, check DTC(s) and record the result(s).

**NOTE:**

- For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.
- For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>



# Drive Cycle

ENGINE (DIAGNOSTIC)

---

## 12. Drive Cycle

### A: OPERATION

There are three driving patterns on diagnosis. Following trouble can be diagnosed with driving specified patterns. After repair the following trouble, be sure to check that the trouble is cleared correctly by the driving specified patterns.

#### 1. PREPARATION FOR DRIVE CYCLE

- 1) Check battery voltage is more than 12 V and fuel remains half [20 — 40 ℓ (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
- 2) Disconnect the test mode connectors.

NOTE:

Be sure to perform the diagnosis after idling from starting the cooled engine except when the engine coolant temperature is specified.

#### 2. DRIVE THE VEHICLE 20 MINUTES AT THE SPEED OF 80 KM/H (50 MPH), AND THEN IDLE THE ENGINE 1 MINUTE.

DTC	Item	On condition
P0546	Exhaust Gas Temperature Sensor Circuit High - Bank 1	—
P0692	Cooling Fan 1 Control Circuit High	—

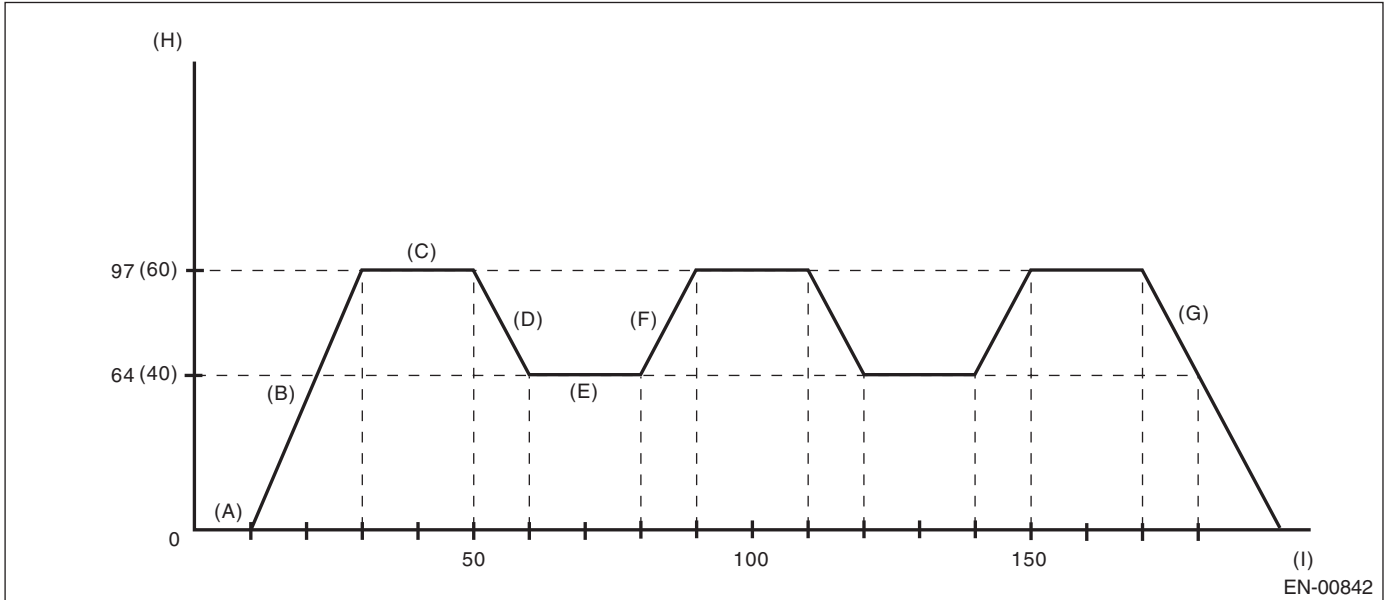
#### 3. 10 MINUTES IDLING

NOTE:

Drive the vehicle more than 10 km/h (6 MPH) before diagnosis.

DTC	Item	On condition
P0171	System Too Lean (Bank 1)	—
P0172	System Too Rich (Bank 2)	—

## 4. DRIVE THE VEHICLE WITH FOLLOWING DRIVE PATTERNS



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

DTC	Item	On condition
P0134	O <sub>2</sub> Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	—
P0246	Turbo/Super Charger Wastegate Solenoid "A" High	—
P1090	Tumble Generated Valve System 1 (Valve Open)	—
P1092	Tumble Generated Valve System 2 (Valve Open)	—

## 13. Clear Memory Mode

### A: OPERATION

#### 1. SUBARU SELECT MONITOR (NORMAL MODE)

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

**NOTE:**

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

#### 2. SUBARU SELECT MONITOR (OBD MODE)

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
- 2) On the «System Selection Menu» display screen, select the {Engine} and press the [YES] key.
- 3) Press the [YES] key after the information of engine type was displayed.
- 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press the [YES] key.
- 5) On the «OBD Menu» display screen, select the {DTC Clear} and press the [YES] key.
- 6) When the “Perform Diagnostic Code(s) Clear?” is shown on the screen, press the [YES] key.
- 7) Turn the ignition switch to OFF and then turn the SUBARU SELECT MONITOR to OFF.

**NOTE:**

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

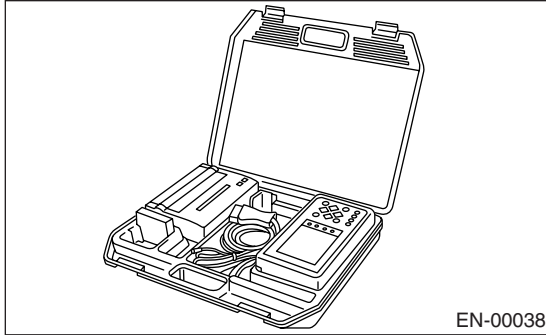
#### 3. OBD-II GENERAL SCAN TOOL

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

## 14. Compulsory Valve Operation Check Mode

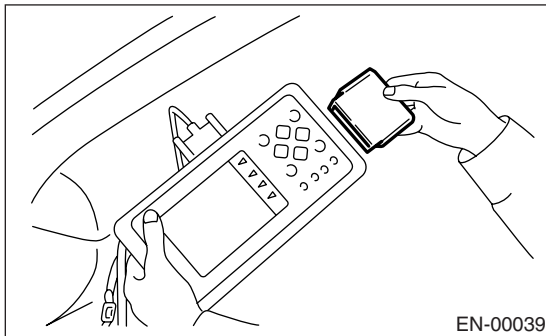
### A: OPERATION

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC 2.5)-7, PREPARATION TOOL, General Description.>

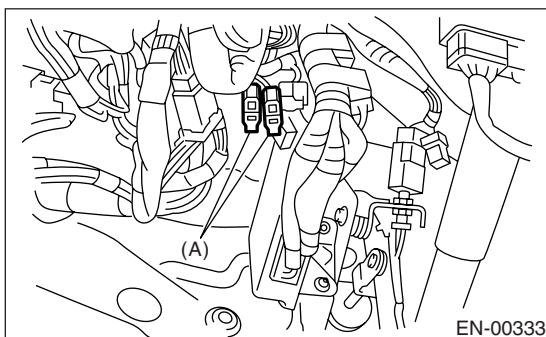


2) Connect the diagnosis cable to Subaru Select Monitor.

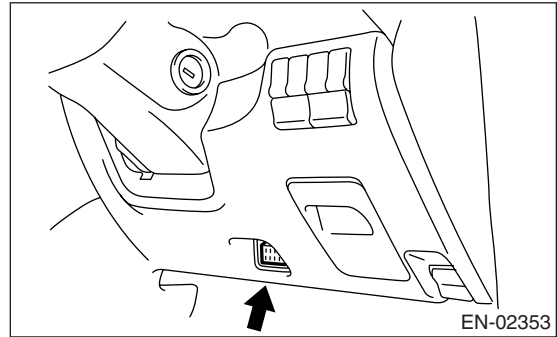
3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC 2.5)-7, PREPARATION TOOL, General Description.>



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



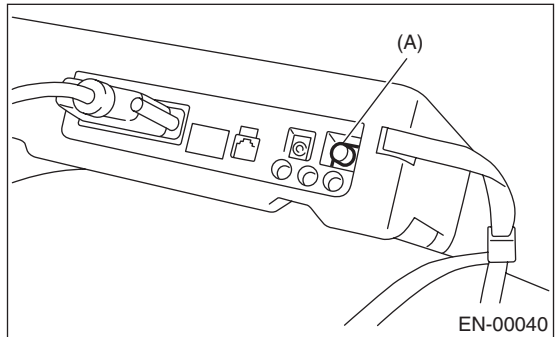
5) Connect the Subaru Select Monitor to data link connector located in the lower portion of the instrument panel (on the driver's side).



### CAUTION:

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

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



(A) Power switch

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

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

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

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

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

12) On the «Actuator ON/OFF Operation» screen, select the desired compulsory actuator and press the [YES] key.

# Compulsory Valve Operation Check Mode

## ENGINE (DIAGNOSTIC)

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13) Pressing the [NO] key completes the compulsory 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 radiator fan relay operation check	Radiator Fan Relay
Compulsory air conditioning relay operation check	A/C Compressor Relay
Compulsory purge control solenoid valve operation check	CPC Solenoid
Compulsory wastegate control solenoid operation check	Wastegate control solenoid

### NOTE:

- The following parts will be displayed but not functional.

Display
EGR Solenoid
ASV Solenoid
FICD Solenoid
Vent. solenoid
Atmospheric pressure switching solenoid 1
AAI Solenoid
PCV Solenoid
Atmospheric pressure switching solenoid 2
EXH. Bypass control permit flag

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

## 15. Malfunction Indicator Light

### A: PROCEDURE

1. Activation of malfunction indicator light. <Ref. to EN(H4DOTC 2.5)-45, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.>
↓
2. Check that the malfunction indicator light does not come on. <Ref. to EN(H4DOTC 2.5)-47, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
↓
3. Check that the malfunction indicator light does not go off. <Ref. to EN(H4DOTC 2.5)-49, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF, Malfunction Indicator Light.>
↓
4. Malfunction indicator light does not blink at a cycle of 3 Hz. <Ref. to EN(H4DOTC 2.5)-50, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK AT A CYCLE OF 3 HZ, Malfunction Indicator Light.>
↓
5. Malfunction indicator light remains blinking at a cycle of 3 Hz. <Ref. to EN(H4DOTC 2.5)-52, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING AT A CYCLE OF 3 HZ, Malfunction Indicator Light.>

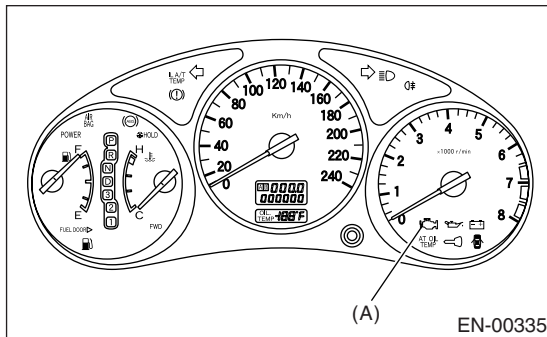
### B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

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

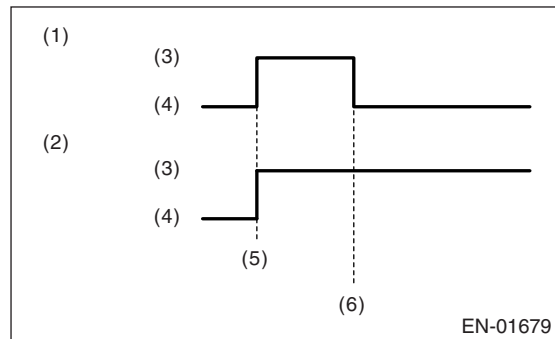
**NOTE:**

If the malfunction indicator light does not illuminate, perform the diagnosis of malfunction indicator light circuit or the combination meter circuit. <Ref. to EN(H4DOTC 2.5)-47, 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, either the engine or the emission control system is malfunctioning.



(A) Malfunction indicator light

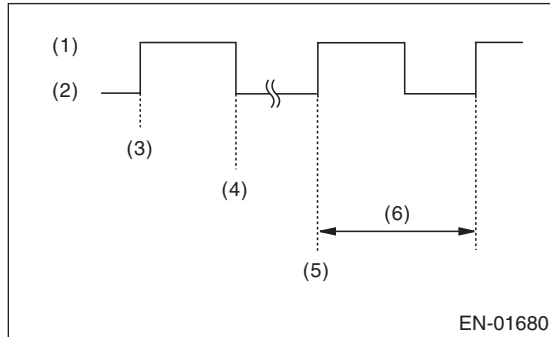


- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

# Malfunction Indicator Light

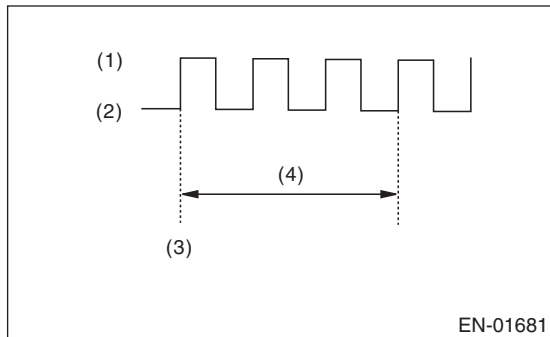
## ENGINE (DIAGNOSTIC)

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



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

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



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

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

## C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

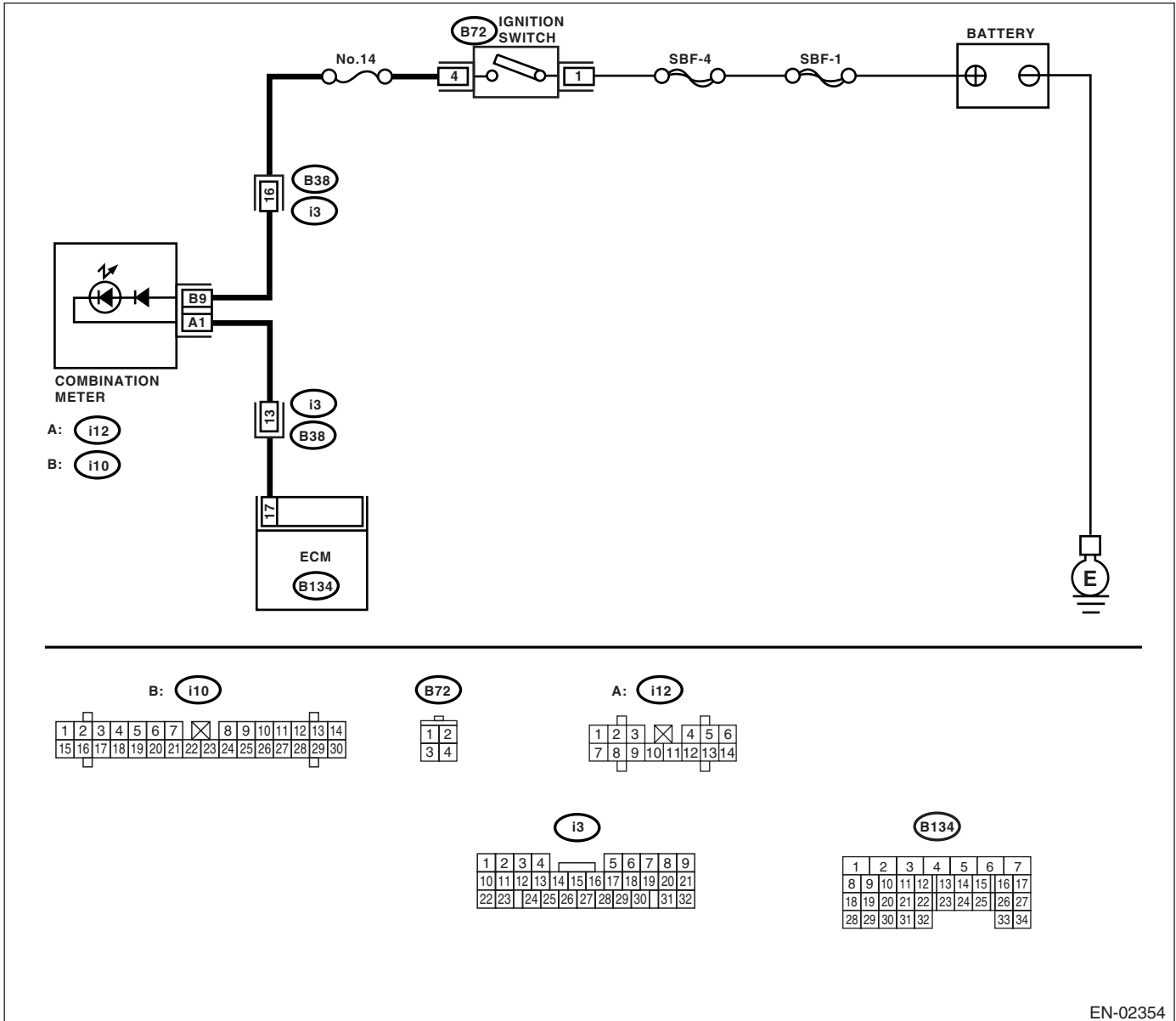
### DIAGNOSIS:

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 operate.

### WIRING DIAGRAM:



EN-02354



# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 17 (+) — Chassis ground (-):</b></i>	Is the voltage less than 1 V?	Go to step 4.	Go to step 2.
<b>2 CHECK POOR CONTACT.</b>	Does the malfunction indicator light come on when shaking or pulling the ECM connector and harness?	Repair the poor contact in ECM connector.	Go to step 3.
<b>3 CHECK ECM CONNECTOR.</b>	Is the ECM connector correctly connected?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Repair the connection of ECM connector.
<b>4 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Remove the combination meter. <Ref. to IDI-10, Combination Meter Assembly.> 3) Disconnect the connector from ECM and combination meter. 4) Measure the resistance of harness between ECM and combination meter connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 17 — (i12) No. 1:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and combination meter connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>5 CHECK POOR CONTACT.</b> Check poor contact in combination meter connector.	Is there poor contact in combination meter connector?	Repair poor contact in combination meter connector.	Go to step 6.
<b>6 CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between combination meter connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(i10) No. 9 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Replace the board of combination meter. <Ref. to IDI-10, Combination Meter Assembly.>	Check the following and repair if necessary.  NOTE: <ul style="list-style-type: none"> <li>• Blown out of fuse (No. 14)</li> <li>• Open or short circuit in harness between fuse (No. 14) and battery terminal</li> <li>• Poor contact in ignition switch connector</li> </ul>

## D: MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

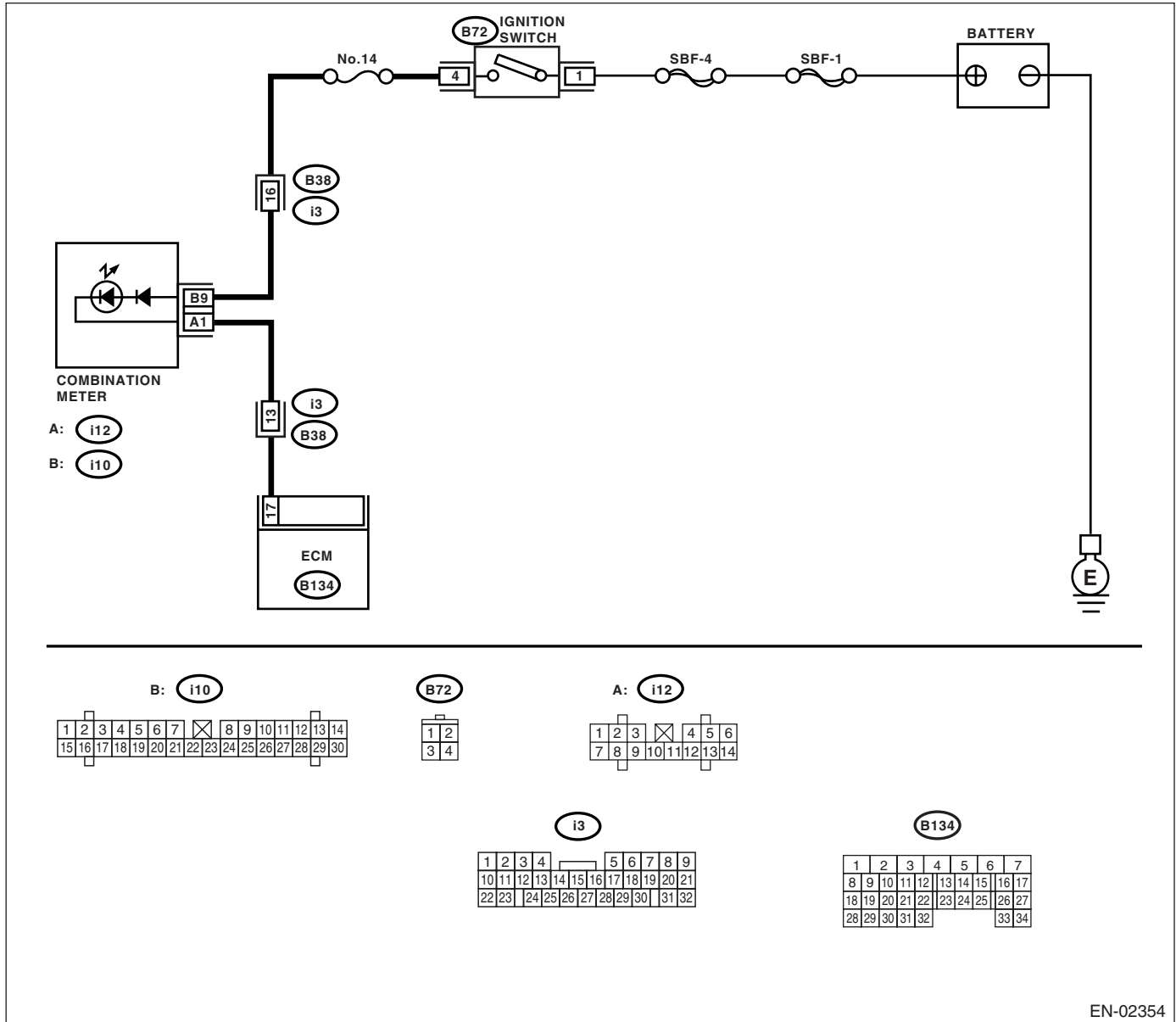
### DIAGNOSIS:

The malfunction indicator light circuit is shorted.

### TROUBLE SYMPTOM:

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

### WIRING DIAGRAM:



Step	Check	Yes	No	
1	<p><b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON.</p>	Does malfunction indicator light illuminate?	Repair short circuit in harness between combination meter and ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

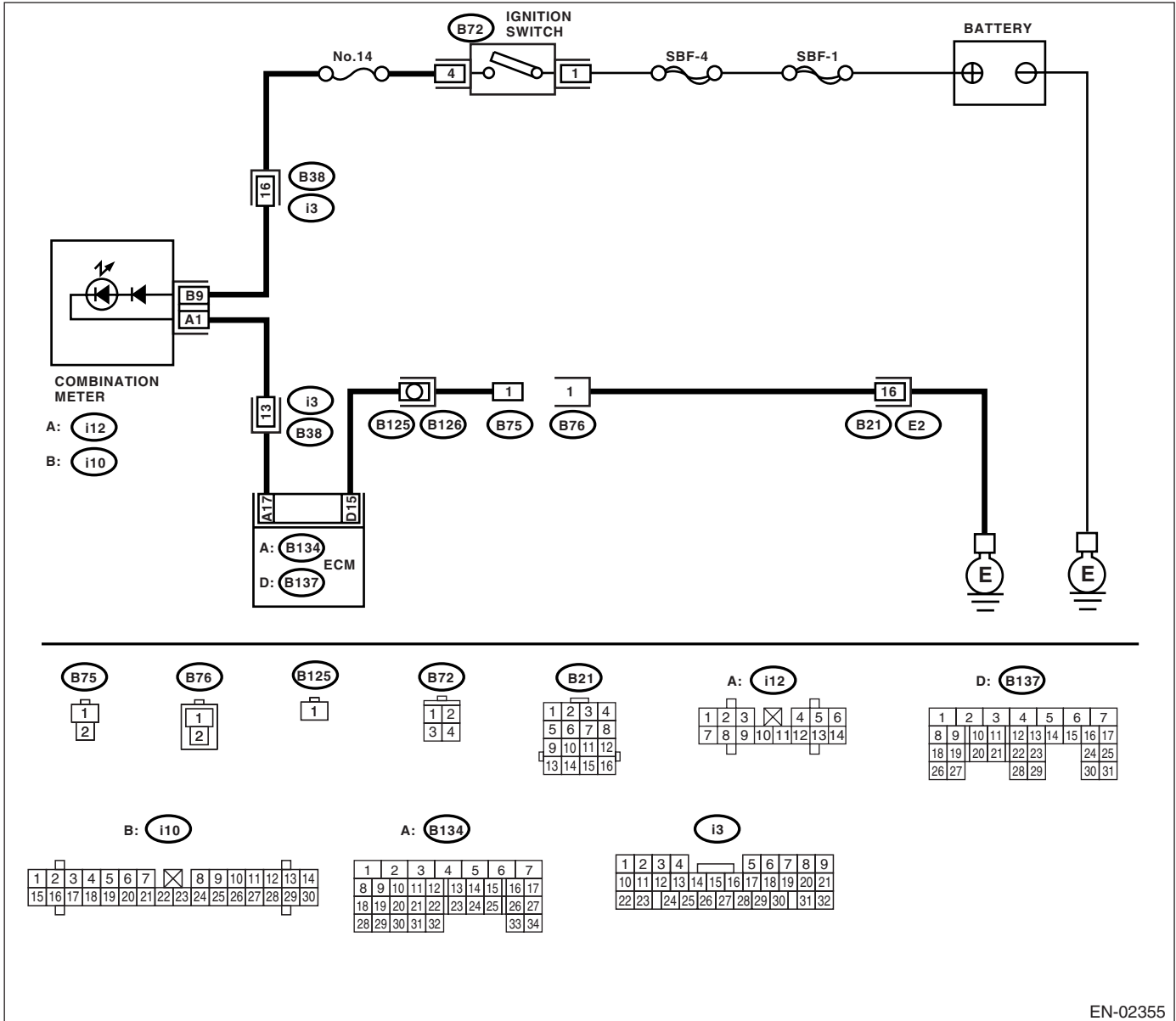
## E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK AT A CYCLE OF 3 Hz DIAGNOSIS:

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

### TROUBLE SYMPTOM:

When in inspection mode, malfunction indicator light does not blink at a cycle of 3 Hz.

### WIRING DIAGRAM:



EN-02355

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connectors. 3) Turn the ignition switch to ON. (engine OFF)	Does malfunction indicator light illuminate?	Go to step 2.	Repair the malfunction indicator light circuit. <Ref. to EN(H4DOTC 2.5)-47, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
<b>2</b> <b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON.	Does malfunction indicator light illuminate?	Repair ground short circuit in harness between combination meter and ECM connector.	Go to step 3.
<b>3</b> <b>CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND CHASSIS GROUND.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between test mode connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B76) No. 1 — Chassis ground:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between test mode connector and chassis ground</li> </ul>
<b>4</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Go to step 5.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.</b> 1) Connect the test mode connector. 2) Measure the resistance of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 15 — Chassis ground:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair open circuit in harness between ECM and test mode connector.
<b>6</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

## F: MALFUNCTION INDICATOR LIGHT REMAINS BLINKING AT A CYCLE OF 3 Hz

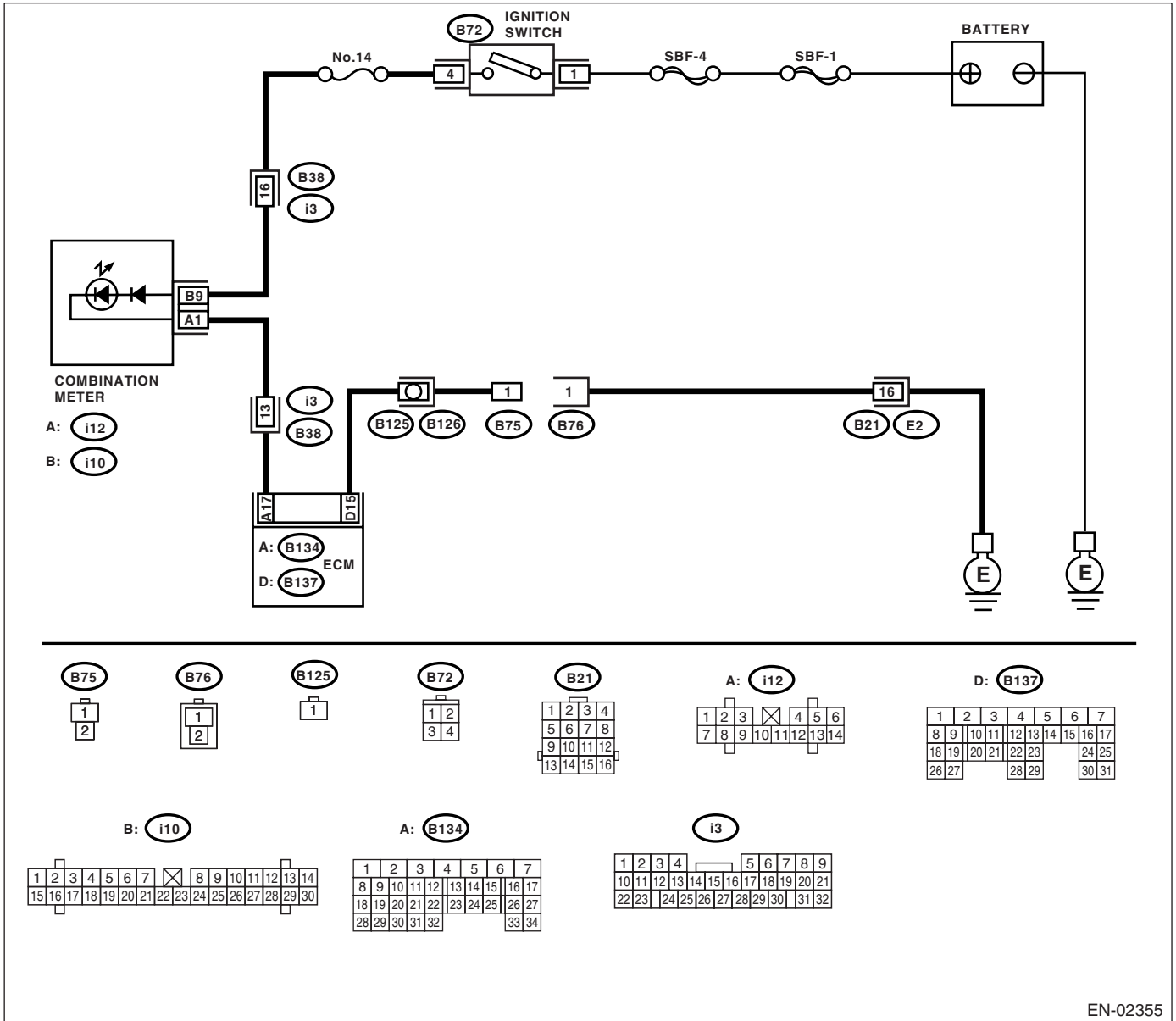
### DIAGNOSIS:

Test mode connector circuit is shorted.

### TROUBLE SYMPTOM:

Malfunction indicator light blinks at a cycle of 3 Hz when the ignition switch is turned to ON.

### WIRING DIAGRAM:



EN-02355

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK TEST MODE CONNECTOR.</b> 1) Disconnect the test mode connectors 2) Turn the ignition switch to ON.	Does the malfunction indicator light blink?	Go to step 2.	System is in good order.  NOTE: Malfunction indicator light blinks at a cycle of 3 Hz when test mode connector is connected.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUND TERMINAL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 15 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Repair the short circuit in harness between ECM and test mode connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

## 16. Diagnostics for Engine Starting Failure

### A: PROCEDURE

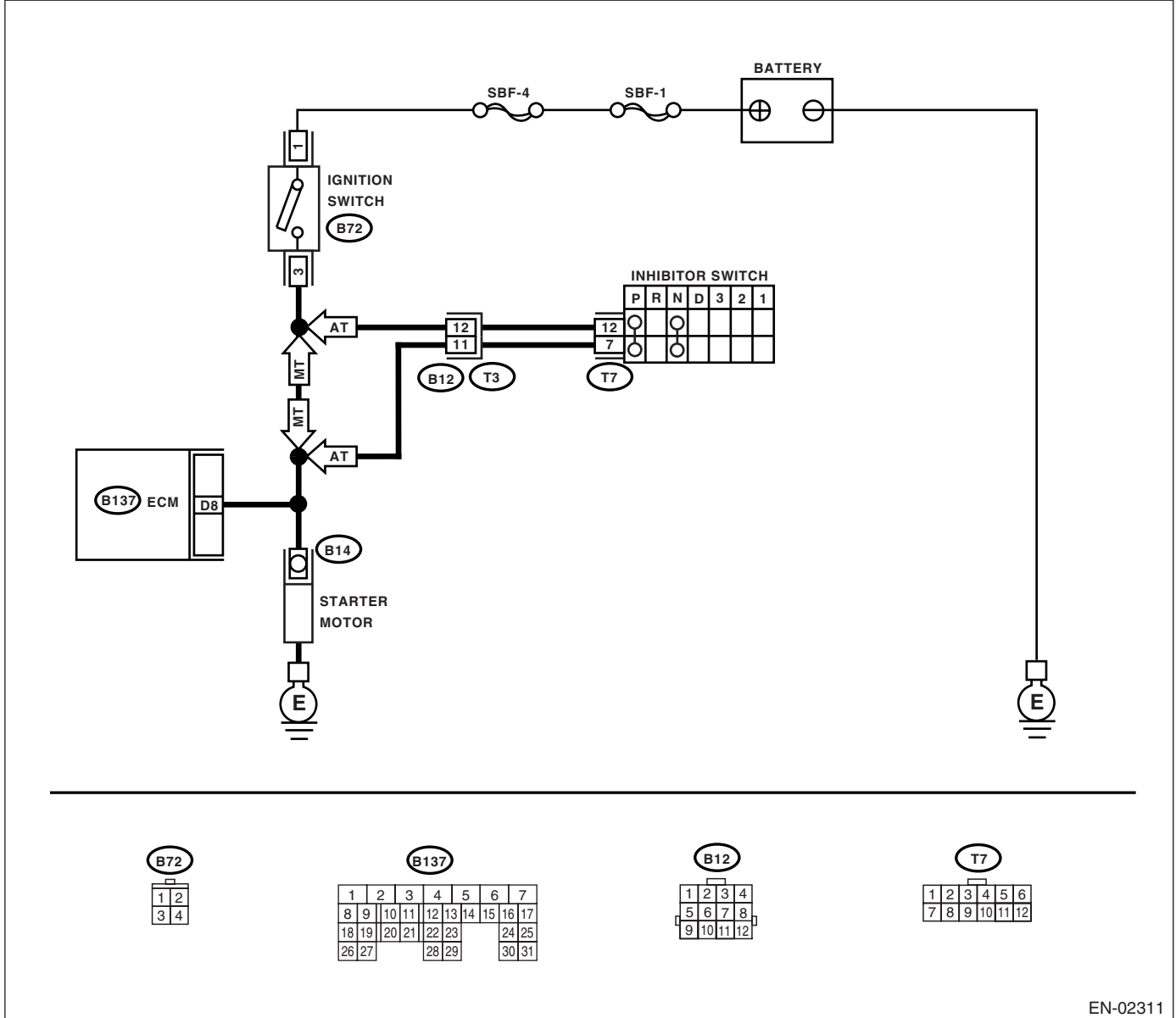
1. Check for fuel amount.
↓
2. Inspection of starter motor circuit. <Ref. to EN(H4DOTC 2.5)-55, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ECM power supply and ground line. <Ref. to EN(H4DOTC 2.5)-57, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>
↓
4. Inspection of ignition control system. <Ref. to EN(H4DOTC 2.5)-59, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel pump circuit. <Ref. to EN(H4DOTC 2.5)-62, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
6. Inspection of fuel injector circuit. <Ref. to EN(H4DOTC 2.5)-63, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

## B: STARTER MOTOR CIRCUIT

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02311



# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

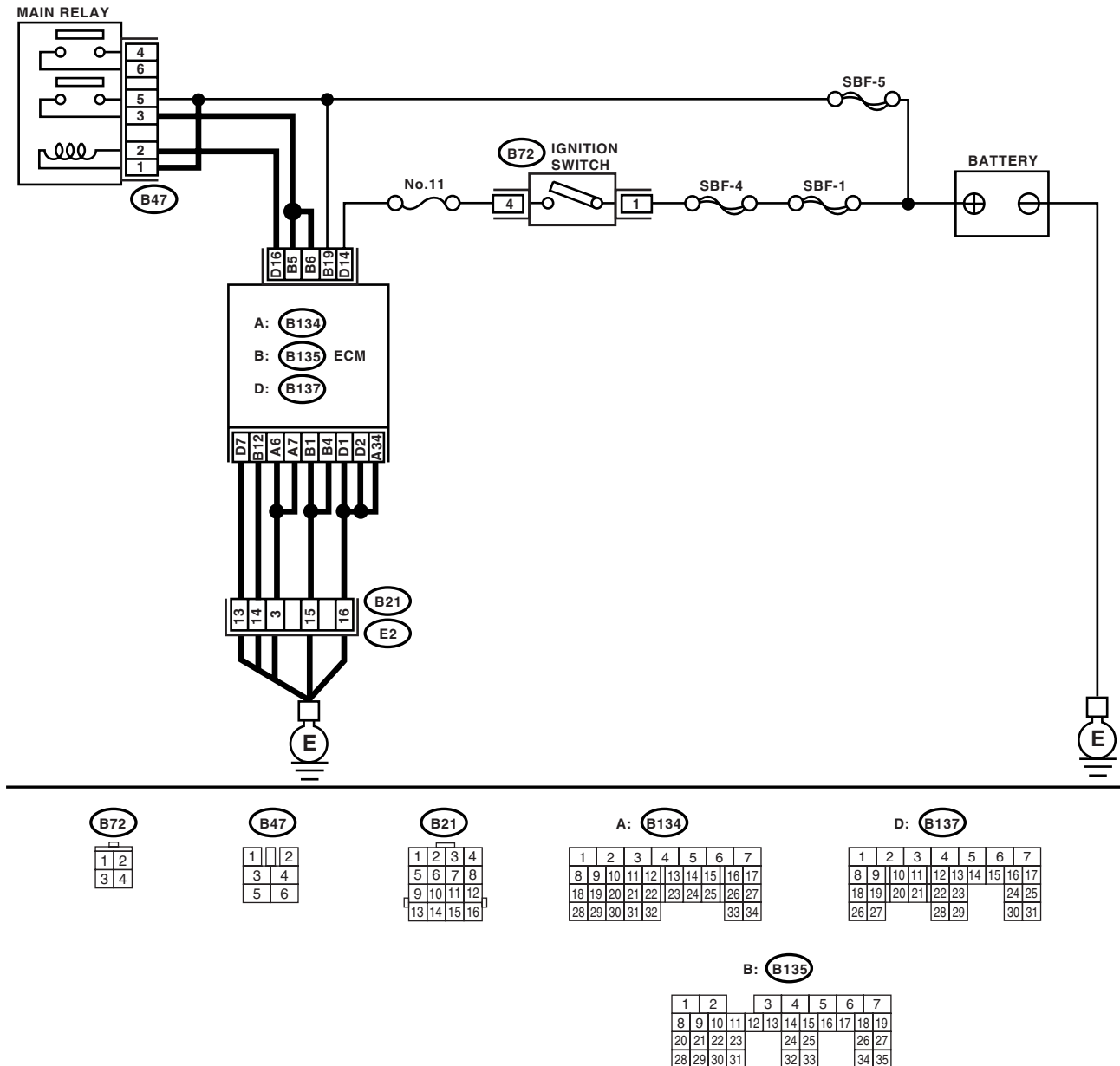
Step	Check	Yes	No
<b>1 CHECK BATTERY.</b> Check the battery voltage.	Is the voltage more than 12 V?	Go to step 2.	Charge or replace the battery.
<b>2 CHECK OPERATION OF STARTER MOTOR.</b>	Does the starter motor operate?	Check ECM power supply and ground line. <Ref. to EN(H4DOTC 2.5)-57, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>	Go to step 3.
<b>3 CHECK INPUT SIGNAL FOR STARTER MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter motor. 3) Turn the ignition switch to START. 4) Measure the power supply voltage between starter motor connector terminal and engine ground. <b>Connector &amp; terminal</b> <b>(B14) No. 1 (+) — Engine ground (-):</b> NOTE: • For AT model, shift the select lever to “P” or “N” range. • For MT model, depress the clutch pedal.	Is the voltage more than 10 V?	Go to step 4.	Go to step 5.
<b>4 CHECK GROUND CIRCUIT OF STARTER MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the terminal from starter motor. 3) Measure the resistance of ground cable between ground cable terminal and engine ground.	Is the resistance less than 5 Ω?	Check the starter motor. <Ref. to SC(H4SO)-6, Starter.>	Repair open circuit of ground cable.
<b>5 CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.</b> 1) Disconnect the connector from ignition switch. 2) Measure the power supply voltage between ignition switch connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B72) No. 1 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit in harness between ignition switch and battery, and check fuse SBF No. 4 and SBF No. 1.
<b>6 CHECK IGNITION SWITCH.</b> 1) Disconnect the connector from ignition switch. 2) Measure the resistance between ignition switch terminals while turning the ignition switch to START. <b>Terminals</b> <b>No. 1 — No. 3:</b>	Is the resistance less than 5 Ω?	Repair the poor contact in ignition switch.	Replace the ignition switch.

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

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



# Diagnostics for Engine Starting Failure

## ENGINE (DIAGNOSTIC)

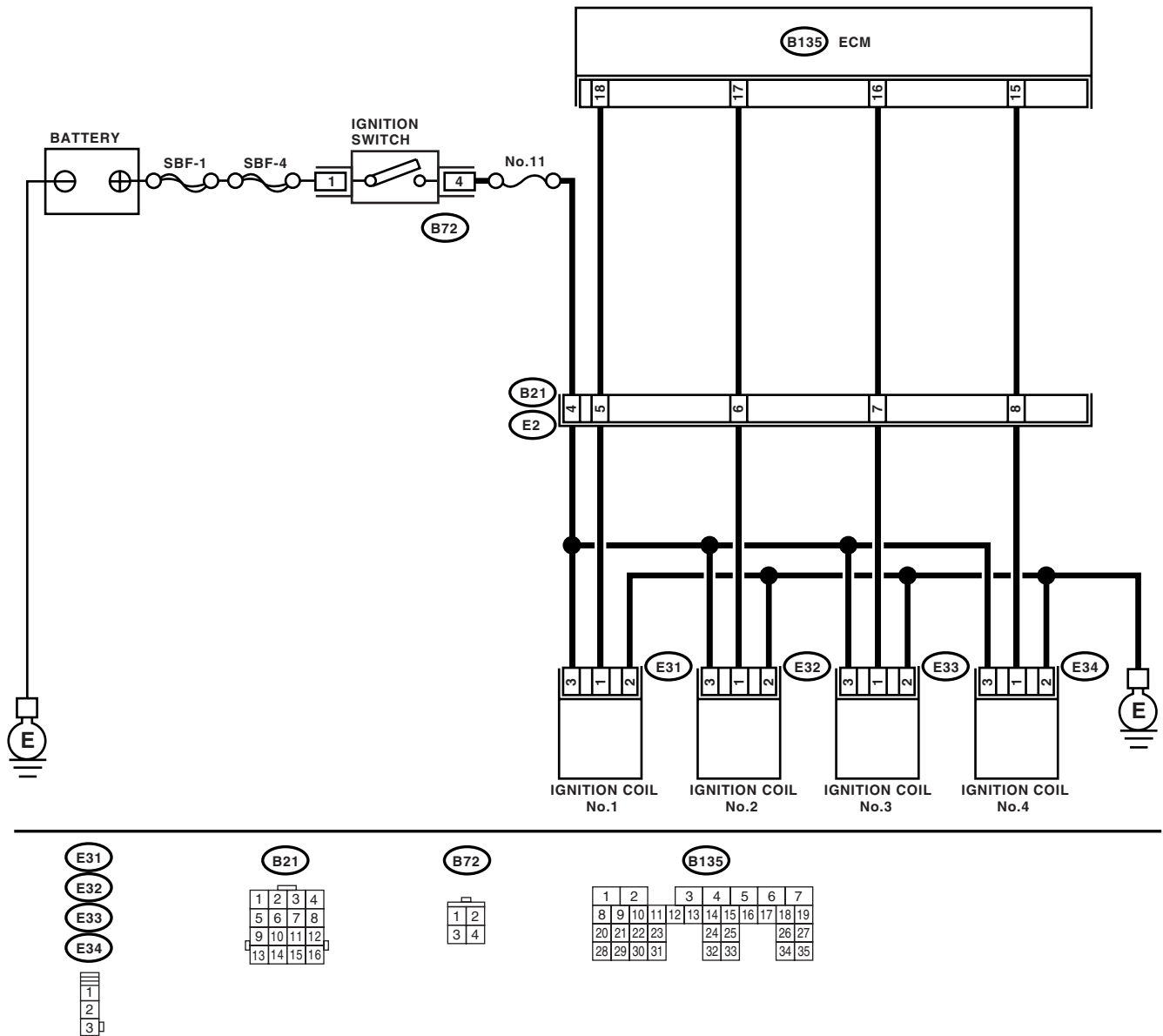
Step	Check	Yes	No
<b>1 CHECK MAIN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Connect the battery to main relay terminals No. 1 and No. 2. 4) Measure the resistance between main relay terminals. <b>Terminals</b> <b>No. 3 — No. 5:</b> <b>No. 4 — No. 6:</b>	Is the resistance less than 10 $\Omega$ ?	Go to step 2.	Replace the main relay.
<b>2 CHECK GROUND CIRCUIT FOR ECM.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 6 — Chassis ground:</b> <b>(B134) No. 7 — Chassis ground:</b> <b>(B134) No. 34 — Chassis ground:</b> <b>(B135) No. 1 — Chassis ground:</b> <b>(B135) No. 4 — Chassis ground:</b> <b>(B135) No. 12 — Chassis ground:</b> <b>(B137) No. 1 — Chassis ground:</b> <b>(B137) No. 2 — Chassis ground:</b> <b>(B137) No. 7 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair open circuit in harness between ECM connector and engine ground terminal.
<b>3 CHECK INPUT VOLTAGE OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 19 (+) — Chassis ground (-):</b> <b>(B137) No. 14 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 4.	Repair open or ground short circuit of power supply circuit.
<b>4 CHECK INPUT VOLTAGE OF MAIN RELAY.</b> Measure the voltage between main relay connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B47) No. 1 (+) — Chassis ground (-):</b> <b>(B47) No. 5 (+) — Chassis ground (-):</b> <b>(B47) No. 6 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 5.	Repair open or ground short circuit in harness of power supply circuit.
<b>5 CHECK INPUT VOLTAGE OF ECM.</b> 1) Connect the main relay connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 5 (+) — Chassis ground (-):</b> <b>(B135) No. 6 (+) — Chassis ground (-):</b> <b>(B137) No. 16 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Check ignition control system. <Ref. to EN(H4DOTC 2.5)-59, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair open or ground short circuit in harness between ECM connector and main relay connector.

## D: IGNITION CONTROL SYSTEM

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostics for Engine Starting Failure

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK SPARK PLUG CONDITION.</b> 1) Remove the spark plug. <Ref. to IG(H4DOTC)-6, INSTALLATION, Spark Plug.> 2) Check the spark plug condition. <Ref. to IG(H4DOTC)-6, INSPECTION, Spark Plug.>	Is the spark plug's status OK?	Go to step 2.	Replace the spark plug.
<b>2 CHECK IGNITION SYSTEM FOR SPARKS.</b> 1) Connect the spark plug to ignition coil. 2) Release the fuel pressure. <Ref. to FU(H4DOTC 2.5)-45, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.> 3) Contact the spark plug's thread portion on 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(H4DOTC 2.5)-62, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 3.
<b>3 CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL &amp; IGNITOR ASSY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition coil & ignitor ASSY. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between ignition coil & ignitor ASSY connector and engine ground.  <i>Connector &amp; terminal</i> (E31) No. 3 (+) — Engine ground (-): (E32) No. 3 (+) — Engine ground (-): (E33) No. 3 (+) — Engine ground (-): (E34) No. 3 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ignition coil &amp; ignitor ASSY, and ignition switch connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>4 CHECK HARNESS OF IGNITION COIL &amp; IGNITOR ASSY GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between ignition coil & ignitor ASSY connector and engine ground.  <i>Connector &amp; terminal</i> (E31) No. 2 — Engine ground: (E32) No. 2 — Engine ground: (E33) No. 2 — Engine ground: (E34) No. 2 — Engine ground:	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ignition coil &amp; ignitor ASSY connector and engine ground terminal</li> </ul>
<b>5 CHECK HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSY CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from ignition coil & ignitor ASSY. 4) Measure the resistance of harness between ECM and ignition coil & ignitor ASSY connector.  <i>Connector &amp; terminal</i> (B135) No. 15 — (E34) No. 1: (B135) No. 16 — (E33) No. 1: (B135) No. 17 — (E32) No. 1: (B135) No. 18 — (E31) No. 1:	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• OPEN CIRCUIT IN HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSY CONNECTOR.</li> <li>• Poor contact in coupling connector</li> </ul>

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSY CONNECTOR.</b>                      Measure the resistance of harness between ECM and engine ground.  <i>Connector &amp; terminal</i>                      (B135) No. 15 — Engine ground:                      (B135) No. 16 — Engine ground:                      (B135) No. 17 — Engine ground:                      (B135) No. 18 — Engine ground:</p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Go to step 7.</p>	<p>Repair ground short circuit in harness between ECM and ignition coil &amp; ignitor ASSY connector.</p>
<p><b>7</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact in ECM connector.</p>	<p>Is there poor contact in ECM connector?</p>	<p>Repair the poor contact in ECM connector.</p>	<p>Check fuel pump circuit. &lt;Ref. to EN(H4DOTC 2.5)-62, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.&gt;</p>

# Diagnostics for Engine Starting Failure

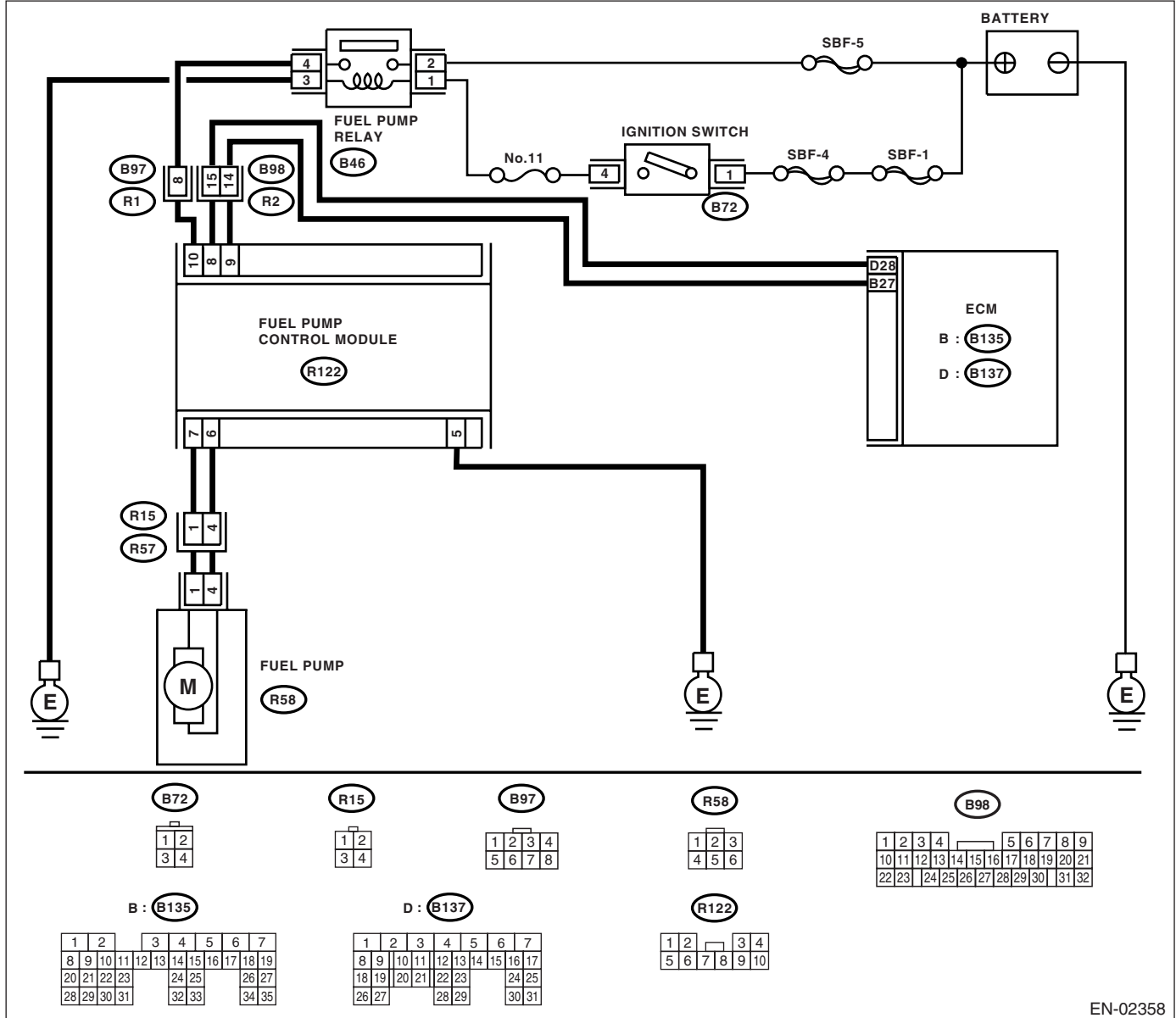
ENGINE (DIAGNOSTIC)

## E: FUEL PUMP CIRCUIT

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02358

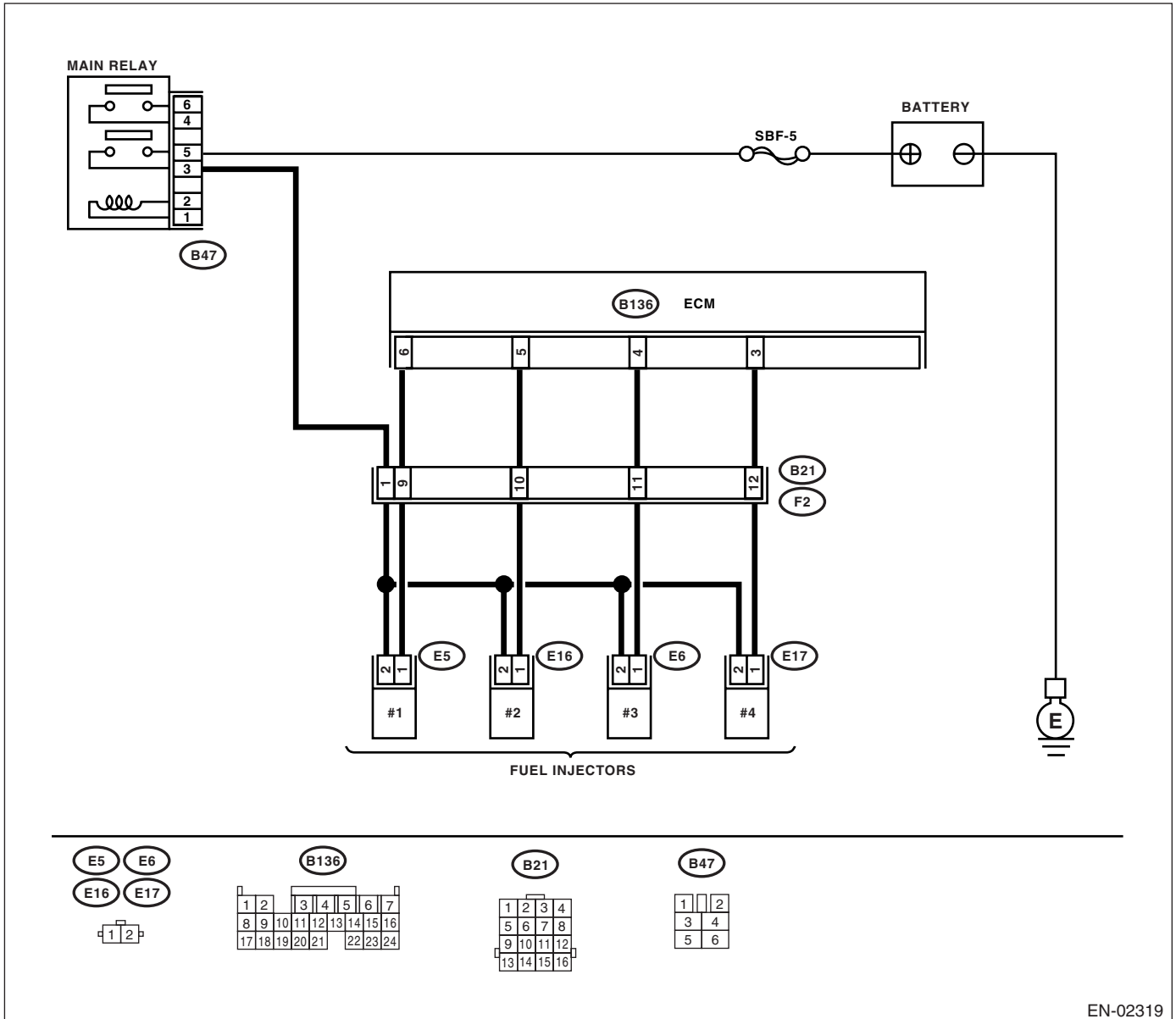
Step	Check	Yes	No	
1	<p><b>CHECK OPERATING SOUND OF FUEL PUMP.</b> Make sure that fuel pump is in operation for two seconds when turning the ignition switch to ON. NOTE: Fuel pump operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". &lt;Ref. to EN(H4DOTC 2.5)-43, Compulsory Valve Operation Check Mode.&gt;</p>	Does the fuel pump produce operating sound?	<p>Check the fuel injector circuit. &lt;Ref. to EN(H4DOTC 2.5)-63, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.&gt;</p>	<p>Display DTC. &lt;Ref. to EN(H4DOTC 2.5)-34, OPERATION, Read Diagnostic Trouble Code (DTC).&gt;</p>

## F: FUEL INJECTOR CIRCUIT

### CAUTION:

- Check or repair only faulty parts.
- After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>

### WIRING DIAGRAM:



EN-02319

Step	Check	Yes	No	
1	<p><b>CHECK OPERATION OF EACH FUEL INJECTOR.</b></p> <p>While cranking the engine, check that each fuel injector emits operating sound. Use a sound scope or attach a screwdriver to the injector for this check.</p>	<p>Does the fuel pump produce operating sound?</p>	<p>Check the fuel pressure. &lt;Ref. to ME(H4DOTC)-36, INSPECTION, Fuel Pressure.&gt;</p>	<p>Go to step 2.</p>



## Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>2</b>      <b>CHECK POWER SUPPLY TO EACH FUEL INJECTOR.</b>                      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.  <b>Connector &amp; terminal</b>  <b>#1 (E5) No. 2 (+) — Engine ground (-):</b>  <b>#2 (E16) No. 2 (+) — Engine ground (-):</b>  <b>#3 (E6) No. 2 (+) — Engine ground (-):</b>  <b>#4 (E17) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 3.	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between main relay and fuel injector connector • Poor contact in main relay connector • Poor contact in coupling connector • Poor contact in fuel injector connector
<p><b>3</b>      <b>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.</b>                      1) Disconnect the connector from ECM.                      2) Measure the resistance of harness between ECM and fuel injector connector.  <b>Connector &amp; terminal</b>  <b>(B136) No. 6 — (E5) No. 1:</b>  <b>(B136) No. 5 — (E16) No. 1:</b>  <b>(B136) No. 4 — (E6) No. 1:</b>  <b>(B136) No. 3 — (E17) No. 1:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between ECM and fuel injector connector • Poor contact in coupling connector
<p><b>4</b>      <b>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.</b>                      Measure the resistance of harness between ECM and fuel injector connector.  <b>Connector &amp; terminal</b>  <b>(B136) No. 3 — Chassis ground:</b>  <b>(B136) No. 4 — Chassis ground:</b>  <b>(B136) No. 5 — Chassis ground:</b>  <b>(B136) No. 6 — Chassis ground:</b></p>	Is the resistance less than 1 $\Omega$ ?	Repair ground short circuit in harness between ECM and fuel injector connector.	Go to step 5.
<p><b>5</b>      <b>CHECK EACH FUEL INJECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between each fuel injector terminals.  <b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	Is the resistance 5 — 20 $\Omega$ ?	Go to step 6.	Replace the faulty fuel injector.
<p><b>6</b>      <b>CHECK POOR CONTACT.</b>                      Check poor contact in ECM connector.</p>	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Inspection using "General Diagnostic Table". <Ref. to EN(H4DOTC 2.5)-258, INSPECTION, General Diagnostic Table.>

## List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

### 17. List of Diagnostic Trouble Code (DTC)

#### A: LIST

DTC	Item	NOTE
P0031	HO <sub>2</sub> S Heater Control Circuit Low (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC 2.5)-70, DTC P0031 HO <sub>2</sub> S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0032	HO <sub>2</sub> S Heater Control Circuit High (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC 2.5)-73, DTC P0032 HO <sub>2</sub> S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0037	HO <sub>2</sub> S Heater Control Circuit Low (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC 2.5)-75, DTC P0037 HO <sub>2</sub> S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0038	HO <sub>2</sub> S Heater Control Circuit High (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC 2.5)-78, DTC P0038 HO <sub>2</sub> S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0102	Mass or Volume Air Flow Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-80, 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(H4DOTC 2.5)-83, 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(H4DOTC 2.5)-85, 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(H4DOTC 2.5)-87, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0112	Intake Air Temperature Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-89, DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0113	Intake Air Temperature Circuit High Input	<Ref. to EN(H4DOTC 2.5)-91, DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0117	Engine Coolant Temperature Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-94, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0118	Engine Coolant Temperature Circuit High Input	<Ref. to EN(H4DOTC 2.5)-96, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-99, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High Input	<Ref. to EN(H4DOTC 2.5)-102, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0131	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC 2.5)-105, DTC P0131 O <sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0132	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC 2.5)-107, DTC P0132 O <sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0134	O <sub>2</sub> Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC 2.5)-109, DTC P0134 O <sub>2</sub> SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## List of Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0137	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC 2.5)-111, DTC P0137 O <sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0138	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC 2.5)-113, DTC P0138 O <sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0171	System Too Lean (Bank 1)	<Ref. to EN(H4DOTC 2.5)-115, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0172	System Too Rich (Bank 1)	<Ref. to EN(H4DOTC 2.5)-115, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0222	Throttle/Pedal Position Sensor/Switch "B" Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-118, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0223	Throttle/Pedal Position Sensor/Switch "B" Circuit High Input	<Ref. to EN(H4DOTC 2.5)-121, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0230	Fuel Pump Primary Circuit	<Ref. to EN(H4DOTC 2.5)-124, DTC P0230 FUEL PUMP PRIMARY CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0245	Turbo/Super Charger Wastegate Solenoid "A" Low	<Ref. to EN(H4DOTC 2.5)-127, DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0246	Turbo/Super Charger Wastegate Solenoid "A" High	<Ref. to EN(H4DOTC 2.5)-129, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	<Ref. to EN(H4DOTC 2.5)-131, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)	<Ref. to EN(H4DOTC 2.5)-133, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0335	Crankshaft Position Sensor "A" Circuit	<Ref. to EN(H4DOTC 2.5)-135, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)	<Ref. to EN(H4DOTC 2.5)-137, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0345	Camshaft Position Sensor "A" Circuit (Bank 2)	<Ref. to EN(H4DOTC 2.5)-139, DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0458	Evaporative Emission Control System Purge Control Valve Circuit Low	<Ref. to EN(H4DOTC 2.5)-141, DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0459	Evaporative Emission Control System Purge Control Valve Circuit High	<Ref. to EN(H4DOTC 2.5)-143, DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel Level Sensor Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-145, DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel Level Sensor Circuit High Input	<Ref. to EN(H4DOTC 2.5)-148, DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0502	Vehicle Speed Sensor Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-151, DTC P0502 VEHICLE SPEED SENSOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0503	Vehicle Speed Sensor Intermittent/Erratic/High	<Ref. to EN(H4DOTC 2.5)-153, DTC P0503 VEHICLE SPEED SENSOR INTERMITTENT/ERRATIC/HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0512	Starter Request Circuit	<Ref. to EN(H4DOTC 2.5)-155, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0513	Incorrect Immobilizer Key	<Ref. to IM-20, DTC P0513 INCORRECT IMMOBILIZER KEY, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P0519	Idle Control System Malfunction (Fail-Safe)	<Ref. to EN(H4DOTC 2.5)-157, DTC P0519 IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0545	Exhaust Gas Temperature Sensor Circuit Low-Bank 1	<Ref. to EN(H4DOTC 2.5)-160, DTC P0545 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW - BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0546	Exhaust Gas Temperature Sensor Circuit High-Bank 1	<Ref. to EN(H4DOTC 2.5)-162, DTC P0546 EXHAUST GAS TEMPERATURE SENSOR HIGH - BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0600	Serial Communication Link	<Ref. to EN(H4DOTC 2.5)-165, DTC P0600 SERIAL COMMUNICATION LINK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0604	Internal Control Module Random Access Memory (RAM) Error	<Ref. to EN(H4DOTC 2.5)-167, DTC P0604 INTERNAL CONTROL MODULE READ ACCESS MEMORY (RAM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0605	Internal Control Module Read Access Memory (RAM) Error	<Ref. to EN(H4DOTC 2.5)-169, DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0607	Control Module Performance	<Ref. to EN(H4DOTC 2.5)-170, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0638	Throttle Actuator Control Range/Performance (Bank 1)	<Ref. to EN(H4DOTC 2.5)-172, DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0691	Cooling Fan 1 Control Circuit Low	<Ref. to EN(H4DOTC 2.5)-173, DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0692	Cooling Fan 1 Control Circuit High	<Ref. to EN(H4DOTC 2.5)-176, DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0700	Transmission Control System (MIL Request)	<Ref. to EN(H4DOTC 2.5)-178, DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0851	Neutral Switch Input Circuit Low	<Ref. to EN(H4DOTC 2.5)-181, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0852	Neutral Switch Input Circuit High	<Ref. to EN(H4DOTC 2.5)-183, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1086	Tumble Generated Valve Position Sensor 2 Circuit Low	<Ref. to EN(H4DOTC 2.5)-188, DTC P1086 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1087	Tumble Generated Valve Position Sensor 2 Circuit High	<Ref. to EN(H4DOTC 2.5)-191, DTC P1087 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1088	Tumble Generated Valve Position Sensor 1 Circuit Low	<Ref. to EN(H4DOTC 2.5)-193, DTC P1088 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1089	Tumble Generated Valve Position Sensor 1 Circuit High	<Ref. to EN(H4DOTC 2.5)-196, DTC P1089 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1090	Tumble Generated Valve System 1 (Valve Open)	<Ref. to EN(H4DOTC 2.5)-198, DTC P1090 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1091	Tumble Generated Valve System 1 (Valve Close)	<Ref. to EN(H4DOTC 2.5)-198, DTC P1091 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE CLOSE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## List of Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P1092	Tumble Generated Valve System 2 (Valve Open)	<Ref. to EN(H4DOTC 2.5)-199, DTC P1092 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1093	Tumble Generated Valve System 2 (Valve Close)	<Ref. to EN(H4DOTC 2.5)-200, DTC P1093 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE CLOSE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1094	Tumble Generated Valve Signal 1 Circuit Malfunction (Open)	<Ref. to EN(H4DOTC 2.5)-201, DTC P1094 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1095	Tumble Generated Valve Signal 1 Circuit Malfunction (Short)	<Ref. to EN(H4DOTC 2.5)-203, DTC P1095 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (SHORT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1096	Tumble Generated Valve Signal 2 Circuit Malfunction (Open)	<Ref. to EN(H4DOTC 2.5)-205, DTC P1096 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1097	Tumble Generated Valve Signal 2 Circuit Malfunction (Short)	<Ref. to EN(H4DOTC 2.5)-207, DTC P1097 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (SHORT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1110	Atmospheric Pressure Sensor Circuit Malfunction (Low Input)	<Ref. to EN(H4DOTC 2.5)-209, DTC P1110 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1111	Atmospheric Pressure Sensor Circuit Malfunction (High Input)	<Ref. to EN(H4DOTC 2.5)-209, DTC P1111 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1160	Return Spring Failure	<Ref. to EN(H4DOTC 2.5)-209, DTC P1160 RETURN SPRING FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1518	Starter Switch Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-210, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1544	Exhaust Gas Temperature Too High	<Ref. to EN(H4DOTC 2.5)-212, DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1560	Back-Up Voltage Circuit Malfunction	<Ref. to EN(H4DOTC 2.5)-214, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1570	ANTENNA	<Ref. to IM-21, DTC P1570 ANTENNA, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1571	Reference Code Incompatibility	<Ref. to IM-15, DTC P1571 REFERENCE CODE INCOMPATIBILITY, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1572	IMM Circuit Failure (Except Antenna Circuit)	<Ref. to IM-16, DTC P1572 IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT), Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1574	Key Communication Failure	<Ref. to IM-19, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1576	EGI Control Module EEPROM	<Ref. to IM-20, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1577	IMM Control Module EEPROM	<Ref. to IM-20, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P2088	OCV Solenoid Valve Signal A Circuit Open (Bank 1)	<Ref. to EN(H4DOTC 2.5)-216, DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2089	OCV Solenoid Valve Signal A Circuit Short (Bank 1)	<Ref. to EN(H4DOTC 2.5)-218, DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2092	OCV Solenoid Valve Signal A Circuit Open (Bank 2)	<Ref. to EN(H4DOTC 2.5)-220, DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2093	OCV Solenoid Valve Signal A Circuit Short (Bank 2)	<Ref. to EN(H4DOTC 2.5)-222, DTC P2093 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P2101	Throttle Actuator Control Motor Circuit Range/Performance	<Ref. to EN(H4DOTC 2.5)-224, 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(H4DOTC 2.5)-231, 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(H4DOTC 2.5)-234, 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(H4DOTC 2.5)-235, DTC P2109 THROTTLE/PEDAL POSITION SENSOR A MINIMUM STOP PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2122	Throttle/Pedal Position Sensor/Switch "D" Circuit Low Input	<Ref. to EN(H4DOTC 2.5)-236, 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(H4DOTC 2.5)-239, 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(H4DOTC 2.5)-242, 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(H4DOTC 2.5)-245, 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 Rationality	<Ref. to EN(H4DOTC 2.5)-248, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE RATIONALITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2138	Throttle/Pedal Position Sensor/Switch "D"/"E" Voltage Rationality	<Ref. to EN(H4DOTC 2.5)-253, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE RATIONALITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

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

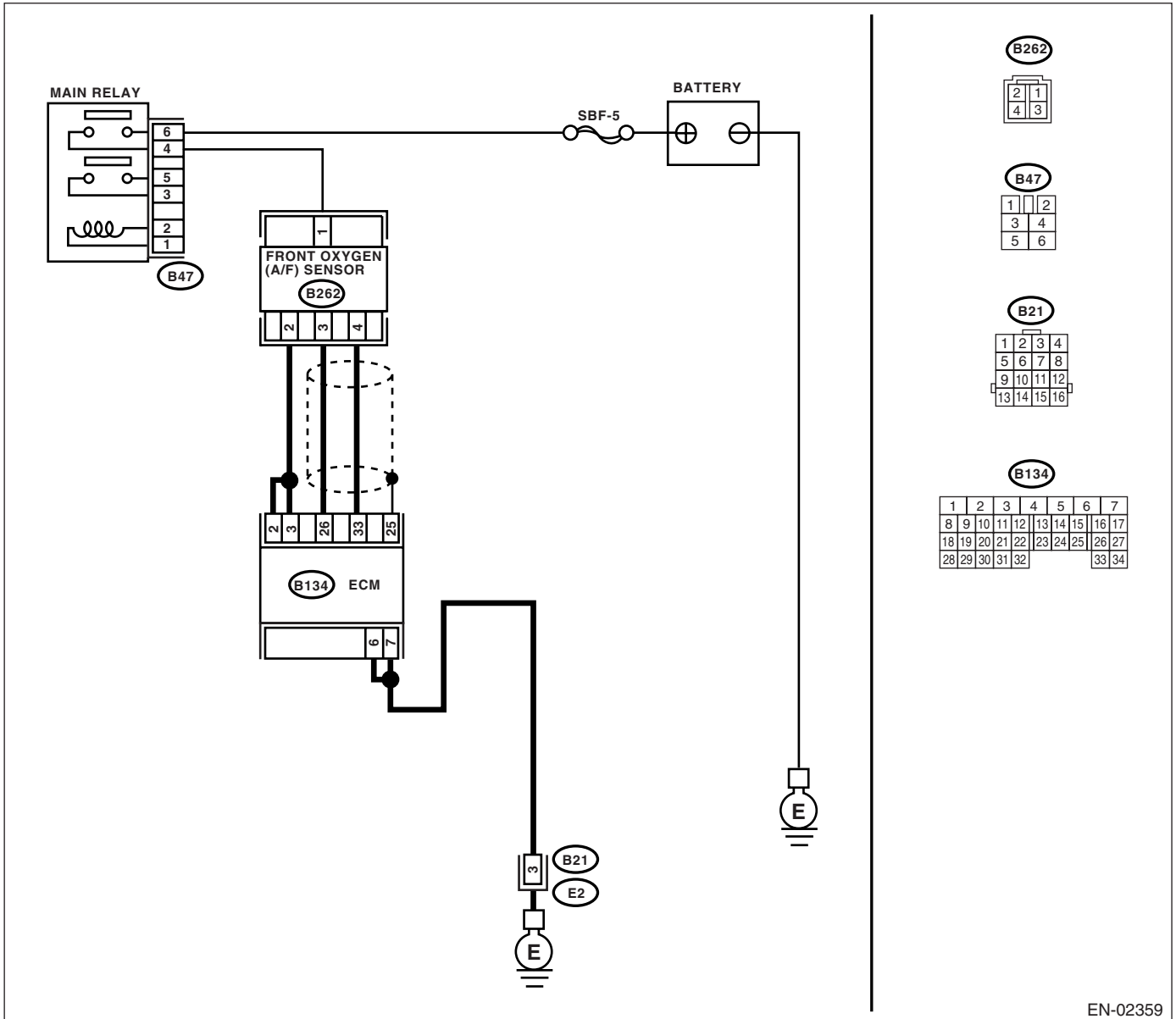
#### DTC DETECTING CONDITION:

Immediately at fault recognition.

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

#### WIRING DIAGRAM:



EN-02359

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.</b></p> <p>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> <p><b>Connector &amp; terminal</b>  <b>(B262) No. 1 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 2.	Repair the power supply line. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between main relay and front oxygen (A/F) sensor connector</li> <li>• Poor contact in front oxygen (A/F) sensor connector</li> <li>• Poor contact in main relay connector</li> </ul>
<p><b>2 CHECK GROUND CIRCUIT FOR ECM.</b></p> <p>Measure the resistance of harness between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B134) No. 6 — Chassis ground:</b>  <b>(B134) No. 7 — Chassis ground:</b></p>	Is the resistance less than 5 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine ground cable</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>3 CHECK CURRENT DATA.</b></p> <p>1) Start the engine.                      2) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:                      • Subaru Select Monitor                      For detailed operation procedure, refer to “READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE”. &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;                      • OBD-II general scan tool                      For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	Is the current more than 0.2 A?	Repair poor contact connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in front oxygen (A/F) sensor connector</li> <li>• Poor contact in ECM connector.</li> </ul>	Go to step 4.
<p><b>4 CHECK OUTPUT SIGNAL FROM ECM.</b></p> <p>1) Start and idle the engine.                      2) Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B134) No. 2 (+) — Chassis ground (-):</b>  <b>(B134) No. 3 (+) — Chassis ground (-):</b></p>	Is the voltage less than 1 V?	Go to step 6.	Go to step 5.
<p><b>5 CHECK OUTPUT SIGNAL FROM ECM.</b></p> <p>Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B134) No. 2 (+) — Chassis ground (-):</b>  <b>(B134) No. 3 (+) — Chassis ground (-):</b></p>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair the poor contact in ECM connector.	Go to step 6.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b>    <b>CHECK FRONT OXYGEN (A/F) SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between front oxygen (A/F) sensor connector terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance less than 10 <math>\Omega</math>?</p>	<p>Repair the harness and connector. <b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"><li>• Open or ground short circuit in harness between front oxygen (A/F) sensor and ECM connector</li><li>• Poor contact in front oxygen (A/F) sensor connector</li><li>• Poor contact in ECM connector.</li></ul>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4DOTC 2.5)-36, Front Oxygen (A/F) Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

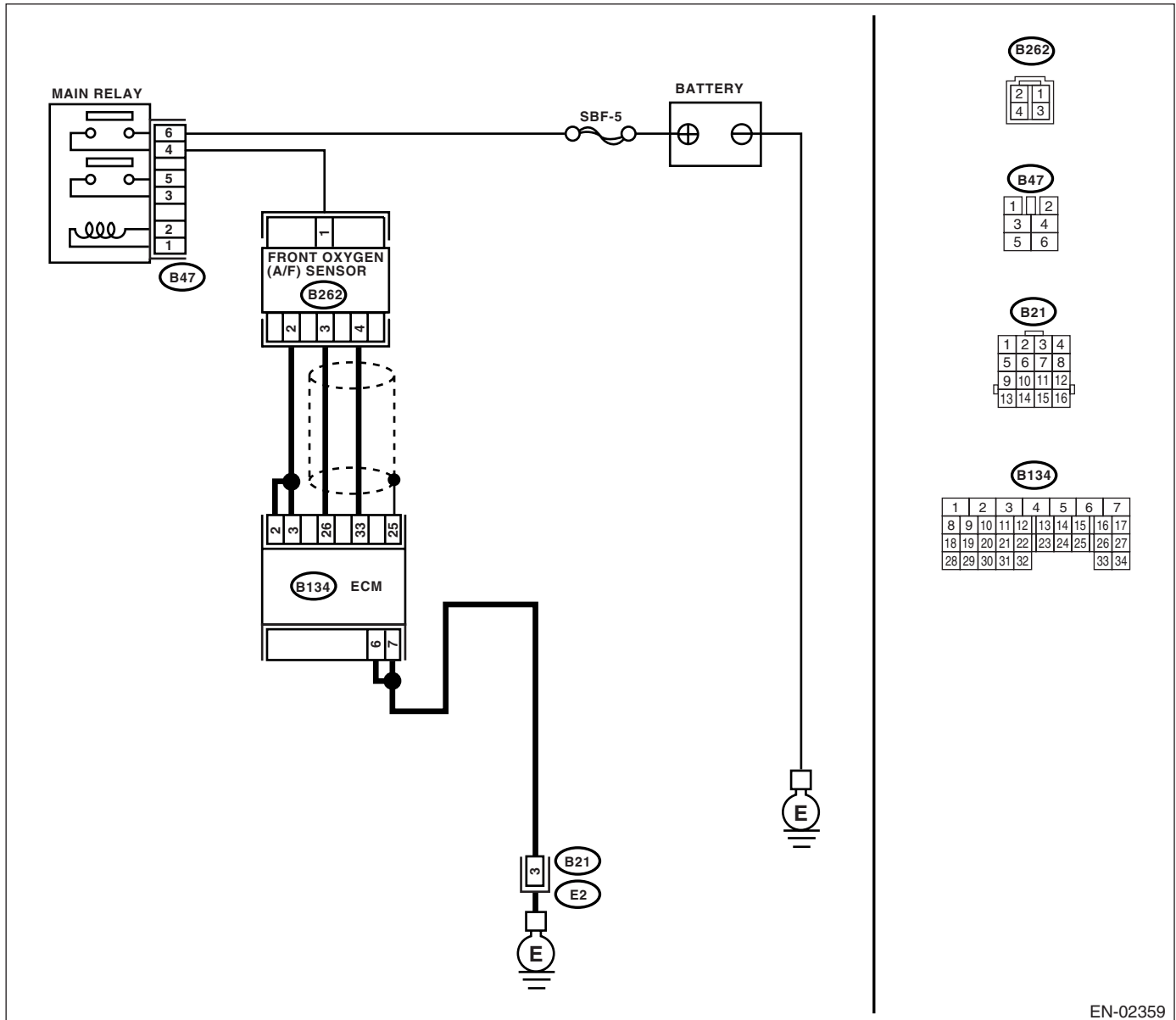
### DTC DETECTING CONDITION:

Detect as soon as the malfunction occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 2 (+) — Chassis ground (-):</i> <i>(B134) No. 3 (+) — Chassis ground (-):</i>	Is the voltage more than 8 V?	Go to step 3.	Go to step 2.
<b>2</b> <b>CHECK FRONT OXYGEN (A/F) SENSOR HEATER CURRENT.</b> 1) Turn the ignition switch to OFF. 2) Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. 3) Turn the ignition switch to ON. 4) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool. <b>NOTE:</b> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the current more than 2.3 A?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	END.
<b>3</b> <b>CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 2 (+) — Chassis ground (-):</i> <i>(B134) No. 3 (+) — Chassis ground (-):</i>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.	END.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

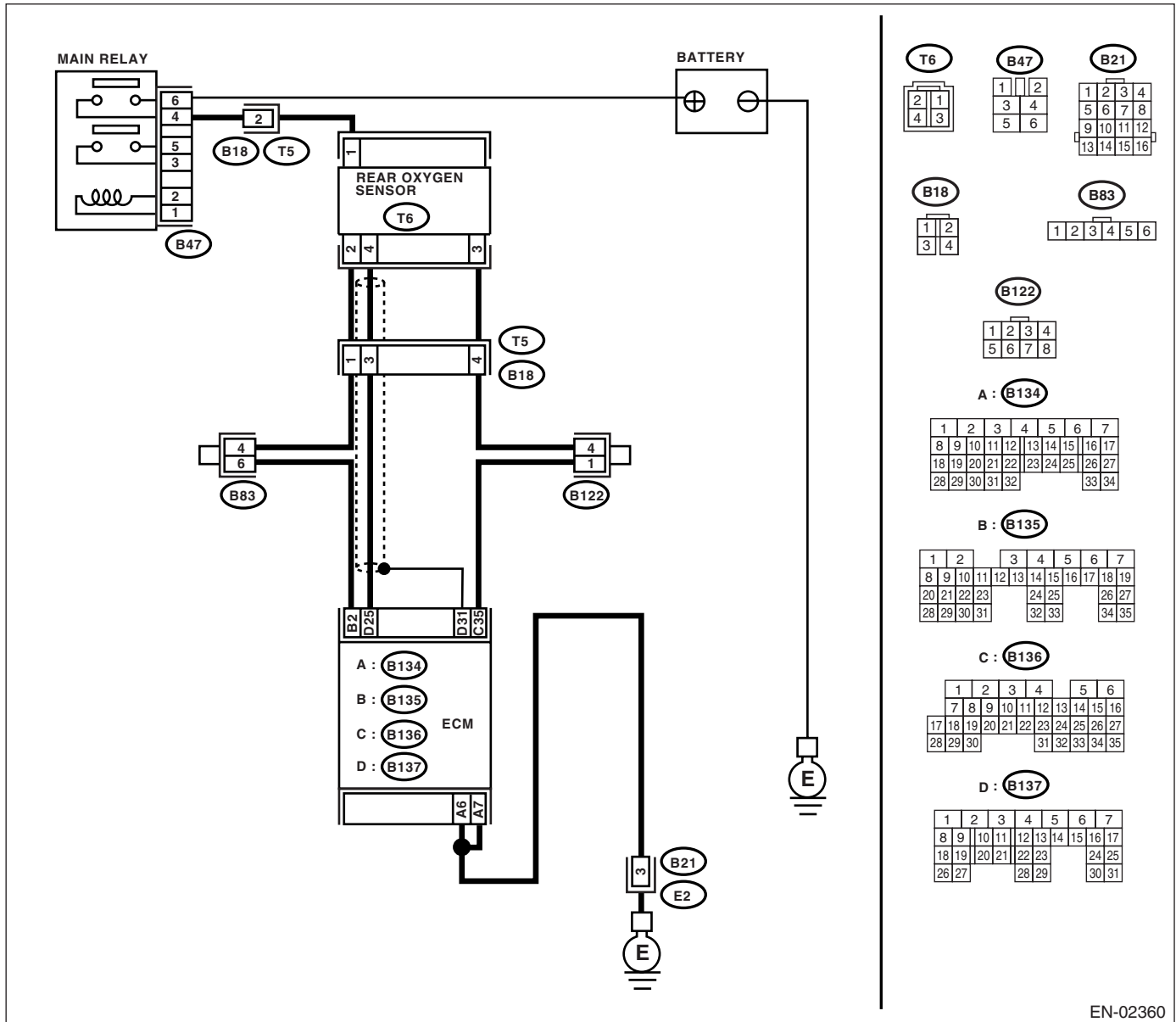
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02360

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK GROUND CIRCUIT FOR ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 6 — Chassis ground:</b> <b>(B134) No. 7 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 2.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine ground cable</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<b>2 CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of rear oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool.  NOTE: <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the current more than 0.2 A?	Repair the connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in rear oxygen sensor connecting harness connector</li> <li>• Poor contact in ECM connector.</li> </ul>	Go to step 3.
<b>3 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Start and idle the engine. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 2 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 6.	Go to step 4.
<b>4 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 2 (+) — Chassis ground (-):</b>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair the poor contact in ECM connector.	Go to step 5.
<b>5 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 2 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Repair battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.</b></p> <p>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.</p> <p><b>Connector &amp; terminal</b>  <b>(B18) No. 2 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Repair the power supply line.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between main relay and rear oxygen sensor connector</li> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK REAR OXYGEN SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance between rear oxygen sensor connector terminals.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	<p>Is the resistance less than 30 <math>\Omega</math>?</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between rear oxygen sensor and ECM connector</li> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in ECM connector</li> <li>• Poor contact in coupling connector</li> </ul>	<p>Replace the rear oxygen sensor.</p> <p>&lt;Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

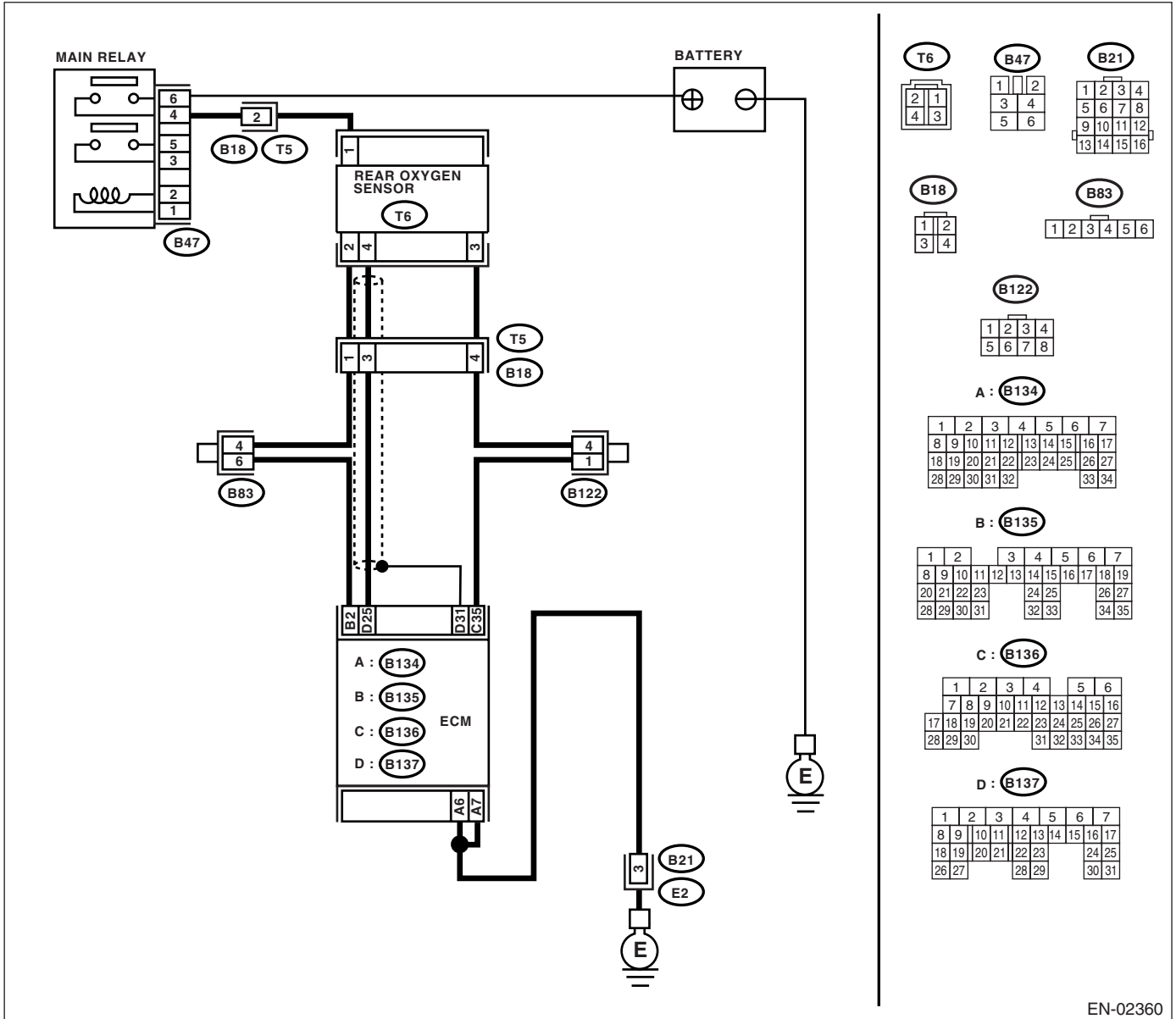
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02360

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 2 (+) — Chassis ground (-):</b>	Is the voltage more than 8 V?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK CURRENT DATA.</b> 1) Repair battery short circuit in harness between ECM and rear oxygen sensor connector. 2) Turn the ignition switch to ON. 3) Read the data of rear oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool. <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the current more than 7 A?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	END.
<b>3</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	END.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## E: DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT

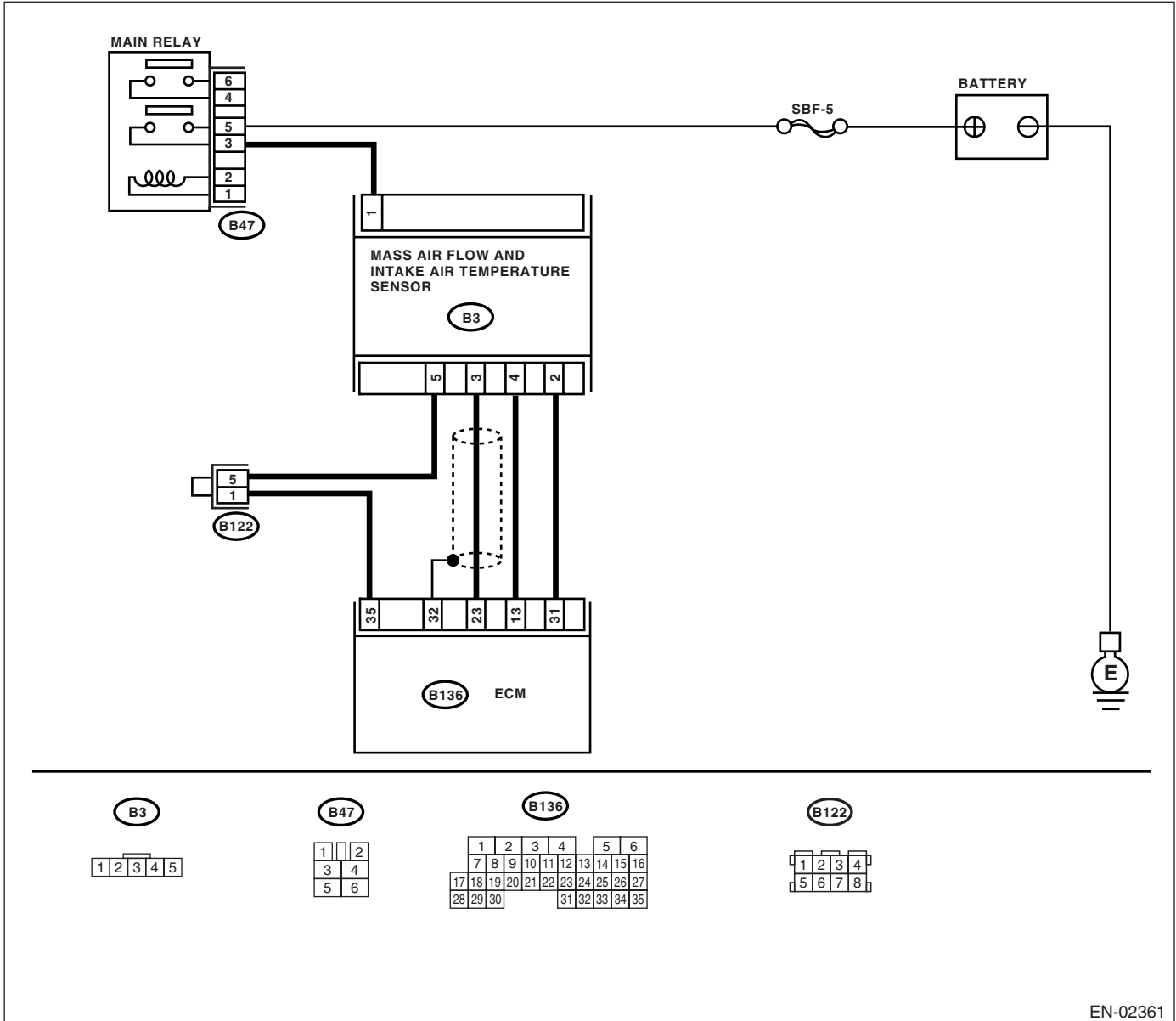
### DTC DETECTING CONDITION:

Immediately at fault recognition

### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### WIRING DIAGRAM:



EN-02361

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.                      3) Turn the ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON.                      4) Start the engine.                      5) Connect the Subaru Select Monitor or OBD-II general scan tool, and read the mass air flow sensor voltage.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</li> <li>• OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</li> </ul>	Is the voltage 0.2 — 4.7 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor.	Go to step 2.
<p><b>2 CHECK INPUT SIGNAL FROM ECM.</b></p> <p>Measure the voltage between ECM connector and chassis ground while engine is idling.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 23 (+) — Chassis ground (-):</b></p>	Is the voltage more than 0.2 V?	Go to step 4.	Go to step 3.
<p><b>3 CHECK INPUT SIGNAL FOR ECM (WITH SUBARU SELECT MONITOR).</b></p> <p>Measure the voltage between ECM connector and chassis ground while engine is idling.</p>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair the poor contact in ECM connector.	Contact the SUBARU dealer.  <b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<p><b>4 CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from mass air flow sensor.                      3) Turn the ignition switch to ON.                      4) Measure voltage between mass air flow sensor connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B3) No. 1 (+) — Chassis ground (-):</b></p>	Is the voltage more than 5 V?	Go to step 5.	Repair open circuit between mass air flow sensor and main relay
<p><b>5 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Measure the resistance of harness between ECM and mass air flow sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 23 — (B3) No. 3:</b>  <b>(B136) No. 31 — (B3) No. 2:</b>  <b>(B136) No. 35 — (B3) No. 5:</b></p>	Is the resistance less than 1 Ω?	Go to step 6.	Repair open circuit between ECM and mass air flow sensor connector.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 23 — Chassis ground:</b></i> <i><b>(B136) No. 31 — Chassis ground:</b></i> <i><b>(B136) No. 35 — Chassis ground:</b></i>	Is the resistance more than 1 MΩ?	Go to step 7.	Repair ground short circuit between ECM and mass air flow sensor connector.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact in mass air flow sensor connector.	Is there poor contact in mass air flow sensor connector?	Repair poor contact in mass air flow sensor connector.	Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC 2.5)-30, Mass Air Flow and Intake Air Temperature Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## F: DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT

### DTC DETECTING CONDITION:

Immediately at fault recognition

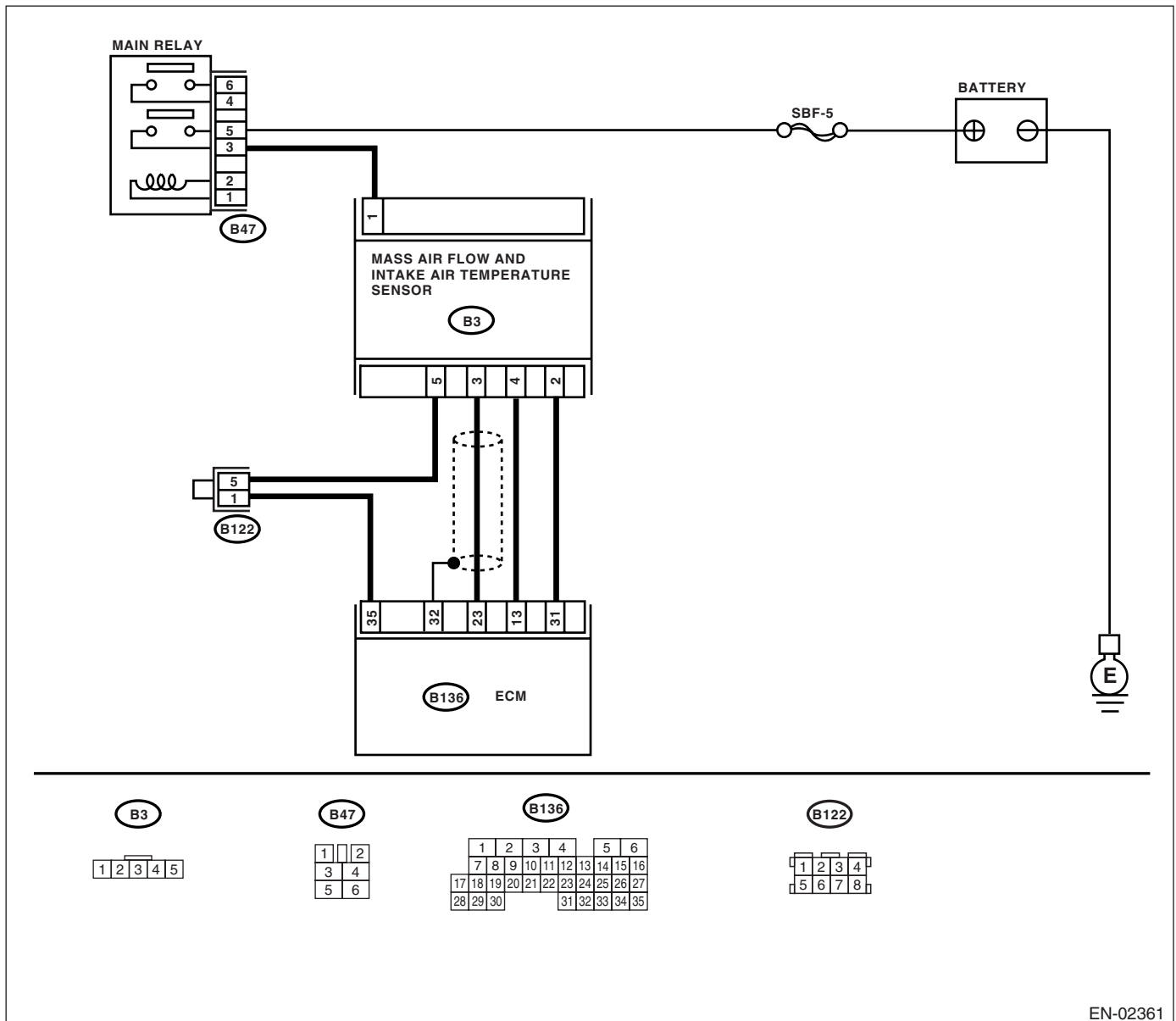
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02361

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.                      3) Turn the ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON.                      4) Start the engine.                      5) Connect the Subaru Select Monitor or OBD-II general scan tool, and read the mass air flow sensor voltage.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor                              For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</li> <li>• OBD-II general scan tool                              For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</li> </ul>	Is the voltage 0.2 — 4.7 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 2.
<p><b>2 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from mass air flow sensor.                      3) Turn the ignition switch to ON.                      4) Measure voltage between mass air flow sensor connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B3) No. 3 (+) — Chassis ground (-):</b></p>	Is the voltage more than 5 V?	Repair battery short circuit in harness between mass air flow sensor connector and ECM connector.	Go to step 3.
<p><b>3 CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Measure the resistance of harness between ECM connector and mass air flow sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B3) No. 2 — (B136) No. 31:</b></p>	Is the resistance less than 1 $\Omega$ ?	Replace the mass air flow sensor. <Ref. to FU(H4DOTC 2.5)-30, Mass Air Flow and Intake Air Temperature Sensor.>	Repair open circuit in harness between mass air flow sensor connector and ECM connector.

## G: DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT

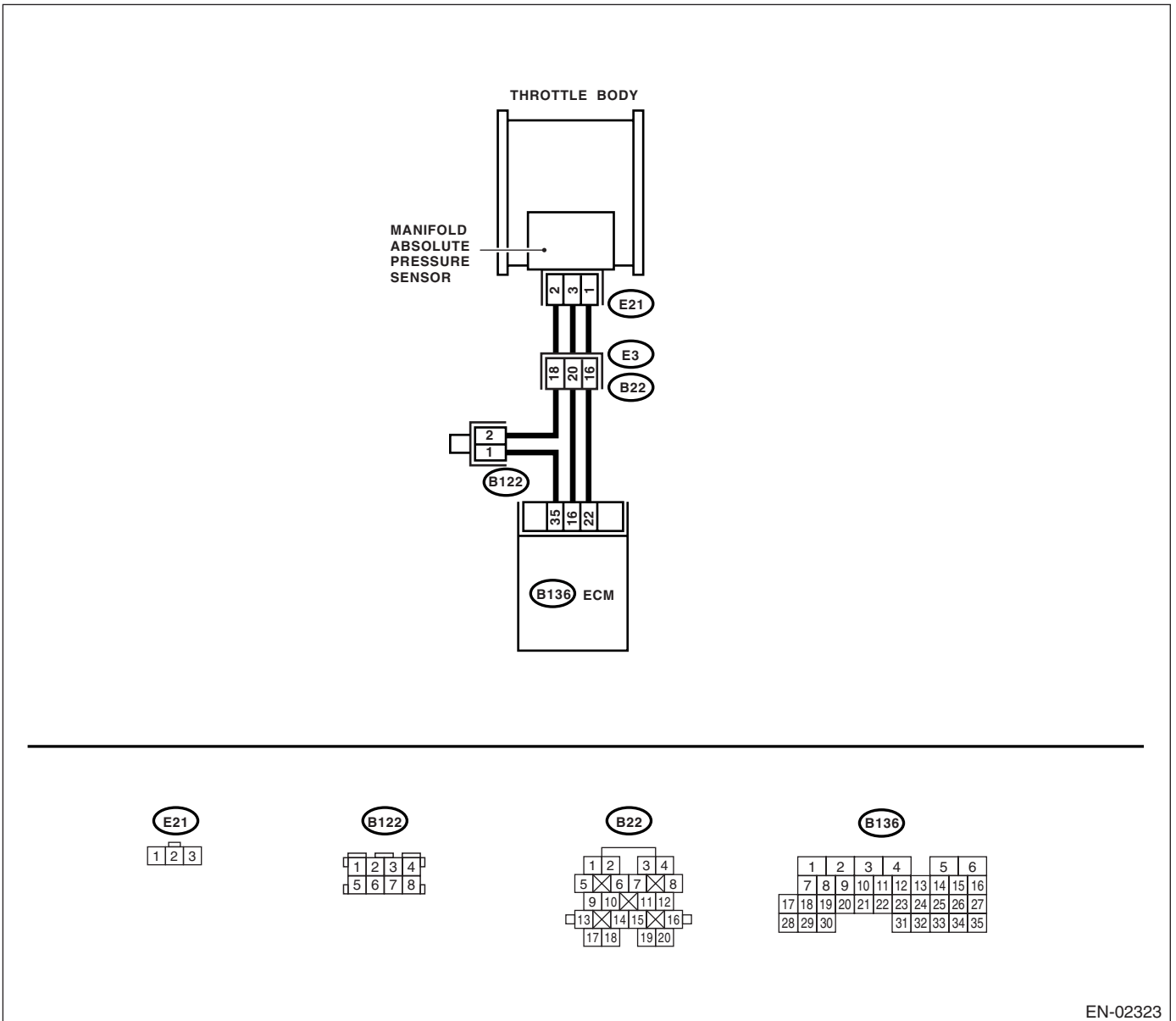
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



	Step	Check	Yes	No
1	<b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 3.	Go to step 2.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>2</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair the poor contact in ECM connector.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>3</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 22 (+) — Chassis ground (-):</i>	Is the voltage less than 0.7 V?	Go to step 4.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. <i>Connector &amp; terminal</i> <i>(E21) No. 3 (+) — Engine ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 5.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector &amp; terminal</i> <i>(B136) No. 35 — (E21) No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground. <i>Connector &amp; terminal</i> <i>(E21) No. 1 — Engine ground:</i>	Is the resistance more than 1 $M\Omega$ ?	Go to step 7.	Repair the ground short circuit in harness between ECM and manifold absolute pressure sensor connector.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact in manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair poor contact in manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC 2.5)-31, Manifold Absolute Pressure Sensor.>

## H: DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT

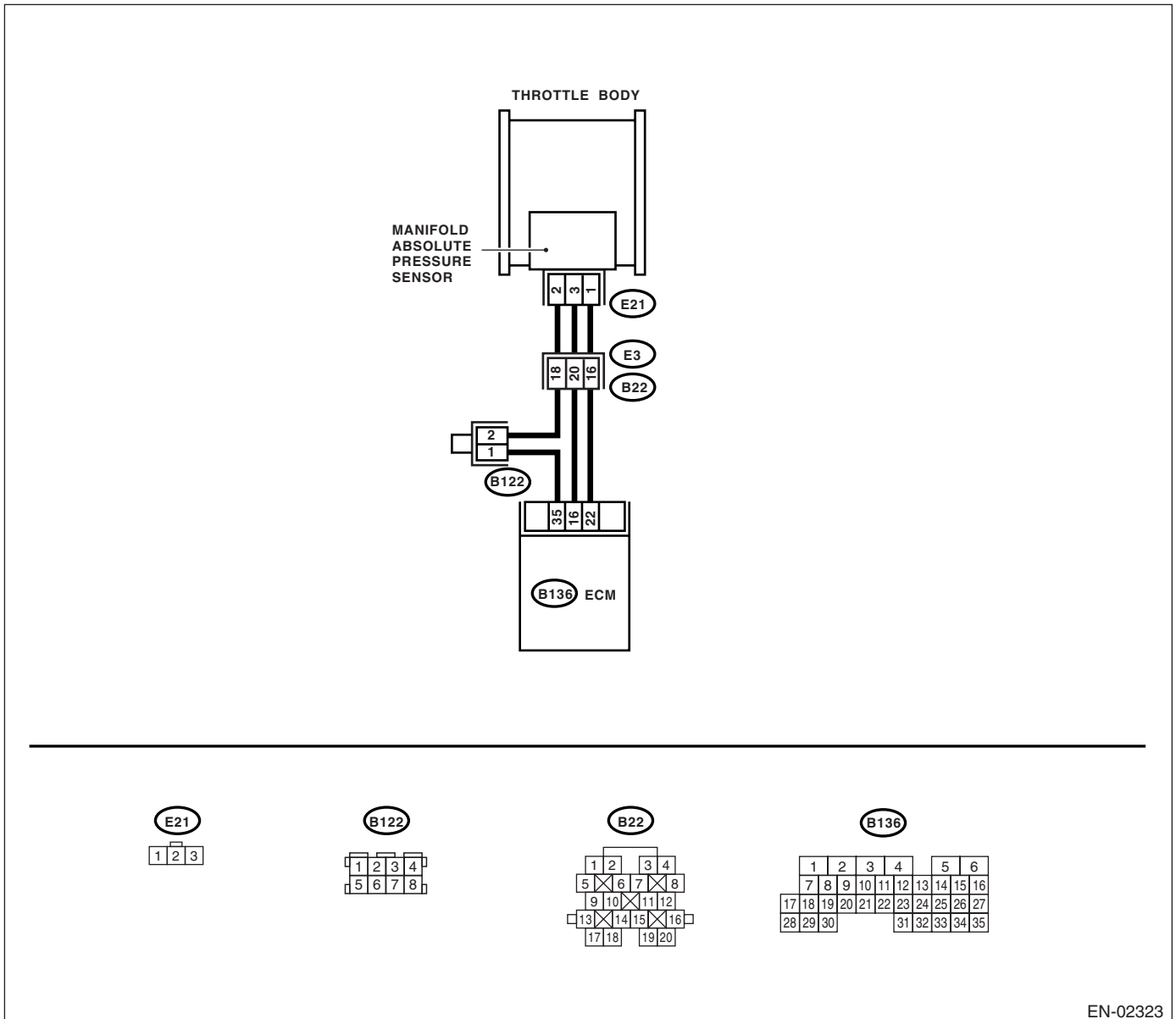
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



Step	Check	Yes	No
<b>1</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 3.	Go to step 2.



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair the poor contact in ECM connector.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>3 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 22 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 4.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. <i>Connector &amp; terminal</i> <i>(E21) No. 3 (+) — Engine ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 5.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
<b>5 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector &amp; terminal</i> <i>(B136) No. 22 — (E21) No. 1:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
<b>6 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. <i>Connector &amp; terminal</i> <i>(B136) No. 35 — (E21) No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 7.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.
<b>7 CHECK POOR CONTACT.</b> Check poor contact in manifold absolute pressure sensor connector.	Is there poor contact in manifold absolute pressure sensor connector?	Repair poor contact in manifold absolute pressure sensor connector.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC 2.5)-31, Manifold Absolute Pressure Sensor.>

## I: DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT

### DTC DETECTING CONDITION:

Immediately at fault recognition

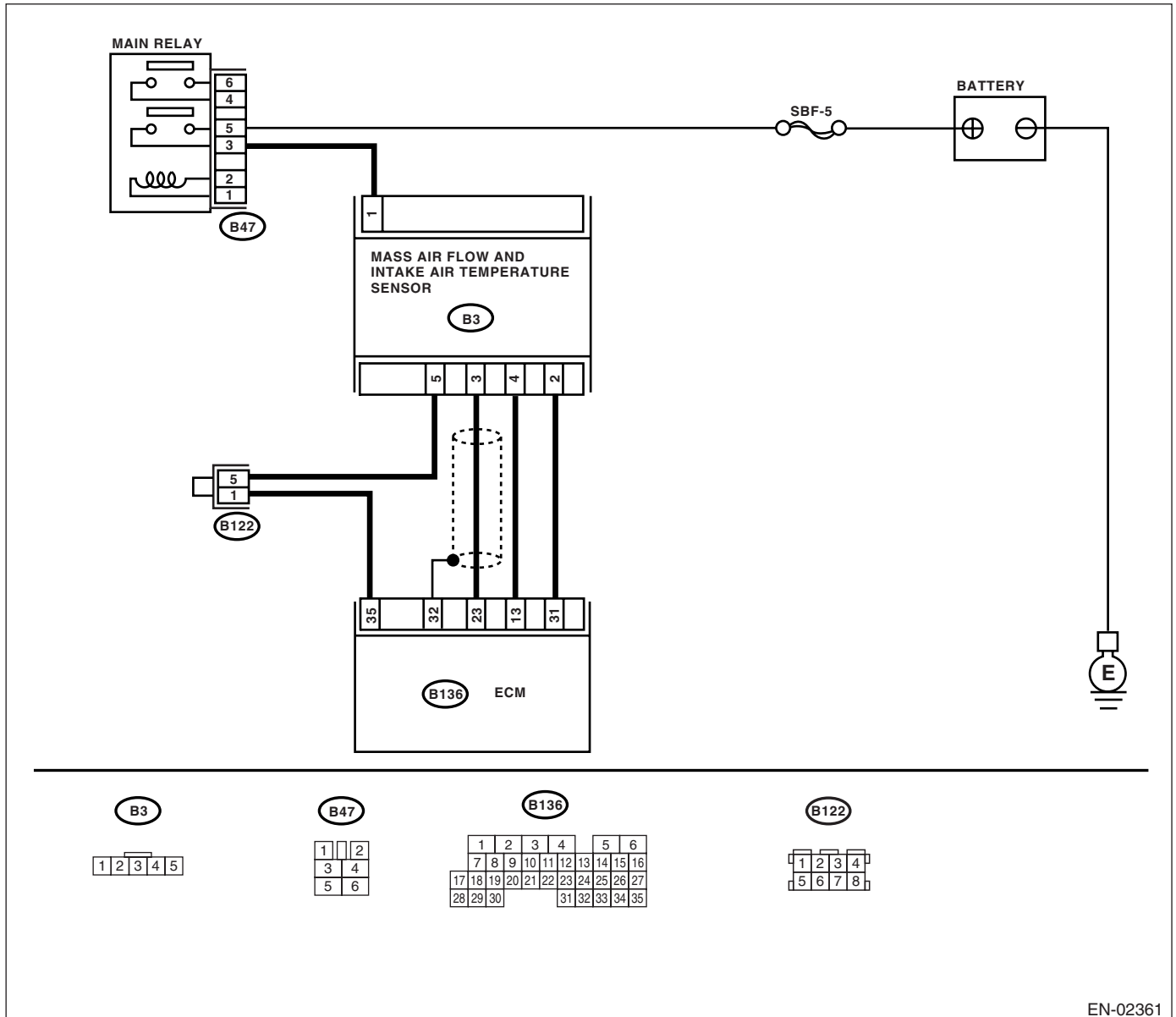
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02361

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is engine coolant temperature more than 55°C (131°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from mass air flow and intake air temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the value less than -36°C (-33°F)?</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-30, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>	<p>Repair ground short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.</p>

## J: DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT

### DTC DETECTING CONDITION:

Immediately at fault recognition

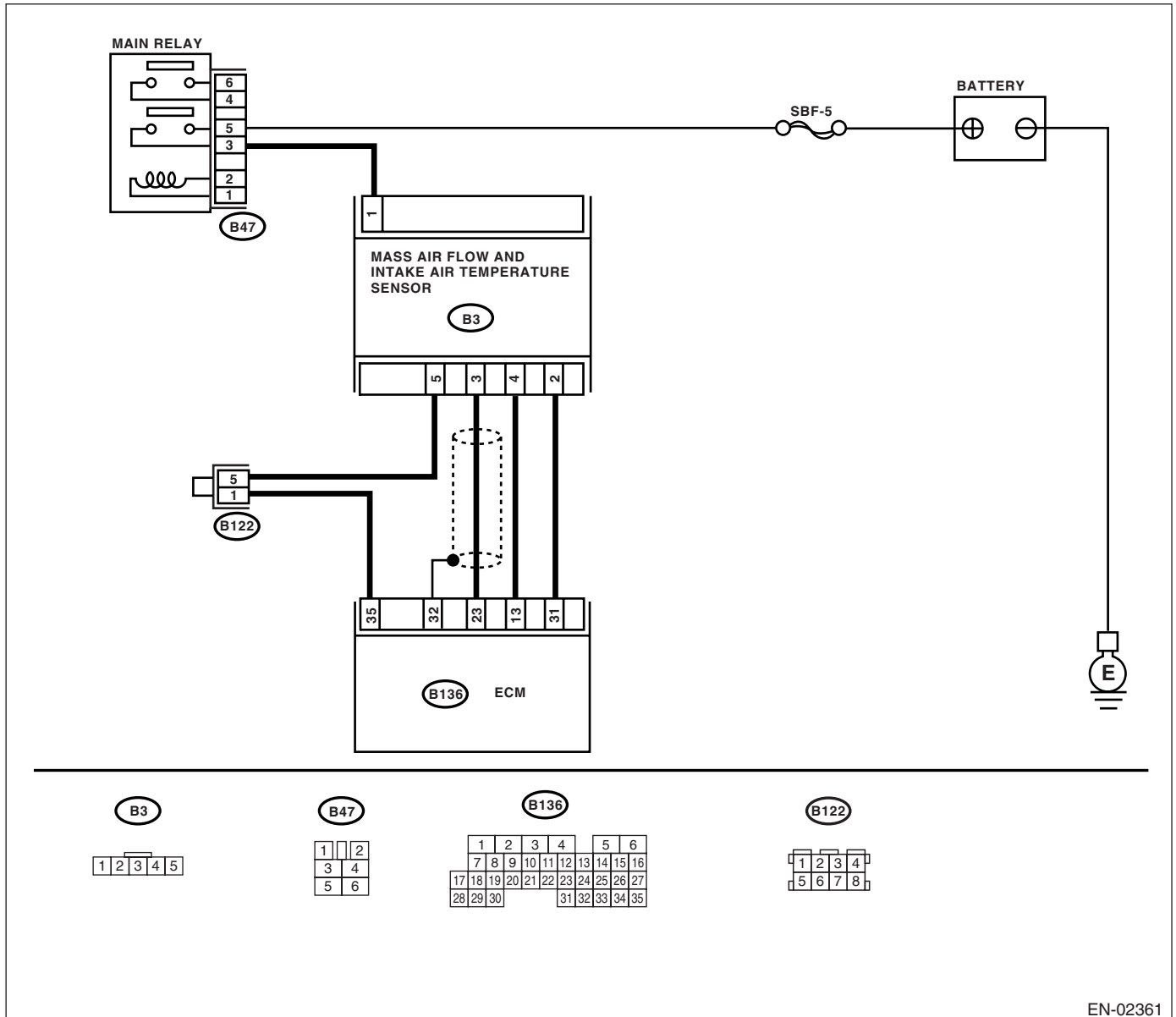
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02361

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the value less than <math>-36^{\circ}\text{C}</math> (<math>-33^{\circ}\text{F}</math>)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from mass air flow and intake air temperature sensor.</p> <p>3) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 4 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.</p>	<p>Go to step 3.</p>
<p><b>3 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 4 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair the battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector.</p>	<p>Go to step 4.</p>
<p><b>4 CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between mass air flow and intake air temperature sensor and manifold absolute pressure sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 4 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector</li> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between mass air flow and intake air temperature sensor and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B3) No. 5 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-30, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector</li> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## K: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT

### DTC DETECTING CONDITION:

Immediately at fault recognition

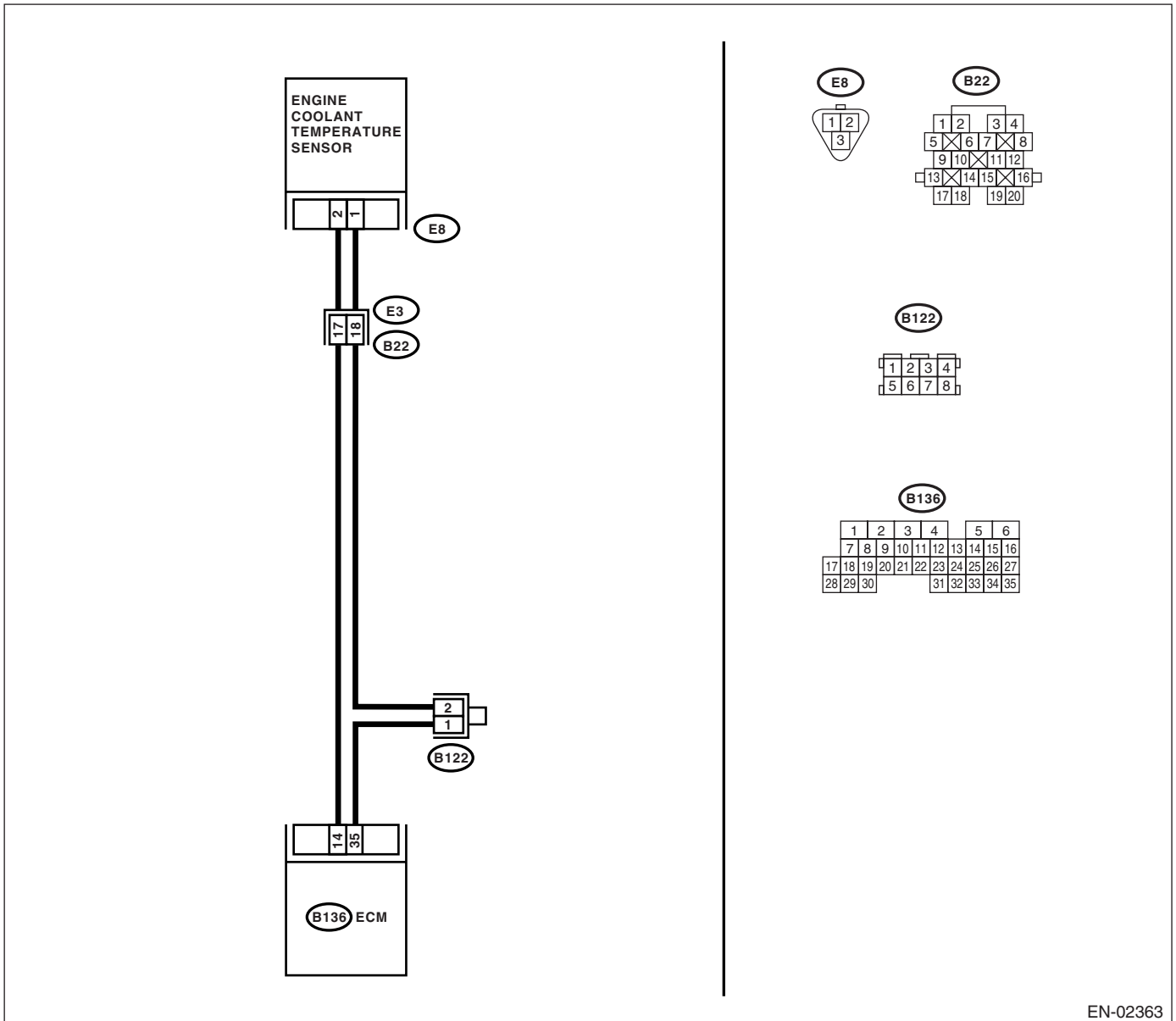
### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is engine coolant temperature more than 120°C (248°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in engine coolant temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the engine coolant temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the temperature more than -40°C (-40°F)?</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-26, Engine Coolant Temperature Sensor.&gt;</p>	<p>Repair ground short circuit in harness between engine coolant temperature sensor and ECM connector.</p>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## L: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT

### DTC DETECTING CONDITION:

Immediately at fault recognition

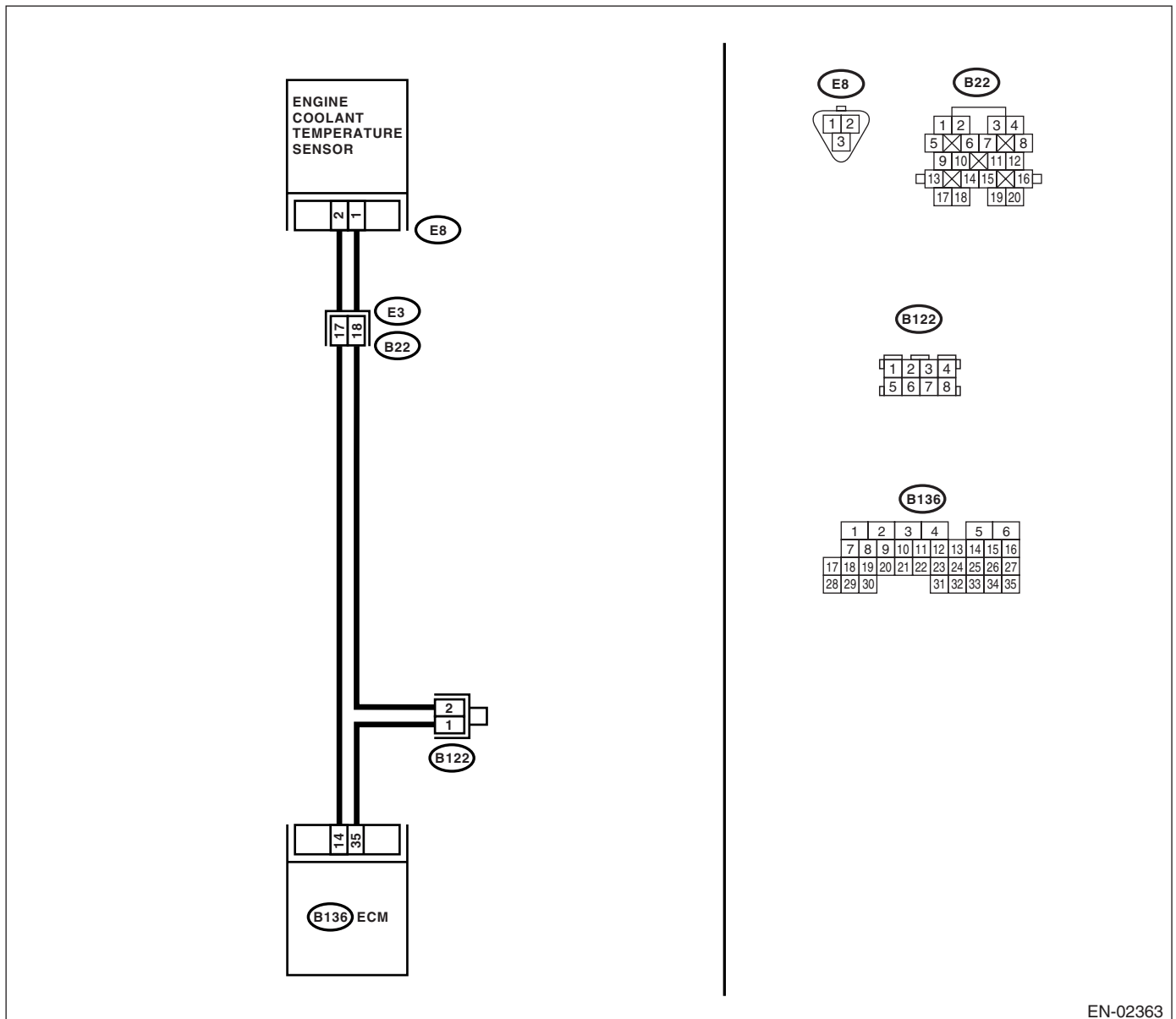
### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02363

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the value less than <math>-40^{\circ}\text{C}</math> (<math>-40^{\circ}\text{F}</math>)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in engine coolant temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the engine coolant temperature sensor.</p> <p>3) Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine coolant temperature sensor connector</li> <li>• Poor contact in engine coolant temperature sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 1 — Engine ground:</b></p>	<p>Is the resistance less than 5 Ω?</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-26, Engine Coolant Temperature Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine coolant temperature sensor connector</li> <li>• Poor contact in engine coolant temperature sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>

**M: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT  
LOW INPUT**

**DTC DETECTING CONDITION:**

Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

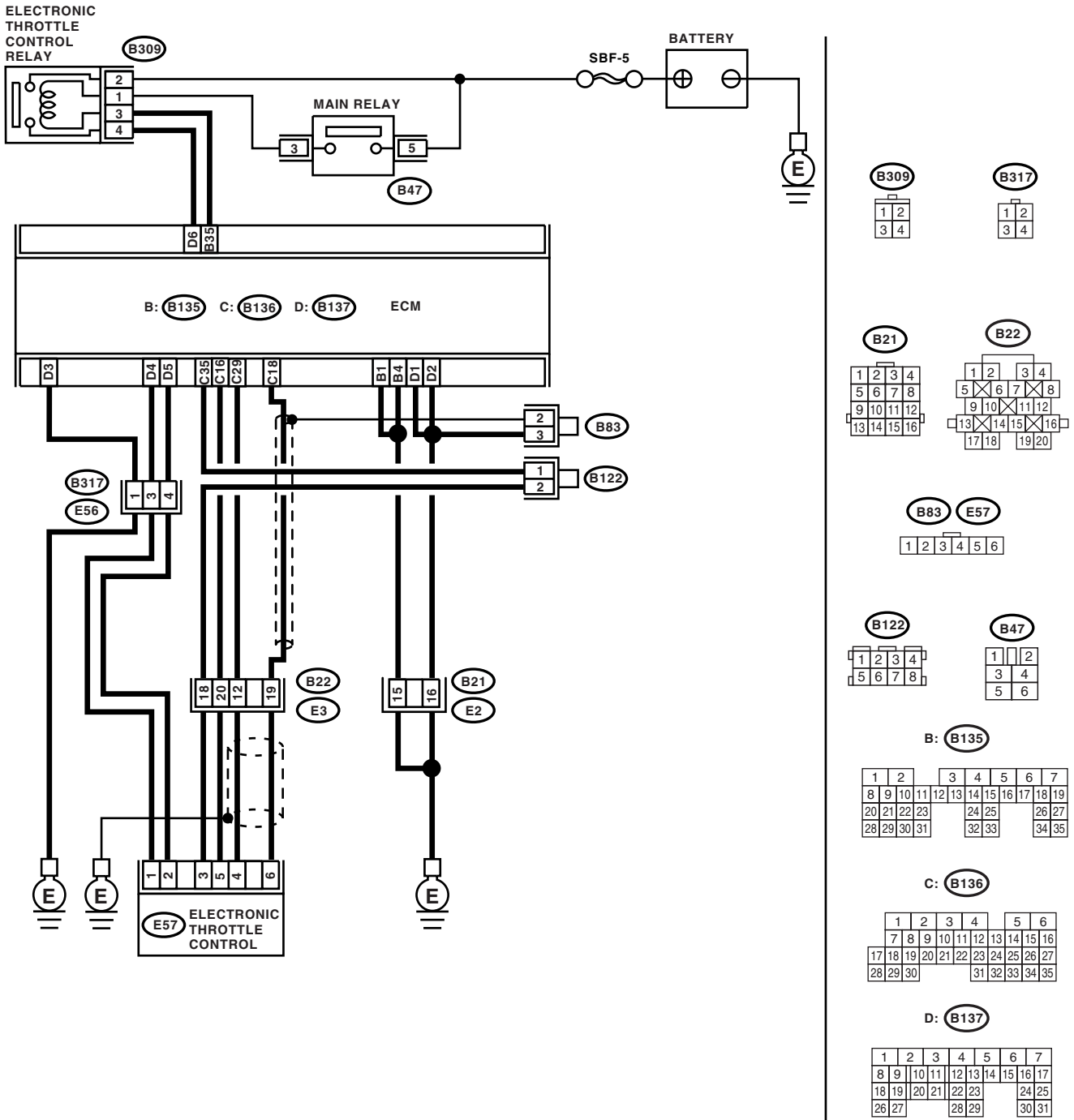
**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and terminal. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 29 (+) — (B136) No. 35 (-):</b></i> 3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact in connector between ECM and electronic throttle control?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 16 — (E57) No. 5:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 18 — Chassis ground:</b></i> <i><b>(B136) No. 16 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>6 CHECK SHORT CIRCUIT INSIDE THE ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 6 — Engine ground:</b></i>	Is the resistance more than 10 $\Omega$ ?	Repair poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **N: DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT HIGH INPUT**

#### **DTC DETECTING CONDITION:**

Immediately at fault recognition

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

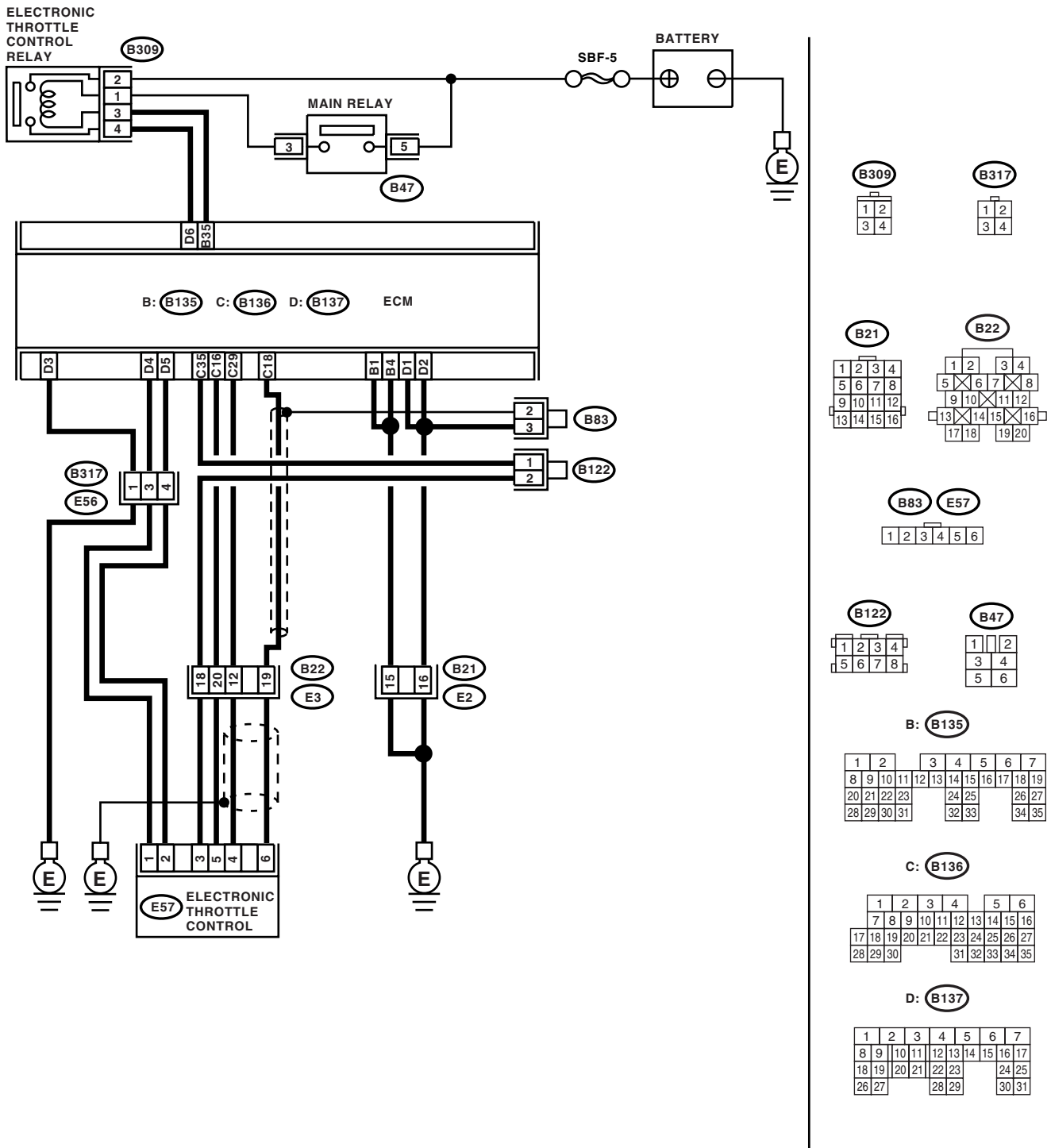
#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

Step	Check	Yes	No	
1	<p><b>CHECK SENSOR OUTPUT.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Read the data of main throttle sensor signal using Subaru Select Monitor.</p> <p>3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.</p>	Is the voltage less than 4.63 V?	Go to step 2.	Go to step 3.



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>2 CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact in connector between ECM and electronic throttle control?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i>Connector &amp; terminal</i> <i>(B136) No. 18 — (E57) No. 6:</i> <i>(B136) No. 35 — (E57) No. 3:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> <i>(E57) No. 3 — Engine ground:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> <i>(E57) No. 5 (+) — Engine ground (-):</i> 3) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage more than 10 V?	Go to step 6.	Repair battery short circuit in harness between ECM connector and electronic throttle control connector.
<b>6 CHECK SENSOR OUTPUT POWER SUPPLY.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> <i>(E57) No. 6 (+) — Engine ground (-):</i> 2) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 7.	Repair battery short circuit in harness between ECM connector and electronic throttle control connector.
<b>7 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connectors. <i>Connector &amp; terminal</i> <i>(B136) No. 18 — (B136) No. 16:</i>	Is the resistance more than 1 M $\Omega$ ?	Repair poor contact in harness. Repair the electronic throttle control.	Repair short circuit to sensor power supply.

## O: DTC P0131 O<sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1)

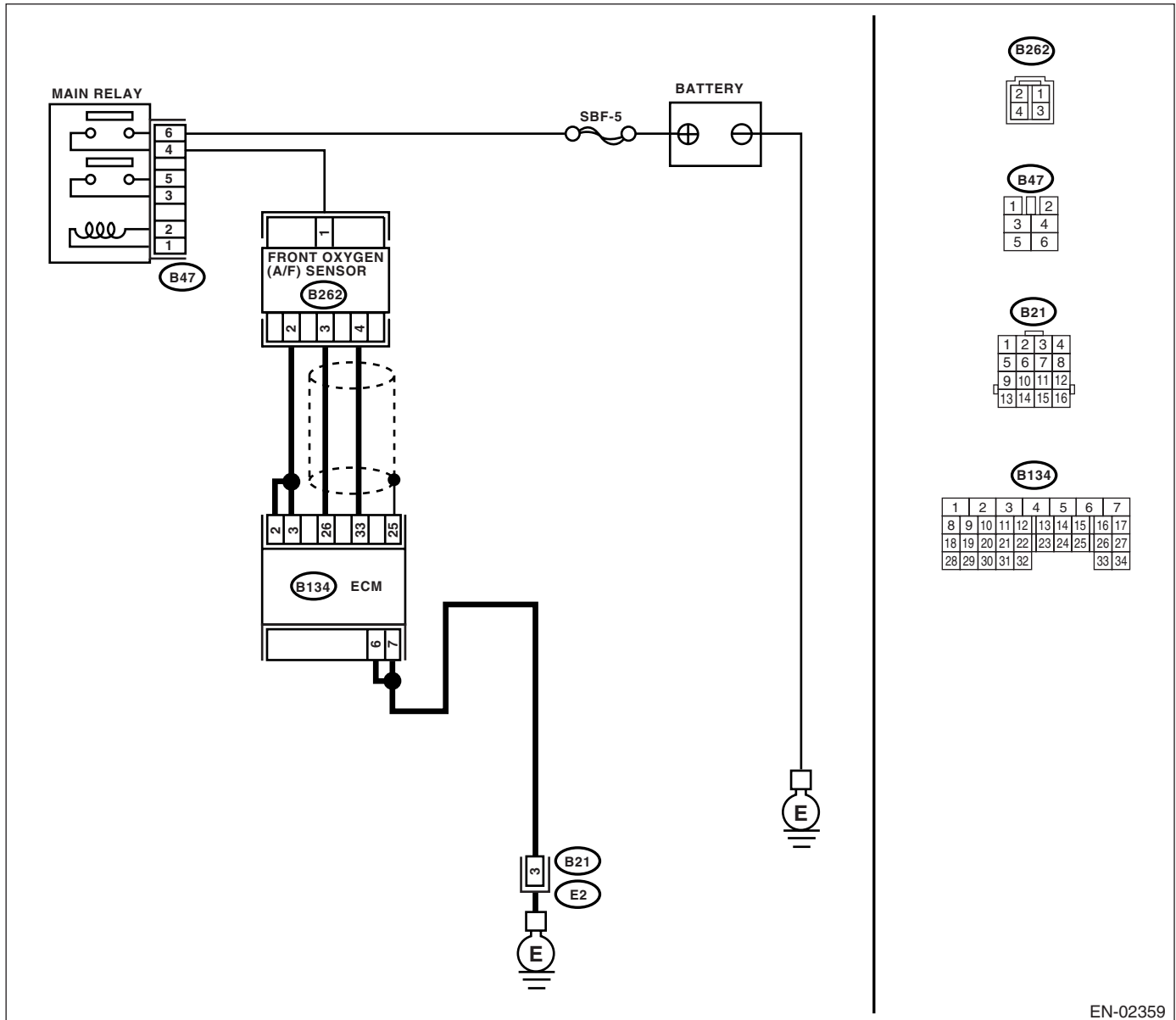
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02359

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b>    <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p><b>Connector &amp; terminal</b> <b>(B134) No. 26 — Chassis ground:</b> <b>(B134) No. 33 — Chassis ground:</b></p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4DOTC 2.5)-36, Front Oxygen (A/F) Sensor.&gt;</p>	<p>Repair ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## P: DTC P0132 O<sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1)

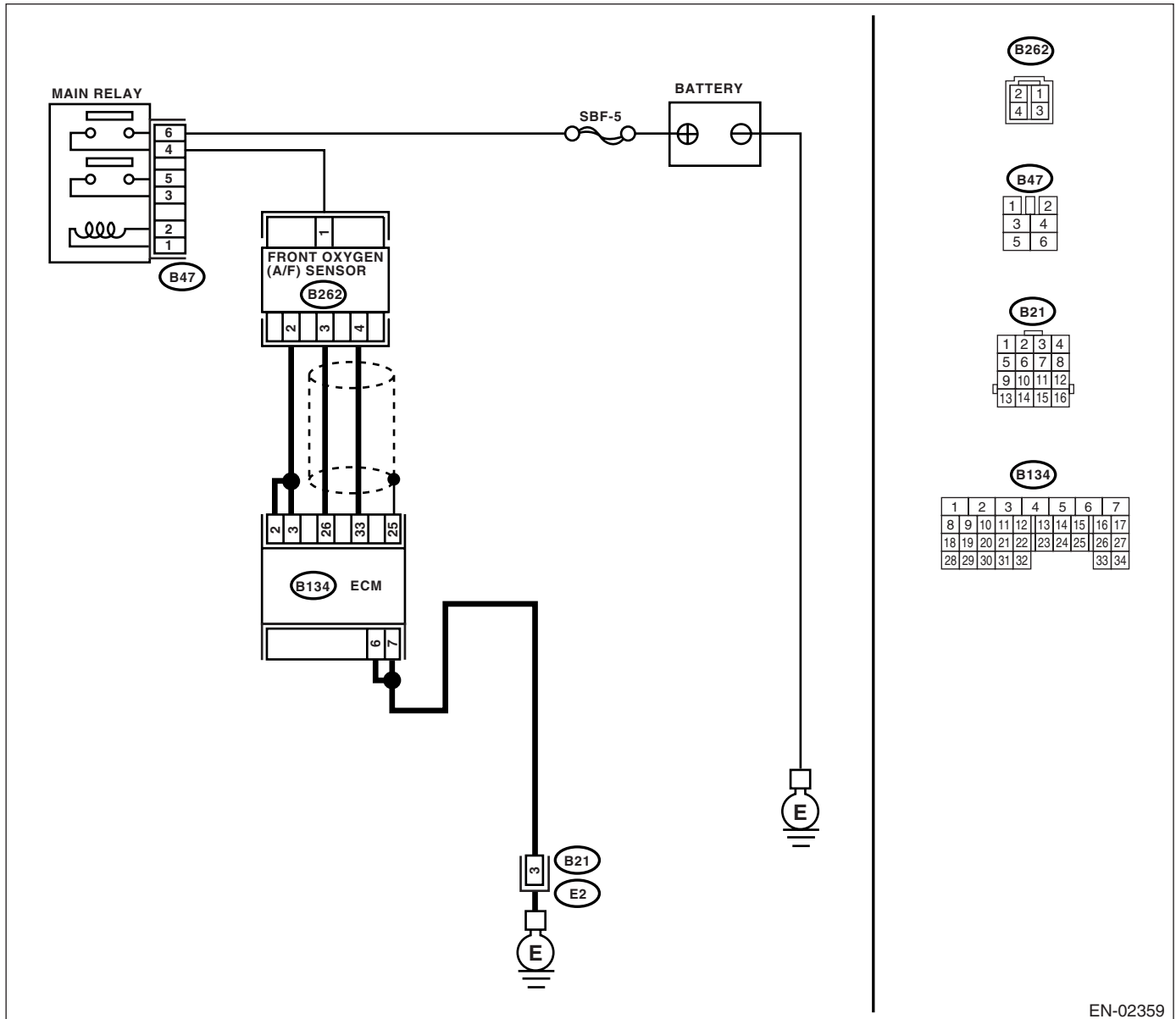
### DTC DETECTING CONDITION:

Detect as soon as the malfunction occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02359

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.                      2) Disconnect the connector from front oxygen (A/F) sensor.                      3) Measure the voltage of harness between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <i>(B134) No. 26 (+) — Chassis ground (-):</i>  <i>(B134) No. 33 (+) — Chassis ground (-):</i></p>	<p>Is the voltage more than 8 V?</p>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4DOTC 2.5)-36, Front Oxygen (A/F) Sensor.&gt;</p>	<p>Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## Q: DTC P0134 O<sub>2</sub> SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1)

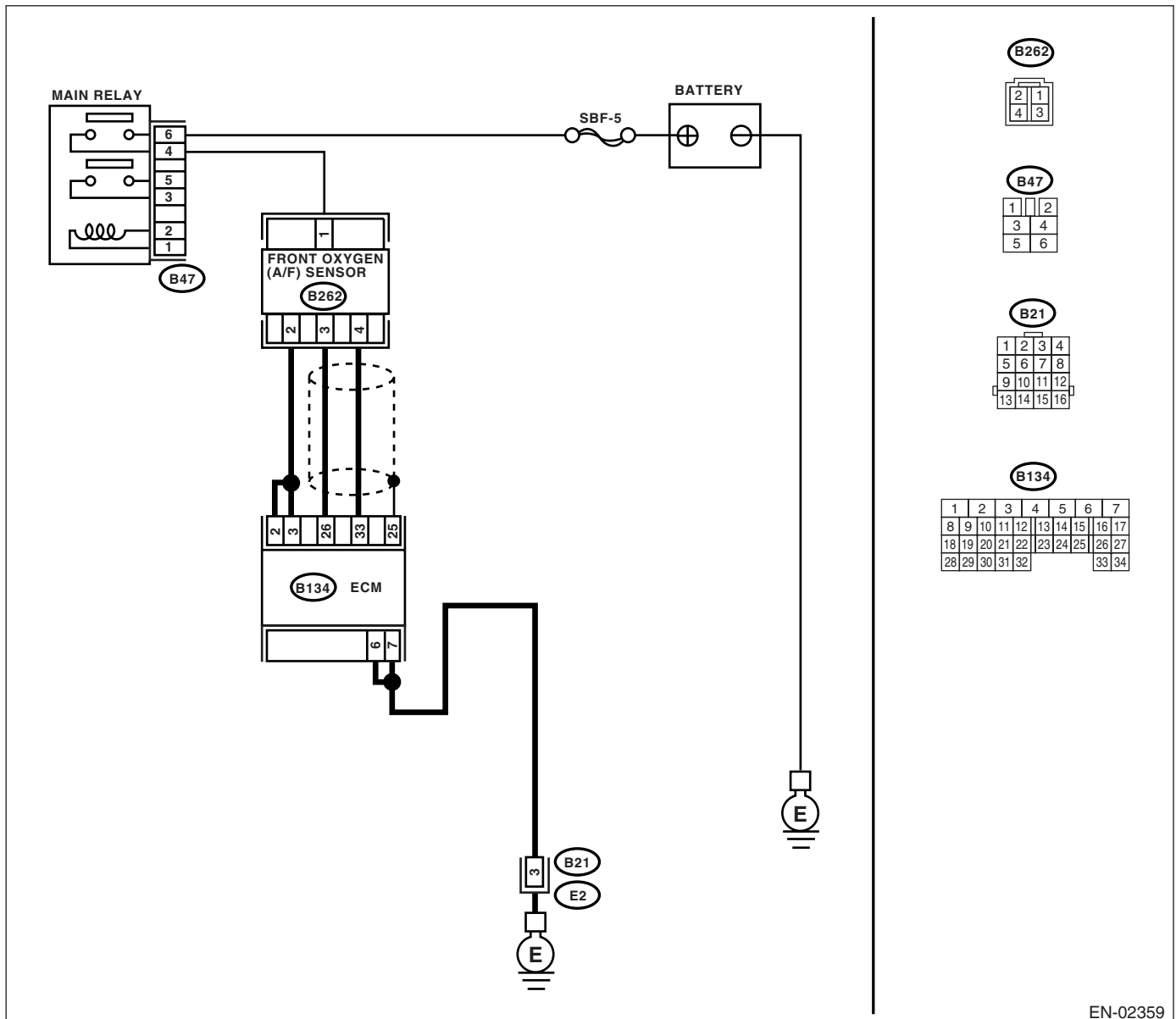
### DTC DETECTING CONDITION:

Detect as soon as the malfunction occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02359

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p><b>Connector &amp; terminal</b> <b>(B134) No. 26 — (B262) No. 3:</b> <b>(B134) No. 33 — (B262) No. 4:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4DOTC 2.5)-36, Front Oxygen (A/F) Sensor.&gt;</p>	<p>Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## R: DTC P0137 O<sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2)

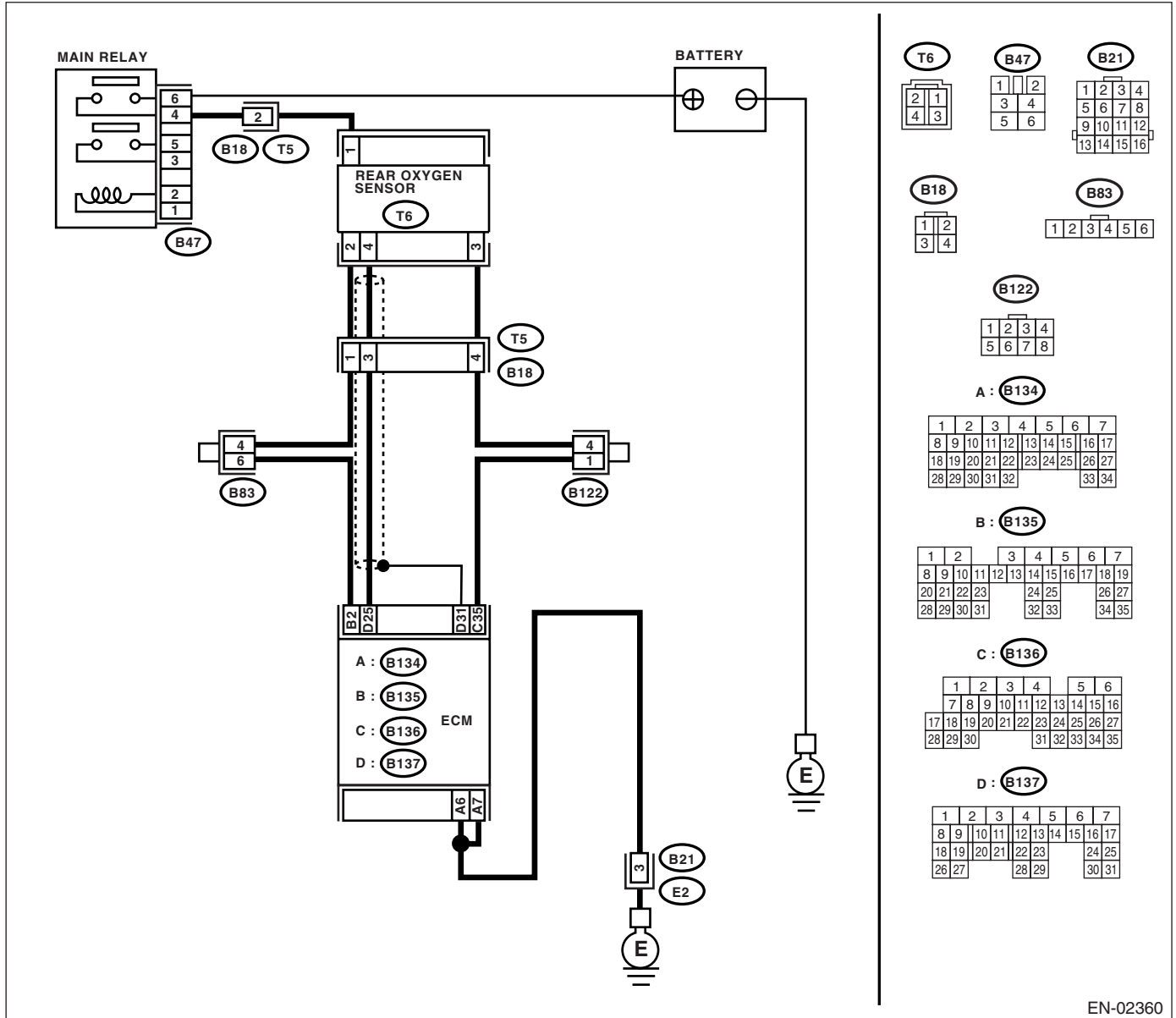
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02360

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b> Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>2 CHECK REAR OXYGEN SENSOR DATA.</b>                      1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for two minutes.                      2) Read the data of rear oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	Does the value fluctuate?	Go to step 6.	Go to step 3.
<p><b>3 CHECK REAR OXYGEN SENSOR DATA.</b>                      Read the data of rear oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p>	Is the voltage 0.2 — 0.4 V?	Go to step 4.	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.>
<p><b>4 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM and rear oxygen sensor.                      3) Measure the resistance in harness between ECM and rear oxygen sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B137) No. 25 — (T6) No. 4:</b></p>	Is the resistance more than 3 Ω?	Repair open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 5.
<p><b>5 CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b>                      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 harness connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(T6) No. 4 (+) — Chassis ground (-):</b></p>	Is the voltage more than 0.2 V?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.>	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between rear oxygen sensor and ECM connector</li> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in ECM connector</li> </ul>
<p><b>6 CHECK EXHAUST SYSTEM.</b>                      Check exhaust system parts.</p> <p><b>NOTE:</b>                      Check the following items:</p> <ul style="list-style-type: none"> <li>• Loose part of exhaust system and incomplete installation</li> <li>• Damage (crack, hole etc.) of parts</li> <li>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor</li> </ul>	Is there a fault in exhaust system?	Repair or replace the faulty part.	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## S: DTC P0138 O<sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2)

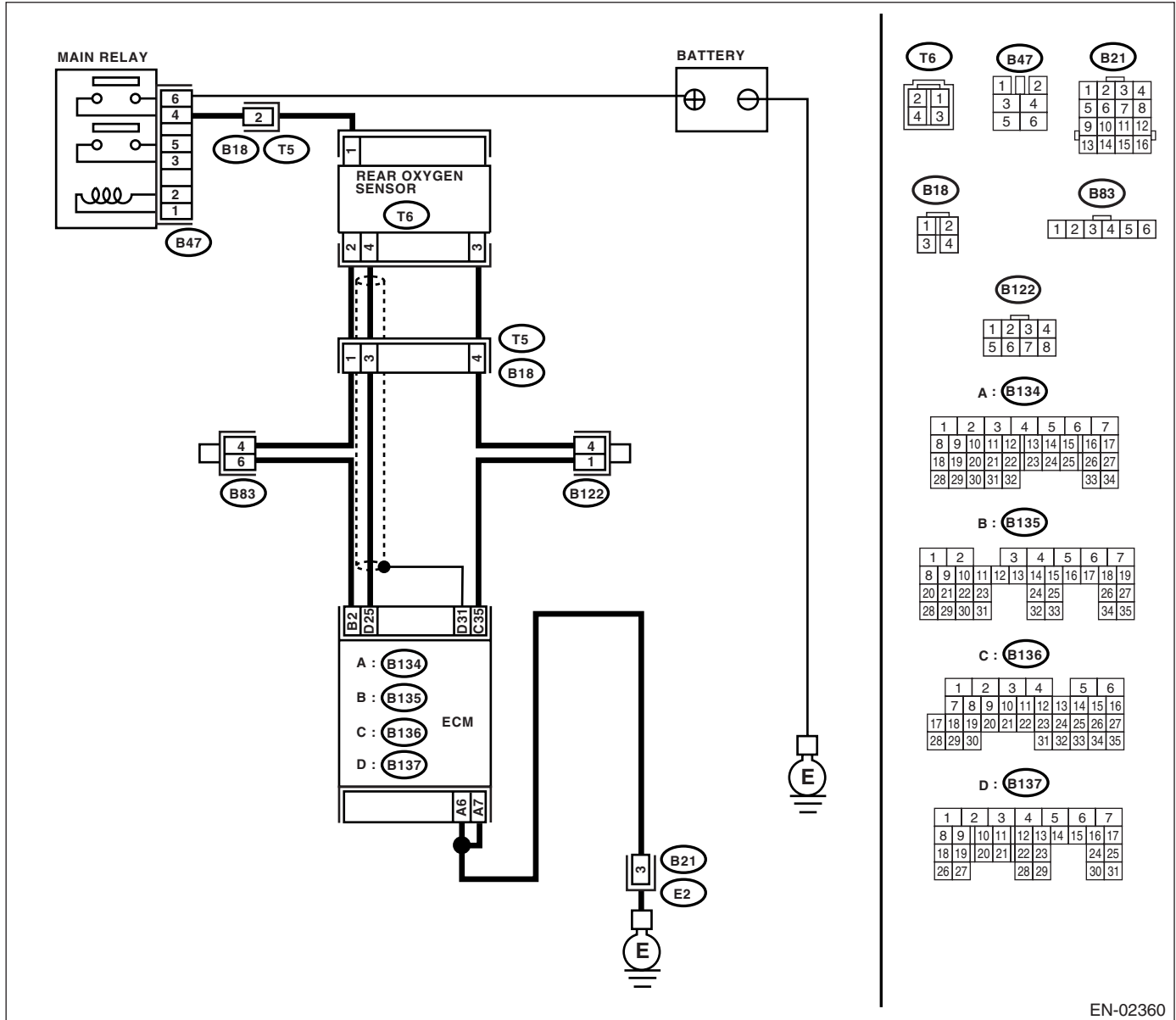
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02360

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b> Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>2 CHECK REAR OXYGEN SENSOR DATA.</b>                      1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for two minutes.                      2) Read the data of rear oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	Does the value fluctuate?	Go to step 6.	Go to step 3.
<p><b>3 CHECK REAR OXYGEN SENSOR DATA.</b>                      Read the data of rear oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p>	Is the voltage 0.2 — 0.4 V?	Go to step 4.	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.>
<p><b>4 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM and rear oxygen sensor.                      3) Measure the resistance in harness between ECM and rear oxygen sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B137) No. 25 — (T6) No. 4:</b></p>	Is the resistance more than 3 Ω?	Repair open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 5.
<p><b>5 CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b>                      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 harness connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(T6) No. 4 (+) — Chassis ground (-):</b></p>	Is the voltage more than 0.2 V?	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.>	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between rear oxygen sensor and ECM connector</li> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in ECM connector</li> </ul>
<p><b>6 CHECK EXHAUST SYSTEM.</b>                      Check exhaust system parts.</p> <p><b>NOTE:</b>                      Check the following items:</p> <ul style="list-style-type: none"> <li>• Loose part of exhaust system and incomplete installation</li> <li>• Damage (crack, hole etc.) of parts</li> <li>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor</li> </ul>	Is there a fault in exhaust system?	Repair or replace the faulty part.	Replace the rear oxygen sensor. <Ref. to FU(H4DOTC 2.5)-38, Rear Oxygen Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## T: DTC P0171 SYSTEM TOO LEAN (BANK 1)

NOTE:

For diagnostic procedure, refer to DTC P0172. <Ref. to EN(H4DOTC 2.5)-115, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## U: DTC P0172 SYSTEM TOO RICH (BANK 1)

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### CAUTION:

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

Step	Check	Yes	No	
1	<b>CHECK EXHAUST SYSTEM.</b>	Are there holes or loose bolts on exhaust system?	Repair exhaust system. Go to step 2.	
2	<b>CHECK AIR INTAKE SYSTEM.</b>	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair air intake system. Go to step 3.	
3	<b>CHECK FUEL PRESSURE.</b> <b>Warning:</b> <ul style="list-style-type: none"> <li>• Place “NO FIRE” signs near the working area.</li> <li>• Be careful not to spill fuel.</li> </ul> 1) Release the fuel pressure. (1) Disconnect the connector from fuel pump relay. (2) Start the engine and run it until it stalls. (3) After the engine stalls, crank it for five more seconds. (4) Turn the ignition switch to OFF. 2) Connect the connector to fuel pump relay. 3) Disconnect the fuel delivery hose from fuel filter, and connect the fuel pressure gauge. 4) Install the fuel filler cap. 5) Start the engine and idle while gear position is neutral. 6) Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.	Is measured value 284 — 314 kPa (2.9 — 3.2 kg/cm <sup>2</sup> , 41 — 46 psi)?	Go to step 4.	Repair the following items. Fuel pressure is too high: <ul style="list-style-type: none"> <li>• Clogged fuel return line or bent hose</li> </ul> Fuel pressure is too low: <ul style="list-style-type: none"> <li>• Improper fuel pump discharge</li> <li>• Clogged fuel supply line</li> </ul>
	<b>Warning:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b>  <b>NOTE:</b> If fuel pressure does not increase, squeeze the fuel return hose 2 to 3 times, then measure fuel pressure again.			

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>4</b></p> <p><b>CHECK FUEL PRESSURE.</b> After connecting the pressure regulator vacuum hose, measure fuel pressure.</p> <p><b>Warning:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b></p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.</li> <li>• If out of specification as measured at this step, check or replace pressure regulator and pressure regulator vacuum hose.</li> </ul>	<p>Is measured value 206 — 235 kPa (2.1 — 2.4 kg/cm<sup>2</sup>, 30 — 34 psi)?</p>	Go to step 5.	<p>Repair the following items.</p> <p>Fuel pressure is too high:</p> <ul style="list-style-type: none"> <li>• Faulty pressure regulator</li> <li>• Clogged fuel return line or bent hose</li> </ul> <p>Fuel pressure is too low:</p> <ul style="list-style-type: none"> <li>• Faulty pressure regulator</li> <li>• Improper fuel pump discharge</li> <li>• Clogged fuel supply line</li> </ul>
<p><b>5</b></p> <p><b>CHECK ENGINE COOLANT TEMPERATURE SENSOR.</b></p> <ol style="list-style-type: none"> <li>1) Start the engine and warm-up completely.</li> <li>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</li> </ol> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is engine coolant temperature more than 60°C (140°F)?</p>	Go to step 6.	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-26, Engine Coolant Temperature Sensor.&gt;</p>
<p><b>6</b></p> <p><b>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR</b></p> <ol style="list-style-type: none"> <li>1) Start and warm-up the engine until engine coolant temperature is greater than 60°C (140°F).</li> <li>2) Place the shift lever in neutral position.</li> <li>3) Turn the A/C switch to OFF.</li> <li>4) Turn all accessory switches to OFF.</li> <li>5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</li> </ol> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the measured value within the following?</p> <p>Ignition ON: 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling: 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg)</p>	Go to step 7.	<p>Replace the mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-30, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR</b></p> <p>1) Start and warm-up the engine until engine coolant temperature is greater than 60°C (140°F).</p> <p>2) Place the shift lever in neutral position.</p> <p>3) Turn the A/C switch to OFF.</p> <p>4) Turn all accessory switches to OFF.</p> <p>5) Open the 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 the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Subtract the ambient temperature from intake air temperature, and is the value -10 — 50°C (14 — 122°F)?</p>	<p>Contact the SUBARU dealer.</p> <p>NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.</p>	<p>Check mass air flow and intake air temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-30, Mass Air Flow and Intake Air Temperature Sensor.&gt;</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **V: DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT LOW INPUT**

#### **DTC DETECTING CONDITION:**

Immediately at fault recognition

#### **TROUBLE SYMPTOM:**

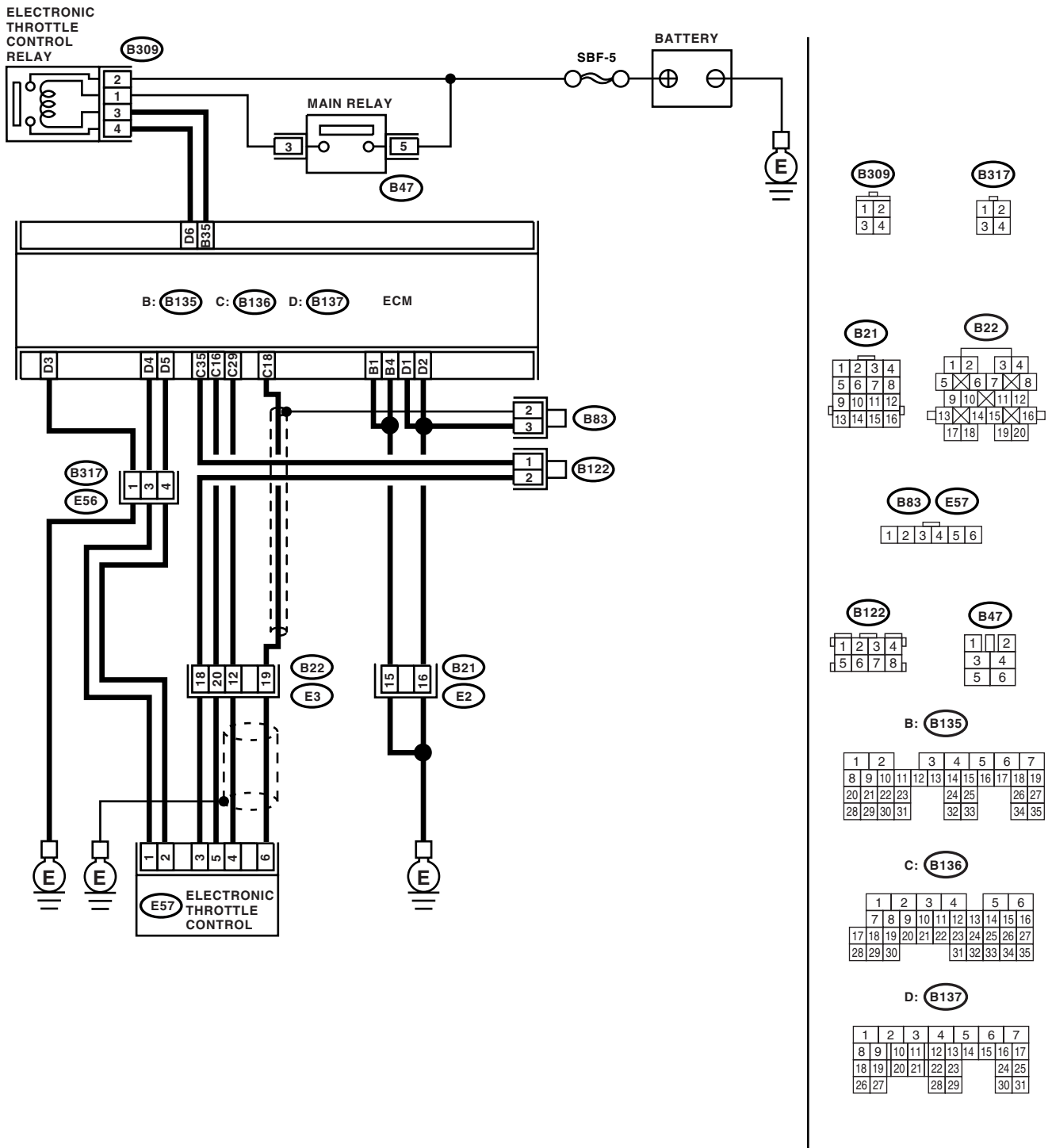
- Erroneous idling
- Poor driving performance
- Engine stalls.

#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and terminal. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 29 (+) — (B136) No. 35 (-):</b></i> 3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage more than 0.8 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 16 — (E57) No. 5:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 16 — Chassis ground:</b></i> <i><b>(B136) No. 29 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK SENSOR POWER SUPPLY.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>6 CHECK SHORT CIRCUIT INSIDE THE ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 4 — Engine ground:</b></i>	Is the resistance more than 10 $\Omega$ ?	Repair poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

**W: DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT  
HIGH INPUT**

**DTC DETECTING CONDITION:**

Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

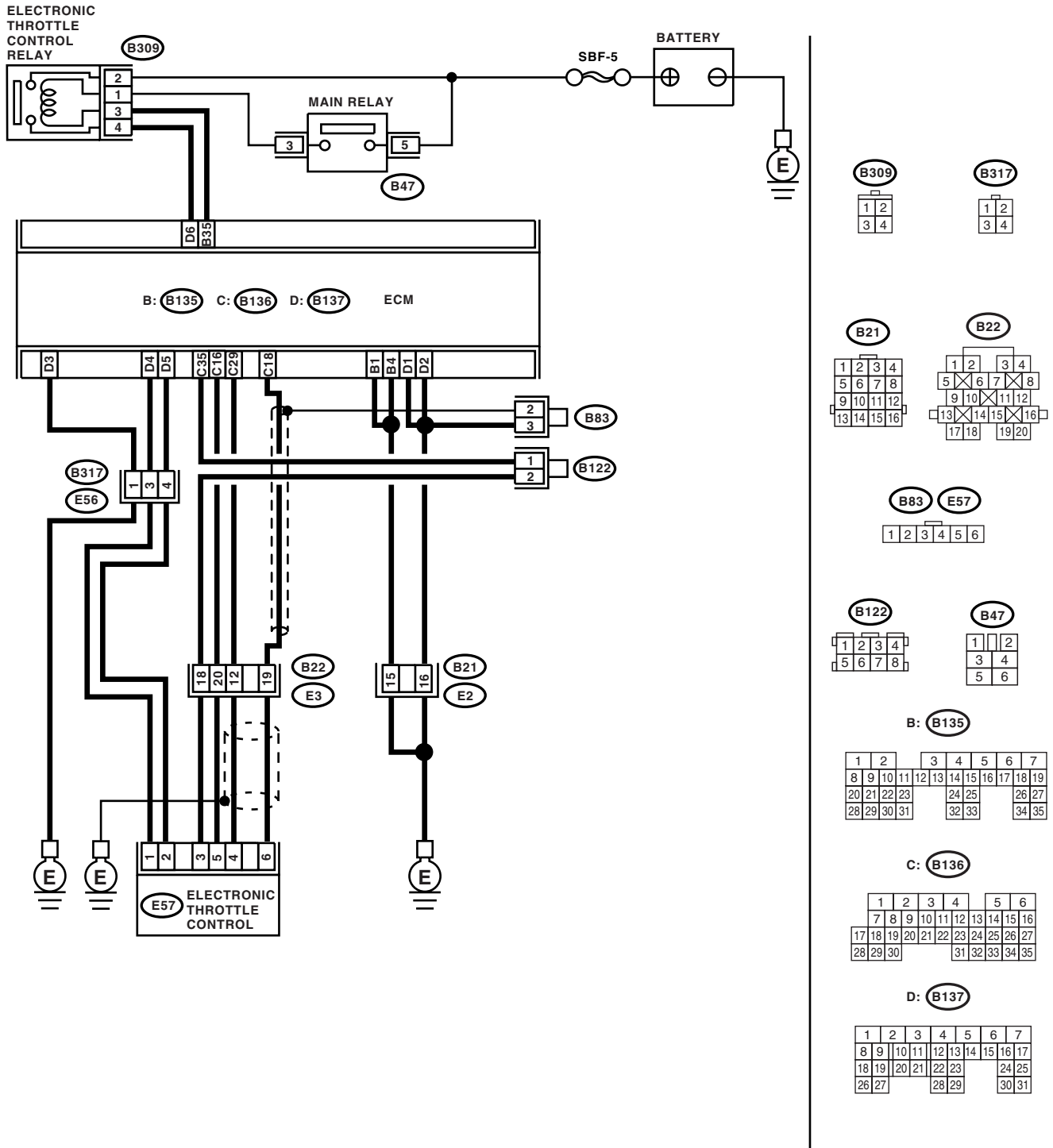
**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

Step	Check	Yes	No	
1	<p><b>CHECK SENSOR OUTPUT.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Read the data of sub throttle sensor signal using Subaru Select Monitor.</p> <p>3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.</p>	Is the voltage less than 4.73 V?	Go to step 2.	Go to step 3.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>2</b> <b>CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact in connector between ECM and electronic throttle control?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <b>Connector &amp; terminal</b> <b>(B136) No. 29 — (E57) No. 4:</b> <b>(B136) No. 35 — (E57) No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 3 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 5 (+) — Engine ground (-):</b> 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage more than 10 V?	Go to step 6.	Repair battery short circuit in harness between ECM connector and electronic throttle control connector.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 4 (+) — Engine ground (-):</b> 2) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 7.	Repair battery short circuit in harness between ECM connector and electronic throttle control connector.
<b>7</b> <b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between connector terminals. <b>Connector &amp; terminal</b> <b>(B136) No. 29 — (B136) No. 16:</b>	Is the resistance more than 1 M $\Omega$ ?	Repair the poor contact. Replace the electronic throttle control if defective.	Sensor power supply circuit may be shorted.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## X: DTC P0230 FUEL PUMP PRIMARY CIRCUIT

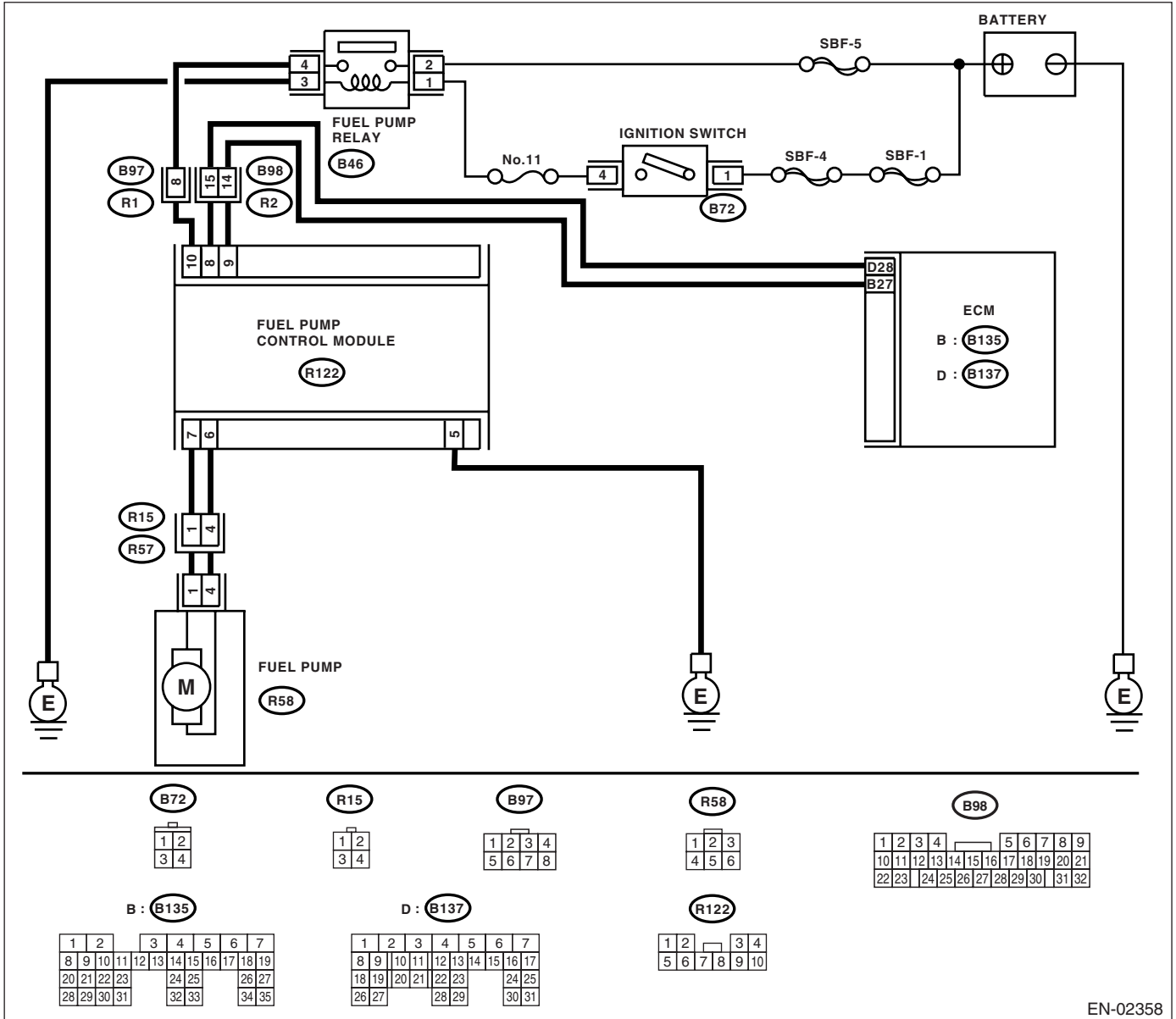
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02358

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK POWER SUPPLY CIRCUIT TO FUEL PUMP CONTROL UNIT.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel pump control unit. 3) Turn the ignition switch to ON. 4) Measure the voltage between fuel pump control unit and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R122) No. 10 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 2.	<p>Repair the power supply circuit.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open or ground short circuit in harness between fuel pump relay and fuel pump control unit.</li> <li>• Poor contact in fuel pump control unit connector.</li> <li>• Poor contact in fuel pump relay connector.</li> </ul>
<p><b>2</b></p> <p><b>CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between fuel pump control unit and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R122) No. 5 — Chassis ground:</b></p>	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit between fuel pump control unit and chassis ground.</li> <li>• Poor contact in fuel pump control unit connector.</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.</b></p> <p>1) Disconnect the connector from fuel pump. 2) Measure the resistance of harness between fuel pump control unit and fuel pump connector.</p> <p><b>Connector &amp; terminal</b> <b>(R122) No. 6 — (R58) No. 4:</b> <b>(R122) No. 7 — (R58) No. 1:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit between fuel pump control unit and fuel pump.
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.</b></p> <p>Measure the resistance of harness between fuel pump control unit and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R122) No. 6 — Chassis ground:</b> <b>(R122) No. 7 — Chassis ground:</b></p>	Is the resistance more than 1 $M\Omega$ ?	Go to step 5.	Repair ground short circuit between fuel pump control unit and fuel pump.
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance in harness between fuel pump control unit and ECM connector.</p> <p><b>Connector &amp; terminal</b> <b>(R122) No. 8 — (B137) No. 28:</b> <b>(R122) No. 9 — (B135) No. 27:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit between fuel pump control unit and ECM.</li> <li>• Poor contact in fuel pump control unit and ECM connector</li> </ul>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>6</b> <b>CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.</b> Measure the resistance of harness between fuel pump control unit and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(R122) No. 8 — Chassis ground:</b></i> <i><b>(R122) No. 9 — Chassis ground:</b></i>	Is the resistance more than 1 MΩ?	Go to step 7.	Repair the ground short circuit between fuel pump control unit and ECM.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM and fuel pump control unit connector.	Is there poor contact in ECM and fuel pump control unit connector?	Repair the poor contact in ECM and fuel pump control unit.	Go to step 8.
<b>8</b> <b>CHECK EXPERIENCE OF RUNNING OUT OF FUEL.</b>	Did the vehicle experience running out of fuel?	Finish the diagnosis.  NOTE: DTC record may be conducted as a result of fuel pump idling while running out of gas.	Replace the fuel pump control unit. <Ref. to FU(H4DOTC 2.5)-44, Fuel Pump Control Unit.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## Y: DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW

### DTC DETECTING CONDITION:

Immediately at fault recognition

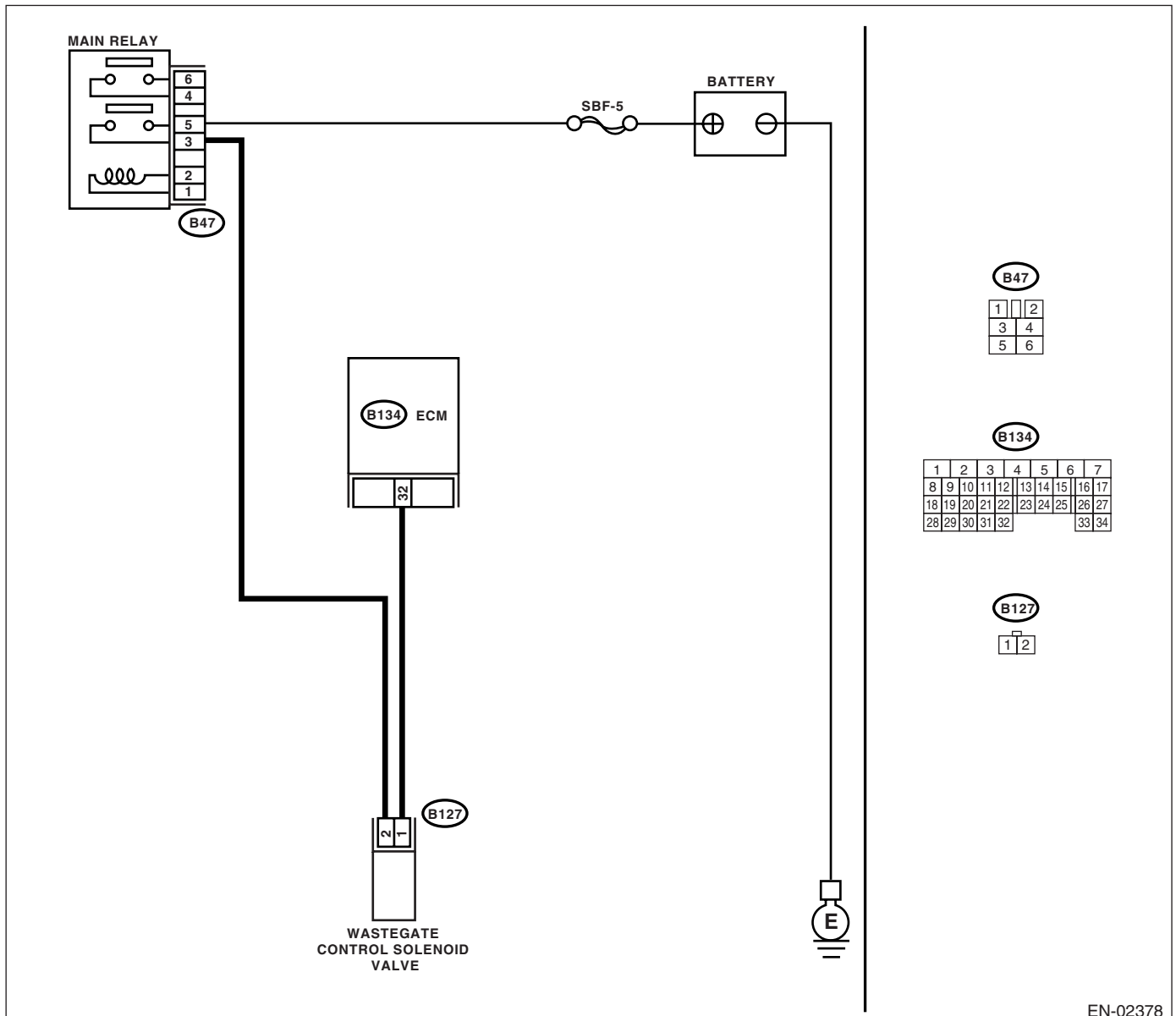
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:





# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 32 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from wastegate control solenoid valve and ECM. 3) Measure the resistance in harness between wastegate control solenoid valve connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B127) No. 1 — Engine ground:</b></i>	Is the resistance less than 10 $\Omega$ ?	Repair ground short circuit in harness between ECM and wastegate control solenoid valve connector.	Go to step 3.
<b>3 CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> Measure the resistance of harness between wastegate control solenoid valve and ECM. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 32 — (B127) No. 1:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit in harness between ECM and wastegate control solenoid valve connector.  NOTE: In this case repair the following: • Open circuit in harness between ECM and wastegate control solenoid valve connector
<b>4 CHECK WASTEGATE CONTROL SOLENOID VALVE.</b> 1) Remove the wastegate control solenoid valve. 2) Measure the resistance between wastegate control solenoid valve terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance 30 — 34 $\Omega$ ?	Go to step 5.	Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC 2.5)-35, Wastegate Control Solenoid Valve.>
<b>5 CHECK POWER SUPPLY TO WASTEGATE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between wastegate control solenoid valve and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B127) No. 2 (+) — Engine ground (-):</b></i>	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit in harness between main relay and wastegate control solenoid valve connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in wastegate control solenoid valve connector.	Is there poor contact in wastegate control solenoid valve connector?	Repair poor contact in wastegate control solenoid valve connector.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## Z: DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH

### DTC DETECTING CONDITION:

Immediately at fault recognition

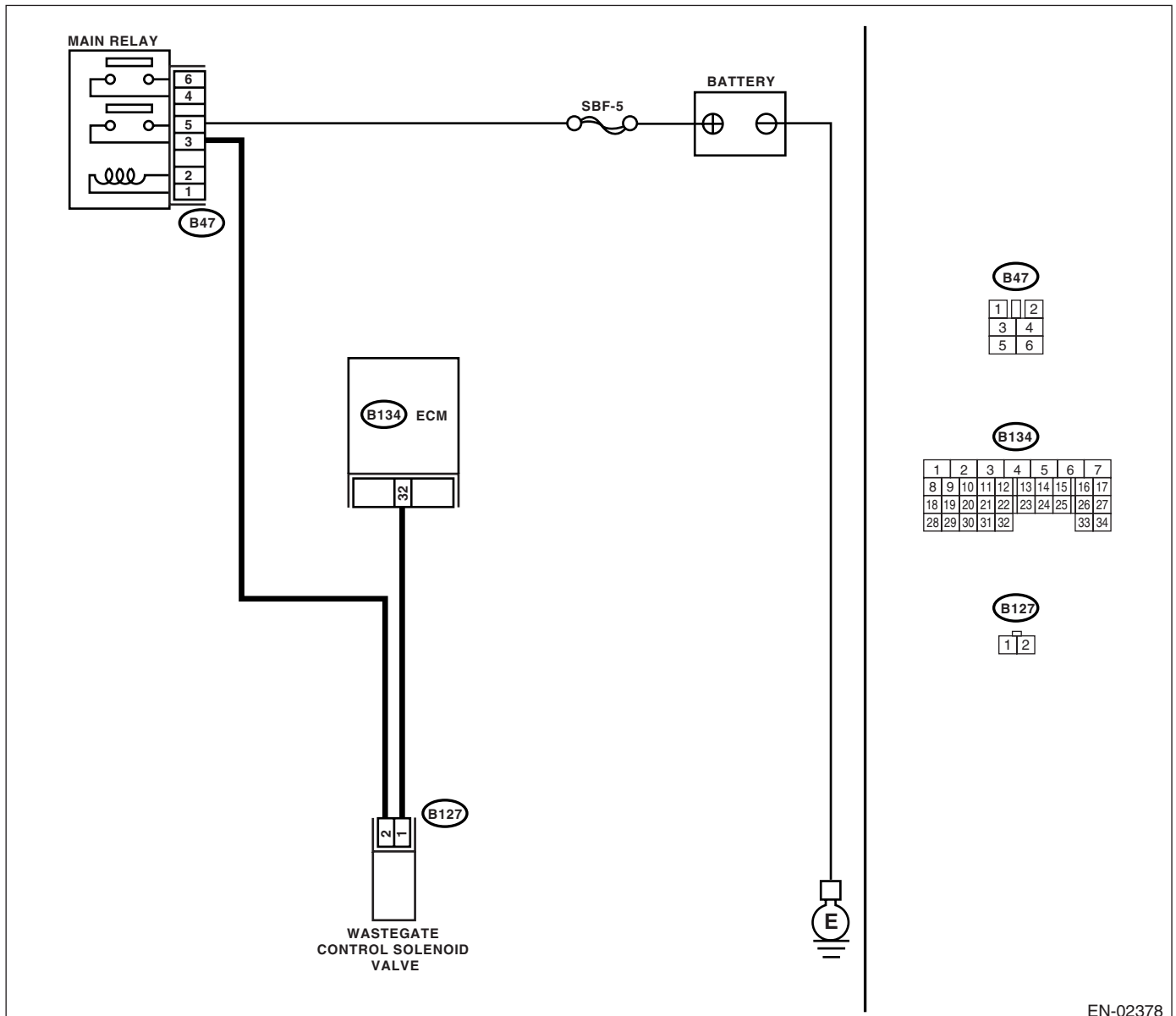
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02378

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 32 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 3.	Go to step 2.
<b>2 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>3 CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from wastegate control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 32 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and wastegate control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 4.
<b>4 CHECK WASTEGATE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between wastegate control solenoid valve terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the wastegate control solenoid valve and ECM. <Ref. to FU(H4DOTC 2.5)-35, Wastegate Control Solenoid Valve.> <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

## AA:DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR)

### DTC DETECTING CONDITION:

Immediately at fault recognition

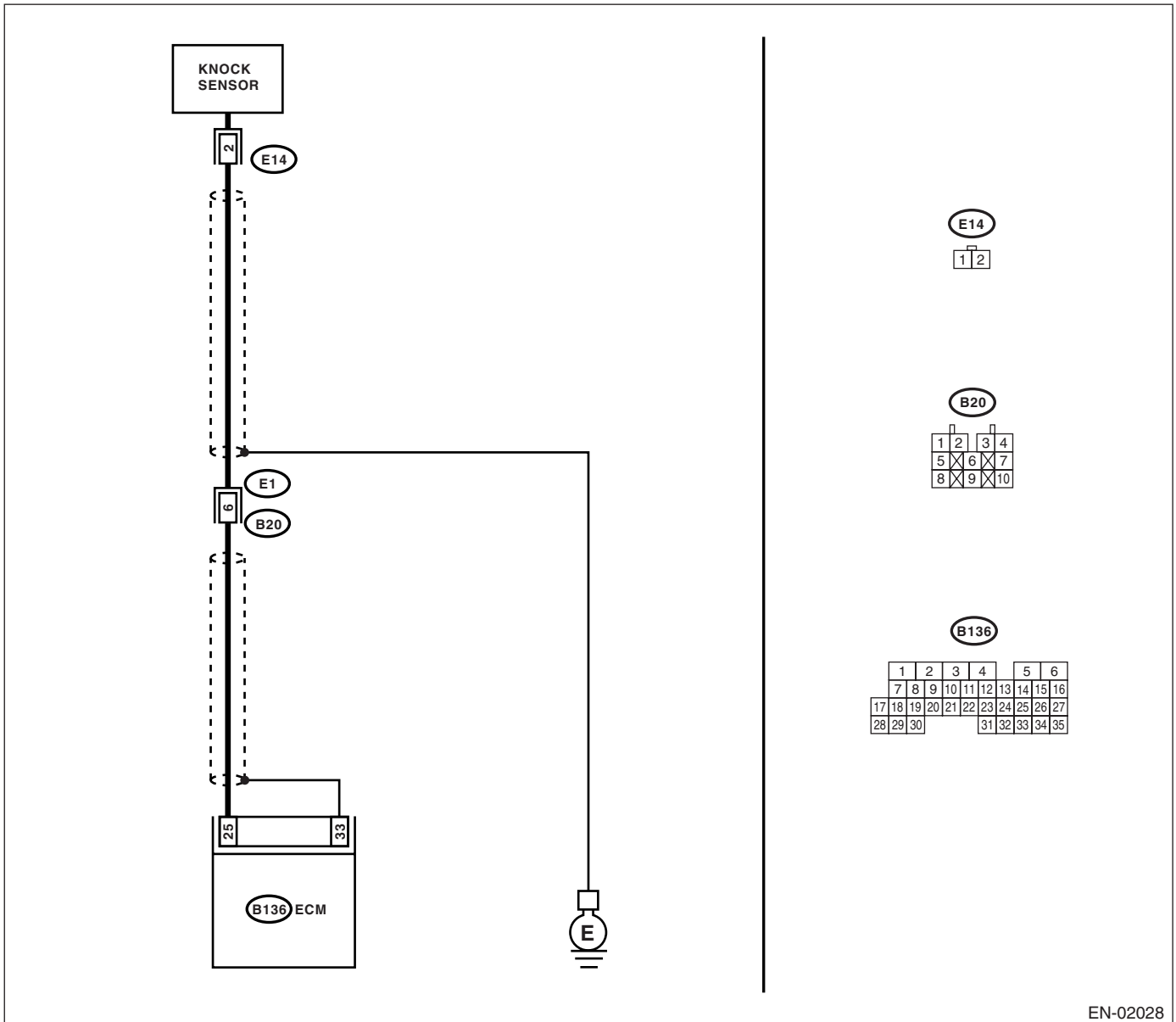
### TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02028

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM harness connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 25 — Chassis ground:</b></i>	Is the resistance more than 700 k $\Omega$ ?	Go to step 2.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between knock sensor and ECM connector</li> <li>• Poor contact in knock sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>2 CHECK KNOCK SENSOR.</b> 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E14) No. 2 — Engine ground:</b></i>	Is the resistance more than 700 k $\Omega$ ?	Go to step 3.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in knock sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>3 CHECK CONDITION OF KNOCK SENSOR INSTALLATION.</b>	Is the knock sensor installation bolt tightened securely?	Replace the knock sensor. <Ref. to FU(H4DOTC 2.5)-29, Knock Sensor.>	Tighten knock sensor installation bolt securely.

## AB:DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR)

### DTC DETECTING CONDITION:

Immediately at fault recognition

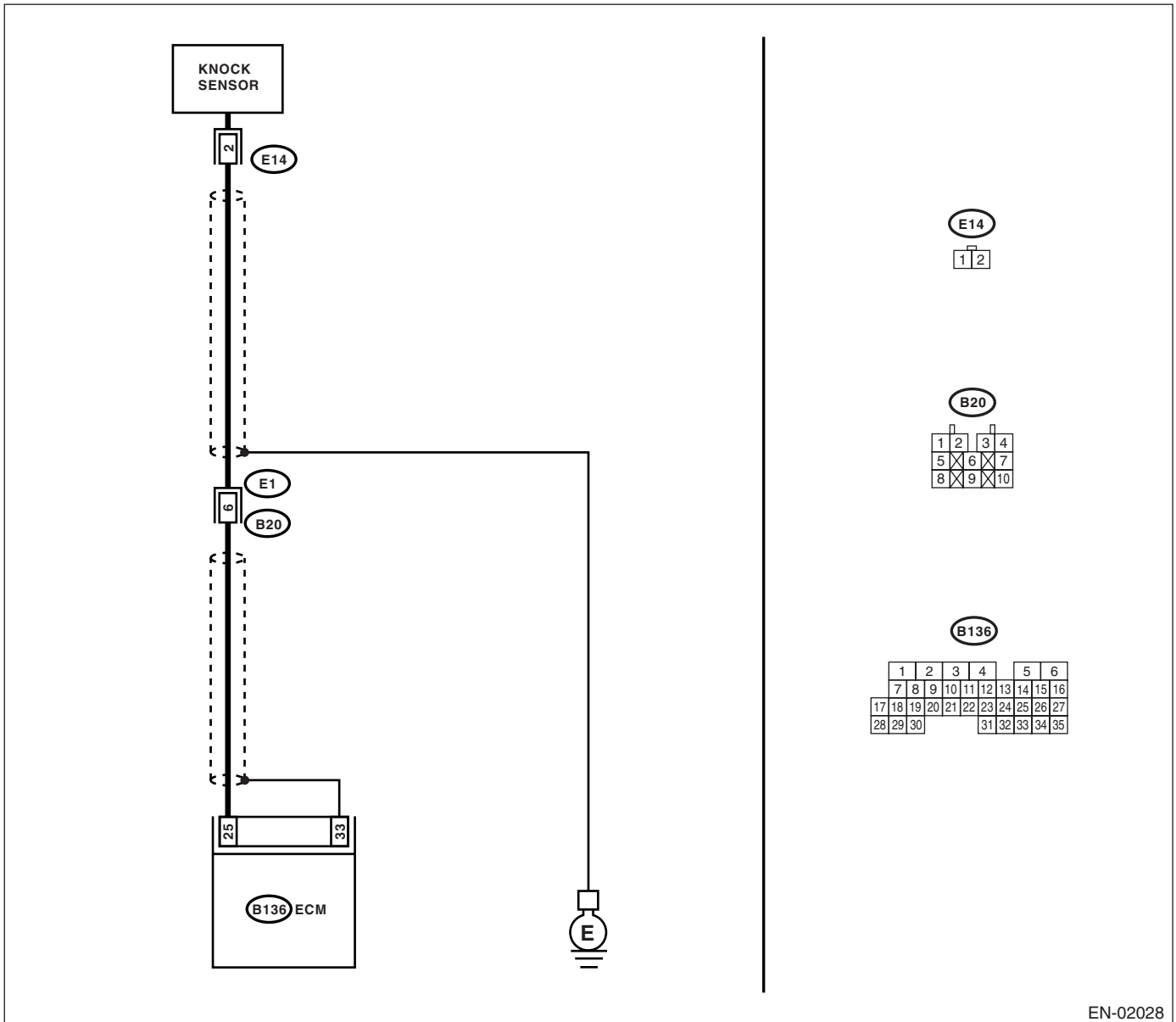
### TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02028

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.</b> Measure the resistance of harness between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 25 — Chassis ground:</b></i>	Is the resistance less than 400 k $\Omega$ ?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK KNOCK SENSOR.</b> 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. <i><b>Terminals</b></i> <i><b>No. 2 — Engine ground:</b></i>	Is the resistance less than 400 k $\Omega$ ?	Replace the knock sensor. <Ref. to FU(H4DOTC 2.5)-29, Knock Sensor.>	Repair ground short circuit in harness between knock sensor connector and ECM connector.  NOTE: The harness between both connectors are shielded. Repair short circuit in harness covered with shield.
<b>3</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Connect the connectors to ECM and knock sensor. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 25 (+) — Chassis ground (-):</b></i>	Is the voltage more than 2 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in knock sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	Repair the poor contact in ECM connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AC:DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

### DTC DETECTING CONDITION:

Immediately at fault recognition

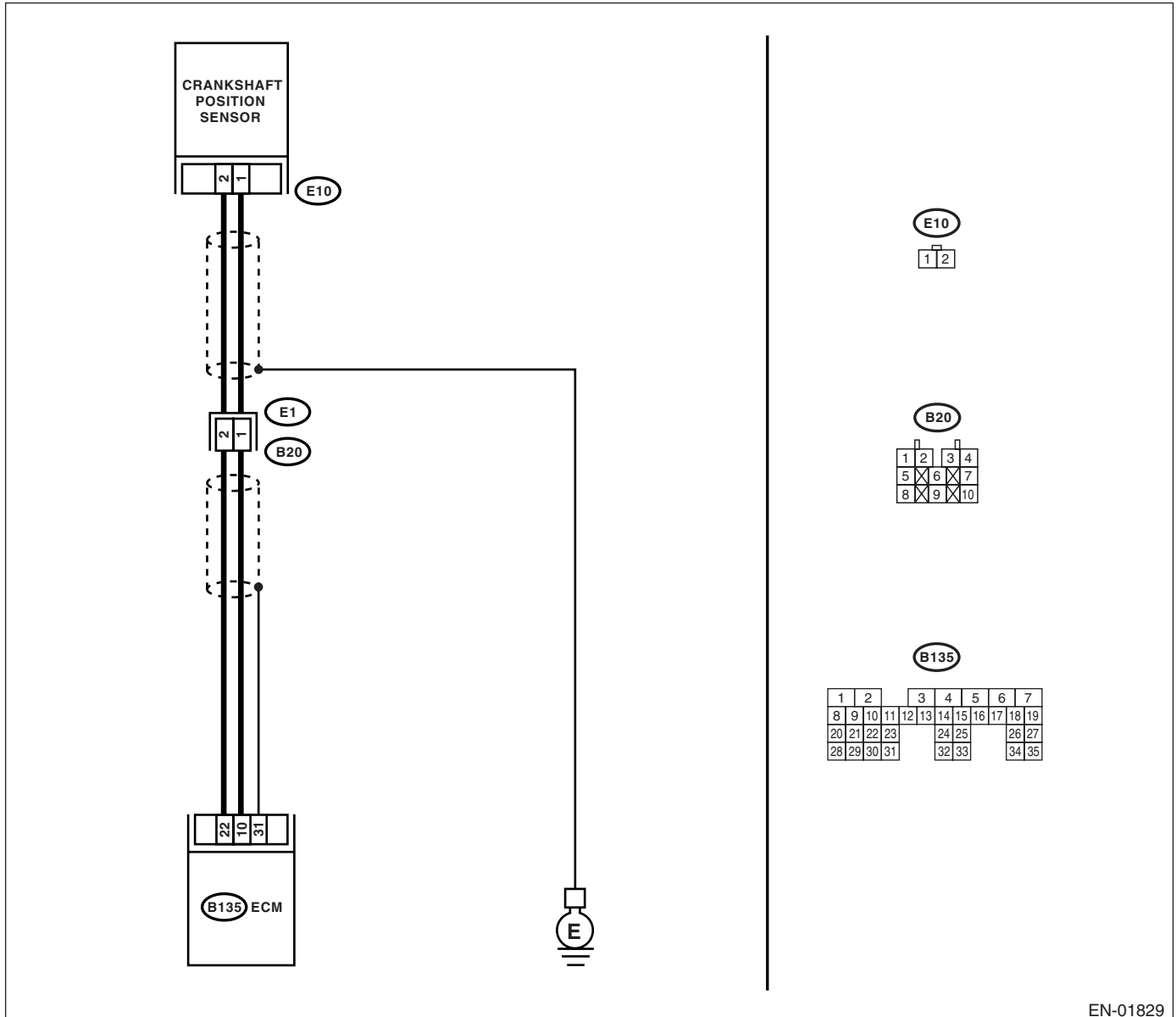
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-01829



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the crankshaft position sensor. 3) Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 100 k<math>\Omega</math>?</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between crankshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	<p>Go to step 2.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair ground short circuit in harness between crankshaft position sensor and ECM connector.</p> <p>NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 4.</p>	<p>Repair the harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between crankshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>4</b></p> <p><b>CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.</b></p>	<p>Is the crankshaft position sensor installation bolt tightened securely?</p>	<p>Go to step 5.</p>	<p>Tighten the crankshaft position sensor installation bolt securely.</p>
<p><b>5</b></p> <p><b>CHECK CRANKSHAFT POSITION SENSOR.</b></p> <p>1) Remove the crankshaft position sensor. 2) Measure the resistance between connector terminals of crankshaft position sensor.</p> <p><b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance 1 — 4 k<math>\Omega</math>?</p>	<p>Repair poor contact in crankshaft position sensor connector.</p>	<p>Replace the crankshaft position sensor. &lt;Ref. to FU(H4DOTC 2.5)-27, Crankshaft Position Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

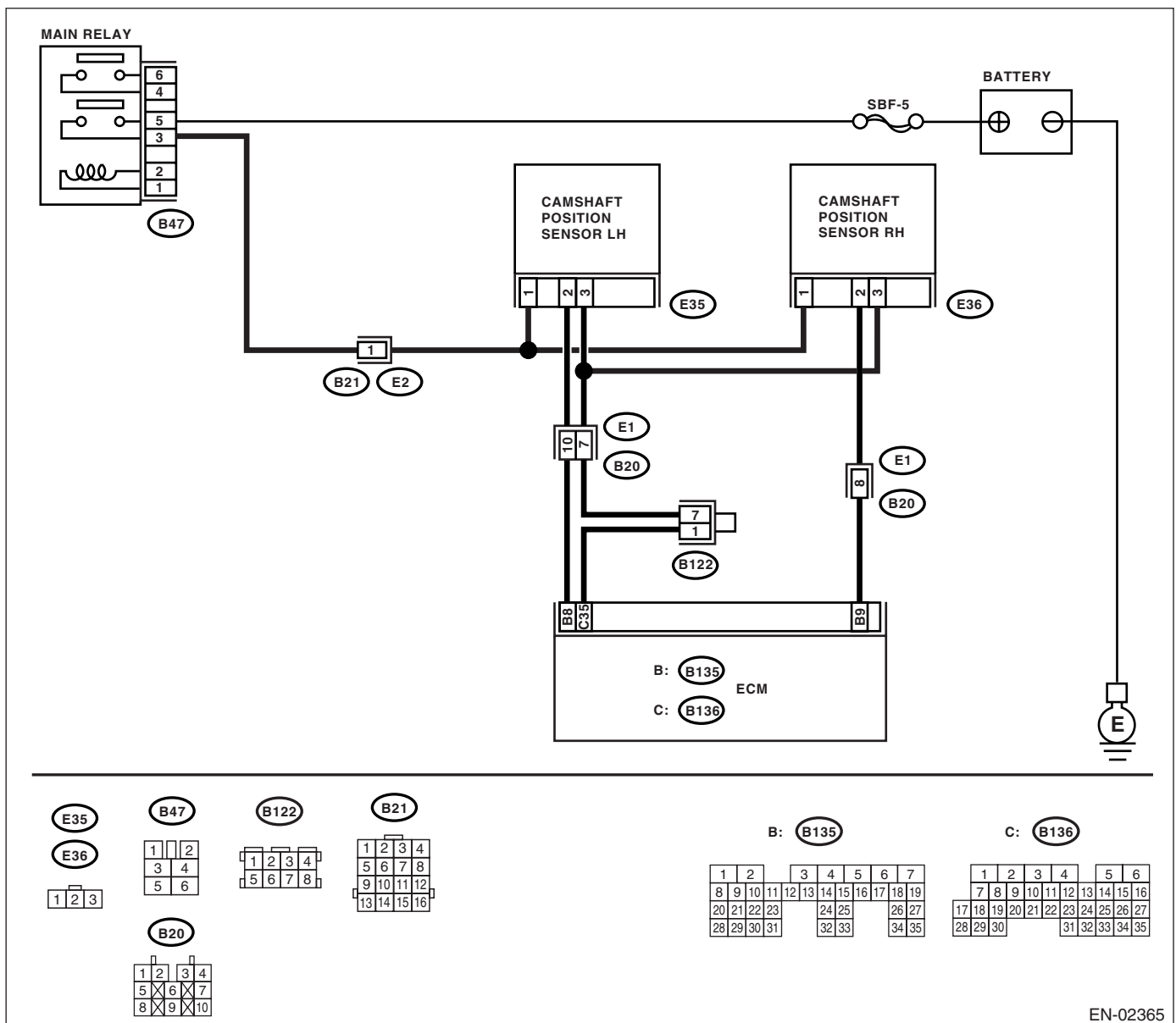
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02365

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the voltage between camshaft position sensor and engine ground. <i>Connector &amp; terminal</i> <i>(E36) No. 1 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit between main relay connector and camshaft position sensor connector.	Go to step 2.
<b>2 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between camshaft position sensor and engine ground. <i>Connector &amp; terminal</i> <i>(E36) No. 1 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Go to step 3.	Repair open or battery short circuit between main relay connector and camshaft position sensor connector.
<b>3 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between camshaft position sensor and ECM. <i>Connector &amp; terminal</i> <i>(E36) No. 2 — (B135) No. 9:</i> <i>(E36) No. 3 — (B136) No. 35:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit between camshaft position sensor and ECM.
<b>4 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> Measure the resistance between camshaft position sensor and engine ground. <i>Connector &amp; terminal</i> <i>(E36) No. 2 — Engine ground:</i> <i>(E36) No. 3 — Engine ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair ground short circuit between camshaft position sensor and ECM.
<b>5 CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b>	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the camshaft position sensor installation bolt securely.
<b>6 CHECK CAMSHAFT POSITION SENSOR.</b> Check waveform of camshaft position sensor. <Ref. to EN(H4DOTC 2.5)-17, Engine Control Module (ECM) I/O Signal.>	Is there any abnormality in waveform?	Replace the camshaft position sensor. <Ref. to FU(H4DOTC 2.5)-28, Camshaft Position Sensor.>	Go to step 7.
<b>7 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

## AE:DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 2)

### DTC DETECTING CONDITION:

Immediately at fault recognition

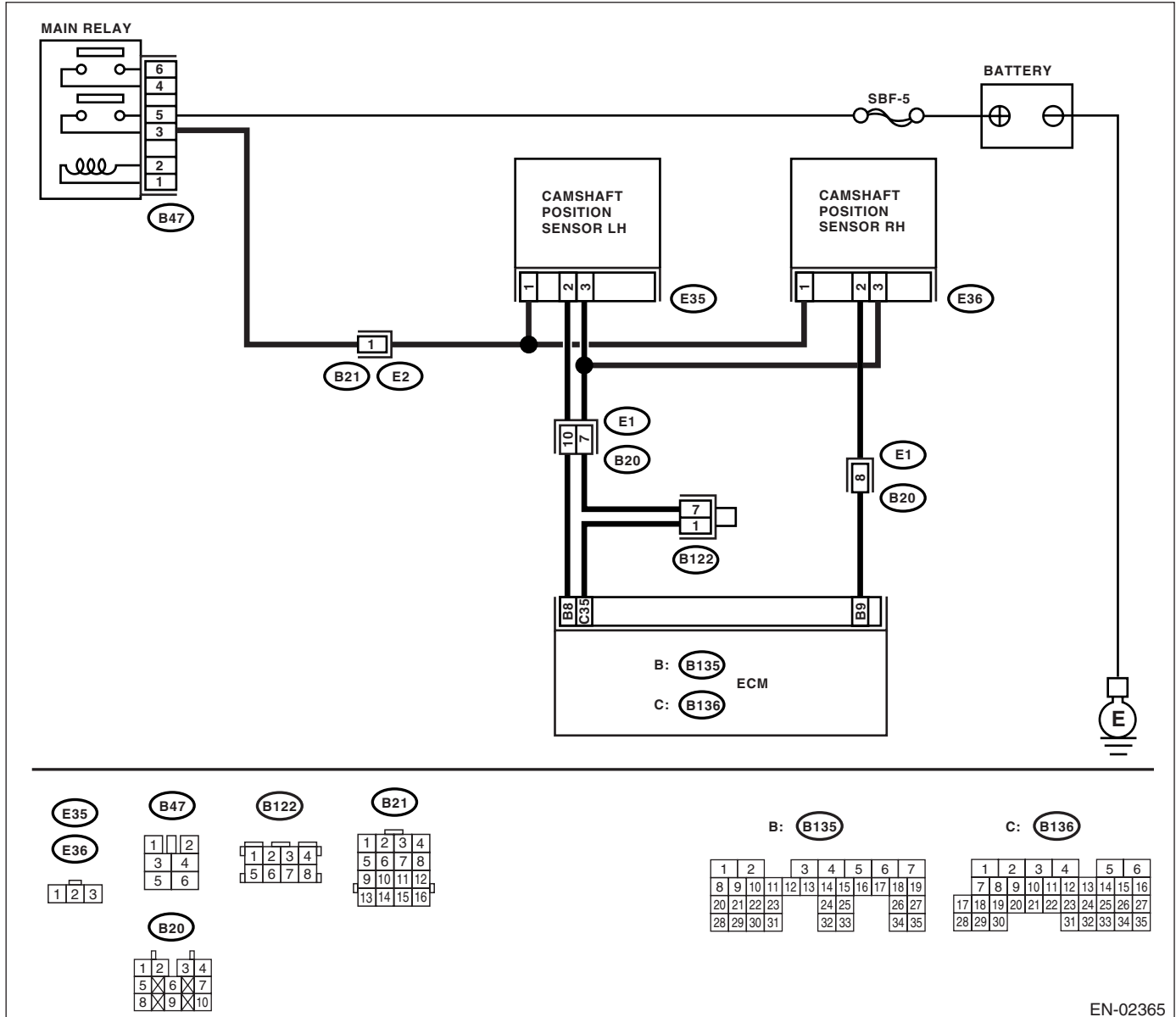
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02365

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the voltage between camshaft position sensor and engine ground. <i>Connector &amp; terminal</i> <i>(E35) No. 1 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit between main relay connector and camshaft position sensor connector.	Go to step 2.
<b>2 CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between camshaft position sensor and engine ground. <i>Connector &amp; terminal</i> <i>(E35) No. 1 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Go to step 3.	Repair open or battery short circuit between main relay connector and camshaft position sensor connector.
<b>3 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between camshaft position sensor and ECM. <i>Connector &amp; terminal</i> <i>(E35) No. 2 — (B135) No. 8:</i> <i>(E35) No. 3 — (B136) No. 35:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit between camshaft position sensor and ECM.
<b>4 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM.</b> Measure the resistance between camshaft position sensor and engine ground. <i>Connector &amp; terminal</i> <i>(E35) No. 2 — Engine ground:</i> <i>(E35) No. 3 — Engine ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair ground short circuit between camshaft position sensor and ECM.
<b>5 CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b>	Is the camshaft position sensor installation bolt tightened securely?	Go to step 6.	Tighten the camshaft position sensor installation bolt securely.
<b>6 CHECK CAMSHAFT POSITION SENSOR.</b> Check waveform of camshaft position sensor. <Ref. to EN(H4DOTC 2.5)-17, Engine Control Module (ECM) I/O Signal.>	Is there any abnormality in waveform?	Replace the camshaft position sensor. <Ref. to FU(H4DOTC 2.5)-28, Camshaft Position Sensor.>	Go to step 7.
<b>7 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

## AF:DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

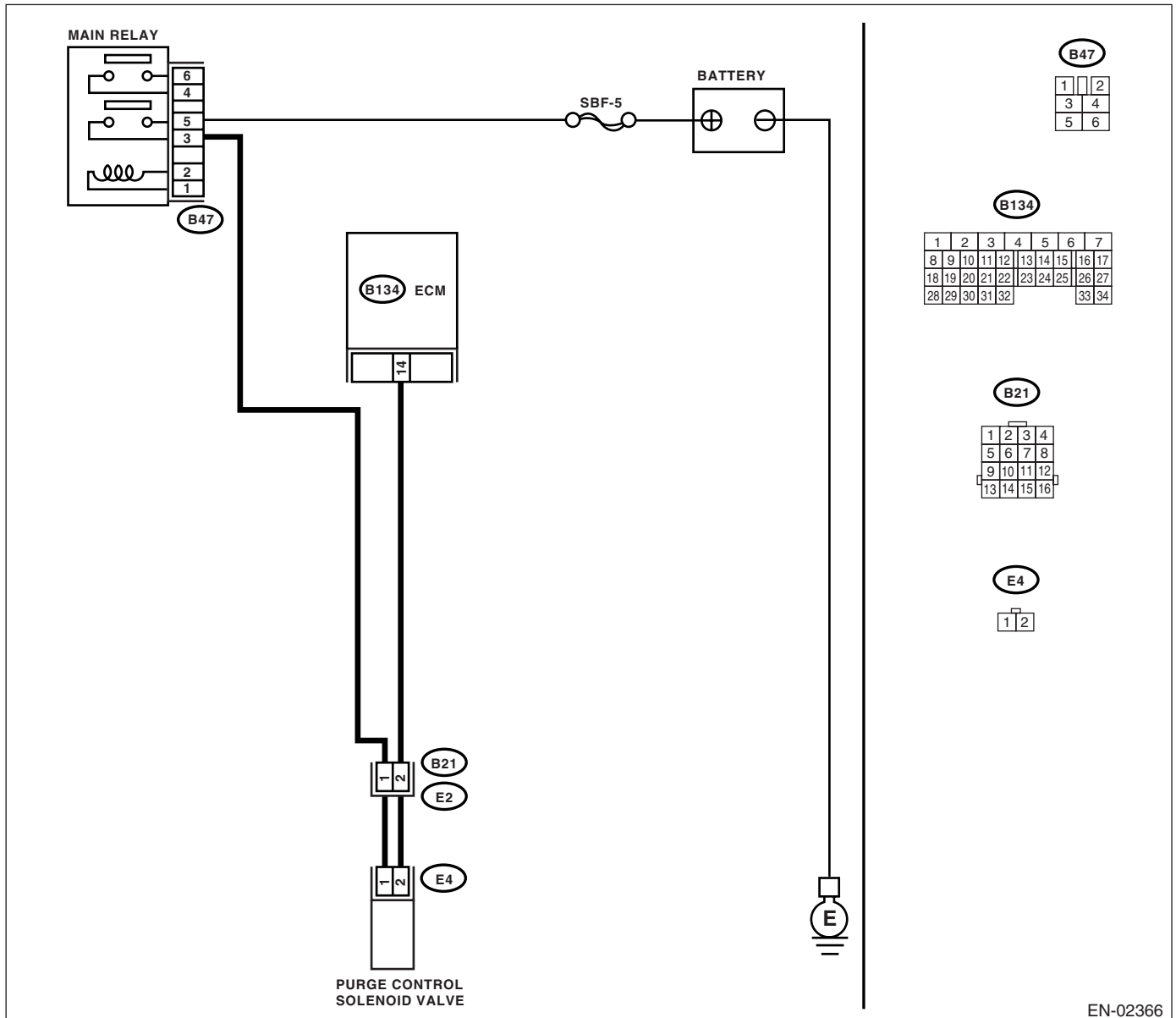
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 14 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from purge control solenoid valve and ECM. 3) Measure the resistance of harness between purge control solenoid valve connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E4) No. 2 — Engine ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair ground short circuit in harness between ECM and purge control solenoid valve connector.
<b>3 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> Measure the resistance of harness between ECM and purge control solenoid valve of harness connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 14 — (E4) No. 2:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit in harness between ECM and purge control solenoid valve connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and purge control solenoid valve connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>4 CHECK PURGE CONTROL SOLENOID VALVE.</b> 1) Remove the purge control solenoid valve. 2) Measure the resistance between purge control solenoid valve terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance 10 — 100 $\Omega$ ?	Go to step 5.	Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.>
<b>5 CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between purge control solenoid valve and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E4) No. 1 (+) — Engine ground (-):</b></i>	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit in harness between main relay and purge control solenoid valve connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in purge control solenoid valve connector.	Is there poor contact in purge control solenoid valve connector?	Repair poor contact in purge control solenoid valve connector.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

## AG:DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

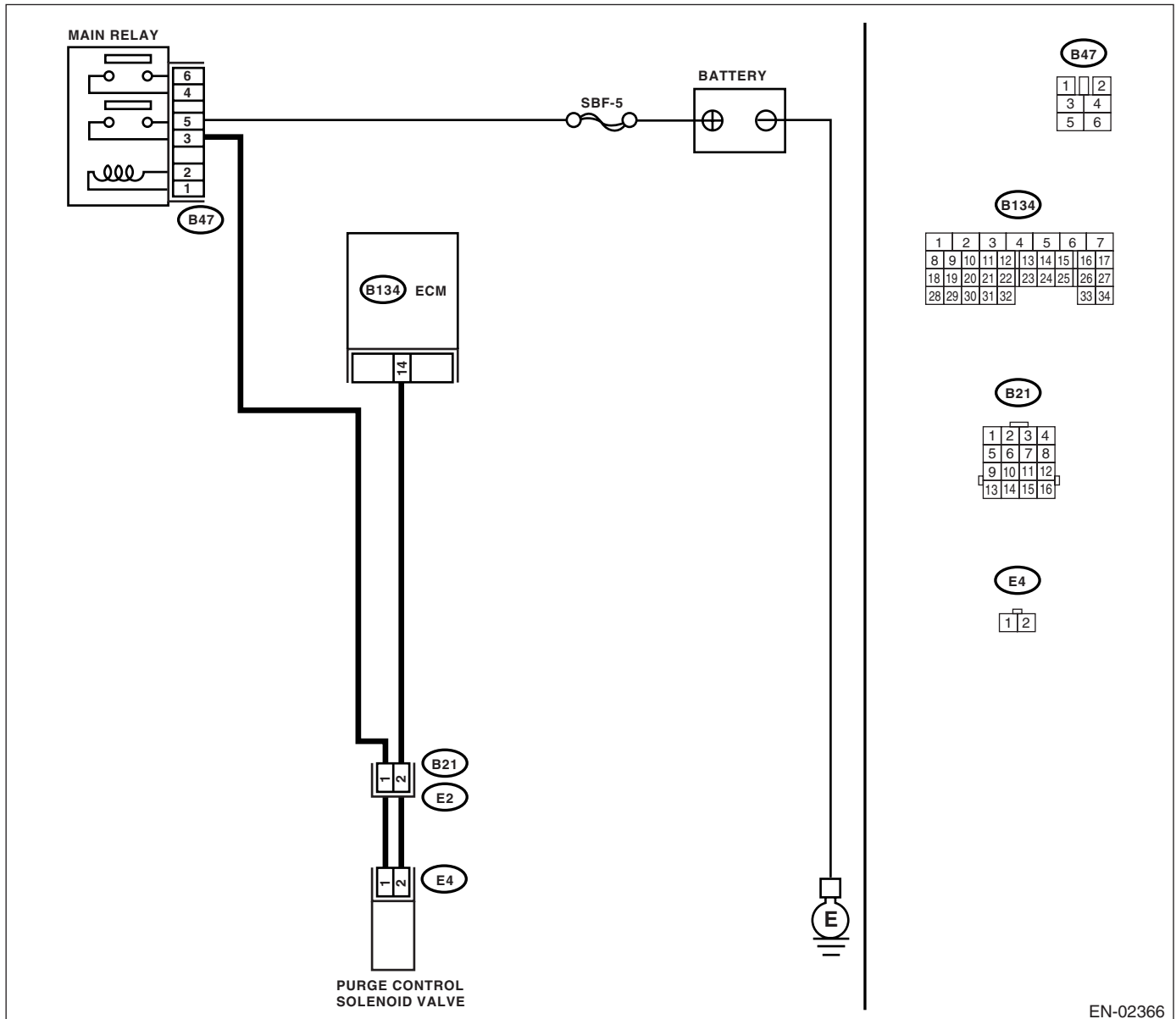
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:





# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side). 3) Turn the ignition switch to ON. 4) While operating the purge control solenoid valve, measure voltage between ECM and chassis ground.  <b>NOTE:</b> Purge control solenoid valve operation can be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC 2.5)-43, Compulsory Valve Operation Check Mode.>  <b>Connector &amp; terminal</b> <b>(B134) No. 14 (+) — Chassis ground (-):</b>	Is the voltage 0 — 13 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.
<b>2 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b> <b>(B134) No. 14 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>4 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from purge control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b> <b>(B134) No. 14 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK PURGE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between purge control solenoid valve terminals.  <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the purge control solenoid valve and ECM. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 6.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AH:DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT

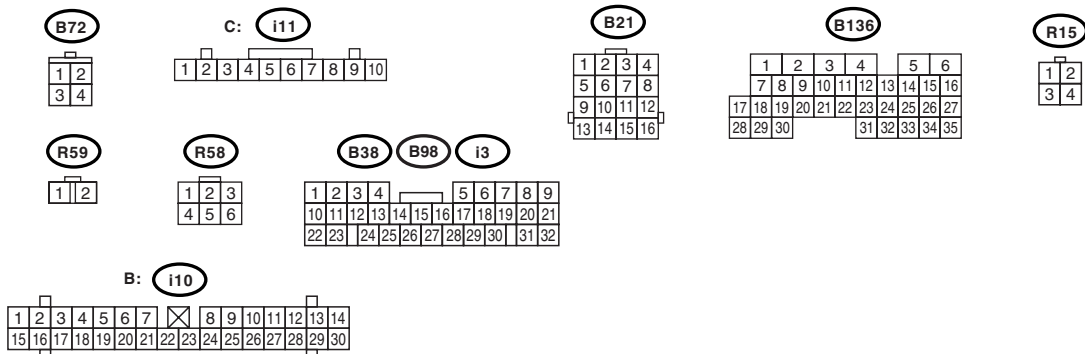
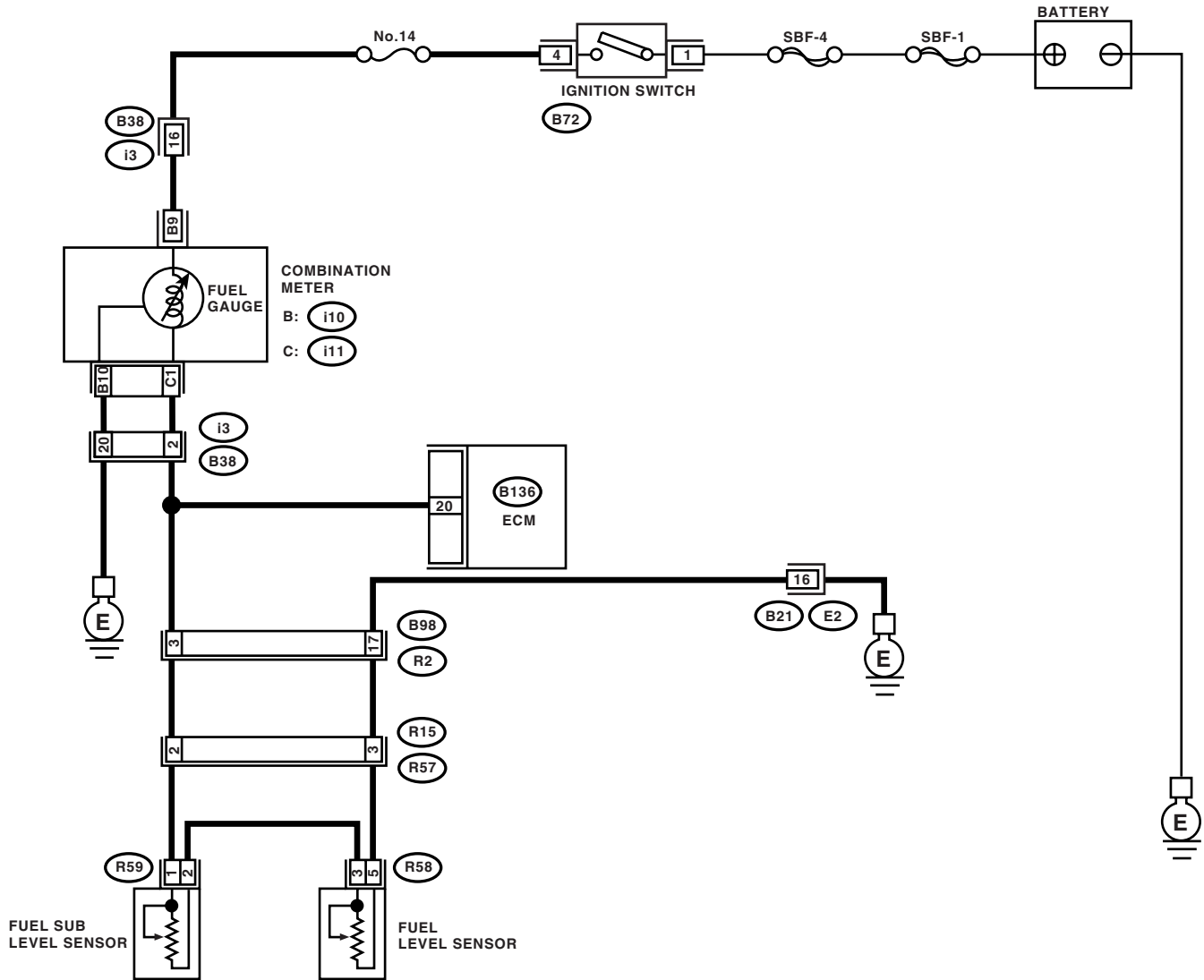
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02367

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No	
1	<b>CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.</b>	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>
2	<b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 20 (+) — Chassis ground (-):</b>	Is the voltage less than 0.12 V?	Go to step 4.	Go to step 3.
3	<b>CHECK INPUT SIGNAL FOR ECM WITH SUBARU SELECT MONITOR.</b> Read the data of fuel level sensor signal using Subaru Select Monitor.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.>	Does the voltage change by shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case repair the following: • Poor contact in combination meter connector • Poor contact in ECM connector. • Poor contact in coupling connector
4	<b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Turn the ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Turn the ignition switch to ON. 4) Measure the voltage of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 20 (+) — Chassis ground (-):</b>	Is the voltage more than 0.12 V?	Go to step 5.	Go to step 6.
5	<b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from connector (i10), (i11) and ECM connector. 3) Measure the resistance between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 20 — Chassis ground:</b>	Is the resistance more than 1 MΩ?	Go to step 7.	Repair the ground short in harness between ECM and combination meter connector.
6	<b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER.</b> Measure the resistance between ECM and combination meter connector. <b>Connector &amp; terminal</b> <b>(B136) No. 20 — (i11) No. 1:</b>	Is the resistance less than 10 Ω?	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>	Repair open circuit between ECM and combination meter connector.  NOTE: In this case repair the following: Poor contact in coupling connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7</b> <b>CHECK FUEL TANK CORD.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel sub level sensor. 3) Measure the resistance between fuel sub level sensor and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(R59) No. 1 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 8.	Repair ground short circuit in fuel tank cord.
<b>8</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel pump assembly. 2) Measure the resistance between fuel pump assembly and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(R59) No. 2 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 9.	Repair ground short circuit in fuel tank cord.
<b>9</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-62, Fuel Pump.> 2) Measure the resistance between fuel level sensor and terminals with its float set to the full position. <i><b>Terminals</b></i> <i><b>No. 2 — No. 3:</b></i>	Is the resistance 0.5 — 2.5 $\Omega$ ?	Go to step 10.	Replace the fuel level sensor.
<b>10</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC 2.5)-55, Fuel Sub Level Sensor.> 2) Measure the resistance between fuel sub level sensor and terminals with its float set to the full position. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance 0.5 — 2.5 $\Omega$ ?	Repair poor contact in harness between ECM and combination meter connector.	Replace the fuel sub level sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AI: DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT

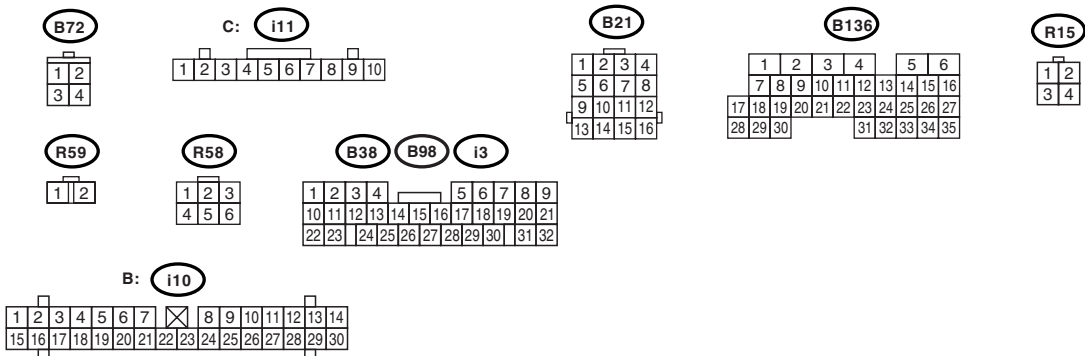
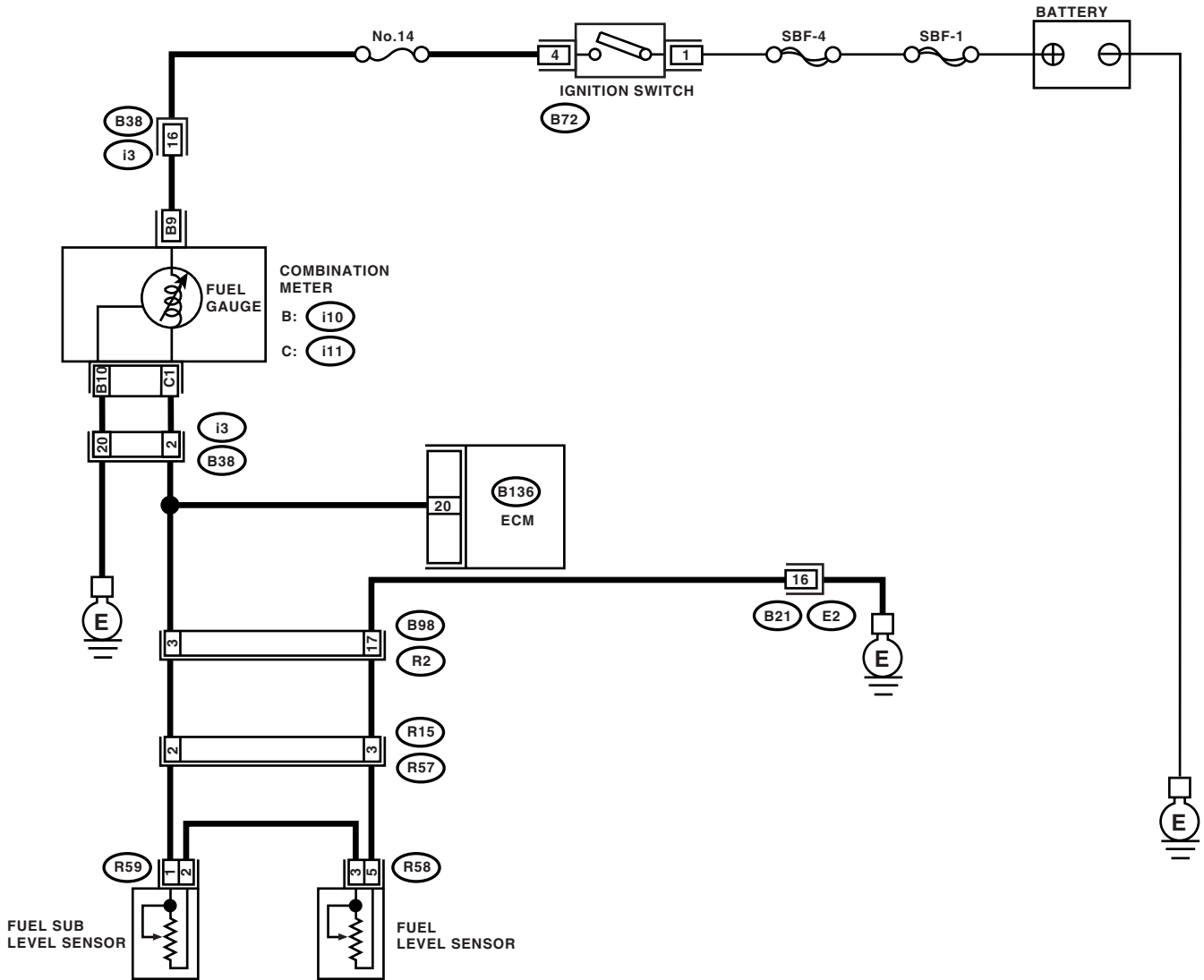
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02367

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.</b>	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>
<b>2</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 20 (+) — Chassis ground (-):</b>	Is the voltage more than 4.75 V?	Go to step 3.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in fuel pump connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>3</b> <b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the combination meter connector (i11) and ECM connector. 3) Turn the ignition switch to ON. 4) Measure the voltage of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 20 (+) — Chassis ground (-):</b>	Is the voltage more than 4.75 V?	Go to step 4.	Repair battery short circuit between ECM and combination meter connector.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD.</b> 1) Turn the ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Measure the resistance between ECM and fuel tank cord. <b>Connector &amp; terminal</b> <b>(B136) No. 20 — (R15) No. 7:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair open circuit between ECM and fuel tank cord.
<b>5</b> <b>CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND.</b> Measure the resistance between fuel tank cord and chassis ground. <b>Connector &amp; terminal</b> <b>(R15) No. 3 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 6.	Repair open circuit between fuel tank cord and chassis ground.  <b>NOTE:</b> In this case repair the following: Poor contact in coupling connector
<b>6</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel level sensor. 2) Measure the resistance between fuel level sensor and coupler connector. <b>Connector &amp; terminal</b> <b>(R57) No. 3 — (R58) No. 5:</b>	Is the resistance less than 10 $\Omega$ ?	Go to step 7.	Repair open circuit between coupling connector and fuel level sensor.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel sub level sensor. 2) Measure the resistance between fuel level sensor and fuel sub level sensor. <i><b>Connector &amp; terminal</b></i> <i><b>(R58) No. 3 — (R59) No. 2:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step <b>8</b> .	Repair open circuit between fuel level sensor and fuel sub level sensor.
<b>8</b> <b>CHECK FUEL TANK CORD.</b> Measure the resistance between fuel sub level sensor and coupler connector. <i><b>Connector &amp; terminal</b></i> <i><b>(R57) No. 2 — (R59) No. 1:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step <b>9</b> .	Repair open circuit between coupling connector and fuel sub level sensor.
<b>9</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC 2.5)-52, Fuel Pump.> 2) While moving the fuel level sensor float up and down, measure resistance between fuel level sensor terminals. <i><b>Terminals</b></i> <i><b>No. 2 — No. 3:</b></i>	Is the resistance more than 53 $\Omega$ ?	Replace the fuel level sensor. <Ref. to FU(H4DOTC 2.5)-54, Fuel Level Sensor.>	Go to step <b>10</b> .
<b>10</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC 2.5)-55, Fuel Sub Level Sensor.> 2) While moving the fuel sub level sensor float up and down, measure resistance between fuel sub level sensor terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance more than 45 $\Omega$ ?	Replace the fuel sub level sensor. <Ref. to FU(H4DOTC 2.5)-55, Fuel Sub Level Sensor.>	Replace the combination meter. <Ref. to IDI-10, Combination Meter Assembly.>

**AJ:DTC P0502 VEHICLE SPEED SENSOR CIRCUIT LOW INPUT**

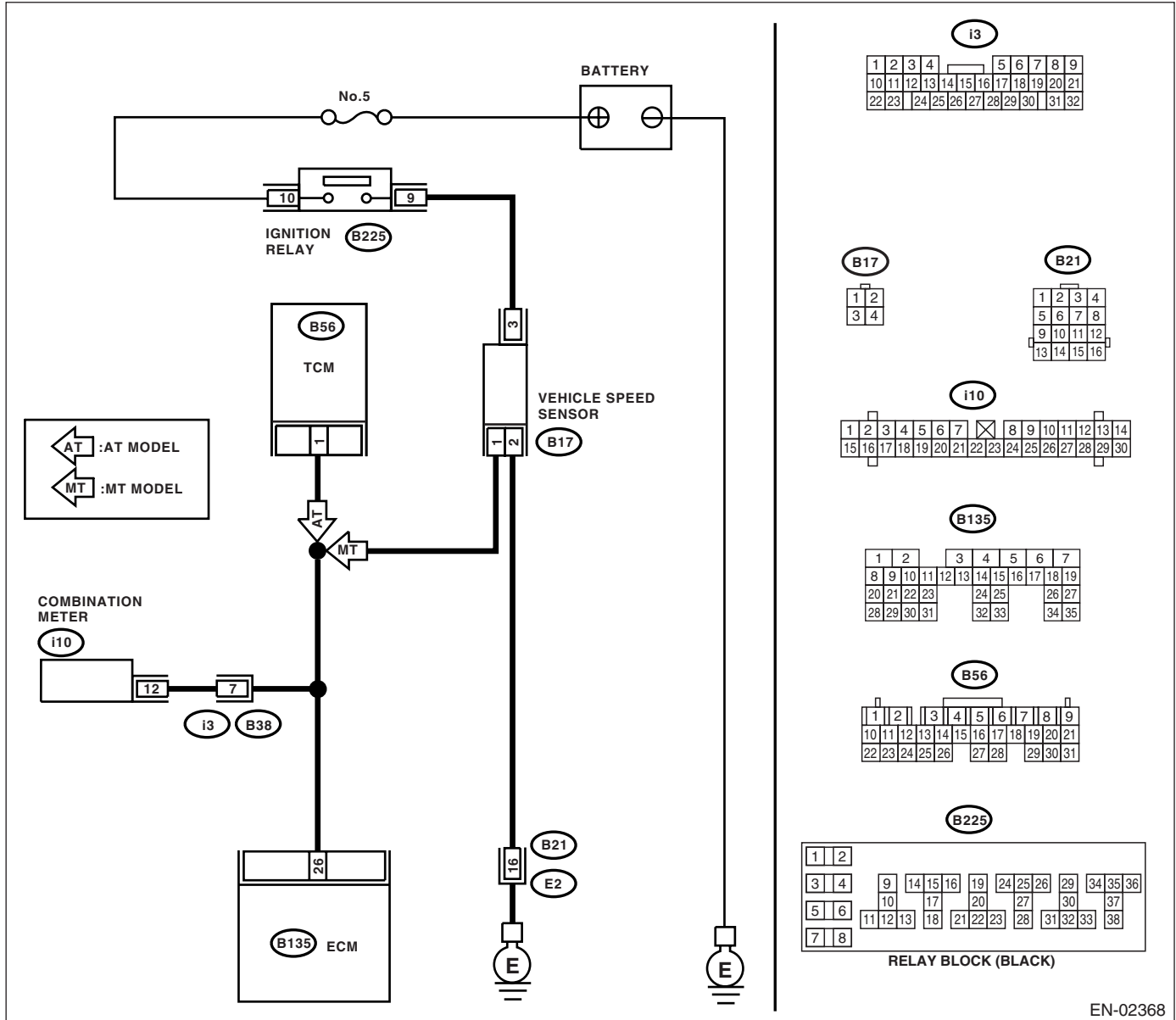
**DTC DETECTING CONDITION:**

Immediately at fault recognition

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02368



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN VEHICLE SPEED SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from vehicle speed sensor ECM.                      3) Measure the resistance of harness between vehicle speed sensor connector and chassis ground.</p> <p><b>Connector &amp; terminal (B17) No. 1 — Chassis ground:</b></p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Go to step 2.</p>	<p>Repair ground short circuit in harness between vehicle speed sensor and ECM connector.</p>
<p><b>2</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in vehicle speed sensor connector.</p>	<p>Is there poor contact in vehicle speed sensor connector?</p>	<p>Repair poor contact in vehicle speed sensor connector.</p>	<p>Replace the vehicle speed sensor. &lt;Ref. to 5MT-46, Vehicle Speed Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AK:DTC P0503 VEHICLE SPEED SENSOR INTERMITTENT/ERRATIC/HIGH

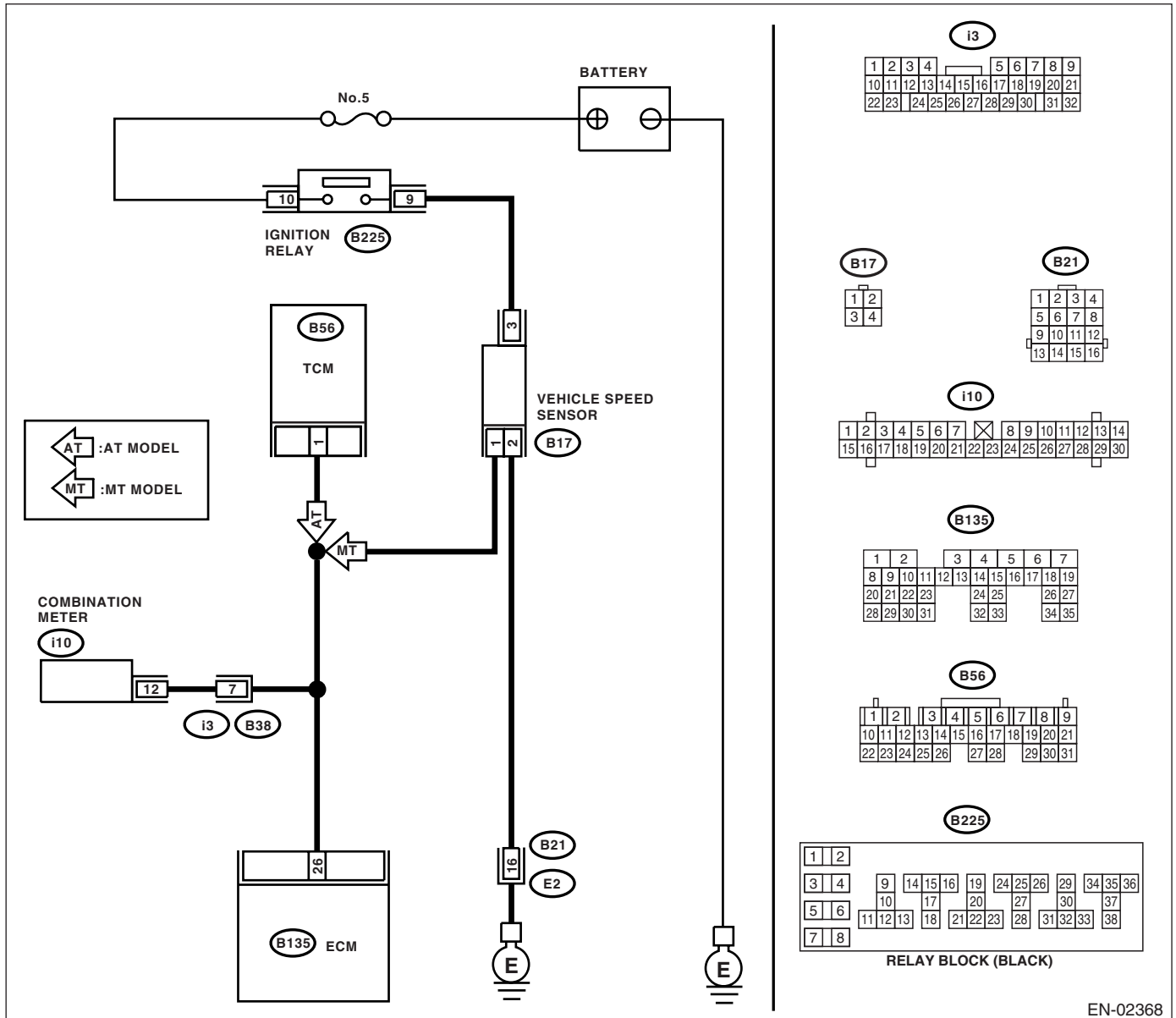
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02368

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK SPEEDOMETER OPERATION IN COMBINATION METER.</b>	Does speedometer operate normally?	Go to step 2.	Check the speedometer. <Ref. to IDI-13, Speedometer.>
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the combination meter. 3) Measure the resistance between ECM and combination meter connector. <b>Connector &amp; terminal</b> <b>(B135) No. 26 — (i10) No. 12:</b>	Is the resistance less than 10 $\Omega$ ?	Repair the poor contact in ECM connector.	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and combination meter connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in combination meter connector</li> <li>• Poor contact in coupling connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AL:DTC P0512 STARTER REQUEST CIRCUIT

### DTC DETECTING CONDITION:

Immediately at fault recognition

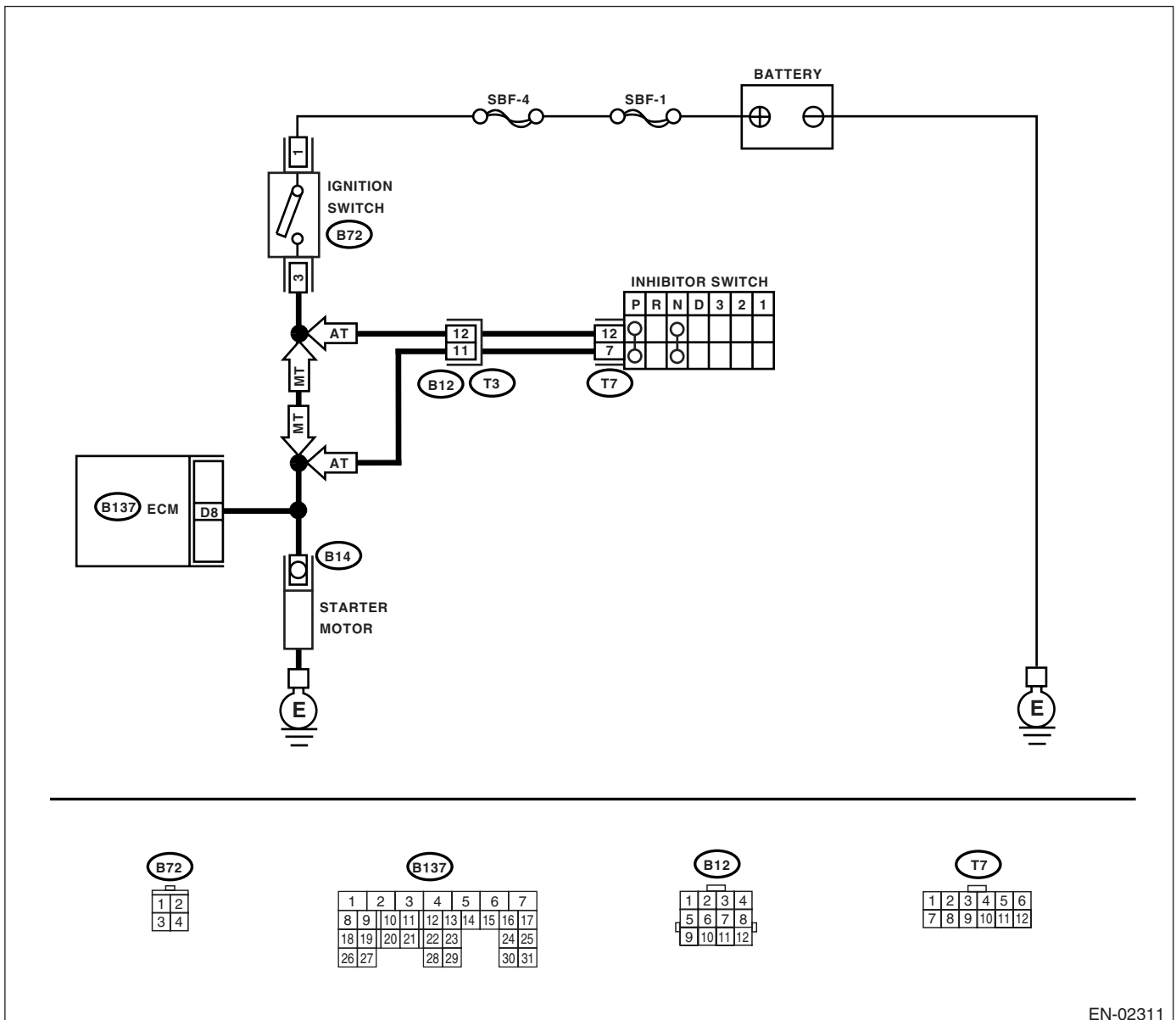
### TROUBLE SYMPTOM:

Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK OPERATION OF STARTER MOTOR.</b>	Does the starter motor operate when ignition switch to ON?	Repair battery short circuit in starter motor circuit. After repair, replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Check starter motor circuit. <Ref. to EN(H4DOTC 2.5)-55, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

## **AM:DTC P0519 IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE)**

### **DTC DETECTING CONDITION:**

Immediately at fault recognition

### **TROUBLE SYMPTOM:**

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

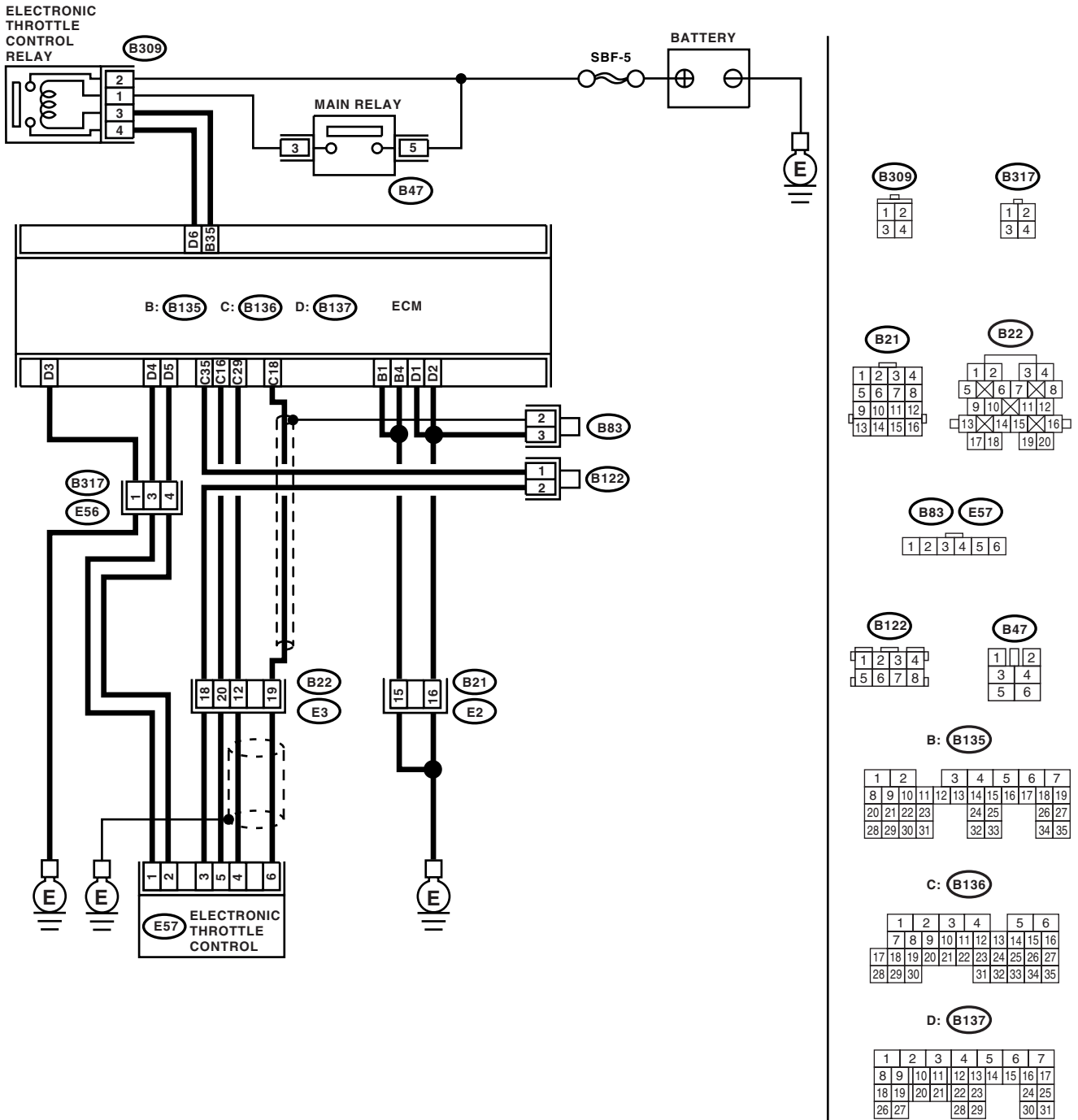
### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0519.	Go to step 2.
<b>2</b> <b>CHECK AIR INTAKE SYSTEM.</b> 1) Turn the ignition switch to ON. 2) Start and idle the engine. 3) Check the following items: <ul style="list-style-type: none"> <li>• Loose installation of intake manifold and throttle body</li> <li>• Cracks of intake manifold gasket and throttle body gasket</li> <li>• Disconnections of vacuum hoses</li> </ul>	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
<b>3</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Replace the electronic throttle control. 3) Check the electronic throttle control.	Are foreign matters found inside the electronic throttle control?	Remove foreign matters from the electronic throttle control.	Perform the diagnosis of DTC P2101.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AN:DTC P0545 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW - BANK 1

### DTC DETECTING CONDITION:

Immediately at fault recognition

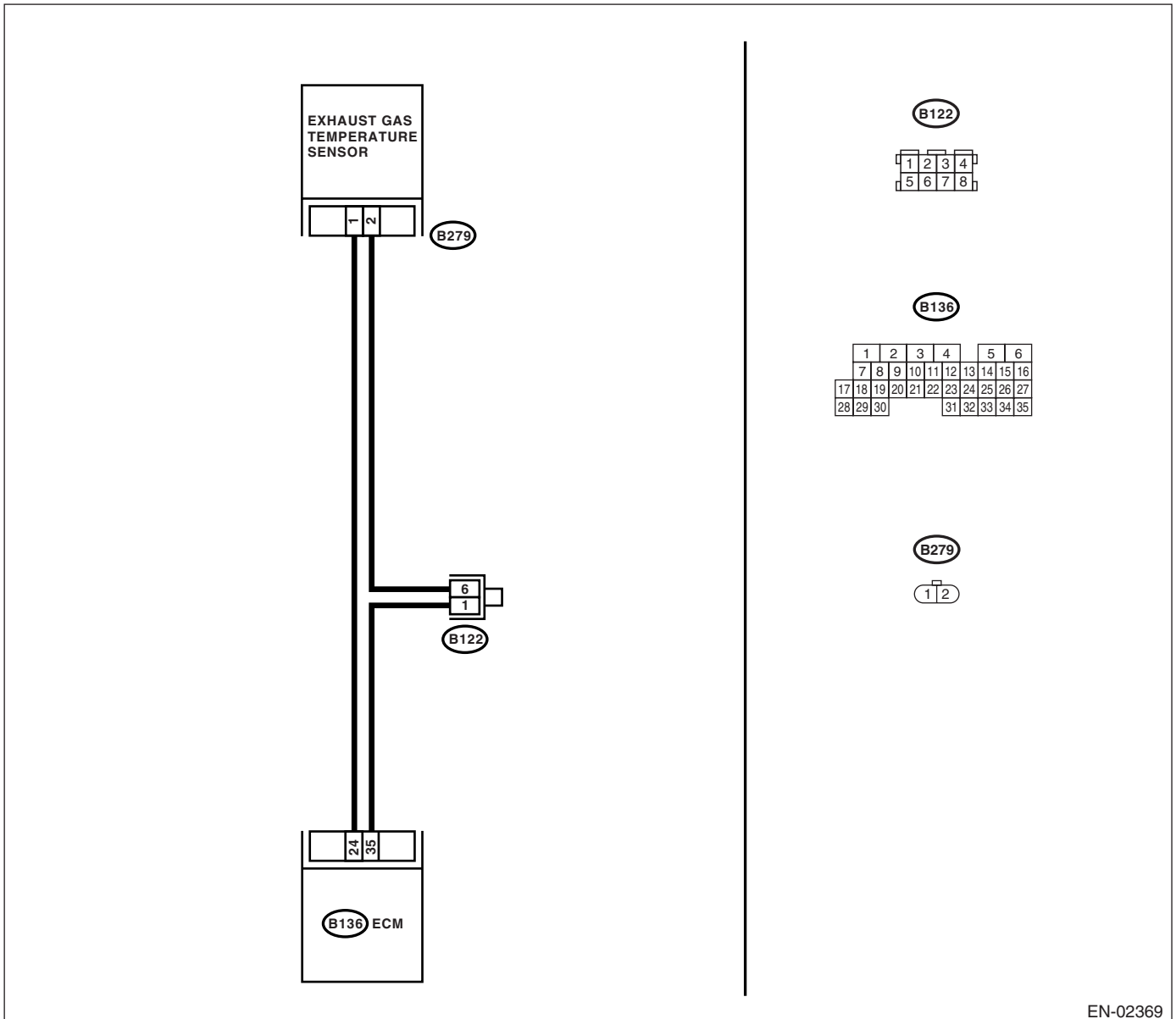
### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of exhaust temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the temperature more than 1,200°C (2,192°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact of exhaust temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN EXHAUST TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from exhaust temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of exhaust temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the temperature less than 372°C (702°F)?</p>	<p>Replace the exhaust temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-40, Exhaust Temperature Sensor.&gt;</p>	<p>Repair ground short circuit in harness between exhaust temperature sensor and ECM connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AO:DTC P0546 EXHAUST GAS TEMPERATURE SENSOR HIGH - BANK 1

### DTC DETECTING CONDITION:

Immediately at fault recognition

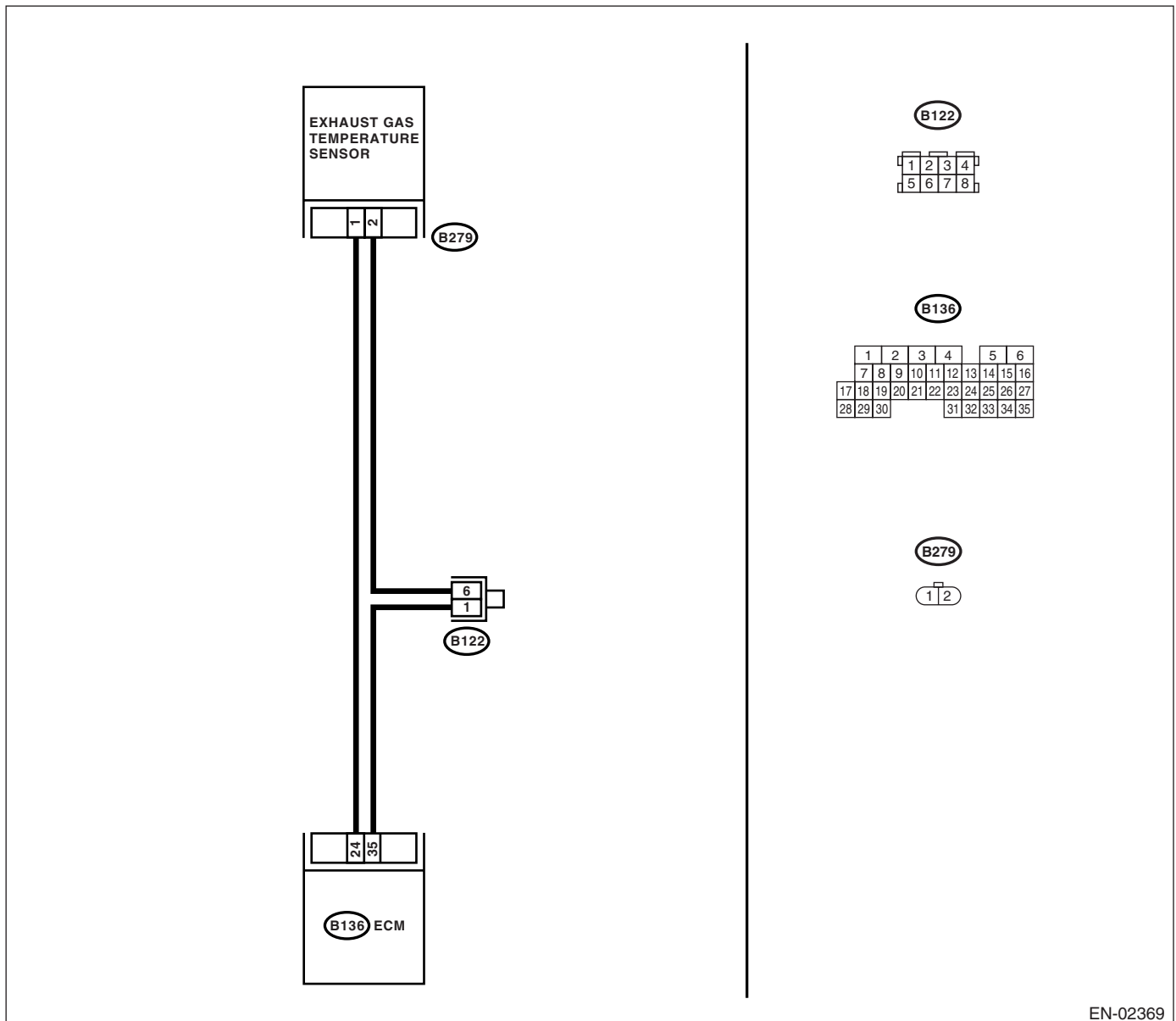
### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02369

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of exhaust temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the temperature less than 372°C (702°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact of exhaust temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN EXHAUST TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from exhaust temperature sensor.</p> <p>3) Measure the voltage between exhaust temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B279) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between ECM and exhaust temperature sensor connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN EXHAUST TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between exhaust temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B279) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between ECM and exhaust temperature sensor connector.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN EXHAUST TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between exhaust temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B279) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and exhaust temperature sensor connector</li> <li>• Poor contact of exhaust temperature sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in joint connector</li> </ul>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN EXHAUST TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between exhaust temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B279) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Replace the exhaust temperature sensor. &lt;Ref. to FU(H4DOTC 2.5)-40, Exhaust Temperature Sensor.&gt;</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and exhaust temperature sensor connector</li> <li>• Poor contact of exhaust temperature sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in joint connector</li> </ul>

## AP:DTC P0600 SERIAL COMMUNICATION LINK

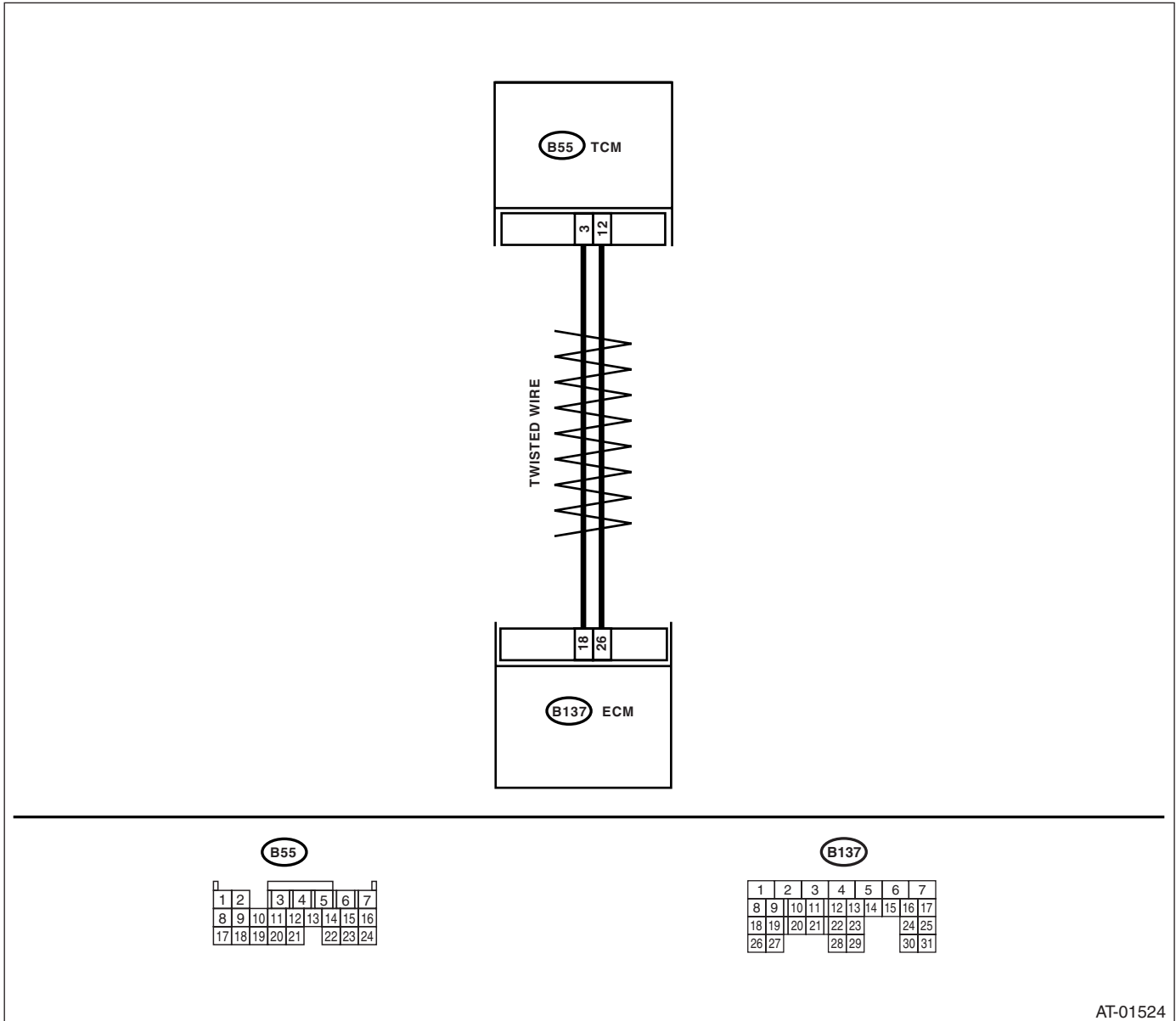
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



AT-01524

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK HARNESS BETWEEN ECM AND TCM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from TCM. 4) Measure the resistance between ECM and TCM connectors. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 18 — (B55) No. 3:</b></i> <i><b>(B137) No. 26 — (B55) No. 12:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair the harness and connector.
<b>2 CHECK HARNESS BETWEEN ECM AND TCM.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 18 — Chassis ground:</b></i> <i><b>(B137) No. 26 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair the harness and connector.
<b>3 CHECK HARNESS BETWEEN ECM AND TCM.</b> Check the resistance between ECM connectors. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 18 — (B137) No. 26:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair the harness and connector.
<b>4 CHECK AT SYSTEM CONDITION.</b> Perform the diagnosis for AT using Subaru Select Monitor.	Is DTC P1718 displayed?	Check AT system.	Replace the ECM.

**AQ:DTC P0604 INTERNAL CONTROL MODULE READ ACCESS MEMORY  
(RAM) ERROR**

**DTC DETECTING CONDITION:**

Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Engine does not start.
- Engine stalls.

**CAUTION:**

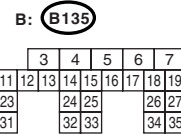
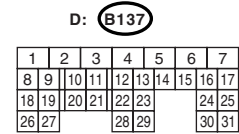
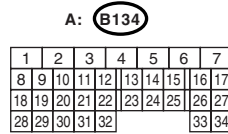
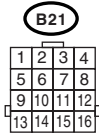
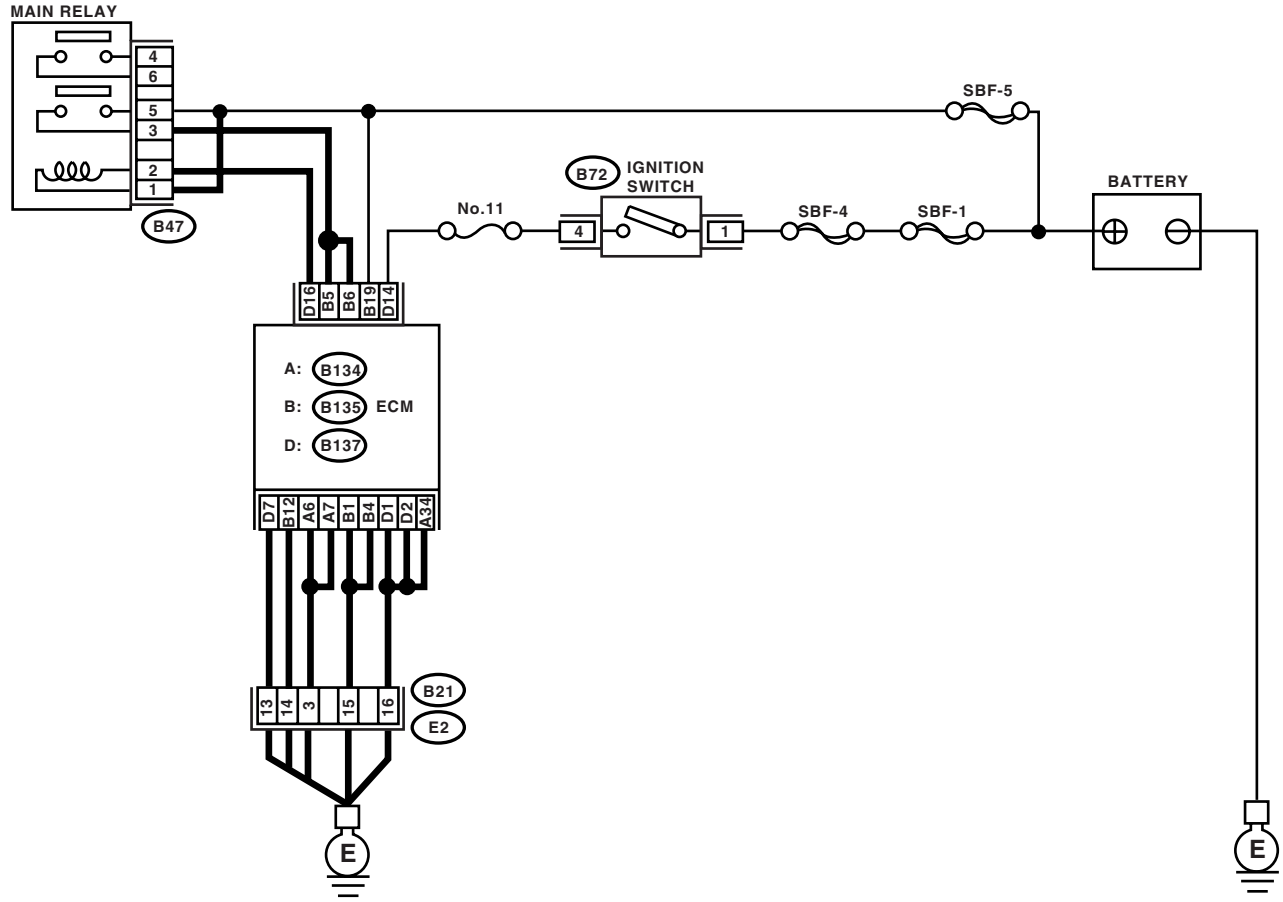
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02356

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b> Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0604?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Temporary poor contact occurs.

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

**NOTE:**

For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4DOTC 2.5)-170, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **AS:DTC P0607 CONTROL MODULE PERFORMANCE**

#### **DTC DETECTING CONDITION:**

Immediately at fault recognition

#### **TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

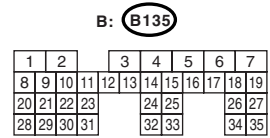
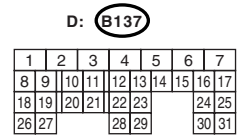
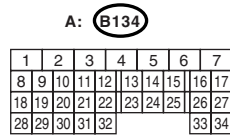
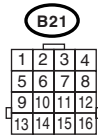
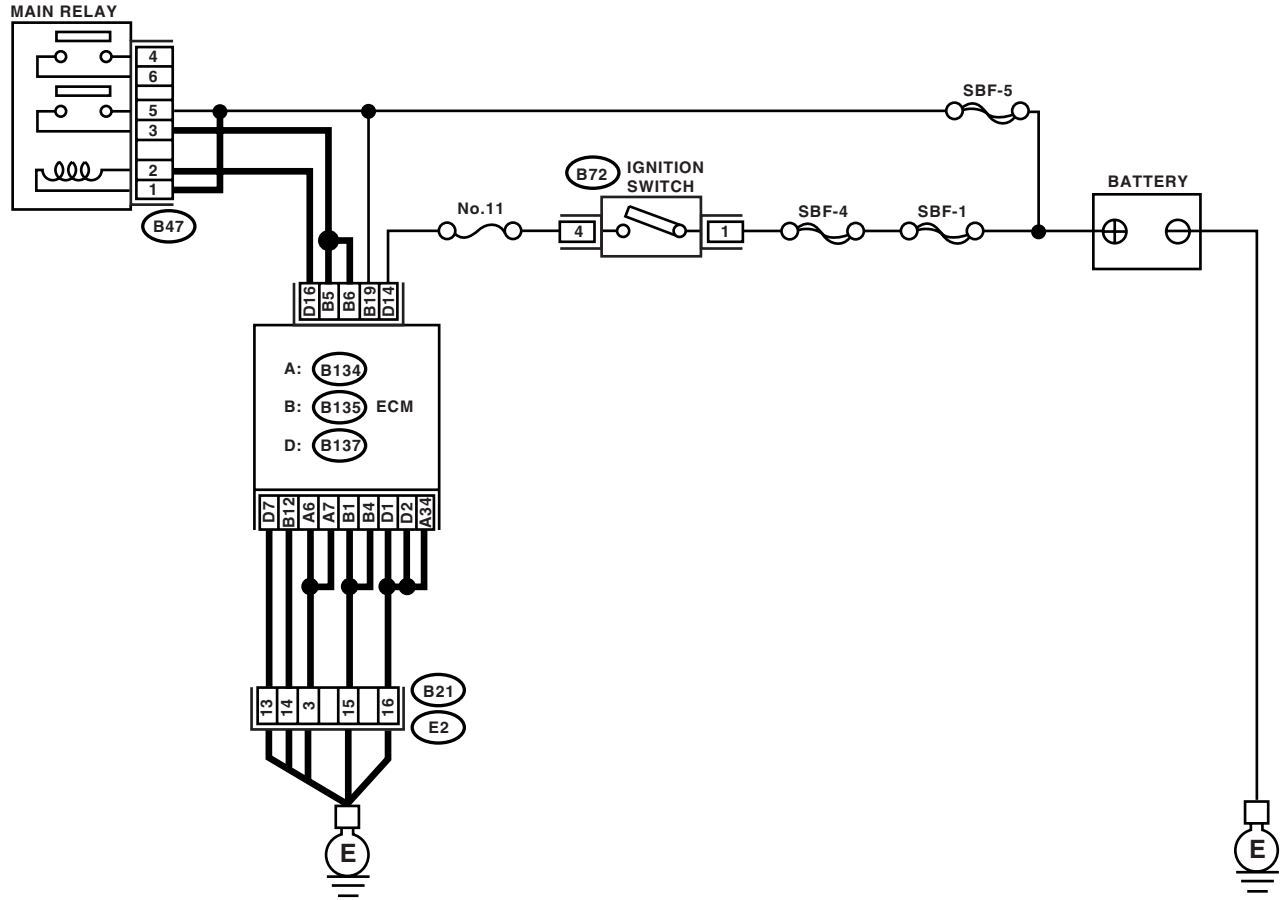
#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02356

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 5 (+) — Chassis ground (-):</b></i> <i><b>(B135) No. 6 (+) — Chassis ground (-):</b></i>	Is the voltage 10 — 13 V?	Go to step 2.	Repair open or ground short circuit of power supply circuit.
<b>2</b> <b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Start the engine. 2) Measure the voltage between ECM connector and ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 5 (+) — Chassis ground (-):</b></i> <i><b>(B135) No. 6 (+) — Chassis ground (-):</b></i>	Is the voltage 13 — 15 V?	Go to step 3.	Repair open or ground short circuit of power supply circuit.
<b>3</b> <b>CHECK ECM GROUND HARNESS.</b> Measure the voltage between ECM connector and ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 1 (+) — Chassis ground (-):</b></i> <i><b>(B137) No. 2 (+) — Chassis ground (-):</b></i>	Is the voltage less than 1 V?	Repair the poor contact in ECM connector. Replace the ECM if defective.	Further tighten the engine ground terminal.

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

NOTE:

For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC 2.5)-224, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **AU:DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW**

### **DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

### **TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Over-heating

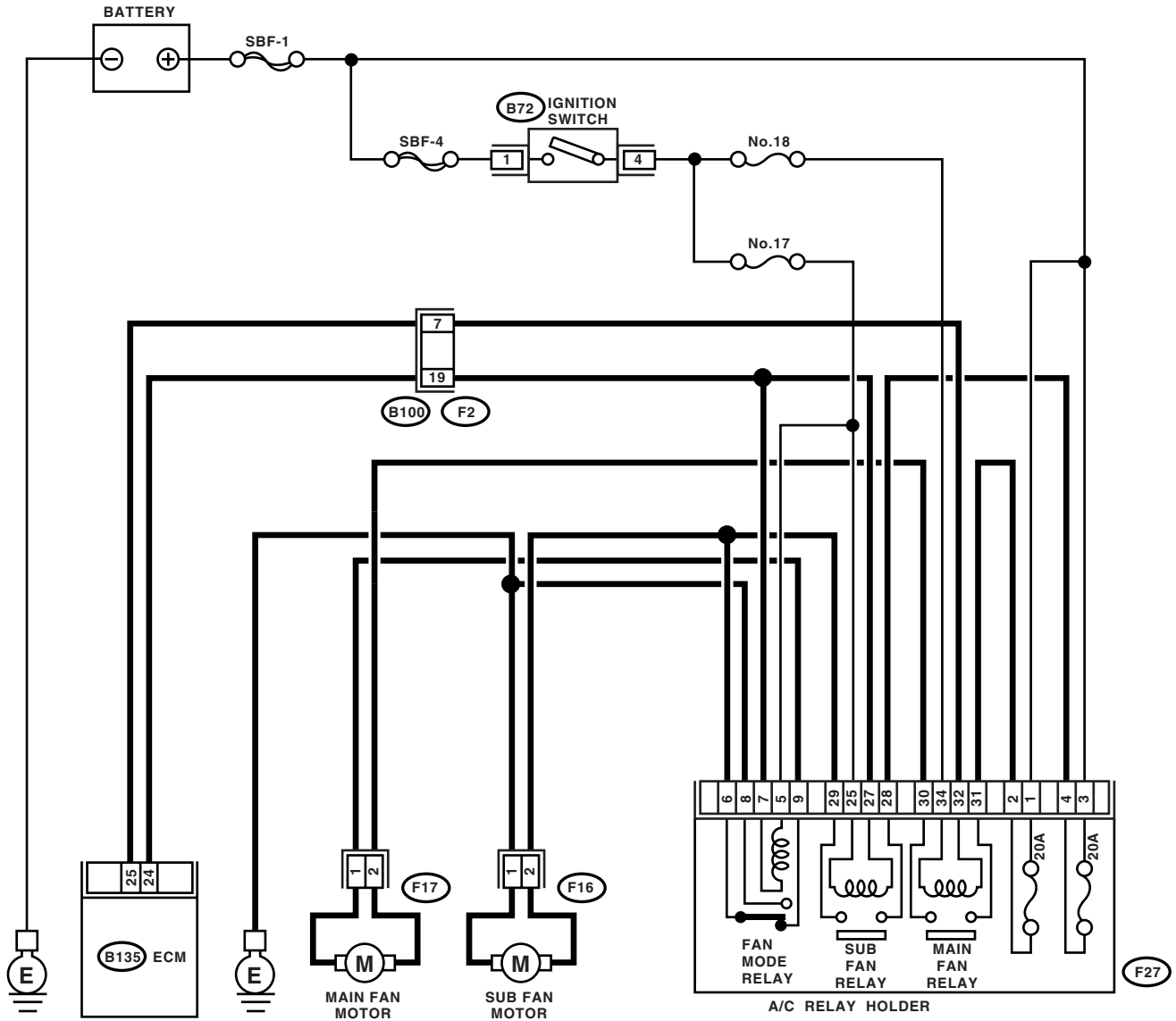
### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



F16

F17

1	2
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B135

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

B72

1	2
3	4

F2

1	2	3	4	5	6	7	8	9	10		
11	12	13	14	15	16	17	18	19	20	21	22

F27

1	2	5	6	7	10	15	16	17	20	25	26	27	30	35
3	4	8	11	18	21	28	31							
9	12	13	14	19	22	23	24	29	32	33	34	36		

EN-02410

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK OUTPUT SIGNAL FROM ECM.</b></p> <p>1) Turn the ignition switch to OFF. 2) Connect the test mode connector. 3) Turn the ignition switch to ON. 4) While operating the radiator fan relay, measure voltage between ECM terminal and ground.</p> <p>NOTE: Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 24 (+) — Chassis ground (-):</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b></p>	Does the voltage vary between 0 — 10 V?	Repair the poor contact in ECM connector.	Go to step 2.
<p><b>2 CHECK GROUND SHORT CIRCUIT IN RADIATOR FAN RELAY CONTROL CIRCUIT.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 24 — Chassis ground:</b> <b>(B135) No. 25 — Chassis ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair ground short circuit in radiator fan relay control circuit.
<p><b>3 CHECK POWER SUPPLY FOR RELAY.</b></p> <p>1) Remove the main fan relay and sub fan relay from A/C relay holder. 2) Turn the ignition switch to ON. 3) Measure the voltage between fuse and relay box (F/B) connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(F27) No. 27 (+) — Chassis ground (-):</b> <b>(F27) No. 32 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 4.	Repair open circuit in harness between ignition switch and fuse and relay box (F/B) connector.
<p><b>4 CHECK FAN RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between fan relay terminals.</p> <p><b>Terminals</b> <b>No. 32 — No. 34 (Main fan relay)</b> <b>No. 25 — No. 27 (Sub fan relay)</b></p>	Is the resistance 87 — 107 $\Omega$ ?	Go to step 5.	Replace the fan relay.
<p><b>5 CHECK OPEN CIRCUIT IN FAN RELAY CONTROL CIRCUIT.</b></p> <p>Measure the resistance of harness between ECM and fan relay connector.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 24 — (F27) No. 27:</b> <b>(B135) No. 25 — (F27) No. 32:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair harness and connector. NOTE: In this case repair the following: • Open circuit in harness between ECM and fan relay connector • Poor contact in coupling connector
<p><b>6 CHECK POOR CONTACT.</b></p> <p>Check poor contact in ECM or fan relay connector.</p>	Is there poor contact in ECM or fan relay connector?	Repair the poor contact in ECM or fan relay connector.	Contact the SUB-ARU dealer.



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **AV:DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH**

#### **DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

#### **TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Over-heating

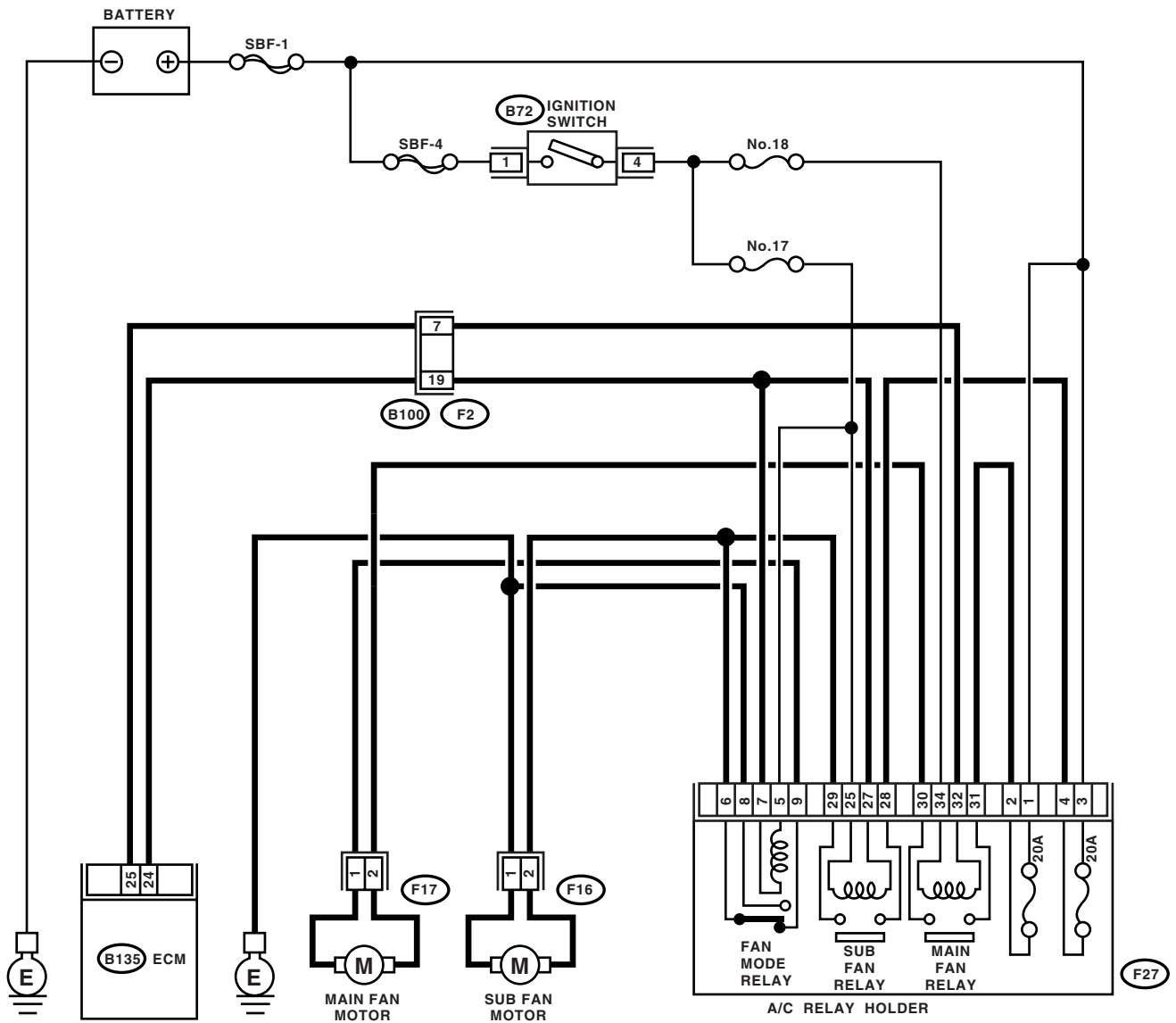
#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



F16

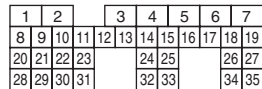
F17



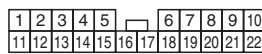
B72



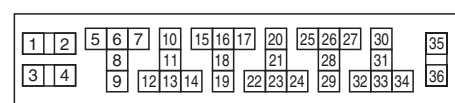
B135



F2



F27



EN-02410

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Connect the test mode connector. 3) Turn the ignition switch to ON. 4) While operating the radiator fan relay, measure voltage between ECM and chassis ground. <b>NOTE:</b> Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC 2.5)-43, Compulsory Valve Operation Check Mode.> <b>Connector &amp; terminal</b> <b>(B135) No. 24 (+) — Chassis ground (-):</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b>	Does the voltage vary between 0 — 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.	Go to step 2.
<b>2 CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY CONTROL CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Remove the main fan relay, sub fan relay and fan mode relay. 3) Disconnect the test mode connectors 4) Turn the ignition switch to ON. 5) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 24 (+) — Chassis ground (-):</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit in radiator fan relay control circuit. After repair, replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 3.
<b>3 CHECK FAN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the fan relay. 3) Measure the resistance between fan relay terminals. <b>Terminals</b> <b>No. 30 — No. 31 (Main fan relay)</b> <b>No. 28 — No. 29 (Sub fan relay)</b>	Is the resistance less than 1 $\Omega$ ?	Replace the fan relay and ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 4.
<b>4 CHECK FAN MODE RELAY.</b> 1) Remove the fan mode relay. 2) Measure the resistance between fan mode relay terminals. <b>Terminals</b> <b>No. 8 — No. 9: (Fan mode relay)</b>	Is the resistance less than 1 $\Omega$ ?	Replace the fan mode relay and ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>

## AW:DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

NOTE:

For the diagnostic procedure, refer to AT section. <Ref. to 4AT(H4SO)-2, PROCEDURE, Basic Diagnostic Procedure.>

**AX:DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL)**

**DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

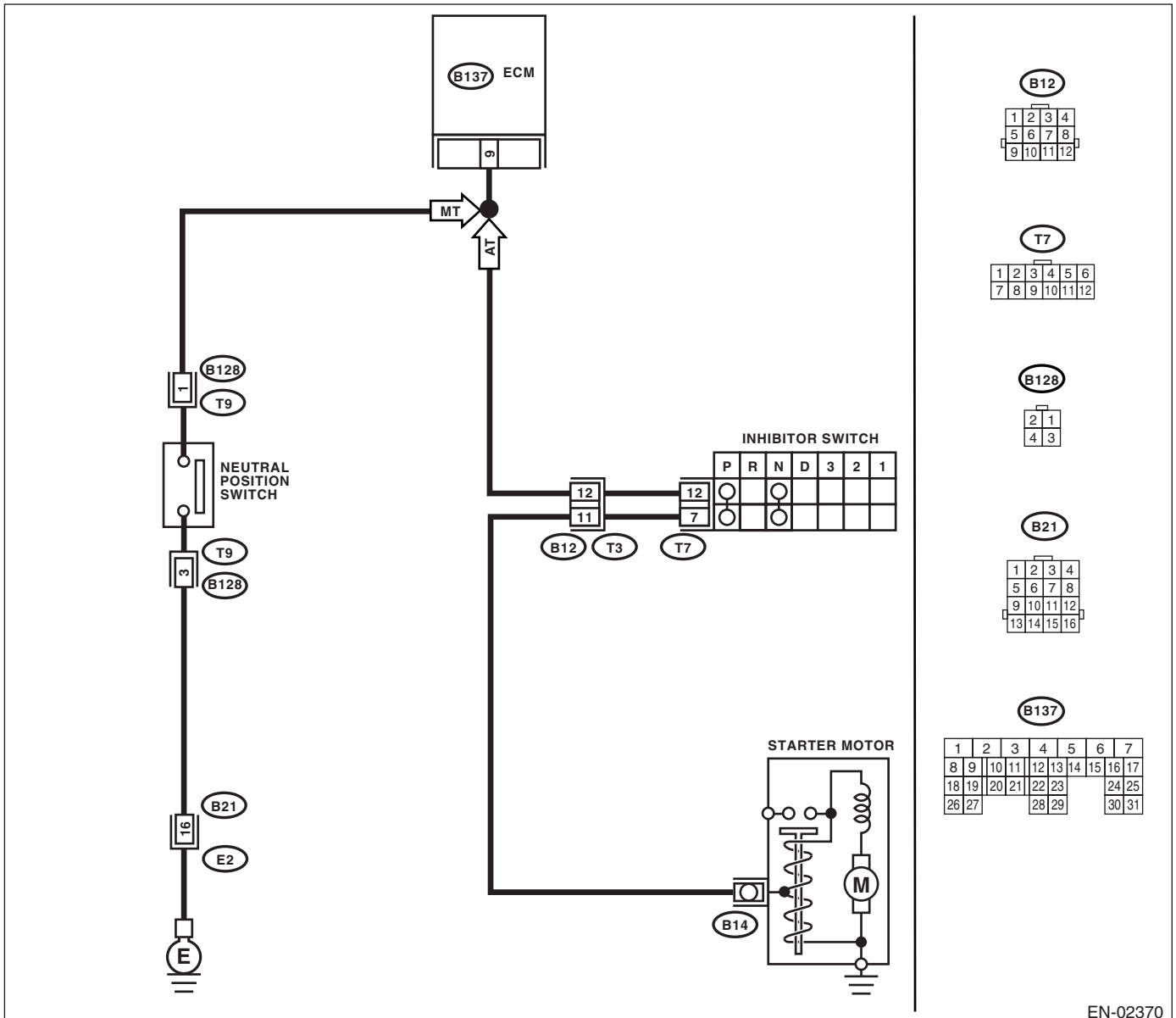
**TROUBLE SYMPTOM:**

Erroneous idling.

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02370

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Shift the select lever to other than "N" and "P" ranges. 3) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 9 (+) — Chassis ground (-):</b></i>	Is the voltage 4.5 — 5.5 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T3). 3) Measure the resistance of harness between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 9 — Chassis ground:</b></i>	Is the resistance more than 1 MΩ?	Go to step 3.	Repair ground short circuit in harness between ECM and transmission harness connector.
<b>3 CHECK TRANSMISSION HARNESS CONNECTOR.</b> 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance of harness between transmission harness connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(T3) No. 12 — Engine ground:</b></i>	Is the resistance more than 1 MΩ?	Go to step 4.	Repair ground short circuit in harness between transmission harness and inhibitor switch connector.
<b>4 CHECK INHIBITOR SWITCH.</b> Measure the resistance between inhibitor switch connector the receptacle's terminals in selector lever except for "N" range. <i><b>Terminals</b></i> <i><b>No. 7 — No. 12:</b></i>	Is the resistance more than 1 MΩ?	Go to step 5.	Replace the inhibitor switch. <Ref. to 4AT-51, Inhibitor Switch.>
<b>5 CHECK SELECTOR CABLE CONNECTION.</b>	Is there any fault in selector cable connection to inhibitor switch?	Repair selector cable connection. <Ref. to CS-14, INSPECTION, Select Cable.>	Contact the SUBARU dealer. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

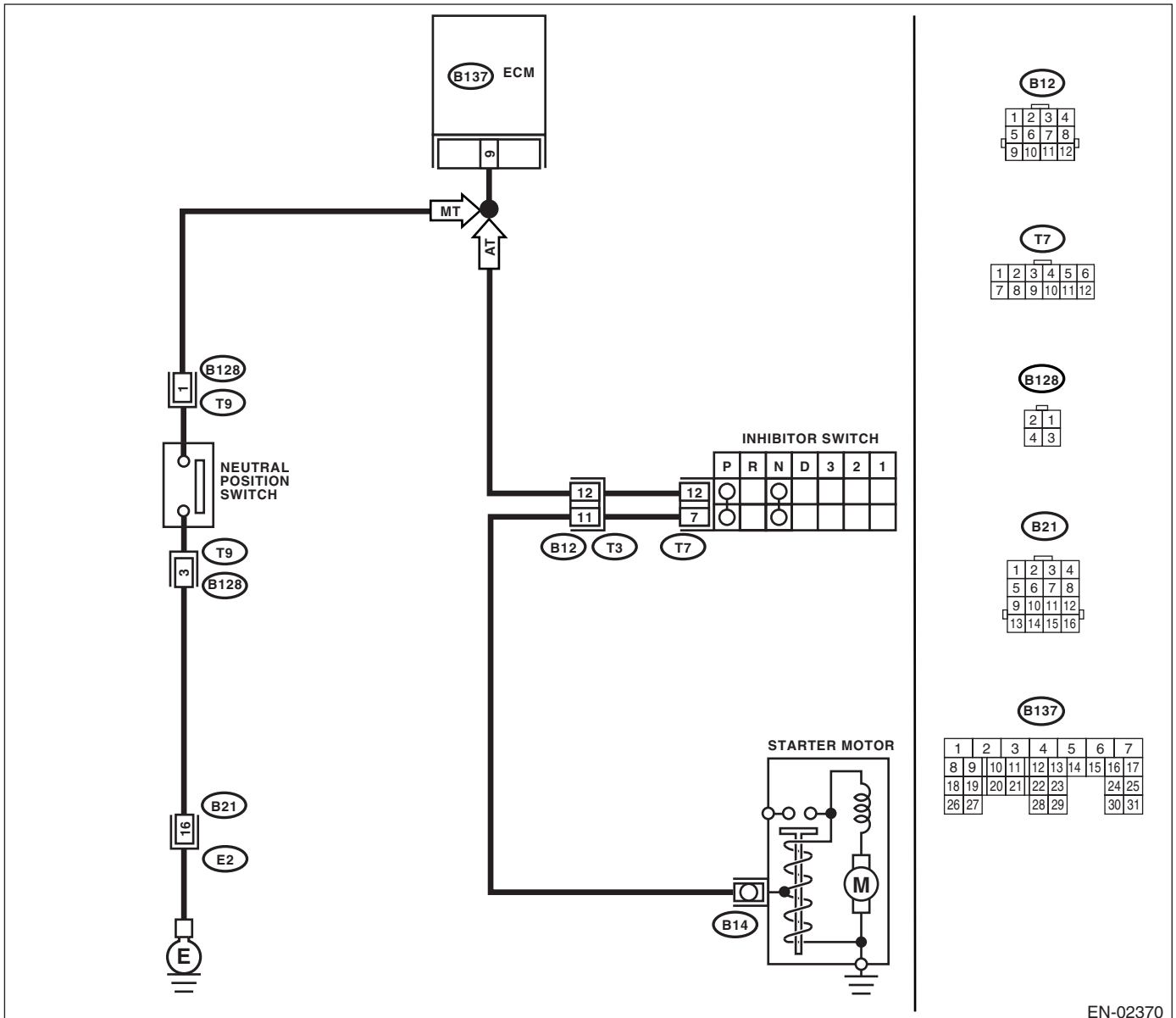
### TROUBLE SYMPTOM:

Erroneous idling.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02370

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Place the shift lever in neutral. 3) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B137) No. 9 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> 1) Place the shift lever except in neutral. 2) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B137) No. 9 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Contact the SUB-ARU dealer.
<b>4 CHECK NEUTRAL POSITION SWITCH.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from transmission harness. 3) Place the shift lever in neutral. 4) Measure the resistance between transmission harness and connector terminals. <i>Connector &amp; terminal</i> <i>(T9) No. 1 — No. 3:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair short circuit in transmission harness or replace the neutral position switch.
<b>5 CHECK NEUTRAL POSITION SWITCH.</b> 1) Place the shift lever except in neutral. 2) Measure the resistance between transmission harness connector terminals. <i>Terminals</i> <i>No. 1 — No. 3:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair short circuit in transmission harness or replace the neutral position switch.
<b>6 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> Measure the resistance between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B137) No. 9 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair ground short circuit in harness between ECM and transmission harness connector.
<b>7 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and transmission harness connector. <i>Connector &amp; terminal</i> <i>(B137) No. 9 — (B128) No. 1:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair open circuit in harness between ECM and transmission harness connector.
<b>8 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> Measure the resistance of harness between transmission harness connector and engine ground. <i>Connector &amp; terminal</i> <i>(B128) No. 1 — Engine ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step 9.	Repair open circuit between transmission harness connector and engine ground terminal.
<b>9 CHECK POOR CONTACT.</b> Check poor contact in transmission harness connector.	Is there poor contact in transmission harness connector?	Repair poor contact in transmission harness connector.	Contact the SUB-ARU dealer.

**AZ:DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL)**

**DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

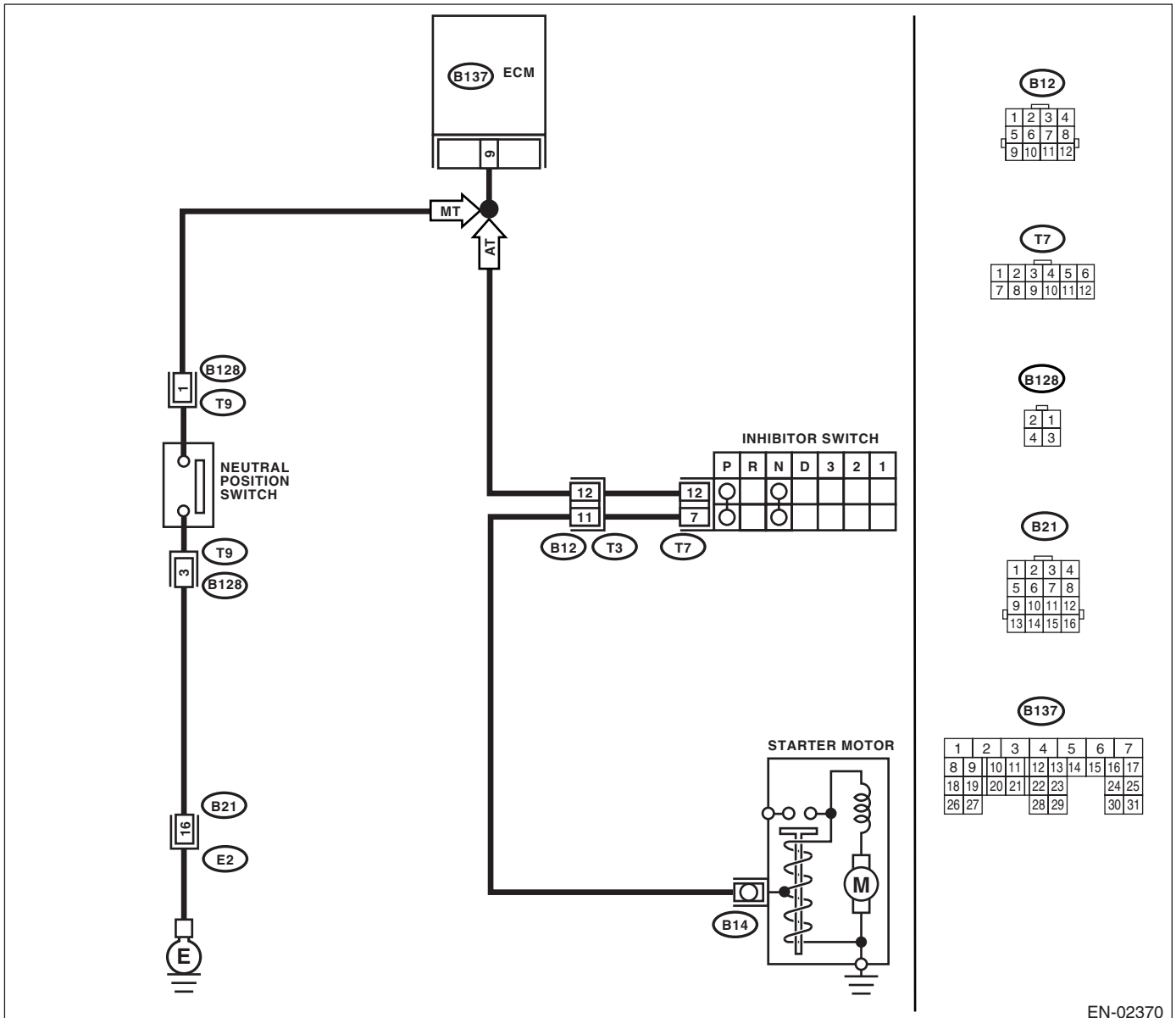
**TROUBLE SYMPTOM:**

Erroneous idling.

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02370



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground with select lever at "N" and "P" ranges. <i>Connector &amp; terminal</i> <i>(B137) No. 9 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground with select lever at except "N" and "P" ranges. <i>Connector &amp; terminal</i> <i>(B137) No. 9 (+) — Chassis ground (-):</i>	Is the voltage 4.5 — 5.5 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B137) No. 9 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and inhibitor switch connector.	Go to step 5.
<b>5 CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and inhibitor switch. 3) Measure the resistance of harness between ECM and inhibitor switch connector. <i>Connector &amp; terminal</i> <i>(B137) No. 9 — (T7) No. 12:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and inhibitor switch connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in inhibitor switch connector</li> <li>• Poor contact in ECM connector.</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b>      <b>CHECK INHIBITOR SWITCH GROUND LINE.</b>                      Measure the resistance of harness between inhibitor switch connector and engine ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(T7) No. 7 — Engine ground:</b></i></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 7.</p>	<p>Repair open circuit in harness between inhibitor switch connector and starter motor ground line.                       NOTE:                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between inhibitor switch connector and starter motor ground line</li> <li>• Poor contact in starter motor connector</li> <li>• Poor contact in starter motor ground</li> <li>• Starter motor</li> </ul>
<p><b>7</b>      <b>CHECK INHIBITOR SWITCH.</b>                      Measure the resistance between inhibitor switch connector receptacle's terminals with select lever at "N" and "P" ranges.  <i><b>Terminals</b></i>  <i><b>No. 7 — No. 12:</b></i></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Replace the inhibitor switch. &lt;Ref. to 4AT-51, Inhibitor Switch.&gt;</p>
<p><b>8</b>      <b>CHECK SELECTOR CABLE CONNECTION.</b></p>	<p>Is there any fault in selector cable connection to inhibitor switch?</p>	<p>Repair selector cable connection.                      &lt;Ref. to CS-14, INSPECTION, Select Cable.&gt;</p>	<p>Contact the SUB-ARU dealer.                       NOTE:                      Inspection by DTM is required, because probable cause is deterioration of multiple parts.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

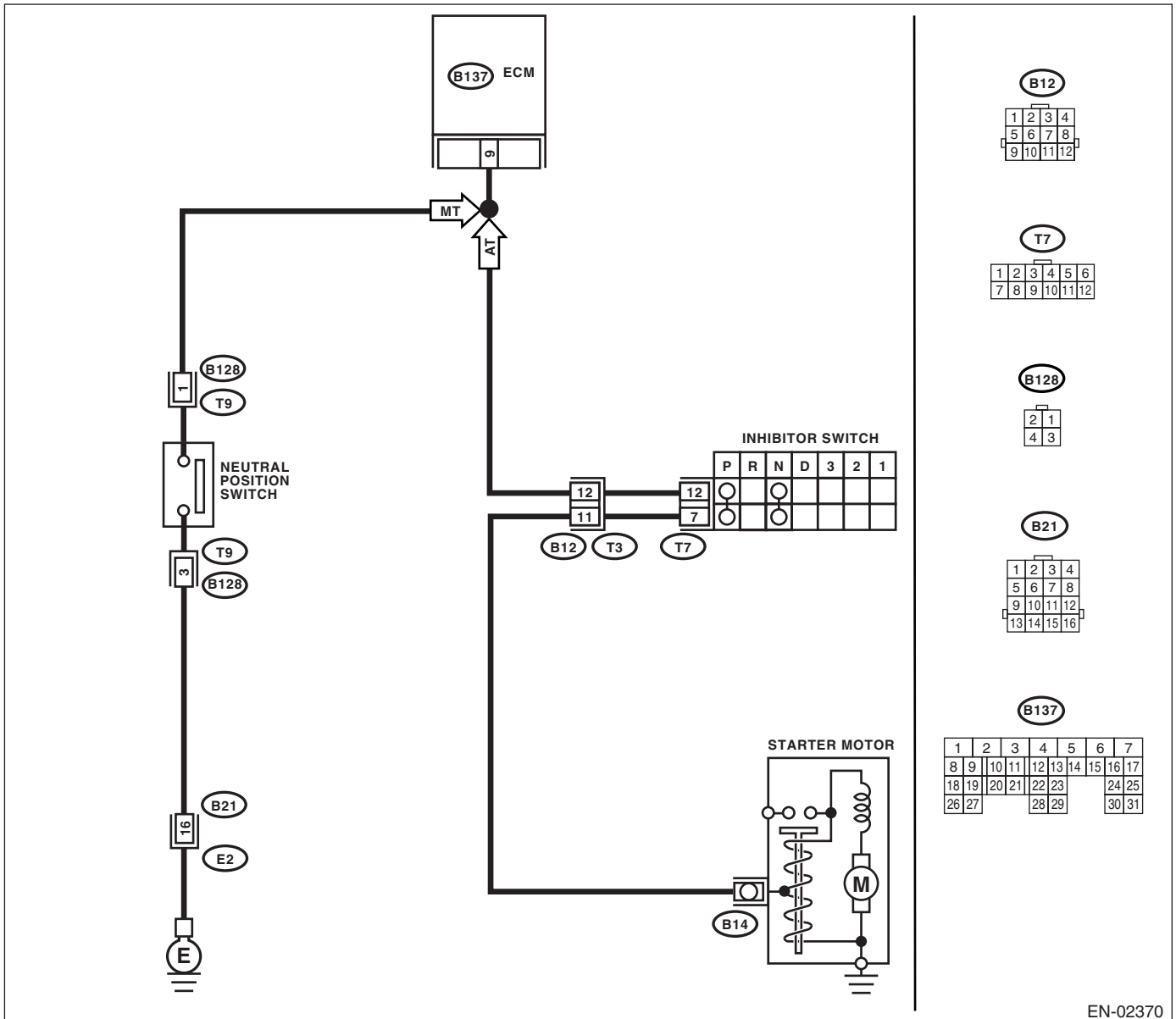
### TROUBLE SYMPTOM:

Erroneous idling.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02370

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Place the shift lever except in neutral position. 3) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 9 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> 1) Place the shift lever in neutral position. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 9 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Contact the SUB-ARU dealer.
<b>4 CHECK INPUT SIGNAL FROM ECM.</b> 1) Disconnect the connector from ECM. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 9 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and transmission harness connector.	Go to step 5.
<b>5 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T9). 3) Measure the resistance of harness between ECM and neutral switch connector. <b>Connector &amp; terminal</b> <b>(B137) No. 9 — (B128) No. 1:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and transmission harness connector</li> <li>• Poor contact in transmission harness connector.</li> <li>• Poor contact in ECM connector.</li> </ul>
<b>6 CHECK NEUTRAL POSITION SWITCH GROUND LINE.</b> Measure the resistance of harness between transmission harness connector and engine ground. <b>Connector &amp; terminal</b> <b>(B128) No. 3 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 7.	Repair open circuit in the neutral position switch ground line.
<b>7 CHECK NEUTRAL POSITION SWITCH.</b> 1) Place the shift lever except in neutral position. 2) Measure the resistance between transmission harness connector socket terminals. <b>Terminals</b> <b>No. 1 — No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Replace the neutral position switch.
<b>8 CHECK POOR CONTACT.</b> Check poor contact in transmission harness connector.	Is there poor contact in transmission harness connector?	Repair poor contact in transmission harness connector.	Contact the SUB-ARU dealer.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BB:DTC P1086 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT LOW

### DTC DETECTING CONDITION:

Immediately at fault recognition

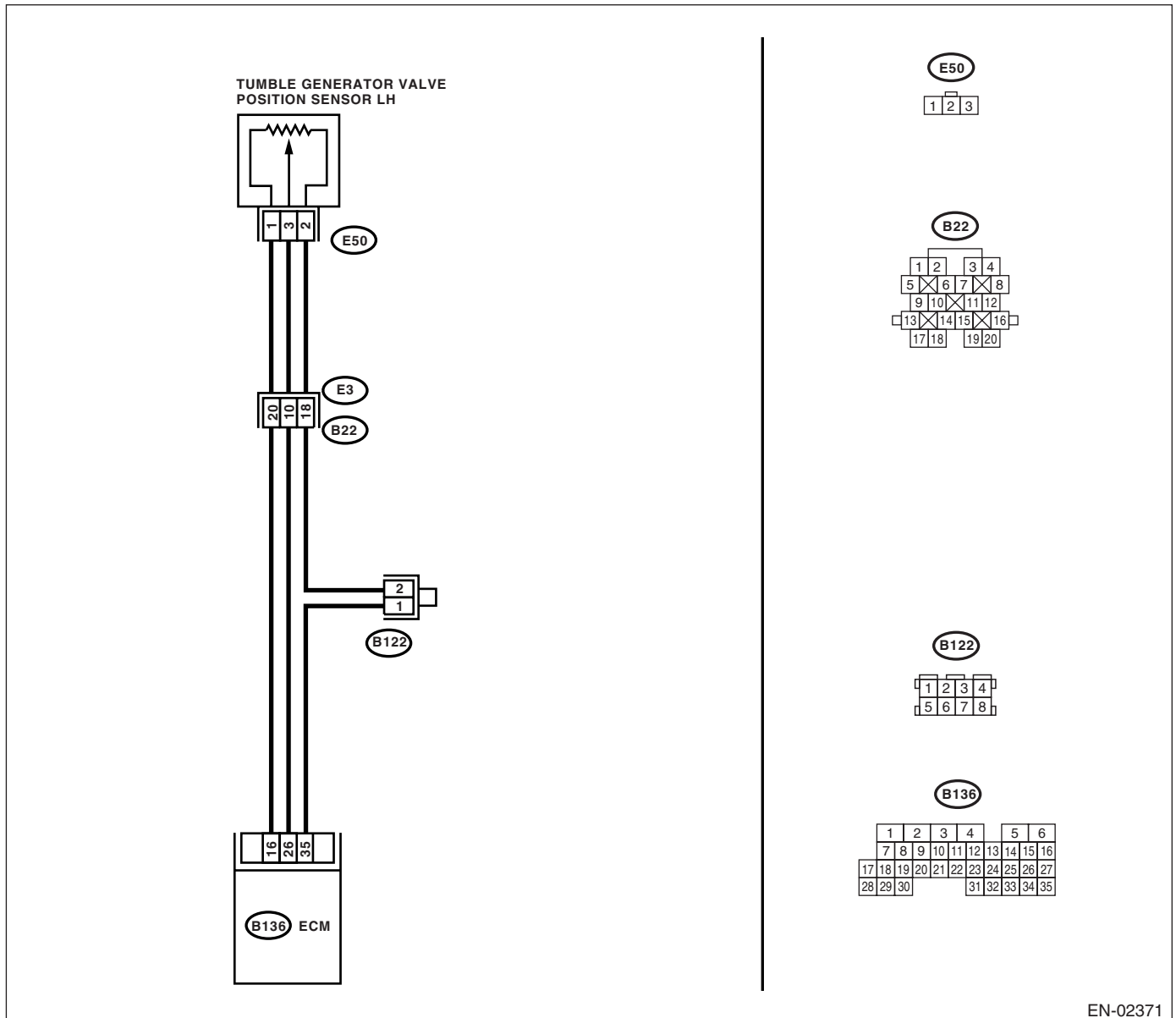
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02371

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the voltage less than 0.1 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case repair the following: • Poor contact in throttle position sensor connector • Poor contact in ECM connector. • Poor contact in coupling connector
<b>2</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground while tumble generator valve is fully closed.  <i>Connector &amp; terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
<b>3</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B136) No. 16 (+) — Chassis ground (-):</i>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair the poor contact in ECM connector.	Contact the SUBARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B136) No. 26 (+) — Chassis ground (-):</i>	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
<b>5</b> <b>CHECK INPUT SIGNAL FOR ECM WITH SUBARU SELECT MONITOR.</b> Measure the voltage between ECM connector and chassis ground.	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair the poor contact in ECM connector.	Go to step 6.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from tumble generator valve position sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E50) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 7.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance of harness between ECM connector and tumble generator valve position sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 26 — (E50) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in tumble generator valve position sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E50) No. 3 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 9.</p>	<p>Repair ground short circuit in harness between tumble generator valve position sensor and ECM connector.</p>
<p><b>9</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Repair poor contact in tumble generator valve position sensor connector.</p>	<p>Is there poor contact in tumble generator valve position sensor connector?</p>	<p>Repair the poor contact in tumble generator valve position sensor connector.</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>

## BC:DTC P1087 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT HIGH

**DTC DETECTING CONDITION:**

Immediately at fault recognition

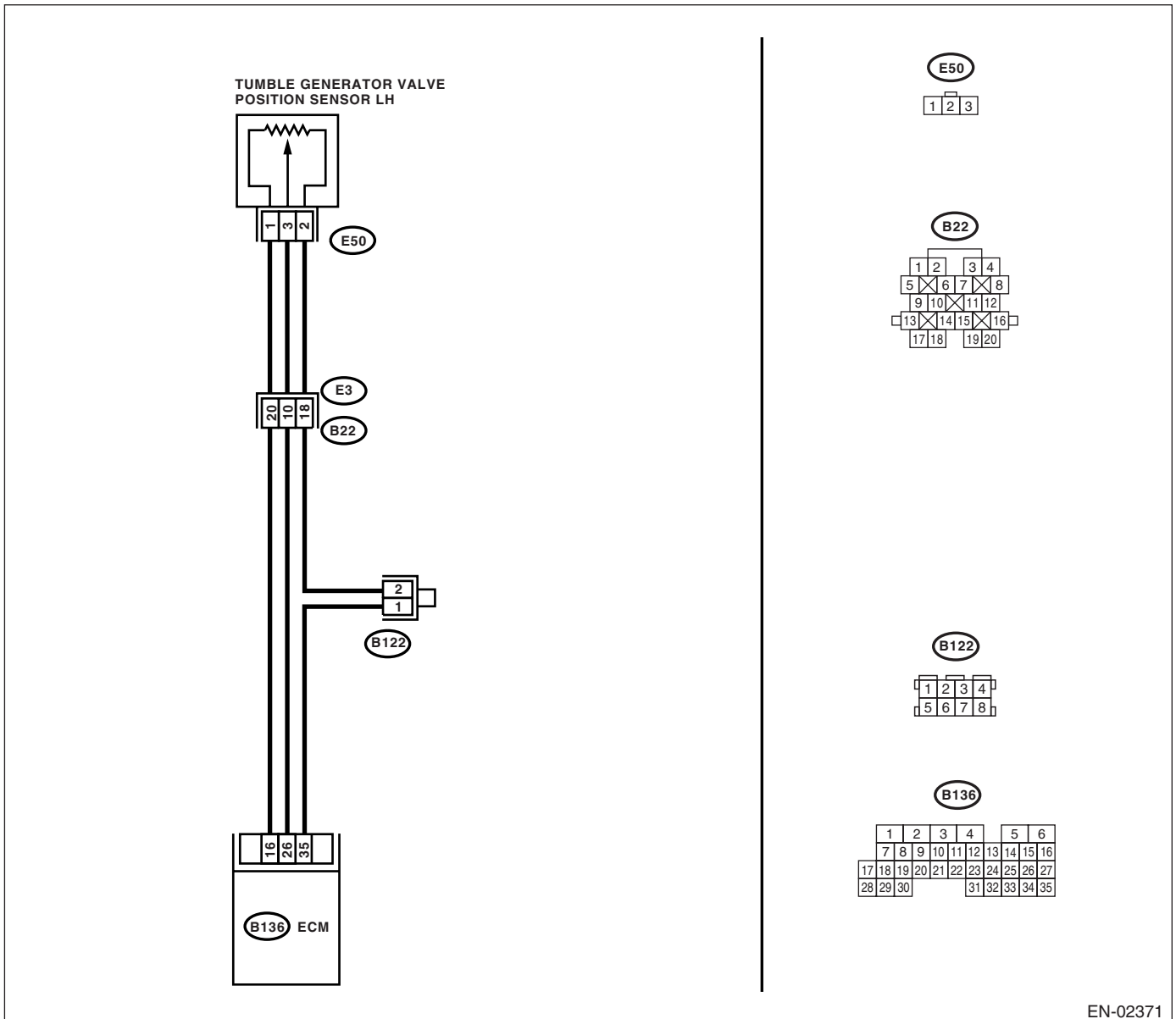
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02371



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the voltage more than 4.9 V?</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. A temporary poor contact of the connector may be the cause.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from throttle position sensor.</p> <p>3) Measure the resistance of harness between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E50) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E50) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.9 V?</p>	<p>Repair battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. &lt;Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).&gt;</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>

## BD:DTC P1088 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW

### DTC DETECTING CONDITION:

Immediately at fault recognition

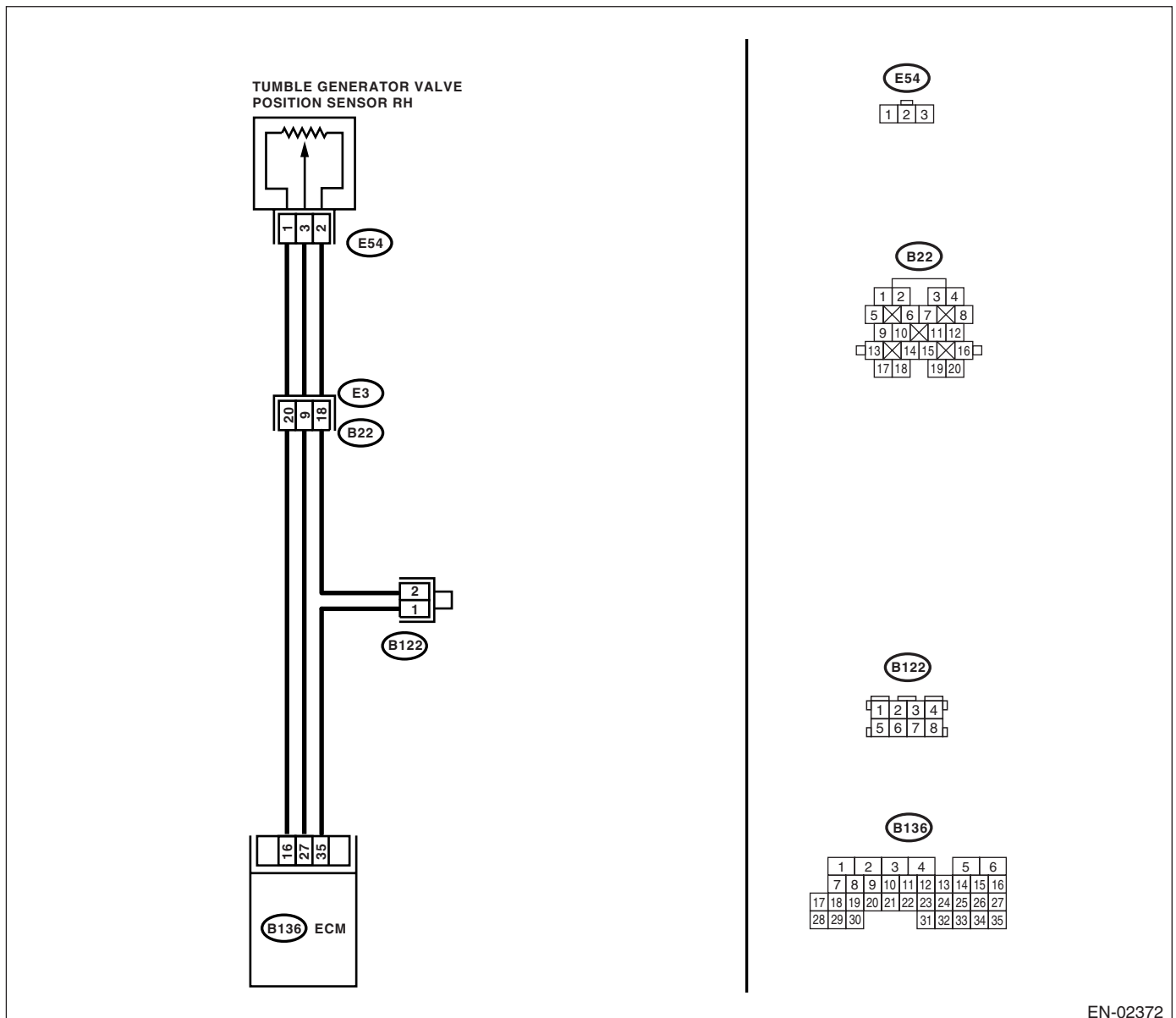
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02372

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool.  <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the voltage less than 0.1 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  <b>NOTE:</b> In this case repair the following: • Poor contact in tumble generator valve position sensor connector • Poor contact in ECM connector. • Poor contact in coupling connector
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground while throttle valve is fully closed.  <b>Connector &amp; terminal</b> <b>(B136) No. 16 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
<b>3 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B136) No. 16 (+) — Chassis ground (-):</b>	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter?	Repair the poor contact in ECM connector.	Contact the SUBARU dealer.  <b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B136) No. 27 (+) — Chassis ground (-):</b>	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
<b>5 CHECK INPUT SIGNAL FOR ECM WITH SUBARU SELECT MONITOR.</b> Measure the voltage between ECM connector and chassis ground.	Does the voltage change by shaking the harness and connector of ECM while monitoring the value with Subaru Select Monitor?	Repair the poor contact in ECM connector.	Go to step 6.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from throttle position sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E54) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 7.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in throttle position sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance of harness between ECM connector and throttle position sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 27 — (E54) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair the harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in tumble generator valve position sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.</b></p> <p>Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E54) No. 3 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 9.</p>	<p>Repair ground short circuit in harness between tumble generator valve position sensor and ECM connector.</p>
<p><b>9</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Repair poor contact in tumble generator valve position sensor connector.</p>	<p>Is there poor contact in tumble generator valve position sensor connector?</p>	<p>Repair the poor contact in tumble generator valve position sensor connector.</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BE:DTC P1089 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT HIGH

### DTC DETECTING CONDITION:

Immediately at fault recognition

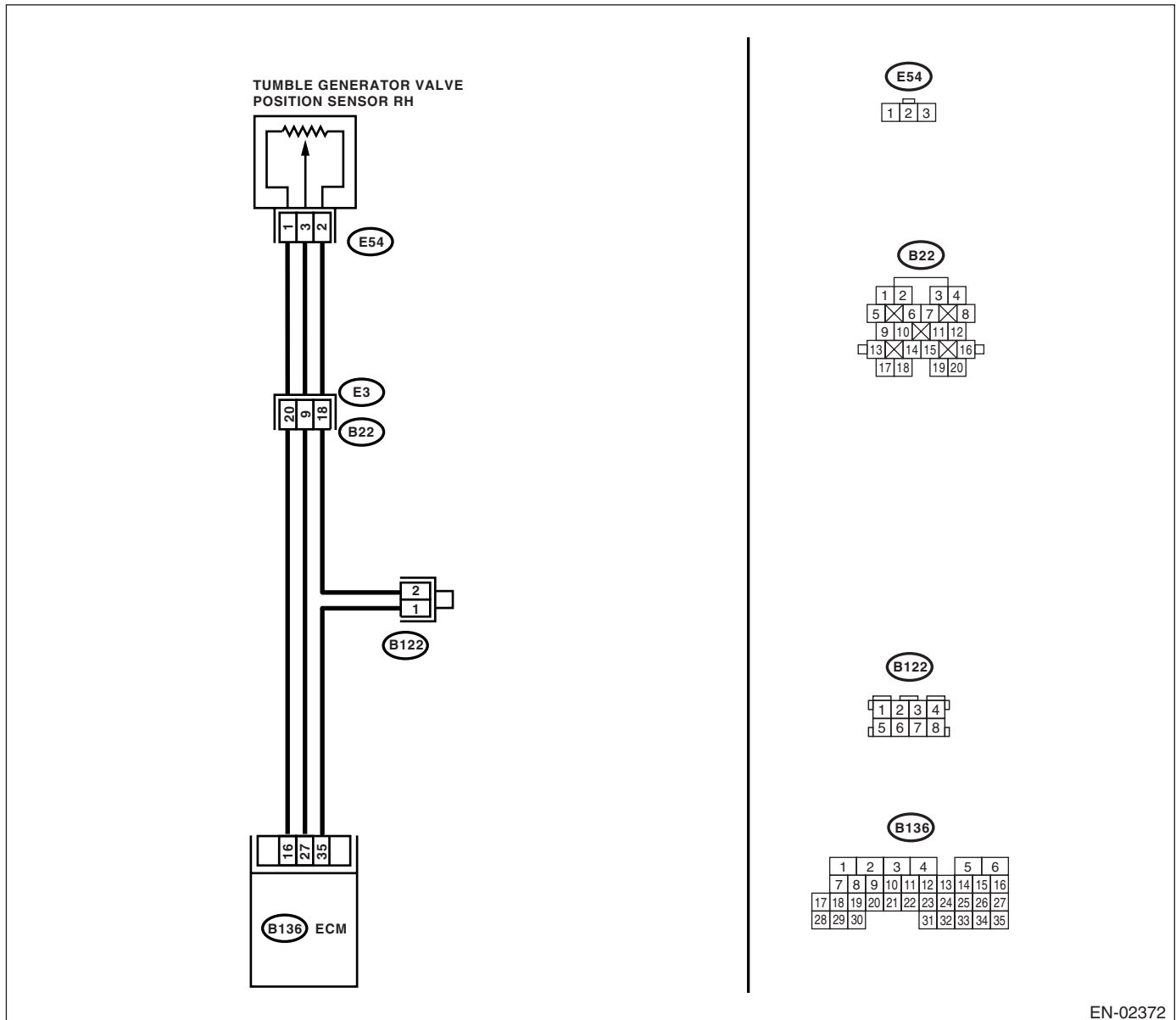
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02372

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". &lt;Ref. to EN(H4DOTC 2.5)-27, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the voltage more than 4.9 V?</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. A temporary poor contact of the connector may be the cause.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in tumble generator valve position sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from throttle position sensor.</p> <p>3) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E54) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between tumble generator valve position sensor and ECM connector</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E54) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.9 V?</p>	<p>Repair battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. &lt;Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).&gt;</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

### BF:DTC P1090 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE OPEN)

#### DTC DETECTING CONDITION:

Immediately at fault recognition

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK TUMBLE GENERATOR VALVE RH</b> 1) Remove the tumble generator valve assembly. 2) Check tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

### BG:DTC P1091 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE CLOSE)

#### DTC DETECTING CONDITION:

Immediately at fault recognition

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK TUMBLE GENERATOR VALVE RH</b> 1) Remove the tumble generator valve assembly. 2) Check tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BH:DTC P1092 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE OPEN)

### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK TUMBLE GENERATOR VALVE RH</b> 1) Remove the tumble generator valve assembly. 2) Check tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.>	Clean tumble generator valve.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BI: DTC P1093 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE CLOSE)

### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2 <b>CHECK TUMBLE GENERATOR VALVE RH</b> 1) Remove the tumble generator valve assembly. 2) Check tumble generator valve body.	Does the tumble generator valve move smoothly? (No dirt or foreign materials clogged)	Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.>	Clean tumble generator valve.

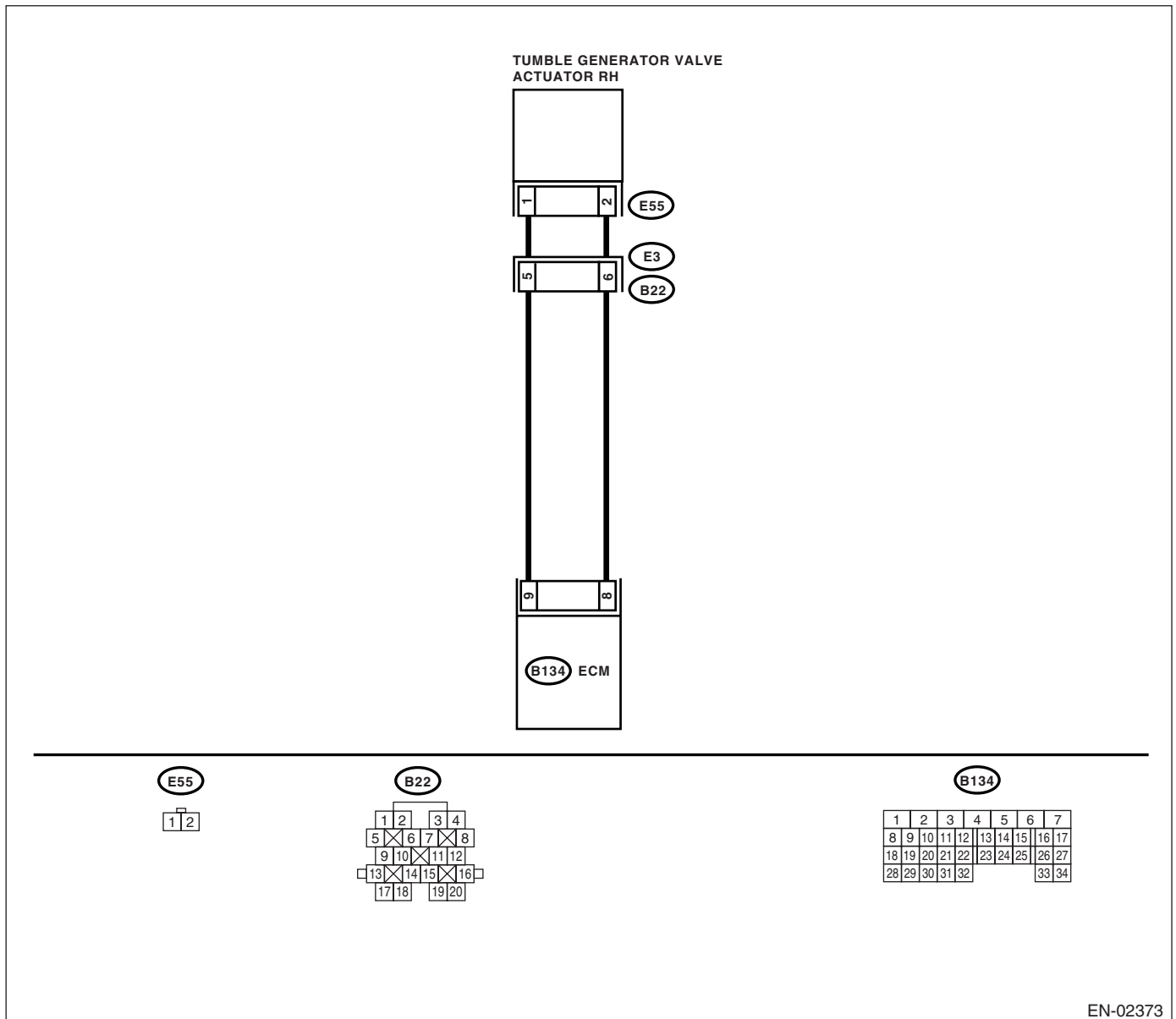
**BJ:DTC P1094 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (OPEN)**

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

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02373

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from tumble generator valve and ECM connector.                      3) Measure the resistance between tumble generator valve actuator and ECM connector.</p> <p><b>Connector &amp; terminal</b>  <b>(E55) No. 1 — (B134) No. 9:</b>  <b>(E55) No. 2 — (B134) No. 8:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit between ECM and tumble generator valve connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and tumble generator valve actuator connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in tumble generator valve actuator connector.</p>	<p>Is there poor contact in tumble generator valve actuator connector.</p>	<p>Repair the poor contact in tumble generator valve actuator connector.</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>

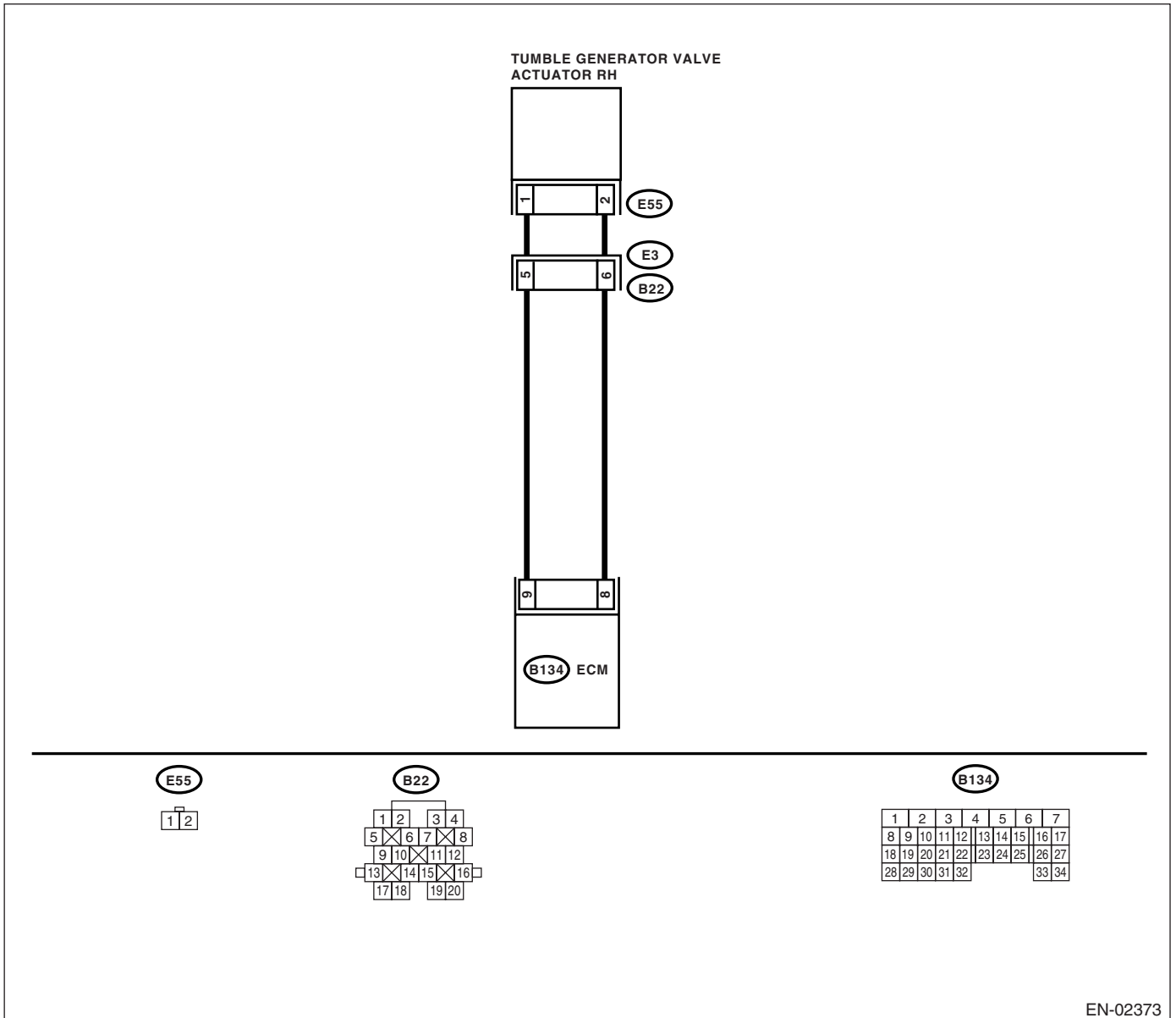
**BK:DTC P1095 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (SHORT)**

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

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02373

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve connector. 3) Measure the voltage between tumble generator valve actuator and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(E55) No. 1 (+) — Chassis ground (-):</b> <b>(E55) No. 2 (+) — Chassis ground (-):</b></p>	<p>Is the voltage less than 5 V?</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>	<p>Repair the battery short circuit between ECM and tumble generator valve actuator.</p>

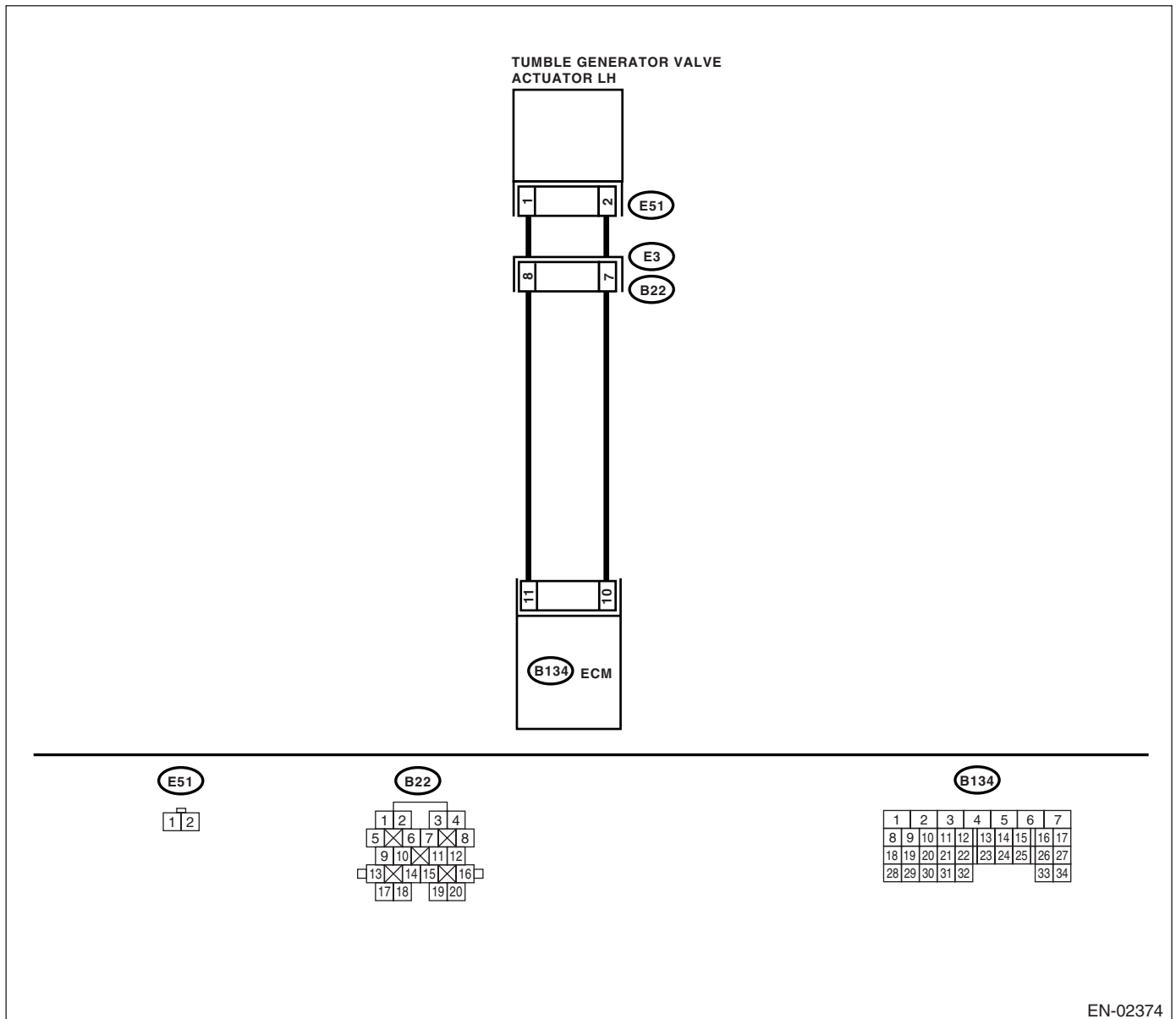
**BL:DTC P1096 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (OPEN)**

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

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02374

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from tumble generator valve and ECM connector.                      3) Measure the resistance between tumble generator valve actuator and ECM connector.</p> <p><b>Connector &amp; terminal</b>  <b>(E51) No. 1 — (B134) No. 11:</b>  <b>(E51) No. 2 — (B134) No. 10:</b></p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 2.</p>	<p>Repair the open circuit between ECM and tumble generator valve connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and tumble generator valve actuator connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact in tumble generator valve actuator connector.</p>	<p>Is there poor contact in tumble generator valve actuator connector?</p>	<p>Repair the poor contact in tumble generator valve actuator connector.</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>

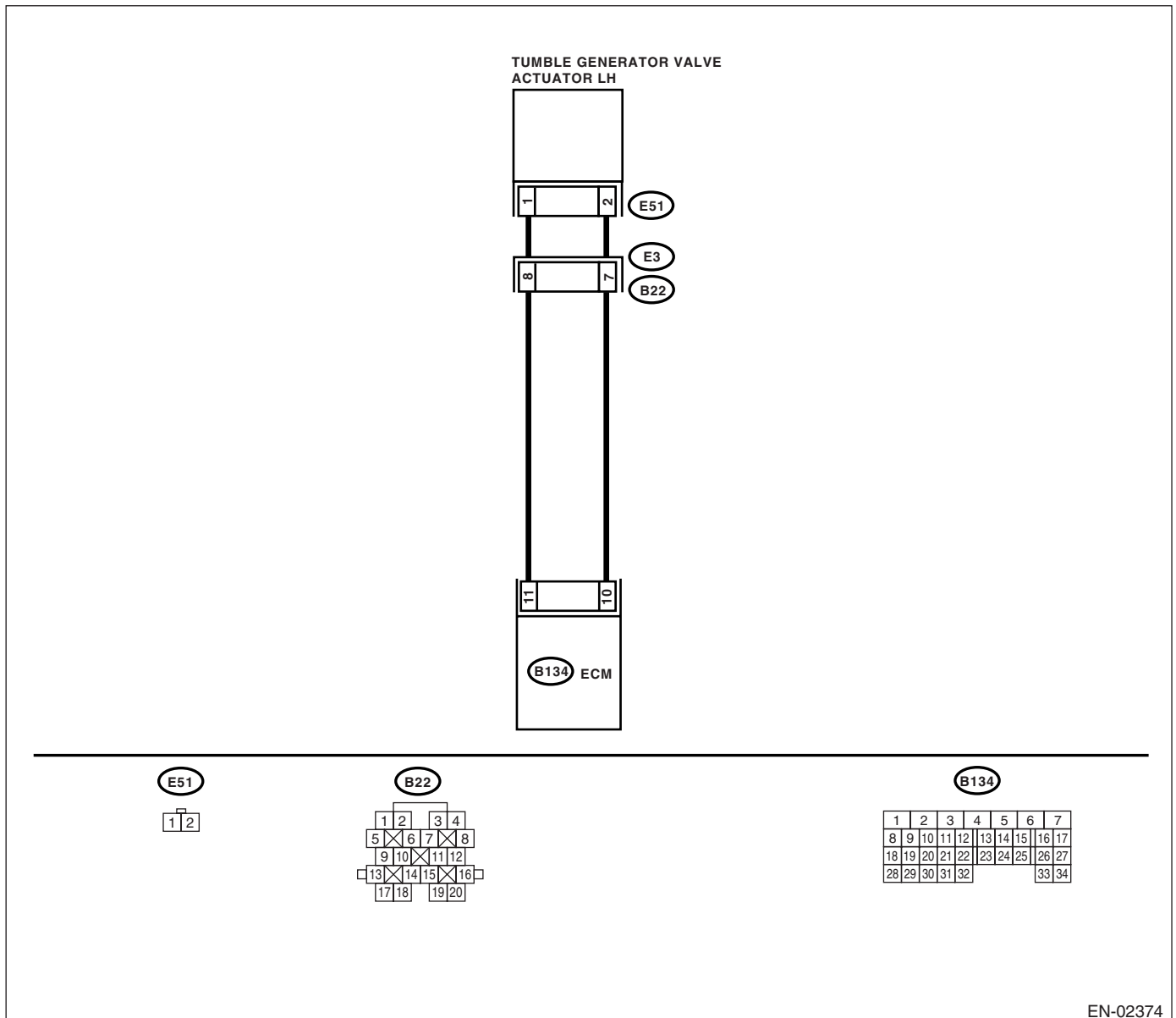
**BM:DTC P1097 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (SHORT)**

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

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**





# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve connector. 3) Measure the voltage between tumble generator valve actuator and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(E51) No. 1 (+) — Chassis ground (-):</b> <b>(E51) No. 2 (+) — Chassis ground (-):</b></p>	<p>Is the voltage less than 5 V?</p>	<p>Replace the tumble generator valve assembly. &lt;Ref. to FU(H4DOTC 2.5)-33, Tumble Generator Valve Assembly.&gt;</p>	<p>Repair the battery short circuit between ECM and tumble generator valve actuator.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BN:DTC P1110 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (LOW INPUT)

### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1110?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).> NOTE: Atmospheric pressure sensor is built in ECM.	Temporary poor contact occurs.

## BO:DTC P1111 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT)

### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P1111?	Replace the ECM. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).> NOTE: Atmospheric pressure sensor is built in ECM.	Temporary poor contact occurs.

## BP:DTC P1160 RETURN SPRING FAILURE

### NOTE:

For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC 2.5)-224, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BQ:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

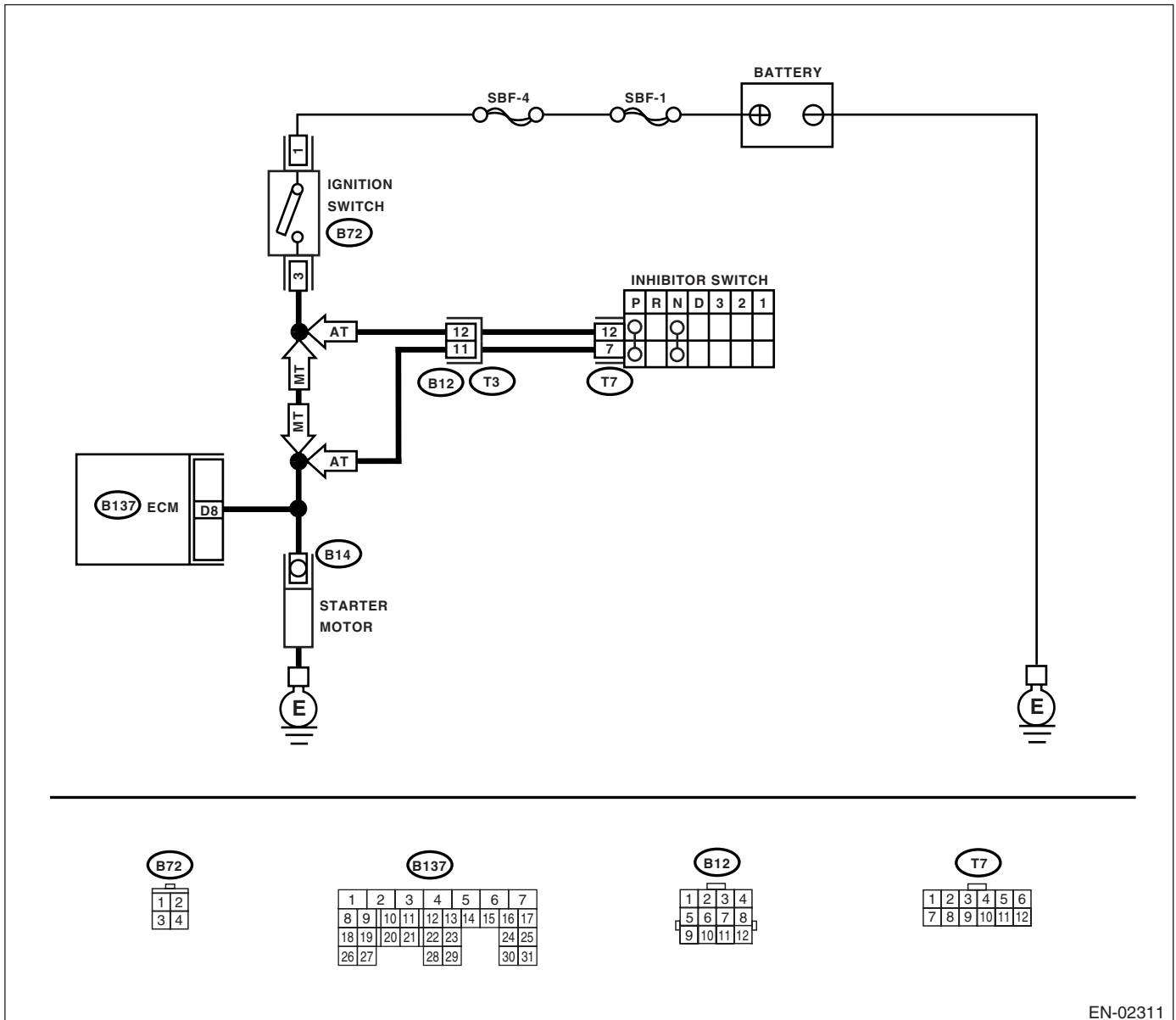
### TROUBLE SYMPTOM:

Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02311

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK OPERATION OF STARTER MOTOR.</b>	Does the starter motor operate when ignition switch to START?	Repair the harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"><li>• Open or ground short circuit in harness between ECM and starter motor connector.</li><li>• Poor contact in ECM connector.</li></ul>	Check starter motor circuit. <Ref. to EN(H4DOTC 2.5)-55, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BR:DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH

### DTC DETECTING CONDITION:

Immediately at fault recognition

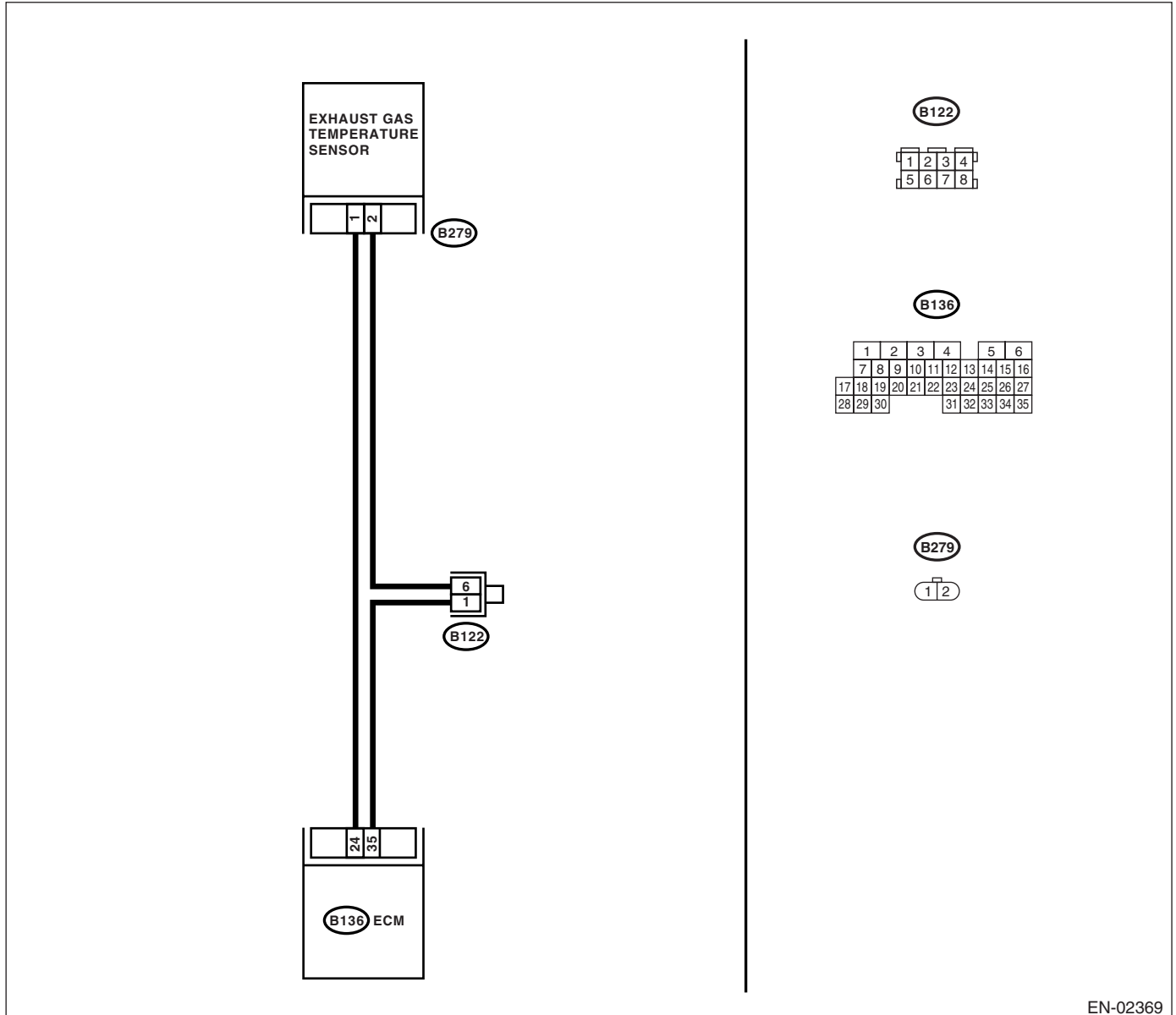
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02369

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC 2.5)-65, List of Diagnostic Trouble Code (DTC).> <b>NOTE:</b> In this case, it is not necessary to inspect DTC P1544.	Go to step 2.
<b>2</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"><li>• Loose installation of exhaust manifold</li><li>• Cracks or hole of exhaust manifold</li><li>• Loose installation of front oxygen (A/F) sensor</li></ul>	Is there a fault in exhaust system?	Repair or replace failure, then replace the pre-catalytic converter.	Contact the SUBARU dealer. <b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BS:DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION

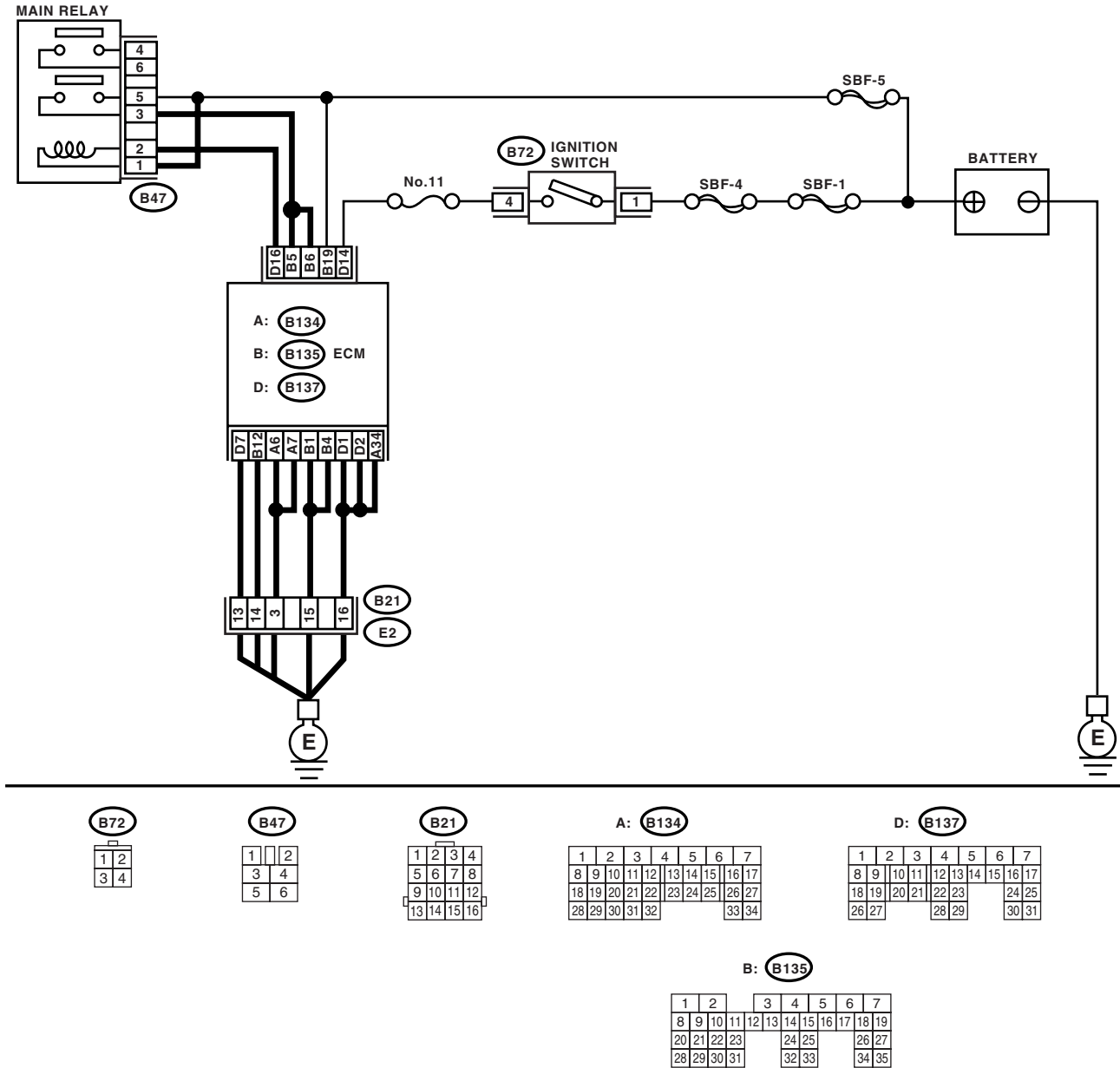
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02356

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 19 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Repair the poor contact in ECM connector.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 19 — Chassis ground:</b></i>	Is the resistance less than 10 $\Omega$ ?	Repair ground short circuit in harness between ECM connector and battery terminal.	Go to step 3.
<b>3 CHECK FUSE SBF-5.</b>	Is the fuse blown out?	Replace the fuse.	Repair the harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and battery</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in battery terminal</li> </ul>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BT:DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1)

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

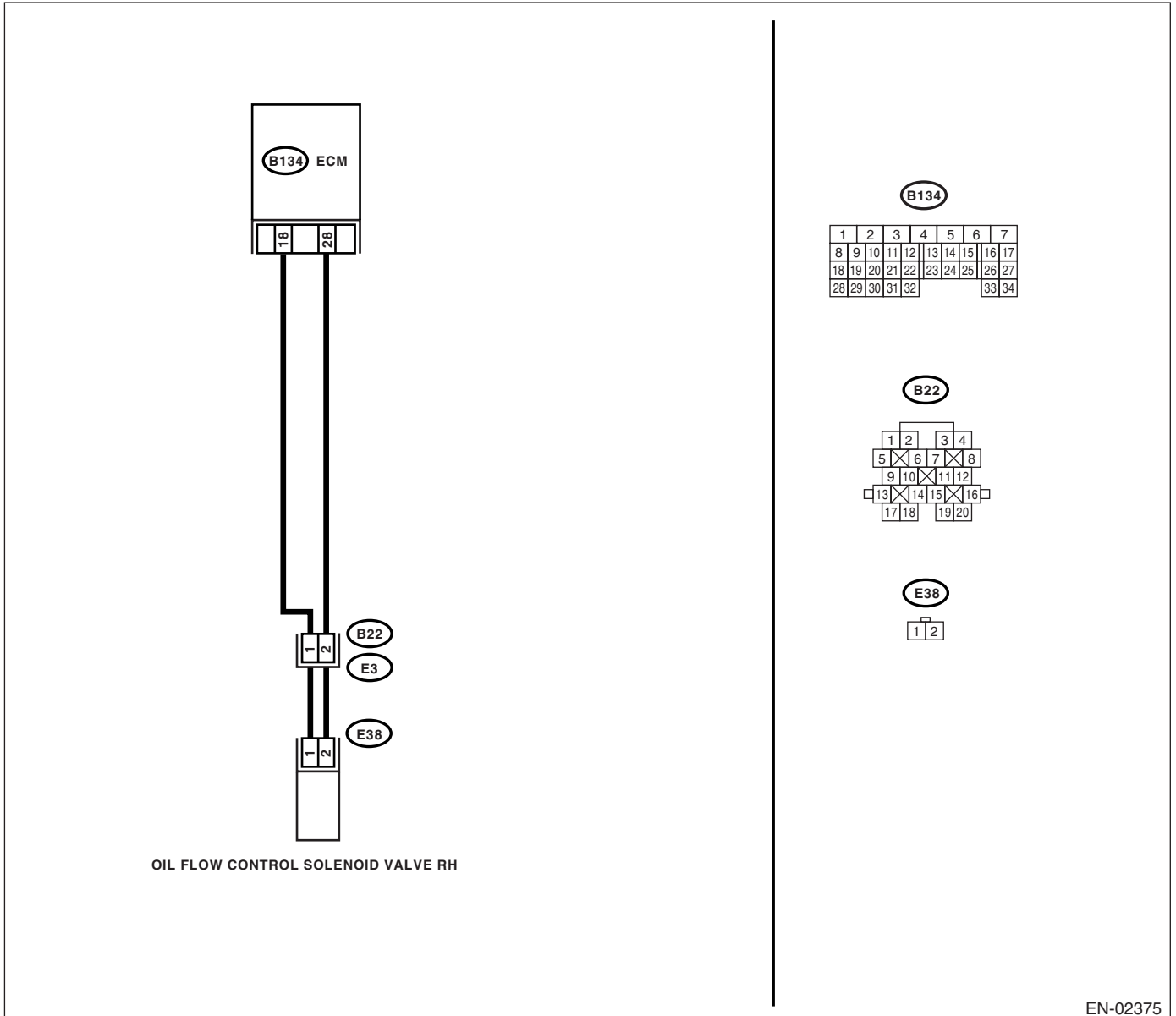
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and oil flow control solenoid valve. 3) Measure the resistance between ECM and oil flow control solenoid valve. <b>Connector &amp; terminal</b> <b>(B134) No. 18 — (E38) No. 1:</b> <b>(B134) No. 28 — (E38) No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair open circuit in harness between ECM and oil flow control solenoid valve connector.  <b>NOTE:</b> In this case, repair the following <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b> Measure the resistance between oil flow control solenoid valve and engine ground. <b>Connector &amp; terminal</b> <b>(E38) No. 1 — Engine ground:</b> <b>(E38) No. 2 — Engine ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair short circuit between ECM and oil flow control solenoid valve connector.
<b>3</b> <b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b> 1) Remove the oil flow control solenoid valve connector. 2) Measure the resistance between oil flow control solenoid valve terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance 6 — 12 $\Omega$ ?	Repair poor contact in ECM and oil flow control solenoid valve.	Replace the oil flow control solenoid valve. <Ref. to ME(H4DOTC)-68, Camshaft.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BU:DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1)

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

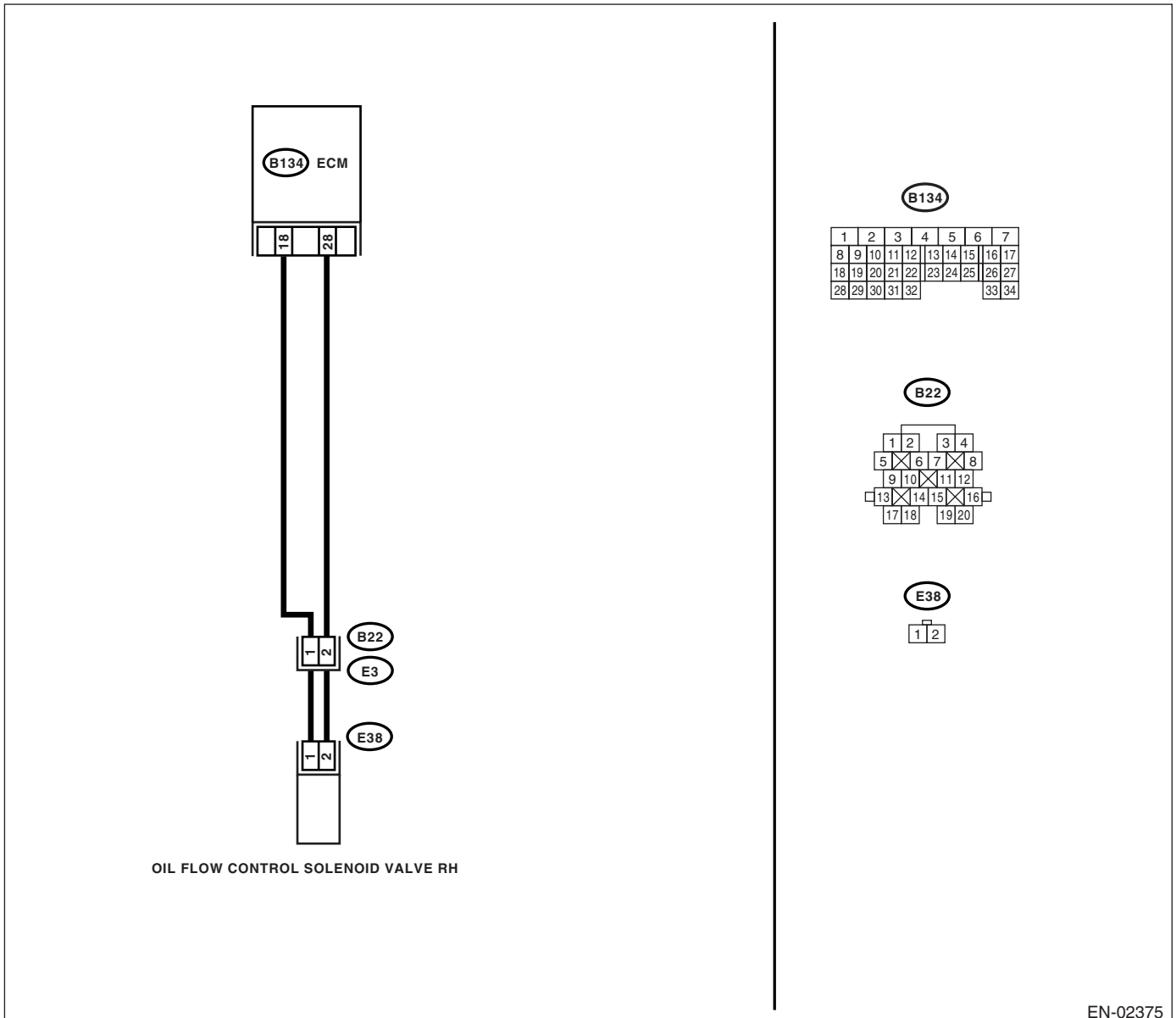
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02375

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and oil flow control solenoid valve. 3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b> <b>(B134) No. 18 — (E38) No. 1:</b> <b>(B134) No. 28 — (E38) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit in harness between ECM and oil flow control solenoid valve connector.</p> <p><b>NOTE:</b> In this case, repair the following</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and oil flow control solenoid valve. 3) Measure the resistance between oil flow control solenoid valve and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E38) No. 1 — Engine ground:</b> <b>(E38) No. 2 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector. 2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance 6 — 12 <math>\Omega</math>?</p>	<p>Repair poor contact in ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-68, Camshaft.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BV:DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2)

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

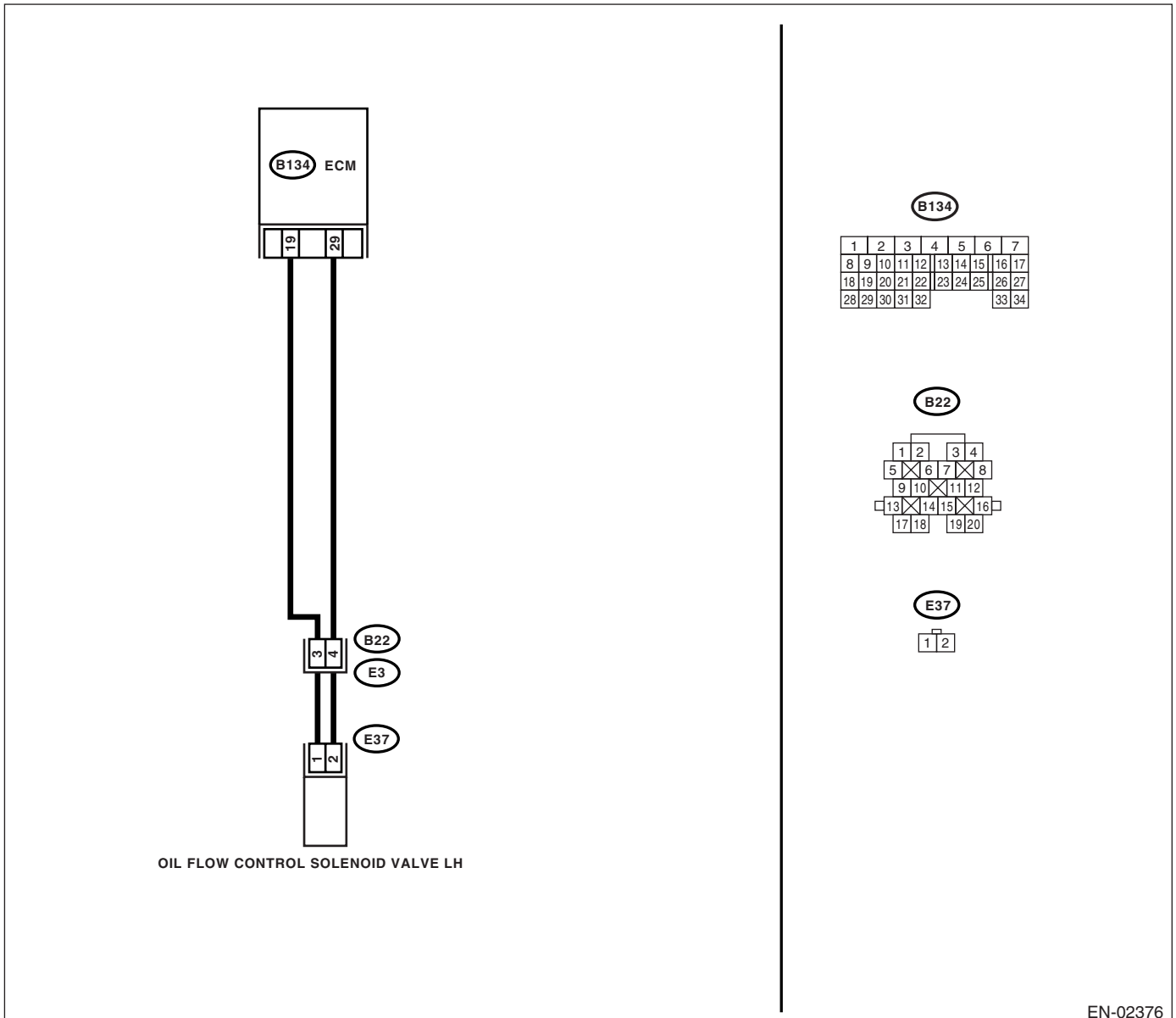
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02376

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM and oil flow control solenoid valve.                      3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 19 — (E37) No. 1:                      (B134) No. 29 — (E37) No. 2:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit in harness between ECM and oil flow control solenoid valve connector.</p> <p><b>NOTE:</b>                      In this case, repair the following</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>Measure the resistance between oil flow control solenoid valve and engine ground.</p> <p><b>Connector &amp; terminal</b>                      (E37) No. 1 — Engine ground:                      (E37) No. 2 — Engine ground:</p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector.                      2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b>                      No. 1 — No. 2:</p>	<p>Is the resistance 6 — 12 <math>\Omega</math>?</p>	<p>Repair poor contact in ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-68, Camshaft.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BW:DTC P2093 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2)

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

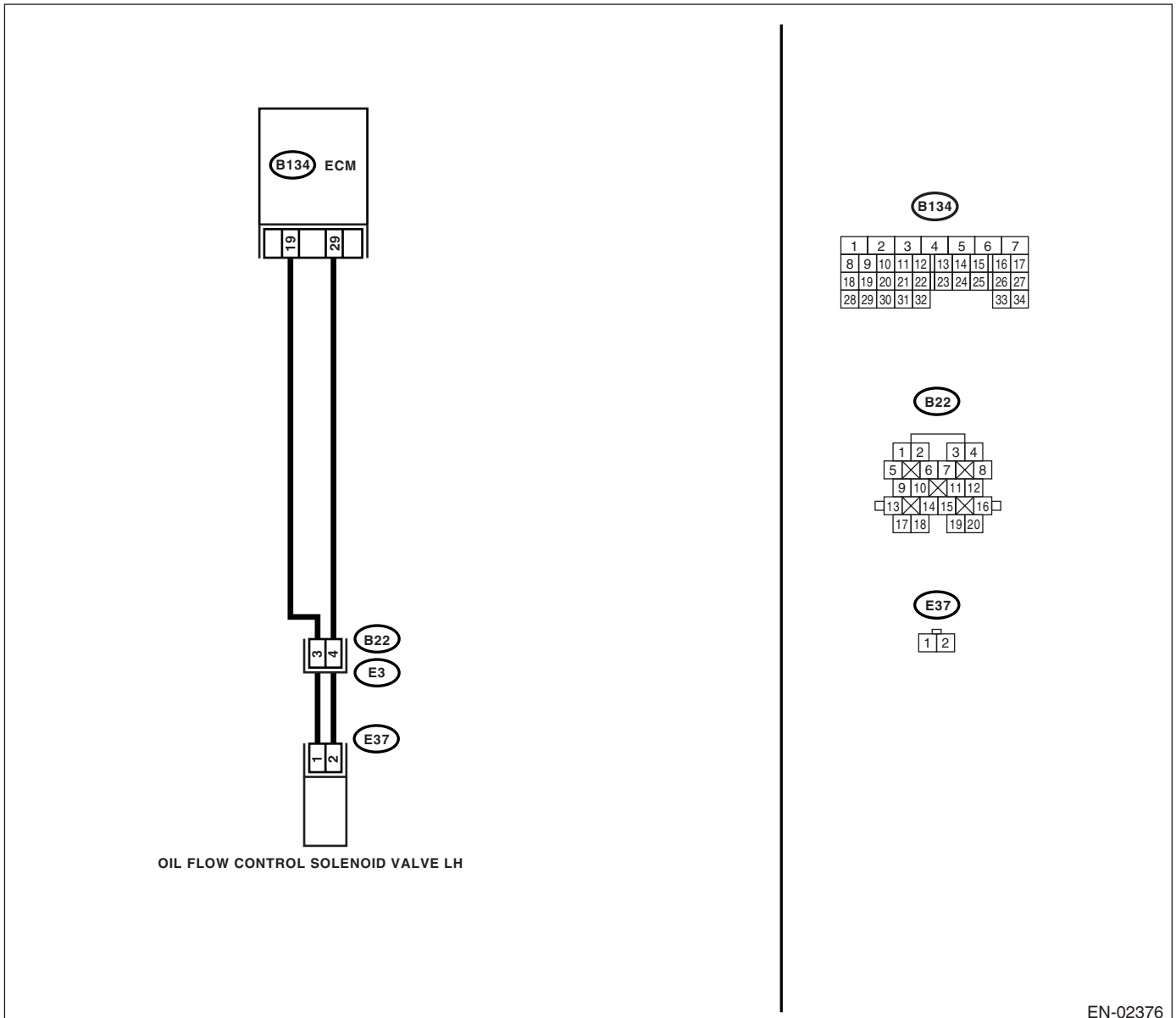
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02376

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM and oil flow control solenoid valve.                      3) Measure the resistance between ECM and oil flow control solenoid valve.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 19 — (E37) No. 1:                      (B134) No. 29 — (E37) No. 2:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit in harness between ECM and oil flow control solenoid valve connector.</p> <p><b>NOTE:</b>                      In this case, repair the following</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and oil flow control solenoid valve connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM and oil flow control solenoid valve.                      3) Measure the resistance between oil flow control solenoid valve and engine ground.</p> <p><b>Connector &amp; terminal</b>                      (E37) No. 1 — Engine ground:                      (E37) No. 2 — Engine ground:</p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair short circuit between ECM and oil flow control solenoid valve connector.</p>
<p><b>3</b></p> <p><b>CHECK OIL FLOW CONTROL SOLENOID VALVE.</b></p> <p>1) Remove the oil flow control solenoid valve connector.                      2) Measure the resistance between oil flow control solenoid valve terminals.</p> <p><b>Terminals</b>                      No. 1 — No. 2:</p>	<p>Is the resistance 6 — 12 <math>\Omega</math>?</p>	<p>Repair poor contact in ECM and oil flow control solenoid valve.</p>	<p>Replace the oil flow control solenoid valve. &lt;Ref. to ME(H4DOTC)-68, Camshaft.&gt;</p>



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **BX:DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/ PERFORMANCE**

#### **DTC DETECTING CONDITION:**

Immediately at fault recognition

#### **TROUBLE SYMPTOM:**

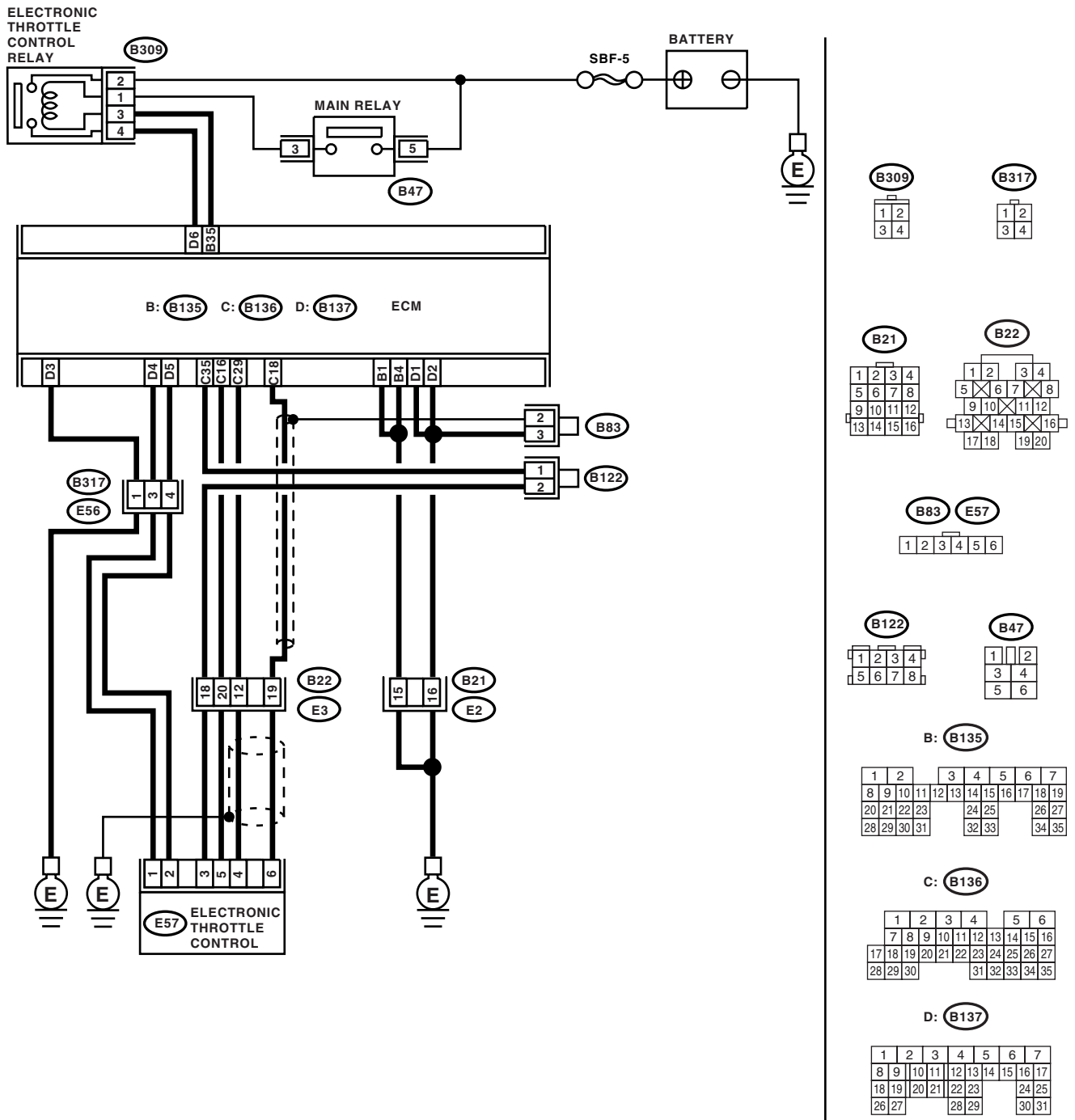
- Erroneous idling
- Poor driving performance
- Engine stalls.

#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to electronic throttle control relay terminals No. 1 and No. 3. 4) Measure the resistance between electronic throttle control relay terminals.</p> <p><b>Terminals</b> <b>No. 2 — No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Replace the electronic throttle control relay.
<p><b>2 CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>Measure the voltage between electronic throttle control relay connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 1 (+) — Engine ground (-):</b> <b>(B309) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 5 V?	Go to step 3.	Repair open or ground short circuit of power supply circuit.
<p><b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Disconnect the connector from ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 3 (+) — Engine ground (-):</b></p>	Is the voltage less than 5 V?	Go to step 4.	Repair power supply short circuit in harness between ECM and electronic throttle control.
<p><b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B309) No. 3 — Engine ground:</b> <b>(B309) No. 4 — Engine ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair ground short circuit in harness between ECM and electronic throttle control relay.
<p><b>5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>Measure the resistance between ECM connector and electronic throttle control relay connector.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 35 — (B309) No. 3:</b> <b>(B137) No. 6 — (B309) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair open circuit in harness between ECM and electronic throttle control relay.
<p><b>6 CHECK SENSOR OUTPUT.</b></p> <p>1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector terminals.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 18 (+) — (B136) No. 35 (-):</b></p> <p>4) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.</p>	Is the voltage more than 0.4 V?	Go to step 7.	Go to step 9.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7 CHECK SENSOR OUTPUT.</b> 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector terminals. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 29 (+) — (B136) No. 35 (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage more than 0.8 V?	Go to step 8.	Go to step 9.
<b>8 CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Go to step 13.
<b>9 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 16 — (E57) No. 5:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 10.	Repair the open circuit of harness connector.
<b>10 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 16 — Chassis ground:</b></i> <i><b>(B136) No. 18 — Chassis ground:</b></i> <i><b>(B136) No. 29 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 11.	Repair the ground short circuit of harness.
<b>11 CHECK SENSOR POWER SUPPLY.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 5 (+) — Engine ground (-):</b></i> 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 12.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>12 CHECK SHORT CIRCUIT IN ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 4 — Engine ground:</b></i> <i><b>(E57) No. 6 — Engine ground:</b></i>	Is the resistance more than 10 $\Omega$ ?	Go to step 13.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>13 CHECK SENSOR OUTPUT.</b> 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor. 4) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage 4.63 V?	Go to step 14.	Go to step 16.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>14 CHECK SENSOR OUTPUT.</b> 1) Read the data of sub throttle sensor signal using Subaru Select Monitor. 2) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage 4.73 V?	Go to step 15.	Go to step 16.
<b>15 CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Go to step 21.
<b>16 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <b>Connector &amp; terminal</b> <b>(B136) No. 18 — (E57) No. 6:</b> <b>(B136) No. 29 — (E57) No. 4:</b> <b>(B136) No. 35 — (E57) No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 17.	Repair the open circuit of harness connector.
<b>17 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 3 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 18.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>18 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 5 (+) — Engine ground (-):</b> 3) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage more than 10 V?	Go to step 19.	Repair battery short circuit in harness between ECM connector and electronic throttle control connector.
<b>19 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <b>Connector &amp; terminal</b> <b>(E57) No. 4 (+) — Engine ground (-):</b> <b>(E57) No. 6 (+) — Engine ground (-):</b> 2) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 20.	Repair short circuit in harness between ECM connector and electronic throttle control connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>20 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Remove the ECM. 3) Measure the resistance between ECM connectors. <i>Connector &amp; terminal</i> (B136) No. 18 — (B136) No. 35: (B136) No. 29 — (B136) No. 35:	Is the resistance more than 1 M $\Omega$ ?	Go to step 21.	Repair short circuit to sensor power supply.
<b>21 CHECK SENSOR OUTPUT.</b> 1) Turn the ignition switch to OFF. 2) Connect the connectors except of the electric control throttle relay. 3) Turn the ignition switch to ON. 4) Read the data of main throttle sensor signal using Subaru Select Monitor.	Is the voltage 0.81 — 0.87 V?	Go to step 22.	Repair poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.
<b>22 CHECK SENSOR OUTPUT.</b> Read the data of sub throttle sensor signal using Subaru Select Monitor.	Is the voltage 1.64 — 1.70 V?	Go to step 23.	Repair the poor contact in ECM connector. Replace the electronic throttle control if defective.
<b>23 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i>Connector &amp; terminal</i> (B137) No. 4 — (E57) No. 1: (B137) No. 5 — (E57) No. 2:	Is the resistance less than 1 $\Omega$ ?	Go to step 24.	Repair the open circuit of harness connector.
<b>24 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.</b> 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> (E57) No. 1 (+) — Engine ground (-): (E57) No. 2 (+) — Engine ground (-):	Is the voltage less than 5 V?	Go to step 25.	Repair power supply short circuit in harness between ECM and electronic throttle control.
<b>25 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> (E57) No. 1 — Engine ground: (E57) No. 2 — Engine ground:	Is the resistance more than 1 M $\Omega$ ?	Go to step 26.	Repair the short circuit of harness.
<b>26 CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.</b> Measure the resistance between electronic throttle control connector terminals. <i>Connector &amp; terminal</i> (E57) No. 2 — (E57) No. 1:	Is the resistance more than 1 M $\Omega$ ?	Go to step 27.	Repair the short circuit of harness.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>27</b> <b>CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.</b> Measure the resistance between ECM connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B137) No. 3 — Engine ground:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step <b>28</b> .	Repair the open circuit of harness.
<b>28</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> Measure the resistance between electronic throttle control terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance less than 5 $\Omega$ ?	Go to step <b>29</b> .	Repair the electronic throttle control.
<b>29</b> <b>CHECK ELECTRONIC THROTTLE CONTROL.</b> Move the throttle valve to the fully open and fully closed positions with fingers Check 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 in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>	Repair the electronic throttle control.

## **BY:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW**

### **DTC DETECTING CONDITION:**

Immediately at fault recognition

### **TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

### **CAUTION:**

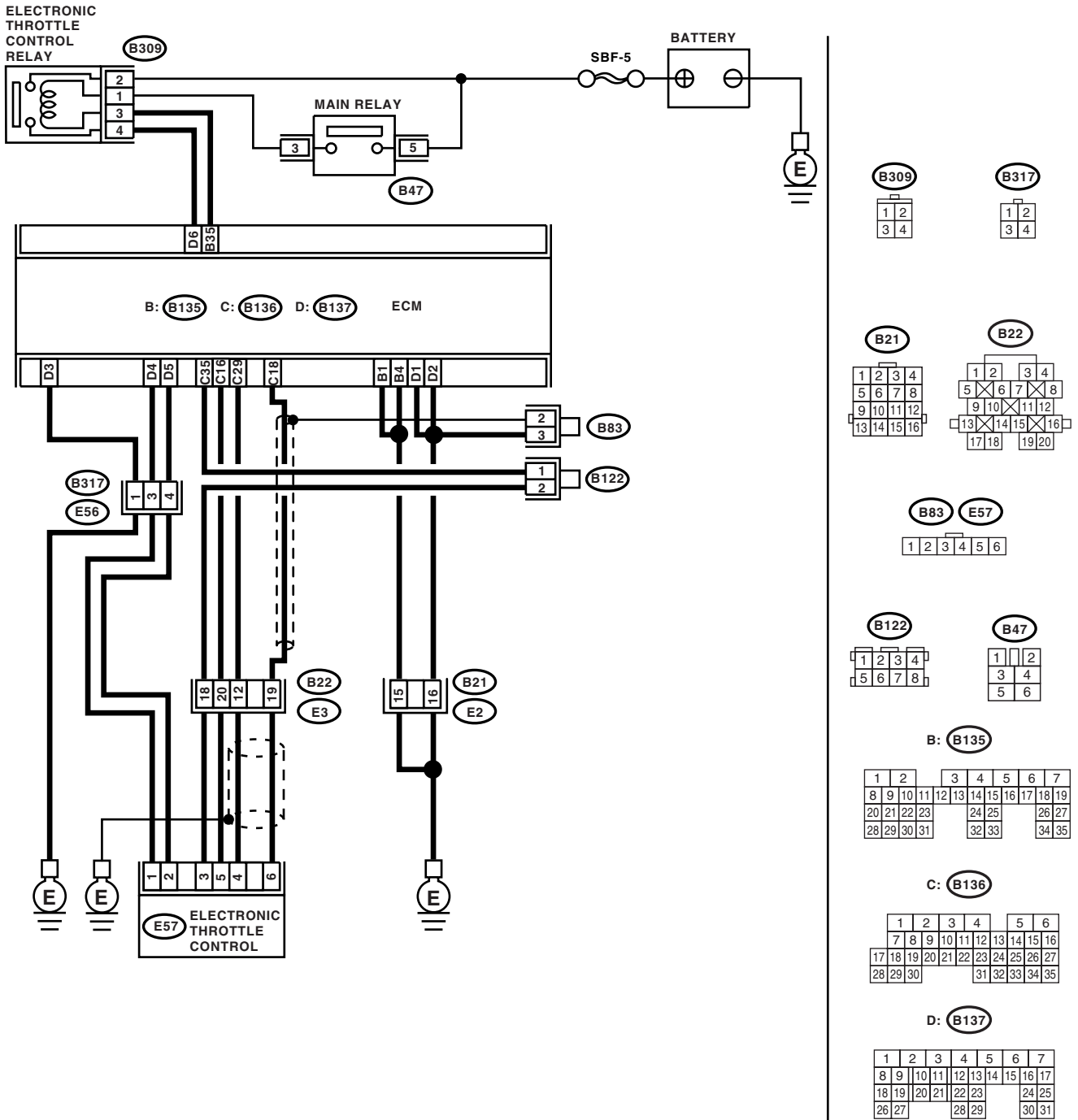
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Remove the electronic throttle control relay.                      3) Connect the battery to electronic throttle control relay terminals No. 1 and No. 3.                      4) Measure the resistance between electronic throttle control terminals.</p> <p><i>Terminals</i>  <b>(B309) No. 2 — (B309) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Replace the electronic throttle control relay.
<p><b>2 CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>Measure the voltage between electronic throttle control relay connector and engine ground.</p> <p><i>Connector &amp; terminal</i>  <b>(B309) No. 1 (+) — Engine ground (-):</b>  <b>(B309) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 5 V?	Go to step 3.	Repair open or ground short circuit of power supply circuit.
<p><b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Disconnect the connector from ECM.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between electronic throttle control relay connector and engine ground.</p> <p><i>Connector &amp; terminal</i>  <b>(B309) No. 3 (+) — Engine ground (-):</b></p>	Is the voltage less than 5 V?	Go to step 4.	Repair power supply short circuit in harness between ECM and electronic throttle control relay.
<p><b>4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance between electronic throttle control relay connector and chassis ground.</p> <p><i>Connector &amp; terminal</i>  <b>(B309) No. 3 — Engine ground:</b>  <b>(B309) No. 4 — Engine ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair ground short circuit in harness between ECM and electronic throttle control relay.
<p><b>5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b></p> <p>Measure the resistance between ECM connector and electronic throttle control relay connector.</p> <p><i>Connector &amp; terminal</i>  <b>(B135) No. 35 — (B309) No. 3:</b>  <b>(B137) No. 6 — (B309) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Repair the poor contact in ECM connector. Replace the ECM if defective.	Repair open circuit in harness between ECM and electronic throttle control relay.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BZ:DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH

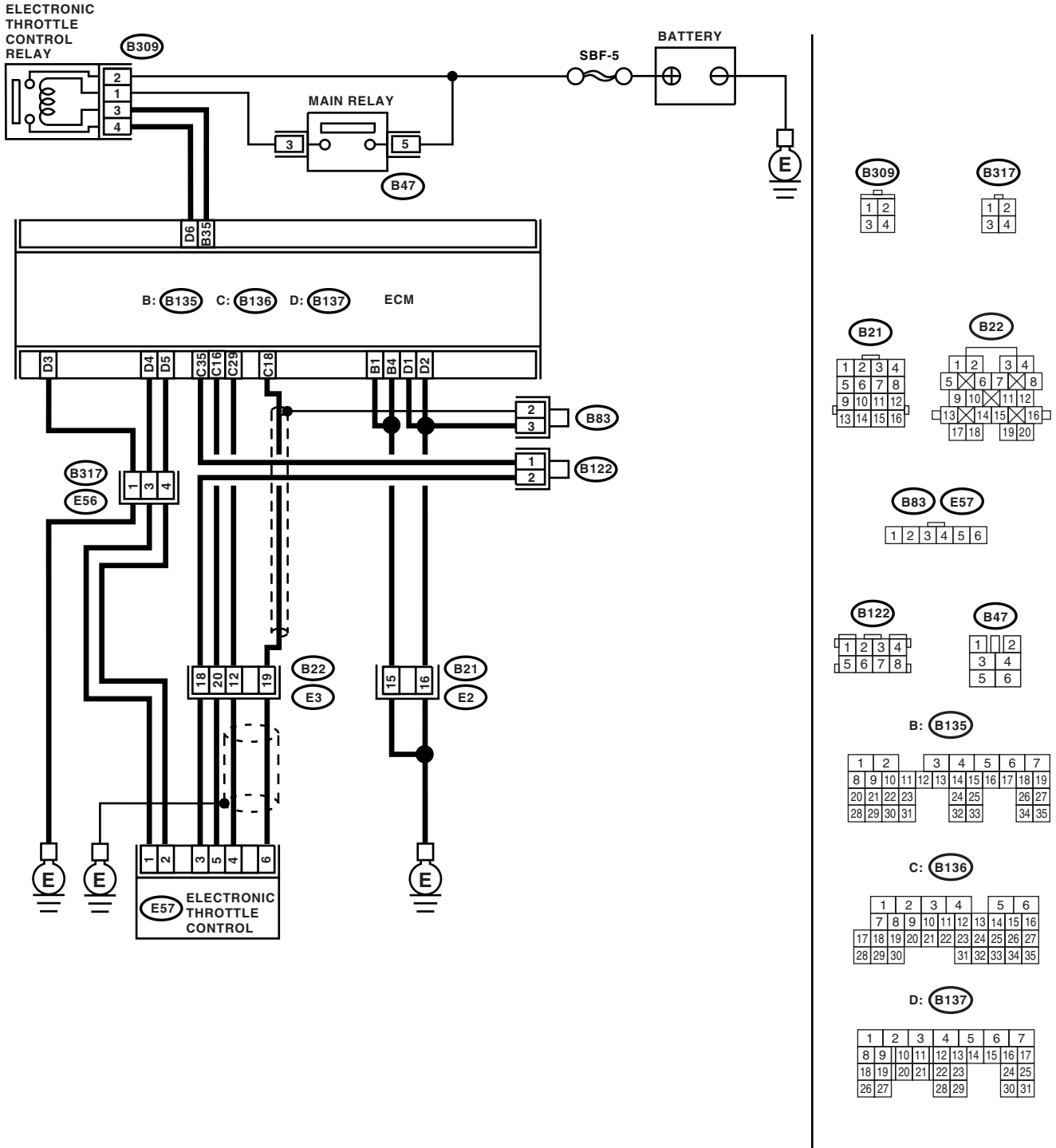
DTC DETECTING CONDITION:

Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

WIRING DIAGRAM:



EN-02364

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK ELECTRONIC THROTTLE CONTROL RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Measure the resistance between electronic throttle control relay terminals. <i>Terminals</i> <i>No. 2 — No. 4:</i>	Is the resistance more than 1 MΩ?	Go to step 2.	Replace the electronic throttle control relay.
<b>2 CHECK POWER SUPPLY SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control relay connector and engine ground. <i>Connector &amp; terminal</i> <i>(B309) No. 4 (+) — Engine ground (-):</i>	Is the voltage more than 5 V?	Go to step 3.	Repair power supply short circuit in harness between ECM and electronic throttle control relay.
<b>3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM connector and engine ground. <i>Connector &amp; terminal</i> <i>(B135) No. 35 — Engine ground:</i>	Is the resistance more than 1 MΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective.	Repair ground short circuit in harness between ECM and electronic throttle control relay.

## CA:DTC P2109 THROTTLE/PEDAL POSITION SENSOR A MINIMUM STOP PERFORMANCE

**NOTE:**

For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC 2.5)-224, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

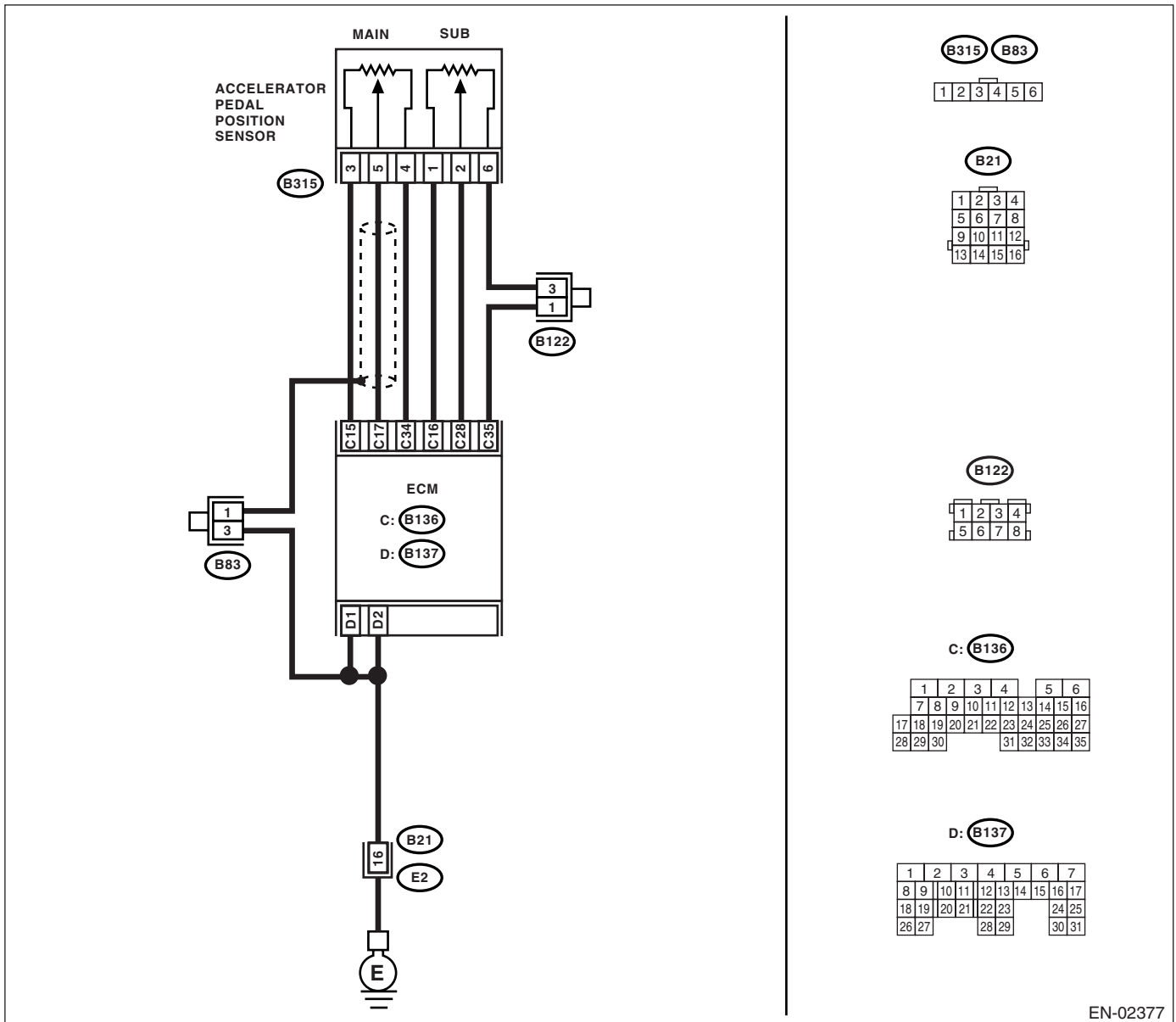
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02377

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector terminals. <i>Connector &amp; terminal</i> <i>(B136) No. 17 (+) — (B136) No. 34 (-):</i> 3) Check the voltage change by shaking the harness and connector of ECM and accelerator pedal position sensor connector and harness.	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact in connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from the accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector. <i>Connector &amp; terminal</i> <i>(B136) No. 15 — (B315) No. 3:</i> <i>(B136) No. 17 — (B315) No. 5:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 15 — Chassis ground:</i> <i>(B136) No. 17 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<b>5 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator pedal position sensor connector and engine ground. <i>Connector &amp; terminal</i> <i>(B315) No. 3 (+) — Engine ground (-):</i> 4) Check the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC 2.5)-41, Engine Control Module (ECM).>
<b>6 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor. <i>Terminals</i> <i>No. 3 — No. 4:</i>	Is the resistance 1.2 — 4.8 k $\Omega$ ?	Go to step 7.	Replace the accelerator pedal position sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor. <b>Terminals</b> <b>No. 5 — No. 4:</b> Check the measured value is within the specification without depressing the accelerator pedal.</p>	<p>Is the resistance 0.2 — 1.0 k<math>\Omega</math>?</p>	<p>Go to step <b>8</b>.</p>	<p>Replace the accelerator pedal position sensor.</p>
<p><b>8</b></p> <p><b>CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor. <b>Terminals</b> <b>No. 5 — No. 4:</b> Check the measured value is within the specification with the accelerator pedal depressed.</p>	<p>Is the resistance 0.5 — 2.5 k<math>\Omega</math>?</p>	<p>Repair the poor contact in ECM connector. Replace the ECM if defective.</p>	<p>Replace the accelerator pedal position sensor.</p>

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

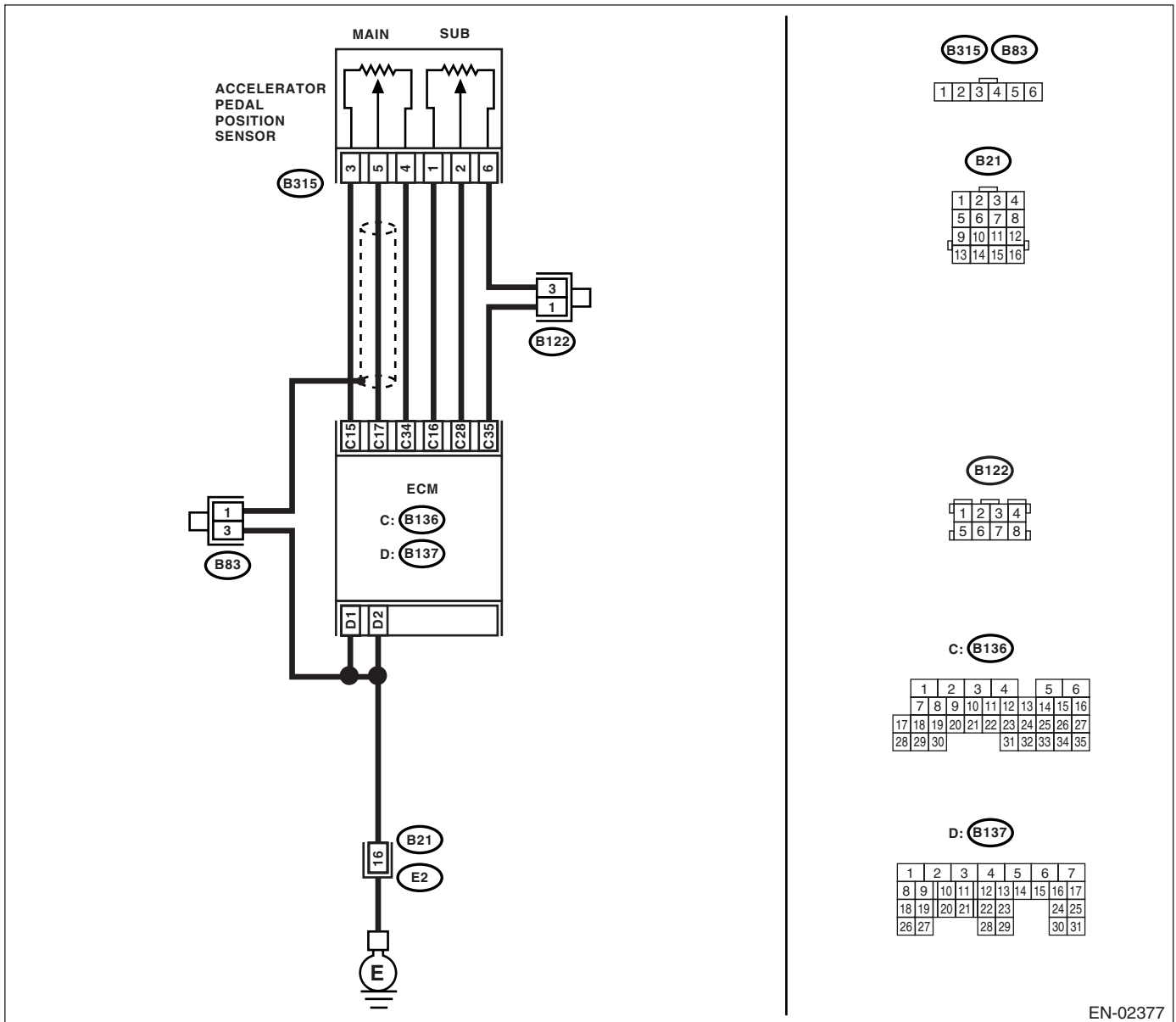
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02377



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of main accelerator pedal position sensor signal using Subaru Select Monitor. 3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and accelerator pedal position sensor connector harness.	Is the voltage less than 4.8 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact in connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from the accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <i>Connector &amp; terminal (B136) No. 34 — (B315) No. 4:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal (B315) No. 4 — Engine ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>5 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal (B315) No. 3 (+) — Engine ground (-):</i> 4) Check the voltage is above the specified value when shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage more than 6 V?	Go to step 6.	Repair battery short circuit in harness between ECM connector and accelerator pedal position sensor connector.
<b>6 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal (B315) No. 5 (+) — Engine ground (-):</i> 2) Check the voltage is below the specified value when shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage less than 4.8 V?	Go to step 7.	Repair short circuit in harness between ECM connector and accelerator pedal position sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p>7</p> <p><b>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Connect the accelerator pedal position sensor connector.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b></p>	<p>Is the voltage 4.8 V?</p>	<p>Repair the poor contact in ECM connector.</p> <p>Replace the ECM if defective.</p>	<p>Repair poor contact in accelerator pedal position sensor connector.</p> <p>Replace the accelerator pedal position sensor if defective.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

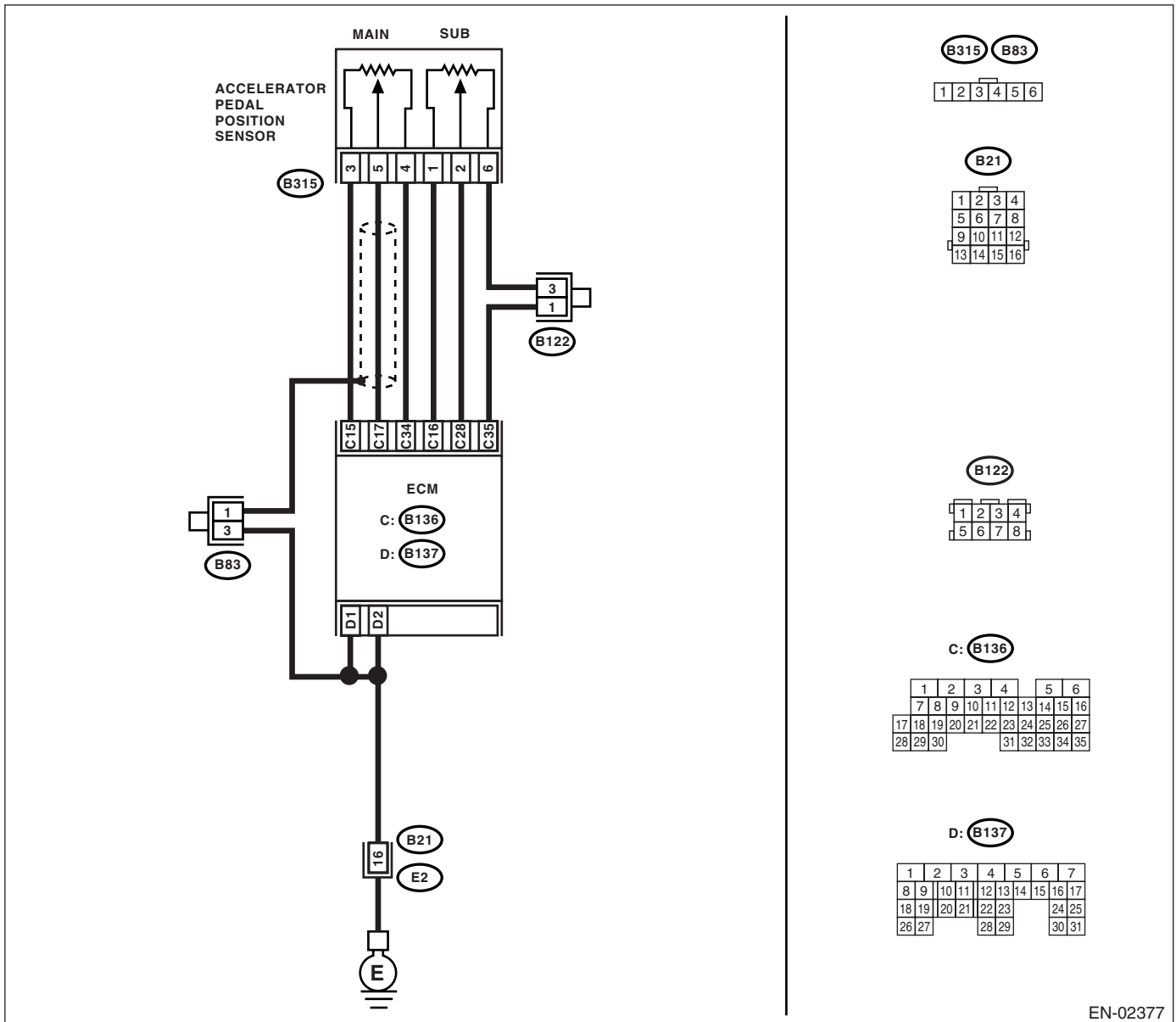
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02377

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM connector terminals.  <i>Connector &amp; terminal</i>  <i>(B136) No. 28 (+) — (B136) No. 35 (-):</i>                      3) Check the voltage exceed the standard value by shaking the harness and connector of ECM and accelerator pedal position sensor connector and harness.</p>	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<p><b>2 CHECK POOR CONTACT.</b>                      Check poor contact in connector between ECM and accelerator pedal position sensor.</p>	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<p><b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Disconnect the connector from the accelerator pedal position sensor.                      4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <i>Connector &amp; terminal</i>  <i>(B136) No. 16 — (B315) No. 1:</i>  <i>(B136) No. 28 — (B315) No. 2:</i></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<p><b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b>                      Measure the resistance between ECM connector and chassis ground.  <i>Connector &amp; terminal</i>  <i>(B136) No. 16 — Chassis ground:</i>  <i>(B136) No. 28 — Chassis ground:</i></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the chassis short circuit of harness.
<p><b>5 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b>                      1) Connect the ECM connector.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal</i>  <i>(B315) No. 1 (+) — Engine ground (-):</i>                      4) Check the voltage is within the specified value when shaking the harness and connector of ECM while monitoring the value with voltage meter.</p>	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<p><b>6 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b>                      Measure the resistance of accelerator pedal position sensor.  <i>Terminals</i>  <i>No. 1 — No. 6:</i></p>	Is the resistance 0.75 — 3.15 k $\Omega$ ?	Go to step 7.	Replace the accelerator pedal position sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK ACCELERATOR PEDAL POSITION SENSOR.</b></p> <p>1) Measure the resistance of accelerator pedal position sensor.</p> <p><b>Terminals</b></p> <p><b>No. 2 — No. 6:</b></p> <p>2) Check the measured value is within the specification without depressing the accelerator pedal.</p>	<p>Is the resistance 0.15 — 0.63 kΩ?</p>	<p>Go to step 8.</p>	<p>Replace the accelerator pedal position sensor.</p>
<p><b>8</b></p> <p><b>CHECK ACCELERATOR PEDAL POSITION SENSOR.</b></p> <p>1) Measure the resistance of accelerator pedal position sensor.</p> <p><b>Terminals</b></p> <p><b>No. 2 — No. 6:</b></p> <p>2) Check the measured value is within the specification with the accelerator pedal depressed.</p>	<p>Is the resistance 0.28 — 1.68 kΩ?</p>	<p>Repair the poor contact in ECM connector. Replace the ECM if defective.</p>	<p>Replace the accelerator pedal position sensor.</p>

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

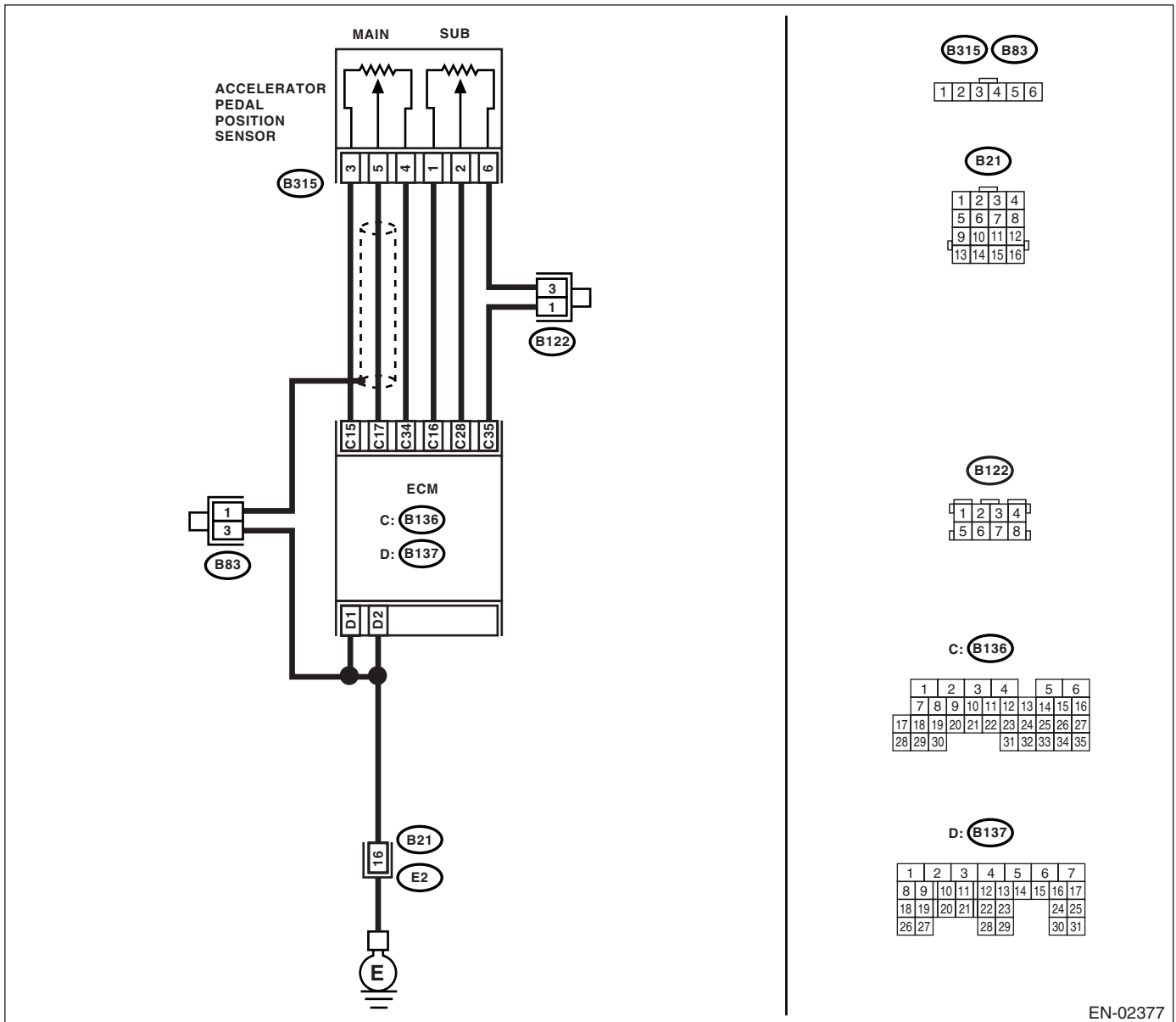
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02377

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to ON. 2) Read the data of sub accelerator pedal position sensor signal using Subaru Select Monitor. 3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and accelerator pedal position sensor connector harness.	Is the voltage less than 4.8 V?	Go to step 2.	Go to step 3.
<b>2 CHECK POOR CONTACT.</b> Check poor contact in connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from the accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <i>Connector &amp; terminal (B136) No. 35 — (B315) No. 6:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal (B315) No. 6 — Engine ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>5 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal (B315) No. 1 (+) — Engine ground (-):</i> 4) Check the voltage is above the specified value when shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage less than 6 V?	Go to step 6.	Repair battery short circuit in harness between ECM connector and accelerator pedal position sensor connector.
<b>6 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal (B315) No. 2 (+) — Engine ground (-):</i> 2) Check the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage less than 4.8 V?	Go to step 7.	Repair short circuit in harness between ECM connector and accelerator pedal position sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p>7</p> <p><b>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Connect the accelerator pedal position sensor connector.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Measure the voltage between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 16 (+) — Chassis ground (-):</b></p>	<p>Is the voltage 4.8 V?</p>	<p>Repair the poor contact in ECM connector.</p> <p>Replace the ECM if defective.</p>	<p>Repair poor contact in accelerator pedal position sensor connector.</p> <p>Replace the accelerator pedal position sensor if defective.</p>



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **CF:DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A”/“B” VOLTAGE RATIONALITY**

#### **DTC DETECTING CONDITION:**

Immediately at fault recognition

#### **TROUBLE SYMPTOM:**

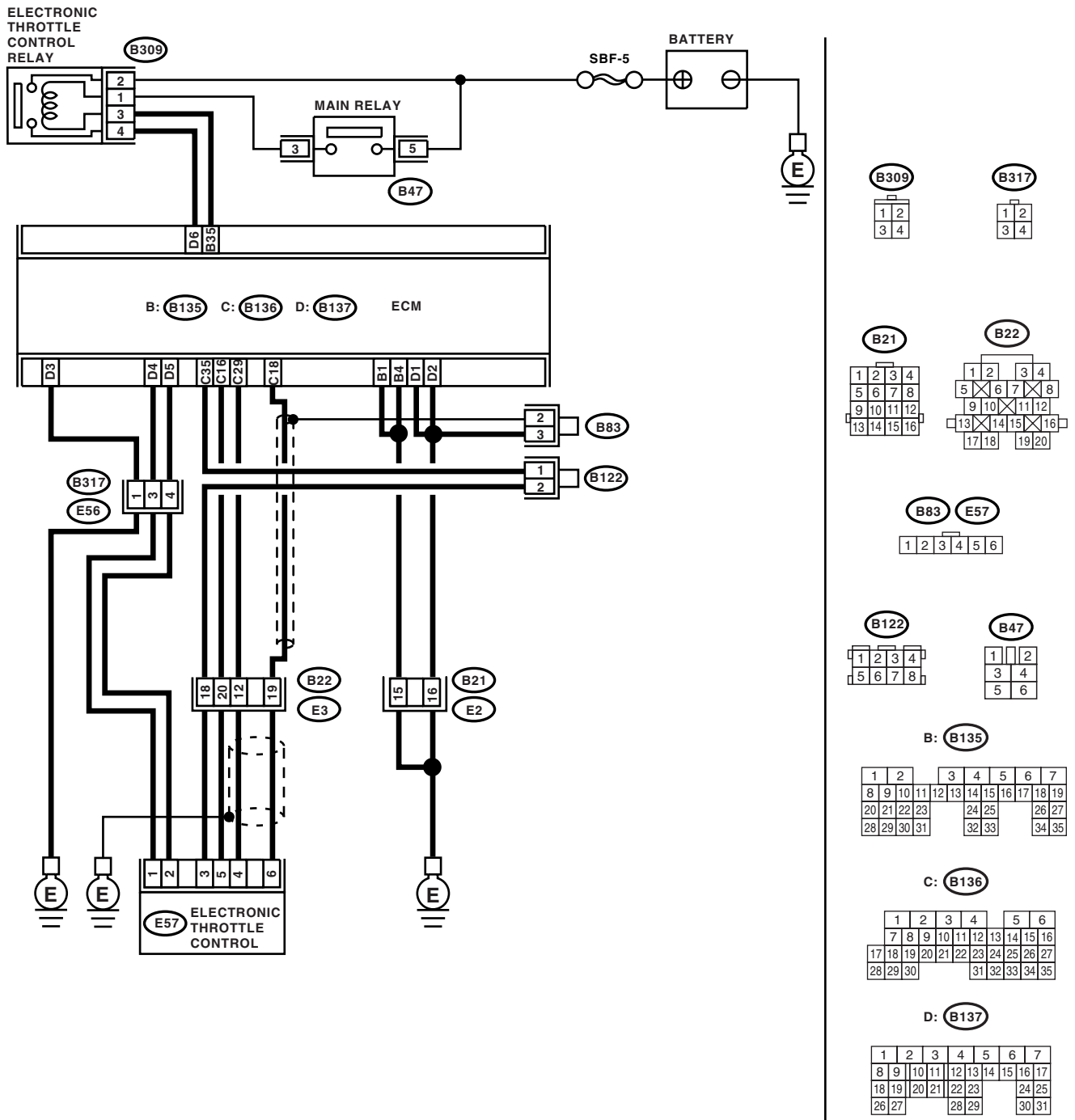
- Erroneous idling
- Poor driving performance

#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-02364

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK SENSOR OUTPUT.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM connector terminals.  <i>Connector &amp; terminal</i>  <i>(B136) No. 18 (+) — (B136) No. 35 (-):</i>                      3) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.</p>	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 4.
<p><b>2</b></p> <p><b>CHECK SENSOR OUTPUT.</b>                      1) Measure the voltage between ECM connector terminals.  <i>Connector &amp; terminal</i>  <i>(B136) No. 29 (+) — (B136) No. 35 (-):</i>                      2) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.</p>	Is the voltage more than 0.8 V?	Go to step 3.	Go to step 4.
<p><b>3</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check the poor contact in connector between ECM and electronic throttle control.</p>	Is there poor contact?	Repair the poor contact.	Go to step 14.
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Disconnect the connectors from the electronic throttle control.                      4) Measure the resistance between ECM connector and electronic throttle control connector.  <i>Connector &amp; terminal</i>  <i>(B136) No. 16 — (E57) No. 5:</i></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit of harness connector.
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b>                      Measure the resistance between ECM connector and chassis ground.  <i>Connector &amp; terminal</i>  <i>(B136) No. 16 — Chassis ground:</i>  <i>(B136) No. 18 — Chassis ground:</i>  <i>(B136) No. 29 — Chassis ground:</i></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair the ground short circuit of harness.
<p><b>6</b></p> <p><b>CHECK SENSOR POWER SUPPLY.</b>                      1) Connect the ECM connector.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between electronic throttle control connector and engine ground.  <i>Connector &amp; terminal</i>  <i>(E57) No. 5 (+) — Engine ground (-):</i>                      4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.</p>	Is the voltage 4.5 — 5.5 V?	Go to step 7.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<p><b>7</b></p> <p><b>CHECK SHORT CIRCUIT IN ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between electronic throttle control connector and engine ground.  <i>Connector &amp; terminal</i>  <i>(E57) No. 4 — Engine ground:</i>  <i>(E57) No. 6 — Engine ground:</i></p>	Is the resistance more than 10 $\Omega$ ?	Go to step 8.	Repair the poor contact in ECM connector. Replace the ECM if defective.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>8 CHECK SENSOR OUTPUT.</b> 1) Connect all the connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor. 4) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage less than 4.63 V?	Go to step 9.	Go to step 11.
<b>9 CHECK SENSOR OUTPUT.</b> 1) Read the data of sub throttle sensor signal using Subaru Select Monitor. 2) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and electronic throttle control connector.	Is the voltage less than 4.73 V?	Go to step 10.	Go to step 11.
<b>10 CHECK POOR CONTACT.</b> Check the poor contact in connector between ECM and electronic throttle control.	Is there poor contact?	Repair the poor contact.	Temporary poor contact occurred, but it is normal at present.
<b>11 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connectors from the electronic throttle control. 4) Measure the resistance between ECM connector and electronic throttle control connector. <i>Connector &amp; terminal</i> (B136) No. 18 — (E57) No. 6: (B136) No. 29 — (E57) No. 4: (B136) No. 35 — (E57) No. 3:	Is the resistance less than 1 Ω?	Go to step 12.	Repair the open circuit of harness connector.
<b>12 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Measure the resistance between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> (E57) No. 3 — Engine ground:	Is the resistance less than 5 Ω?	Go to step 13.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>13 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. <i>Connector &amp; terminal</i> (E57) No. 5 (+) — Engine ground (-): 4) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage more than 10 V?	Go to step 14.	Repair battery short circuit in harness between ECM connector and electronic throttle control connector.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>14 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Measure the voltage between electronic throttle control connector and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 4 (+) — Engine ground (-):</b></i> <i><b>(E57) No. 6 (+) — Engine ground (-):</b></i> 2) Check the voltage change by shaking the harness and connector of ECM and engine harness connector while monitoring the value with voltage meter.	Is the voltage less than 10 V?	Go to step 15.	Repair short circuit in harness between ECM connector and electronic throttle control connector.
<b>15 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ECM connector. 3) Measure the resistance between ECM connectors. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 18 — (B136) No. 35:</b></i> <i><b>(B136) No. 29 — (B136) No. 35:</b></i>	Is the resistance more than 1 MΩ?	Go to step 16.	Repair short circuit to sensor power supply.
<b>16 CHECK ELECTRONIC THROTTLE CONTROL HARNESS.</b> 1) Disconnect the connector from ECM. 2) Disconnect the connectors from the electronic throttle control. 3) Measure the resistance between electronic throttle control connector terminals. <i><b>Connector &amp; terminal</b></i> <i><b>(E57) No. 6 — (E57) No. 4:</b></i>	Is the resistance more than 1 MΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective.	Repair the short circuit of harness.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## CG:DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D”/“E” VOLTAGE RATIONALITY

### DTC DETECTING CONDITION:

Immediately at fault recognition

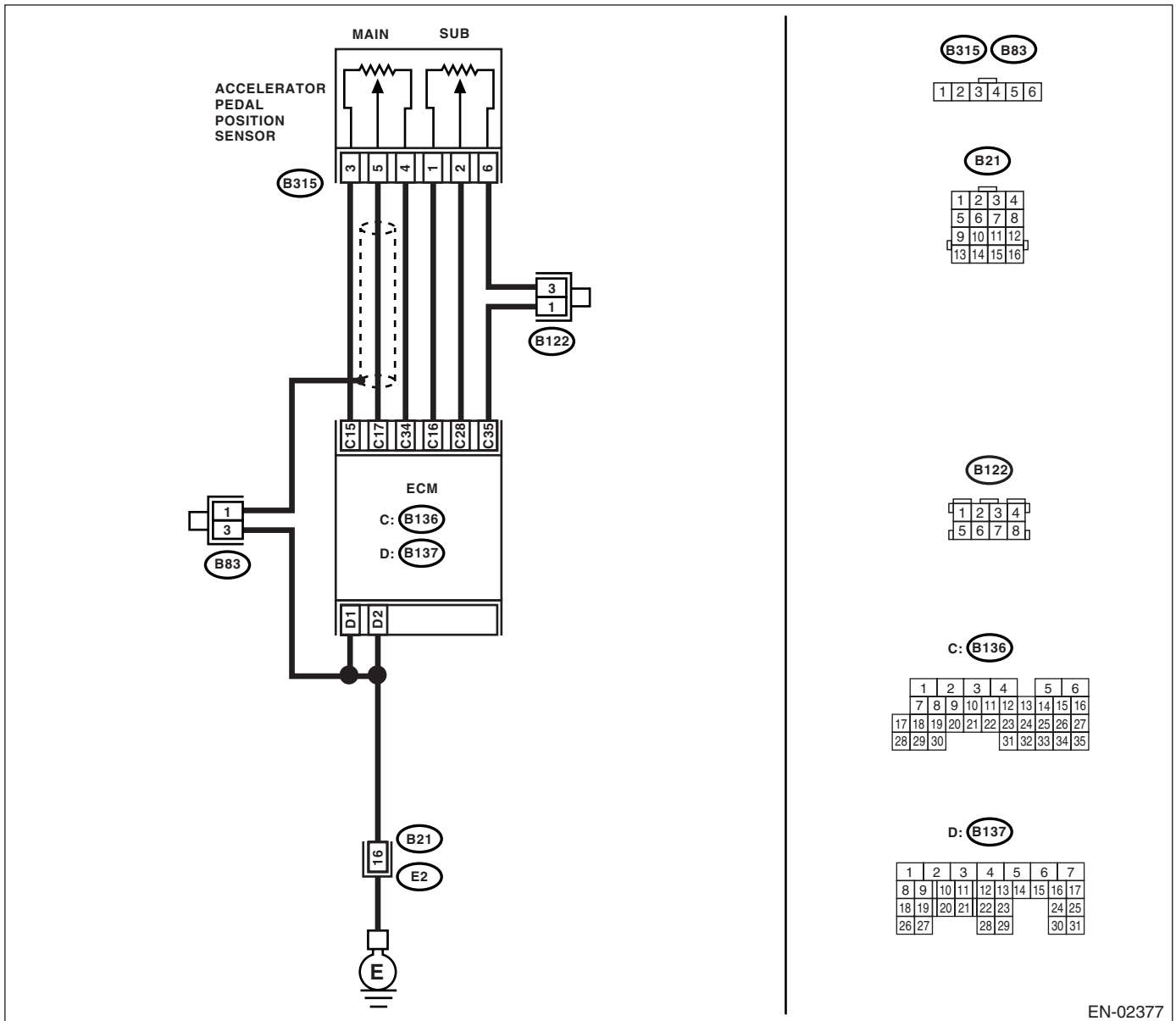
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC 2.5)-42, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC 2.5)-35, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02377

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM connector and terminal.  <i>Connector &amp; terminal</i>                      (B136) No. 17 (+) — (B136) No. 34 (-):                      (B136) No. 28 (+) — (B136) No. 35 (-):</p> <p>3) Check the voltage change by shaking the harness and connector of ECM and accelerator pedal position sensor connector and harness.</p>	Is the voltage more than 0.4 V?	Go to step 2.	Go to step 3.
<p><b>2 CHECK POOR CONTACT.</b>                      Check poor contact in connector between ECM and accelerator pedal position sensor.</p>	Is there poor contact?	Repair the poor contact.	Go to step 12.
<p><b>3 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Disconnect the connector from the accelerator pedal position sensor.                      4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <i>Connector &amp; terminal</i>                      (B136) No. 15 — (B315) No. 3:                      (B136) No. 16 — (B315) No. 1:                      (B136) No. 17 — (B315) No. 5:                      (B136) No. 28 — (B315) No. 2:</p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair the open circuit of harness connector.
<p><b>4 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b>                      Measure the resistance between ECM connector and chassis ground.  <i>Connector &amp; terminal</i>                      (B136) No. 15 — Chassis ground:                      (B136) No. 16 — Chassis ground:                      (B136) No. 17 — Chassis ground:                      (B136) No. 28 — Chassis ground:</p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair the ground short circuit of harness.
<p><b>5 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b>                      1) Connect the ECM connector.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal</i>                      (B315) No. 3 (+) — Engine ground (-):                      (B315) No. 1 (+) — Engine ground (-):</p> <p>4) Check the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter.</p>	Is the voltage 4.5 — 5.5 V?	Go to step 6.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<p><b>6 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b>                      Measure the resistance of accelerator pedal position sensor.  <i>Terminals</i>                      No. 3 — No. 4:</p>	Is the resistance 1.2 — 4.8 k $\Omega$ ?	Go to step 7.	Replace the accelerator pedal position sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor. <i>Terminals</i> <i>No. 1 — No. 6:</i>	Is the resistance 0.75 — 3.15 k $\Omega$ ?	Go to step 8.	Replace the accelerator pedal position sensor.
<b>8 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor without depressing the accelerator pedal. <i>Terminals</i> <i>No. 5 — No. 4:</i>	Is the resistance 0.2 — 0.8 k $\Omega$ ?	Go to step 9.	Replace the accelerator pedal position sensor.
<b>9 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor without depressing the accelerator pedal. <i>Terminals</i> <i>No. 2 — No. 6:</i>	Is the resistance 0.15 — 0.63 k $\Omega$ ?	Go to step 10.	Replace the accelerator pedal position sensor.
<b>10 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor with the accelerator pedal depressed. <i>Terminals</i> <i>No. 5 — No. 4:</i>	Is the resistance 0.5 — 2.5 k $\Omega$ ?	Go to step 11.	Replace the accelerator pedal position sensor.
<b>11 CHECK ACCELERATOR PEDAL POSITION SENSOR.</b> Measure the resistance of accelerator pedal position sensor with the accelerator pedal depressed. <i>Terminals</i> <i>No. 2 — No. 6:</i>	Is the resistance 0.28 — 1.68 k $\Omega$ ?	Go to step 12.	Replace the accelerator pedal position sensor.
<b>12 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.</b> 1) Turn the ignition switch to OFF. 2) Connect all the connectors. 3) Turn the ignition switch to ON. 4) Read the data of main throttle sensor signal and sub accelerator pedal position sensor signal using Subaru Select Monitor. 5) Check the voltage change by shaking the harness and connector of ECM, engine harness connector and accelerator pedal position sensor connector harness.	Is the voltage less than 4.8 V?	Go to step 13.	Go to step 14.
<b>13 CHECK POOR CONTACT.</b> Check poor contact in connector between ECM and accelerator pedal position sensor.	Is there poor contact?	Repair the poor contact.	Go to step 19.



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>14 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from the accelerator pedal position sensor. 4) Measure the resistance between ECM connector and accelerator pedal position sensor connector.  <i>Connector &amp; terminal</i> <i>(B136) No. 34 — (B315) No. 4:</i> <i>(B136) No. 35 — (B315) No. 6:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 15.	Repair the open circuit of harness connector.
<b>15 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Measure the resistance between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal</i> <i>(B315) No. 4 — Engine ground:</i> <i>(B315) No. 6 — Engine ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step 16.	Repair the poor contact in ECM connector. Replace the ECM if defective.
<b>16 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Connect the ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal</i> <i>(B315) No. 1 (+) — Engine ground (-):</i> <i>(B315) No. 3 (+) — Engine ground (-):</i> 4) Check the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage less than 6 V?	Go to step 17.	Repair battery short circuit in harness between ECM connector and accelerator pedal position sensor connector.
<b>17 CHECK POWER SUPPLY OF ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Measure the voltage between accelerator pedal position sensor connector and engine ground.  <i>Connector &amp; terminal</i> <i>(B315) No. 2 (+) — Engine ground (-):</i> <i>(B315) No. 5 (+) — Engine ground (-):</i> 2) Check the voltage change by shaking the harness and connector of ECM while monitoring the value with voltage meter.	Is the voltage less than 4.8 V?	Go to step 18.	Repair short circuit in harness between ECM connector and accelerator pedal position sensor connector.
<b>18 CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Connect the accelerator pedal position sensor connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B136) No. 17 (+) — Chassis ground (-):</i> <i>(B136) No. 28 (+) — Chassis ground (-):</i>	Is the voltage less than 4.8 V?	Go to step 19.	Repair poor contact in accelerator pedal position sensor connector. Replace the accelerator pedal position sensor if defective.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>19</b> <b>CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from the accelerator pedal position sensor. 4) Measure the resistance between connector terminals of accelerator pedal position sensor. <b>Connector &amp; terminal</b> <b>(B315) No. 5 — (B315) No. 2:</b>	Is the resistance more than 1 MΩ?	Repair the poor contact in ECM connector. Replace the ECM if defective.	Repair short circuit in harness between ECM connector and accelerator pedal position sensor connector.

## General Diagnostic Table

ENGINE (DIAGNOSTIC)

### 19. General Diagnostic Table

#### A: INSPECTION

##### 1. ENGINE

NOTE:

Malfunction of parts other than those listed is also possible. <Ref. to ME(H4DOTC)-118, Engine Trouble in General.>

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

# General Diagnostic Table

ENGINE (DIAGNOSTIC)

Symptom	Problem parts
7. Spark knock	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor 4) Knock sensor 5) Fuel injection parts (*4) 6) Fuel pump and fuel pump relay
8. After burning in exhaust system	1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay

\*1: Check ignition coil & ignitor ASSY 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 (DIAGNOSTIC)

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