# ENGINE (DIAGNOSTICS)

# EN(H4DOTC)(diag)


| | | Page |
|---|---|---|
| 1. | Basic Diagnostic Procedure | 2 |
| 2. | Check List for Interview | 3 |
| 3. | General Description | 5 |
| 4. | Electrical Component Location | 8 |
| 5. | Engine Control Module (ECM) I/O Signal | 18 |
| 6. | Engine Condition Data | 23 |
| 7. | Data Link Connector | 24 |
| 8. | General Scan Tool | 25 |
| 9. | Subaru Select Monitor | 28 |
| 10. | Read Diagnostic Trouble Code (DTC) | 35 |
| 11. | Inspection Mode | 36 |
| 12. | Drive Cycle | 41 |
| 13. | Clear Memory Mode | 45 |
| 14. | Compulsory Valve Operation Check Mode | 46 |
| 15. | Malfunction Indicator Light | 48 |
| 16. | Diagnostics for Engine Starting Failure | 57 |
| 17. | List of Diagnostic Trouble Code (DTC) | 71 |
| 18. | Diagnostic Procedure with Diagnostic Trouble Code (DTC) | 78 |
| 19. | General Diagnostic Table | 331 |

# 1. Basic Diagnostic Procedure

## A: PROCEDURE

### 1. ENGINE

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ENGINE START FAILURE.**<br>1) Ask the customer when and how the trouble occurred using the interview check list. <Ref. to EN(H4DOTC)(diag)-3, CHECK, Check List for Interview.><br>2) Start the engine. | Does the engine start? | Go to step **2.** | Inspection using "Diagnostics for Engine Starting Failure". <Ref. to EN(H4DOTC)(diag)-57, Diagnostics for Engine Starting Failure.> |
| 2 | **CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.** | Does malfunction indicator light illuminate? | Go to step **3.** | Inspection using "General Diagnostic Table". <Ref. to EN(H4DOTC)(diag)-331, General Diagnostic Table.> |
| 3 | **CHECK INDICATION OF DTC ON SCREEN.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the Subaru Select Monitor or general scan tool to data link connector.<br>3) Turn the ignition switch to ON, and the Subaru Select Monitor or general scan tool switch to ON.<br>4) Read DTC on Subaru Select Monitor or general scan tool. | Is DTC displayed on the Subaru Select Monitor or general scan tool? | Record the DTC. Repair the trouble cause. <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> Go to step **4.** | Repair the related parts.<br>NOTE:<br>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)(diag)-48, Malfunction Indicator Light.> |
| 4 | **PERFORM THE DIAGNOSIS.**<br>1) Perform clear memory mode. <Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.><br>2) Perform the inspection mode. <Ref. to EN(H4DOTC)(diag)-36, Inspection Mode.> | Is DTC displayed on the Subaru Select Monitor or general scan tool? | Check on "Diagnostic Chart with Diagnostic Trouble Code (DTC)" <Ref. to EN(H4DOTC)(diag)-78, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> | Finish the diagnosis. |

# 2. Check List for Interview

## A: CHECK

### 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 | ❑ Fine<br>❑ Cloudy<br>❑ Rainy<br>❑ Snowy<br>❑ Various/Others: | | |
| Ambient air temperature | °C (°F) | | |
| | ❑ Hot<br>❑ Warm<br>❑ Cool<br>❑ Cold | | |
| Place | ❑ Highway<br>❑ Suburbs<br>❑ Inner city<br>❑ Uphill<br>❑ Downhill<br>❑ Rough road<br>❑ Others: | | |
| Engine temperature | ❑ Cold<br>❑ Warming-up<br>❑ After warming-up<br>❑ Any temperature<br>❑ Others: | | |
| Engine speed | rpm | | |
| Vehicle speed | km/h (MPH) | | |
| Driving conditions | ❑ Not affected<br>❑ At starting<br>❑ While idling<br>❑ At racing<br>❑ While accelerating<br>❑ While cruising<br>❑ While decelerating<br>❑ While turning (RH/LH) | | |
| Headlight | ❑ ON / ❑ OFF | Rear defogger | ❑ ON / ❑ OFF |
| Blower | ❑ ON / ❑ OFF | Audio | ❑ ON / ❑ OFF |
| A/C compressor | ❑ ON / ❑ OFF | Car phone | ❑ ON / ❑ OFF |
| Radiator fan | ❑ ON / ❑ OFF | | |
| Front wiper | ❑ ON / ❑ OFF | | |
| Rear wiper | ❑ ON / ❑ OFF | | |

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

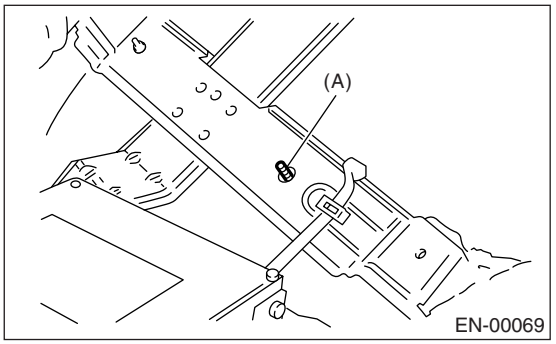
2) Never connect the battery in reverse polarity.
The ECM will be destroyed instantly.
The fuel injector and other part will be damaged.
3) Do not disconnect the battery terminals while the engine is running.
A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM, etc.
4) Before disconnecting the connectors of each sensor and the ECM, be sure to turn the ignition switch to OFF.
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 any damage on the fuel injection system.**

NOTE:
Immobilizer system must be registered when installing the ECM of the model with immobilizer. For doing so, all ignition keys and ID cards should be prepared. Refer to “REGISTRATION MANUAL FOR IMMOBILIZER”.

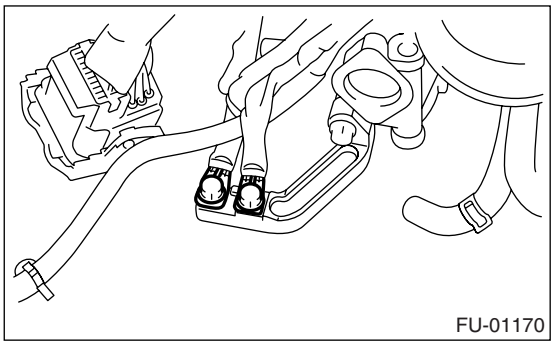
7) Connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a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

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




(A) Stud bolt

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




10) 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.

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.

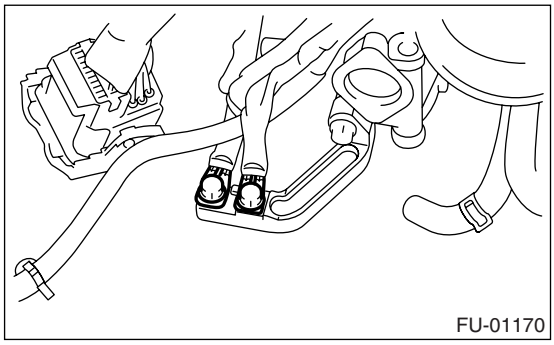
***Standard voltage: 12 V***

***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 grounding terminal is properly connected to engine.




## C: NOTE

### 1. DESCRIPTION

• The on-board diagnostics (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 OBD-II Regulations. The OBD system monitors the components and the system malfunction listed in Engine Section which affects on emissions.
• When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a DTC and a freeze frame engine conditions are stored into on-board computer.
• The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer 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.
• When troubleshooting the vehicle which complies with OBD-II Regulations, connect the Subaru Select Monitor or general scan tool to the vehicle.

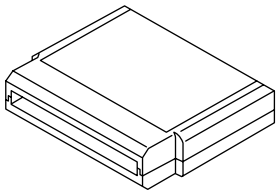
### 2. ENGINE AND EMISSION CONTROL SYSTEM

• The Multipoint Fuel Injection (MFI) system is a system that supplies the optimum air-fuel mixture to the engine for all the various operating conditions through the use of the latest electronic technology.
With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system where the electro-magnetic injection valve (fuel injector) opens only for a short period of time, depending on the quantity of air required for one cycle of operation. In actual operation, the injection quantity is determined by the duration of an electric pulse applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

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

The MFI system also has the following features:
- Reduced emission of harmful exhaust gases.
- Reduced in fuel consumption.
- Increased engine output.
- Superior acceleration and deceleration.
- Superior startability and warm-up performance in cold weather since compensation is made for coolant and intake air temperature.

## D: PREPARATION TOOL

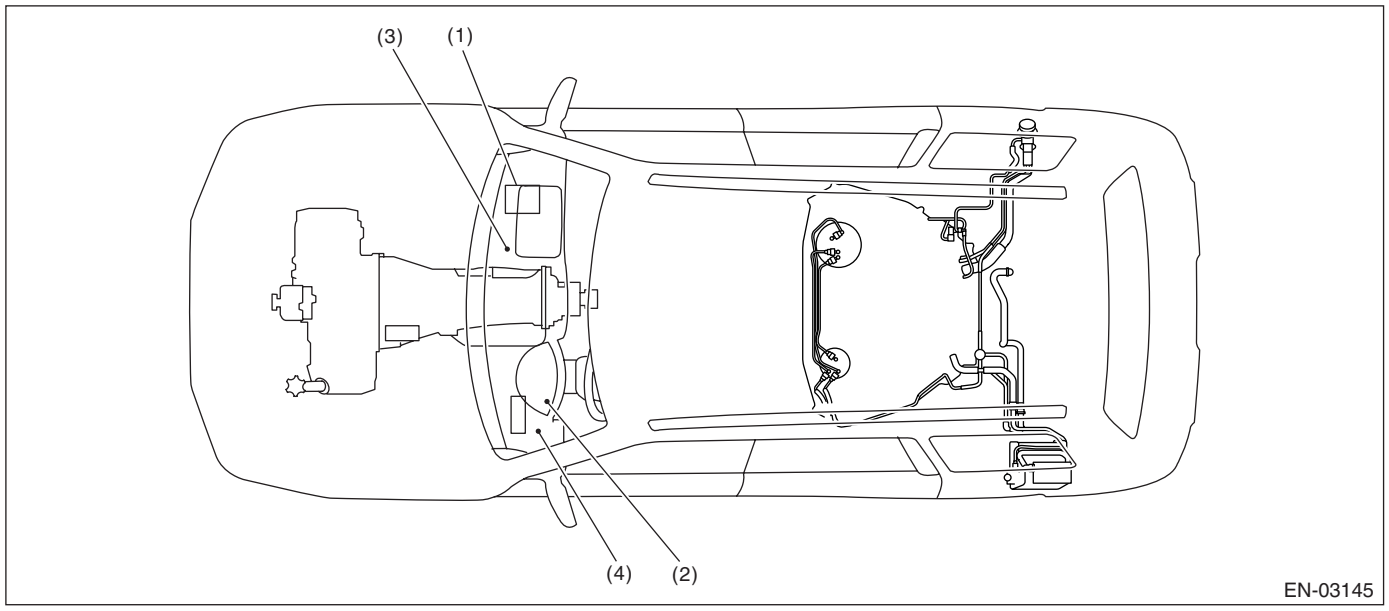
| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|---|---|---|---|
|  ST24082AA260 | 24082AA260 | CARTRIDGE | Troubleshooting for electrical system. |
|  ST22771AA030 | 22771AA030 | SUBARU SELECT MONITOR KIT | Troubleshooting for electrical system. |

# 4. Electrical Component Location

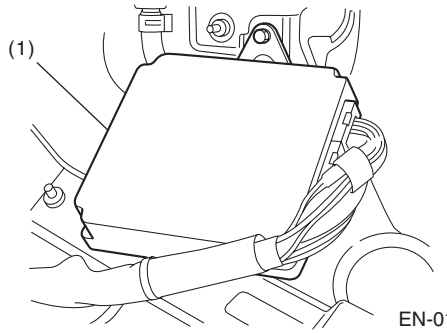
## A: LOCATION

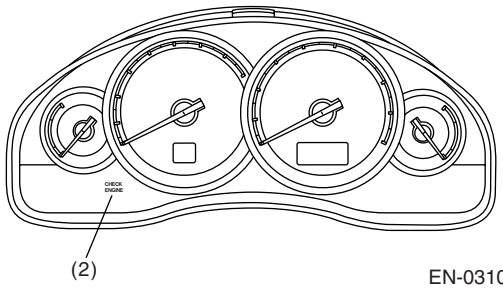
### 1. ENGINE

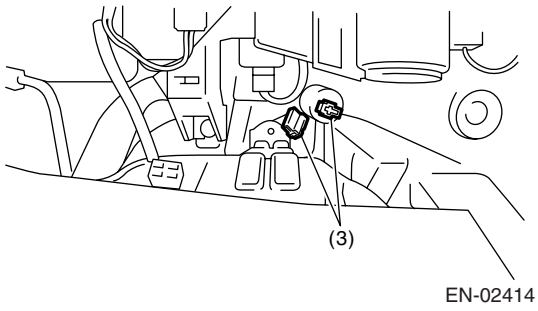
- Control module

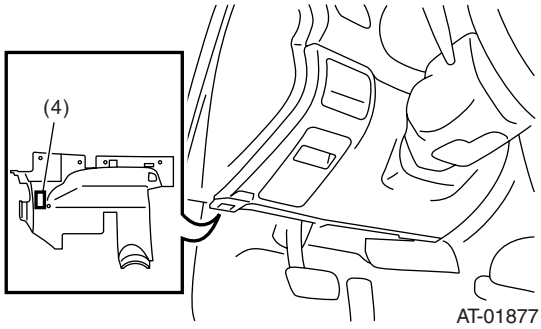



(1) Engine control module (ECM)
(2) Malfunction indicator light
(3) Test mode connector
(4) Data link connector

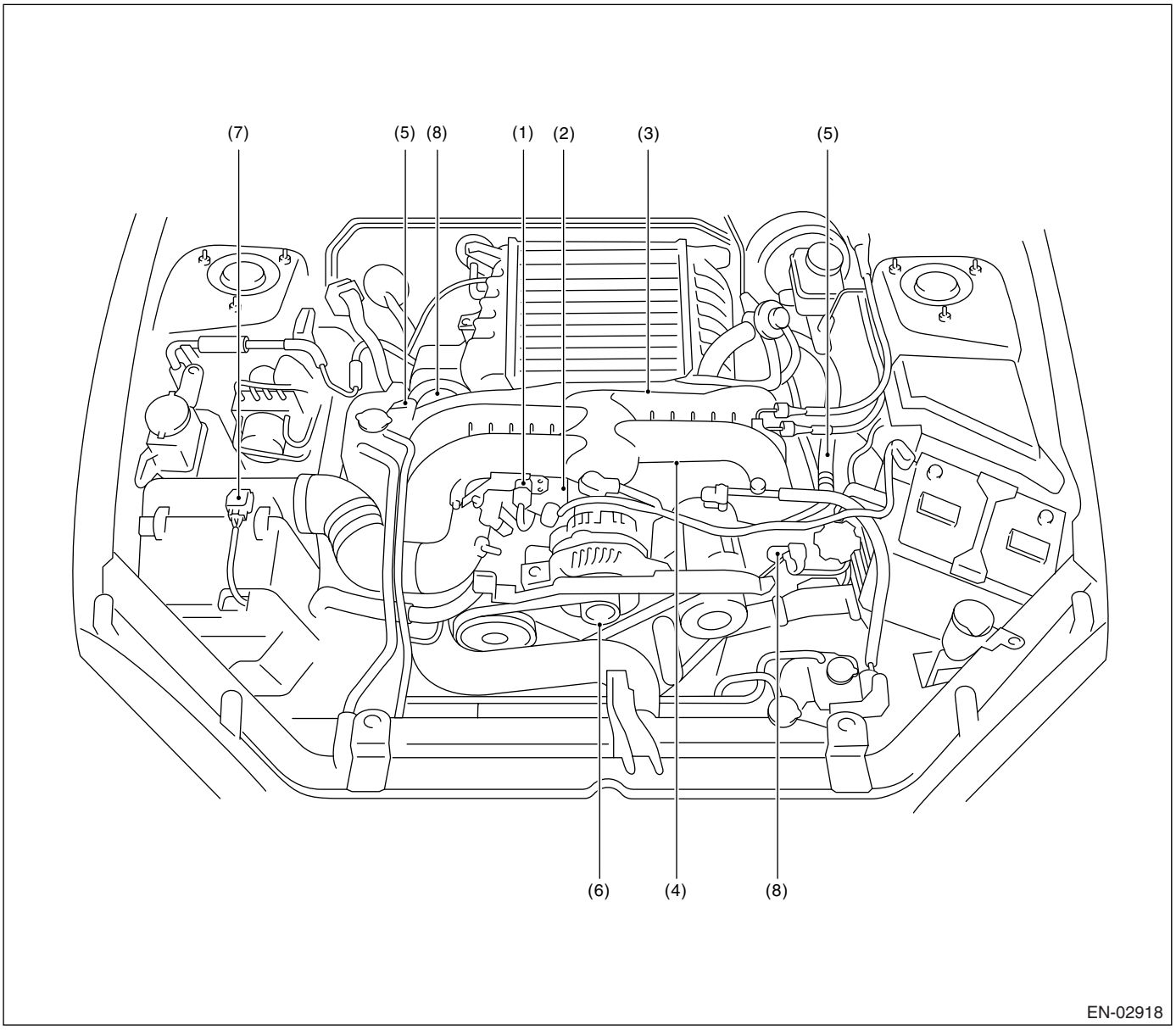


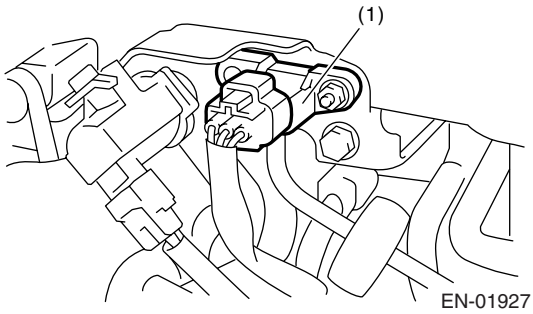



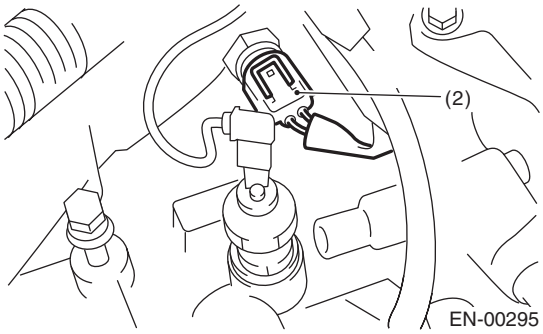
- Sensor

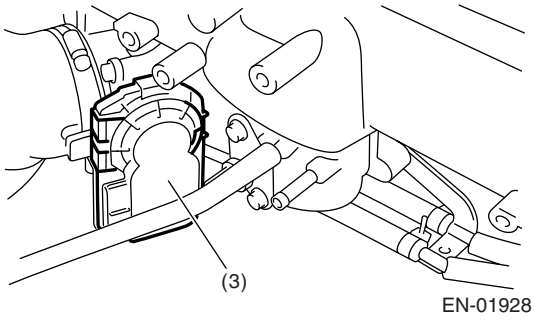


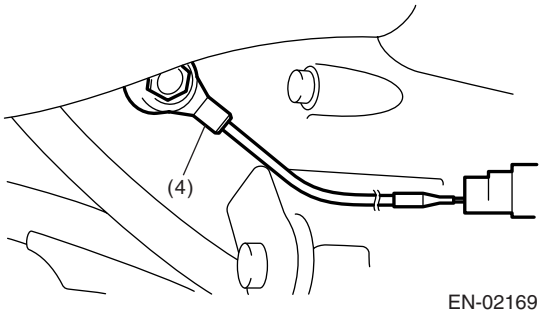

(1) Manifold absolute pressure sensor
(2) Engine coolant temperature sensor
(3) Electronic throttle control
(4) Knock sensor
(5) Intake camshaft position sensor
(6) Crankshaft position sensor
(7) Mass air flow and intake air temperature sensor
(8) Tumble generator valve position sensor

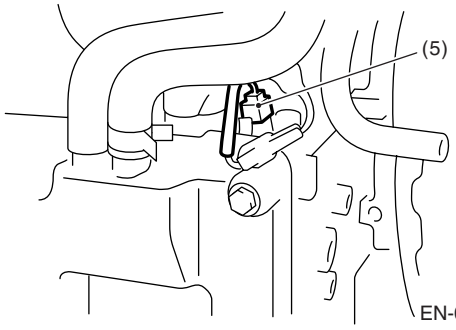
# Electrical Component Location

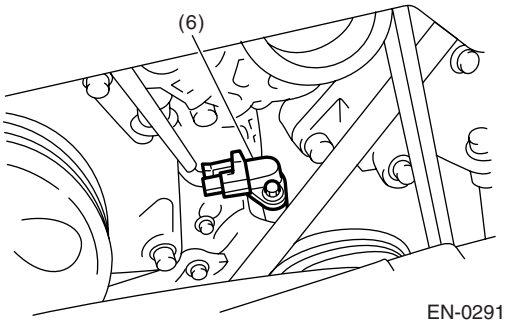


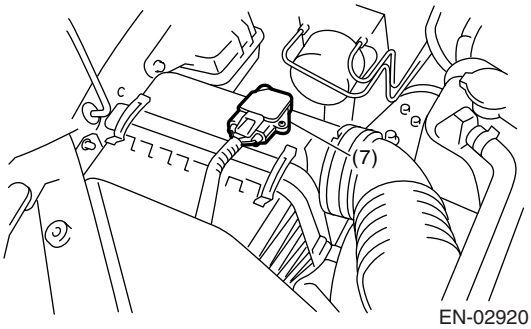



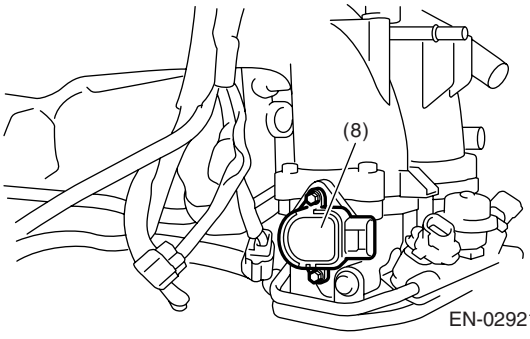



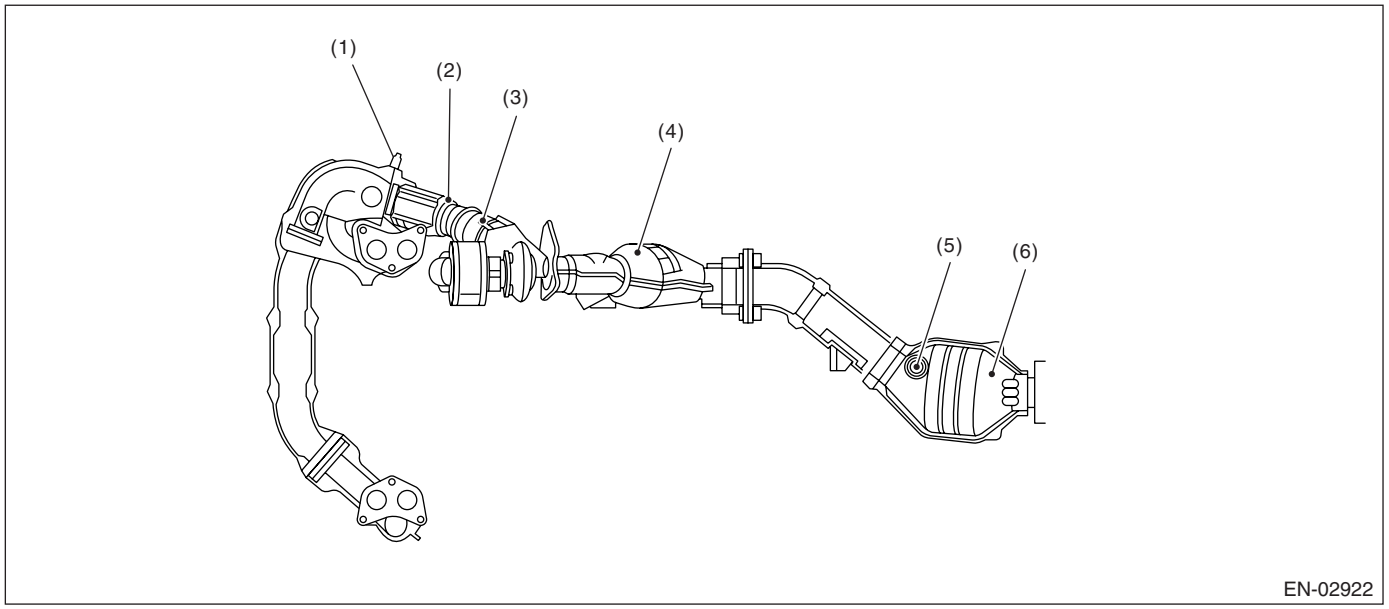



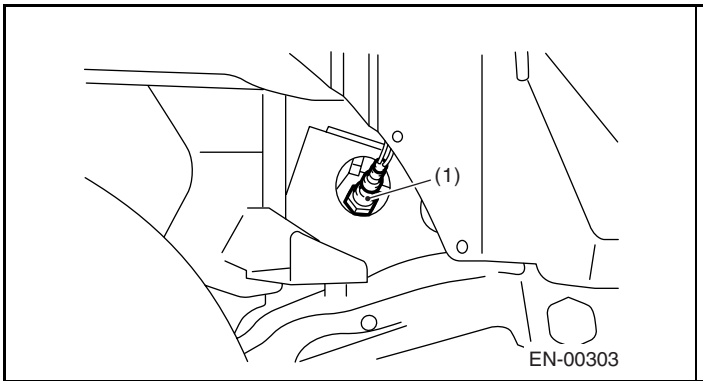



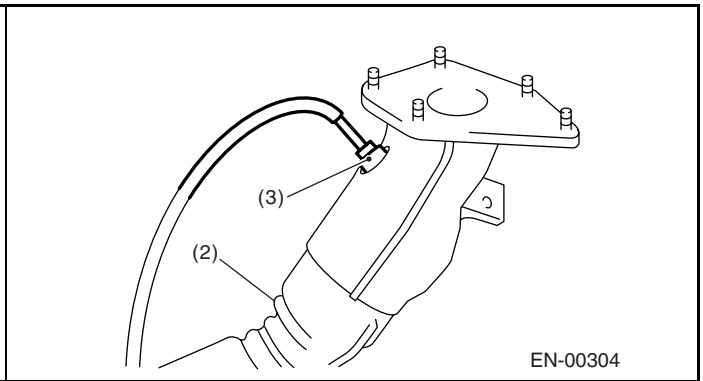



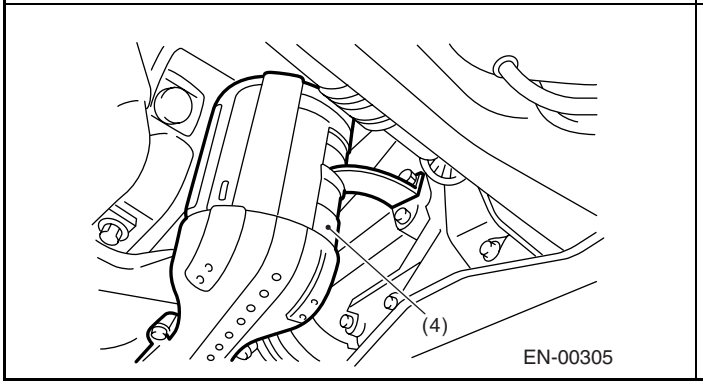



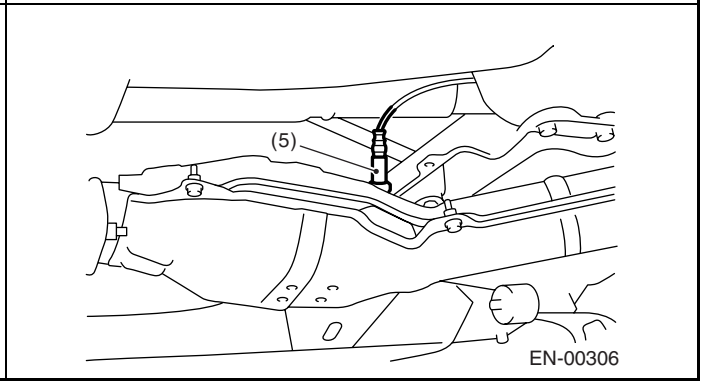



(1) Front oxygen (A/F) sensor
(2) Precatalytic converter
(3) Exhaust gas temperature sensor
(4) Front catalytic converter
(5) Rear oxygen sensor
(6) Rear catalytic converter

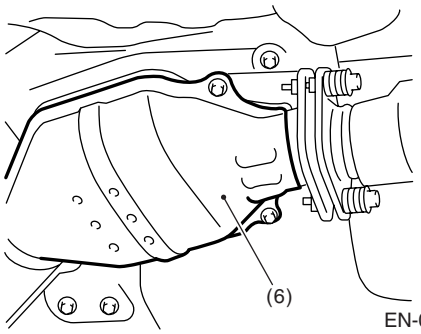


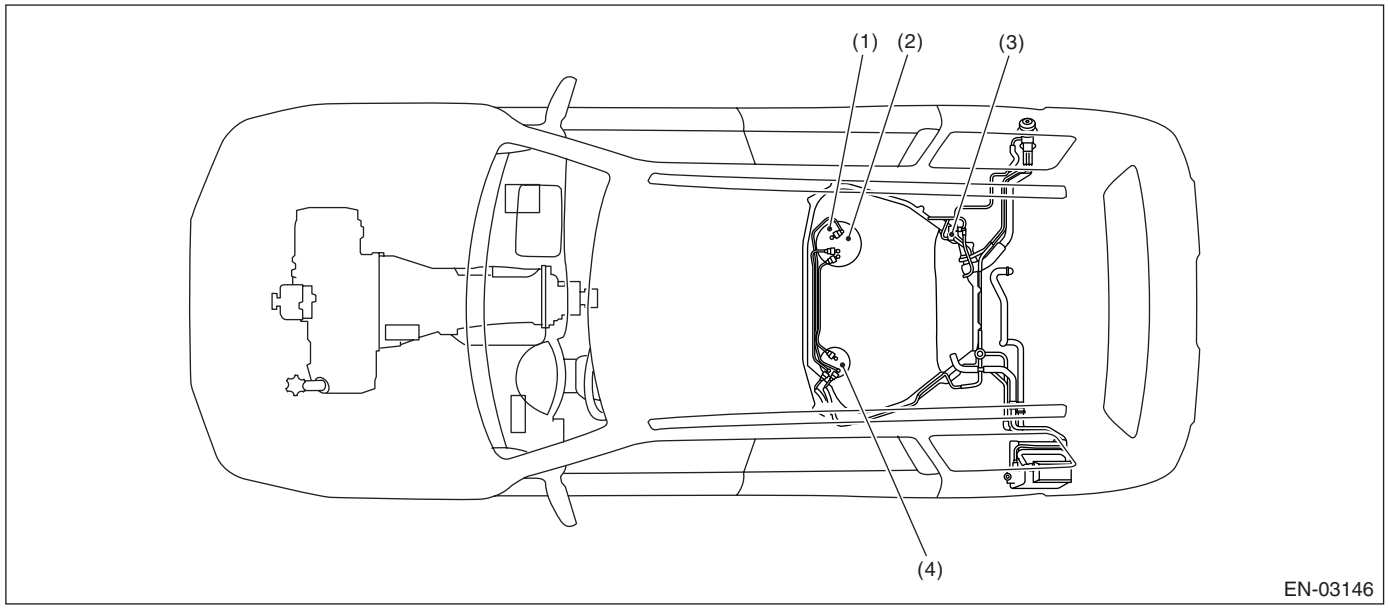



# Electrical Component Location

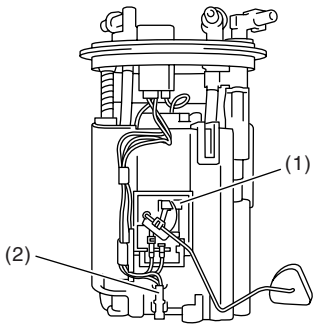



EN-00307

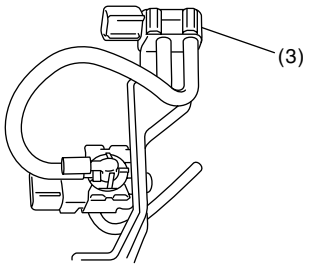



EN-03146

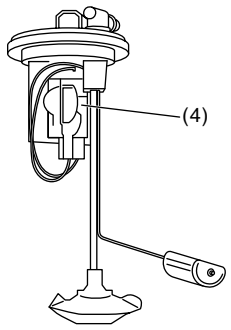
(1) Fuel level sensor
(2) Fuel temperature sensor
(3) Fuel tank pressure sensor
(4) Fuel sub level sensor




EN-03147

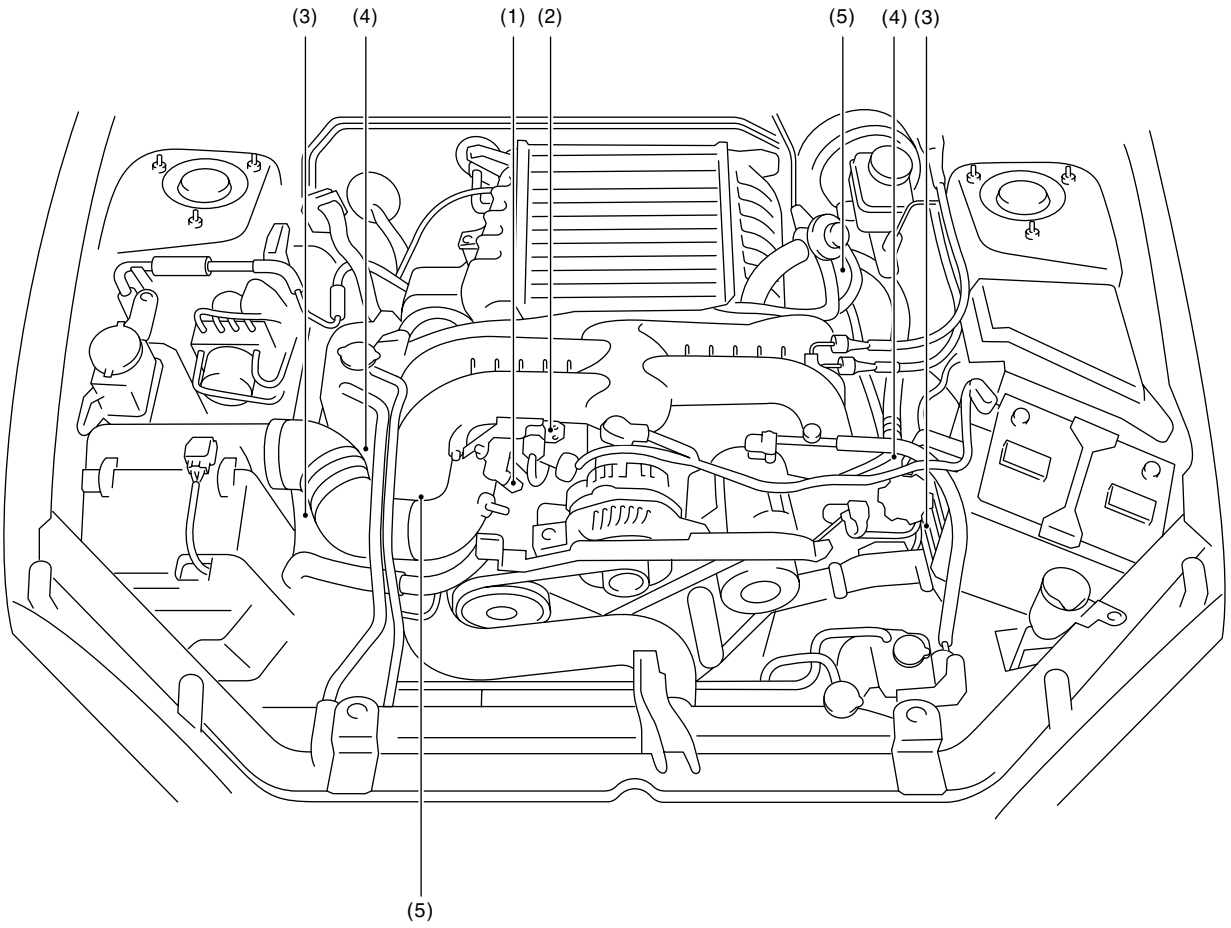



EN-03003




EN-03132

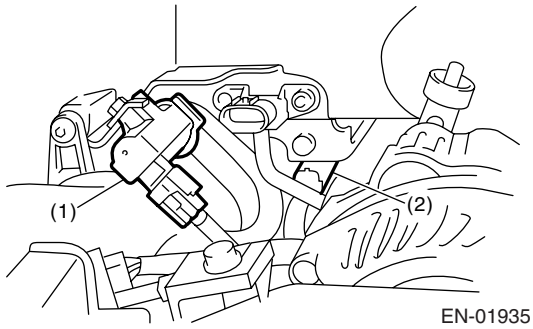
- Solenoid valve, actuator, emission control system parts and ignition system parts



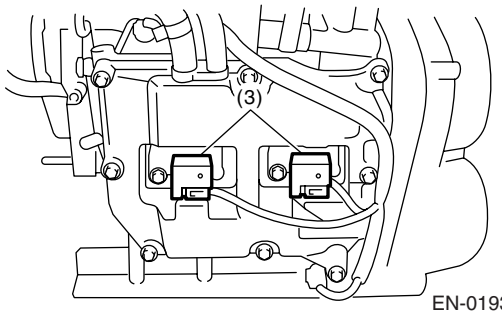

EN-02927

(1) Wastegate control solenoid valve
(2) Purge control solenoid valve
(3) Ignition coil
(4) Intake oil flow control solenoid valve
(5) Tumble generator valve actuator

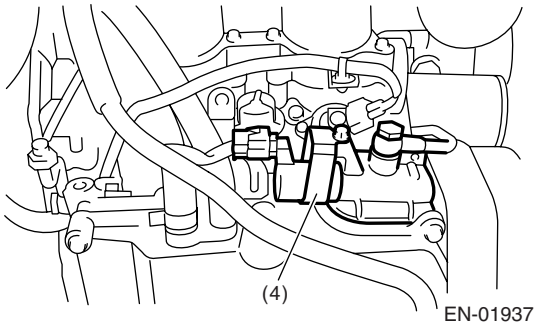
# Electrical Component Location



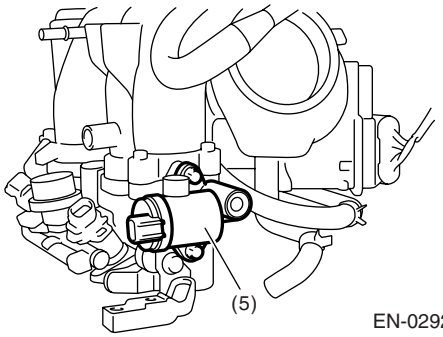
EN-01935



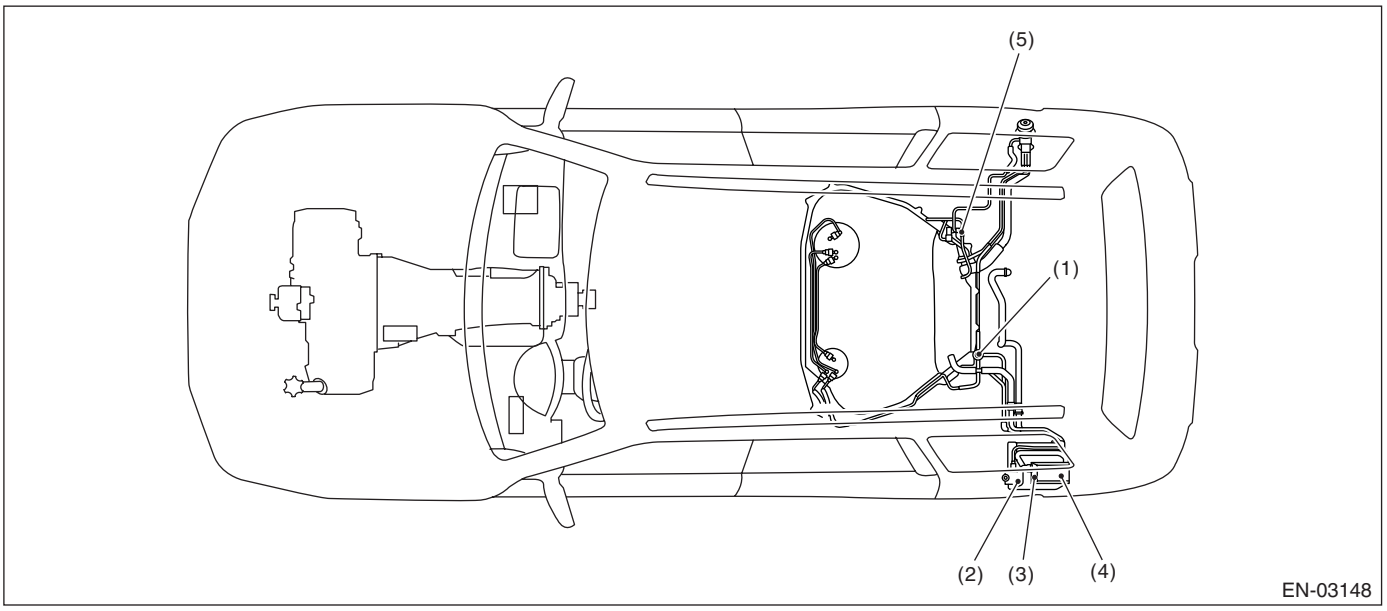
EN-01936



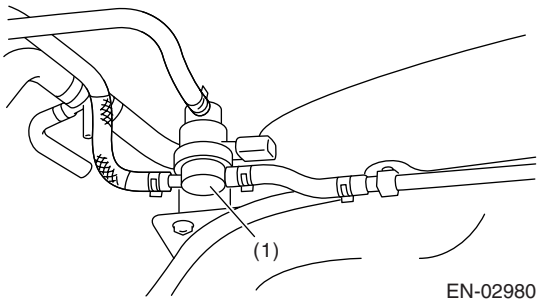
EN-01937

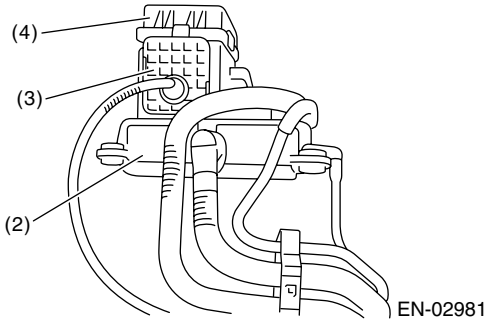


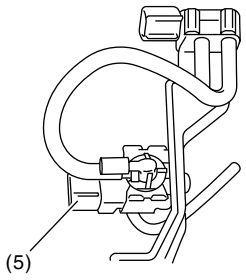
EN-02928



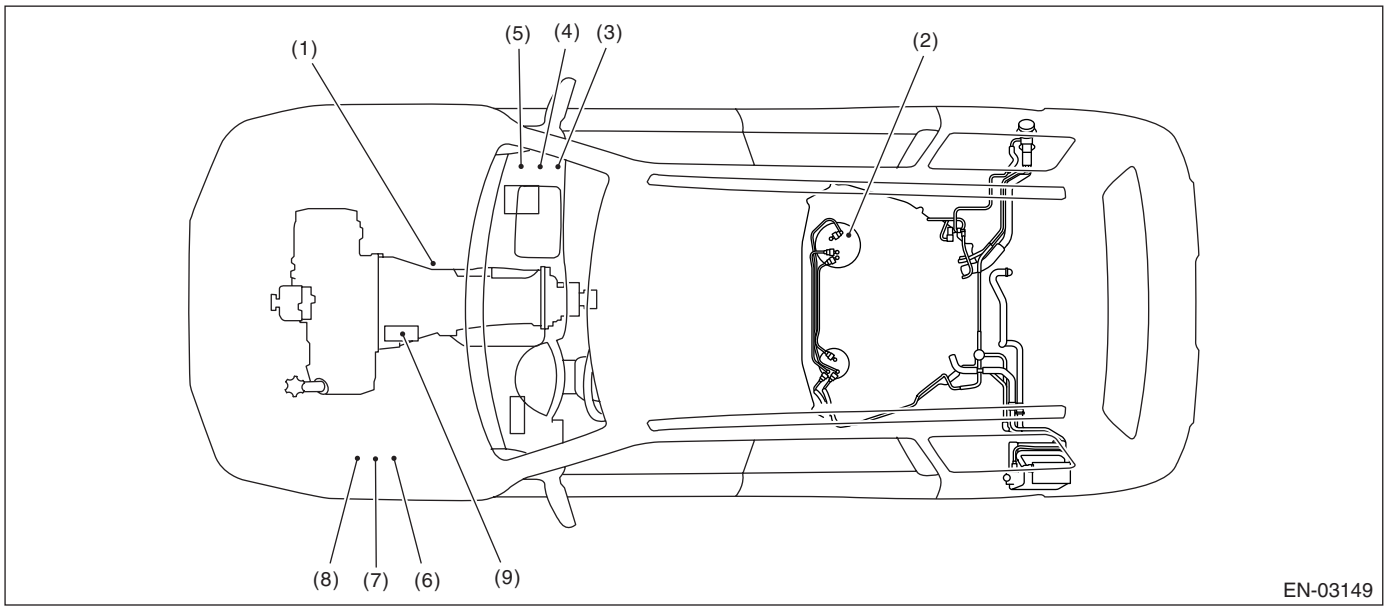

(1) Pressure control solenoid valve
(2) Canister
(3) Drain valve
(4) Drain filter
(5) Fuel tank sensor control valve



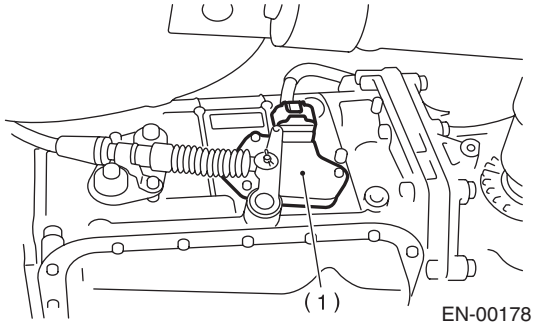



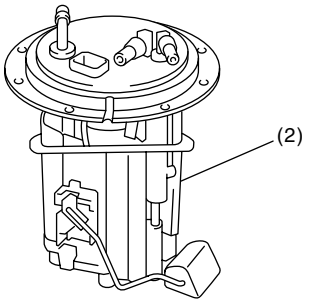



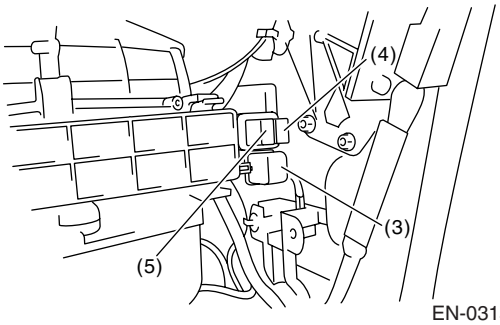
# Electrical Component Location

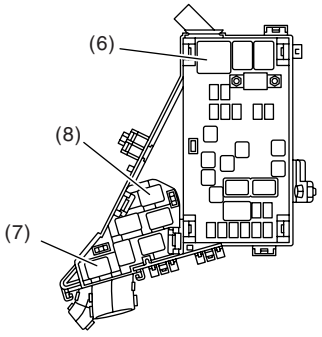


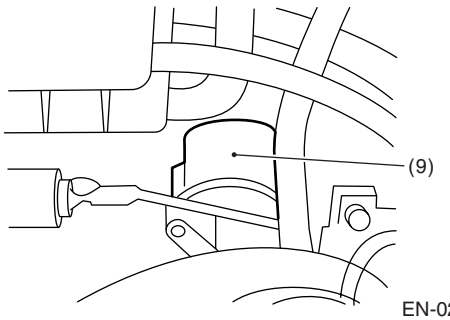

(1) Inhibitor switch
(2) Fuel pump
(3) Main relay
(4) Fuel pump relay
(5) Electronic throttle control relay
(6) Radiator main fan relay 1
(7) Radiator sub fan relay
(8) Radiator main fan relay 2
(9) Starter



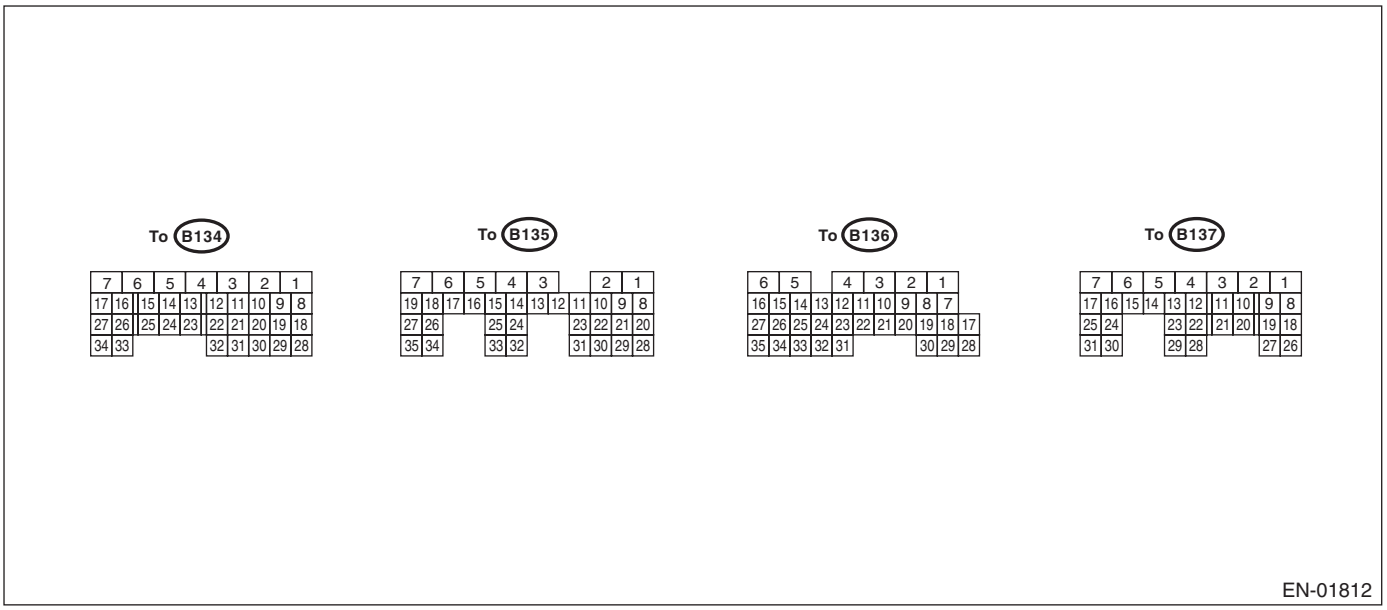




(9)
EN-02096

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

## A: ELECTRICAL SPECIFICATION




| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Crankshaft 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 (sensor) | B136 | 35 | 0 | 0 | — |
| Front oxygen (A/F) sensor heater | Signal 1 | B134 | 3 | — | — | Waveform |
| | Signal 2 | B134 | 2 | — | — | Waveform |
| Rear oxygen sensor heater signal | | B135 | 2 | 0 — 13 | 13 — 14 | Waveform |
| Engine coolant temperature sensor | Signal | B136 | 14 | 1.0 — 1.4 | 1.0 — 1.4 | After engine is warmed-up. |
| | GND (sensor) | B136 | 35 | 0 | 0 | After engine is warmed-up. |
| 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 | — |
| 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<br>OFF: 0 | ON: 13 — 14<br>OFF: 0 | — |
| Ignition switch | | B137 | 14 | 10 — 13 | 13 — 14 | — |
| Neutral position switch (MT) | | B137 | 9 | ON: 10 — 13<br>OFF: 0 | ON: 13 — 14<br>OFF: 0 | — |

| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Neutral position switch (AT) | | B137 | 9 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 13 — 14 | — |
| 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 | Signal 1 | B137 | 28 | 10 — 13 | 13 — 14 | — |
| | Signal 2 | B135 | 27 | 0 or 5 | 0 or 5 | Waveform |
| A/C relay control | | B135 | 33 | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 13 — 14 | — |
| Radiator fan relay 1 control | | B135 | 25 | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 13 — 14 | — |
| Radiator fan relay 2 control | | B135 | 24 | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 13 — 14 | Model with A/C |
| Malfunction indicator light | | B134 | 17 | — | — | Light “ON”: 1 or less<br>Light “OFF”: 10 — 14 |
| Engine speed output | | B134 | 23 | — | 0 — 13 or more | Waveform |
| Purge control solenoid valve | | B134 | 14 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>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 (sensor) | B136 | 35 | 0 | 0 | |
| Power steering oil pressure switch | | B137 | 10 | 10 — 13 | ON: 0<br>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 communication line | | B137 | 20 | Less than 1←→ More than 4 | Less than 1←→ More than 4 | — |
| GND (injector) | | B137 | 7 | 0 | 0 | — |
| GND (sensor) | | B136 | 35 | 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 | — |

# Engine Control Module (ECM) I/O Signal

| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| GND (Front oxygen (A/F) sensor heater 1) | | B134 | 7 | 0 | 0 | — |
| GND (Front oxygen (A/F) sensor heater 2) | | B134 | 6 | 0 | 0 | — |
| GND (Electronic throttle control) | | B137 | 3 | 0 | 0 | — |
| Intake camshaft position sensor (LH) | | B135 | 8 | 0 or 5 | 0 or 5 | Waveform |
| Intake camshaft position sensor (RH) | | B135 | 9 | 0 or 5 | 0 or 5 | Waveform |
| Electronic throttle control | Main | B136 | 18 | 0.64 — 0.72<br>Fully open: 3.96 | 0.64 — 0.72<br>(After engine is warmed-up.) | Fully closed: 0.6 Fully open: 3.96 |
| | Sub | B136 | 29 | 1.51 — 1.58<br>Fully open: 4.17 | 1.51 — 1.58<br>(After engine is warmed-up.) | Fully closed: 1.48 Fully open: 4.17 |
| | Power supply | B136 | 16 | 5 | 5 | — |
| | GND (sensor) | B136 | 35 | 0 | 0 | — |
| Electronic throttle control motor (+) | | B137 | 5 | Duty waveform | Duty waveform | Drive frequency: 500 Hz |
| Electronic throttle control motor (−) | | B137 | 4 | Duty waveform | Duty waveform | Drive frequency: 500 Hz |
| Electronic throttle control motor power supply | | B137 | 6 | 10 — 13 | 13 — 14 | — |
| Electronic throttle control motor relay | | B135 | 35 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 13 — 14 | When ignition switch is turned to ON: ON |
| Intake AVCS solenoid (LH) | Signal (+) | B134 | 19 | ON: 10 — 13<br>OFF: 0 | ON: 13 — 14<br>OFF: 0 | — |
| | Signal (−) | B134 | 29 | 0 | 0 | — |
| Intake AVCS solenoid (RH) | Signal (+) | B134 | 18 | ON: 10 — 13<br>OFF: 0 | ON: 13 — 14<br>OFF: 0 | — |
| | Signal (−) | B134 | 28 | 0 | 0 | — |
| Accelerator position sensor | Main | B136 | 17 | Fully closed: 1<br>Fully open: 3.3 | Fully closed: 1<br>Fully open: 3.3 | — |
| | Power supply | B136 | 15 | 5 | 5 | — |
| | GND (sensor) | B136 | 34 | 0 | 0 | — |
| | Sub | B136 | 28 | Fully closed: 1<br>Fully open: 3.3 | Fully closed: 1<br>Fully open: 3.3 | — |
| | Shield | B137 | 2 | 0 | 0 | — |
| | Power supply | B136 | 16 | 5 | 5 | — |
| | GND (sensor) | B136 | 35 | 0 | 0 | — |
| Starter relay | | B135 | 32 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 13 — 14 | ON: Cranking |
| A/C middle pressure switch | | B136 | 30 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 13 — 14 | — |

| Description | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|
| | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Clutch switch | B134 | 1 | When clutch pedal is depressed: 0<br>When clutch pedal is released: 10 — 13 | When clutch pedal is depressed: 0<br>When clutch pedal is released: 13 — 14 | — |
| Brake switch 1 | B136 | 9 | When brake pedal is depressed: 0<br>When brake pedal is released: 10 — 13 | When brake pedal is depressed: 0<br>When brake pedal is released: 13 — 14 | — |
| Brake switch 2 | B136 | 8 | When brake pedal is depressed: 10 — 13<br>When brake pedal is released: 0 | When brake pedal is depressed: 13 — 14<br>When brake pedal is released: 0 | — |
| Cruise control command switch | B136 | 11 | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating CANCEL: 0 — 0.5 | When operating nothing: 3.5 — 4.5<br>When operating RES/ACC: 2.5 — 3.5<br>When operating SET/COAST: 0.5 — 1.5<br>When operating CANCEL: 0 — 0.5 | — |
| Cruise control main switch | B136 | 7 | ON: 0<br>OFF: 5 | ON: 0<br>OFF: 5 | — |
| Exhaust gas temperature sensor | B136 | 24 | — | — | — |
| Fuel tank pressure sensor | B136 | 21 | 2.3 — 2.7 | 2.3 — 2.7 | — |
| Pressure control solenoid valve | B134 | 12 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 13 — 14 | — |
| Drain valve | B134 | 13 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 13 — 14 | — |
| Fuel tank sensor control valve | B134 | 24 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 13 — 14 | — |
| Fuel temperature sensor signal | B136 | 12 | 2.5 — 3.8 | 2.5 — 3.8 | Ambient temperature: 25°C |
| Immobilizer Signal 1 | B137 | 19 | — | — | — |
| Immobilizer Signal 2 | B137 | 27 | — | — | — |
| CAN Communication (+) | B137 | 18 | — | — | — |
| CAN Communication (−) | B137 | 26 | — | — | — |
| AT/MT identification signal | B134 | 34 | 0 | 0 | — |
| Blow-by leak diagnosis signal | B137 | 24 | 0 | 0 | — |
| Tumble generator valve position sensor RH | B136 | 27 | Fully closed: 3.8 — 4.9<br>Fully opened: 0.2 — 0.9 | Fully closed: 3.8 — 4.9<br>Fully opened: 0.2 — 0.9 | — |
| Tumble generator valve position sensor LH | B136 | 26 | Fully closed: 3.8 — 4.9<br>Fully opened: 0.2 — 0.9 | Fully closed: 3.8 — 4.9<br>Fully opened: 0.2 — 0.9 | — |
| Tumble generator valve RH (close) | B134 | 8 | 0 or 10 — 13 | 0 or 13 — 14 | — |
| Tumble generator valve LH (close) | B134 | 10 | 0 or 10 — 13 | 0 or 13 — 14 | — |

| Description | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|
| | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Tumble generator valve RH (open) | B134 | 9 | 0 or 10 — 13 | 0 or 13 — 14 | — |
| Tumble generator valve LH (open) | B134 | 11 | 0 or 10 — 13 | 0 or 13 — 14 | — |

# 6. Engine Condition Data

## A: ELECTRICAL SPECIFICATION

| Remarks | Specification |
|---|---|
| Engine load | 1.6 — 3.2 (%): Idling |
| | 5.0 — 10.2 (%): 2,500 rpm racing |

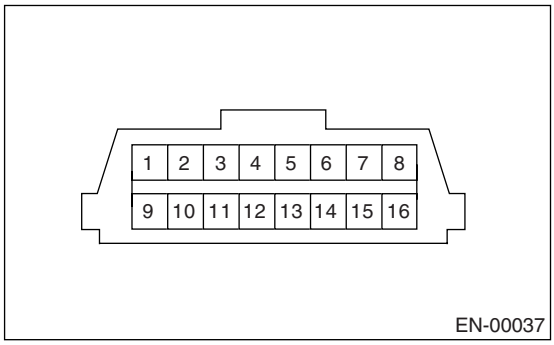
Measuring condition:
- After engine is warmed-up.
- Gear position is in neutral.
- A/C is turned off.
- Turn all accessory switches to OFF.

# 7. Data Link Connector

## A: NOTE

This connector is used for Subaru Select Monitor.

**CAUTION:**
**Do not connect any scan tools other than Subaru Select Monitor and general scan tool, because the circuit for the Subaru Select Monitor may be damaged.**



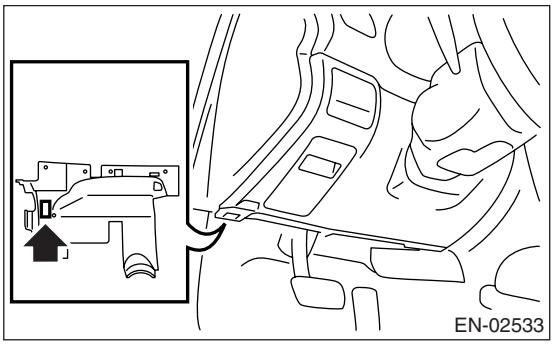

| Terminal No. | Remarks | Terminal No. | Remarks |
|---|---|---|---|
| 1 | Power supply | 9 | Empty |
| 2 | Empty | 10 | Subaru Select Monitor signal |
| 3 | Empty | 11 | Empty |
| 4 | Empty | 12 | Ground |
| 5 | Empty | 13 | Ground |
| 6 | Line end check signal 1 | 14 | Empty |
| 7 | Empty | 15 | Empty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

# 8. General Scan Tool

## A: OPERATION

### 1. HOW TO USE GENERAL SCAN TOOL

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




3) Using the general scan tool, call up DTC and freeze frame data.
General scan tool functions consist of:
(1) MODE $01: Current powertrain diagnostic data
(2) MODE $02: Powertrain freeze frame data
(3) MODE $03: Emission-related powertrain DTC
(4) MODE $04: Clear/Reset emission-related diagnostic information
(5) MODE $06: Request on-board monitoring test results for non-continuously monitored systems
(6) MODE $07: Request on-board monitoring test results for continuously monitored systems
(7) MODE $09: Request vehicle information
Read out the data according to repair procedures. (For detailed operation procedures, refer to the operation manual of general scan tool.)

NOTE:
For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).>

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

Refer to data denoting the current operating condition of analog input/output, digital input/output 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 and malfunction indicator light status and diagnosis support information | — |
| 03 | Fuel system control status | — |
| 04 | Calculated engine load value | % |
| 05 | Engine coolant temperature | °C |
| 06 | Short term fuel trim | % |
| 07 | Long term fuel trim | % |
| 0B | Intake manifold absolute pressure | kPa |
| 0C | Engine revolution | rpm |
| 0D | Vehicle speed | MPH |
| 0E | Ignition timing advance | ° |
| 0F | Intake air temperature | °C |
| 10 | Air flow rate from mass air flow sensor | g/sec |
| 11 | Throttle valve absolute opening angle | % |
| 13 | Check whether oxygen sensor is installed. | — |
| 15 | Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor | V and % |
| 1C | Supporting OBD system | — |
| 21 | Driving distance after MIL illuminates | miles |
| 24 | A/F value and A/F sensor output voltage | — and V |

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

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

Refer to data denoting the operating condition when trouble is detected by 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 fuel trim | % |
| 0B | Intake manifold absolute pressure | kPa |
| 0C | Engine speed | rpm |
| 0D | Vehicle speed | MPH |
| 0E | Ignition timing advance | ° |
| 0F | Intake air temperature | °C |
| 10 | Air flow rate from mass air flow sensor | g/sec |
| 11 | Throttle valve opening angle | % |

NOTE:
Refer to general scan tool manufacturer's operation manual to access freeze frame data (MODE $02).

### 4. MODE $03 (EMISSION-RELATED POWERTRAIN DIAGNOSTIC TROUBLE CODE (DTC))

Refer to "List of Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).>

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

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

NOTE:
Refer to general scan tool manufacturer's operation manual to clear or reset emission-related diagnostic information (MODE $04).

### 6. MODE $06

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

| TID | CID | Test value & Test limit |
|---|---|---|
| $81 | $01 | Catalyst system efficiency |
| $83 | $01 | Evaporative emission control system 0.04 inch leak |
| | $02 | Evaporative emission control system 0.04 inch leak |
| | $03 | Evaporative emission control system 0.04 inch leak |
| | $04 | Evaporative emission control system 0.04 inch leak |
| | $05 | Evaporative emission control system 0.02 inch leak |
| | $86 | Evaporative emission control system 0.02 inch leak |
| $84 | $01 | A/F sensor circuit slow response (Bank 1 Sensor 1) |
| $85 | $01 | $O_2$ sensor circuit (Bank 1 Sensor 2) (rich → lean) |
| | $02 | $O_2$ sensor circuit (Bank 1 Sensor 2) (lean → rich) |
| $41 | $81 | $O_2$ sensor circuit (Bank 1 Sensor 2) |
| | $02 | $O_2$ sensor circuit (Bank 1 Sensor 2) |

### 7. MODE $07

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

### 8. MODE $09

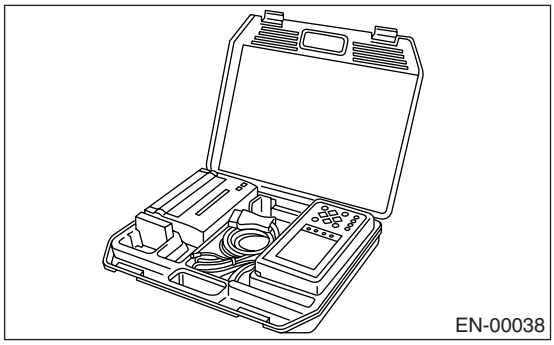
Refer to the data of vehicle specification (VIN, calibration ID, etc.).

# 9. Subaru Select Monitor

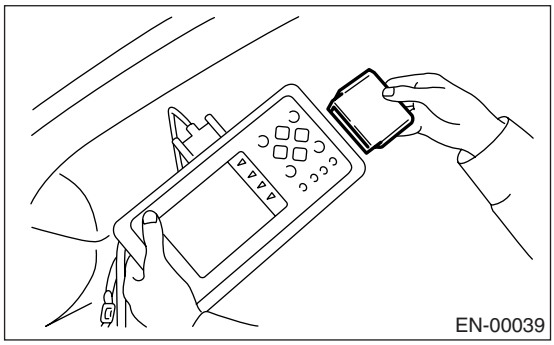
## A: OPERATION

### 1. HOW TO USE SUBARU SELECT MONITOR

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

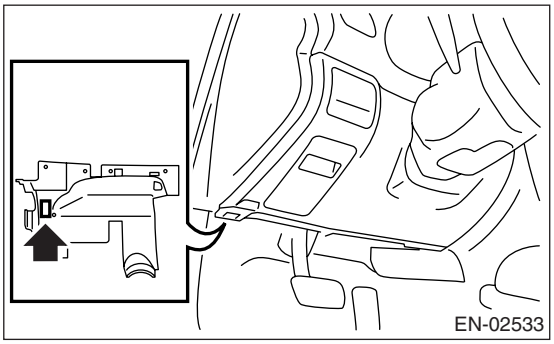



2) Connect the diagnosis cable to Subaru Select Monitor.
3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>




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

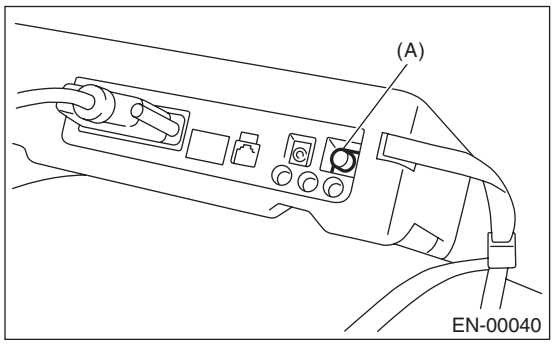
(1) Data link connector is located in the lower portion of the instrument panel (on the driver's side).




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

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

5) Turn the ignition switch to ON (engine OFF) and turn 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)(diag)-35, 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)(diag)-35, Read Diagnostic Trouble Code (DTC).>

## 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 | Note (at idling) |
|---|---|---|---|
| Engine coolant temperature signal | Coolant Temp. | °C or °F | 80 — 100°C or 176 — 212°F |
| A/F correction 1 | A/F Correction #1 | % | –10 — +10% |
| A/F learning 1 | A/F Learning #1 | % | –15 — +15% |
| Intake manifold absolute pressure | Mani. Absolute Pressure | mmHg, kPa, inHg or psig | 220 — 275 mmHg, 29.5 — 37 kPa, 8.7 — 10 inHg or 4.2 — 5.3 psig |
| Engine speed signal | Engine Speed | rpm | 630 — 770 rpm (Agree with the tachometer indication) |
| Vehicle speed signal | Vehicle Speed | km/h or MPH | 0 km/h or 0 MPH (at parking) |
| Ignition timing signal | Ignition Timing | deg | 10 — 15 deg |
| Intake air temperature signal | Intake Air Temp. | °C or °F | 20 — 50°C or 68 — 122°F |
| Amount of intake air | Mass Air Flow | g/s or lb/m | 2.1 — 3.1 g/s or 0.35 — 0.40 lb/m |
| Throttle opening angle signal | Throttle Opening Angle | % | 2.0 — 2.4% |
| Rear oxygen sensor voltage | Rear O2 Sensor | V | 0 — 1.0 V |
| Battery voltage | Battery Voltage | V | 12 — 15 V |
| Mass air flow voltage | Air Flow Sensor Voltage | V | 1.0 — 1.7 V |
| Injection 1 pulse width | Fuel Injection #1 Pulse | ms | 1.2 — 2.2 ms |
| Knock sensor correction | Knock Correction | deg | 0.0 deg |
| Acceleration opening angle signal | Accel. Opening Angle | % | 0.0% |
| Primary supercharged pressure control signal | Primary Control | % | 0.0% |
| Purge control solenoid duty ratio | CPC Valve Duty Ratio | % | 0 — 25% |
| Generator duty ratio | ALT Duty | % | 0 — 100% |
| Fuel pump duty ratio | Fuel Pump Duty | % | 30 — 40% |
| AVCS advance angle amount RH | VVT Adv. Ang. Amount R | deg | ±5 deg |
| AVCS advance angle amount LH | VVT Adv. Ang. Amount L | deg | ±5 deg |
| Oil flow control solenoid valve duty RH (AVCS) | OCV Duty R | % | 0 — 20% |
| Oil flow control solenoid valve duty LH (AVCS) | OCV Duty L | % | 0 — 20% |
| Oil flow control solenoid valve current RH | OCV Current R | mA | 40 — 100 mA |
| Oil flow control solenoid valve current LH | OCV Current L | mA | 40 — 100 mA |
| A/F sensor current value 1 | A/F Sensor #1 Current | mA | –20 — 20 mA |
| A/F sensor resistance value 1 | A/F Sensor #1 Resistance | Ω | 27 — 35 mA |
| A/F sensor output lambda 1 | A/F Sensor #1 | — | 1.0 |
| A/F correction 3 | A/F Correction #3 | % | 0.00% |
| Throttle motor duty | Throttle Motor Duty | % | –5% |
| Throttle power supply voltage | Throttle Motor Voltage | V | 12 — 15 V |
| Sub throttle sensor voltage | Sub-throttle Sensor | V | 1.5 V |
| Main throttle sensor voltage | Main-throttle Sensor | V | 0.6 V |
| Sub accelerator sensor voltage | Sub-accelerator Sensor | V | 1.1 V |

| Remarks | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| Fuel tank pressure signal | Fuel Tank Pressure | mmHg, kPa, inHg or psig | +8.8 mmHg, +1.2 kPa, +0.4 inHg or + 0.2 psig |
| Fuel temperature signal | Fuel Temp. | °C or °F | +28 |
| Main accelerator sensor voltage | Main-accelerator Sensor | V | 1.0 V |
| Atmospheric pressure signal | Atmospheric Pressure | mmHg, kPa, inHg or psig | — |
| Intake manifold relative pressure | Mani. Relative Pressure | mmHg, kPa, inHg or psig | Intake manifold absolute pressure – Atmospheric pressure |
| Memory vehicle speed | Memorized Cruise Speed | km/h or MPH | — |
| Estimated cumulative driving distance | Estimated Cumulative Driving Distance | km | — |
| Fuel level signal | Fuel Level | V | 5.10 |
| Tumble generator valve RH opening angle signal | TGV Position Sensor R | V | 0.34 |
| Tumble generator valve LH opening angle signal | TGV Position Sensor L | V | 0.32 |
| Exhaust gas temperature signal | Exhaust Gas Temperature | °C or °F | 385 °C or 725°F |
| #1 cylinder roughness monitor | Roughness Monitor #1 | — | 0 |
| #2 cylinder roughness monitor | Roughness Monitor #2 | — | 0 |
| #3 cylinder roughness monitor | Roughness Monitor #3 | — | 0 |
| #4 cylinder roughness monitor | Roughness Monitor #4 | — | 0 |
| AT/MT identification terminal | AT Vehicle ID Signal | — | AT/MT |
| Test mode terminal | Test Mode Signal | — | U-check |
| Neutral position switch signal | Neutral Position Switch | — | Neutral |
| Soft idle switch signal | Soft Idle Switch Signal | — | In idle |
| Ignition switch signal | Ignition Switch | — | ON |
| Power steering switch input signal | P/S Switch | — | OFF (At OFF) |
| Air conditioning switch signal | A/C Switch | — | OFF (At OFF) |
| Starter switch signal | Starter Switch | — | OFF |
| Rear O2 monitor | Rear O2 Rich Signal | — | Rich/Lean |
| Knocking signal | Knocking Signal | — | None |
| Crankshaft position sensor signal | Crankshaft Position Sig. | — | Provided |
| Camshaft position sensor signal | Camshaft Position Sig. | — | Provided |
| Rear defogger switch signal | Rear Defogger SW | — | OFF (At OFF) |
| Blower fan switch signal | Blower Fan SW | — | OFF (At OFF) |
| Light switch signal | Light Switch | — | OFF (At OFF) |
| A/C middle pressure switch signal | A/C Mid Pressure Switch | — | OFF (At OFF) |
| Air conditioner compressor relay output signal | A/C Compressor Signal | — | OFF (At OFF) |
| Radiator fan relay 1 signal | Radiator Fan Relay #1 | — | OFF (At OFF) |
| Radiator fan relay 2 signal | Radiator Fan Relay #2 | — | OFF (At OFF) |
| PCV hose assembly diagnosis signal | Blow-by leak Connector | — | Connect |
| Pressure control solenoid valve signal | PCV Solenoid | — | OFF (At OFF) |
| Tumble generator valve output signal | TGV Output | — | OFF |
| Tumble generator valve drive signal | TGV Drive | — | Open |
| Drain valve signal | Vent Control Solenoid | — | OFF (At OFF) |
| Fuel tank sensor control valve signal | Fuel Tank Sensor Ctrl Valve | — | OFF (At OFF) |
| AT coordinate retard angle demand signal | Retard Signal from AT | — | None |
| AT coordinate fuel cut demand signal | Fuel Cut Signal from AT | — | None |
| AT coordinate permission demand | Torque Permission Signal | — | Permission/Prohibition |

| Remarks | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| ETC motor relay signal | ETC Motor Relay | — | ON |
| Clutch switch signal | Clutch Switch | — | OFF (At OFF) |
| Stop light switch signal | Stop Light Switch | — | OFF (At OFF) |
| SET/COAST switch signal | SET/COAST Switch | — | OFF (At OFF) |
| RES/ACC switch signal | RESUME/ACCEL Switch | — | OFF (At OFF) |
| Brake switch signal | Brake Switch | — | OFF (At OFF) |
| Main switch signal | Main Switch | — | OFF (At OFF) |
| Integrated unit data reception | Body Int. Unit Data | — | Provided |
| Integrated unit data update | Body Int. Unit Count | — | Provided |
| Cruise control cancel switch signal | CC Cancel SW | — | OFF (At OFF) |

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

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

1) On the «Main Menu» display screen, select 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 | Note (at idling) |
|---|---|---|---|
| Number of diagnosis code | Number of Diag. Code: | — | — |
| Condition of malfunction indicator light | MI (MIL) | — | ON or OFF |
| Monitoring test of misfire | Misfire monitoring | — | complete or incomplete |
| Monitoring test of fuel system | Fuel system monitoring | — | complete or incomplete |
| Monitoring test of comprehensive component | Component monitoring | — | complete or incomplete |
| Test of catalyst | Catalyst Diagnosis | — | complete or incomplete |
| Test of heating-type catalyst | Heated catalyst | — | no support |
| Test of evaporative emission purge control system | Evaporative purge system | — | complete or incomplete |
| Test of secondary air system | Secondary air system | — | no support |
| Test of air conditioning system refrigerant | A/C system refrigerant | — | no support |
| Test of oxygen sensor | Oxygen sensor | — | complete or incomplete |
| Test of oxygen sensor heater | O2 Heater Diagnosis | — | complete or incomplete |
| Test of EGR system | EGR system | — | no support |
| Air fuel ratio control system for bank 1 | Fuel System for Bank 1 | — | CLOSE normal |
| Engine load data | Calculated load value | % | 1.6% |
| Engine coolant temperature signal | Coolant Temp. | °C or °F | +91°C or 196°F |
| Short term fuel trim by front oxygen (A/F) sensor | Short term fuel trim B1 | % | +0.0% |
| Long term fuel trim by front oxygen (A/F) sensor | Long term fuel trim B1 | % | +1.6% |
| Intake manifold absolute pressure signal | Mani. Absolute Pressure | mmHg, kPa, inHg or psig | 256 mmHg |
| Engine speed signal | Engine Speed | rpm | 693 rpm |
| Vehicle speed signal | Vehicle Speed | km/h or MPH | 0 km/h |
| Ignition timing advance for #1 cylinder | Ignition timing adv. #1 | ° | +16.0° |
| Intake air temperature signal | Intake Air Temp. | °C or °F | 54°C or 129°F |
| Intake air amount | Mass Air Flow | g/s or lb/m | 3.1 g/s |

| Description | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| Throttle position signal | Throttle Opening Angle | % | 13% |
| Oxygen sensor #12 | Oxygen Sensor #12 | V | +0.800 V |
| Air fuel ratio correction by rear oxygen sensor | Short term fuel trim #12 | % | +0.8% |
| On-board diagnostic system | OBD System | — | CARB-OBD2 |
| Oxygen sensor #11 | Oxygen Sensor #11 | — | Support |
| Rear oxygen sensor output signal | Oxygen Sensor #12 | — | Support |
| A/F sensor output signal | A/F sensor #11 | — | 0.984 |
| A/F lambda signal | A/F sensor #11 | V | 2.712 V |
| A/F lambda signal #11 | A/F sensor #11 | — | 0.992 |
| A/F sensor current #11 | A/F sensor #11 | mA | −0.03 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 has been 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 |
|---|---|---|
| DTC of freeze frame data | Freeze frame data | DTC |
| Air fuel ratio control system for bank 1 | Fuel system for Bank1 | — |
| Engine load data | Engine Load | % |
| Engine coolant temperature signal | Coolant Temp. | °C or °F |
| Short term fuel trim by front oxygen (A/F) sensor (bank 1) | Short term fuel trim B1 | % |
| Long term fuel trim by front oxygen (A/F) sensor (bank 1) | 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 #1 | Ignition timing adv. #1 | ° |
| Intake air temperature | Intake Air Temp. | °C |
| Amount of intake air | Mass Air Flow | g/s |
| Throttle valve angle | Throttle Opening Angle | % |

NOTE:
For detailed operation procedures, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

## 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.

| Remarks | Display | Message | LED "ON" requirements |
|---|---|---|---|
| AT/MT identification signal | AT Vehicle ID Signal | ON or OFF | Illuminate (AT model) |
| 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. |
| Idle switch signal | Idle Switch Signal | ON or OFF | When idle switch signal is entered. |
| Ignition switch signal | Ignition Switch | ON or OFF | When ignition switch is turned to ON. |
| Power steering switch signal | P/S Switch | ON or OFF | When power steering switch is entered. |
| Starter switch signal | Starter Switch | ON or OFF | When starter switch is input. |
| Air conditioning switch signal | A/C Switch | ON or OFF | When air conditioning switch is input. |
| Rear oxygen sensor rich signal | Rear O2 Rich Signal | Lean or Rich | When rear oxygen sensor mixture ratio is rich. |
| Knocking signal | Knocking Signal | Provided or None | When knocking signal is input. |
| Crankshaft position sensor signal | Crankshaft Position Signal | Provided or None | When crankshaft position sensor signal is input. |
| Camshaft position sensor signal | Camshaft Position Signal | Provided or None | When camshaft position sensor signal is input. |
| Rear defogger switch signal | Rear Defogger Switch | ON or OFF | When rear defogger switch is turned to ON. |
| Blower fan switch signal | Blower Fan Switch | ON or OFF | When blower fan switch is turned to ON. |
| Small light switch signal | Light Switch | ON or OFF | When small light switch is turned to ON. |
| A/C middle pressure switch signal | A/C Mid Pressure Switch | ON or OFF | When A/C middle pressure switch is turned to ON. |
| Air conditioning relay signal | A/C Compressor Signal | ON or OFF | When air conditioning relay is in function. |
| Radiator fan relay 1 signal | Radiator Fan Relay #1 | ON or OFF | When radiator fan relay 1 is in function. |
| Radiator fan relay 2 signal | Radiator Fan Relay #2 | ON or OFF | When radiator fan relay 2 is in function. |
| PCV hose assembly diagnosis signal | Blow-by leak Connector | Connect or Unconnect | When PCV hose assembly is connected. |
| Pressure control solenoid valve signal | PCV Solenoid | ON or OFF | When pressure control solenoid valve is ON. |
| Tumble generator valve signal | TGV Output | Provided or None | When tumble generator valve signal is input. |
| Tumble generator valve drive signal | TGV Drive | Open or Close | When tumble generator valve is open. |
| Drain valve signal | Vent Control Solenoid | ON or OFF | When drain valve is ON. |
| Fuel tank sensor control valve signal | Fuel Tank Sensor Ctrl Valve | ON or OFF | When fuel tank sensor control valve is ON. |

| Remarks | Display | Message | LED “ON” requirements |
|---|---|---|---|
| AT retard angle demand signal | Retard Signal | Provided or None | When AT retard angle demand signal is input. |
| AT fuel cut signal | Fuel Cut | Provided or None | When AT fuel cut signal is input. |
| AT coordinate permission signal | Torque Control Permission | Provided or None | When AT coordinate permission signal is input. |
| Electronic throttle control motor relay signal | ETC Motor Relay | ON or OFF | When electronic throttle control motor relay is in function. |
| Clutch switch signal | Clutch Switch | ON or OFF | When clutch switch is turned to ON. |
| Stop light switch signal | Stop Light Switch | ON or OFF | When stop switch is turned to ON. |
| SET/COAST switch signal | SET/COAST Switch | ON or OFF | When SET/COAST switch is turned to ON. |
| RES/ACC switch signal | RESUME/ACCEL Switch | ON or OFF | When RES/ACC switch is turned to ON. |
| Brake switch signal | Brake Switch | ON or OFF | When brake switch is turned to ON. |
| Main switch signal | Main Switch | ON or OFF | When main switch is turned to ON. |
| Cancel switch signal | Cancel Switch | ON or OFF | When cancel switch is turned to ON. |
| Data reception signal | Body Int. Unit Data | Provided or None | When data reception signal is entered. |
| Counter update signal | Body Int. Unit Count | Provided or None | When counter update signal is entered. |

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

## 8. VIN REGISTRATION

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 {VIN registration} and press the [YES] key.
5) Perform the procedure as shown in the display.

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

# 10. Read Diagnostic Trouble Code (DTC)

## A: OPERATION

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

1) On the «Main Menu» display screen, select 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)(diag)-71, 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)(diag)-71, List of Diagnostic Trouble Code (DTC).>

# 11.Inspection Mode

## A: PROCEDURE

Carry out trouble diagnosis shown in the following DTC table.
When performing trouble diagnosis which is not shown in the DTC table, refer to the next item Drive cycle. <Ref. to EN(H4DOTC)(diag)-41, Drive Cycle.>

| DTC | Item | Condition |
|---|---|---|
| P0011 | Intake Camshaft Position Timing - Over-Advanced (Bank 1) | — |
| P0021 | Intake Camshaft Position Timing - Over-Advanced (Bank 2) | — |
| 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 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) | — |
| P0132 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) | — |
| P0137 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2) | — |
| P0138 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 2) | — |
| P0182 | Fuel Temperature Sensor “A” Circuit Low Input | — |
| P0183 | Fuel Temperature Sensor “A” Circuit High Input | — |
| 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 | — |
| P0336 | Crankshaft Position Sensor “A” Circuit Range/Performance | — |
| P0340 | Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor) | — |
| P0345 | Camshaft Position Sensor “A” Circuit (Bank 2) | — |
| P0447 | Evaporative Emission Control System Vent Control Circuit Open | — |
| P0448 | Evaporative Emission Control System Vent Control Circuit Shorted | — |
| P0452 | Evaporative Emission Control System Pressure Sensor Low Input | — |
| P0453 | Evaporative Emission Control System Pressure Sensor High Input | — |
| P0458 | Evaporative Emission Control System Purge Control Valve Circuit Low | — |
| P0462 | Fuel Level Sensor Circuit Low Input | — |
| P0463 | Fuel Level Sensor Circuit High Input | — |
| P0500 | Vehicle Speed Sensor | — |
| P0513 | Incorrect Immobilizer Key | — |
| P0512 | Starter Request Circuit | — |
| P0519 | Idle Control System Malfunction (Fail-Safe) | — |
| P0545 | Exhaust Gas Temperature Sensor Circuit Low-Bank 1 | — |
| P0600 | Serial Communication Link | — |

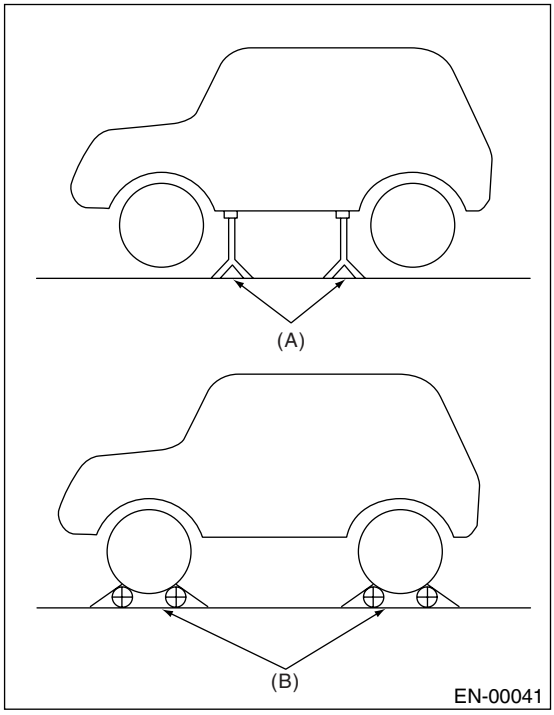
| DTC | Item | Condition |
|---|---|---|
| P0604 | Internal Control Module Random Access Memory (RAM) Error | — |
| P0605 | Internal Control Module Read Only Memory (ROM) Error | — |
| P0607 | Control Module Performance | — |
| P0638 | Throttle Actuator Control Range/Performance (Bank 1) | — |
| P0691 | Cooling Fan 1 Control Circuit Low | — |
| P0700 | Transmission Control System (MIL Request) | — |
| P0851 | Neutral Switch Input Circuit Low | — |
| P0852 | Neutral Switch Input Circuit High | — |
| P1152 | O2 Sensor Circuit Range/Performance (Low) (Bank1 Sensor1) | — |
| P1153 | O2 Sensor Circuit Range/Performance (High) (Bank1 Sensor1) | — |
| P1160 | Return Spring Failure | — |
| P1400 | Fuel Tank Pressure Control Solenoid Valve Circuit Low | — |
| P1420 | Fuel Tank Pressure Control Sol. Valve Circuit High | — |
| P1446 | Fuel Tank Sensor Control Valve Circuit Low | — |
| P1447 | Fuel Tank Sensor Control Valve Circuit High | — |
| P1491 | Positive Crankcase Ventilation (Blow-by) Function Problem | — |
| P1518 | Starter Switch Circuit Low Input | — |
| P1544 | Exhaust Gas Temperature Too High | — |
| P1560 | Back-up Voltage Circuit Malfunction | — |
| P1570 | Antenna | — |
| P1571 | Reference Code Incompatibility | — |
| P1572 | IMM Circuit Failure (Except Antenna Circuit) | — |
| P1574 | Key Communication Failure | — |
| P1576 | EGI Control Module EEPROM | — |
| P1577 | IMM Control Module EEPROM | — |
| P1578 | Meter Failure | — |
| P2006 | Intake Manifold Runner Control Stuck Closed (Bank 1) | — |
| P2007 | Intake Manifold Runner Control Stuck Closed (Bank 2) | — |
| P2008 | Intake Manifold Runner Control Circuit / Open (Bank 1) | — |
| P2009 | Intake Manifold Runner Control Circuit Low (Bank 1) | — |
| P2011 | Intake Manifold Runner Control Circuit / Open (Bank 2) | — |
| P2012 | Intake Manifold Runner Control Circuit Low (Bank 2) | — |
| P2016 | Intake Manifold Runner Position Sensor/Switch Circuit Low (Bank 1) | — |
| P2017 | Intake Manifold Runner Position Sensor/Switch Circuit High (Bank 1) | — |
| P2021 | Intake Manifold Runner Position Sensor/Switch Circuit Low (Bank 2) | — |
| P2022 | Intake Manifold Runner Position Sensor/Switch Circuit High (Bank 2) | — |
| 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 | — |
| P2227 | Barometric Pressure Circuit Range/Performance | — |

| DTC | Item | Condition |
|---|---|---|
| P2228 | Barometric Pressure Circuit Low Input | — |
| P2229 | Barometric Pressure Circuit High Input | — |

## 1. PREPARATION FOR THE INSPECTION MODE

1) Make sure that the fuel remains approx. half amount [20 — 40 ℓ (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)] and the battery voltage is 12 V or more.
2) Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

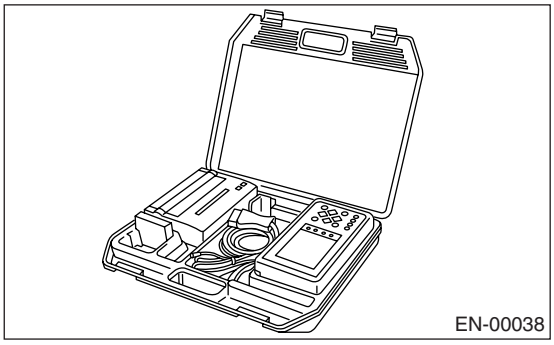
**WARNING:**
**• Before raising the vehicle, ensure the parking brake is applied.**
**• Do not use a pantograph jack in place of a safety stand.**
**• Secure a rope or wire to the front and rear towing or tie-down hooks to prevent the lateral runout of front wheels.**
**• Do not abruptly depress/release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



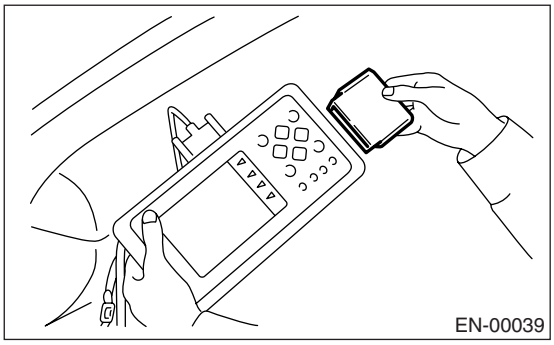

(A) Safety stand
(B) Free rollers

## 2. SUBARU SELECT MONITOR

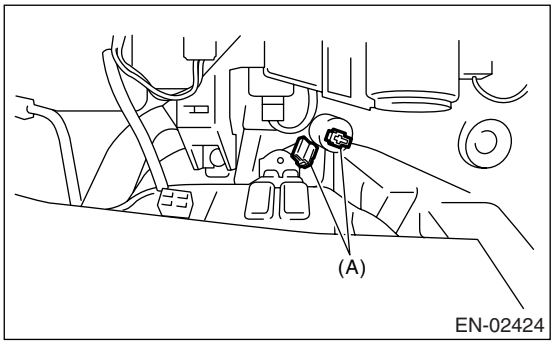
1) After clearing the memory, check for any remaining trouble data unresolved. <Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.>
2) Warm up the engine.
3) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>




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

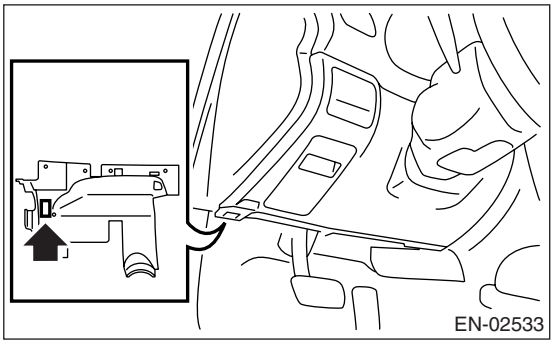



6) Connect the test mode connector (A) at the lower portion of glove box.



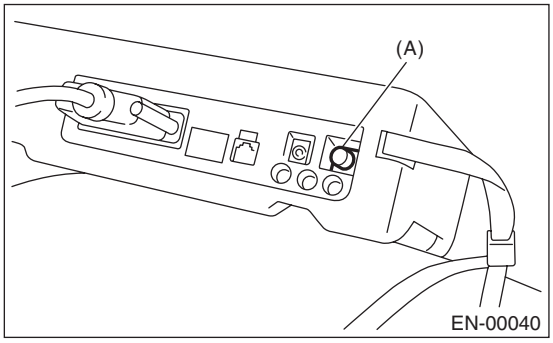

(A) Test mode connector

7) 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 general scan tool.**

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




(A) Power switch

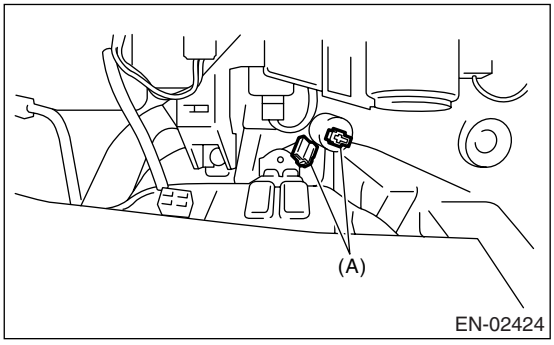
9) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.
10) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
11) Press the [YES] key after the information of engine type is displayed.
12) On the «Engine Diagnosis» display screen, select the {Dealer Check Mode Procedure} and press the [YES] key.
13) When the "Perform Inspection (Dealer Check) Mode?" is shown on the display screen, press the [YES] key.
14) 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 detailed concerning the DTC, refer to the List of Diagnostic Trouble Code (DTC).
<Ref. to EN(H4DOTC)(diag)-71, 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 the engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function. <Ref. to ABS(diag)-25, Clear Memory Mode.>

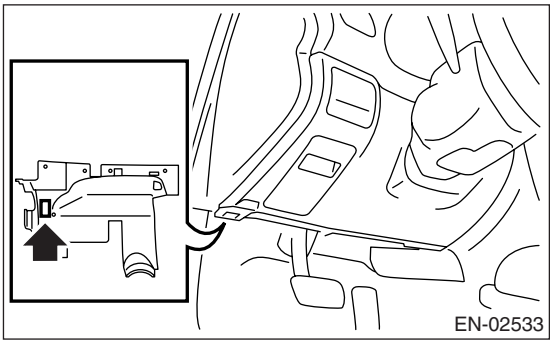
## 3. GENERAL SCAN TOOL

1) After clearing the memory, check for any remaining trouble data unresolved. <Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.>
2) Warm up the engine.
3) Connect the test mode connector (A) at the lower side of glove box.




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

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




5) Start the engine.

NOTE:
• Ensure the selector lever is placed in "P" position before starting. (AT model)
• Depress the clutch pedal when starting engine. (MT model)

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

NOTE:
• On AWD model, release the parking brake.
• The speed difference between front and rear wheels may light ABS warning light, but this indicates no malfunctions. When the engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function. <Ref. to ABS(diag)-25, Clear Memory Mode.>

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

NOTE:
• For detailed operation procedures, refer to the general scan tool instruction manual.
• For detailed concerning DTC, refer to the List of Diagnostic Trouble Code (DTC).
<Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).>

# 12.Drive Cycle

## A: PROCEDURE

There are five drive patterns of drive cycles A — E for the trouble diagnosis. Performing the specified drive pattern allows to diagnose malfunctioning items listed below. After the malfunctioning items listed below are repaired, always check if they correctly resume their functions by performing the required drive pattern.

### 1. PREPARATION FOR THE DRIVE CYCLE

1) Make sure that the fuel remains approx. half amount [20 — 40 ℓ (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)], and battery voltage is 12 V or more.
2) After performing the diagnostics and cleaning memory, check for any remaining unresolved trouble data. <Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.>
3) Disconnect the test mode connector.

NOTE:
• Except for the engine coolant temperature specified items at starting, the diagnosis is carried out after engine warm up.
• Carry out the diagnosis which is marked * on DTC twice, then, after finishing first diagnosis, stop the engine and do second time at the same condition.

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

| DTC | Item | Condition |
|---|---|---|
| *P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control | Engine coolant temperature is less than 20°C (68°F) at engine start. |
| *P0126 | Insufficient Coolant Temperature for Stable Operation | — |
| *P0128 | Coolant Thermostat | Engine coolant temperature is less than 55°C (131°F) at engine start. |
| *P0133 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 1) | — |
| *P0171 | Fuel System 1 (Lean) | Diagnosis completes in drive cycle B or C as well. |
| *P0172 | Fuel System 2 (Rich) | Diagnosis completes in drive cycle B or C as well. |
| *P0301 | Cylinder 1 Misfire Detected | Diagnosis completes in drive cycle B or C as well. |
| *P0302 | Cylinder 2 Misfire Detected | Diagnosis completes in drive cycle B or C as well. |
| *P0303 | Cylinder 3 Misfire Detected | Diagnosis completes in drive cycle B or C as well. |
| *P0304 | Cylinder 4 Misfire Detected | Diagnosis completes in drive cycle B or C as well. |
| *P0420 | Catalyst System Efficiency Below Threshold (Bank 1) | — |
| *P0442 | Evaporative Emission Control System Leak Detected (small leak) | Engine coolant temperature at engine start is 25°C (77°F) or less. |
| *P0451 | Evaporative Emission Control System Pressure Sensor Range/Performance | — |
| *P0456 | Evaporative Emission Control System Leak Detected (very small leak) | Engine coolant temperature at engine start is 25°C (77°F) or less. |
| *P0457 | Evaporative Emission Control System Leak Detected (fuel cap loose/off) | Engine coolant temperature at engine start is 25°C (77°F) or less. |
| P0459 | Evaporative Emission Control System Purge Control Valve Circuit High | — |
| P0546 | Exhaust Gas Temperature Sensor Circuit High-Bank1 | — |
| P0692 | Cooling Fan 1 Control Circuit High | — |
| P1301 | Misfire Detected (High Temperature Exhaust Gas) | Diagnosis completes in drive cycle B or C as well. |
| P1312 | Exhaust Gas Temperature Sensor Malfunction | Engine coolant temperature is less than 30°C (86°F) at engine start. |

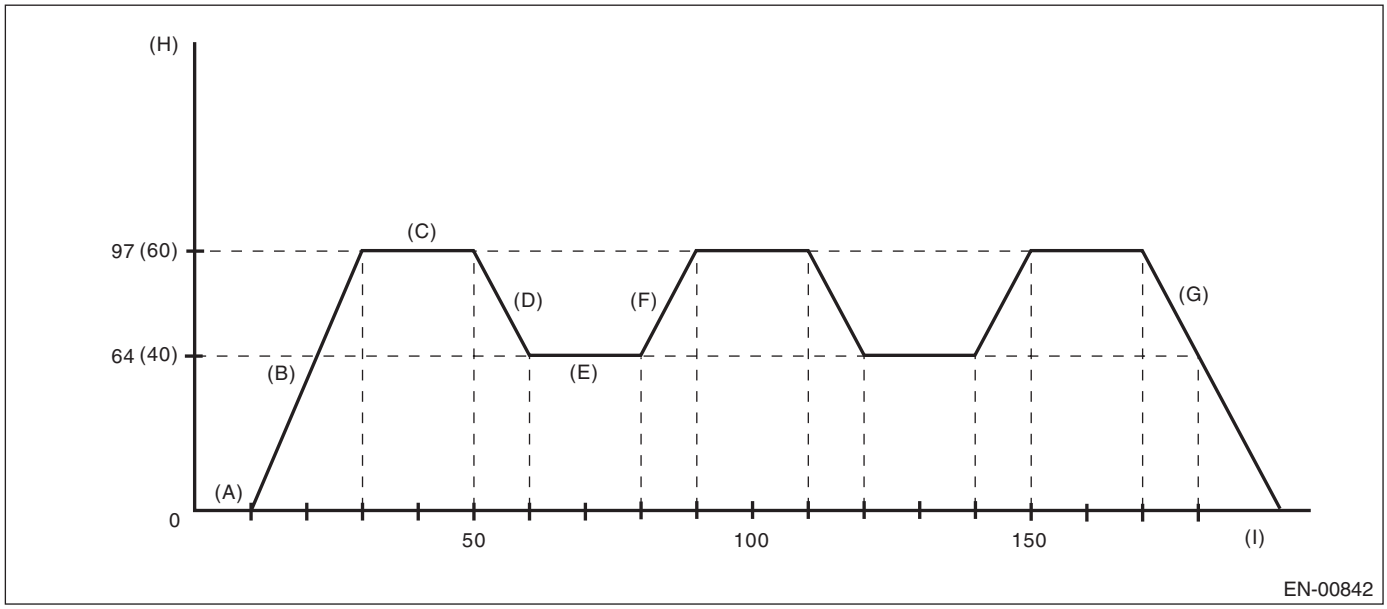
| DTC | Item | Condition |
|---|---|---|
| P1443 | Vent Control Solenoid Valve Function Problem | — |
| *P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | Diagnosis completes in drive cycle B or C as well. |
| *P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | Diagnosis completes in drive cycle B or C as well. |

### 3. DRIVE CYCLE B (10 MINUTES IDLING)

NOTE:
Before the diagnosis, drive the vehicle at 10 km/h (6 MPH) or more.

| DTC | Item | Condition |
|---|---|---|
| *P0111 | Intake Air Temperature Sensor Range/Performance Problem | Engine coolant temperature is less than 30°C (86°F) at engine start. |
| *P0171 | System too Lean (Bank 1) | Diagnosis completes in drive cycle A or C as well. |
| *P0172 | System too Rich (Bank 1) | Diagnosis completes in drive cycle A or C as well. |
| *P0301 | Cylinder 1 Misfire Detected | Diagnosis completes in drive cycle A or C as well. |
| *P0302 | Cylinder 2 Misfire Detected | Diagnosis completes in drive cycle A or C as well. |
| *P0303 | Cylinder 3 Misfire Detected | Diagnosis completes in drive cycle A or C as well. |
| *P0304 | Cylinder 4 Misfire Detected | Diagnosis completes in drive cycle A or C as well. |
| *P0464 | Fuel Level Sensor Circuit Intermittent | — |
| *P0483 | Cooling Fan Rationality Check | — |
| *P0506 | Idle Control System RPM Lower Than Expected | — |
| *P0507 | Idle Control System RPM Higher Than Expected | — |
| P1301 | Misfire Detected (High Temperature Exhaust Gas) | Diagnosis completes in drive cycle A or C as well. |
| *P2096 | Post Catalyst Fuel Trim System Too Lean (Bank 1) | Diagnosis completes in drive cycle A or C as well. |
| *P2097 | Post Catalyst Fuel Trim System Too Rich (Bank 1) | Diagnosis completes in drive cycle A or C as well. |

## 4. DRIVE CYCLE C (DRIVE ACCORDING TO THE FOLLOWING DRIVE PATTERN)




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

| DTC | Item | Condition |
|---|---|---|
| *P0030 | HO2S Heater Control Circuit (Bank 1 Sensor 1) | — |
| P0068 | MAP/MAF - Throttle Position Correlation | — |
| *P0101 | Mass or Volume Air Flow Circuit Range/Performance | — |
| P0134 | $O_2$ Sensor Circuit No Activity Detected (Bank 1 Sensor 1) | — |
| *P0139 | $O_2$ Sensor Circuit Slow Response (Bank 1 Sensor 2) | — |
| *P0171 | System too Lean (Bank 1) | Diagnosis completes in drive cycle A or B as well. |
| *P0172 | System too Rich (Bank 1) | Diagnosis completes in drive cycle A or B as well. |
| *P0244 | Turbo/Supercharger Wastegate Solenoid “A” Range/Performance | — |
| P0246 | Turbo/Supercharger Wastegate Solenoid “A” High | — |
| *P0301 | Cylinder 1 Misfire Detected | Diagnosis completes in drive cycle A or B as well. |
| *P0302 | Cylinder 2 Misfire Detected | Diagnosis completes in drive cycle A or B as well. |
| *P0303 | Cylinder 3 Misfire Detected | Diagnosis completes in drive cycle A or B as well. |
| *P0304 | Cylinder 4 Misfire Detected | Diagnosis completes in drive cycle A or B as well. |
| P1301 | Misfire Detected (High Temperature Exhaust Gas) | Diagnosis completes in drive cycle A or B as well. |
| P2004 | Intake Manifold Runner Control Stuck Open (Bank 1) | — |
| P2005 | Intake Manifold Runner Control Stuck Open (Bank 2) | — |
| *P2096 | Post Catalyst Fuel Trim System Too Lean (Bank 1) | Diagnosis completes in drive cycle A or B as well. |

| DTC | Item | Condition |
|---|---|---|
| *P2097 | Post Catalyst Fuel Trim System Too Rich (Bank 1) | Diagnosis completes in drive cycle A or B as well. |

## 5. DRIVE CYCLE D

**• DRIFT DIAGNOSIS**

1) Make sure that the engine coolant temperature at engine starting is less than 30°C (86°F).
2) Make sure that fuel of more than 9.6 ℓ (2.5 US gal, 2.1 Imp gal) remains and the battery voltage is more than 10.9 V.
3) Make sure that the engine coolant temperature rises for more than 10°C (50°F) from the level of engine starting and is also more than 75°C (167°F).
4) Idle the engine for more than 120 seconds in the condition of step 3.

**• STUCK DIAGNOSIS**

1) Make sure that the battery voltage is more than 10.9 V.
2) Perform the clear memory mode. <Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.>
3) Drive the vehicle for the distance equal to fuel of 50 ℓ (13.2 US gal, 11 Imp gal).

NOTE:
• It is possible to drive intermittently.
• Do not disconnect the terminal of battery during diagnosis. (If disconnecting the terminal of battery, the data will be cleared.)

| DTC | Item | Condition |
|---|---|---|
| P0181 | Fuel Temperature Sensor “A” Circuit Range/Performance | — |

## 6. DRIVE CYCLE E

1) Make sure that the battery voltage is more than 10.9 V.
2) Perform the clear memory mode. <Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.>
3) Drive the vehicle for the distance equal to fuel of 30 ℓ (7.9 US gal, 6.6 Imp gal).

NOTE:
• It is possible to drive intermittently.
• Do not disconnect the terminal of battery during diagnosis. (If disconnecting the terminal of battery, the data will be cleared.)

| DTC | Item | Condition |
|---|---|---|
| P0461 | Fuel Level Sensor Circuit Range/Performance | — |

# 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” and “Turn Ignition Switch OFF” are shown on the display screen, turn the ignition switch to OFF and then Subaru Select Monitor to OFF.

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

NOTE:
• Initial diagnosis of electronic throttle control is performed after memory clearance. For this reason, start the engine after 10 seconds or more have elapsed since the ignition switch is turned ON.
• For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

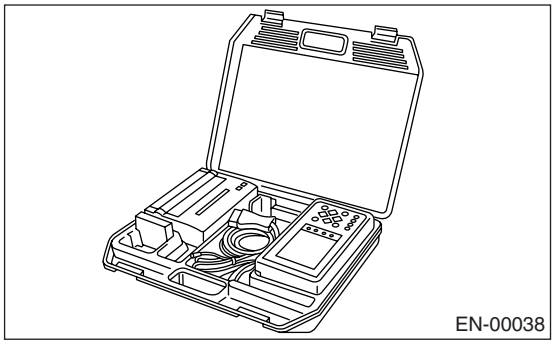
### 3. GENERAL SCAN TOOL

For clear memory procedures using the general scan tool, refer to the general scan tool instruction manual.

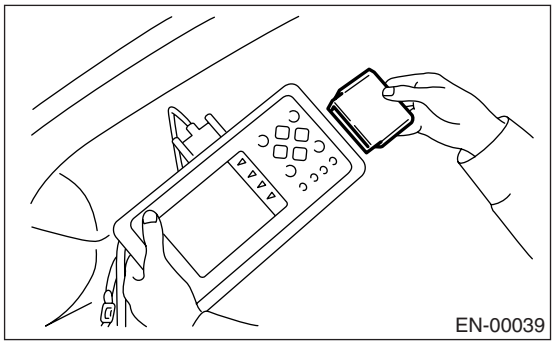
# 14.Compulsory Valve Operation Check Mode

## A: OPERATION

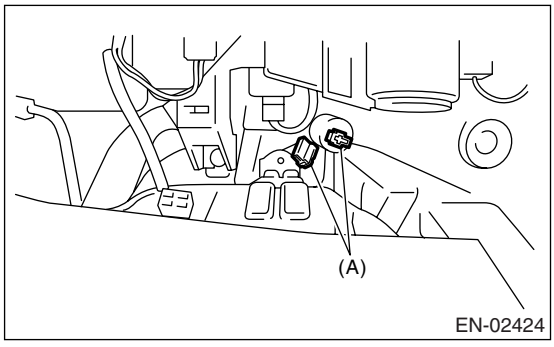
1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>



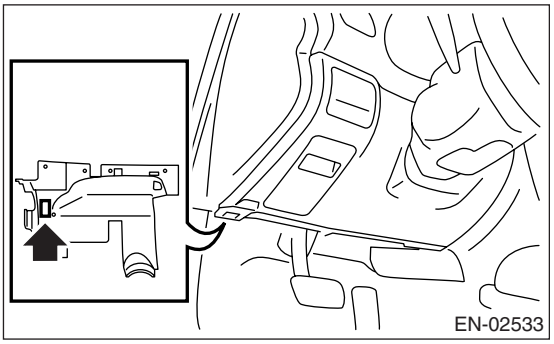

2) Connect the diagnosis cable to Subaru Select Monitor.
3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>




4) Connect the test mode connector (A) located at the lower portion of glove box.

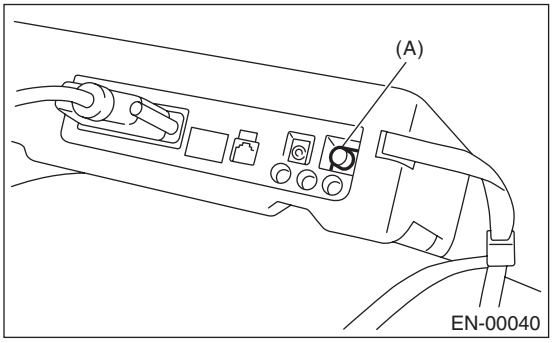



5) Connect the Subaru Select Monitor to data link connector located in the lower portion of the instrument panel (on the driver's side).




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

6) Turn the ignition switch to ON (engine OFF) and turn 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.
13) Pressing the [NO] key completes the compulsory valve operation check mode. The display will then return to the «Actuator ON/OFF Operation» screen.

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

| Description | Display |
|---|---|
| Compulsory fuel pump relay operation check | Fuel Pump |
| Compulsory 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 valve operation check | Wastegate control solenoid |
| Compulsory pressure control solenoid valve operation check | PCV solenoid |
| Compulsory drain valve operation check | Vent Control Solenoid |
| Compulsory fuel tank sensor control valve operation check | Fuel Tank Sensor Ctrl Valve |

NOTE:
• The following parts will be displayed but not functional.

| Display |
|---|
| EGR Solenoid |
| ASV Solenoid |
| FICD Solenoid |
| AAI Solenoid |
| EXH. Bypass Control Permit Flag |

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

# 15.Malfunction Indicator Light

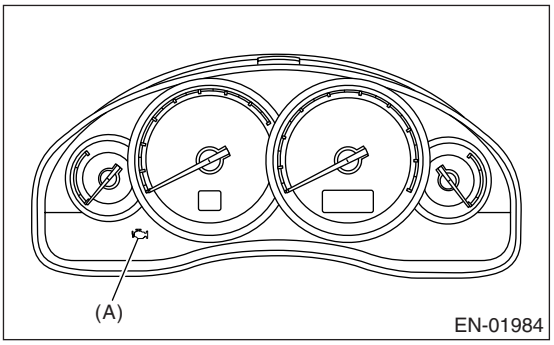
## A: PROCEDURE

| |
|---|
| 1. Activation of malfunction indicator light. <Ref. to EN(H4DOTC)(diag)-49, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.> |
| ↓ |
| 2. Check that the malfunction indicator light does not come on. <Ref. to EN(H4DOTC)(diag)-50, 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)(diag)-52, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF., Malfunction Indicator Light.> |
| ↓ |
| 4. Check that the malfunction indicator light does not blink. <Ref. to EN(H4DOTC)(diag)-53, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK., Malfunction Indicator Light.> |
| ↓ |
| 5. Check that the malfunction indicator light remains blinking. <Ref. to EN(H4DOTC)(diag)-55, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING., Malfunction Indicator Light.> |

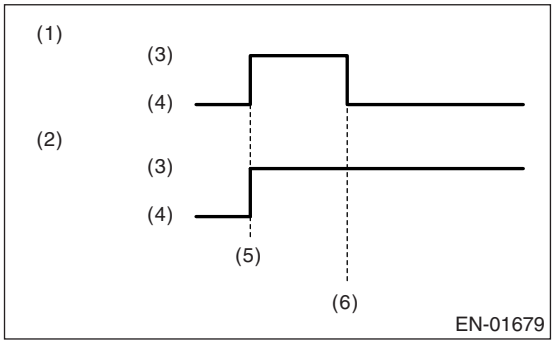
## B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

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

NOTE:
If the malfunction indicator light does not illuminate, perform the diagnosis of malfunction indicator light circuit or the combination meter circuit. <Ref. to EN(H4DOTC)(diag)-50, 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.



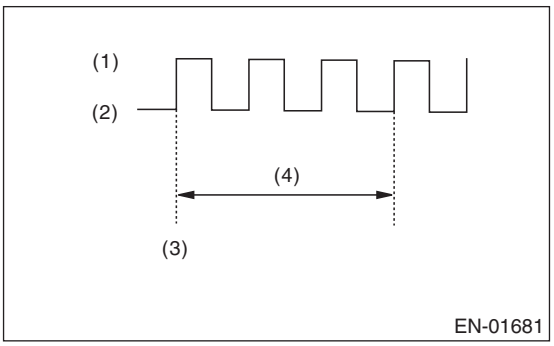

(1) No trouble
(2) Trouble occurs
(3) ON
(4) OFF
(5) Ignition switch ON
(6) Engine start

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

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

(2) Malfunction indicator light blinks at a cycle of 0.5 Hz after starting the engine. (During diagnosis)

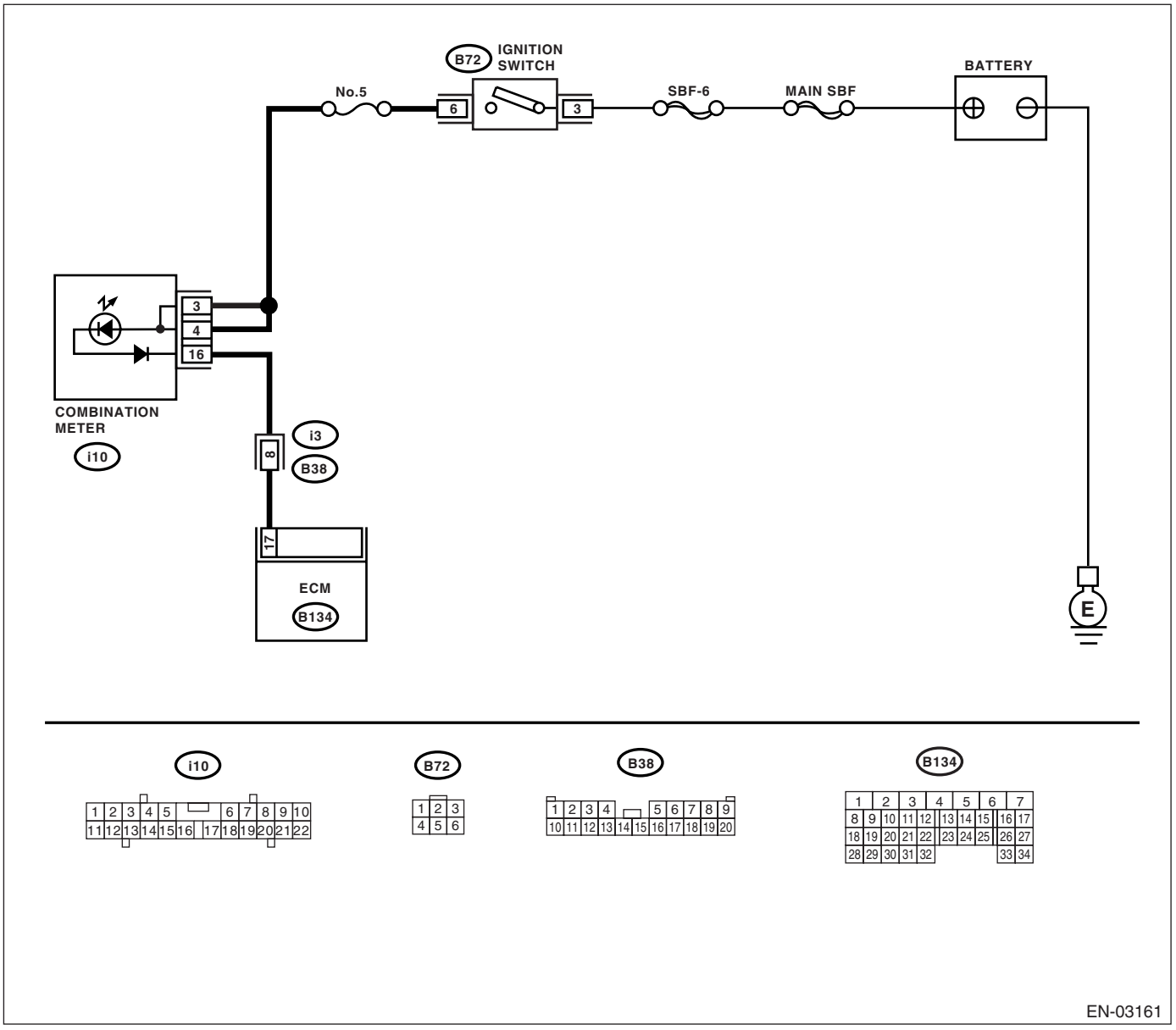
(3) Malfunction indicator light blinks at a cycle of 3 Hz after diagnosis if there is no trouble. Malfunction indicator light illuminates if faulty.




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

## C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

**DIAGNOSIS:**
The malfunction indicator light circuit is open or shorted.
**TROUBLE SYMPTOM:**
When the ignition switch is turned to ON (engine OFF), malfunction indicator light does not come on.
**WIRING DIAGRAM:**



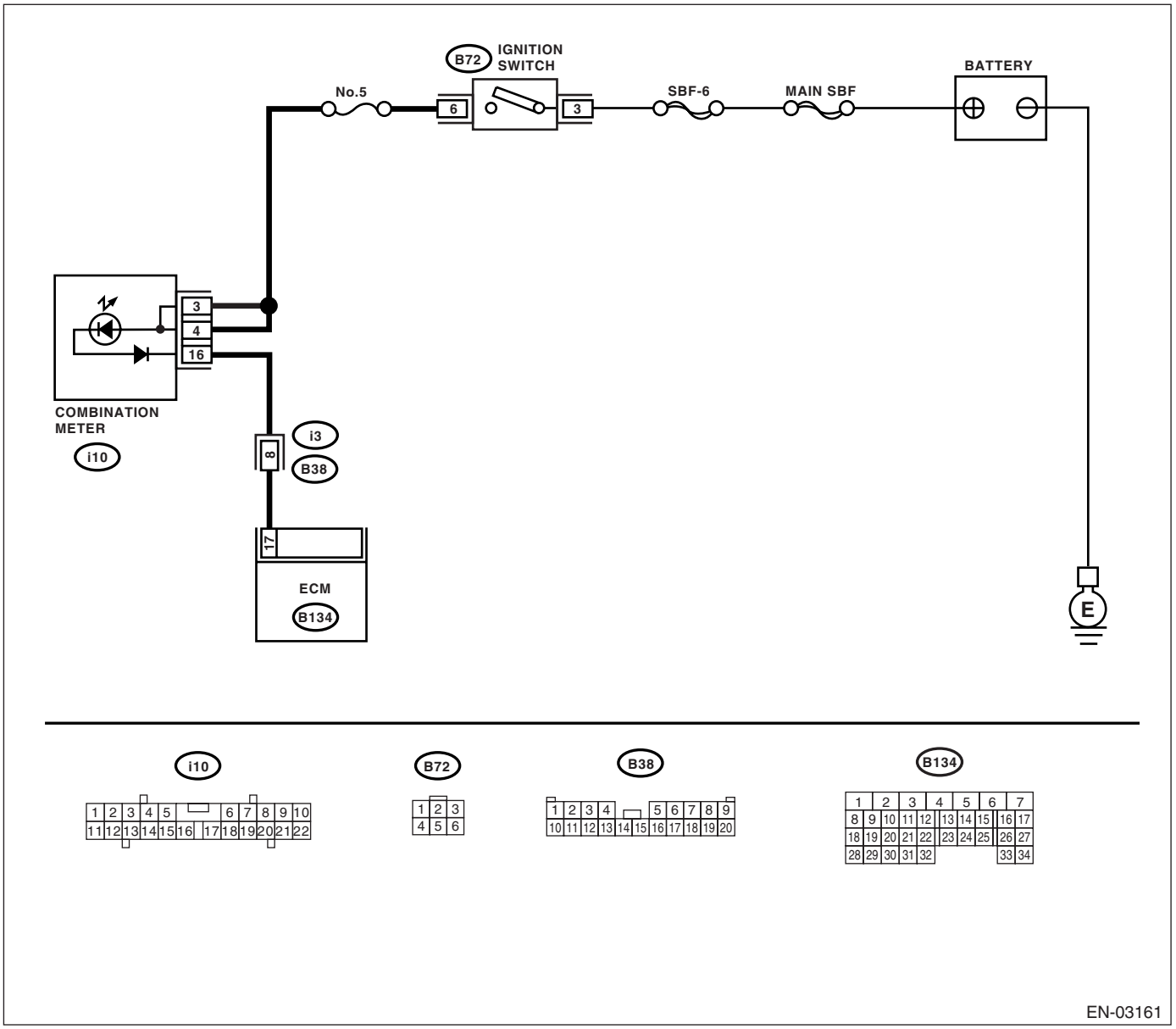
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 17 (+) — Chassis ground (−):*** | Is the voltage less than 1 V? | Go to step **4.** | Go to step **2.** |
| 2 | **CHECK POOR CONTACT.**<br>Check for poor connection when shaking or pulling ECM connector and harness. | Does malfunction indicator light illuminate? | Repair the poor contact in ECM connector. | Go to step **3.** |
| 3 | **CHECK ECM CONNECTOR.**<br>Check the connection of ECM connector. | Is the ECM connector correctly connected? | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the connection of ECM connector. |
| 4 | **CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the combination meter. <Ref. to IDI-15, Combination Meter.><br>3) Disconnect the connector from ECM and combination meter.<br>4) Measure the resistance of harness between ECM and combination meter connector.<br>***Connector & terminal***<br>***(B134) No. 17 — (i10) No. 16:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and combination meter connector<br>• Poor contact in coupling connector |
| 5 | **CHECK POOR CONTACT.**<br>Check poor contact in combination meter connector. | Is there poor contact in combination meter connector? | Repair the poor contact in combination meter connector. | Go to step **6.** |
| 6 | **CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between combination meter connector and chassis ground.<br>***Connector & terminal***<br>***(i10) No. 3 (+) — Chassis ground (−):***<br>***(i10) No. 4 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Replace the board of combination meter. <Ref. to IDI-15, Combination Meter.> | Check the following and repair if necessary.<br>NOTE:<br>• Blown out fuse<br>• Open or short circuit in harness between fuse and battery terminal<br>• Poor contact in ignition switch connector |

## 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 display.

**WIRING DIAGRAM:**




| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Turn the ignition switch to ON. | Does malfunction indicator light illuminate? | Repair the short circuit in harness between combination meter and ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

## E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK.

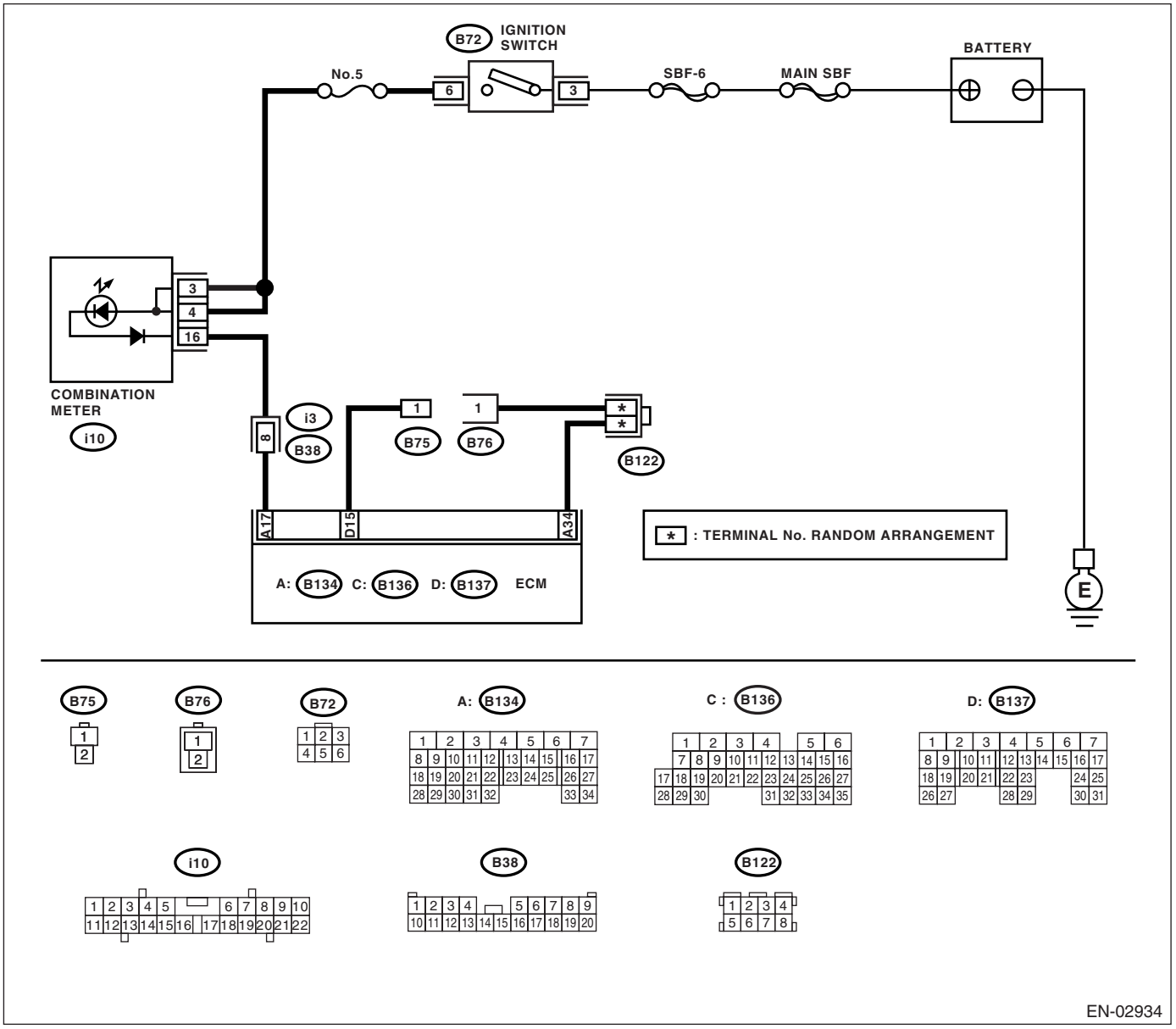
**DIAGNOSIS:**

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

**TROUBLE SYMPTOM:**

Malfunction indicator light does not blink during inspection mode.

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the test mode connector.<br>3) Turn the ignition switch to ON. (engine OFF) | Does malfunction indicator light illuminate? | Go to step **2.** | Repair the malfunction indictor light circuit. <Ref. to EN(H4DOTC)(diag)-50, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.> |
| 2 | **CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Turn the ignition switch to ON. | Does malfunction indicator light illuminate? | Repair the ground short circuit in harness between combination meter and ECM connector. | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between test mode connector and ECM.<br>***Connector & terminal***<br>***(B76) No. 1 — (B134) No. 34:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between test mode connector and ECM<br>• Poor contact in joint connector |
| 4 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is the poor contact in ECM connector? | Repair the poor contact in ECM connector. | Go to step **5.** |
| 5 | **CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.**<br>Measure the resistance of harness between ECM and test mode connector.<br>***Connector & terminal***<br>***(B137) No. 15 — (B75) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the open circuit in harness between ECM and test mode connector. |
| 6 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is the poor contact in ECM connector? | Repair the poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

## F: MALFUNCTION INDICATOR LIGHT REMAINS BLINKING.

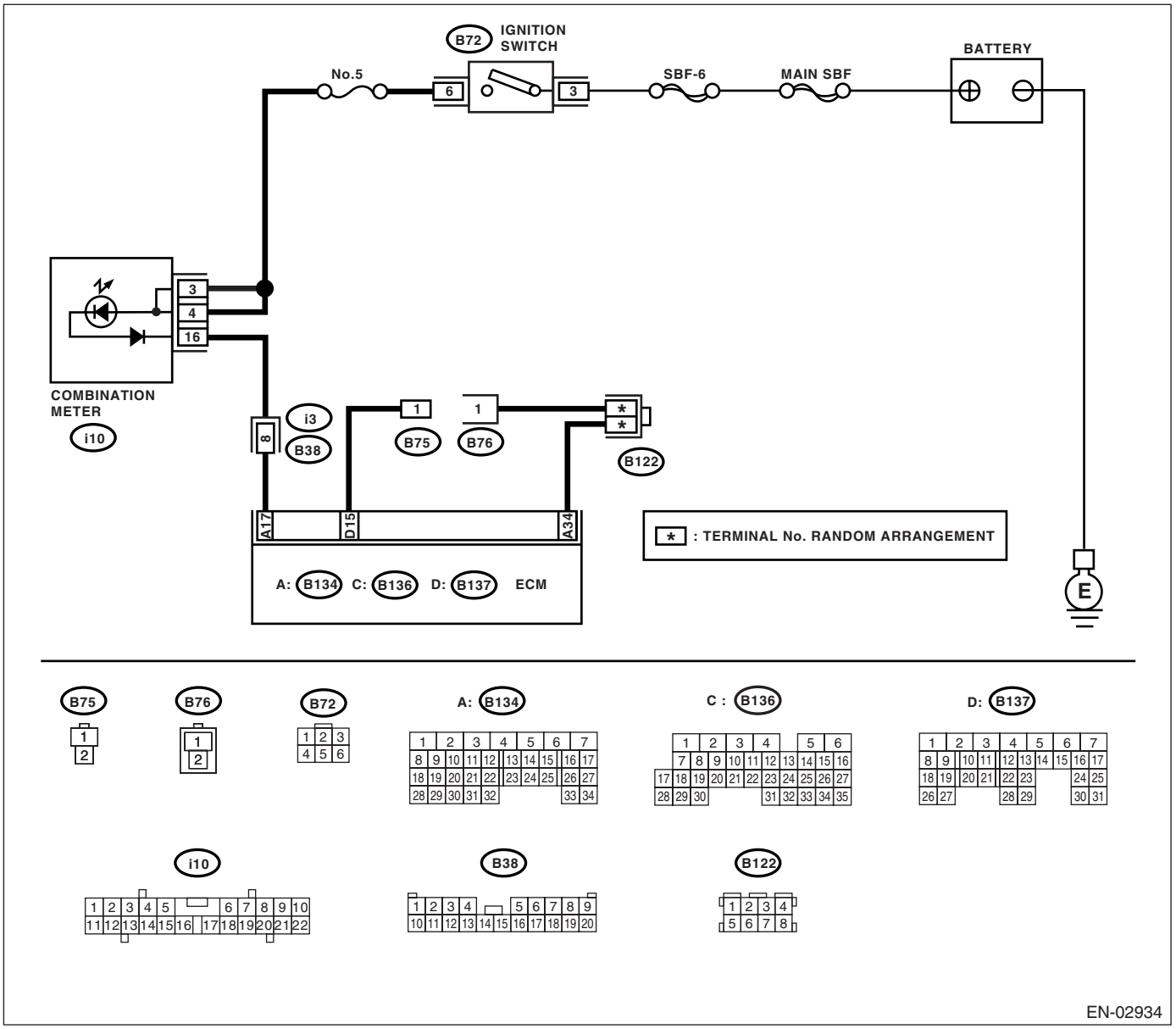
**DIAGNOSIS:**

Test mode connector circuit is shorted.

**TROUBLE SYMPTOM:**

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

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK TEST MODE CONNECTOR.**<br>1) Disconnect the test mode connector.<br>2) Turn the ignition switch to ON. | Does the malfunction indicator light blink? | Go to step **2.** | System is in good order.<br>NOTE:<br>Malfunction indicator light blinks at a cycle of 3 Hz when test mode connector is connected. |
| 2 | **CHECK HARNESS BETWEEN ECM CONNECTOR AND CHASSIS GROUNDING TERMINAL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 15 — Chassis ground:*** | Is the resistance less than 5 Ω? | Repair the short circuit in harness between ECM and test mode connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

# 16.Diagnostics for Engine Starting Failure

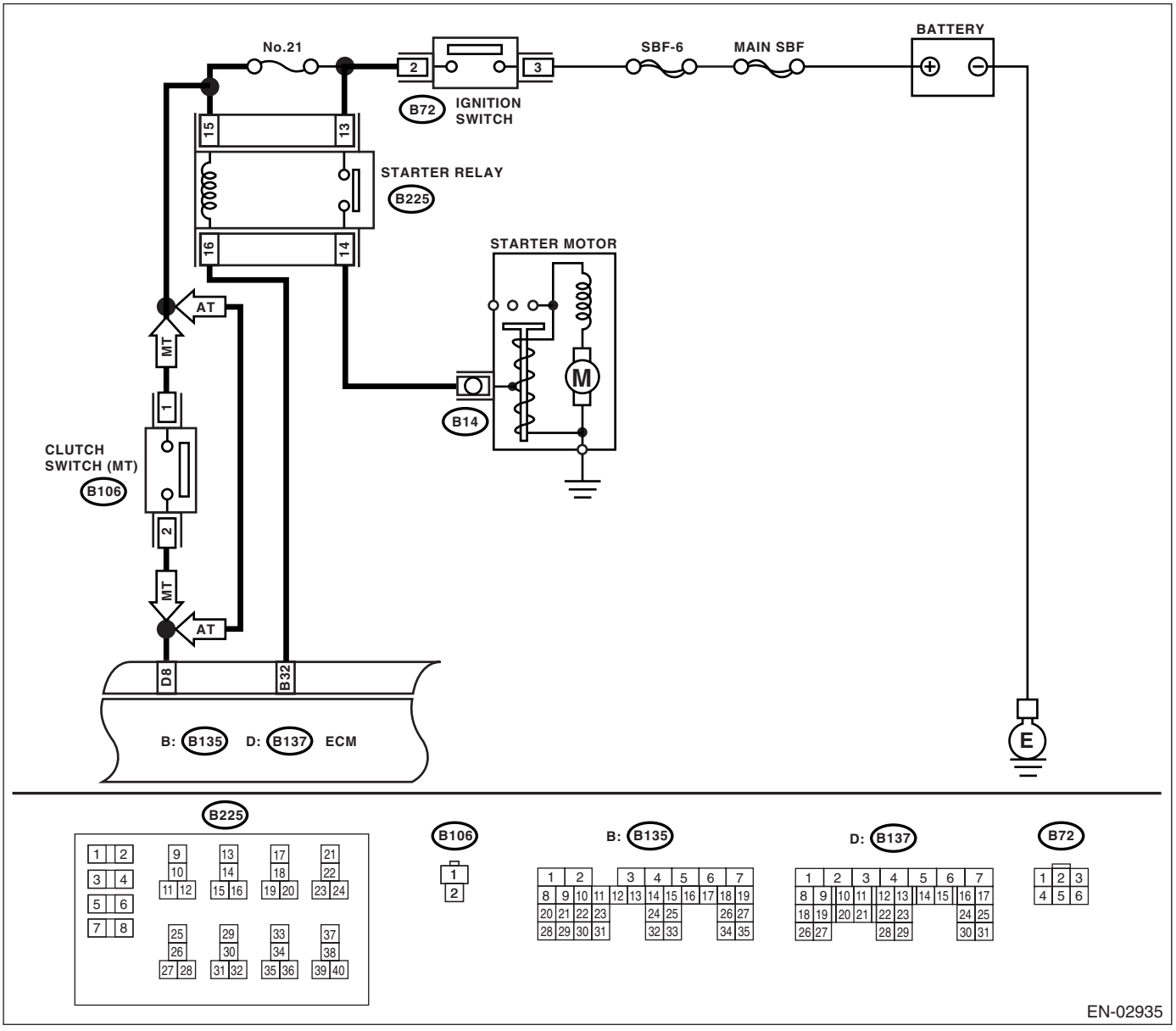
## A: PROCEDURE

| |
|---|
| 1. Check for fuel amount. |
| ↓ |
| 2. Inspection of starter motor circuit. <Ref. to EN(H4DOTC)(diag)-58, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.> |
| ↓ |
| 3. Inspection of ECM power supply and ground line. <Ref. to EN(H4DOTC)(diag)-62, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.> |
| ↓ |
| 4. Inspection of ignition control system. <Ref. to EN(H4DOTC)(diag)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.> |
| ↓ |
| 5. Inspection of fuel pump circuit. <Ref. to EN(H4DOTC)(diag)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.> |
| ↓ |
| 6. Inspection of fuel injector circuit. <Ref. to EN(H4DOTC)(diag)-69, 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)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATION OF STARTER MOTOR.** | Does the starter motor operate? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK DTC.** | Is DTC displayed? <Ref. to EN(H4DOTC)(diag)-35, OPERATION, Read Diagnostic Trouble Code (DTC).> | Inspect the relevant DTC using List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Repair the poor contact in ECM connector. |
| 3 | **CHECK INPUT SIGNAL FOR STARTER MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from starter motor.<br>3) Turn the ignition switch to START.<br>4) Measure the power supply voltage between starter motor connector terminal and engine ground.<br>***Connector & terminal***<br>***(B14) No. 1 (+) — Engine ground (−):***<br>NOTE:<br>• On AT vehicles, set the selector lever in the "P" or "N" range.<br>• On MT vehicles, depress the clutch pedal. | Is the voltage more than 10 V? | Go to step **4.** | Go to step **5.** |
| 4 | **CHECK GROUND CIRCUIT OF STARTER MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the ground cable terminal from starter motor.<br>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 the open circuit of ground cable. |
| 5 | **CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.**<br>1) Disconnect the connector from ignition switch.<br>2) Measure the power supply voltage between ignition switch connector and chassis ground.<br>***Connector & terminal***<br>***(B72) No. 3 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **6.** | Check the following and repair if necessary.<br>• Blown out fuse<br>• Open circuit in harness between ignition switch and battery |
| 6 | **CHECK IGNITION SWITCH.**<br>1) Disconnect the connector from ignition switch.<br>2) Measure the resistance between ignition switch terminals while turning the ignition switch to START position.<br>***Terminals***<br>***No. 2 — No. 3:*** | Is the resistance less than 5 Ω? | Go to step **7.** | Replace the ignition switch. |

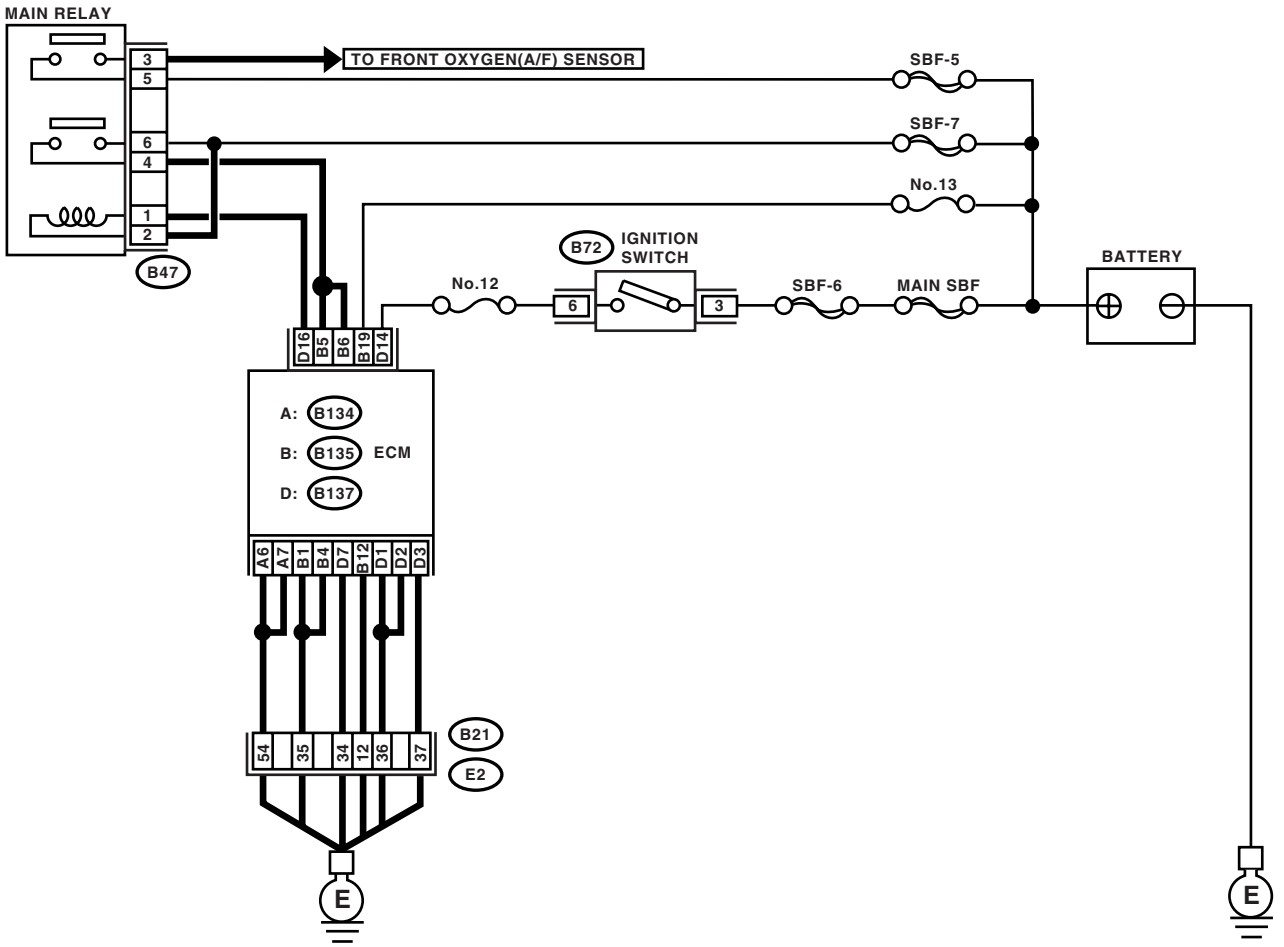
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK INPUT VOLTAGE OF STARTER RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from starter relay.<br>3) Connect the connector to ignition switch.<br>4) Measure the input voltage between starter relay connector and chassis ground while turning the ignition switch to START position.<br>***Connector & terminal***<br>***(B225) No. 14 (+) — Chassis ground (−):***<br>***(B225) No. 16 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **8.** | Repair the open or ground short circuit in harness between starter relay and ignition switch. |
| 8 | **CHECK STARTER RELAY.**<br>1) Connect the battery to starter relay terminals No. 15 and No. 16.<br>2) Measure the resistance between starter relay terminals.<br>***Terminals***<br>***No. 13 — No. 14:*** | Is the resistance less than 1 Ω? | Go to step **9.** | Replace the starter relay. |
| 9 | **CHECK INPUT VOLTAGE FROM ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the starter relay connector.<br>3) Disconnect the connectors from ECM.<br>4) Measure the resistance of harness between ECM and starter relay connector.<br>***Connector & terminal***<br>***(B135) No. 32 — (B225) No. 15:*** | Is the resistance less than 1 Ω? | Go to step **10.** | Repair the open circuit in harness between ECM and starter relay. |
| 10 | **CHECK INPUT VOLTAGE FOR STARTER MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the connector to ECM.<br>3) Turn the ignition switch to START.<br>4) Measure the voltage between starter motor and engine ground.<br>***Connector & terminal***<br>***(B14) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **15.** | Repair the open or ground short circuit in harness between starter relay and starter. |
| 11 | **CHECK TRANSMISSION TYPE.** | Is the transmission type AT? | Go to step **15.** | Go to step **12.** |
| 12 | **CHECK CLUTCH SWITCH INPUT VOLTAGE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from clutch switch.<br>3) Turn the ignition switch to START.<br>4) Measure the voltage between clutch switch connector and chassis ground.<br>***Connector & terminal***<br>***(B106) No. 1 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **13.** | Repair open circuit in harness between clutch switch and ignition switch. |
| 13 | **CHECK CLUTCH SWITCH.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between clutch switch terminals while depressing the clutch pedal.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Go to step **14.** | Replace the clutch switch. <Ref. to CL-25, Clutch Switch.> |

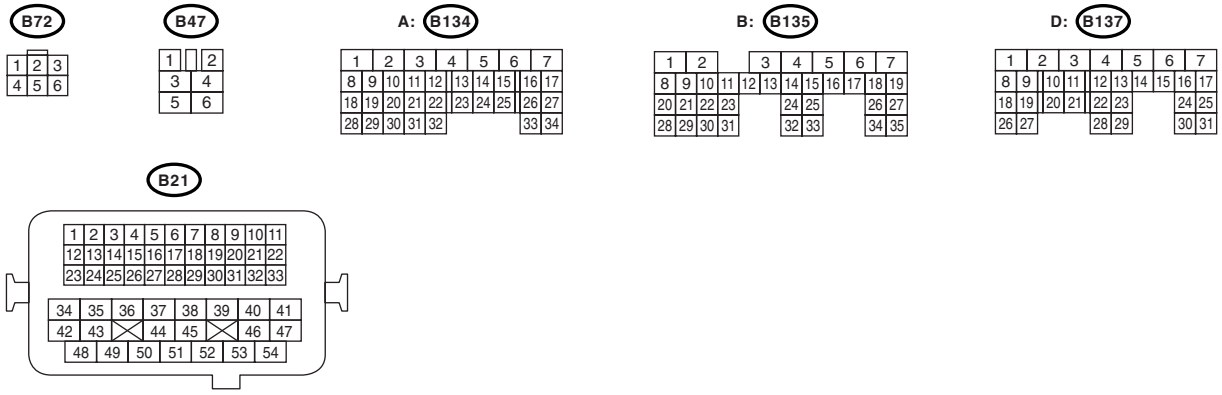
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 14 | **CHECK HARNESS BETWEEN CLUTCH SWITCH AND ECM.**<br>1) Disconnect the connector from ECM.<br>2) Measure the resistance of harness between clutch switch and ECM connector.<br>***Connector & terminal***<br>***(B137) No. 8 — (B106) No. 2:*** | Is the resistance less than 1 Ω? | Check engine control module (ECM) power supply and ground line. <Ref. to EN(H4DOTC)(diag)-62, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.> | Repair open circuit in harness between clutch switch and ECM. |
| 15 | **CHECK HARNESS BETWEEN IGNITION SWITCH AND ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ignition switch and ECM.<br>3) Measure the resistance of harness between ignition switch and ECM connector.<br>***Connector & terminal***<br>***(B137) No. 8 — (B72) No. 2:*** | Is the resistance less than 1 Ω? | Check engine control module (ECM) power supply and ground line. <Ref. to EN(H4DOTC)(diag)-62, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.> | Repair the open circuit between ignition switch and ECM. |

## 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)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



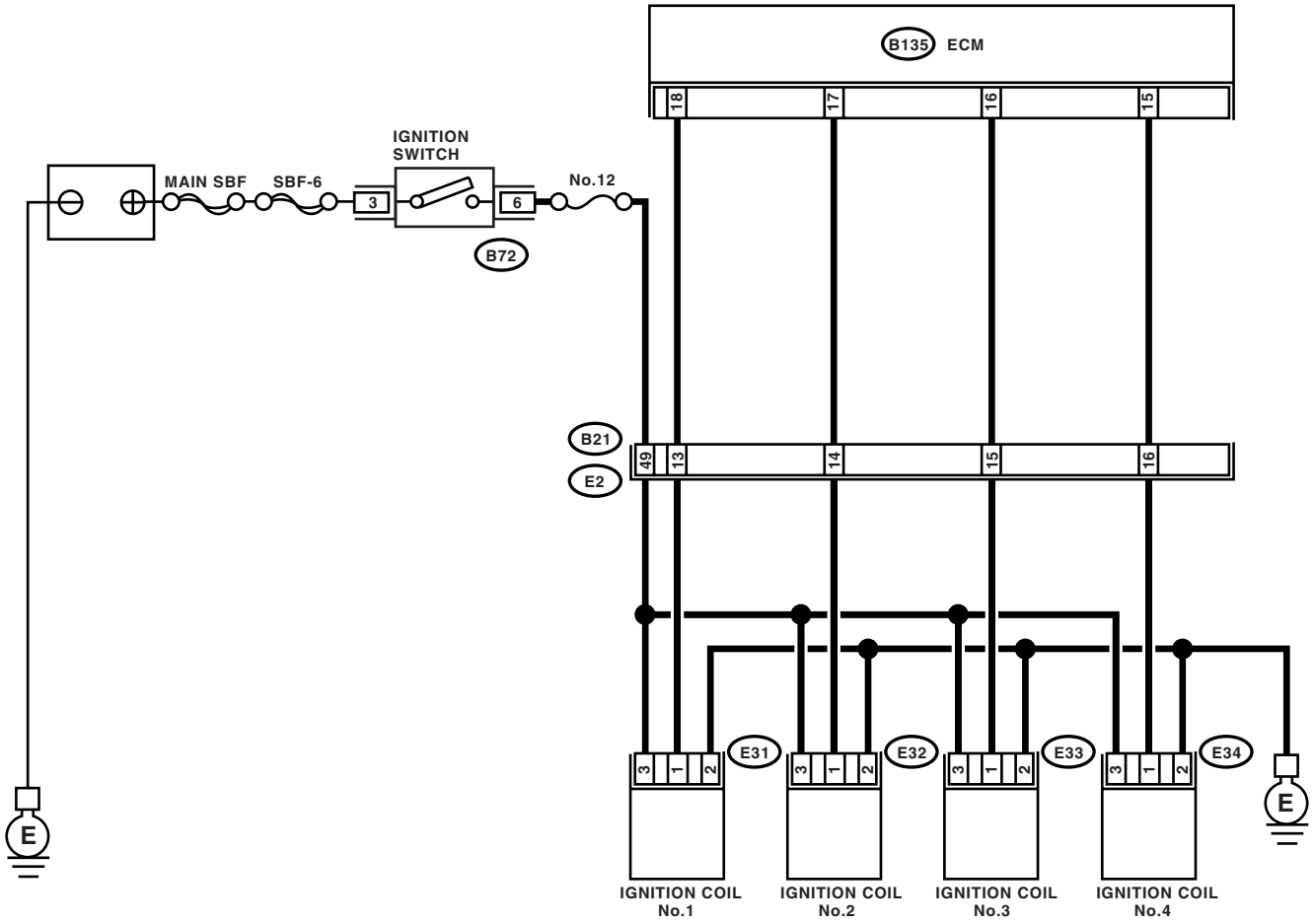

EN-03162

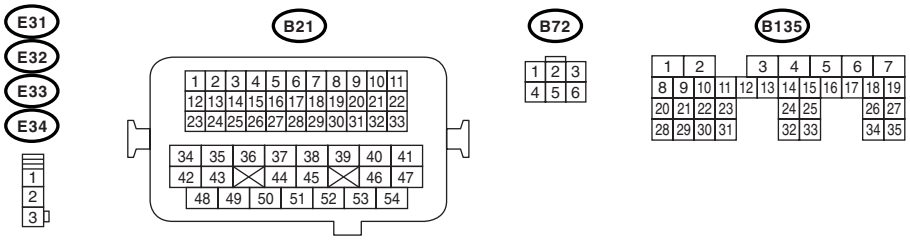
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK MAIN RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the main relay.<br>3) Connect the battery to main relay terminals No. 1 and No. 2.<br>4) Measure the resistance between main relay terminals.<br>***Terminals***<br>***No. 3 — No. 5:***<br>***No. 4 — No. 6:*** | Is the resistance less than 10 Ω? | Go to step **2.** | Replace the main relay. |
| 2 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Disconnect the connector from ECM.<br>2) Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 6 — Chassis ground:***<br>***(B134) No. 7 — Chassis ground:***<br>***(B135) No. 1 — Chassis ground:***<br>***(B135) No. 4 — Chassis ground:***<br>***(B135) No. 12 — Chassis ground:***<br>***(B137) No. 1 — Chassis ground:***<br>***(B137) No. 2 — Chassis ground:***<br>***(B137) No. 3 — Chassis ground:***<br>***(B137) No. 7 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **3.** | Repair the open circuit in harness between ECM connector and engine grounding terminal. |
| 3 | **CHECK INPUT VOLTAGE OF ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 19 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **4.** | Repair the open or ground short circuit of power supply circuit. |
| 4 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 14 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **5.** | Repair the open or ground short circuit of power supply circuit. |
| 5 | **CHECK INPUT VOLTAGE OF MAIN RELAY.**<br>Measure the voltage between main relay connector and chassis ground.<br>***Connector & terminal***<br>***(B47) No. 2 (+) — Chassis ground (−):***<br>***(B47) No. 5 (+) — Chassis ground (−):***<br>***(B47) No. 6 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **6.** | Repair the open or ground short circuit in harness of power supply circuit. |
| 6 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Connect the main relay connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 5 (+) — Chassis ground (−):***<br>***(B135) No. 6 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Check ignition control system. <Ref. to EN(H4DOTC)(diag)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.> | Repair the 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)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-03163

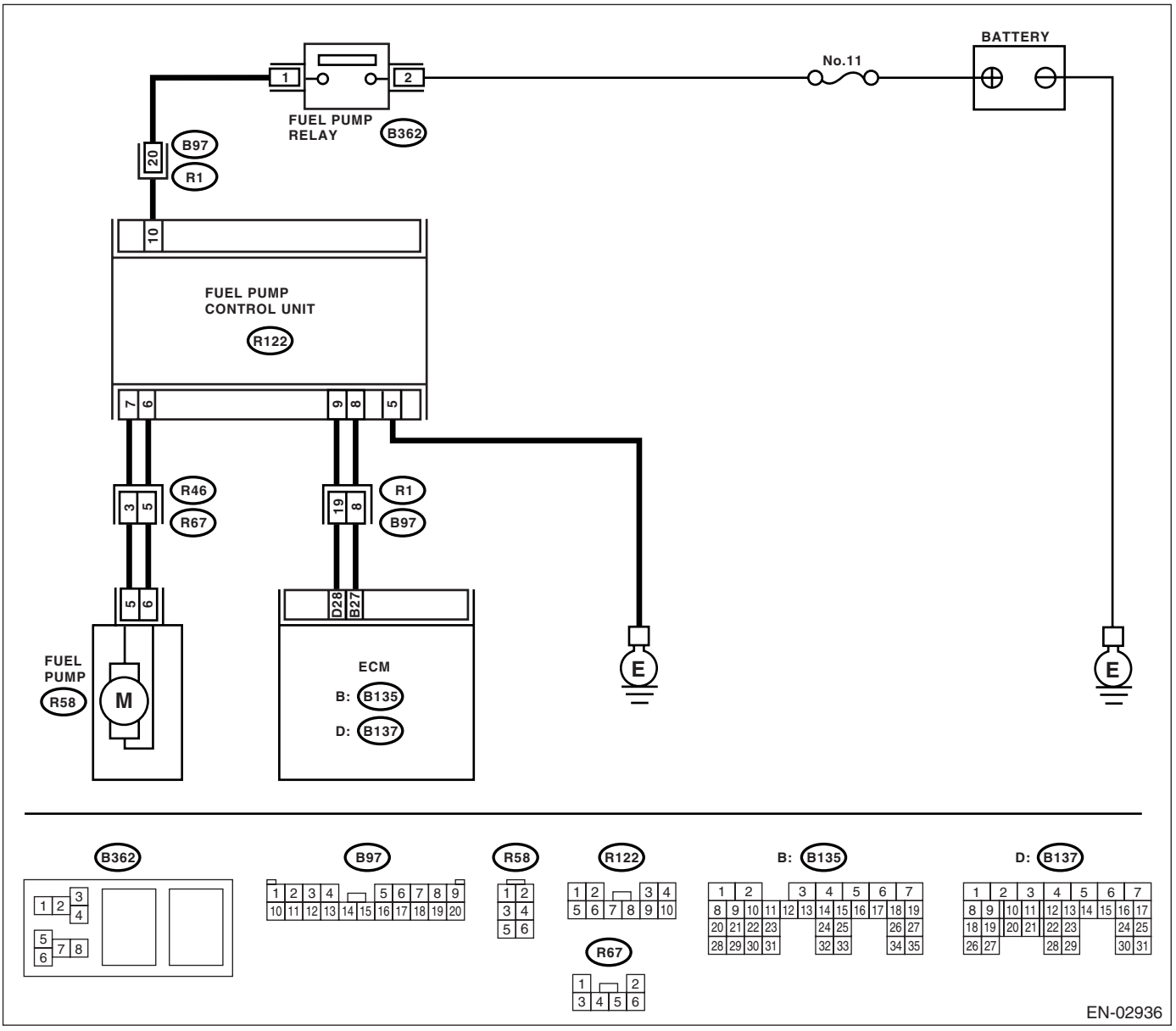
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SPARK PLUG CONDITION.**<br>1) Remove the spark plug. <Ref. to IG(H4DOTC)-4, REMOVAL, Spark Plug.><br>2) Check the spark plug condition. <Ref. to IG(H4DOTC)-5, INSPECTION, Spark Plug.> | Is the spark plug's status OK? | Go to step **2.** | Replace the spark plug. |
| 2 | **INSPECTION FOR SPARK OF IGNITION SYSTEM.**<br>1) Connect the spark plug to ignition coil.<br>2) Release the fuel pressure. <Ref. to FU(H4DOTC)-44, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.><br>3) Contact the spark plug's thread portion on engine.<br>4) While the throttle valve is opening 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)(diag)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.> | Go to step **3.** |
| 3 | **CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL AND IGNITOR ASSEMBLY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ignition coil and ignitor assembly.<br>3) Turn the ignition switch to ON.<br>4) Measure the power supply voltage between ignition coil and ignitor assembly connector and engine ground.<br>***Connector & terminal***<br>***(E31) No. 3 (+) — Engine ground (–):***<br>***(E32) No. 3 (+) — Engine ground (–):***<br>***(E33) No. 3 (+) — Engine ground (–):***<br>***(E34) No. 3 (+) — Engine ground (–):*** | Is the voltage more than 10 V? | Go to step **4.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ignition coil and ignitor assembly, and ignition switch connector<br>• Poor contact in coupling connector |
| 4 | **CHECK HARNESS OF IGNITION COIL AND IGNITOR ASSEMBLY GROUND CIRCUIT.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between ignition coil and ignitor assembly connector and engine ground.<br>***Connector & terminal***<br>***(E31) No. 2 — Engine ground:***<br>***(E32) No. 2 — Engine ground:***<br>***(E33) No. 2 — Engine ground:***<br>***(E34) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **5.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ignition coil and ignitor assembly connector and engine grounding terminal |
| 5 | **CHECK HARNESS BETWEEN ECM AND IGNITION COIL AND IGNITOR ASSEMBLY CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from ignition coil and ignitor assembly.<br>4) Measure the resistance of harness between ECM and ignition coil and ignitor assembly connector.<br>***Connector & terminal***<br>***(B135) No. 15 — (E34) No. 1:***<br>***(B135) No. 16 — (E33) No. 1:***<br>***(B135) No. 17 — (E32) No. 1:***<br>***(B135) No. 18 — (E31) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and ignition coil and ignitor assembly connector<br>• Poor contact in coupling connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND IGNITION COIL AND IGNITOR ASSEMBLY CONNECTOR.**<br>Measure the resistance of harness between ECM and engine ground.<br>***Connector & terminal***<br>***(B135) No. 15 — Engine ground:***<br>***(B135) No. 16 — Engine ground:***<br>***(B135) No. 17 — Engine ground:***<br>***(B135) No. 18 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **7.** | Repair the ground short circuit in harness between ECM and ignition coil and ignitor assembly connector. |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is the poor contact in ECM connector? | Repair the poor contact in ECM connector. | Replace the ignition coil and ignitor assembly. |

## E: FUEL PUMP CIRCUIT

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**

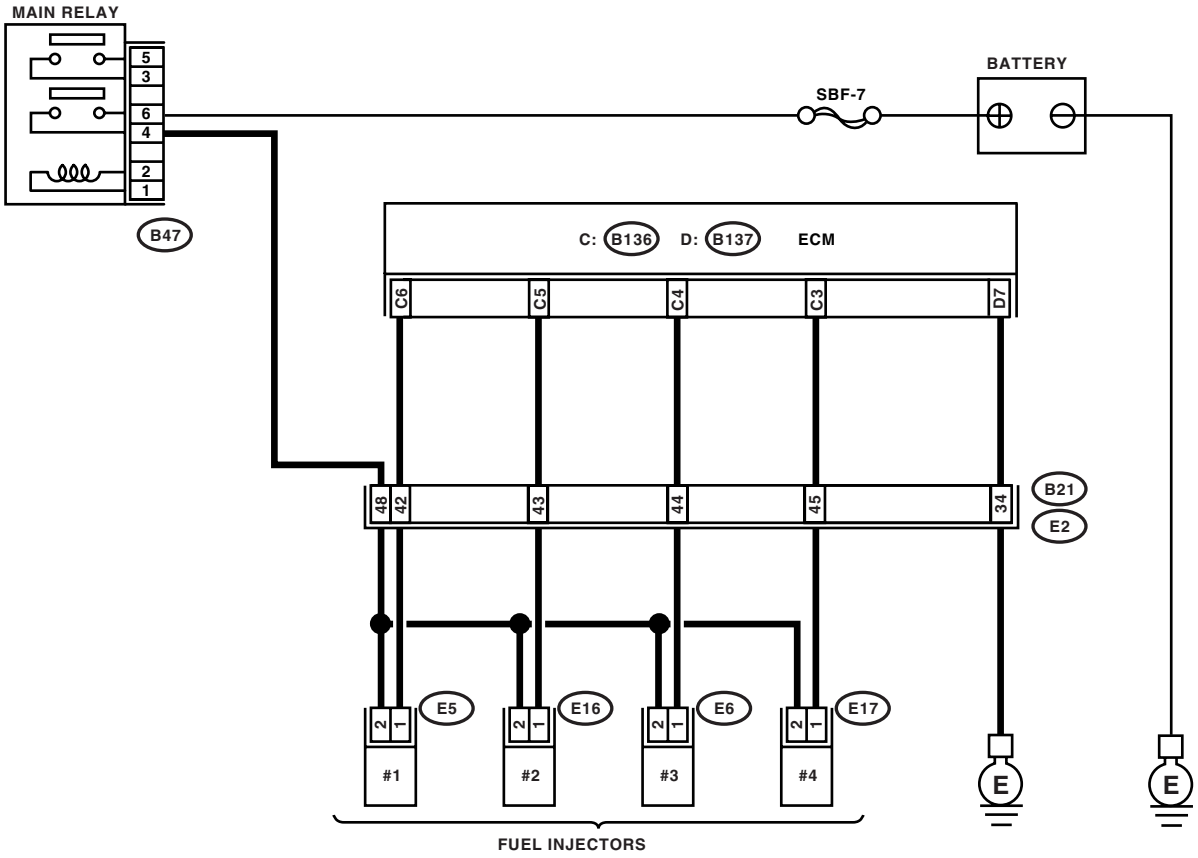


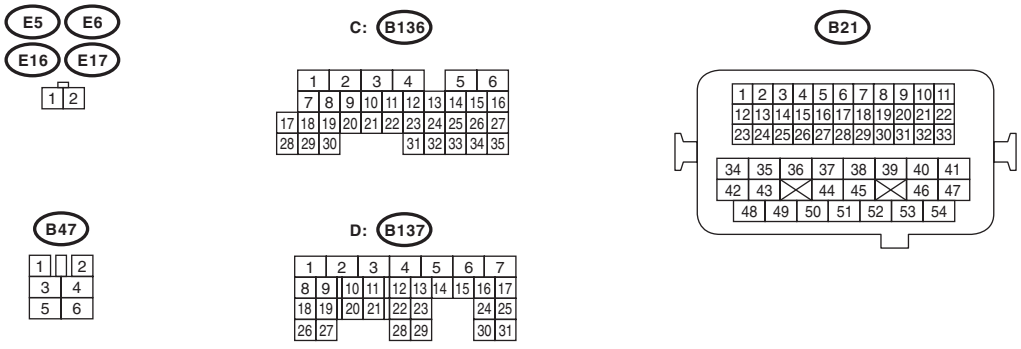
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATING SOUND OF FUEL PUMP.**<br>Make sure that fuel pump is in operation for 2 seconds when turning the ignition switch to ON.<br>NOTE:<br>Fuel pump operation can also be executed using Subaru Select Monitor.<br>Refer to “Compulsory Valve Operation Check Mode” for procedures. <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the fuel pump produce operating sound? | Check the fuel injector circuit. <Ref. to EN(H4DOTC)(diag)-69, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.> | Display DTC. <Ref. to EN(H4DOTC)(diag)-35, OPERATION, Read Diagnostic Trouble Code (DTC).> |

## 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)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-03164

# Diagnostics for Engine Starting Failure

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATION OF EACH FUEL INJECTOR.**<br>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. | Does the fuel pump produce operating sound? | Check the fuel pressure. <Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.> | Go to step **2.** |
| 2 | **CHECK POWER SUPPLY TO EACH FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector.<br>3) Turn the ignition switch to ON.<br>4) Measure the power supply voltage between fuel injector terminal and engine ground.<br>***Connector & terminal***<br>***#1 (E5) No. 2 (+) — Engine ground (−):***<br>***#2 (E16) No. 2 (+) — Engine ground (−):***<br>***#3 (E6) No. 2 (+) — Engine ground (−):***<br>***#4 (E17) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and fuel injector connector<br>• Poor contact in main relay connector<br>• Poor contact in coupling connector<br>• Poor contact in fuel injector connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.**<br>1) Disconnect the connector from ECM.<br>2) Measure the resistance of harness between ECM and fuel injector connector.<br>***Connector & terminal***<br>***(B136) No. 6 — (E5) No. 1:***<br>***(B136) No. 5 — (E16) No. 1:***<br>***(B136) No. 4 — (E6) No. 1:***<br>***(B136) No. 3 — (E17) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and fuel injector connector<br>• Poor contact in coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.**<br>Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 6 — Chassis ground:***<br>***(B136) No. 5 — Chassis ground:***<br>***(B136) No. 4 — Chassis ground:***<br>***(B136) No. 3 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the ground short circuit in harness between ECM and fuel injector connector. |
| 5 | **CHECK EACH FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between each fuel injector terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 5 — 20 Ω? | Go to step **6.** | Replace the faulty fuel injector. |
| 6 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is the poor contact in ECM connector? | Repair the poor contact in ECM connector. | Inspection using “General Diagnostic Table” <Ref. to EN(H4DOTC)(diag)-331, INSPECTION, General Diagnostic Table.> |

# 17.List of Diagnostic Trouble Code (DTC)

## A: LIST

| DTC | Item | Index |
|---|---|---|
| P0011 | Intake Camshaft Position Timing - Over-Advanced (Bank 1) | <Ref. to EN(H4DOTC)(diag)-78, DTC P0011 INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0021 | Intake Camshaft Position Timing - Over-Advanced (Bank 2) | <Ref. to EN(H4DOTC)(diag)-79, DTC P0021 INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0030 | HO2S Heater Control Circuit (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-80, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0031 | HO2S Heater Control Circuit Low (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-82, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0032 | HO2S Heater Control Circuit High (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-84, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0037 | HO2S Heater Control Circuit Low (Bank 1 Sensor 2) | <Ref. to EN(H4DOTC)(diag)-86, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0038 | HO2S Heater Control Circuit High (Bank 1 Sensor 2) | <Ref. to EN(H4DOTC)(diag)-89, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0068 | MAP/MAF - Throttle Position Correlation | <Ref. to EN(H4DOTC)(diag)-91, DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0101 | Mass or Volume Air Flow Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-93, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0102 | Mass or Volume Air Flow Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-95, 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)(diag)-98, 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)(diag)-100, 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)(diag)-102, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0111 | Intake Air Temperature Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-104, DTC P0111 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0112 | Intake Air Temperature Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-106, 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)(diag)-108, 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)(diag)-111, 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)(diag)-113, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Index |
|---|---|---|
| P0122 | Throttle/Pedal Position Sensor/ Switch “A” Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-115, 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)(diag)-118, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control | <Ref. to EN(H4DOTC)(diag)-121, DTC P0125 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0126 | Insufficient Coolant Temperature for Stable Operation | <Ref. to EN(H4DOTC)(diag)-123, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0128 | Coolant Thermostat (Coolant Temperature Below Thermostat Regulating Temperature) | <Ref. to EN(H4DOTC)(diag)-125, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0131 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-126, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0132 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-128, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0133 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-130, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0134 | O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-132, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0137 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2) | <Ref. to EN(H4DOTC)(diag)-134, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0138 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 2) | <Ref. to EN(H4DOTC)(diag)-137, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0139 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 2) | <Ref. to EN(H4DOTC)(diag)-140, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0171 | System too Lean (Bank 1) | <Ref. to EN(H4DOTC)(diag)-141, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0172 | System too Rich (Bank 1) | <Ref. to EN(H4DOTC)(diag)-142, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0181 | Fuel Temperature Sensor “A” Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-144, DTC P0181 FUEL TEMPERATURE SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0182 | Fuel Temperature Sensor “A” Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-146, DTC P0182 FUEL TEMPERATURE SENSOR “A” CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0183 | Fuel Temperature Sensor “A” Circuit High Input | <Ref. to EN(H4DOTC)(diag)-148, DTC P0183 FUEL TEMPERATURE SENSOR “A” CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0222 | Throttle/Pedal Position Sensor/ Switch “B” Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-150, 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)(diag)-153, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Index |
|---|---|---|
| P0230 | Fuel Pump Primary Circuit | <Ref. to EN(H4DOTC)(diag)-156, DTC P0230 FUEL PUMP PRIMARY CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0244 | Turbo/Super Charger Wastegate Solenoid “A” Range/Performance | <Ref. to EN(H4DOTC)(diag)-159, DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0245 | Turbo/Super Charger Wastegate Solenoid “A” Low | <Ref. to EN(H4DOTC)(diag)-161, 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)(diag)-163, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0301 | Cylinder 1 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-165, DTC P0301 CYLINDER 1 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0302 | Cylinder 2 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-165, DTC P0302 CYLINDER 2 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0303 | Cylinder 3 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-165, DTC P0303 CYLINDER 3 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0304 | Cylinder 4 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0327 | Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor) | <Ref. to EN(H4DOTC)(diag)-170, 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)(diag)-172, 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)(diag)-174, DTC P0335 CRANKSHAFT POSITION SENSOR “A” CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0336 | Crankshaft Position Sensor “A” Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-176, DTC P0336 CRANKSHAFT POSITION SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0340 | Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor) | <Ref. to EN(H4DOTC)(diag)-178, 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)(diag)-180, DTC P0345 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0420 | Catalyst System Efficiency Below Threshold (Bank 1) | <Ref. to EN(H4DOTC)(diag)-182, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0442 | Evaporative Emission Control System Leak Detected (small Leak) | <Ref. to EN(H4DOTC)(diag)-186, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0447 | Evaporative Emission Control System Vent Control Circuit Open | <Ref. to EN(H4DOTC)(diag)-190, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0448 | Evaporative Emission Control System Vent Control Circuit Shorted | <Ref. to EN(H4DOTC)(diag)-193, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0451 | Evaporative Emission Control System Pressure Sensor Range/Performance | <Ref. to EN(H4DOTC)(diag)-195, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0452 | Evaporative Emission Control System Pressure Sensor Low Input | <Ref. to EN(H4DOTC)(diag)-197, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

# List of Diagnostic Trouble Code (DTC)

| DTC | Item | Index |
|---|---|---|
| P0453 | Evaporative Emission Control System Pressure Sensor High Input | <Ref. to EN(H4DOTC)(diag)-200, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0456 | Evaporative Emission Control System Leak Detected (Very Small Leak) | <Ref. to EN(H4DOTC)(diag)-203, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0457 | Evaporative Emission Control System Leak Detected (Fuel Cap Loose/Off) | <Ref. to EN(H4DOTC)(diag)-206, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0458 | Evaporative Emission Control System Purge Control Valve Circuit Low | <Ref. to EN(H4DOTC)(diag)-210, 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)(diag)-212, DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0461 | Fuel Level Sensor Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-214, DTC P0461 FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0462 | Fuel Level Sensor Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-214, 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)(diag)-215, DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0464 | Fuel Level Sensor Circuit Intermittent | <Ref. to EN(H4DOTC)(diag)-215, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0483 | Cooling Fan Rationality Check | <Ref. to EN(H4DOTC)(diag)-216, DTC P0483 COOLING FAN RATIONALITY CHECK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0500 | Vehicle Speed Sensor | <Ref. to EN(H4DOTC)(diag)-216, DTC P0500 VEHICLE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0506 | Idle Control System RPM Lower Than Expected | <Ref. to EN(H4DOTC)(diag)-217, DTC P0506 IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0507 | Idle Control System RPM Higher Than Expected | <Ref. to EN(H4DOTC)(diag)-219, DTC P0507 IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0512 | Starter Request Circuit | <Ref. to EN(H4DOTC)(diag)-222, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0513 | Incorrect Immobilizer Key | <Ref. to IM(diag)-17, DTC P0513 INCORRECT IMMOBILIZER KEY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0519 | Idle Control System Malfunction (Fail-Safe) | <Ref. to EN(H4DOTC)(diag)-223, 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)(diag)-224, 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)(diag)-226, DTC P0546 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH-BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0600 | Serial Communication Link | <Ref. to EN(H4DOTC)(diag)-228, 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)(diag)-228, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Index |
|---|---|---|
| P0605 | Internal Control Module Read Only Memory (ROM) Error | <Ref. to EN(H4DOTC)(diag)-228, 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)(diag)-228, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0638 | Throttle Actuator Control Range/Performance (Bank 1) | <Ref. to EN(H4DOTC)(diag)-230, 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)(diag)-230, 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)(diag)-231, 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)(diag)-231, DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0851 | Neutral Switch Input Circuit Low | <Ref. to EN(H4DOTC)(diag)-231, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0852 | Neutral Switch Input Circuit High | <Ref. to EN(H4DOTC)(diag)-231, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1152 | O2 Sensor Circuit Range/Performance (Low) (Bank1 Sensor1) | <Ref. to EN(H4DOTC)(diag)-232, DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1153 | O2 Sensor Circuit Range/Performance (High) (Bank1 Sensor1) | <Ref. to EN(H4DOTC)(diag)-234, DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1160 | Return Spring Failure | <Ref. to EN(H4DOTC)(diag)-236, DTC P1160 RETURN SPRING FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1301 | Misfire Detected (High Temperature Exhaust Gas) | <Ref. to EN(H4DOTC)(diag)-237, DTC P1301 MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1312 | Exhaust Gas Temperature Sensor Malfunction | <Ref. to EN(H4DOTC)(diag)-238, DTC P1312 EXHAUST GAS TEMPERATURE SENSOR MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1400 | Fuel Tank Pressure Control Solenoid Valve Circuit Low | <Ref. to EN(H4DOTC)(diag)-240, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1420 | Fuel Tank Pressure Control Sol. Valve Circuit High | <Ref. to EN(H4DOTC)(diag)-242, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1443 | Vent Control Solenoid Valve Function Problem | <Ref. to EN(H4DOTC)(diag)-244, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1446 | Fuel Tank Sensor Control Valve Circuit Low | <Ref. to EN(H4DOTC)(diag)-246, DTC P1446 FUEL TANK SENSOR CONTROL VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1447 | Fuel Tank Sensor Control Valve Circuit High | <Ref. to EN(H4DOTC)(diag)-249, DTC P1447 FUEL TANK SENSOR CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1491 | Positive Crankcase Ventilation (Blow-by) Function Problem | <Ref. to EN(H4DOTC)(diag)-251, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1518 | Starter Switch Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-253, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Index |
|---|---|---|
| P1544 | Exhaust Gas Temperature Too High | <Ref. to EN(H4DOTC)(diag)-255, DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1560 | Back-Up Voltage Circuit Malfunction | <Ref. to EN(H4DOTC)(diag)-256, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1570 | Antenna | <Ref. to IM(diag)-18, DTC P1570 ANTENNA, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1571 | Reference Code Incompatibility | <Ref. to IM(diag)-20, DTC P1571 REFERENCE CODE INCOMPATIBILITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1572 | IMM Circuit Failure (Except Antenna Circuit) | <Ref. to IM(diag)-21, DTC P1572 IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1574 | Key Communication Failure | <Ref. to IM(diag)-24, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1576 | EGI Control Module EEPROM | <Ref. to IM(diag)-24, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1577 | IMM Control Module EEPROM | <Ref. to IM(diag)-24, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1578 | Meter Failure | <Ref. to IM(diag)-25, DTC P1578 METER FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2004 | Intake Manifold Runner Control Stuck Open (Bank 1) | <Ref. to EN(H4DOTC)(diag)-258, DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2005 | Intake Manifold Runner Control Stuck Open (Bank 2) | <Ref. to EN(H4DOTC)(diag)-259, DTC P2005 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2006 | Intake Manifold Runner Control Stuck Closed (Bank 1) | <Ref. to EN(H4DOTC)(diag)-259, DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2007 | Intake Manifold Runner Control Stuck Closed (Bank 2) | <Ref. to EN(H4DOTC)(diag)-260, DTC P2007 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2008 | Intake Manifold Runner Control Circuit / Open (Bank 1) | <Ref. to EN(H4DOTC)(diag)-261, DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2009 | Intake Manifold Runner Control Circuit Low (Bank 1) | <Ref. to EN(H4DOTC)(diag)-263, DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2011 | Intake Manifold Runner Control Circuit / Open (Bank 2) | <Ref. to EN(H4DOTC)(diag)-265, DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2012 | Intake Manifold Runner Control Circuit Low (Bank 2) | <Ref. to EN(H4DOTC)(diag)-267, DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2016 | Intake Manifold Runner Position Sensor/Switch Circuit Low (Bank 1) | <Ref. to EN(H4DOTC)(diag)-269, DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2017 | Intake Manifold Runner Position Sensor/Switch Circuit High (Bank 1) | <Ref. to EN(H4DOTC)(diag)-272, DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2021 | Intake Manifold Runner Position Sensor/Switch Circuit Low (Bank 2) | <Ref. to EN(H4DOTC)(diag)-274, DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2022 | Intake Manifold Runner Position Sensor/Switch Circuit High (Bank 2) | <Ref. to EN(H4DOTC)(diag)-277, DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Index |
|---|---|---|
| P2088 | OCV Solenoid Valve Signal A Circuit Open (Bank 1) | <Ref. to EN(H4DOTC)(diag)-279, 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)(diag)-281, 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)(diag)-283, 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)(diag)-285, DTC P2093 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | <Ref. to EN(H4DOTC)(diag)-287, DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | <Ref. to EN(H4DOTC)(diag)-294, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2101 | Throttle Actuator Control Motor Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-300, 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)(diag)-306, 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)(diag)-309, 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)(diag)-310, 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)(diag)-311, 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)(diag)-314, 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)(diag)-316, 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)(diag)-319, 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)(diag)-321, 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)(diag)-326, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D”/“E” VOLTAGE RATIONALITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2227 | Barometric Pressure Circuit Range/ Performance | <Ref. to EN(H4DOTC)(diag)-329, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2228 | Barometric Pressure Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-330, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2229 | Barometric Pressure Circuit High Input | <Ref. to EN(H4DOTC)(diag)-330, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

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

## A: DTC P0011 INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 1)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-9, DTC P0011 INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK CURRENT DATA.**<br>1) Start the engine and let it idle.<br>2) Inspect the VVT advance timing and OCV duty output using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the general scan tool instruction manual. | Is the VVT advance timing more than approx. 0°C and the OCV duty output more than approx. 10%? | Inspect the following items and repair or replace if necessary.<br>• Engine oil (amount, contamination)<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or contamination in oil passage, settling at spring, stuck at valve)<br>• Intake camshaft (sludge, damage at camshaft)<br>• Timing belt (timing mark aligning) | A temporary malfunction. Conduct the following to clean the oil passage.<br>Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil. |

## B: DTC P0021 INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 2)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-11, DTC P0021 INTAKE CAMSHAFT POSITION TIMING - OVER-ADVANCED (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK CURRENT DATA.**<br>1) Start the engine and let it idle.<br>2) Inspect the VVT advance timing and OCV duty output using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the general scan tool instruction manual. | Is the VVT advance timing more than approx. 0°C and the OCV duty output more than approx. 10%? | Inspect the following items and repair or replace if necessary.<br>• Engine oil (amount, contamination)<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or contamination in oil passage, settling at spring, stuck at valve)<br>• Intake camshaft (sludge, damage at camshaft)<br>• Timing belt (timing mark aligning) | A temporary malfunction. Conduct the following to clean the oil passage.<br>Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil. |

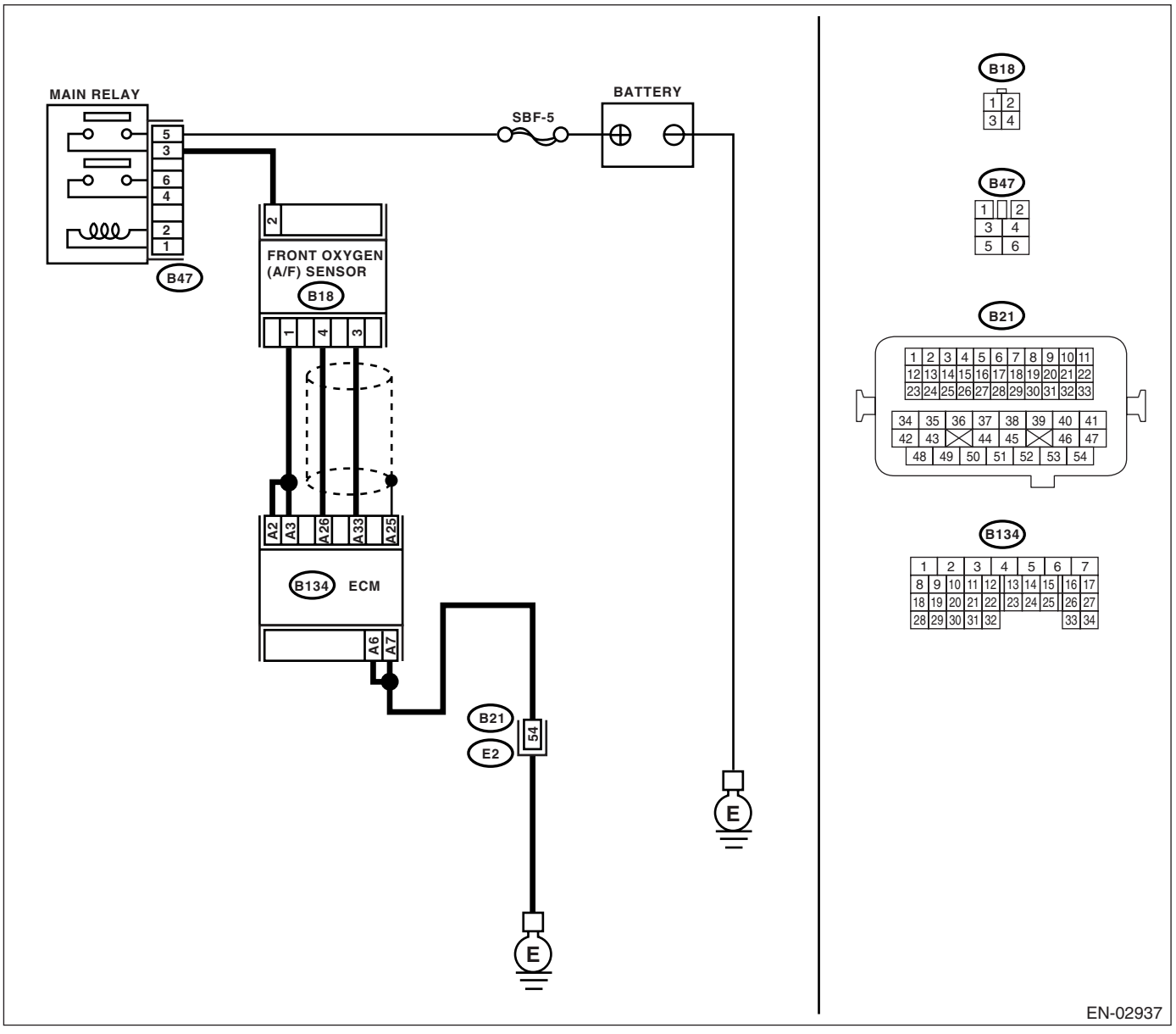
## C: DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-12, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Start the engine and warm-up engine.<br>2) Turn the ignition switch to OFF.<br>3) Disconnect the connectors from ECM and front oxygen (A/F) sensor.<br>4) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B134) No. 2 — (B18) No. 1:***<br>***(B134) No. 3 — (B18) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B134) No. 26 — (B18) No. 4:***<br>***(B134) No. 33 — (B18) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3.** | Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>Measure the resistance of harness between main relay and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B47) No. 3 — (B18) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector. |
| 4 | **CHECK FRONT OXYGEN (A/F) SENSOR.**<br>Measure the resistance between front oxygen (A/F) sensor connector terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 5 Ω? | Go to step **5.** | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> |
| 5 | **CHECK POOR CONTACT.**<br>Check the poor contact in ECM and front oxygen (A/F) sensor connector. | Is there poor contact in ECM or front oxygen (A/F) sensor connector? | Repair the poor contact in ECM or front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> |

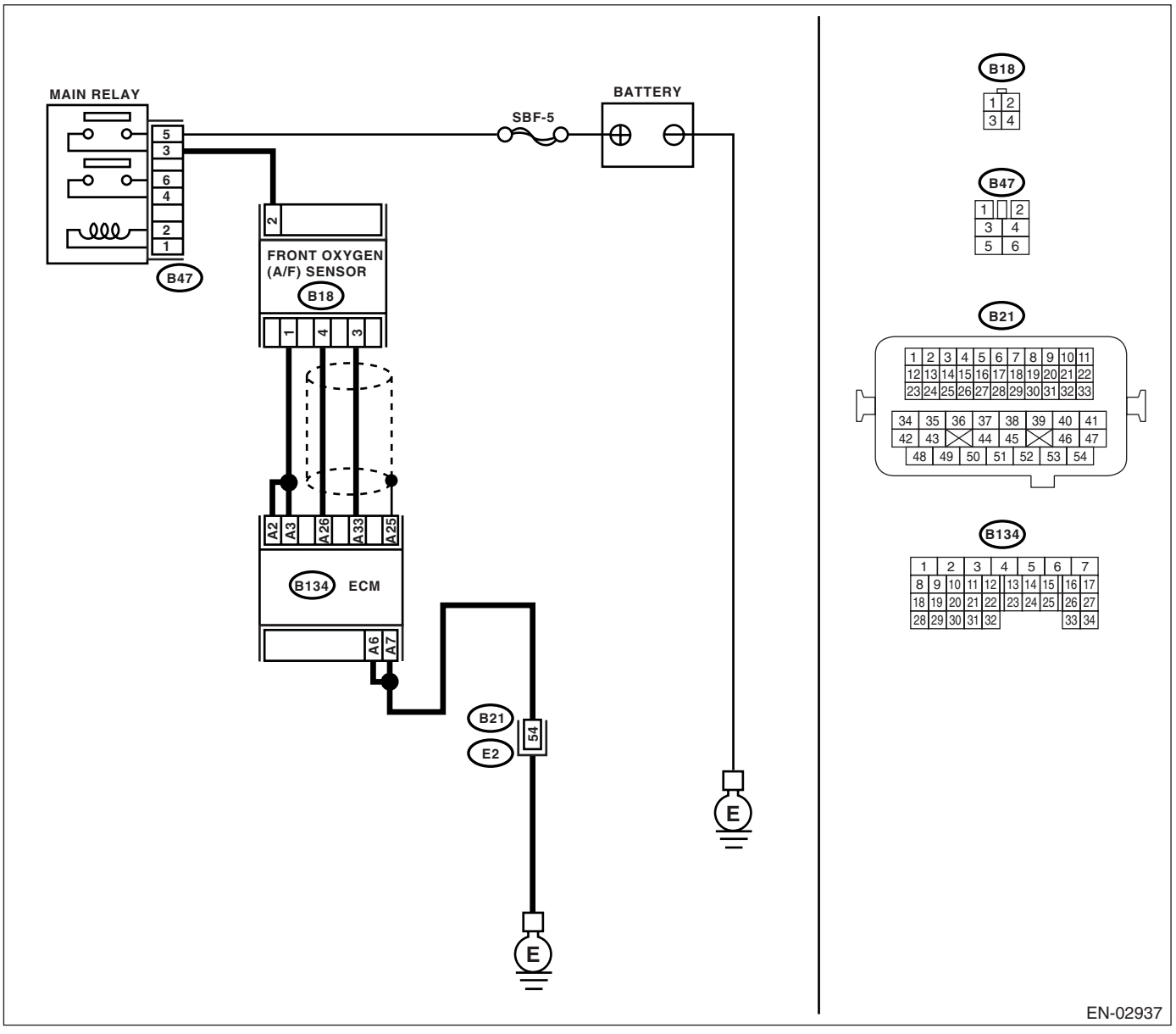
## D: DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1)

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-14, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from front oxygen (A/F) sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between front oxygen (A/F) sensor connector and engine ground.<br>***Connector & terminal***<br>***(B18) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **2.** | Repair the power supply line.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and front oxygen (A/F) sensor connector<br>• Poor contact in main relay connector<br>• Malfunction in main relay |
| 2 | **CHECK HARNESS BETWEEN FRONT OXYGEN (A/F) SENSOR AND ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM.<br>3) Measure the resistance between front oxygen (A/F) sensor connector and ECM.<br>***Connector & terminal***<br>***(B18) No. 1 — (B134) No. 2:***<br>***(B18) No. 1 — (B134) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3.** | Repair the open circuit in harness between ECM and front oxygen (A/F) sensor. |
| 3 | **CHECK HARNESS BETWEEN FRONT OXYGEN (A/F) SENSOR AND ECM.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 2 — Chassis ground:***<br>***(B134) No. 3 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor. |
| 4 | **CHECK FRONT OXYGEN (A/F) SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between front oxygen (A/F) sensor connector terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 2.4 Ω? | Repair the poor contact in ECM connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> |

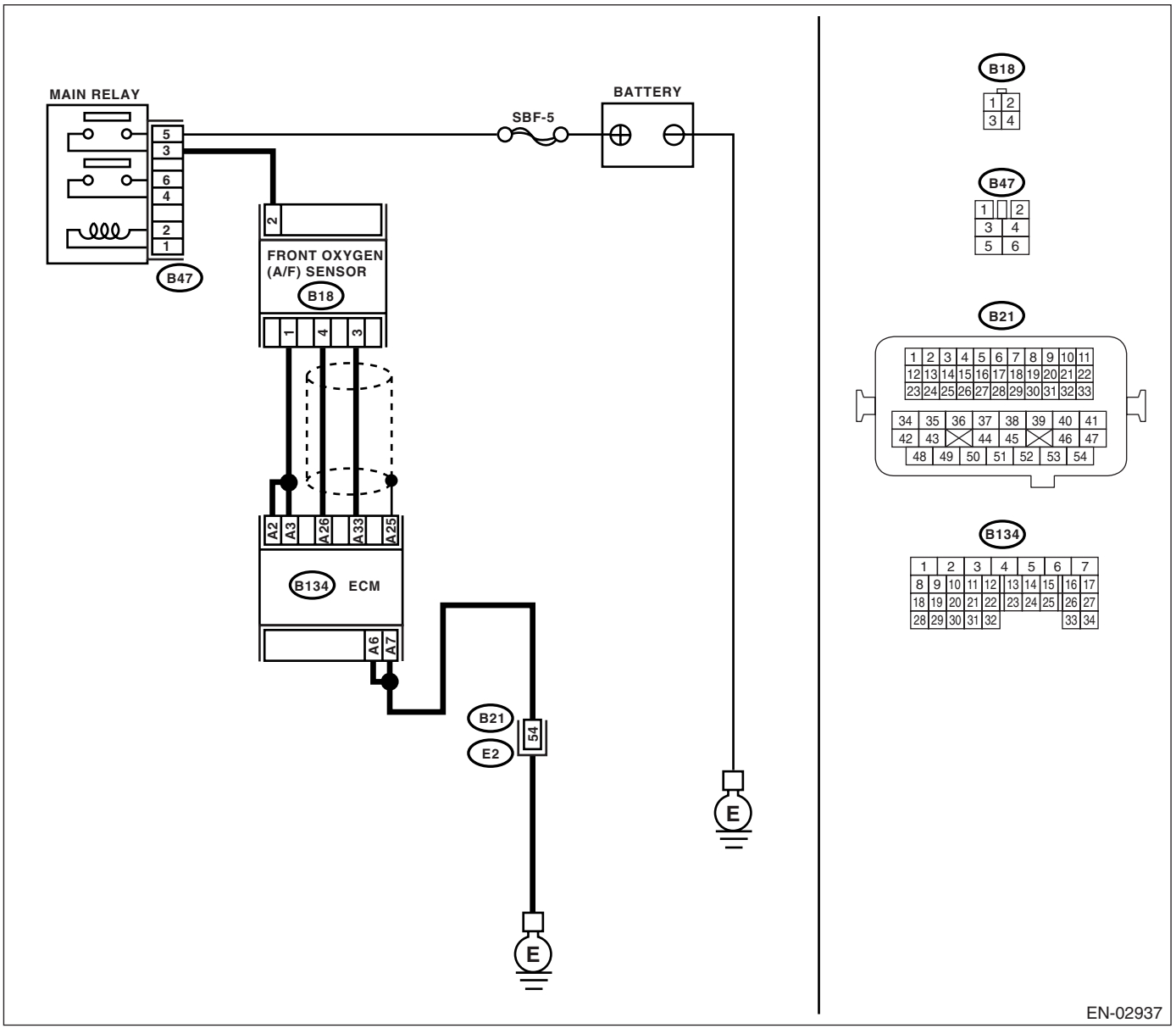
## E: DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1)

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-16, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 6 — Chassis ground:***<br>***(B136) No. 7 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **2.** | Repair the open circuit in harness between ECM connector and chassis ground. |
| 2 | **CHECK VOLTAGE BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 2 (+) — Chassis ground (−):***<br>***(B137) No. 3 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. | Repair the poor contact in ECM connector. |

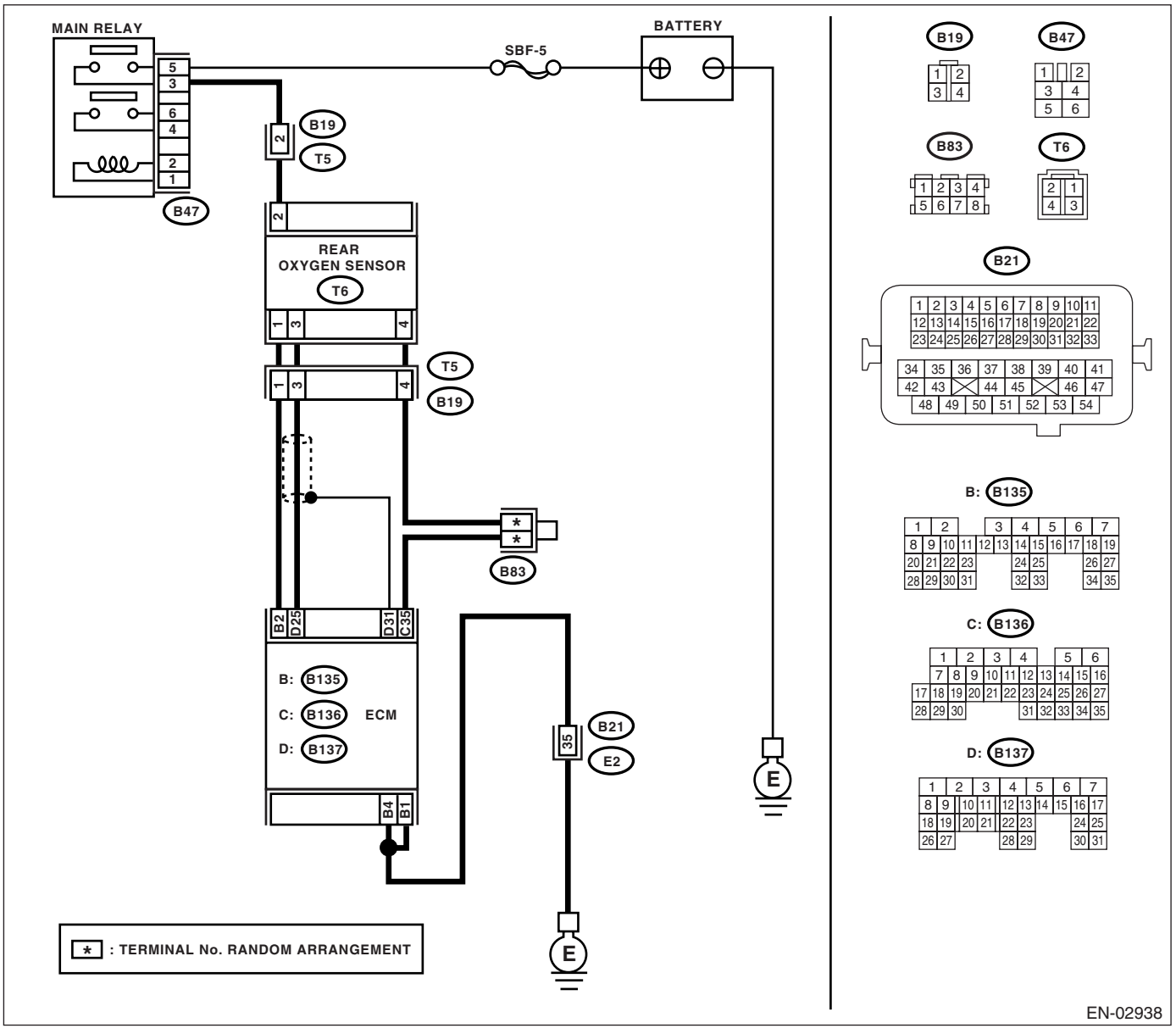
## F: DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-18, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 1 — Chassis ground:***<br>***(B135) No. 4 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **2.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and engine ground cable<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>1) Disconnect the connector from rear oxygen sensor.<br>2) Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 2 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **3.** | Repair the ground short circuit in harness between ECM and rear oxygen sensor connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 2 — Chassis ground:*** | Does the resistance change by shaking the ECM harness and connector? | Repair the poor contact in ECM connector. | Go to step **4.** |
| 4 | **CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between rear oxygen sensor connector and chassis ground.<br>***Connector & terminal***<br>***(T6) No. 2 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **5.** | Repair the power supply line.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and rear oxygen sensor connector<br>• Poor contact in main relay connector<br>• Poor contact in coupling connector<br>• Malfunction in main relay |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between rear oxygen sensor connector terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 30 Ω? | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> |

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

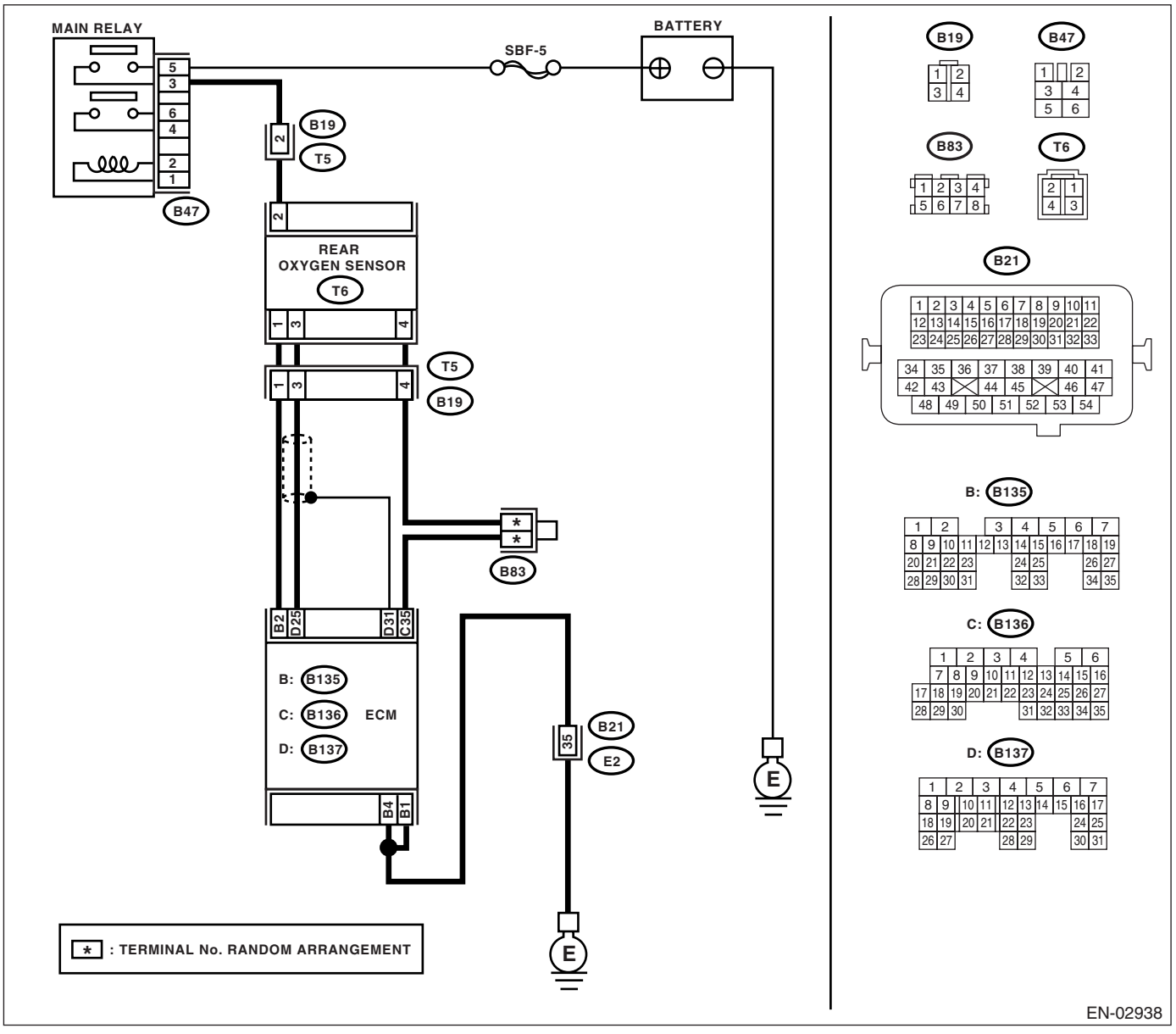
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-20, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 4 — Chassis ground:***<br>***(B135) No. 1 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **2.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and engine ground cable<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 2 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and rear oxygen sensor. | Repair the poor connection in ECM connector. |

## H: DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-22, DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

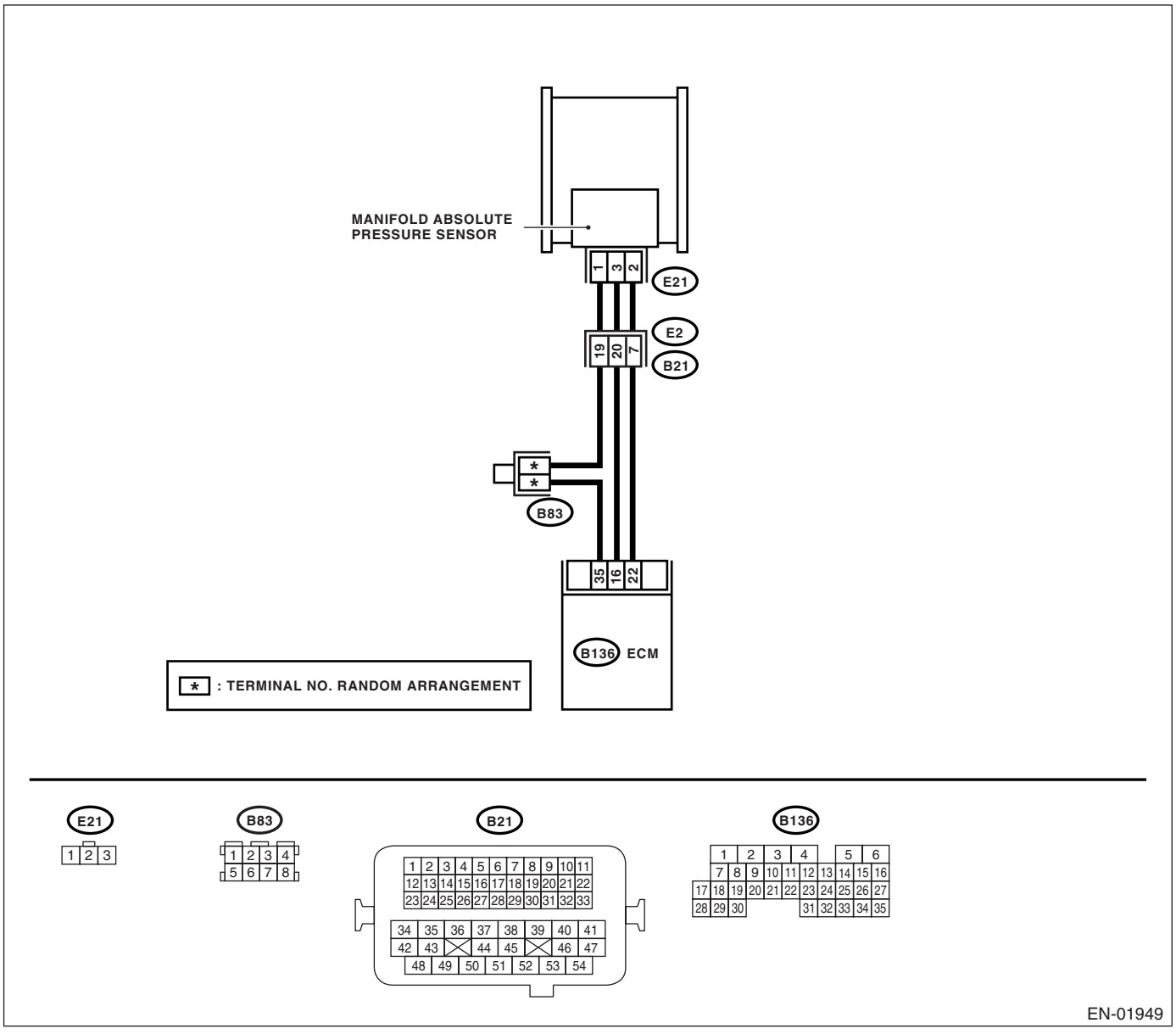
**TROUBLE SYMPTOM:**

Failure of engine to start

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK IDLE SWITCH SIGNAL.**<br>1) Turn the ignition switch to ON.<br>2) Operate the LED operation mode for engine using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the “LED OPERATION MODE FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Does the LED of {Idle Switch Signal} come on? | Go to step **2.** | Check the throttle position sensor circuit. <Ref. to EN(H4DOTC)(diag)-321, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A”/“B” VOLTAGE RATIONALITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0106. |
| 2 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC. “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0106. | Go to step **3.** |
| 3 | **CHECK CONDITION OF MANIFOLD ABSOLUTE PRESSURE SENSOR.** | Is the manifold absolute pressure sensor installation bolt tightened securely? | Go to step **4.** | Tighten the manifold absolute pressure sensor installation bolt securely. |
| 4 | **CHECK CONDITION OF THROTTLE BODY.** | Is the throttle body installation bolt tightened securely? | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-28, Manifold Absolute Pressure Sensor.> | Tighten the throttle body installation bolt securely. |

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-24, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

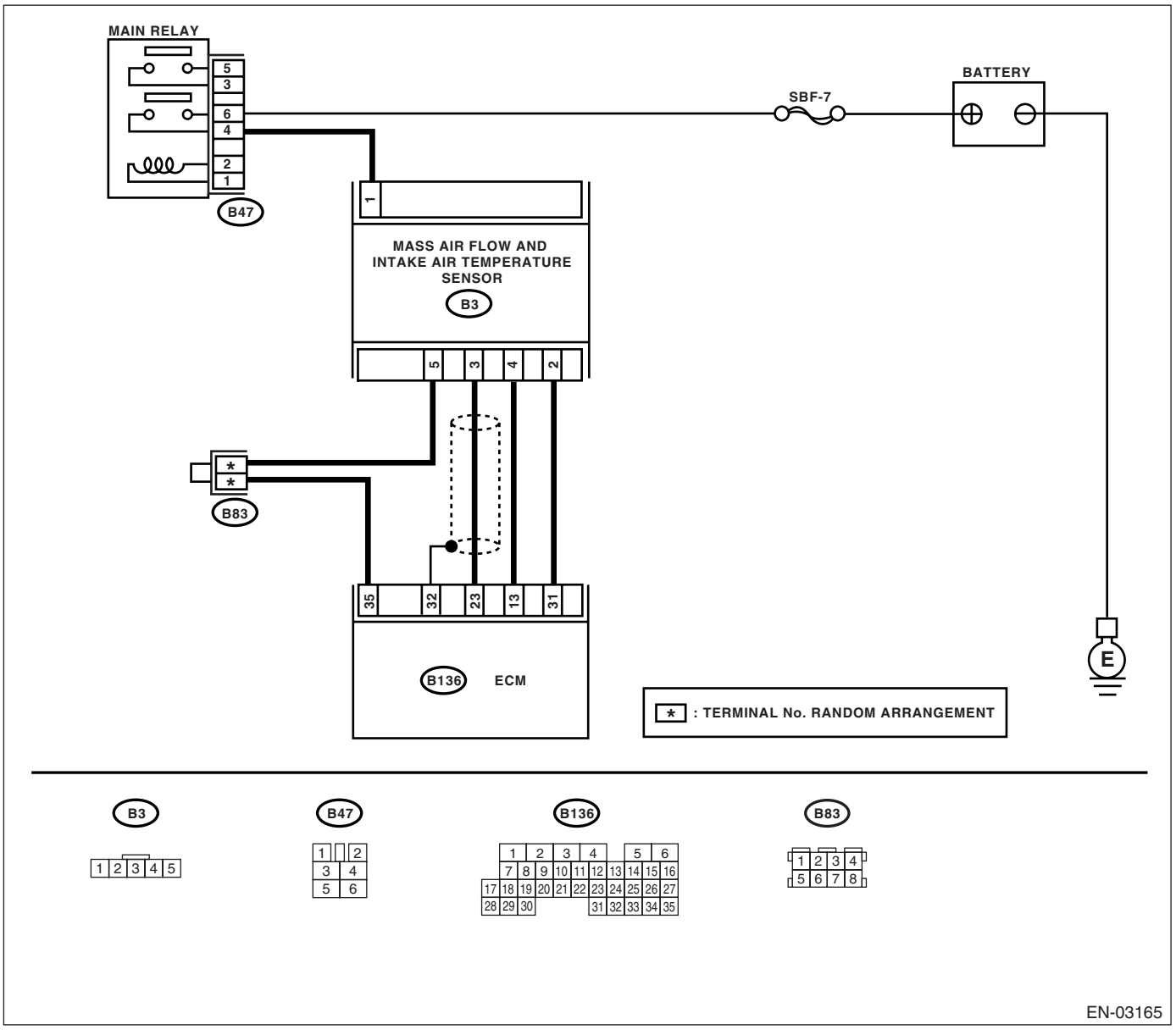
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0101. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-27, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

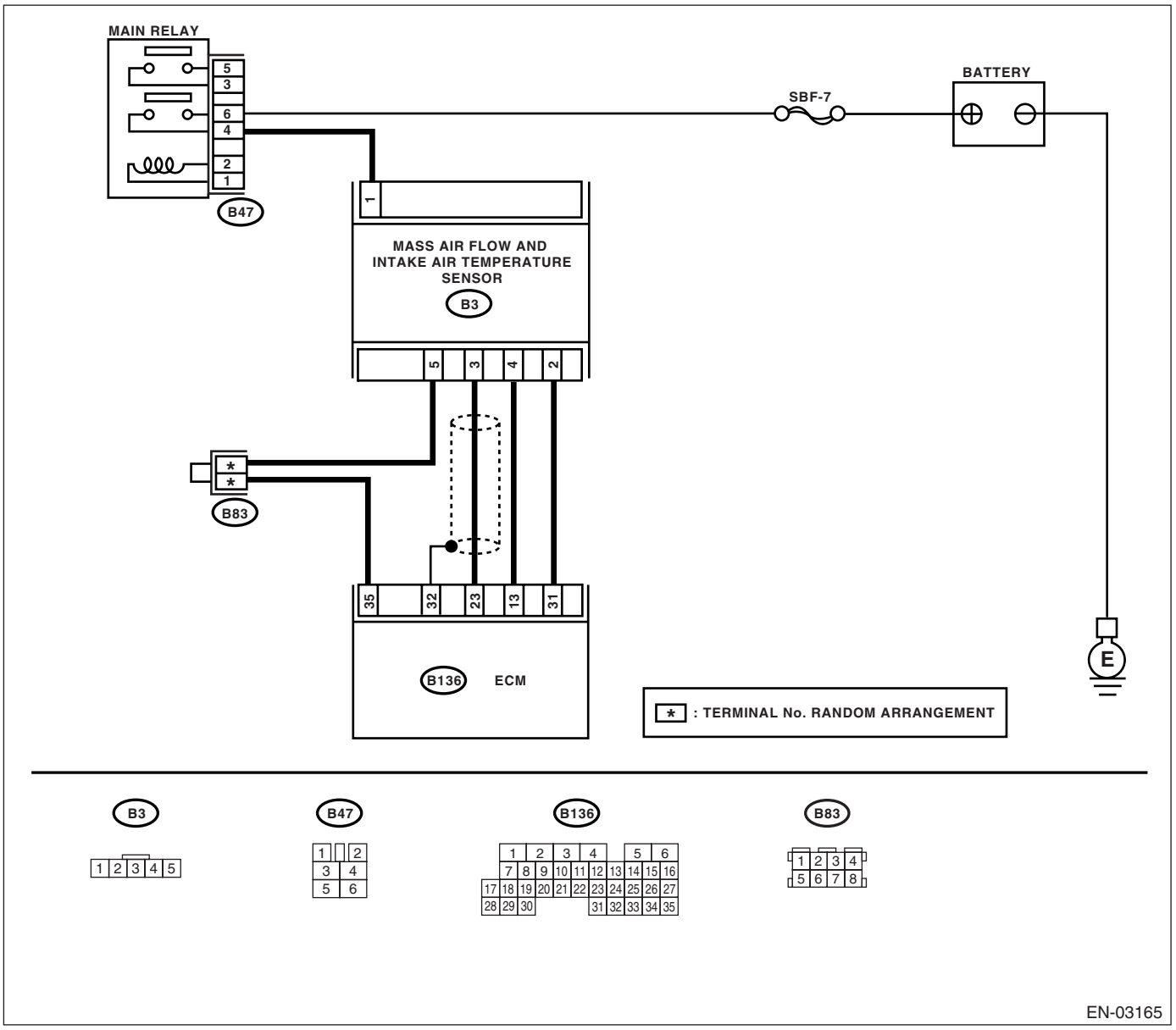
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **READ THE DATA CONNECTING SUBARU SELECT MONITOR OR GENERAL SCAN TOOL.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the Subaru Select Monitor to data link connector.<br>3) Turn the ignition switch to ON, and the Subaru Select Monitor switch to ON.<br>4) Start and idle the engine.<br>5) Read the voltage of mass air flow sensor using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | 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.<br>NOTE:<br>In this case, repair the following:<br>• Open or ground short circuit in harness between mass air flow sensor and ECM connector<br>• Poor contact in mass air flow sensor or ECM connector | Go to step **2.** |
| 2 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM connector and chassis ground while engine is idling.<br>***Connector & terminal***<br>***(B136) No. 23 (+) — Chassis ground (−):*** | Is the voltage more than 0.2 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).**<br>Measure the voltage between ECM connector and chassis ground while engine is idling. | 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. | Replace and check it again because of ECM malfunction possibility. |
| 4 | **CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from mass air flow sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure voltage between mass air flow sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B3) No. 1 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **5.** | Repair the open circuit between mass air flow sensor and main relay. |
| 5 | **CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM and mass air flow sensor connector.<br>***Connector & terminal***<br>***(B136) No. 23 — (B3) No. 3:***<br>***(B136) No. 31 — (B3) No. 2:***<br>***(B136) No. 35 — (B3) No. 5:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the open circuit between ECM and mass air flow sensor connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.**<br>Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 23 — Chassis ground:***<br>***(B136) No. 31 — Chassis ground:***<br>***(B136) No. 35 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **7.** | Repair the ground short circuit between ECM and mass air flow sensor connector. |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in mass air flow sensor connector. | Is there poor contact in mass air flow sensor connector? | Repair the poor contact in mass air flow sensor connector. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-29, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

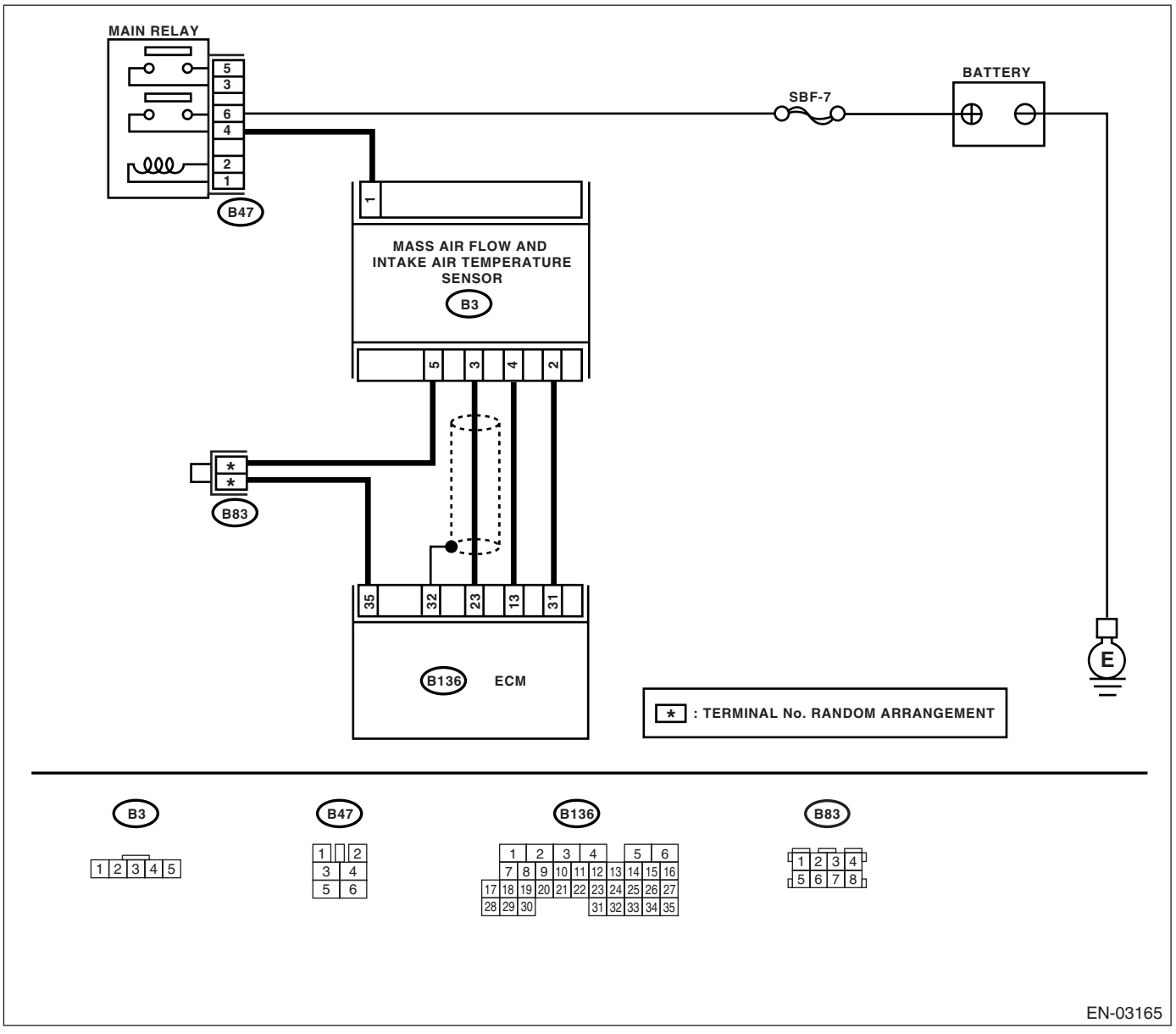
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **READ THE DATA CONNECTING SUBARU SELECT MONITOR OR GENERAL SCAN TOOL.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the Subaru Select Monitor to data link connector.<br>3) Turn the ignition switch to ON, and the Subaru Select Monitor switch to ON.<br>4) Start and idle the engine.<br>5) Read the voltage of mass air flow sensor using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | 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.** |
| 2 | **CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from mass airflow sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure voltage between mass air flow sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B3) No. 3 (+) — Chassis ground (−):*** | Is the voltage more than 5 V? | Repair the battery short circuit in harness between mass air flow sensor connector and ECM connector. | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM connector and mass air flow sensor connector.<br>***Connector & terminal***<br>***(B3) No. 2 — (B136) No. 31:*** | Is the resistance less than 1 Ω? | Replace the mass air flow sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> | Repair the open circuit in harness between mass air flow sensor connector and ECM connector. |

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

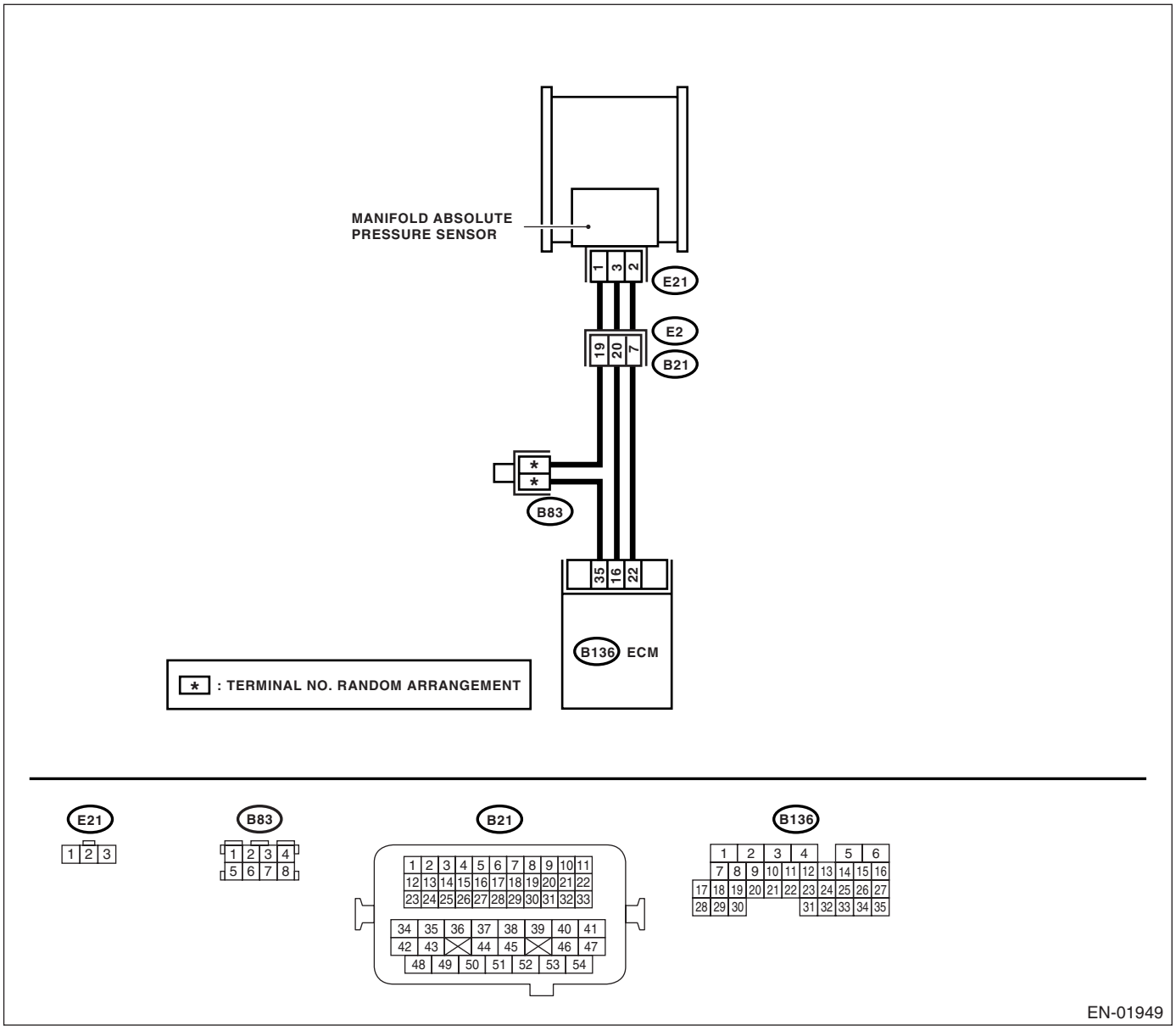
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-31, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/ BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Go to step **3.** | Go to step **2.** |
| 2 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | 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. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 3 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 22 (+) — Chassis ground (–):*** | Is the voltage less than 0.7 V? | Go to step **4.** | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 4 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from manifold absolute pressure sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between manifold absolute pressure sensor connector and engine ground.<br>***Connector & terminal***<br>***(E21) No. 3 (+) — Engine ground (–):*** | 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. |
| 5 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (E21) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector. |
| 6 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground.<br>***Connector & terminal***<br>***(E21) No. 1 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **7.** | Repair the ground short circuit in harness between ECM and manifold absolute pressure sensor connector. |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in manifold absolute pressure sensor connector. | Is there poor contact in manifold absolute pressure sensor connector? | Repair the poor contact in manifold absolute pressure sensor connector. | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |

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

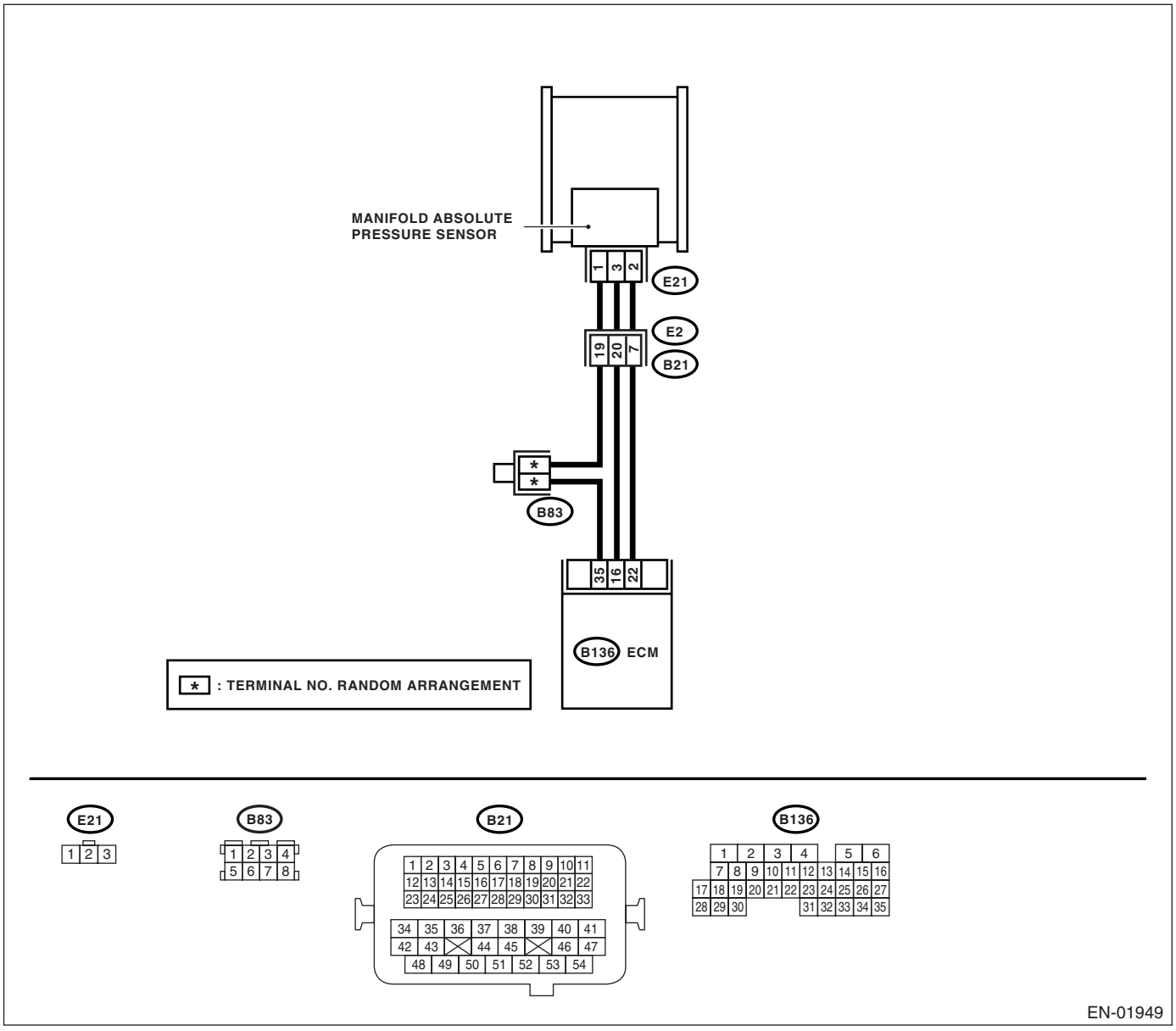
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-33, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/ BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Go to step **3.** | Go to step **2.** |
| 2 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | 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. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 3 | **CHECK INPUT SIGNAL FROM ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 22 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Go to step **4.** | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 4 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from manifold absolute pressure sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between manifold absolute pressure sensor connector and engine ground.<br>***Connector & terminal***<br>***(E21) No. 3 (+) — Engine ground (–):*** | 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. |
| 5 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.<br>***Connector & terminal***<br>***(B136) No. 22 — (E21) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector. |
| 6 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (E21) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **7.** | Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector. |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in manifold absolute pressure sensor connector. | Is there poor contact in manifold absolute pressure sensor connector? | Repair the poor contact in manifold absolute pressure sensor connector. | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-28, Manifold Absolute Pressure Sensor.> |

## N: DTC P0111 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-35, DTC P0111 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

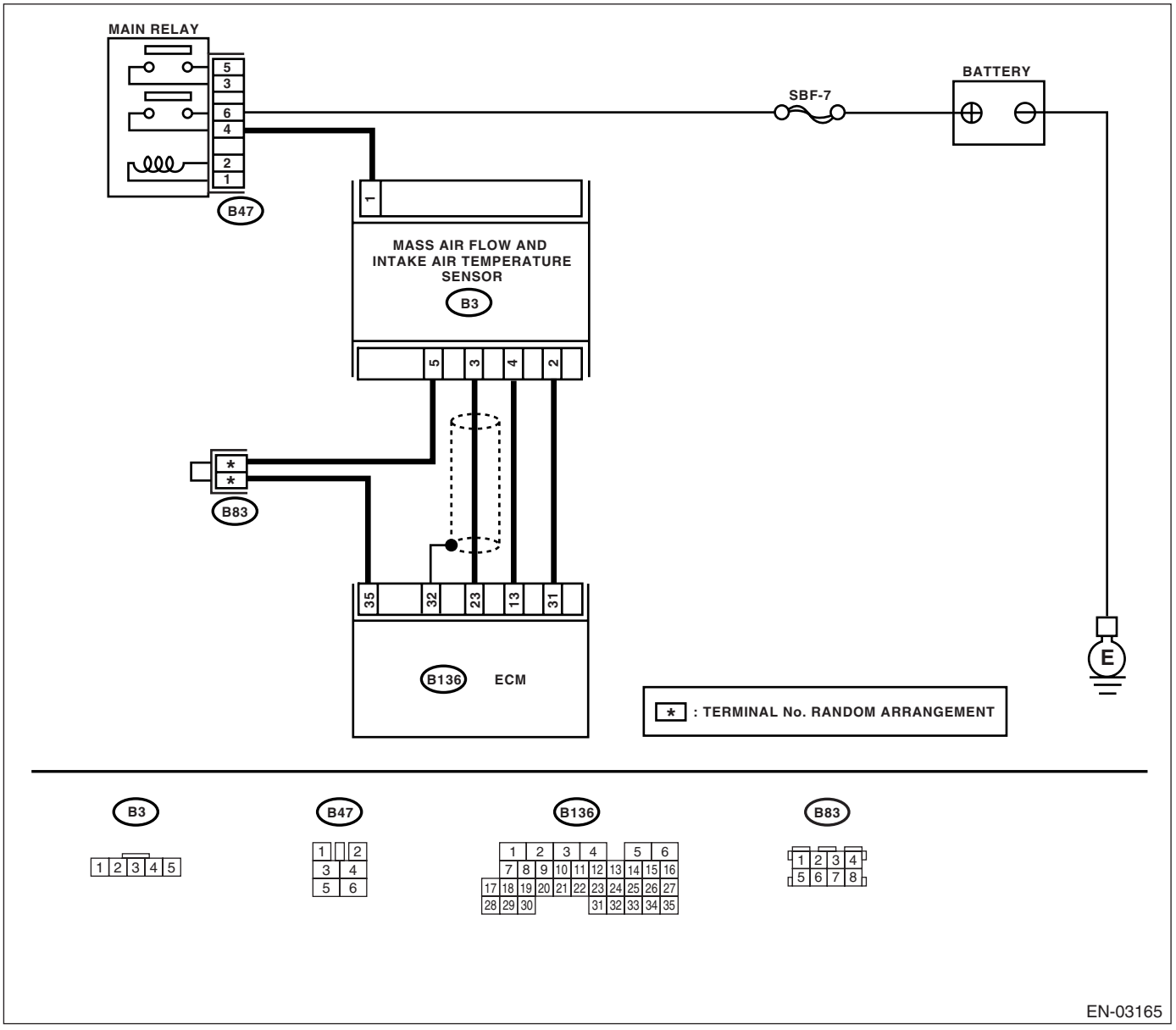
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0111. | Go to step **2.** |
| 2 | **CHECK ENGINE COOLANT TEMPERATURE.**<br>1) Start the engine and warm it up completely.<br>2) Measure the engine coolant temperature using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the general scan tool instruction manual. | Is the engine coolant temperature 75°C (167°F) to 95°C (203°F)? | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> | Inspect the DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-37, DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

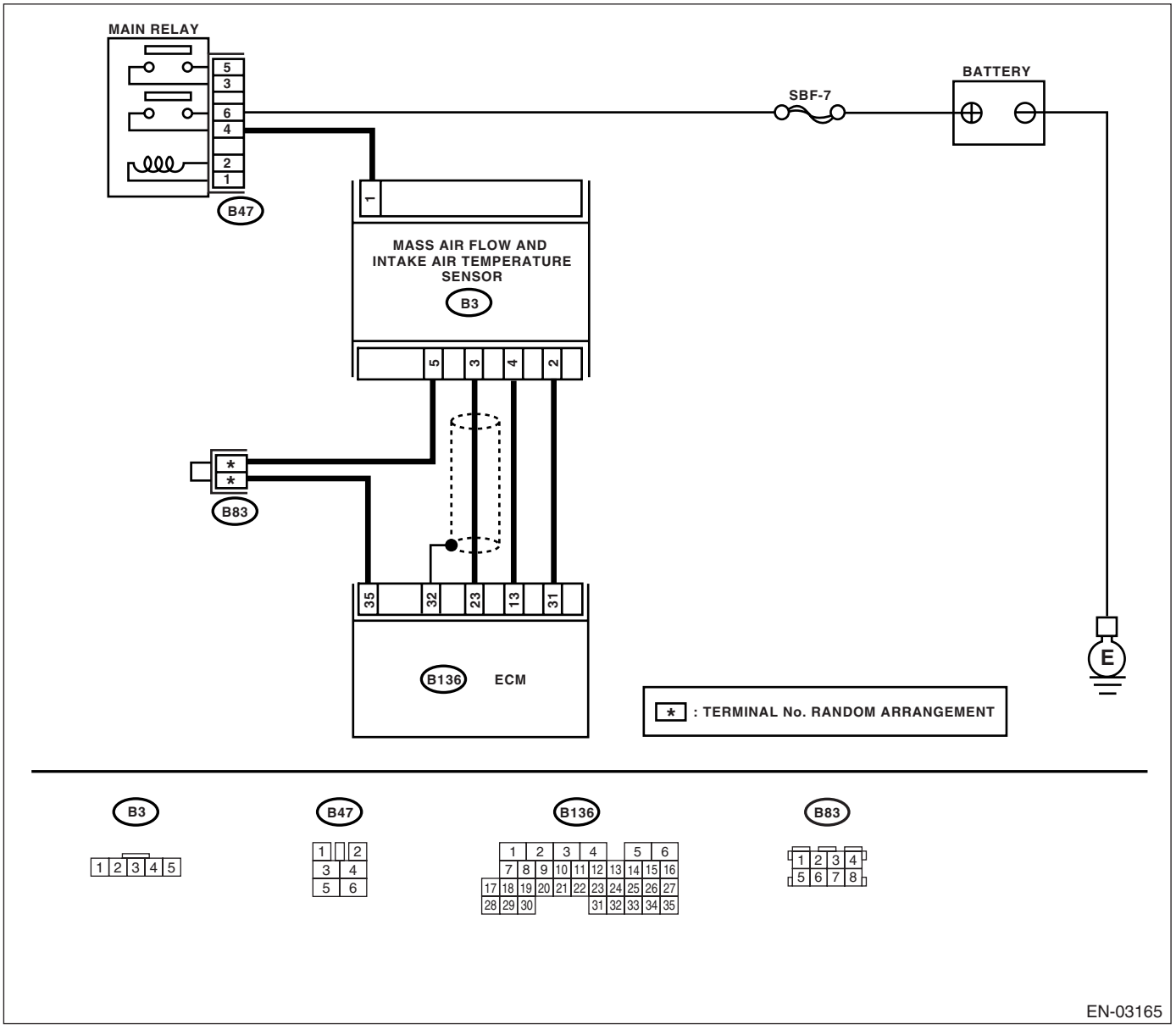
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is intake air temperature more than 55°C (131°F)? | Go to step **2.** | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in mass air flow and intake air temperature sensor<br>• Poor contact in ECM<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from mass air flow and intake air temperature sensor.<br>3) Turn the ignition switch to ON.<br>4) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the value less than –36°C (–33°F)? | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> | Repair the ground short circuit in harness between mass air flow and intake air temperature sensor and ECM connector. |

# P: DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-39, DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

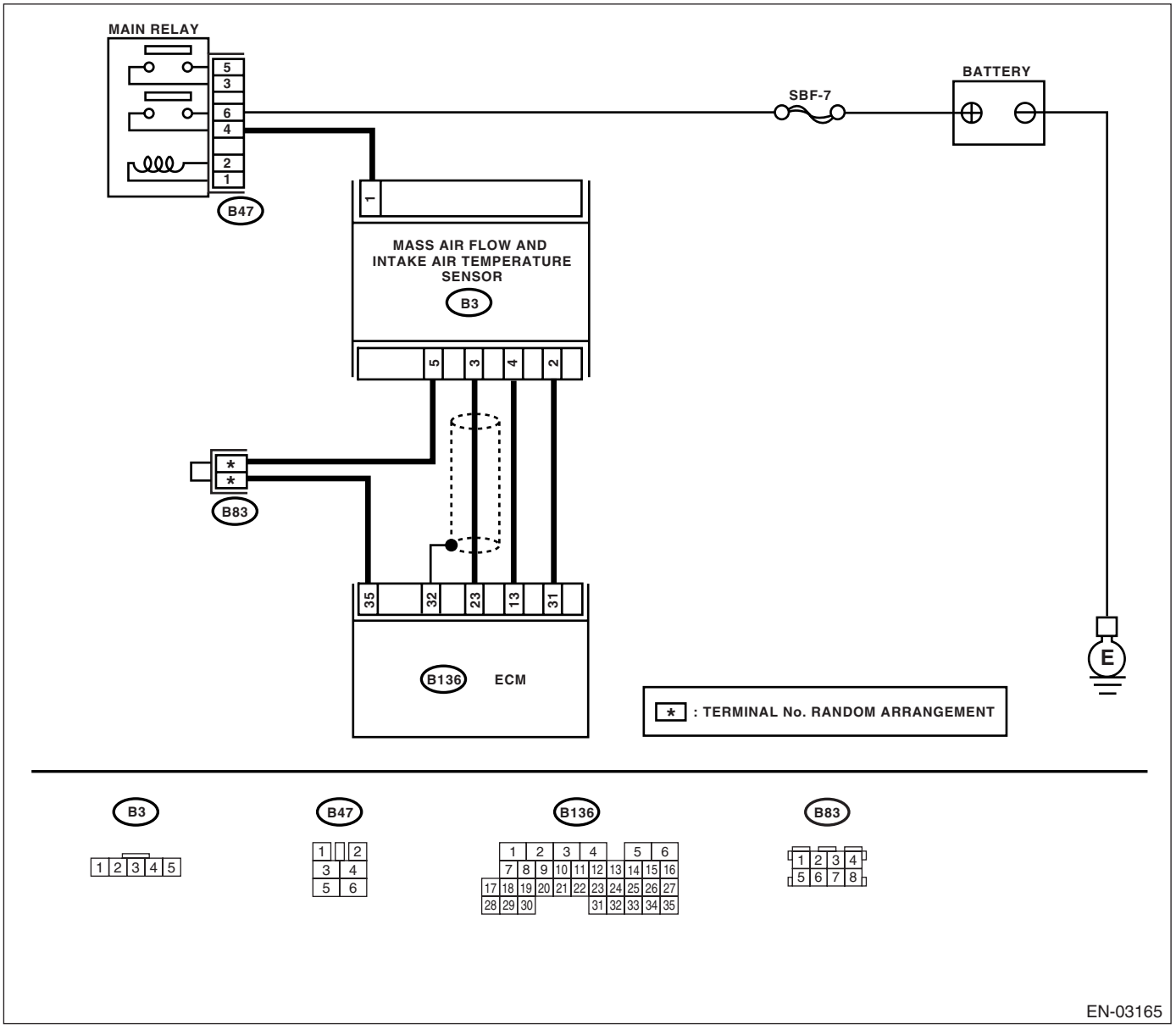
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the value less than –36°C (–33°F)? | Go to step **2.** | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in mass air flow and intake air temperature sensor<br>• Poor contact in ECM<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from mass air flow and intake air temperature sensor.<br>3) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B3) No. 4 (+) — Engine ground (–):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector. | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B3) No. 4 (+) — Engine ground (–):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between mass air flow and intake air temperature sensor and ECM connector. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B3) No. 4 (+) — Engine ground (–):*** | Is the voltage more than 4 V? | Go to step **5.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in ness between mass air flow and intake air temperature sensor and ECM connector<br>• Poor contact in mass air flow and intake air temperature sensor<br>• Poor contact in ECM<br>• Poor contact in joint connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK HARNESS BETWEEN MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between mass air flow and intake air temperature sensor and engine ground.<br>***Connector & terminal***<br>***(B3) No. 5 — Engine ground:*** | Is the resistance less than 5 Ω? | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in ness between mass air flow and intake air temperature sensor and ECM connector<br>• Poor contact in mass air flow and intake air temperature sensor<br>• Poor contact in ECM<br>• Poor contact in joint connector |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-41, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

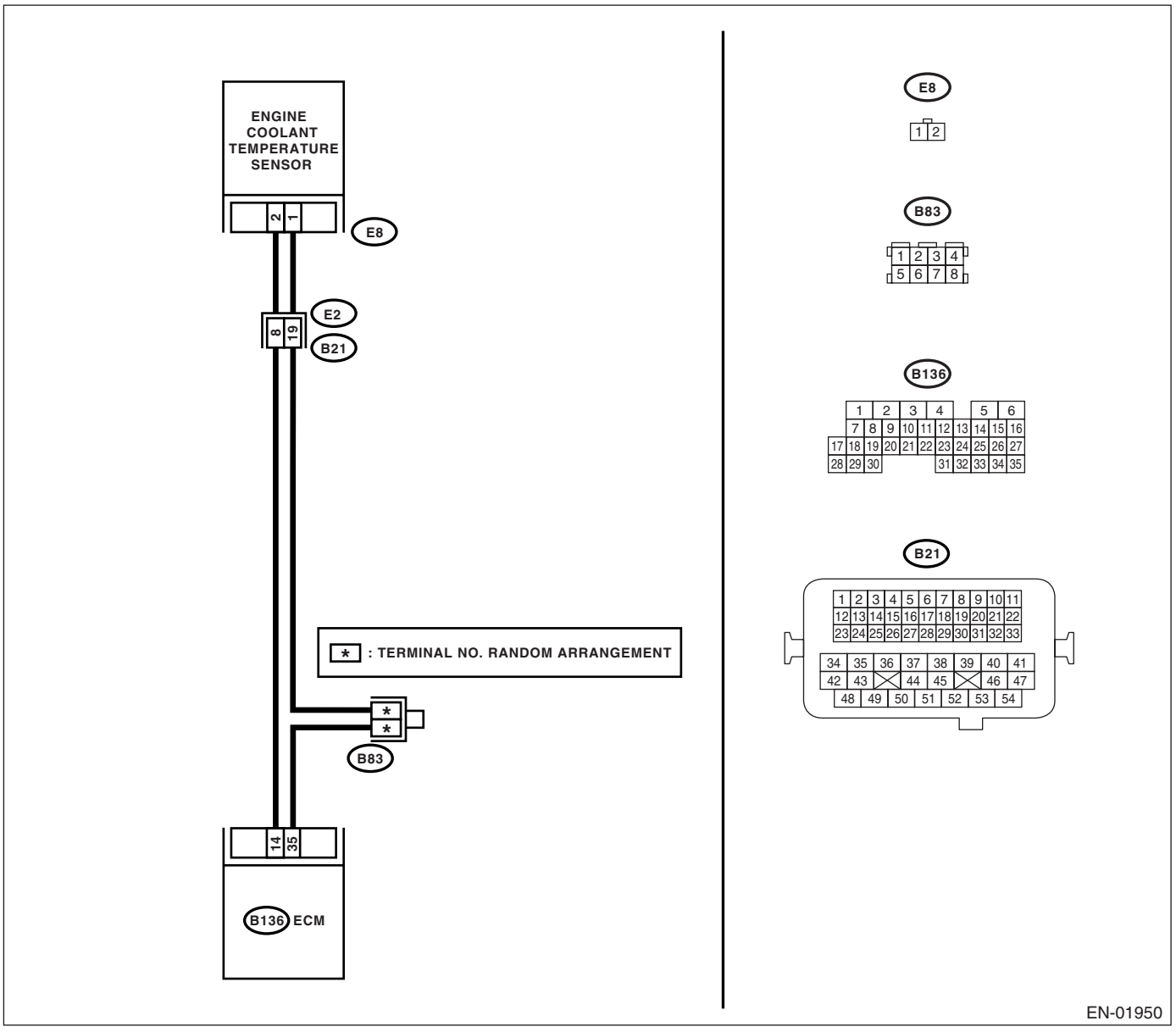
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is engine coolant temperature more than 120°C (248°F)? | Go to step **2.** | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in engine coolant temperature sensor<br>• Poor contact in ECM<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the engine coolant temperature sensor.<br>3) Turn the ignition switch to ON.<br>4) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is engine coolant temperature less than −40°C (−40°F)? | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> | Repair the ground short circuit in harness between engine coolant temperature sensor and ECM connector. |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-43, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

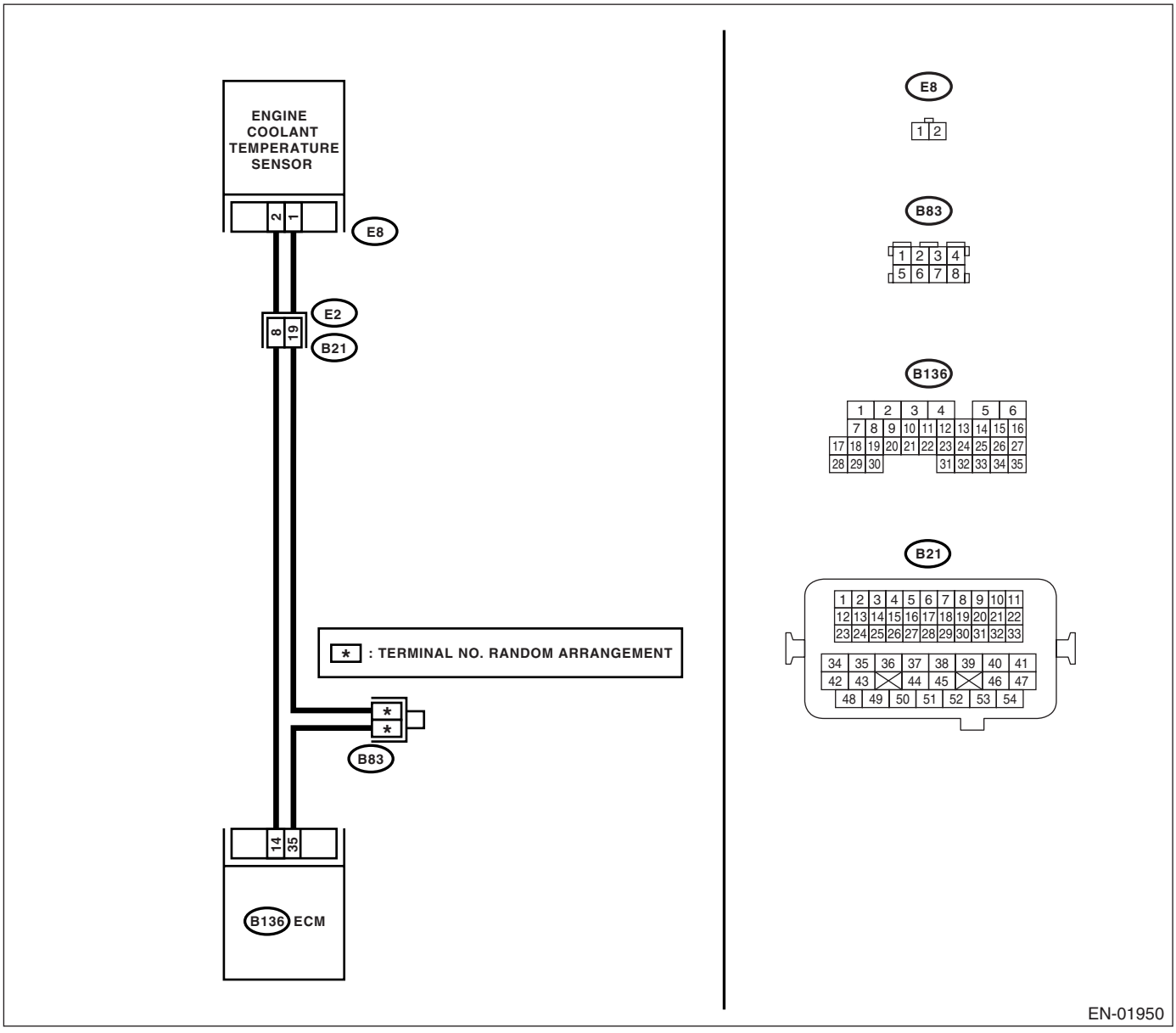
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is engine coolant temperature less than −40°C (−40°F)? | Go to step **2.** | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in engine coolant temperature sensor<br>• Poor contact in ECM<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the engine coolant temperature sensor.<br>3) Measure the voltage between engine coolant temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(E8) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and engine coolant temperature sensor connector. | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between engine coolant temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(E8) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and engine coolant temperature sensor connector. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>Measure the voltage between engine coolant temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(E8) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 4 V? | Go to step **5.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and engine coolant temperature sensor connector<br>• Poor contact in engine coolant temperature sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between engine coolant temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(E8) No. 1 — Engine ground:*** | Is the resistance less than 5 Ω? | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and engine coolant temperature sensor connector<br>• Poor contact in engine coolant temperature sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |

## S: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT LOW INPUT

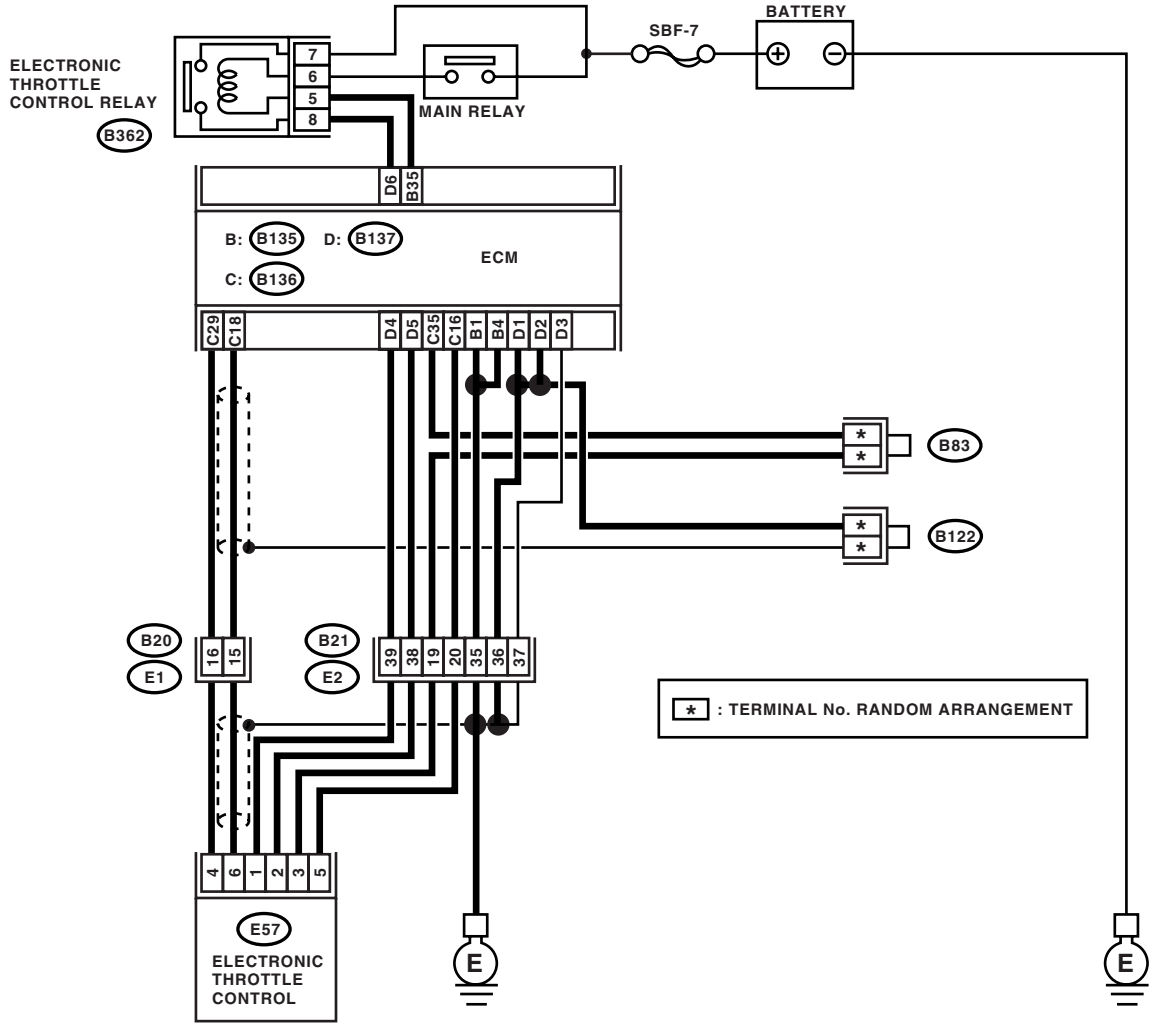
**DTC DETECTING CONDITION:**

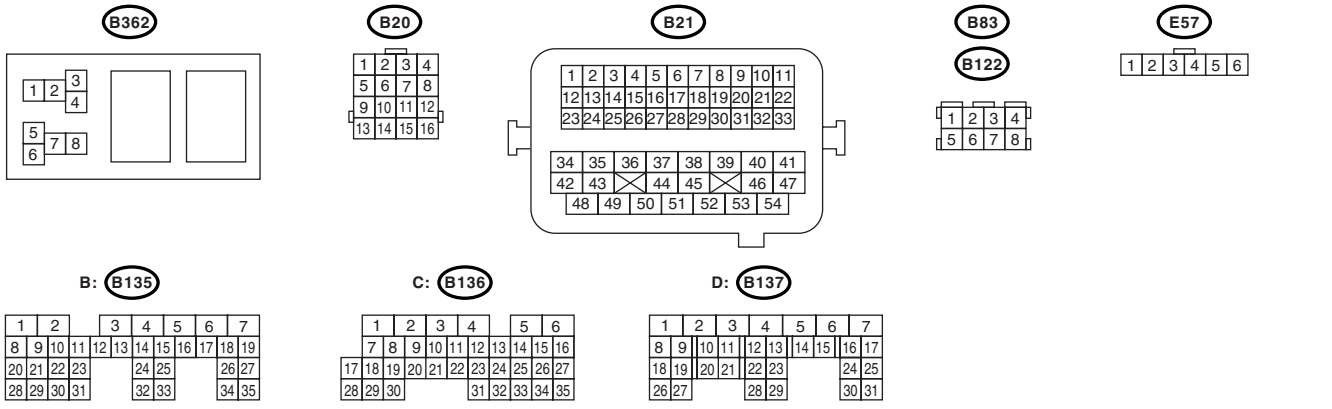
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-45, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of main throttle sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage more than 0.4 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>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. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 16 — (E57) No. 5:***<br>***(B136) No. 18 — (E57) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 18 — Chassis ground:***<br>***(B136) No. 16 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the chassis short circuit of harness. |
| 5 | **CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 5 (+) — Engine ground (−):*** | 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)-39, Engine Control Module (ECM).> |
| 6 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 — Engine ground:*** | Is the resistance more than 10 Ω? | Repair the 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)-39, Engine Control Module (ECM).> |

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

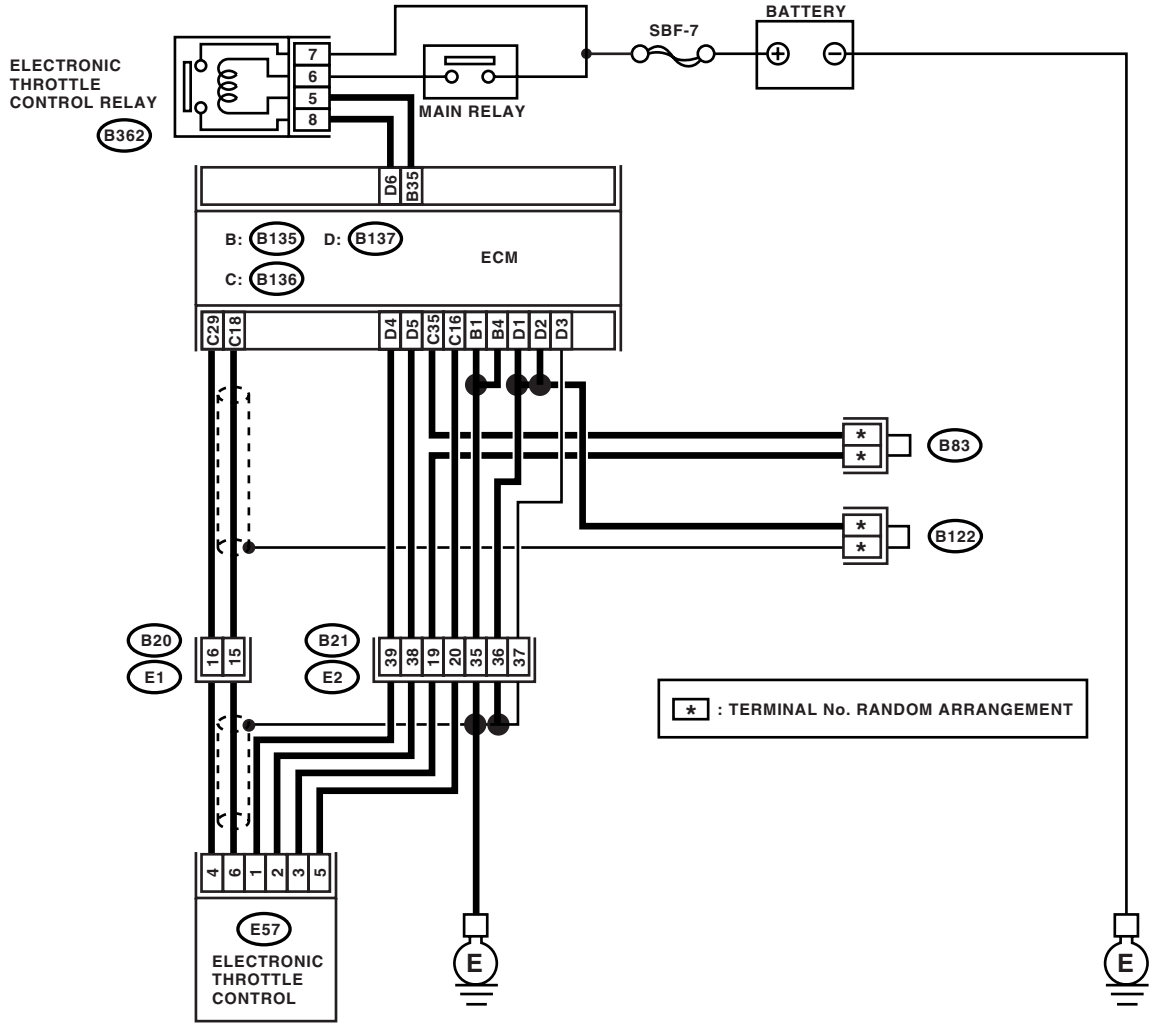
**DTC DETECTING CONDITION:**

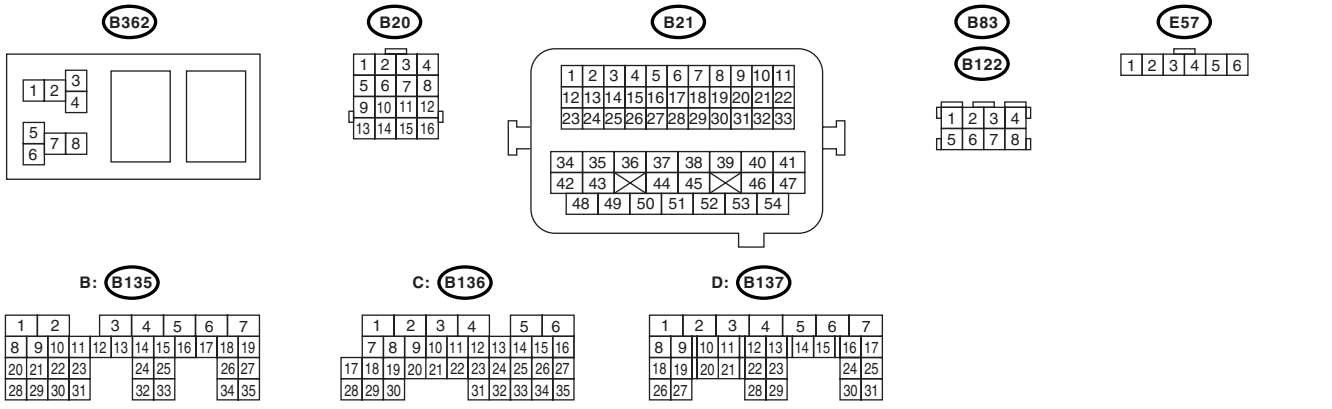
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-47, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of main throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage less than 4.63 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>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. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 18 — (E57) No. 6:***<br>***(B136) No. 35 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 (+) — Engine ground (−):***<br>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 less than 10 V? | Go to step **5.** | Repair the battery short circuit in harness between ECM connector and electronic throttle control connector. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B136) No. 18 — (B136) No. 16:*** | Is the resistance more than 1 MΩ? | Repair the poor contact in harness. Repair the electronic throttle control. | Repair the short circuit to sensor power supply. |

## U: DTC P0125 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-49, DTC P0125 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Trouble Code (DTC) Detecting Criteria.>

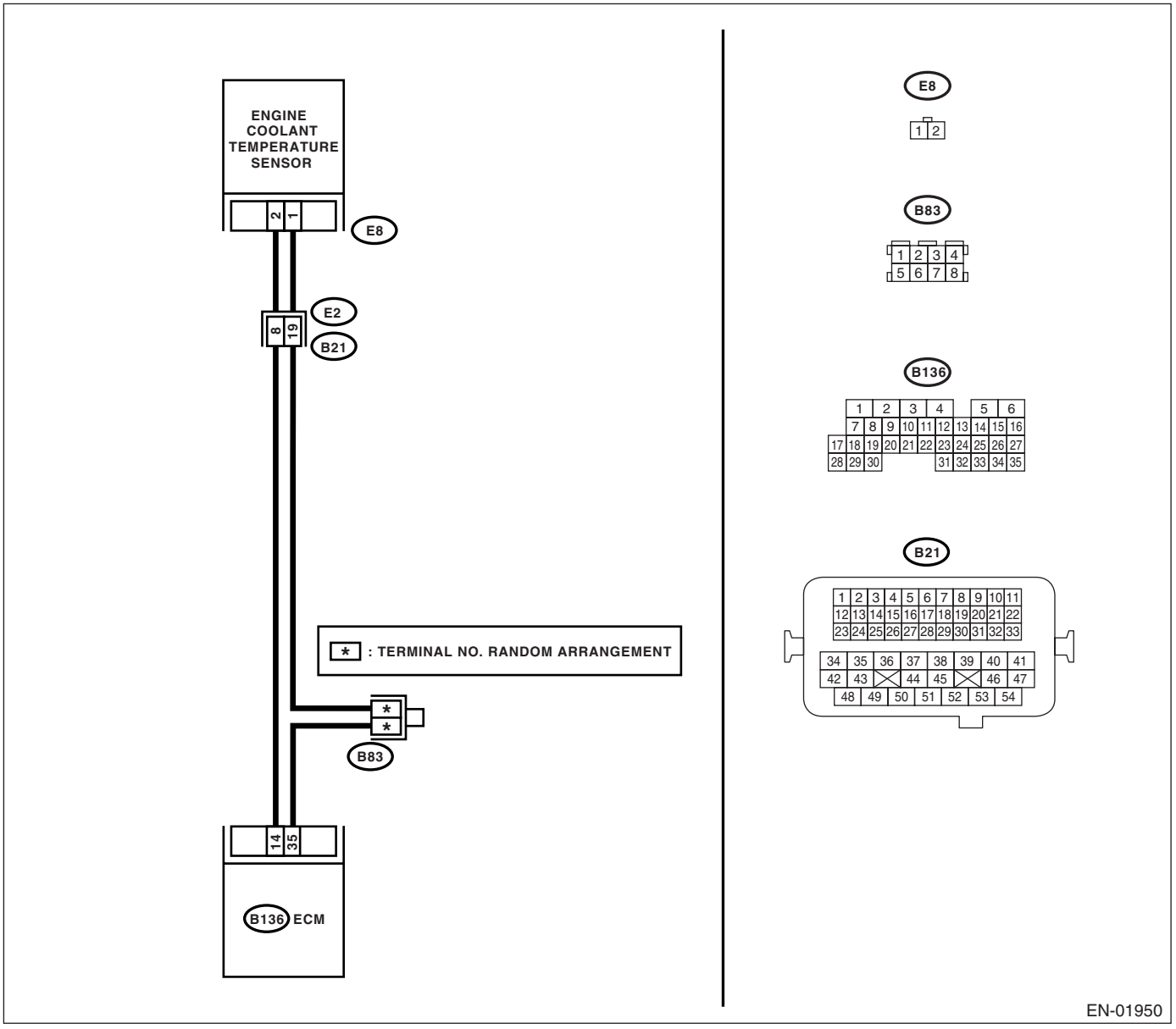
**TROUBLE SYMPTOM:**

Engine does not return to idling.

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0125. | Go to step **2.** |
| 2 | **CHECK ENGINE COOLING SYSTEM.**<br>NOTE:<br>Check the following items.<br>• Thermostat open stuck<br>• Coolant level<br>• Coolant freeze<br>• Tire diameter | Is there any fault in engine cooling system? | Replace the thermostat. <Ref. to CO(H4SO)-17, Thermostat.> | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> |

## V: DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-51, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

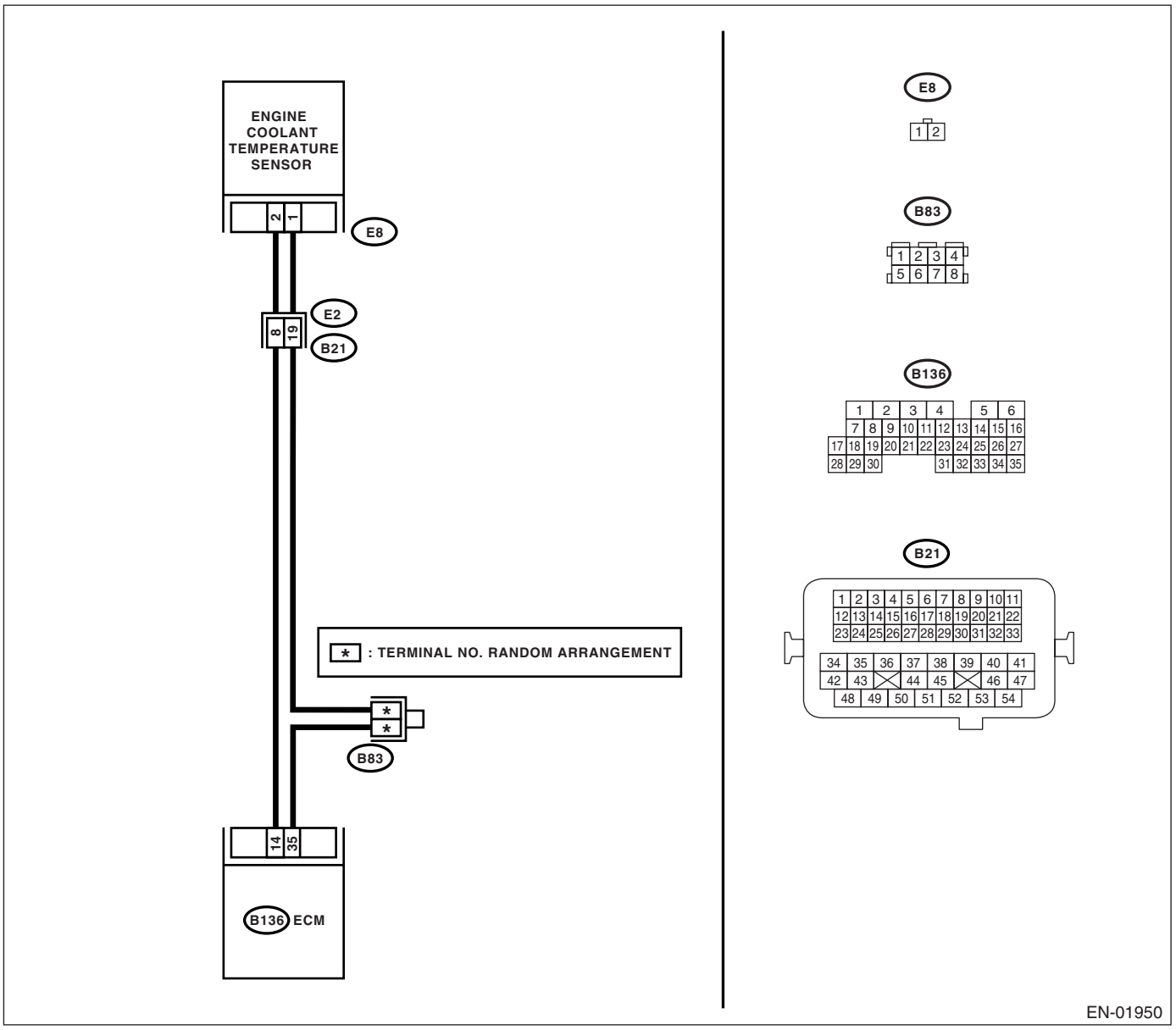
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK ENGINE COOLANT TEMPERATURE SENSOR.**<br>Measure the resistance between engine coolant temperature sensor terminals when engine coolant is cold and after warmed-up.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance of engine coolant temperature sensor different between when engine coolant is cold and after warmed-up? | Contact your SOA Service Center. | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> |

## W: DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-53, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

Thermostat remains open.

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK VEHICLE CONDITION.** | Was the vehicle driven or idled with the engine partially submerged under water? | In this case, it is not necessary to inspect DTC P0128. | Go to step **2.** |
| 2 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Codes (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **3.** |
| 3 | **CHECK ENGINE COOLANT.** | Are coolant level and mixture ratio of cooling water to antifreeze solution correct? | Go to step **4.** | Replace the engine coolant. <Ref. to CO(H4SO)-12, REPLACEMENT, Engine Coolant.> |
| 4 | **CHECK RADIATOR FAN.**<br>1) Start the engine.<br>2) Check radiator fan operation. | Does the radiator fan continuously rotate for more than 3 minutes during idling? | Repair radiator fan circuit. <Ref. to CO(H4SO)-23, Radiator Main Fan and Fan Motor.> and <Ref. to CO(H4SO)-25, Radiator Sub Fan and Fan Motor.>. | Replace the thermostat. <Ref. to CO(H4SO)-17, Thermostat.> |

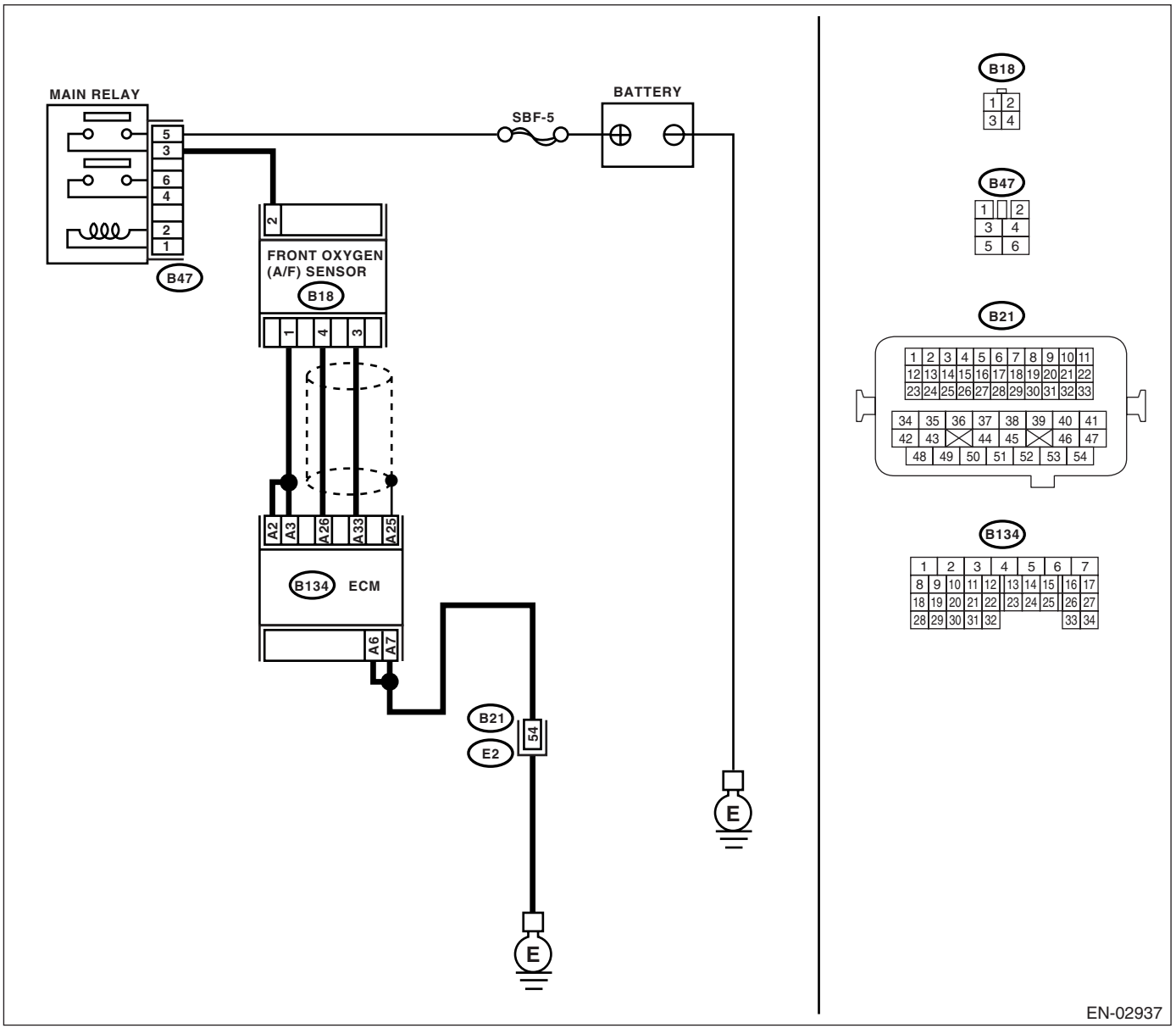
## X: DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1)

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-55, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector.<br>3) Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 — Chassis ground:***<br>***(B134) No. 33 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> | Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector. |

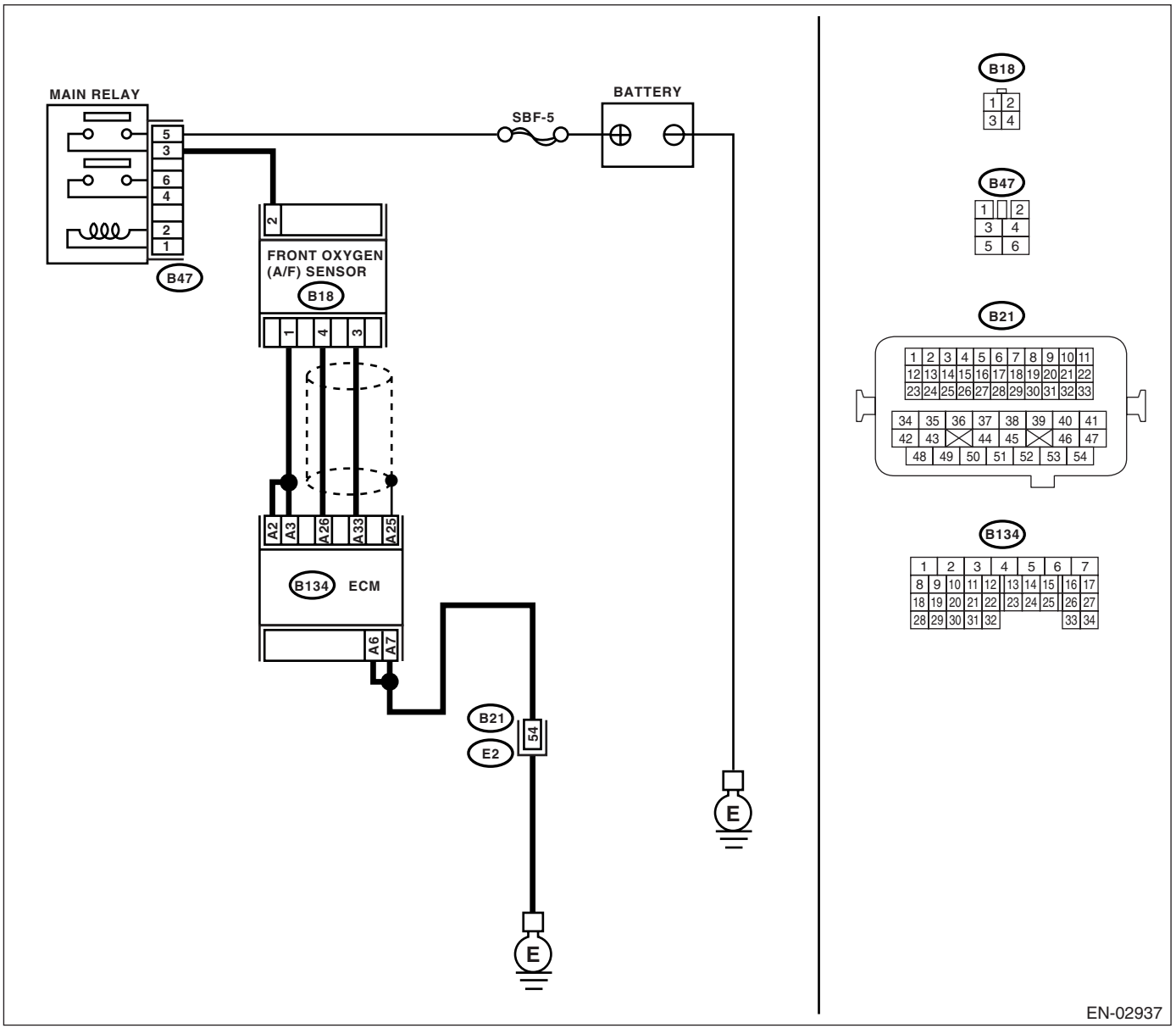
## Y: DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1)

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-57, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Disconnect the connector from front oxygen (A/F) sensor.<br>3) Measure the voltage of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the voltage more than 8 V? | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. |

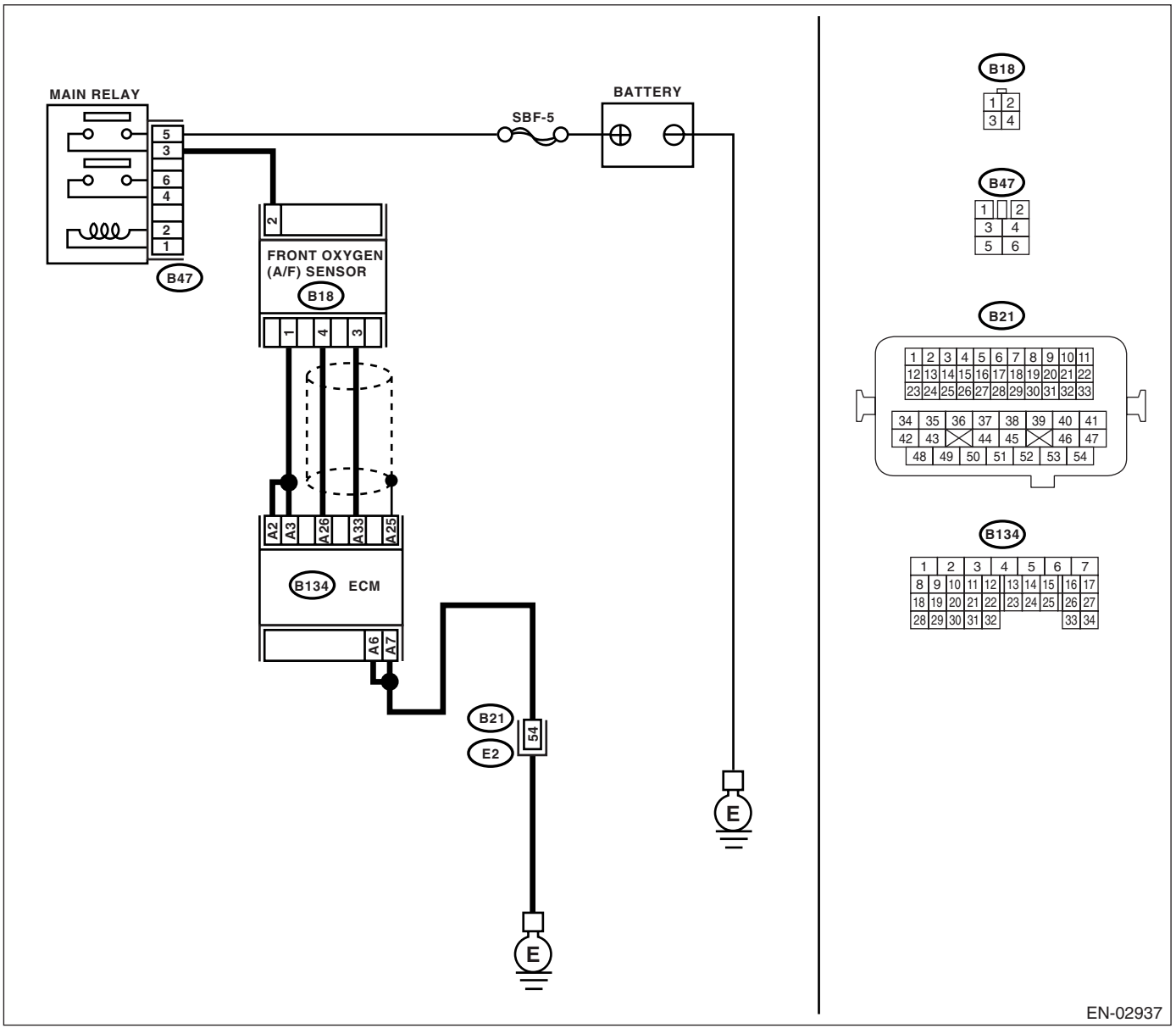
## Z: DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-59, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0133. | Go to step **2.** |
| 2 | **CHECK EXHAUST SYSTEM.**<br>NOTE:<br>Check the following items.<br>• Loose installation of front portion of exhaust pipe onto cylinder heads<br>• Loose connection between front exhaust pipe and front catalytic converter<br>• Damage of exhaust pipe resulting in a hole | Is there any fault in exhaust system? | Repair the exhaust system. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> |

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

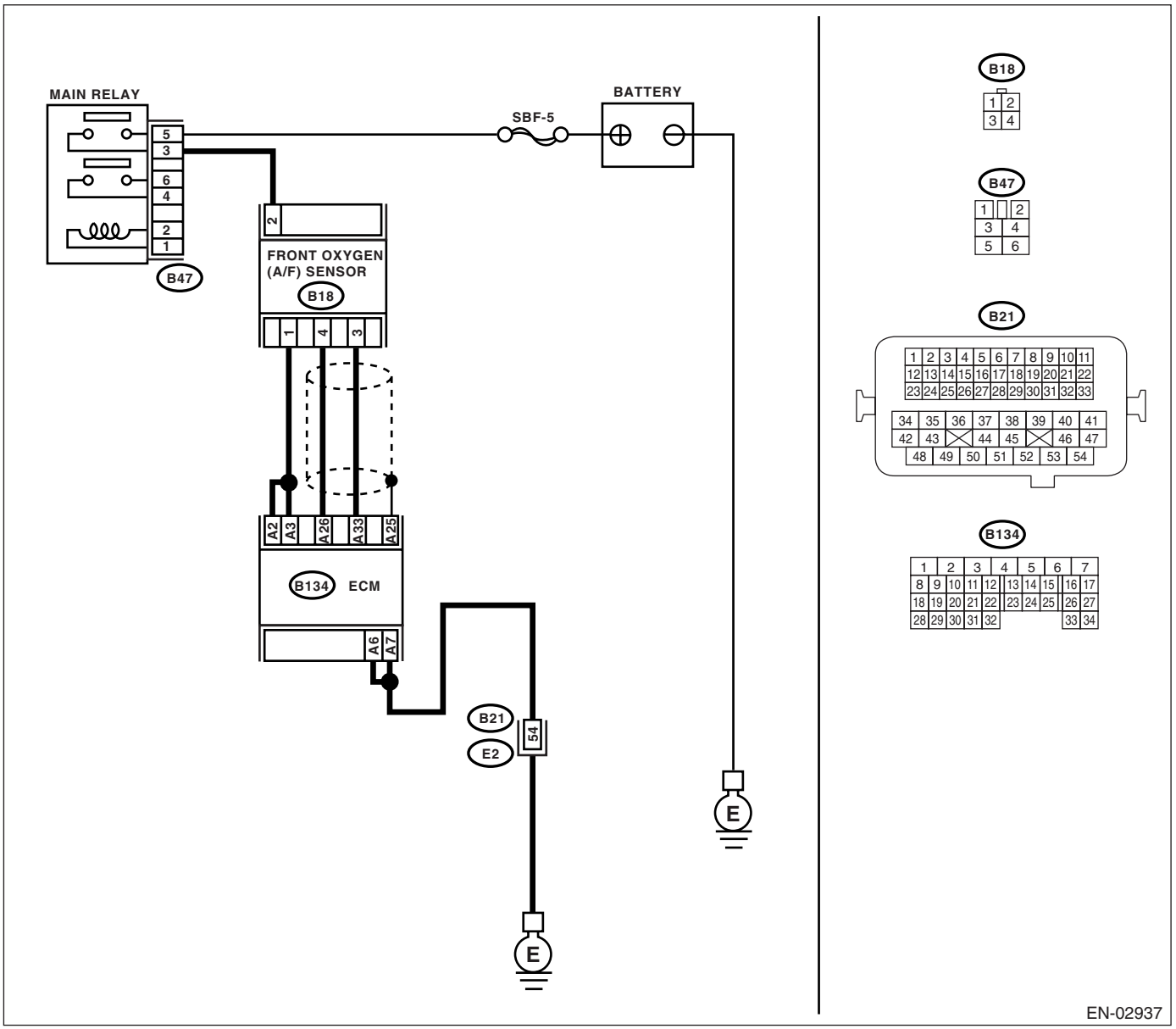
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-62, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and front oxygen (A/F) sensor.<br>3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B134) No. 26 — (B18) No. 4:***<br>***(B134) No. 33 — (B18) No. 3:*** | Is the resistance less than 1 Ω? | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> | Repair the open circuit in harness between ECM and front oxygen (A/F) sensor connector. |

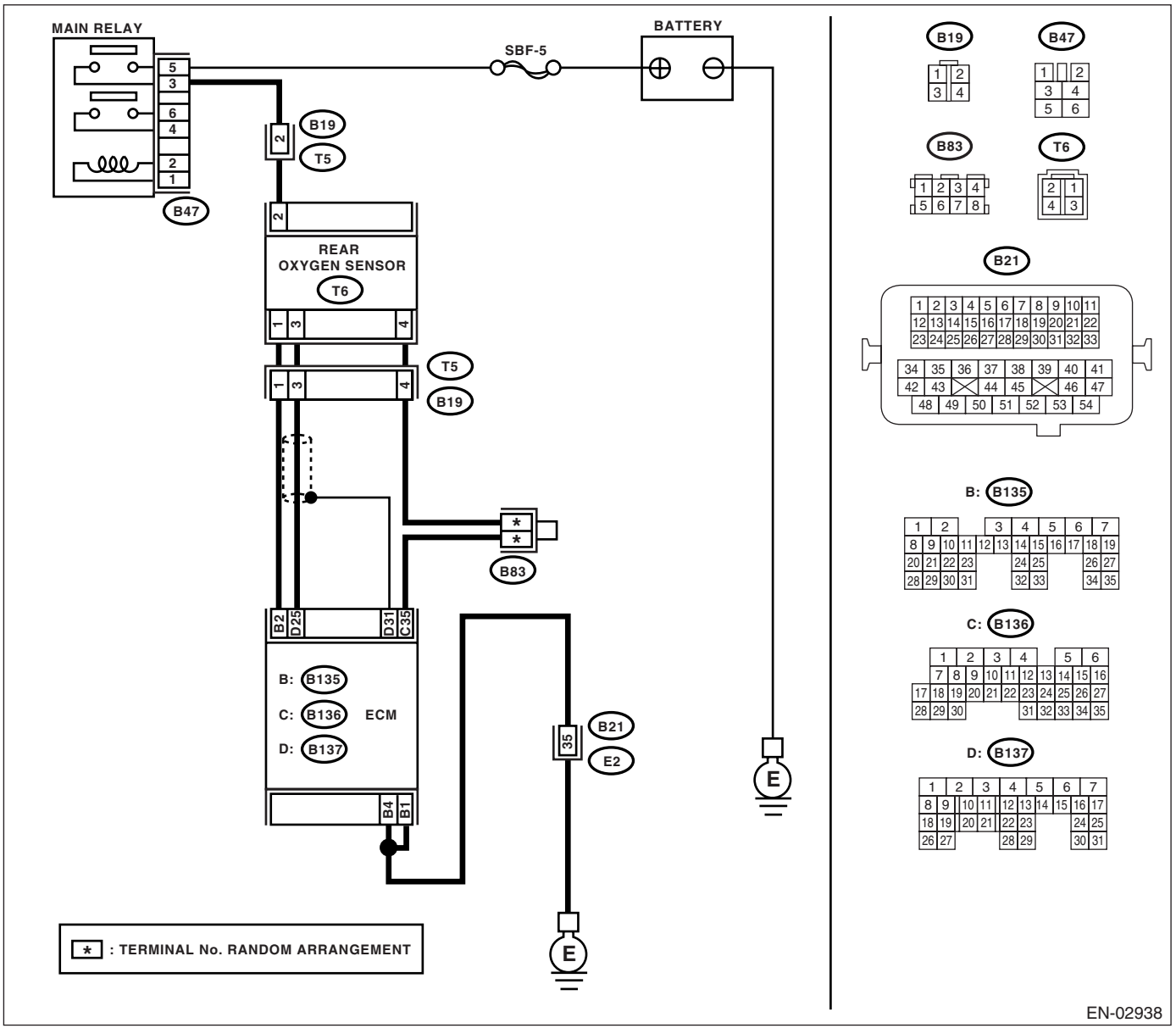
## AB:DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2)

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-64, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0137. | Go to step **2.** |
| 2 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 5,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the voltage more than 490 mV? | Go to step **5.** | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and rear oxygen sensor.<br>3) Measure the resistance in harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the resistance more than 3 Ω? | Repair the open circuit in harness between ECM and rear oxygen sensor connector. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor harness connector and chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Chassis ground (−):*** | Is the voltage 0.2 — 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK EXHAUST SYSTEM.**<br>Check exhaust system parts.<br>NOTE:<br>Check the following items:<br>• Loose part of exhaust system and incomplete installation<br>• Damage (crack, hole etc.) of parts<br>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor | Is there any fault in exhaust system? | Repair or replace the faulty part. | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> |

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

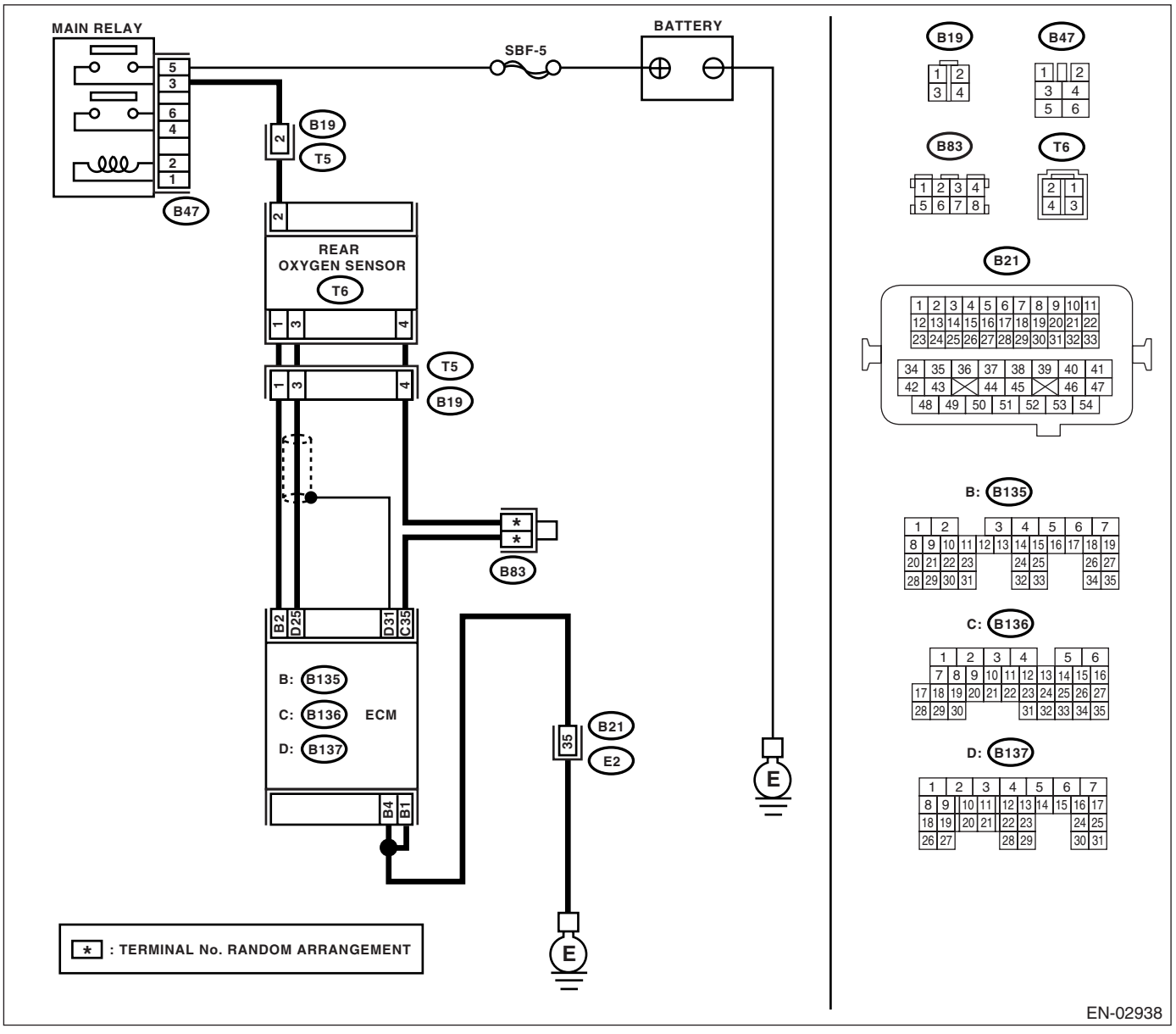
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-66, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0138. | Go to step **2.** |
| 2 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and lower the engine speed rapidly from 5,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the “READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the voltage less than 250 mV? | Go to step **5.** | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and rear oxygen sensor.<br>3) Measure the resistance in harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the resistance more than 3 Ω? | Repair the open circuit in harness between ECM and rear oxygen sensor connector. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor harness connector and chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Chassis ground (−):*** | Is the voltage 0.2 — 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK EXHAUST SYSTEM.**<br>Check exhaust system parts.<br>NOTE:<br>Check the following items:<br>• Loose part of exhaust system and incomplete installation<br>• Damage (crack, hole etc.) of parts<br>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor | Is there any fault in exhaust system? | Repair or replace the faulty part. | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> |

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

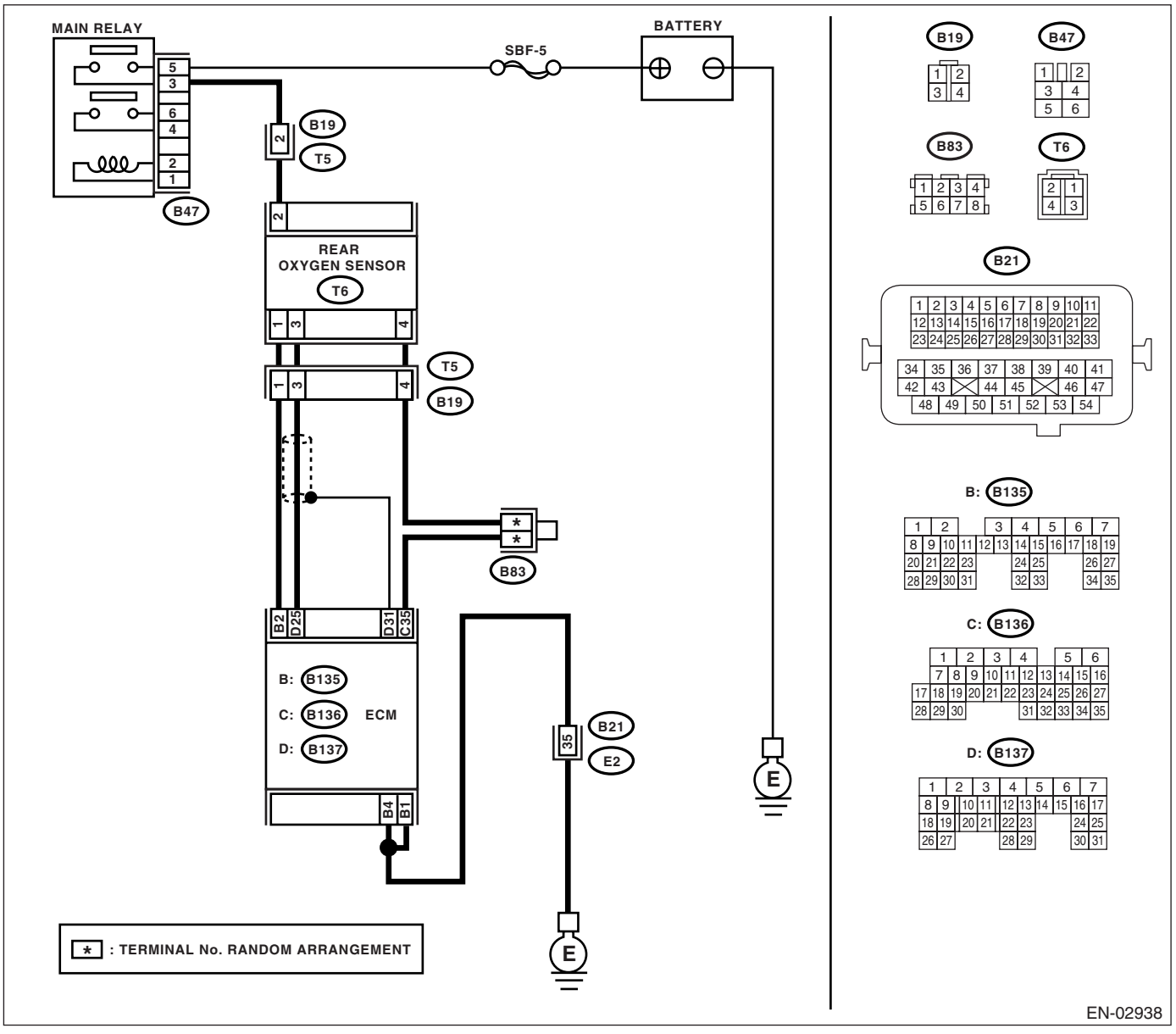
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-68, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0139. | Go to step **2.** |
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and rear oxygen sensor.<br>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector |
| 3 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>Measure the resistance between rear oxygen sensor harness connector and chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair short circuit to ground in harness between rear oxygen sensor and ECM connector. |
| 4 | **CHECK REAR OXYGEN SENSOR DATA.**<br>Measure the resistance between connector terminals of rear oxygen sensor.<br>***terminals***<br>***No. 3 — No. 4:*** | Is the resistance less than 1 Ω? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair connector. Poor contact in rear oxygen sensor connector. |

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

NOTE:
For diagnostic procedure, refer to DTC P0172. <Ref. to EN(H4DOTC)(diag)-142, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-76, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**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)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK EXHAUST SYSTEM.** | Are there holes or loose bolts on exhaust system? | Repair exhaust system. | Go to step **2.** |
| 2 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hoses on air intake system? | Repair air intake system. | Go to step **3.** |
| 3 | **CHECK FUEL PRESSURE.**<br>**Warning:**<br>**• Place "NO FIRE" signs near the working area.**<br>**• Be careful not to spill fuel.**<br>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.<br><Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.><br>**Warning:**<br>**Release fuel pressure before removing the fuel pressure gauge.**<br>NOTE:<br>If fuel pressure does not increase, squeeze the fuel return hose 2 to 3 times, then measure fuel pressure again. | Is fuel pressure 284 — 314 kPa (2.9 — 3.2 kg/cm$^2$, 41 — 46 psi)? | Go to step **4.** | Repair the following items.<br>Fuel pressure is too high:<br>• Clogged fuel return line or bent hose<br>Fuel pressure is too low:<br>• Improper fuel pump discharge<br>• Clogged fuel supply line |
| 4 | **CHECK FUEL PRESSURE.**<br>After connecting the pressure regulator vacuum hose, measure fuel pressure.<br><Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.><br>**Warning:**<br>**Release fuel pressure before removing the fuel pressure gauge.**<br>NOTE:<br>• If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.<br>• If out of specification as measured at this step, check or replace pressure regulator and pressure regulator vacuum hose. | Is measured value 206 — 235 kPa (2.1 — 2.4 kg/cm$^2$, 30 — 34 psi)? | Go to step **5.** | Repair the following items.<br>Fuel pressure is too high:<br>• Faulty pressure regulator<br>• Clogged fuel return line or bent hose<br>Fuel pressure is too low:<br>• Faulty pressure regulator<br>• Improper fuel pump discharge<br>• Clogged fuel supply line |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK ENGINE COOLANT TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up completely.<br>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is engine coolant temperature more than 60°C (140°F)? | Go to step **6.** | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> |
| 6 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start and warm-up the engine until engine coolant temperature is greater than 60°C (140°F).<br>2) Place the shift lever in neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all accessory switches to OFF.<br>5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value 2.1 — 3.4 g/s (0.28 — 0.45 lb/m)? | Go to step **7.** | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |
| 7 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start and warm-up the engine until engine coolant temperature is greater than 60°C (140°F).<br>2) Place the shift lever in neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all accessory switches to OFF.<br>5) Open the hood.<br>6) Measure the ambient temperature.<br>7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Subtract the ambient temperature from intake air temperature, and is the value from −10°C (14°F) to 50°C (122°F)? | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Check mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |

# AG:DTC P0181 FUEL TEMPERATURE SENSOR “A” CIRCUIT RANGE/PERFORMANCE

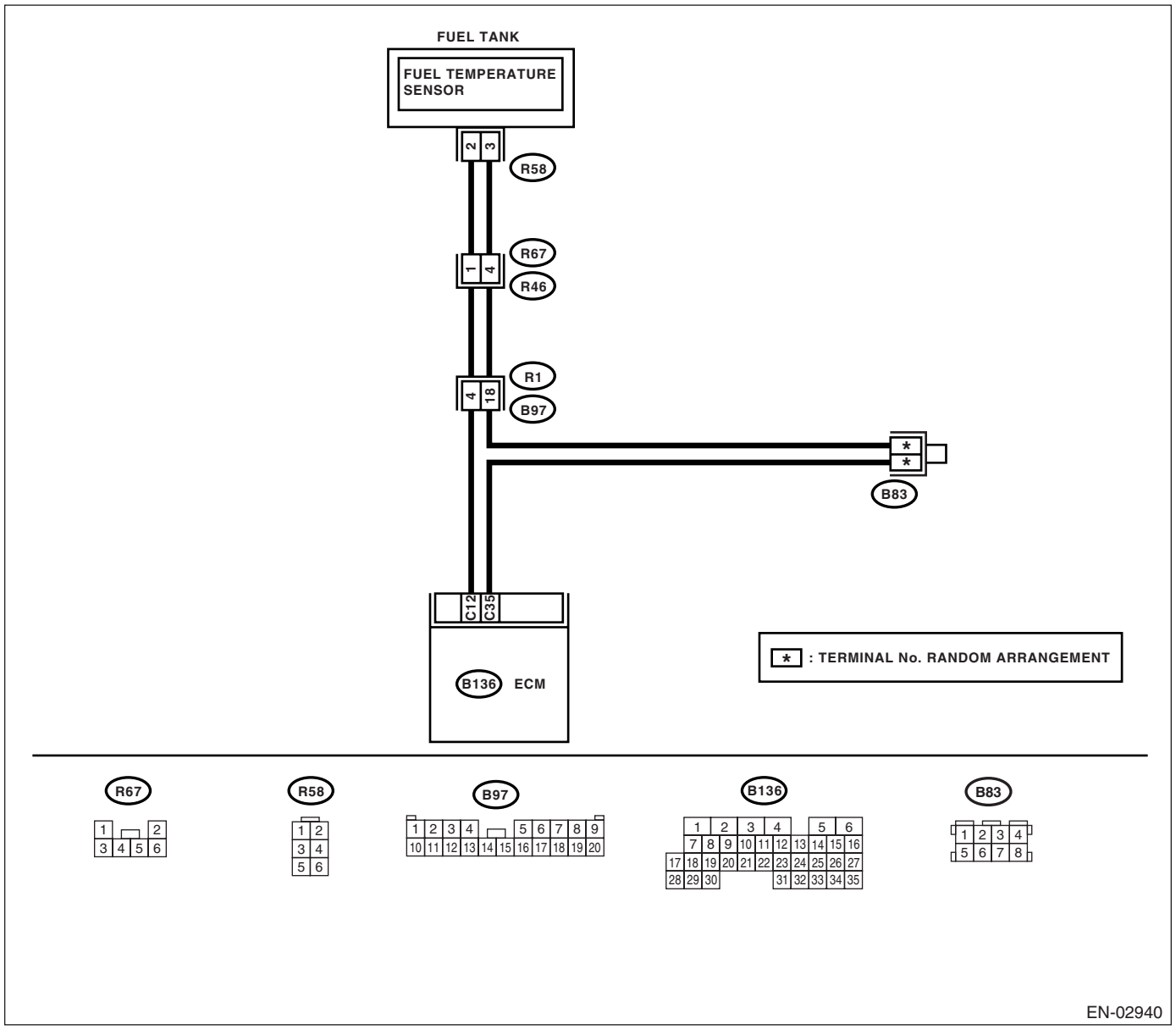
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-78, DTC P0181 FUEL TEMPERATURE SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Codes (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0181. | Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-9, Fuel Temperature Sensor.> |

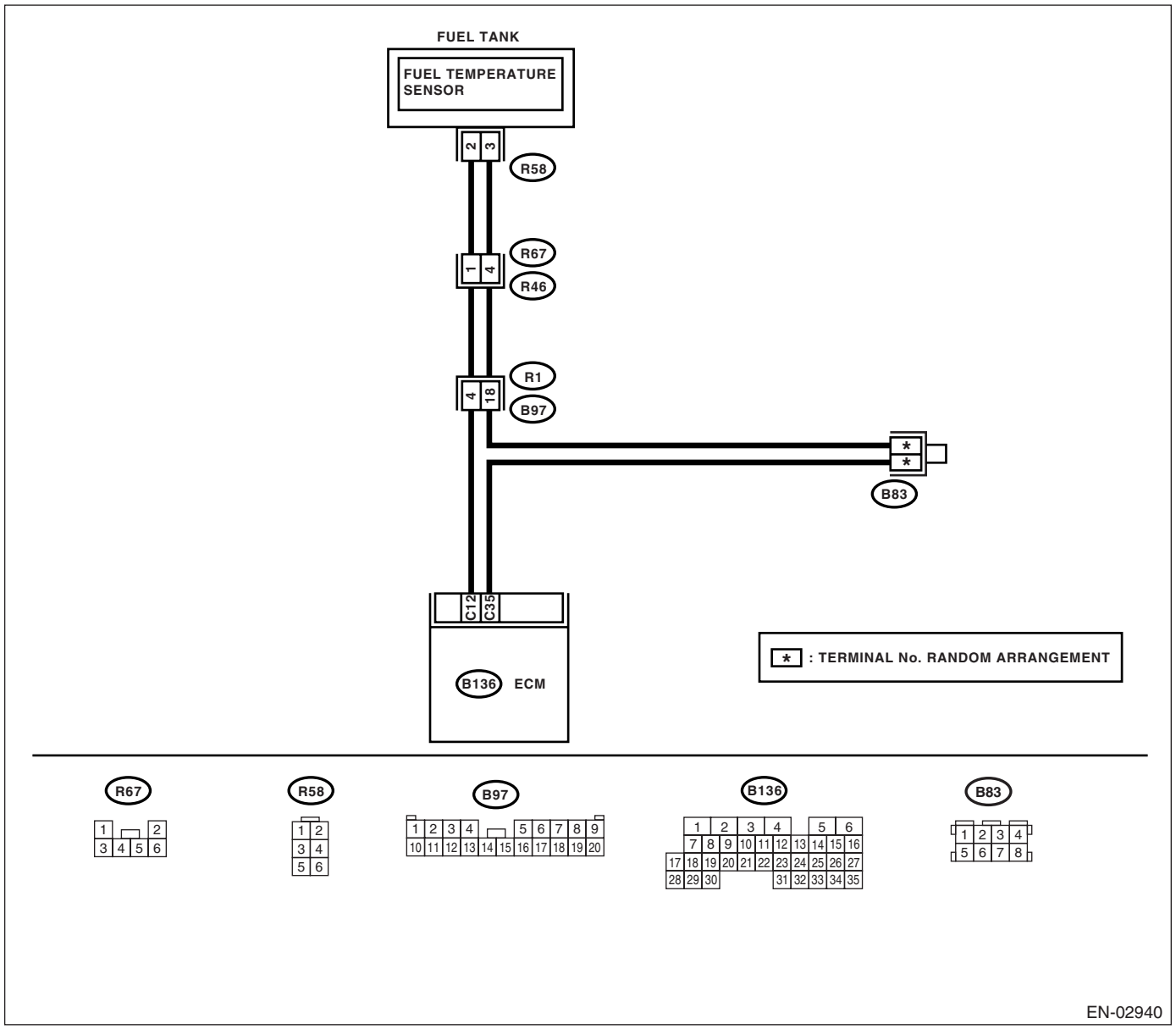
## AH:DTC P0182 FUEL TEMPERATURE SENSOR “A” CIRCUIT LOW INPUT

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-81, DTC P0182 FUEL TEMPERATURE SENSOR “A” CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of fuel temperature sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the temperature more than 150°C (302°F)? | Go to step **2.** | The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. |
| 2 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the access hole lid.<br>3) Disconnect the connector from fuel pump.<br>4) Turn the ignition switch to ON.<br>5) Read the data of fuel temperature sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the temperature less than −40°C (−40°F)? | Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-9, Fuel Temperature Sensor.> | Repair short circuit to ground in harness between fuel pump and ECM connector. |

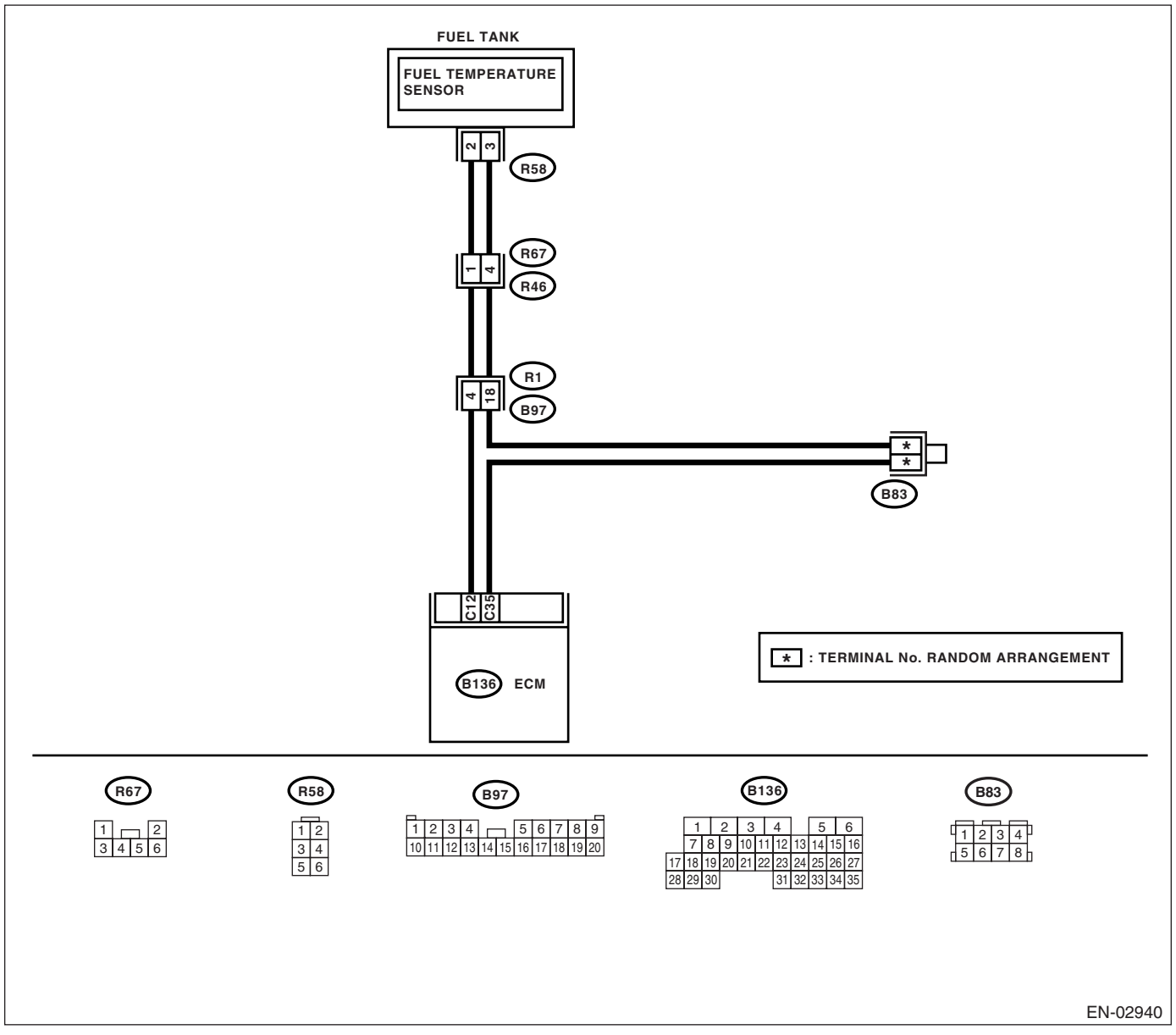
## AI: DTC P0183 FUEL TEMPERATURE SENSOR “A” CIRCUIT HIGH INPUT

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-83, DTC P0183 FUEL TEMPERATURE SENSOR “A” CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of fuel temperature sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the temperature less than −40°C (−40°F)? | Go to step **2.** | Repair poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in fuel pump connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the access hole lid.<br>3) Disconnect the connector from fuel pump.<br>4) Measure the voltage between fuel pump connector and chassis ground.<br>***Connector & terminal***<br>***(R58) No. 2 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair short circuit to battery in harness between ECM and fuel pump connector. | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between fuel pump connector and chassis ground.<br>***Connector & terminal***<br>***(R58) No. 2 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair short circuit to battery in harness between ECM and fuel pump connector. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>Measure the voltage between fuel pump connector and chassis ground.<br>***Connector & terminal***<br>***(R58) No. 2 (+) — Chassis ground (−):*** | Is the voltage more than 4 V? | Go to step **5.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and fuel pump connector<br>• Poor contact in fuel pump connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between fuel pump connector and ECM.<br>***Connector & terminal***<br>***(R58) No. 3 — (B136) No. 35:*** | Is the resistance less than 1 Ω? | Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-9, Fuel Temperature Sensor.> | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and fuel pump connector<br>• Poor contact in fuel pump connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |

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

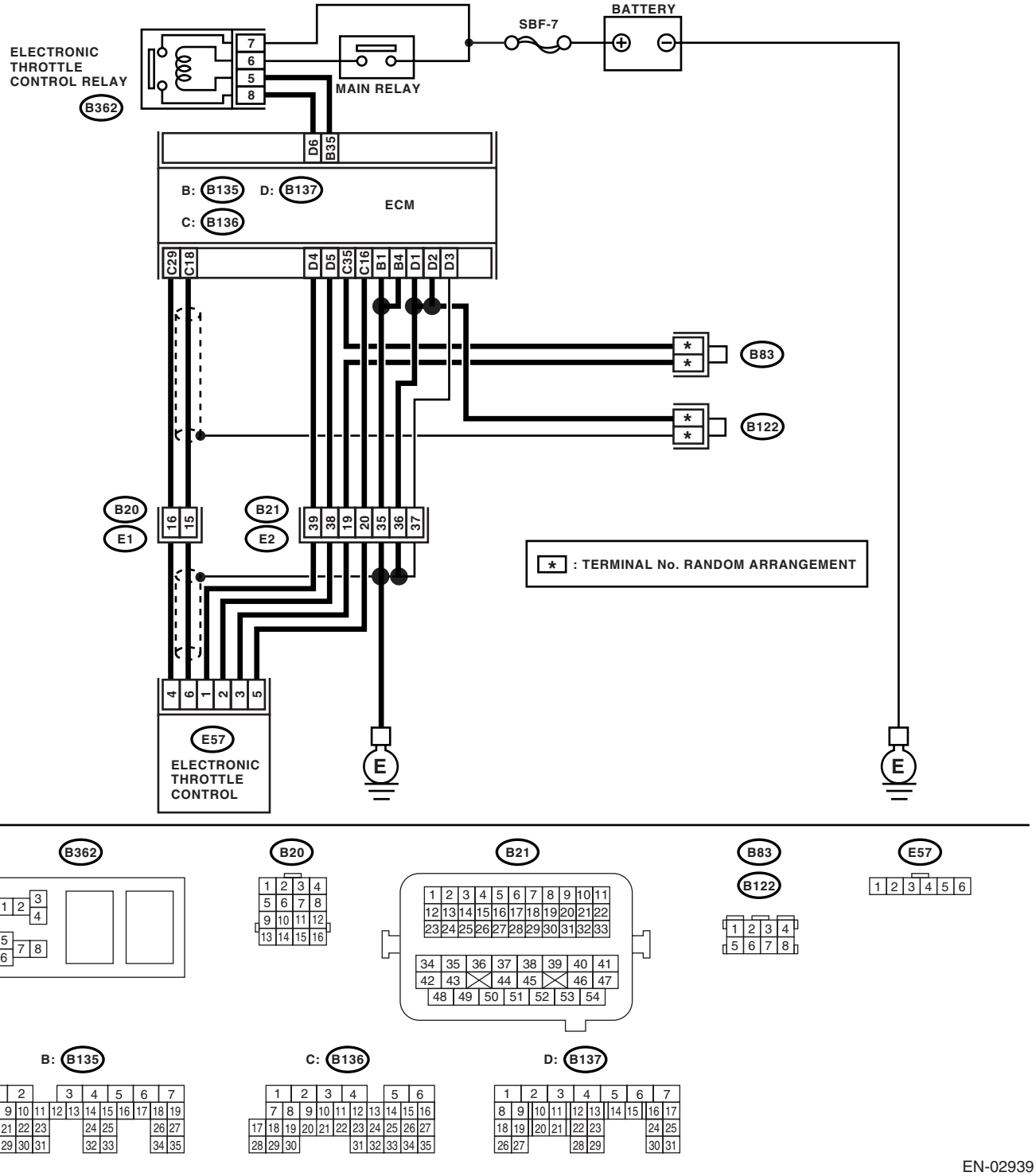
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-85, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of sub throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage more than 0.8 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>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. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 16 — (E57) No. 5:***<br>***(B136) No. 29 — (E57) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 29 — Chassis ground:***<br>***(B136) No. 16 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the chassis short circuit of harness. |
| 5 | **CHECK SENSOR POWER SUPPLY.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 5 (+) — Engine ground (−):*** | 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)-39, Engine Control Module (ECM).> |
| 6 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 4 — Engine ground:*** | Is the resistance more than 10 Ω? | Repair the 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)-39, Engine Control Module (ECM).> |

## AK:DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT HIGH INPUT

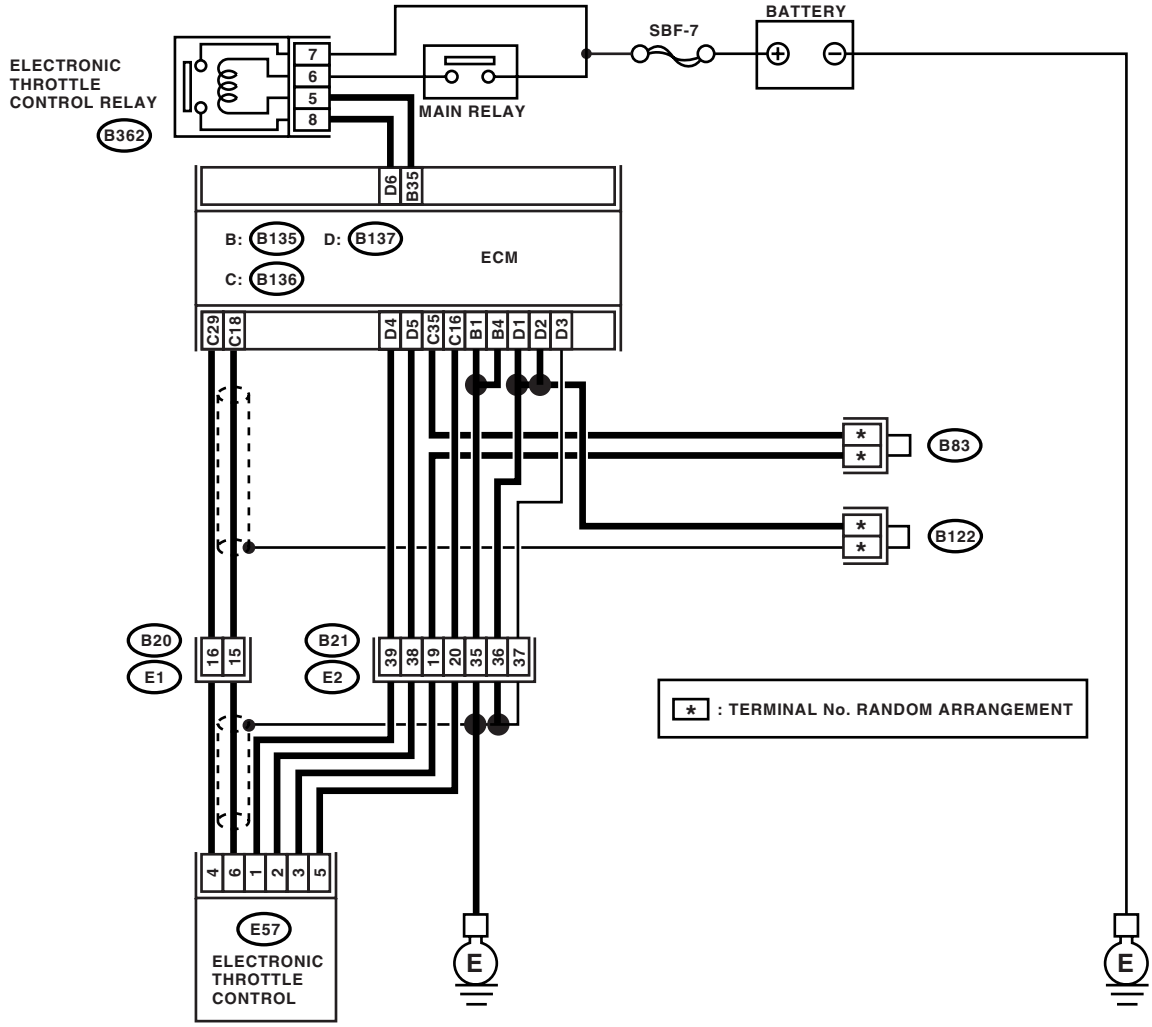
**DTC DETECTING CONDITION:**

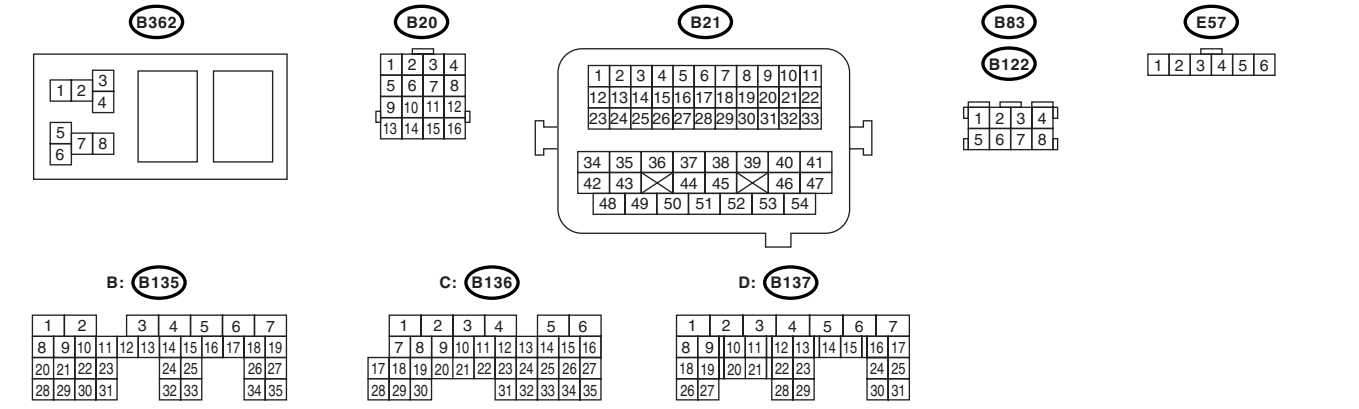
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-87, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of sub throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage less than 4.73 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>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. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (E57) No. 3:***<br>***(B136) No. 29 — (E57) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 4 (+) — Engine ground (−):*** | Is the voltage less than 10 V? | Go to step **5.** | Repair the battery short circuit in harness between ECM connector and electronic throttle control connector. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between connector terminals.<br>***Connector & terminal***<br>***(B136) No. 29 — (B136) No. 16:*** | Is the resistance more than 1 MΩ? | Repair the poor contact. Repair the electronic throttle control. | Sensor power supply circuit may be shorted. |

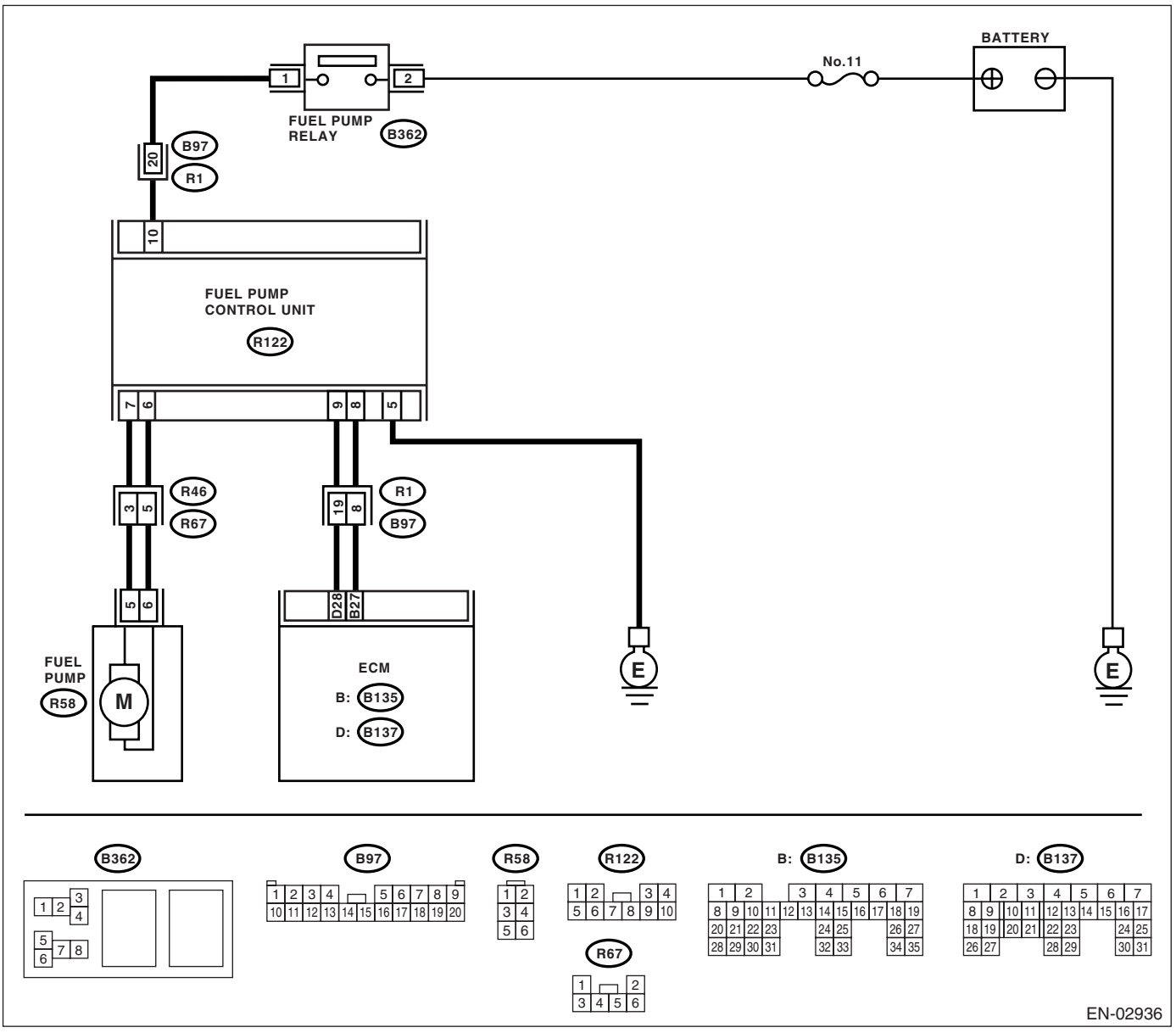
# AL:DTC P0230 FUEL PUMP PRIMARY CIRCUIT

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-89, DTC P0230 FUEL PUMP PRIMARY CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK POWER SUPPLY CIRCUIT TO FUEL PUMP CONTROL UNIT.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel pump control unit.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between fuel pump control unit and chassis ground.<br>***Connector & terminal***<br>***(R122) No. 10 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **2.** | Repair the power supply circuit.<br>NOTE:<br>In this case, repair the following:<br>• Open or ground short circuit in harness between fuel pump relay and fuel pump control unit<br>• Poor contact in fuel pump control unit connector<br>• Poor contact in fuel pump relay connector |
| 2 | **CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between fuel pump control unit and chassis ground.<br>***Connector & terminal***<br>***(R122) No. 5 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit between fuel pump control unit and chassis ground<br>• Poor contact in fuel pump control unit connector |
| 3 | **CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.**<br>1) Disconnect the connector from fuel pump.<br>2) Measure the resistance of harness between fuel pump control unit and fuel pump connector.<br>***Connector & terminal***<br>***(R122) No. 7 — (R58) No. 5:***<br>***(R122) No. 6 — (R58) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit between fuel pump control unit and fuel pump. |
| 4 | **CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.**<br>Measure the resistance of harness between fuel pump control unit and chassis ground.<br>***Connector & terminal***<br>***(R122) No. 7 — Chassis ground:***<br>***(R122) No. 6 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the ground short circuit between fuel pump control unit and fuel pump. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance in harness between fuel pump control unit and ECM connector.<br>***Connector & terminal***<br>***(R122) No. 9 — (B137) No. 28:***<br>***(R122) No. 8 — (B135) No. 27:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit between fuel pump control unit and ECM<br>• Poor contact in fuel pump control unit and ECM connector |
| 6 | **CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND ECM CONNECTOR.**<br>Measure the resistance of harness between fuel pump control unit and chassis ground.<br>***Connector & terminal***<br>***(R122) No. 9 — Chassis ground:***<br>***(R122) No. 8 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **7.** | Repair the ground short circuit between fuel pump control unit and ECM. |
| 7 | **CHECK POOR CONTACT.**<br>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.** |
| 8 | **CHECK EXPERIENCE OF RUNNING OUT OF FUEL.** | Did the vehicle experience running out of fuel? | Finish the diagnosis.<br>NOTE:<br>DTC record may be conducted as a result of fuel pump idling while running out of fuel. | Replace the fuel pump control unit. <Ref. to FU(H4DOTC)-43, Fuel Pump Control Unit.> |

# AM:DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” RANGE/PERFORMANCE

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-91, DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

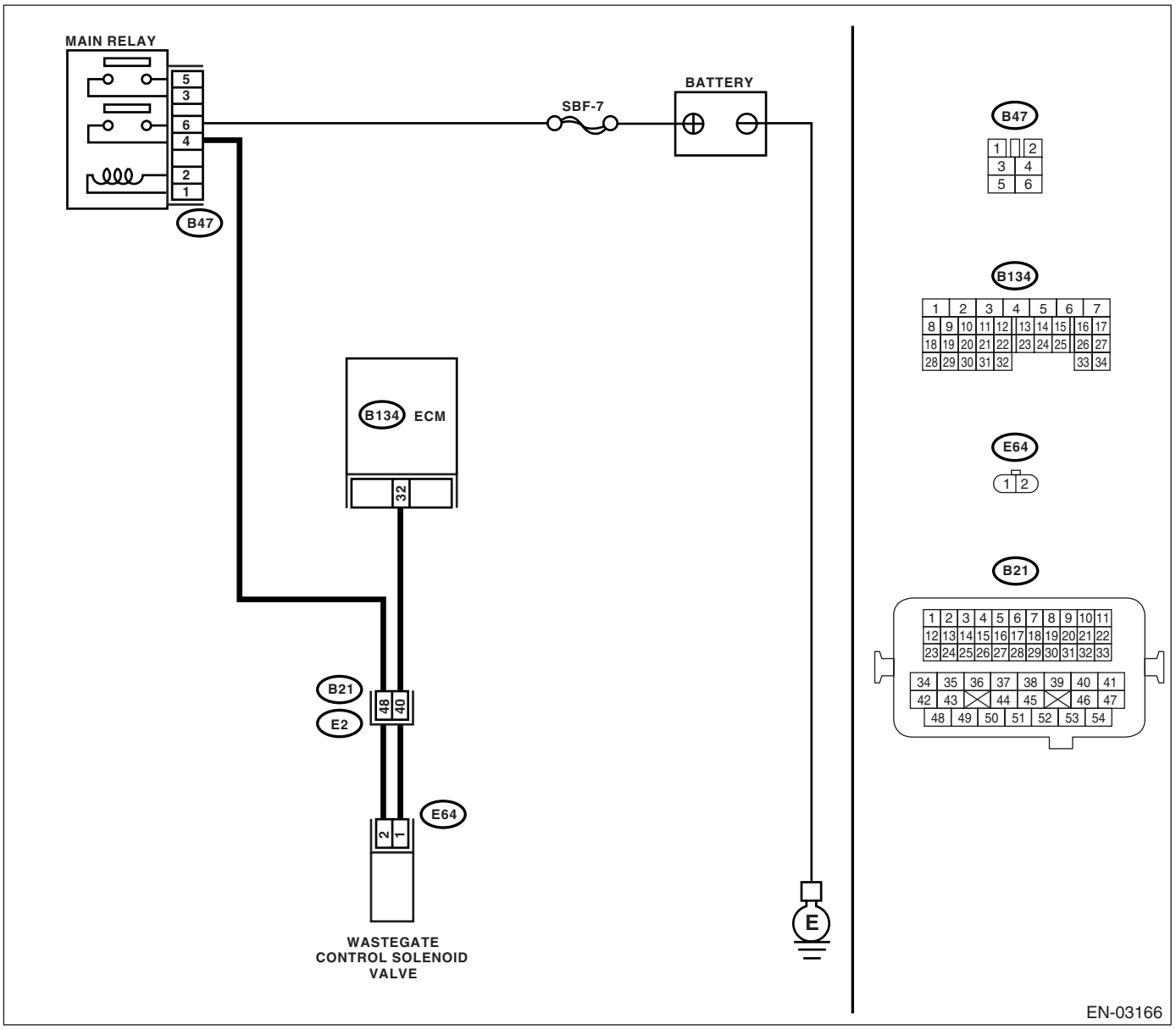
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0244. | Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC)-34, Wastegate Control Solenoid Valve.> |

# AN:DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” LOW

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-93, DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

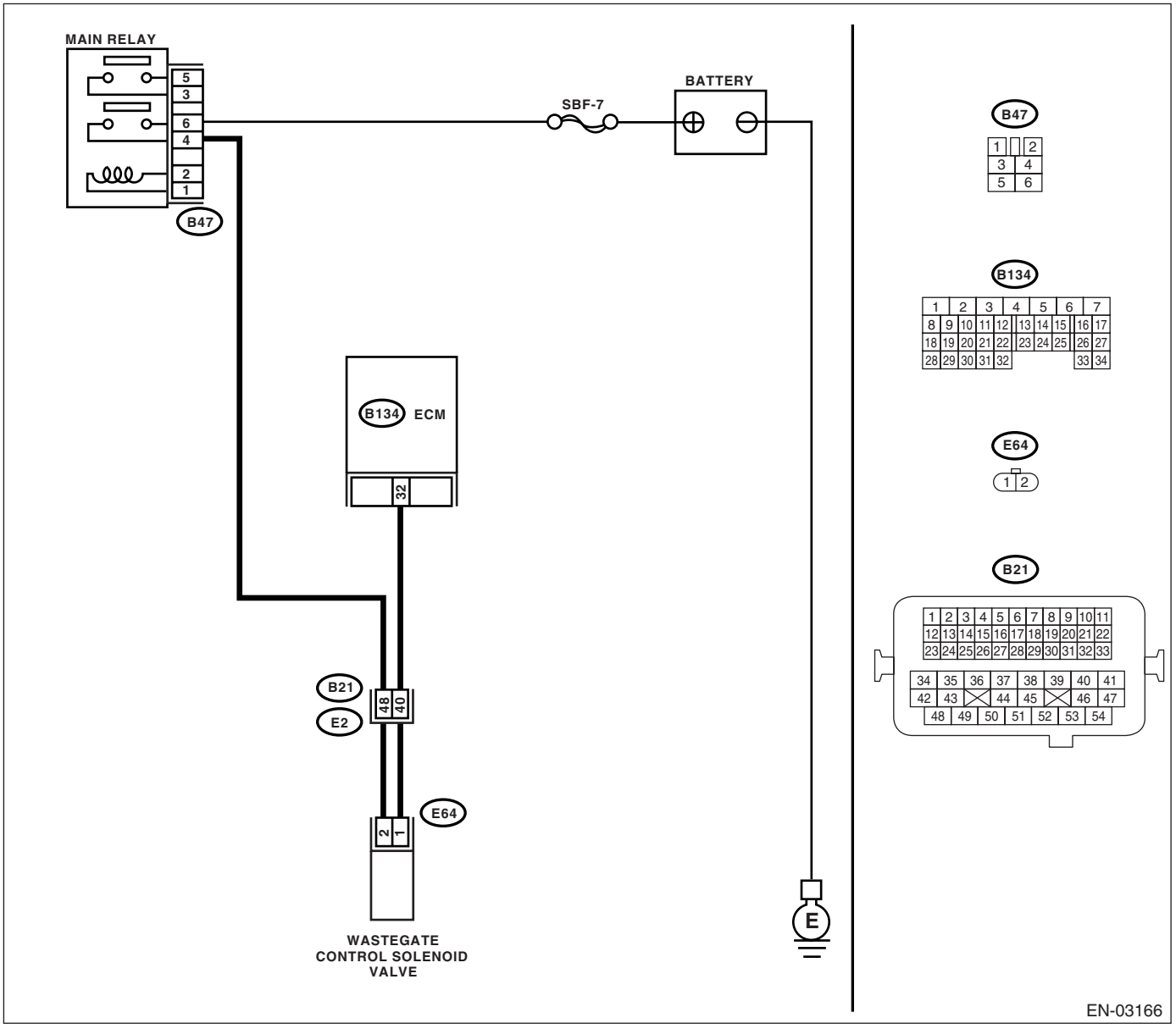
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 32 (+) — Chassis ground (−):*** | 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.** |
| 2 | **CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from wastegate control solenoid valve and ECM.<br>3) Measure the resistance in harness between wastegate control solenoid valve connector and engine ground.<br>***Connector & terminal***<br>***(E64) No. 1 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **3.** | Repair the ground short circuit in harness between ECM and wastegate control solenoid valve connector. |
| 3 | **CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>Measure the resistance of harness between wastegate control solenoid valve of harness connector and ECM.<br>***Connector & terminal***<br>***(B134) No. 32 — (E64) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit in harness between ECM and wastegate control solenoid valve connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and wastegate control solenoid valve connector |
| 4 | **CHECK WASTEGATE CONTROL SOLENOID VALVE.**<br>1) Remove the wastegate control solenoid valve.<br>2) Measure the resistance between wastegate control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 30 — 34 Ω? | Go to step **5.** | Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC)-34, Wastegate Control Solenoid Valve.> |
| 5 | **CHECK POWER SUPPLY TO WASTEGATE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between wastegate control solenoid valve and engine ground.<br>***Connector & terminal***<br>***(E64) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **6.** | Repair the open circuit in harness between main relay and wastegate control solenoid valve connector. |
| 6 | **CHECK POOR CONTACT.**<br>Check poor contact in wastegate control solenoid valve connector. | Is there poor contact in wastegate control solenoid valve connector? | Repair the poor contact in wastegate control solenoid valve connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

## AO:DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” HIGH

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-95, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

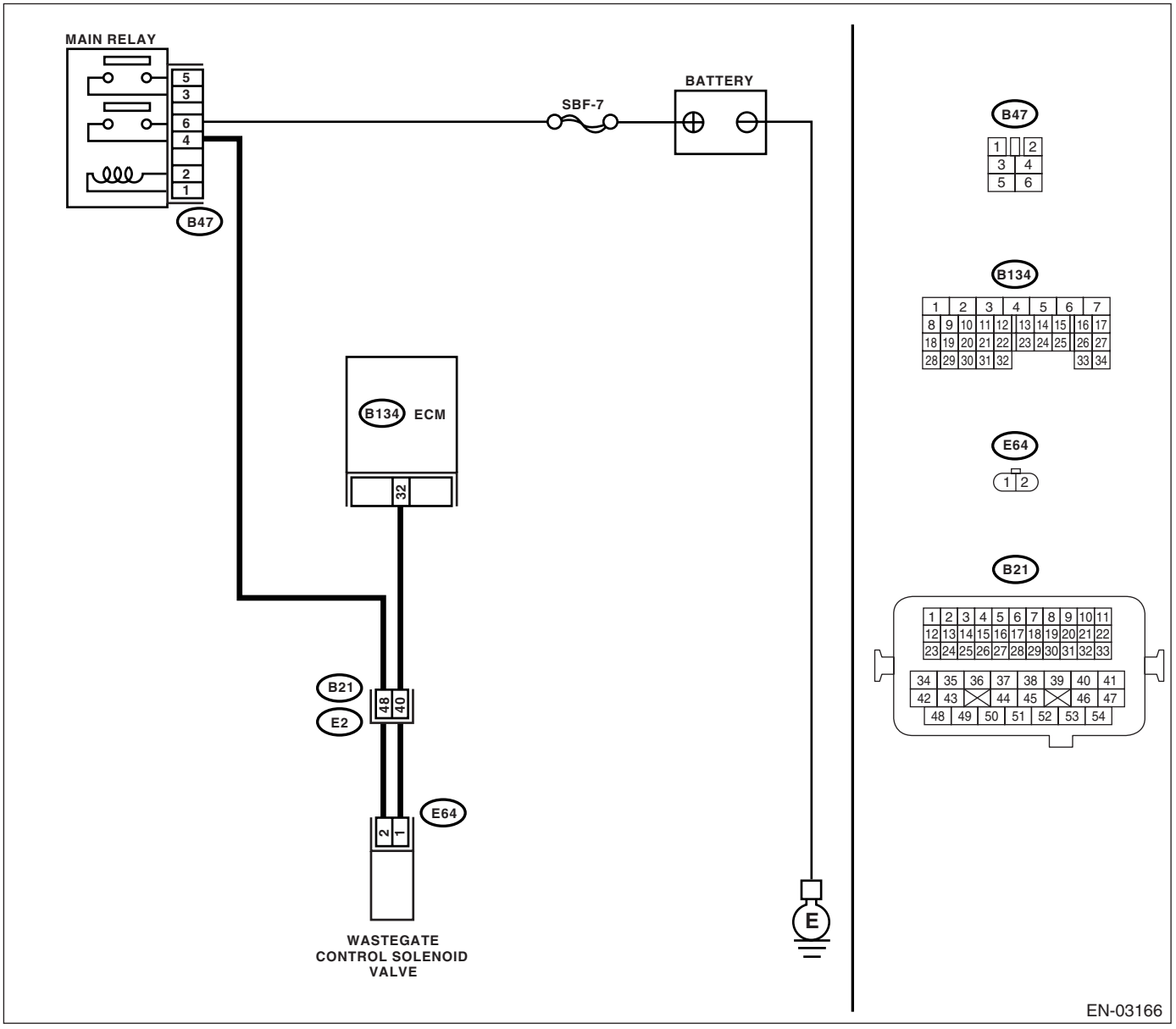
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 32 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **3.** | Go to step **2.** |
| 2 | **CHECK POOR CONTACT.**<br>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)-39, Engine Control Module (ECM).> |
| 3 | **CHECK HARNESS BETWEEN WASTEGATE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from wastegate control solenoid valve.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 32 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and wastegate control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Go to step **4.** |
| 4 | **CHECK WASTEGATE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between wastegate control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Replace the wastegate control solenoid valve and ECM. <Ref. to FU(H4DOTC)-34, Wastegate Control Solenoid Valve.> <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Go to step **5.** |
| 5 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is the poor contact in ECM connector? | Repair the poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

## AP:DTC P0301 CYLINDER 1 MISFIRE DETECTED

NOTE:
For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## AQ:DTC P0302 CYLINDER 2 MISFIRE DETECTED

NOTE:
For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## AR:DTC P0303 CYLINDER 3 MISFIRE DETECTED

NOTE:
For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4DOTC)(diag)-165, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## AS:DTC P0304 CYLINDER 4 MISFIRE DETECTED

**DTC DETECTING CONDITION:**

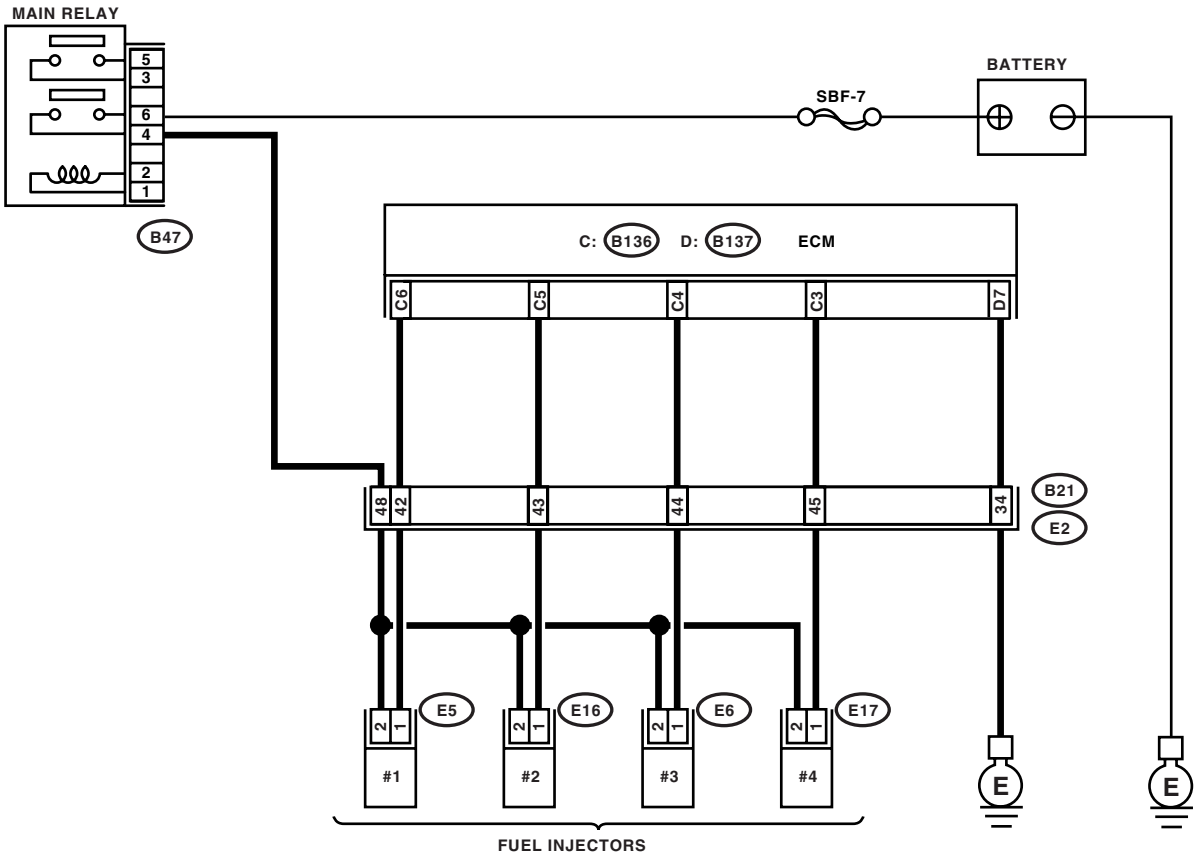
- Two consecutive driving cycles with fault
- Detect as soon as malfunction occurs. (A misfire which could damage catalyst occurs.)
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-102, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

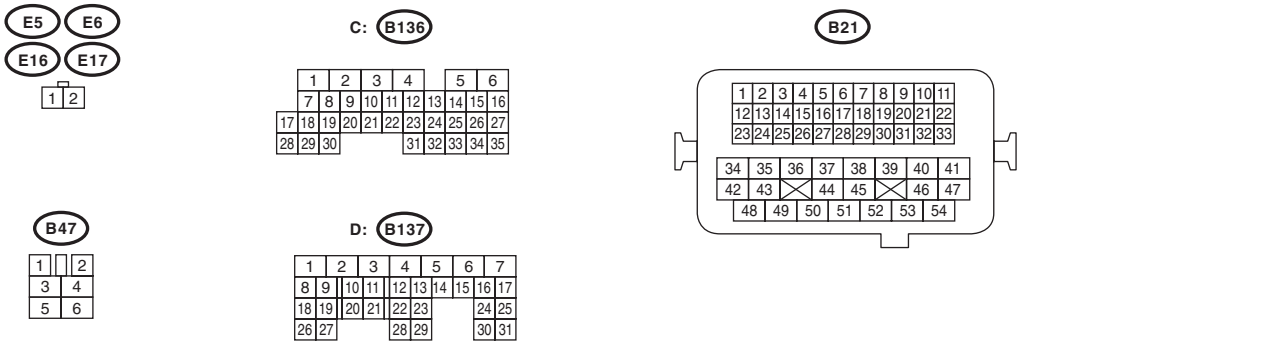
**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling
- Rough driving

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-03164

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM connector and chassis ground on faulty cylinders.<br>***Connector & terminal***<br>***#1 (B136) No. 6 (+) — Chassis ground (–):***<br>***#2 (B136) No. 5 (+) — Chassis ground (–):***<br>***#3 (B136) No. 4 (+) — Chassis ground (–):***<br>***#4 (B136) No. 3 (+) — Chassis ground (–):*** | Is the voltage more than 10 V? | Go to step **7.** | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector on faulty cylinders.<br>3) Disconnect the connector from ECM.<br>4) Measure the resistance between ECM connector and engine ground on faulty cylinders.<br>***Connector & terminal***<br>***#1 (E5) No. 1 — Engine ground:***<br>***#2 (E16) No. 1 — Engine ground:***<br>***#3 (E6) No. 1 — Engine ground:***<br>***#4 (E17) No. 1 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair the ground short circuit in harness between fuel injector and ECM connector. |
| 4 | **CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.**<br>Measure the resistance of harness connector between ECM connector and fuel injector on faulty cylinders.<br>***Connector & terminal***<br>***#1 (B136) No. 6 — (E5) No. 1:***<br>***#2 (B136) No. 5 — (E16) No. 1:***<br>***#3 (B136) No. 4 — (E6) No. 1:***<br>***#4 (B136) No. 3 — (E17) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and fuel injector connector<br>• Poor contact in coupling connector |
| 5 | **CHECK FUEL INJECTOR.**<br>Measure the resistance between fuel injector terminals on faulty cylinder.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 5 — 20 Ω? | Go to step **6.** | Replace the faulty fuel injector. <Ref. to FU(H4DOTC)-29, Fuel Injector.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK POWER SUPPLY LINE.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between fuel injector and engine ground on faulty cylinders.<br>***Connector & terminal***<br>***#1 (E5) No. 2 (+) — Engine ground (−):***<br>***#2 (E16) No. 2 (+) — Engine ground (−):***<br>***#3 (E6) No. 2 (+) — Engine ground (−):***<br>***#4 (E17) No. 2 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the poor contact in all connectors in fuel injector circuit. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and fuel injector connector on faulty cylinders<br>• Poor contact in coupling connector<br>• Poor contact in main relay connector<br>• Poor contact in fuel injector connector on faulty cylinders |
| 7 | **CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector on faulty cylinder.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM connector and chassis ground on faulty cylinders.<br>***Connector & terminal***<br>***#1 (B136) No. 6 (+) — Chassis ground (−):***<br>***#2 (B136) No. 5 (+) — Chassis ground (−):***<br>***#3 (B136) No. 4 (+) — Chassis ground (−):***<br>***#4 (B136) No. 3 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and fuel injector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Go to step **8.** |
| 8 | **CHECK FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between fuel injector terminals on faulty cylinder.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 5 — 20 Ω? | Go to step **9.** | Replace the faulty fuel injector <Ref. to FU(H4DOTC)-29, Fuel Injector.> and ECM <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 9 | **CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.** | Is the camshaft position sensor or crankshaft position sensor loosely installed? | Tighten the camshaft position sensor or crankshaft position sensor. | Go to step **10.** |
| 10 | **CHECK CRANK SPROCKET.**<br>Remove the timing belt cover. | Is the crank sprocket rusted or does it have broken teeth? | Replace the crank sprocket. <Ref. to ME(H4DOTC)-51, Crank Sprocket.> | Go to step **11.** |
| 11 | **CHECK INSTALLATION CONDITION OF TIMING BELT.**<br>Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block. | Is the timing belt dislocated from its proper position? | Repair the installation condition of timing belt. <Ref. to ME(H4DOTC)-42, Timing Belt.> | Go to step **12.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 12 | **CHECK FUEL LEVEL.** | Is the fuel meter indication higher than the “Lower” level? | Go to step **13.** | Replenish the fuel so fuel meter indication is higher than the “Lower” level. After replenishing fuel; Go to step **13.** |
| 13 | **CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.**<br>1) Clear the memory using Subaru Select Monitor.<br><Ref. to EN(H4DOTC)(diag)-45, Clear Memory Mode.><br>2) Start the engine, and drive the vehicle more than 10 minutes. | Is the malfunction indicator light coming on or blinking? | Go to step **15.** | Go to step **14.** |
| 14 | **CHECK CAUSE OF MISFIRE DIAGNOSED.** | Was the cause of misfire diagnosed when the engine is running? | Finish the diagnostics operation, if the engine has no abnormality. | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in ignition coil connector<br>• Poor contact in fuel injector connector on faulty cylinders<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 15 | **CHECK AIR INTAKE SYSTEM.** | Is there any fault in air intake system? | Repair the air intake system.<br>NOTE:<br>Check the following items:<br>• Are there air leaks or air suction caused by loose or dislocated nuts and bolts?<br>• Are there cracks or any disconnection of hoses? | Go to step **16.** |
| 16 | **CHECK CYLINDER.** | Is there any fault in that cylinder? | Repair or replace the faulty parts.<br>NOTE:<br>Check the following items.<br>• Spark plug<br>• Fuel injector<br>• Compression pressure | Go to DTC P0171 and P0172. <Ref. to EN(H4DOTC)(diag)-141, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

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

**DTC DETECTING CONDITION:**

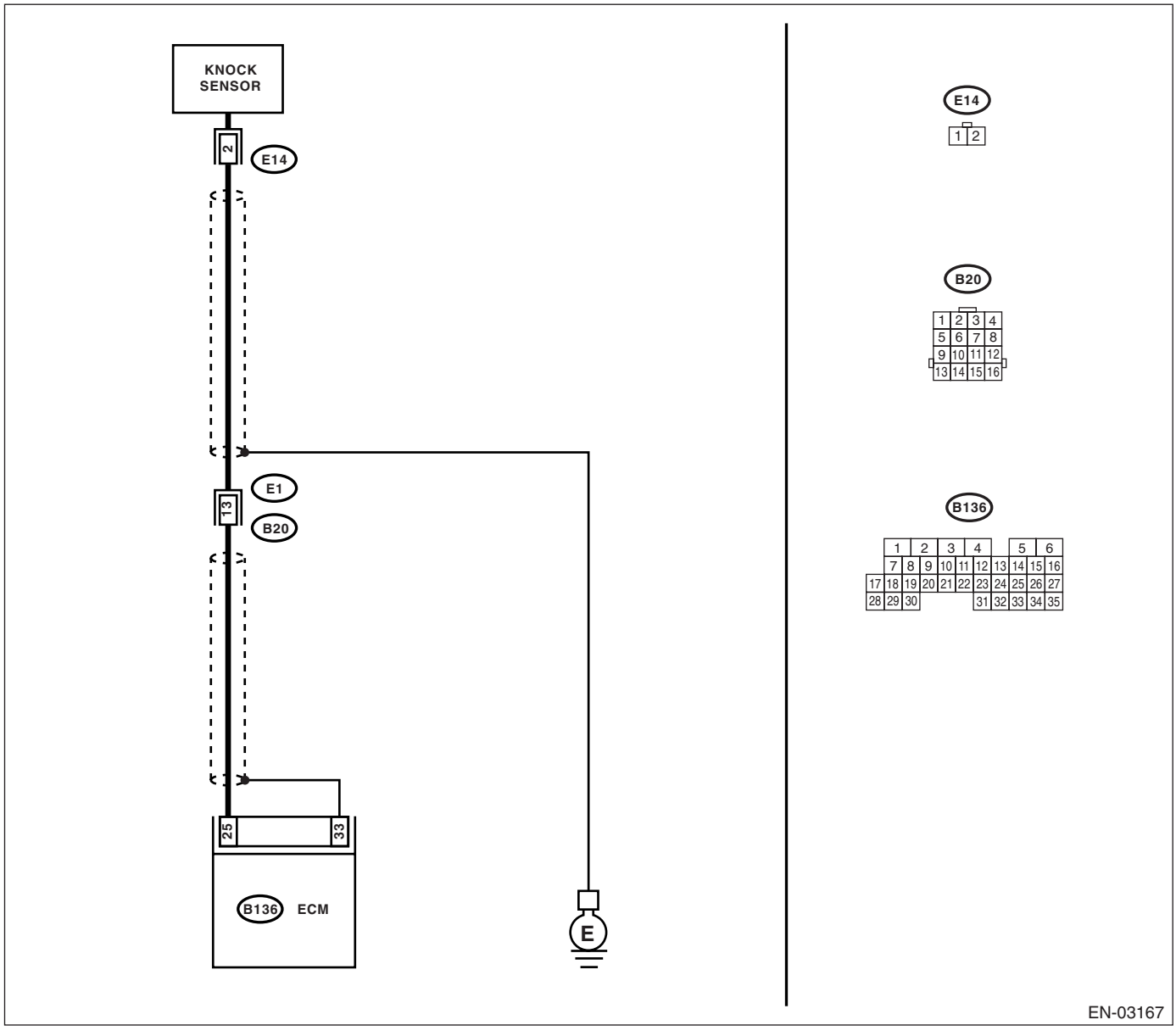
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-103, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Poor driving performance
- Knocking occurs.

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM harness connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 25 — Chassis ground:*** | Is the resistance more than 700 kΩ? | Go to step **2.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the followingin this case, repair the following:<br>• Open circuit in harness between knock sensor and ECM connector<br>• Poor contact in knock sensor connector<br>• Poor contact in coupling connector |
| 2 | **CHECK KNOCK SENSOR.**<br>1) Disconnect the connector from knock sensor.<br>2) Measure the resistance between knock sensor connector terminal and engine ground.<br>***Terminals***<br>***No. 2 — Engine ground:*** | Is the resistance more than 700 kΩ? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the followingin this case, repair the following:<br>• Poor contact in knock sensor connector<br>• Poor contact in coupling connector |
| 3 | **CHECK CONDITION OF KNOCK SENSOR INSTALLATION.** | Is the knock sensor installation bolt tightened securely? | Replace the knock sensor. <Ref. to FU(H4DOTC)-25, Knock Sensor.> | Tighten knock sensor installation bolt securely. |

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

**DTC DETECTING CONDITION:**

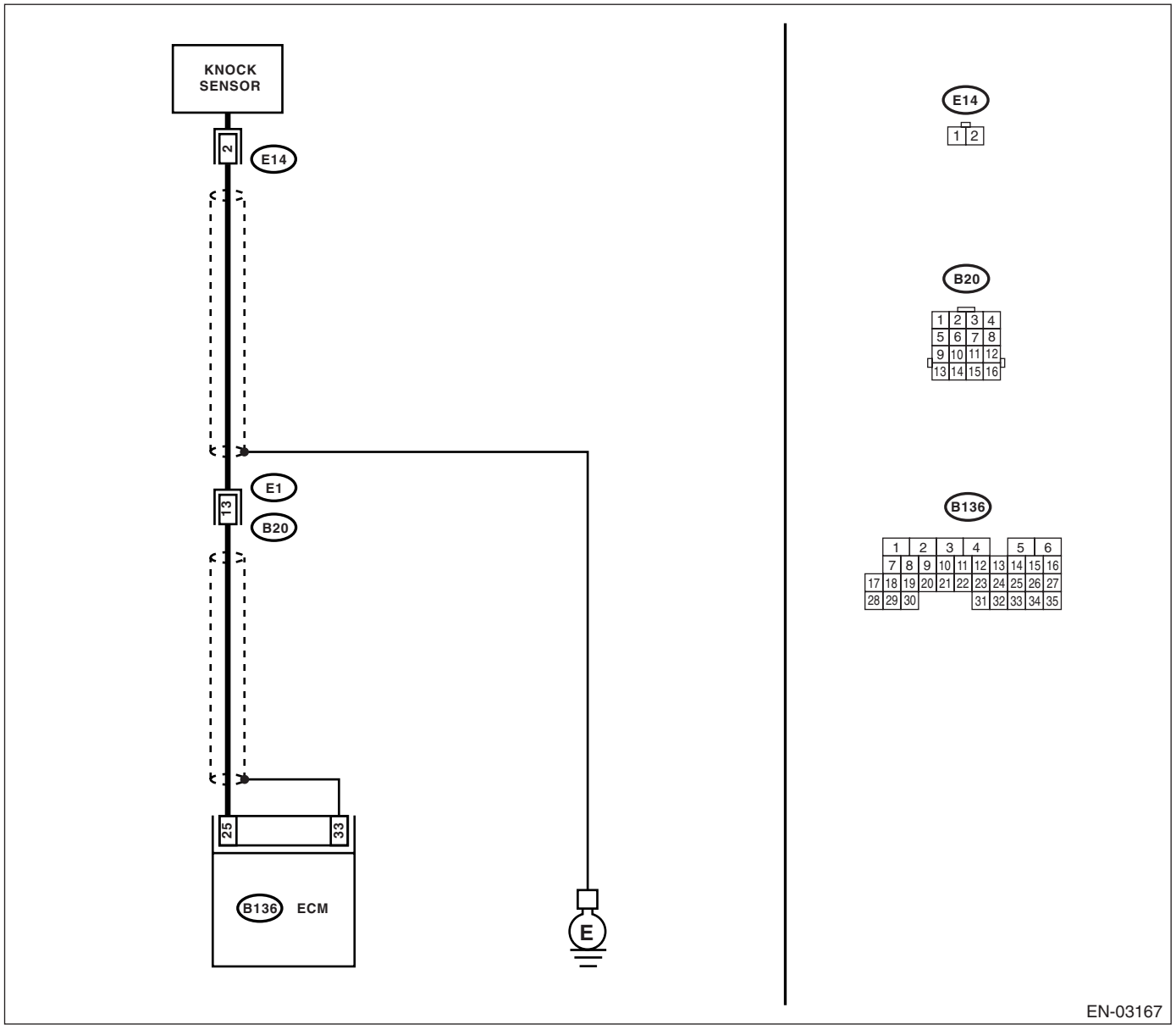
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-105, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Poor driving performance
- Knocking occurs.

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.**<br>Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 25 — Chassis ground:*** | Is the resistance less than 400 kΩ? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK KNOCK SENSOR.**<br>1) Disconnect the connector from knock sensor.<br>2) Measure the resistance between knock sensor connector terminal and engine ground.<br>***Terminals***<br>***No. 2 — Engine ground:*** | Is the resistance less than 400 kΩ? | Replace the knock sensor. <Ref. to FU(H4DOTC)-25, Knock Sensor.> | Repair the ground short circuit in harness between knock sensor connector and ECM connector.<br>NOTE:<br>The harness between both connectors are shielded. Repair the short circuit in harness covered with shield. |
| 3 | **CHECK INPUT SIGNAL FROM ECM.**<br>1) Connect the connectors to ECM and knock sensor.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 25 (+) — Chassis ground (−):*** | 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.)<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in knock sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector | Repair the poor contact in ECM connector. |

## AV:DTC P0335 CRANKSHAFT POSITION SENSOR “A” CIRCUIT

**DTC DETECTING CONDITION:**

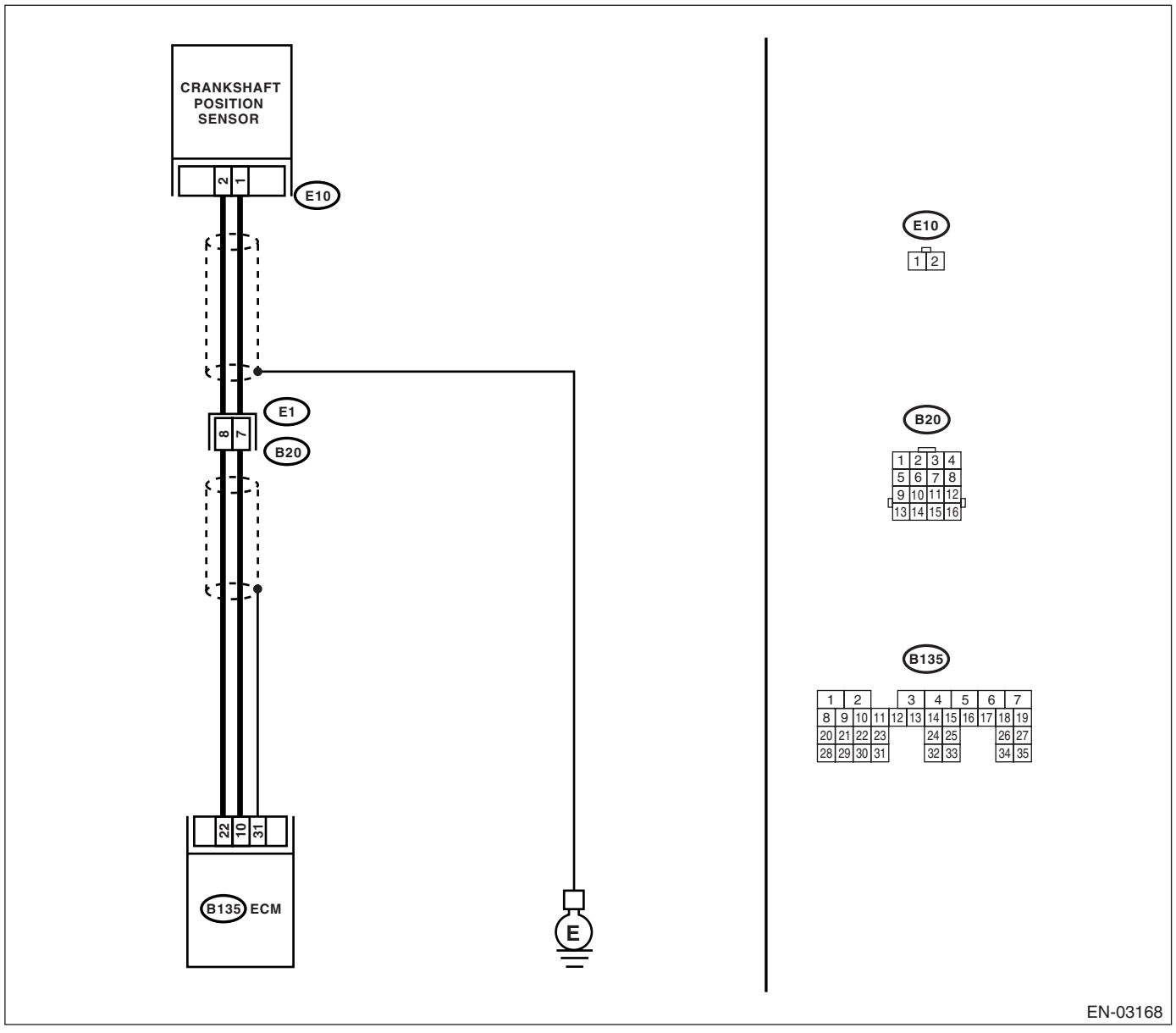
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-107, DTC P0335 CRANKSHAFT POSITION SENSOR “A” CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the crankshaft position sensor.<br>3) Measure the resistance of harness between crankshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E10) No. 1 — (B135) No. 10:***<br>***(E10) No. 2 — (B135) No. 22:*** | Is the resistance more than 100 kΩ? | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between crankshaft position sensor and ECM connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.**<br>Measure the resistance of harness between crankshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E10) No. 1 — Engine ground:***<br>***(E10) No. 2 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair the ground short circuit in harness between crankshaft position sensor and ECM connector.<br>NOTE:<br>The harness between both connectors are shielded. Repair the ground short circuit in harness together with shield. |
| 4 | **CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.** | Is the crankshaft position sensor installation bolt tightened securely? | Go to step **5.** | Tighten the crankshaft position sensor installation bolt securely. |
| 5 | **CHECK CRANKSHAFT POSITION SENSOR.**<br>1) Remove the crankshaft position sensor.<br>2) Measure the resistance between connector terminals of crankshaft position sensor.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 1 — 4 kΩ? | Repair the poor contact in crankshaft position sensor connector. | Replace the crankshaft position sensor. <Ref. to FU(H4DOTC)-23, Crankshaft Position Sensor.> |

## AW:DTC P0336 CRANKSHAFT POSITION SENSOR “A” CIRCUIT RANGE/PERFORMANCE

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-109, DTC P0336 CRANKSHAFT POSITION SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

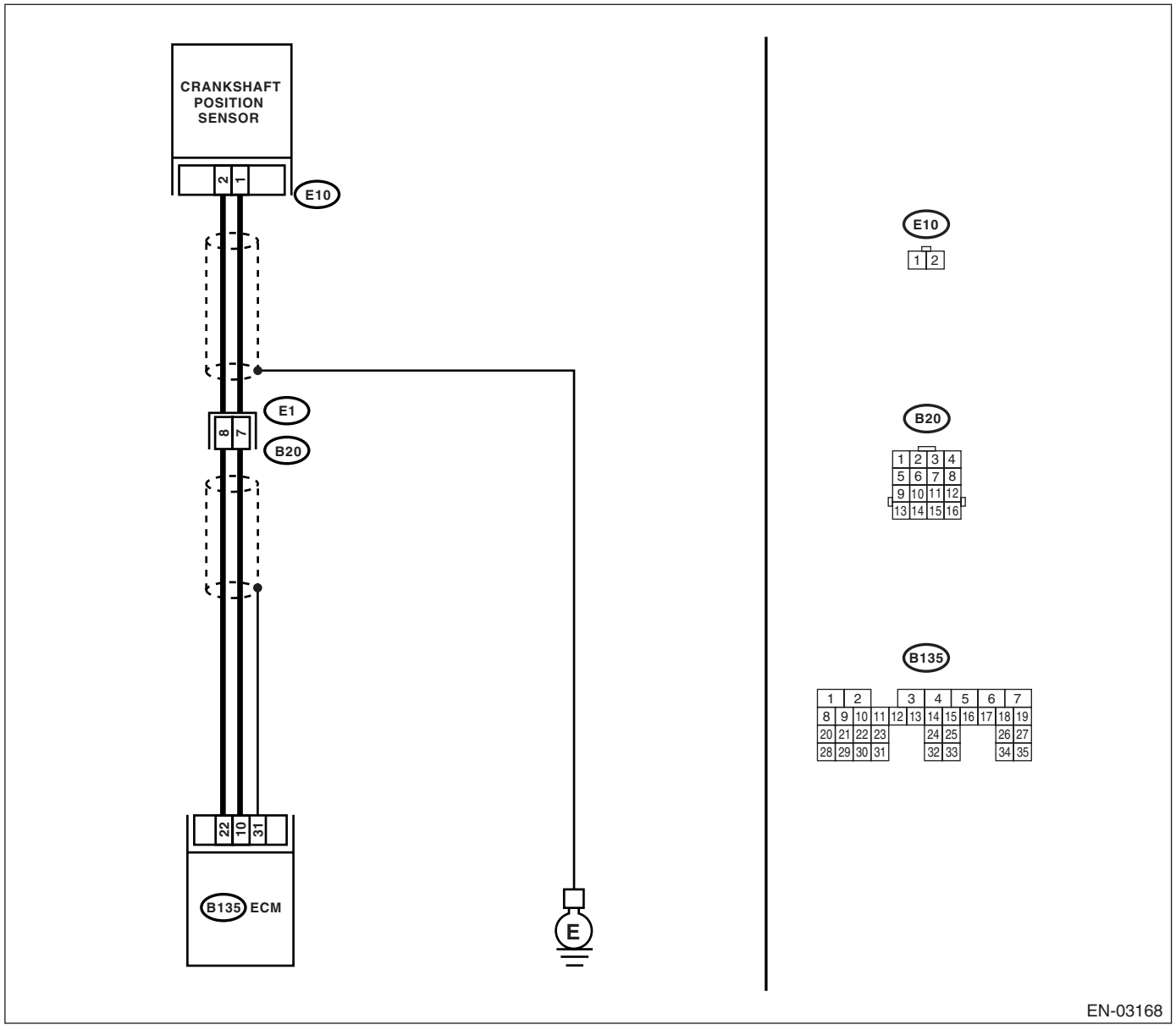
**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.**<br>Turn the ignition switch to OFF. | Is the crankshaft position sensor installation bolt tightened securely? | Go to step **3.** | Tighten the crankshaft position sensor installation bolt securely. |
| 3 | **CHECK CRANK SPROCKET.**<br>Remove the front belt cover. | Are the crank sprocket teeth cracked or damaged? | Replace the crank sprocket. <Ref. to FU(H4DOTC)-23, Crankshaft Position Sensor.> | Go to step **4.** |
| 4 | **CHECK INSTALLATION CONDITION OF TIMING BELT.**<br>Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block. | Is the timing belt dislocated from its proper position? | Repair the installation condition of timing belt. <Ref. to ME(H4DOTC)-42, Timing Belt.> | Replace the crankshaft position sensor. <Ref. to FU(H4DOTC)-23, Crankshaft Position Sensor.> |

## AX:DTC P0340 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 1 OR SINGLE SENSOR)

**DTC DETECTING CONDITION:**

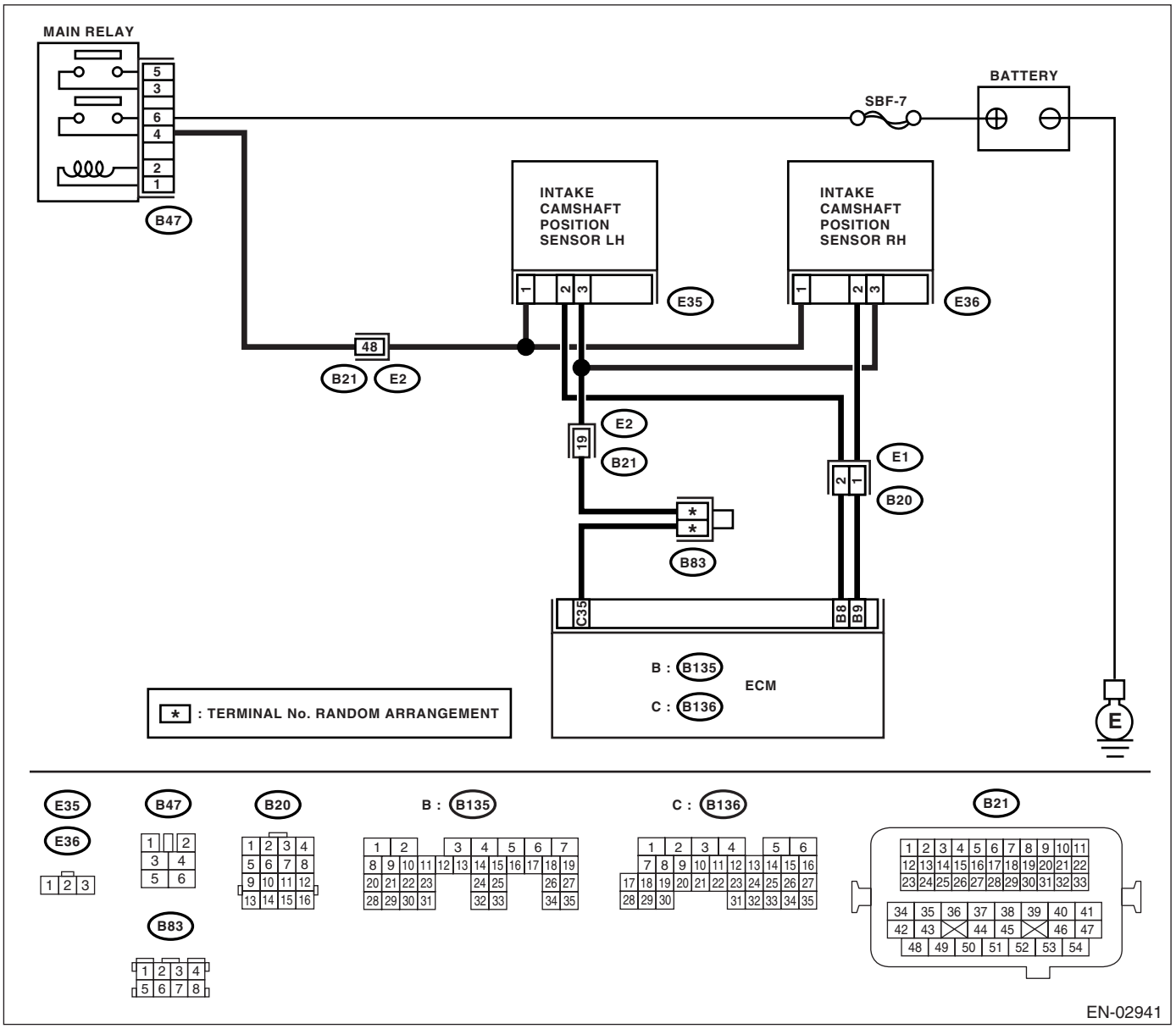
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-111, DTC P0340 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from camshaft position sensor.<br>3) Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E36) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit between main relay connector and camshaft position sensor connector. | Go to step **3.** |
| 3 | **CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E36) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **4.** | Repair the open or ground short circuit between main relay connector and camshaft position sensor connector. |
| 4 | **CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR CONNECTOR AND ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between camshaft position sensor connector and ECM.<br>***Connector & terminal***<br>***(E36) No. 2 — (B135) No. 9:***<br>***(E36) No. 3 — (B136) No. 35:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair the open circuit between camshaft position sensor and ECM. |
| 5 | **CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR CONNECTOR AND ECM.**<br>Measure the resistance between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E36) No. 2 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **6.** | Repair the ground short circuit between camshaft position sensor and ECM. |
| 6 | **CHECK CONDITION OF CAMSHAFT POSITION SENSOR.** | Is the camshaft position sensor installation bolt tightened securely? | Go to step **7.** | Tighten the camshaft position sensor installation bolt securely. |
| 7 | **CHECK CAMSHAFT POSITION SENSOR.**<br>Check waveform of camshaft position sensor. <Ref. to EN(H4DOTC)(diag)-18, Engine Control Module (ECM) I/O Signal.> | Is there any abnormality in waveform? | Replace the camshaft position sensor. <Ref. to FU(H4DOTC)-24, Camshaft Position Sensor.> | Go to step **8.** |
| 8 | **CHECK POOR CONTACT.**<br>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)-39, Engine Control Module (ECM).> |

# AY:DTC P0345 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 2)

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-112, DTC P0345 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

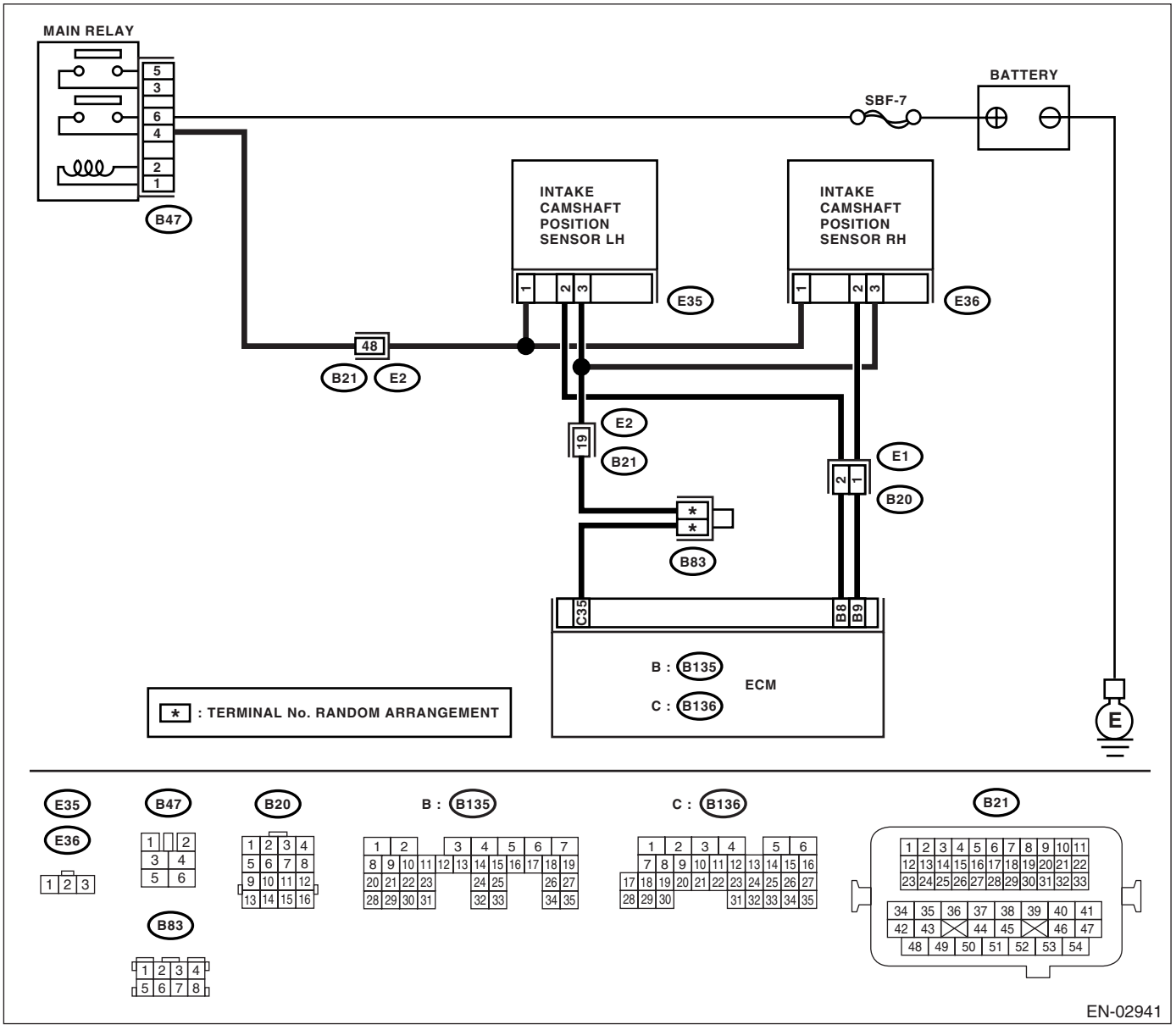
**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from camshaft position sensor.<br>3) Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E35) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit between main relay connector and camshaft position sensor connector. | Go to step **3.** |
| 3 | **CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E35) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **4.** | Repair the open or ground short circuit between main relay connector and camshaft position sensor connector. |
| 4 | **CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR CONNECTOR AND ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between camshaft position sensor connector and ECM.<br>***Connector & terminal***<br>***(E35) No. 2 — (B135) No. 8:***<br>***(E35) No. 3 — (B136) No. 35:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair the open circuit between camshaft position sensor and ECM. |
| 5 | **CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR CONNECTOR AND ECM.**<br>Measure the resistance between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E35) No. 2 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **6.** | Repair the ground short circuit between camshaft position sensor and ECM. |
| 6 | **CHECK CONDITION OF CAMSHAFT POSITION SENSOR.** | Is the camshaft position sensor installation bolt tightened securely? | Go to step **7.** | Tighten the camshaft position sensor installation bolt securely. |
| 7 | **CHECK CAMSHAFT POSITION SENSOR.**<br>Check waveform of camshaft position sensor. <Ref. to EN(H4DOTC)(diag)-18, Engine Control Module (ECM) I/O Signal.> | Is there any abnormality in waveform? | Replace the camshaft position sensor. <Ref. to FU(H4DOTC)-24, Camshaft Position Sensor.> | Go to step **8.** |
| 8 | **CHECK POOR CONTACT.**<br>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)-39, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

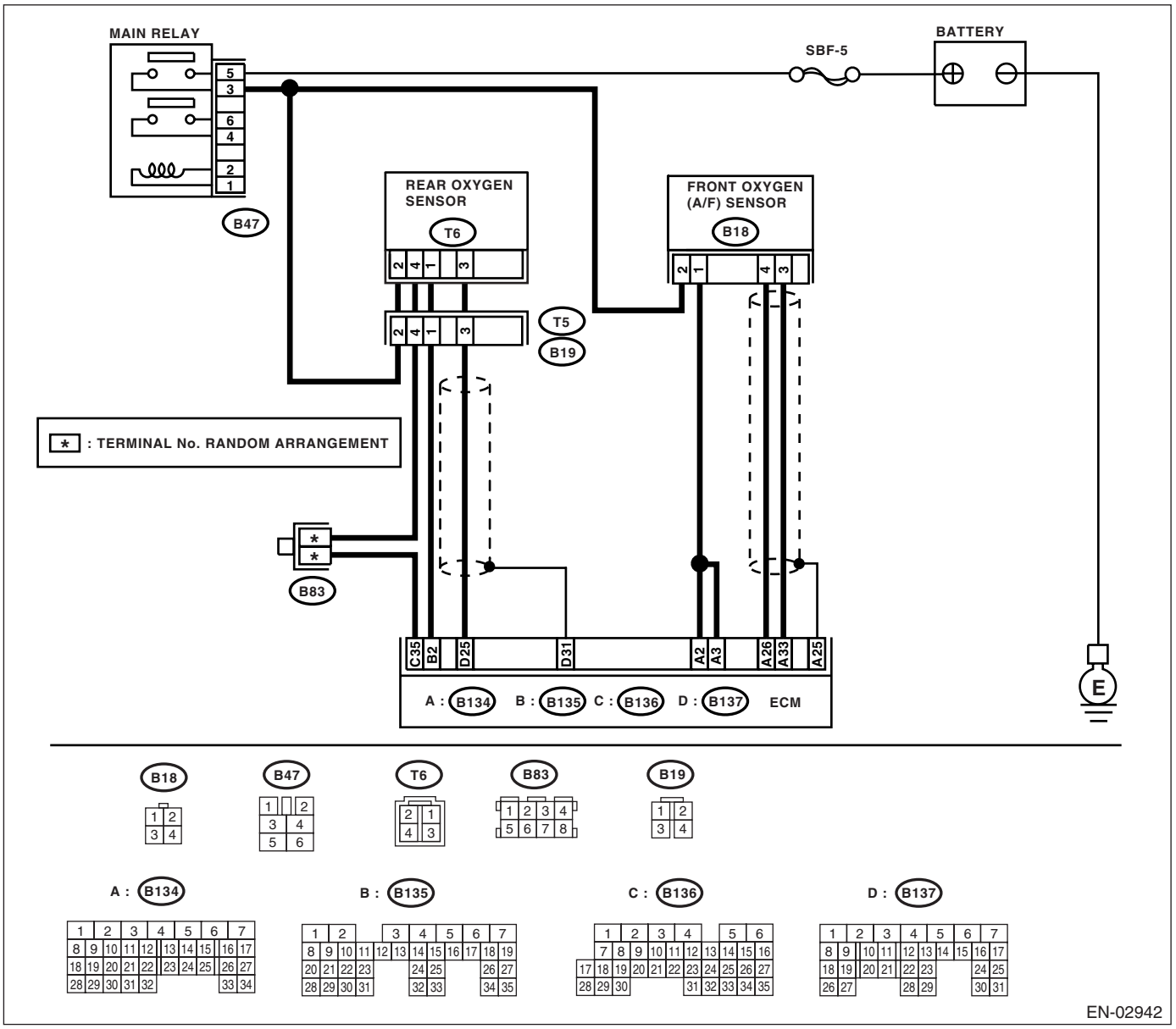
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-113, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

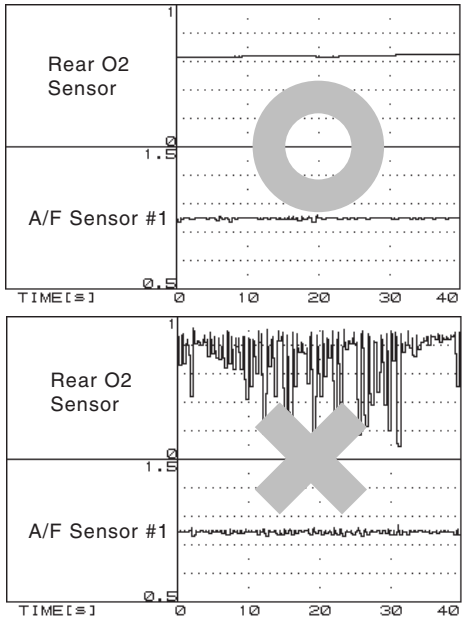
**TROUBLE SYMPTOM:**

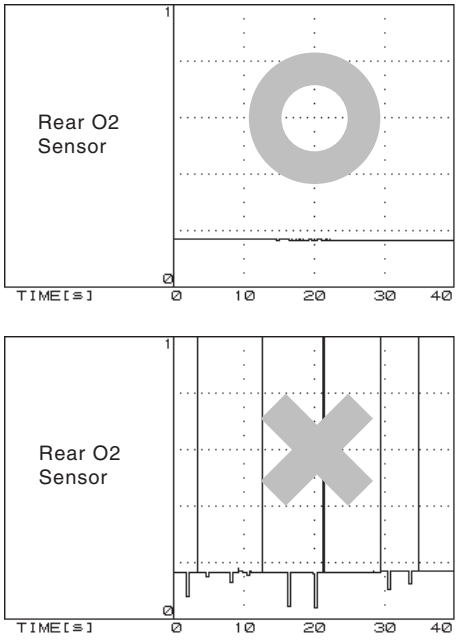
- Engine stalls.
- Idle mixture is out of specifications.

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0420. | Go to step **2.** |
| 2 | **CHECK EXHAUST SYSTEM.**<br>Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.<br>NOTE:<br>Check the following positions.<br>• Between cylinder head and front exhaust pipe<br>• Between front exhaust pipe and front catalytic converter<br>• Between front catalytic converter and rear catalytic converter<br>• Loose part and improper installation of front oxygen (A/F) sensor or rear oxygen sensor | Is there any fault in exhaust system? | Repair or replace the exhaust system. <Ref. to EX(H4DOTC)-2, General Description.> | Go to step **3.** |
| 3 | **CHECK WAVEFORM DATA ON SUBARU SELECT MONITOR (WHILE DRIVING).**<br>1) Drive the vehicle at a constant speed of 80 — 112 km/h (50 — 70 MPH).<br>2) Keep the condition of step 1) for 5 minutes, then read the waveform data in a driving condition using Subaru Select Monitor.<br>  | Is normal waveform pattern displayed? | Contact your SOA Service Center.<br>NOTE:<br>The probable cause is considered as the deterioration of multiple parts. | Go to step **4.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 4 | **CHECK WAVEFORM DATA ON SUBARU SELECT MONITOR (WHILE IDLING).**<br>1) Idle the engine.<br>2) Under the condition of step 1), read the waveform data using Subaru Select Monitor.<br>  <br>EN-04681 | Is normal waveform pattern displayed? | Go to step **10.** | Go to step **5.** |
| 5 | **CHECK REAR OXYGEN SENSOR VOLTAGE.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 3,000 rpm. (Max. 2 minutes)<br>2) Read the voltage of rear oxygen (A/F) sensor using Subaru Select Monitor.<br>NOTE:<br>• For MT model, depress the clutch pedal.<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage more than 490 mV? | Go to step **9.** | Go to step **6.** |
| 6 | **CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Does water enter the connector? | Dry the water thoroughly. | Go to step **7.** |
| 7 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and rear oxygen sensor.<br>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the resistance more than 3 Ω? | Repair the open circuit of harness between ECM and rear oxygen sensor connector. | Go to step **8.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between rear oxygen sensor connector and chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Chassis ground (−):*** | Is the voltage 0.2 — 0.5 V? | Go to step **11.** | Repair the harness and connector.<br>NOTE:<br>Repair the following.<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor and ECM connector<br>• Poor contact in ECM connector |
| 9 | **CHECK REAR OXYGEN SENSOR VOLTAGE.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and rapidly reduce the engine speed from 3,000 rpm.<br>2) Read the voltage of rear oxygen (A/F) sensor using Subaru Select Monitor.<br>NOTE:<br>• For MT model, depress the clutch pedal.<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage 250 mV or less? | Contact your SOA Service Center.<br>NOTE:<br>The probable cause is considered as the deterioration of multiple parts. | Go to step **6.** |
| 10 | **CHECK CATALYTIC CONVERTER.** | Is the catalytic converter damaged? | Replace the catalytic converter. <Ref. to EC(H4DOTC)-3, Front Catalytic Converter.> | Contact your SOA Service Center.<br>NOTE:<br>The probable cause is considered as the deterioration of multiple parts. |
| 11 | **CHECK REAR OXYGEN SENSOR SHIELD.**<br>1) Turn the ignition switch to OFF.<br>2) Bare the harness sensor shield on the body side of rear oxygen sensor connector.<br>3) Measure the resistance between sensor shield and chassis ground. | Is resistance less than 1 Ω? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair the open circuit of rear oxygen sensor harness. |

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

**DTC DETECTING CONDITION:**

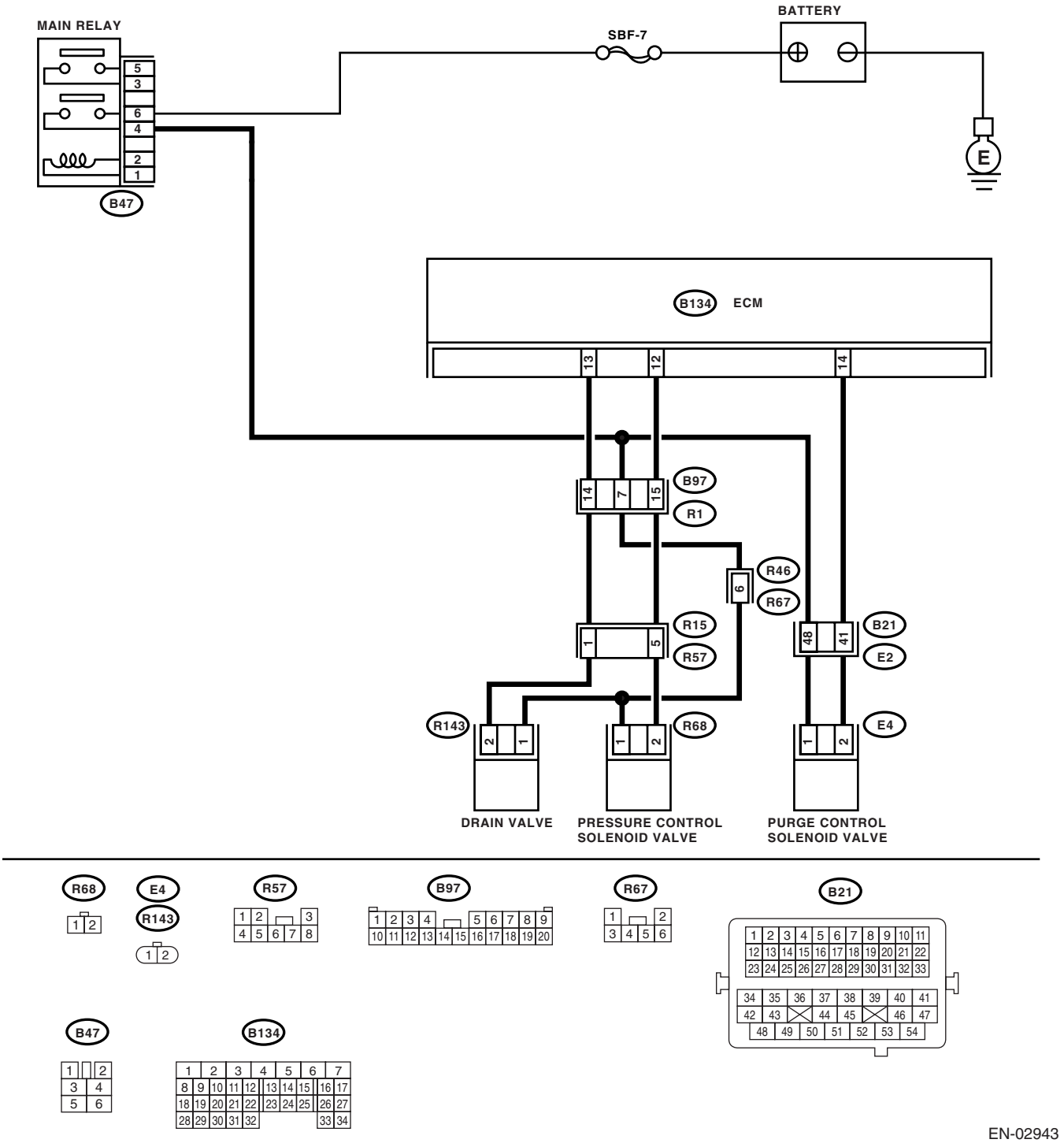
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-116, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

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

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-02943

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK FUEL FILLER CAP.**<br>1) Turn the ignition switch to OFF.<br>2) Check the fuel filler cap.<br>NOTE:<br>The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening. | Is the fuel filler cap tightened securely? | Go to step **3.** | Tighten fuel filler cap securely. |
| 3 | **CHECK FUEL FILLER CAP.** | Is the fuel filler cap SUBARU genuine? | Go to step **4.** | Replace with a SUBARU genuine fuel filler cap. |
| 4 | **CHECK FUEL FILLER PIPE PACKING.** | Is there any damage to the seal between fuel filler cap and fuel filler pipe? | Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-51, Fuel Filler Pipe.> | Go to step **5.** |
| 5 | **CHECK DRAIN VALVE.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the drain valve.<br>NOTE:<br>Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Go to step **6.** | Replace the drain valve. <Ref. to EC(H4DOTC)-16, Drain Valve.> |
| 6 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>Operate the purge control solenoid valve.<br>NOTE:<br>Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the purge control solenoid valve operate? | Go to step **7.** | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 7 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Operate the pressure control solenoid valve.<br>NOTE:<br>Pressure control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the pressure control solenoid valve operate? | Go to step **8.** | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-13, Pressure Control Solenoid Valve.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.**<br>Turn the ignition switch to OFF. | Is there a hole of more than 1.0 mm (0.04 in) dia. on evaporation line? | Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-60, Fuel Delivery, Return and Evaporation Lines.> | Go to step **9.** |
| 9 | **CHECK CANISTER.** | Is the canister damaged or is there a hole of more than 1.0 mm (0.04 in) dia. in it? | Repair or replace the canister. <Ref. to EC(H4DOTC)-6, Canister.> | Go to step **10.** |
| 10 | **CHECK FUEL TANK.**<br>Remove the fuel tank. <Ref. to FU(H4DOTC)-45, Fuel Tank.> | Is the fuel tank damaged or is there a hole of more than 1.0 mm (0.04 in) dia. in it? | Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-45, Fuel Tank.> | Go to step **11.** |
| 11 | **CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.** | Are there holes of more than 1.0 mm (0.04 in) dia., cracks, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system? | Repair or replace the hoses or pipes. | Contact with SOA Service Center. |

## BB:DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN

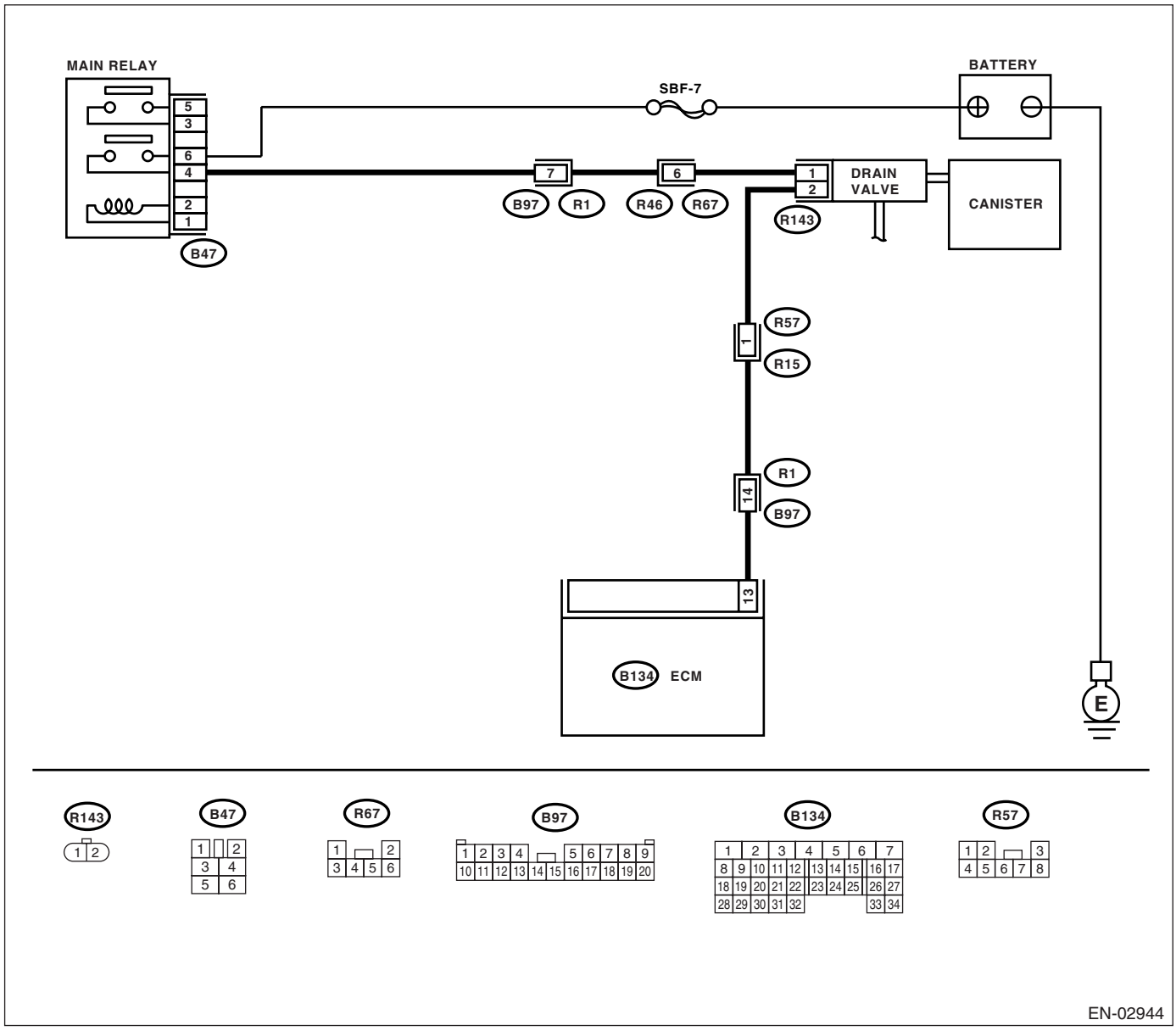
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-131, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 13 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. (However, the possibility of poor contact still remains.)<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in drain valve connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 3 | **CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from drain valve and ECM.<br>3) Measure the resistance of harness between drain valve connector and chassis ground.<br>***Connector & terminal***<br>***(R143) No. 2 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair short circuit to ground in harness between ECM and drain valve connector. |
| 4 | **CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.**<br>Measure the resistance of harness between ECM and drain valve connector.<br>***Connector & terminal***<br>***(B134) No. 13 — (R143) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and drain valve connector<br>• Poor contact in coupling connector |
| 5 | **CHECK DRAIN VALVE.**<br>Measure the resistance between drain valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 10 — 100 Ω? | Go to step **6.** | Replace the drain valve. <Ref. to EC(H4DOTC)-16, Drain Valve.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK POWER SUPPLY TO DRAIN VALVE.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between drain valve and chassis ground.<br>***Connector & terminal***<br>***(R143) No. 1 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **7.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and drain valve<br>• Poor contact in coupling connector<br>• Poor contact in main relay connector |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in drain valve connector. | Is there poor contact in drain valve connector? | Repair poor contact in drain valve connector. | Contact with SOA Service Center. |

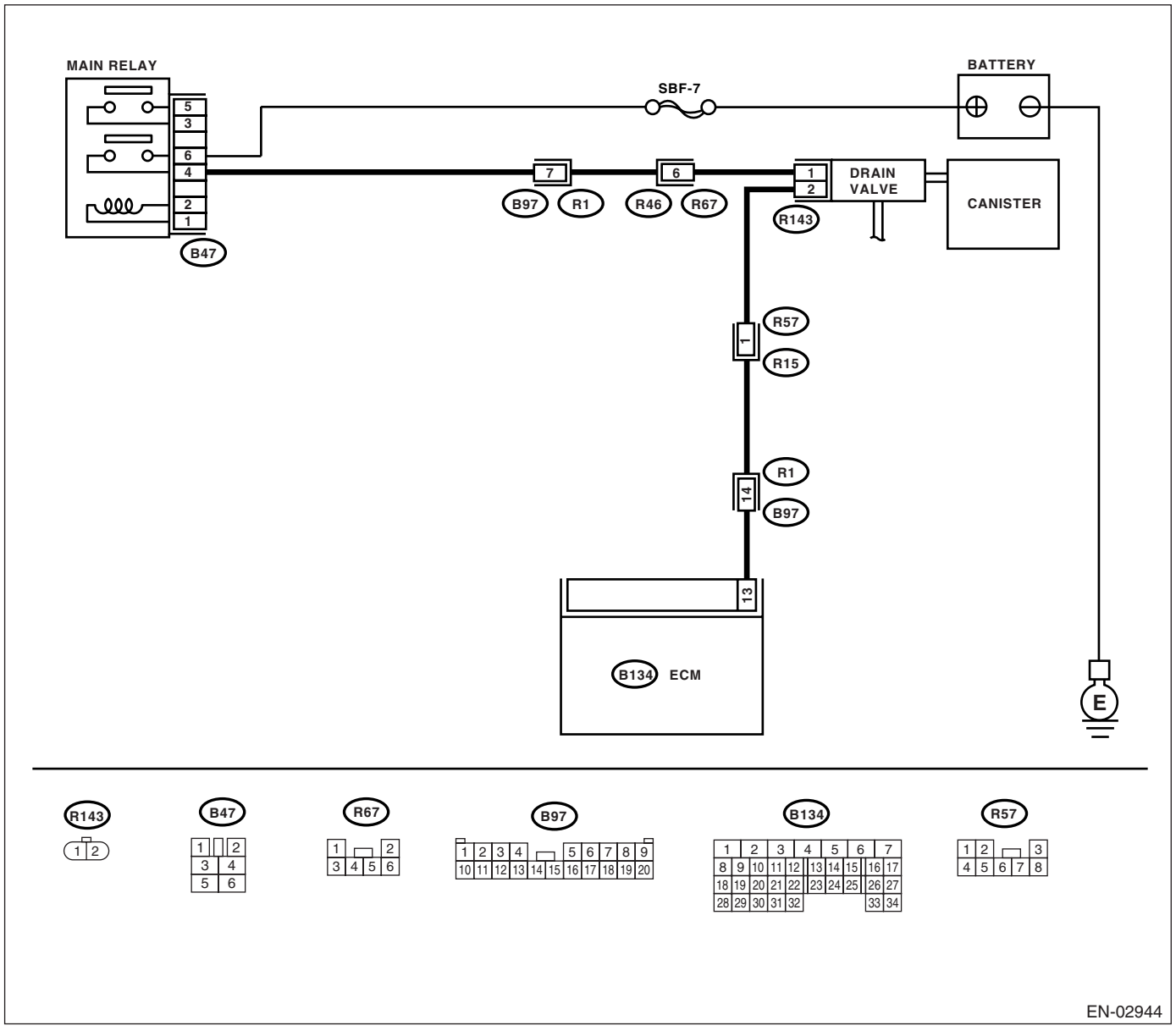
# BC:DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-133, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL FOR ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).<br>3) Turn the ignition switch to ON.<br>4) While operating the drain valve, measure voltage between ECM and chassis ground.<br>NOTE:<br>Drain valve operation can be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.><br>***Connector & terminal***<br>***(B134) No. 13 (+) — Chassis ground (–):*** | Is the voltage 0 — 10 V? | Go to step **2.** | The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. In this case, repair poor contact in ECM connector. |
| 2 | **CHECK INPUT SIGNAL FOR ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 13 (+) — Chassis ground (–):*** | Is the voltage more than 10 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 4 | **CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from drain valve.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 13 (+) — Chassis ground (–):*** | Is the voltage more than 10 V? | Repair short circuit to battery in harness between ECM and drain valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Go to step **5.** |
| 5 | **CHECK DRAIN VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between drain valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Replace the drain valve <Ref. to EC(H4DOTC)-16, Drain Valve.> and ECM <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).>. | Go to step **6.** |
| 6 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

## BD:DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR

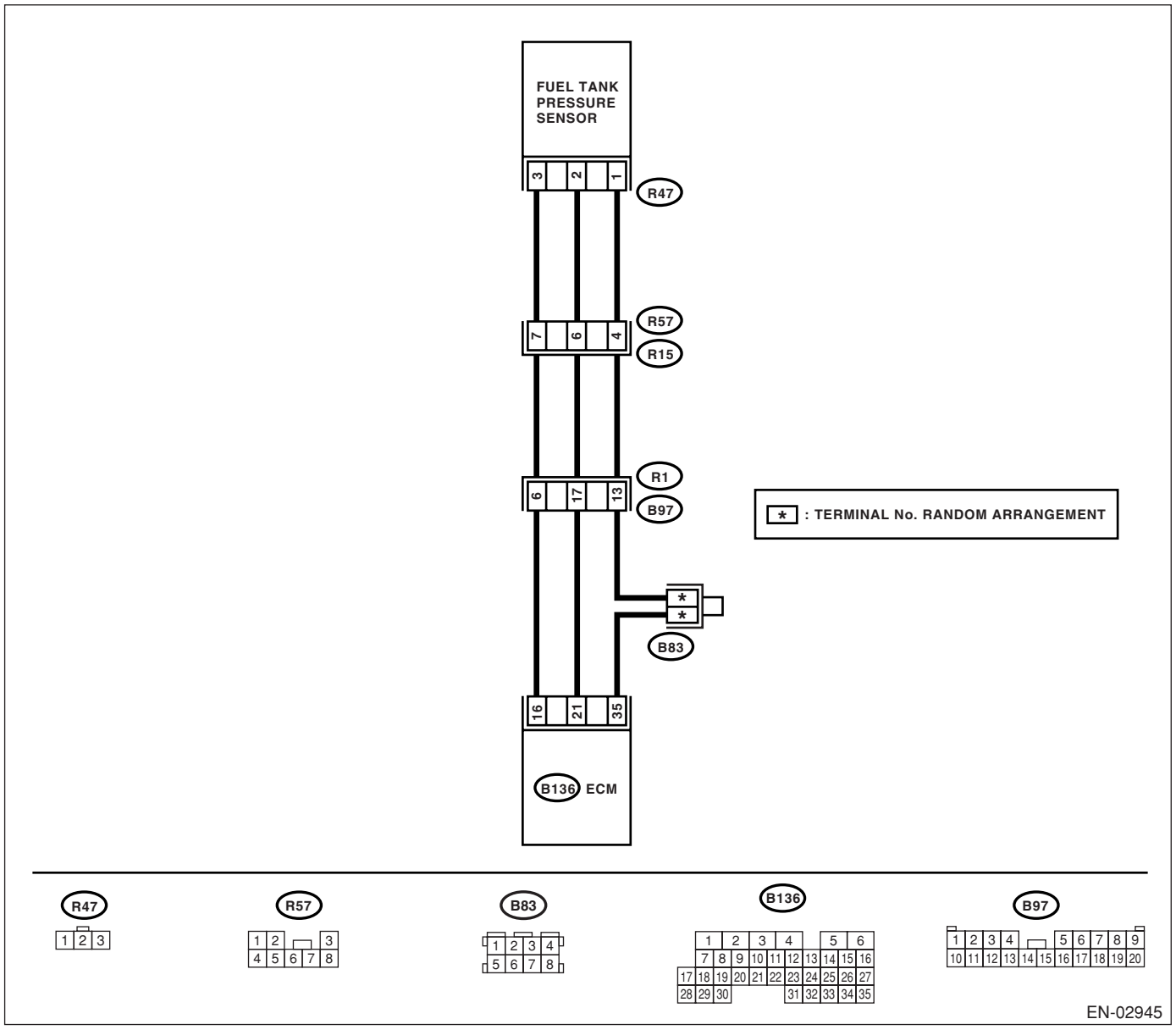
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-135, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK FUEL FILLER CAP.**<br>1) Turn the ignition switch to OFF.<br>2) Open the fuel flap. | Is the fuel filler cap tightened securely? | Go to step **3.** | Tighten fuel filler cap securely. |
| 3 | **CHECK PRESSURE/VACUUM LINE.**<br>NOTE:<br>Check the following items.<br>• Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank<br>• Disconnection, leakage and clogging of air ventilation hoses and pipes between fuel filler pipe and fuel tank | Is there any fault in pressure/vacuum line? | Repair or replace the hoses and pipes. | Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-11, Fuel Tank Pressure Sensor.> |

## BE:DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT

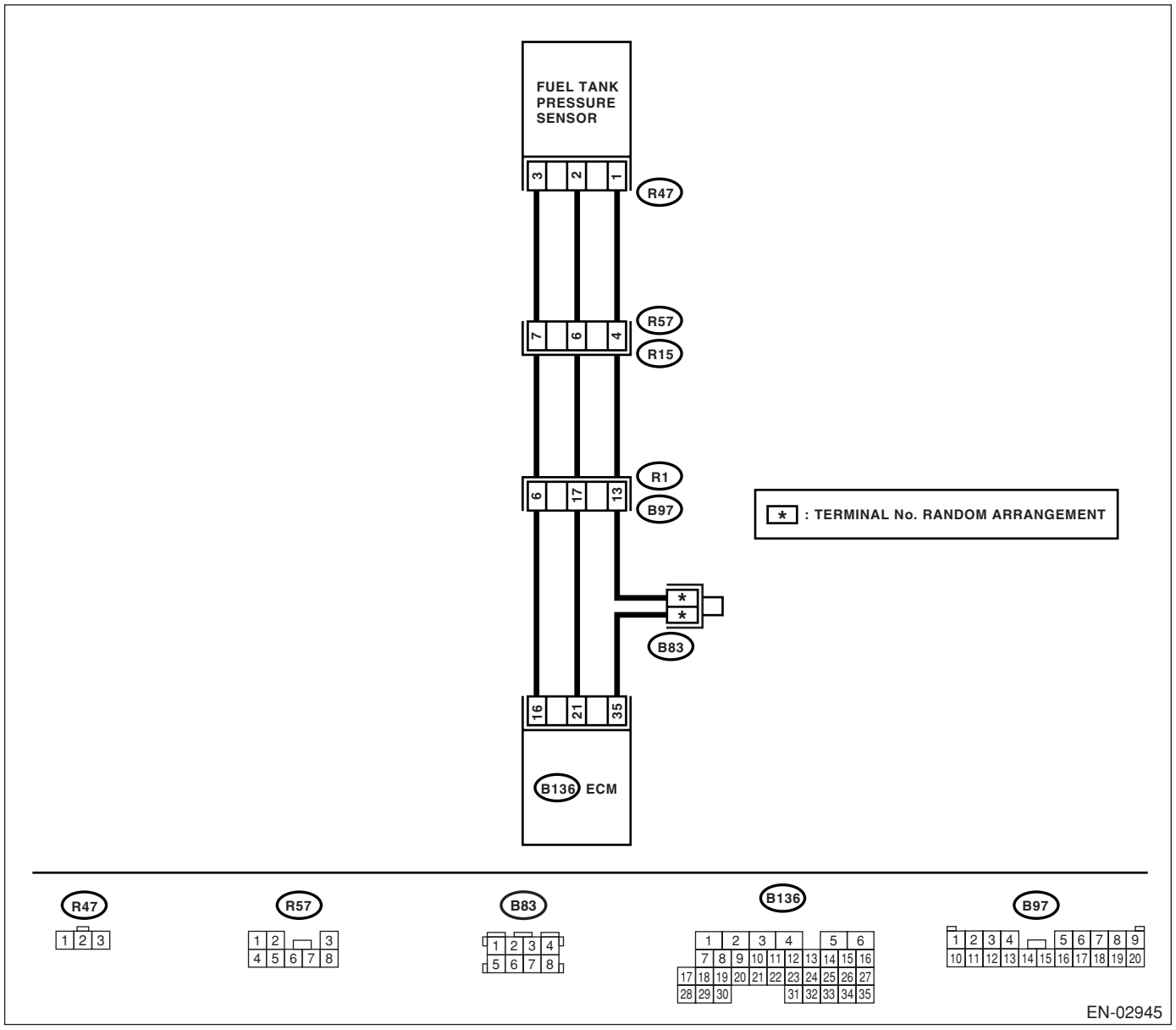
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-137, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the fuel filler cap.<br>3) Install the fuel filler cap.<br>4) Turn the ignition switch to ON.<br>5) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the measured valve less than –2.8 kPa (–21.0 mmHg, –0.827 inHg)? | Go to step **2.** | The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. |
| 2 | **CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Repair poor contact in ECM connector. | Contact with SOA Service Center. |
| 4 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 21 (+) — Chassis ground (–):*** | Is the voltage less than 0.2 V? | Go to step **6.** | Go to step **5.** |
| 5 | **CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.)**<br>Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Does the measured value exceed the specified value by shaking the ECM harness and connector? | Repair poor contact in ECM connector. | Go to step **6.** |
| 6 | **CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the rear seat cushion.<br>3) Separate rear wiring harness and fuel tank cord.<br>4) Turn the ignition switch to ON.<br>5) Measure the voltage between rear wiring harness connector and chassis ground.<br>***Connector & terminal***<br>***(R15) No. 7 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Go to step **7.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and rear wiring harness connector<br>• Poor contact in coupling connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM and rear wiring harness connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (R15) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **8.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and rear wiring harness connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 8 | **CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.**<br>Measure the resistance of harness between rear wiring harness connector and chassis ground.<br>***Connector & terminal***<br>***(R15) No. 4 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **9.** | Repair short circuit to ground in harness between ECM and rear wiring harness connector. |
| 9 | **CHECK FUEL TANK CORD.**<br>1) Disconnect the connector from fuel tank pressure sensor.<br>2) Measure the resistance of fuel tank cord.<br>***Connector & terminal***<br>***(R57) No. 7 — (R47) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **10.** | Repair open circuit in fuel tank cord. |
| 10 | **CHECK FUEL TANK CORD.**<br>Measure the resistance of fuel tank cord.<br>***Connector & terminal***<br>***(R57) No. 4 — (R47) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **11.** | Repair open circuit in fuel tank cord. |
| 11 | **CHECK FUEL TANK CORD.**<br>Measure the resistance of harness between fuel tank pressure sensor connector and engine ground.<br>***Connector & terminal***<br>***(R47) No. 2 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **12.** | Repair short circuit to ground in fuel tank cord. |
| 12 | **CHECK POOR CONTACT.**<br>Check poor contact in fuel tank pressure sensor connector. | Is there poor contact in fuel tank pressure sensor connector? | Repair poor contact in fuel tank pressure sensor connector. | Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-11, Fuel Tank Pressure Sensor.> |

## BF:DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT

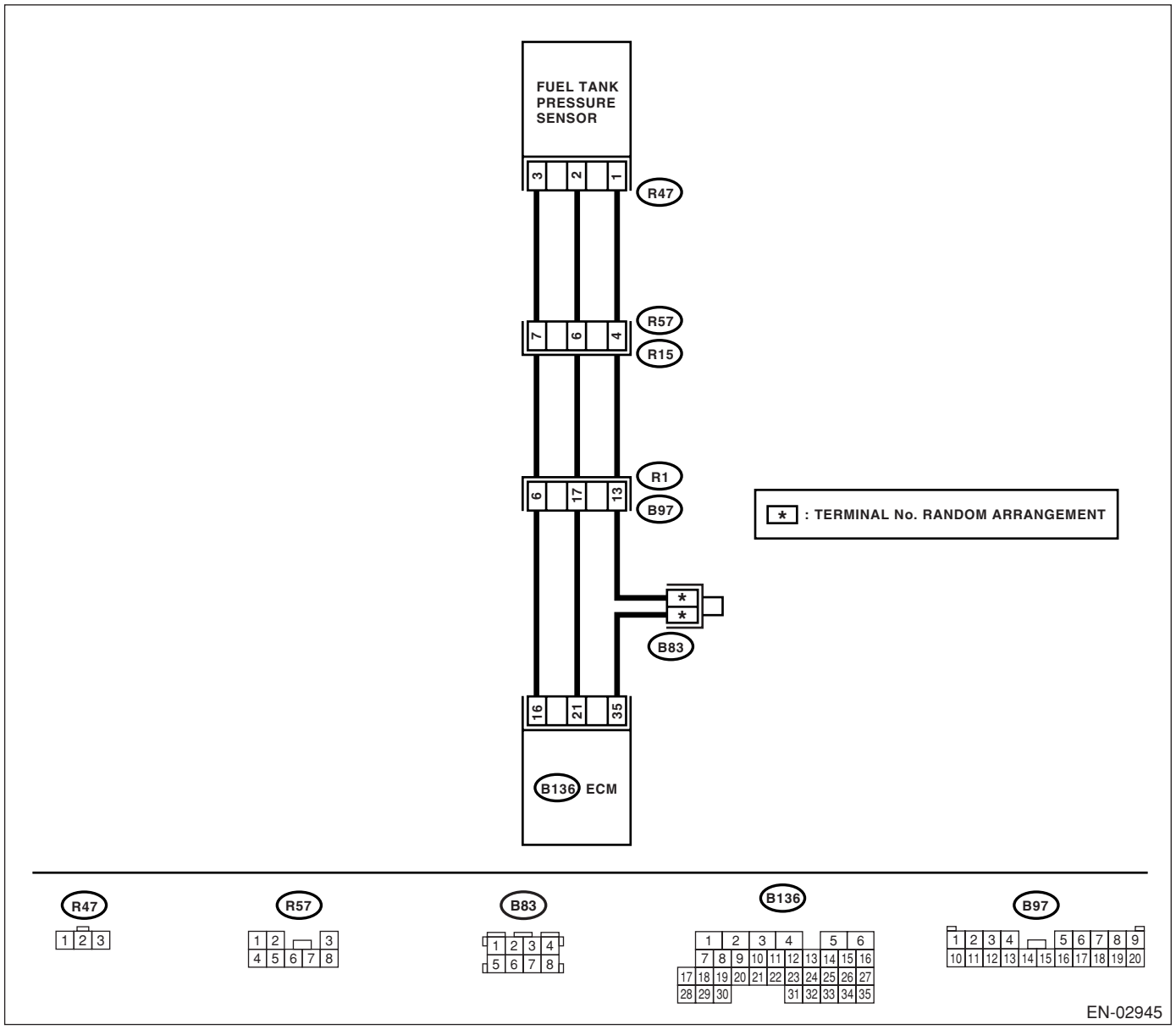
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-139, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the fuel filler cap.<br>3) Install the fuel filler cap.<br>4) Turn the ignition switch to ON.<br>5) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the measured value more than 2.8 kPa (21.0 mmHg, 0.827 inHg) | Go to step **11.** | Go to step **2.** |
| 2 | **CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (−):*** | Is the voltage more than 4.5 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (−):*** | Does the measured value exceed the specified value by shaking the ECM harness and connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 4 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 21 (+) — Chassis ground (−):*** | Is the voltage less than 0.2 V? | Go to step **6.** | Go to step **5.** |
| 5 | **CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.)**<br>Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Does the measured value exceed −2.8 kPa (−21.0 mmHg, −0.827 inHg) by shaking the ECM harness and connector? | Repair poor contact in ECM connector. | Go to step **6.** |
| 6 | **CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the rear seat cushion.<br>3) Separate rear wiring harness and fuel tank cord.<br>4) Turn the ignition switch to ON.<br>5) Measure the voltage between rear wiring harness connector and chassis ground.<br>***Connector & terminal***<br>***(R15) No. 7 (+) — Chassis ground (−):*** | Is the voltage more than 4.5 V? | Go to step **7.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and rear wiring harness connector<br>• Poor contact in coupling connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM and rear wiring harness connector.<br>***Connector & terminal***<br>***(B136) No. 21 — (R15) No. 6:***<br>***(B136) No. 35 — (R15) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **8.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and rear wiring harness connector<br>• Poor contact in coupling connector |
| 8 | **CHECK FUEL TANK CORD.**<br>1) Disconnect the connector from fuel tank pressure sensor.<br>2) Measure the resistance of fuel tank cord.<br>***Connector & terminal***<br>***(R57) No. 6 — (R47) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **9.** | Repair open circuit in fuel tank cord. |
| 9 | **CHECK FUEL TANK CORD.**<br>Measure the resistance of fuel tank cord.<br>***Connector & terminal***<br>***(R57) No. 4 — (R47) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **10.** | Repair open circuit in fuel tank cord. |
| 10 | **CHECK POOR CONTACT.**<br>Check poor contact in fuel tank pressure sensor connector. | Is there poor contact in fuel tank pressure sensor connector? | Repair poor contact in fuel tank pressure sensor connector. | Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-11, Fuel Tank Pressure Sensor.> |
| 11 | **CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel tank pressure sensor.<br>3) Turn the ignition switch to ON.<br>4) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the measured value more than 2.8 kPa (21.0 mmHg, 0.827 inHg)? | Repair short circuit to battery in harness between ECM and fuel tank pressure sensor connector. | Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-11, Fuel Tank Pressure Sensor.> |

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

**DTC DETECTING CONDITION:**

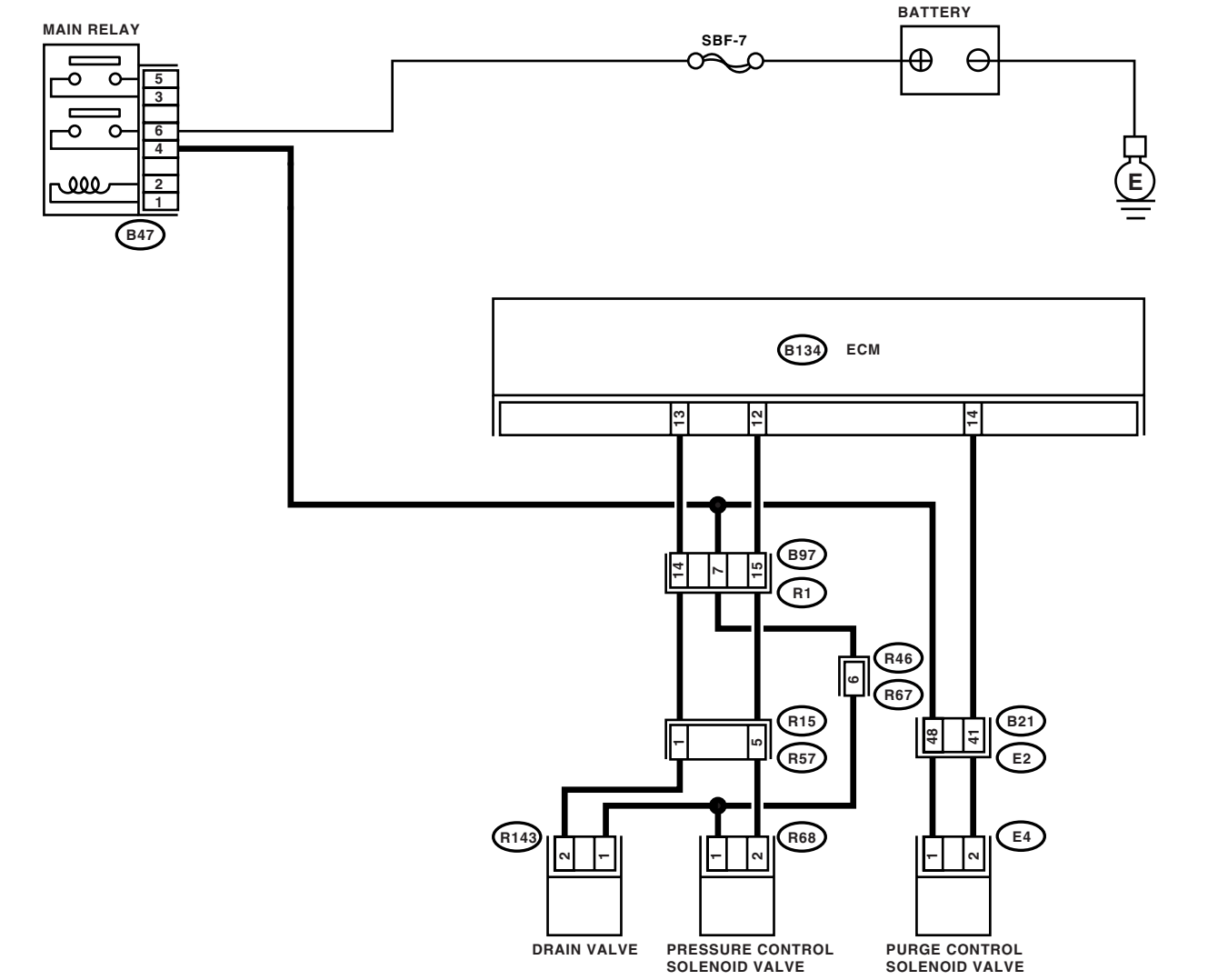
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-140, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

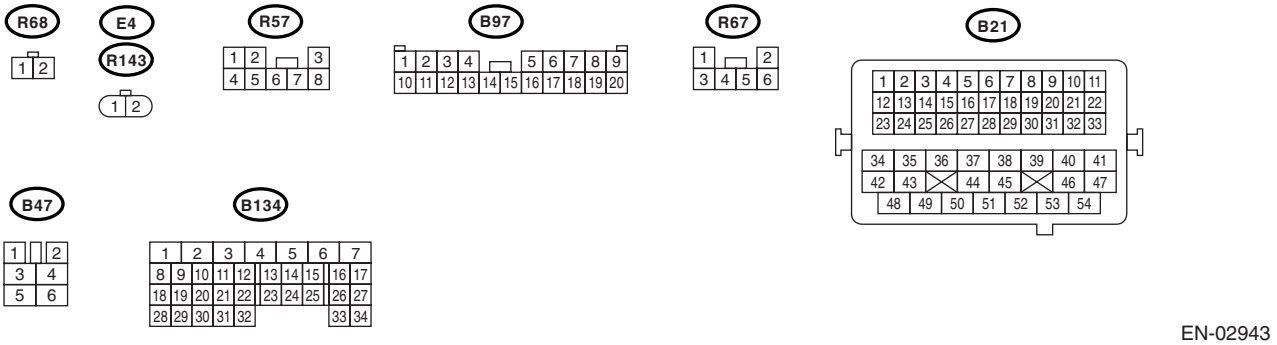
**TROUBLE SYMPTOM:**

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

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-02943

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK FUEL FILLER CAP.**<br>1) Turn the ignition switch to OFF.<br>2) Check the fuel filler cap.<br>NOTE:<br>The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening. | Is the fuel filler cap tightened securely? | Go to step **3.** | Tighten fuel filler cap securely. |
| 3 | **CHECK FUEL FILLER CAP.** | Is the fuel filler cap SUBARU genuine? | Go to step **4.** | Replace with a SUBARU genuine fuel filler cap. |
| 4 | **CHECK FUEL FILLER PIPE PACKING.** | Is there any damage to the seal between fuel filler cap and fuel filler pipe? | Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-51, Fuel Filler Pipe.> | Go to step **5.** |
| 5 | **CHECK DRAIN VALVE.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the drain valve.<br>NOTE:<br>Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Go to step **6.** | Replace the drain valve. <Ref. to EC(H4DOTC)-16, Drain Valve.> |
| 6 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>Operate the purge control solenoid valve.<br>NOTE:<br>Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the purge control solenoid valve operate? | Go to step **7.** | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 7 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Operate the pressure control solenoid valve.<br>NOTE:<br>Pressure control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the pressure control solenoid valve operate? | Go to step **8.** | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.**<br>Turn the ignition switch to OFF. | Is there a hole of more than 0.5 mm (0.020 in) dia. on evaporation line? | Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-60, Fuel Delivery, Return and Evaporation Lines.> | Go to step **9.** |
| 9 | **CHECK CANISTER.** | Is the canister damaged or is there a hole of more than 0.5 mm (0.020 in) dia. in it? | Repair or replace the canister. <Ref. to EC(H4DOTC)-6, Canister.> | Go to step **10.** |
| 10 | **CHECK FUEL TANK.**<br>Remove the fuel tank. <Ref. to FU(H4DOTC)-45, Fuel Tank.> | Is the fuel tank damaged or is there a hole of more than 0.5 mm (0.020 in) dia. in it? | Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-45, Fuel Tank.> | Go to step **11.** |
| 11 | **CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.** | Are there holes of more than 0.5 mm (0.020 in) dia., cracks, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system? | Repair or replace the hoses or pipes. | Contact with SOA Service Center. |

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-140, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Trouble Code (DTC) Detecting Criteria.>

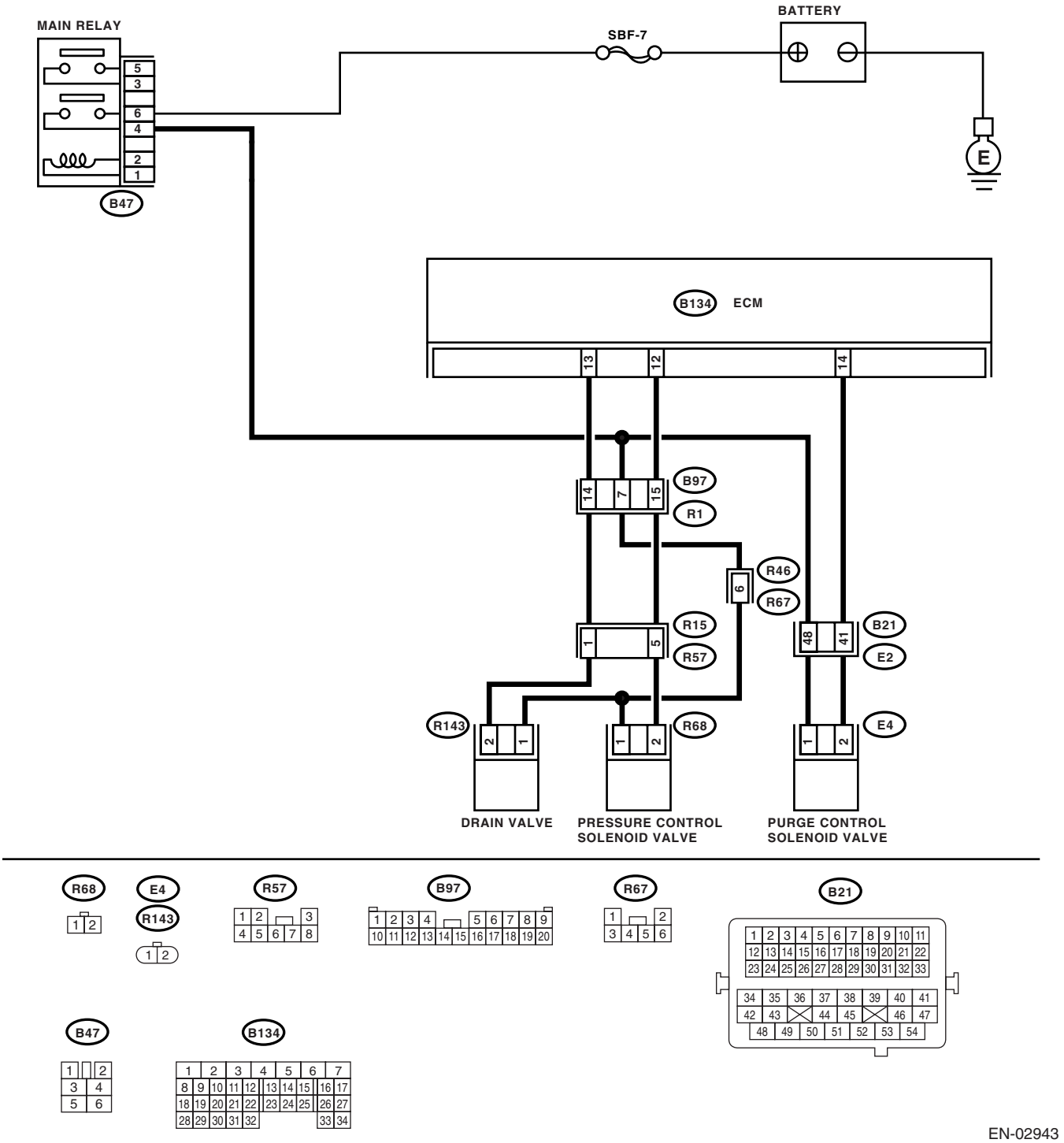
**TROUBLE SYMPTOM:**

- Fuel odor
- Fuel filler cap is loose or not installed.

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**







EN-02943

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK FUEL FILLER CAP.**<br>1) Turn the ignition switch to OFF.<br>2) Check the fuel filler cap.<br>NOTE:<br>The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain was caught while tightening. | Is the fuel filler cap tightened securely? | Go to step **3.** | Tighten fuel filler cap securely. |
| 3 | **CHECK FUEL FILLER CAP.** | Is the fuel filler cap SUBARU genuine? | Go to step **4.** | Replace with a SUBARU genuine fuel filler cap. |
| 4 | **CHECK FUEL FILLER PIPE PACKING.** | Is there any damage to the seal between fuel filler cap and fuel filler pipe? | Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-51, Fuel Filler Pipe.> | Go to step **5.** |
| 5 | **CHECK DRAIN VALVE.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the drain valve.<br>NOTE:<br>Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Go to step **6.** | Replace the drain valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 6 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>Operate the purge control solenoid valve.<br>NOTE:<br>Purge control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Does the purge control solenoid valve operate? | Go to step **7.** | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 7 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Operate the pressure control solenoid valve.<br>NOTE:<br>Pressure control solenoid valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the pressure control solenoid valve operate? | Go to step **8.** | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 8 | **CHECK CANISTER.** | Is the canister damaged? | Repair or replace the canister. <Ref. to EC(H4DOTC)-6, Canister.> | Go to step **9.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 9 | **CHECK FUEL TANK.**<br>Remove the fuel tank. <Ref. to FU(H4DOTC)-45, Fuel Tank.> | Is the fuel tank damaged? | Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-45, Fuel Tank.> | Go to step **10.** |
| 10 | **CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.** | Are there holes of more than 0.5 mm (0.020 in) dia., cracks, clogging, or disconnections, misconnection of hoses or pipes in evaporative emission control system? | Repair or replace the hoses or pipes. | Contact with SOA Service Center. |

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-141, DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

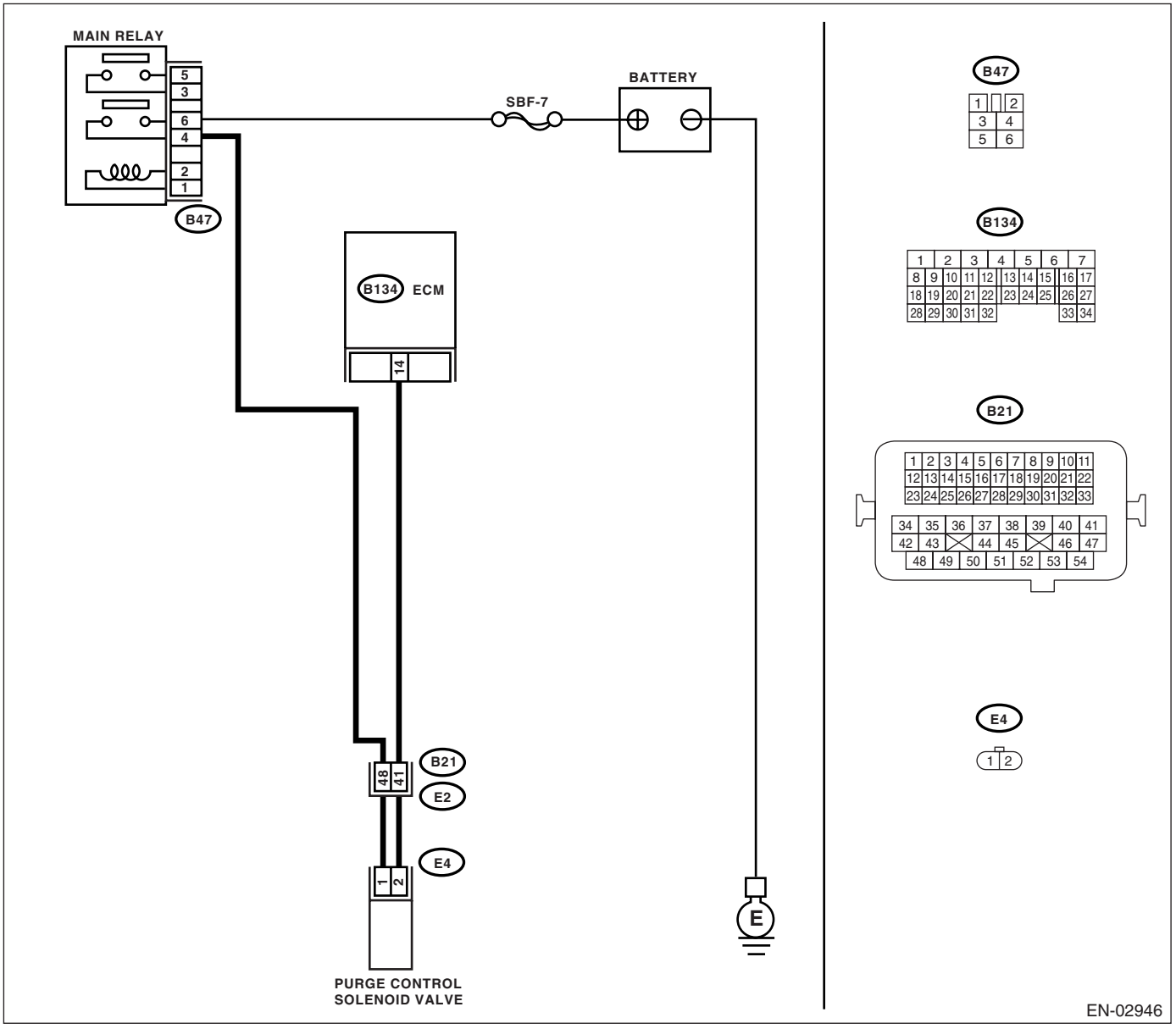
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 14 (+) — Chassis ground (−):*** | 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.** |
| 2 | **CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from purge control solenoid valve and ECM.<br>3) Measure the resistance of harness between purge control solenoid valve connector and engine ground.<br>***Connector & terminal***<br>***(E4) No. 2 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **3.** | Repair the ground short circuit in harness between ECM and purge control solenoid valve connector. |
| 3 | **CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>Measure the resistance of harness between ECM and purge control solenoid valve of harness connector.<br>***Connector & terminal***<br>***(B134) No. 14 — (E4) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit in harness between ECM and purge control solenoid valve connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and purge control solenoid valve connector<br>• Poor contact in coupling connector |
| 4 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>1) Remove the purge control solenoid valve.<br>2) Measure the resistance between purge control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 29 — 35 Ω? | Go to step **5.** | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 5 | **CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between purge control solenoid valve and engine ground.<br>***Connector & terminal***<br>***(E4) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Go to step **6.** | Repair the open circuit in harness between main relay and purge control solenoid valve connector. |
| 6 | **CHECK POOR CONTACT.**<br>Check poor contact in purge control solenoid valve connector. | Is there poor contact in purge control solenoid valve connector? | Repair the poor contact in purge control solenoid valve connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-143, DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

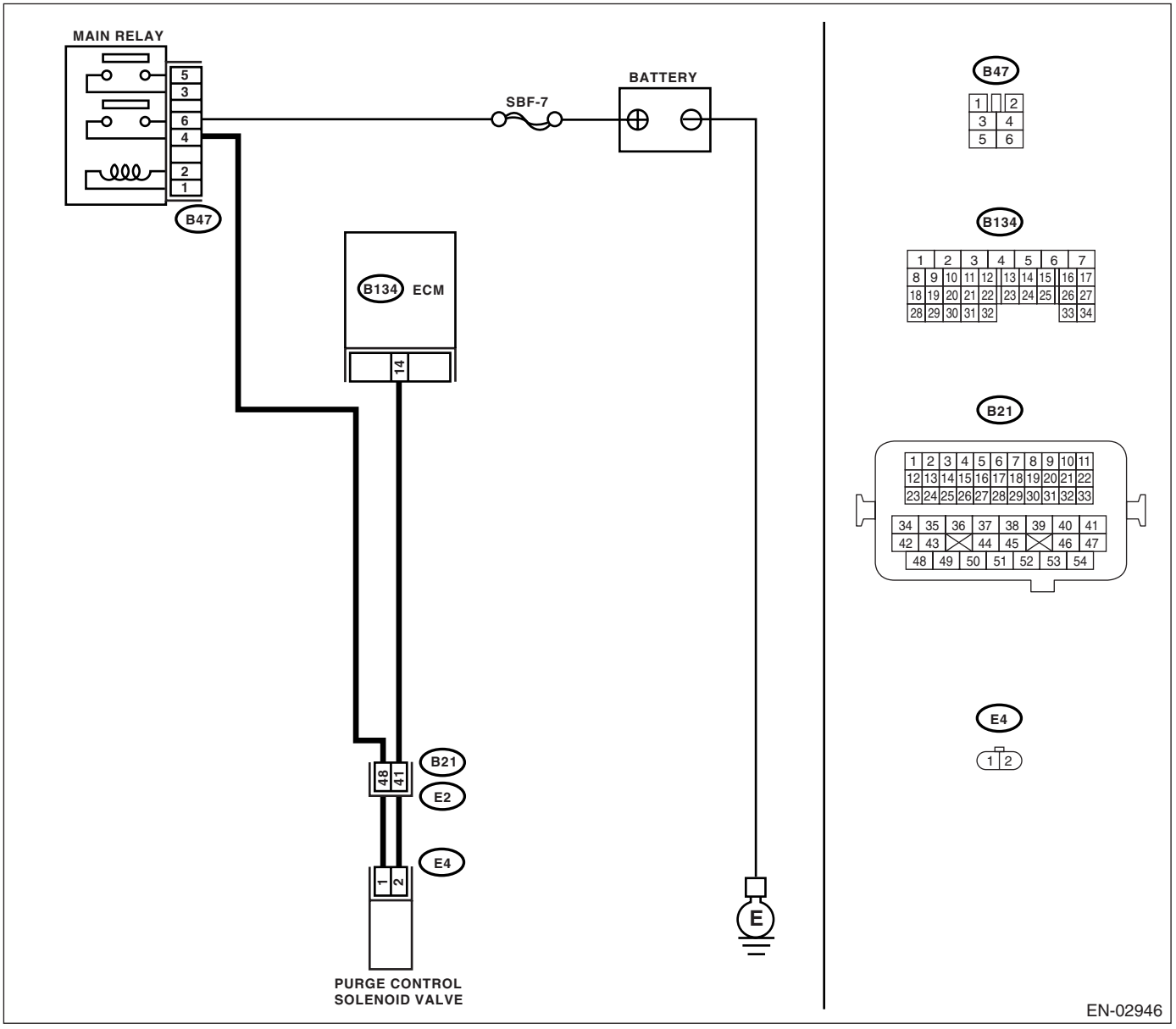
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).<br>3) Turn the ignition switch to ON. | Does the purge control solenoid valve operate? | 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 the poor contact in ECM connector. |
| 2 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from purge control solenoid valve.<br>3) Measure the resistance between purge control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 29 — 35 Ω? | Go to step **3.** | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-7, Purge Control Solenoid Valve.> |
| 3 | **CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from purge control solenoid valve.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 14 (+) — Chassis ground (−):*** | Is the voltage less than 1 V? | Go to step **4.** | Repair the battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 4 | **CHECK POOR CONTACT.**<br>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)-39, Engine Control Module (ECM).> |

## BK:DTC P0461 FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-145, DTC P0461 FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0461. | Replace the fuel level sensor. <Ref. to FU(H4DOTC)-56, Fuel Level Sensor.> and fuel sub level sensor <Ref. to FU(H4DOTC)-57, Fuel Sub Level Sensor.> |

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-147, DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Does DTC P0462 appear on the Subaru Select Monitor? | Check the combination meter. <Ref. to IDI-3, Combination Meter System.> | Temporary poor contact occurs. |

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

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-149, DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Does DTC P0463 appear on the Subaru Select Monitor? | Check the combination meter. <Ref. to IDI-3, Combination Meter System.> | Temporary poor contact occurs. |

## BN:DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-151, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Does DTC P0464 appear on the Subaru Select Monitor? | Check the combination meter. <Ref. to IDI-3, Combination Meter System.> | Temporary poor contact occurs. |

## BO:DTC P0483 COOLING FAN RATIONALITY CHECK

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-154, DTC P0483 COOLING FAN RATIONALITY CHECK, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Occurrence of noise
- Overheating

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

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

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Check the radiator fan, fan motor and thermostat. <Ref. to CO(H4DOTC)-24, Radiator Main Fan and Fan Motor.> and <Ref. to CO(H4DOTC)-27, Radiator Sub Fan and Fan Motor.> If thermostat is stuck, replace thermostat. |

## BP:DTC P0500 VEHICLE SPEED SENSOR

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-155, DTC P0500 VEHICLE SPEED SENSOR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK DTC OF ABS.**<br>Check DTC of ABS. | Is DTC of ABS displayed? | Perform the diagnosis according to the DTC. <Ref. to ABS(diag)-34, List of Diagnostic Trouble Code (DTC).> | Repair the poor contact in ECM. |

## BQ:DTC P0506 IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED

**DTC DETECTING CONDITION:**

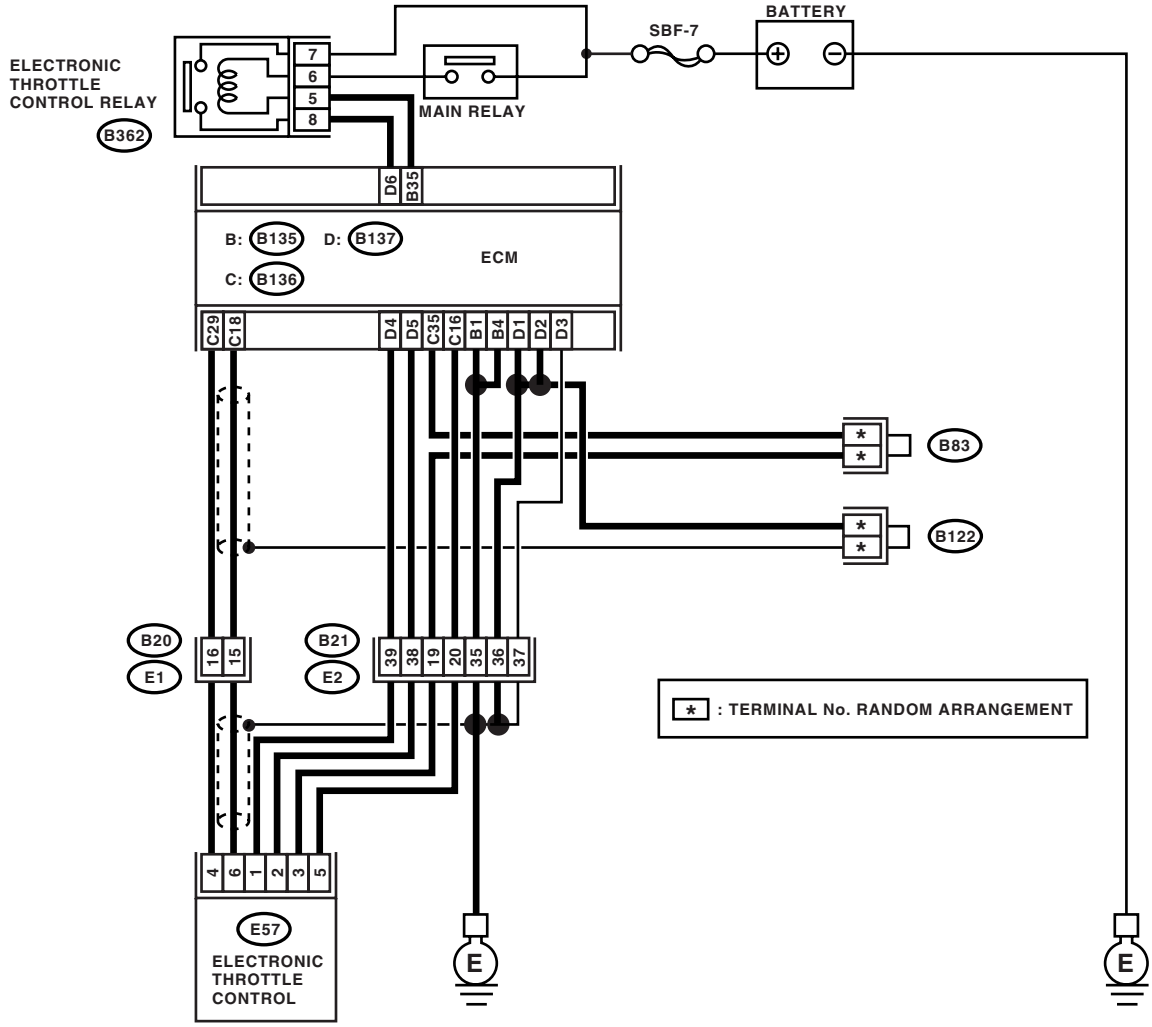
- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-157, DTC P0506 IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

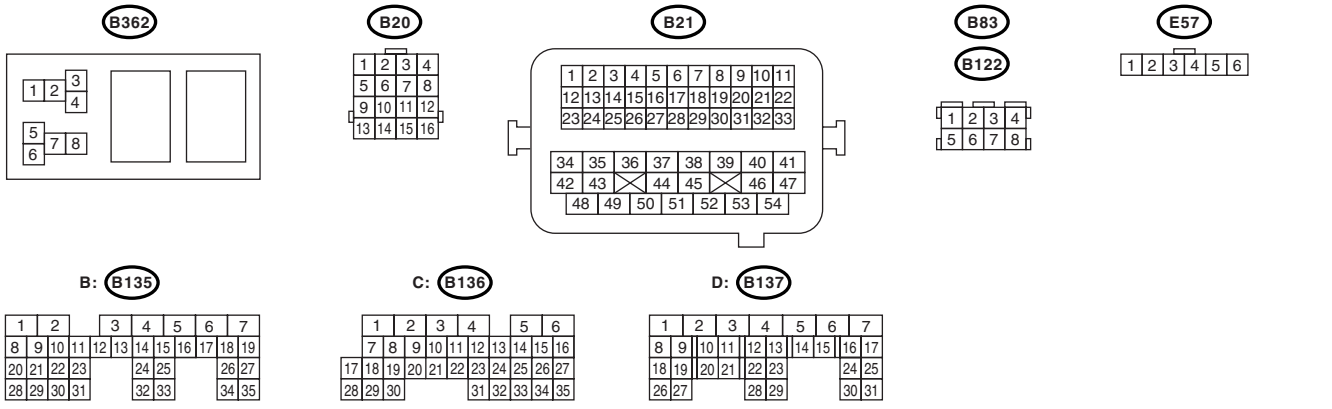
**TROUBLE SYMPTOM:**

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

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0506. | Go to step **2.** |
| 2 | **CHECK THE AIR CLEANER ELEMENT.**<br>1) Turn the ignition switch to OFF.<br>2) Check the air cleaner element. | Is there excessive clogging on air cleaner element. | Replace the air cleaner element. <Ref. to IN(H4DOTC)-8, Air Cleaner Case.> | Go to step **3.** |
| 3 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control.<br>3) Check the electronic throttle control. | Are there foreign particles in electronic throttle control? | Remove the foreign particles from electronic throttle control. | Perform the diagnosis of DTC P2101. |

## BR:DTC P0507 IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-159, DTC P0507 IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

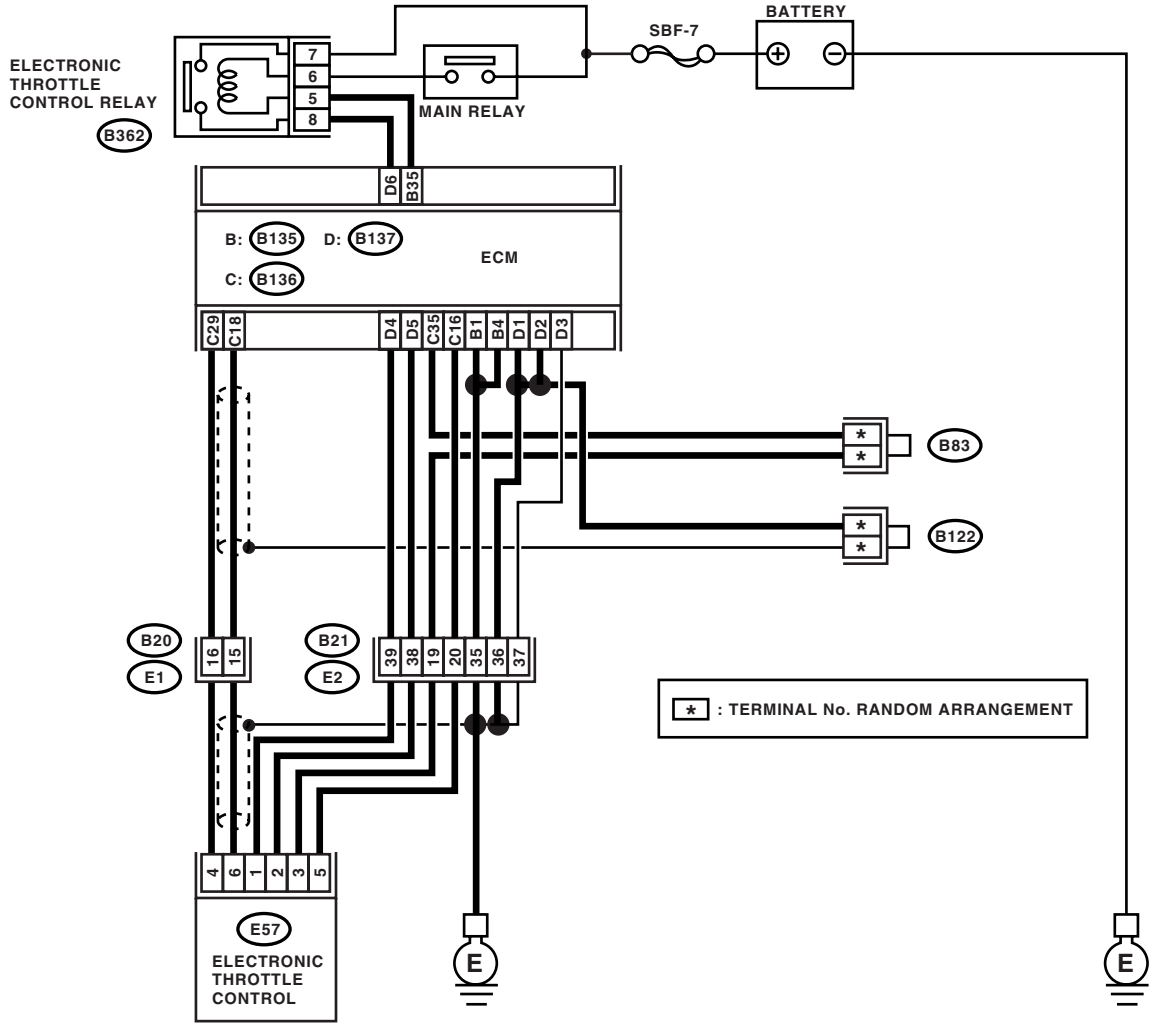
**TROUBLE SYMPTOM:**

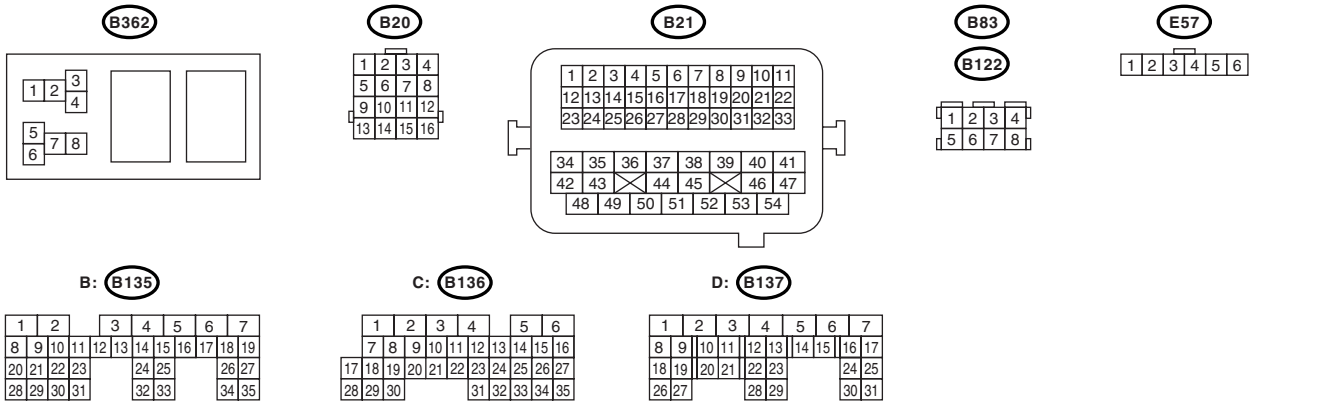
Engine keeps running at higher revolution than specified idling revolution.

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0507. | Go to step **2.** |
| 2 | **CHECK AIR INTAKE SYSTEM.**<br>1) Turn the ignition switch to ON.<br>2) Start the engine, and idle it.<br>3) Check the following items.<br>• Loose installation of intake manifold and throttle body<br>• Cracks of intake manifold gasket and throttle body gasket<br>• Disconnections of vacuum hoses | Is there any fault in air intake system? | Repair the air suction and leaks. | Go to step **3.** |
| 3 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control.<br>3) Check the electronic throttle control. | Are there foreign particles in electronic throttle control? | Remove the foreign particles from electronic throttle control. | Perform the diagnosis of DTC P2101. |

## BS:DTC P0512 STARTER REQUEST CIRCUIT

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-161, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

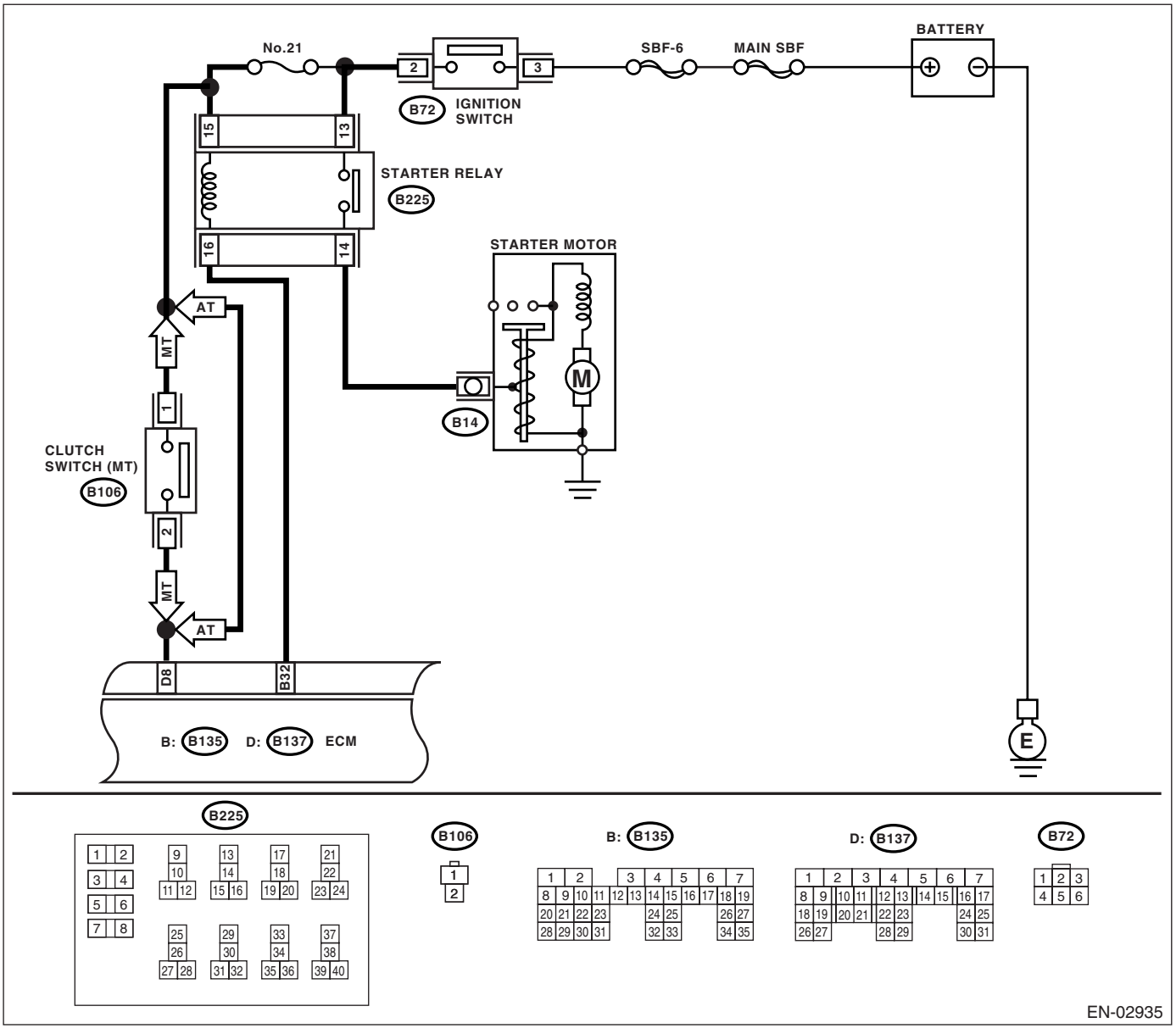
**TROUBLE SYMPTOM:**

Failure of engine to start

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN IGNITION SWITCH AND ECM.**<br>1) Disconnect the connectors from ECM.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 32 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ignition switch and ECM. | Repair the poor contact in ECM. |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-163, DTC P0519 IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**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)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P0519. | Go to step **2.** |
| 2 | **CHECK AIR INTAKE SYSTEM.**<br>1) Turn the ignition switch to ON.<br>2) Start and idle the engine.<br>3) Check the following items:<br>• Loose installation of intake manifold and throttle body<br>• Cracks of intake manifold gasket and throttle body gasket<br>• Disconnections of vacuum hoses | Is there any fault in air intake system? | Repair air suction and leaks. | Go to step **3.** |
| 3 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control.<br>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. |

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

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-164, DTC P0545 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW-BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

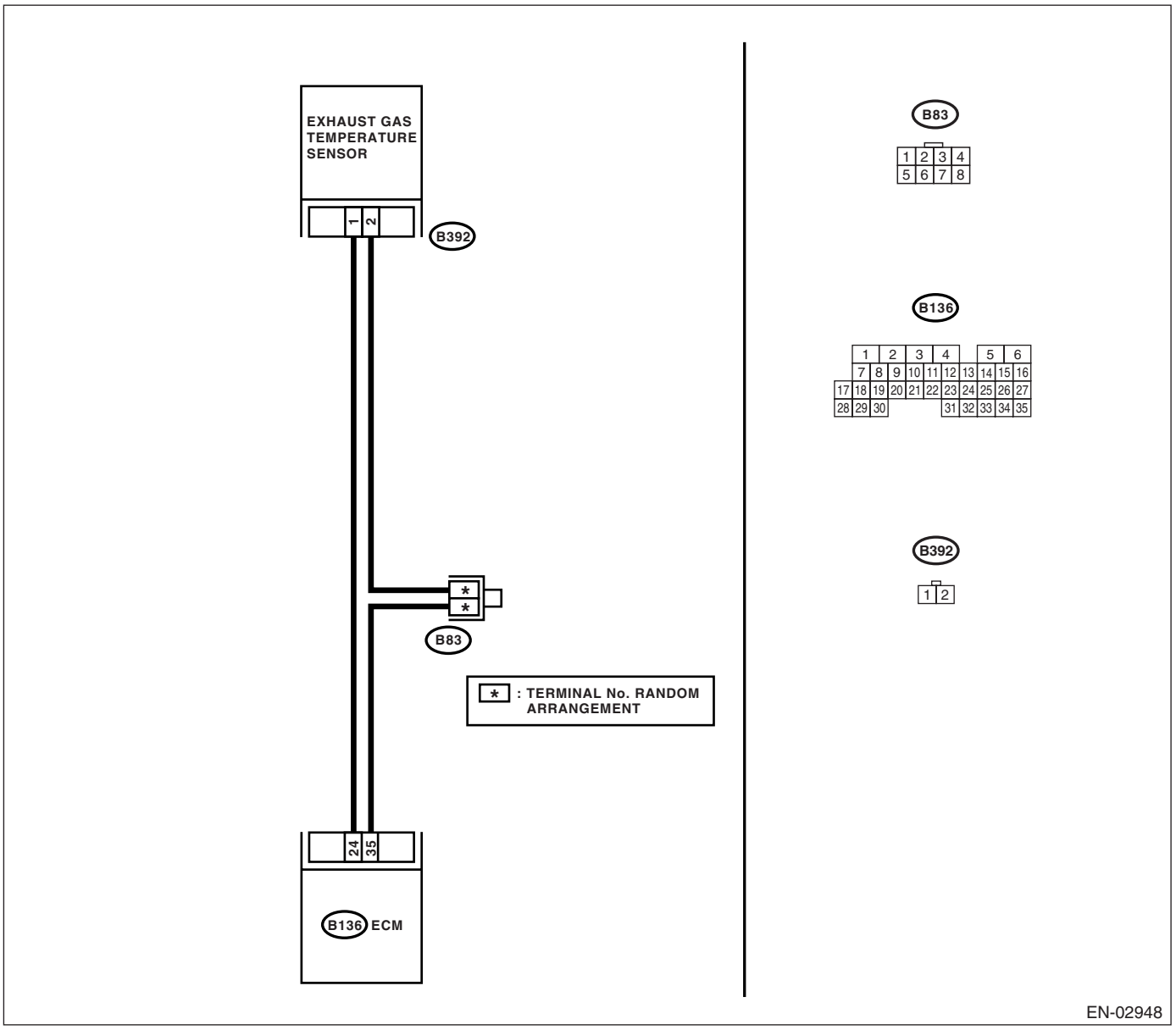
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of exhaust gas temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the general scan tool instruction manual. | Is the temperature more than 1200°C (2192°F)? | Go to step **2.** | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in exhaust gas temperature sensor<br>• Poor contact in ECM<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from exhaust gas temperature sensor.<br>3) Turn the ignition switch to ON.<br>4) Read the data of exhaust gas temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the general scan tool instruction manual. | Is the temperature less than 372°C (702°F)? | Replace the exhaust gas temperature sensor. <Ref. to FU(H4DOTC)-38, Exhaust Temperature Sensor.> | Repair the ground short circuit in harness between exhaust gas temperature sensor and ECM connector. |

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

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-166, DTC P0546 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH-BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

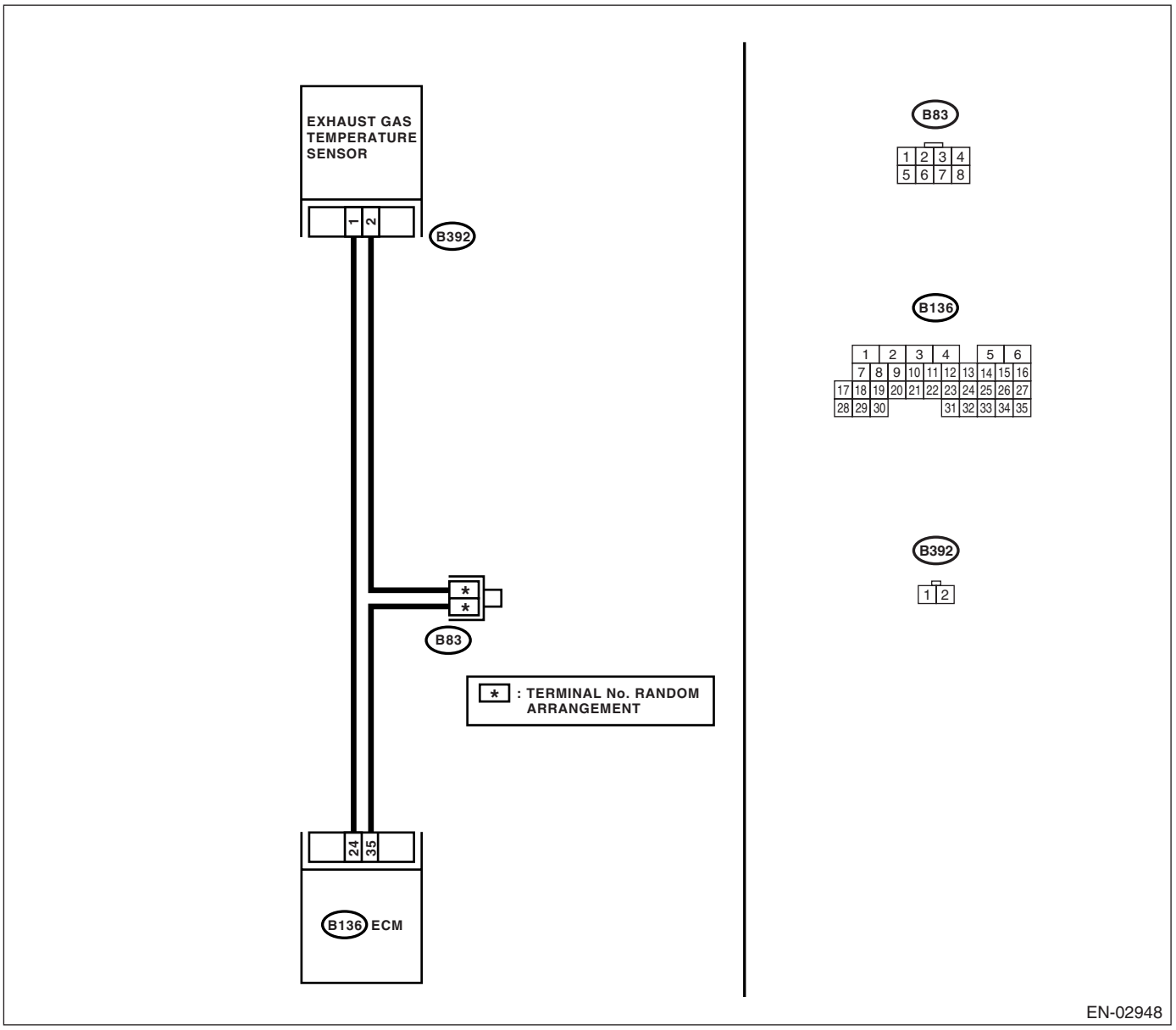
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of exhaust gas temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the General Scan Tool Instruction Manual. | Is the temperature less than 372°C (702°F)? | Go to step **2.** | Repair the poor contact.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in exhaust gas temperature sensor<br>• Poor contact in ECM<br>• Poor contact in joint connector |
| 2 | **CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from exhaust gas temperature sensor.<br>3) Measure the voltage between exhaust gas temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B392) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and exhaust gas temperature sensor connector. | Go to step **3.** |
| 3 | **CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between exhaust gas temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B392) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 10 V? | Repair the battery short circuit in harness between ECM and exhaust gas temperature sensor connector. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>Measure the voltage between exhaust gas temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B392) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 4 V? | Go to step **5.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and exhaust gas temperature sensor connector<br>• Poor contact in exhaust gas temperature sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in joint connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 5 | **CHECK HARNESS BETWEEN EXHAUST GAS TEMPERATURE SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between exhaust gas temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B392) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Replace the exhaust gas temperature sensor. <Ref. to FU(H4DOTC)-38, Exhaust Temperature Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and exhaust gas temperature sensor connector<br>• Poor contact in exhaust gas temperature sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in joint connector |

## BW:DTC P0600 SERIAL COMMUNICATION LINK

NOTE:
For the diagnostic procedure, refer to LAN system.

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

NOTE:
For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4DOTC)(diag)-228, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

NOTE:
For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4DOTC)(diag)-228, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## BZ:DTC P0607 CONTROL MODULE PERFORMANCE

**DTC DETECTING CONDITION:**

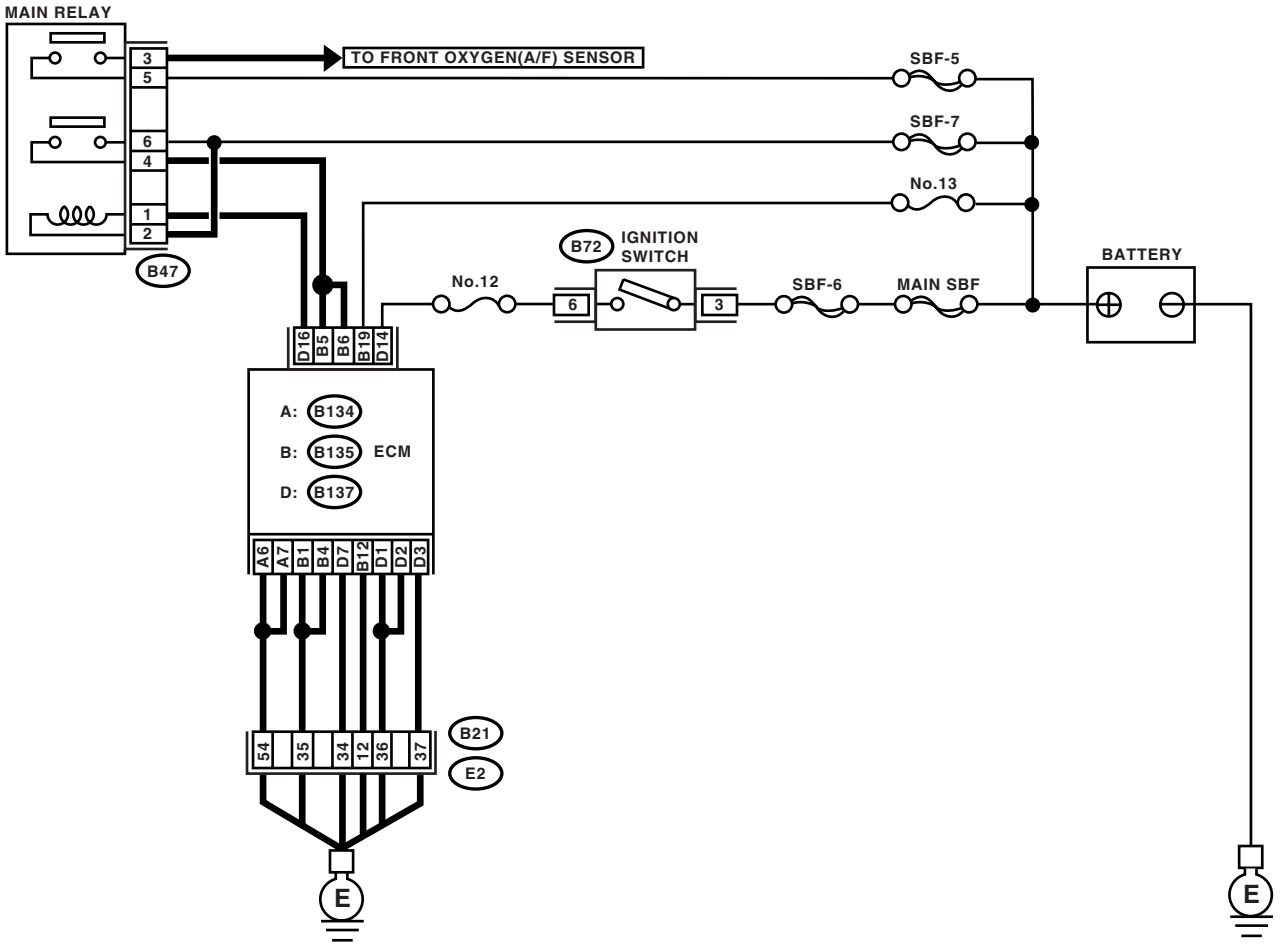
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-171, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

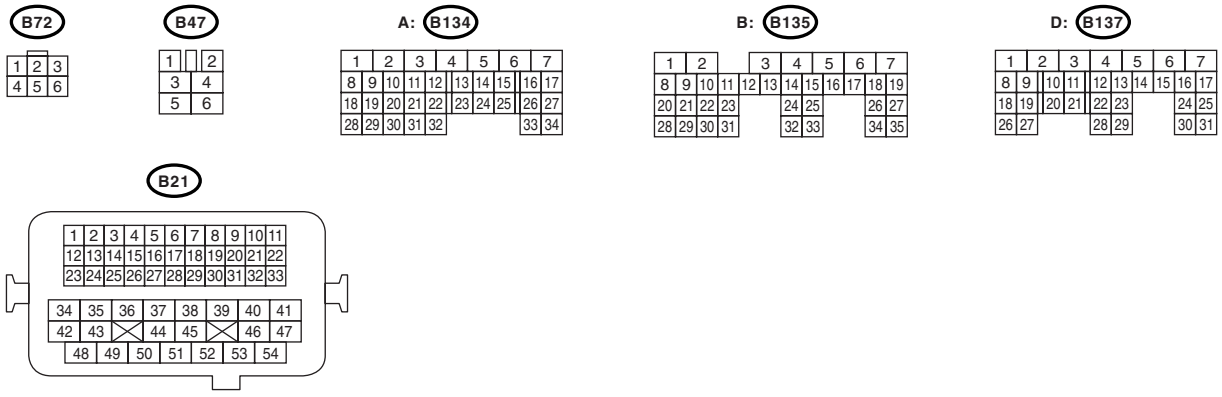
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**







EN-03162

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 5 (+) — Chassis ground (−):***<br>***(B135) No. 6 (+) — Chassis ground (−):*** | Is the voltage 10 — 13 V? | Go to step **2.** | Repair the open or ground short circuit of power supply circuit. |
| 2 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Start the engine.<br>2) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 5 (+) — Chassis ground (−):***<br>***(B135) No. 6 (+) — Chassis ground (−):*** | Is the voltage 13 — 15 V? | Go to step **3.** | Repair the open or ground short circuit of power supply circuit. |
| 3 | **CHECK ECM GROUND HARNESS.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 1 (+) — Chassis ground (−):***<br>***(B137) No. 2 (+) — Chassis ground (−):*** | Is the voltage less than 1 V? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Further tighten the engine ground terminal. |

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

NOTE:
For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-300, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CB:DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-177, DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Overheating

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is DTC P0691 displayed on the Subaru Select Monitor? | Check the radiator fan relay. <Ref. to CO(H4DOTC)-8, Radiator Fan System.> | Temporary poor contact occurs. |

## CC:DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-178, DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Overheating

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is DTC P0692 displayed on the Subaru Select Monitor? | Check the radiator fan relay. <Ref. to CO(H4DOTC)-8, Radiator Fan System.> | Temporary poor contact occurs. |

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

NOTE:
For the diagnostic procedure, refer to AT section. <Ref. to 5AT(diag)-2, Basic Diagnostic Procedure.>

## CE:DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW

NOTE:
For the diagnostic procedure, refer to AT section. <Ref. to 5AT(diag)-2, Basic Diagnostic Procedure.>

## CF:DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH

NOTE:
For the diagnostic procedure, refer to AT section. <Ref. to 5AT(diag)-2, Basic Diagnostic Procedure.>

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

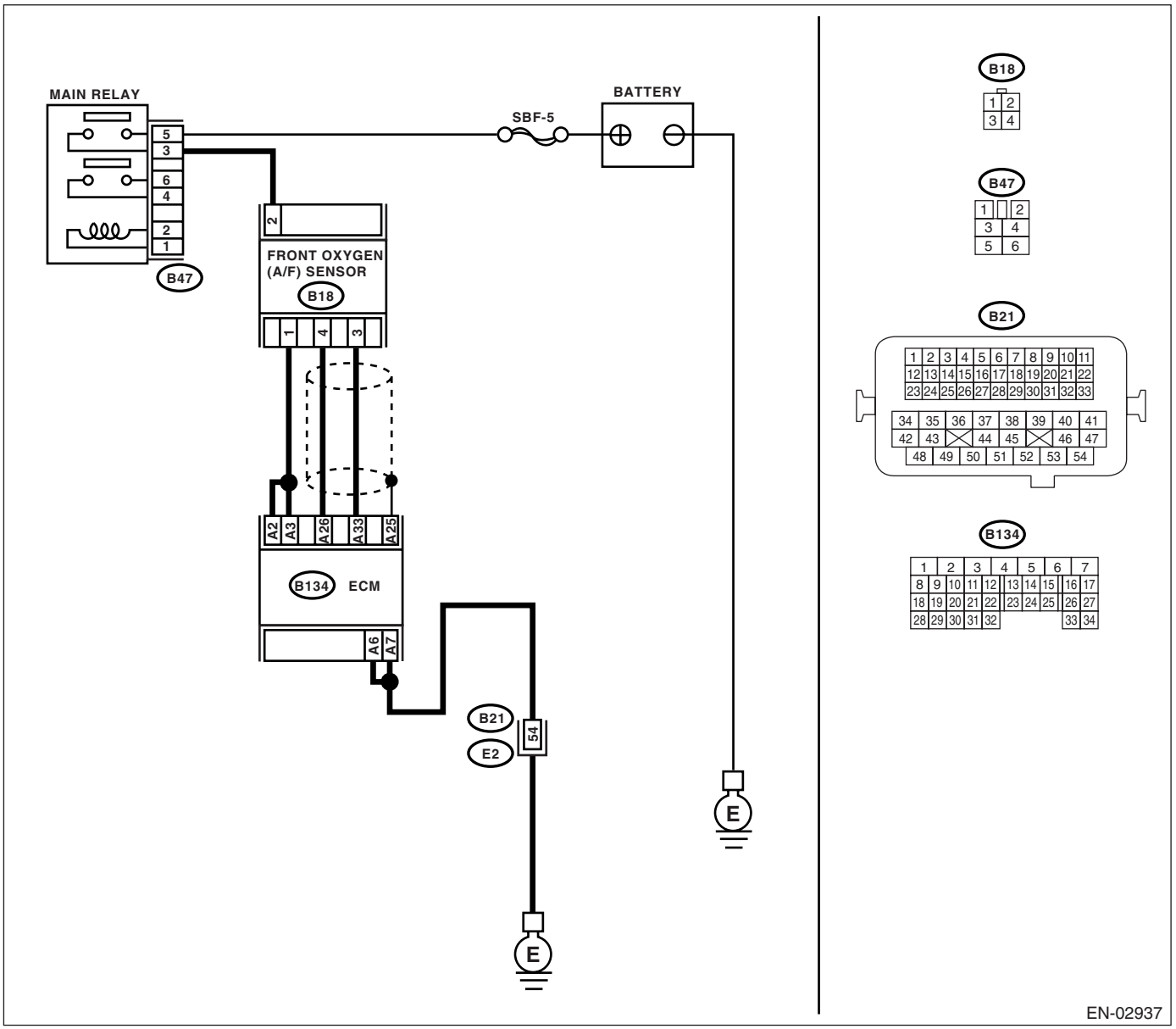
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-184, DTC P1152 O2 SENSOR CIRCUIT RANGE/ PERFORMANCE (LOW) (BANK1 SENSOR1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector.<br>3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B134) No. 26 — (B18) No. 4:***<br>***(B134) No. 33 — (B18) No. 3:*** | Is the measured value less than 1 Ω? | Go to step **2.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and front oxygen (A/F) sensor connector<br>• Poor contact in front oxygen (A/F) sensor connector<br>• Poor contact in ECM connector |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact in front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> |

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

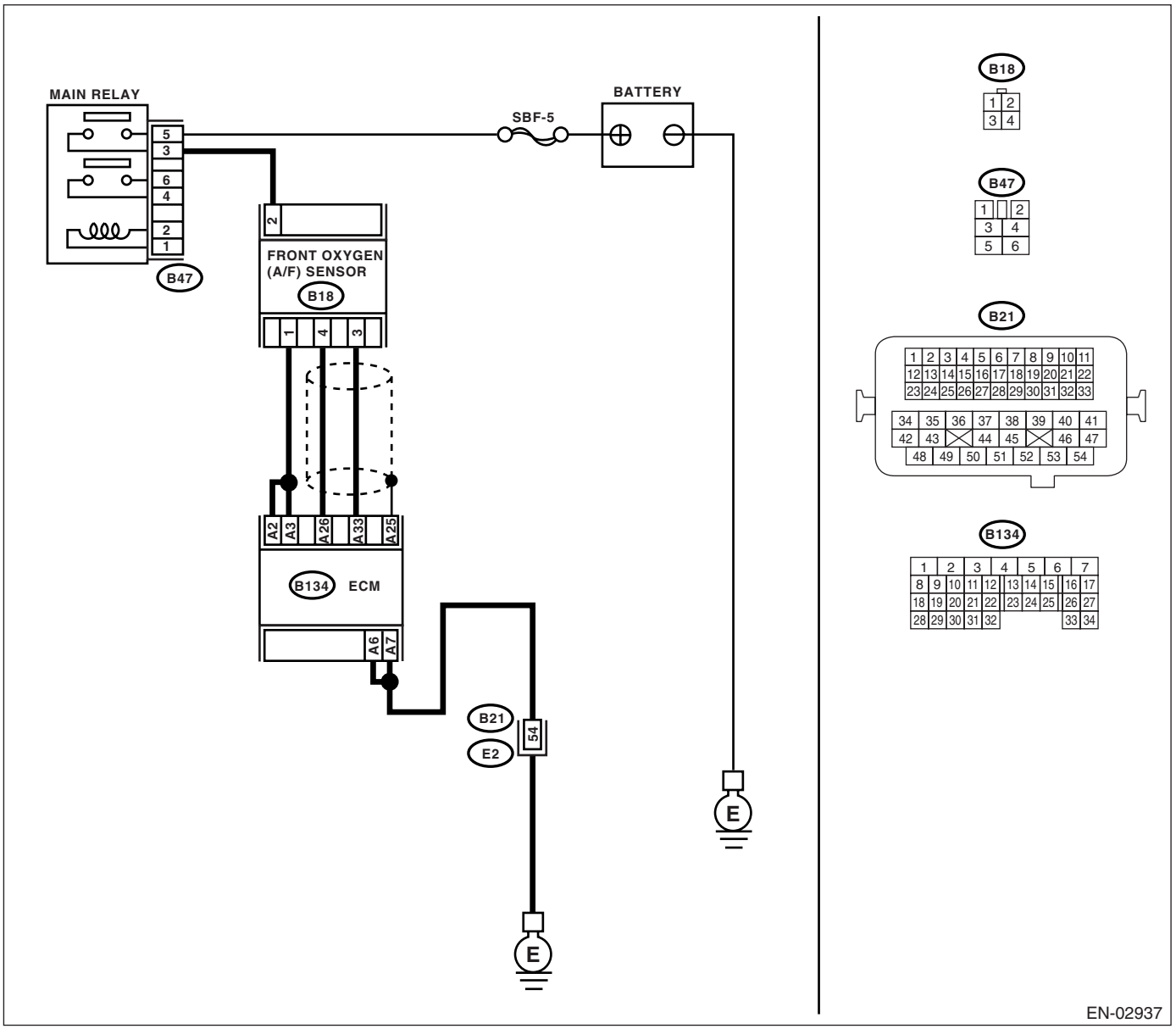
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-187, DTC P1153 O2 SENSOR CIRCUIT RANGE/ PERFORMANCE (HIGH) (BANK1 SENSOR1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 — Chassis ground:*** | Is the measured value more than 1 MΩ? | Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector. | Go to step **2.** |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 — Chassis ground:*** | Is the measured value more than 1 MΩ? | Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector. | Go to step **3.** |
| 3 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):*** | Is the measured value more than 4.5 V? | Go to step **4.** | Go to step **5.** |
| 4 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):*** | Is the measured value more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the poor contact in ECM connector. |
| 5 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the measured value more than 4.95 V? | Go to step **6.** | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> |
| 6 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the measured value more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the poor contact in ECM connector. |

## CI: DTC P1160 RETURN SPRING FAILURE

NOTE:
For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-300, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CJ:DTC P1301 MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-192, DTC P1301 MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS), Diagnostic Trouble Code (DTC) Detecting Criteria.>

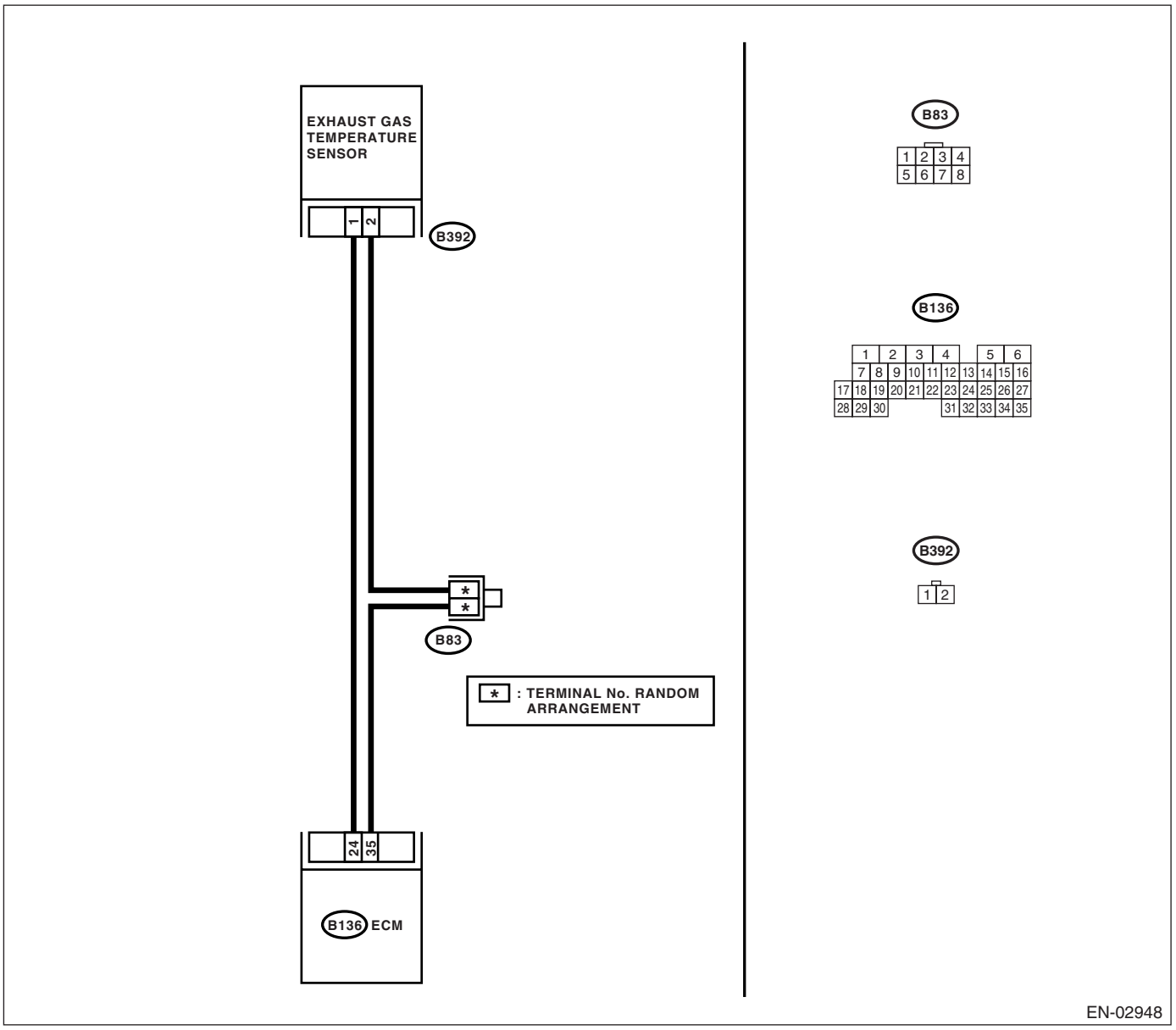
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK DTC.**<br>Conduct the troubleshooting for all DTC P0301, P0302, P0303 and P0304. <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Is there any failure for repair or replacement exist? | Repair or replace the faulty part, then replace pre-catalytic converter. | Contact your SOA Service Center. |

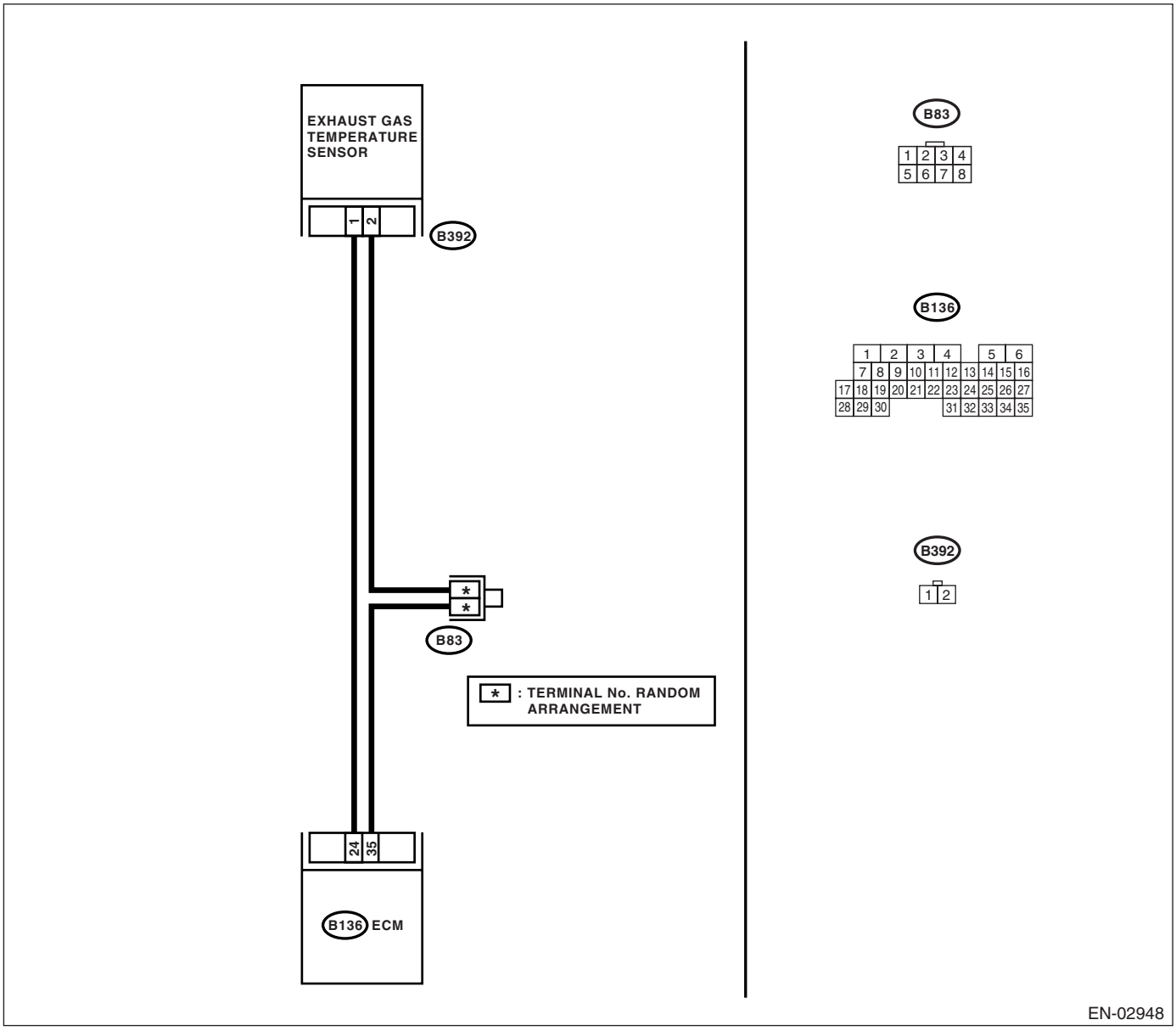
## CK:DTC P1312 EXHAUST GAS TEMPERATURE SENSOR MALFUNCTION

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-194, DTC P1312 EXHAUST GAS TEMPERATURE SENSOR MALFUNCTION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P1312. | Replace the exhaust gas temperature sensor. <Ref. to FU(H4DOTC)-38, Exhaust Temperature Sensor.> |

## CL:DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW

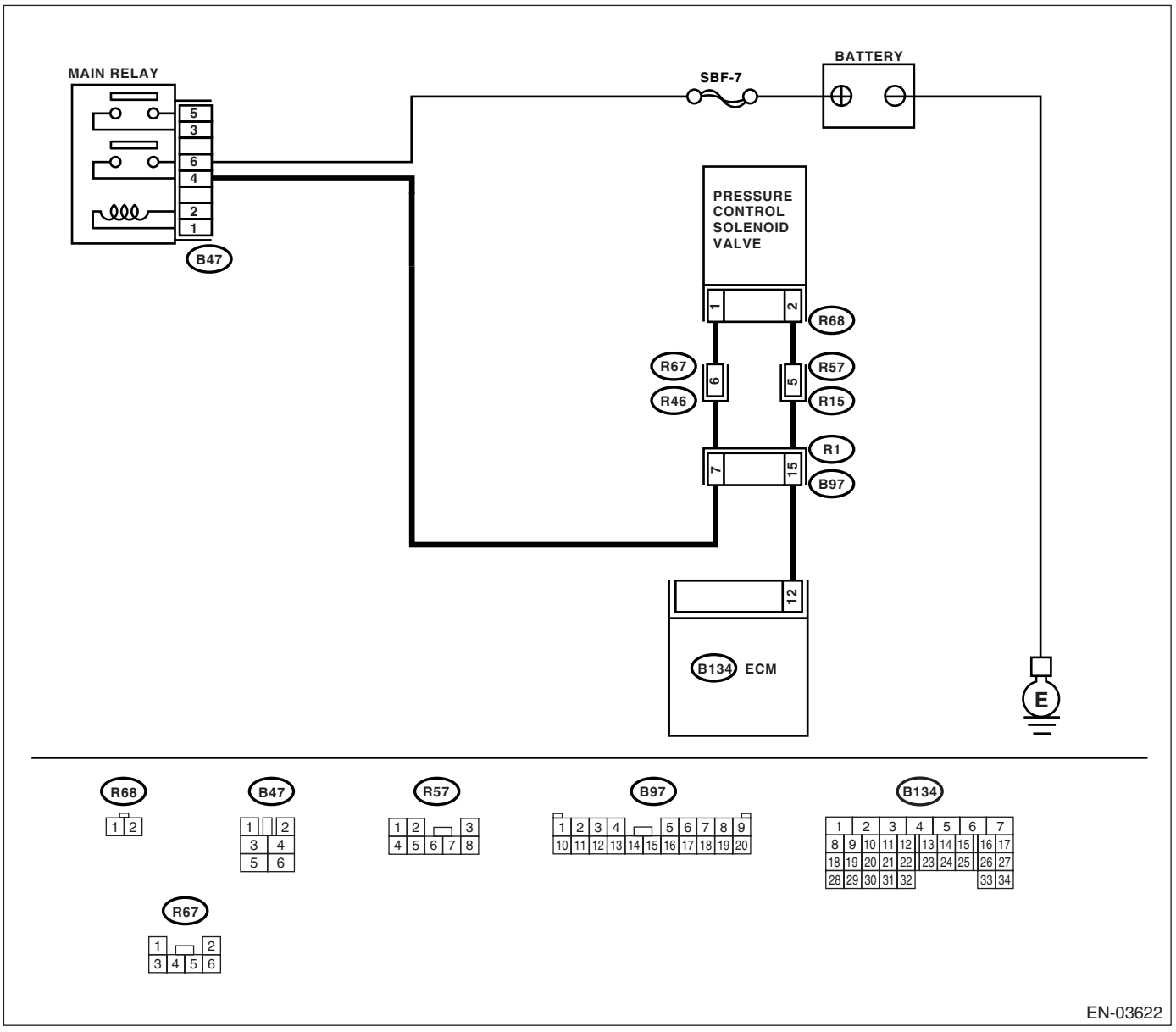
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-195, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 12 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Contact with SOA Service Center. |
| 3 | **CHECK HARNESS BETWEEN PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from pressure control solenoid valve and ECM.<br>3) Measure the resistance of harness between pressure control solenoid valve connector and chassis ground.<br>***Connector & terminal***<br>***(R68) No. 2 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair short circuit to ground in harness between ECM and pressure control solenoid valve connector. |
| 4 | **CHECK HARNESS BETWEEN PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>Measure the resistance of harness between ECM and pressure control solenoid valve connector.<br>***Connector & terminal***<br>***(B134) No. 12 — (R68) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and pressure control solenoid valve connector<br>• Poor contact in coupling connector |
| 5 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Measure the resistance between pressure control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 10 — 100 Ω? | Go to step **6.** | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-13, Pressure Control Solenoid Valve.> |
| 6 | **CHECK POWER SUPPLY TO PRESSURE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between pressure control solenoid valve and chassis ground.<br>***Connector & terminal***<br>***(R68) No. 1 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **7.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and pressure control solenoid valve connector<br>• Poor contact in coupling connector<br>• Poor contact in main relay connector |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in pressure control solenoid valve connector. | Is there poor contact in pressure control solenoid valve connector? | Repair poor contact in pressure control solenoid valve connector. | Contact with SOA Service Center. |

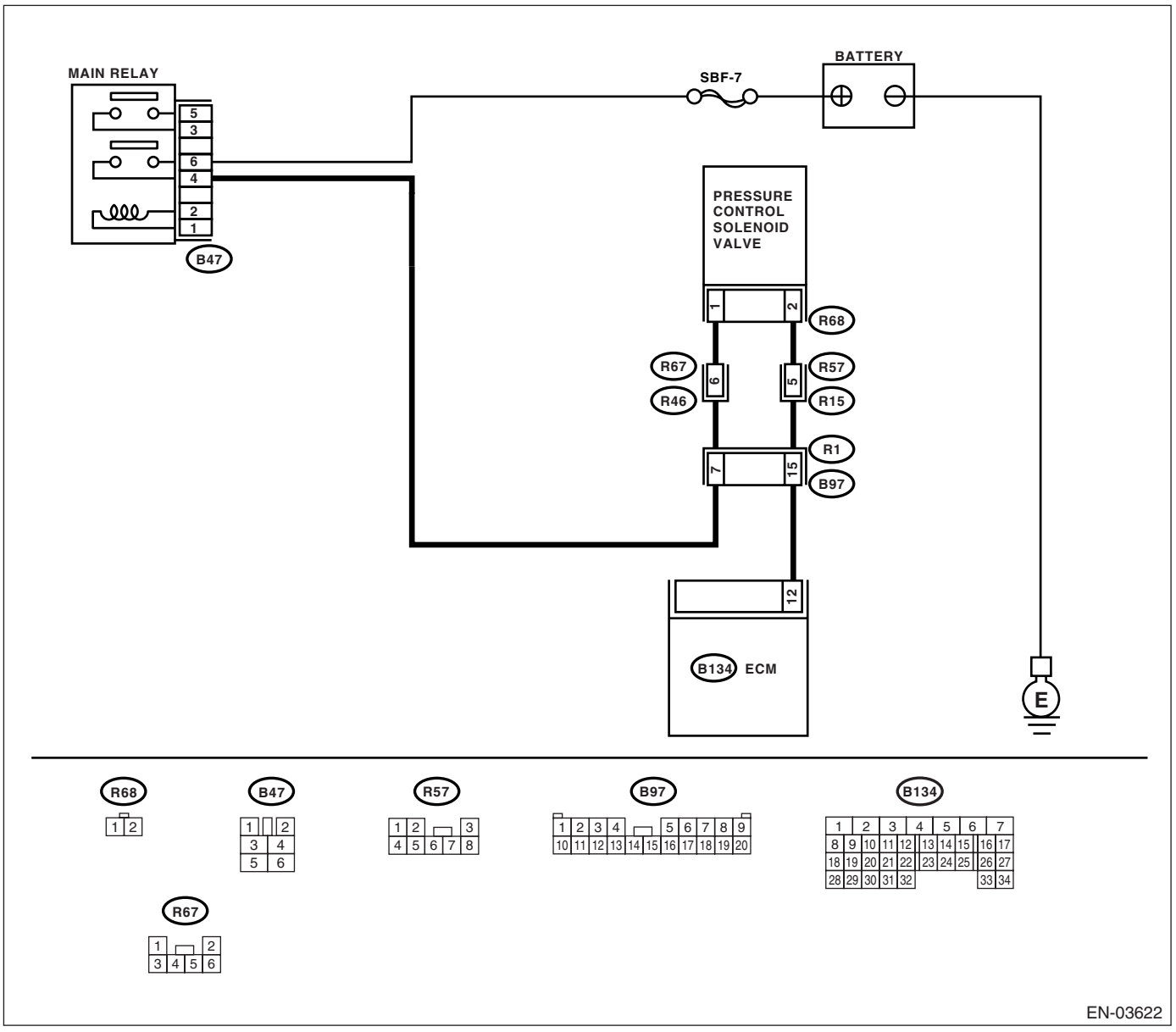
## CM:DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-197, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL FOR ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).<br>3) Turn the ignition switch to ON.<br>4) While operating the pressure control solenoid valve, measure voltage between ECM and chassis ground.<br>NOTE:<br>Pressure 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)(diag)-46, Compulsory Valve Operation Check Mode.><br>***Connector & terminal***<br>***(B134) No. 12 (+) — Chassis ground (–):*** | Does the voltage change 0 — 10 V? | Go to step **2.** | The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. In this case, repair poor contact in ECM connector. |
| 2 | **CHECK INPUT SIGNAL FOR ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 12 (+) — Chassis ground (–):*** | Is the voltage more than 10 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 4 | **CHECK HARNESS BETWEEN PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from pressure control solenoid valve.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 12 (+) — Chassis ground (–):*** | Is the voltage more than 10 V? | Repair short circuit to battery in harness between ECM and pressure control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Go to step **5.** |
| 5 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between pressure control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Replace the pressure control solenoid valve <Ref. to EC(H4DOTC)-13, Pressure Control Solenoid Valve.> and the ECM <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> . | Go to step **6.** |
| 6 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

## CN:DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-199, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

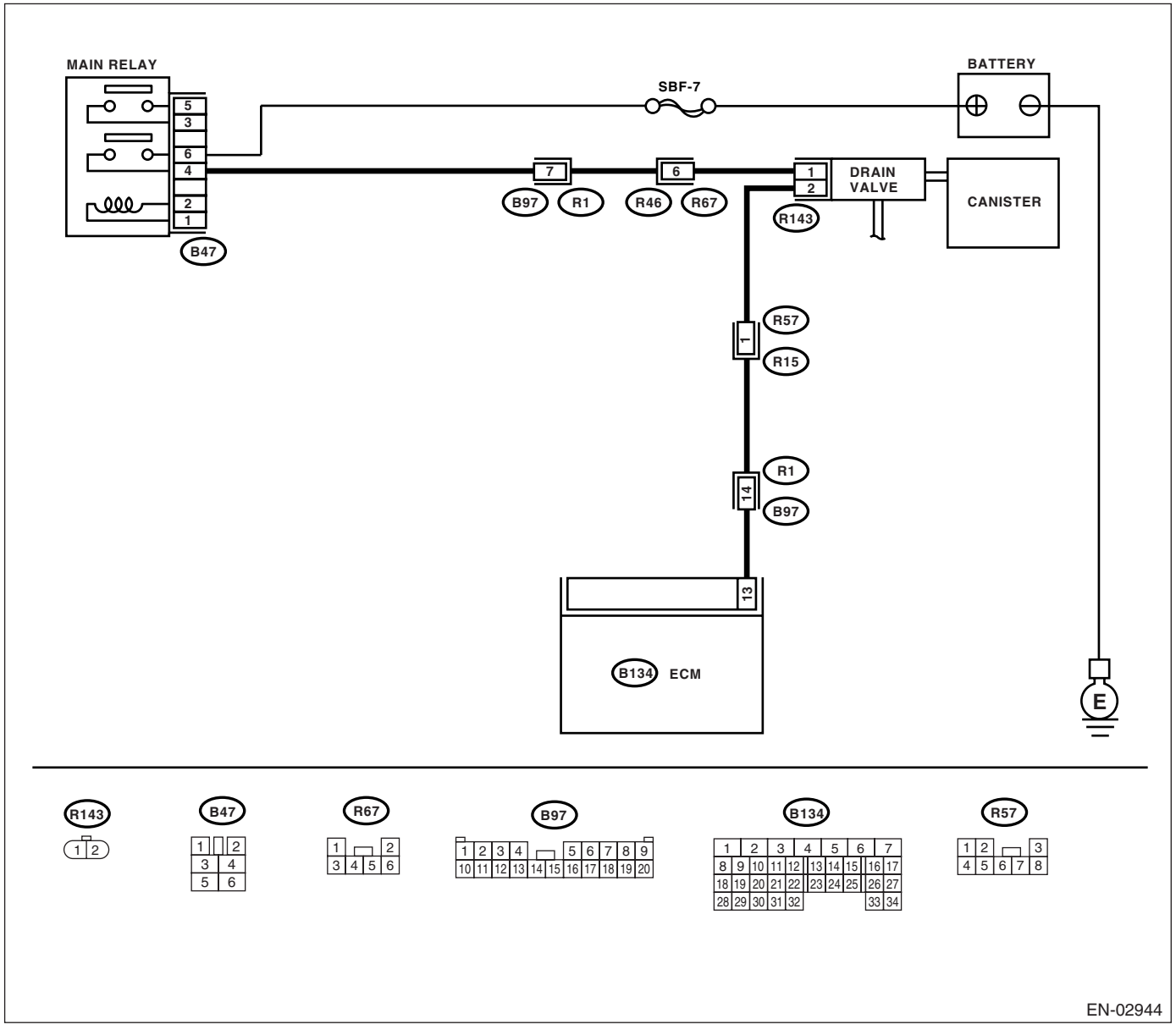
**TROUBLE SYMPTOM:**

Improper fuel supply

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK DRAIN HOSE.**<br>Check the drain hose for clogging. | Is there clogging in the drain hose? | Replace the drain hose. | Go to step **3.** |
| 3 | **CHECK DRAIN VALVE OPERATION.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).<br>3) Turn the ignition switch to ON.<br>4) Operate the drain valve.<br>NOTE:<br>Drain valve operation can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-46, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Contact with SOA Service Center. | Replace the drain valve. <Ref. to EC(H4DOTC)-16, Drain Valve.> |

# CO:DTC P1446 FUEL TANK SENSOR CONTROL VALVE CIRCUIT LOW

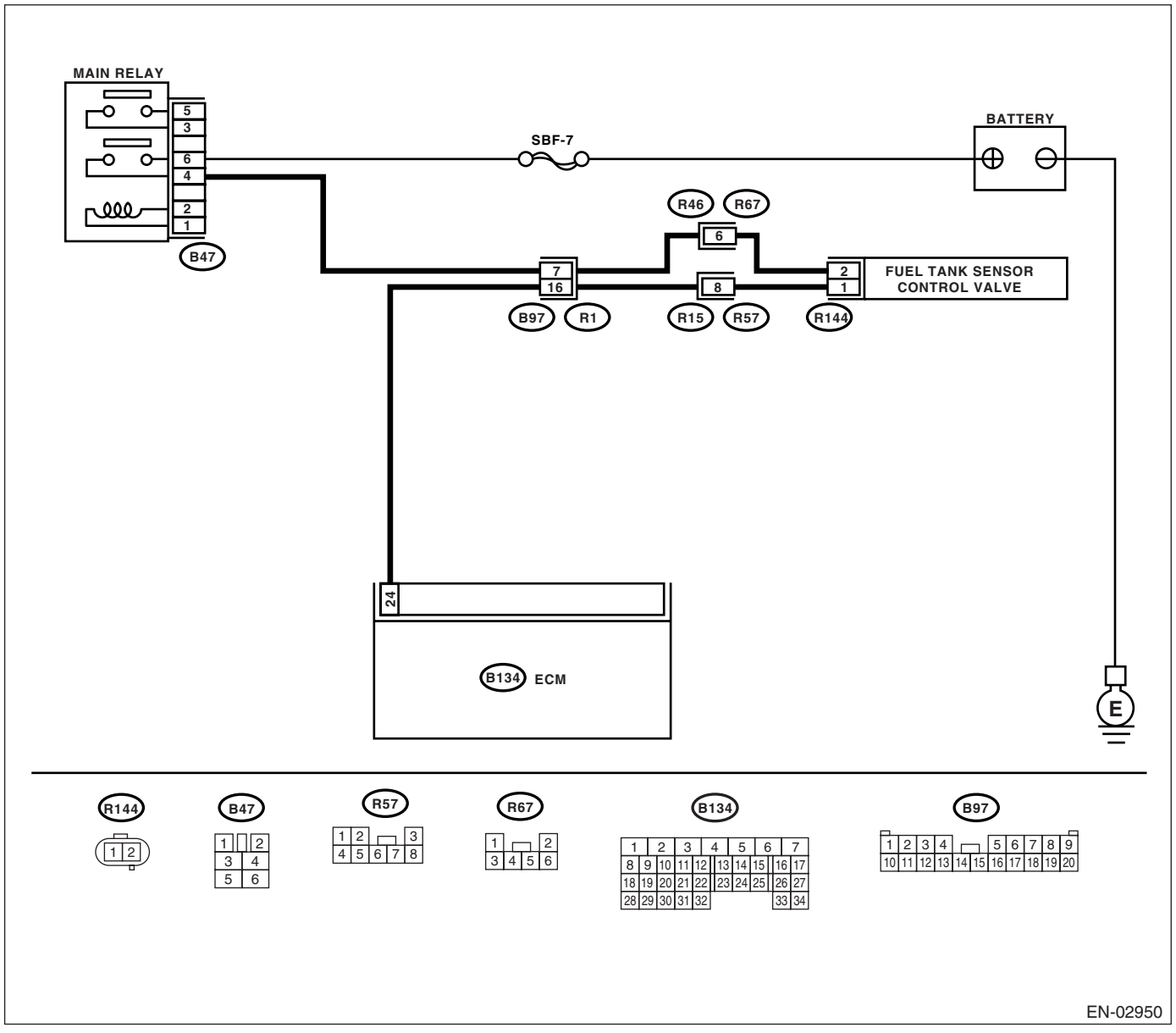
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-201, DTC P1446 FUEL TANK SENSOR CONTROL VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 24 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | The malfunction indicator light may light up, however, the circuit is returned to the normal status at the moment. (However, the possibility of poor contact still remains.)<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in fuel tank sensor control valve connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 3 | **CHECK HARNESS BETWEEN FUEL TANK SENSOR CONTROL VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from fuel tank sensor control valve and ECM.<br>3) Measure the resistance of harness between fuel tank sensor control valve connector and chassis ground.<br>***Connector & terminal***<br>***(R144) No. 2 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair short circuit to ground in harness between ECM and fuel tank sensor control valve connector. |
| 4 | **CHECK HARNESS BETWEEN FUEL TANK SENSOR CONTROL VALVE AND ECM CONNECTOR.**<br>Measure the resistance of harness between ECM and fuel tank sensor control valve connector.<br>***Connector & terminal***<br>***(B134) No. 24 — (R144) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and fuel tank sensor control valve connector<br>• Poor contact in coupling connector |
| 5 | **CHECK FUEL TANK SENSOR CONTROL VALVE.**<br>Measure the resistance between fuel tank sensor control valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 10 — 100 Ω? | Go to step **6.** | Replace the fuel tank sensor control valve. <Ref. to EC(H4DOTC)-16, Drain Valve.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK POWER SUPPLY TO FUEL TANK SENSOR CONTROL VALVE.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between fuel tank sensor control valve and chassis ground.<br>***Connector & terminal***<br>***(R144) No. 1 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **7.** | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between main relay and fuel tank sensor control valve<br>• Poor contact in coupling connector<br>• Poor contact in main relay connector |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact in fuel tank sensor control valve connector. | Is there poor contact in fuel tank sensor control valve connector? | Repair poor contact in fuel tank sensor control valve connector. | Contact with SOA Service Center. |

# CP:DTC P1447 FUEL TANK SENSOR CONTROL VALVE CIRCUIT HIGH

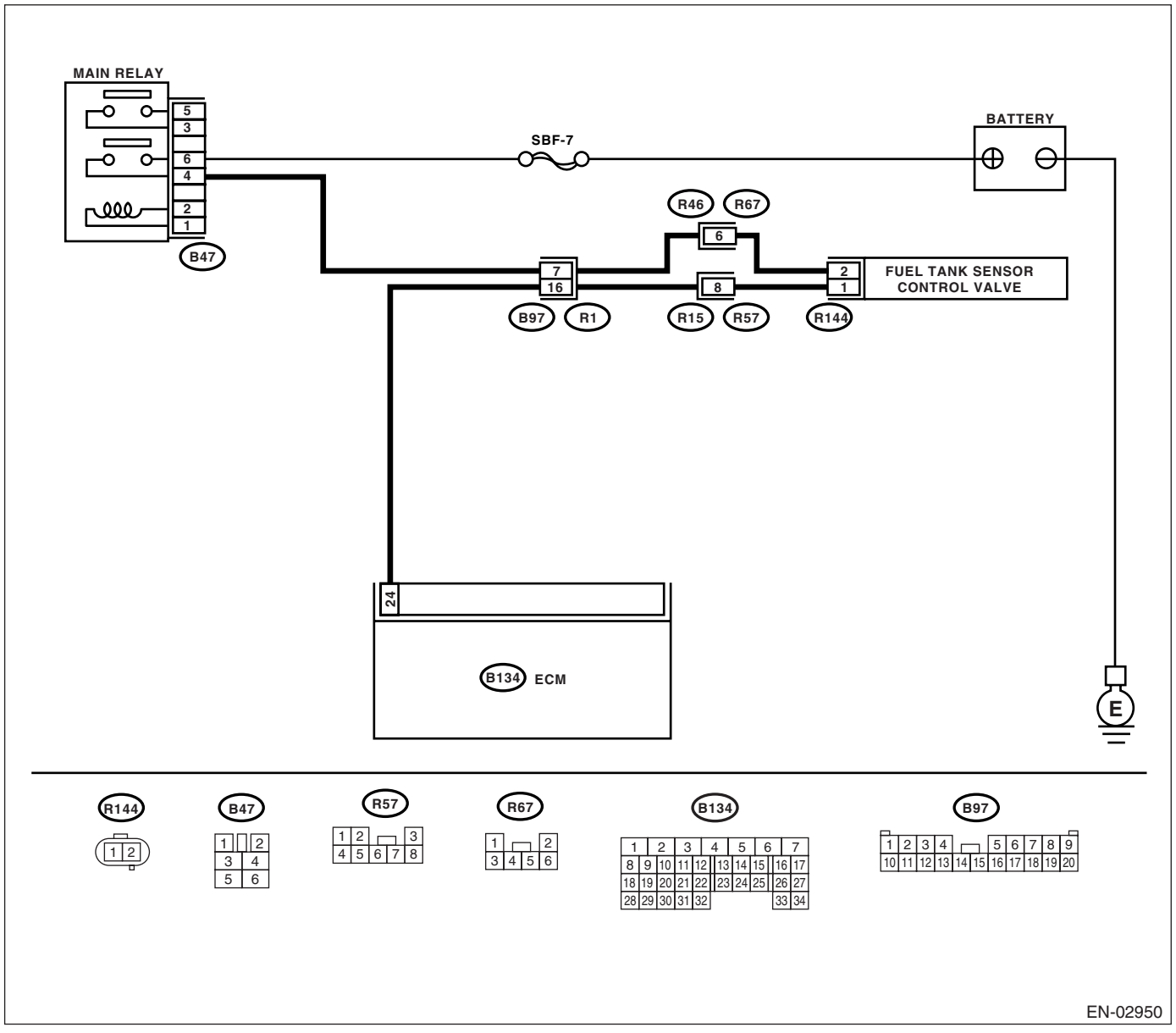
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-203, DTC P1447 FUEL TANK SENSOR CONTROL VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 24 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **3.** | Go to step **2.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 3 | **CHECK HARNESS BETWEEN FUEL TANK SENSOR CONTROL VALVE AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel tank sensor control valve.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 24 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair short circuit to battery in harness between ECM and fuel tank sensor control valve connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Go to step **4.** |
| 4 | **CHECK FUEL TANK SENSOR CONTROL VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between fuel tank sensor control valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Replace the fuel tank sensor control valve <Ref. to EC(H4DOTC)-12, Fuel Tank Sensor Control Valve.> and the ECM <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).>. | Go to step **5.** |
| 5 | **CHECK POOR CONTACT.**<br>Check poor contact in ECM connector. | Is there poor contact in ECM connector? | Repair poor contact in ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-205, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

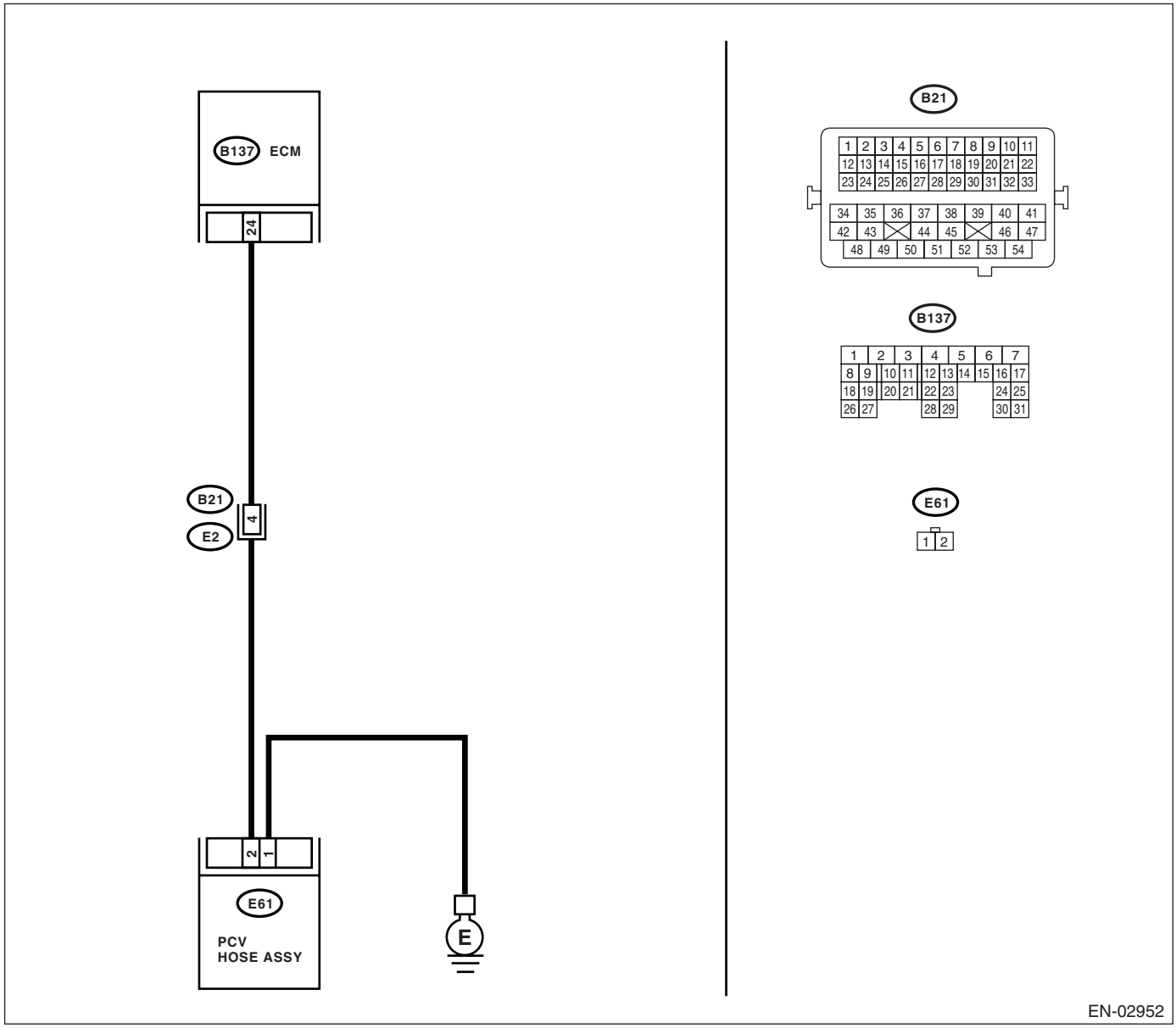
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK BLOW-BY HOSE.**<br>Check the blow-by hose. | Is there disconnection or crack in blow-by hose? | Replace or repair blow-by hose. | Go to step **2.** |
| 2 | **CHECK HARNESS BETWEEN PCV HOSE ASSEMBLY AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from PCV hose assembly and ECM.<br>3) Measure the resistance of harness between PCV hose assembly and ECM connector.<br>***Connector & terminal***<br>***(B137) No. 24 — (E61) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **3.** | Repair open circuit in harness between PCV hose assembly and ECM. |
| 3 | **CHECK HARNESS BETWEEN PCV HOSE ASSEMBLY AND ECM CONNECTOR.**<br>Measure the resistance of harness between PCV hose assembly and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 24 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **4.** | Repair short circuit to chassis ground in harness between PCV hose assembly and ECM. |
| 4 | **CHECK PCV HOSE ASSEMBLY GROUND CIRCUIT.**<br>Measure the resistance between PCV hose assembly and engine ground.<br>***Connector & terminal***<br>***(B61) No. 1 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **5.** | Repair PCV hose assembly ground circuit. |
| 5 | **CHECK PCV HOSE ASSEMBLY.**<br>Measure the resistance between PCV hose assembly and terminal.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Repair poor contact in ECM and PCV hose assembly. | Replace PCV hose assembly. |

# CR:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-207, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

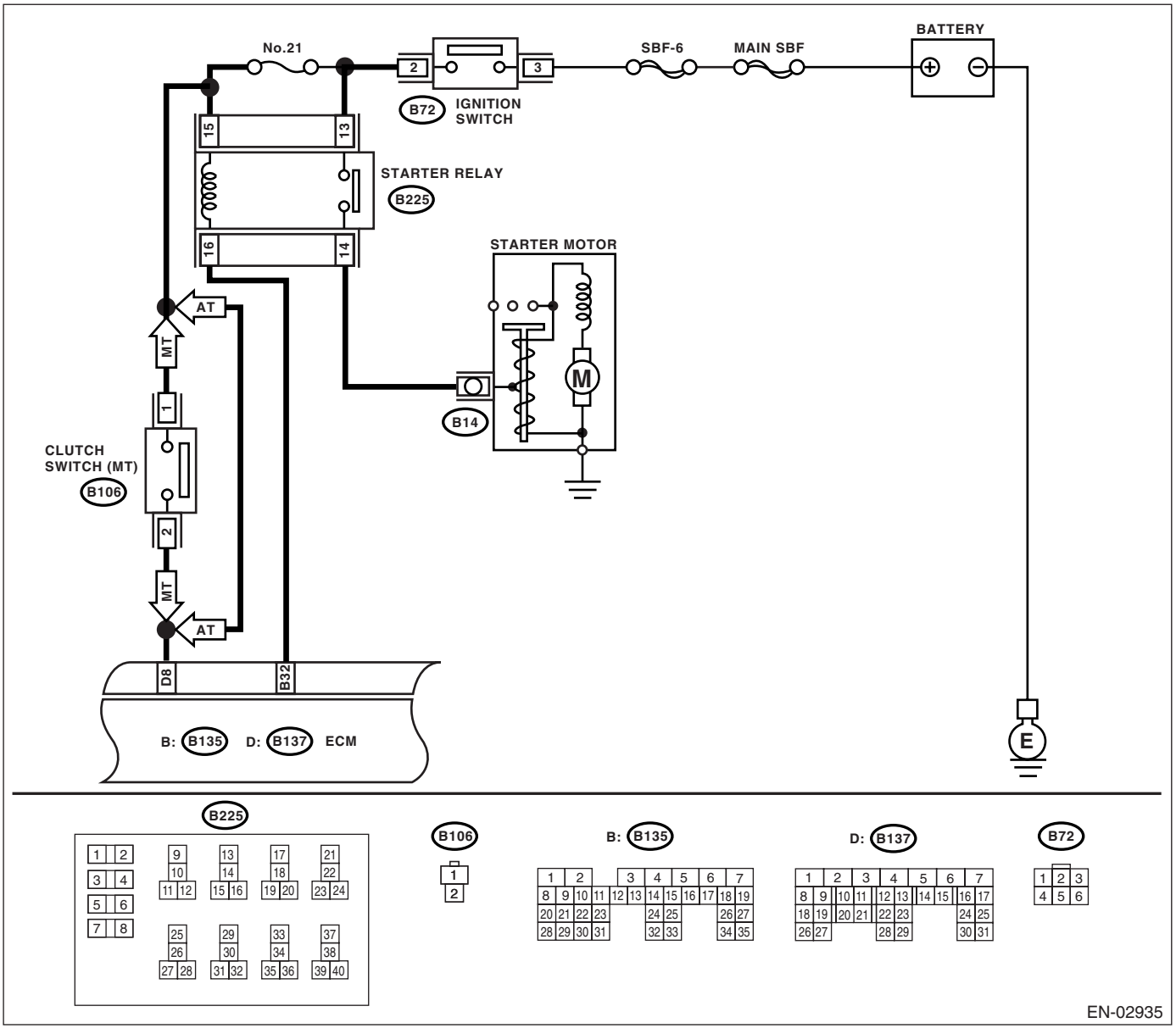
**TROUBLE SYMPTOM:**

Failure of engine to start

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK HARNESS BETWEEN STARTER RELAY AND ECM.**<br>1) Disconnect the connectors from starter relay and ECM.<br>2) Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 32 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Repair the ground short circuit between starter motor and ECM. | Repair the poor contact in ECM connector. |

# CS:DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-208, DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

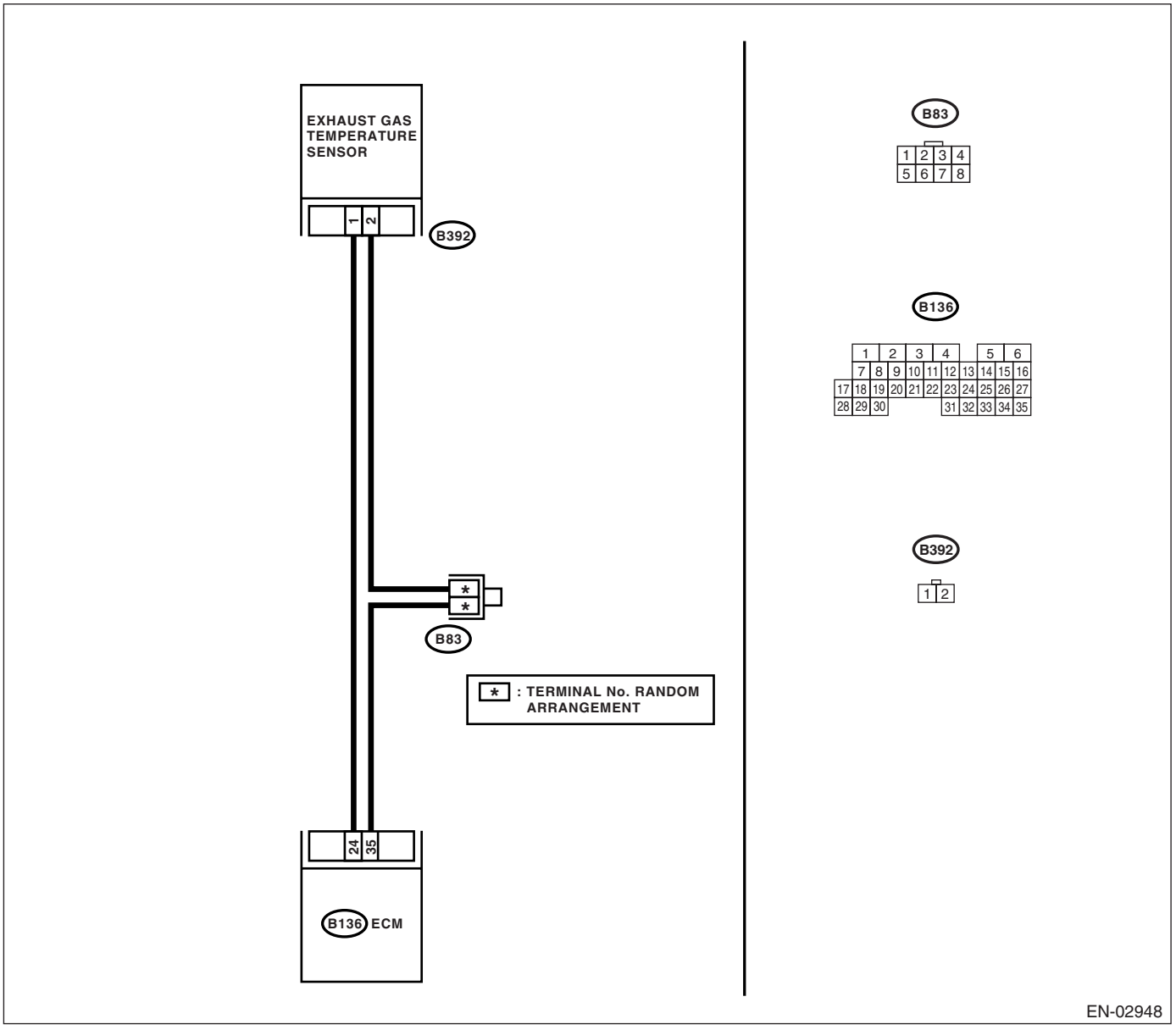
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P1544. | Go to step **2.** |
| 2 | **CHECK EXHAUST SYSTEM.**<br>Check the exhaust system parts.<br>NOTE:<br>Check the following items.<br>• Loose installation of exhaust manifold<br>• Cracks or hole of exhaust manifold<br>• Loose installation of front oxygen (A/F) sensor | Is there any fault in exhaust system? | Repair or replace the failure, then replace precatalytic converter. | Contact your SOA Service Center. |

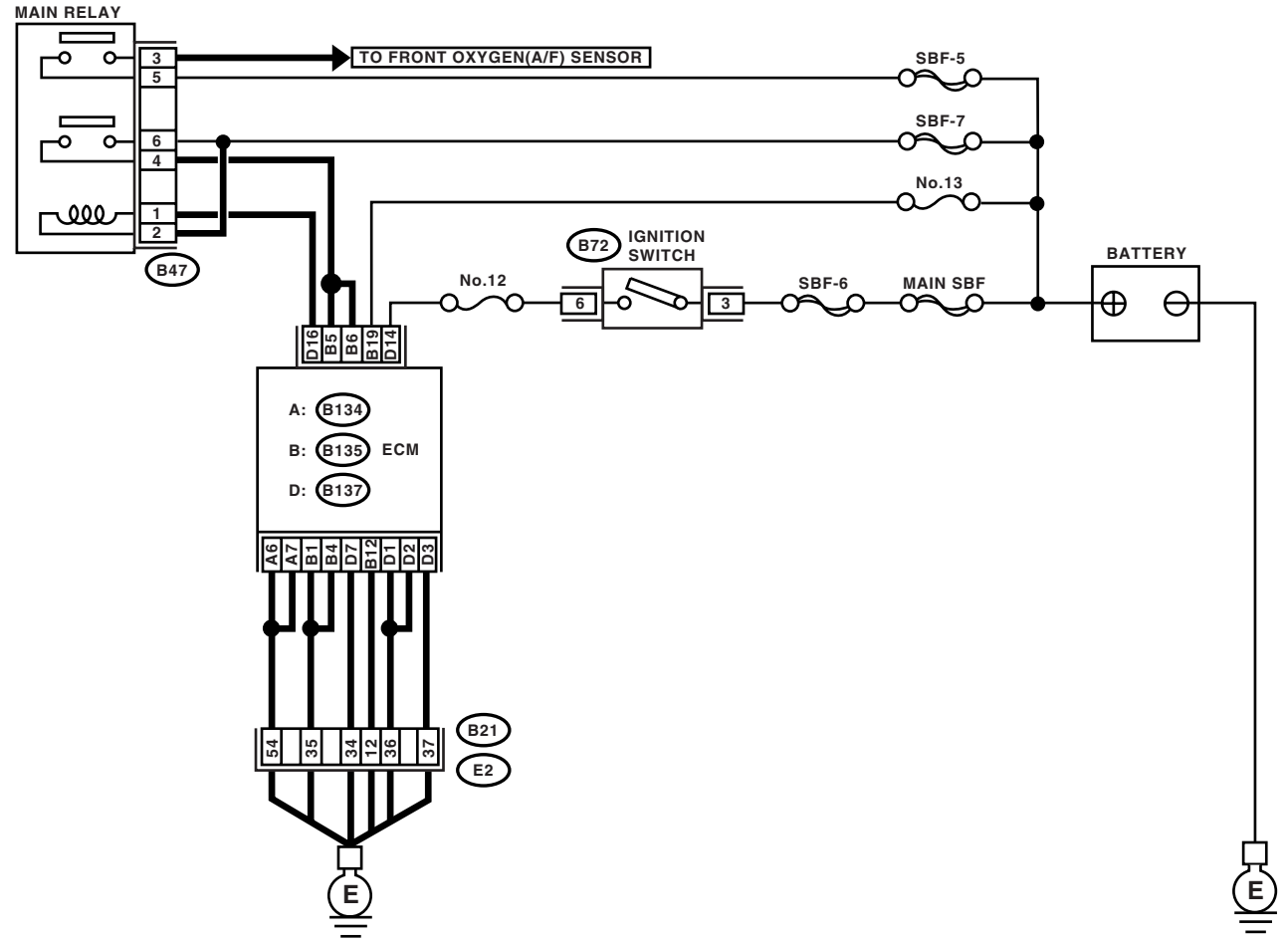
## CT:DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION

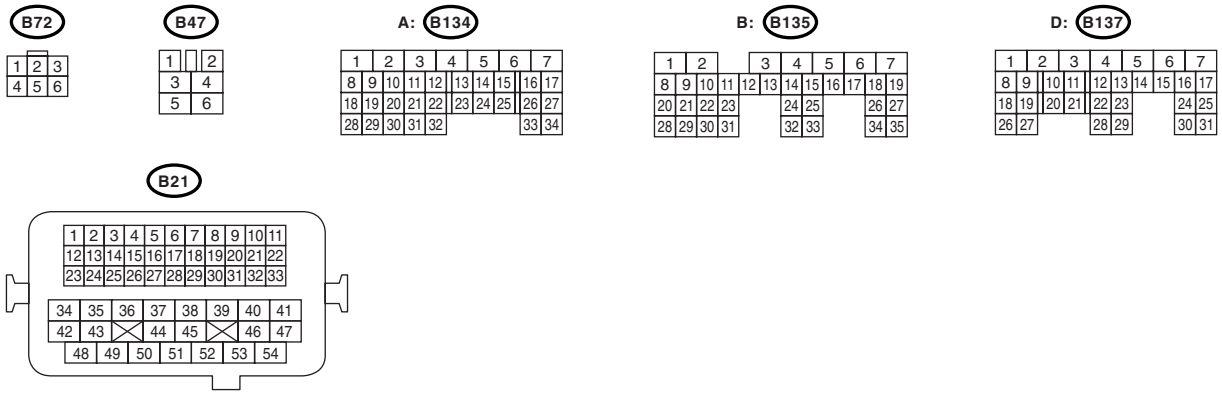
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-209, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**




EN-03162

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL FROM ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 19 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair the poor contact in ECM connector. | Go to step **2.** |
| 2 | **CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.**<br>1) Disconnect the connector from ECM.<br>2) Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 19 — Chassis ground:*** | Is the resistance less than 10 Ω? | Repair the ground short circuit in harness between ECM connector and battery terminal. | Go to step **3.** |
| 3 | **CHECK FUSE No. 13** | Is the fuse blown out? | Replace the fuse. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and battery<br>• Poor contact in ECM connector<br>• Poor contact in battery terminal |

## CU:DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-211, DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK TUMBLE GENERATOR VALVE RH.**<br>1) Remove the tumble generator valve assembly.<br>2) Check the 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)-30, Tumble Generator Valve Assembly.> | Clean the tumble generator valve. |

## CV:DTC P2005 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 2)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-212, DTC P2005 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK TUMBLE GENERATOR VALVE LH.**<br>1) Remove the tumble generator valve assembly.<br>2) Check the 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)-30, Tumble Generator Valve Assembly.> | Clean the tumble generator valve. |

## CW:DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 1)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-213, DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)" <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK TUMBLE GENERATOR VALVE RH.**<br>1) Remove the tumble generator valve assembly.<br>2) Check the 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)-30, Tumble Generator Valve Assembly.> | Clean the tumble generator valve. |

## CX:DTC P2007 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 2)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-214, DTC P2007 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).> | Go to step **2.** |
| 2 | **CHECK TUMBLE GENERATOR VALVE LH.**<br>1) Remove the tumble generator valve assembly.<br>2) Check the 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)-30, Tumble Generator Valve Assembly.> | Clean the tumble generator valve. |

# CY:DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1)

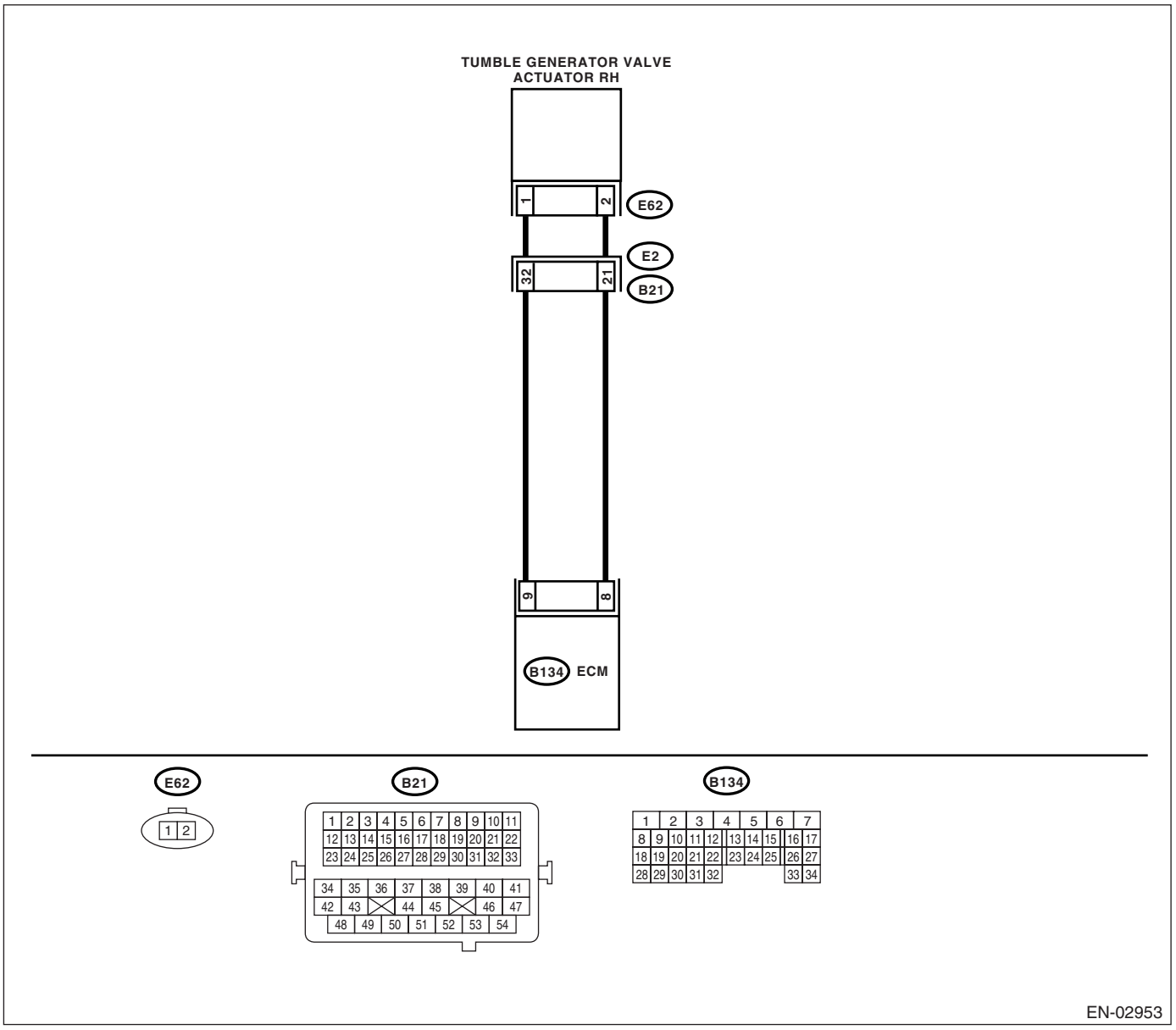
**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-215, DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve and ECM connector.<br>3) Measure the resistance between tumble generator valve actuator and ECM connector.<br>***Connector & terminal***<br>***(E62) No. 1 — (B134) No. 9:***<br>***(E62) No. 2 — (B134) No. 8:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Repair the open circuit between ECM and tumble generator valve connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and tumble generator valve actuator connector.<br>• Poor contact in coupling connector. |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in tumble generator valve actuator connector. | Is there poor contact in tumble generator valve actuator connector? | Repair the poor contact in tumble generator valve actuator connector. | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-31, Tumble Generator Valve Actuator.> |

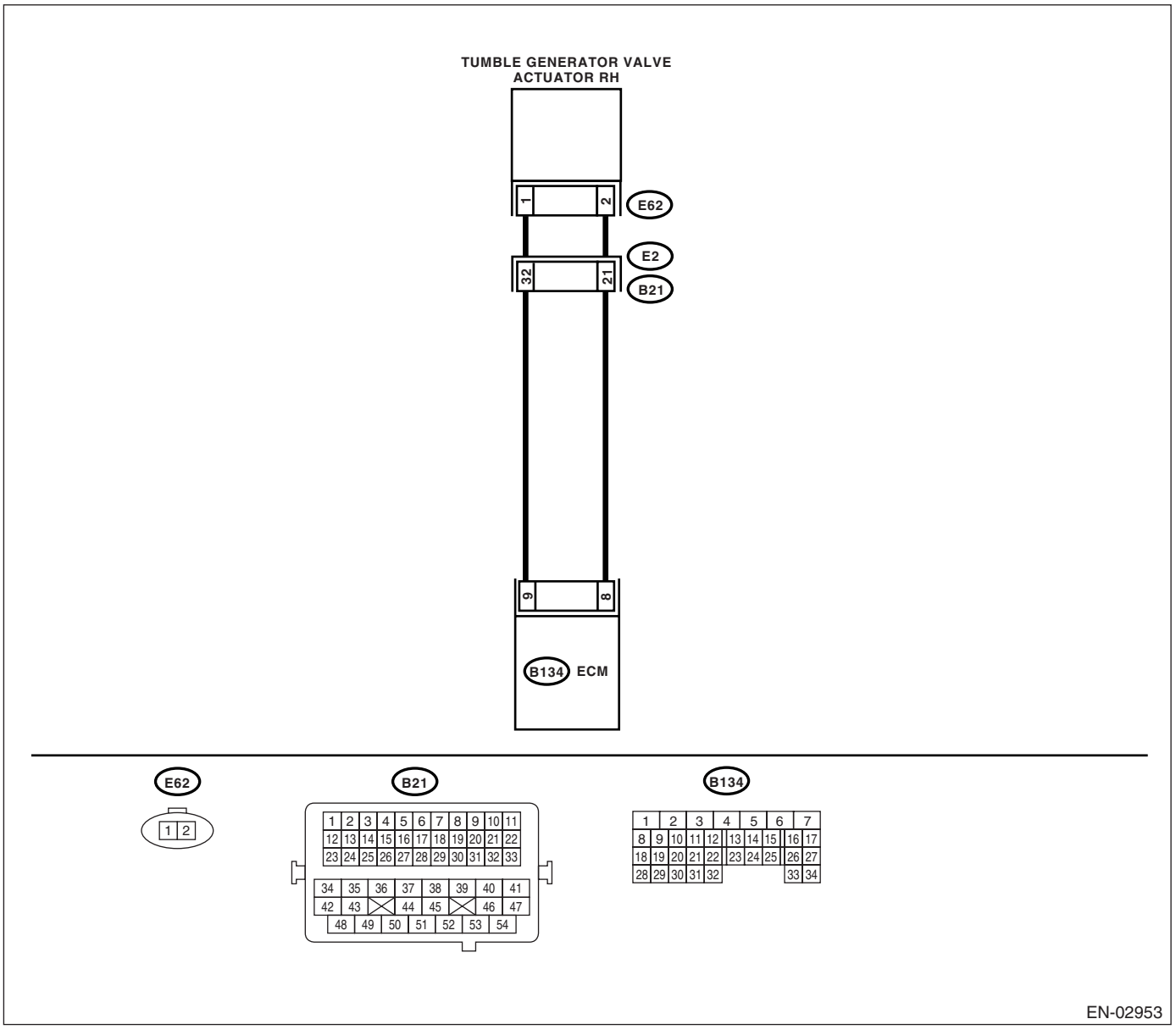
## CZ:DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-217, DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve connector.<br>3) Measure the voltage between tumble generator valve actuator and chassis ground.<br>***Connector & terminal***<br>***(E62) No. 1 (+) — Chassis ground (−):***<br>***(E62) No. 2 (+) — Chassis ground (−):*** | Is the voltage less than 5 V? | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-31, Tumble Generator Valve Actuator.> | Repair the battery short circuit between ECM and tumble generator valve actuator. |

# DA:DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2)

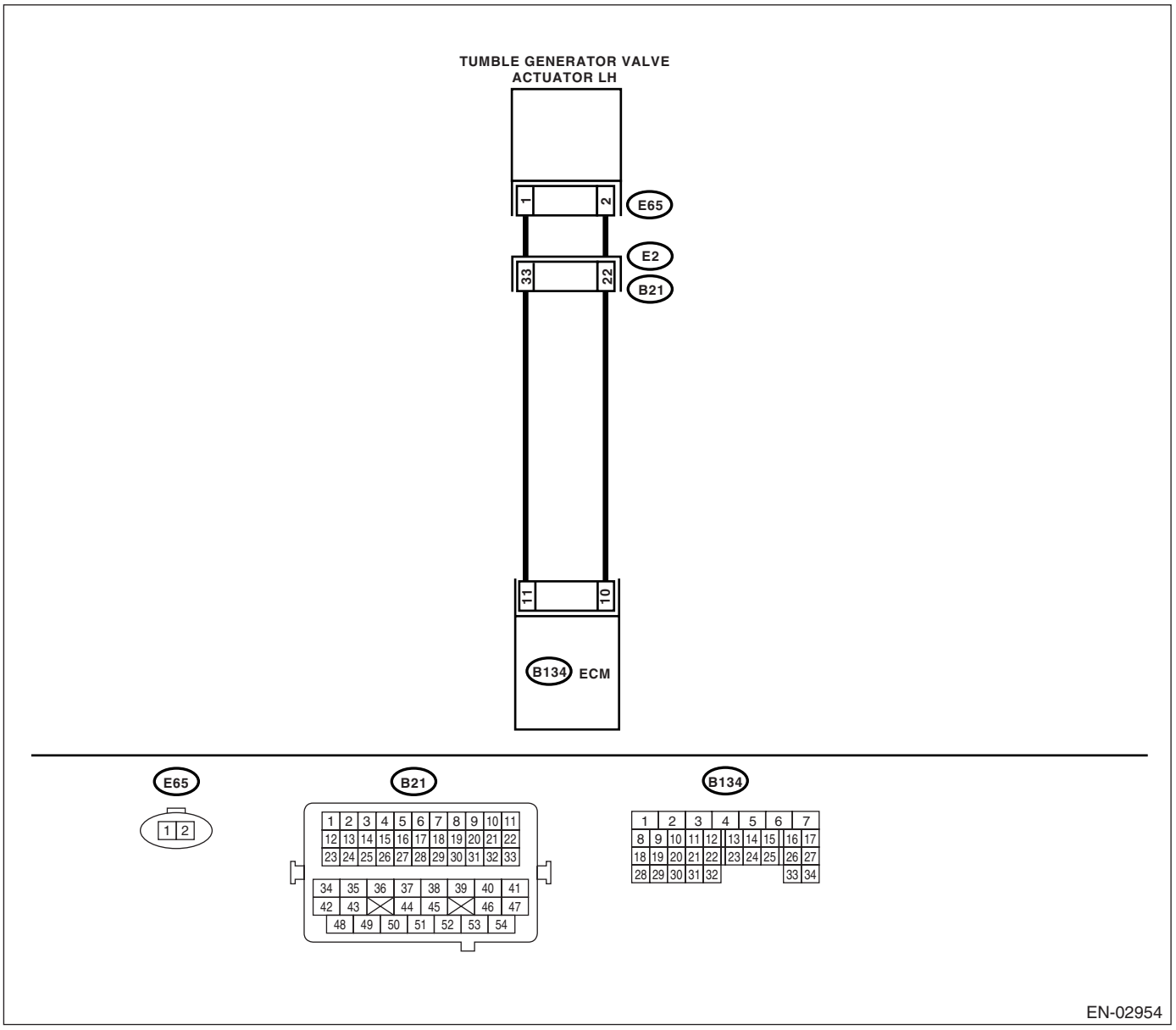
**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-219, DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve and ECM connector.<br>3) Measure the resistance between tumble generator valve actuator and ECM connector.<br>***Connector & terminal***<br>***(E65) No. 1 — (B134) No. 11:***<br>***(E65) No. 2 — (B134) No. 10:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Repair the open circuit between ECM and tumble generator valve connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and tumble generator valve actuator connector.<br>• Poor contact in coupling connector. |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in tumble generator valve actuator connector. | Is there poor contact in tumble generator valve actuator connector? | Repair the poor contact in tumble generator valve actuator connector. | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-31, Tumble Generator Valve Actuator.> |

# DB:DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2)

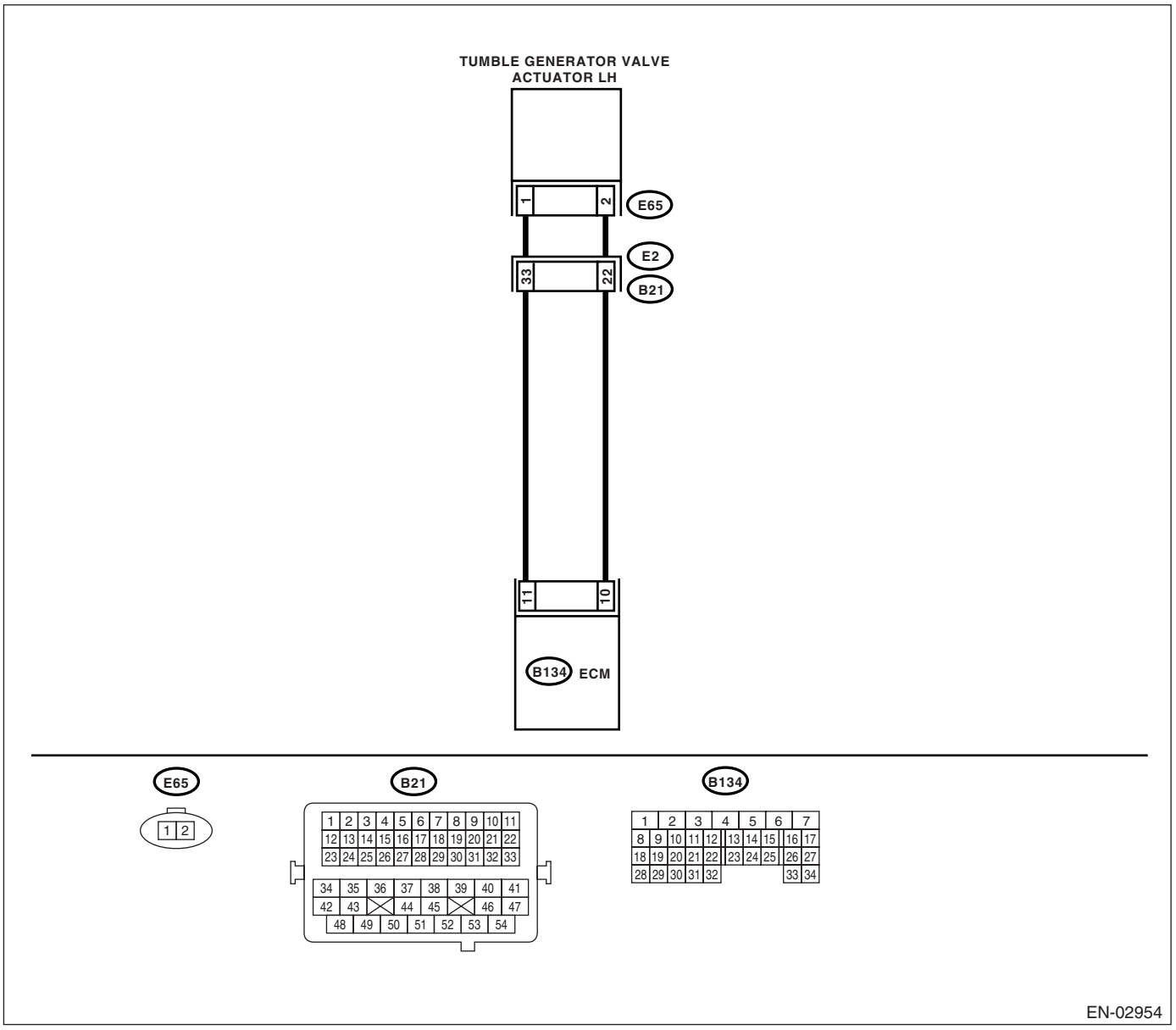
**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-221, DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve connector.<br>3) Measure the voltage between tumble generator valve actuator and chassis ground.<br>***Connector & terminal***<br>***(E65) No. 1 (+) — Chassis ground (−):***<br>***(E65) No. 2 (+) — Chassis ground (−):*** | Is the voltage less than 5 V? | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-31, Tumble Generator Valve Actuator.> | Repair the battery short circuit between ECM and tumble generator valve actuator. |

# DC:DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 1)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-223, DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

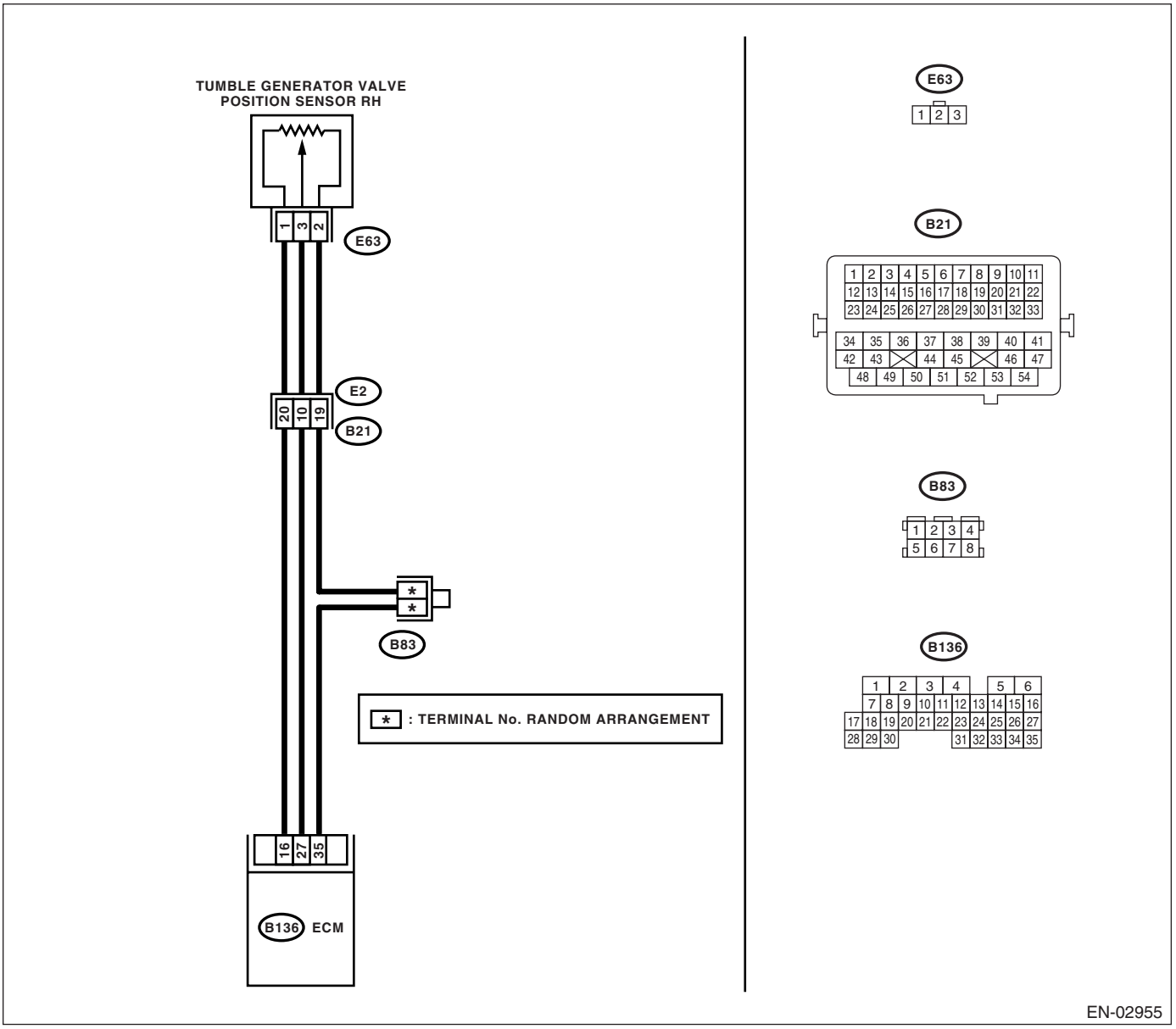
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the voltage less than 0.1 V? | Go to step **2.** | Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 2 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | Is the voltage more than 4.5 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (–):*** | Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change? | Repair the poor contact in ECM connector. | Contact your SOA Service Center. |
| 4 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 27 (+) — Chassis ground (–):*** | Is the voltage less than 0.1 V? | Go to step **6.** | Go to step **5.** |
| 5 | **CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR)**<br>Measure the voltage between ECM connector and chassis ground. | Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change? | Repair the poor contact in ECM connector. | Go to step **6.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from tumble generator valve position sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E63) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 4.5 V? | Go to step **7.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between tumble generator valve position sensor and ECM connector<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 7 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between ECM connector and tumble generator valve position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 27 — (E63) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **8.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between tumble generator valve position sensor and ECM connector<br>• Poor contact in ECM connector<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in coupling connector |
| 8 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E63) No. 3 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **9.** | Repair the ground short circuit in harness between tumble generator valve position sensor and ECM connector. |
| 9 | **CHECK POOR CONTACT.**<br>Check poor contact in tumble generator valve position sensor connector. | Is there poor contact in tumble generator valve position sensor connector? | Repair the poor contact in tumble generator valve position sensor connector. | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-32, Tumble Generator Valve Position Sensor.> |

# DD:DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 1)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-225, DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

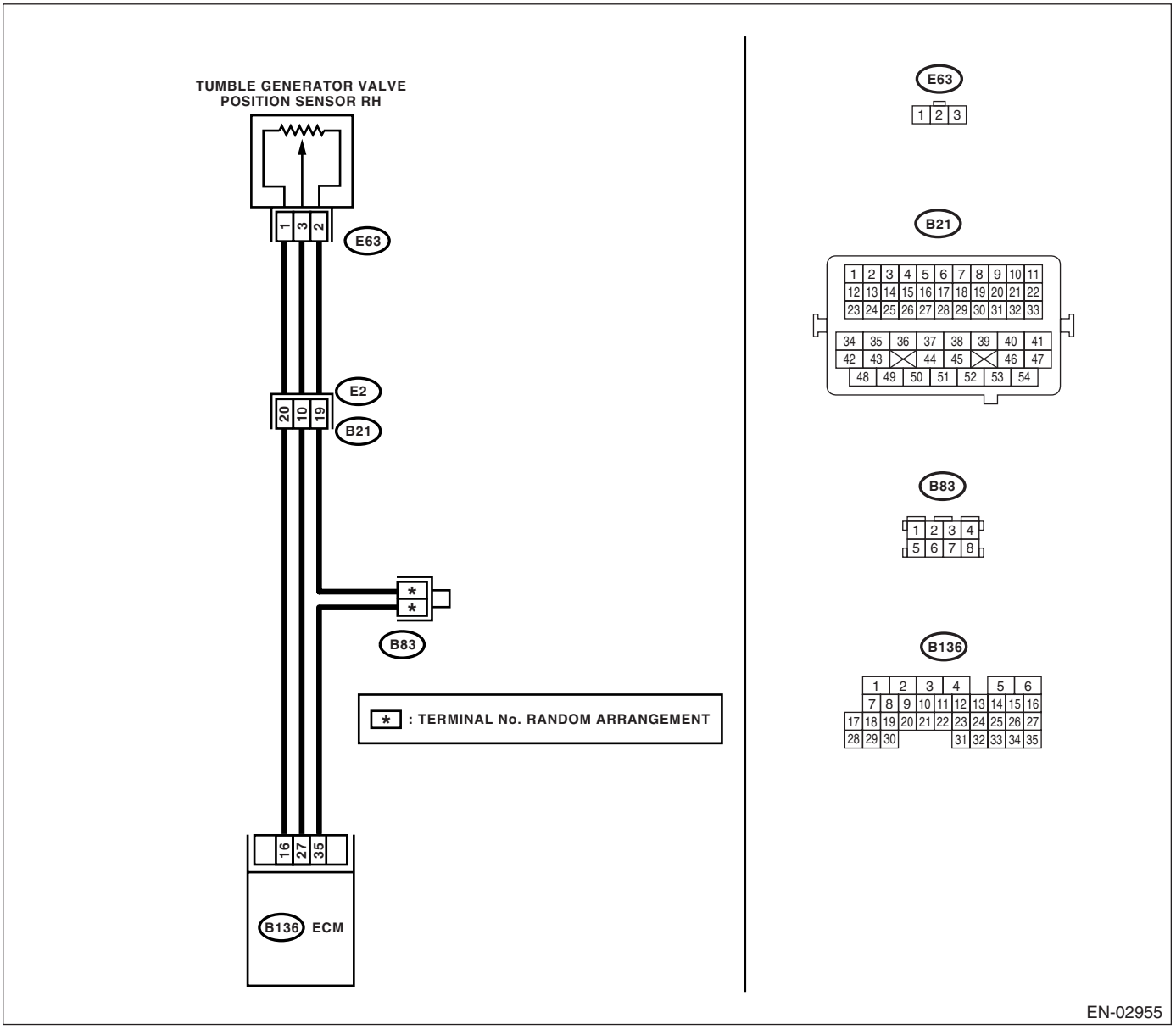
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the general scan tool instruction manual. | Is the voltage more than 4.9 V? | Go to step **2.** | Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 2 | **CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve position sensor.<br>3) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E63) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between tumble generator valve position sensor and ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 3 | **CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E63) No. 3 (+) — Engine ground (−):*** | Is the voltage more than 4.9 V? | Repair the battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-32, Tumble Generator Valve Position Sensor.> |

# DE:DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 2)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-227, DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

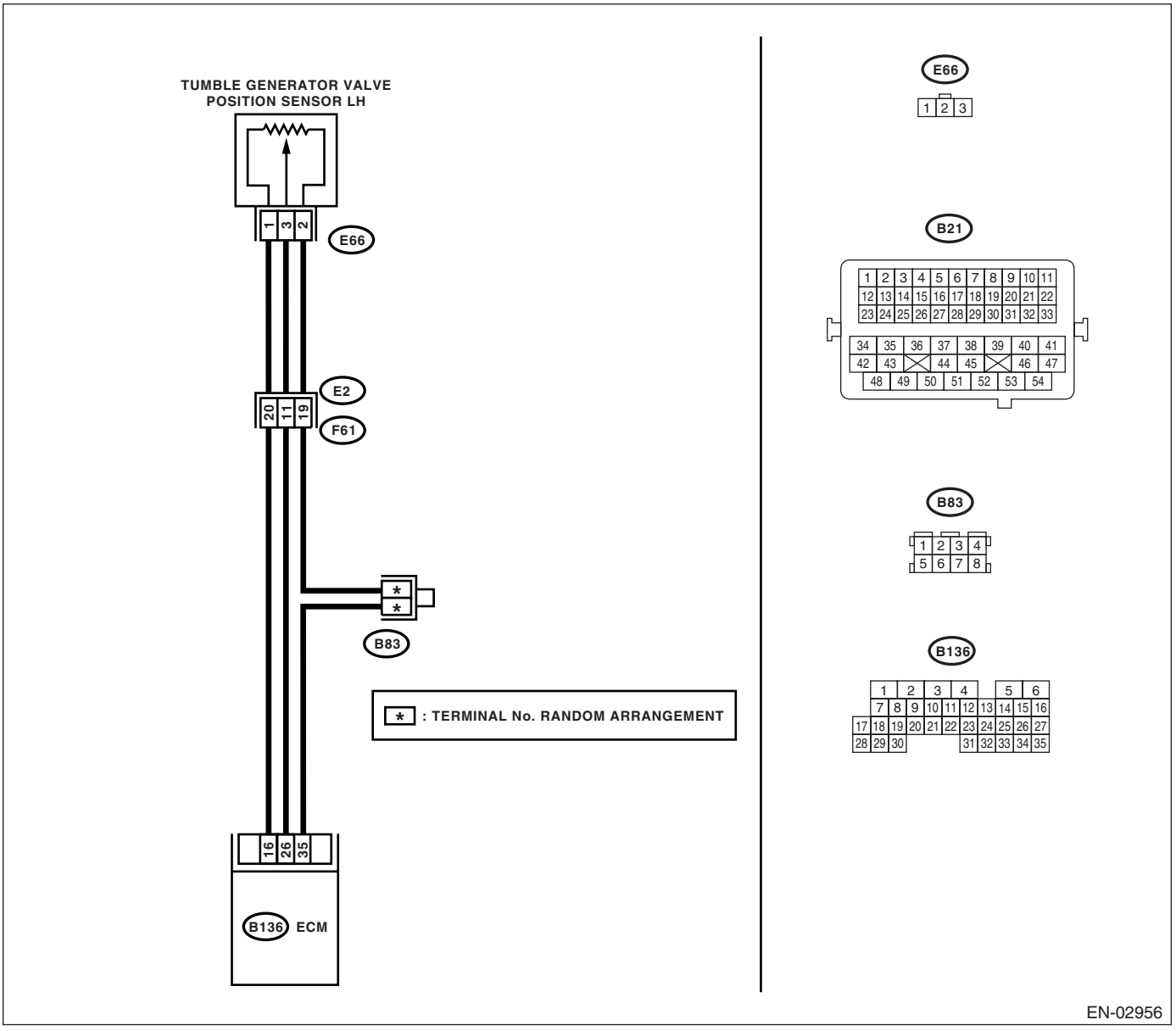
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the voltage less than 0.1 V? | Go to step **2.** | Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 2 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (−):*** | Is the voltage more than 4.5 V? | Go to step **4.** | Go to step **3.** |
| 3 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 (+) — Chassis ground (−):*** | Shake the ECM harness and connector, while monitoring value of voltage meter. Does the voltage change? | Repair the poor contact in ECM connector. | Contact your SOA Service Center. |
| 4 | **CHECK INPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 26 (+) — Chassis ground (−):*** | Is the voltage less than 0.1 V? | Go to step **6.** | Go to step **5.** |
| 5 | **CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR)**<br>Measure the voltage between ECM connector and chassis ground. | Shake the ECM harness and connector, while monitoring value of Subaru Select Monitor. Does the voltage change? | Repair the poor contact in ECM connector. | Go to step **6.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from tumble generator valve position sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E66) No. 1 (+) — Engine ground (−):*** | Is the voltage more than 4.5 V? | Go to step **7.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between tumble generator valve position sensor and ECM connector<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 7 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between ECM connector and tumble generator valve position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 26 — (E66) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **8.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between tumble generator valve position sensor and ECM connector<br>• Poor contact in ECM connector<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in coupling connector |
| 8 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E66) No. 3 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **9.** | Repair the ground short circuit in harness between tumble generator valve position sensor and ECM connector. |
| 9 | **CHECK POOR CONTACT.**<br>Check poor contact in tumble generator valve position sensor connector. | Is there poor contact in tumble generator valve position sensor connector? | Repair the poor contact in tumble generator valve position sensor connector. | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-32, Tumble Generator Valve Position Sensor.> |

# DF:DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2)

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-229, DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

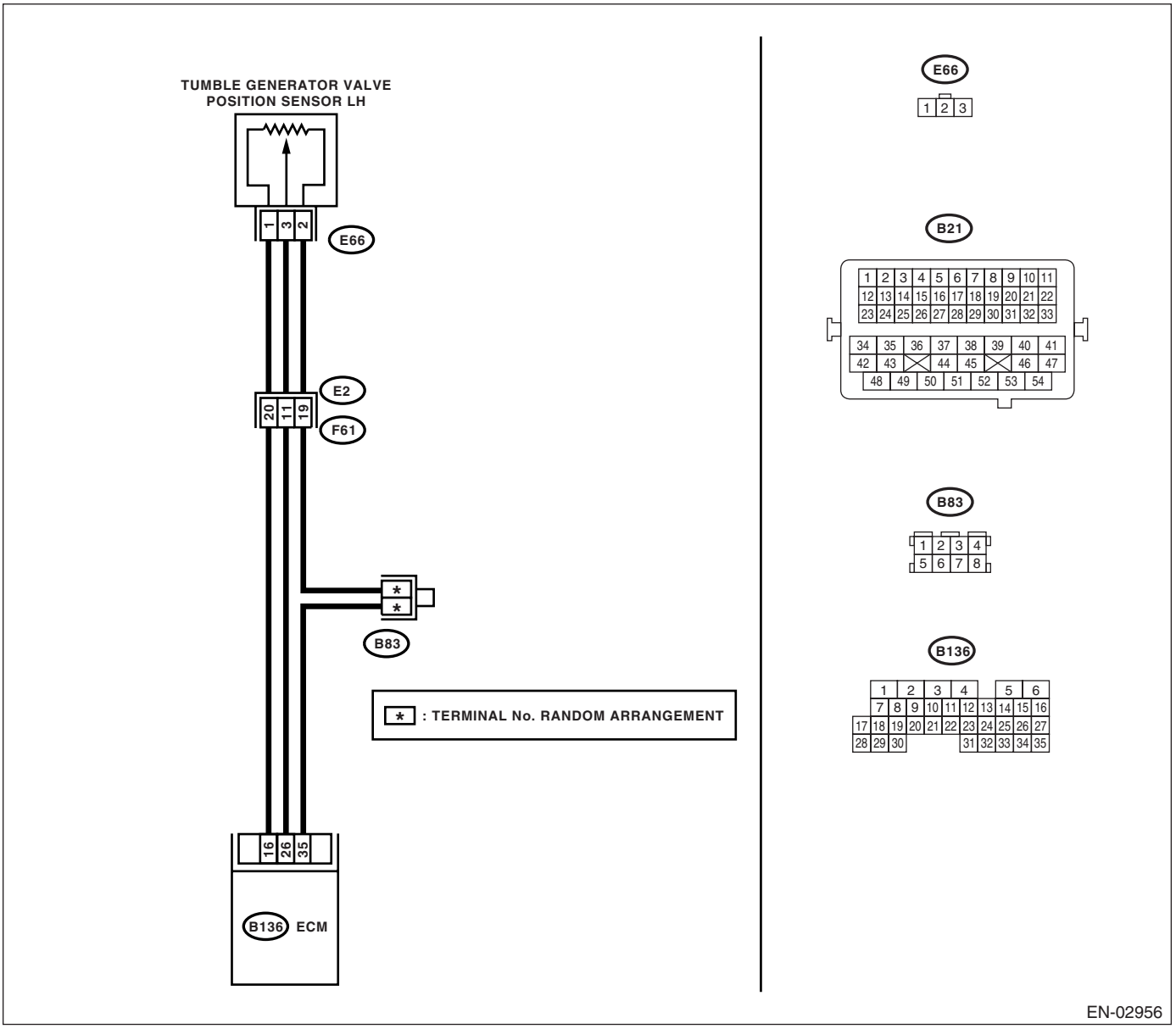
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the voltage more than 4.9 V? | Go to step **2.** | Even if malfunction indicator light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.<br>NOTE:<br>In this case, repair the following:<br>• Poor contact in tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact in coupling connector |
| 2 | **CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve position sensor.<br>3) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E66) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between tumble generator valve position sensor and ECM connector<br>• Poor contact in coupling connector<br>• Poor contact in joint connector |
| 3 | **CHECK HARNESS BETWEEN TUMBLE GENERATOR VALVE POSITION SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E66) No. 3 (+) — Engine ground (−):*** | Is the voltage more than 4.9 V? | Repair the battery short circuit in harness between tumble generator valve position sensor and ECM connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-32, Tumble Generator Valve Position Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-231, DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

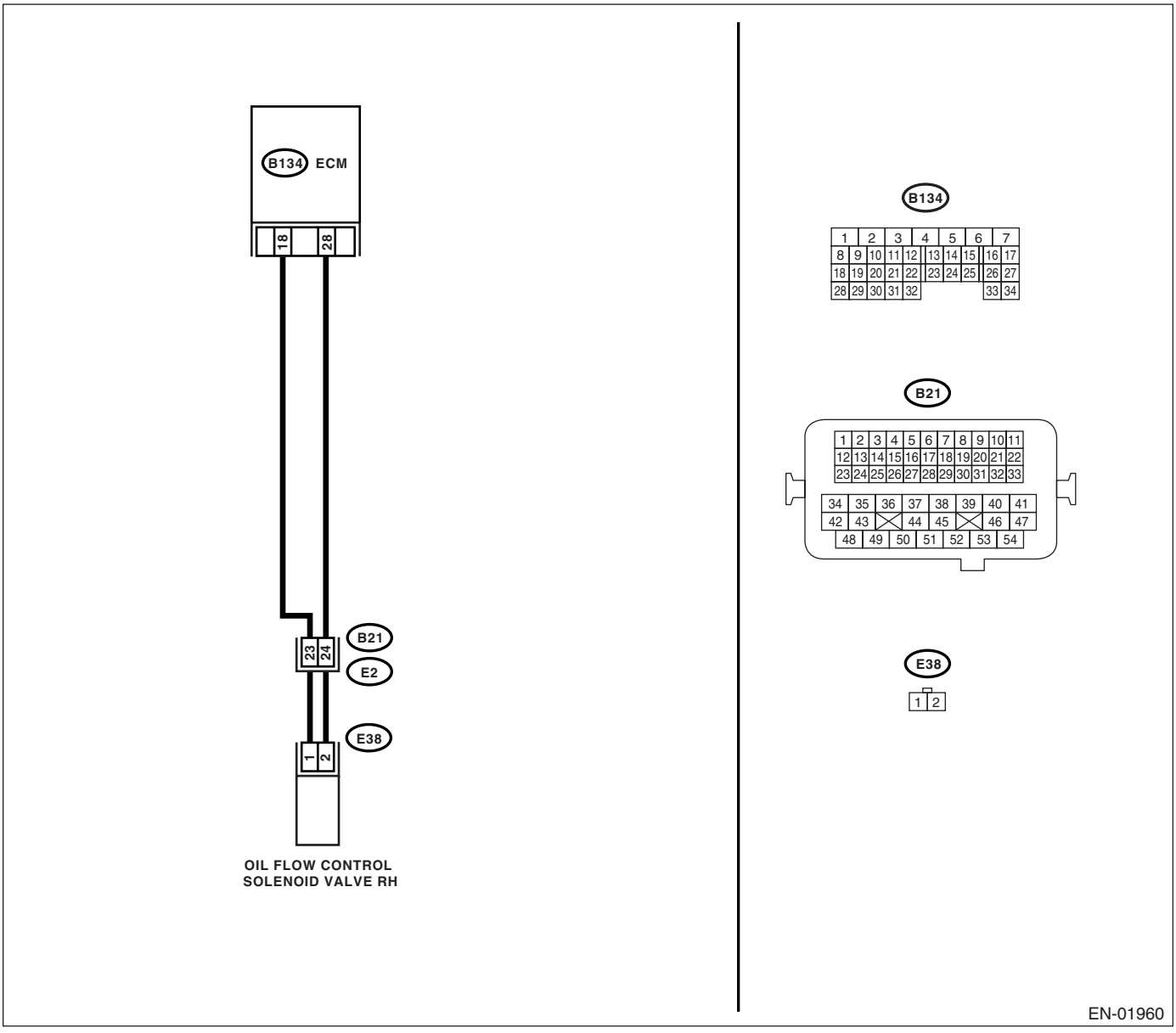
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and oil flow control solenoid valve.<br>3) Measure the resistance between ECM and oil flow control solenoid valve.<br>***Connector & terminal***<br>***(B134) No. 18 — (E38) No. 1:***<br>***(B134) No. 28 — (E38) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Repair the open circuit in harness between ECM and oil flow control solenoid valve connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and oil flow control solenoid valve connector<br>• Poor contact in coupling connector |
| 2 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Disconnect the oil flow control solenoid valve connector.<br>2) Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 6 — 12 Ω? | Repair the poor contact in ECM and oil flow control solenoid valve. | Replace the oil flow control solenoid valve. <Ref. to ME(H4DOTC)-52, Camshaft.> |

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

**DTC DETECTING CONDITION:**

Detect as soon as the malfunction occurs.

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-233, DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

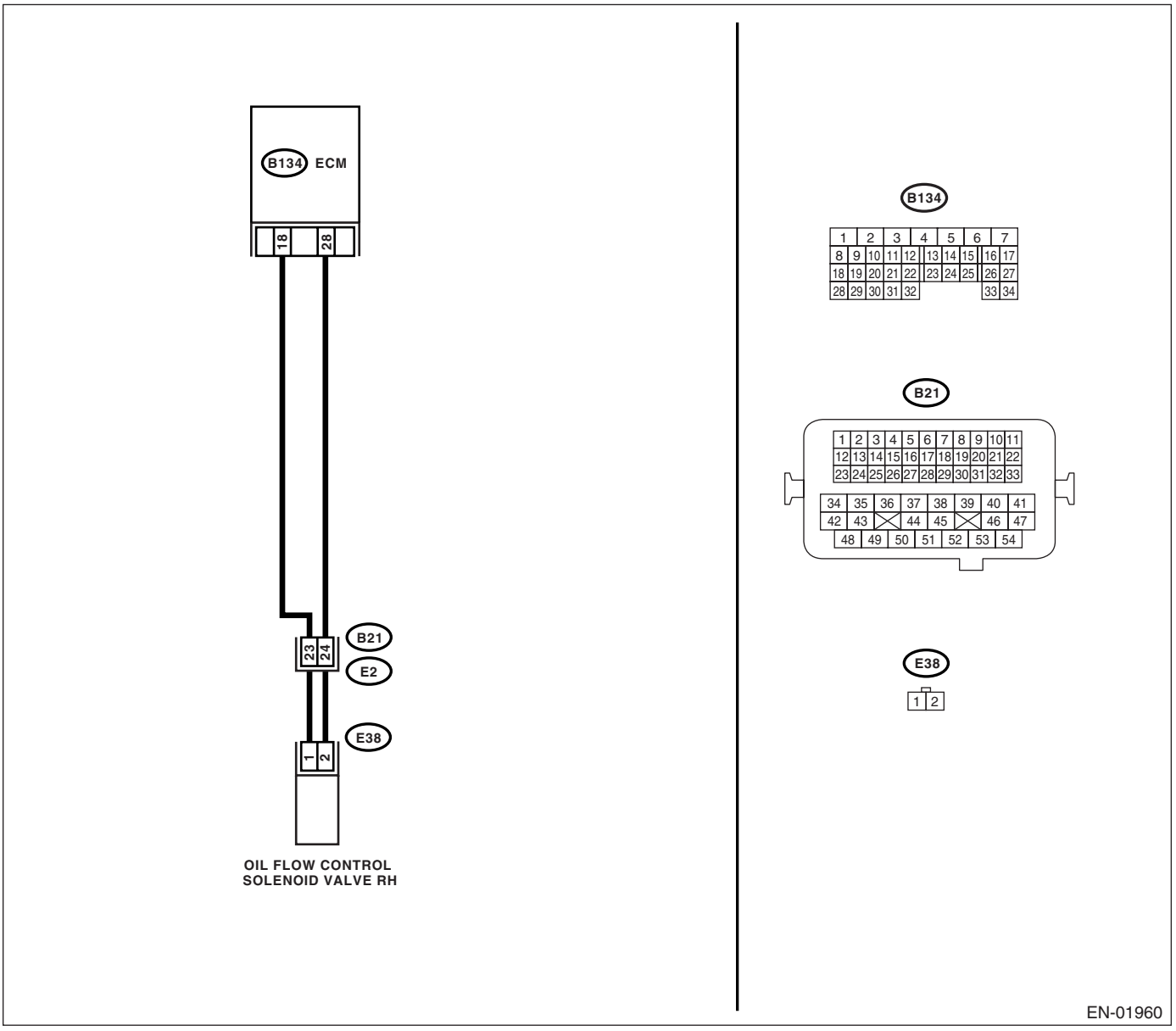
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and oil flow control solenoid valve.<br>3) Measure the resistance between oil flow control solenoid valve and engine ground.<br>***Connector & terminal***<br>***(E38) No. 1 — Engine ground:***<br>***(E38) No. 2 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **2.** | Repair the short circuit between ECM and oil flow control solenoid valve connector. |
| 2 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Disconnect the oil flow control solenoid valve connector.<br>2) Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 6 — 12 Ω? | Repair the poor contact in ECM and oil flow control solenoid valve. | Replace the oil flow control solenoid valve. <Ref. to ME(H4DOTC)-52, Camshaft.> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-234, DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

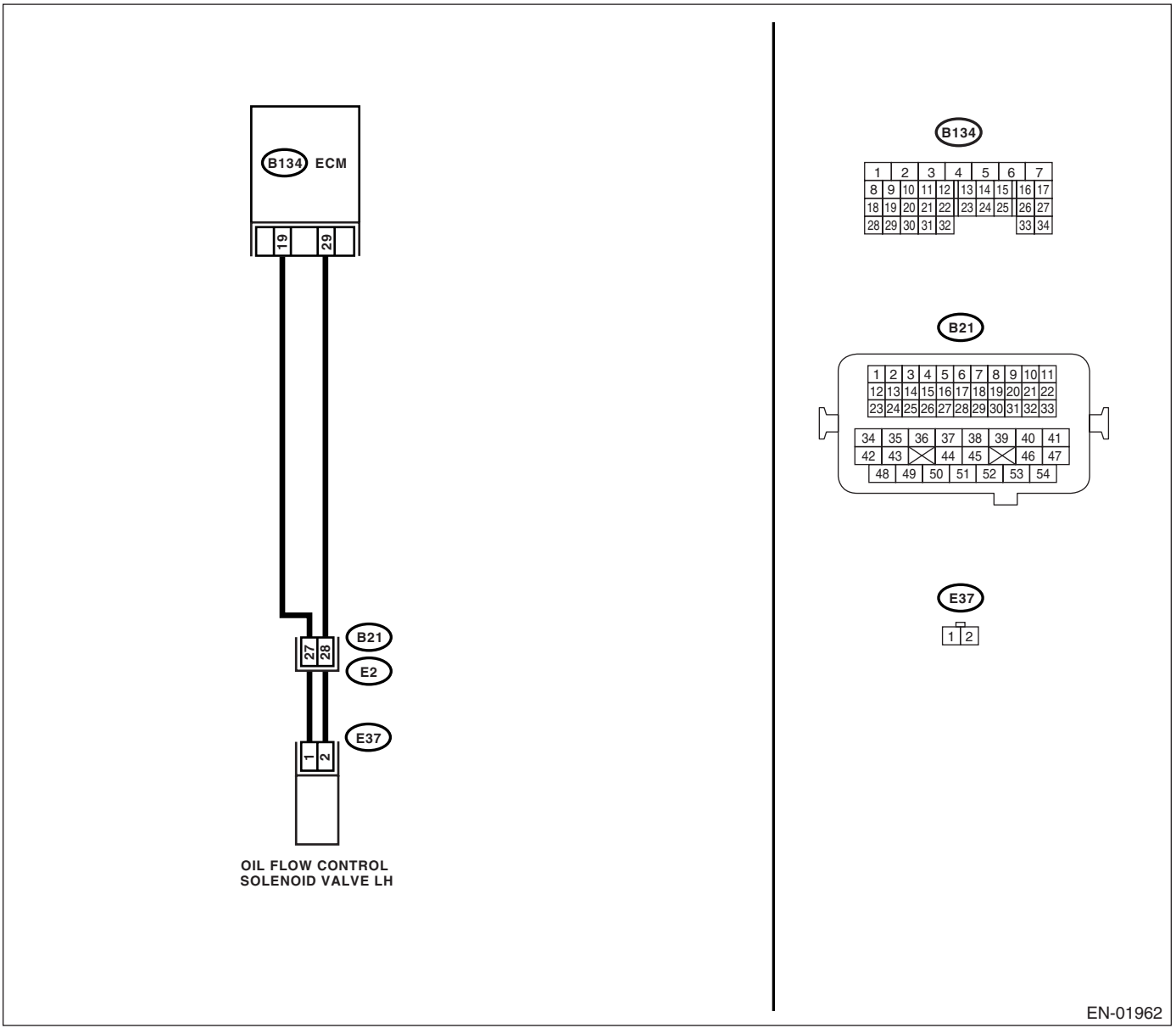
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and oil flow control solenoid valve.<br>3) Measure the resistance between ECM and oil flow control solenoid valve.<br>***Connector & terminal***<br>***(B134) No. 19 — (E37) No. 1:***<br>***(B134) No. 29 — (E37) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Repair the open circuit in harness between ECM and oil flow control solenoid valve connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and oil flow control solenoid valve connector<br>• Poor contact in coupling connector |
| 2 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Disconnect the oil flow control solenoid valve connector.<br>2) Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 6 — 12 Ω? | Repair the poor contact in ECM and oil flow control solenoid valve. | Replace the oil flow control solenoid valve. <Ref. to ME(H4DOTC)-52, Camshaft.> |

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

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-234, DTC P2093 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

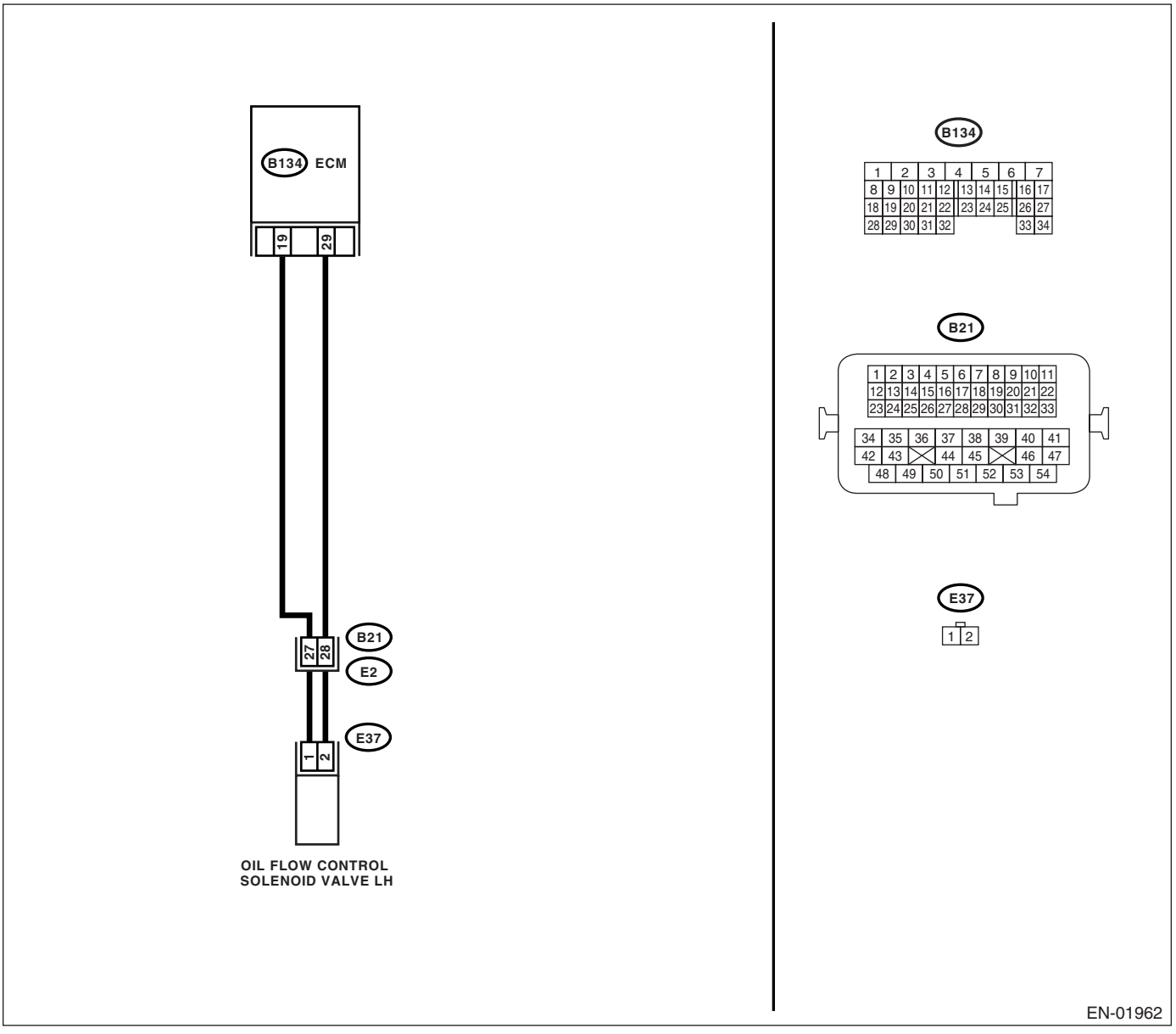
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and oil flow control solenoid valve.<br>3) Measure the resistance between oil flow control solenoid valve and engine ground.<br>***Connector & terminal***<br>***(E37) No. 1 — Engine ground:***<br>***(E37) No. 2 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **2.** | Repair the short circuit between ECM and oil flow control solenoid valve connector. |
| 2 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>1) Disconnect the oil flow control solenoid valve connector.<br>2) Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 6 — 12 Ω? | Repair the poor contact in ECM and oil flow control solenoid valve. | Replace the oil flow control solenoid valve. <Ref. to ME(H4DOTC)-52, Camshaft.> |

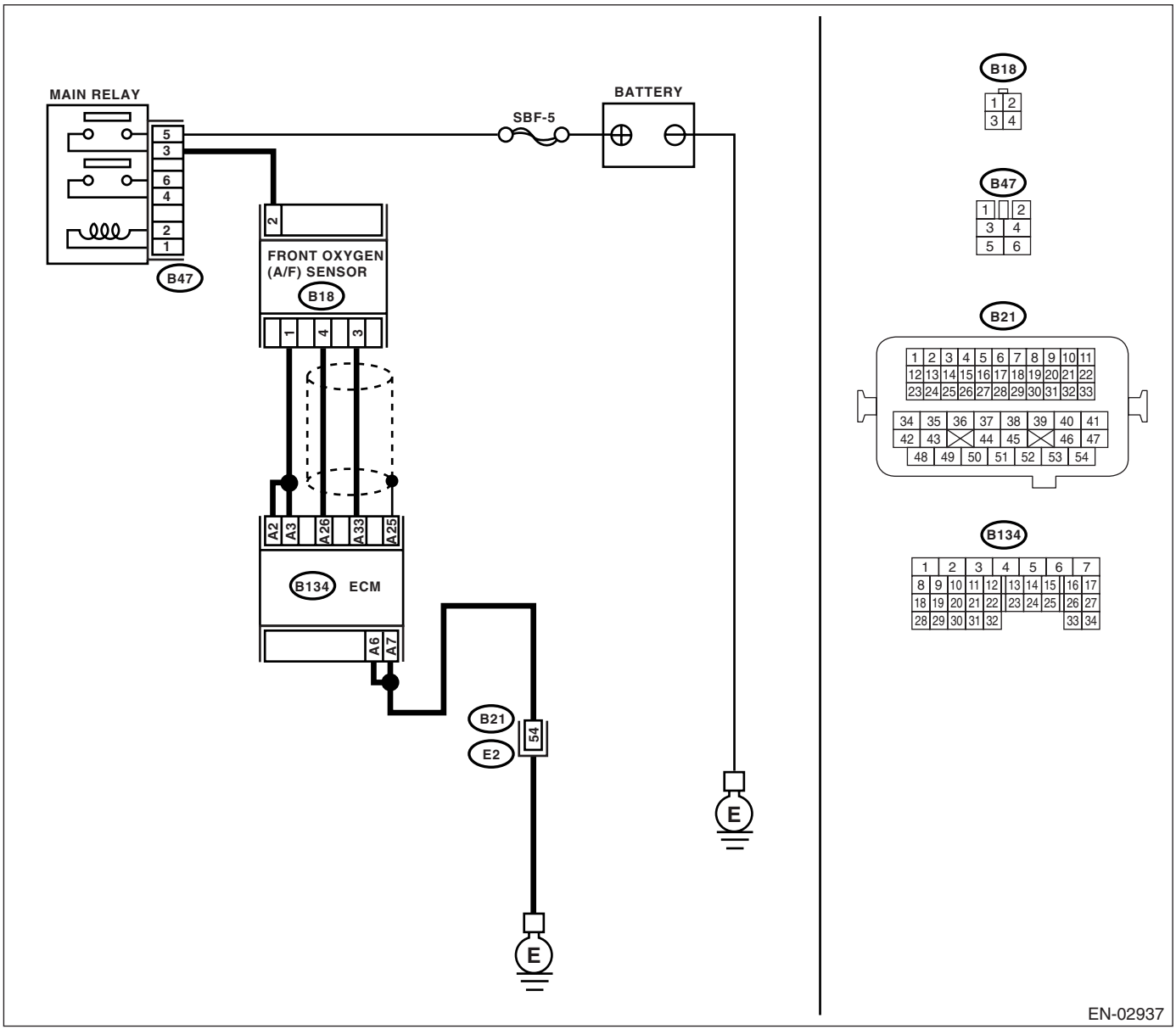
## DK:DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

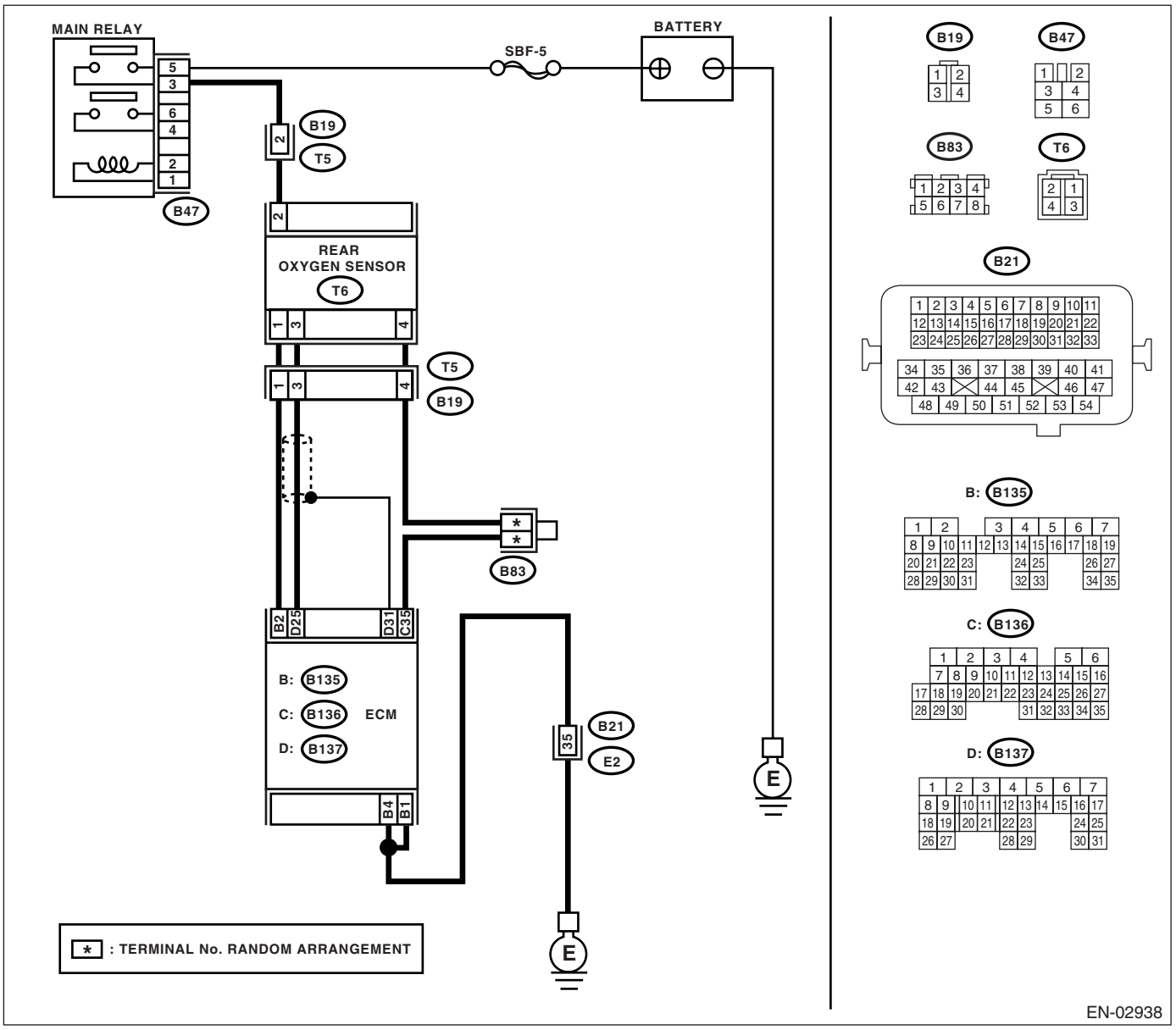
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-235, DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**






| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P2096. | Go to step **2.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector.<br>3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B134) No. 26 — (B18) No. 4:***<br>***(B134) No. 33 — (B18) No. 3:*** | Is the measured value less than 1 Ω? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and front oxygen (A/F) sensor connector<br>• Poor contact in front oxygen (A/F) sensor connector<br>• Poor contact in ECM connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN (A/F) SENSOR CONNECTOR.**<br>Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 — Chassis ground:***<br>***(B134) No. 33 — Chassis ground:*** | Is the measured value more than 1 MΩ? | Go to step **4.** | Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector. |
| 4 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):*** | Is the measured value more than 4.5 V? | Go to step **5.** | Go to step **6.** |
| 5 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):*** | Is the measured value more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the poor contact in ECM connector. |
| 6 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the measured value more than 4.95 V? | Go to step **7.** | Go to step **8.** |
| 7 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the measured value more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the poor contact in ECM connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK EXHAUST SYSTEM.** | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step **9.** |
| 9 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step **10.** |
| 10 | **CHECK FUEL PRESSURE.**<br>**Warning:**<br>**• Place "NO FIRE" signs near the working area.**<br>**• Be careful not to spill fuel on the floor.**<br>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.<br><Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.><br>**Warning:**<br>**Before removing the fuel pressure gauge, release fuel pressure.**<br>NOTE:<br>If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again. | Is the measured value 284 — 314 kPa (2.9 — 3.2 kg/cm$^2$, 41 — 46 psi)? | Go to step **11.** | Repair the following items.<br>Fuel pressure too high:<br>• Clogged fuel return line or bent hose<br>Fuel pressure too low:<br>• Improper fuel pump discharge<br>• Clogged fuel supply line |
| 11 | **CHECK FUEL PRESSURE.**<br>After connecting the pressure regulator vacuum hose, measure fuel pressure.<br><Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.><br>**Warning:**<br>**Before removing the fuel pressure gauge, release fuel pressure.**<br>NOTE:<br>• If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.<br>• If out of specification as measured at this step, check or replace the pressure regulator and pressure regulator vacuum hose. | Is the measured value 206 — 235 kPa (2.1 — 2.4 kg/cm$^2$, 30 — 34 psi)? | Go to step **12.** | Repair the following items.<br>Fuel pressure too high:<br>• Faulty pressure regulator<br>• Clogged fuel return line or bent hose<br>Fuel pressure too low:<br>• Faulty pressure regulator<br>• Improper fuel pump discharge<br>• Clogged fuel supply line |
| 12 | **CHECK ENGINE COOLANT TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up completely.<br>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the temperature more than 60°C (140°F)? | Go to step **13.** | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 13 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE.**<br>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).<br>2) Place the shift lever in neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all accessory switches to OFF.<br>5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value 2.7 — 4.7 g/s (0.36 — 0.62 lb/m)? | Go to step **14.** | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |
| 14 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).<br>2) Place the shift lever in neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all accessory switches to OFF.<br>5) Open the front hood.<br>6) Measure the ambient temperature.<br>7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Subtract ambient temperature from intake air temperature. Is the obtained value −10°C — 50°C (−18°F — 90°F)? | Go to step **15.** | Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |
| 15 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 5,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value more than 490 mV? | Go to step **18.** | Go to step **16.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 16 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and rear oxygen sensor.<br>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the measured value more than 3 Ω? | Repair open circuit in harness between ECM and rear oxygen sensor connector. | Go to step **17.** |
| 17 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Engine ground (−):*** | Is the measured value within 0.2 to 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector |
| 18 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and immediately decrease the engine speed from 5,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the “READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value less than 250 mV? | Go to step **19.** | Go to step **20.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 19 | **CHECK FRONT OXYGEN (A/F) SENSOR AND REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until the engine coolant temperature exceeds 70°C (158°F), and leave it at idle for more than 5 minutes.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Does the voltage keep 0.8 V for more than 5 minutes? | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> | Go to step **20.** |
| 20 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and rear oxygen sensor.<br>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the measured value more than 3 Ω? | Repair open circuit in harness between ECM and rear oxygen sensor connector. | Go to step **21.** |
| 21 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Engine ground (−):*** | Is the measured value within 0.2 to 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector |

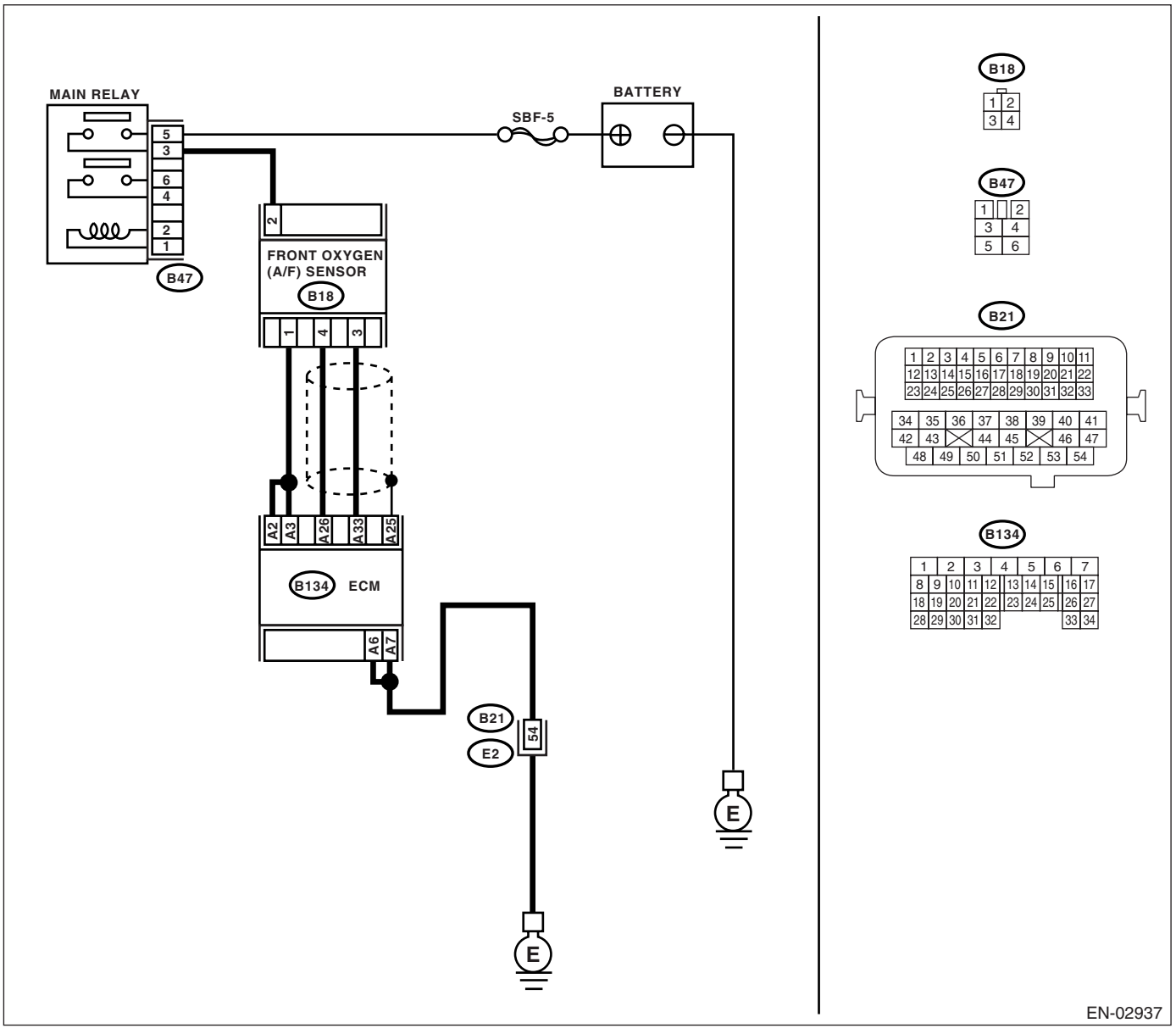
# DL:DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1

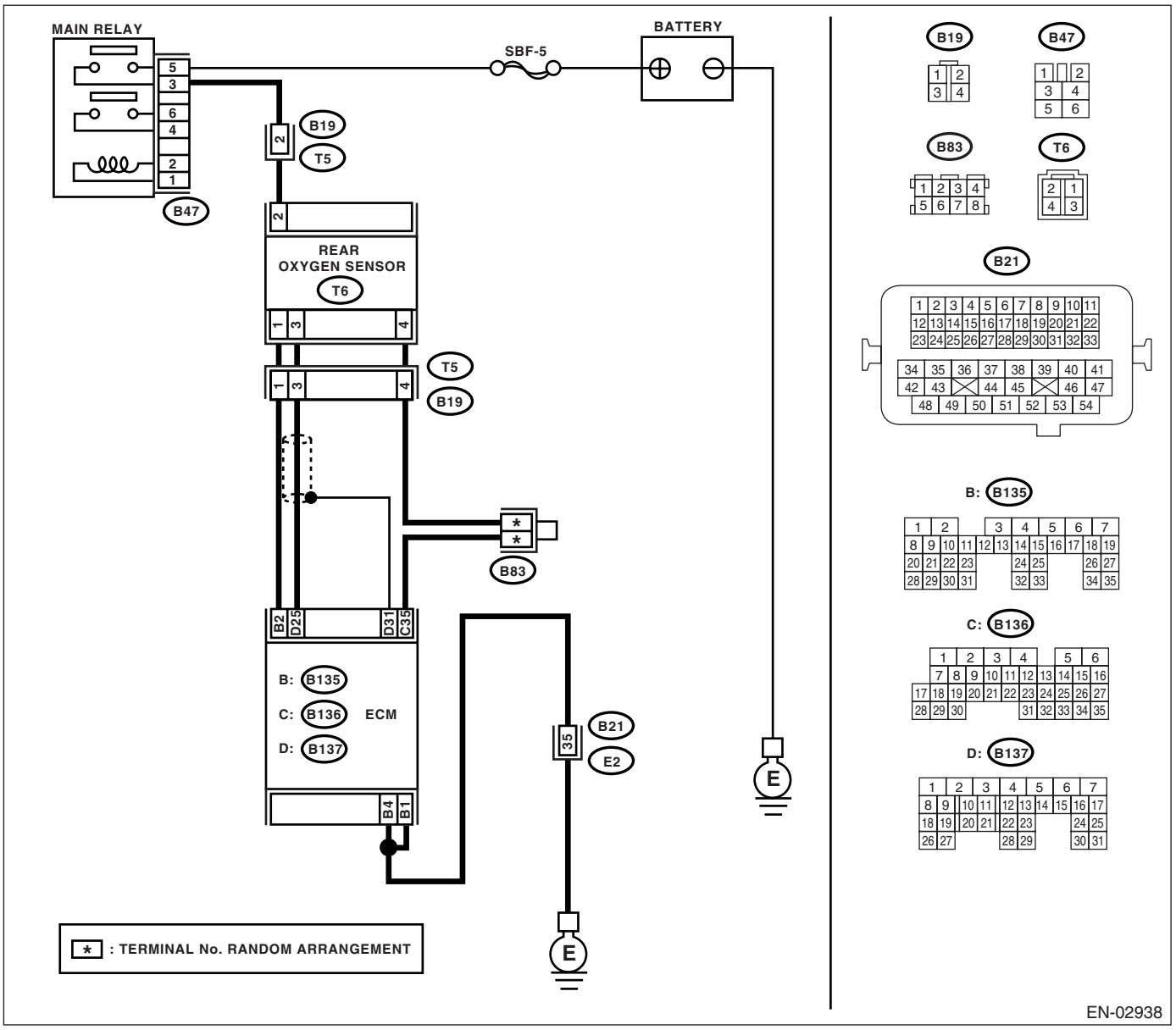
**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-237, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**






| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-71, List of Diagnostic Trouble Code (DTC).><br>NOTE:<br>In this case, it is not necessary to inspect DTC P2096. | Go to step **2.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and front oxygen (A/F) sensor connector.<br>3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B134) No. 26 — (B18) No. 4:***<br>***(B134) No. 33 — (B18) No. 3:*** | Is the measured value less than 1 Ω? | Go to step **3.** | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between ECM and front oxygen (A/F) sensor connector<br>• Poor contact in front oxygen (A/F) sensor connector<br>• Poor contact in ECM connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN (A/F) SENSOR CONNECTOR.**<br>Measure the resistance of harness between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 — Chassis ground:***<br>***(B134) No. 33 — Chassis ground:*** | Is the measured value more than 1 MΩ? | Go to step **4.** | Repair the ground short circuit in harness between ECM and front oxygen (A/F) sensor connector. |
| 4 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):*** | Is the measured value more than 4.5 V? | Go to step **5.** | Go to step **6.** |
| 5 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 (+) — Chassis ground (−):*** | Is the measured value more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the poor contact in ECM connector. |
| 6 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the measured value more than 4.95 V? | Go to step **7.** | Go to step **8.** |
| 7 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 33 (+) — Chassis ground (−):*** | Is the measured value more than 10 V? | Repair the battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the poor contact in ECM connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK EXHAUST SYSTEM.** | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step **9.** |
| 9 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step **10.** |
| 10 | **CHECK FUEL PRESSURE.**<br>**Warning:**<br>**• Place "NO FIRE" signs near the working area.**<br>**• Be careful not to spill fuel on the floor.**<br>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.<br><Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.><br>**Warning:**<br>**Before removing the fuel pressure gauge, release fuel pressure.**<br>NOTE:<br>If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again. | Is the measured value 284 — 314 kPa (2.9 — 3.2 kg/cm$^2$, 41 — 46 psi)? | Go to step **11.** | Repair the following items.<br>Fuel pressure too high:<br>• Clogged fuel return line or bent hose<br>Fuel pressure too low:<br>• Improper fuel pump discharge<br>• Clogged fuel supply line |
| 11 | **CHECK FUEL PRESSURE.**<br>After connecting the pressure regulator vacuum hose, measure fuel pressure.<br><Ref. to ME(H4DOTC)-25, INSPECTION, Fuel Pressure.><br>**Warning:**<br>**Before removing the fuel pressure gauge, release fuel pressure.**<br>NOTE:<br>• If the fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.<br>• If out of specification as measured at this step, check or replace the pressure regulator and pressure regulator vacuum hose. | Is the measured value 206 — 235 kPa (2.1 — 2.4 kg/cm$^2$, 30 — 34 psi)? | Go to step **12.** | Repair the following items.<br>Fuel pressure too high:<br>• Faulty pressure regulator<br>• Clogged fuel return line or bent hose<br>Fuel pressure too low:<br>• Faulty pressure regulator<br>• Improper fuel pump discharge<br>• Clogged fuel supply line |
| 12 | **CHECK ENGINE COOLANT TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up completely.<br>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the temperature more than 60°C (140°F)? | Go to step **13.** | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-22, Engine Coolant Temperature Sensor.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 13 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE.**<br>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).<br>2) Place the shift lever in neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all accessory switches to OFF.<br>5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value 2.7 — 4.7 g/s (0.36 — 0.62 lb/m)? | Go to step **14.** | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |
| 14 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).<br>2) Place the shift lever in neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all accessory switches to OFF.<br>5) Open the front hood.<br>6) Measure the ambient temperature.<br>7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Subtract ambient temperature from intake air temperature. Is the obtained value −10°C — 50°C (−18°F — 90°F)? | Go to step **15.** | Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-27, Mass Air Flow and Intake Air Temperature Sensor.> |
| 15 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 5,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value more than 490 mV? | Go to step **18.** | Go to step **16.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 16 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and rear oxygen sensor.<br>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the measured value more than 3 Ω? | Repair open circuit in harness between ECM and rear oxygen sensor connector. | Go to step **17.** |
| 17 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Engine ground (−):*** | Is the measured value within 0.2 to 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector |
| 18 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and immediately decrease the engine speed from 5,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the “READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Is the measured value less than 250 mV? | Go to step **19.** | Go to step **20.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 19 | **CHECK FRONT OXYGEN (A/F) SENSOR AND REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until the engine coolant temperature exceeds 70°C (158°F), and leave it at idle for more than 5 minutes.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool instruction manual. | Does the voltage keep 0.8 V for more than 5 minutes? | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-35, Front Oxygen (A/F) Sensor.> | Go to step **20.** |
| 20 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and rear oxygen sensor.<br>3) Measure the resistance of harness between ECM and rear oxygen sensor connector.<br>***Connector & terminal***<br>***(B137) No. 25 — (T6) No. 3:***<br>***(B136) No. 35 — (T6) No. 4:*** | Is the measured value more than 3 Ω? | Repair open circuit in harness between ECM and rear oxygen sensor connector. | Go to step **21.** |
| 21 | **CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor harness connector and engine ground or chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 (+) — Engine ground (−):*** | Is the measured value within 0.2 to 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-37, Rear Oxygen Sensor.> | Repair harness and connector.<br>NOTE:<br>In this case, repair the following:<br>• Open circuit in harness between rear oxygen sensor and ECM connector<br>• Poor contact in rear oxygen sensor connector<br>• Poor contact in ECM connector |

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

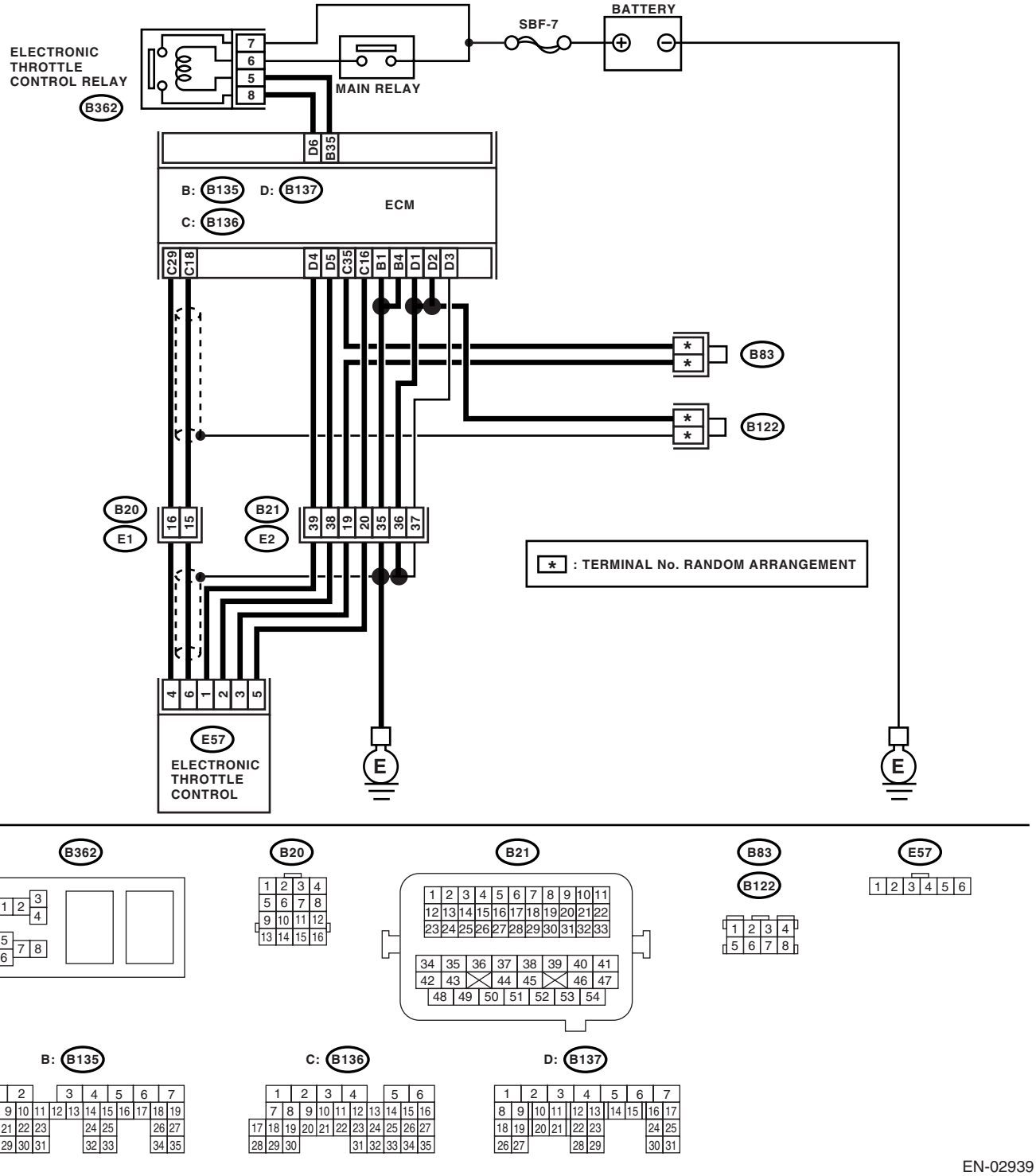
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-239, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**WIRING DIAGRAM:**







EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control relay.<br>3) Connect the battery to terminals No. 5 and No. 6 of electronic throttle control relay.<br>4) Measure the resistance between electronic throttle control control relay terminals.<br>***Terminals***<br>***No. 7 — No. 8:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Replace the electronic throttle control control relay. |
| 2 | **CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 7 (+) — Chassis ground (−):***<br>***(B362) No. 6 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **3.** | Repair the open or ground short circuit of power supply circuit. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 5 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair power supply short circuit in harness between ECM and electronic throttle control. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between electronic throttle control control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 5 — Chassis ground:***<br>***(B362) No. 8 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the ground short circuit in harness between ECM and electronic throttle control relay. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the resistance between ECM connector and electronic throttle control relay connector.<br>***Connector & terminal***<br>***(B135) No. 35 — (B362) No. 5:***<br>***(B137) No. 6 — (B362) No. 8:*** | Is the resistance less than 1 Ω? | Go to step **6.** | Repair the open circuit in harness between ECM and electronic throttle control relay. |
| 6 | **CHECK SENSOR OUTPUT.**<br>1) Connect all the connectors.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM connector terminals.<br>***Connector & terminal***<br>***(B136) No. 18 (+) — (B136) No. 35 (−):*** | Is the voltage more than 0.4 V? | Go to step **7.** | Go to step **9.** |
| 7 | **CHECK SENSOR OUTPUT.**<br>1) Connect all the connectors.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM connector terminals.<br>***Connector & terminal***<br>***(B136) No. 29 (+) — (B136) No. 35 (−):*** | Is the voltage more than 0.8 V? | Go to step **8.** | Go to step **9.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK POOR CONTACT.**<br>Check the poor contact in connector between ECM and electronic throttle control. | Is there poor contact? | Repair the poor contact. | Go to step **13.** |
| 9 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 16 — (E57) No. 5:*** | Is the resistance less than 1 Ω? | Go to step **10.** | Repair the open circuit of harness connector. |
| 10 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 16 — Chassis ground:***<br>***(B136) No. 18 — Chassis ground:***<br>***(B136) No. 29 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **11.** | Repair the ground short circuit of harness. |
| 11 | **CHECK SENSOR POWER SUPPLY.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 5 (+) — Engine ground (−):*** | 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)-39, Engine Control Module (ECM).> |
| 12 | **CHECK SHORT CIRCUIT IN ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 — Engine ground:***<br>***(E57) No. 4 — Engine ground:*** | Is the resistance more than 10 Ω? | Go to step **13.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 13 | **CHECK SENSOR OUTPUT.**<br>1) Connect all the connectors.<br>2) Turn the ignition switch to ON.<br>3) Read the data of main throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage 4.63 V? | Go to step **14.** | Go to step **16.** |
| 14 | **CHECK SENSOR OUTPUT.**<br>Read the data of sub throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage 4.73 V? | Go to step **15.** | Go to step **16.** |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 15 | **CHECK POOR CONTACT.**<br>Check the poor contact in connector between ECM and electronic throttle control. | Is there poor contact? | Repair the poor contact. | Go to step **20.** |
| 16 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (E57) No. 3:***<br>***(B136) No. 18 — (E57) No. 6:***<br>***(B136) No. 29 — (E57) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **17.** | Repair the open circuit of harness connector. |
| 17 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the ECM connector.<br>2) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 3 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **18.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 18 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 (+) — Engine ground (–):***<br>***(E57) No. 4 (+) — Engine ground (–):*** | Is the voltage less than 10 V? | Go to step **19.** | Repair the short circuit in harness between ECM connector and electronic throttle control connector. |
| 19 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B136) No. 18 — (B136) No. 35:***<br>***(B136) No. 29 — (B136) No. 35:*** | Is the resistance more than 1 MΩ? | Go to step **20.** | Repair the short circuit to sensor power supply. |
| 20 | **CHECK SENSOR OUTPUT.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the connectors except of the electric control throttle relay.<br>3) Turn the ignition switch to ON.<br>4) Read the data of main throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage 0.81 — 0.87 V? | Go to step **21.** | Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 21 | **CHECK SENSOR OUTPUT.**<br>Read the data of sub throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage 1.64 — 1.70 V? | Go to step **22.** | Repair the poor contact in ECM connector.<br>Replace the electronic throttle control if defective. |
| 22 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B137) No. 5 — (E57) No. 2:***<br>***(B137) No. 4 — (E57) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **23.** | Repair the open circuit of harness connector. |
| 23 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 2 (+) — Engine ground (−):***<br>***(E57) No. 1 (+) — Engine ground (−):*** | Is the voltage less than 5 V? | Go to step **24.** | Repair power supply short circuit in harness between ECM and electronic throttle control. |
| 24 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 2 — Engine ground:***<br>***(E57) No. 1 — Engine ground:*** | Is the resistance more than 1 MΩ? | Go to step **25.** | Repair the short circuit of harness. |
| 25 | **CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.**<br>Measure the resistance between electronic throttle control connector terminals.<br>***Connector & terminal***<br>***(E57) No. 2 — (E57) No. 1:*** | Is the resistance more than 1 MΩ? | Go to step **26.** | Repair the short circuit of harness. |
| 26 | **CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 3 — Chassis ground:*** | Is the resistance less than 10 Ω? | Go to step **27.** | Repair the open circuit of harness. |
| 27 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between electronic throttle control terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 5 Ω? | Go to step **28.** | Replace the electronic throttle control control. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 28 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>Move the throttle valve to the fully open and fully closed positions with fingers.<br>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)-39, Engine Control Module (ECM).> | Replace the electronic throttle control control. |

## DN:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

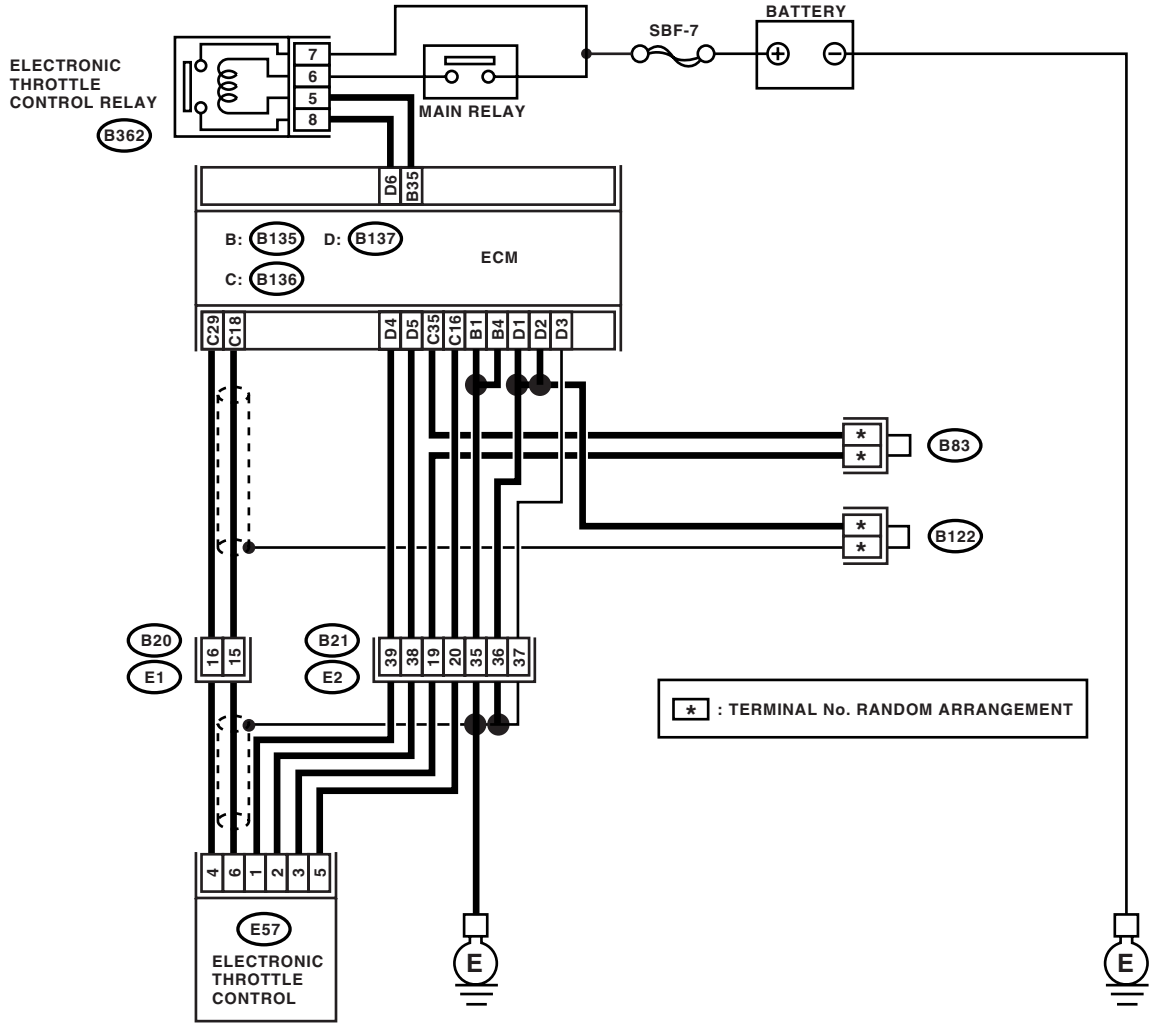
**DTC DETECTING CONDITION:**

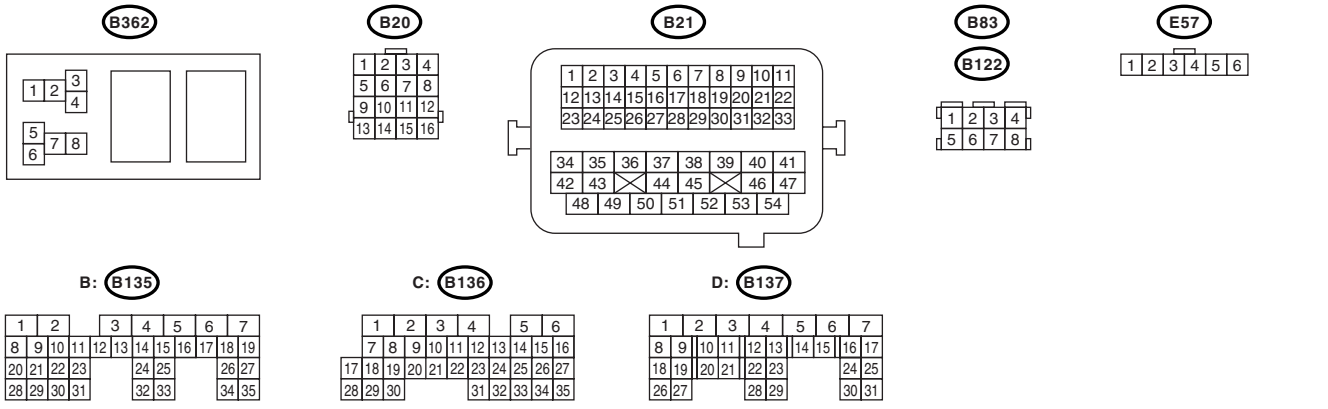
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-241, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**WIRING DIAGRAM:**




EN-02939

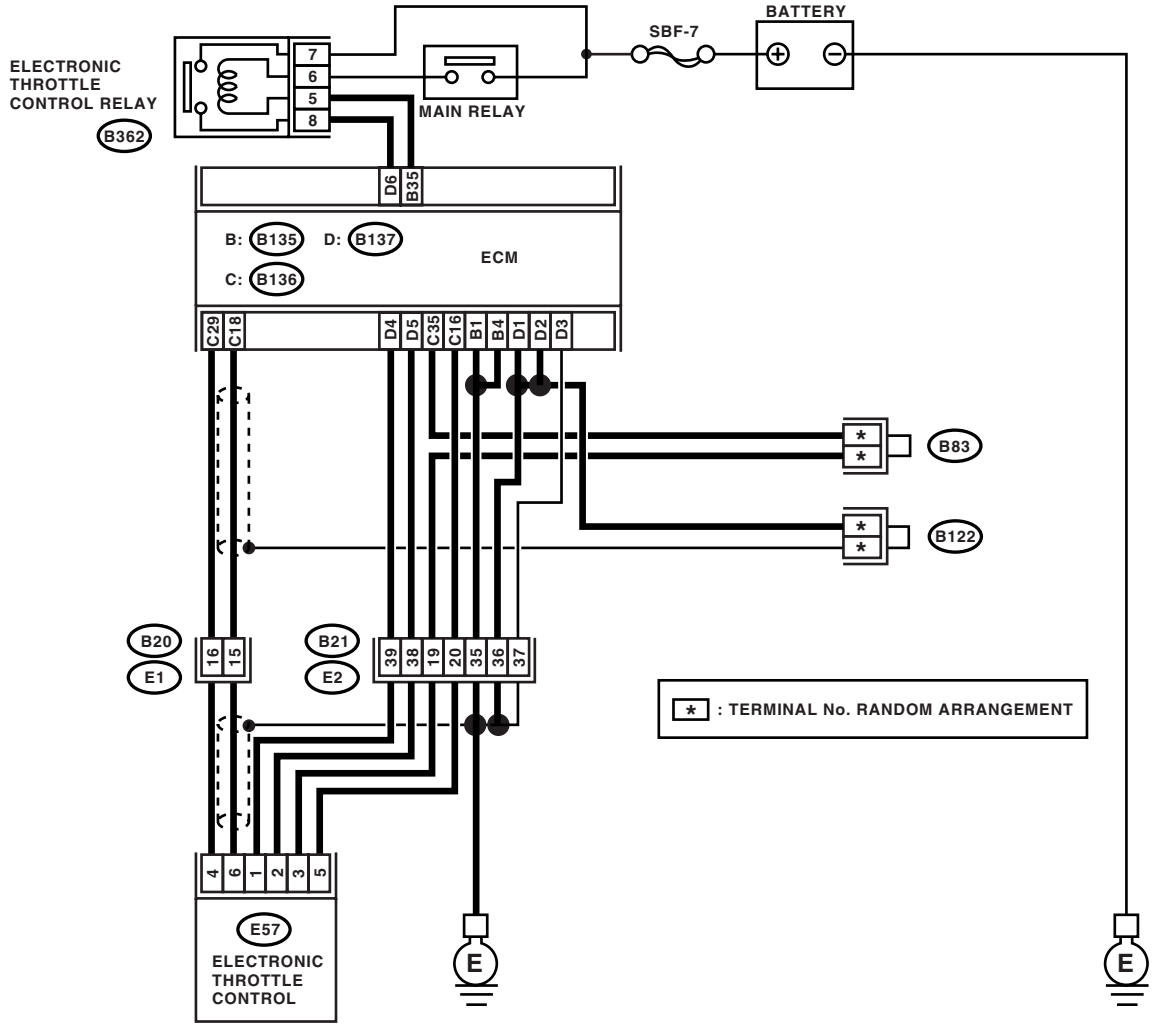
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control relay.<br>3) Connect the battery to terminals No. 5 and No. 6 of electronic throttle control relay.<br>4) Measure the resistance between electronic throttle control control terminals.<br>***Terminals***<br>***(B362) No. 7 — (B362) No. 8:*** | Is the resistance less than 1 Ω? | Go to step **2.** | Replace the electronic throttle control control relay. |
| 2 | **CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 7 (+) — Chassis ground (−):***<br>***(B362) No. 6 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Go to step **3.** | Repair the open or ground short circuit of power supply circuit. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 5 (+) — Chassis ground (−):*** | Is the voltage more than 10 V? | Repair power supply short circuit in harness between ECM and electronic throttle control relay. | Go to step **4.** |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between electronic throttle control control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 5 — Chassis ground:***<br>***(B362) No. 8 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the ground short circuit in harness between ECM and electronic throttle control relay. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the resistance between ECM connector and electronic throttle control relay connector.<br>***Connector & terminal***<br>***(B135) No. 35 — (B362) No. 5:***<br>***(B137) No. 6 — (B362) No. 8:*** | Is the resistance less than 1 Ω? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the open circuit in harness between ECM and electronic throttle control relay. |

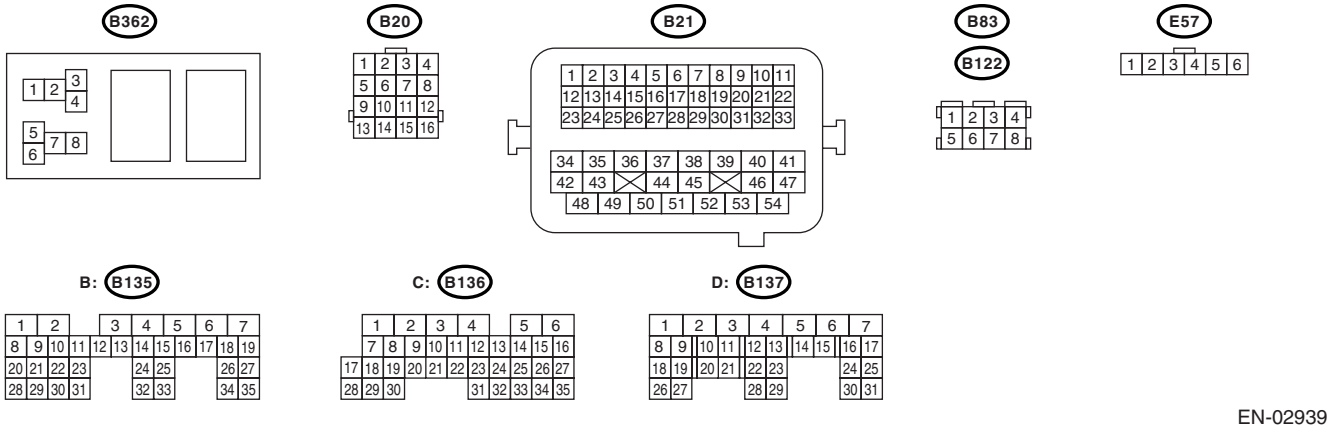
# DO:DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-243, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control relay.<br>3) Measure the resistance between electronic throttle control control relay terminals.<br>***Terminals***<br>***No. 7 — No. 8:*** | Is the resistance more than 1 MΩ? | Go to step **2.** | Replace the electronic throttle control control relay. |
| 2 | **CHECK POWER SUPPLY SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B362) No. 8 (+) — Chassis ground (−):*** | 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. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 35 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the ground short circuit in harness between ECM and electronic throttle control relay. |

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

NOTE:
For diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-300, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# DQ:DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D” CIRCUIT LOW INPUT

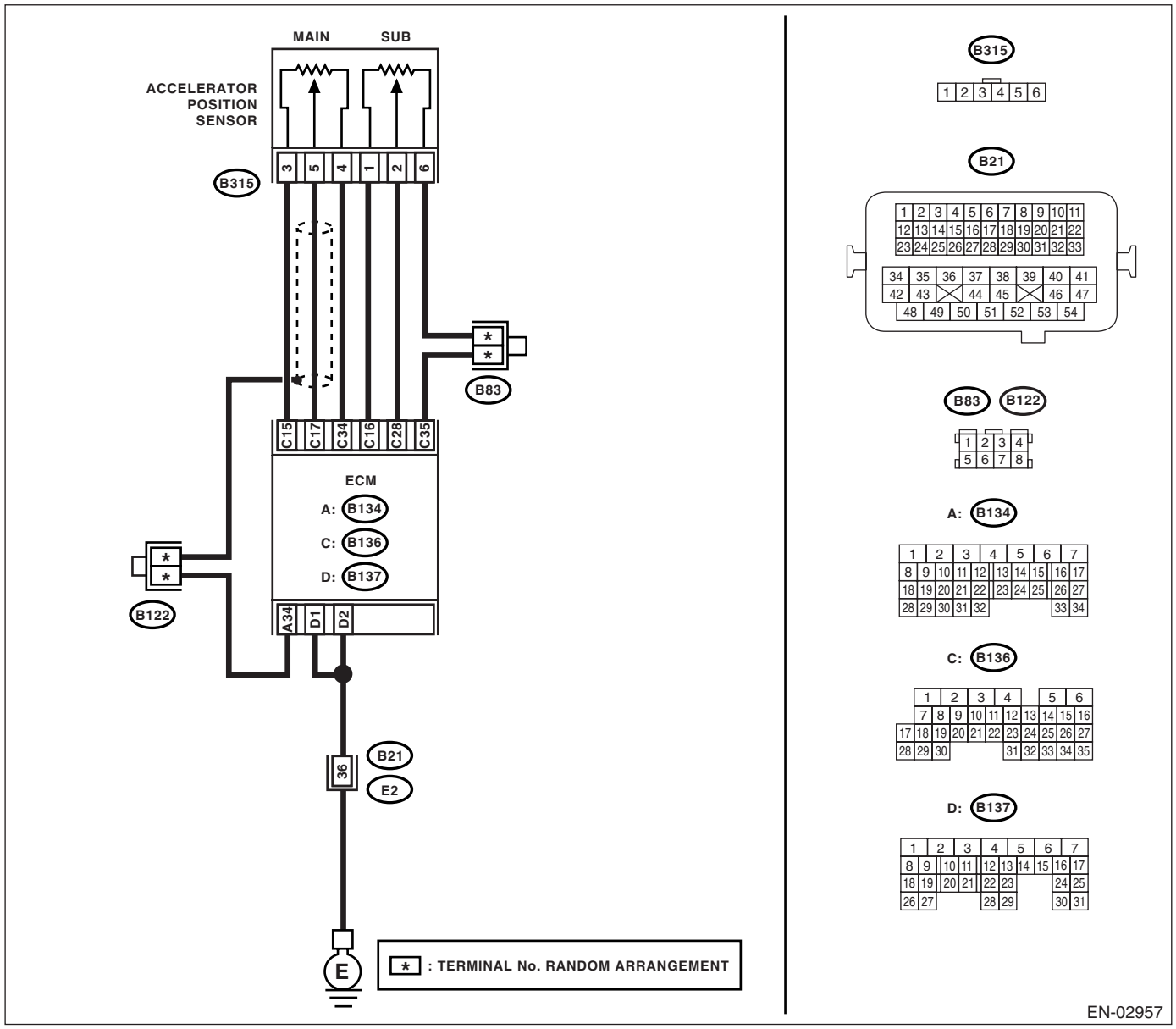
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-247, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D” CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ACCELERATOR POSITION SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of main accelerator position sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage more than 0.4 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in connector between ECM and accelerator position sensor. | Is there poor contact? | Repair the poor contact. | Temporary poor contact occurred, but it is normal at present. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between ECM connector and accelerator position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 17 — (B315) No. 5:***<br>***(B136) No. 15 — (B315) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 17 — Chassis ground:***<br>***(B136) No. 15 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the chassis short circuit of harness. |
| 5 | **CHECK POWER SUPPLY OF ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 3 (+) — Chassis ground (−):*** | 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)-39, Engine Control Module (ECM).> |
| 6 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 3 — No. 4:*** | Is the resistance 1.2 — 4.8 kΩ? | Go to step **7.** | Replace the accelerator position sensor. |
| 7 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 5 — No. 4:***<br>Check the measured value is within the specification without depressing the accelerator pedal. | Is the resistance 0.2 — 1.0 kΩ? | Go to step **8.** | Replace the accelerator position sensor. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 5 — No. 4:***<br>Check the measured value is within the specification with the accelerator pedal depressed. | Is the resistance 0.5 — 2.5 kΩ? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Replace the accelerator position sensor. |

# DR:DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D” CIRCUIT HIGH INPUT

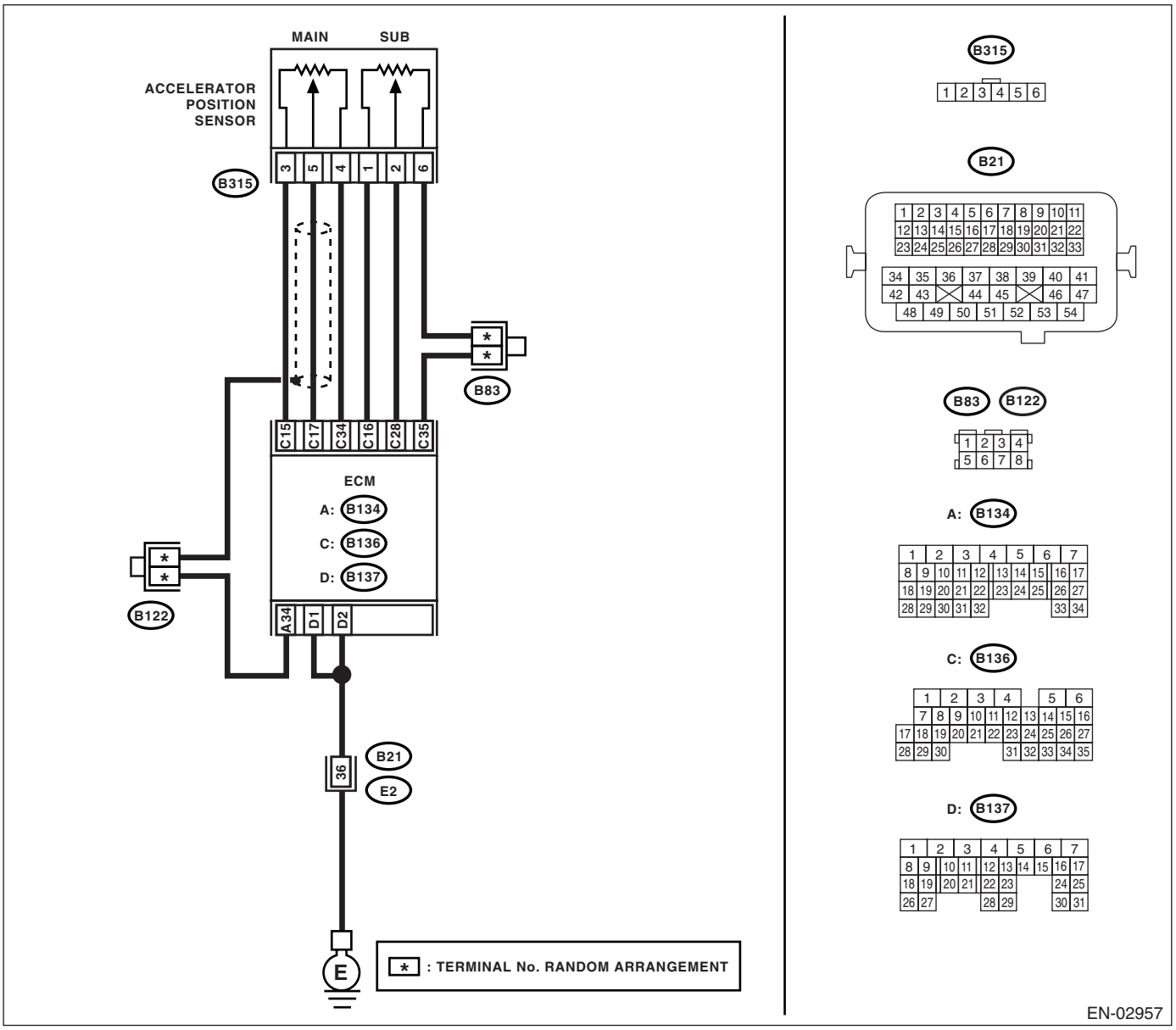
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-249, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D” CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ACCELERATOR POSITION SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of main accelerator position sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage less than 4.8 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in connector between ECM and accelerator position sensor. | Is there poor contact? | Repair the poor contact. | Temporary poor contact occurred, but it is normal at present. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between ECM connector and accelerator position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 34 — (B315) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Measure the resistance between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 4 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **5.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 5 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 5 (+) — Chassis ground (−):*** | Is the voltage less than 6 V? | Go to step **6.** | Repair the battery short circuit in harness between ECM connector and accelerator position sensor connector. |
| 6 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM connector terminals.<br>***Connector & terminal***<br>***(B136) No. 17 — (B136) No. 15:***<br>***(B136) No. 17 — (B136) No. 16:*** | Is the resistance more than 1 MΩ? | Repair the poor contact in accelerator position sensor connector. Replace the accelerator position sensor if defective. | Repair the short circuit to sensor power supply. |

# DS:DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH “E” CIRCUIT LOW INPUT

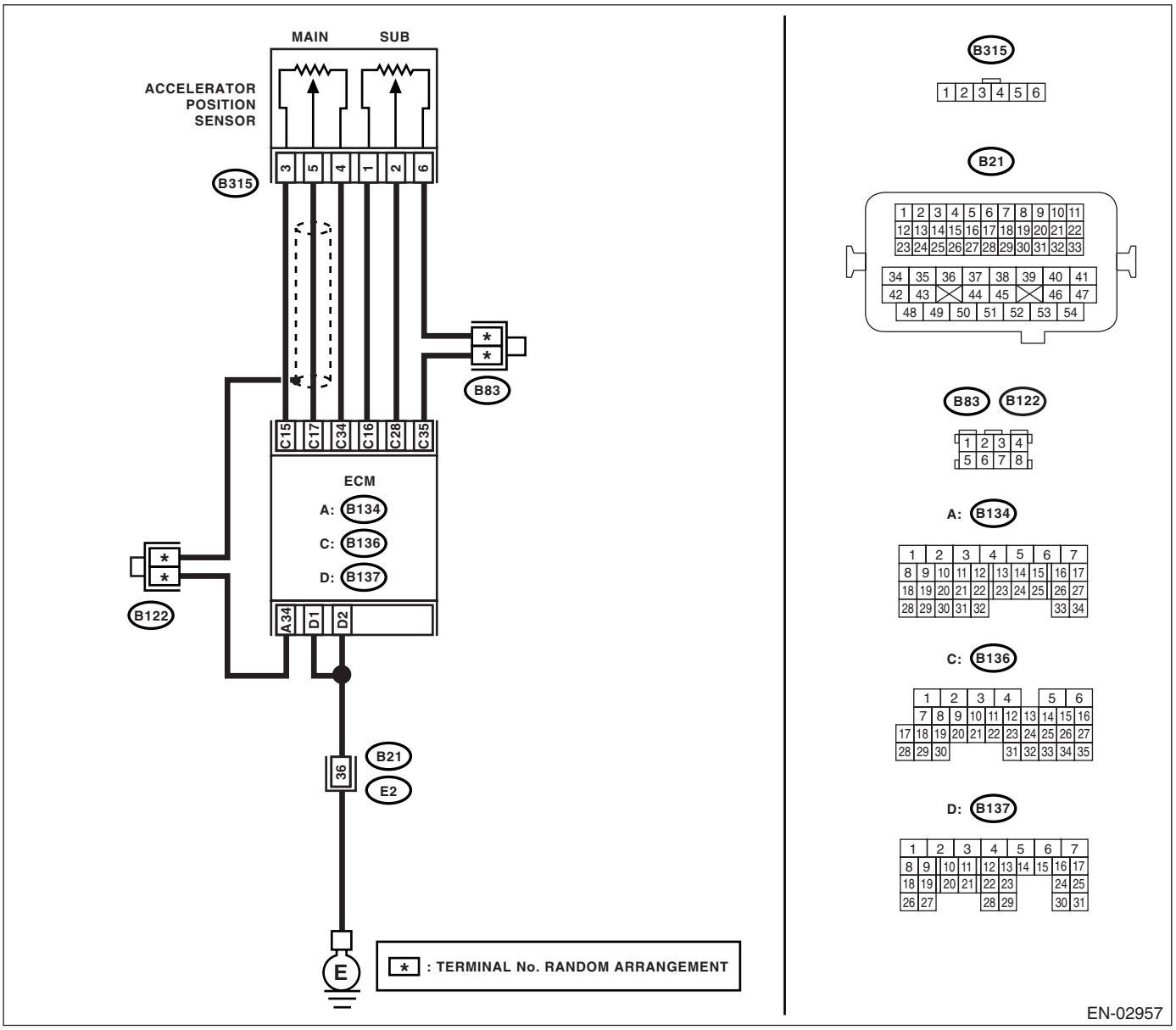
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-251, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH “E” CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ACCELERATOR POSITION SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of sub accelerator position sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage more than 0.4 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in connector between ECM and accelerator position sensor. | Is there poor contact? | Repair the poor contact. | Temporary poor contact occurred, but it is normal at present. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between ECM connector and accelerator position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 28 — (B315) No. 2:***<br>***(B136) No. 16 — (B315) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 28 — Chassis ground:***<br>***(B136) No. 16 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the chassis short circuit of harness. |
| 5 | **CHECK POWER SUPPLY OF ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 1 (+) — Chassis ground (−):*** | 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)-39, Engine Control Module (ECM).> |
| 6 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 1 — No. 6:*** | Is the resistance 0.75 — 3.15 kΩ? | Go to step **7.** | Replace the accelerator position sensor. |
| 7 | **CHECK ACCELERATOR POSITION SENSOR.**<br>1) Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 2 — No. 6:***<br>2) Check the measured value is within the specification without depressing the accelerator pedal. | Is the resistance 0.15 — 0.63 kΩ? | Go to step **8.** | Replace the accelerator position sensor. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK ACCELERATOR POSITION SENSOR.**<br>1) Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 2 — No. 6:***<br>2) Check the measured value is within the specification with the accelerator pedal depressed. | Is the resistance 0.28 — 1.68 kΩ? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Replace the accelerator position sensor. |

# DT:DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH “E” CIRCUIT HIGH INPUT

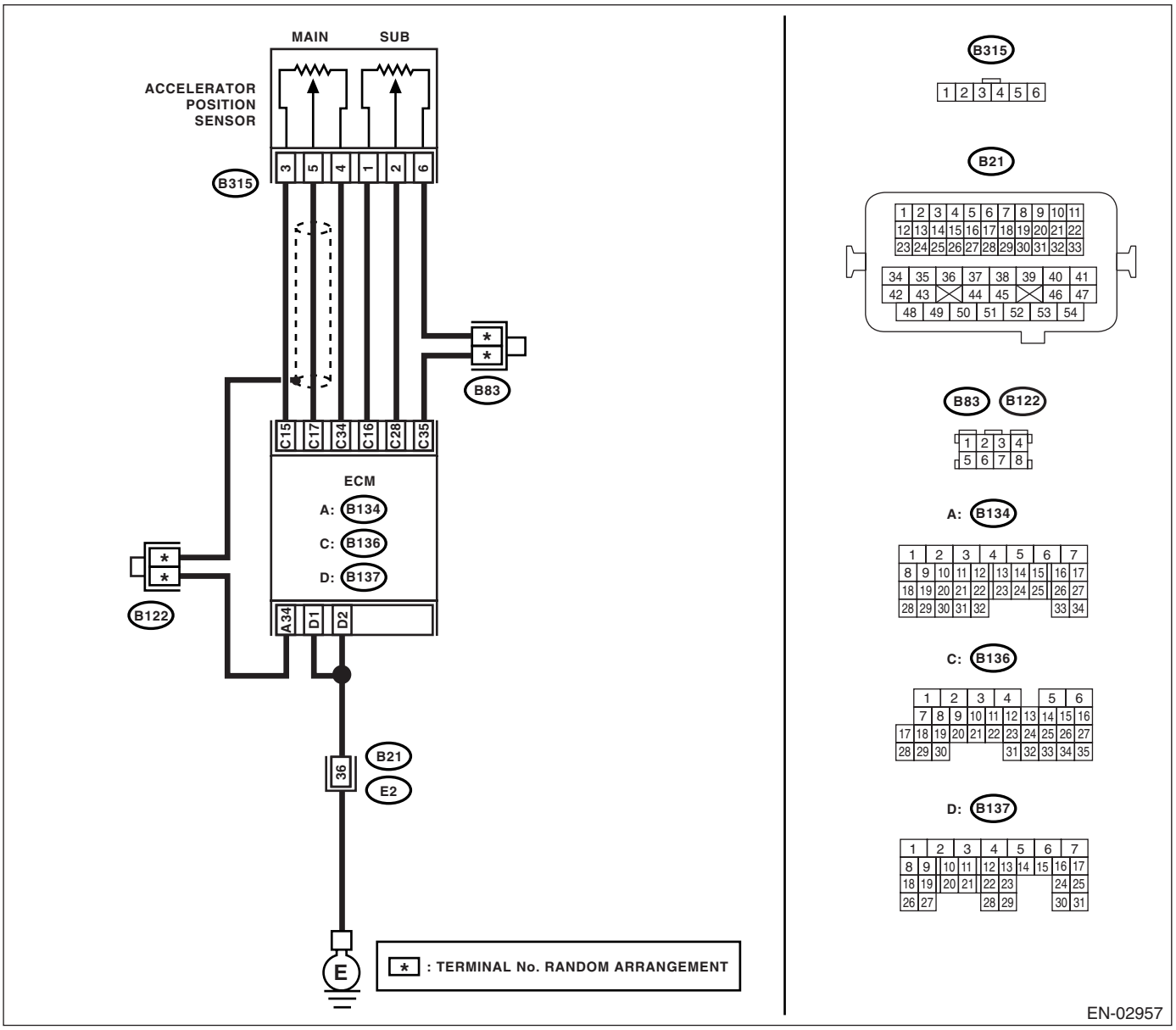
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-253, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH “E” CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ACCELERATOR POSITION SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of sub accelerator position sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage less than 4.8 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in connector between ECM and accelerator position sensor. | Is there poor contact? | Repair the poor contact. | Temporary poor contact occurred, but it is normal at present. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between ECM connector and accelerator position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (B315) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Measure the resistance between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 6 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **5.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 5 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 2 (+) — Chassis ground (−):*** | Is the voltage less than 6 V? | Go to step **6.** | Repair the battery short circuit in harness between ECM connector and accelerator position sensor connector. |
| 6 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between ECM connector terminals.<br>***Connector & terminal***<br>***(B137) No. 28 — (B137) No. 15:***<br>***(B137) No. 28 — (B137) No. 16:*** | Is the resistance more than 1 MΩ? | Repair the poor contact in accelerator position sensor connector. Replace the accelerator position sensor if defective. | Repair the short circuit to sensor power supply. |

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

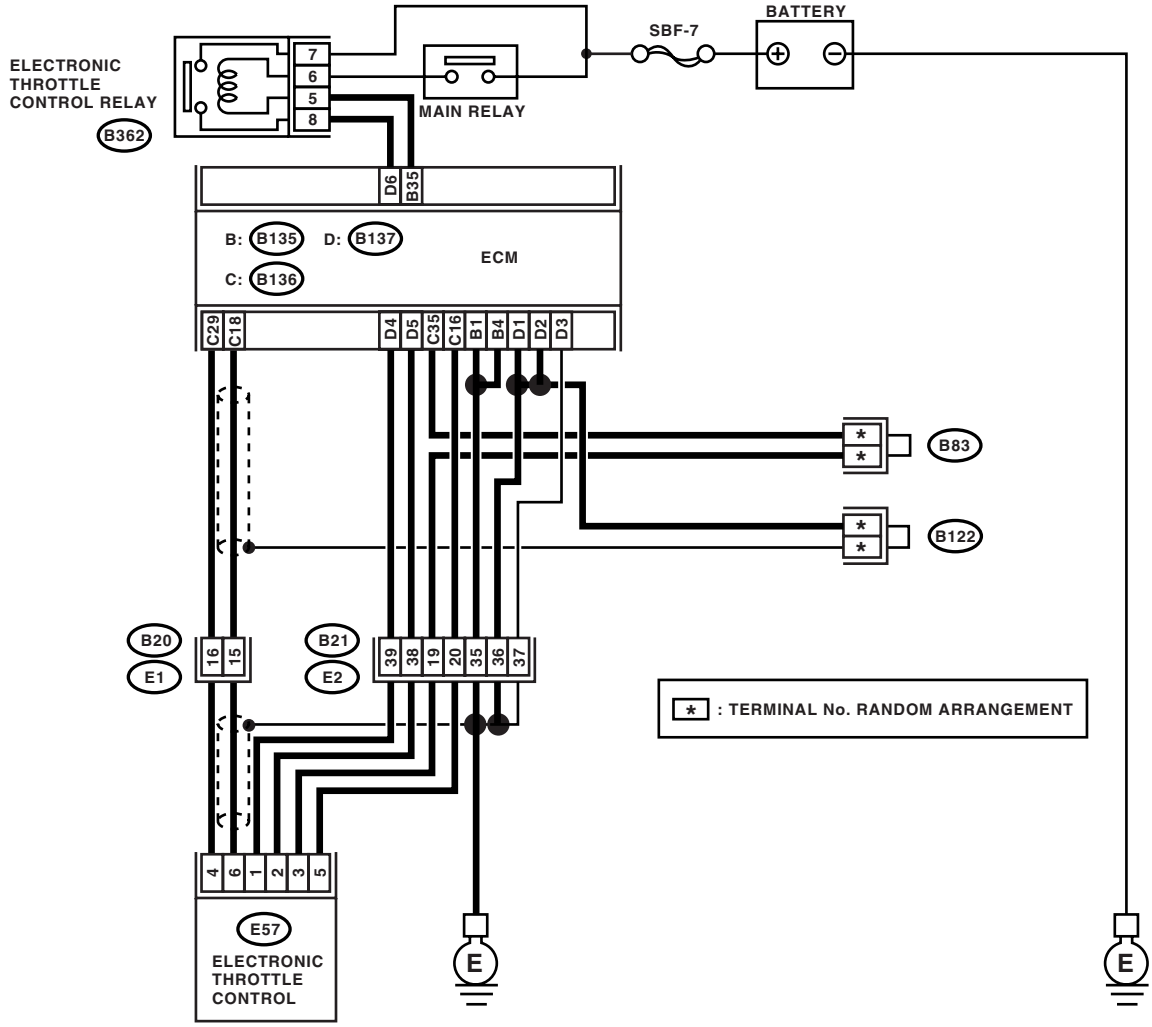
**DTC DETECTING CONDITION:**

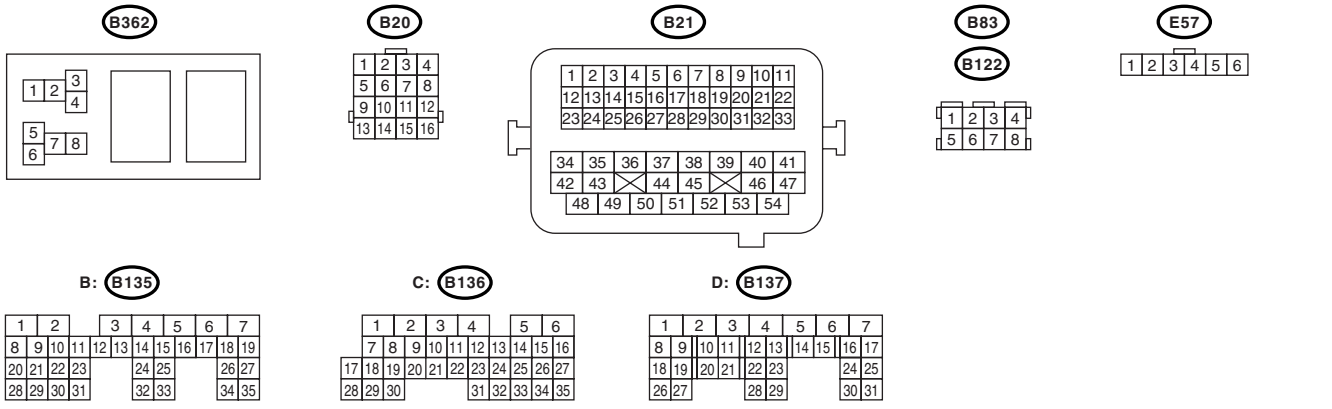
- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-254, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A”/“B” VOLTAGE RATIONALITY, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**




EN-02939

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM connector terminals.<br>***Connector & terminal***<br>***(B136) No. 18 (+) — (B136) No. 35 (–):*** | Is the voltage more than 0.4 V? | Go to step **2.** | Go to step **4.** |
| 2 | **CHECK SENSOR OUTPUT.**<br>Measure the voltage between ECM connector terminals.<br>***Connector & terminal***<br>***(B136) No. 29 (+) — (B136) No. 35 (–):*** | Is the voltage more than 0.8 V? | Go to step **3.** | Go to step **4.** |
| 3 | **CHECK POOR CONTACT.**<br>Check the poor contact in connector between ECM and electronic throttle control. | Is there poor contact? | Repair the poor contact. | Go to step **14.** |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 16 — (E57) No. 5:*** | Is the resistance less than 1 Ω? | Go to step **5.** | Repair the open circuit of harness connector. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 18 — Chassis ground:***<br>***(B136) No. 29 — Chassis ground:***<br>***(B136) No. 16 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **6.** | Repair the ground short circuit of harness. |
| 6 | **CHECK SENSOR POWER SUPPLY.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 5 (+) — Engine ground (–):*** | Is the voltage 4.5 — 5.5 V? | Go to step **7.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 7 | **CHECK SHORT CIRCUIT IN ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 — Engine ground:***<br>***(E57) No. 4 — Engine ground:*** | Is the resistance more than 10 Ω? | Go to step **8.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK SENSOR OUTPUT.**<br>1) Connect all the connectors.<br>2) Turn the ignition switch to ON.<br>3) Read the data of main throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage less than 4.63 V? | Go to step **9.** | Go to step **11.** |
| 9 | **CHECK SENSOR OUTPUT.**<br>Read the data of sub throttle sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage less than 4.73 V? | Go to step **10.** | Go to step **11.** |
| 10 | **CHECK POOR CONTACT.**<br>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. |
| 11 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connectors from the electronic throttle control control.<br>4) Measure the resistance between ECM connector and electronic throttle control connector.<br>***Connector & terminal***<br>***(B136) No. 35 — (E57) No. 3:***<br>***(B136) No. 18 — (E57) No. 6:***<br>***(B136) No. 29 — (E57) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **12.** | Repair the open circuit of harness connector. |
| 12 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the ECM connector.<br>2) Measure the resistance between electronic throttle control control connector and engine ground.<br>***Connector & terminal***<br>***(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. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |
| 13 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 5 (+) — Engine ground (–):*** | Is the voltage less than 10 V? | Go to step **14.** | Repair the battery short circuit in harness between ECM connector and electronic throttle control connector. |
| 14 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>Measure the voltage between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 (+) — Engine ground (–):***<br>***(E57) No. 4 (+) — Engine ground (–):*** | Is the voltage less than 10 V? | Go to step **15.** | Repair the short circuit in harness between ECM connector and electronic throttle control connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 15 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B136) No. 18 — (B136) No. 35:***<br>***(B136) No. 29 — (B136) No. 35:*** | Is the resistance more than 1 MΩ? | Go to step **16.** | Repair the short circuit to sensor power supply. |
| 16 | **CHECK ELECTRONIC THROTTLE CONTROL HARNESS.**<br>1) Disconnect the connector from ECM.<br>2) Disconnect the connectors from the electronic throttle control control.<br>3) Measure the resistance between electronic throttle control control connector terminals.<br>***Connector & terminal***<br>***(E57) No. 6 — (E57) No. 4:*** | Is the resistance more than 1 MΩ? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the short circuit of harness. |

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

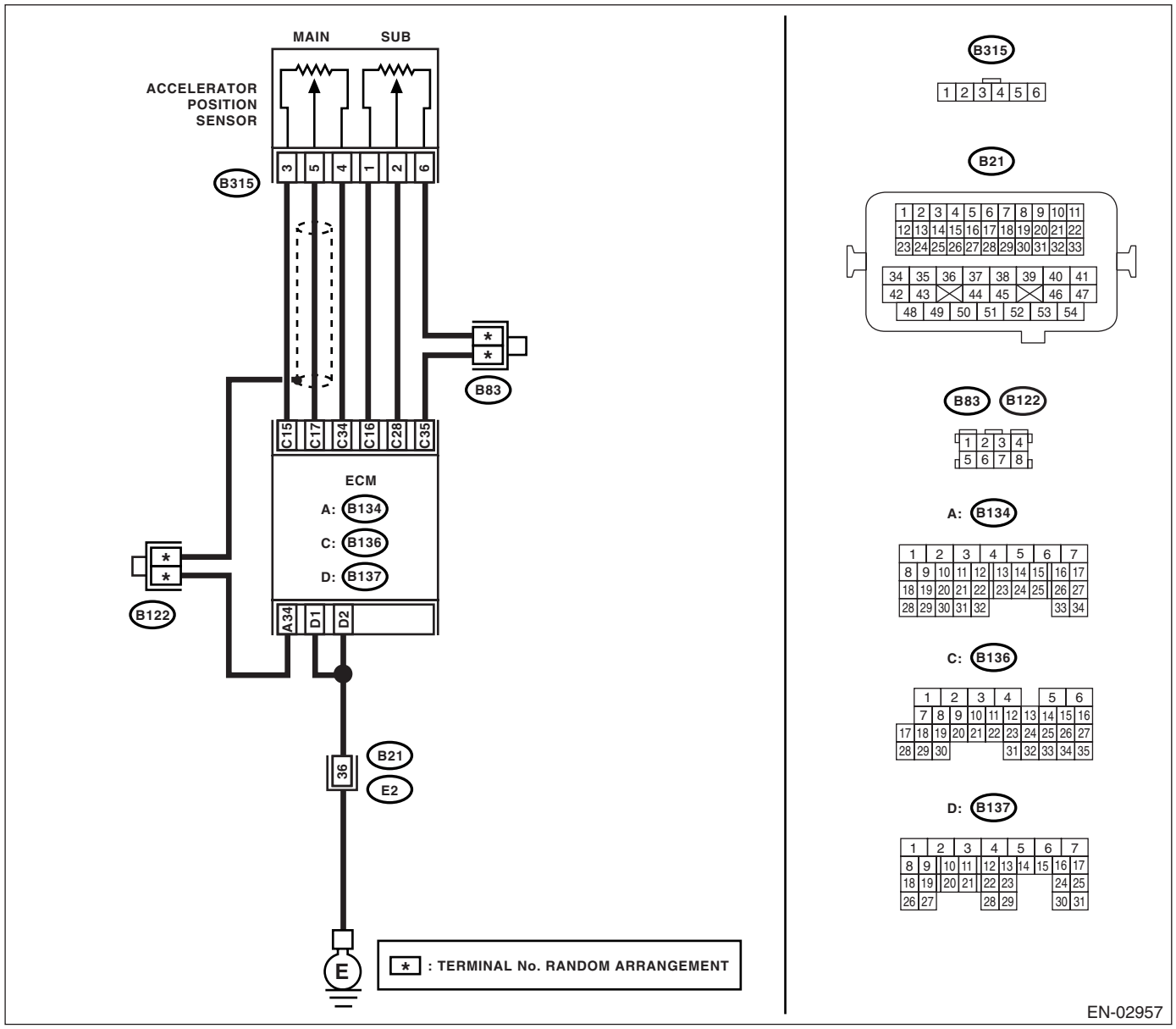
**DTC DETECTING CONDITION:**

- Detect as soon as the malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-256, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D”/“E” VOLTAGE RATIONALITY, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ACCELERATOR POSITION SENSOR OUTPUT.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of main accelerator position sensor signal and sub accelerator position sensor signal using Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-28, Subaru Select Monitor.> | Is the voltage more than 0.4 V? | Go to step **2.** | Go to step **3.** |
| 2 | **CHECK POOR CONTACT.**<br>Check poor contact in connector between ECM and accelerator position sensor. | Is there poor contact? | Repair the poor contact. | Go to step **12.** |
| 3 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between ECM connector and accelerator position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 17 — (B315) No. 5:***<br>***(B136) No. 15 — (B315) No. 3:***<br>***(B136) No. 28 — (B315) No. 2:***<br>***(B136) No. 16 — (B315) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **4.** | Repair the open circuit of harness connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>Measure the resistance between ECM connector and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 17 — Chassis ground:***<br>***(B136) No. 15 — Chassis ground:***<br>***(B136) No. 28 — Chassis ground:***<br>***(B136) No. 16 — Chassis ground:*** | Is the resistance more than 1 MΩ? | Go to step **5.** | Repair the ground short circuit of harness. |
| 5 | **CHECK POWER SUPPLY OF ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 3 (+) — Chassis ground (−):***<br>***(B315) No. 1 (+) — Chassis ground (−):*** | 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)-39, Engine Control Module (ECM).> |
| 6 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 3 — No. 4:*** | Is the resistance 1.2 — 4.8 kΩ? | Go to step **7.** | Replace the accelerator position sensor. |
| 7 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor.<br>***Terminals***<br>***No. 1 — No. 6:*** | Is the resistance 0.75 — 3.15 kΩ? | Go to step **8.** | Replace the accelerator position sensor. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor without depressing the accelerator pedal.<br>***Terminals***<br>***No. 5 — No. 4:*** | Is the resistance 0.2 — 0.8 kΩ? | Go to step **9.** | Replace the accelerator position sensor. |
| 9 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor without depressing the accelerator pedal.<br>***Terminals***<br>***No. 2 — No. 6:*** | Is the resistance 0.15 — 0.63 kΩ? | Go to step **10.** | Replace the accelerator position sensor. |
| 10 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor with the accelerator pedal depressed.<br>***Terminals***<br>***No. 5 — No. 4:*** | Is the resistance 0.5 — 2.5 kΩ? | Go to step **11.** | Replace the accelerator position sensor. |
| 11 | **CHECK ACCELERATOR POSITION SENSOR.**<br>Measure the resistance of accelerator position sensor with the accelerator pedal depressed.<br>***Terminals***<br>***No. 2 — No. 6:*** | Is the resistance 0.28 — 1.68 kΩ? | Go to step **12.** | Replace the accelerator position sensor. |
| 12 | **CHECK ACCELERATOR POSITION SENSOR OUTPUT.**<br>1) Turn the ignition switch to OFF.<br>2) Connect all the connectors.<br>3) Turn the ignition switch to ON.<br>4) Read the data of main throttle sensor signal and sub accelerator position sensor signal using Subaru Select Monitor. | Is the voltage less than 4.8 V? | Go to step **13.** | Go to step **14.** |
| 13 | **CHECK POOR CONTACT.**<br>Check poor contact in connector between ECM and accelerator position sensor. | Is there poor contact? | Repair the poor contact. | Go to step **18.** |
| 14 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between ECM connector and accelerator position sensor connector.<br>***Connector & terminal***<br>***(B136) No. 34 — (B315) No. 4:***<br>***(B136) No. 35 — (B315) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **15.** | Repair the open circuit of harness connector. |
| 15 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Measure the resistance between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 4 — Chassis ground:***<br>***(B315) No. 6 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **16.** | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 16 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Connect the ECM connector.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between accelerator position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 5 (+) — Chassis ground (−):***<br>***(B315) No. 2 (+) — Chassis ground (−):*** | Is the voltage less than 6 V? | Go to step **17.** | Repair the battery short circuit in harness between ECM connector and accelerator position sensor connector. |
| 17 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Measure the resistance between ECM connector terminals.<br>***Connector & terminal***<br>***(B136) No. 17 — (B136) No. 15:***<br>***(B136) No. 17 — (B136) No. 16:***<br>***(B136) No. 28 — (B136) No. 15:***<br>***(B136) No. 28 — (B136) No. 16:*** | Is the resistance more than 1 MΩ? | Go to step **18.** | Repair the short circuit to sensor power supply. |
| 18 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM.<br>3) Disconnect the connector from the accelerator position sensor.<br>4) Measure the resistance between connector terminals of accelerator position sensor.<br>***Connector & terminal***<br>***(B315) No. 5 — (B315) No. 2:*** | Is the resistance more than 1 MΩ? | Repair the poor contact in ECM connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).> | Repair the short circuit in harness between ECM connector and accelerator position sensor connector. |

## DW:DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE

**DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-258, DTC P2227 BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).><br>NOTE:<br>Atmospheric pressure sensor is built into ECM. | NOTE:<br>It is not necessary to inspect DTC P0129. |

## DX:DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW INPUT

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-259, DTC P2228 BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Does the Subaru Select Monitor or general scan tool indicate DTC P1110? | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).><br>NOTE:<br>Atmospheric pressure sensor is built into ECM. | A temporary poor contact. |

## DY:DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH INPUT

**DTC DETECTING CONDITION:**

- Detect as soon as malfunction occurs.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-260, DTC P2229 BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-45, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-36, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Does the Subaru Select Monitor or general scan tool indicate DTC P1111? | Replace the ECM. <Ref. to FU(H4DOTC)-39, Engine Control Module (ECM).><br>NOTE:<br>Atmospheric pressure sensor is built into ECM. | A temporary poor contact. |

# 19.General Diagnostic Table

## A: INSPECTION

### 1. ENGINE

NOTE:
Malfunction of parts other than those listed is also possible. <Ref. to ME(H4DOTC)-87, Engine Trouble in General.>

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

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

*1: Check ignition coil and ignitor assembly and spark plug.
*2: Indicate the symptom occurring only in cold temperatures.
*3: Ensure the secure installation.
*4: Check fuel injector, fuel pressure regulator and fuel filter.
*5: Inspect air leak in air intake system.