# ENGINE (DIAGNOSTICS)

# 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 Start Failure". <Ref. to EN(H4DOTC)(diag)-64, Diagnostics for Engine Starting Failure.> |
| 2 | **CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.** | Does the malfunction indicator light illuminate? | Go to step **3**. | Inspection using "General Diagnostic Table". <Ref. to EN(H4DOTC)(diag)-378, 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 run the Subaru Select Monitor or general scan tool.<br>4) Read the DTC on Subaru Select Monitor or general scan tool. | Is DTC displayed on the Subaru Select Monitor or general scan tool? | Record the DTC. Repair the trouble cause. <Ref. to EN(H4DOTC)(diag)-76, 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 diagnosis of malfunction indicator light circuit or combination meter. <Ref. to EN(H4DOTC)(diag)-55, Malfunction Indicator Light.> |
| 4 | **PERFORM DIAGNOSIS.**<br>1) Perform the Clear Memory Mode. <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.><br>2) Perform the Inspection Mode. <Ref. to EN(H4DOTC)(diag)-43, Inspection Mode.> | Is DTC displayed on the Subaru Select Monitor or general scan tool? | Inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-83, 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 item when problem has occurred.

NOTE:
Use copies of this page for interviewing customers.

| | | | |
|---|---|---|---|
| Customer's name | | Engine No. | |
| Date of purchase | | Fuel brand | |
| Date of repair | | Odometer reading | km |
| V.I.N. | | | miles |
| Weather | ❑ 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 | 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 | Radio | ❑ ON/❑ OFF |
| A/C compressor | ❑ ON/❑ OFF | CD/Cassette | ❑ ON/❑ OFF |
| Radiator fan | ❑ ON/❑ OFF | Car phone | ❑ ON/❑ OFF |
| Front wiper | ❑ ON/❑ OFF | CB | ❑ ON/❑ OFF |
| Rear wiper | ❑ ON/❑ OFF | | |

## 2. CHECK LIST NO. 2

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

NOTE:
Use copies of this page for interviewing customers.

| |
|---|
| a) Other warning lights or indicators illuminate. ❑ 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 parts other than 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

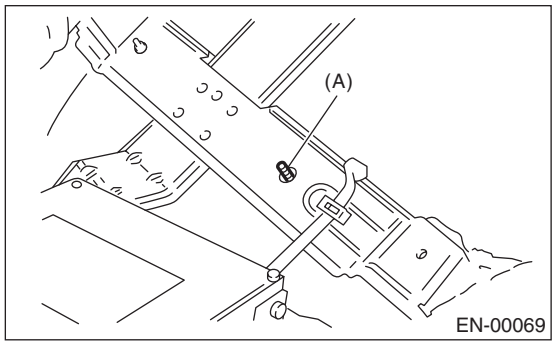
1) Airbag system wiring harness is routed near the ECM, main relay and fuel pump relay.

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

2) Never connect the battery in reverse polarity. Failure to do so will damage the ECM instantly, and the fuel injector and other parts will also be damaged.
3) Do not disconnect the battery terminals while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM etc.
4) Before disconnecting the connectors of each sensor and ECM, be sure to turn the ignition switch to OFF. Perform the Clear Memory Mode after connecting the connectors. <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.>
5) Measure the voltage or resistance of individual sensor or all electrical control modules using a tapered pin with a diameter of less than 0.6 mm (0.024 in). Do not insert the pin 4 mm (0.16 in) or more into the part.

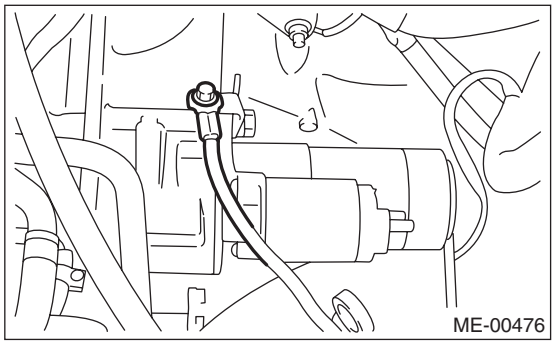
**CAUTION:**
**When replacing the ECM, be careful not to use the wrong spec. ECM to avoid any damage on the fuel injection system.**

6) Connectors of each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. Even if the connectors are waterproof, take care not to allow water to get into them when washing the vehicle, or when servicing the vehicle in rainy weather.
7) Use ECM mounting stud bolts as the body head grounding point when measuring voltage and resistance in the passenger compartment.




(A) Stud bolt

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




9) Every MFI-related part is a precision part. Do not drop them.
10) Observe the following cautions when installing a radio in MFI equipped models.

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

11) Before disconnecting the fuel hoses, disconnect the fuel pump connector and crank the engine for 5 seconds or more to release the pressure of fuel system. If engine starts during this operation, run it until it stops.
12) For the model with ABS, the ABS warning light may illuminate when performing driving test with jacked-up or lifted-up condition, but this is not a system malfunction. The reason for this is the speed difference between the front and rear wheels. After diagnosis of engine control system, perform the ABS memory clear procedure of self-diagnosis system.

## B: INSPECTION

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

### 1. BATTERY

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

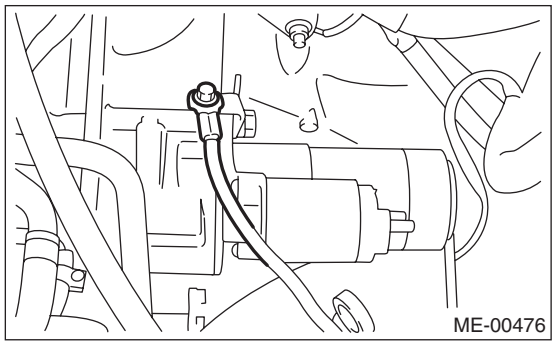
***Standard voltage: 12 V***

***Specific gravity: 1.260 or more***

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

### 2. ENGINE GROUND

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




## C: NOTE

### 1. GENERAL DESCRIPTION

• The on-board diagnostic (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. Malfunction indicator light in the combination meter indicates occurrence of a fault or trouble.

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

• The OBD system incorporated with the vehicles within this type of engine complies with OBD-II regulations. The OBD system monitors the components and the system malfunction listed in “Engine Section” which affects on emissions.

• When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a DTC and a freeze frame engine conditions are stored into on-board computer.

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

• If the OBD system detects malfunctions such as the fault of fuel trim or misfire, the OBD system first stores freeze frame engine conditions about the fuel trim or misfire.

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

• When troubleshooting the vehicle which complies with OBD-II regulations, connect the Subaru Select Monitor or general scan tool to the vehicle.

### 2. ENGINE AND EMISSION CONTROL SYSTEM

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

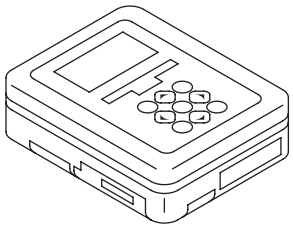
With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system where the electro-magnetic injection valve (fuel injector) opens only for a short period of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

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

The MFI system also has the following features:

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

## D: PREPARATION TOOL

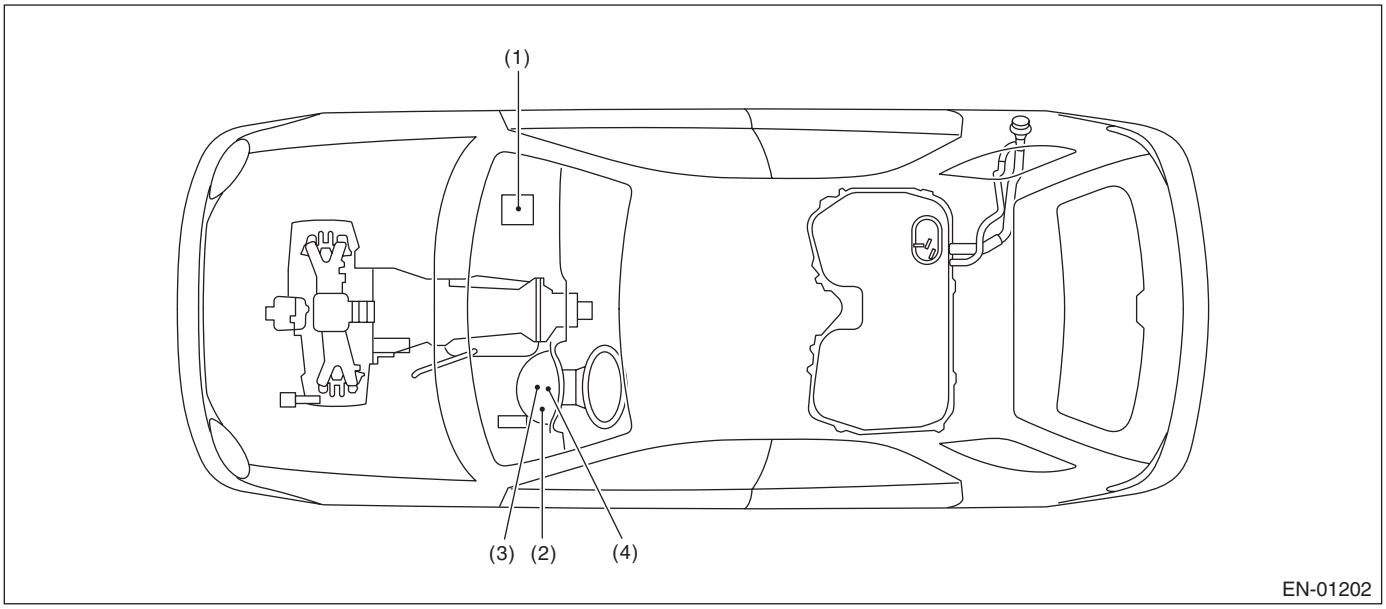
| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS |
|---|---|---|---|
|  ST1B020XU0 | 1B020XU0 | SUBARU SELECT MONITOR KIT | Used for troubleshooting the electrical system. |

# 4. Electrical Component Location

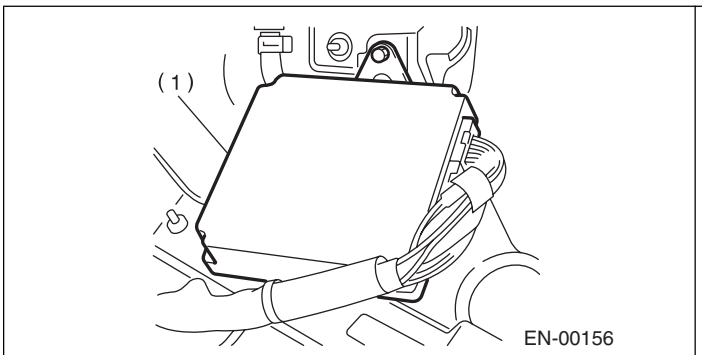
## A: LOCATION

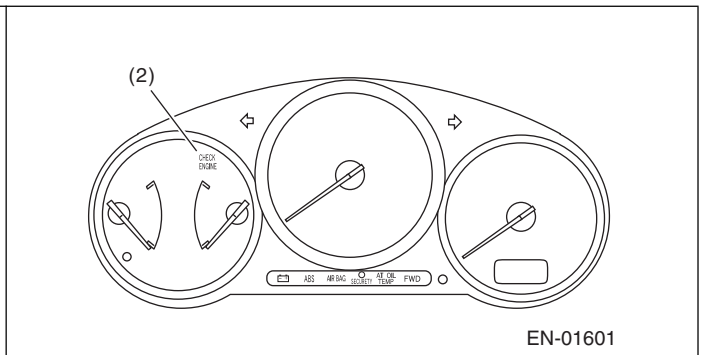
### 1. ENGINE

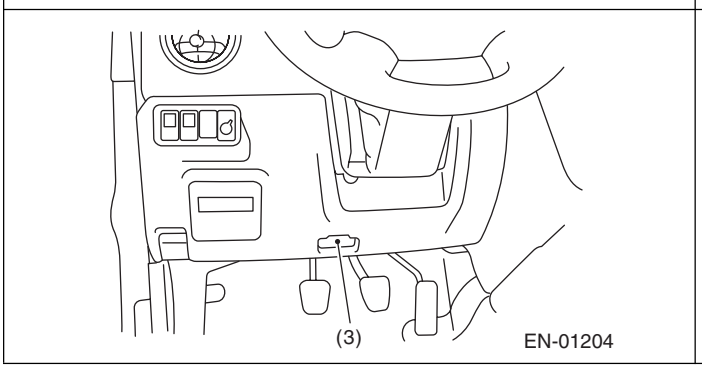
#### Control module

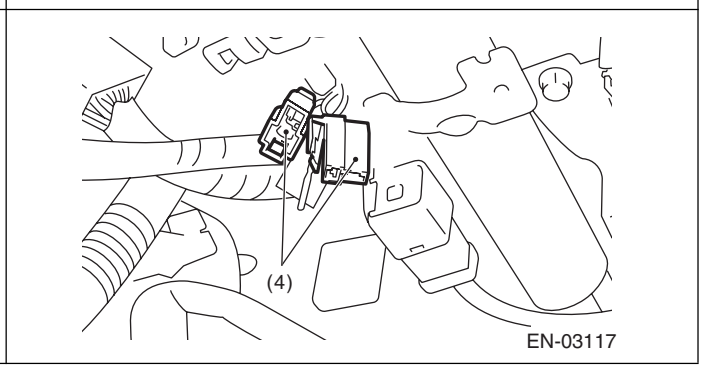



(1) Engine control module (ECM)
(2) Malfunction indicator light
(3) Data link connector
(4) Test mode connector

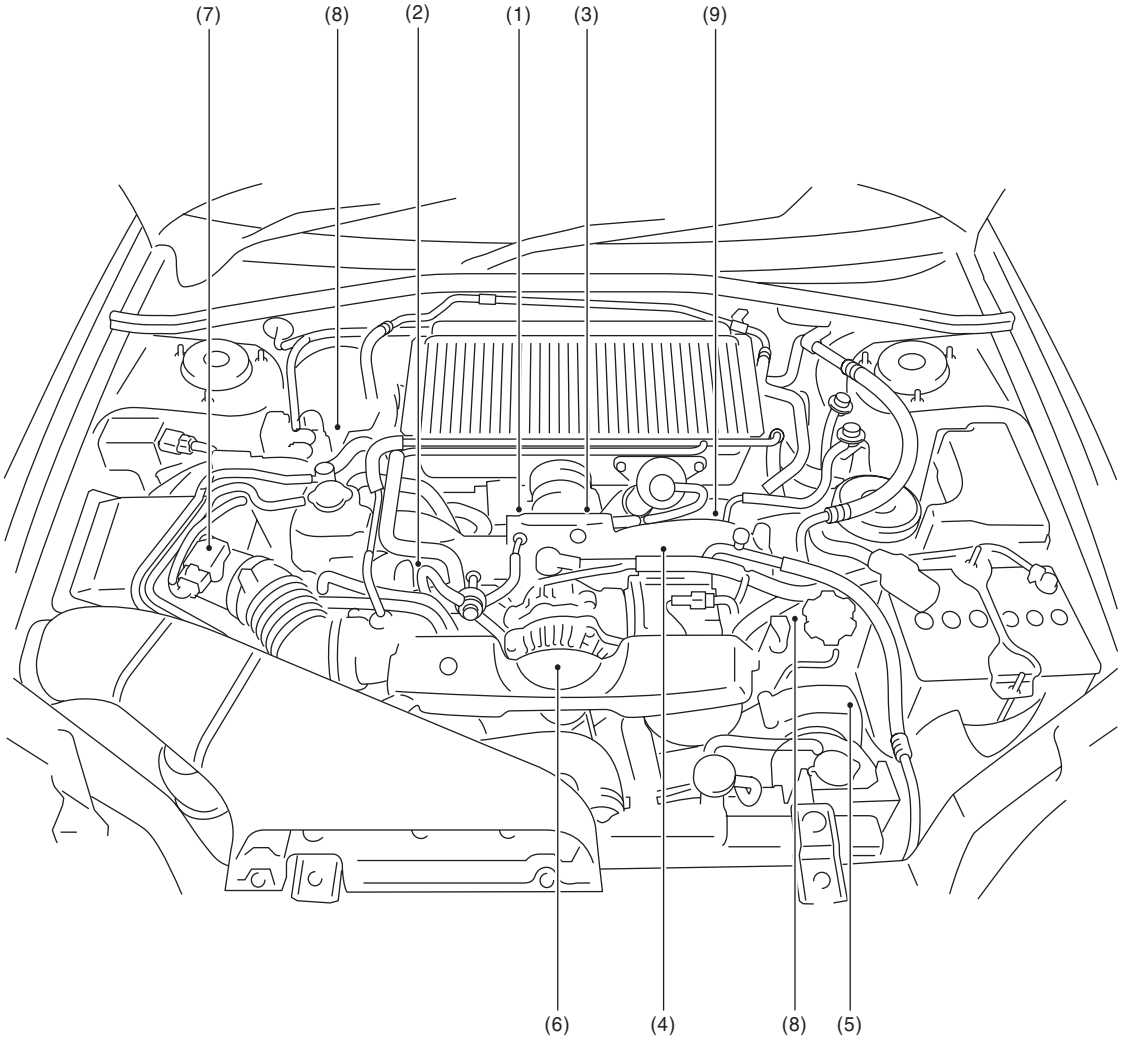


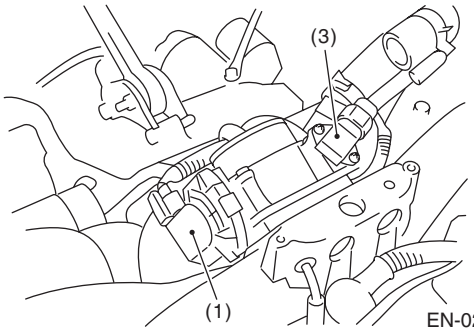



**Sensor**




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



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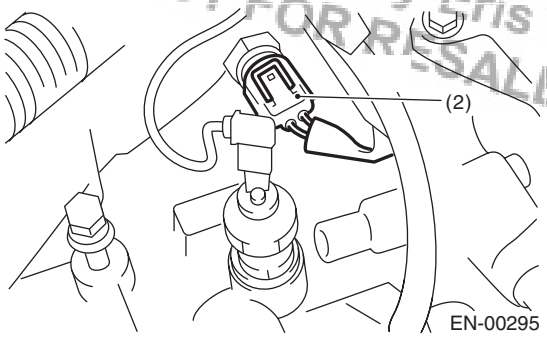

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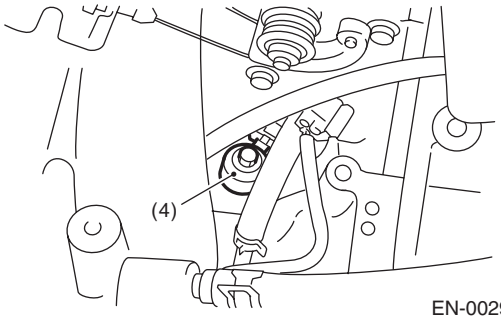

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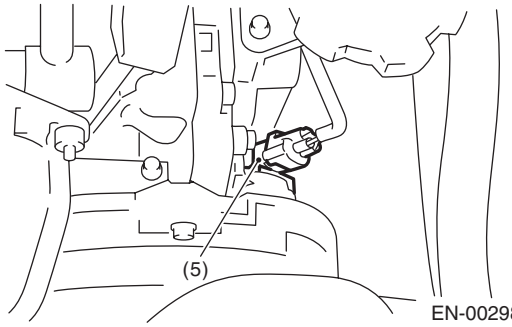

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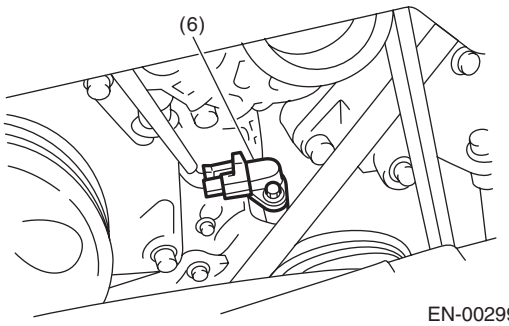

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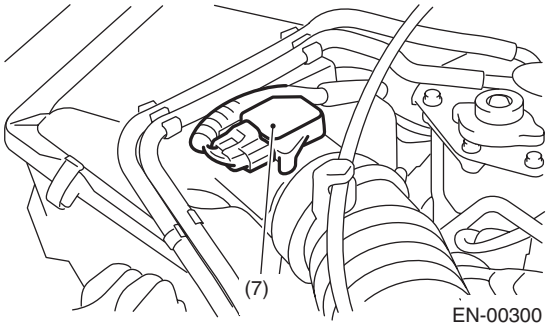
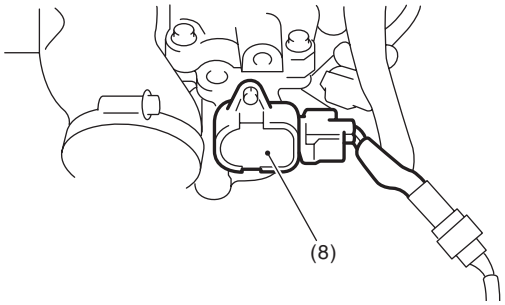


EN-00300



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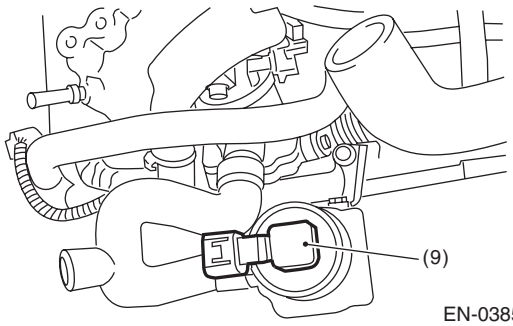
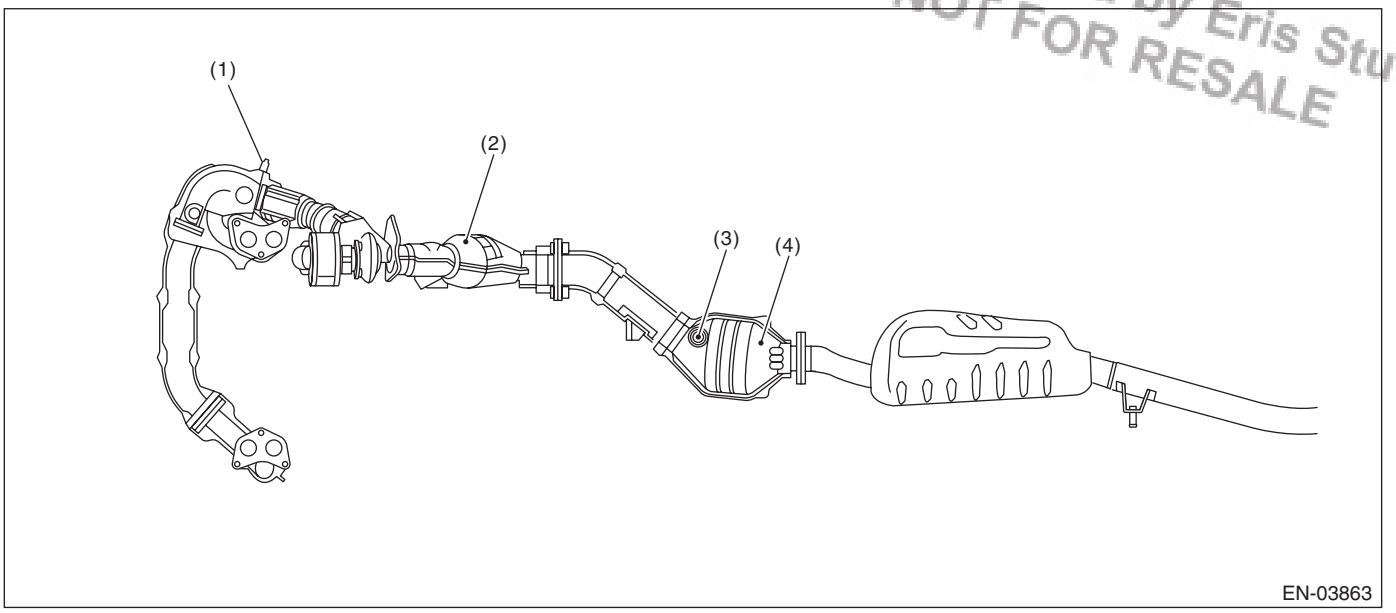
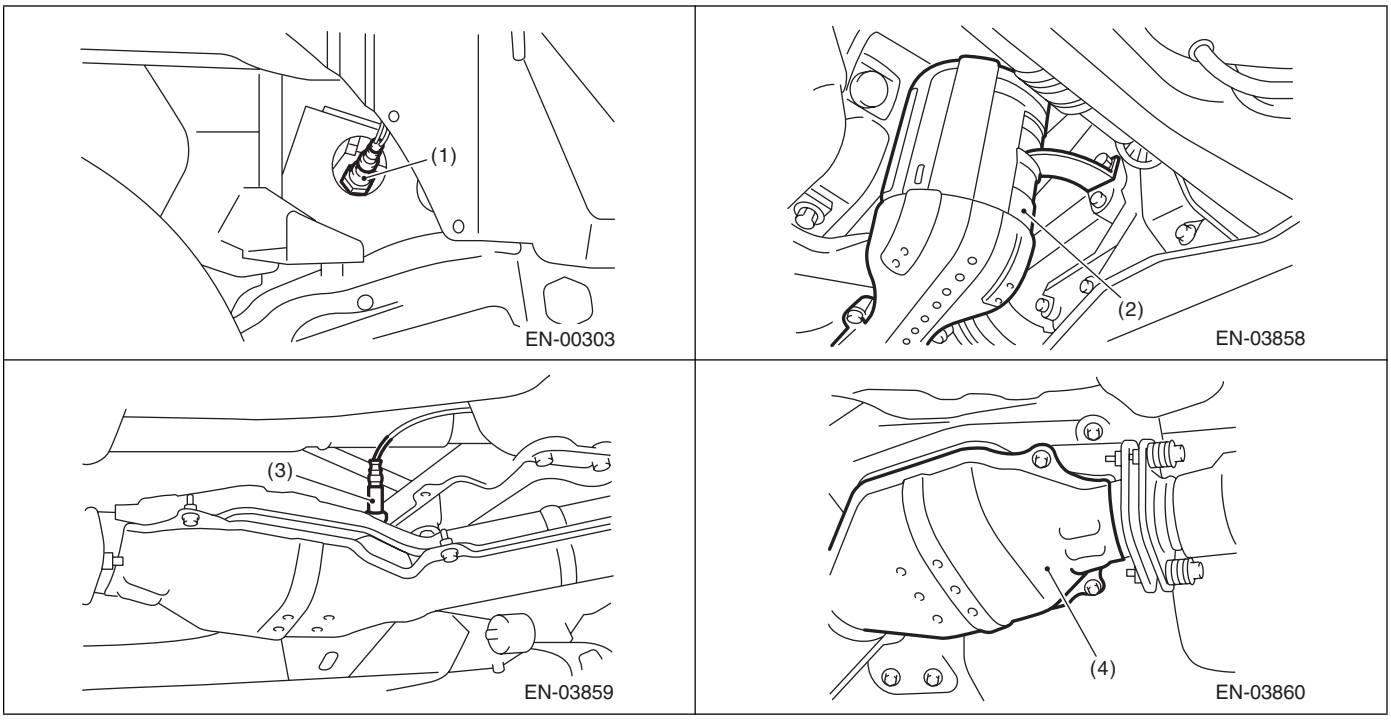
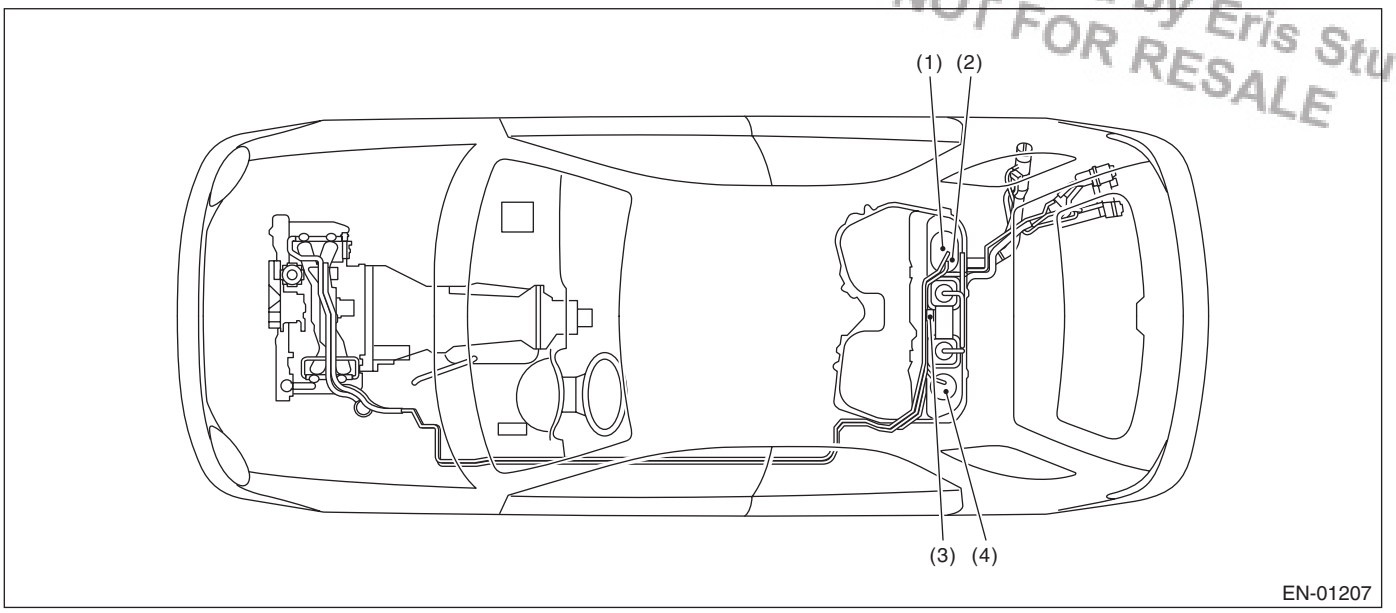


EN-03855

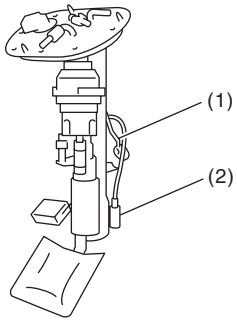


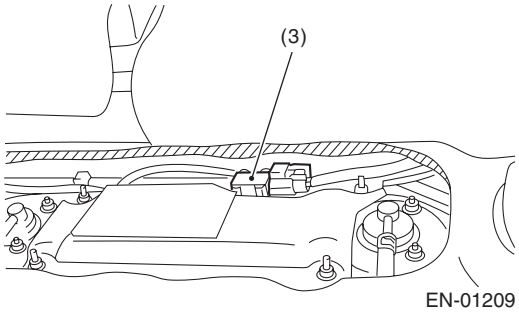

(1) Front oxygen (A/F) sensor
(2) Front catalytic converter
(3) Rear oxygen sensor
(4) Rear catalytic converter

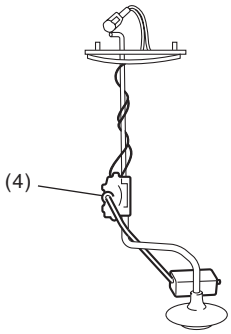




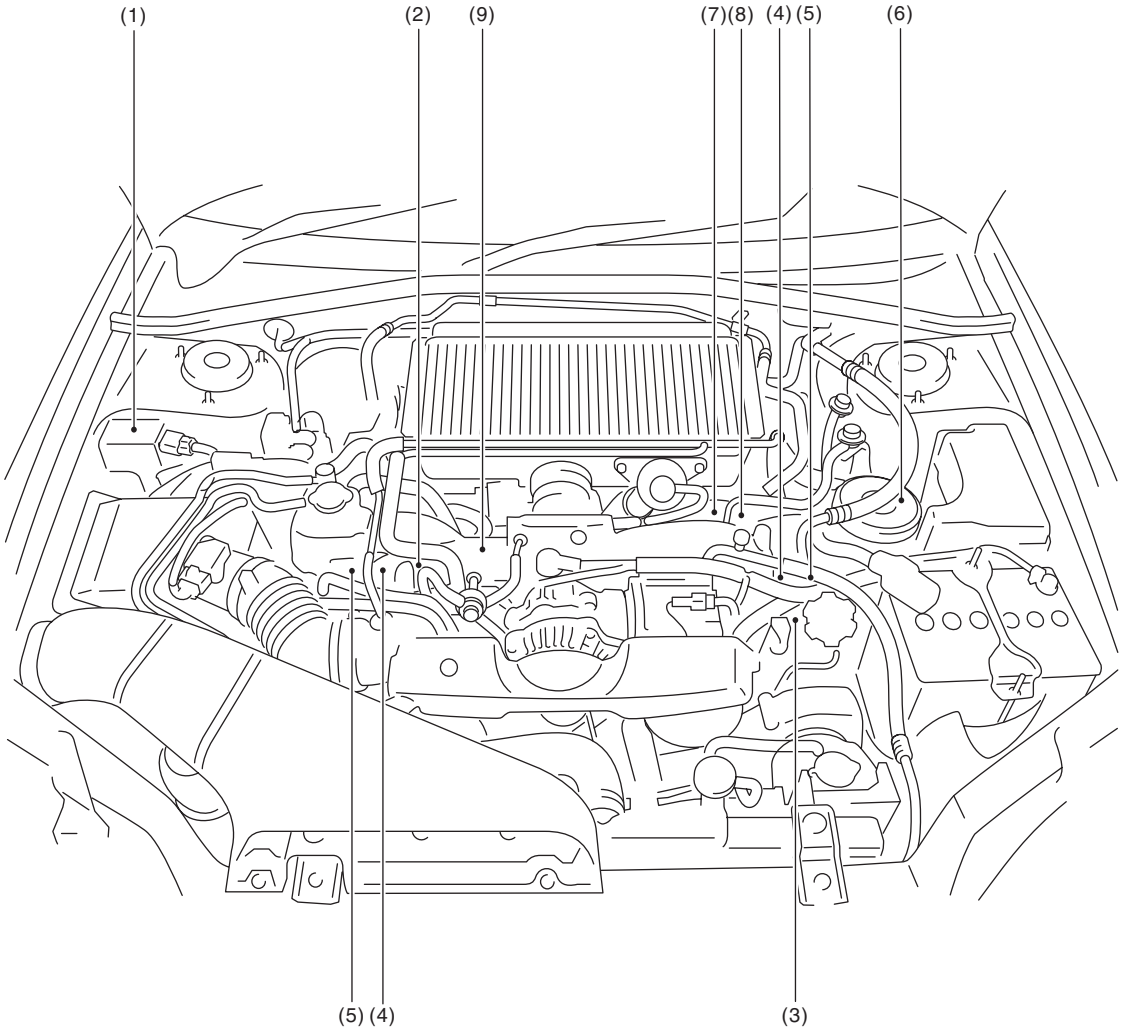

(1) Fuel level sensor
(2) Fuel temperature sensor
(3) Fuel tank pressure sensor
(4) Fuel sub level sensor



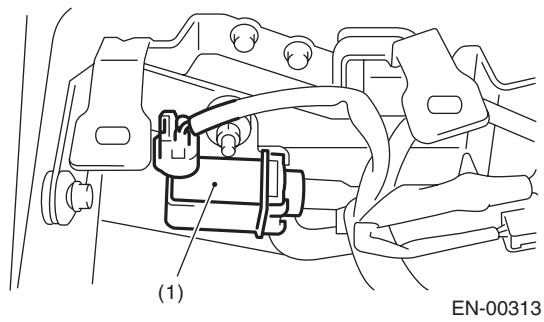



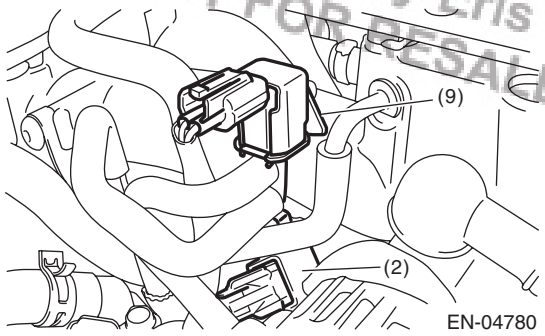



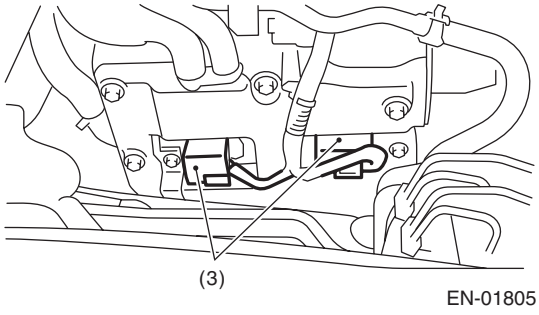
**Solenoid valve, actuator, emission control system parts and ignition system parts**

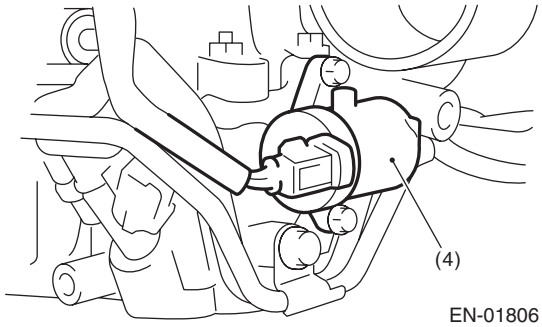


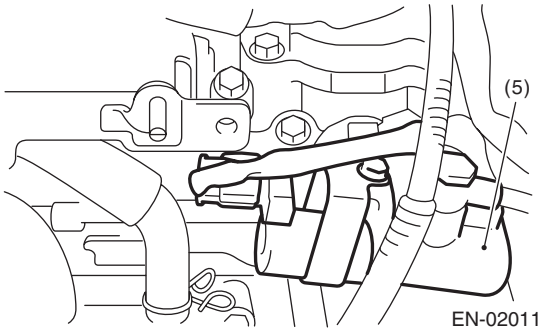

(1) Wastegate control solenoid valve
(2) Purge control solenoid valve 1
(3) Ignition coil and ignitor ASSY
(4) Tumble generator valve actuator
(5) Oil flow control solenoid valve
(6) Secondary air pump
(7) Secondary air combination valve (RH)
(8) Secondary air combination valve (LH)
(9) Purge control solenoid valve 2

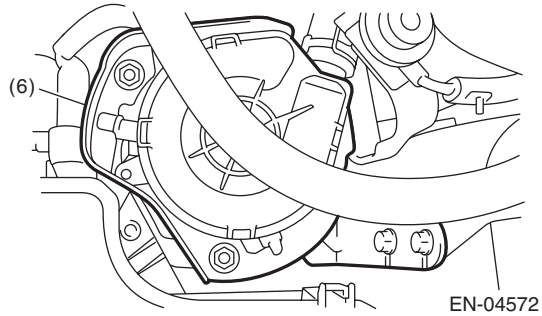


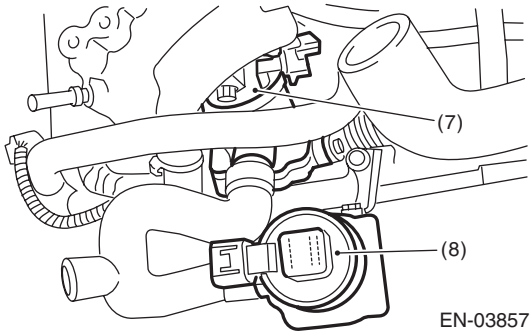



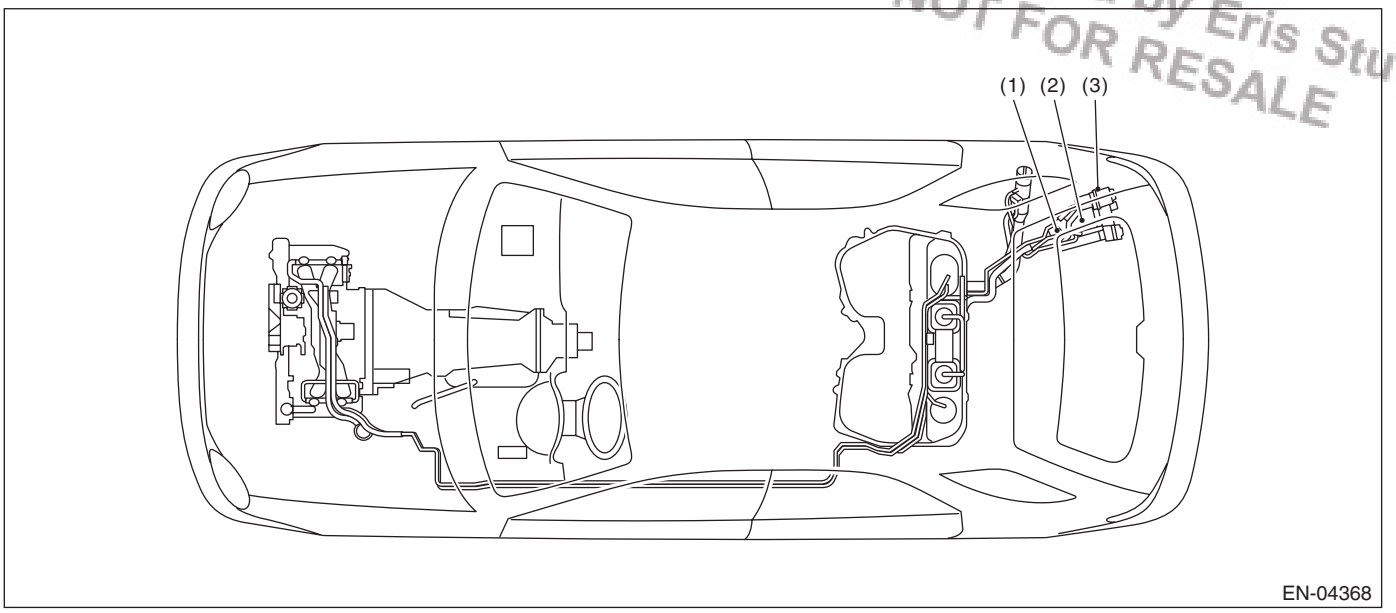



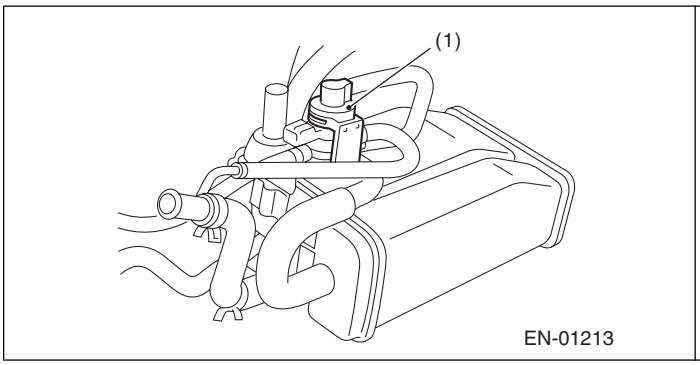



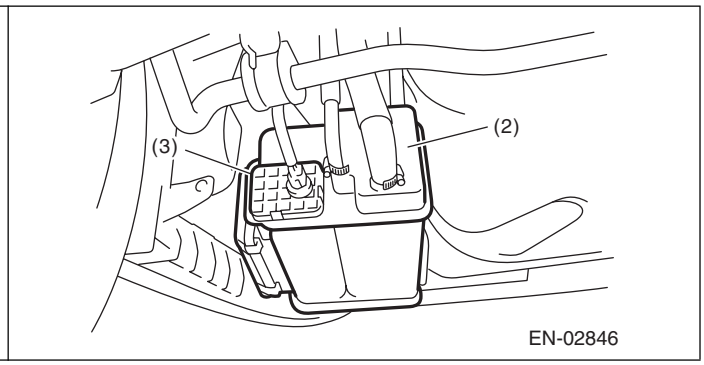



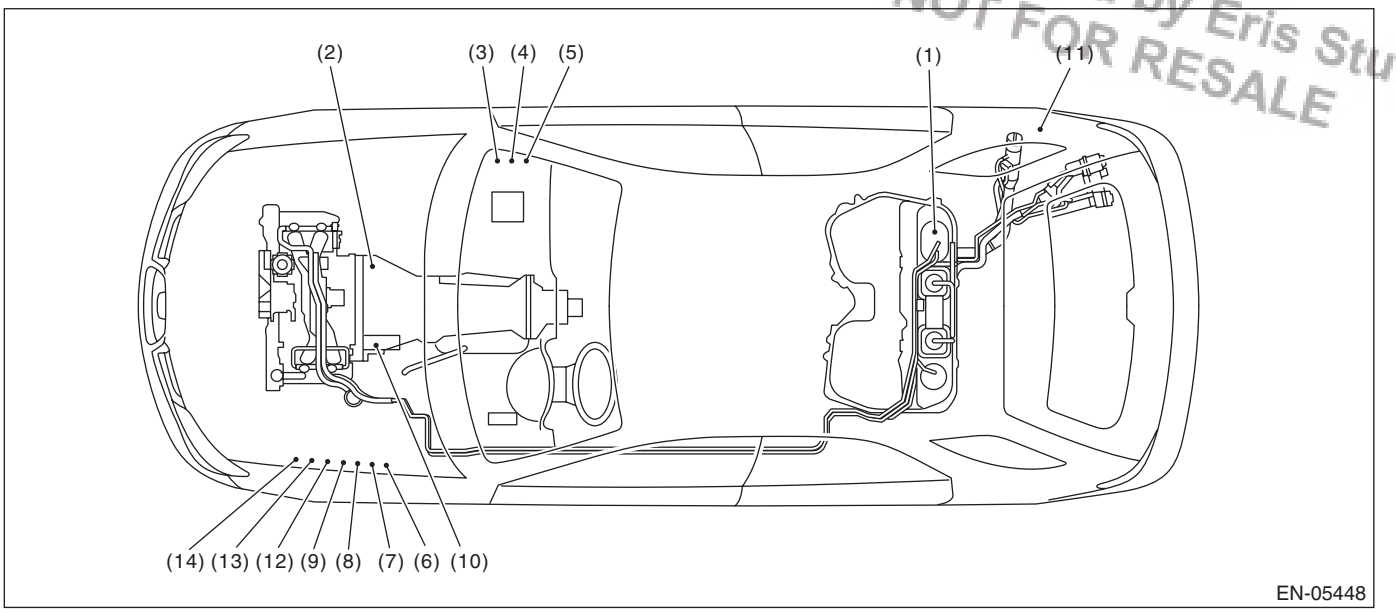





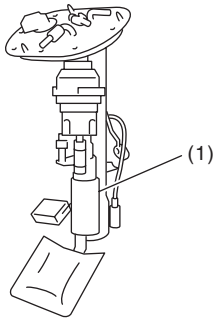

(1) Pressure control solenoid valve (2) Canister (3) Drain valve



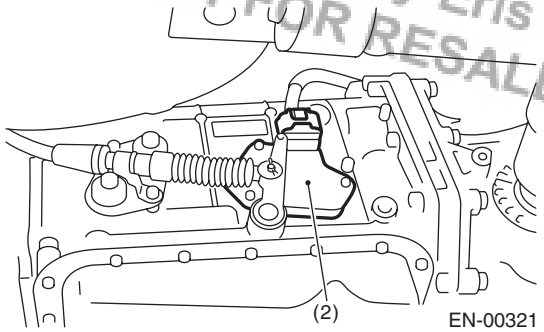





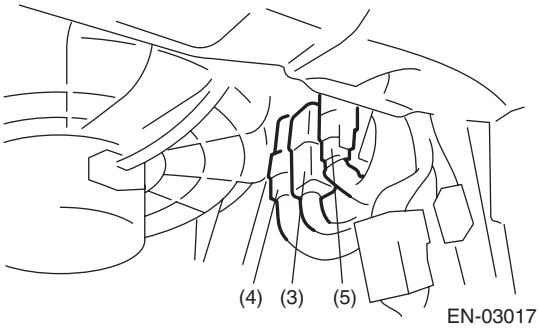

(1) Fuel pump
(2) Inhibitor switch
(3) Main relay
(4) Fuel pump relay
(5) Electronic throttle control relay
(6) Radiator main fan relay 1
(7) Radiator main fan relay 2
(8) Radiator sub fan relay 1
(9) Radiator sub fan relay 2
(10) Starter
(11) Fuel pump controller
(12) Secondary air pump relay
(13) Secondary air combination valve relay 1
(14) Secondary air combination valve relay 2



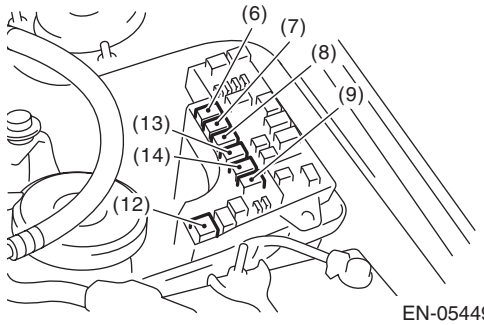
EN-03136



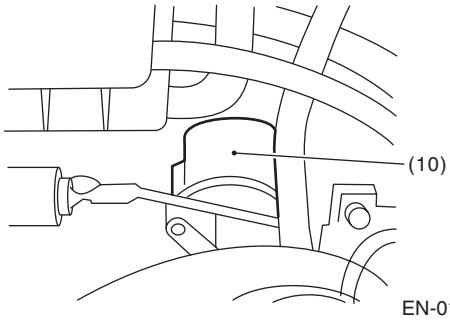
EN-00321



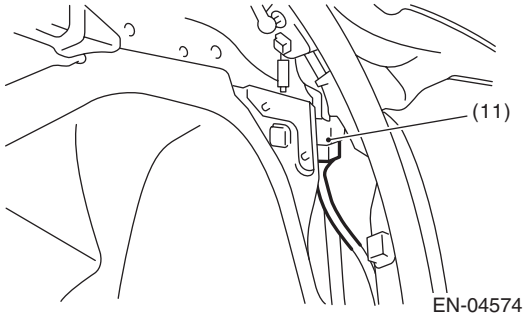
EN-03017



EN-05449



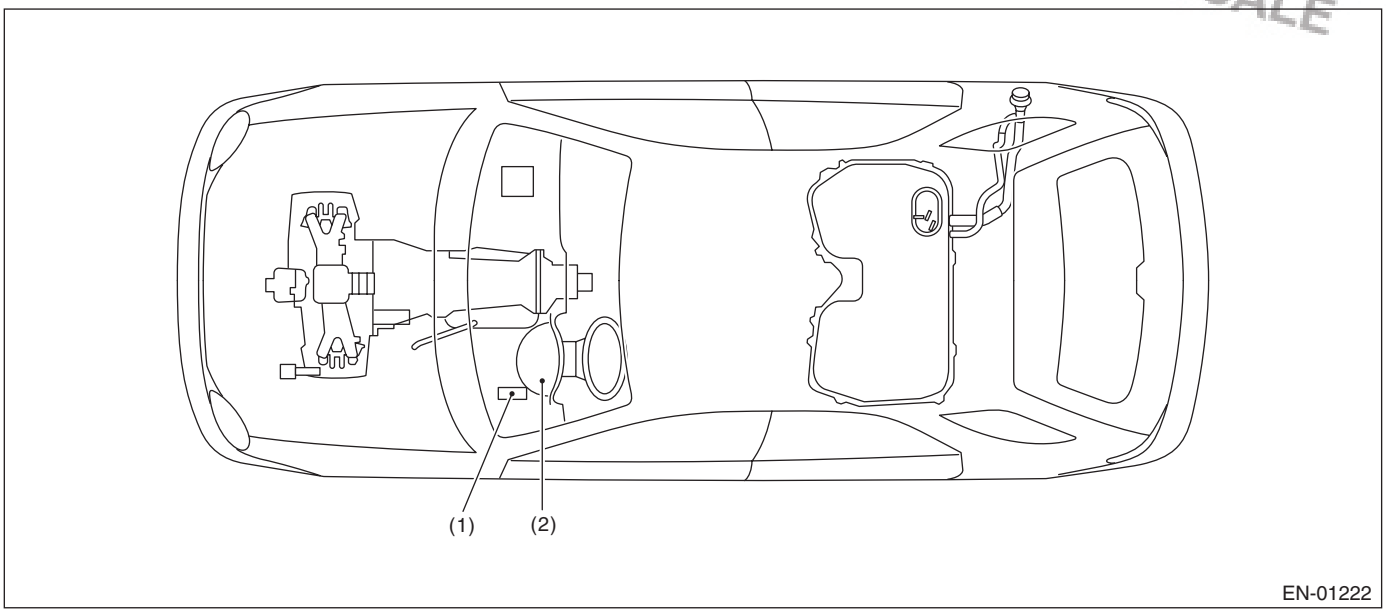
EN-01328



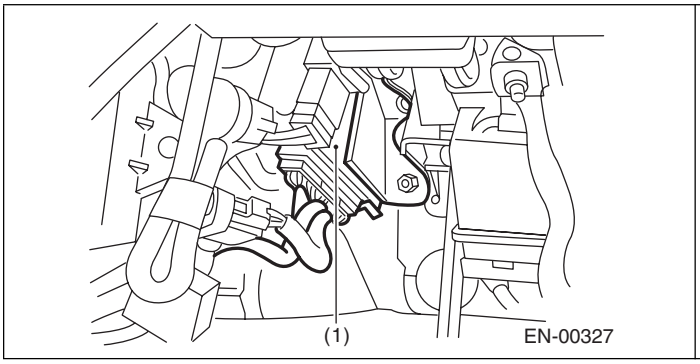
EN-04574

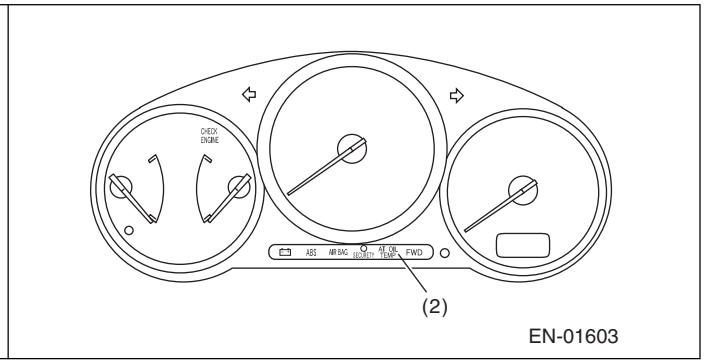
## 2. TRANSMISSION

### Control module

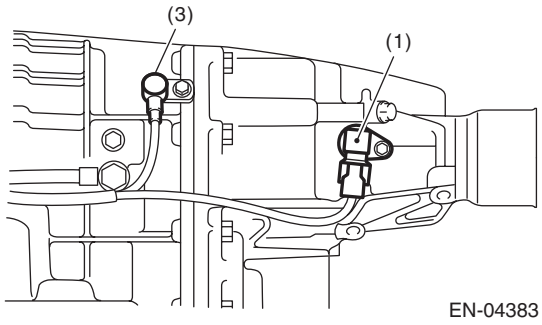


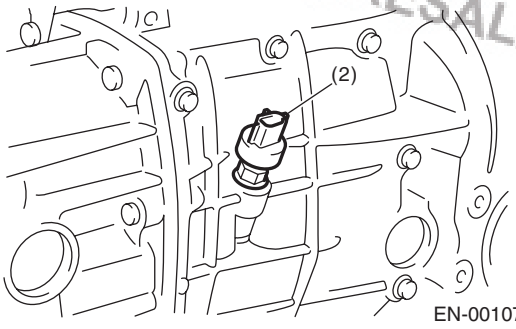

(1) Transmission control module (TCM) (AT model)
(2) AT diagnostic indicator light (AT model)

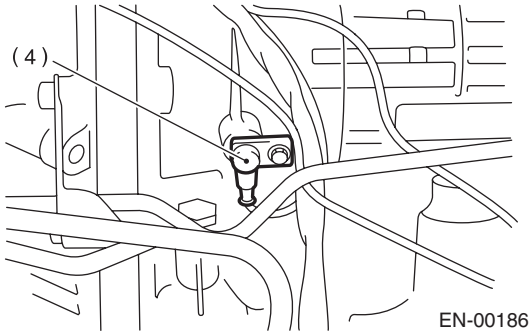


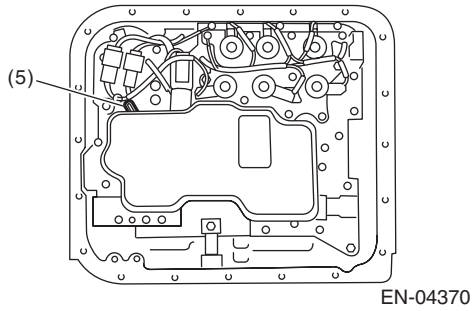



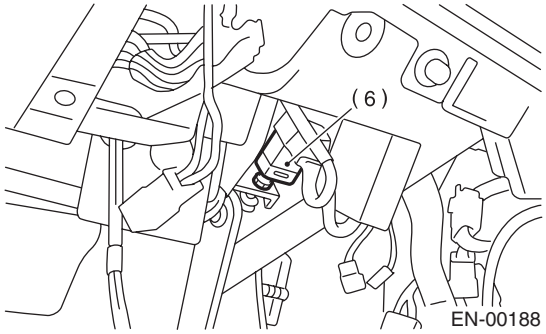
## Sensor



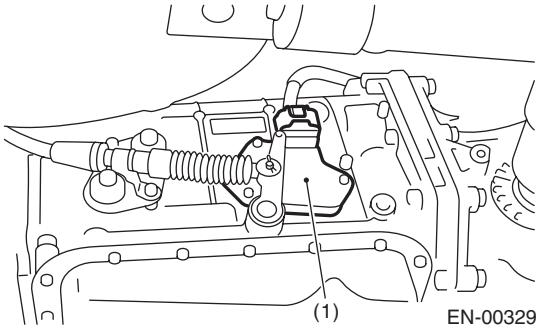



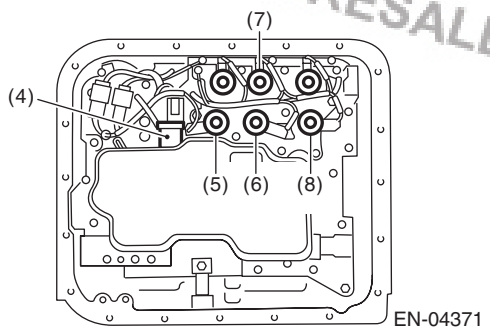



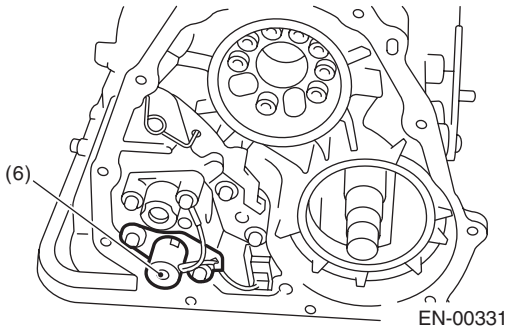




(1) Rear vehicle speed sensor (AT model)
(2) Front vehicle speed sensor (MT model)
(3) Front vehicle speed sensor (AT model)
(4) Torque converter turbine speed sensor (AT model)
(5) ATF temperature sensor (AT model)
(6) Brake light switch

## Solenoid valve and switch (AT model)

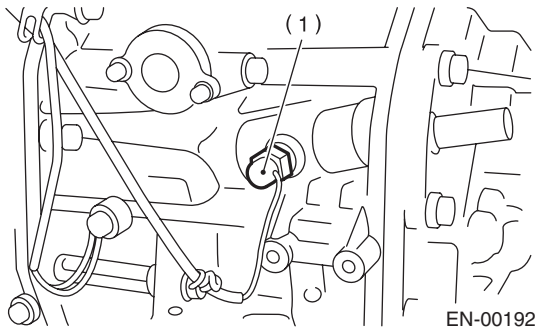



(1) Inhibitor switch
(2) Shift solenoid valve 1
(3) Shift solenoid valve 2
(4) Line pressure linear solenoid
(5) Lock-up duty solenoid
(6) Transfer duty solenoid
(7) 2-4 brake duty solenoid
(8) Low clutch timing solenoid valve

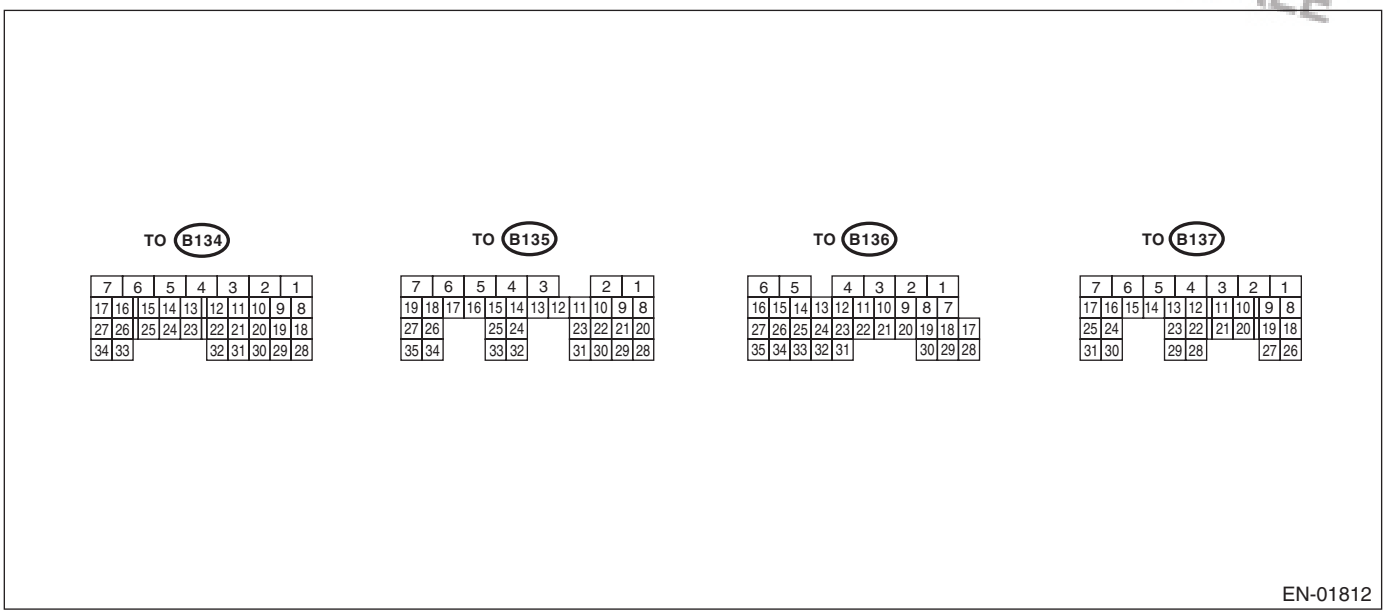
## Solenoid valve and switch (MT model)




(1) Neutral position switch

# 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 (+) | B134 | 13 | 0 | –7 — +7 | Sensor output waveform |
| | Signal (–) | B134 | 14 | 0 | 0 | — |
| | Shield | B134 | 24 | 0 | 0 | — |
| Rear oxygen sensor | Signal | B135 | 4 | 0 | 0 — 0.9 | — |
| | Shield | B135 | 1 | 0 | 0 | — |
| | GND (sensor) | B135 | 30 | 0 | 0 | — |
| Front oxygen (A/F) sensor heater | Signal 1 | B136 | 3 | 0 — 1.0 | — | Sensor output waveform |
| | Signal 2 | B136 | 2 | 0 — 1.0 | — | Sensor output waveform |
| Rear oxygen sensor heater signal | | B136 | 4 | 0 — 1.0 | — | Sensor output waveform |
| Engine coolant temperature sensor | Signal | B134 | 34 | 1.0 — 1.4 | 1.0 — 1.4 | After engine is warmed-up. |
| | GND (sensor) | B134 | 29 | 0 | 0 | After engine is warmed-up. |
| Vehicle speed signal | | B136 | 13 | 0 or 5 | 0 or 5 | “5” and “0” are repeatedly displayed when vehicle is driven. |
| Air flow sensor | Signal | B135 | 26 | — | 0.3 — 4.5 | — |
| | Shield | B135 | 35 | 0 | 0 | — |
| | GND | B135 | 34 | 0 | 0 | — |
| Intake air temperature sensor signal | | B135 | 18 | 0.3 — 4.6 | 0.3 — 4.6 | — |
| Tumble generator valve position sensor RH | Signal | B134 | 26 | Fully closed: 3.8 — 4.9<br>Fully opened: 0.2 — 0.9 | | — |
| | Power supply | B134 | 19 | 5 | 5 | — |
| | GND (sensor) | B134 | 29 | 0 | 0 | — |
| Tumble generator valve position sensor LH | Signal | B134 | 16 | Fully closed: 3.8 — 4.9<br>Fully opened: 0.2 — 0.9 | | — |
| | Power supply | B134 | 19 | 5 | 5 | — |
| | GND (sensor) | B134 | 29 | 0 | 0 | — |

# Engine Control Module (ECM) I/O Signal

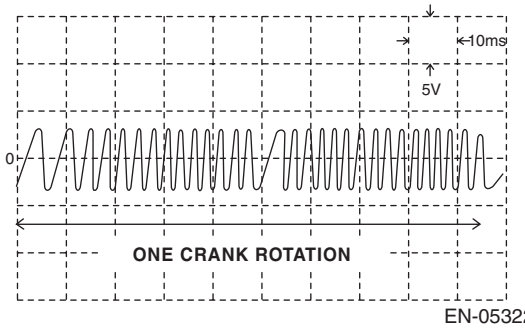
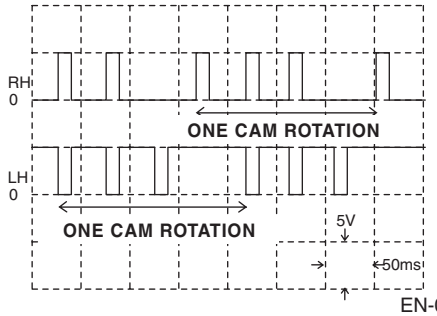


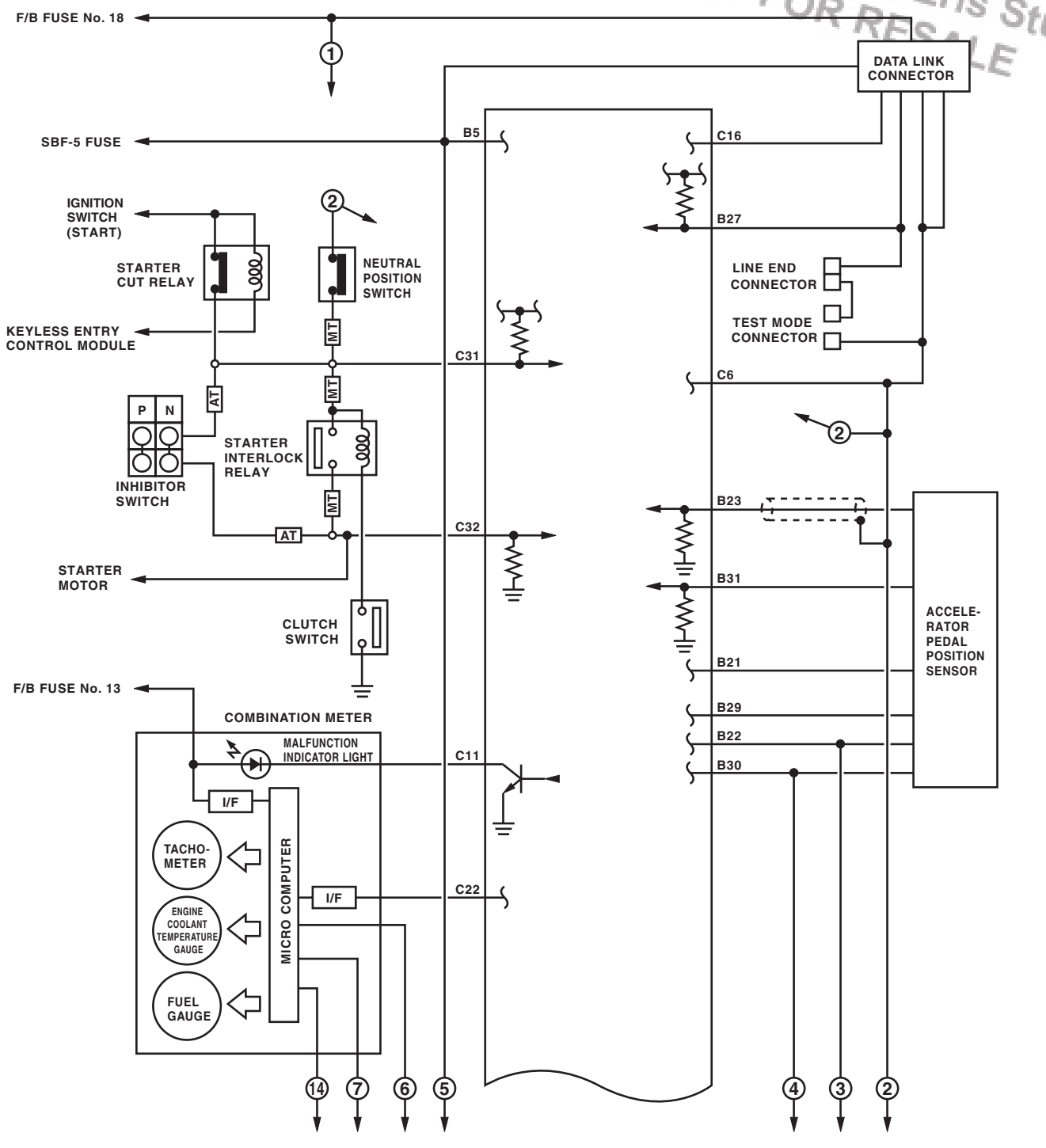
| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Tumble generator valve RH (open) | | B137 | 22 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Tumble generator valve RH (closed) | | B137 | 23 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Tumble generator valve LH (open) | | B137 | 12 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Tumble generator valve LH (closed) | | B137 | 13 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Wastegate control solenoid valve | | B137 | 27 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Starter switch | | B136 | 32 | 0 | 0 | Cranking: 8 — 14 |
| A/C switch | | B136 | 24 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| Ignition switch | | B135 | 19 | 10 — 13 | 12 — 14 | — |
| Neutral position switch | | B136 | 31 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| Test mode connector | | B135 | 27 | 10 — 13 | 12 — 14 | When connected: 0 |
| Knock sensor | Signal | B134 | 15 | 2.8 | 2.8 | — |
| | Shield | B134 | 25 | 0 | 0 | — |
| Back-up power supply | | B135 | 5 | 10 — 13 | 12 — 14 | Ignition switch “OFF”: 10 — 13 |
| Control module power supply | | B134 | 7 | 10 — 13 | 12 — 14 | — |
| | | B135 | 2 | 10 — 13 | 12 — 14 | — |
| Sensor power supply | | B134 | 19 | 5 | 5 | — |
| Ignition control | #1 | B137 | 18 | 0 | 12 — 14 | Waveform |
| | #2 | B137 | 19 | 0 | 12 — 14 | Waveform |
| | #3 | B137 | 20 | 0 | 12 — 14 | Waveform |
| | #4 | B137 | 21 | 0 | 12 — 14 | Waveform |
| Fuel injector | #1 | B137 | 8 | 10 — 13 | 1 — 14 | Waveform |
| | #2 | B137 | 9 | 10 — 13 | 1 — 14 | Waveform |
| | #3 | B137 | 10 | 10 — 13 | 1 — 14 | Waveform |
| | #4 | B137 | 11 | 10 — 13 | 1 — 14 | Waveform |
| Fuel pump control unit | Signal 1 | B136 | 12 | 0 or 5 | 0 or 5 | — |
| | Signal 2 | B135 | 33 | 10 — 13 | 12 — 14 | — |
| A/C relay control | | B136 | 9 | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | — |
| Radiator fan relay 1 control | | B136 | 18 | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | — |
| Radiator fan relay 2 control | | B136 | 29 | ON: 0.5 or less<br>OFF: 10 — 13 | ON: 0.5 or less<br>OFF: 12 — 14 | Model with A/C only |
| Malfunction indicator light | | B136 | 11 | — | — | Light “ON”: 1 or less<br>Light “OFF”: 10 — 14 |
| Engine speed output | | B136 | 22 | — | 0— 13 or more | Waveform |
| Purge control solenoid valve 1 | | B137 | 29 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 12 — 14 | Sensor output waveform |
| Purge control solenoid valve 2 | | B136 | 7 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 12 — 14 | Sensor output waveform |
| Manifold absolute pressure sensor | Signal | B134 | 6 | 1.7 — 2.4 | 1.1 — 1.6 | — |
| | Power supply | B134 | 19 | 5 | 5 | |
| | GND (sensor) | B134 | 29 | 0 | 0 | |

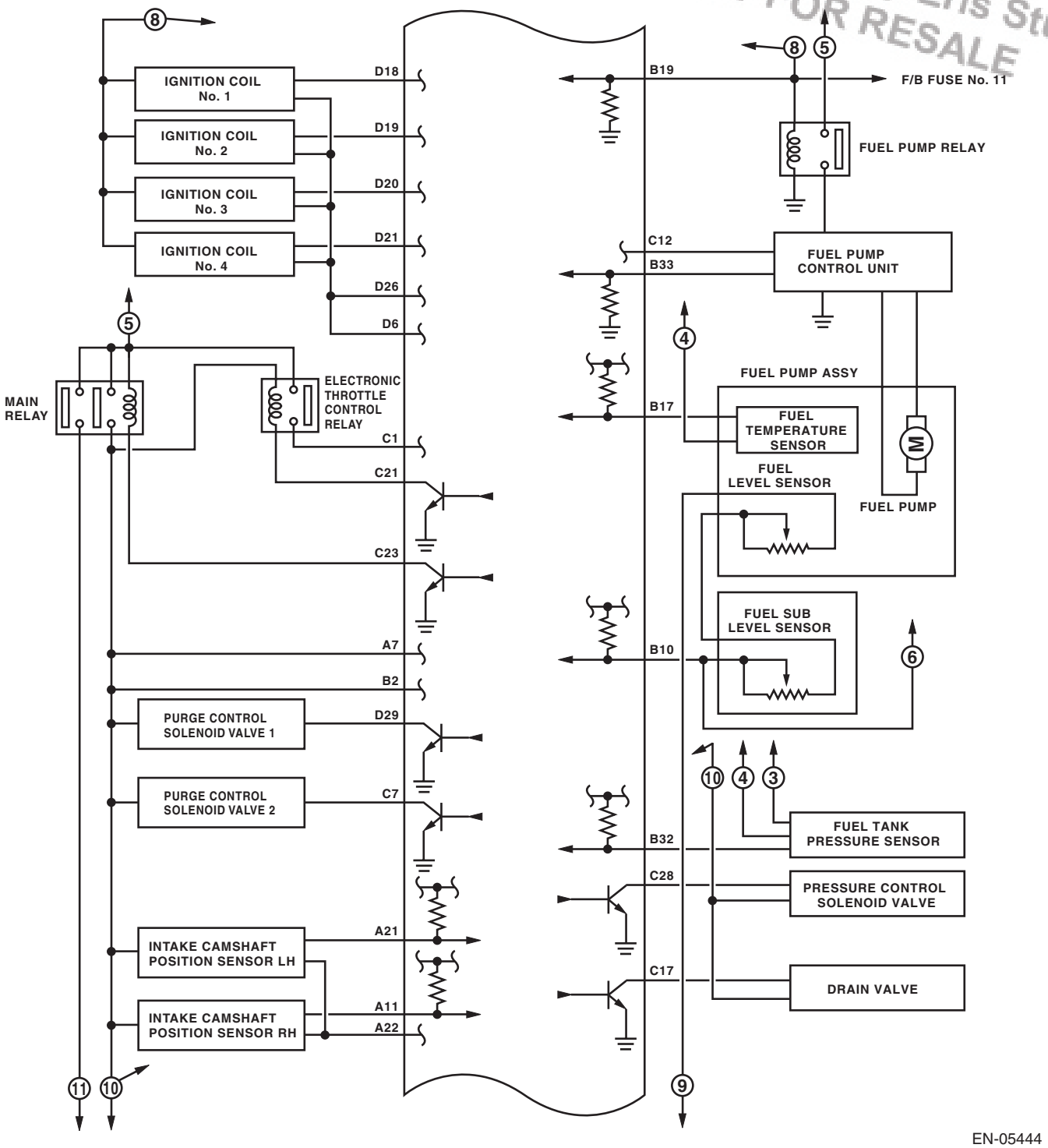
| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Fuel tank pressure sensor | Signal | B135 | 32 | 2.3 — 2.7 | 2.3 — 2.7 | Valve operates after removing fuel filler cap and installing again. |
| | Power supply | B135 | 22 | 5 | 5 | |
| | GND (sensor) | B135 | 30 | 0 | 0 | — |
| Pressure control solenoid valve | | B136 | 28 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 12 — 14 | — |
| Drain valve | | B136 | 17 | ON: 1 or less<br>OFF: 10 — 13 | ON: 1 or less<br>OFF: 12 — 14 | — |
| Fuel level sensor | | B135 | 10 | 0.12 — 4.75 | 0.12 — 4.75 | — |
| Fuel temperature sensor signal | | B135 | 17 | 2.5 — 3.8 | 2.5 — 3.8 | Ambient temperature: 25°C (77°F) |
| Blow-by leak diagnosis signal | | B134 | 30 | 0 | 0 | At the time of open circuit (fault): 5 |
| Small light switch | | B135 | 15 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Blower fan switch | | B135 | 16 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Rear defogger switch | | B135 | 14 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Power steering oil pressure switch | | B134 | 33 | 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Front oxygen (A/F) sensor signal (+) | | B135 | 9 | 2.8 — 3.2 | 2.8 — 3.2 | — |
| Front oxygen (A/F) sensor signal (–) | | B135 | 8 | 2.4 — 2.7 | 2.4 — 2.7 | — |
| Front oxygen (A/F) sensor shield | | B135 | 1 | 0 | 0 | — |
| SSM/GST communication line | | B136 | 16 | 1 ←→ 4 | 1 ←→ 4 | — |
| Ground (engine 4) | | B137 | 1 | 0 | 0 | — |
| Ground | (Ignition 1) | B137 | 26 | 0 | 0 | — |
| | (Ignition 2) | B137 | 6 | | | |
| Ground (engine 3) | | B137 | 2 | 0 | 0 | — |
| Ground (engine 5) | | B137 | 3 | 0 | 0 | — |
| Ground (body) | | B136 | 6 | 0 | 0 | — |
| Ground (engine 1) | | B134 | 5 | 0 | 0 | — |
| Ground (engine 2) | | B137 | 7 | 0 | 0 | — |
| Camshaft position sensor (LH) | | B134 | 21 | 0 — 0.9 | ON: 0<br>OFF: 4.7 — 5.3 | Sensor output waveform |
| Camshaft position sensor (RH) | | B134 | 11 | 0 — 0.9 | ON: 0<br>OFF: 4.7 — 5.3 | Sensor output waveform |
| Electronic throttle control | Main | B134 | 18 | 0.64 — 0.72<br>Fully opened: 3.96 | 0.64 — 0.72<br>(After engine is warmed-up.) | Fully closed: 0.6 Fully opened: 3.96 |
| | Sub | B134 | 28 | 1.51 — 1.58<br>Fully opened: 4.17 | 1.51— 1.58 (After engine is warmed-up.) | Fully closed: 1.48 Fully opened: 4.17 |
| | Power supply | B134 | 19 | 5 | 5 | — |
| | GND (sensor) | B134 | 29 | 0 | 0 | — |
| Electronic throttle control motor (+) | | B137 | 5 | Duty waveform | Duty waveform | Drive frequency: 500 Hz |

| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Electronic throttle control motor (–) | | B137 | 4 | Duty waveform | Duty waveform | Drive frequency: 500 Hz |
| Electronic throttle control motor power supply | | B136 | 1 | 10 — 13 | 12 — 14 | — |
| Electronic throttle control motor relay | | B136 | 21 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | When ignition switch is turned to ON: ON |
| Oil flow control solenoid (LH) | Signal (+) | B137 | 15 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| | Signal (–) | B137 | 14 | 0 | 0 | — |
| Oil flow control solenoid (RH) | Signal (+) | B137 | 17 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| | Signal (–) | B137 | 16 | 0 | 0 | — |
| Immobilizer | Signal 1 | B136 | 26 | — | — | — |
| | Signal 2 | B136 | 34 | — | — | — |
| Self-shutoff control | | B136 | 23 | 0 | 0 | — |
| AT/MT identification signal | | B136 | 15 | 0 | 0 | MT model only |
| Accelerator pedal position sensor | Main sensor signal | B135 | 23 | Fully closed: 1<br>Fully opened: 3.5 | Fully closed: 1<br>Fully opened: 3.5 | — |
| | Main power supply | B135 | 21 | 5 | 5 | — |
| | GND (main sensor) | B135 | 29 | 0 | 0 | — |
| | Sub sensor signal | B135 | 31 | Fully closed: 1<br>Fully opened: 3.5 | Fully closed: 1<br>Fully opened: 3.5 | — |
| | Sub power supply | B135 | 22 | 5 | 5 | — |
| | GND (Sub sensor) | B135 | 30 | 0 | 0 | — |
| Cruise control main light | | B135 | 6 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Cruise control set light | | B135 | 3 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Clutch switch | | B136 | 25 | When clutch pedal is depressed: 0<br>When brake pedal is released: 10 — 13 | When clutch pedal is depressed: 0<br>When brake pedal is released: 12 — 14 | — |
| SET/COAST switch | | B135 | 24 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| RESUME/ACC switch | | B135 | 13 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| Brake switch 1 | | B135 | 20 | 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: 12 — 14 | — |
| Brake switch 2 | | B135 | 28 | When brake pedal is depressed: 10 — 13<br>When brake pedal is released: 0 | When brake pedal is depressed: 12 — 14<br>When brake pedal is released: 0 | — |
| Cruise control main switch | | B135 | 12 | ON: 10 — 13<br>OFF: 0 | ON: 12 — 14<br>OFF: 0 | — |
| CAN communication | Signal (+) | B136 | 27 | Pulse signal | | — |
| | Signal (–) | B136 | 35 | Pulse signal | | — |

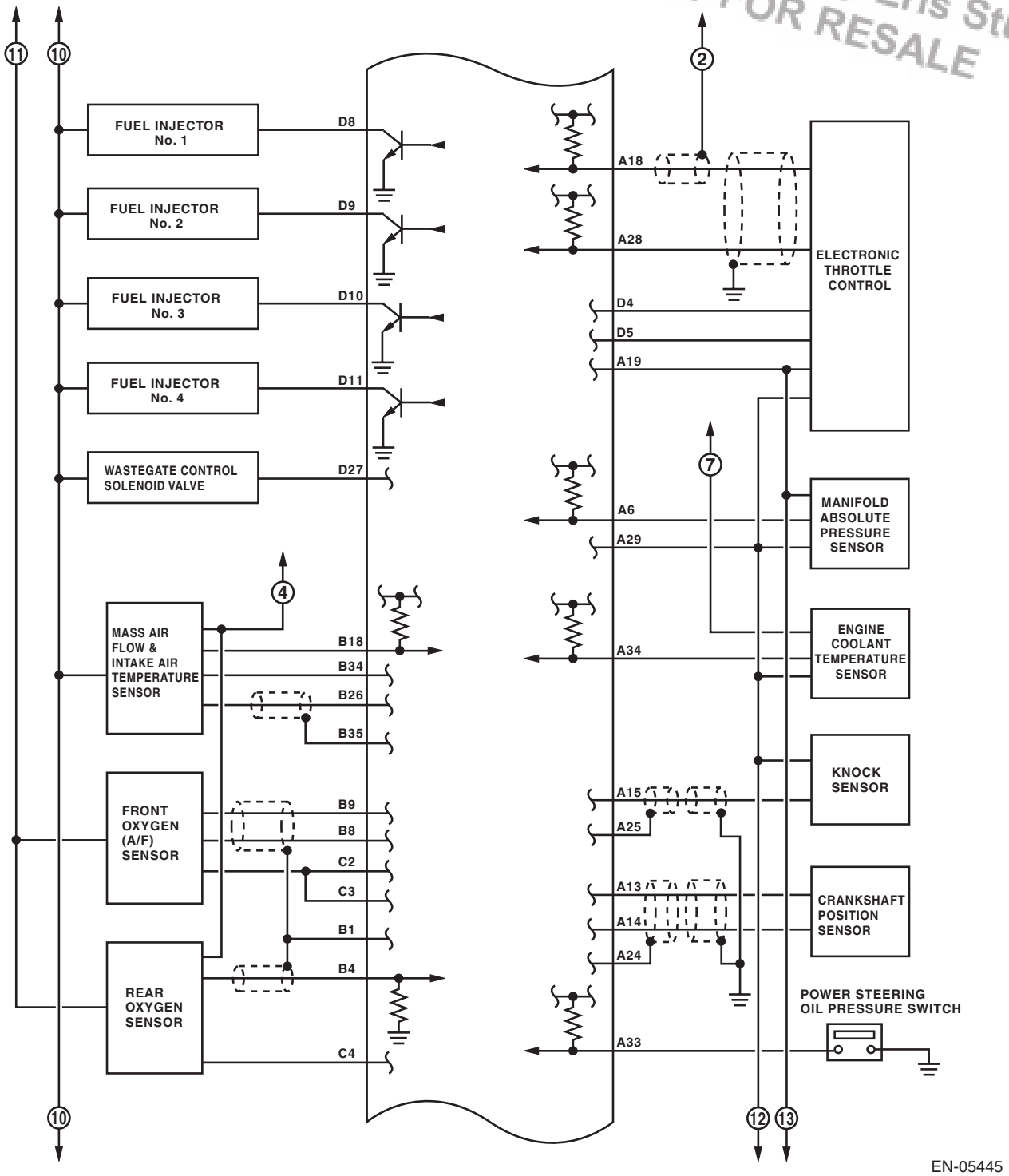
| Description | | Connector No. | Terminal No. | Signal (V) | | Note |
|---|---|---|---|---|---|---|
| | | | | Ignition SW ON (engine OFF) | Engine ON (idling) | |
| Secondary air pipe pressure sensor | Signal | B134 | 27 | 1.7 — 2.4 | 1.1 — 1.6 | — |
| | Power supply | B134 | 19 | 5 | 5 | — |
| | GND (sensor) | B134 | 29 | 0 | 0 | — |
| Secondary air combination valve relay 1 | | B136 | 19 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Secondary air combination valve relay 2 | | B136 | 30 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |
| Secondary air pump relay | | B136 | 8 | ON: 0<br>OFF: 10 — 13 | ON: 0<br>OFF: 12 — 14 | — |

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

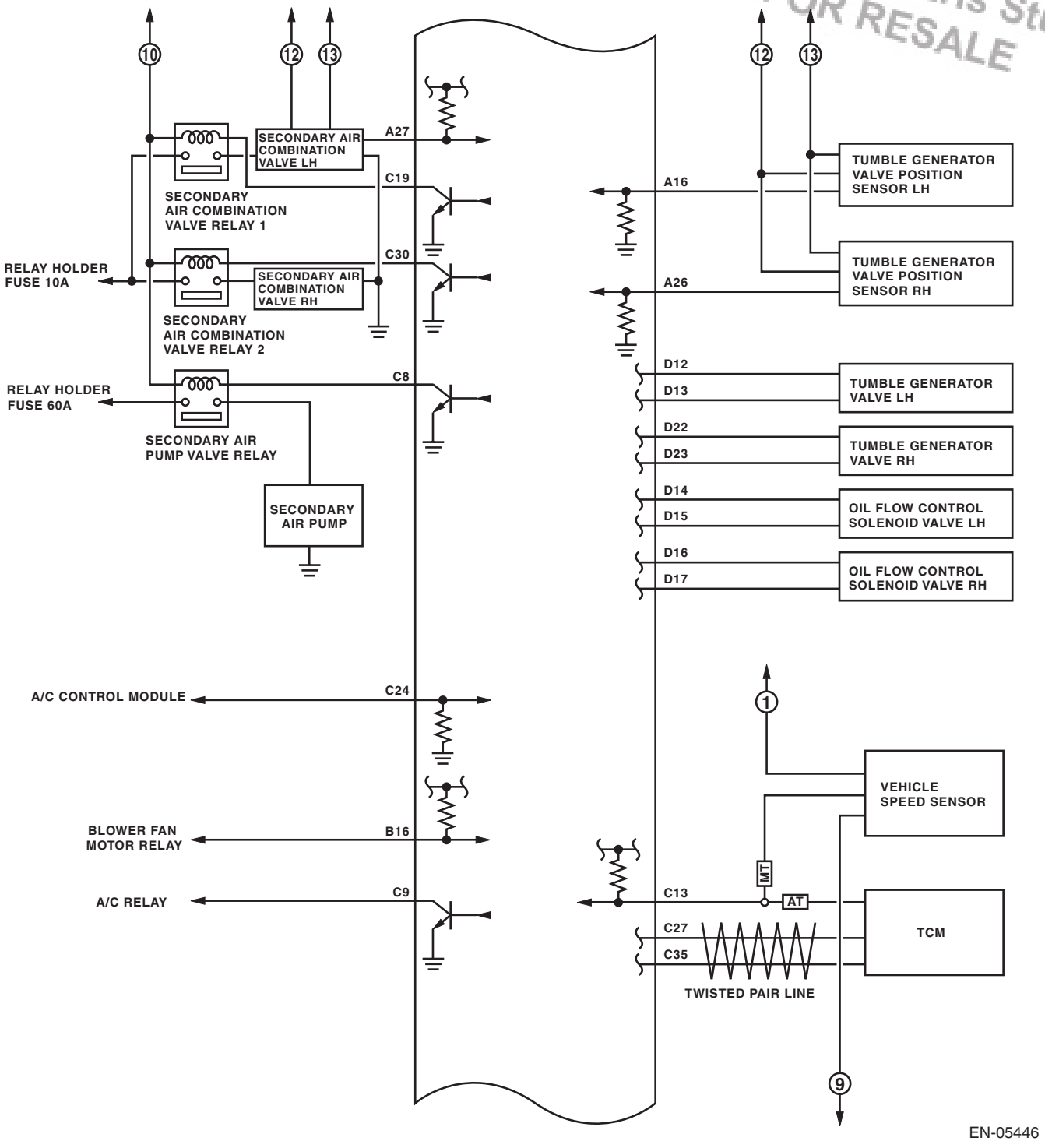


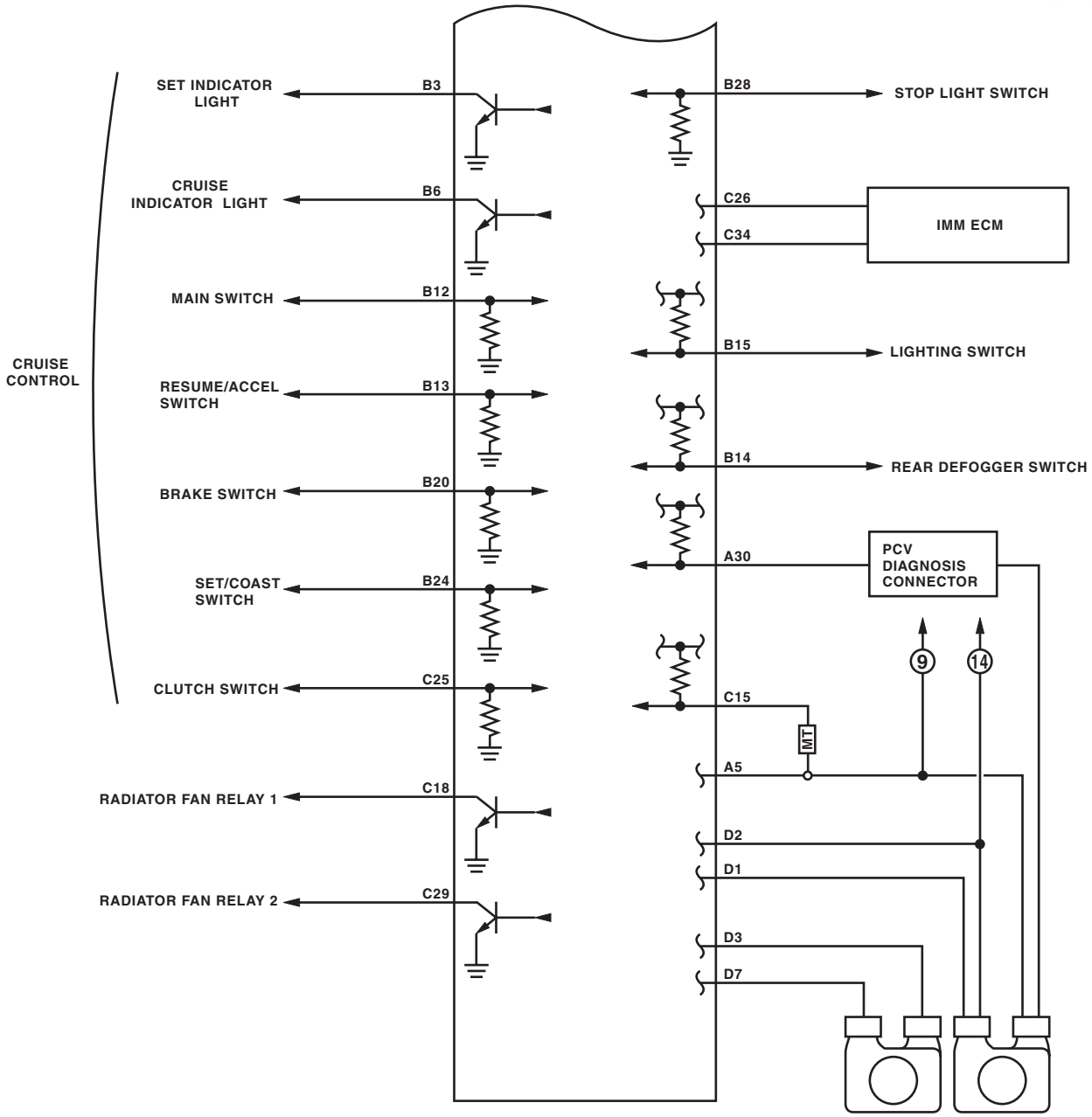



EN-05444




EN-05445






EN-05447

# 6. Engine Condition Data

## A: ELECTRICAL SPECIFICATION

| Contents | Specification |
|---|---|
| Engine load | 17.6— 35.64 (%): Idling |
| | 13.2— 26.73 (%): 2,500 rpm racing |

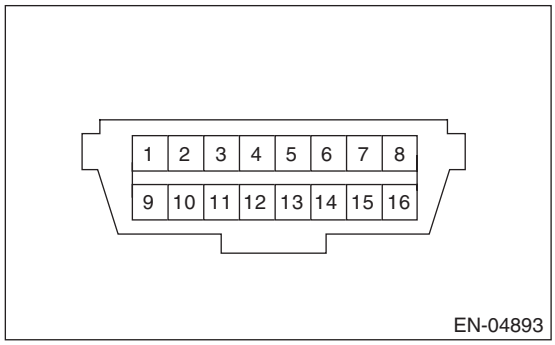
Measuring condition:
- After engine is warmed-up.
- Gear position is in neutral.
- Turn the A/C to OFF.
- Turn all the accessory switches to OFF.

# 7. Data Link Connector

## A: NOTE

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

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



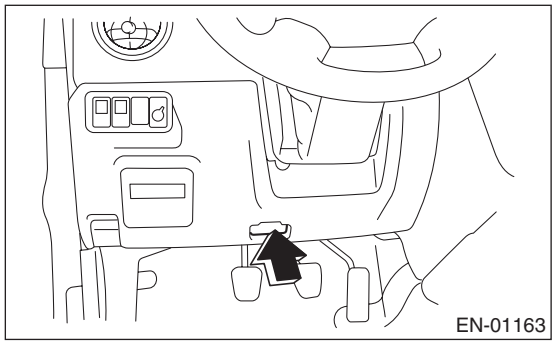

| Terminal No. | Remarks | Terminal No. | Remarks |
|---|---|---|---|
| 1 | Empty | 9 | Empty |
| 2 | Empty | 10 | Empty |
| 3 | Empty | 11 | Empty |
| 4 | Ground | 12 | Empty |
| 5 | Ground | 13 | Empty |
| 6 | Empty | 14 | Empty |
| 7 | Subaru Select Monitor/general scan tools signal | 15 | Empty |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

# 8. General Scan Tool

## A: OPERATION

### 1. HOW TO USE GENERAL SCAN TOOL

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




3) Using the general scan tool, call up DTC and freeze frame data.
General scan tool functions consist of:

(1) MODE $01: Current powertrain diagnostic data
(2) MODE $02: Powertrain freeze frame data
(3) MODE $03: Emission-related powertrain DTC
(4) MODE $04: Clear/Reset emission-related diagnostic information
(5) MODE $06: Request on-board monitoring test results for intermittently monitored systems
(6) MODE $07: Request on-board monitoring test results for continuously monitored systems
(7) MODE $09: Request vehicle information

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

NOTE:
For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
<Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).>

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

Refer to data denoting the current operating condition of analog input/output, digital input/output or the powertrain system.
A list of the support data and PID (Parameter Identification) codes are shown in the following table.

| PID | Data | Unit of measure |
|---|---|---|
| 01 | Number of emission-related powertrain DTCs, and malfunction indicator light status and diagnosis support information | — |
| 03 | Fuel system control status | — |
| 04 | Calculated engine load value | % |
| 05 | Engine coolant temperature | °C |
| 06 | Short term fuel trim | % |
| 07 | Long term fuel trim | % |
| 0B | Intake manifold absolute pressure | kPa |
| 0C | Engine speed | rpm |
| 0D | Vehicle speed | km/h |
| 0E | Ignition timing advance | ° |
| 0F | Intake air temperature | °C |
| 10 | Air flow rate from mass air flow sensor | g/sec |
| 11 | Throttle valve absolute opening angle | % |
| 12 | Secondary air control status | — |
| 13 | Check whether oxygen sensor is installed. | — |
| 15 | Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor | V and % |
| 1C | Supporting OBD system | — |
| 24 | A/F value and A/F sensor output voltage | — and V |
| 34 | A/F value and A/F sensor current | — and mA |

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

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

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

| PID | Data | Unit of measure |
|---|---|---|
| 02 | DTC that caused CARB required freeze frame data storage | — |
| 03 | Fuel system control status | — |
| 04 | Calculated engine load value | % |
| 05 | Engine coolant temperature | °C |
| 06 | Short term fuel trim | % |
| 07 | Long term fuel trim | % |
| 0B | Intake manifold absolute pressure | kPa |
| 0C | Engine speed | rpm |
| 0D | Vehicle speed | km/h |
| 0E | Ignition timing advance | ° |
| 0F | Intake air temperature | °C |
| 10 | Air flow rate from mass air flow sensor | g/sec |
| 11 | Throttle valve absolute opening angle | % |
| 12 | Secondary air control status | — |
| 13 | Air fuel ratio sensor | — |
| 15 | Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor | V and % |
| 1C | Supporting OBD system | — |

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

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

Refer to “Read Diagnostic Trouble Code” for information about data denoting emission-related powertrain DTC. <Ref. to EN(H4DOTC)(diag)-42, Read Diagnostic Trouble Code (DTC).>

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

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

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

## 6. MODE $06

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

| TID | CID | Test value of troubleshooting & test limit |
|---|---|---|
| $41 | $81 | Rear oxygen sensor circuit (bank 1 sensor 2) |
| | $02 | Rear oxygen sensor circuit (bank 1 sensor 2) |
| $81 | $01 | Catalyst system |
| $83 | $01 | Evaporative emission control system (0.04 inch leak) |
| | $02 | Evaporative emission control system (0.04 inch leak) |
| | $03 | Evaporative emission control system (0.04 inch leak) |
| | $04 | Evaporative emission control system (0.04 inch leak) |
| | $05 | Evaporative emission control system (0.02 inch leak) |
| | $86 | Evaporative emission control system (0.02 inch leak) |
| $84 | $01 | Front oxygen (A/F) sensor response (bank 1 sensor 1) |
| $85 | $01 | Rear oxygen sensor response (bank 1 sensor 2) (rich → lean) |
| | $02 | Rear oxygen sensor response (bank 1 sensor 2) (lean → rich) |
| $89 | $06 | Secondary air system |
| | $07 | |
| | $08 | |
| | $81 | |
| | $82 | |
| | $83 | |
| | $84 | |
| | $85 | |
| $8A | $81 | CPC2 stuck open diagnosis |

## 7. MODE $07

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

## 8. MODE $09

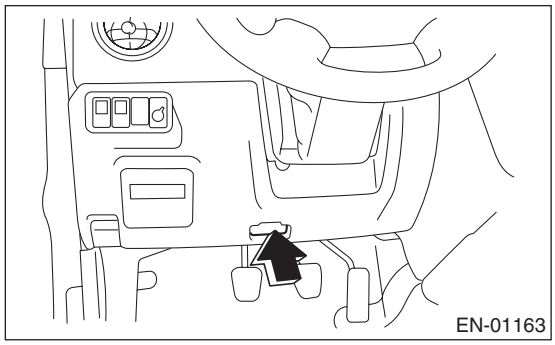
Refer to the data of vehicle specification (V.I.N., calibration ID, etc.).

# 9. Subaru Select Monitor

## A: OPERATION

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

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>
2) Connect the diagnosis cable to the Subaru Select Monitor.
3) Connect the Subaru Select Monitor to the data link connector.
   (1) Data link connector is located in the lower portion of instrument panel (on the driver's side).




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

**CAUTION:**
**Do not connect any scan tools except the Subaru Select Monitor or general scan tool.**
4) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
5) Using the Subaru Select Monitor, call up DTC and data, then record them.

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

Refer to "Read Diagnostic Trouble Code" for information about how to display a DTC. <Ref. to EN(H4DOTC)(diag)-42, Read Diagnostic Trouble Code (DTC).>

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

Refer to "Read Diagnostic Trouble Code" for information about how to display a DTC. <Ref. to EN(H4DOTC)(diag)-42, Read Diagnostic Trouble Code (DTC).>

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

1) On the «Main Menu» display screen, select {Each System Check}.
2) On the «System Selection Menu» display screen, select {Engine Control System}.
3) Select the [OK] after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select the {Current Data Display/Save}.
5) On the «Data Display Menu» display screen, select the {Data Display}.
6) Using the scroll key, scroll the display screen up or down until the desired data is shown.

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

| Remarks | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| Engine load | Engine Load | % | 21.0% |
| 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 | 700 rpm (Agree with the tachometer indication) |
| Meter vehicle speed signal | Meter Vehicle Speed | km/h or MPH | 0 km/h or 0 MPH (at parking) |
| Ignition timing signal | Ignition Timing | deg | +17.0 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 | 3.6 g/s or 0.48 lb/m |
| Throttle opening angle signal | Throttle Opening Angle | % | 3.0 — 3.2% |
| 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 |
| Atmospheric pressure | Atmospheric Pressure | mmHg, kPa, inHg or psig | (Atmospheric pressure) |
| Intake manifold relative pressure | Mani. Relative Pressure | mmHg, kPa, inHg or psig | (Intake manifold absolute pressure — barometric pressure) |
| 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 |
| Acceleration opening angle signal | Accel. Opening Angle | % | 0.00% |
| Fuel temperature signal | Fuel Temp. | °C or °F | +21°C or 70°F |
| Fuel level signal | Fuel Level | V | 0— 5 V |
| Primary supercharged pressure control signal | Primary Control | % | 0.0% |
| Purge control solenoid duty ratio | CPC Valve Duty Ratio | % | 0 — 25% |
| Tumble generator valve RH opening signal | TGV Position Sensor R | V | 0.44 |
| Tumble generator valve LH opening signal | TGV Position Sensor L | V | 0.48 |
| Fuel pump duty ratio | Fuel Pump Duty | % | 33% |
| AVCS advance angle amount RH | VVT Adv. Ang. Amount R | deg | 0 deg |
| AVCS advance angle amount LH | VVT Adv. Ang. Amount L | deg | 0 deg |
| Oil flow control solenoid valve duty RH (AVCS) | OCV Duty R | % | 9.4% |
| Oil flow control solenoid valve duty LH (AVCS) | OCV Duty L | % | 9.4% |
| 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 Ω |
| A/F sensor output lambda 1 | A/F Sensor #1 | — | 1.00 |
| A/F correction 3 | A/F Correction #3 | % | 0.00% |

| Remarks | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| A/F learning 3 | A/F Learning #3 | % | 0.00% |
| Throttle motor duty | Throttle Motor Duty | % | –10% |
| Throttle power supply voltage | Throttle Motor Voltage | V | 12— 15 V |
| Sub throttle sensor voltage | Sub-throttle Sensor | V | 1.52 V |
| Main throttle sensor voltage | Main-throttle Sensor | V | 0.66 V |
| Sub accelerator sensor voltage | Sub-accelerator Sensor | V | 0.68 V |
| Main accelerator sensor voltage | Main-accelerator Sensor | V | 0.66 V |
| Secondary air supply piping pressure signal | Secondary air supply piping pressure | mmHg, kPa, inHg or psig | 765 mmHg, 102 kPa, 30.1 inHg or 14.8 psig |
| Secondary airflow signal | Secondary airflow amount | g/s or lb/m | 0.00 g/s or 0.00 lb/m |
| Memory vehicle speed | Memorized Cruise Speed | km/h or MPH | 0 km/h or 0 MPH |
| Estimated Cumulative Driving Distance | Estimated Cumulative Driving Distance | km | — |
| #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 | — | At idle |
| Ignition switch signal | Ignition Switch | — | ON input |
| Power steering switch signal | P/S Switch | — | OFF input (At OFF) |
| Air conditioning switch signal | A/C Switch | — | OFF input (At OFF) |
| Starter switch signal | Starter Switch | — | OFF input |
| Rear oxygen monitor | Rear O2 Rich Signal | — | Rich/Lean |
| Knocking signal | Knock Signal | — | None |
| Crankshaft position sensor signal | Crankshaft Position Sig. | — | Provided |
| Camshaft position sensor signal | Camshaft Position Sig. | — | Provided |
| Rear defogger switch signal | Rear Defogger SW | — | OFF input (At OFF) |
| Blower fan switch signal | Blower Fan SW | — | OFF input (At OFF) |
| Light switch signal | Light Switch | — | OFF input (At OFF) |
| Air conditioner compressor relay output signal | A/C Compressor Signal | — | OFF output (At OFF) |
| Radiator fan relay 1 signal | Radiator Fan Relay #1 | — | OFF output (At OFF) |
| Radiator fan relay 2 signal | Radiator Fan Relay #2 | — | OFF output (At OFF) |
| PCV hose assembly diagnosis signal | Blow-by Leak Connector | — | Connected |
| Pressure control solenoid valve signal | PCV Solenoid | — | OFF output (At OFF) |
| Tumble generator valve output signal | TGV Output | — | None |
| Tumble generator valve drive signal | TGV Drive | — | Opening direction |
| Drain valve signal | Vent Control Solenoid | — | OFF output (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 cooperative permission signal | Torque Permission Signal | — | Permission |
| 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 SW | — | OFF (At OFF) |
| Brake switch signal | Brake Switch | — | OFF (At OFF) |

| Remarks | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| Main switch signal | Main Switch | — | OFF (At OFF) |
| Secondary air combination valve relay 2 signal | Secondary Air Combination Valve Relay 2 | — | OFF (At OFF) |
| Secondary air pump relay signal | Secondary Air Pump Relay | — | OFF (At OFF) |
| Secondary air combination valve relay 1 signal | Secondary Air Combination Valve Relay 1 | — | 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 {Each System Check}.
2) On the «System Selection Menu» display screen, select {Engine Control System}.
3) Select the [OK] after the information of engine type has been displayed.
4) On the «Engine Diagnosis» display screen, select {OBD System}.
5) On the «OBD system» display screen, select the {Current Data Display/Save}.
6) On the «Data Display Menu» display screen, select the {Data Display}.
7) Using the scroll key, scroll the display screen up or down until the desired data is shown.

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

| Remarks | 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 |
| Misfire monitoring | Misfire Monitoring | Supp | YES or NO |
| | | Rdy | YES or NO |
| Fuel system diagnosis | Fuel system monitoring | Supp | YES or NO |
| | | Rdy | YES or NO |
| Component monitoring | Component monitoring | Supp | YES or NO |
| | | Rdy | YES or NO |
| Catalyst diagnosis | Catalyst Diagnosis | Supp | YES or NO |
| | | Rdy | YES or NO |
| Heated catalyst diagnosis | Heated catalyst | Supp | N/A |
| | | Rdy | N/A |
| Evaporative purge system diagnosis | Evaporative purge system | Supp | YES or NO |
| | | Rdy | YES or NO |
| Secondary air system | Secondary air system | Supp | YES or NO |
| | | Rdy | YES or NO |
| A/C system refrigerant diagnosis | A/C system refrigerant | Supp | N/A |
| | | Rdy | N/A |
| Oxygen sensor diagnosis | Oxygen sensor | Supp | YES or NO |
| | | Rdy | YES or NO |
| Oxygen heater diagnosis | O2 Heater Diagnosis | Supp | YES or NO |
| | | Rdy | YES or NO |
| EGR diagnosis | EGR system | Supp | N/A |
| | | Rdy | N/A |
| Air fuel ratio control system for bank 1 | Fuel system for Bank1 | — | Normal CLOSE |
| Engine load data | Engine Load | % | 21.0% |
| 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 | % | 0.8% |
| Long term fuel trim by front oxygen (A/F) sensor | Long term fuel trim B1 | % | 3.9% |
| Intake manifold absolute pressure signal | Mani.Absolute Pressure | mmHg, kPa, inHg or psig | 233 mmHg, 31 kPa, 9.2 inHg or 4.5 psig |
| Engine speed signal | Engine Speed | rpm | 700 rpm |
| Vehicle speed signal | Vehicle Speed | km/h or MPH | 0 km/h or 0 MPH |
| #1 Cylinder ignition timing | Ignition timing adv. #1 | ° | +16.5° |
| Intake air temperature signal | Intake Air Temp. | °C or °F | 54°C or 129°F |
| Amount of intake air | Mass Air Flow | g/s or lb/m | 2.8 g/s or 0.37 lb/m |
| Throttle position signal | Throttle Opening Angle | % | 13% |
| Secondary air system | Secondary air system | — | Stop |
| Oxygen sensor #11 | Oxygen Sensor #11 | — | Support |
| Rear oxygen sensor output signal | Oxygen Sensor #12 | — | Support |
| Oxygen sensor #12 | Oxygen Sensor #12 | V | 0.1— 0.7 V |

| Remarks | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| Air fuel ratio correction by rear oxygen sensor | Short term fuel trim #12 | % | +0.0% |
| On-board diagnostic system | OBD System | — | CARB-OBD2 |
| A/F lambda signal | A/F sensor #11 | — | 1.001 |
| A/F sensor output signal | A/F sensor #11 | V | 2.805 V |
| A/F lambda signal #11 | A/F sensor #11 | — | 0.999 |
| A/F sensor current #11 | A/F sensor #11 | mA | 0.02 mA |

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

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

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

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

| Description | Display | Unit of measure | Note (at idling) |
|---|---|---|---|
| Freeze frame data DTC code | Freeze frame data | — | DTC |
| Air fuel ratio control system for bank 1 | Fuel system for Bank1 | — | Normal CLOSE or OPEN early period |
| Engine load data | Engine Load | % | — |
| Engine coolant temperature signal | Coolant Temp. | °C or °F | — |
| Short term fuel trim by front oxygen (A/F) sensor | Short term fuel trim B1 | % | — |
| Long term fuel trim by front oxygen (A/F) sensor | Long term fuel trim B1 | % | — |
| Intake manifold absolute pressure signal | Mani.Absolute Pressure | mmHg, kPa, inHg or psig | — |
| Engine speed signal | Engine Speed | rpm | — |
| Vehicle speed signal | Vehicle Speed | km/h or MPH | — |
| Ignition timing advance for #1 cylinder | Ignition timing adv. #1 | ° | — |
| Intake air temperature signal | Intake Air Temp. | °C or °F | — |
| Amount of intake air | Mass Air Flow | g/s | — |
| Throttle position signal | Throttle Opening Angle | % | — |
| Secondary air system | Secondary air system | — | — |
| Oxygen sensor #11 | Oxygen Sensor #11 | — | Support |
| Oxygen sensor #12 | Oxygen Sensor #12 | — | Support |
| Oxygen sensor output voltage | Oxygen Sensor #12 | V | — |
| Air fuel ratio correction by rear oxygen sensor | Short term fuel trim #12 | % | — |
| OBD system | OBD System | — | — |

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

## 7. V.I.N. REGISTRATION

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

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

# 10.Read Diagnostic Trouble Code (DTC)

## A: OPERATION

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

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

NOTE:
• For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
• For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
<Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).>

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

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

NOTE:
• For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
• For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
<Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).>

### 3. GENERAL SCAN TOOL

Refer to the data denoting emission-related powertrain DTC.
For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
<Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).>

NOTE:
Refer to the general scan tool manufacturer’s operation manual to access powertrain DTC (MODE $03).

# 11.Inspection Mode

## A: PROCEDURE

Perform the diagnosis shown in the following DTC table.
When performing the diagnosis not listed in “List of Diagnostic Trouble Code (DTC)”, refer to the item on the drive cycle. <Ref. to EN(H4DOTC)(diag)-48, Drive Cycle.>

| DTC | Item | Condition |
|---|---|---|
| P0011 | Intake Camshaft Position - Timing Over-Advanced or System Performance (Bank 1) | — |
| P0016 | Crankshaft Position - Camshaft Position Correlation (Bank1) | — |
| P0018 | Crankshaft Position - Camshaft Position Correlation (Bank2) | — |
| P0021 | Intake Camshaft Position - Timing Over-Advanced or System Performance (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 Sensor 1 Circuit Low | — |
| P0113 | Intake Air Temperature Sensor 1 Circuit High | — |
| P0117 | Engine Coolant Temperature Circuit Low | — |
| P0118 | Engine Coolant Temperature Circuit High | — |
| P0122 | Throttle/Pedal Position Sensor/Switch “A” Circuit Low | — |
| P0123 | Throttle/Pedal Position Sensor/Switch “A” Circuit High | — |
| P0131 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) | — |
| P0132 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) | — |
| P0137 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2) | — |
| P0138 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 2) | — |
| P0140 | O2 Sensor Circuit No Activity Detected (Bank1 Sensor2) | — |
| P0182 | Fuel Temperature Sensor “A” Circuit Low Input | — |
| P0183 | Fuel Temperature Sensor “A” Circuit High Input | — |
| P0222 | Throttle/Pedal Position Sensor/Switch “B” Circuit Low | — |
| P0223 | Throttle/Pedal Position Sensor/Switch “B” Circuit High | — |
| P0230 | Fuel Pump Primary Circuit | — |
| P0245 | Turbo/Super Charger Wastegate Solenoid “A” Low | — |
| P0327 | Knock Sensor 1 Circuit Low (Bank 1 or Single Sensor) | — |
| P0328 | Knock Sensor 1 Circuit High (Bank 1 or Single Sensor) | — |
| P0335 | Crankshaft Position Sensor “A” Circuit | — |
| P0336 | Crankshaft Position Sensor “A” Circuit Range/Performance | — |
| P0340 | Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor) | — |
| P0345 | Camshaft Position Sensor “A” Circuit (Bank 2) | — |
| P0413 | Secondary Air Injection System Switching Valve “A” Circuit Open | — |
| P0416 | Secondary Air Injection System Switching Valve “B” Circuit Open | — |
| P0418 | Secondary Air Injection System Control “A” Circuit Open | — |
| P0447 | Evaporative Emission Control System Vent Control Circuit Open | — |
| P0448 | Evaporative Emission Control System Vent Control Circuit Shorted | — |
| P0452 | Evaporative Emission Control System Pressure Sensor Low Input | — |
| P0453 | Evaporative Emission Control System Pressure Sensor High Input | — |
| P0458 | Evaporative Emission System Purge Control Valve Circuit Low | — |
| P0462 | Fuel Level Sensor “A” Circuit Low | — |

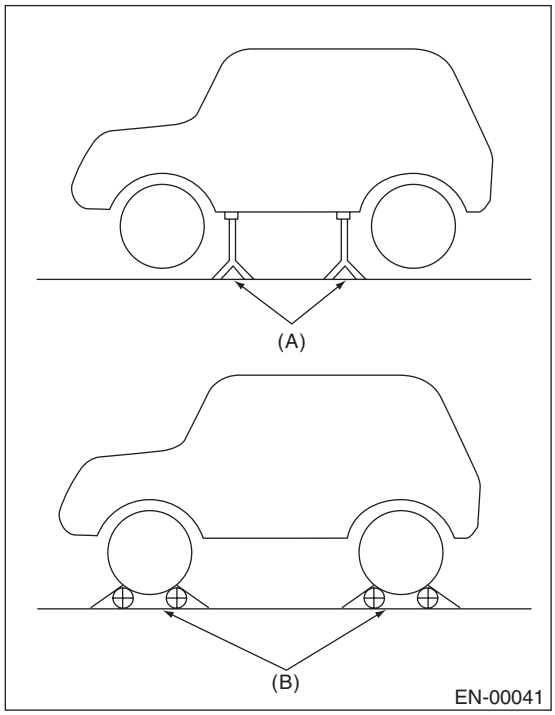
| DTC | Item | Condition |
|---|---|---|
| P0463 | Fuel Level Sensor “A” Circuit High | — |
| P0502 | Vehicle Speed Sensor “A” Circuit Low Input | — |
| P0503 | Vehicle Speed Sensor “A” Intermittent/Erratic/High | — |
| P0512 | Starter Request Circuit | — |
| P0513 | Incorrect Immobilizer Key | — |
| P0519 | Idle Air Control System Performance | — |
| P0600 | Serial Communication Link | — |
| P0604 | Internal Control Module Random Access Memory (RAM) Error | — |
| P0605 | Internal Control Module Read Only Memory (ROM) Error | — |
| P0607 | Control Module Performance | — |
| P0638 | Throttle Actuator Control Range/Performance (Bank 1) | — |
| P0691 | Fan 1 Control Circuit Low | — |
| 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 | — |
| P1410 | Secondary Air Injection System Switching Valve Stuck Open | — |
| P1420 | Fuel Tank Pressure Control Sol. Valve Circuit High | — |
| P1491 | Positive Crankcase Ventilation (Blow-by) Function Problem | — |
| P1518 | Starter Switch Circuit Low Input | — |
| P1560 | Back-up Voltage Circuit Malfunction | — |
| 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 | — |
| 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 | Intake Camshaft Position Actuator Control Circuit Low (Bank 1) | — |
| P2089 | Intake Camshaft Position Actuator Control Circuit High (Bank 1) | — |
| P2092 | Intake Camshaft Position Actuator Control Circuit Low (Bank 2) | — |
| P2093 | Intake Camshaft Position Actuator Control Circuit High (Bank 2) | — |
| P2101 | Throttle Actuator Control Motor Circuit Range/Performance | — |
| P2102 | Throttle Actuator Control Motor Circuit Low | — |
| P2109 | Throttle/Pedal Position Sensor “A” Minimum Stop Performance | — |
| P2122 | Throttle/Pedal Position Sensor/Switch “D” Circuit Low Input | — |
| P2123 | Throttle/Pedal Position Sensor/Switch “D” Circuit High Input | — |
| P2127 | Throttle/Pedal Position Sensor/Switch “E” Circuit Low Input | — |

| DTC | Item | Condition |
|---|---|---|
| P2128 | Throttle/Pedal Position Sensor/Switch “E” Circuit High Input | — |
| P2135 | Throttle/Pedal Position Sensor/Switch “A”/“B” Voltage Correlation | — |
| P2138 | Throttle/Pedal Position Sensor/Switch “D”/“E” Voltage Correlation | — |
| P2419 | Evaporative Emission System Switching Valve Control Circuit Low | — |
| P2420 | Evaporative Emission System Switching Valve Control Circuit High | — |
| P2431 | Secondary Air Injection System Air Flow /Pressure Sensor Circuit Range/Performance | — |
| P2432 | Secondary Air Injection System Air Flow /Pressure Sensor Circuit Low | — |
| P2433 | Secondary Air Injection System Air Flow /Pressure Sensor Circuit High | — |
| P2444 | Secondary Air Injection System Pump Stuck On | — |

## 1. PREPARATION FOR THE INSPECTION MODE

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

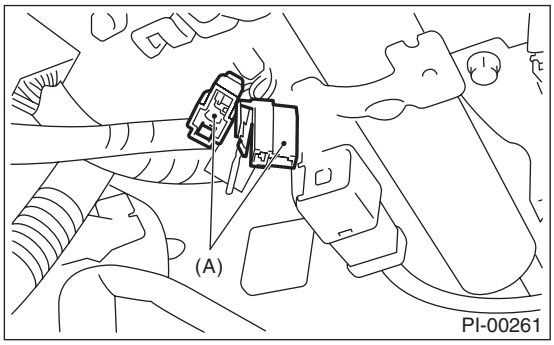
**WARNING:**
**• Before raising the vehicle, ensure parking brakes are applied.**
**• Do not use a pantograph jack in place of a rigid rack.**
**• Secure a rope or wire to the front or rear towing hooks to prevent the lateral runout of front wheels.**
**• Do not abruptly depress/release clutch pedal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




(A) Rigid rack
(B) Free roller

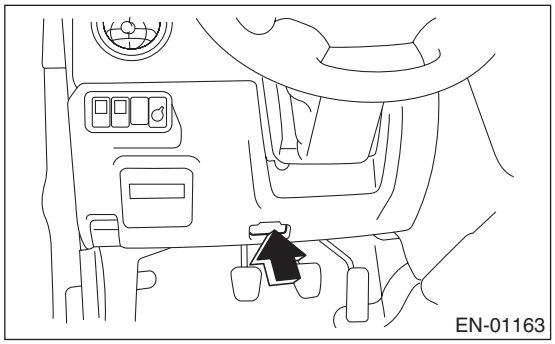
## 2. SUBARU SELECT MONITOR

1) Warm-up the engine.
2) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)(diag)-7, PREPARATION TOOL, General Description.>
3) Connect the diagnosis cable to the Subaru Select Monitor.
4) Connect the test mode connector (A) at the lower portion of instrument panel (on the driver's side).




(A) Test mode connector

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



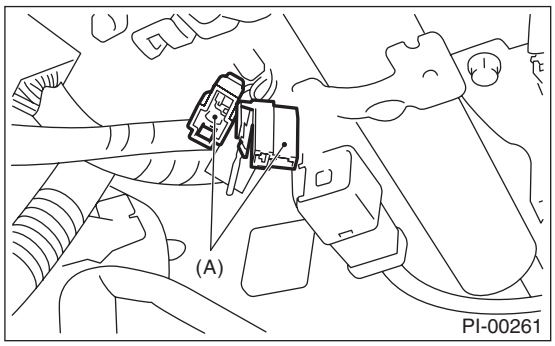

**CAUTION:**
**Do not connect any scan tools except the Subaru Select Monitor or general scan tool.**
6) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
7) On the «Main Menu» display screen, select {Each System Check}.
8) On the «System Selection Menu» display screen, select {Engine Control System}.
9) Select the [OK] after the information of engine type has been displayed.
10) On the «Engine Diagnosis» display screen, select {D Check}.
11) When the "Perform D Check?" is shown on the screen, press the [OK].

12) Perform subsequent procedures as instructed on the display screen.
• If trouble still remains in the memory, the corresponding DTC appears on the display screen.

NOTE:
• For detailed operation procedure, refer to the "SUBARU SELECT MONITOR OPERATION MANUAL".
• For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
<Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).>
• Release the parking brake.
• The speed difference between front and rear wheels may illuminate the ABS warning light, but this does not indicate a malfunction. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

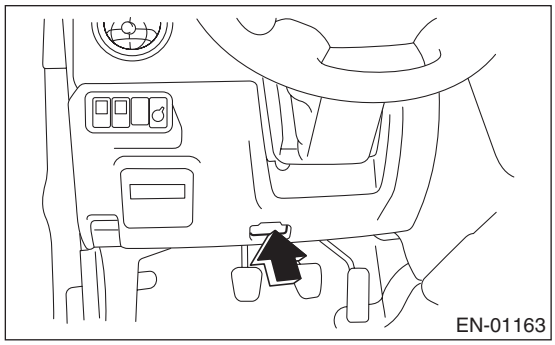
## 3. GENERAL SCAN TOOL

1) Warm-up the engine.
2) Connect the test mode connector (A) at the lower portion of instrument panel (on the driver's side).




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

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




4) Start the engine.

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

NOTE:
• For AWD model, release the parking brake.
• The speed difference between front and rear wheels may illuminate the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.
9) Using the general scan tool, check for DTC and record the result(s).

NOTE:
• For detailed operation procedure, refer to the general scan tool operation manual.
• For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
<Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).>

# 12.Drive Cycle

## A: PROCEDURE

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

### 1. PREPARATION FOR DRIVE CYCLE

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

NOTE:
• Perform the diagnosis after warming up the engine except when the engine coolant temperature at starting is specified.
• Perform the diagnosis twice if the DTC marked with *. After completing the first diagnosis, stop the engine and perform second diagnosis in same condition.

### 2. DRIVE CYCLE A — DRIVE THE VEHICLE WITH 80 KM/H (50 MPH) FOR 20 MINUTES, AND THEN IDLE THE ENGINE FOR A MINUTE.)

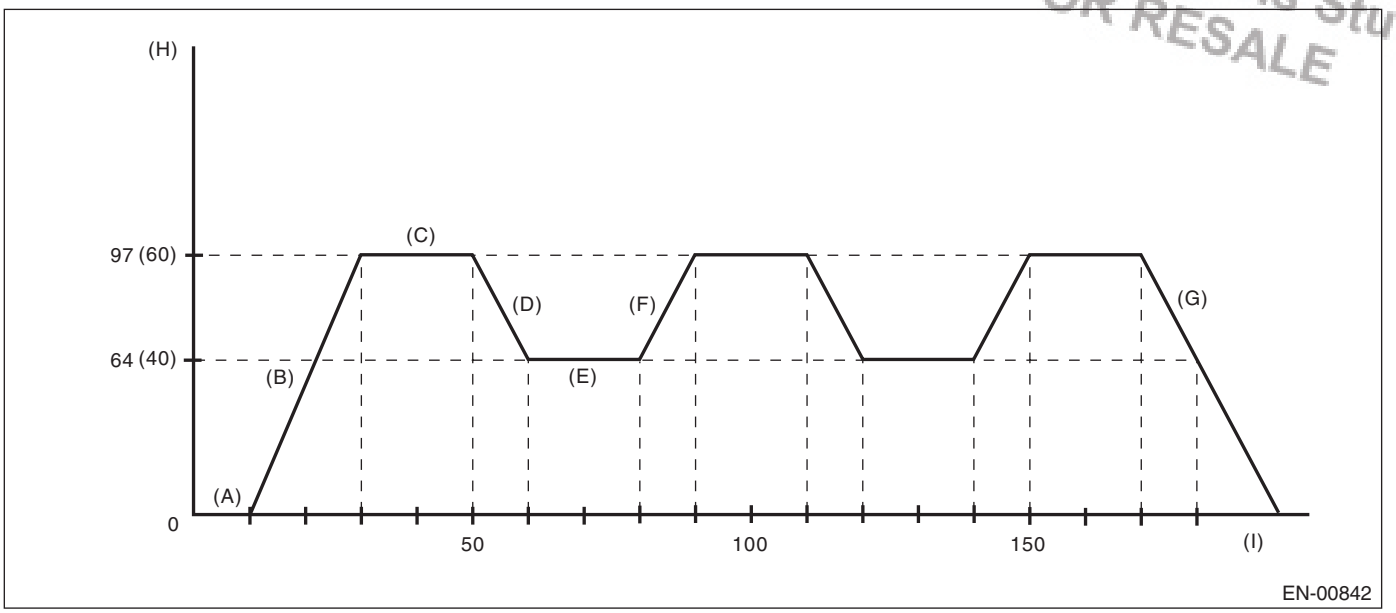
| DTC | Item | Condition |
|---|---|---|
| *P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control | Engine coolant temperature at engine start is less than 20°C (68°F). |
| *P0128 | Coolant Thermostat (Engine Coolant Temperature Below Thermostat Regulating Temperature) | Engine coolant temperature at engine start is less than 55°C (131°F). |
| *P0133 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 1) | — |
| *P0171 | System Too Lean (Bank 1) | Diagnosis completes in drive cycle B or C as well. |
| *P0172 | System Too Rich (Bank 1) | Diagnosis completes in drive cycle B or C as well. |
| 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) | — |
| *P0441 | Evaporative Emission System Incorrect Purge Flow | — |
| *P0442 | Evaporative Emission Control System Leak Detected (Small Leak) | Engine coolant temperature at engine start is less than 25°C (77°F). |
| *P0451 | Evaporative Emission Control System Pressure Sensor | — |
| *P0456 | Evaporative Emission Control System Leak Detected (Very Small Leak) | Engine coolant temperature at engine start is less than 25°C (77°F). |
| *P0457 | Evaporative Emission Control System Leak Detected (Fuel Cap Loose/Off) | Engine coolant temperature at engine start is less than 25°C (77°F). |
| *P0459 | Evaporative Emission System Purge Control Valve Circuit High | — |
| *P0692 | Fan 1 Control Circuit High | — |
| P1443 | Vent Control Solenoid Valve Function Problem | — |
| *P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | Diagnosis completes in drive cycle B or C as well. |
| *P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | Diagnosis completes in drive cycle B or C as well. |
| P2103 | Throttle Actuator Control Motor Circuit High | Diagnosis completes in drive cycle B or C as well. |

### 3. DRIVE CYCLE B — 10 MINUTES IDLING

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

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

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




(A) Idle the engine for 10 seconds or more.

(B) Accelerate to 97 km/h (60 MPH) within 20 seconds.

(C) Drive the vehicle at 97 km/h (60 MPH) for 20 seconds.

(D) Decelerate the vehicle to 64 km/h (40 MPH) with throttle fully closed.

(E) Drive the vehicle at 64 km/h (40 MPH) for 20 seconds.

(F) Accelerate to 97 km/h (60 MPH) within 10 seconds.

(G) Stop the vehicle with throttle fully closed.

(H) Vehicle speed km/h (MPH)

(I) Sec.

| 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 | O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1) | — |
| *P0139 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 2) | — |
| *P0171 | System Too Lean (Bank 1) | Diagnosis completes in drive cycle A or B as well. |
| *P0172 | System Too Rich (Bank 1) | Diagnosis completes in drive cycle A or B as well. |
| *P0244 | Turbo/Super Charger Wastegate Solenoid “A” Range/Performance | — |
| P0246 | Turbo/Super Charger 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. |
| 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. |
| *P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | Diagnosis completes in drive cycle A or B as well. |
| P2103 | Throttle Actuator Control Motor Circuit High | Diagnosis completes in drive cycle A or B as well. |

## 5. DRIVE CYCLE D

### DRIFT DIAGNOSIS

1) Check that the engine coolant temperature at engine start is less than 30°C (86°F).
2) Make sure that fuel remains 10 ℓ (2.6 US gal, 2.2 Imp gal) or more and the battery voltage is 10.9 V or more.
3) Start the engine, and check that the engine coolant temperature increases by 10°C (18°F) or more, and reaches 75°C (167°F) or more, when the engine is warmed up.
4) Idle the engine for 120 seconds or more in the condition of step 3).

### STUCK DIAGNOSIS

1) Make sure that the battery voltage is 10.9 V or more.
2) Perform the Clear Memory Mode. <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.>
3) Drive for approximately 50 ℓ (13.2 US gal, 11 Imp gal) of fuel.

NOTE:
- It is acceptable to drive the vehicle intermittently.
- Do not disconnect the terminal of battery during diagnosis. (Data will be cleared by disconnecting the battery terminals.)

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

## 6. DRIVE CYCLE E

1) Make sure that the battery voltage is 10.9 V or more.
2) Perform the Clear Memory Mode. <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.>
3) Drive for approximately 30 ℓ (7.9 US gal, 6.6 Imp gal) of fuel.

NOTE:
- It is acceptable to drive the vehicle intermittently.
- Do not disconnect the terminal of battery during diagnosis. (Data will be cleared by disconnecting the battery terminals.)

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

## 7. DRIVE CYCLE F

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

NOTE:
Do not disconnect the terminal of battery during diagnosis. (Data will be cleared by disconnecting the battery terminals.)

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

## 8. DRIVE CYCLE G

1) Remove the battery negative terminal, and reconnect after 10 seconds have passed.
2) Start the engine and warm-up engine until coolant temperature is 80°C (176°F).
3) Start the engine and warm-up engine until coolant temperature is 40°C (104°F).

NOTE:
Do not let engine coolant temperature drop below 5°C (41°F).
4) Repeat the step 2) and 3) again.

NOTE:
Do not let engine coolant temperature drop below 5°C (41°F).
5) Start and idle the engine.

| DTC | Item | Condition |
|---|---|---|
| *P0410 | Secondary Air Injection System | — |
| *P0411 | Secondary Air Injection System Incorrect Flow Detected | — |
| P0414 | Secondary Air Injection System Switching Valve “A” Circuit Shorted | — |
| P0417 | Secondary Air Injection System Switching Valve B Circuit Shorted | — |
| P1418 | Secondary Air Injection System Control “A” Circuit Shorted | — |
| *P2440 | Secondary Air Injection System Switching Valve Stuck Open (Bank 1) | — |
| *P2441 | Secondary Air Injection System Switching Valve Stuck Closed (Bank 1) | — |
| *P2442 | Secondary Air Injection System Switching Valve Stuck Open (Bank 2) | — |
| *P2443 | Secondary Air Injection System Switching Valve Stuck Closed (Bank 2) | — |

## 9. DRIVE CYCLE H

1) Perform the Clear Memory Mode. <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.>
2) With the ignition switch ON, read the engine coolant temperature, intake air temperature and fuel temperature. <Ref. to EN(H4DOTC)(diag)-37, READ CURRENT DATA FOR ENGINE (NORMAL MODE), OPERATION, Subaru Select Monitor.>
3) If the values from step 2) satisfy the following two conditions, start the engine.

***Condition:***
***|Engine coolant temperature — intake air temperature| ≤ 5°C (41°F)***
***|Engine coolant temperature — fuel temperature| ≤ 2°C (36°F)***

NOTE:
- If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.
- Start AT vehicles in the P range, and MT vehicles in the N position.

4) Idle the engine for 1 minute under the conditions in step 3).

| DTC | Item | Condition |
|---|---|---|
| *P1602 | Control Module Programming Error (cold start) | — |

# 13.Clear Memory Mode

## A: OPERATION

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

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

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

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

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

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

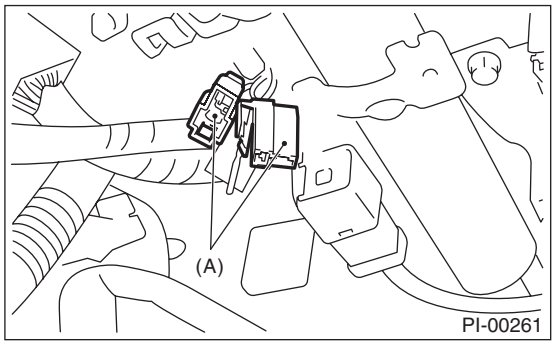
### 3. GENERAL SCAN TOOL

For procedures clearing memory using the general scan tool, refer to the general scan tool operation manual.

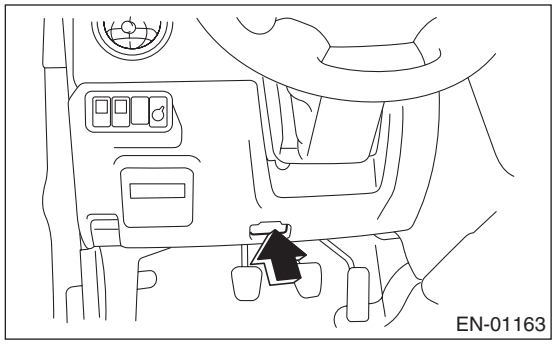
# 14.Compulsory Valve Operation Check Mode

## 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 the Subaru Select Monitor.
3) Connect the test mode connector (A) at the lower portion of instrument panel (on the driver's side).




4) 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 any scan tools except the Subaru Select Monitor or general scan tool.**
5) Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
6) On the «Main Menu» display screen, select {Each System Check}.
7) On the «System Selection Menu» display screen, select {Engine Control System}.
8) Select the [OK] after the information of engine type has been displayed.
9) On the «Engine Diagnosis» display screen, select {System operation check mode}.
10) On the «System operation check mode» display screen, select {Actuator ON/OFF Operation}.
11) Select the desired compulsory actuator on the «Actuator ON/OFF Operation» display screen.
12) Selecting the [NO] completes the compulsory operation check mode. The display will then return to the «Actuator ON/OFF Operation» screen.

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

| Contents | 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 pressure control solenoid valve operation check | PCV solenoid |
| Compulsory drain valve operation check | Vent Control Solenoid |
| Compulsory wastegate control solenoid valve operation check | Wastegate control solenoid |
| Secondary air combination valve 1 compulsory operation check | Secondary Air Combination Valve 1 |
| Secondary air combination valve 2 compulsory operation check | Secondary Air Combination Valve 2 |
| Secondary air pump relay compulsory operation check | Secondary air pump relay |

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

| Display |
|---|
| EGR Solenoid |
| ASV Solenoid |
| FICD Solenoid |
| Pressure Switching Sol.1 |
| Pressure Switching Sol.2 |
| AAI Solenoid |
| Fuel Tank Sensor Control Valve |
| EXH. Bypass Control Permit Flag |

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

# 15.Malfunction Indicator Light

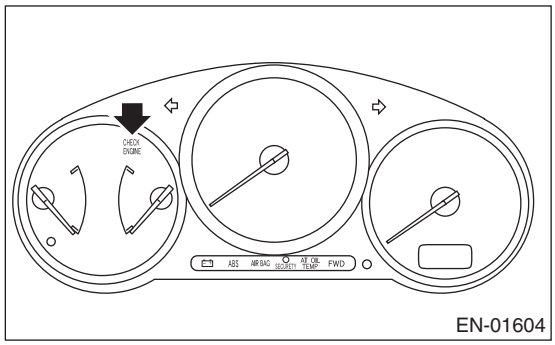
## A: PROCEDURE

| |
|---|
| 1. Activation of malfunction indicator light. <Ref. to EN(H4DOTC)(diag)-56, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.> |
| ↓ |
| 2. Malfunction indicator light does not come on. <Ref. to EN(H4DOTC)(diag)-57, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.> |
| ↓ |
| 3. Malfunction indicator light does not go off. <Ref. to EN(H4DOTC)(diag)-59, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF, Malfunction Indicator Light.> |
| ↓ |
| 4. Malfunction indicator light does not blink. <Ref. to EN(H4DOTC)(diag)-60, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK, Malfunction Indicator Light.> |
| ↓ |
| 5. Malfunction indicator light keep blinking. <Ref. to EN(H4DOTC)(diag)-62, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING, Malfunction Indicator Light.> |

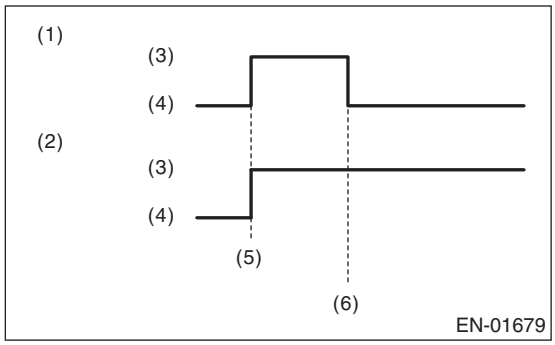
## B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

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

NOTE:
If the malfunction indicator light does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Ref. to EN(H4DOTC)(diag)-57, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>

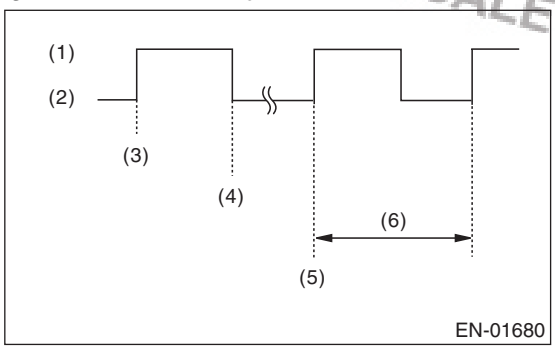



2) After starting the engine, the malfunction indicator light goes out. If it does not, either the engine or the emission control system has a problem.



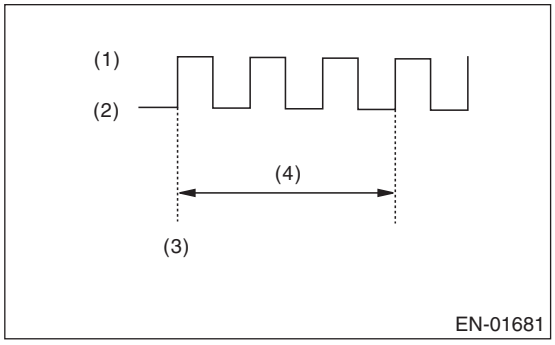

(1) No faulty
(2) Trouble occurs
(3) ON
(4) OFF
(5) Ignition switch ON
(6) Engine start

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




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

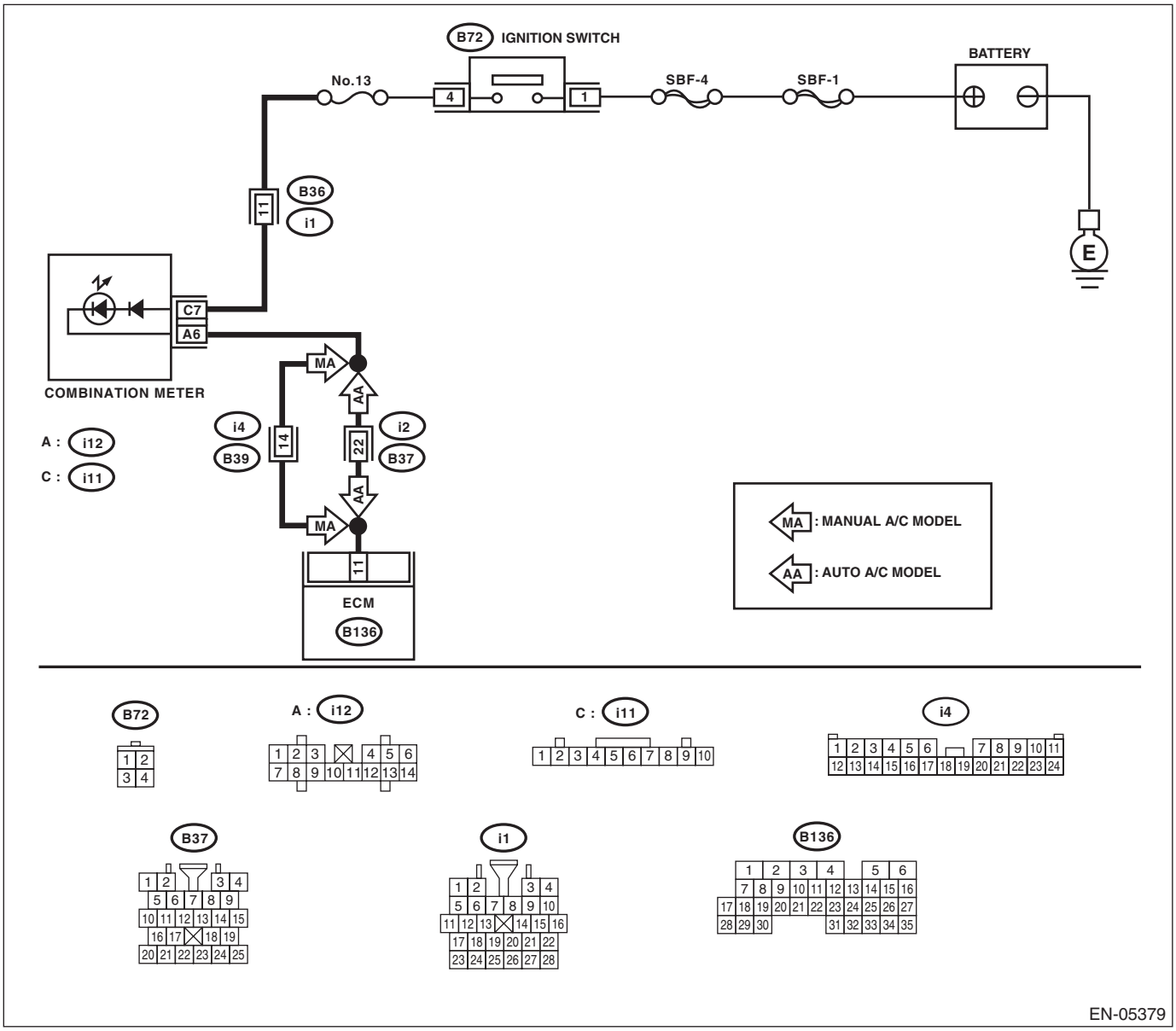
4) When the ignition switch is turned to ON (engine off) or to “START” with the test mode connector connected, the malfunction indicator light blinks at a cycle of 3 Hz.




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

## C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

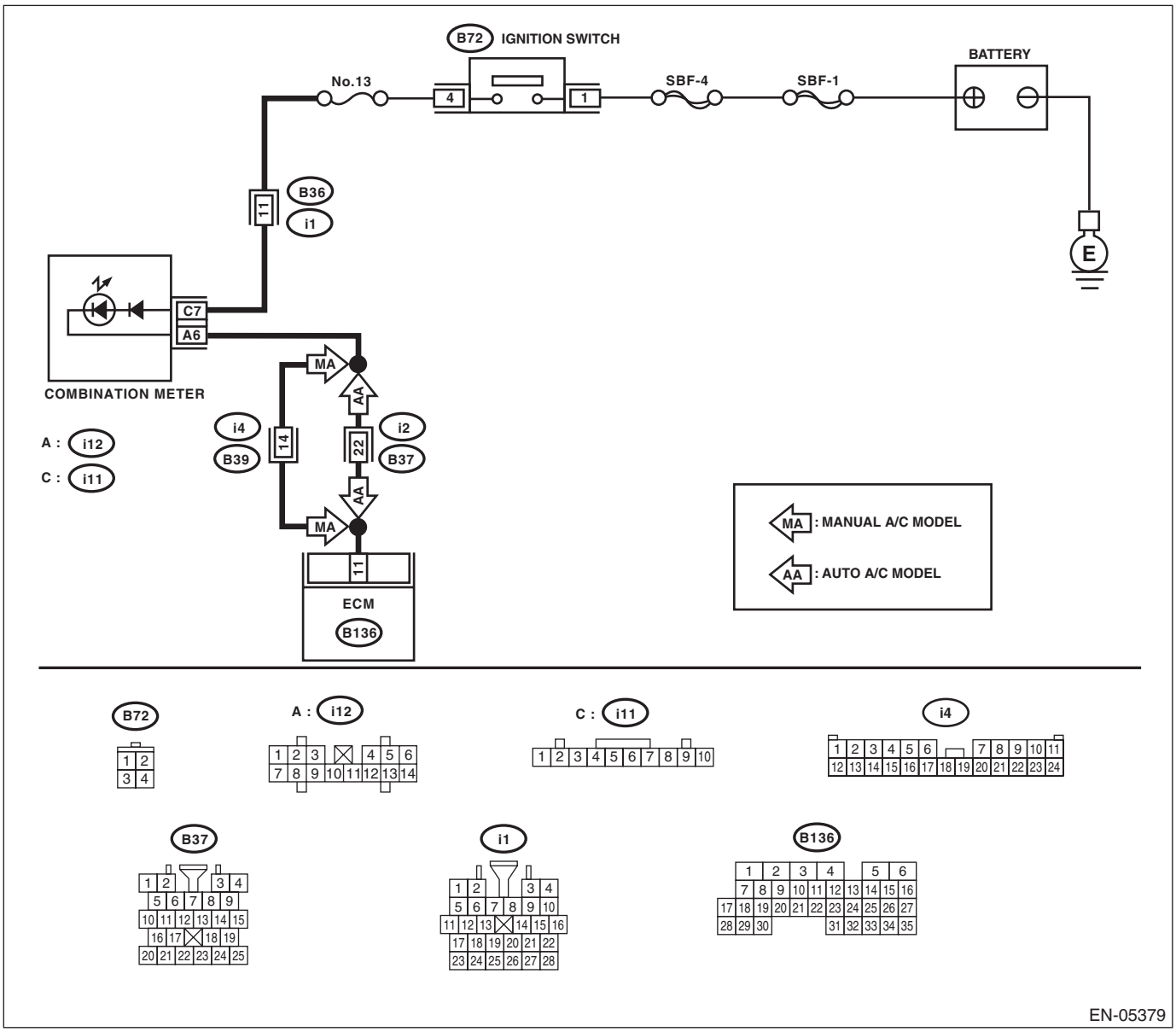
**DIAGNOSIS:**
The malfunction indicator light circuit is open or shorted.
**TROUBLE SYMPTOM:**
When the ignition switch is turned to ON (engine OFF), malfunction indicator light does not come on.
**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 11 (+) — Chassis ground (–):*** | Is the voltage less than 1 V? | Go to step **4**. | Go to step **2**. |
| 2 | **CHECK POOR CONTACT.** | Does the malfunction indicator light illuminate when shaking or pulling the ECM connector and harness? | Repair poor contact of the ECM connector. | Go to step **3**. |
| 3 | **CHECK ECM CONNECTOR.** | Is the ECM connector correctly connected? | Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> | Repair the connection of ECM connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the combination meter. <Ref. to IDI-11, Combination Meter.><br>3) Disconnect the connector from the ECM and combination meter.<br>4) Measure the resistance of harness between ECM and combination meter connector.<br>***Connector & terminal***<br>***(B136) No. 11 — (i12) No. 6:*** | 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 item:<br>• Open circuit of harness between ECM and combination meter connector<br>• Poor contact of coupling connector |
| 5 | **CHECK POOR CONTACT.**<br>Check poor contact of combination meter connector. | Is there poor contact in combination meter connector? | Repair the poor contact of combination meter connector. | Go to step **6**. |
| 6 | **CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between combination meter connector and chassis ground.<br>***Connector & terminal***<br>***(i11) No. 7 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Replace the combination meter circuit board. <Ref. to IDI-11, Combination Meter.> | Check the following item and repair if necessary.<br>NOTE:<br>• Blown out of fuse (No. 13)<br>• Open or short circuit of harness between fuse (No. 13) and battery terminal<br>• Poor contact of 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 illuminates when the engine runs, DTC is not shown on the Subaru Select Monitor or general scan tool display.
**WIRING DIAGRAM:**




| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Turn the ignition switch to ON. | Does the malfunction indicator light illuminate? | Repair the short circuit of harness between ECM and combination meter connector. | Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

## E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK

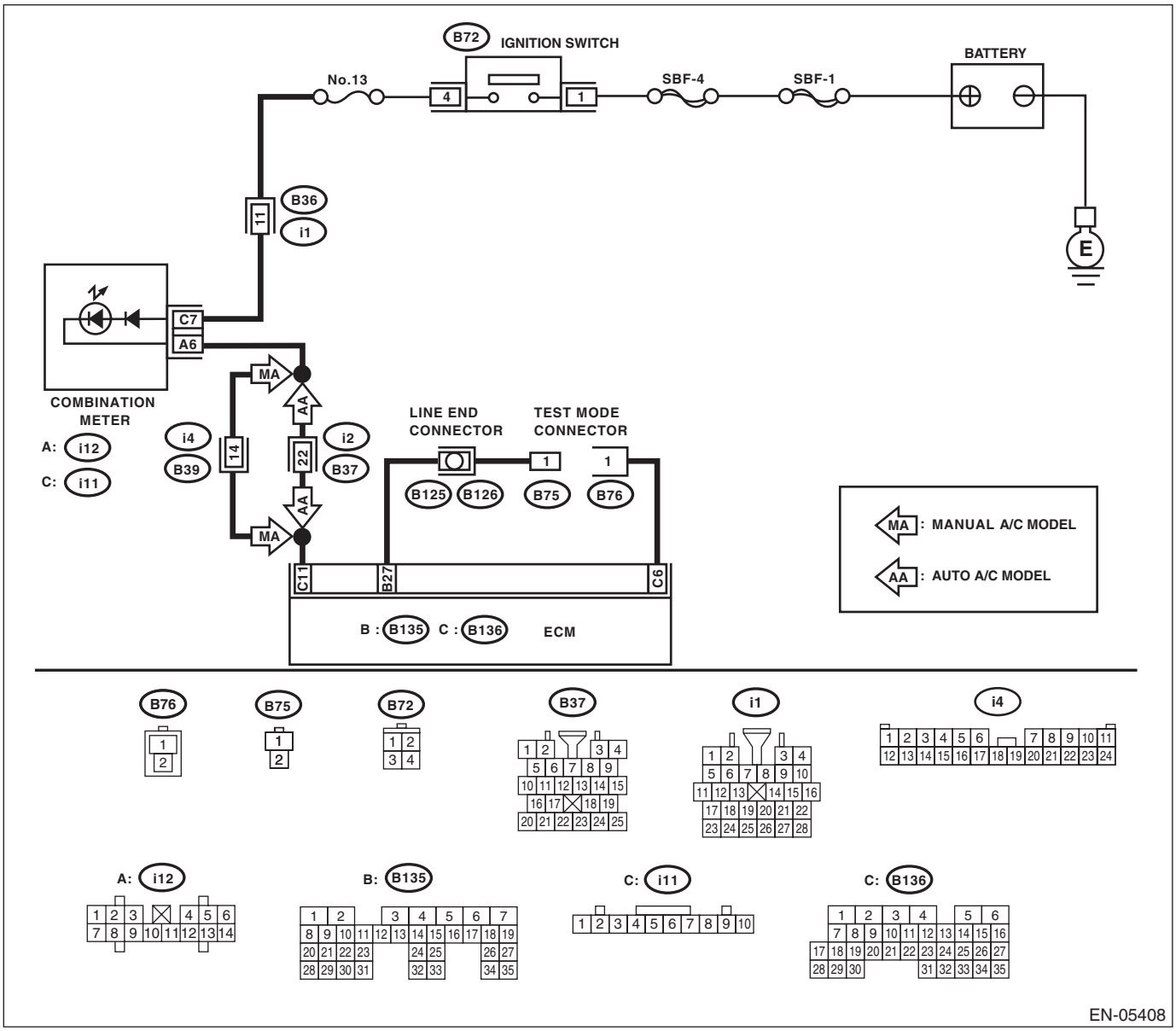
**DIAGNOSIS:**

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

**TROUBLE SYMPTOM:**

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

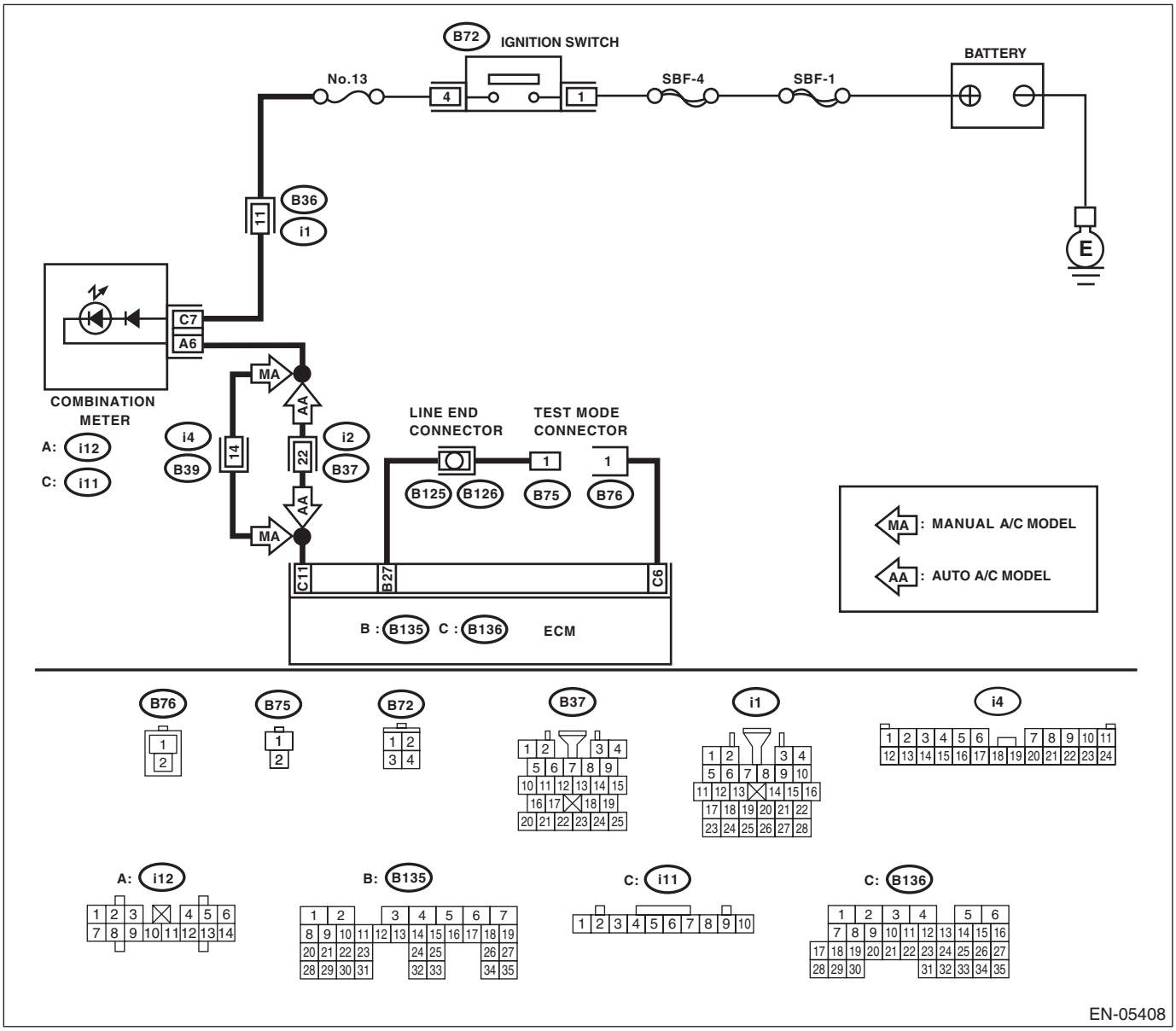
**WIRING DIAGRAM:**



| | 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 the malfunction indicator light illuminate? | Go to step **2**. | Repair the malfunction indicator light circuit. <Ref. to EN(H4DOTC)(diag)-57, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.> |
| 2 | **CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Turn the ignition switch to ON. | Does the malfunction indicator light illuminate? | Repair the ground short circuit of harness between ECM and combination meter connector. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of harness between ECM and test mode connector.<br>***Connector & terminal***<br>***(B76) No. 1 — (B136) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of harness between ECM and test mode connector. |
| 4 | **CHECK POOR CONTACT.**<br>Check for poor contact of the ECM connector. | Is there poor contact in ECM connector? | Repair poor contact of the ECM connector. | Go to step **5**. |
| 5 | **CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.**<br>Measure the resistance of harness between ECM and test mode connector.<br>***Connector & terminal***<br>***(B135) No. 27 — (B75) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **6**. | Repair the open circuit of harness between ECM and test mode connector. |
| 6 | **CHECK POOR CONTACT.**<br>Check for poor contact of the ECM connector. | Is there poor contact in ECM connector? | Repair poor contact of the ECM connector. | Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

## F: MALFUNCTION INDICATOR LIGHT REMAINS BLINKING

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



| | 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 normal.<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 ENGINE GROUND TERMINAL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 27 — Chassis ground:*** | Is the resistance less than 5 Ω? | Repair the short circuit of harness between ECM and test mode connector. | Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

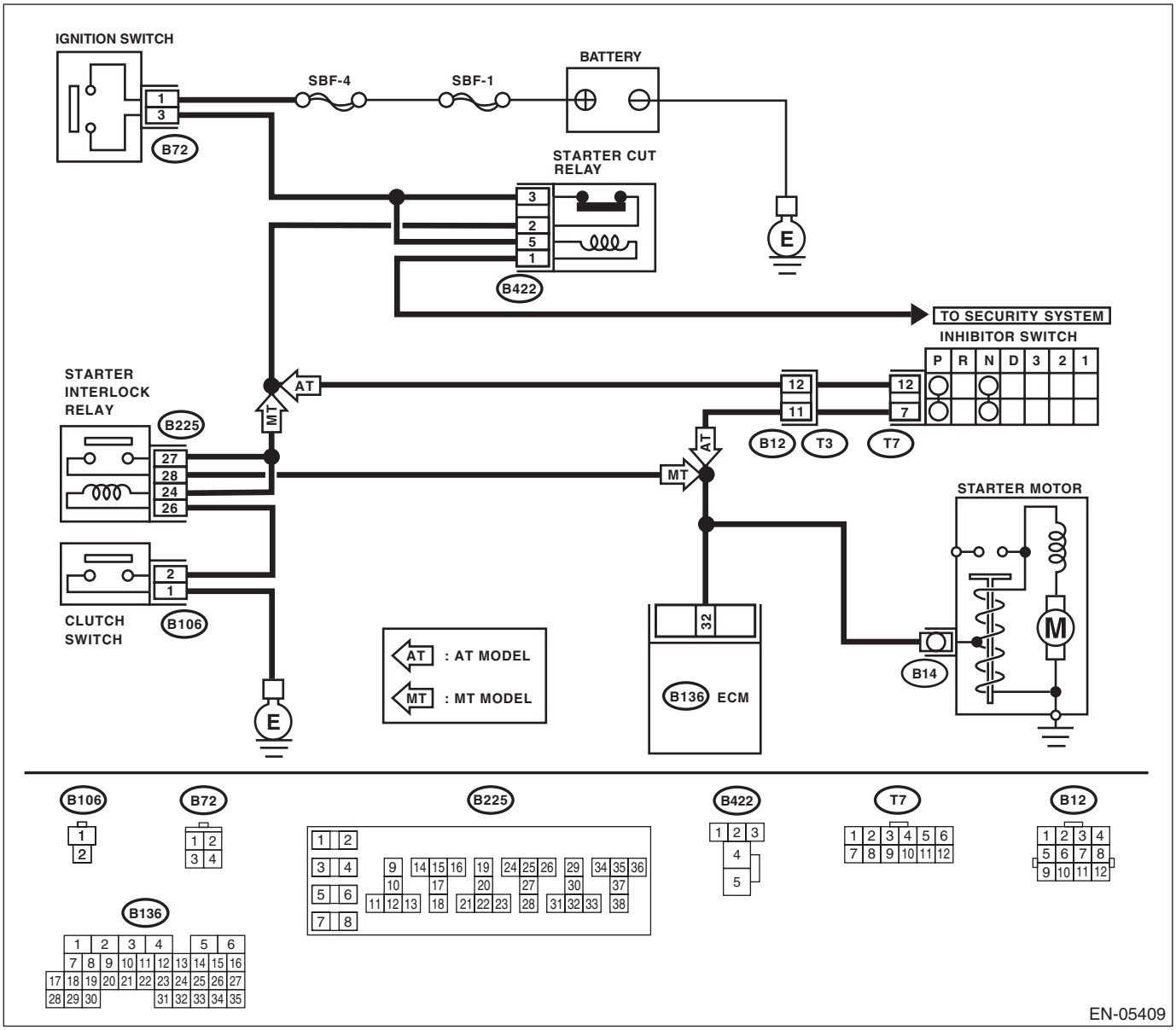
# 16.Diagnostics for Engine Starting Failure

## A: PROCEDURE

| |
|---|
| 1. Check for fuel amount. |
| ↓ |
| 2. Inspection of starter motor circuit. <Ref. to EN(H4DOTC)(diag)-65, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.> |
| ↓ |
| 3. Inspection of ECM power supply and ground line. <Ref. to EN(H4DOTC)(diag)-68, 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)-70, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.> |
| ↓ |
| 5. Inspection of fuel pump circuit. <Ref. to EN(H4DOTC)(diag)-73, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.> |
| ↓ |
| 6. Inspection of fuel injector circuit. <Ref. to EN(H4DOTC)(diag)-74, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.> |

## B: STARTER MOTOR CIRCUIT

**CAUTION:**
**After repairing or replacing the defective part, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**
**WIRING DIAGRAM:**

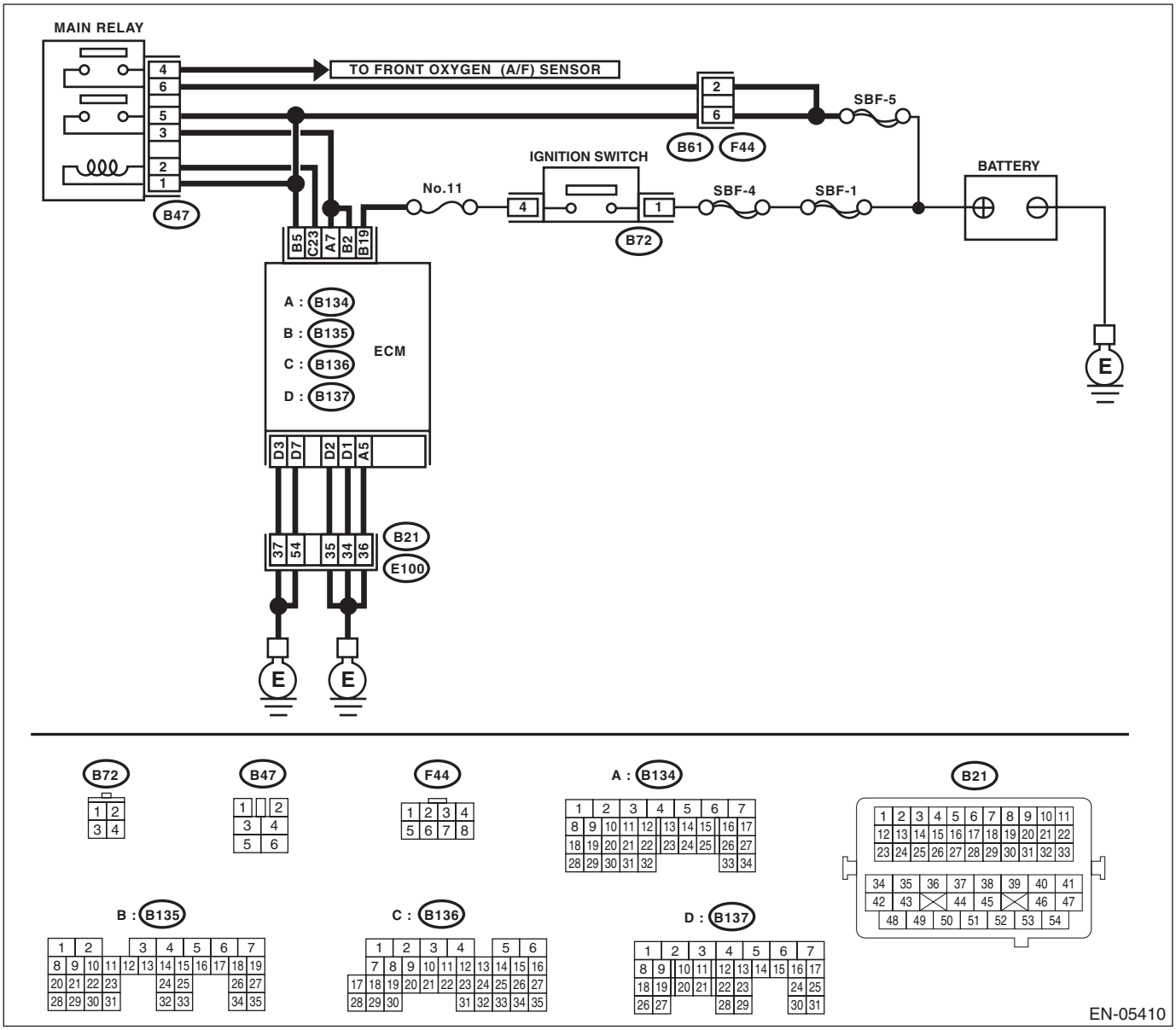


| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK BATTERY.**<br>Check the battery voltage. | Is the voltage 12 V or more? | Go to step **2**. | Charge or replace the battery. |
| 2 | **CHECK OPERATION OF STARTER MOTOR.** | Does the starter motor operate? | Go to step **3**. | Go to step **4**. |
| 3 | **CHECK DTC.** | Is DTC displayed?<br><Ref. to EN(H4DOTC)(diag)-42, OPERATION, Read Diagnostic Trouble Code (DTC).> | Check the appropriate DTC using the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Repair poor contact of the ECM connector. |
| 4 | **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>• For AT model, place the select lever in P or N range.<br>• For MT model, depress the clutch pedal. | Is the voltage 10 V or more? | Check the starter motor. <Ref. to SC(H4SO)-8, Starter.> | Go to step **5**. |
| 5 | **CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.**<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. 1 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **6**. | Check the following item and repair if necessary.<br>• Blown out of fuse<br>• Open circuit of 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 after turning the ignition switch to START position.<br>***Terminals***<br>***No. 1 — No. 3:*** | Is the resistance less than 5 Ω? | Go to step **7**. | Replace the ignition switch. <Ref. to SL-45, Ignition Key Lock.> |
| 7 | **CHECK TRANSMISSION TYPE.** | Is the transmission type AT? | Go to step **8**. | Go to step **10**. |
| 8 | **CHECK INPUT VOLTAGE OF INHIBITOR SWITCH.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from inhibitor switch.<br>3) Connect the connector to ignition switch.<br>4) Measure the input voltage between inhibitor switch connector and chassis ground after turning the ignition switch to START position.<br>***Connector & terminal***<br>***(B12) No. 12 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Go to step **9**. | Repair the open or ground short circuit of harness between inhibitor switch and ignition switch.<br>NOTE:<br>Check the security system. <Ref. to SL-21, Security System.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 9 | **CHECK INHIBITOR SWITCH.**<br>1) Place the select lever in "P" or "N" range.<br>2) Measure the resistance between inhibitor switch terminals.<br>***Connector & terminal***<br>***(T3) No. 11 — No. 12:*** | Is the resistance less than 1 Ω? | Repair the open or ground short circuit of harness between inhibitor switch and starter motor. | Replace the inhibitor switch. <Ref. to 4AT-46, Inhibitor Switch.> |
| 10 | **CHECK INPUT VOLTAGE OF STARTER INTERLOCK RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from starter interlock relay.<br>3) Connect the connector to ignition switch.<br>4) Measure the input voltage between starter interlock relay connector and chassis ground after turning the ignition switch to START position.<br>***Connector & terminal***<br>***(B225) No. 27 (+) — Chassis ground (–):***<br>***(B225) No. 24 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **11**. | Repair open or ground short circuit of harness between starter interlock relay and ignition switch.<br>NOTE:<br>Check the security system. <Ref. to SL-21, Security System.> |
| 11 | **CHECK STARTER INTERLOCK RELAY.**<br>1) Connect the battery to starter interlock relay terminals No. 26 and No. 24.<br>2) Measure the resistance between starter interlock relay terminals.<br>***Terminals***<br>***No. 27 — No. 28:*** | Is the resistance less than 1 Ω? | Go to step **12**. | Replace the starter interlock relay. |
| 12 | **CHECK GROUND CIRCUIT OF CLUTCH SWITCH.**<br>1) Disconnect the connector from clutch switch.<br>2) Measure the resistance between the clutch switch connector and chassis ground.<br>***Connector & terminal***<br>***(B106) No. 1 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **13**. | Repair the open circuit of ground cable. |
| 13 | **CHECK CLUTCH SWITCH.**<br>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-34, Clutch Switch.> |
| 14 | **CHECK CLUTCH SWITCH CIRCUIT.**<br>1) Connect the connector to the clutch switch.<br>2) Measure the resistance between starter interlock relay connector and chassis ground while depressing the clutch pedal.<br>***Connector & terminal***<br>***(B225) No. 26 — Chassis ground:*** | Is the resistance less than 1 Ω? | Repair the ground short of the harness between starter interlock relay and starter motor. | Repair the open circuit of harness between the starter interlock relay and the clutch switch. |

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

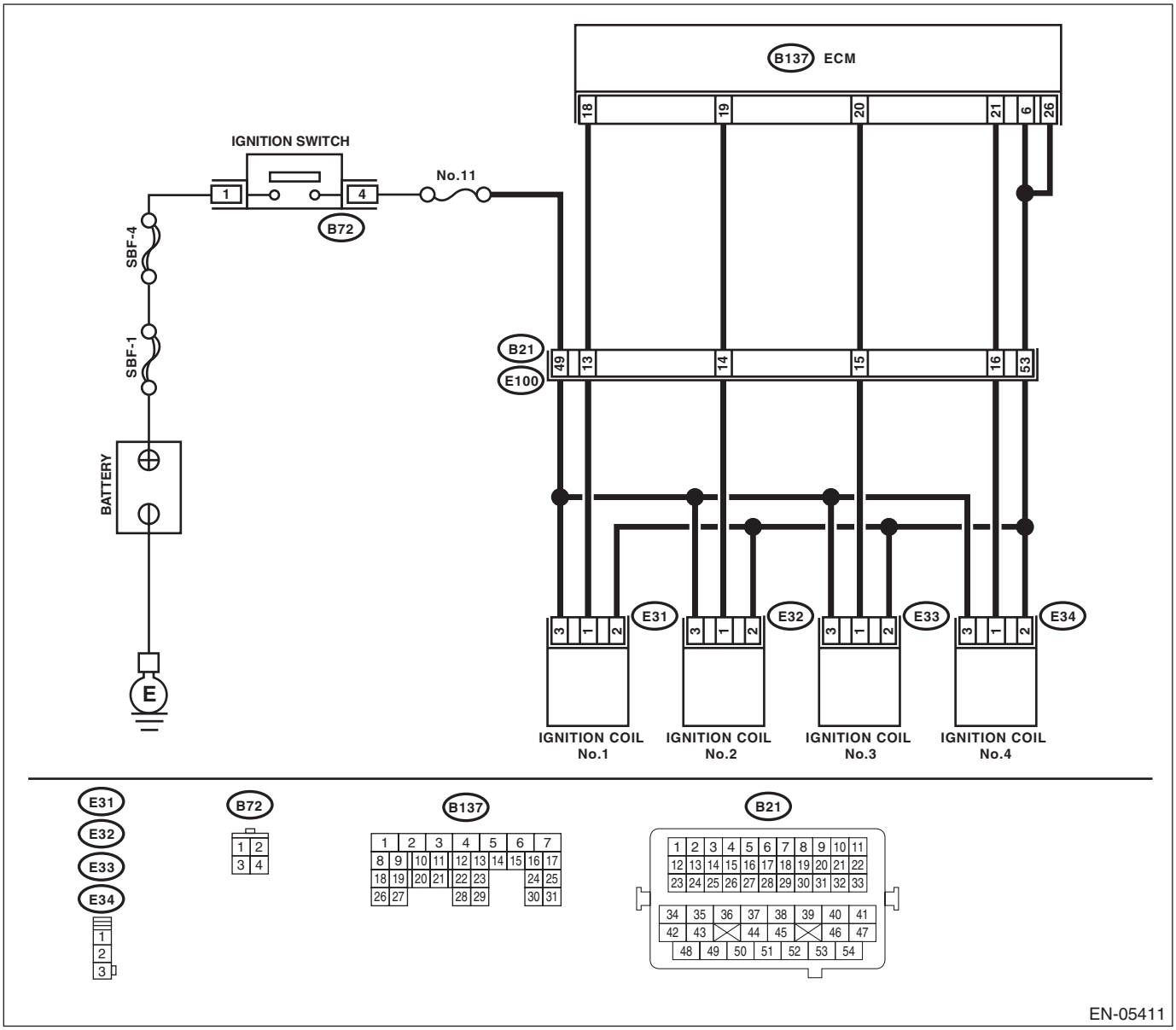
**CAUTION:**
**After repairing or replacing the defective part, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**
**WIRING DIAGRAM:**



| | 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 the 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. <Ref. to EN(H4DOTC)(diag)-8, Electrical Component Location.> |
| 2 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 5 — 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 of harness between the ECM and engine ground terminal. |
| 3 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 5 (+) — Chassis ground (–):***<br>***(B135) No. 19 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **4**. | Repair the open or ground short circuit of power supply circuit. |
| 4 | **CHECK INPUT VOLTAGE OF MAIN RELAY.**<br>Measure the voltage between main relay connector and chassis ground.<br>***Connector & terminal***<br>***(B47) No. 1 (+) — Chassis ground (–):***<br>***(B47) No. 5 (+) — Chassis ground (–):***<br>***(B47) No. 6 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **5**. | Repair the open or ground short circuit of harness of power supply circuit. |
| 5 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the main relay connector.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 7 (+) — Chassis ground (–):***<br>***(B135) No. 2 (+) — Chassis ground (–):***<br>***(B136) No. 23 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Check ignition control system. <Ref. to EN(H4DOTC)(diag)-70, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.> | Repair the open or ground short circuit of harness between ECM and main relay connector. |

## D: IGNITION CONTROL SYSTEM

**CAUTION:**
**After repairing or replacing the defective part, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**
**WIRING DIAGRAM:**

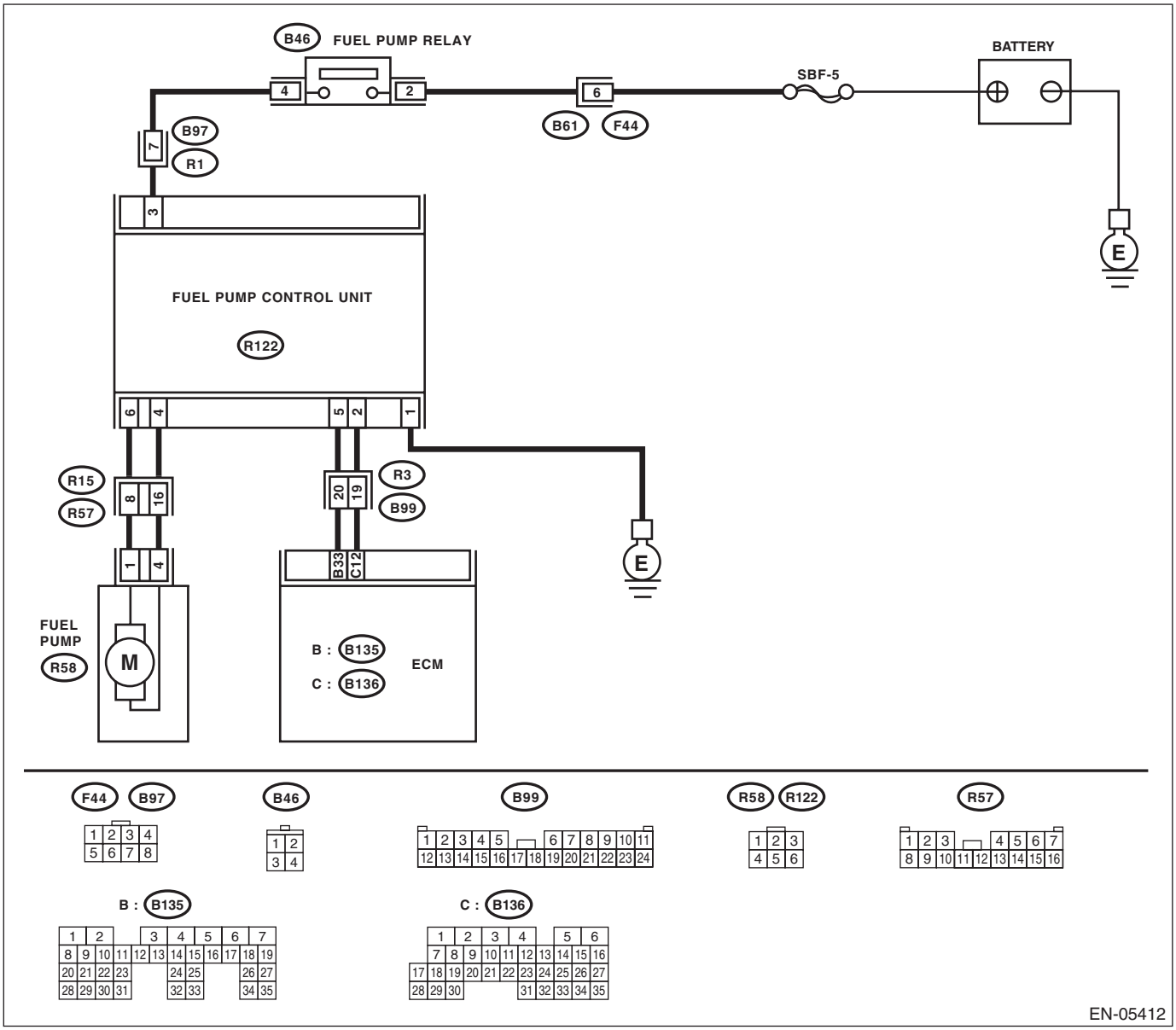


| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SPARK PLUG CONDITION.**<br>1) Remove the spark plug. <Ref. to IG(H4DOTC)-4, INSTALLATION, Spark Plug.><br>2) Check the spark plug condition. <Ref. to IG(H4DOTC)-5, INSPECTION, Spark Plug.> | Is the spark plug condition notmal? | Go to step **2**. | Replace the spark plug. <Ref. to IG(H4DOTC)-4, Spark Plug.> |
| 2 | **CHECK IGNITION SYSTEM FOR SPARKS.**<br>1) Connect the spark plug to ignition coil.<br>2) Release the fuel pressure. <Ref. to FU(H4DOTC)-55, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.><br>3) Contact the spark plug thread portion to engine.<br>4) While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder. | Does spark occur at each cylinder? | Check fuel pump system. <Ref. to EN(H4DOTC)(diag)-73, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.> | Go to step **3**. |
| 3 | **CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ignition coil.<br>3) Turn the ignition switch to ON.<br>4) Measure the power supply voltage between ignition coil 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 10 V or more? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ignition coil and ignition switch connector<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between the ignition coil connector and the 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 item:<br>• Open circuit of harness between the ignition coil connector and engine ground terminal |
| 5 | **CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.**<br>1) Disconnect the connectors from the ECM.<br>2) Disconnect the connector from ignition coil.<br>3) Measure the resistance of harness between the ECM and ignition coil connector.<br>***Connector & terminal***<br>***(B137) No. 18 — (E31) No. 1:***<br>***(B137) No. 19 — (E32) No. 1:***<br>***(B137) No. 20 — (E33) No. 1:***<br>***(B137) No. 21 — (E34) 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 item:<br>• Open circuit of harness between the ECM and ignition coil connector<br>• Poor contact of coupling connector |
| 6 | **CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.**<br>Measure the resistance of harness between ECM and engine ground.<br>***Connector & terminal***<br>***(B137) No. 18 — Engine ground:***<br>***(B137) No. 19 — Engine ground:***<br>***(B137) No. 20 — Engine ground:***<br>***(B137) No. 21 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **7**. | Repair the ground short circuit of harness between the ECM and ignition coil connector. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK POOR CONTACT.**<br>Check for poor contact of the ECM connector. | Is there poor contact in ECM connector? | Repair poor contact of the ECM connector. | Replace the ignition coil. <Ref. to IG(H4DOTC)-6, Ignition Coil.> |

## E: FUEL PUMP CIRCUIT

**CAUTION:**
**After repairing or replacing the defective part, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**
**WIRING DIAGRAM:**

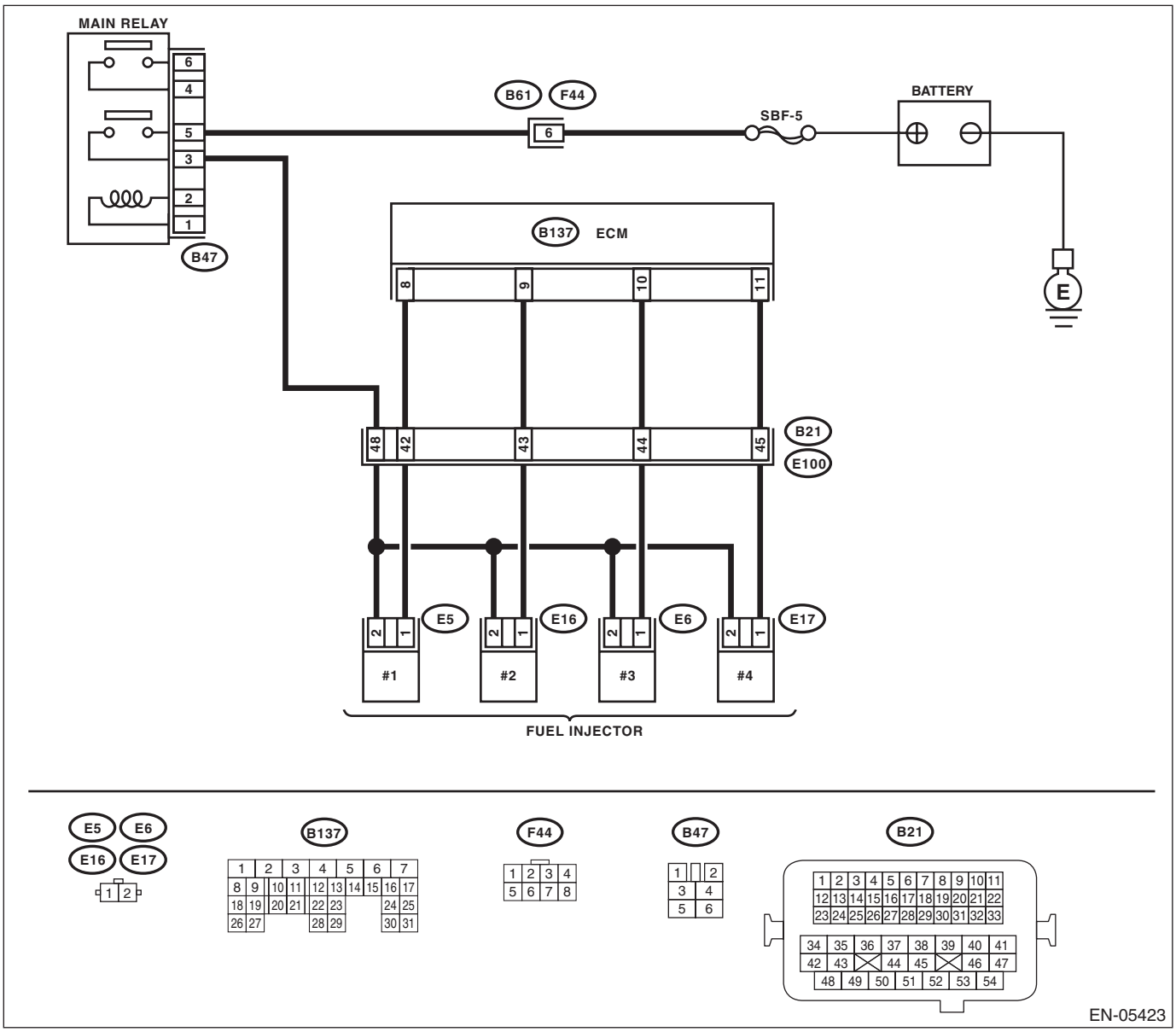



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATING SOUND OF FUEL PUMP.**<br>Make sure that the fuel pump operates for two seconds when turning the ignition switch to ON.<br>NOTE:<br>Fuel pump operation check can also be executed using Subaru Select Monitor.<br>Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the fuel pump emit operating sound? | Check the fuel injector circuit. <Ref. to EN(H4DOTC)(diag)-74, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.> | Display the DTC. <Ref. to EN(H4DOTC)(diag)-42, OPERATION, Read Diagnostic Trouble Code (DTC).> |

## F: FUEL INJECTOR CIRCUIT

**CAUTION:**
- **Check or repair only faulty parts.**
- **After repairing or replacing the defective part, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATION OF EACH FUEL INJECTOR.**<br>While cranking the engine, check each fuel injector emits operating sound. To perform this check, use a sound scope, or listen by placing a screw driver against the injector and the other end to your ear. | Does the fuel injector emit operating sound? | Check the fuel pressure. <Ref. to ME(H4DOTC)-31, 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 10 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between main relay and fuel injector connector<br>• Poor contact of main relay connector<br>• Poor contact of coupling connector<br>• Poor contact of fuel injector connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of harness between ECM and fuel injector connector.<br>***Connector & terminal***<br>***(B137) No. 8 — (E5) No. 1:***<br>***(B137) No. 9 — (E16) No. 1:***<br>***(B137) No. 10 — (E6) No. 1:***<br>***(B137) No. 11 — (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 item:<br>• Open circuit of harness between ECM and fuel injector connector<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.**<br>Measure the resistance of harness between ECM and fuel injector connector.<br>***Connector & terminal***<br>***(B137) No. 8 — Chassis ground:***<br>***(B137) No. 9 — Chassis ground:***<br>***(B137) No. 10 — Chassis ground:***<br>***(B137) No. 11 — Chassis ground:*** | Is the resistance less than 1 Ω? | Repair the ground short circuit of harness between ECM and fuel injector connector. | Go to step **5**. |
| 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 between 5 — 20 Ω? | Go to step **6**. | Replace the faulty fuel injector. <Ref. to FU(H4DOTC)-37, Fuel Injector.> |
| 6 | **CHECK POOR CONTACT.**<br>Check for poor contact of the ECM connector. | Is there poor contact in ECM connector? | Repair poor contact of the ECM connector. | Inspection using “General Diagnostic Table”. <Ref. to EN(H4DOTC)(diag)-378, INSPECTION, General Diagnostic Table.> |

# 17.List of Diagnostic Trouble Code (DTC)

## A: LIST

| DTC | Item | Reference |
|---|---|---|
| P0011 | Intake Camshaft Position - Timing Over-Advanced or System Performance (Bank 1) | <Ref. to EN(H4DOTC)(diag)-83, DTC P0011 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0016 | Crankshaft Position - Camshaft Position Correlation (Bank 1) | <Ref. to EN(H4DOTC)(diag)-84, DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0018 | Crankshaft Position - Camshaft Position Correlation (Bank 2) | <Ref. to EN(H4DOTC)(diag)-85, DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0021 | Intake Camshaft Position - Timing Over-Advanced or System Performance (Bank 2) | <Ref. to EN(H4DOTC)(diag)-86, DTC P0021 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0030 | HO2S Heater Control Circuit (Bank 1 Sensor 1) | <Ref. to EN(H4DOTC)(diag)-87, 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)-89, 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)-91, 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)-93, 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)-95, 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)-97, 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)-99, 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)-101, 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)-103, 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)-105, 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)-107, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/ BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0111 | Intake Air Temperature Sensor 1 Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-109, DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0112 | Intake Air Temperature Sensor 1 Circuit Low | <Ref. to EN(H4DOTC)(diag)-111, DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0113 | Intake Air Temperature Sensor 1 Circuit High | <Ref. to EN(H4DOTC)(diag)-113, DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0117 | Engine Coolant Temperature Circuit Low | <Ref. to EN(H4DOTC)(diag)-115, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0118 | Engine Coolant Temperature Circuit High | <Ref. to EN(H4DOTC)(diag)-117, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0122 | Throttle/Pedal Position Sensor/ Switch “A” Circuit Low | <Ref. to EN(H4DOTC)(diag)-119, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/ SWITCH “A” CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0123 | Throttle/Pedal Position Sensor/ Switch “A” Circuit High | <Ref. to EN(H4DOTC)(diag)-121, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Reference |
|---|---|---|
| P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control | <Ref. to EN(H4DOTC)(diag)-123, DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0126 | Insufficient Engine Coolant Temperature for Stable Operation | <Ref. to EN(H4DOTC)(diag)-124, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0128 | Coolant Thermostat (Engine Coolant Temperature Below Thermostat Regulating Temperature) | <Ref. to EN(H4DOTC)(diag)-126, 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)-127, 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)-129, 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)-131, 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)-133, 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)-135, 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)-139, DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0140 | O2 Sensor Circuit No Activity Detected (Bank1 Sensor2) | <Ref. to EN(H4DOTC)(diag)-141, DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0171 | System Too Lean (Bank 1) | <Ref. to EN(H4DOTC)(diag)-143, 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)-144, 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)-146, 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)-148, 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)-150, 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 | <Ref. to EN(H4DOTC)(diag)-152, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0223 | Throttle/Pedal Position Sensor/Switch “B” Circuit High | <Ref. to EN(H4DOTC)(diag)-154, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| 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).> |

| DTC | Item | Reference |
|---|---|---|
| P0301 | Cylinder 1 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-164, DTC P0301 CYLINDER 1 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0302 | Cylinder 2 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-164, DTC P0302 CYLINDER 2 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0303 | Cylinder 3 Misfire Detected | <Ref. to EN(H4DOTC)(diag)-164, 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 (Bank 1 or Single Sensor) | <Ref. to EN(H4DOTC)(diag)-171, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0328 | Knock Sensor 1 Circuit High (Bank 1 or Single Sensor) | <Ref. to EN(H4DOTC)(diag)-173, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0335 | Crankshaft Position Sensor “A” Circuit | <Ref. to EN(H4DOTC)(diag)-175, DTC P0335 CRANKSHAFT POSITION SENSOR “A” CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0336 | Crankshaft Position Sensor “A” Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-177, DTC P0336 CRANKSHAFT POSITION SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0340 | Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor) | <Ref. to EN(H4DOTC)(diag)-179, 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)-181, DTC P0345 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0410 | Secondary Air Injection System | <Ref. to EN(H4DOTC)(diag)-183, DTC P0410 SECONDARY AIR INJECTION SYSTEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0411 | Secondary Air Injection System Incorrect Flow Detected | <Ref. to EN(H4DOTC)(diag)-187, DTC P0411 SECONDARY AIR INJECTION SYSTEM INCORRECT FLOW DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0413 | Secondary Air Injection System Switching Valve “A” Circuit Open | <Ref. to EN(H4DOTC)(diag)-190, DTC P0413 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT OPEN, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0414 | Secondary Air Injection System Switching Valve “A” Circuit Shorted | <Ref. to EN(H4DOTC)(diag)-193, DTC P0414 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0416 | Secondary Air Injection System Control “A” Circuit | <Ref. to EN(H4DOTC)(diag)-196, DTC P0416 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT OPEN, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0417 | Secondary Air Injection System Switching Valve “B” Circuit Shorted | <Ref. to EN(H4DOTC)(diag)-199, DTC P0417 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0418 | Secondary Air Injection System Control “A” Circuit Open | <Ref. to EN(H4DOTC)(diag)-202, DTC P0418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0420 | Catalyst System Efficiency Below Threshold (Bank 1) | <Ref. to EN(H4DOTC)(diag)-205, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0441 | Evaporative Emission System Incorrect Purge Flow | <Ref. to EN(H4DOTC)(diag)-209, DTC P0441 EVAPORATIVE EMISSION SYSTEM INCORRECT PURGE FLOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0442 | Evaporative Emission Control System Leak Detected (Small Leak) | <Ref. to EN(H4DOTC)(diag)-210, 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)-213, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Reference |
|---|---|---|
| P0448 | Evaporative Emission Control System Vent Control Circuit Shorted | <Ref. to EN(H4DOTC)(diag)-215, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0451 | Evaporative Emission Control System Pressure Sensor | <Ref. to EN(H4DOTC)(diag)-217, 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)-219, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0453 | Evaporative Emission Control System Pressure Sensor High Input | <Ref. to EN(H4DOTC)(diag)-221, 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)-223, 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)-226, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0458 | Evaporative Emission System Purge Control Valve Circuit Low | <Ref. to EN(H4DOTC)(diag)-229, DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0459 | Evaporative Emission System Purge Control Valve Circuit High | <Ref. to EN(H4DOTC)(diag)-231, DTC P0459 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0461 | Fuel Level Sensor “A” Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-233, DTC P0461 FUEL LEVEL SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0462 | Fuel Level Sensor “A” Circuit Low | <Ref. to EN(H4DOTC)(diag)-234, DTC P0462 FUEL LEVEL SENSOR “A” CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0463 | Fuel Level Sensor “A” Circuit High | <Ref. to EN(H4DOTC)(diag)-237, DTC P0463 FUEL LEVEL SENSOR “A” CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0464 | Fuel Level Sensor Circuit Intermittent | <Ref. to EN(H4DOTC)(diag)-240, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0483 | Fan Rationality Check | <Ref. to EN(H4DOTC)(diag)-242, DTC P0483 FAN RATIONALITY CHECK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0502 | Vehicle Speed Sensor “A” Circuit Low Input | <Ref. to EN(H4DOTC)(diag)-242, DTC P0502 VEHICLE SPEED SENSOR “A” CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0503 | Vehicle Speed Sensor “A” Intermittent/ Erratic/High | <Ref. to EN(H4DOTC)(diag)-243, DTC P0503 VEHICLE SPEED SENSOR “A” INTERMITTENT/ERRATIC/HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0506 | Idle Air Control System RPM Lower Than Expected | <Ref. to EN(H4DOTC)(diag)-245, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0507 | Idle Air Control System RPM Higher Than Expected | <Ref. to EN(H4DOTC)(diag)-247, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0512 | Starter Request Circuit | <Ref. to EN(H4DOTC)(diag)-249, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0513 | Incorrect Immobilizer Key | <Ref. to IM(diag)-19, DTC P0513 INCORRECT IMMOBILIZER KEY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0519 | Idle Air Control System Performance | <Ref. to EN(H4DOTC)(diag)-251, DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0600 | Serial Communication Link | <Ref. to EN(H4DOTC)(diag)-252, 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)-254, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0605 | Internal Control Module Read Only Memory (ROM) Error | <Ref. to EN(H4DOTC)(diag)-255, DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

# List of Diagnostic Trouble Code (DTC)



| DTC | Item | Reference |
|---|---|---|
| P0607 | Control Module Performance | <Ref. to EN(H4DOTC)(diag)-256, 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)-257, DTC P0638 THROTTLE ACTUATOR CONTROL RANGE/PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0691 | Fan 1 Control Circuit Low | <Ref. to EN(H4DOTC)(diag)-258, DTC P0691 FAN 1 CONTROL CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0692 | Fan 1 Control Circuit High | <Ref. to EN(H4DOTC)(diag)-258, DTC P0692 FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0700 | Transmission Control System (MIL Request) | <Ref. to EN(H4DOTC)(diag)-258, DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0851 | Park/NeutralL Switch Input Circuit Low (AT Model) | <Ref. to EN(H4DOTC)(diag)-259, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0851 | Neutral Switch Input Circuit Low (MT Model) | <Ref. to EN(H4DOTC)(diag)-261, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0852 | Park/Neutral Switch Input Circuit High (AT Model) | <Ref. to EN(H4DOTC)(diag)-263, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0852 | Park/Neutral Switch Input Circuit High (MT Model) | <Ref. to EN(H4DOTC)(diag)-265, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1152 | O2 Sensor Circuit Range/Performance (Low) (Bank1 Sensor1) | <Ref. to EN(H4DOTC)(diag)-267, DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1153 | O2 Sensor Circuit Range/Performance (High) (Bank1 Sensor1) | <Ref. to EN(H4DOTC)(diag)-269, DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1160 | Return Spring Failure | <Ref. to EN(H4DOTC)(diag)-270, DTC P1160 RETURN SPRING FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1400 | Fuel Tank Pressure Control Solenoid Valve Circuit Low | <Ref. to EN(H4DOTC)(diag)-271, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1410 | Secondary Air Injection System Switching Valve Stuck Open | <Ref. to EN(H4DOTC)(diag)-273, DTC P1410 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1418 | Secondary Air Injection System Control “A” Circuit Shorted | <Ref. to EN(H4DOTC)(diag)-276, DTC P1418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT SHORTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1420 | Fuel Tank Pressure Control Sol. Valve Circuit High | <Ref. to EN(H4DOTC)(diag)-279, 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)-281, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1491 | Positive Crankcase Ventilation (Blow-by) Function Problem | <Ref. to EN(H4DOTC)(diag)-283, 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)-285, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1560 | Back-up Voltage Circuit Malfunction | <Ref. to EN(H4DOTC)(diag)-287, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1570 | Antenna | <Ref. to IM(diag)-20, DTC P1570 ANTENNA, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1571 | Reference Code Incompatibility | <Ref. to IM(diag)-15, DTC P1571 REFERENCE CODE INCOMPATIBILITY, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1572 | IMM Circuit Failure (Except Antenna Circuit) | <Ref. to IM(diag)-16, DTC P1572 IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1574 | Key Communication Failure | <Ref. to IM(diag)-18, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Reference |
|---|---|---|
| P1576 | EGI Control Module EEPROM | <Ref. to IM(diag)-19, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1577 | IMM Control Module EEPROM | <Ref. to IM(diag)-19, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P1602 | Control Module Programming Error | <Ref. to EN(H4DOTC)(diag)-289, DTC P1602 CONTROL MODULE PROGRAMMING ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2004 | Intake Manifold Runner Control Stuck Open (Bank 1) | <Ref. to EN(H4DOTC)(diag)-298, 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)-298, 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)-299, 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)-299, 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)-300, 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)-302, 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)-304, 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)-306, 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)-308, 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)-310, 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)-312, 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)-314, DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2088 | Intake Camshaft Position Actuator Control Circuit Low (Bank 1) | <Ref. to EN(H4DOTC)(diag)-316, DTC P2088 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT LOW (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2089 | Intake Camshaft Position Actuator Control Circuit High (Bank 1) | <Ref. to EN(H4DOTC)(diag)-318, DTC P2089 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2092 | Intake Camshaft Position Actuator Control Circuit Low (Bank 2) | <Ref. to EN(H4DOTC)(diag)-320, DTC P2092 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT LOW (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2093 | Intake Camshaft Position Actuator Control Circuit High (Bank 2) | <Ref. to EN(H4DOTC)(diag)-322, DTC P2093 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | <Ref. to EN(H4DOTC)(diag)-323, 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)-324, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| DTC | Item | Reference |
|---|---|---|
| P2101 | Throttle Actuator Control Motor Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-330, 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)-335, 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)-337, 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)-338, 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)-339, 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)-341, 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)-343, 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)-345, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH “E” CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2135 | Throttle/Pedal Position Sensor/ Switch “A”/“B” Voltage Correlation | <Ref. to EN(H4DOTC)(diag)-347, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A”/“B” VOLTAGE CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2138 | Throttle/Pedal Position Sensor/ Switch “D”/“E” Voltage Correlation | <Ref. to EN(H4DOTC)(diag)-350, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH “D”/“E” VOLTAGE CORRELATION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2419 | Evaporative Emission System Switching Valve Control Circuit Low | <Ref. to EN(H4DOTC)(diag)-352, DTC P2419 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2420 | Evaporative Emission System Switching Valve Control Circuit High | <Ref. to EN(H4DOTC)(diag)-354, DTC P2420 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2431 | Secondary Air Injection System Air Flow /Pressure Sensor Circuit Range/Performance | <Ref. to EN(H4DOTC)(diag)-356, DTC P2431 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2432 | Secondary Air Injection System Air Flow /Pressure Sensor Circuit Low | <Ref. to EN(H4DOTC)(diag)-359, DTC P2432 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2433 | Secondary Air Injection System Air Flow /Pressure Sensor Circuit High | <Ref. to EN(H4DOTC)(diag)-362, DTC P2433 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2440 | Secondary Air Injection System Switching Valve Stuck Open (Bank1) | <Ref. to EN(H4DOTC)(diag)-365, DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2441 | Secondary Air Injection System Switching Valve Stuck Closed (Bank1) | <Ref. to EN(H4DOTC)(diag)-369, DTC P2441 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK CLOSED (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2442 | Secondary Air Injection System Switching Valve Stuck Open (Bank2) | <Ref. to EN(H4DOTC)(diag)-370, DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2443 | Secondary Air Injection System Switching Valve Stuck Closed (Bank2) | <Ref. to EN(H4DOTC)(diag)-374, DTC P2443 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK CLOSED (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P2444 | Secondary Air Injection System Pump Stuck On | <Ref. to EN(H4DOTC)(diag)-375, DTC P2444 SECONDARY AIR INJECTION SYSTEM PUMP STUCK ON, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

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

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

**DTC DETECTING CONDITION:**

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

**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine and let it idle.<br>2) Measure the AVCS system operating angle using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the AVCS system operating angle approx. 0°? | Go to step **2**. | Check the following item and repair or replace if necessary.<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring)<br>• Intake camshaft (dirt, damage of camshaft) |
| 2 | **CHECK CURRENT DATA.**<br>1) Drive (accelerate or decelerate) the vehicle at 80 km/h (50 MPH) or less.<br>NOTE:<br>Drive the vehicle so that duty output of the oil flow control solenoid valve increases.<br>2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | When the oil flow control solenoid valve duty output exceeds 10%, is the AVCS system operating angle approx. 0°? | Check the following item and repair or replace if necessary.<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring)<br>• Intake camshaft (dirt, damage of camshaft) | Perform the following procedures, and clean the oil routing.<br>Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil.<br><Ref. to LU(H4DOTC)-10, REPLACEMENT, Engine Oil.> <Ref. to LU(H4DOTC)-25, Engine Oil Filter.> |

## B: DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK 1)

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-11, DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine and let it idle.<br>2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the AVCS system operating angle approx. 0°, and oil flow control solenoid valve duty output approx. 10%? | Perform the following procedures, and clean the oil routing.<br>Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil. <Ref. to LU(H4DOTC)-10, REPLACEMENT, Engine Oil.> <Ref. to LU(H4DOTC)-25, Engine Oil Filter.> | Check the following item and repair or replace if necessary.<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring)<br>• Intake camshaft (dirt, damage of camshaft)<br>• Timing belt (matching of timing mark) |

## C: DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK2)

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-11, DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine and let it idle.<br>2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the AVCS system operating angle approx. 0°, and oil flow control solenoid valve duty output approx. 10%? | Perform the following procedures, and clean the oil routing.<br>Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil. <Ref. to LU(H4DOTC)-10, REPLACEMENT, Engine Oil.> <Ref. to LU(H4DOTC)-25, Engine Oil Filter.> | Check the following item and repair or replace if necessary.<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring)<br>• Intake camshaft (dirt, damage of camshaft)<br>• Timing belt (matching of timing mark) |

## D: DTC P0021 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 2)

**DTC DETECTING CONDITION:**

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

**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine and let it idle.<br>2) Measure the AVCS system operating angle using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the AVCS system operating angle approx. 0°? | Go to step **2**. | Check the following item and repair or replace if necessary.<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring)<br>• Intake camshaft (dirt, damage of camshaft) |
| 2 | **CHECK CURRENT DATA.**<br>1) Drive (accelerate or decelerate) the vehicle at 80 km/h (50 MPH) or less.<br>NOTE:<br>Drive the vehicle so that duty output of the oil flow control solenoid valve increases.<br>2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | When the oil flow control solenoid valve duty output exceeds 10%, is the AVCS system operating angle approx. 0°? | Check the following item and repair or replace if necessary.<br>• Oil pipe (clog)<br>• Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring)<br>• Intake camshaft (dirt, damage of camshaft) | Perform the following procedures, and clean the oil routing.<br>Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil.<br><Ref. to LU(H4DOTC)-10, REPLACEMENT, Engine Oil.> <Ref. to LU(H4DOTC)-25, Engine Oil Filter.> |

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

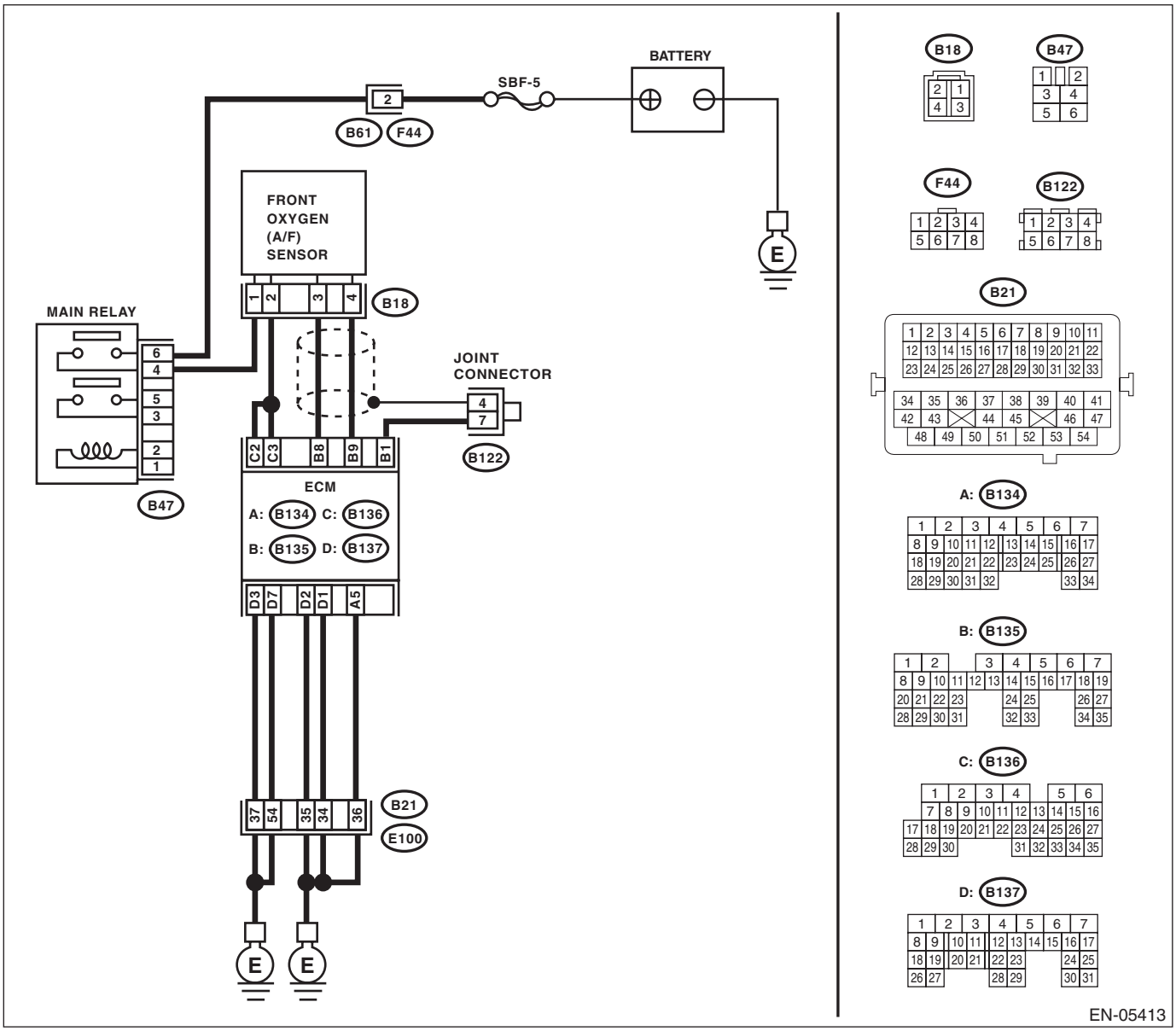
**DTC DETECTING CONDITION:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Start and warm-up the engine.<br>2) Turn the ignition switch to OFF.<br>3) Disconnect the connectors from the 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>***(B136) No. 3 — (B18) No. 2:***<br>***(B136) No. 2 — (B18) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of 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>***(B135) No. 9 — (B18) No. 4:***<br>***(B135) No. 8 — (B18) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector. |
| 3 | **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 **4**. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |
| 4 | **CHECK POOR CONTACT.**<br>Check poor contact of ECM and front oxygen (A/F) sensor connector. | Is there poor contact in ECM or front oxygen (A/F) sensor connector? | Repair the poor contact of ECM or front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |

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

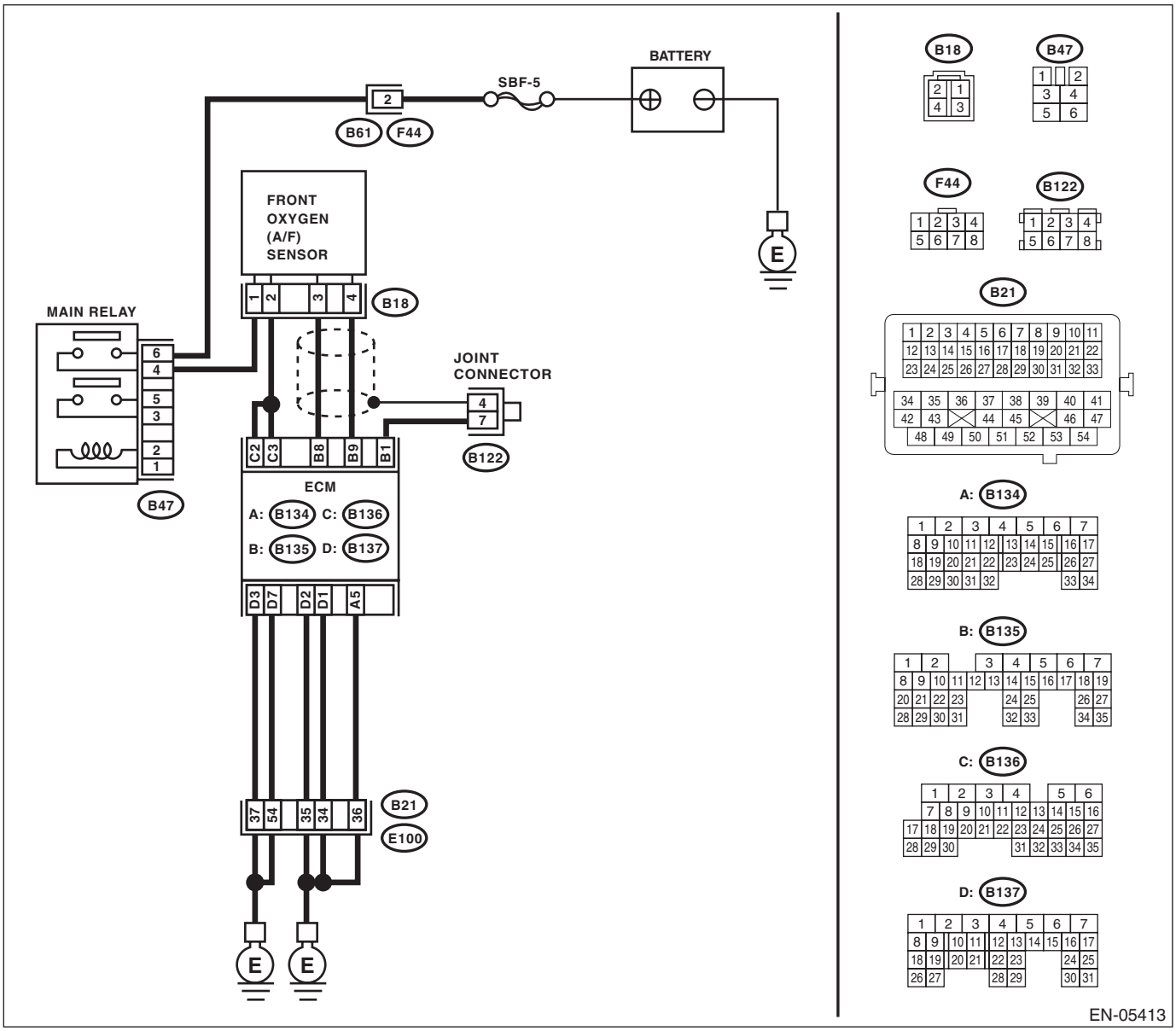
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- 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 repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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. 1 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Go to step **2**. | Repair the power supply line.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between main relay and front oxygen (A/F) sensor connector<br>• Poor contact in front oxygen (A/F) sensor connector<br>• Poor contact of main relay connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM and front oxygen (A/F) sensor connector.<br>***Connector & terminal***<br>***(B136) No. 3 — (B18) No. 2:***<br>***(B136) No. 2 — (B18) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between ECM and front oxygen (A/F) sensor. |
| 3 | **CHECK GROUND CIRCUIT FOR ECM.**<br>Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 5 — 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 **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling 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 between 2 — 3 Ω? | Repair poor contact of the ECM connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |

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

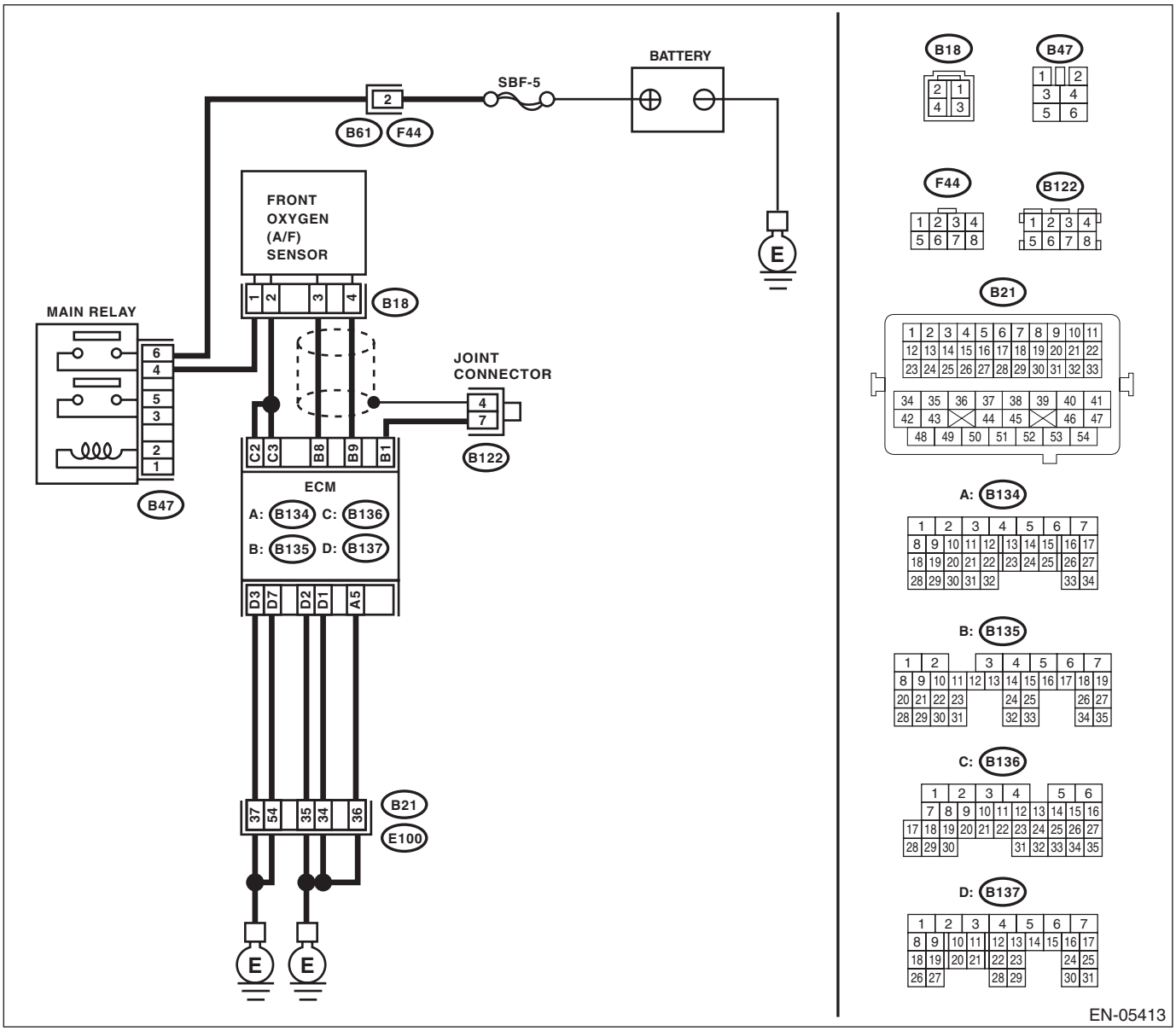
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- 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 repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 3 (+) — Chassis ground (–):***<br>***(B136) No. 2 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. | Go to step **2**. |
| 2 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 5 — 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? | Repair poor contact of the ECM connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |

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

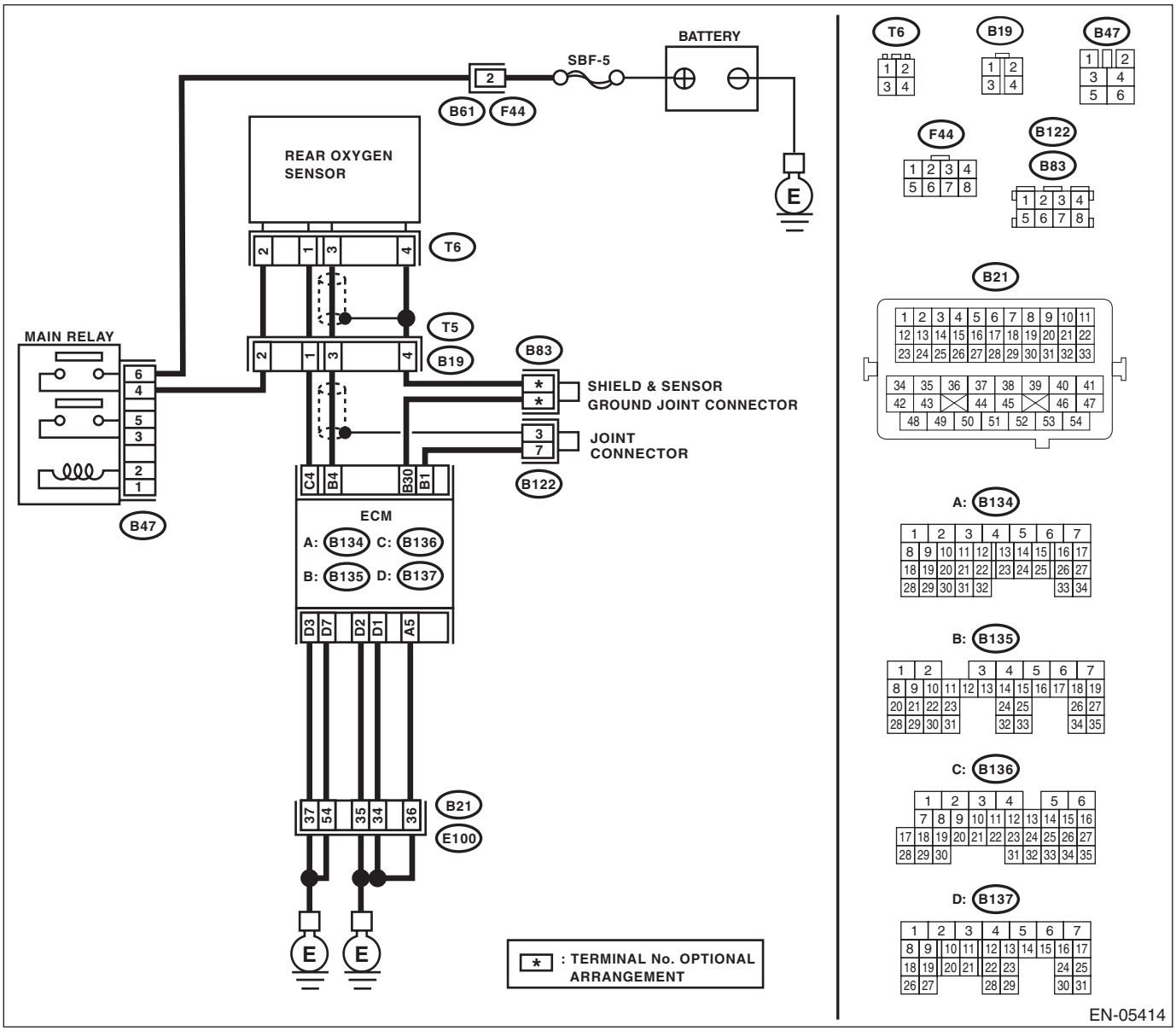
**DTC DETECTING CONDITION:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between rear oxygen sensor connector and engine ground.<br>***Connector & terminal***<br>***(T6) No. 2 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Go to step **2**. | Repair the power supply line.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between main relay and rear oxygen sensor<br>• Poor contact of the rear oxygen sensor<br>• Poor contact of main relay connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM and oxygen sensor connector.<br>***Connector & terminal***<br>***(B136) No. 4 — (T6) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of the harness between ECM and rear oxygen sensor. |
| 3 | **CHECK GROUND CIRCUIT FOR ECM.**<br>Measure the resistance of harness between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 30 — Chassis ground:***<br>***(B134) No. 5 — 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 **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 4 | **CHECK REAR OXYGEN SENSOR.**<br>Measure the resistance between rear oxygen sensor connector terminals.<br>***Terminals***<br>***No. 2 — No. 1:*** | Is the resistance between 5 — 7 Ω? | Repair poor contact of the ECM connector. | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> |

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

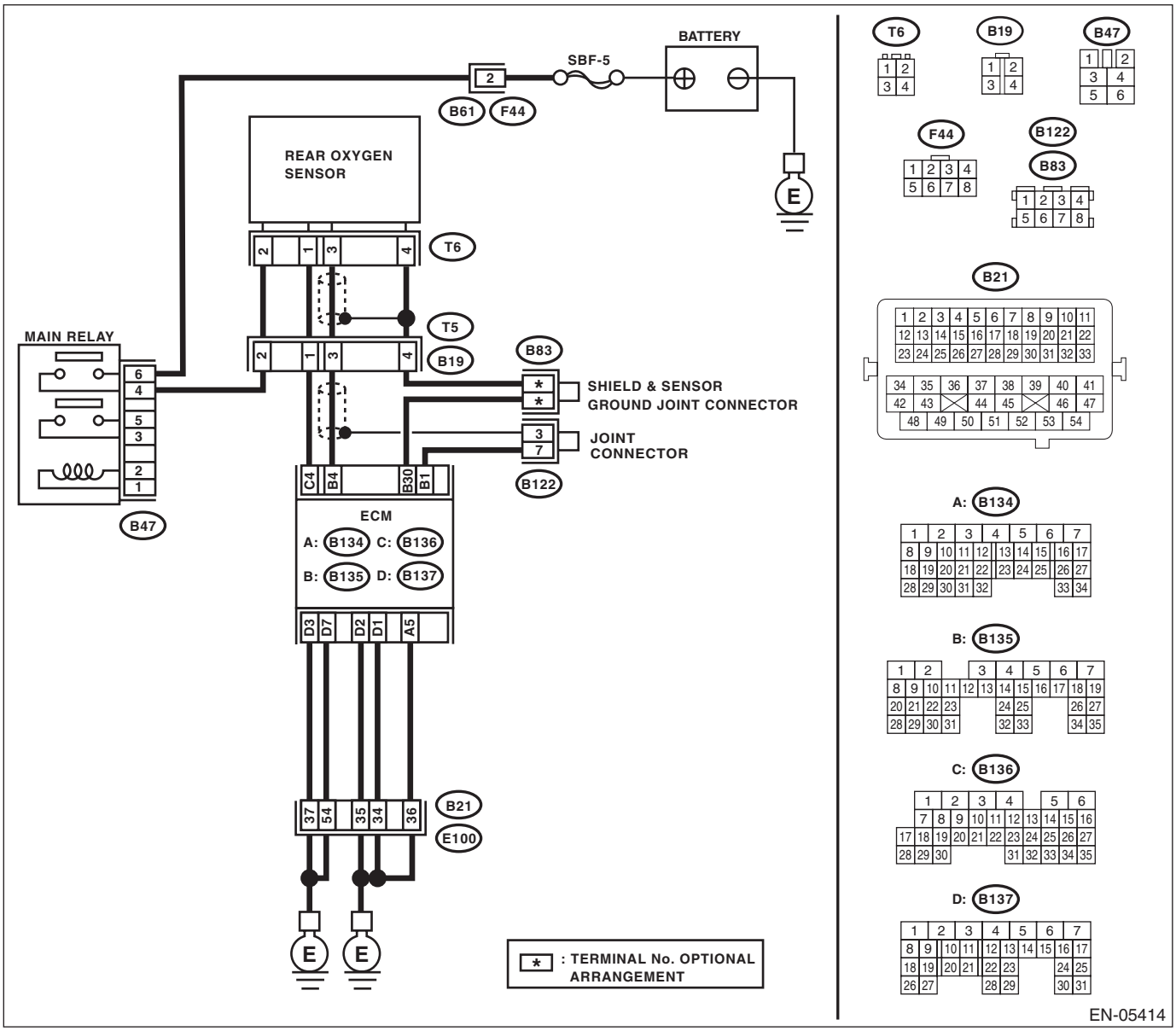
**DTC DETECTING CONDITION:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



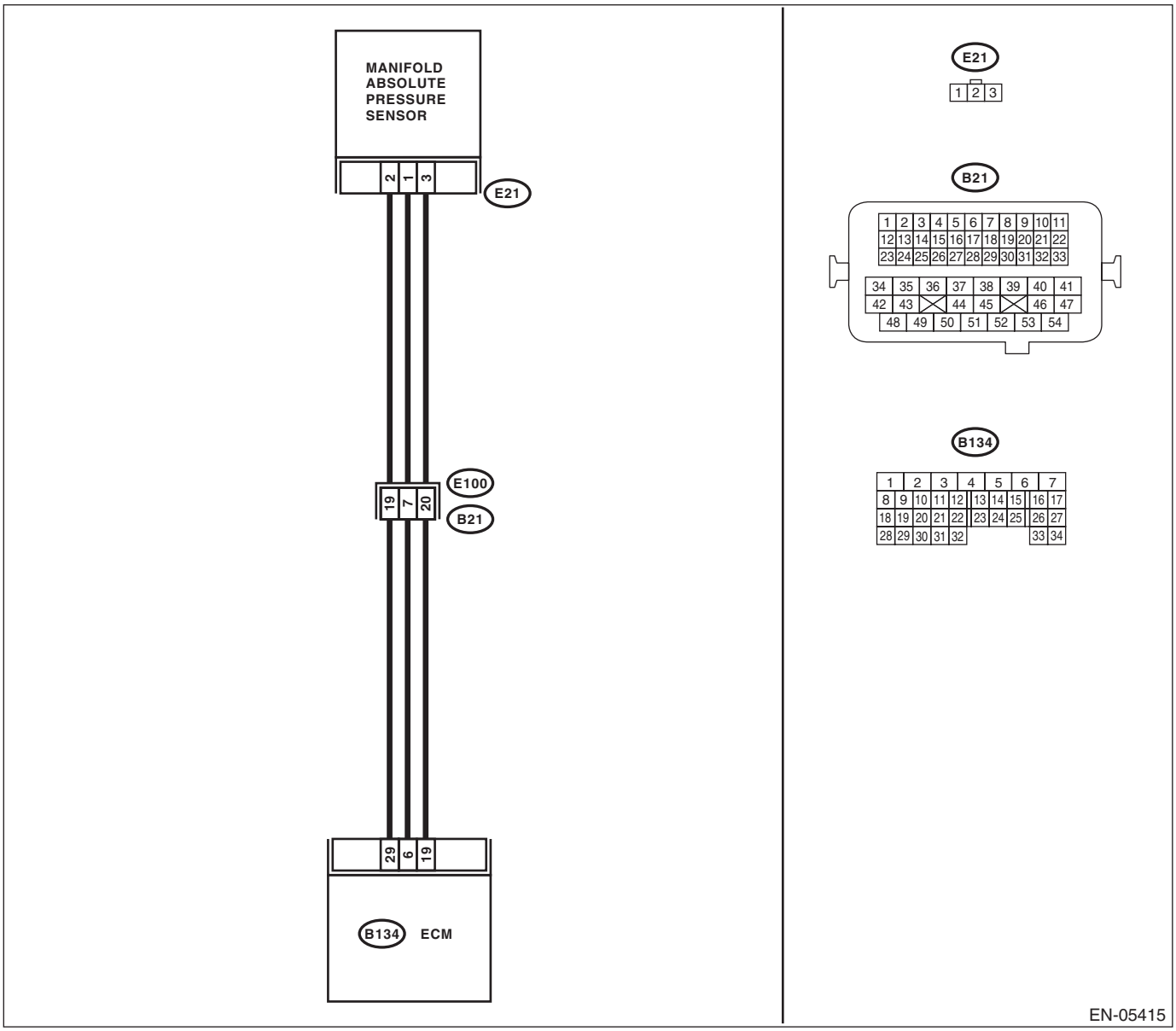
| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 4 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and rear oxygen sensor connector. | Go to step **2**. |
| 2 | **CHECK GROUND CIRCUIT FOR ECM.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 30 — Chassis ground:***<br>***(B134) No. 5 — 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? | Repair poor contact of the ECM connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |

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

**DTC DETECTING CONDITION:**

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

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**
**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step **2**. |
| 2 | **CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 70°C (158°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the accessory switches to OFF.<br>5) Read the data of intake manifold pressure sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the "General Scan Tool Instruction Manual". | Is the measured value 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) when the ignition is turned ON, and 20.0 — 46.7 kPa (150 — 350 mmHg, 5.91 — 13.78 inHg) during idling? | Go to step **3**. | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-36, Manifold Absolute Pressure Sensor.> |
| 3 | **CHECK THROTTLE OPENING ANGLE.**<br>Read the data of throttle position signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedures, refer to the "General Scan Tool Instruction Manual". | Is the measured value less than 5% when throttle is fully closed? | Go to step **4**. | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> |
| 4 | **CHECK THROTTLE OPENING ANGLE.** | Is the measured value 85% or more when throttle is fully open? | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-36, Manifold Absolute Pressure Sensor.> | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> |

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

**DTC DETECTING CONDITION:**

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

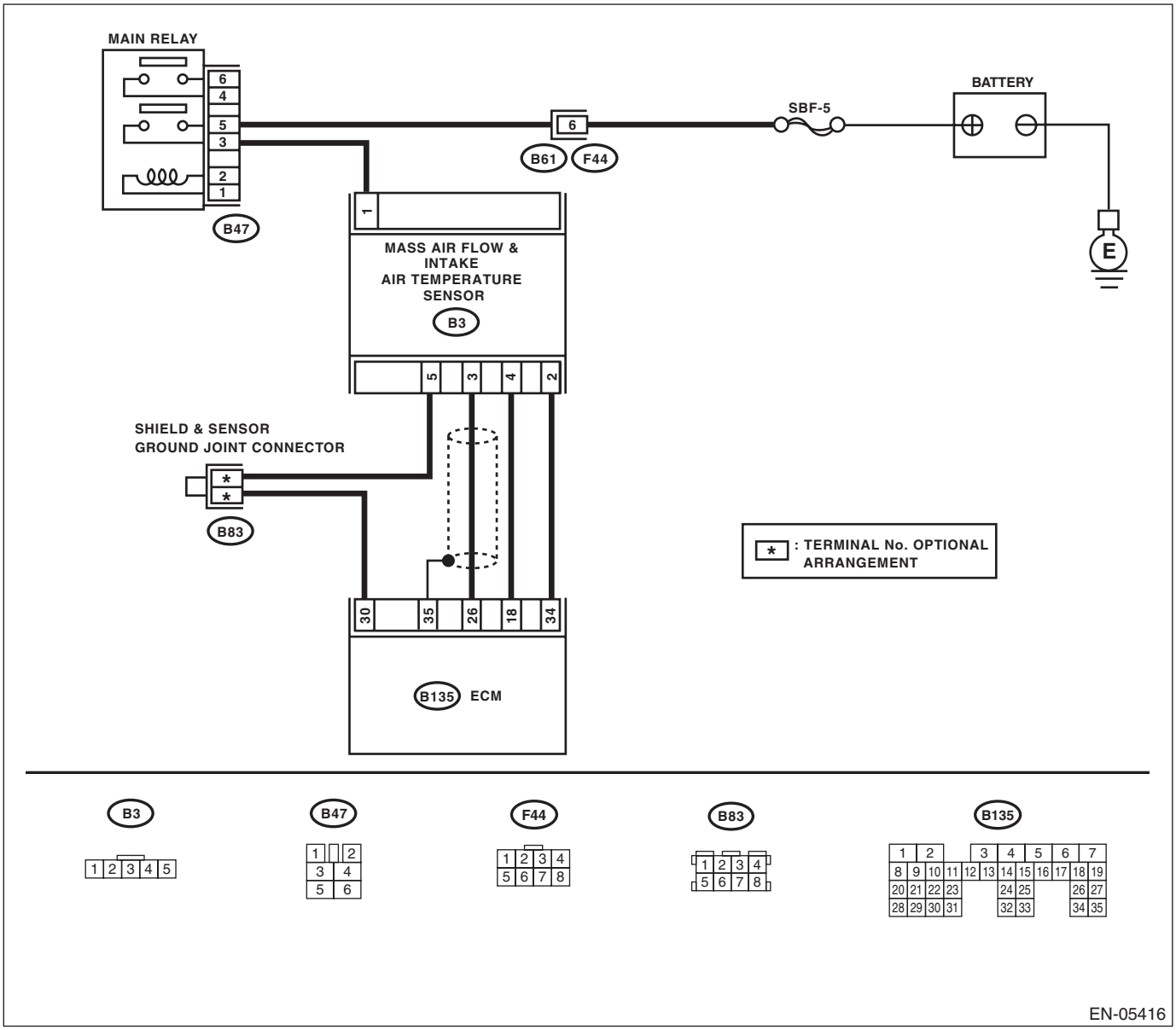
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-27, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

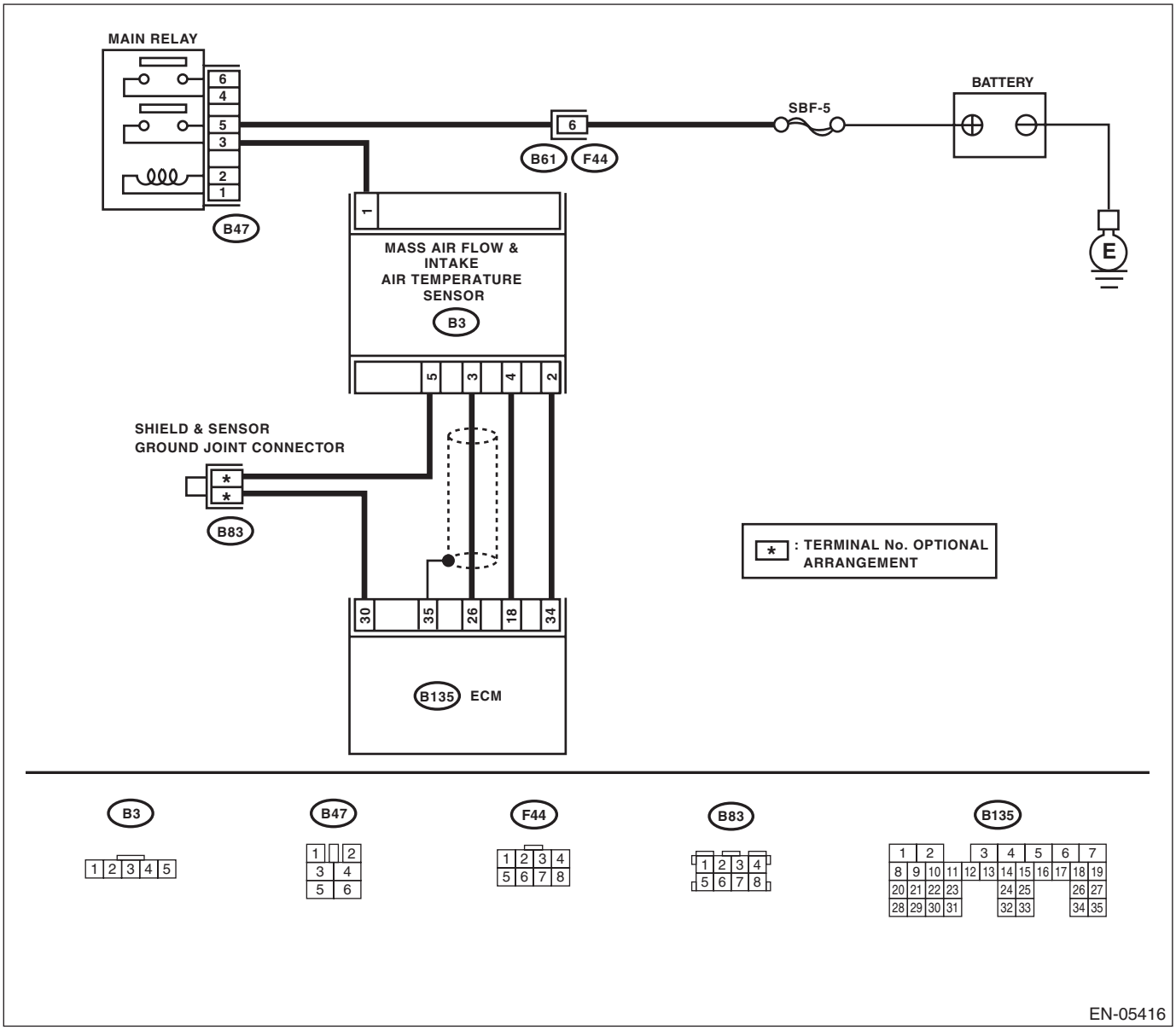
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage less than 0.2 V? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the mass air flow and intake air temperature sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B3) No. 1 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors<br>• Poor contact in ECM connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of harness between ECM and mass air flow and intake air temperature sensor connectors.<br>***Connector & terminal***<br>***(B135) No. 26 — (B3) No. 3:*** | 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 item:<br>• Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors |
| 4 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 26 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between the ECM and the mass air flow and intake air temperature sensor connectors. |
| 5 | **CHECK POOR CONTACT.**<br>Check for any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors. | Is there poor contact in the ECM or the mass air flow and intake air temperature sensor connectors? | Repair any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-29, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

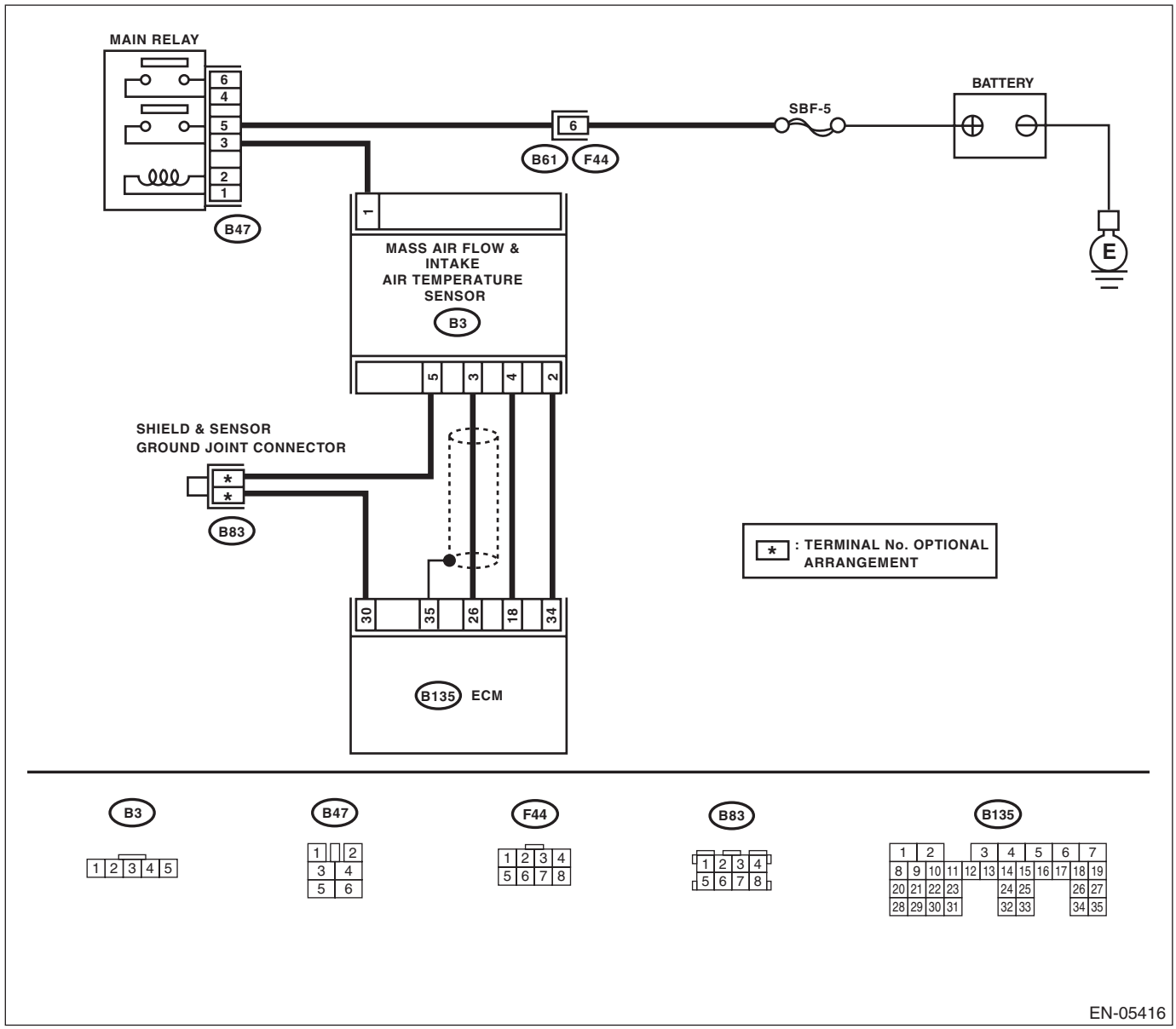
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Start the engine.<br>2) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 5 V or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the mass air flow and intake air temperature sensor.<br>3) Start the engine.<br>4) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and the mass air flow and intake air temperature sensor connectors. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B3) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors<br>• Poor contact in ECM connector |
| 4 | **CHECK POOR CONTACT.**<br>Check for any poor contact between the mass air flow and intake air temperature sensor connectors. | Is there poor contact in the mass air flow and intake air temperature sensor connectors? | Repair any poor contact of the mass air flow and intake air temperature sensor connectors. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |

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

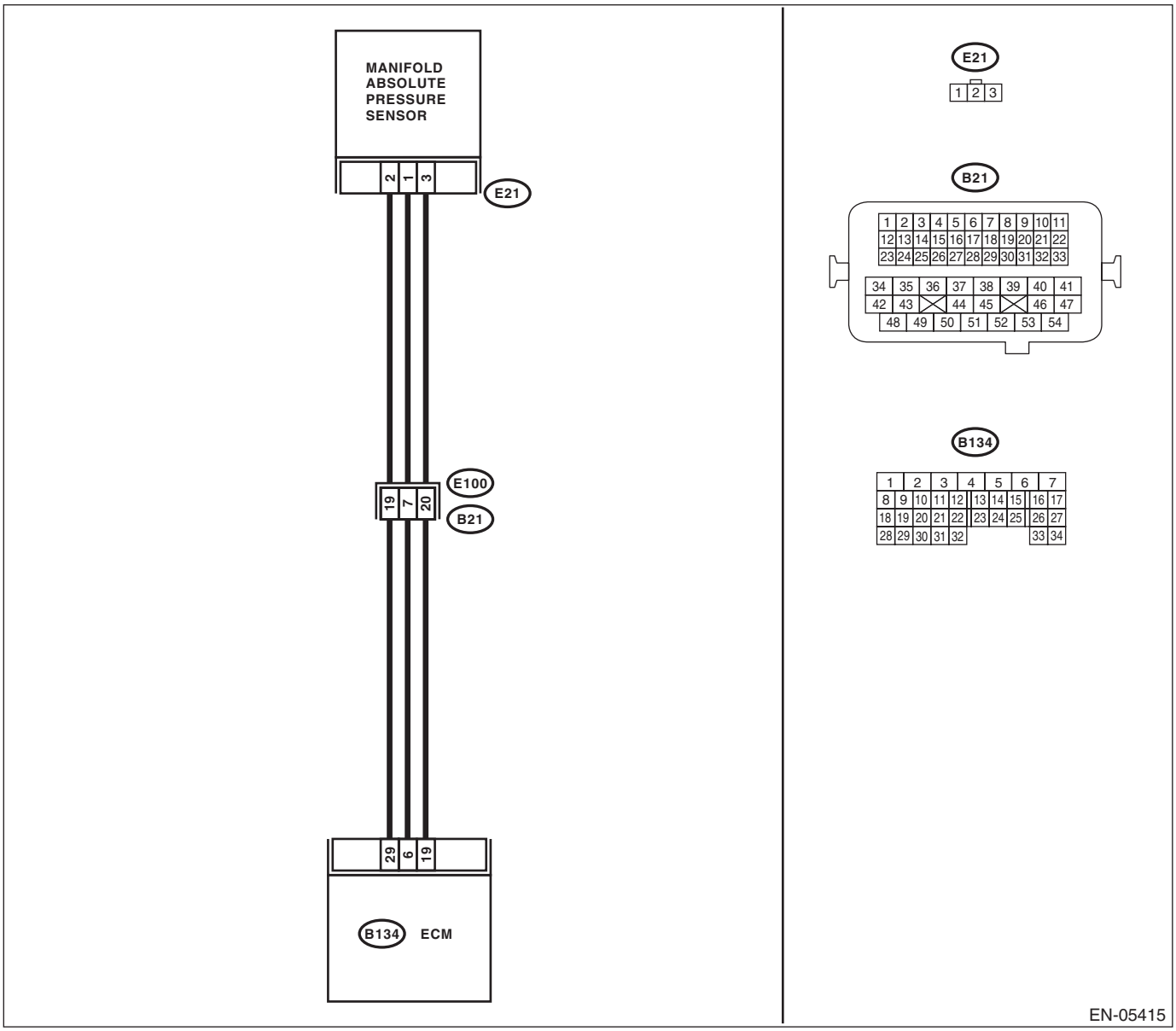
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- 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 repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 manifold absolute pressure signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value less than 13.3 kPa (100 mmHg, 3.94 inHg) ? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POWER SUPPLY OF THE MANIFOLD ABSOLUTE PRESSURE SENSOR.**<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 4.5 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and manifold absolute pressure sensor connector.<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.<br>***Connector & terminal***<br>***(B134) No. 6 — (E21) 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 item:<br>• Open circuit of harness between ECM and manifold absolute pressure sensor connector.<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 6 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and manifold absolute pressure sensor connector. |
| 5 | **CHECK POOR CONTACT.**<br>Check for poor contact between the ECM and manifold pressure sensor connector. | Is there poor contact in the ECM or manifold absolute pressure sensor connector? | Repair the poor contact in the ECM or manifold absolute pressure sensor connector. | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-36, Manifold Absolute Pressure Sensor.> |

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

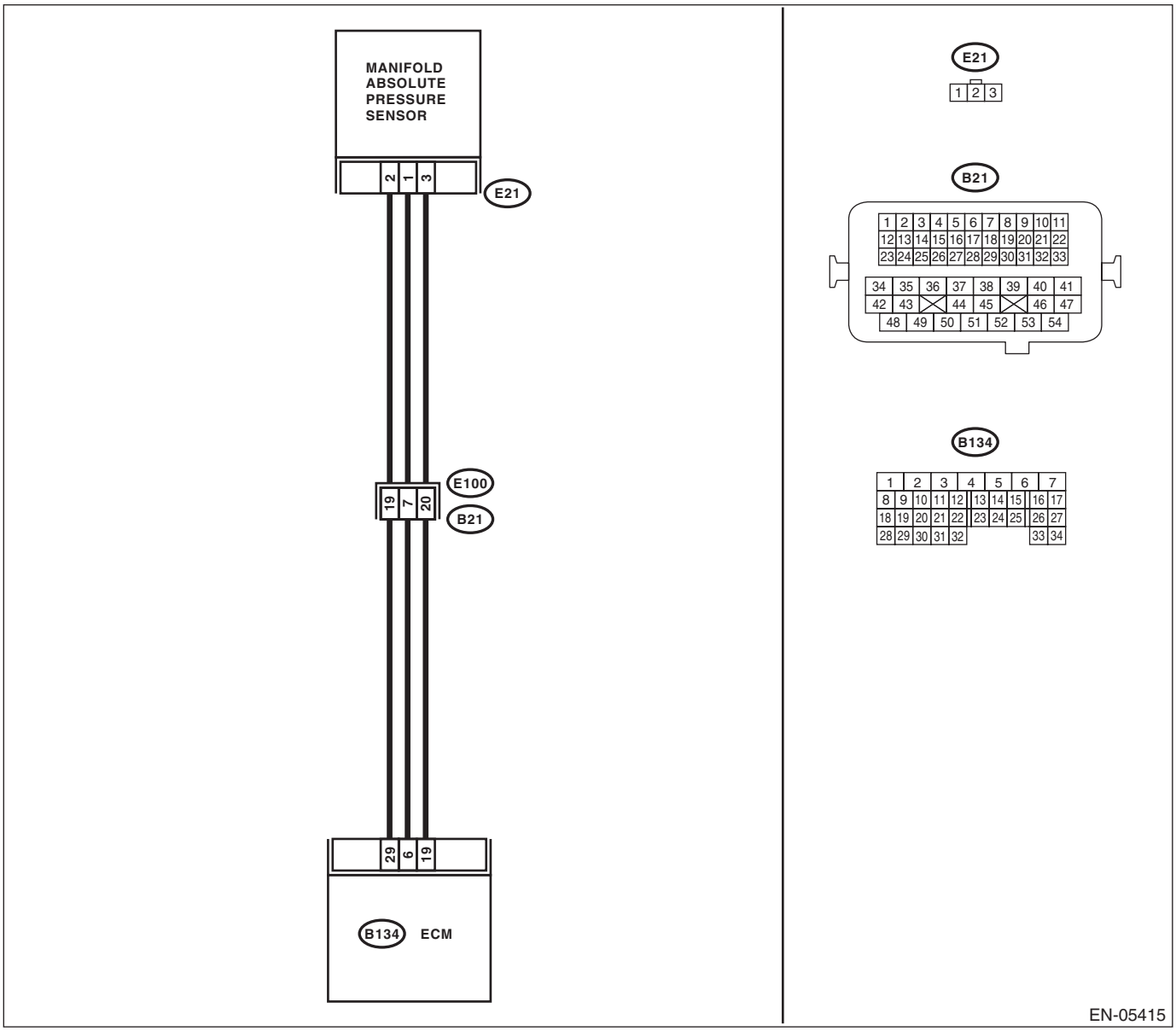
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- 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 repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 manifold absolute pressure signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 119.5 kPa (896.5 mmHg, 35.29 inHg) or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **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) Start the engine.<br>4) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 119.5 kPa (896.5 mmHg, 35.29 inHg) or more? | Repair the short circuit to power in the harness between ECM and manifold absolute pressure sensor connector. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground.<br>***Connector & terminal***<br>***(E21) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and manifold absolute pressure sensor connector.<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 4 | **CHECK POOR CONTACT.**<br>Check for poor contact of the manifold absolute pressure sensor connector. | Is there poor contact in manifold absolute pressure sensor connector? | Repair the poor contact of manifold absolute pressure sensor connector. | Replace the manifold absolute pressure sensor. <Ref. to FU(H4DOTC)-36, Manifold Absolute Pressure Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-35, DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

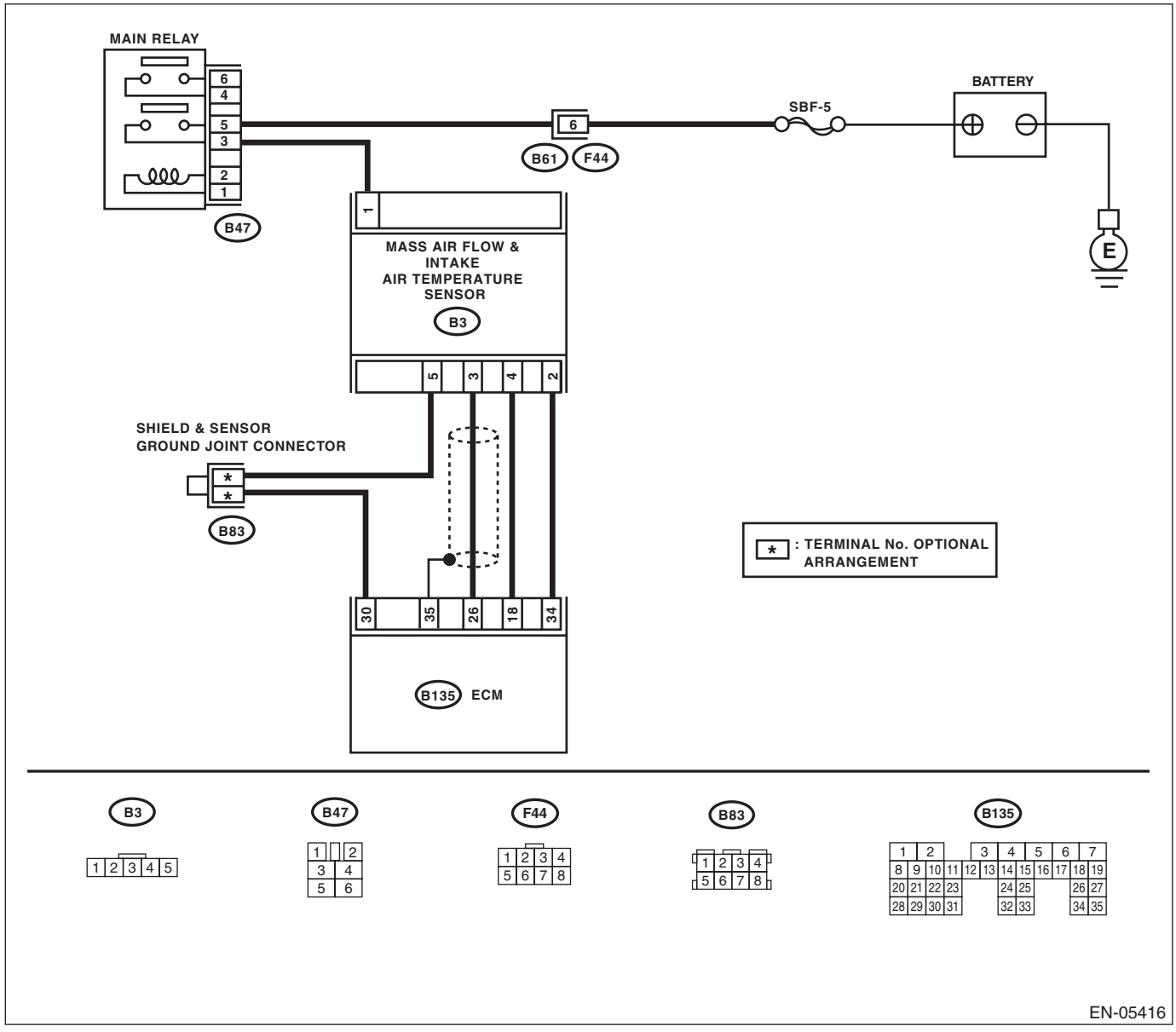
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ENGINE COOLANT TEMPERATURE.**<br>1) Start the engine and warm-up completely.<br>2) Measure the engine coolant temperature using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the engine coolant temperature 75°C (167°F) or higher? | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> | Check DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> |

## Q: DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-37, DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

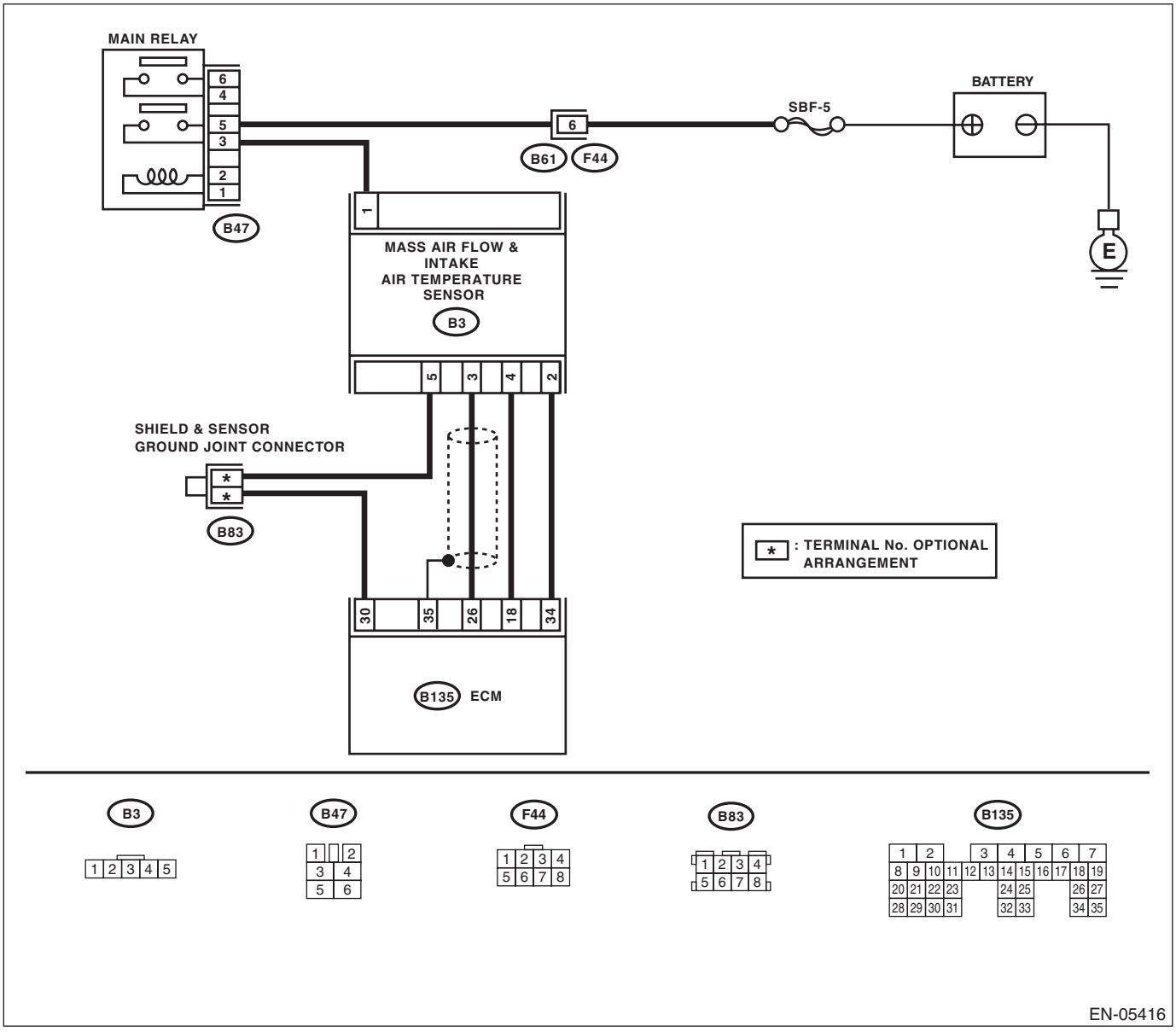
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the intake air temperature 120°C (248°F) or higher? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and the mass air flow and intake air temperature sensor.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 18 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> | Repair short circuit of the harness to ground between the ECM and the mass air flow and intake air temperature sensor connectors. |

## R: DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-39, DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

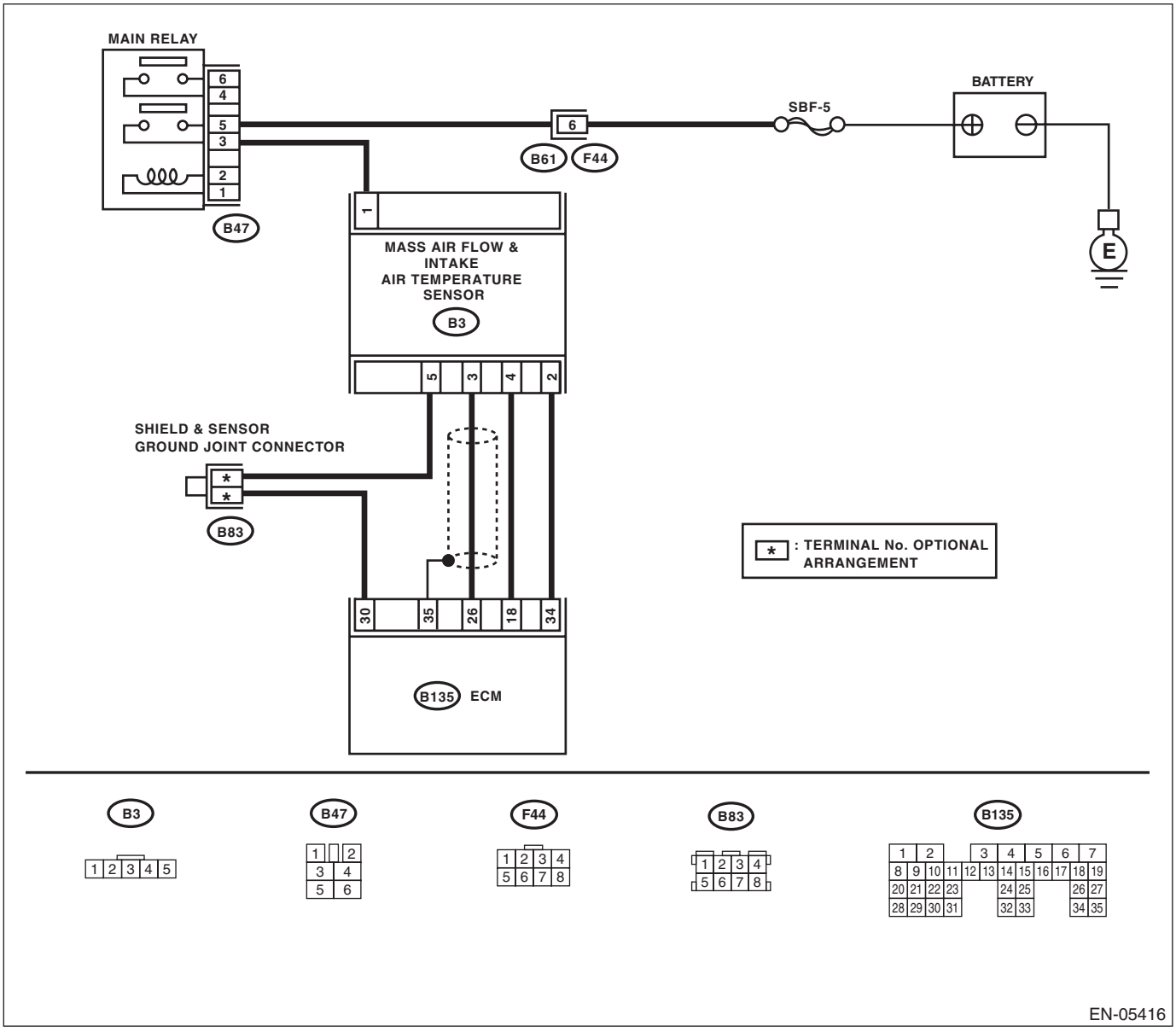
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the intake air temperature less than –40°C (–40°F) ? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POOR CONTACT.**<br>Repair any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors. | Is there poor contact in the ECM or the mass air flow and intake air temperature sensor connectors? | Repair any poor contact between the ECM and the mass air flow and intake air temperature sensor connectors. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and the mass air flow and intake air temperature sensor.<br>3) Measure the resistance of harness between ECM and the mass air flow and intake air temperature sensor connector and engine ground.<br>***Connector & terminal***<br>***(B135) No. 18 — (B3) No. 4:***<br>***(B135) No. 30 — (B3) No. 5:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors |
| 4 | **CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS.**<br>1) Connect all connectors.<br>2) Turn the ignition switch to OFF.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 18 (+) — Chassis ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and the mass air flow and intake air temperature sensor connectors. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |

## S: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-41, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

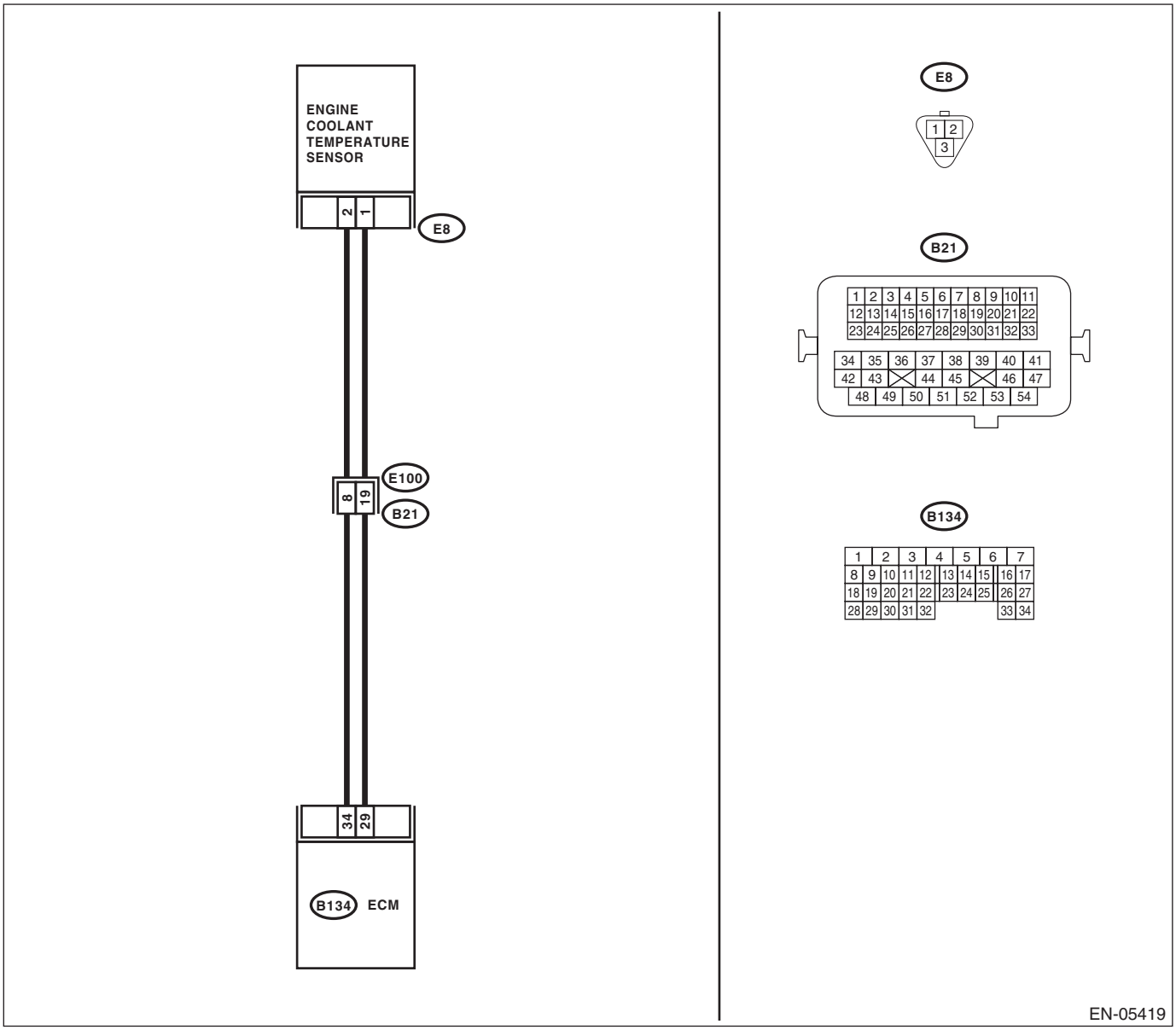
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the engine coolant temperature 150°C (302°F) or higher? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and engine coolant temperature sensor.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 34 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> | Repair short circuit of the harness to ground between the ECM and engine coolant temperature sensor. |

## T: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-43, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

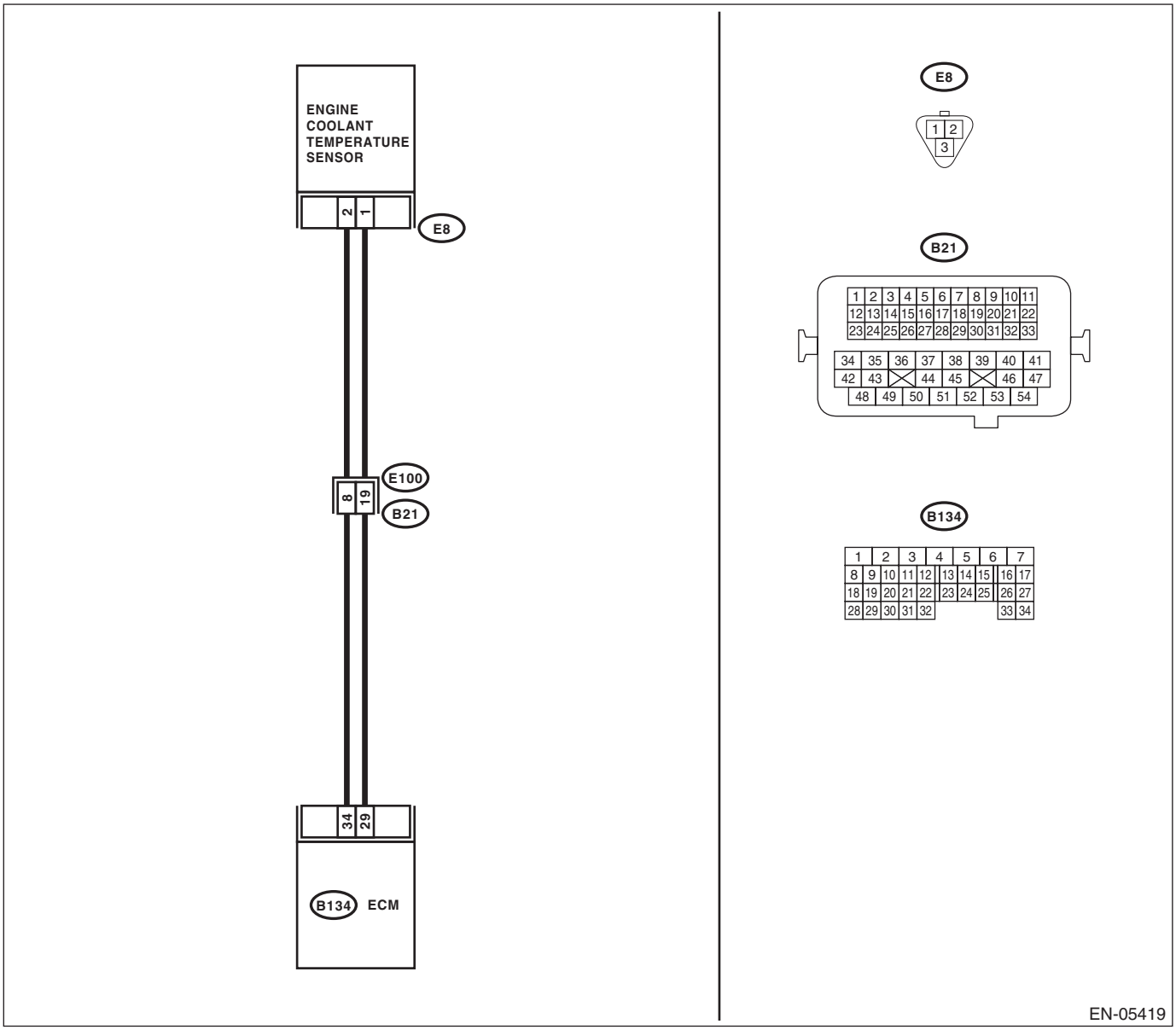
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the engine coolant temperature less than –40°C (–40°F) ? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POOR CONTACT.**<br>Repair any poor contact between the ECM and engine coolant temperature sensor connectors. | Is there poor contact in the ECM or engine coolant temperature sensor connectors? | Repair any poor contact between the ECM and engine coolant temperature sensor connectors. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and engine coolant temperature sensor.<br>3) Measure the resistance of the harness between the ECM and engine coolant temperature sensor connector.<br>***Connector & terminal***<br>***(B134) No. 34 — (E8) No. 2:***<br>***(B134) No. 29 — (E8) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of the harness between the ECM and engine coolant temperature sensor connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.**<br>1) Connect all connectors.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 34 (+) — Chassis ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and engine coolant temperature sensor connector. | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-45, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH “A” CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

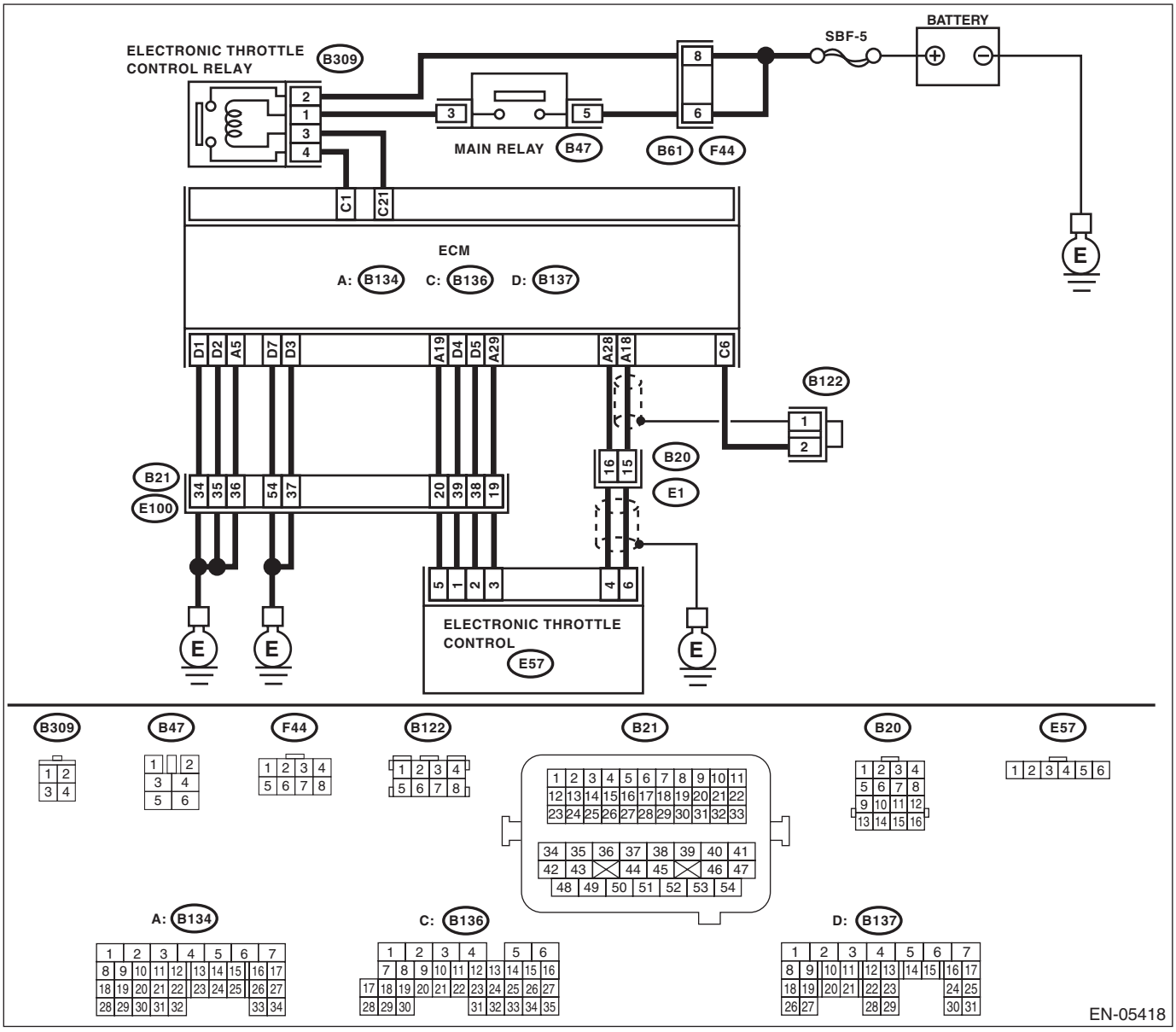
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 19 — Chassis ground:***<br>***(B134) No. 18 — Chassis ground:***<br>***(B134) No. 18 — (B136) No. 6:*** | Is the resistance 1 MΩ or more? | Go to step **2**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |
| 2 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 6 — Engine ground:*** | Is the resistance 1 MΩ or more? | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-47, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

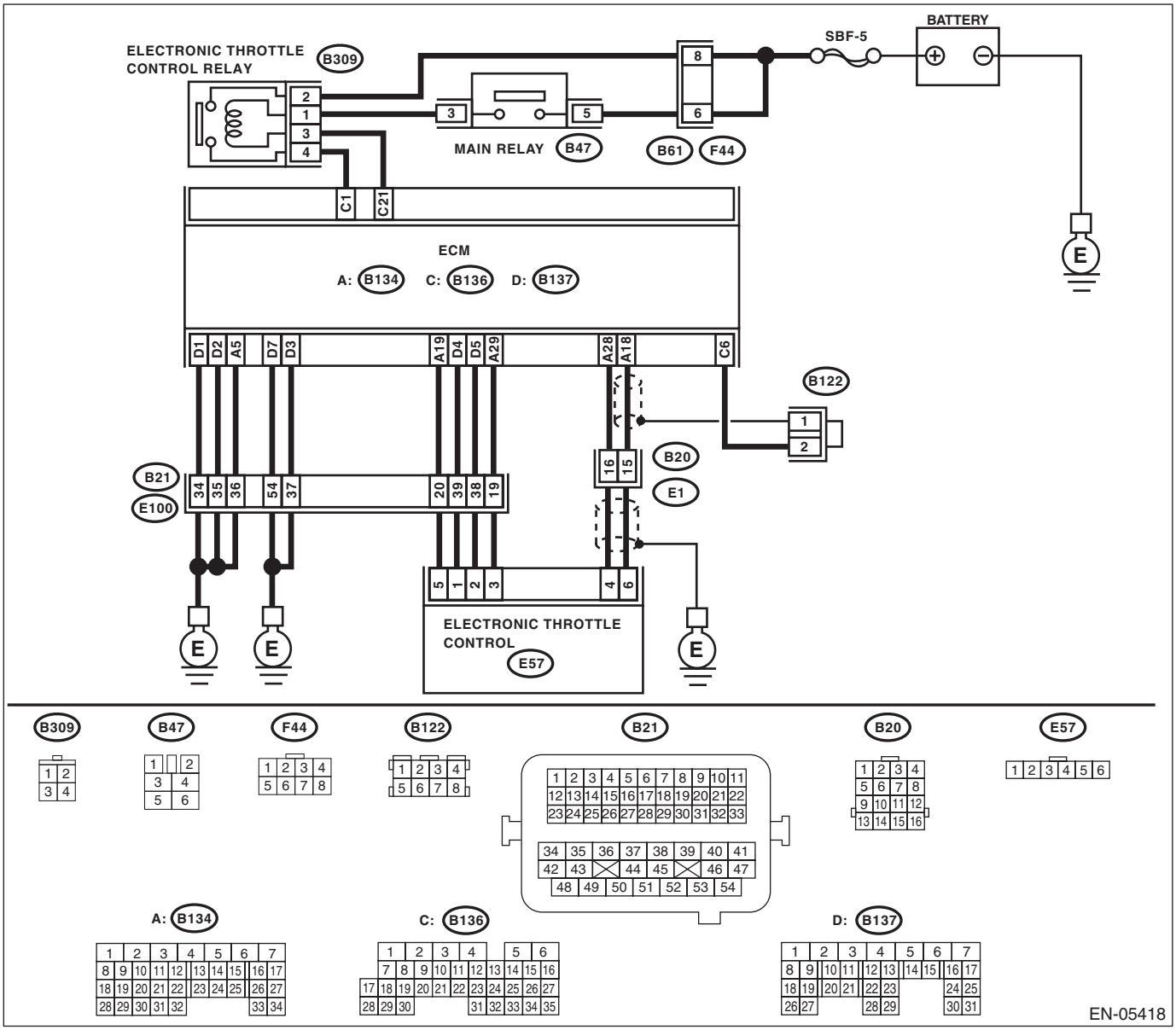
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance of harness between ECM and electronic throttle control connector.<br>***Connector & terminal***<br>***(B134) No. 18 — (E57) No. 6:***<br>***(B134) No. 29 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 3 — 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 item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **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 (–):*** | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step **4**. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 19 — (B134) No. 18:*** | Is the resistance 1 MΩ or more? | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |

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

**DTC DETECTING CONDITION:**

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

**TROUBLE SYMPTOM:**

Engine does not return to idle.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK TIRE SIZE.** | Is the tire size as specified? and the same size as other three wheels? | Go to step **2**. | Replace the tire. |
| 2 | **CHECK ENGINE COOLANT.**<br>Check the following items:<br>• Amount of engine coolant<br>• Engine coolant freeze<br>• Contamination of engine coolant | Is the engine coolant normal? | Go to step **3**. | Fill or replace the engine coolant. <Ref. to CO(H4DOTC)-20, INSPECTION, Engine Coolant.> |
| 3 | **CHECK THERMOSTAT.** | Does the thermostat remain opened? | Replace the thermostat. <Ref. to CO(H4DOTC)-23, Thermostat.> | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-52, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

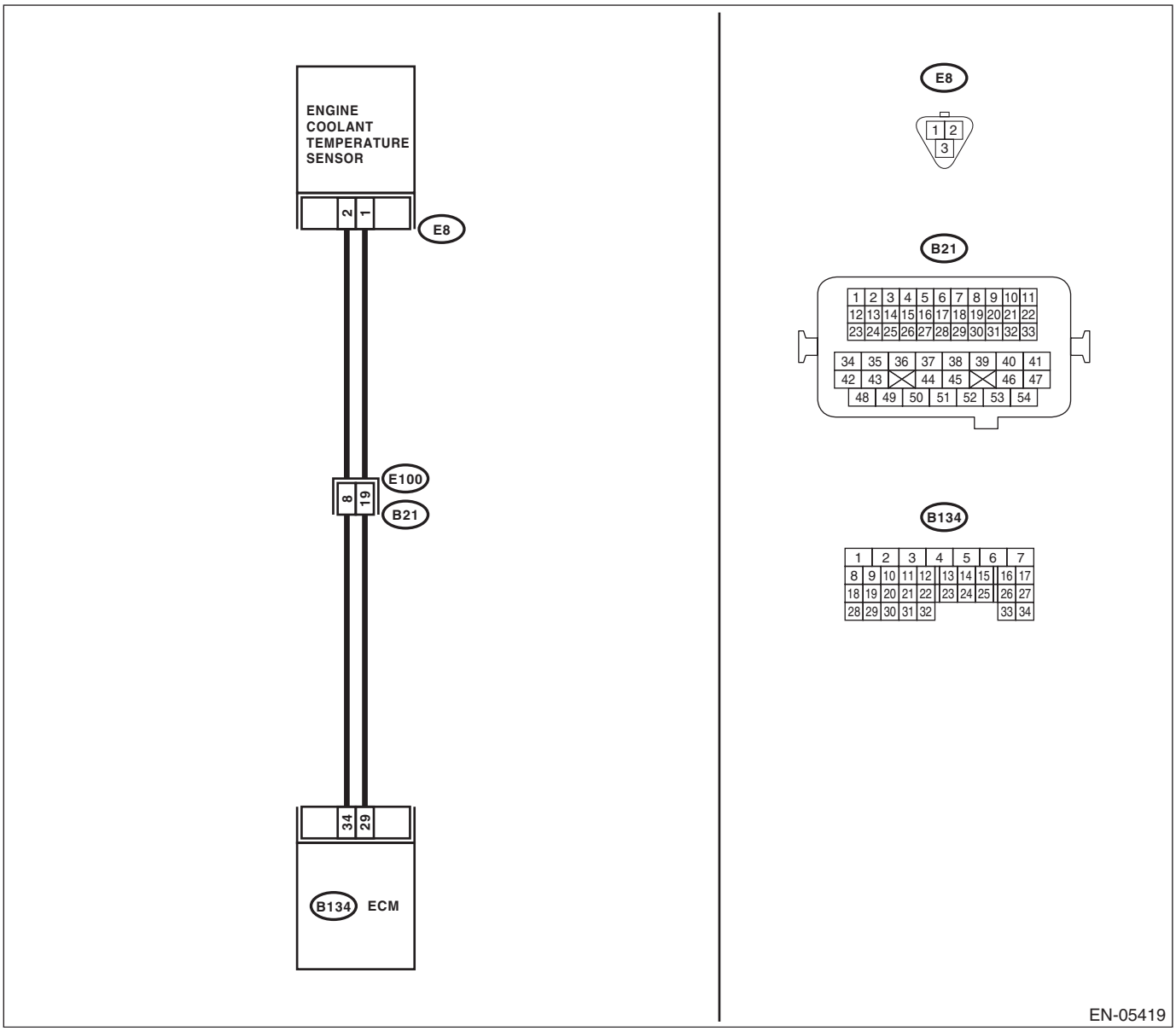
**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ENGINE COOLANT TEMPERATURE SENSOR.**<br>Measure the resistance between engine coolant temperature sensor terminals when the 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? | Repair poor contact of the ECM connector. | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-54, DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

Thermostat remains open.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK ENGINE COOLANT.** | Are the coolant level and mixture ratio of engine coolant to anti-freeze solution correct? | Go to step **2**. | Replace the engine coolant. <Ref. to CO(H4DOTC)-19, REPLACEMENT, Engine Coolant.> |
| 2 | **CHECK RADIATOR FAN.**<br>1) Start the engine.<br>2) Check the radiator fan operation. | Does the radiator fan continuously rotate for 3 minutes or more during idling? | Repair radiator fan circuit. <Ref. to CO(H4DOTC)-30, Radiator Main Fan and Fan Motor.> and <Ref. to CO(H4DOTC)-32, Radiator Sub Fan and Fan Motor.> | Replace the thermostat. <Ref. to CO(H4DOTC)-23, Thermostat.> |

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

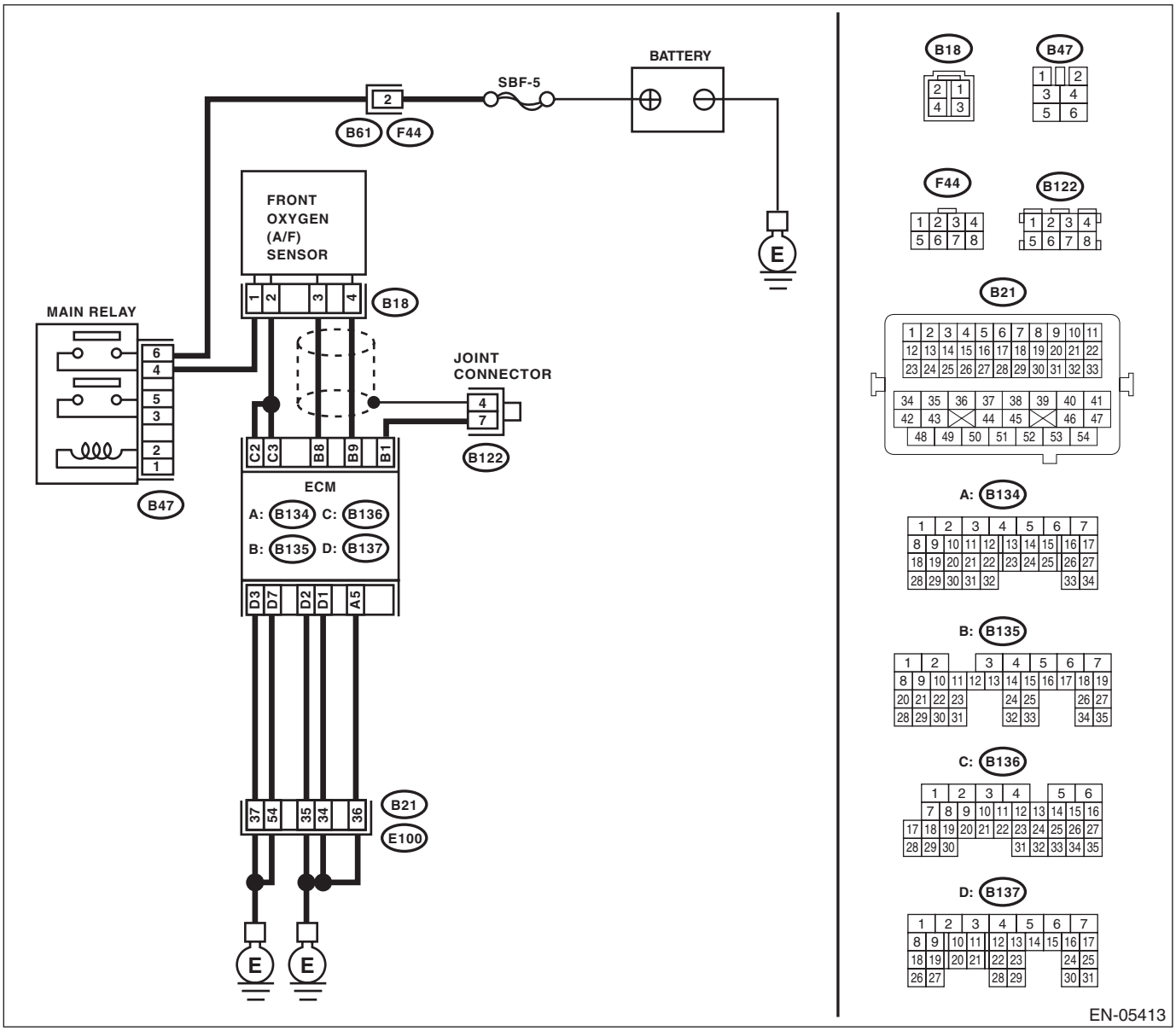
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-56, DTC P0131 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 9 — Chassis ground:***<br>***(B135) No. 8 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector. |
| 3 | **CHECK POOR CONTACT.**<br>Check poor contact of front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact of the front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |

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

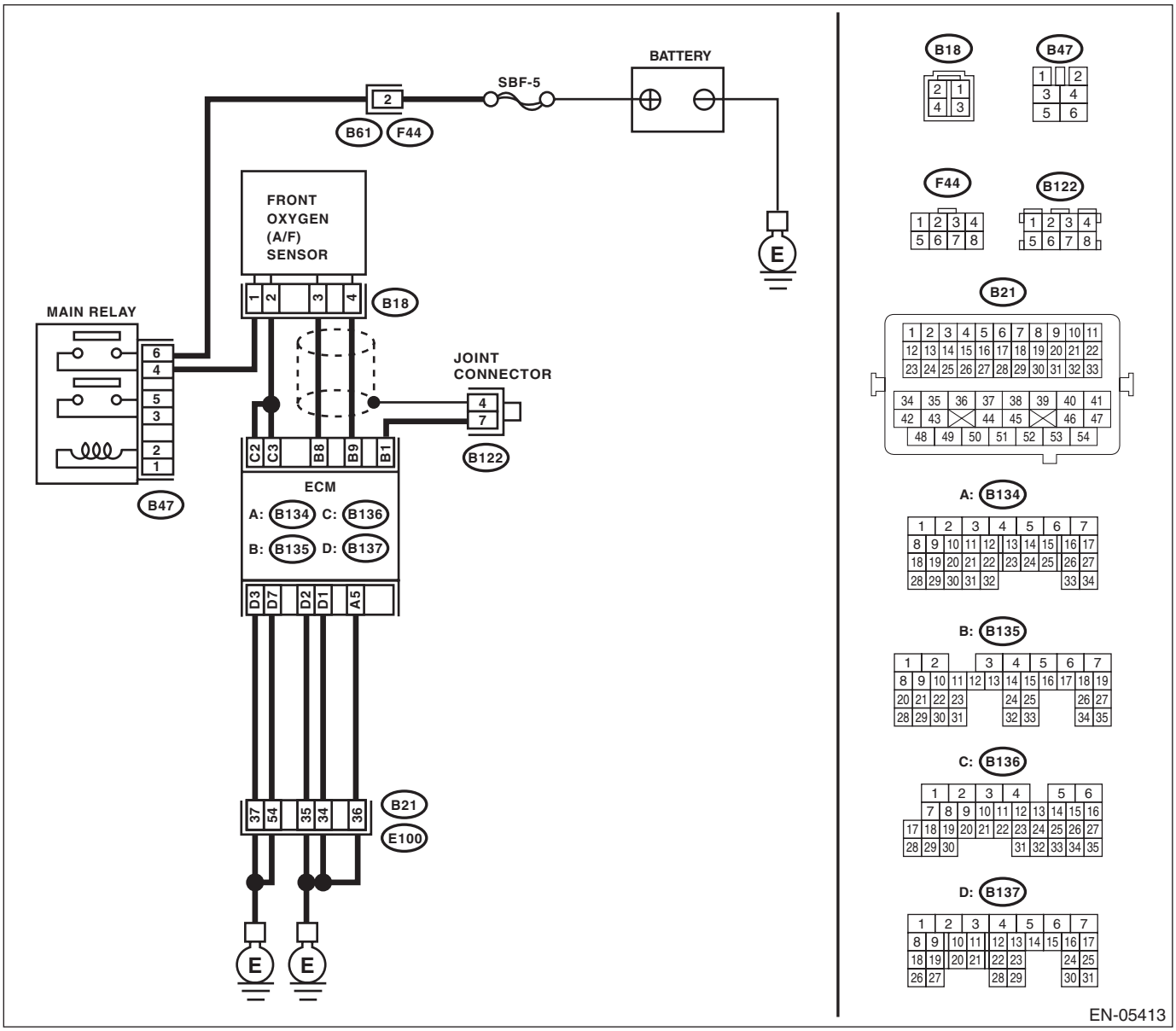
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-58, DTC P0132 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<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 ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 9 (+) — Chassis ground (–):***<br>***(B135) No. 8 (+) — Chassis ground (–):*** | Is the voltage 8 V or more? | Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |

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

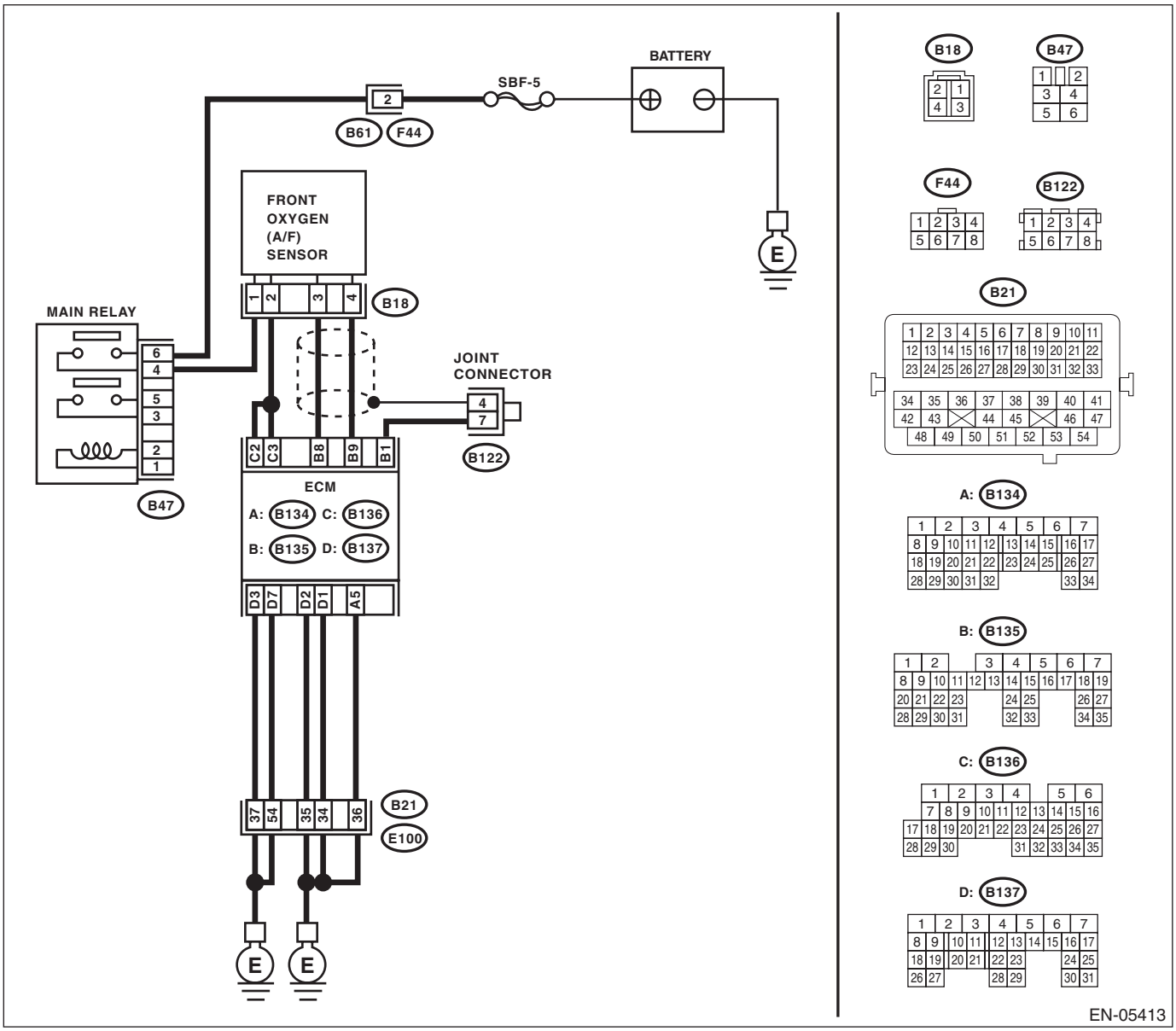
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-60, DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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)-46, Front Oxygen (A/F) Sensor.> |

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

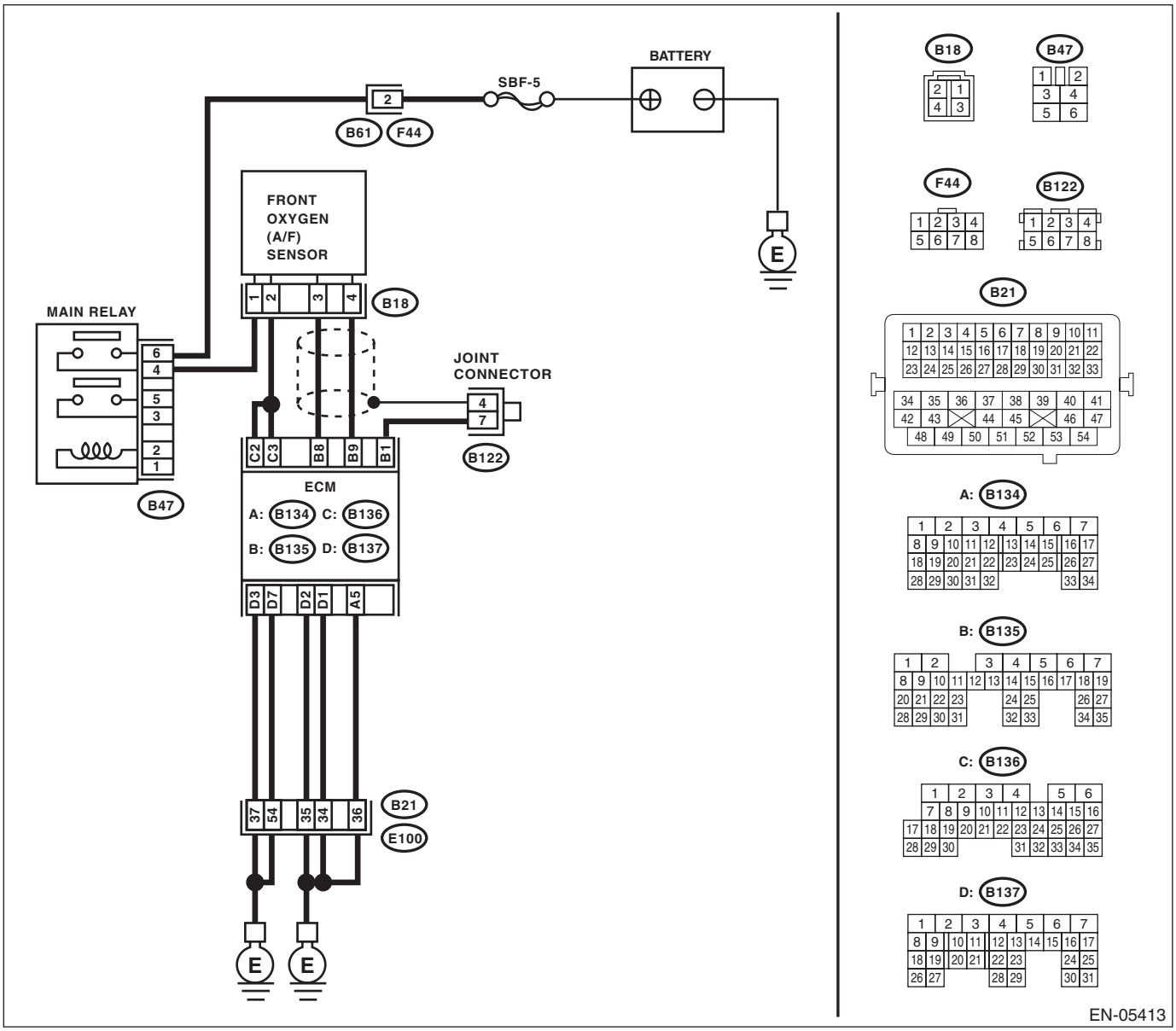
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-63, DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 the 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>***(B135) No. 9 — (B18) No. 4:***<br>***(B135) No. 8 — (B18) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of 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 of front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact of the front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |

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

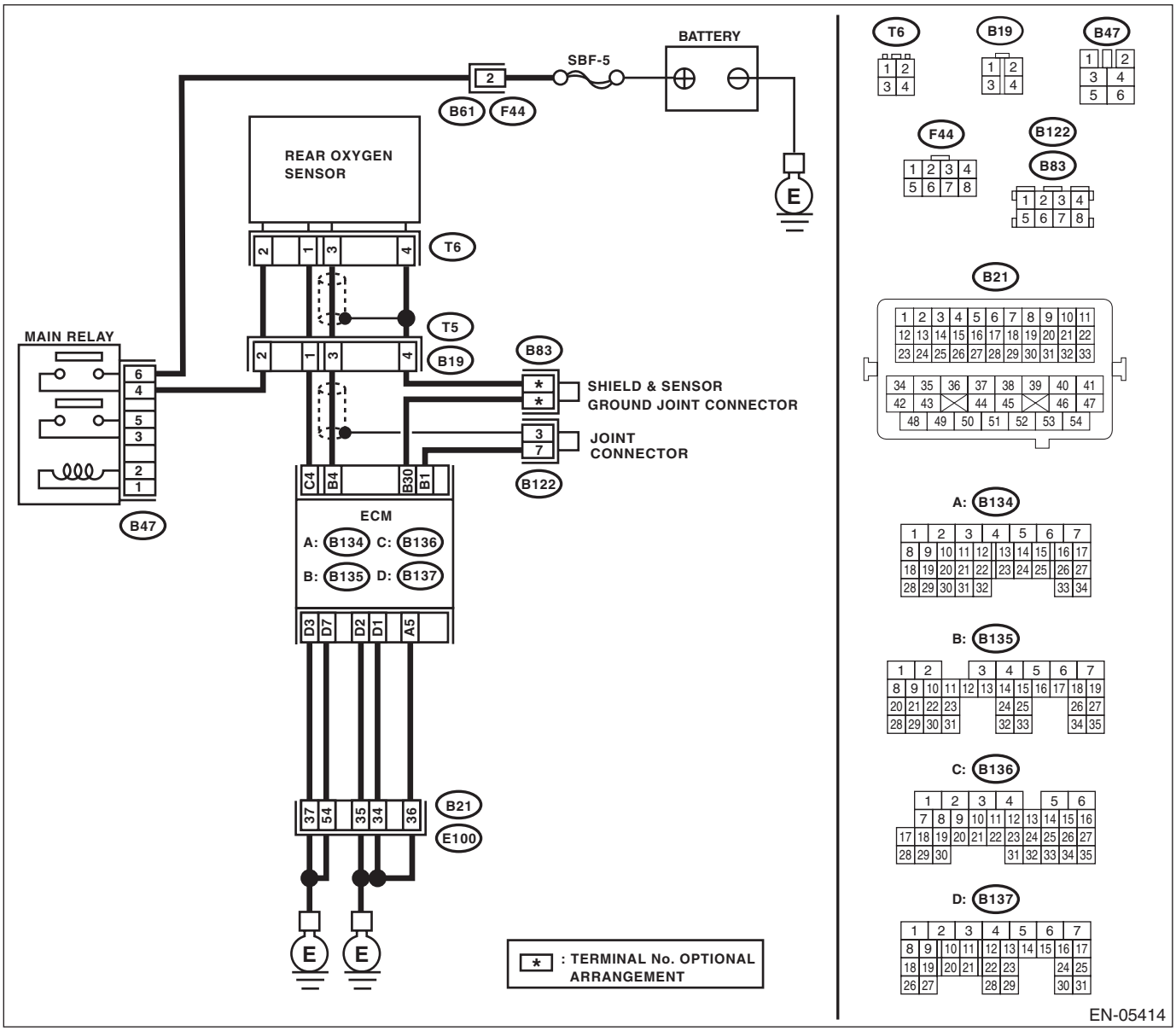
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-65, DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 70°C (158°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)<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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 490 mV or more? | Go to step **5**. | Go to step **2**. |
| 2 | **CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<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>***(B135) No. 4 — (T6) No. 3:***<br>***(B135) No. 30 — (T6) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) 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? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the ECM and rear oxygen sensor<br>• Poor contact of the rear oxygen sensor connector<br>• Poor contact in ECM connector |
| 5 | **CHECK EXHAUST SYSTEM.**<br>Check exhaust system parts.<br>NOTE:<br>Check the following items.<br>• Loose part and incomplete installation of exhaust system<br>• Damage (crack, hole etc.) of parts<br>• Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor | Is there any fault in exhaust system? | Repair or replace faulty parts. | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> |

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

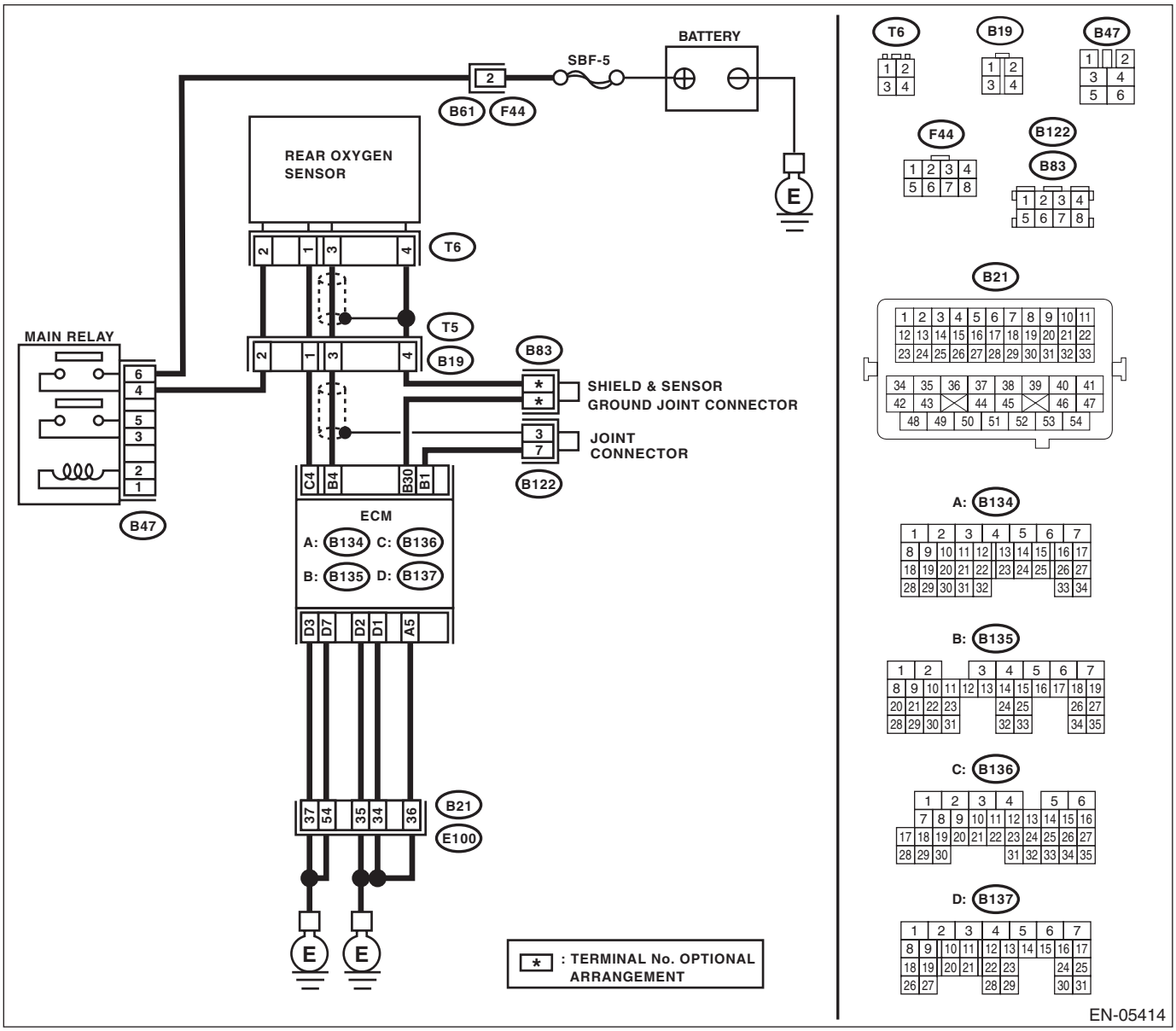
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-67, DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 70°C (158°F), and rapidly reduce the engine speed from 3,000 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 250 mV or less? | Go to step **5**. | Go to step **2**. |
| 2 | **CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<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>***(B135) No. 4 — (T6) No. 3:***<br>***(B135) No. 30 — (T6) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) 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? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the ECM and rear oxygen sensor<br>• Poor contact of the rear oxygen sensor connector<br>• Poor contact in ECM connector |
| 5 | **CHECK EXHAUST SYSTEM.**<br>Check exhaust system parts.<br>NOTE:<br>Check the following items.<br>• Loose part and incomplete installation of exhaust system<br>• Damage (crack, hole etc.) of parts<br>• Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor | Is there any fault in exhaust system? | Repair or replace faulty parts. | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> |

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

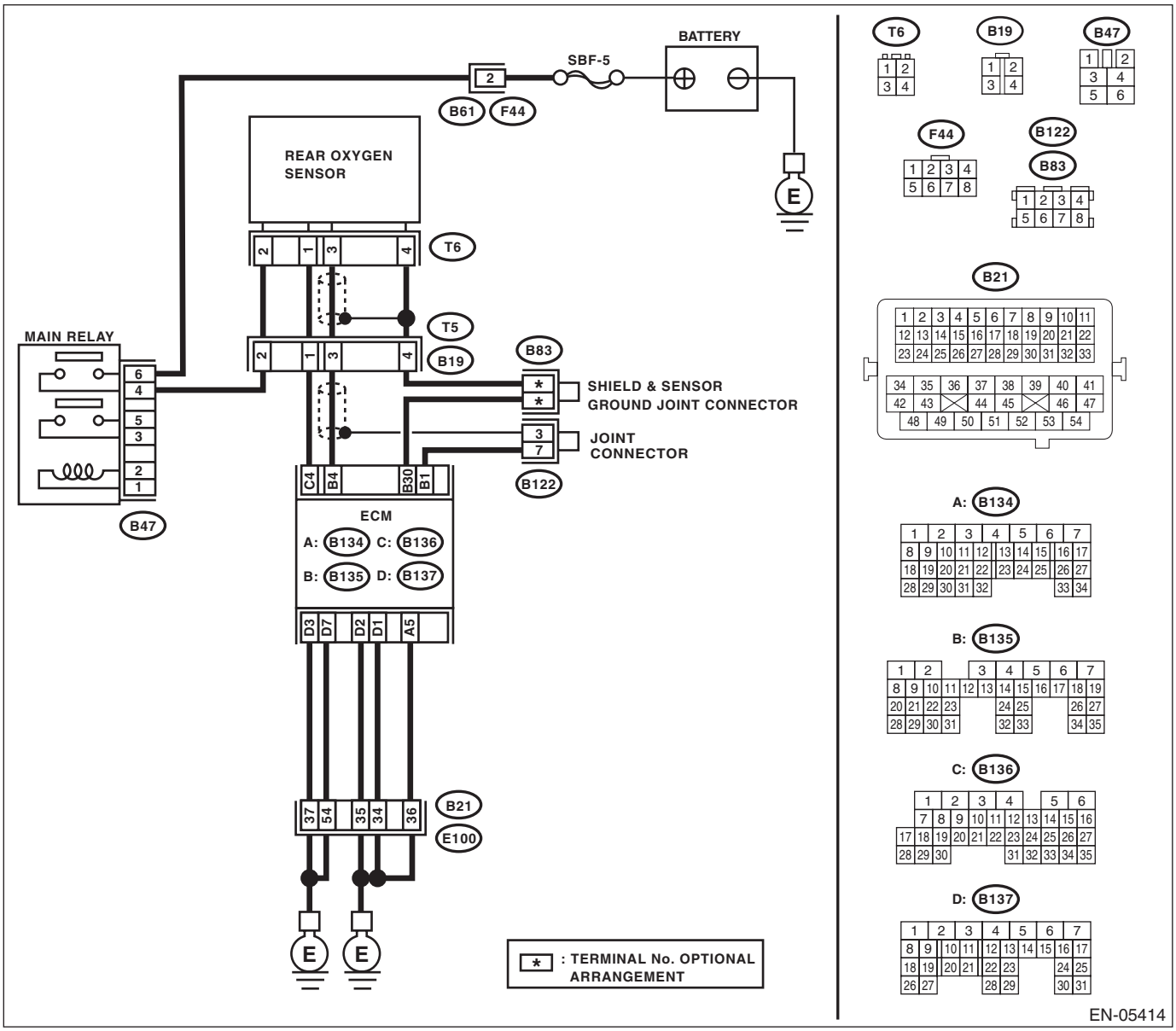
**DTC DETECTING CONDITION:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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>***(B135) No. 4 — (T6) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<br>Measure the resistance between rear oxygen sensor connector and chassis ground.<br>***Connector & terminal***<br>***(T6) No. 3 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and rear oxygen sensor connector. |
| 3 | **CHECK REAR OXYGEN SENSOR.**<br>Measure the resistance between rear oxygen sensor terminals.<br>***Terminals***<br>***No. 3 — No. 4*** | Is the resistance less than 1 Ω? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |

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

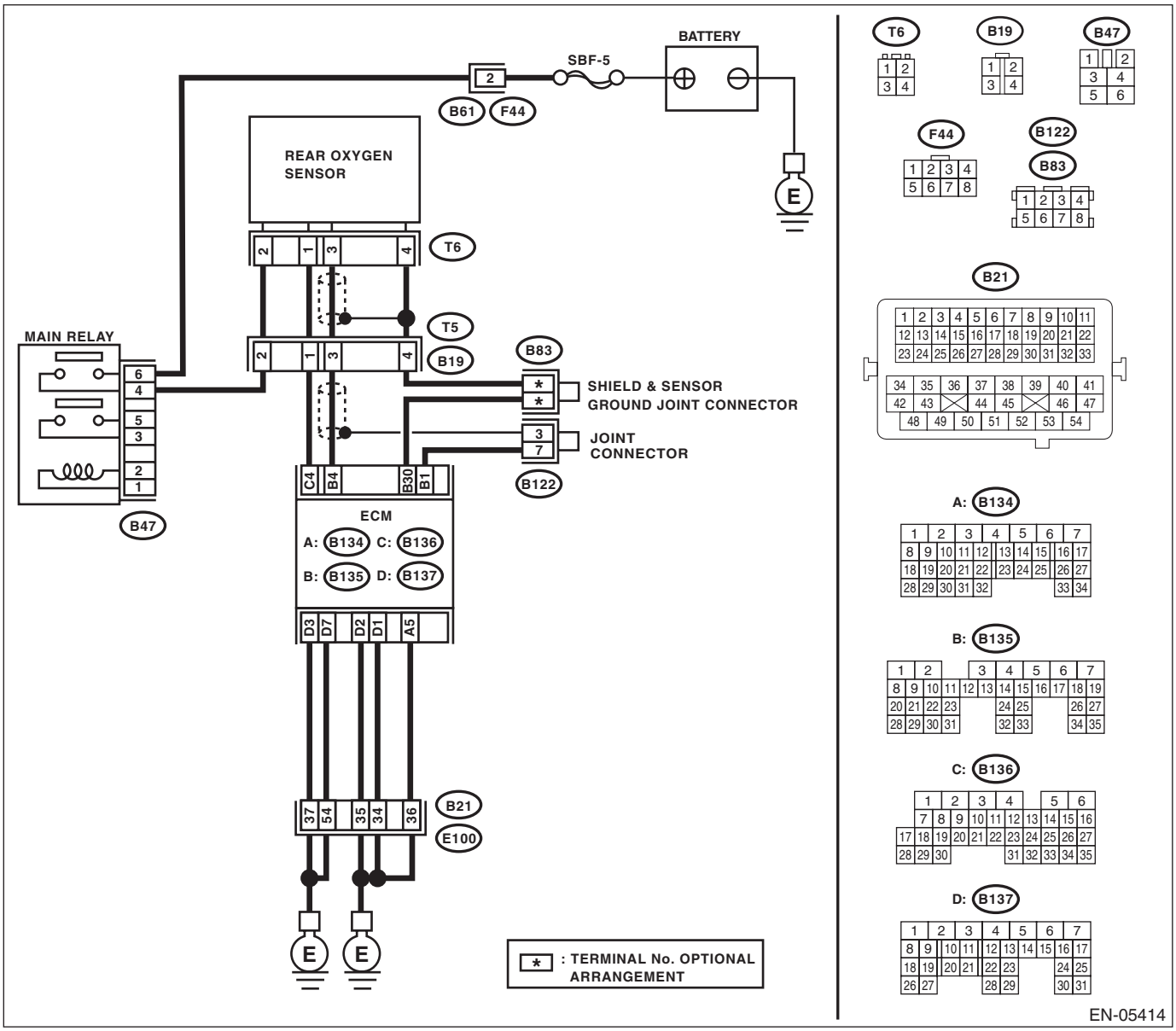
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-73, DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)<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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 490 mV or more? | Go to step **6**. | Go to step **2**. |
| 2 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.<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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 250 mV or less? | Go to step **6**. | Go to step **3**. |
| 3 | **CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **4**. |
| 4 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<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>***(B135) No. 4 — (T6) No. 3:***<br>***(B135) No. 30 — (T6) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **5**. | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |
| 5 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the rear oxygen sensor.<br>3) Turn the ignition switch to ON.<br>4) 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? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the ECM and rear oxygen sensor<br>• Poor contact of the rear oxygen sensor connector<br>• Poor contact in ECM connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK EXHAUST SYSTEM.**<br>Check exhaust system parts.<br>NOTE:<br>Check the following items.<br>• Loose part and incomplete installation of exhaust system<br>• Damage (crack, hole etc.) of parts<br>• Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor | Is there any fault in exhaust system? | Repair or replace faulty parts. | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> |

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

Refer to DTC P0172 for diagnostic procedure. <Ref. to EN(H4DOTC)(diag)-144, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-78, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK EXHAUST SYSTEM.** | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step **2**. |
| 2 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step **3**. |
| 3 | **CHECK FUEL PRESSURE.**<br>**WARNING:**<br>**Place "NO OPEN FLAMES" signs near the working area.**<br>**CAUTION:**<br>**Be careful not to spill fuel.**<br>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <Ref. to ME(H4DOTC)-31, INSPECTION, Fuel Pressure.><br>**CAUTION:**<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 or 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 **4**. | Repair the following item.<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. <Ref. to ME(H4DOTC)-31, INSPECTION, Fuel Pressure.><br>**CAUTION:**<br>**Release fuel pressure before removing the fuel pressure gauge.**<br>NOTE:<br>• If fuel pressure does not increase, squeeze fuel return hose 2 or 3 times, then measure fuel pressure again.<br>• If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose. | Is the measured value 230 — 260 kPa (2.35 — 2.65 kg/cm$^2$, 33 — 38 psi)? | Go to step **5**. | Repair the following item.<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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the engine coolant temperature 75°C (167°F) or higher? | Go to step **6**. | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> |
| 6 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)? | Go to step **7**. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |
| 7 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Subtract ambient temperature from intake air temperature. Is the obtained value –10 — 50°C (–18 — 90°F)? | Repair poor contact of the ECM connector. | Check the mass air flow and intake air temperature sensor.<br><Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |

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

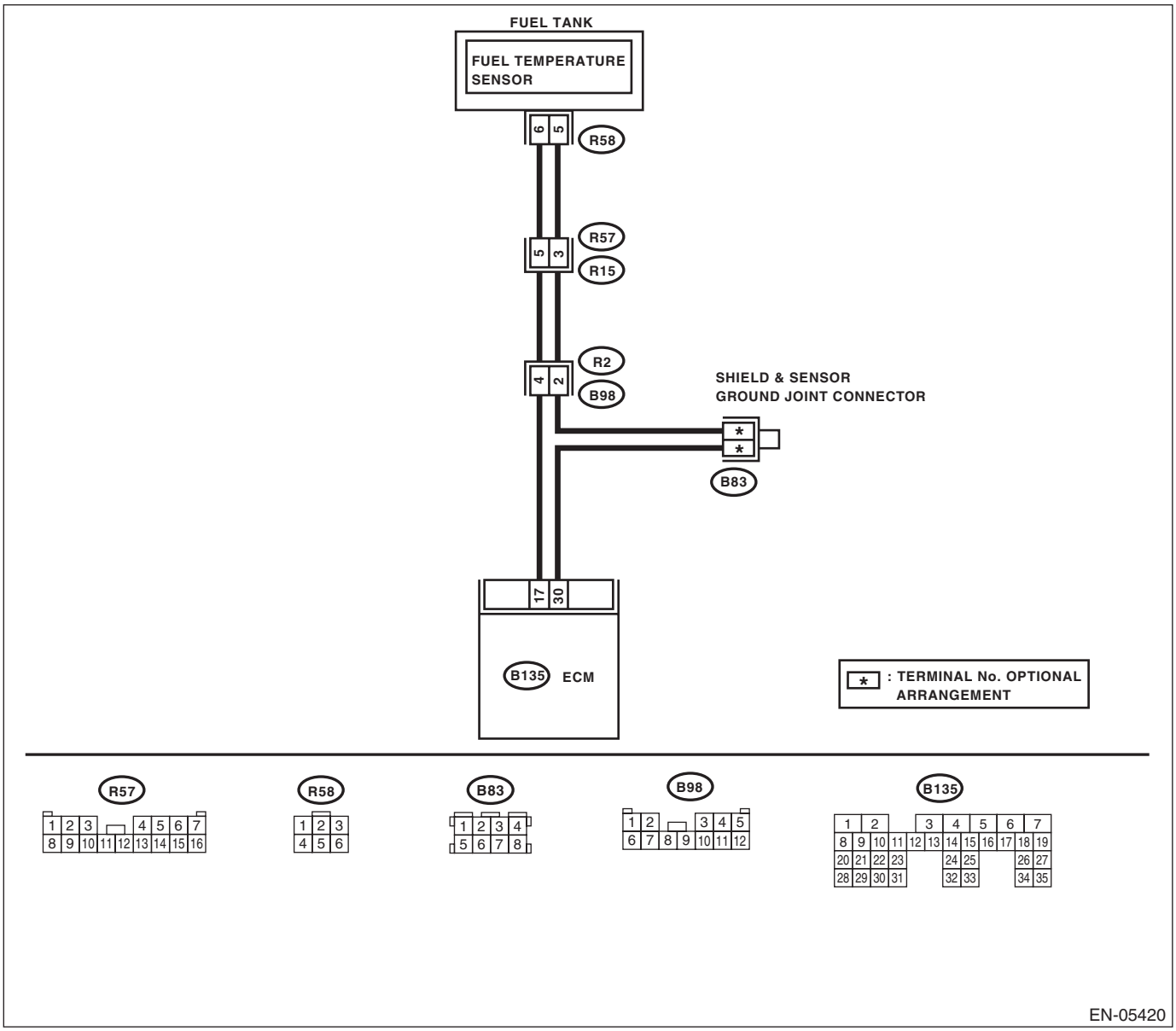
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-81, DTC P0181 FUEL TEMPERATURE SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-13, Fuel Temperature Sensor.> |

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

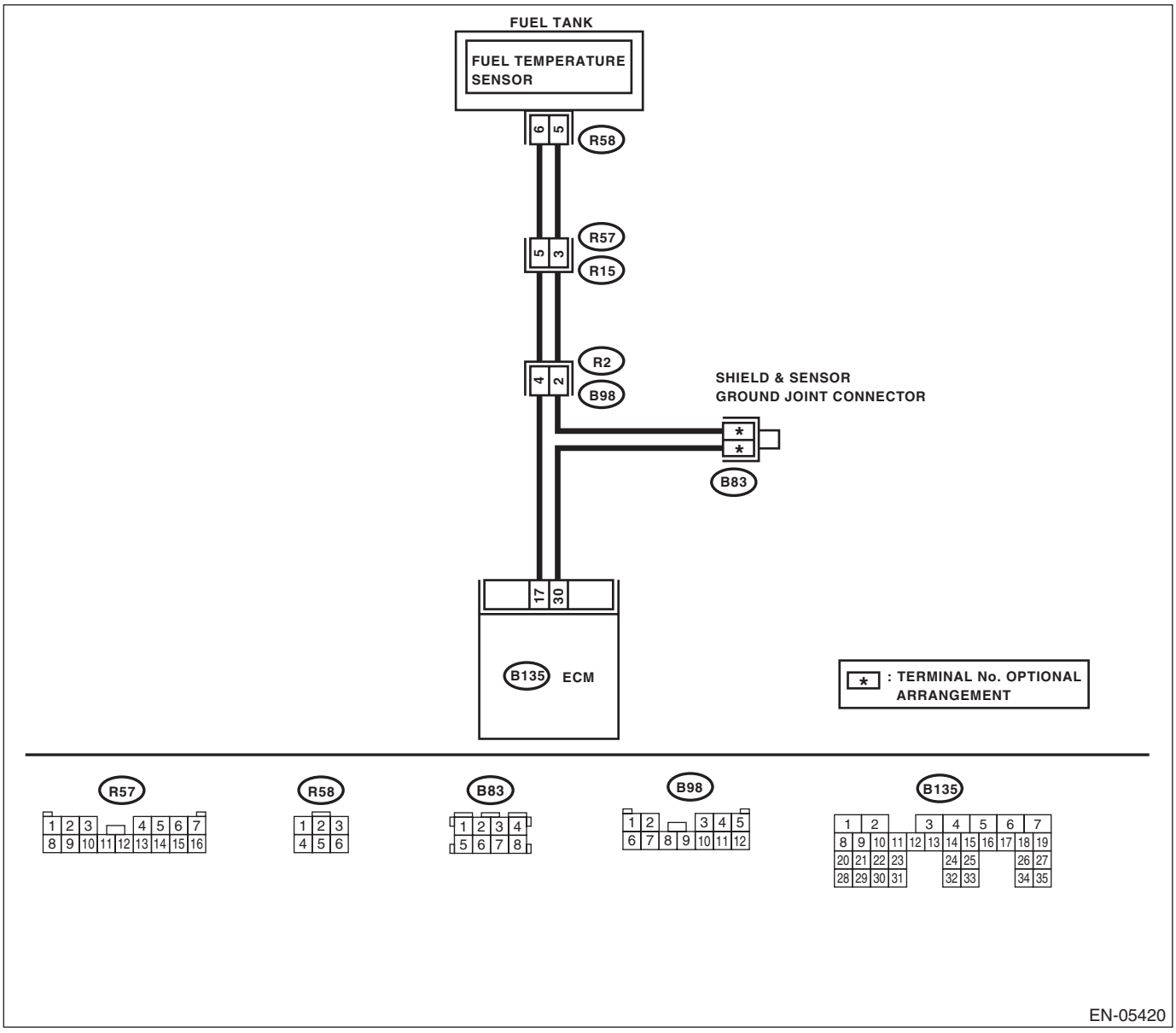
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-84, DTC P0182 FUEL TEMPERATURE SENSOR “A” CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the temperature 120°C (248°F) or higher? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and fuel temperature sensor.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 17 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-13, Fuel Temperature Sensor.> | Repair short circuit of the harness to ground between ECM and fuel pump. |

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

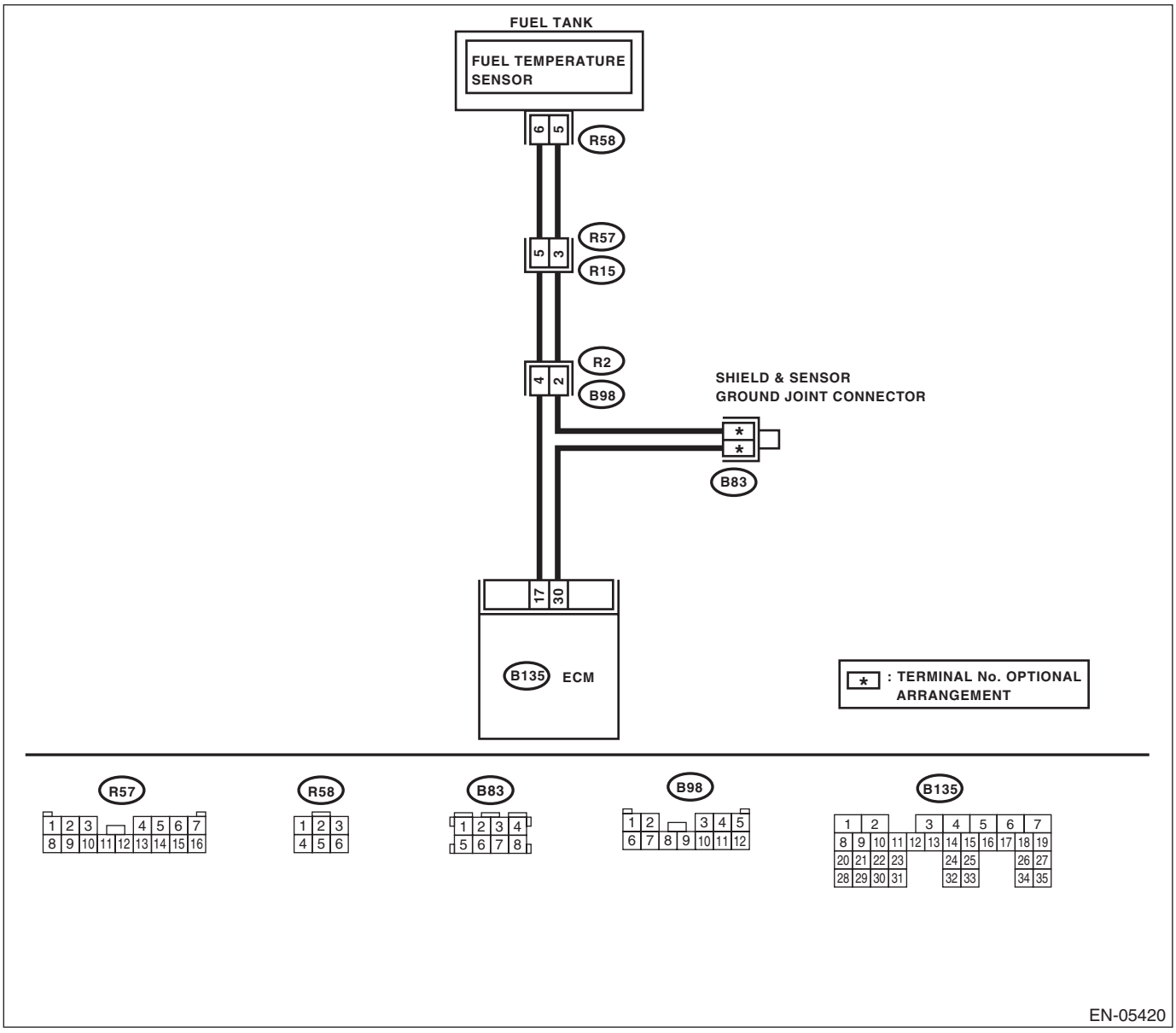
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-86, DTC P0183 FUEL TEMPERATURE SENSOR “A” CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the temperature less than –40°C (–40°F)? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POOR CONTACT.**<br>Repair any poor contact between the ECM and fuel temperature sensor connectors. | Is there poor contact in the ECM or fuel temperature sensor connectors? | Repair any poor contact between the ECM and fuel temperature sensor connectors. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and fuel temperature sensor.<br>3) Measure the resistance of the harness between the ECM and fuel temperature sensor connector.<br>***Connector & terminal***<br>***(B135) No. 17 — (R58) No. 6:***<br>***(B135) No. 30 — (R58) No. 5:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of the harness between the ECM and fuel temperature sensor connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR.**<br>1) Connect all connectors.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 17 (+) — Chassis ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and fuel temperature sensor connector. | Replace the fuel temperature sensor. <Ref. to EC(H4DOTC)-13, Fuel Temperature Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-88, DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

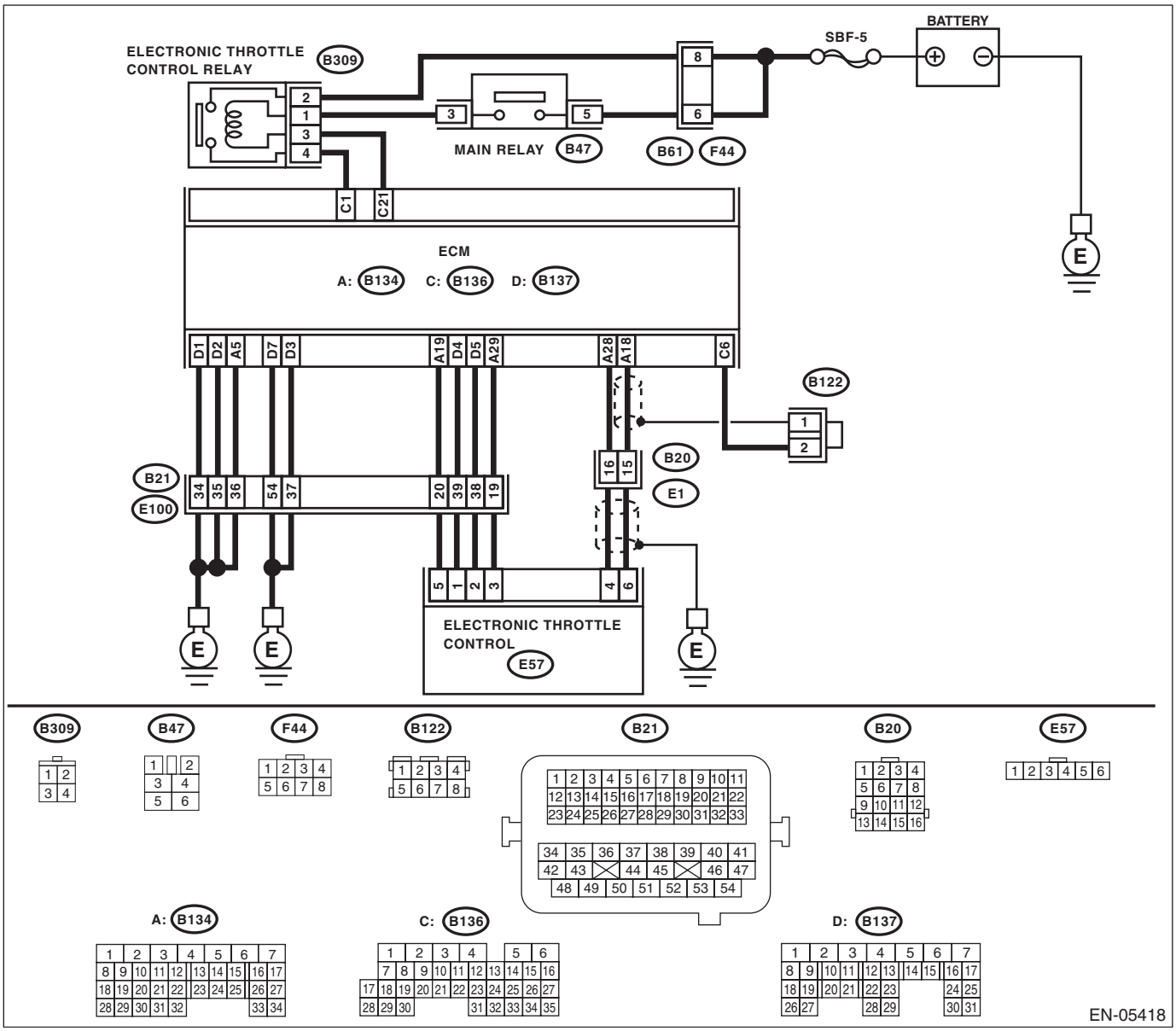
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 19 — Chassis ground:***<br>***(B134) No. 28 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **2**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |
| 2 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 4 — Engine ground:*** | Is the resistance 1 MΩ or more? | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-90, DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH “B” CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

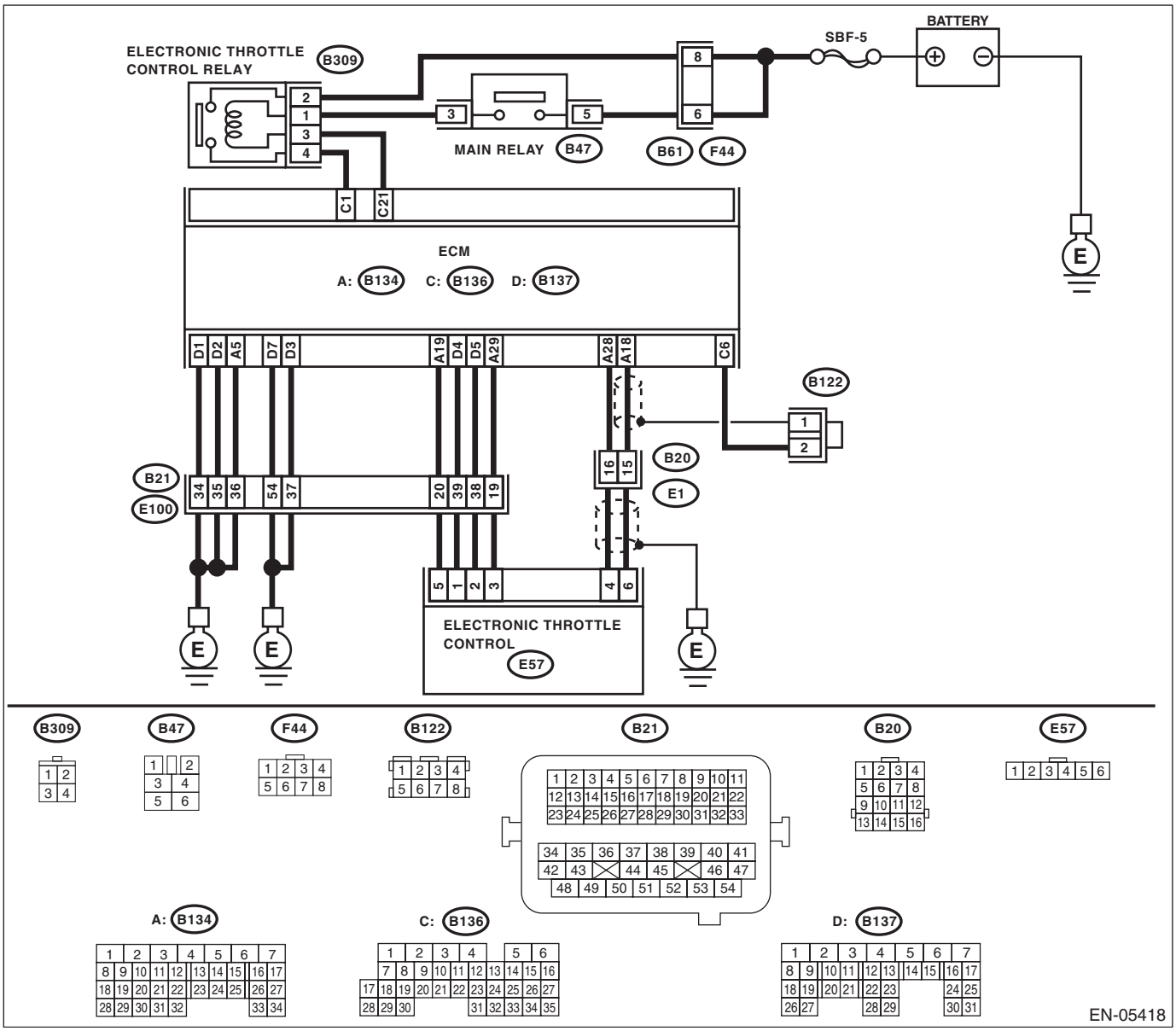
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance of harness between ECM and electronic throttle control connector.<br>***Connector & terminal***<br>***(B134) No. 28 — (E57) No. 4:***<br>***(B134) No. 29 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 3 — 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 item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **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. 4 (+) — Engine ground (–):*** | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step **4**. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 19 — (B134) No. 28:*** | Is the resistance 1 MΩ or more? | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |

## AO:DTC P0230 FUEL PUMP PRIMARY CIRCUIT

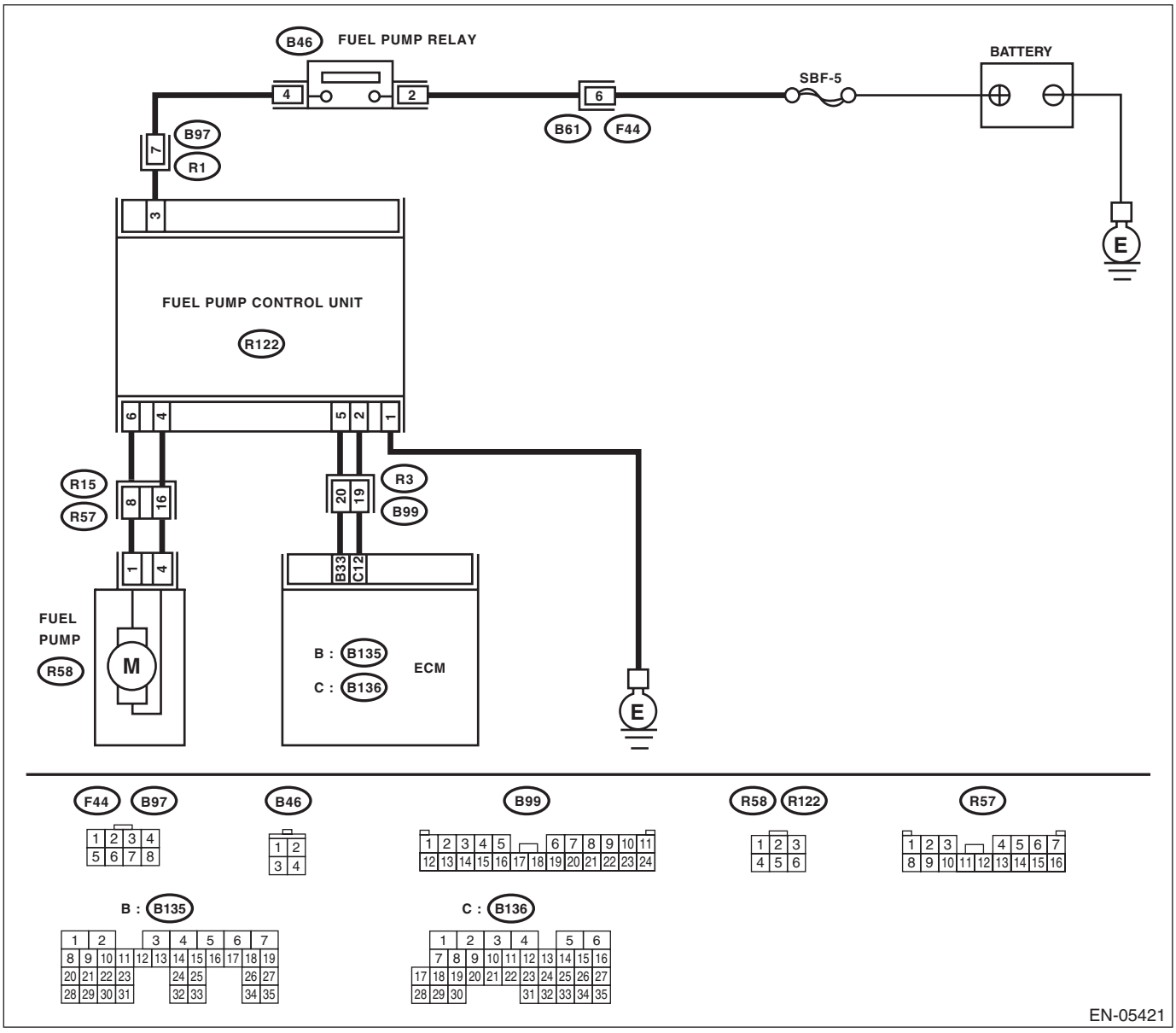
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-92, DTC P0230 FUEL PUMP PRIMARY CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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. 3 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **2**. | Repair the power supply circuit.<br>NOTE:<br>In this case, repair the following item:<br>• Open or ground short circuit of harness between fuel pump relay and fuel pump control unit<br>• Poor contact of fuel pump control unit connector<br>• Poor contact of 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. 1 — 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 item:<br>• Open circuit between fuel pump control unit and chassis ground<br>• Poor contact of 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. 4 — (R58) No. 4:***<br>***(R122) No. 6 — (R58) No. 1:*** | 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 between fuel pump control unit and chassis ground.<br>***Connector & terminal***<br>***(R122) No. 4 — Chassis ground:***<br>***(R122) No. 6 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between fuel pump control unit and fuel pump. |
| 5 | **CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance of the harness between the ECM and fuel pump control unit.<br>***Connector & terminal***<br>***(B136) No. 12 — (R122) No. 2:***<br>***(B135) No. 33 — (R122) No. 5:*** | 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 item:<br>• Open circuit between the ECM and fuel pump control unit<br>• Poor contact between ECM and fuel pump control unit |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT.**<br>Measure the resistance between fuel pump control unit and chassis ground.<br>***Connector & terminal***<br>***(R122) No. 2 — Chassis ground:***<br>***(R122) No. 5 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **7**. | Repair short circuit of the harness to ground between ECM and fuel pump control unit. |
| 7 | **CHECK POOR CONTACT.**<br>Check poor contact of ECM and fuel pump control unit connector. | Is there poor contact of ECM and fuel pump control unit connector? | Repair the poor contact of ECM and fuel pump control unit connector. | Go to step **8**. |
| 8 | **CHECK EXPERIENCE OF RUNNING OUT OF FUEL.** | Has the vehicle experienced running out of fuel? | Finish the diagnosis.<br>NOTE:<br>DTC may be recorded as a result of fuel pump idling while running out of fuel. | Replace the fuel pump control unit. <Ref. to FU(H4DOTC)-54, Fuel Pump Control Unit.> |

# AP:DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/ PERFORMANCE

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-94, DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

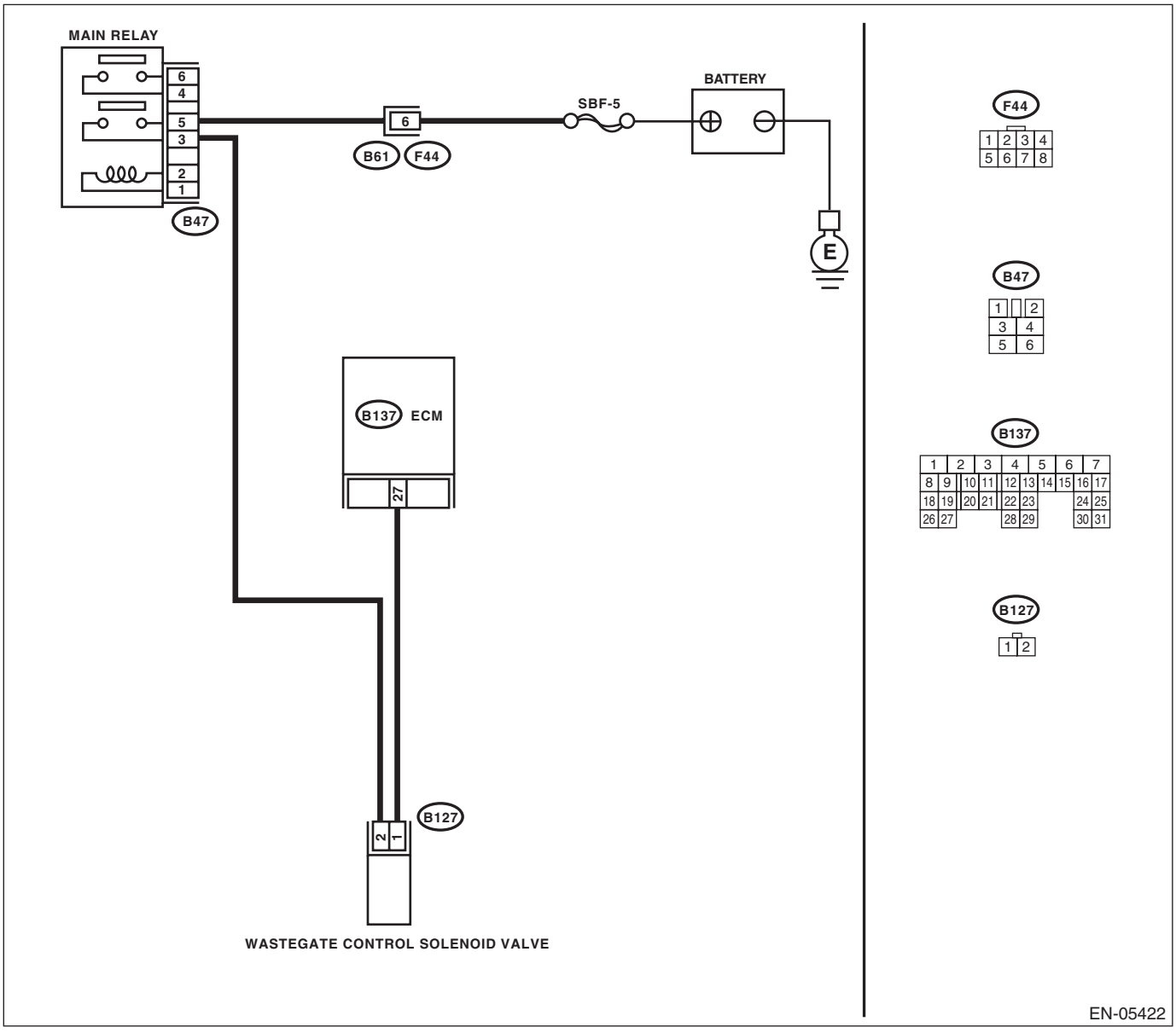
**TROUBLE SYMPTOM:**

Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC)-45, Wastegate Control Solenoid Valve.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-96, DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

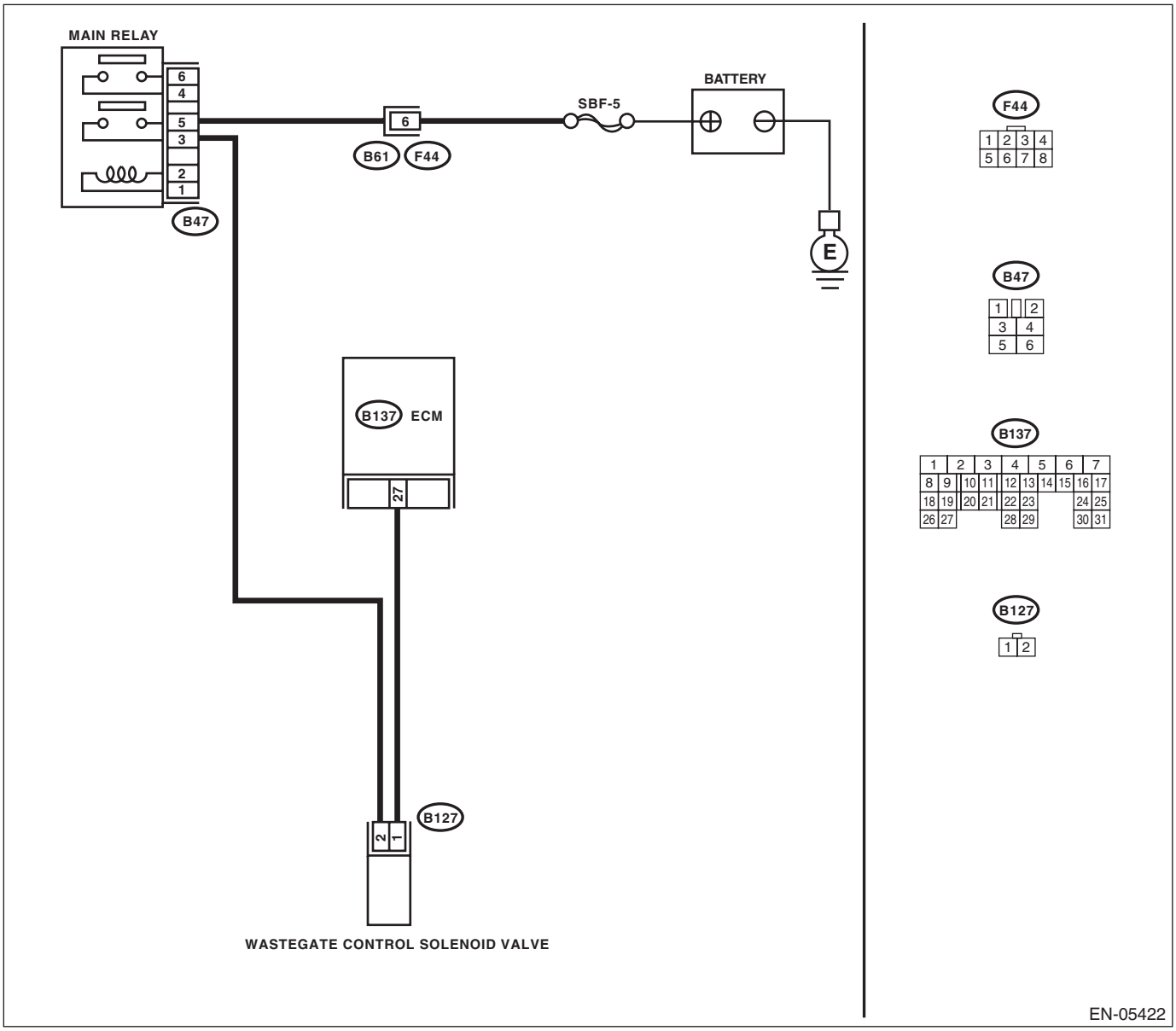
**TROUBLE SYMPTOM:**

Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 27 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and wastegate control solenoid valve.<br>3) Measure the resistance between wastegate control solenoid valve connector and engine ground.<br>***Connector & terminal***<br>***(B127) No. 1 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and wastegate control solenoid valve connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE.**<br>Measure the resistance of harness between ECM and wastegate control solenoid valve connector.<br>***Connector & terminal***<br>***(B137) No. 27 — (B127) 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 item:<br>• Open circuit of 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 between 10 — 100 Ω? | Go to step **5**. | Replace the wastegate control solenoid valve. <Ref. to FU(H4DOTC)-45, 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>***(B127) No. 2 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Repair poor contact in wastegate control solenoid valve connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between main relay and wastegate control solenoid valve connector<br>• Poor contact of main relay connector |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-98, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID “A” HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

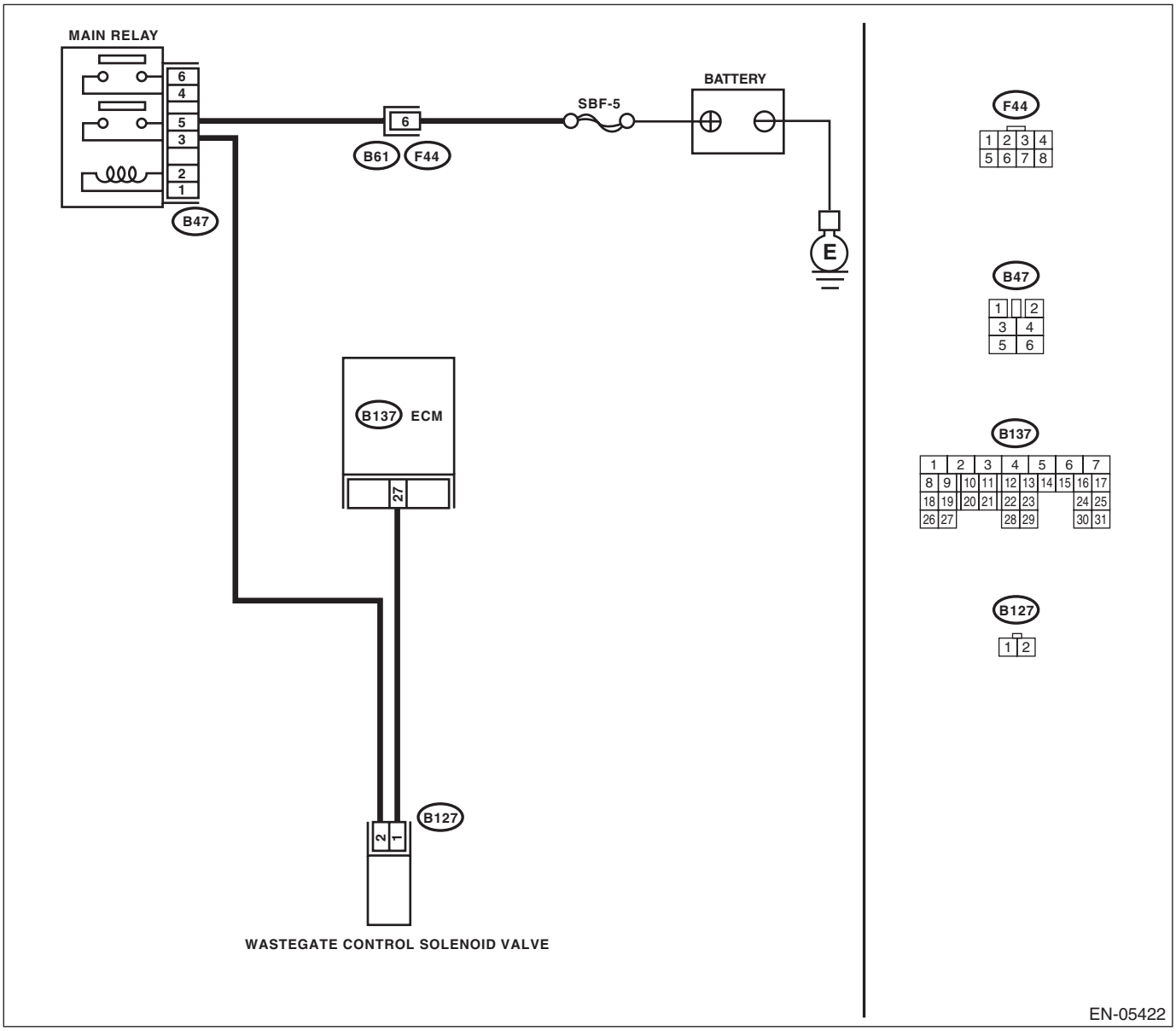
**TROUBLE SYMPTOM:**

Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and 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>***(B137) No. 27 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair short circuit to power in the harness between ECM and wastegate control solenoid valve connector. | Go to step **2**. |
| 2 | **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. <Ref. to FU(H4DOTC)-45, Wastegate Control Solenoid Valve.> | Repair poor contact of the ECM connector. |

## AS: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).>

## AT: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).>

## AU: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).>

## AV:DTC P0304 CYLINDER 4 MISFIRE DETECTED

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-105, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

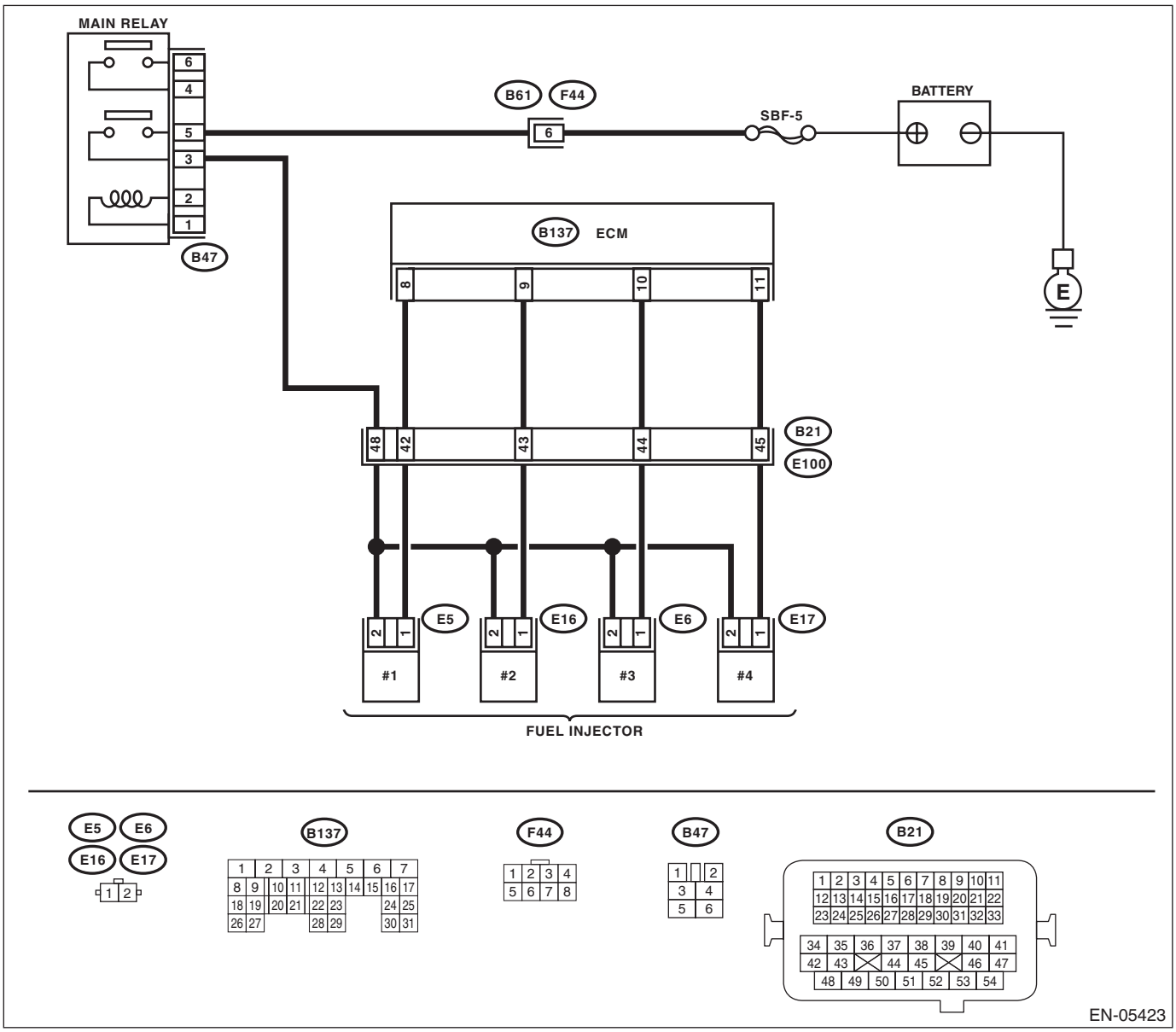
**TROUBLE SYMPTOM:**

- Engine stalls.
- Erroneous idling
- Rough driving

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between the ECM and chassis ground for faulty cylinders.<br>***Connector & terminal***<br>***#1 (B137) No. 8 (+) — Chassis ground (–):***<br>***#2 (B137) No. 9 (+) — Chassis ground (–):***<br>***#3 (B137) No. 10 (+) — Chassis ground (–):***<br>***#4 (B137) No. 11 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **6**. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector on faulty cylinders.<br>3) Measure the resistance between the fuel injector 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 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and fuel injector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.**<br>Measure the resistance of harness between the ECM and fuel injector on faulty cylinders.<br>***Connector & terminal***<br>***#1 (B137) No. 8 — (E5) No. 1:***<br>***#2 (B137) No. 9 — (E16) No. 1:***<br>***#3 (B137) No. 10 — (E6) No. 1:***<br>***#4 (B137) No. 11 — (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 item:<br>• Open circuit of harness between ECM and fuel injector connector<br>• Poor contact of coupling connector |
| 4 | **CHECK FUEL INJECTOR.**<br>Measure the resistance between fuel injector terminals on faulty cylinder.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 5 — 20 Ω? | Go to step **5**. | Replace the faulty fuel injector. <Ref. to FU(H4DOTC)-37, Fuel Injector.> |
| 5 | **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 10 V or more? | Repair the poor contact of all connectors in fuel injector circuit. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the main relay and fuel injector connector on faulty cylinders<br>• Poor contact of coupling connector<br>• Poor contact of main relay connector<br>• Poor contact of fuel injector connector on faulty cylinders |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector on faulty cylinders.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between the ECM and chassis ground for faulty cylinders.<br>***Connector & terminal***<br>***#1 (B137) No. 8 (+) — Chassis ground (–):***<br>***#2 (B137) No. 9 (+) — Chassis ground (–):***<br>***#3 (B137) No. 10 (+) — Chassis ground (–):***<br>***#4 (B137) No. 11 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between the ECM and fuel injector. | Go to step **7**. |
| 7 | **CHECK FUEL INJECTOR.**<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 less than 1 Ω? | Replace the faulty fuel injector. <Ref. to FU(H4DOTC)-37, Fuel Injector.> | Go to step **8**. |
| 8 | **CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.** | Is the camshaft position sensor or crankshaft position sensor loosely installed? | Tighten the camshaft position sensor or crankshaft position sensor. | Go to step **9**. |
| 9 | **CHECK CRANK SPROCKET.**<br>Remove the timing belt cover. | Is the crank sprocket rusted or does it have damaged teeth? | Replace the crank sprocket. <Ref. to ME(H4DOTC)-57, Crank Sprocket.> | Go to step **10**. |
| 10 | **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)-48, Timing Belt.> | Go to step **11**. |
| 11 | **CHECK FUEL LEVEL.** | Is the fuel meter indication higher than the “Lower” level? | Go to step **12**. | Replenish fuel so that fuel meter indication is higher than the “Lower” level. After replenishing fuel, Go to step **12**. |
| 12 | **CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.**<br>1) Clear the memory using the Subaru Select Monitor or general scan tool.<br><Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.><br>NOTE:<br>• Subaru Select Monitor<br><Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>Refer to operating manuals for the general scan tool.<br>2) Start the engine, and drive the vehicle 10 minutes or more. | Does the malfunction indicator light illuminate or blink? | Go to step **14**. | Go to step **13**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 13 | **CHECK CAUSE OF MISFIRE.** | Has the cause of misfire been detected while running the engine? | Finish diagnostics operation, if the engine has no abnormality. | Repair the poor contact of connector.<br>NOTE:<br>In this case, repair the following item:<br>• Poor contact of ignition coil connector<br>• Poor contact of fuel injector connector on faulty cylinders<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 14 | **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 **15**. |
| 15 | **CHECK MISFIRE SYMPTOM.**<br>1) Turn the ignition switch to ON.<br>2) Read the DTC.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Does the Subaru Select Monitor or general scan tool indicate only one DTC? | Go to step **20**. | Go to step **16**. |
| 16 | **CHECK DTC.** | Are DTCs P0301 and P0302 displayed on the Subaru Select Monitor or general scan tool? | Go to step **21**. | Go to step **17**. |
| 17 | **CHECK DTC.** | Are DTCs P0303 and P0304 displayed on the Subaru Select Monitor or general scan tool? | Go to step **22**. | Go to step **18**. |
| 18 | **CHECK DTC.** | Are DTCs P0301 and P0303 displayed on the Subaru Select Monitor or general scan tool? | Go to step **23**. | Go to step **19**. |
| 19 | **CHECK DTC.** | Are DTCs P0302 and P0304 displayed on the Subaru Select Monitor or general scan tool? | Go to step **24**. | Go to step **25**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 20 | **ONLY ONE CYLINDER.** | Is there any fault in the cylinder? | Repair or replace faulty parts.<br>NOTE:<br>Check the following items.<br>• Spark plug<br>• Spark plug cord<br>• Fuel injector<br>• Compression ratio | Go to DTC P0171. <Ref. to EN(H4DOTC)(diag)-143, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| 21 | **GROUP OF #1 AND #2 CYLINDERS.** | Are there any faults in #1 and #2 cylinders? | Repair or replace faulty parts.<br>NOTE:<br>• Check the following items.<br>• Spark plug<br>• Fuel injector<br>• Ignition coil<br>• Compression ratio<br>• If no fault is found, check the "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <Ref. to EN(H4DOTC)(diag)-70, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.> | Go to DTC P0171. <Ref. to EN(H4DOTC)(diag)-143, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| 22 | **GROUP OF #3 AND #4 CYLINDERS.** | Are there any faults in #3 and #4 cylinders? | Repair or replace faulty parts.<br>NOTE:<br>• Check the following items.<br>• Spark plug<br>• Fuel injector<br>• Ignition coil<br>• Compression ratio<br>• If no fault is found, check the "IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to EN(H4DOTC)(diag)-70, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.> | Go to DTC P0171. <Ref. to EN(H4DOTC)(diag)-143, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 23 | GROUP OF #1 AND #3 CYLINDERS. | Are there any faults in #1 and #3 cylinders? | Repair or replace faulty parts.<br>NOTE:<br>Check the following items.<br>• Spark plug<br>• Fuel injector<br>• Compression ratio<br>• Skipping timing belt teeth | Go to DTC P0171. <Ref. to EN(H4DOTC)(diag)-143, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| 24 | GROUP OF #2 AND #4 CYLINDERS. | Are there any faults in #2 and #4 cylinders? | Repair or replace faulty parts.<br>NOTE:<br>Check the following items.<br>• Spark plug<br>• Fuel injector<br>• Compression ratio<br>• Skipping timing belt teeth | Go to DTC P0171. <Ref. to EN(H4DOTC)(diag)-123, DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| 25 | CYLINDER AT RANDOM. | Is the engine idle rough? | Go to DTC P0171. <Ref. to EN(H4DOTC)(diag)-143, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> | Repair or replace faulty parts.<br>NOTE:<br>Check the following items.<br>• Spark plug<br>• Fuel injector<br>• Compression ratio |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-106, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

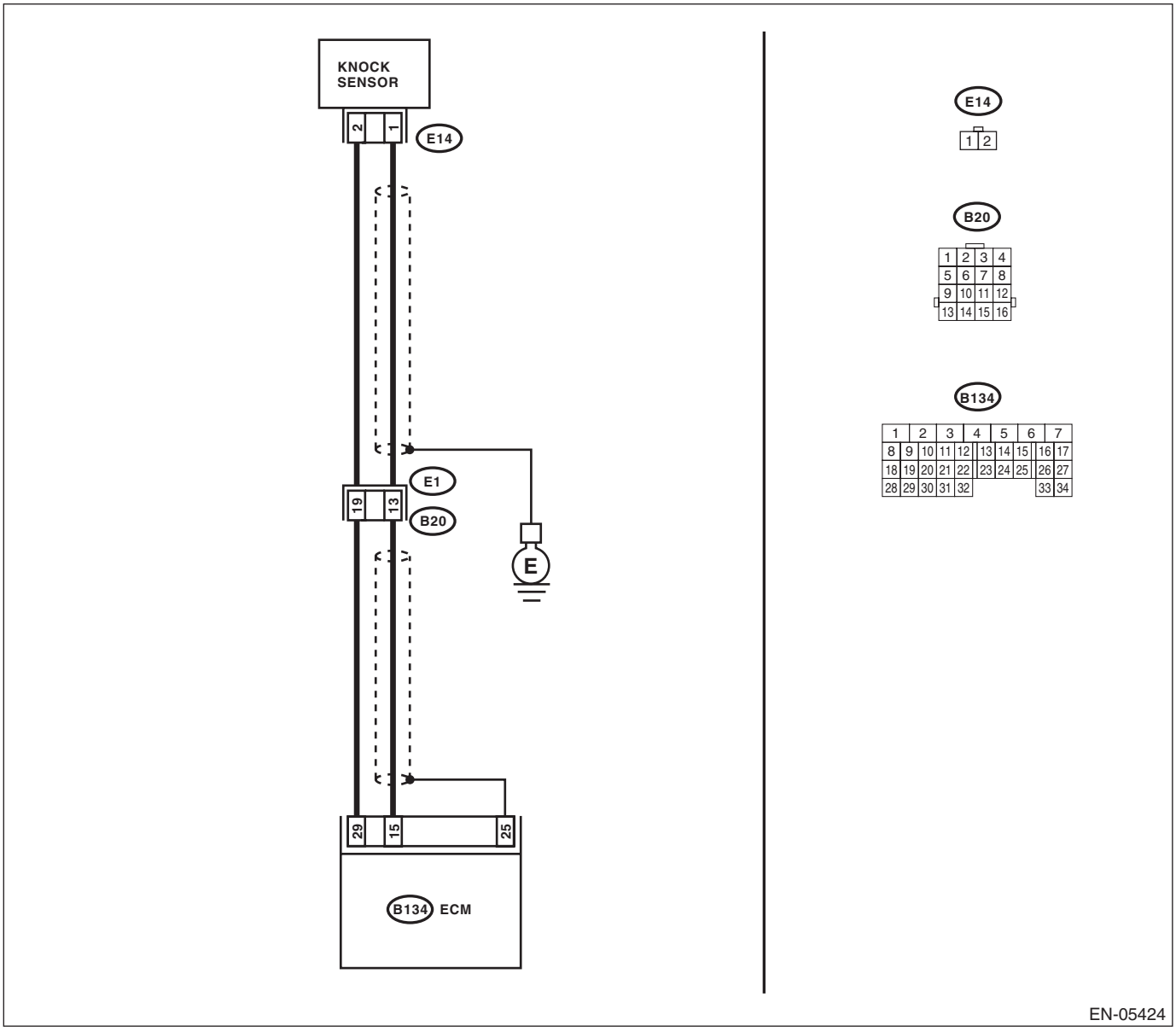
**TROUBLE SYMPTOM:**

- Poor driving performance
- Knocking occurs.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 15 — (B134) No. 29:*** | Is the resistance 600 kΩ or more? | Go to step **2**. | Repair poor contact of the ECM connector. |
| 2 | **CHECK KNOCK SENSOR.**<br>1) Disconnect the connector from knock sensor.<br>2) Measure the resistance between knock sensor terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 600 kΩ or more? | Replace the knock sensor. <Ref. to FU(H4DOTC)-34, Knock Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and knock sensor<br>• Poor contact of knock sensor connector<br>• Poor contact of coupling connector |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-108, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

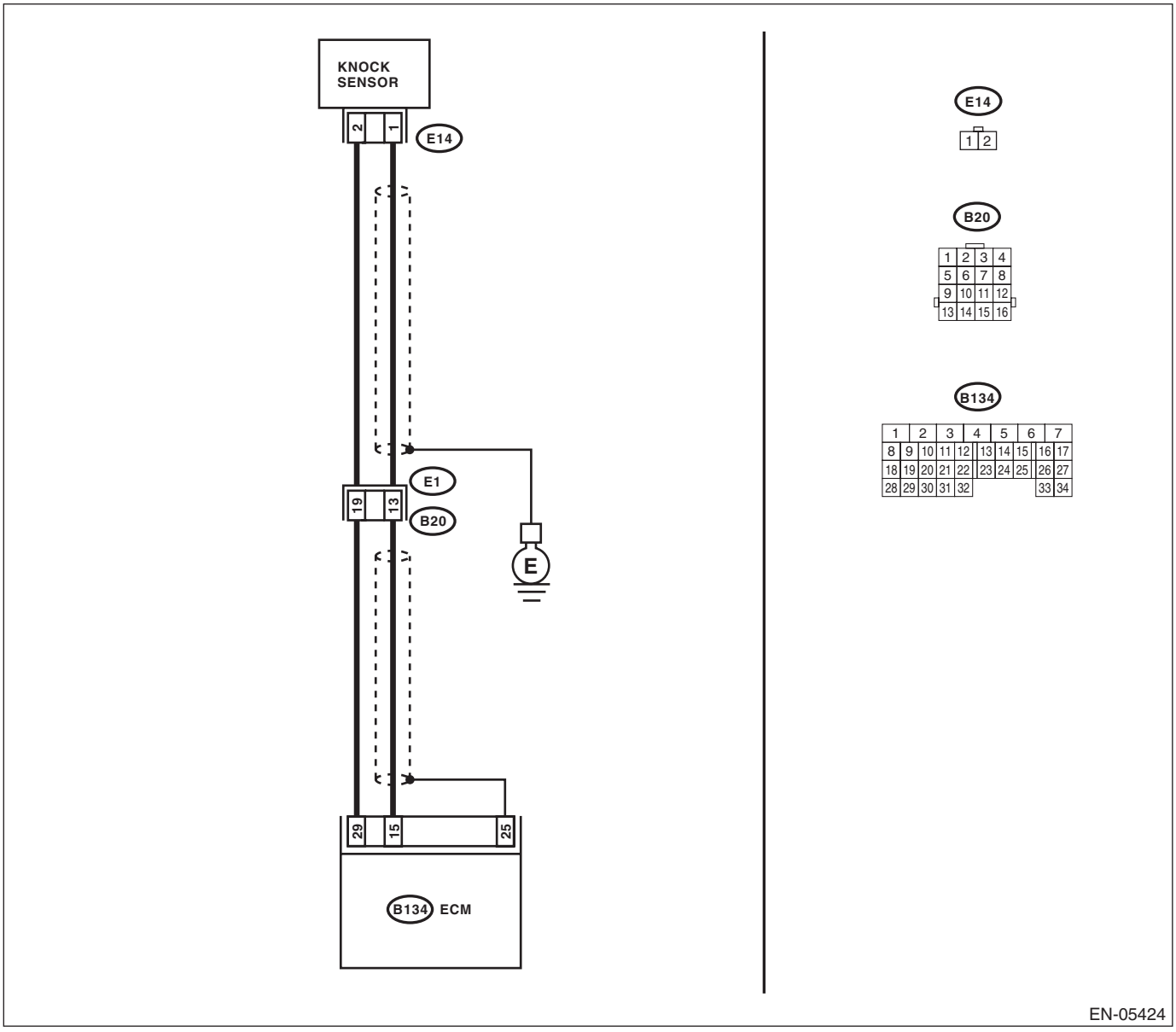
**TROUBLE SYMPTOM:**

- Poor driving performance
- Knocking occurs.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 15 — (B134) No. 29:*** | Is the resistance less than 500 kΩ? | Go to step **2**. | Go to step **3**. |
| 2 | **CHECK KNOCK SENSOR.**<br>1) Disconnect the connector from knock sensor.<br>2) Measure the resistance between knock sensor connectors.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 500 kΩ? | Replace the knock sensor. <Ref. to FU(H4DOTC)-34, Knock Sensor.> | Repair short circuit of the harness to ground between the ECM and knock sensor connector.<br>NOTE:<br>The harness between both connectors are shielded. Repair the short circuit of harness covered with shield. |
| 3 | **CHECK INPUT SIGNAL OF ECM.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 15 (+) — Chassis ground (–):*** | Is the voltage 2 V or more? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. | Repair poor contact of the ECM connector. |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-110, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

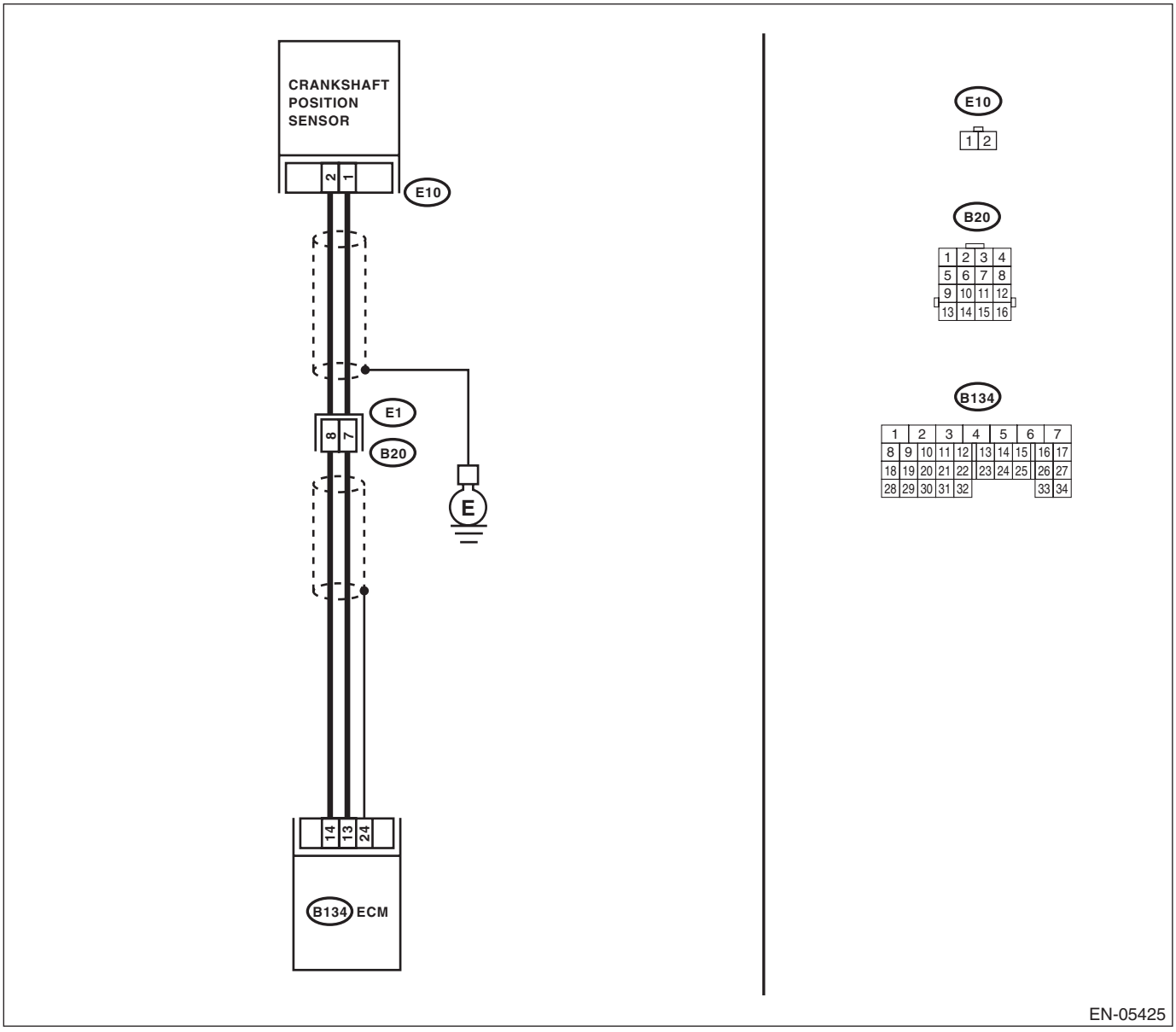
**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.** | Is the crankshaft position sensor installation bolt tightened securely? | Go to step **2**. | Tighten the crankshaft position sensor installation bolt securely. |
| 2 | **CHECK CRANKSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the crankshaft position sensor.<br>3) Measure the resistance between connector terminals of crankshaft position sensor.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 1 — 4 kΩ? | Go to step **3**. | Replace the crankshaft position sensor. <Ref. to FU(H4DOTC)-31, Crankshaft Position Sensor.> |
| 3 | **CHECK HARNESS BETWEEN ECM AND CRANK SHAFT POSITION SENSOR.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance of harness between the ECM and crankshaft position sensor connector.<br>***Connector & terminal***<br>***(B134) No. 13 — (E10) No. 1:***<br>***(B134) No. 14 — (E10) No. 2:*** | Is the resistance less than 1 Ω? | Repair the poor contact of the ECM and crankshaft position sensor connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and crankshaft position sensor connector<br>• Poor contact of coupling connector |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-112, DTC P0336 CRANKSHAFT POSITION SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

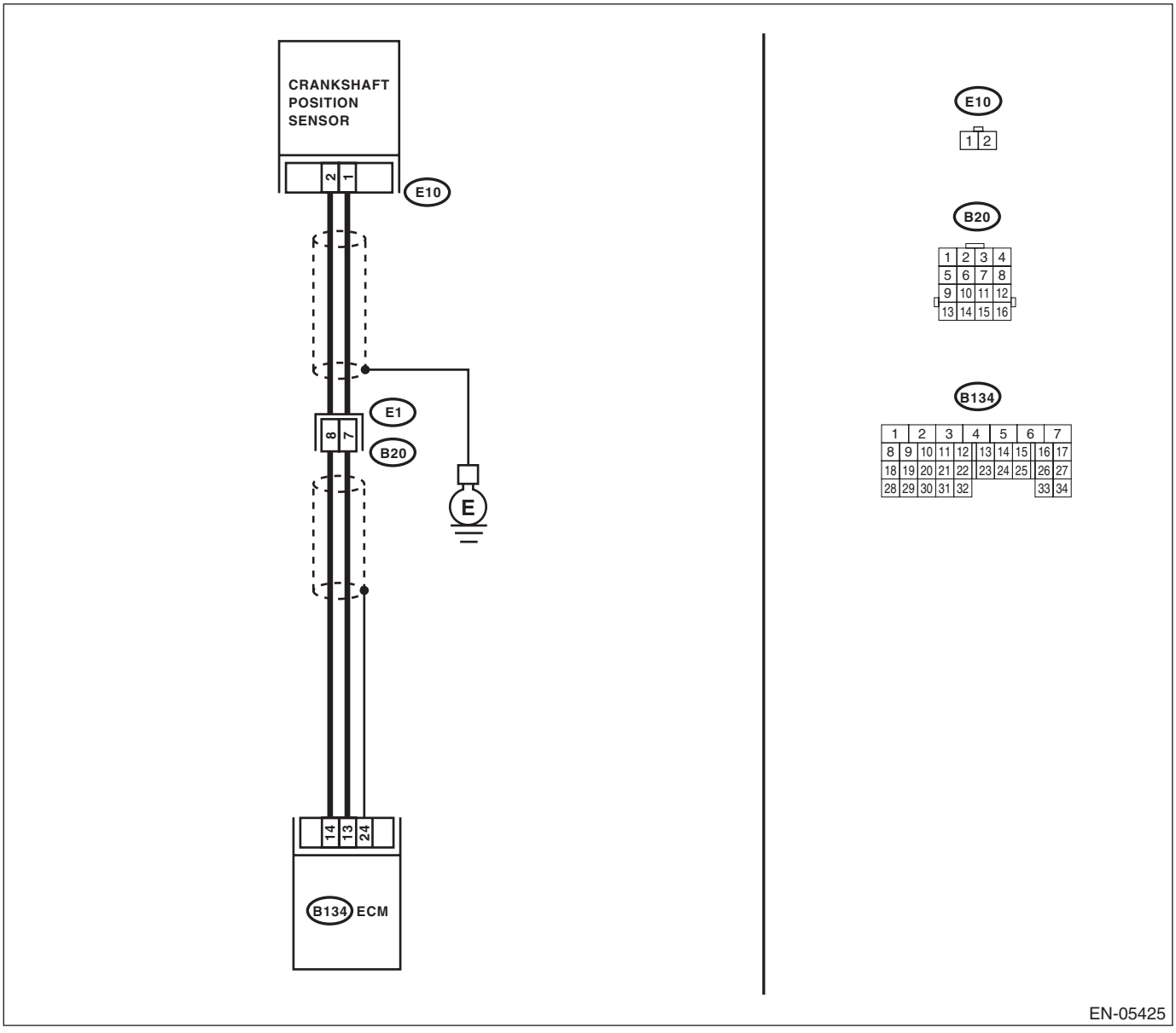
**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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 **2**. | Tighten the crankshaft position sensor installation bolt securely. |
| 2 | **CHECK CRANK SPROCKET.**<br>Remove the timing belt cover. | Are crank sprocket teeth cracked or damaged? | Replace the crank sprocket. <Ref. to ME(H4DOTC)-57, Crank Sprocket.> | Go to step **3**. |
| 3 | **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)-48, Timing Belt.> | Replace the crankshaft position sensor. <Ref. to FU(H4DOTC)-31, Crankshaft Position Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-114, DTC P0340 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

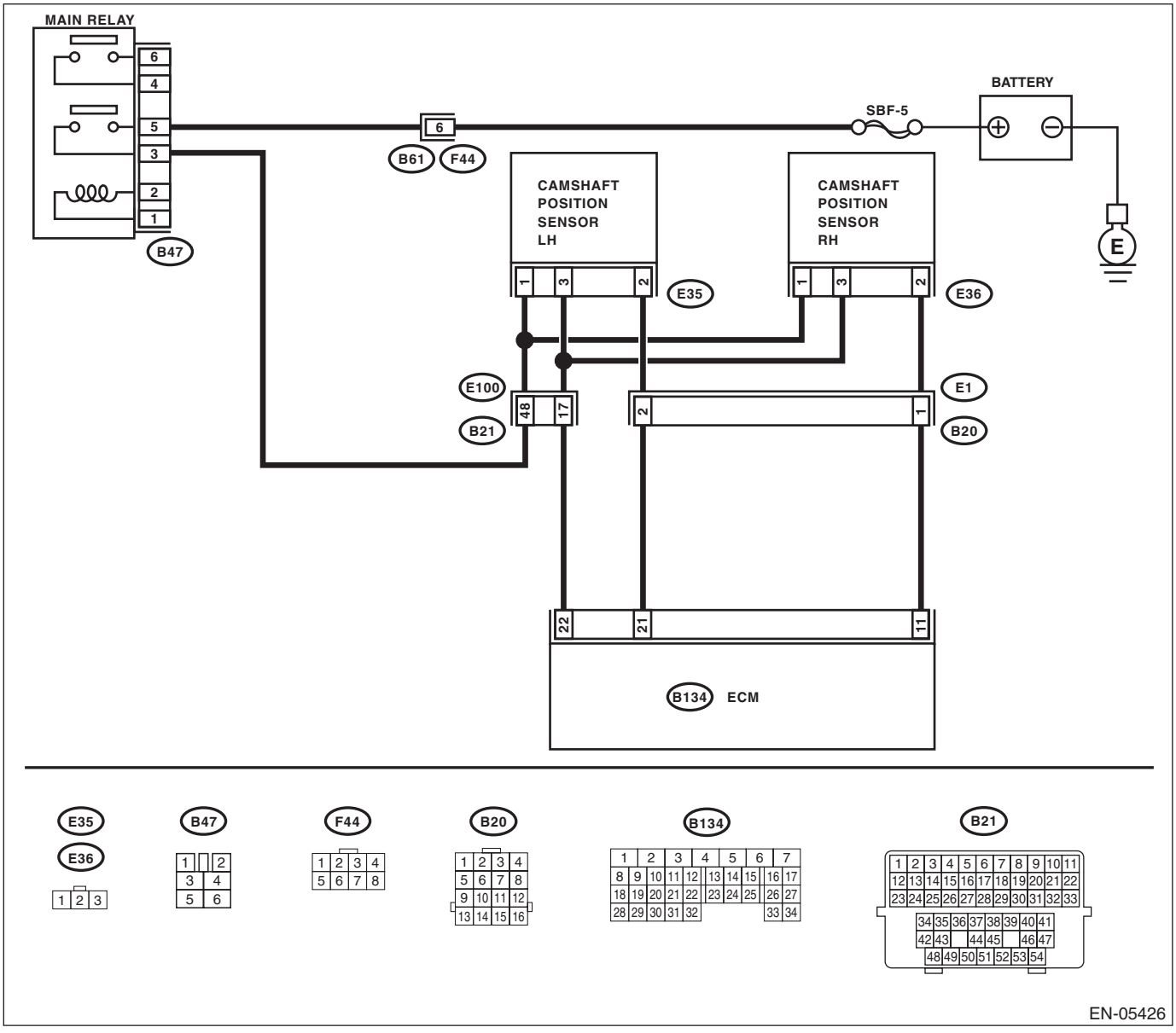
**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the camshaft position sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E36) No. 1 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Go to step **2**. | Repair the open or ground short circuit of harness between main relay connector and camshaft position sensor connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between the ECM and camshaft position sensor connector.<br>***Connector & terminal***<br>***(B134) No. 11 — (E36) No. 2:***<br>***(B134) No. 22 — (E36) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between the ECM and camshaft position sensor. |
| 3 | **CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.**<br>Measure the resistance between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E36) No. 2 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **4**. | Repair short circuit of the harness to ground between the ECM and camshaft position sensor. |
| 4 | **CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.**<br>Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E36) No. 2 (+) — Engine ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and camshaft position sensor. | Go to step **5**. |
| 5 | **CHECK CONDITION OF CAMSHAFT POSITION SENSOR.** | Is the camshaft position sensor installation bolt tightened securely? | Go to step **6**. | Tighten the camshaft position sensor installation bolt securely. |
| 6 | **CHECK CAMSHAFT POSITION SENSOR.**<br>Check the waveform of the camshaft position sensor. <Ref. to EN(H4DOTC)(diag)-21, Engine Control Module (ECM) I/O Signal.> | Is there any abnormality in waveform? | Replace the camshaft position sensor. <Ref. to FU(H4DOTC)-32, Camshaft Position Sensor.> | Repair the connector.<br>NOTE:<br>In this case, repair the following item:<br>• Poor contact in ECM connector<br>• Poor contact in camshaft position sensor connector<br>• Poor contact of coupling connector |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-115, DTC P0345 CAMSHAFT POSITION SENSOR “A” CIRCUIT (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

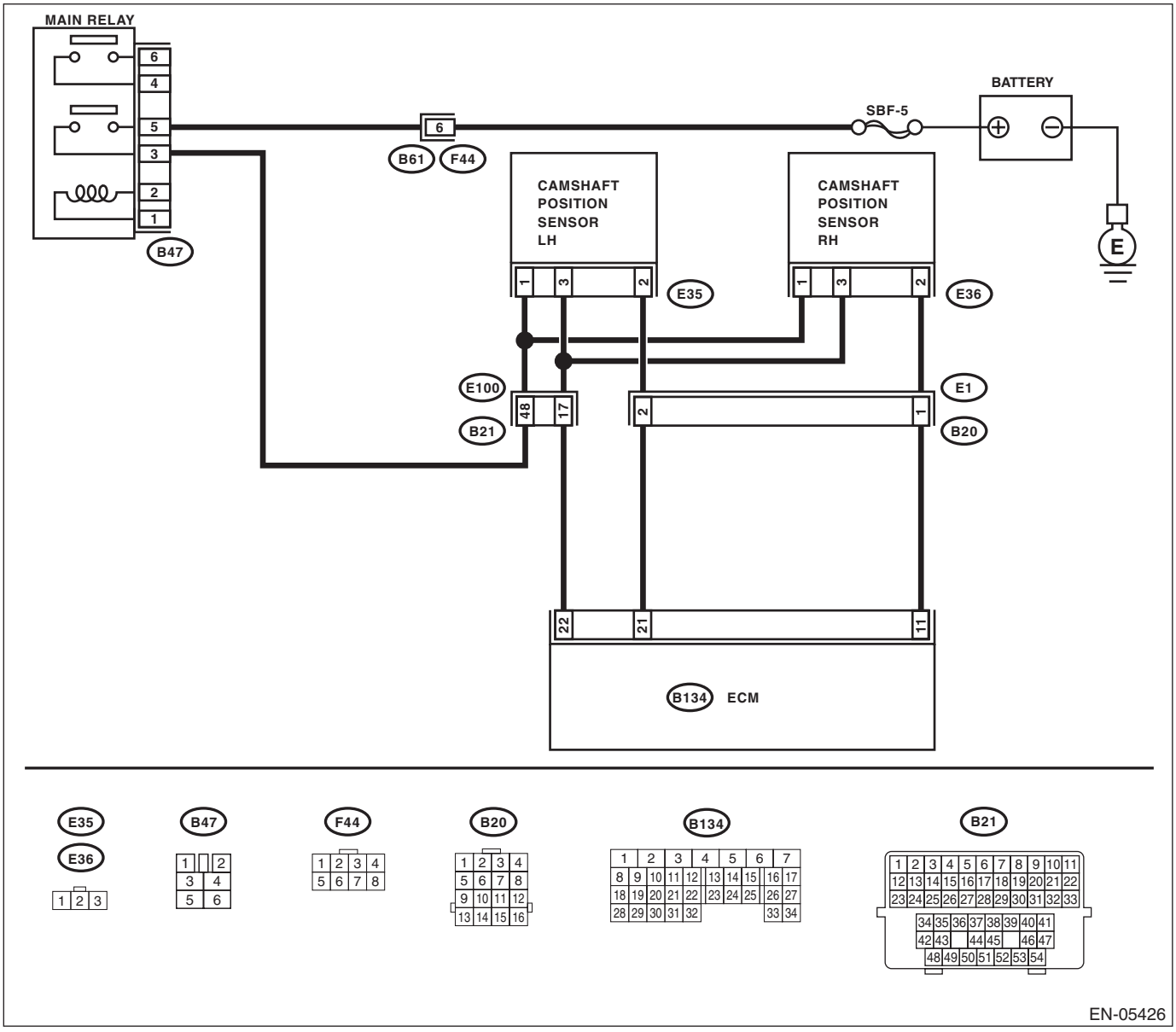
**TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the camshaft position sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E35) No. 1 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Go to step **2**. | Repair the open or ground short circuit of harness between main relay connector and camshaft position sensor connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between the ECM and camshaft position sensor connector.<br>***Connector & terminal***<br>***(B134) No. 21 — (E35) No. 2:***<br>***(B134) No. 22 — (E35) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between the ECM and camshaft position sensor. |
| 3 | **CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.**<br>Measure the resistance between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E35) No. 2 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **4**. | Repair short circuit of the harness to ground between the ECM and camshaft position sensor. |
| 4 | **CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.**<br>Measure the voltage between camshaft position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E35) No. 2 (+) — Engine ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and camshaft position sensor. | Go to step **5**. |
| 5 | **CHECK CONDITION OF CAMSHAFT POSITION SENSOR.** | Is the camshaft position sensor installation bolt tightened securely? | Go to step **6**. | Tighten the camshaft position sensor installation bolt securely. |
| 6 | **CHECK CAMSHAFT POSITION SENSOR.**<br>Check the waveform of the camshaft position sensor. <Ref. to EN(H4DOTC)(diag)-21, Engine Control Module (ECM) I/O Signal.> | Is there any abnormality in waveform? | Replace the camshaft position sensor. <Ref. to FU(H4DOTC)-32, Camshaft Position Sensor.> | Repair the connector.<br>NOTE:<br>In this case, repair the following item:<br>• Poor contact in ECM connector<br>• Poor contact in camshaft position sensor connector<br>• Poor contact of coupling connector |

## BC:DTC P0410 SECONDARY AIR INJECTION SYSTEM

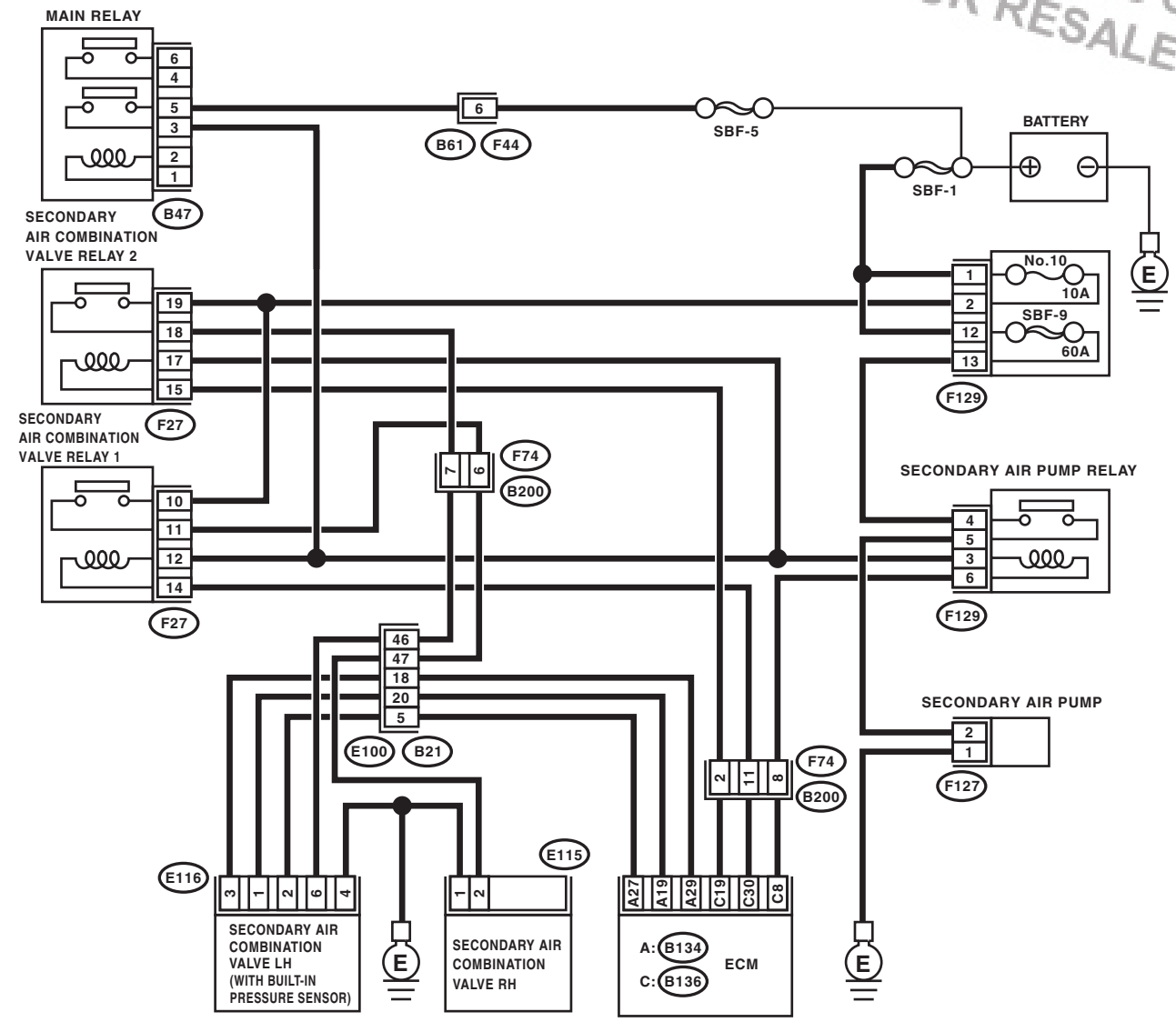
**DTC DETECTING CONDITION:**

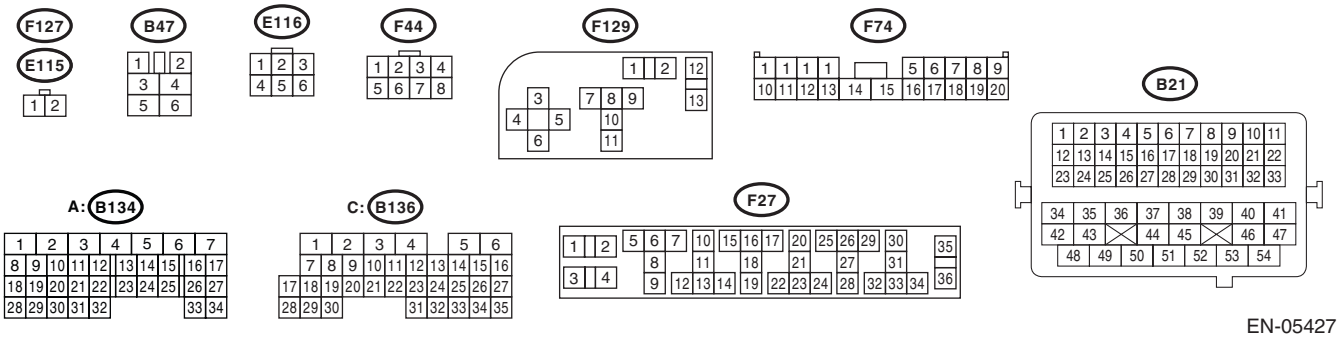
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-116, DTC P0410 SECONDARY AIR INJECTION SYSTEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SECONDARY AIR PUMP FUSE.**<br>Check if the secondary air pump fuse (60 A) is blown out. | Is the fuse blown out? | Go to step **2**. | Go to step **3**. |
| 2 | **CHECK HARNESS BETWEEN FUSE BOX AND SECONDARY AIR PUMP.**<br>1) Remove the secondary air pump fuse from the fuse box.<br>2) Disconnect the secondary air pump connector.<br>3) Measure the resistance between the secondary air pump fuse and secondary air pump connector, and chassis ground.<br>***Connector & terminal***<br>***(F129) No. 5 — Chassis ground:***<br>***(F127) No. 2 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the fuse with a new part, and connect the secondary air pump connector. Go to step **3**. | Repair short circuit of the harness to ground between the fuse box and the secondary air pump. |
| 3 | **CHECK SECONDARY AIR PUMP OPERATION.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Perform the Clear Memory Mode.<br>4) Perform operation check for the secondary air pump using the Subaru Select Monitor.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedure, refer to Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.>and Compulsory Valve Operation Check Mode <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.>.<br>• The compulsory operation using the Subaru Select Monitor is performed only for 5 seconds in order to protect the secondary air pump. When operating again, perform the Clear Memory Mode. | Does the secondary air pump operate? | Go to step **4**. | Go to step **5**. |
| 4 | **CHECK DUCT BETWEEN SECONDARY AIR PUMP AND COMBINATION VALVE.**<br>Inspection of the duct between the secondary air pump and combination valve. | Is there damage, clog or disconnection of the duct? | Replace, clean or connect the duct. | Replace the secondary air combination valve LH. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> |
| 5 | **CHECK POWER SUPPLY TO SECONDARY AIR PUMP.**<br>1) Perform the Clear Memory Mode.<br>2) Turn the ignition switch to OFF.<br>3) Disconnect the secondary air pump connector.<br>4) In the condition of step 3, measure the voltage between the secondary air pump connector and the chassis ground.<br>NOTE:<br>For detailed procedures, refer to Clear Memory Mode. <Ref. to EN(H4DOTC)(diag)-53, Clear Memory Mode.><br>***Connector & terminal***<br>***(F127) No. 2 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Replace the secondary air pump. <Ref. to EC(H4DOTC)-9, Secondary Air Pump.> | Go to step **6**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN SECONDARY AIR PUMP RELAY AND SECONDARY AIR PUMP CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the secondary air pump relay.<br>3) Measure the resistance of harness between secondary air pump relay and secondary air pump connector.<br>***Connector & terminal***<br>***(F129) No. 5 — (F127) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **7**. | Repair the open circuit of harness between secondary air pump relay and secondary air pump connector. |
| 7 | **CHECK HARNESS BETWEEN SECONDARY AIR PUMP CONNECTOR AND CHASSIS GROUND.**<br>Measure the resistance of the harness between secondary air pump connector and chassis ground.<br>***Connector & terminal***<br>***(F127) No. 1 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **8**. | Repair the open circuit of the harness between secondary air pump connector and chassis ground. |
| 8 | **CHECK SECONDARY AIR PUMP RELAY.**<br>1) Connect the battery to terminals No. 3 and No. 6 of the secondary air pump relay.<br>2) Measure the resistance between secondary air pump relay terminals.<br>***Terminals***<br>***No. 4 — No. 5:*** | Is the resistance less than 1 Ω? | Go to step **9**. | Replace the secondary air pump relay. <Ref. to EN(H4DOTC)(diag)-8, Electrical Component Location.> |
| 9 | **CHECK SECONDARY AIR PUMP RELAY POWER SUPPLY.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between the secondary air pump relay connector and chassis ground.<br>***Connector & terminal***<br>***(F129) No. 4 (+) — Chassis ground (–):***<br>***(F129) No. 3 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **10**. | Repair the open or ground short circuit of power supply circuit. |
| 10 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector of ECM.<br>3) Measure the resistance of harness between ECM and secondary air pump relay connector.<br>***Connector & terminal***<br>***(B136) No. 8 — (F129) No. 6:*** | Is the resistance less than 1 Ω? | Repair poor contact of the ECM connector. | Repair the open circuit of harness between ECM and secondary air pump relay connector. |

## BD:DTC P0411 SECONDARY AIR INJECTION SYSTEM INCORRECT FLOW DETECTED

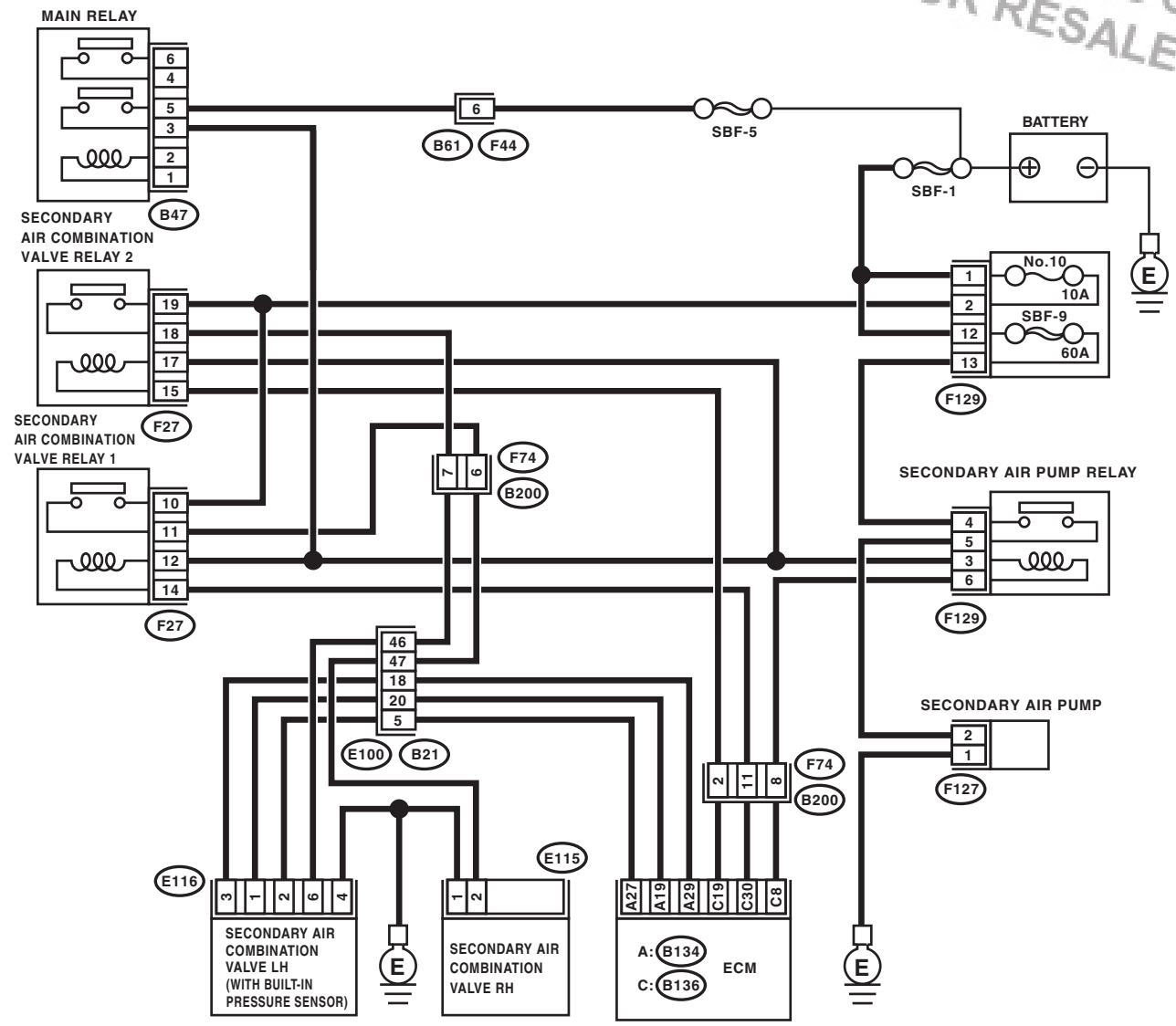
**DTC DETECTING CONDITION:**

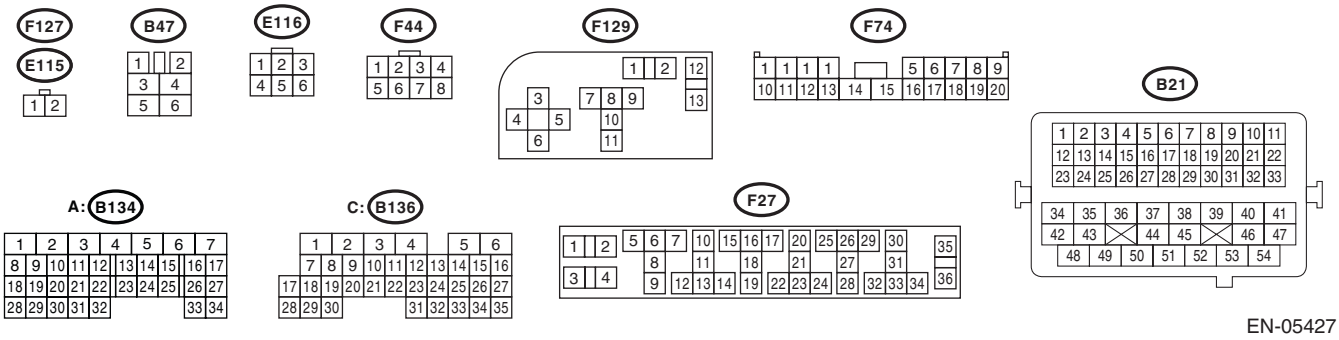
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-123, DTC P0411 SECONDARY AIR INJECTION SYSTEM INCORRECT FLOW DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SECONDARY AIR COMBINATION VALVE.**<br>Inspection of the pipe between the secondary air combination valve and cylinder head. | Is there damage or disconnection of the pipe? | Replace the pipe between secondary air combination valve and cylinder head. | Go to step **2**. |
| 2 | **CHECK SECONDARY AIR COMBINATION VALVE.**<br>Race the engine at 2,000 rpm to check whether or not the exhaust leak is heard. | Is there any exhaust leak? | Replace the pipe between secondary air combination valve and cylinder head. | Repair poor contact of the ECM connector. |

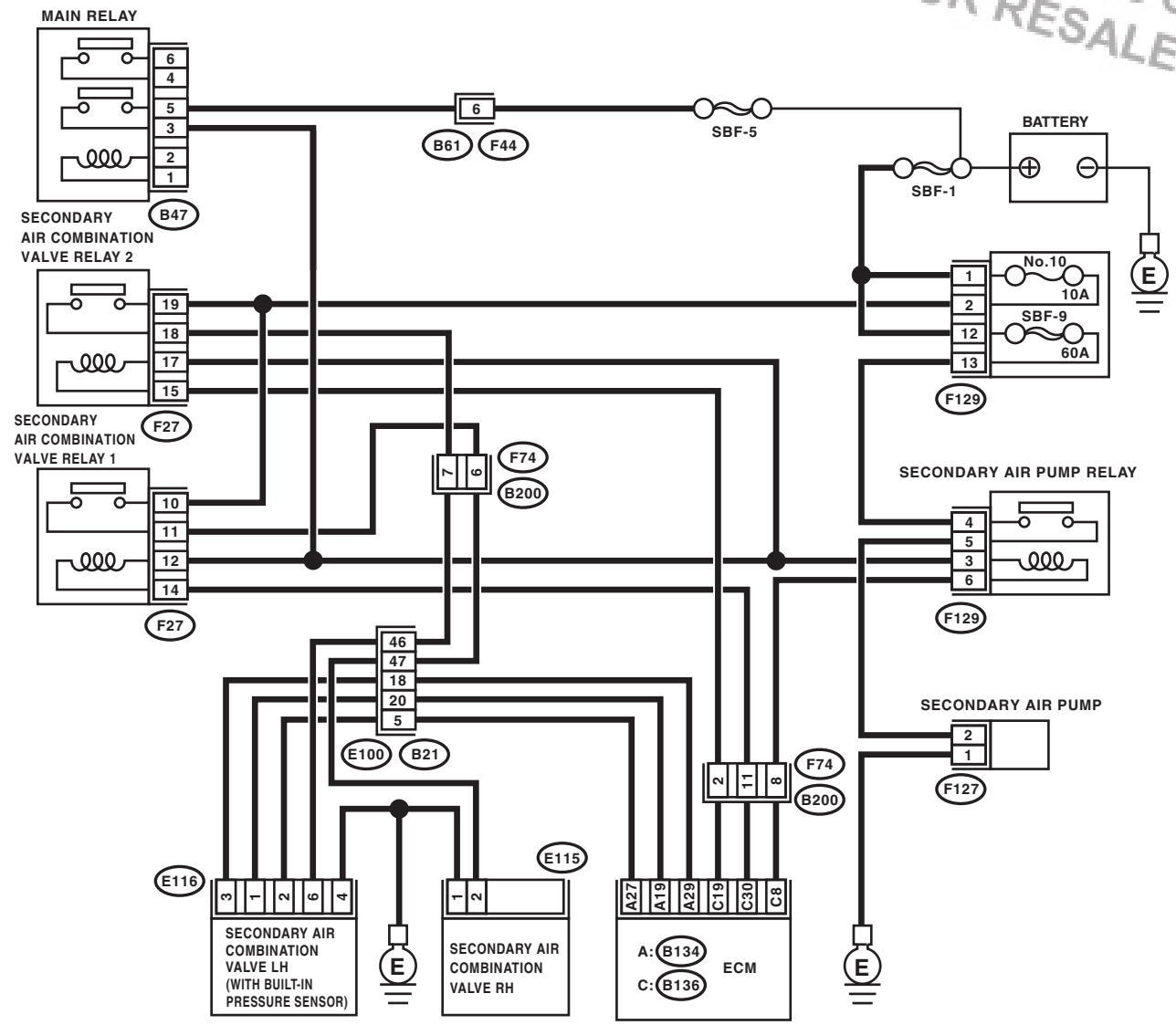
## BE:DTC P0413 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT OPEN

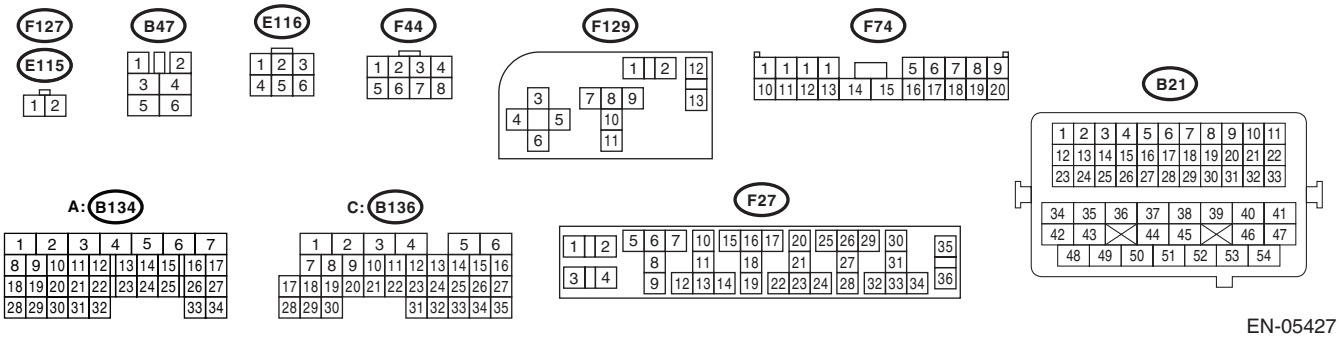
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-124, DTC P0413 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and secondary air combination valve relay 1.<br>3) Measure the resistance of harness between ECM and secondary air combination valve relay 1.<br>***Connector & terminal***<br>***(B136) No. 30 — (F27) No. 14:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of harness between ECM and secondary air combination valve relay 1. |
| 2 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 30 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. | Repair short circuit of the harness to ground between ECM and secondary air combination valve relay 1. |

## BF:DTC P0414 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT SHORTED

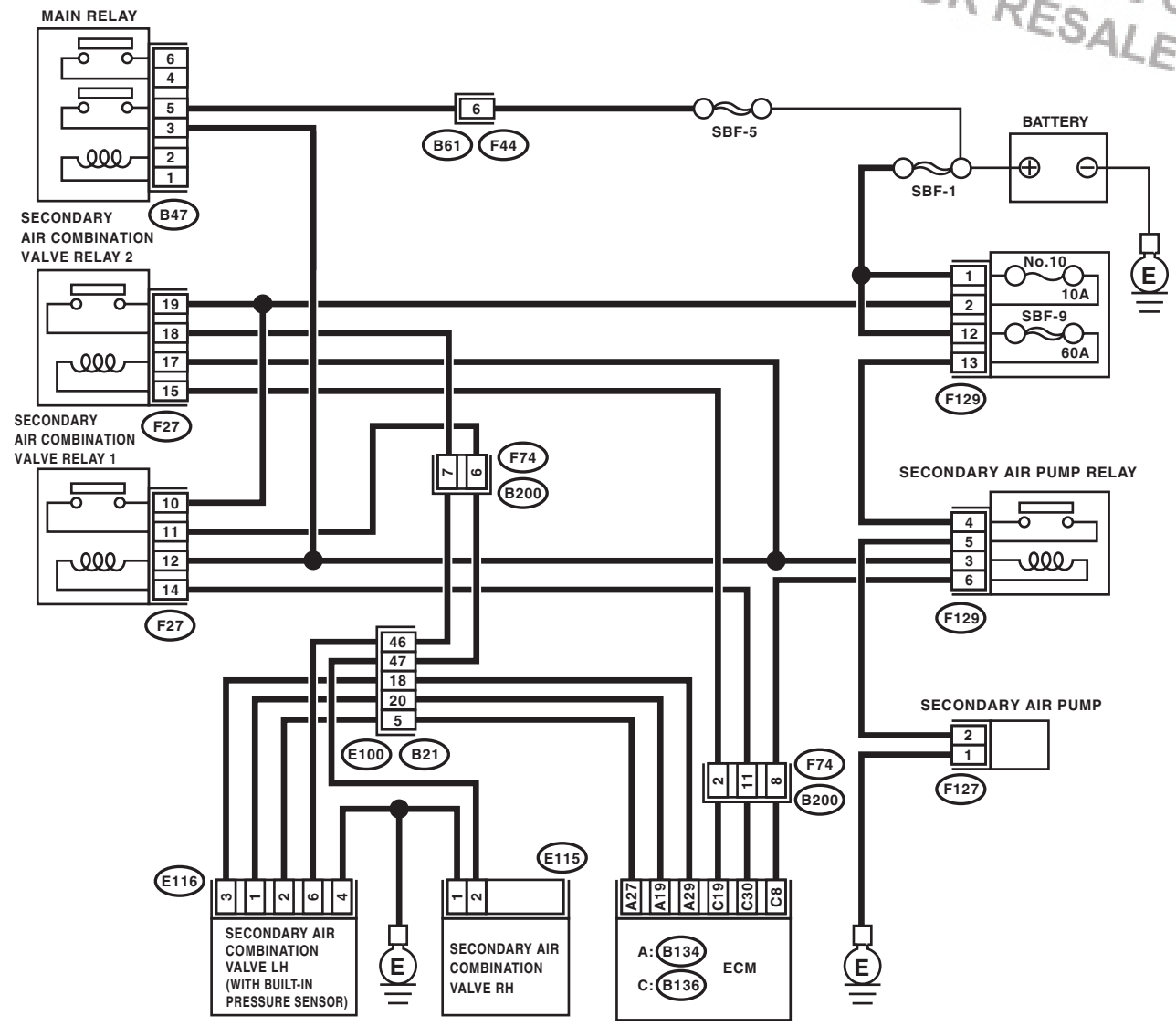
**DTC DETECTING CONDITION:**

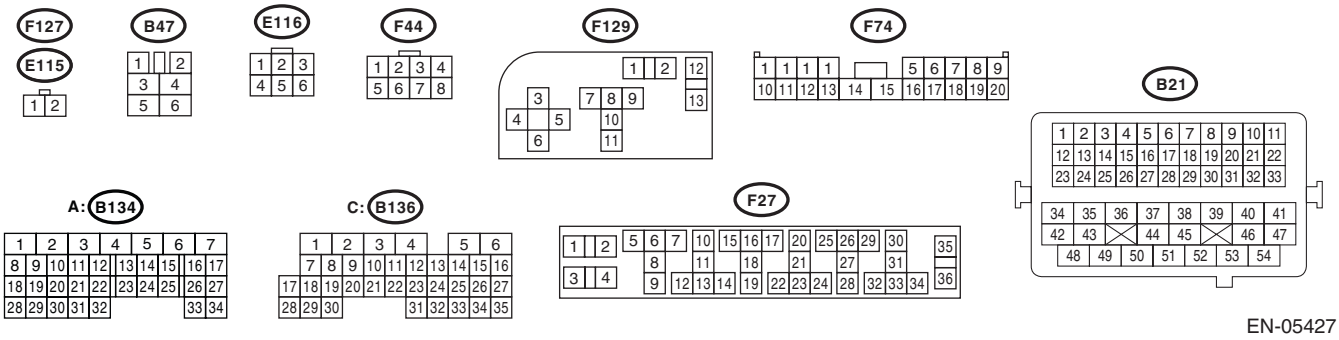
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-125, DTC P0414 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “A” CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and secondary air combination valve relay 1.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 30 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and secondary air combination valve relay 1. | Repair poor contact of the ECM connector. |

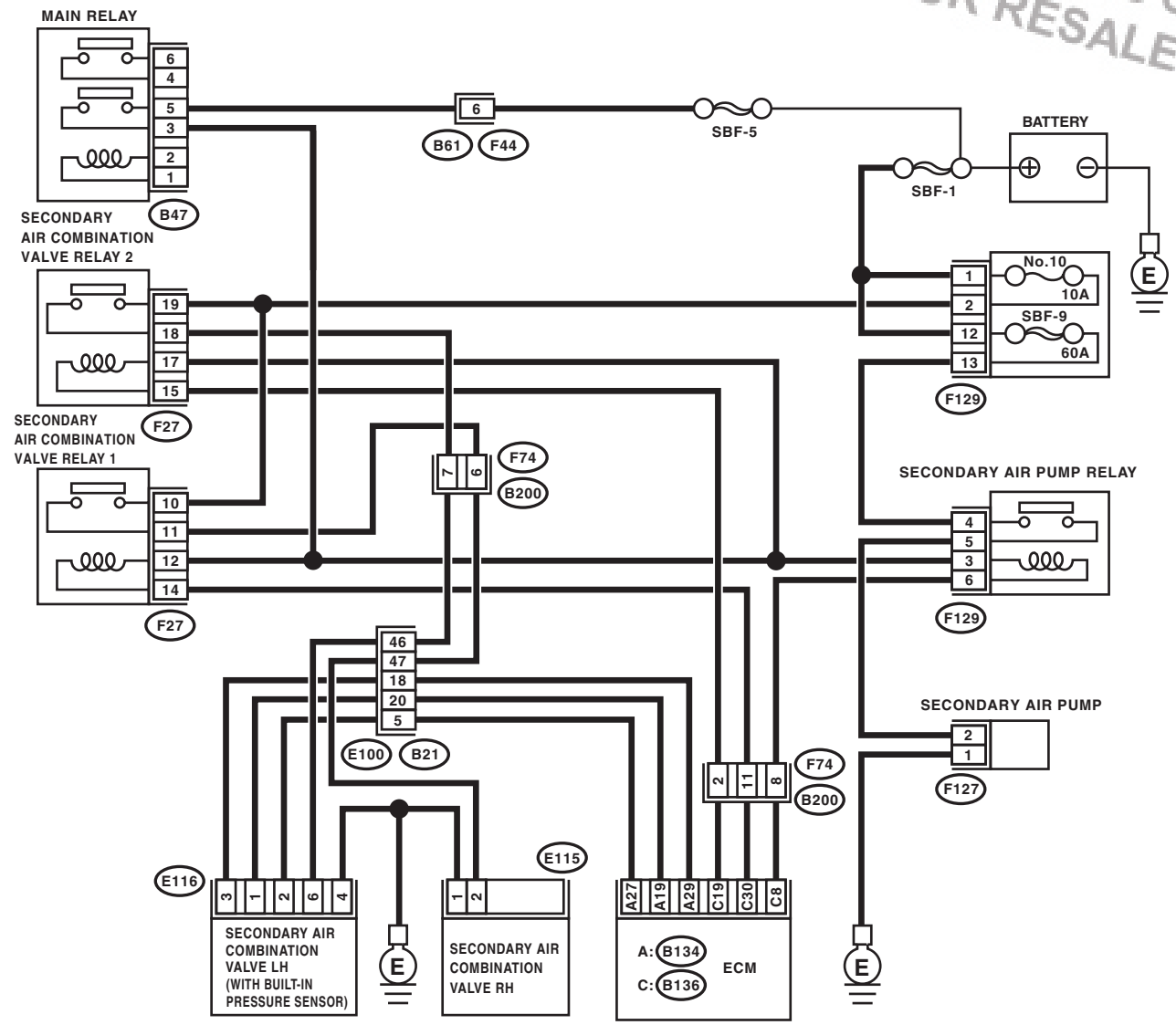
## BG:DTC P0416 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT OPEN

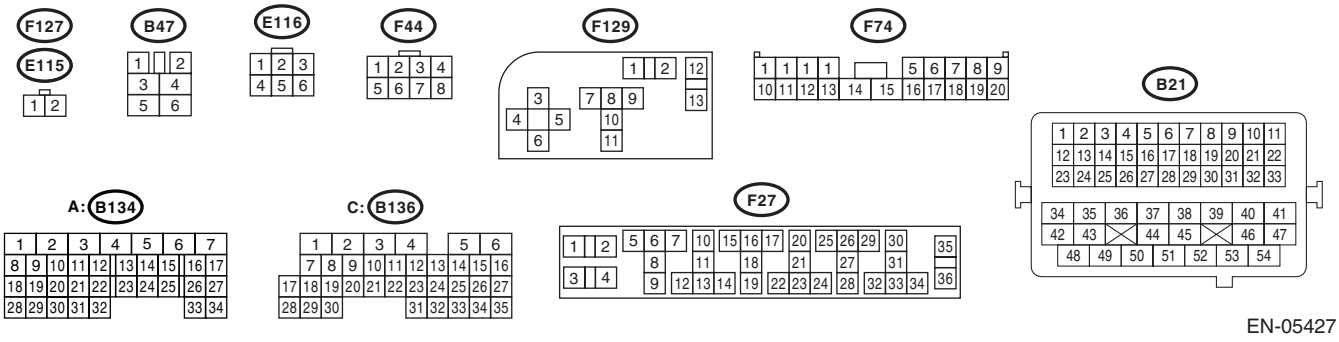
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-126, DTC P0416 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and secondary air combination valve relay 2.<br>3) Measure the resistance of harness between ECM and secondary air combination valve relay 2.<br>***Connector & terminal***<br>***(B136) No. 19 — (F27) No. 15:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of harness between ECM and secondary air combination valve relay 2. |
| 2 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 19 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. | Repair short circuit of the harness to ground between ECM and secondary air combination valve relay 2. |

## BH:DTC P0417 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT SHORTED

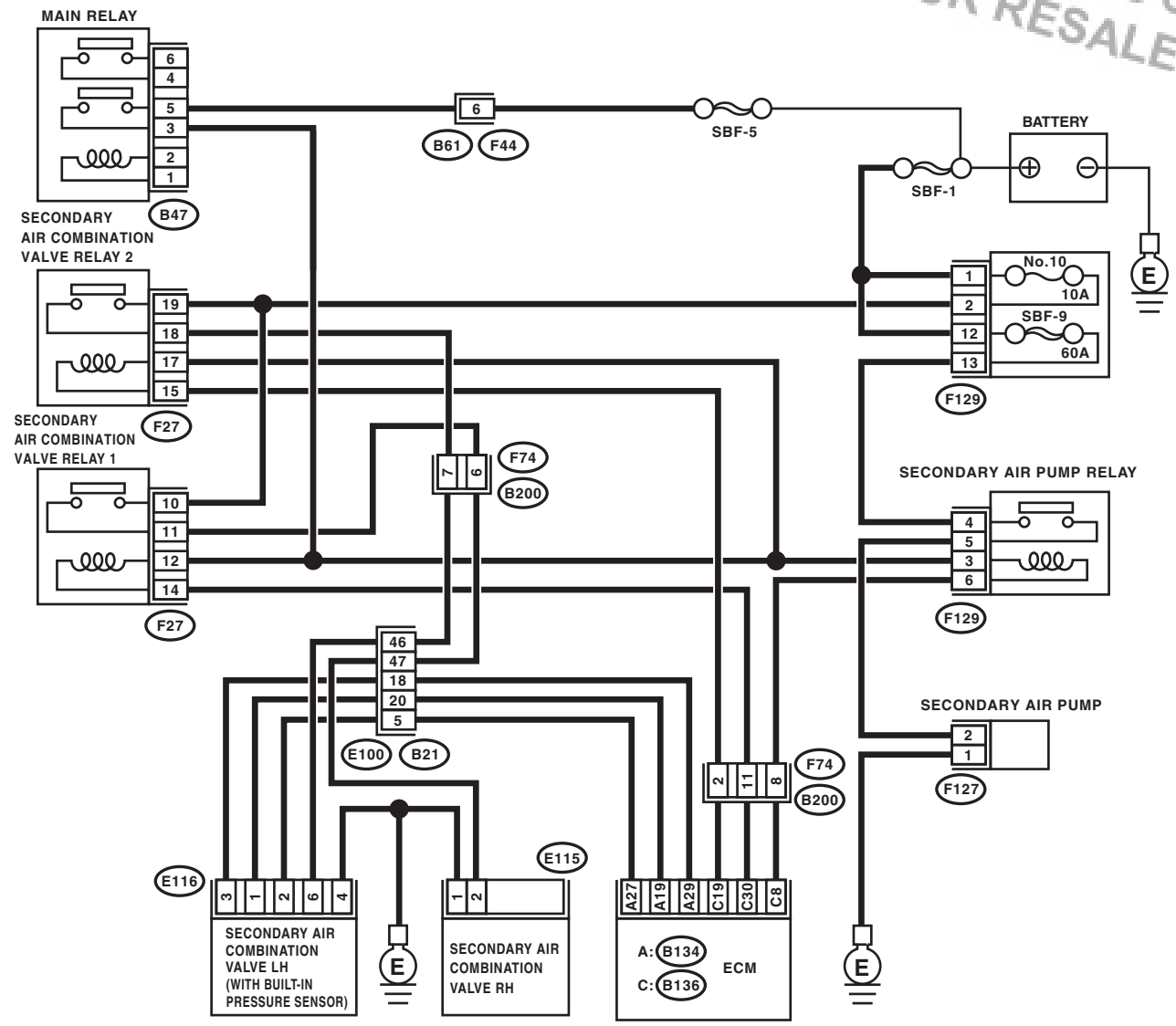
**DTC DETECTING CONDITION:**

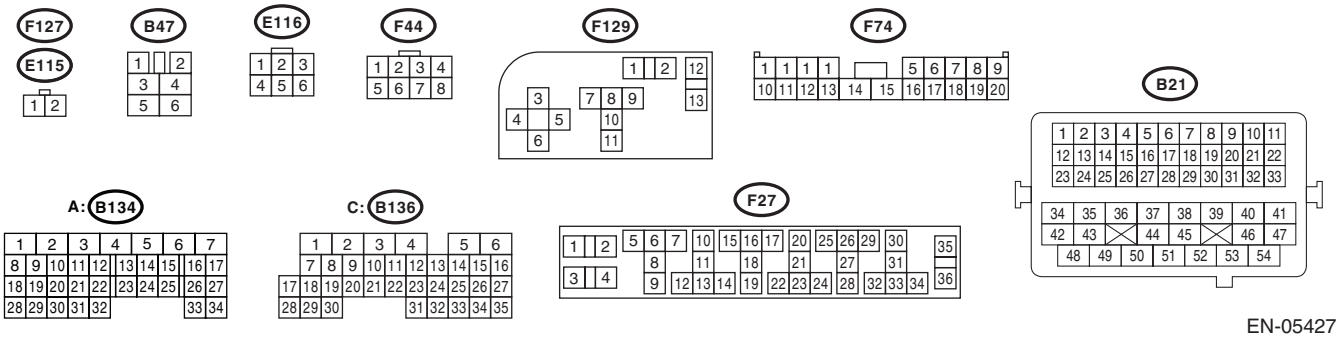
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-126, DTC P0417 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE “B” CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and secondary air combination valve relay 2.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 19 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and secondary air combination valve relay 2. | Repair poor contact of the ECM connector. |

## BI: DTC P0418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT

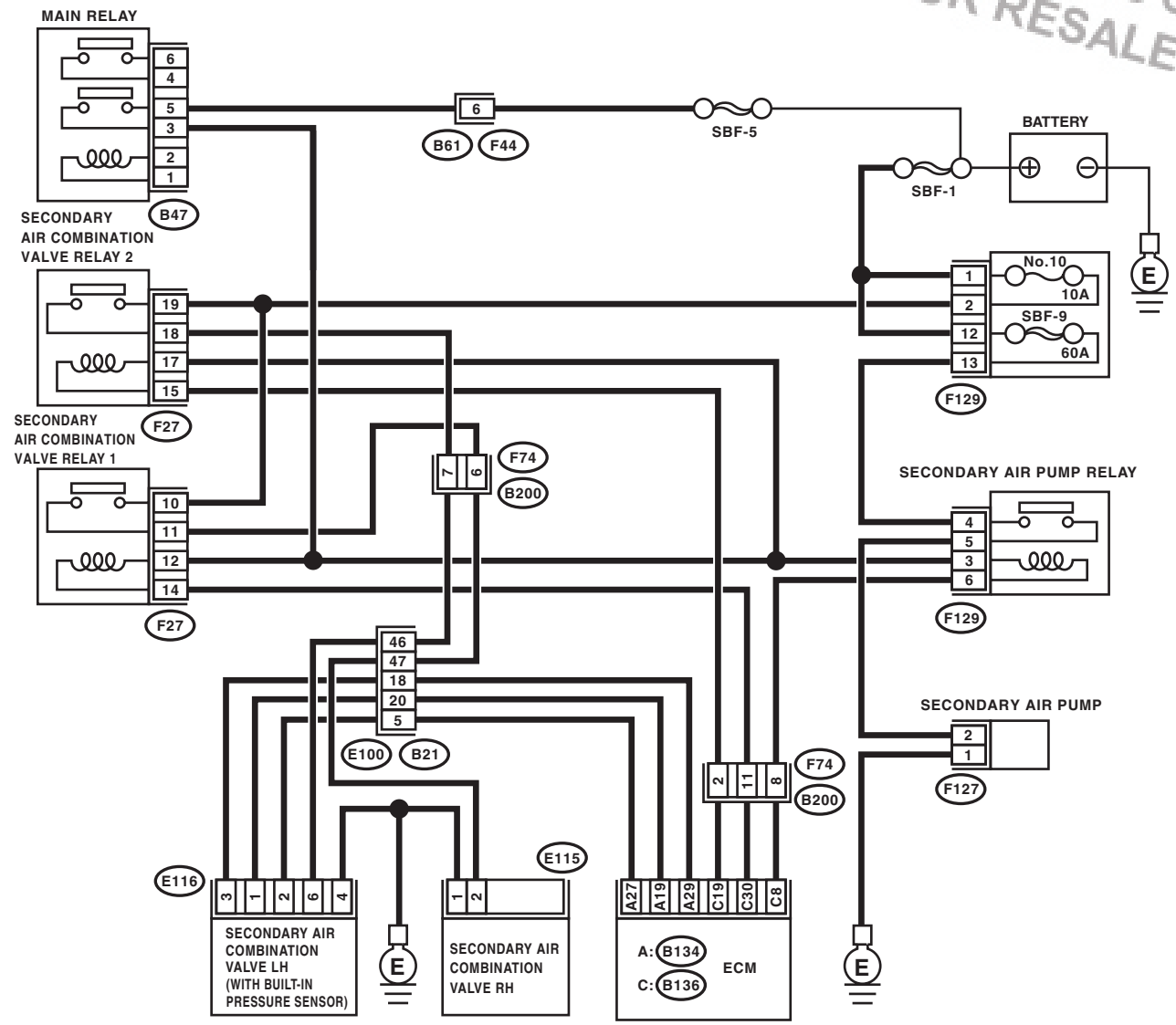
**DTC DETECTING CONDITION:**

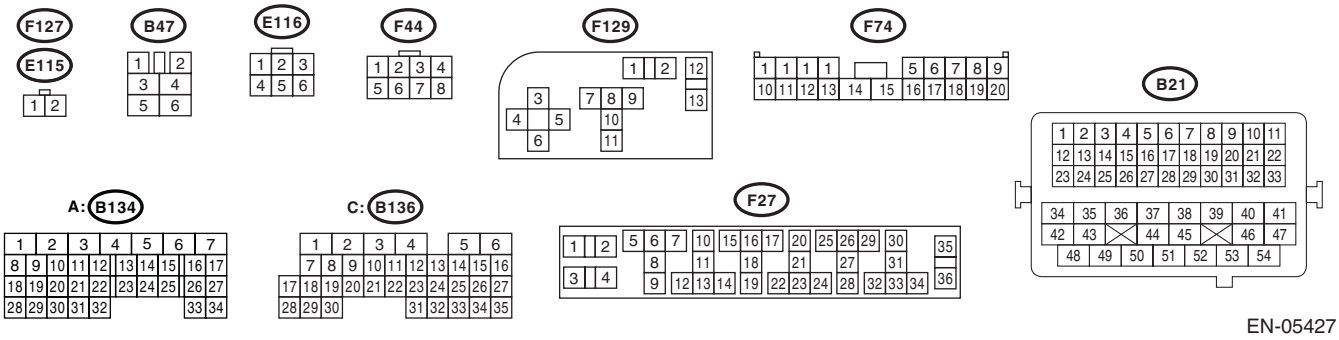
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-127, DTC P0418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and secondary air pump relay.<br>3) Measure the resistance of harness between ECM and secondary air pump relay.<br>***Connector & terminal***<br>***(B136) No. 8 — (F129) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the open circuit of harness between ECM and secondary air pump relay. |
| 2 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 8 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. | Repair short circuit of the harness to ground between ECM and secondary air pump relay. |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-128, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

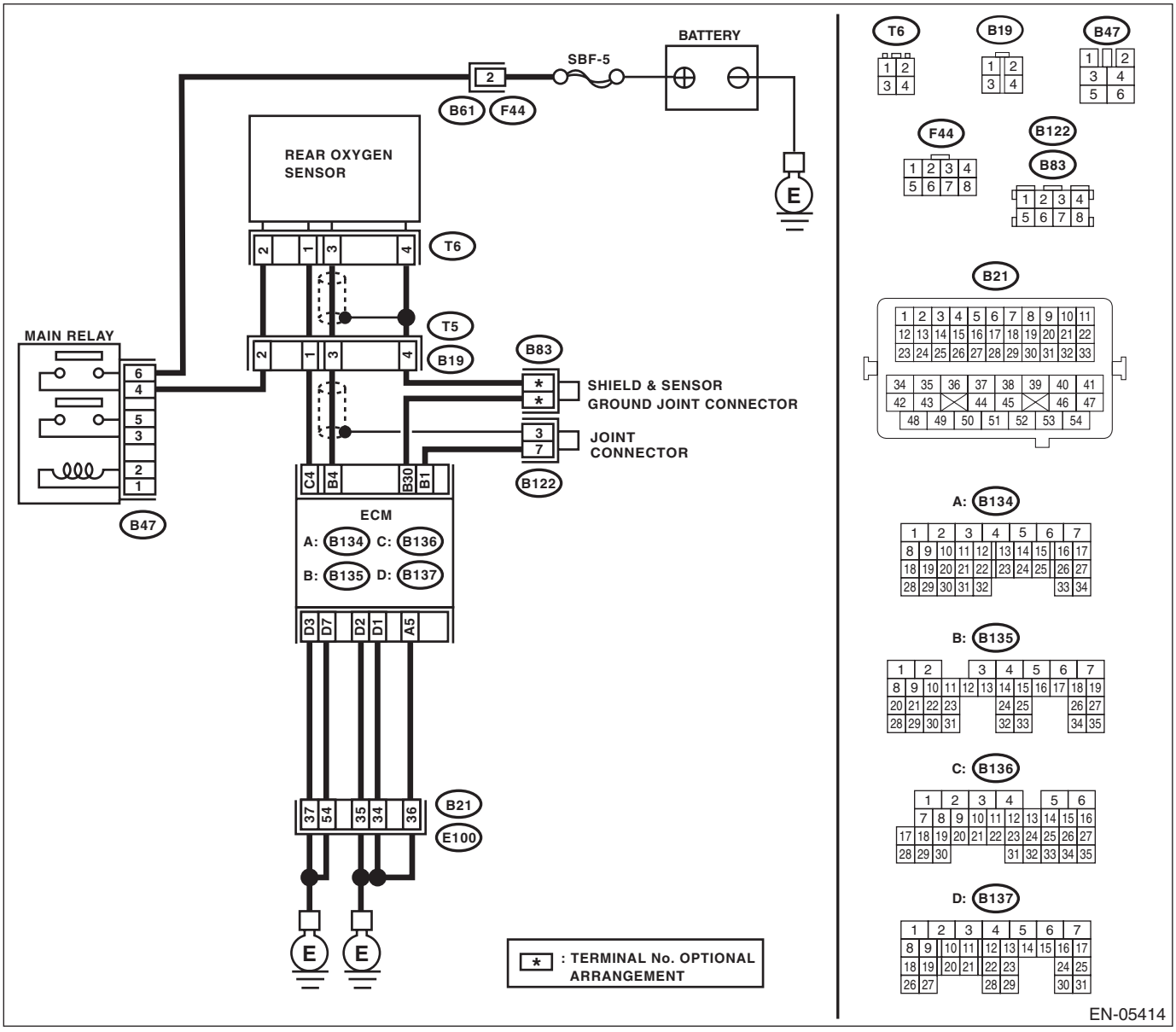
**TROUBLE SYMPTOM:**

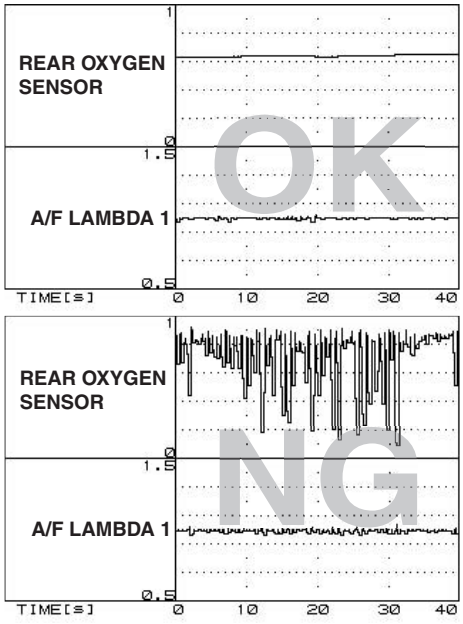
- Engine stalls.
- Idle mixture is out of specifications.

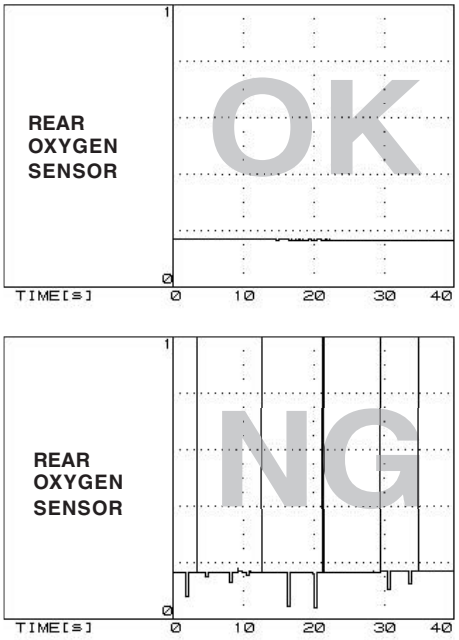
**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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 or improperly attached 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 **2**. |
| 2 | **CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE DRIVING).**<br>1) Drive at a constant speed between 80 — 112 km/h (50 — 70 MPH).<br>2) After 5 minutes have elapsed in the condition of step 1), use the Subaru Select Monitor while still driving to read the waveform data.<br>  <br>EN-04895 | Is a normal waveform displayed? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. | Go to step **3**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 3 | **CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE IDLING).**<br>1) Run the engine at idle.<br>2) In the condition of step 1), use the Subaru Select Monitor to read the waveform data.<br>  <br>EN-04896 | Is a normal waveform displayed? | Go to step **4**. | Go to step **5**. |
| 4 | **CHECK CATALYTIC CONVERTER.** | Is the catalytic converter damaged? | Replace the catalytic converter. <Ref. to EC(H4DOTC)-6, Rear Catalytic Converter.> | Go to step **5**. |
| 5 | **CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **6**. |
| 6 | **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>***(B135) No. 4 — (T6) No. 3:***<br>***(B135) No. 30 — (T6) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **7**. | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **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 **8**. | Repair the harness and connector.<br>NOTE:<br>Repair the following locations.<br>• Open circuit of harness between the ECM and rear oxygen sensor<br>• Poor contact of the ECM and rear oxygen sensor<br>• Poor contact in ECM connector |
| 8 | **CHECK REAR OXYGEN SENSOR SHIELD.**<br>1) Turn the ignition switch to OFF.<br>2) Expose the rear oxygen sensor connector body side harness sensor shield.<br>3) Measure the resistance between the sensor shield and chassis ground. | Is the resistance less than 1 Ω? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> | Repair the open circuit in the rear oxygen sensor harness. |

## BK:DTC P0441 EVAPORATIVE EMISSION SYSTEM INCORRECT PURGE FLOW

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-130, DTC P0441 EVAPORATIVE EMISSION SYSTEM INCORRECT PURGE FLOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK PURGE LINE OF THE PURGE CONTROL SOLENOID VALVE 2.** | Is there any clogging, flattened part or bent in the purge line of purge control solenoid valve 2? | Repair or replace the purge line of purge control solenoid valve 2. | Go to step **3**. |
| 3 | **CHECK PURGE CONTROL SOLENOID VALVE 2.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the purge control solenoid valve 2 using the Subaru Select Monitor.<br>NOTE:<br>Purge control solenoid valve 2 can be operated using the Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the purge control solenoid valve 2 operate? | Repair poor contact of the ECM connector. | Replace the purge control solenoid valve 2. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-131, DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

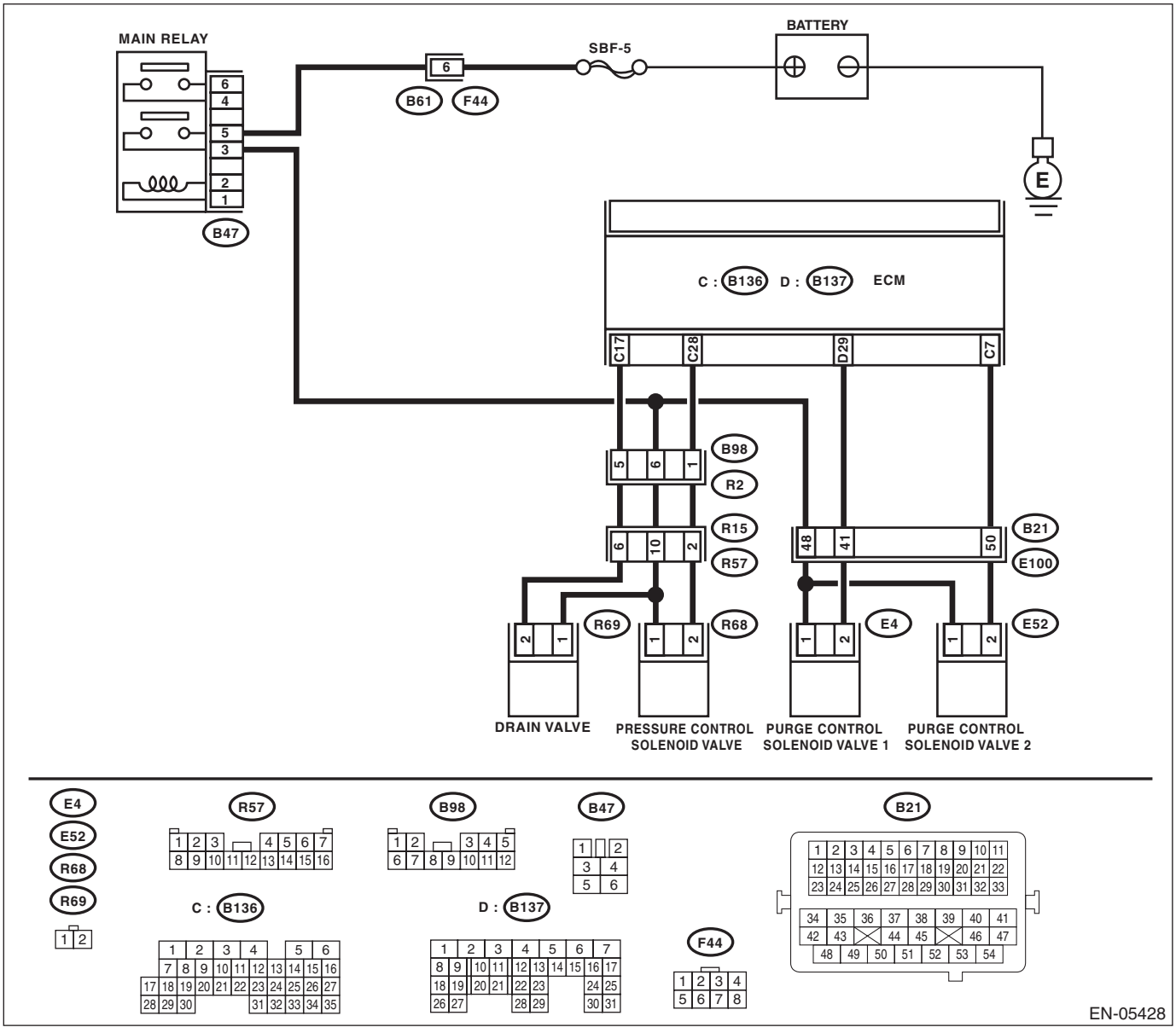
**TROUBLE SYMPTOM:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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 has caught while tightening. | Is the fuel filler cap tightened securely? | Go to step **2**. | Tighten fuel filler cap securely. |
| 2 | **CHECK FUEL FILLER CAP.** | Is the fuel filler cap genuine? | Go to step **3**. | Replace with a genuine fuel filler cap. |
| 3 | **CHECK FUEL FILLER PIPE GASKET.** | Is there any damage to the seal between fuel filler cap and fuel filler pipe? | Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-59, Fuel Filler Pipe.> | Go to step **4**. |
| 4 | **CHECK DRAIN VALVE.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the drain valve using the Subaru Select Monitor.<br>NOTE:<br>Drain valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Go to step **5**. | Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.> |
| 5 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>Operate the purge control solenoid valve using the Subaru Select Monitor.<br>NOTE:<br>Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”.<br><Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the purge control solenoid valve operate? | Go to step **6**. | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> |
| 6 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Operate the pressure control solenoid valve using the Subaru Select Monitor.<br>NOTE:<br>The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the pressure control solenoid valve operate? | Go to step **7**. | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-16, Pressure Control Solenoid Valve.> |
| 7 | **CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the test mode connector. | Is there any hole of more than 1.0 mm (0.04 in) dia. on evaporation line? | Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-70, Fuel Delivery, Return and Evaporation Lines.> | Go to step **8**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK CANISTER.** | Is the canister damaged or is there a hole of more than 1.0 mm (0.04 in) dia. in it? | Repair or replace the canister. <Ref. to EC(H4DOTC)-7, Canister.> | Go to step **9**. |
| 9 | **CHECK FUEL TANK.**<br>Remove the fuel tank. <Ref. to FU(H4DOTC)-56, Fuel Tank.> | Is the fuel tank damaged or is there any hole of more than 1.0 mm (0.04 in) dia. in it? | Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-56, Fuel Tank.> | Go to step **10**. |
| 10 | **CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.** | Is there any hole of more than 1.0 mm (0.04 in) dia., crack, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system? | Repair or replace the hoses or pipes. | Repair poor contact of the ECM connector. |

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

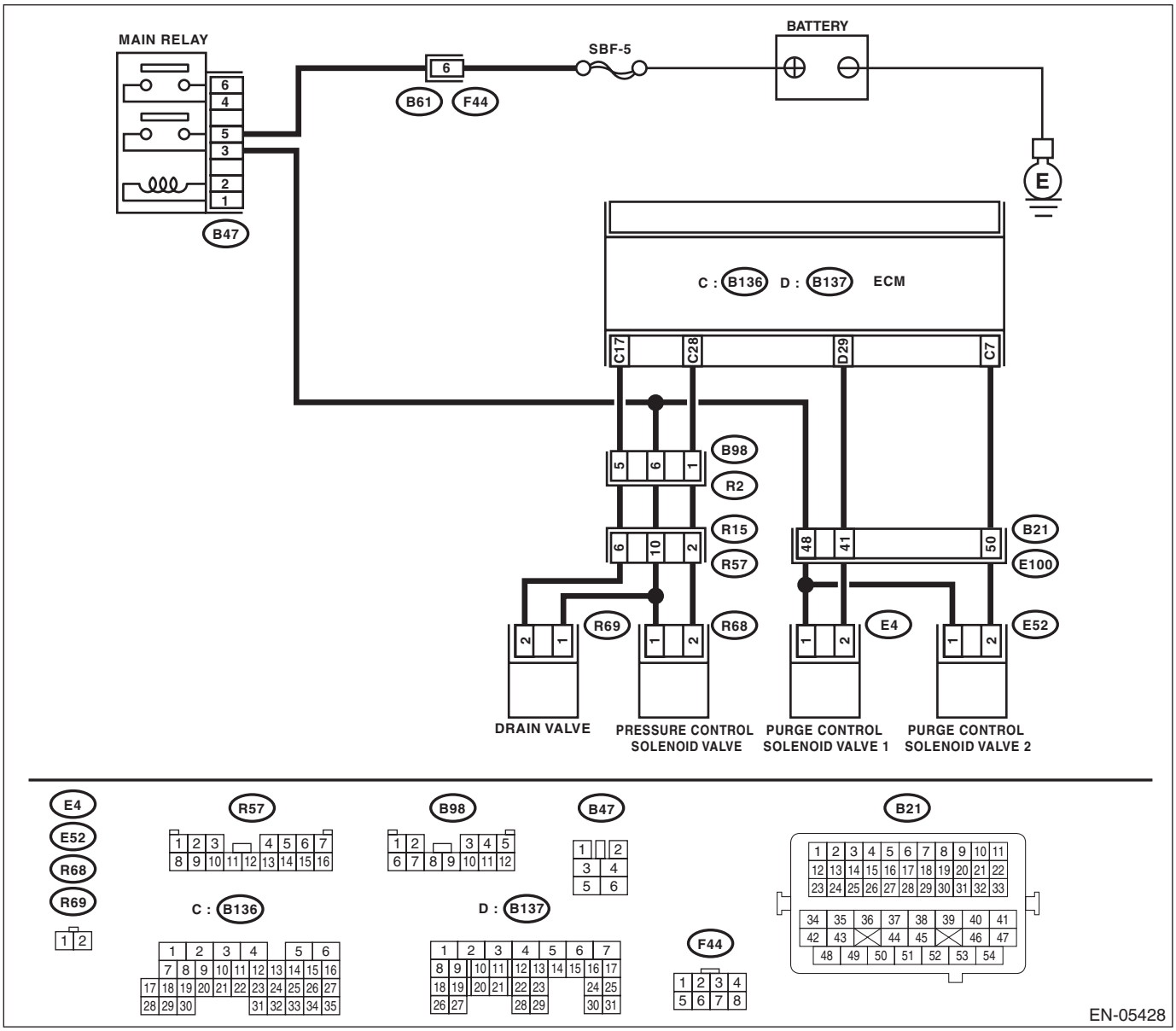
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-145, DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 17 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND DRAIN VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and drain valve.<br>3) Measure the resistance between the drain valve connector and chassis ground.<br>***Connector & terminal***<br>***(R69) No. 2 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and drain valve connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND DRAIN VALVE.**<br>Measure the resistance of harness between ECM and drain valve connector.<br>***Connector & terminal***<br>***(B136) No. 17 — (R69) No. 2:*** | 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 item:<br>• Open circuit of harness between ECM and drain valve connector<br>• Poor contact of coupling connector |
| 4 | **CHECK DRAIN VALVE.**<br>Measure the resistance between drain valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 10 — 100 Ω? | Go to step **5**. | Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.> |
| 5 | **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>***(R69) No. 1 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the poor contact of drain valve connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between main relay and drain valve<br>• Poor contact of coupling connector<br>• Poor contact of main relay connector |

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

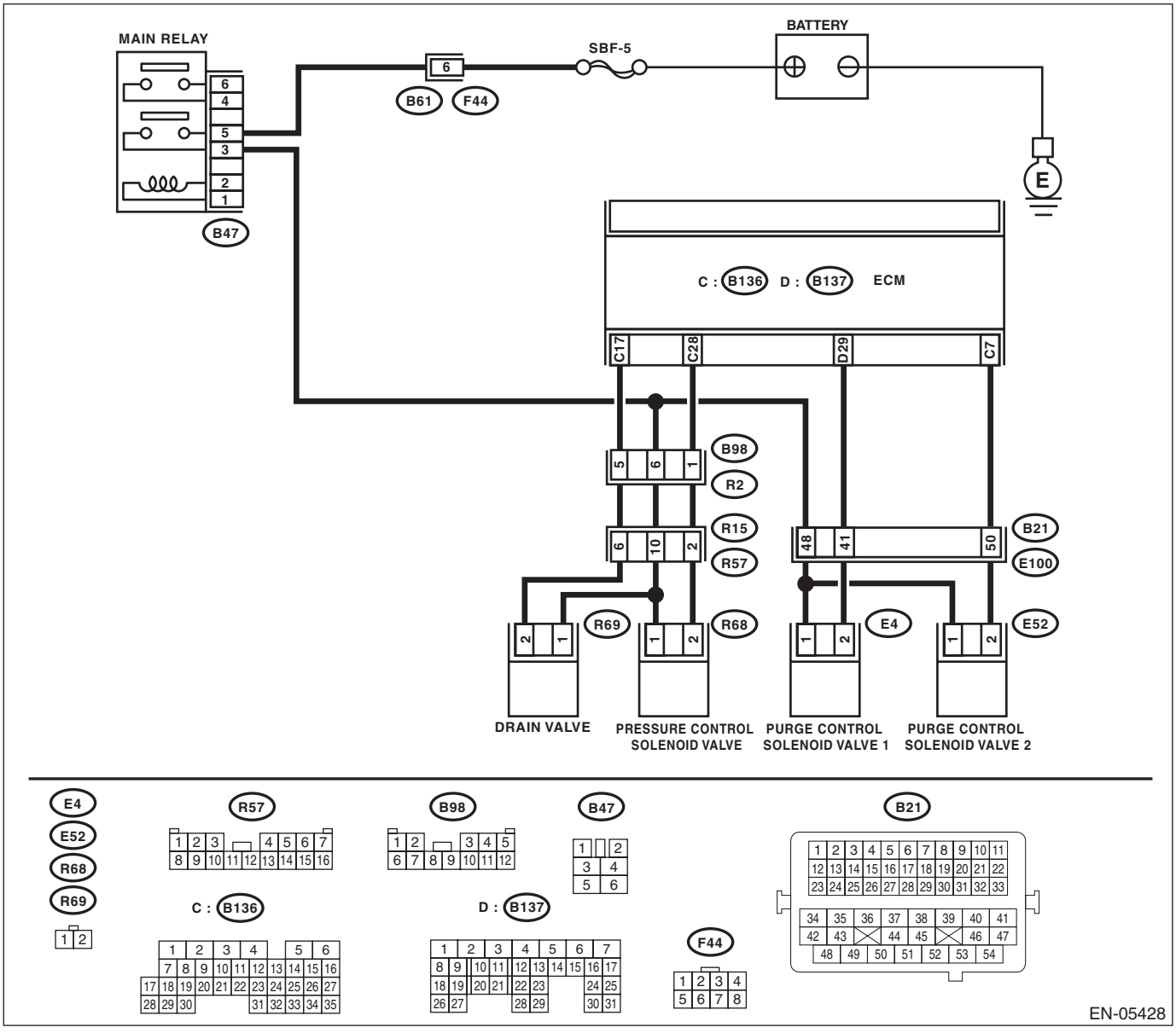
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-147, DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND DRAIN VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and drain valve.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 17 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and drain valve connector. | Go to step **2**. |
| 2 | **CHECK DRAIN VALVE.**<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)-20, Drain Valve.> | Repair poor contact of the ECM connector. |

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

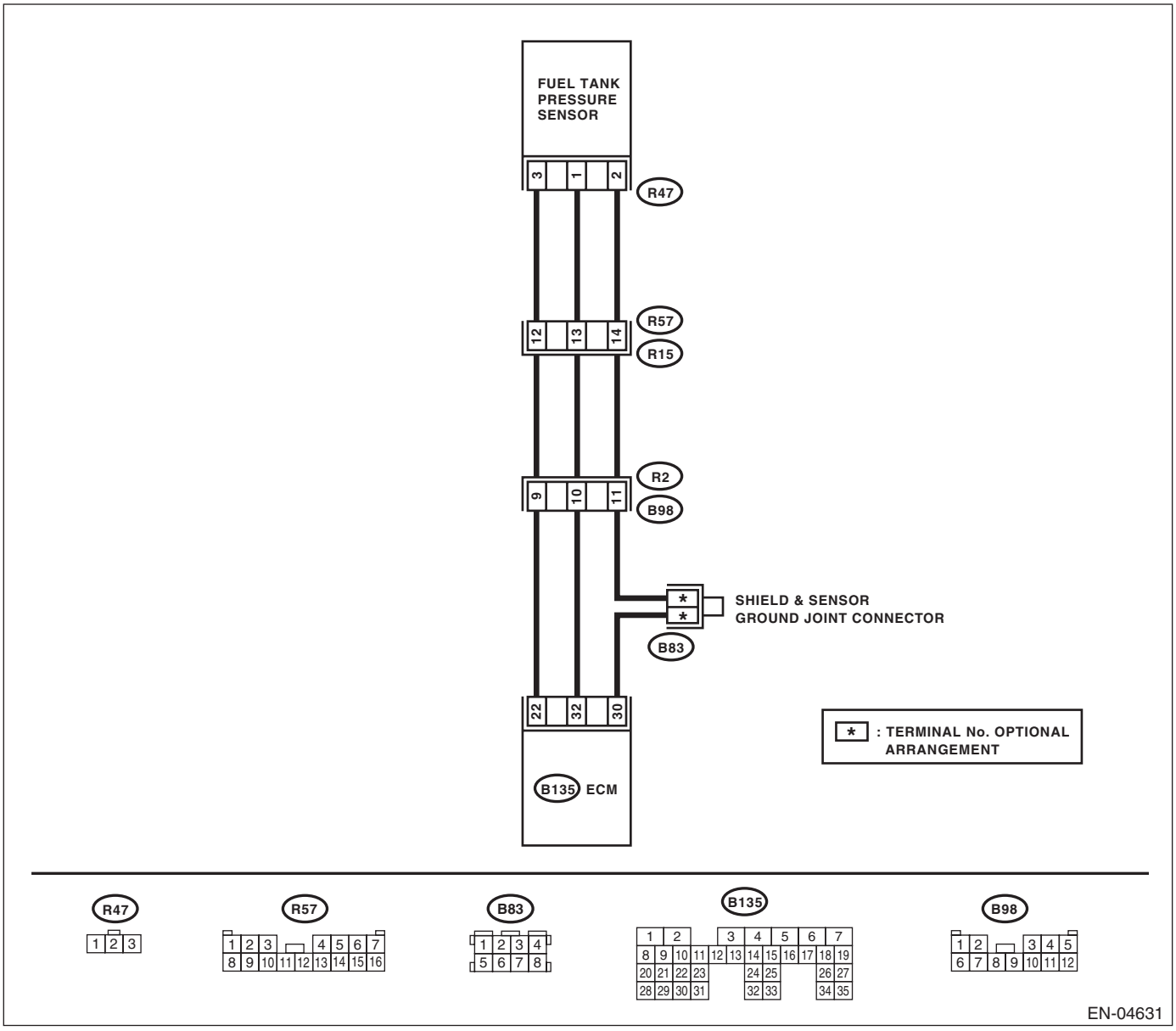
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-149, DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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 **2**. | Tighten fuel filler cap securely. |
| 2 | **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 the 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)-15, Fuel Tank Pressure Sensor.> |

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

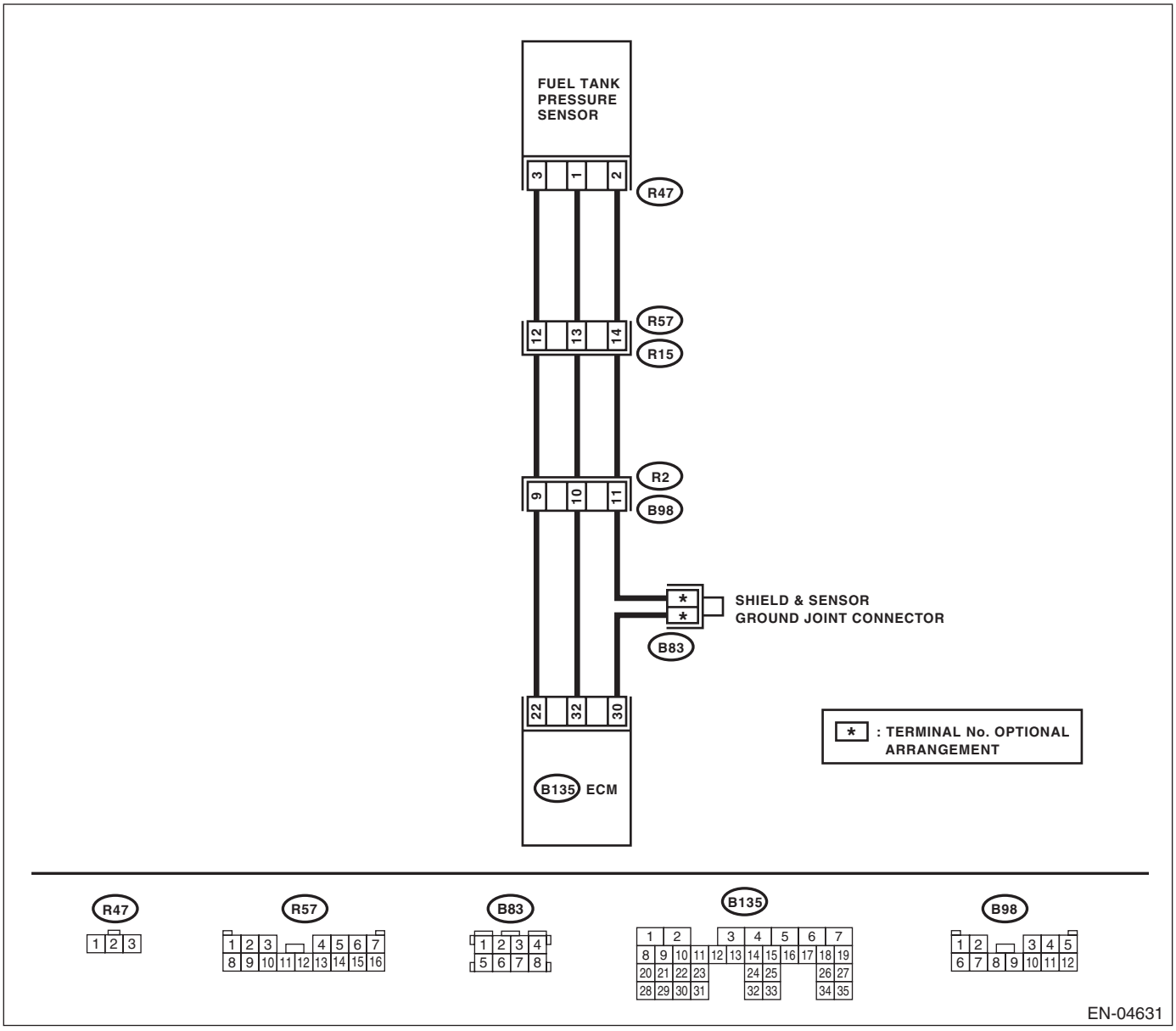
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-151, DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value less than –7.49 kPa (–56.19 mmHg, –2.21 inHg) ? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK FUEL TANK PRESSURE SENSOR POWER SUPPLY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the fuel tank pressure sensor.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between the fuel tank pressure sensor connector and chassis ground.<br>***Connector & terminal***<br>***(R47) No. 3 (+) — Chassis ground (–):*** | Is the voltage 4.5 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and fuel tank pressure sensor connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of harness between the ECM and fuel tank pressure sensor connector.<br>***Connector & terminal***<br>***(B135) No. 32 — (R47) 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 item:<br>• Open circuit of harness between ECM and fuel tank pressure sensor connector<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 32 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and fuel tank pressure sensor connector. |
| 5 | **CHECK POOR CONTACT.**<br>Check for poor contact between the ECM and fuel tank pressure sensor connector. | Is there poor contact in the ECM or fuel tank pressure sensor connector? | Repair the poor contact in the ECM or fuel tank pressure sensor connector. | Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-15, Fuel Tank Pressure Sensor.> |

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

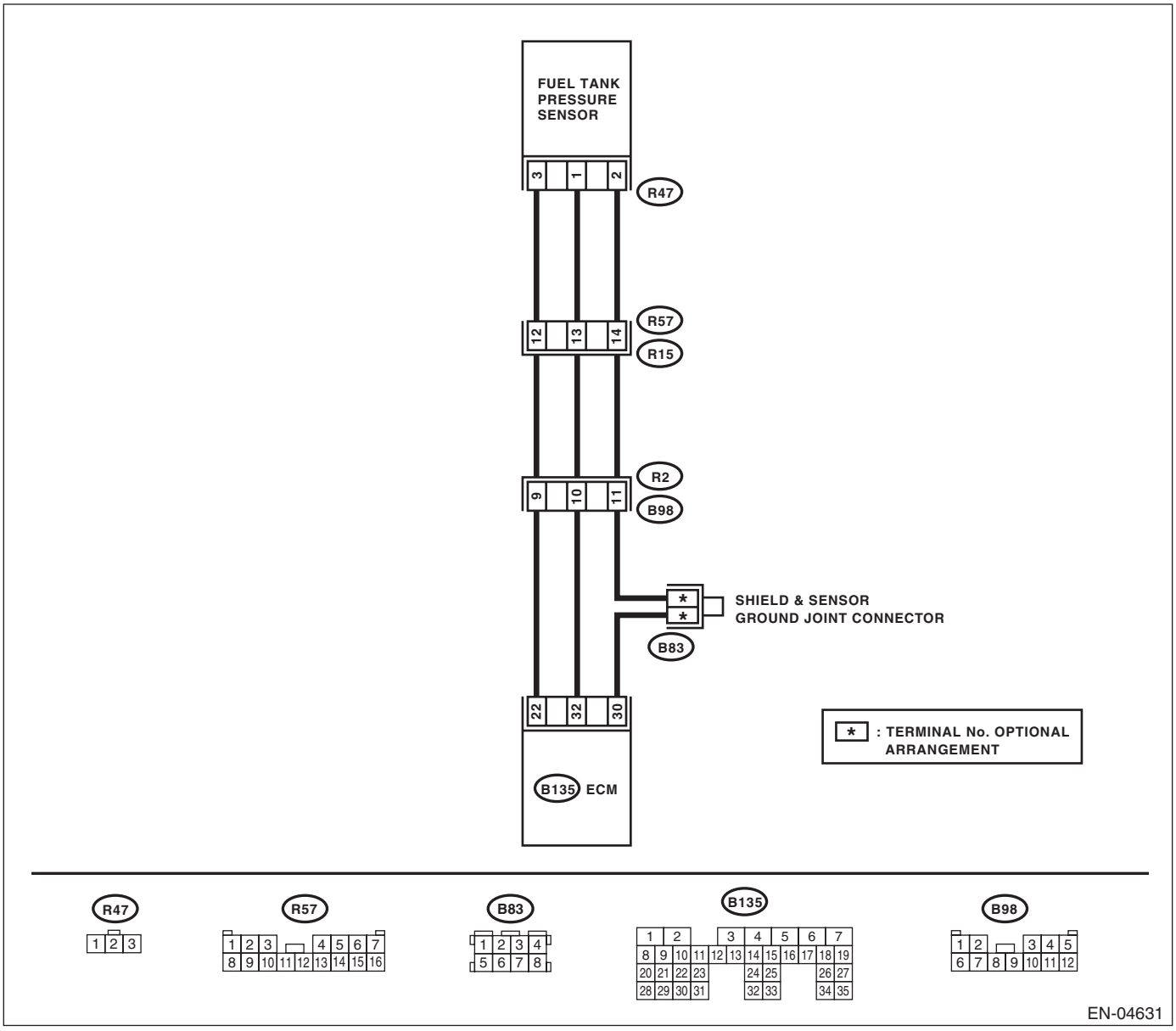
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-153, DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 7.98 kPa (59.86 mmHg, 2.36 inHg) or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the fuel tank pressure sensor.<br>3) Turn the ignition switch to ON.<br>4) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 7.98 kPa (59.86 mmHg, 2.36 inHg) or more? | Repair the short circuit to power in the harness between ECM and fuel tank pressure sensor connector. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of harness between fuel tank pressure sensor connector and engine ground.<br>***Connector & terminal***<br>***(R47) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and fuel tank pressure sensor connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 4 | **CHECK POOR CONTACT.**<br>Check for poor contact of the fuel tank pressure sensor connector. | Is there poor contact in fuel tank pressure sensor connector? | Repair the poor contact in the fuel tank pressure sensor connector. | Replace the fuel tank pressure sensor. <Ref. to EC(H4DOTC)-15, Fuel Tank Pressure Sensor.> |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-154, DTC P0456 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Criteria.>

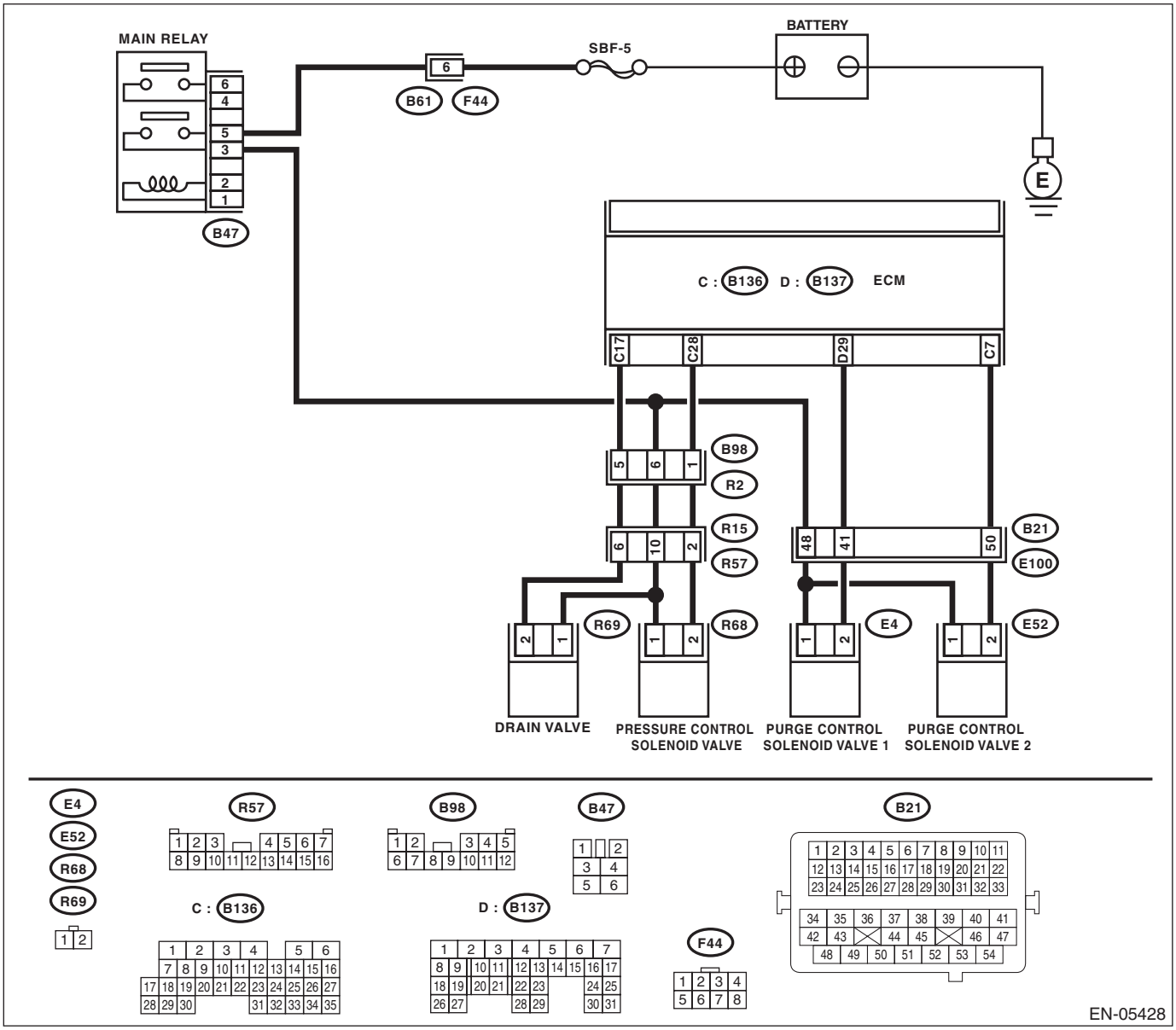
**TROUBLE SYMPTOM:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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 has caught while tightening. | Is the fuel filler cap tightened securely? | Go to step **2**. | Tighten fuel filler cap securely. |
| 2 | **CHECK FUEL FILLER CAP.** | Is the fuel filler cap genuine? | Go to step **3**. | Replace with a genuine fuel filler cap. |
| 3 | **CHECK FUEL FILLER PIPE GASKET.** | Is there any damage to the seal between fuel filler cap and fuel filler pipe? | Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-59, Fuel Filler Pipe.> | Go to step **4**. |
| 4 | **CHECK DRAIN VALVE.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the drain valve using the Subaru Select Monitor.<br>NOTE:<br>Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Go to step **5**. | Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.> |
| 5 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>Operate the purge control solenoid valve using the Subaru Select Monitor.<br>NOTE:<br>Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”.<br><Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the purge control solenoid valve operate? | Go to step **6**. | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> |
| 6 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Operate the pressure control solenoid valve using the Subaru Select Monitor.<br>NOTE:<br>The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the pressure control solenoid valve operate? | Go to step **7**. | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> |
| 7 | **CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the test mode connector. | Is there any hole of more than 0.5 mm (0.020 in) dia. on evaporation line? | Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-70, Fuel Delivery, Return and Evaporation Lines.> | Go to step **8**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK CANISTER.** | Is the canister damaged or is there a hole of more than 0.5 mm (0.020 in) dia. in it? | Repair or replace the canister. <Ref. to EC(H4DOTC)-7, Canister.> | Go to step **9**. |
| 9 | **CHECK FUEL TANK.**<br>Remove the fuel tank. <Ref. to FU(H4DOTC)-56, Fuel Tank.> | Is the fuel tank damaged or is there any hole of more than 0.5 mm (0.020 in) dia. in it? | Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-56, Fuel Tank.> | Go to step **10**. |
| 10 | **CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.** | Is there any hole of more than 0.5 mm (0.020 in) dia., crack, clogging, or disconnections, bend, misconnection of hoses or pipes in evaporative emission control system? | Repair or replace the hoses or pipes. | Repair poor contact of the ECM connector. |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-154, DTC P0457 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Trouble Code (DTC) Detecting Criteria.>

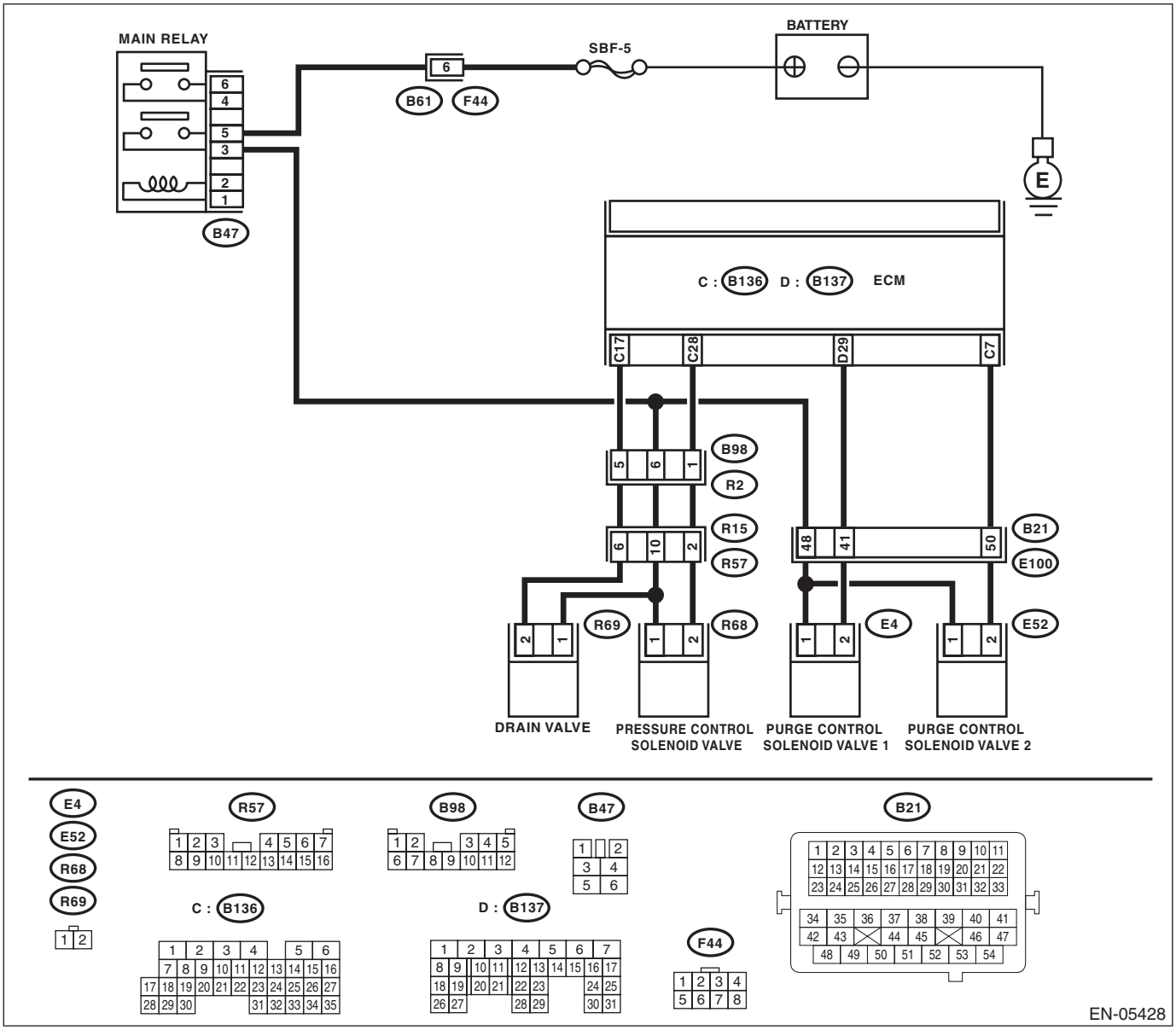
**TROUBLE SYMPTOM:**

- Fuel odor
- Fuel filler cap loose or lost

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **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 has caught while tightening. | Is the fuel filler cap tightened securely? | Go to step **2**. | Tighten fuel filler cap securely. |
| 2 | **CHECK FUEL FILLER CAP.** | Is the fuel filler cap genuine? | Go to step **3**. | Replace with a genuine fuel filler cap. |
| 3 | **CHECK FUEL FILLER PIPE GASKET.** | Is there any damage to the seal between fuel filler cap and fuel filler pipe? | Repair or replace the fuel filler cap and fuel filler pipe. <Ref. to FU(H4DOTC)-59, Fuel Filler Pipe.> | Go to step **4**. |
| 4 | **CHECK DRAIN VALVE.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Operate the drain valve using the Subaru Select Monitor.<br>NOTE:<br>Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Go to step **5**. | Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.> |
| 5 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>Operate the purge control solenoid valve using the Subaru Select Monitor.<br>NOTE:<br>Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”.<br><Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the purge control solenoid valve operate? | Go to step **6**. | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> |
| 6 | **CHECK PRESSURE CONTROL SOLENOID VALVE.**<br>Operate the pressure control solenoid valve using the Subaru Select Monitor.<br>NOTE:<br>The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to “Compulsory Valve Operation Check Mode”. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the pressure control solenoid valve operate? | Go to step **7**. | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-16, Pressure Control Solenoid Valve.> |
| 7 | **CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the test mode connector. | Is there any disconnection, damage or clogging on the evaporation line? | Repair or replace the evaporation line. <Ref. to FU(H4DOTC)-70, Fuel Delivery, Return and Evaporation Lines.> | Go to step **8**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK CANISTER.** | Is the canister damaged? | Repair or replace the canister. <Ref. to EC(H4DOTC)-7, Canister.> | Go to step **9**. |
| 9 | **CHECK FUEL TANK.**<br>Remove the fuel tank. <Ref. to FU(H4DOTC)-56, Fuel Tank.> | Is the fuel tank damaged? | Repair or replace the fuel tank. <Ref. to FU(H4DOTC)-56, Fuel Tank.> | Go to step **10**. |
| 10 | **CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.** | Are there holes, cracks, clogging, or disconnections, misconnection of hoses or pipes in evaporative emission control system? | Repair or replace the hoses or pipes. | Repair poor contact of the ECM connector. |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-155, DTC P0458 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

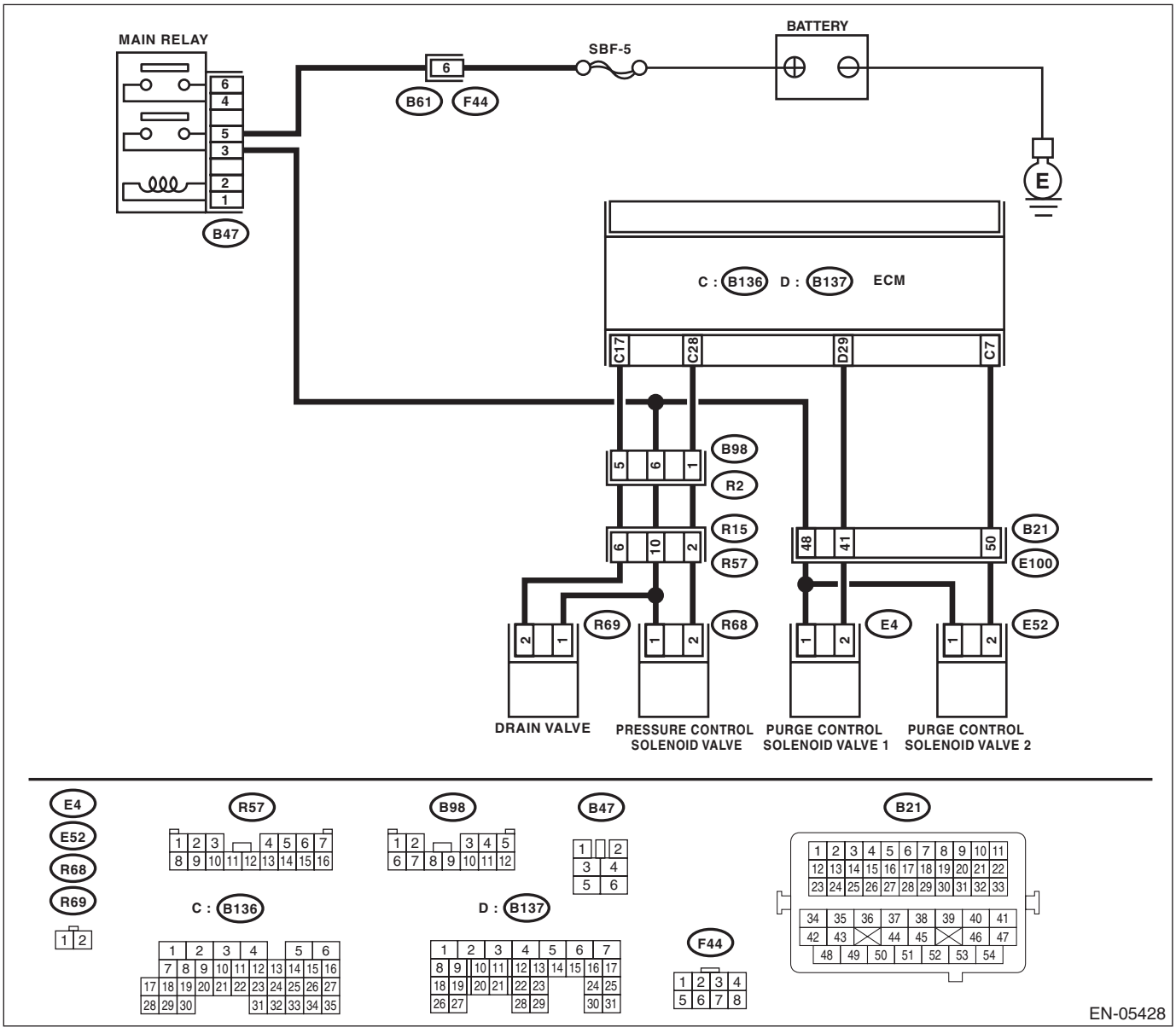
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 29 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and purge control solenoid valve.<br>3) Measure the resistance between the purge control solenoid valve connector and engine ground.<br>***Connector & terminal***<br>***(E4) No. 2 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and purge control solenoid valve connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE.**<br>Measure the resistance of harness between ECM and purge control solenoid valve.<br>***Connector & terminal***<br>***(B137) No. 29 — (E4) No. 2:*** | 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 item:<br>• Open circuit of harness between ECM and purge control solenoid valve connector<br>• Poor contact of 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 between 10 — 100 Ω? | Go to step **5**. | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, 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 10 V or more? | Repair the poor contact of purge control solenoid valve connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the main relay and purge control solenoid valve<br>• Poor contact of coupling connector<br>• Poor contact of main relay connector |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-157, DTC P0459 EVAPORATIVE EMISSION SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

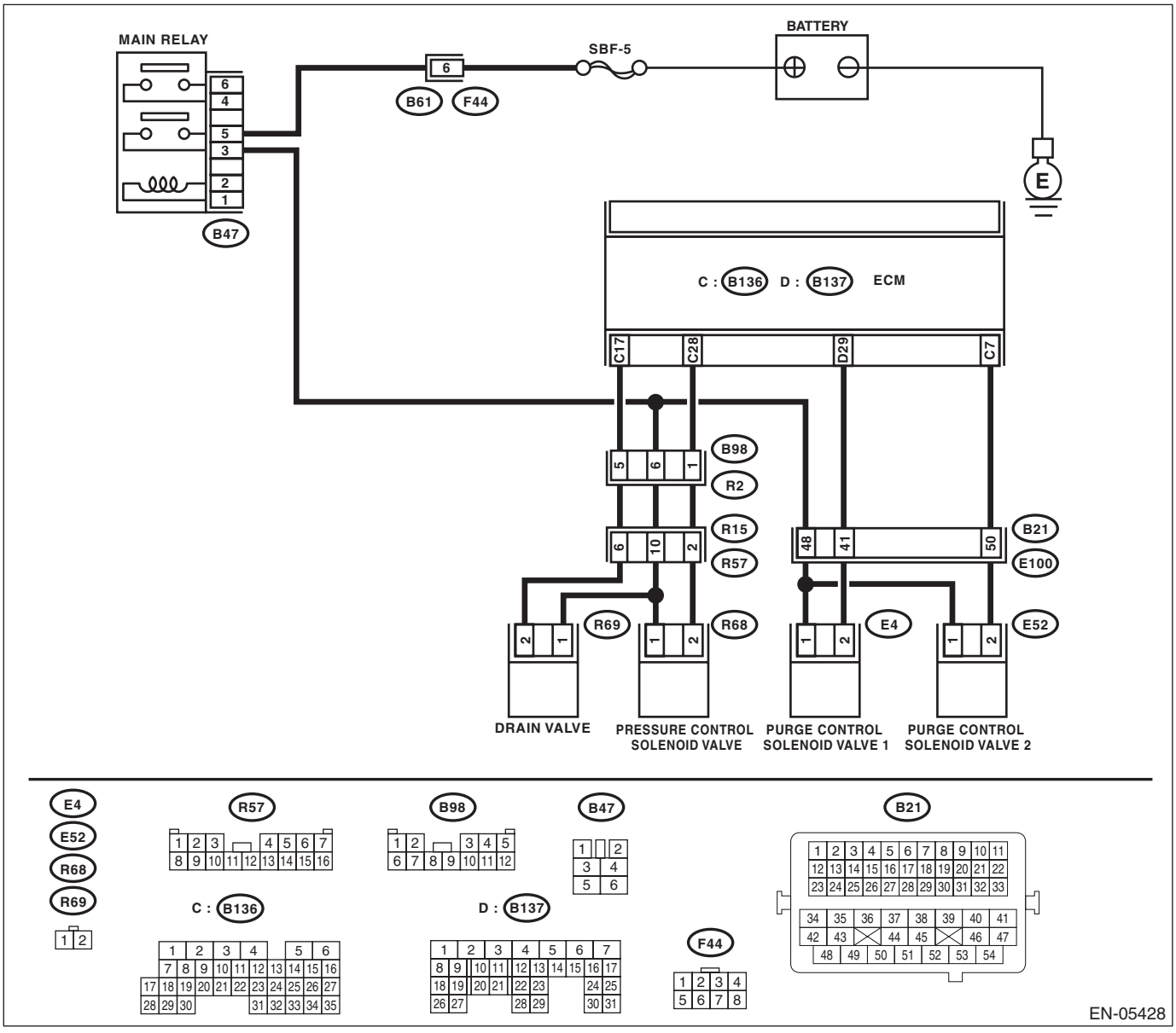
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and 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>***(B137) No. 29 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between the ECM and purge control solenoid valve connector. | Go to step **2**. |
| 2 | **CHECK PURGE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between purge control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Replace the purge control solenoid valve. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> | Repair poor contact of the ECM connector. |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-159, DTC P0461 FUEL LEVEL SENSOR “A” CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| Step | Check | Yes | No |
|---|---|---|---|
| 1 **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Replace the fuel level sensor and fuel sub level sensor. <Ref. to FU(H4DOTC)-65, Fuel Level Sensor.> <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.> |

## BW:DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW

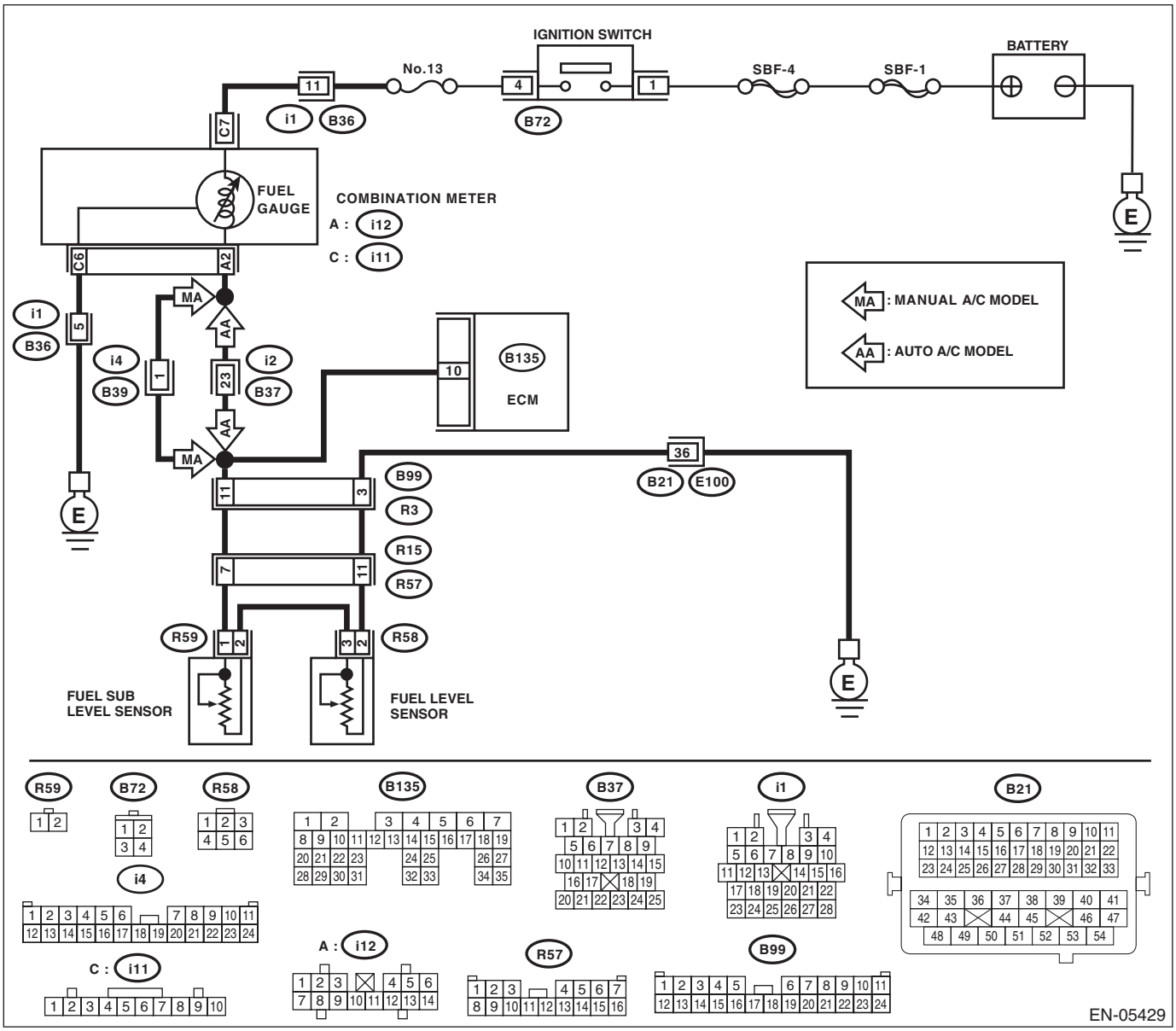
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-161, DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATION OF SPEEDOMETER AND TACHOMETER.** | Are speedometer and tachometer operate normally? | Go to step **2**. | Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.> |
| 2 | **CHECK INPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON. (engine OFF)<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 10 (+) — Chassis ground (–):*** | Is the voltage less than 0.04 V? | Go to step **4**. | Go to step **3**. |
| 3 | **CHECK INPUT SIGNAL OF ECM (USING SUBARU SELECT MONITOR).**<br>Read the data of fuel level sensor signal using Subaru Select Monitor.<br>NOTE:<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Does the measured value change when shaking the ECM harness and connector? | Repair poor contact of the ECM connector. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 4 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the fuel tank cord connector (R57) from the rear wiring harness connector (R15).<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 10 (+) — Chassis ground (–):*** | Is the voltage less than 0.04 V? | Go to step **5**. | Go to step **6**. |
| 5 | **CHECK HARNESS BETWEEN ECM AND COMBINATION METER.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and combination meter connector (i12).<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 10 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.> | Repair the harness.<br>NOTE:<br>In this case, repair the following item:<br>• Short circuit of the harness to ground between the ECM and combination meter connector.<br>• Short circuit of the harness to ground between the ECM and fuel tank cord connector. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK FUEL TANK CORD.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the fuel sub level sensor.<br>3) Measure the resistance between the fuel sub level sensor and chassis ground.<br>***Connector & terminal***<br>***(R59) No. 1 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **7**. | Repair short circuit of the harness to ground of the fuel tank cord. |
| 7 | **CHECK FUEL TANK CORD.**<br>1) Disconnect the connector from fuel pump assembly.<br>2) Measure the resistance between fuel pump assembly and chassis ground.<br>***Connector & terminal***<br>***(R59) No. 2 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **8**. | Repair short circuit of the harness to ground of the fuel tank cord. |
| 8 | **CHECK FUEL LEVEL SENSOR.**<br>1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-63, Fuel Pump.><br>2) Measure the resistance between fuel level sensor and terminals with float set at full position.<br>***Terminals***<br>***No. 2 — No. 3:*** | Is the resistance between 0.5 — 2.5 Ω? | Go to step **9**. | Replace the fuel level sensor. <Ref. to FU(H4DOTC)-65, Fuel Level Sensor.> |
| 9 | **CHECK FUEL SUB LEVEL SENSOR.**<br>1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.><br>2) Measure the resistance between fuel sub level sensor and terminals with float set at full position.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 0.5 — 2.5 Ω? | Repair the poor contact of harness between ECM and combination meter connector. | Replace the fuel sub level sensor. <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.> |

## BX:DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH

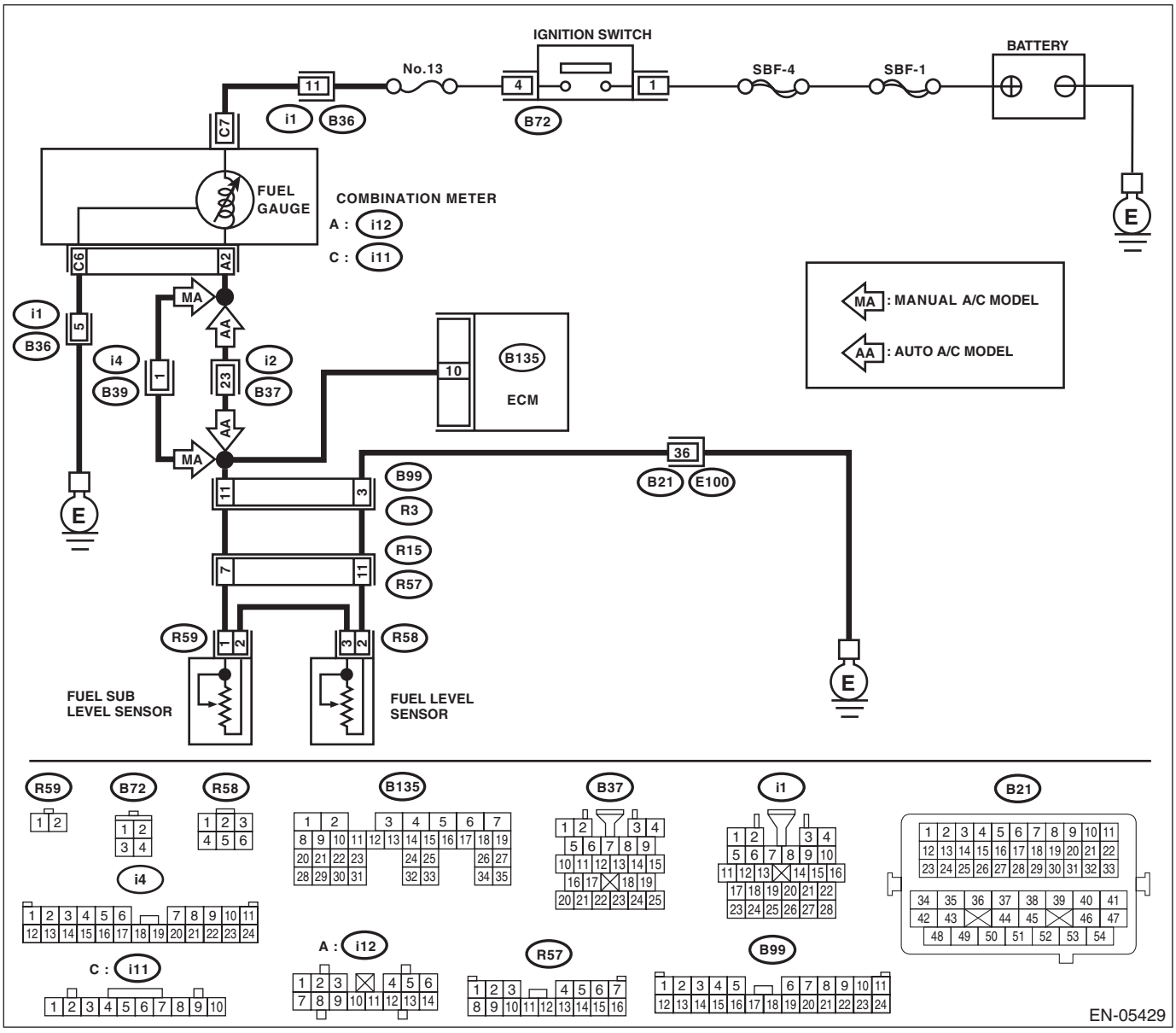
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-163, DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OPERATION OF SPEEDOMETER AND TACHOMETER.** | Are speedometer and tachometer operate normally? | Go to step **2**. | Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.> |
| 2 | **CHECK INPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON. (engine OFF)<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 10 (+) — Chassis ground (–):*** | Is the voltage 4.9 V or more? | Go to step **4**. | Go to step **3**. |
| 3 | **CHECK INPUT SIGNAL OF ECM (USING SUBARU SELECT MONITOR).**<br>Read the data of fuel level sensor signal using Subaru Select Monitor.<br>NOTE:<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Does the measured value change when shaking the ECM harness and connector? | Repair poor contact of the ECM connector. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 4 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the ECM and combination meter connector (i12).<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 10 (+) — Chassis ground (–):*** | Is the voltage 4.9 V or more? | Repair the short circuit to power of harness between ECM and combination meter connector. | Go to step **5**. |
| 5 | **CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the fuel tank cord connector (R57) from the rear wiring harness connector (R15).<br>3) Measure the resistance between ECM and fuel tank cord.<br>***Connector & terminal***<br>***(B135) No. 10 — (R15) No. 7:*** | Is the resistance less than 1 Ω? | Go to step **6**. | Repair the open circuit between ECM and fuel tank cord. |
| 6 | **CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND.**<br>Measure the resistance between fuel tank cord and chassis ground.<br>***Connector & terminal***<br>***(R15) No. 11 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **7**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between fuel tank cord and chassis ground<br>• Poor contact of coupling connector |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK FUEL TANK CORD.**<br>1) Disconnect the connector from the fuel level sensor.<br>2) Measure the resistance between the fuel level sensor and coupling connector.<br>***Connector & terminal***<br>***(R57) No. 11 — (R58) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **8**. | Repair the open circuit between the coupling connector and fuel level sensor. |
| 8 | **CHECK FUEL TANK CORD.**<br>1) Disconnect the connector from the fuel sub level sensor.<br>2) Measure the resistance between the fuel level sensor and fuel sub level sensor.<br>***Connector & terminal***<br>***(R58) No. 3 — (R59) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **9**. | Repair the open circuit between the fuel level sensor and fuel sub level sensor. |
| 9 | **CHECK FUEL TANK CORD.**<br>Measure the resistance between the fuel level sensor and coupling connector.<br>***Connector & terminal***<br>***(R57) No. 7 — (R59) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **10**. | Repair the open circuit of harness between the coupling connector and fuel level sensor. |
| 10 | **CHECK FUEL LEVEL SENSOR.**<br>1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-63, Fuel Pump.><br>2) Measure the resistance between fuel level sensor terminals moving the fuel level sensor float up and down.<br>***Terminals***<br>***No. 2 — No. 3:*** | Is the resistance 52 Ω or more? | Replace the fuel level sensor. <Ref. to FU(H4DOTC)-65, Fuel Level Sensor.> | Go to step **11**. |
| 11 | **CHECK FUEL SUB LEVEL SENSOR.**<br>1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.><br>2) Measure the resistance between fuel sub level sensor terminals moving the fuel sub level sensor float up and down.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 44 Ω or more? | Replace the fuel sub level sensor. <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.> | Check the combination meter. <Ref. to IDI-11, Combination Meter.> |

## BY:DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT

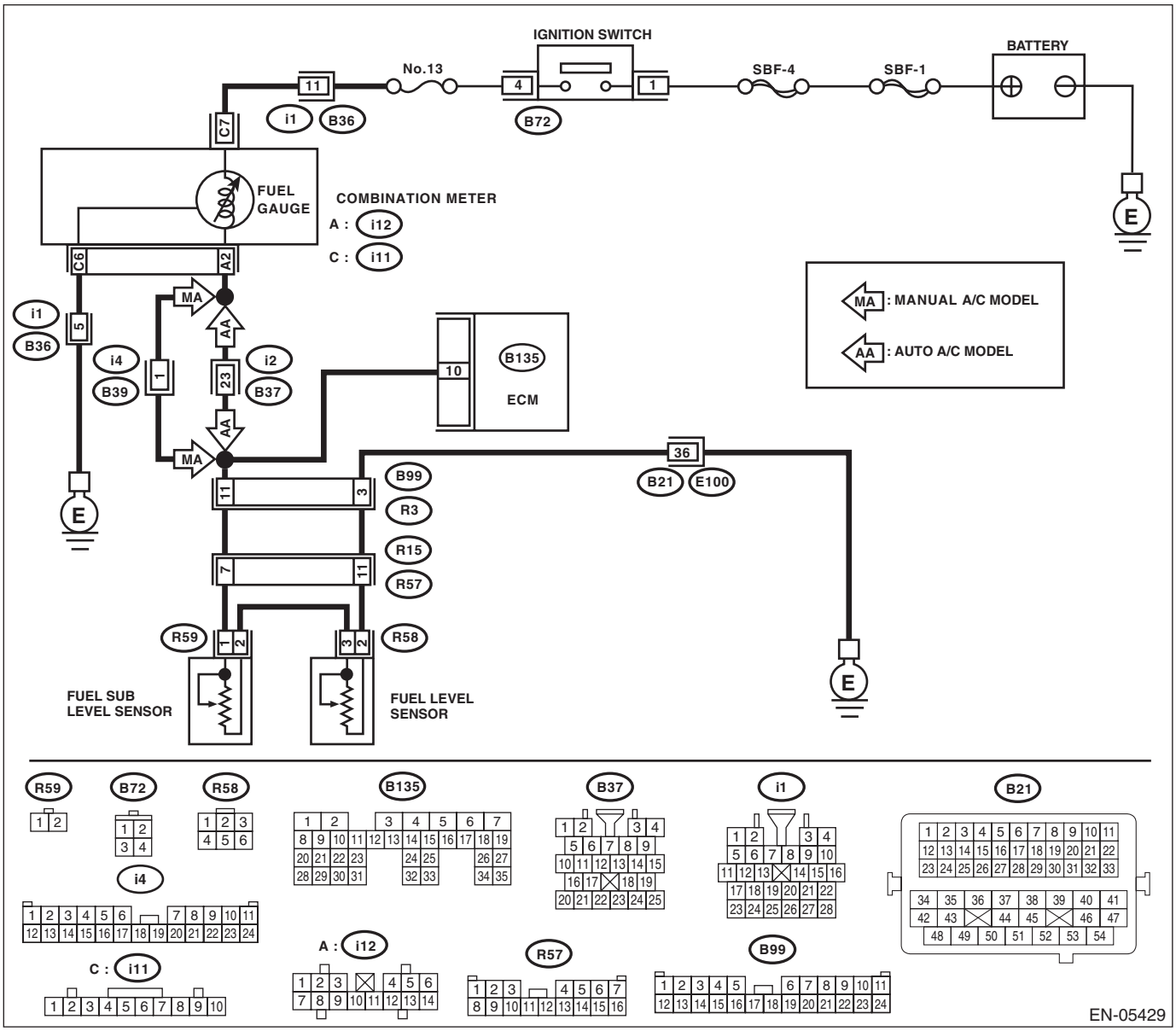
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-165, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FUEL LEVEL SENSOR.**<br>1) Remove the fuel pump assembly. <Ref. to FU(H4DOTC)-63, Fuel Pump.><br>2) Check if the resistance between fuel level sensor terminals changes smoothly when moving the fuel level sensor float up and down.<br>***Terminals***<br>***No. 2 — No. 3:*** | Does the resistance change smoothly? | Go to step **2**. | Replace the fuel level sensor. <Ref. to FU(H4DOTC)-65, Fuel Level Sensor.> |
| 2 | **CHECK FUEL SUB LEVEL SENSOR.**<br>1) Remove the fuel sub level sensor. <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.><br>2) Check if the resistance between fuel level sensor terminals changes smoothly when moving the fuel sub level sensor float up and down.<br>***Terminals***<br>***No. 1 — No. 2:*** | Does the resistance change smoothly? | Repair the connector.<br>NOTE:<br>In this case, repair the following item:<br>• Poor contact in ECM connector<br>• Poor contact in combination meter connector<br>• Poor contact of coupling connector | Replace the fuel sub level sensor. <Ref. to FU(H4DOTC)-66, Fuel Sub Level Sensor.> |

## BZ:DTC P0483 FAN RATIONALITY CHECK

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-168, DTC P0483 FAN RATIONALITY CHECK, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Occurrence of noise
- Overheat

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

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

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Check radiator fan, fan motor and thermostat and if thermostat is stuck, replace thermostat. <Ref. to CO(H4DOTC)-30, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4DOTC)-32, Radiator Sub Fan and Fan Motor.> |

## CA:DTC P0502 VEHICLE SPEED SENSOR “A” CIRCUIT LOW INPUT

NOTE:
For the diagnostic procedure, refer to DTC P0503. <Ref. to EN(H4DOTC)(diag)-243, DTC P0503 VEHICLE SPEED SENSOR “A” INTERMITTENT/ERRATIC/HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CB:DTC P0503 VEHICLE SPEED SENSOR “A” INTERMITTENT/ERRATIC/HIGH

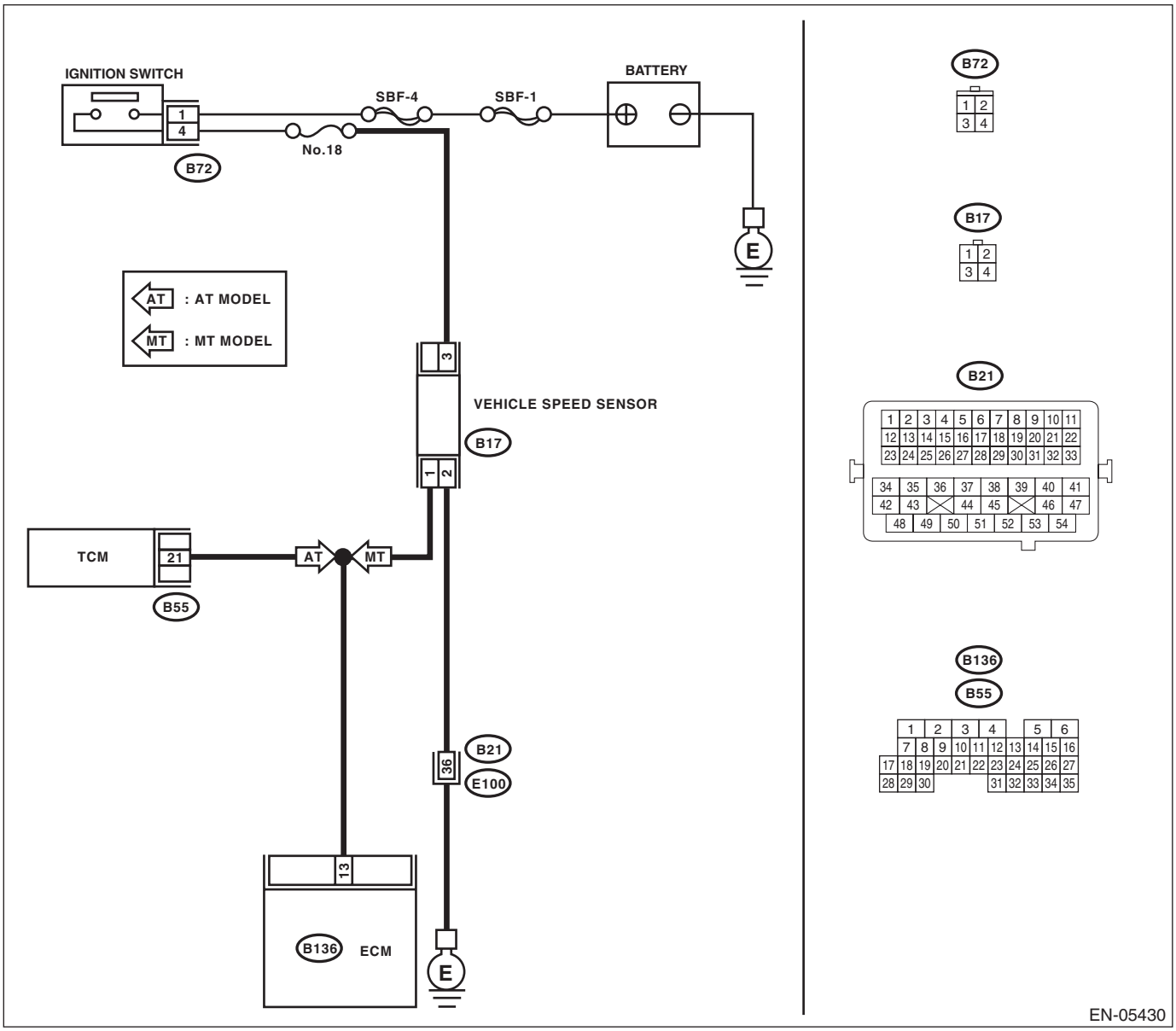
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-171, DTC P0503 VEHICLE SPEED SENSOR “A” INTERMITTENT/ERRATIC/HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK TRANSMISSION TYPE.** | Is the transmission type AT? | Go to step **2**. | Go to step **6**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and TCM.<br>3) Measure the resistance of harness between ECM and TCM connector.<br>***Connector & terminal***<br>***(B136) No. 13 — (B55) No. 21:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between ECM and TCM connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.**<br>Measure the resistance between TCM connector and chassis ground.<br>***Connector & terminal***<br>***(B55) No. 21 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **4**. | Repair short circuit of the harness to ground between ECM and TCM connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between TCM connector and chassis ground.<br>***Connector & terminal***<br>***(B55) No. 21 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power of harness between ECM and TCM connector. | Go to step **5**. |
| 5 | **CHECK POOR CONTACT.**<br>Check for poor contact of the TCM connector. | Is there poor contact of TCM connector? | Repair the poor contact of TCM connector. | Repair poor contact of the ECM connector. |
| 6 | **CHECK POWER OF VEHICLE SPEED SENSOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between vehicle speed sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B17) No. 3 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **7**. | Repair the open or ground short circuit of power supply circuit. |
| 7 | **CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and vehicle speed sensor.<br>3) Measure the resistance of the harness between the ECM and vehicle speed sensor connector.<br>***Connector & terminal***<br>***(B136) No. 13 — (B17) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **8**. | Repair the open circuit of harness between ECM and vehicle speed sensor connector. |
| 8 | **CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR.**<br>Measure the resistance between vehicle speed sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B17) No. 1 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **9**. | Repair short circuit of the harness to ground between ECM and vehicle speed sensor. |
| 9 | **CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between vehicle speed sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B17) No. 1 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power of harness between ECM and vehicle speed sensor. | Go to step **10**. |
| 10 | **CHECK POOR CONTACT.**<br>Check poor contact of vehicle speed sensor connector. | Is there poor contact of vehicle speed sensor connector? | Repair the poor contact of vehicle speed sensor connector. | Replace the vehicle speed sensor. <Ref. to 5MT-37, Vehicle Speed Sensor.> |

# CC:DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-173, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

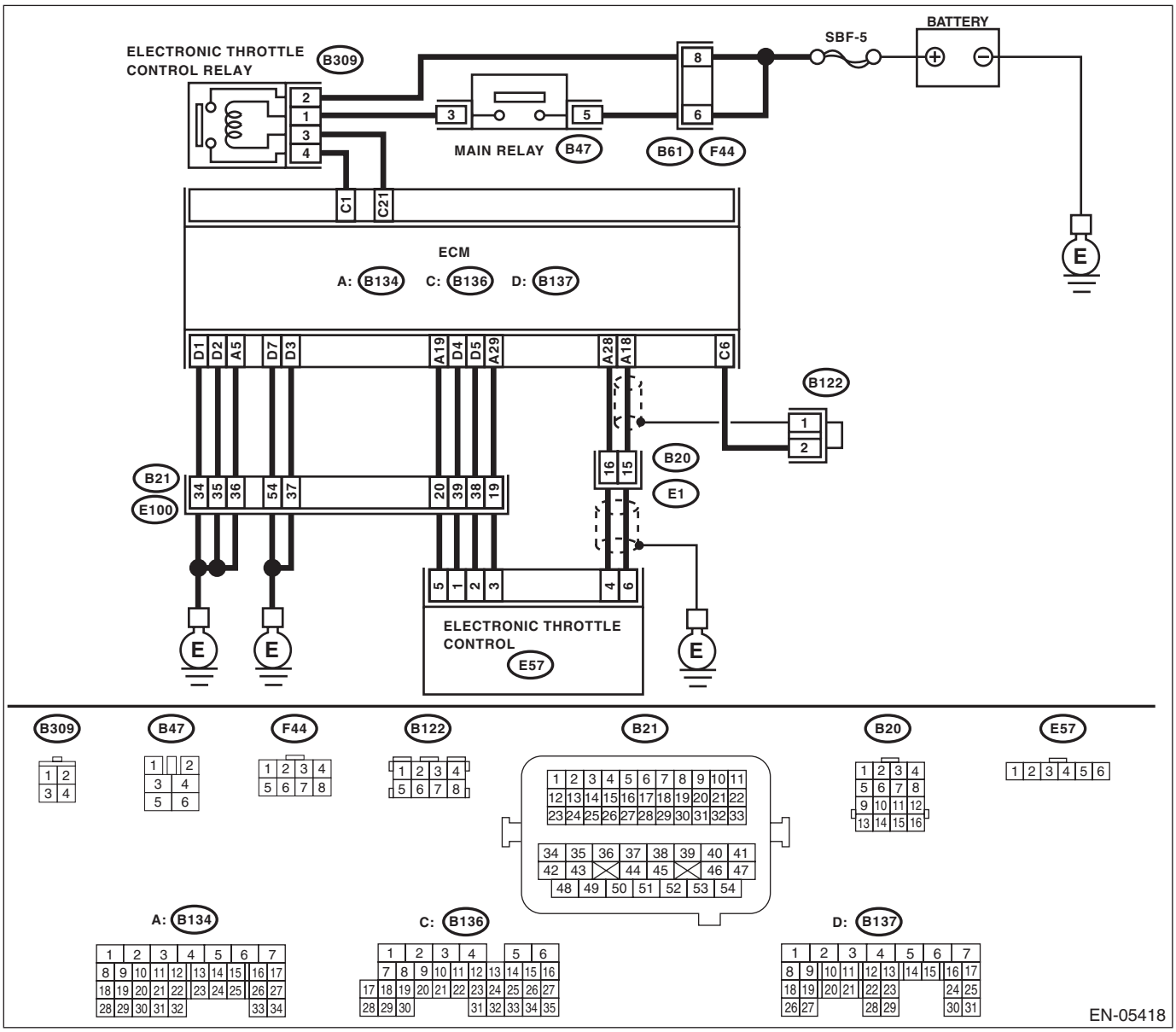
**TROUBLE SYMPTOM:**

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

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK 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)-9, Air Cleaner Element.> | Go to step **3**. |
| 3 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>1) Remove the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.><br>2) Check the electronic throttle control. | Are foreign matter found inside electronic throttle control? | Remove foreign matter from electronic throttle control. | Perform the diagnosis of DTC P2101. <Ref. to EN(H4DOTC)(diag)-330, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

## CD:DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-175, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

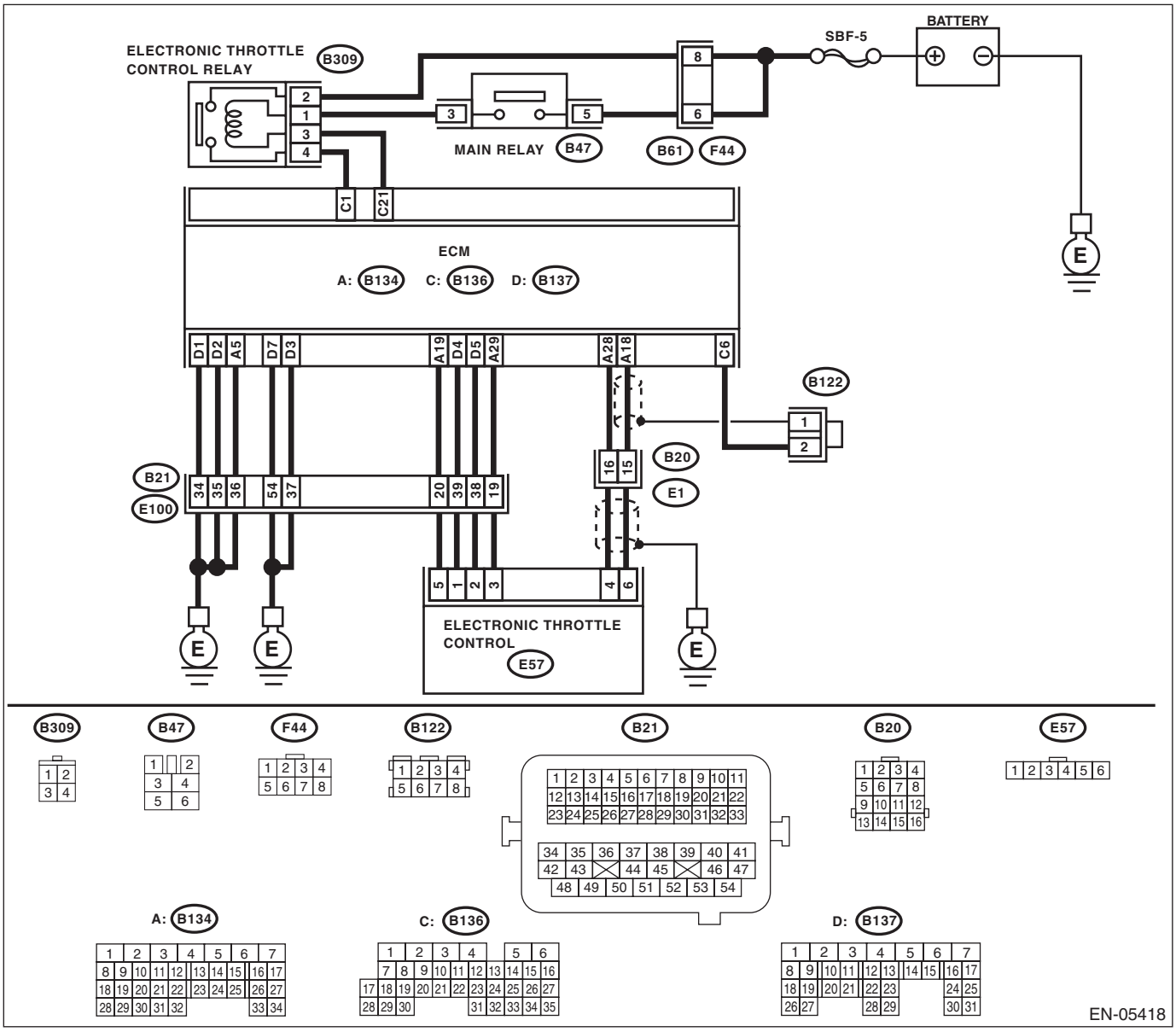
**TROUBLE SYMPTOM:**

Engine keeps running at higher speed than specified idle speed.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK AIR INTAKE SYSTEM.**<br>1) Start and idle the engine.<br>2) Check the following items.<br>• Loose installation of intake manifold and throttle body<br>• Cracks of intake manifold gasket and throttle body gasket<br>• Disconnection of vacuum hoses | Is there any fault in air intake system? | Repair air suction and leaks. | Go to step **3**. |
| 3 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.><br>3) Check the electronic throttle control. | Are foreign matter found inside electronic throttle control? | Remove foreign matter from electronic throttle control. | Perform the diagnosis of DTC P2101. <Ref. to EN(H4DOTC)(diag)-330, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

## CE:DTC P0512 STARTER REQUEST CIRCUIT

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-177, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

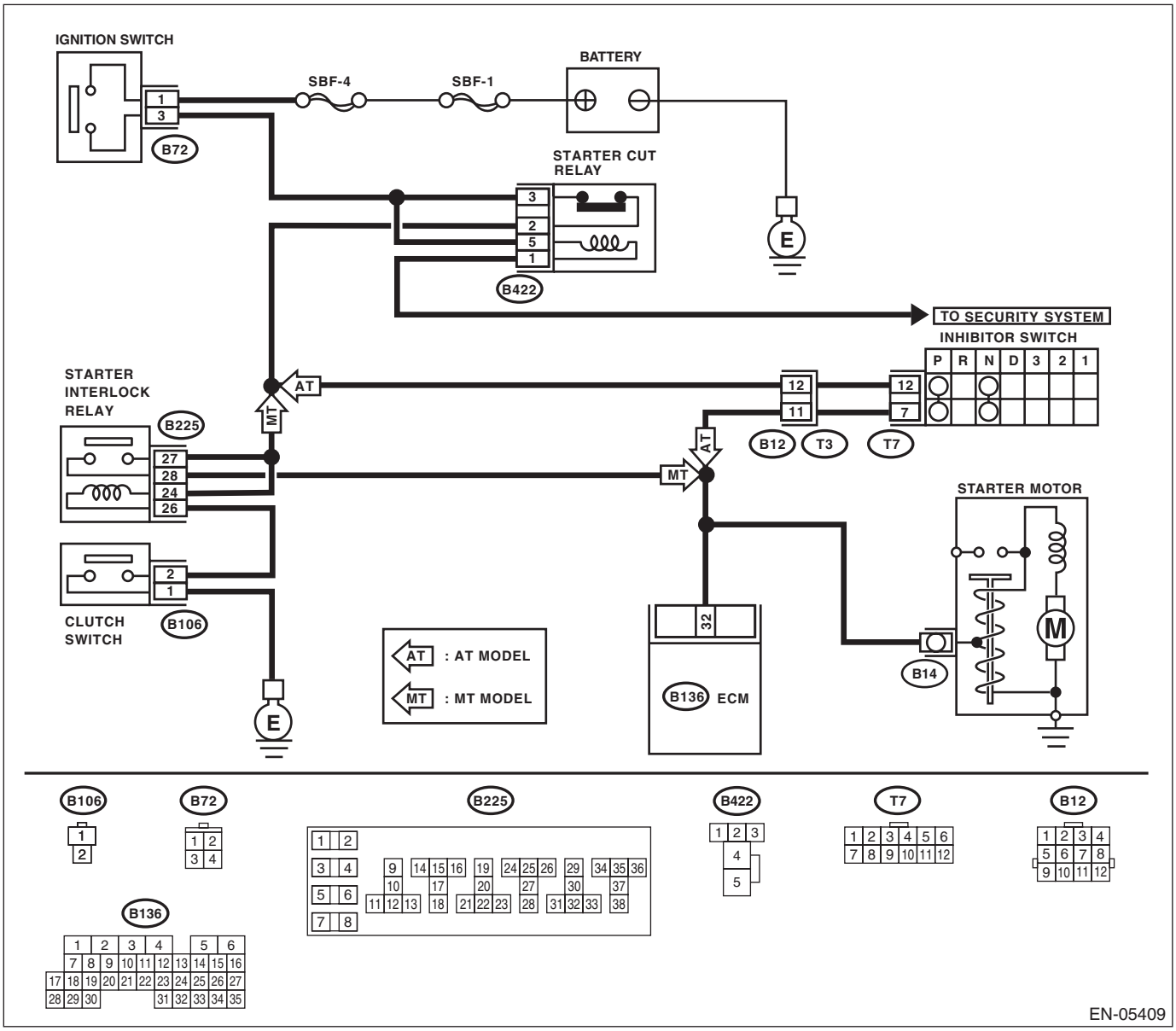
**TROUBLE SYMPTOM:**

Failure of engine to start

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 32 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power of the harness between ECM and ignition switch. | Repair poor contact of the ECM connector. |

## CF:DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-179, DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

Engine keeps running at higher speed than specified idle speed.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK AIR INTAKE SYSTEM.**<br>1) Start and idle the engine.<br>2) Check the following items.<br>• Loose installation of intake manifold and throttle body<br>• Cracks of intake manifold gasket and throttle body gasket<br>• Disconnection of vacuum hoses | Is there any fault in air intake system? | Repair air suction and leaks. | Go to step **3**. |
| 3 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.><br>3) Check the electronic throttle control. | Are foreign matter found inside electronic throttle control? | Remove foreign matter from electronic throttle control. | Perform the diagnosis of DTC P2101. <Ref. to EN(H4DOTC)(diag)-330, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |

## CG:DTC P0600 SERIAL COMMUNICATION LINK

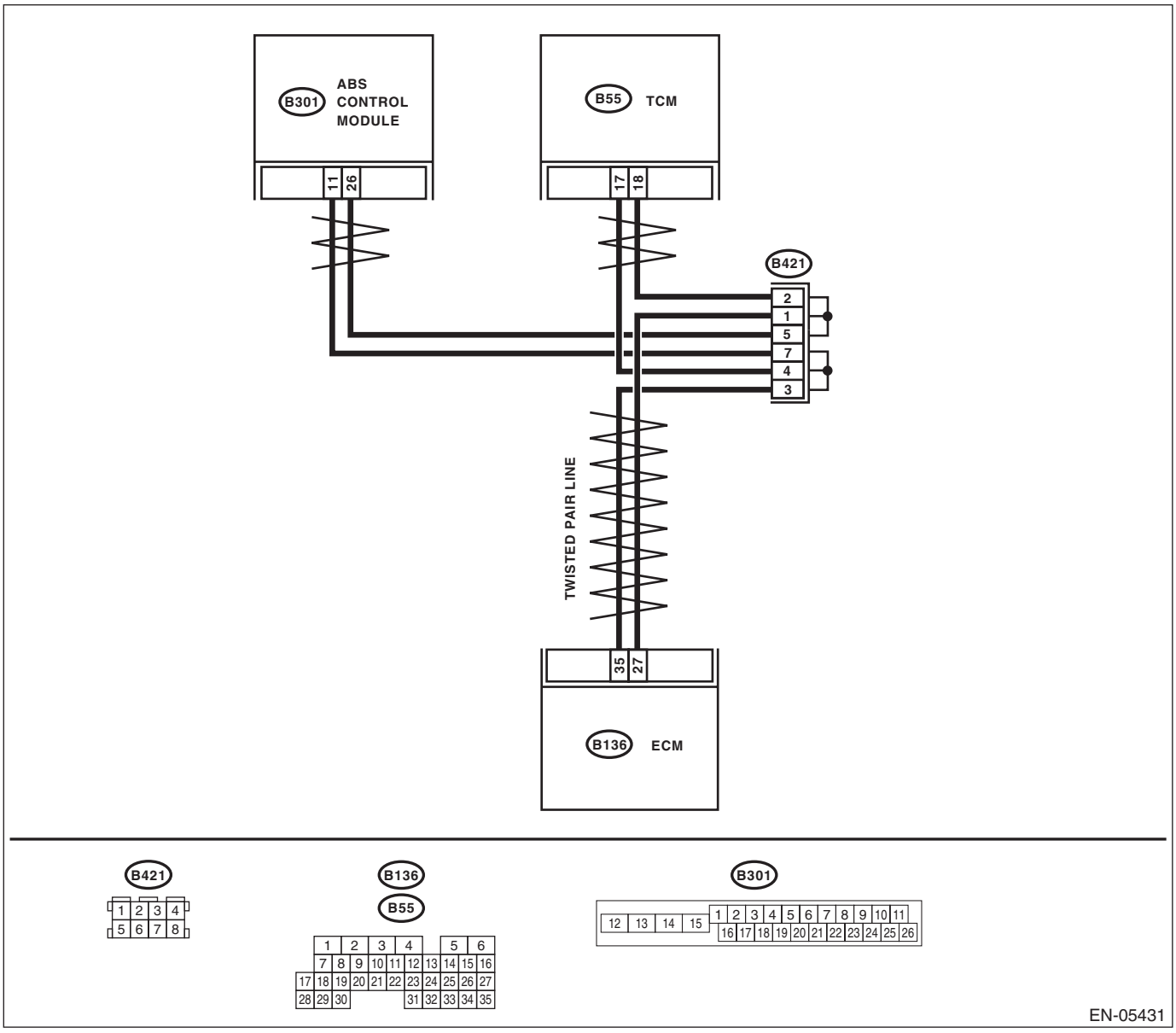
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-180, DTC P0600 SERIAL COMMUNICATION LINK, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND TCM.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and TCM.<br>3) Measure the resistance between ECM and TCM connector.<br>***Connector & terminal***<br>***(B136) No. 27 — (B55) No. 18:***<br>***(B136) No. 35 — (B55) No. 17:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and TCM connector<br>• Poor contact of joint connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND ABSCM&H/U.**<br>1) Disconnect the connector from the ABSCM&H/U.<br>2) Measure the resistance between ECM and ABSCM&H/U.<br>***Connector & terminal***<br>***(B136) No. 27 — (B301) No. 26:***<br>***(B136) No. 35 — (B301) No. 11:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and ABSCM&H/U<br>• Poor contact of joint connector |
| 3 | **CHECK HARNESS BETWEEN ECM, TCM AND ABSCM&H/U.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 27 — Chassis ground:***<br>***(B136) No. 35 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **4**. | Repair short circuit of the harness to ground between ECM, TCM AND ABSCM&H/U. |
| 4 | **CHECK HARNESS BETWEEN ECM, TCM AND ABSCM&H/U.**<br>Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B136) No. 27 — (B136) No. 35:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair the short circuit of harness between ECM, TCM AND ABSCM&H/U. |
| 5 | **CHECK AT SYSTEM CONDITION.**<br>Perform the diagnosis of AT using the Subaru Select Monitor. | Is DTC P1718 displayed? | Check the AT system. | Go to step **6**. |
| 6 | **CHECK ABS SYSTEM CONDITION.**<br>Perform the diagnosis of ABS using the Subaru Select Monitor. | Is DTC 47 displayed? | Check the ABS system. | Repair poor contact of the ECM connector. |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-181, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

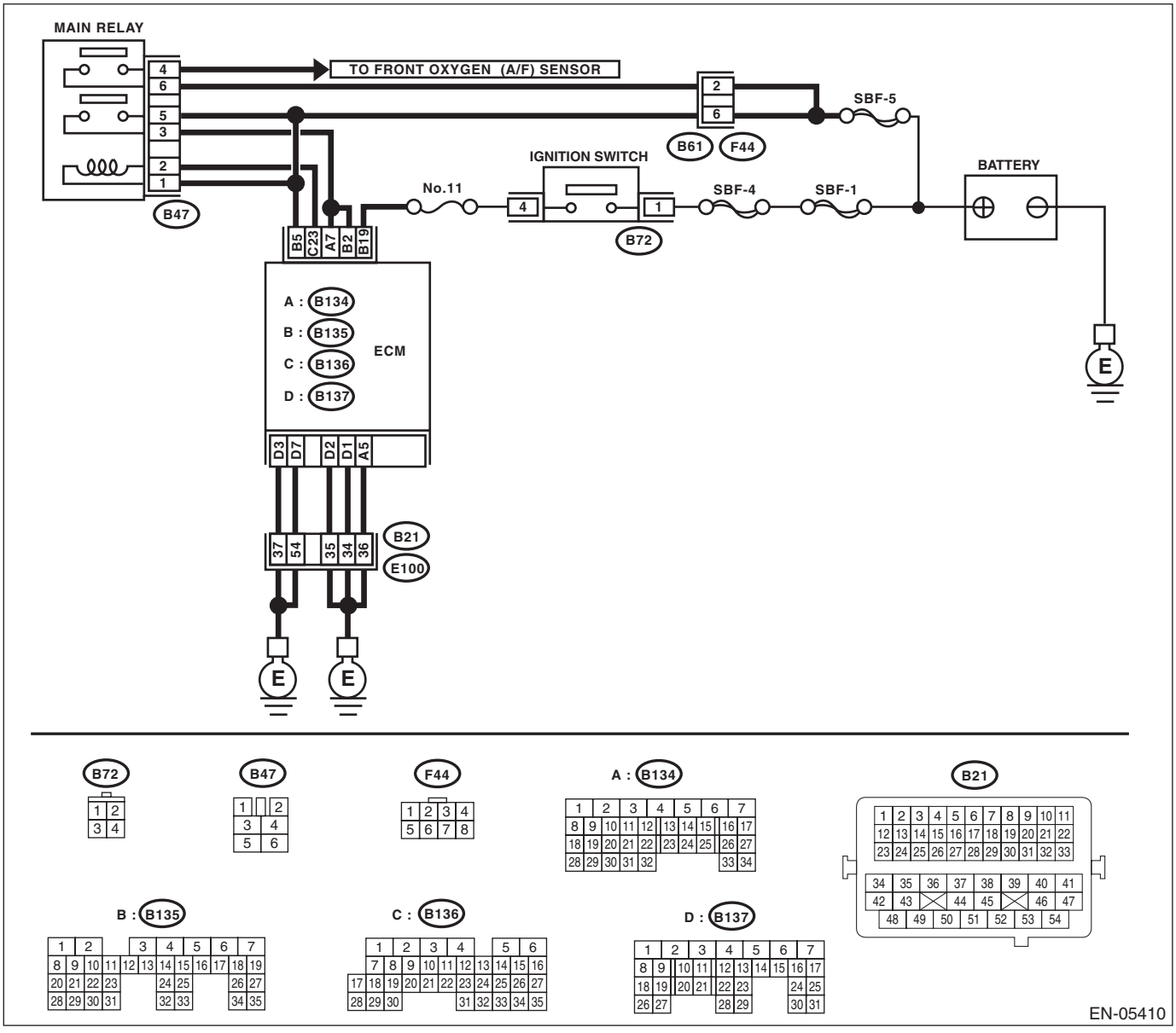
**TROUBLE SYMPTOM:**

- Engine does not start.
- Engine stalls.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |

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

NOTE:
For the diagnostic procedure, refer to DTC P0607. <Ref. to EN(H4DOTC)(diag)-256, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CJ:DTC P0607 CONTROL MODULE PERFORMANCE

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-183, DTC P0607 CONTROL MODULE PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

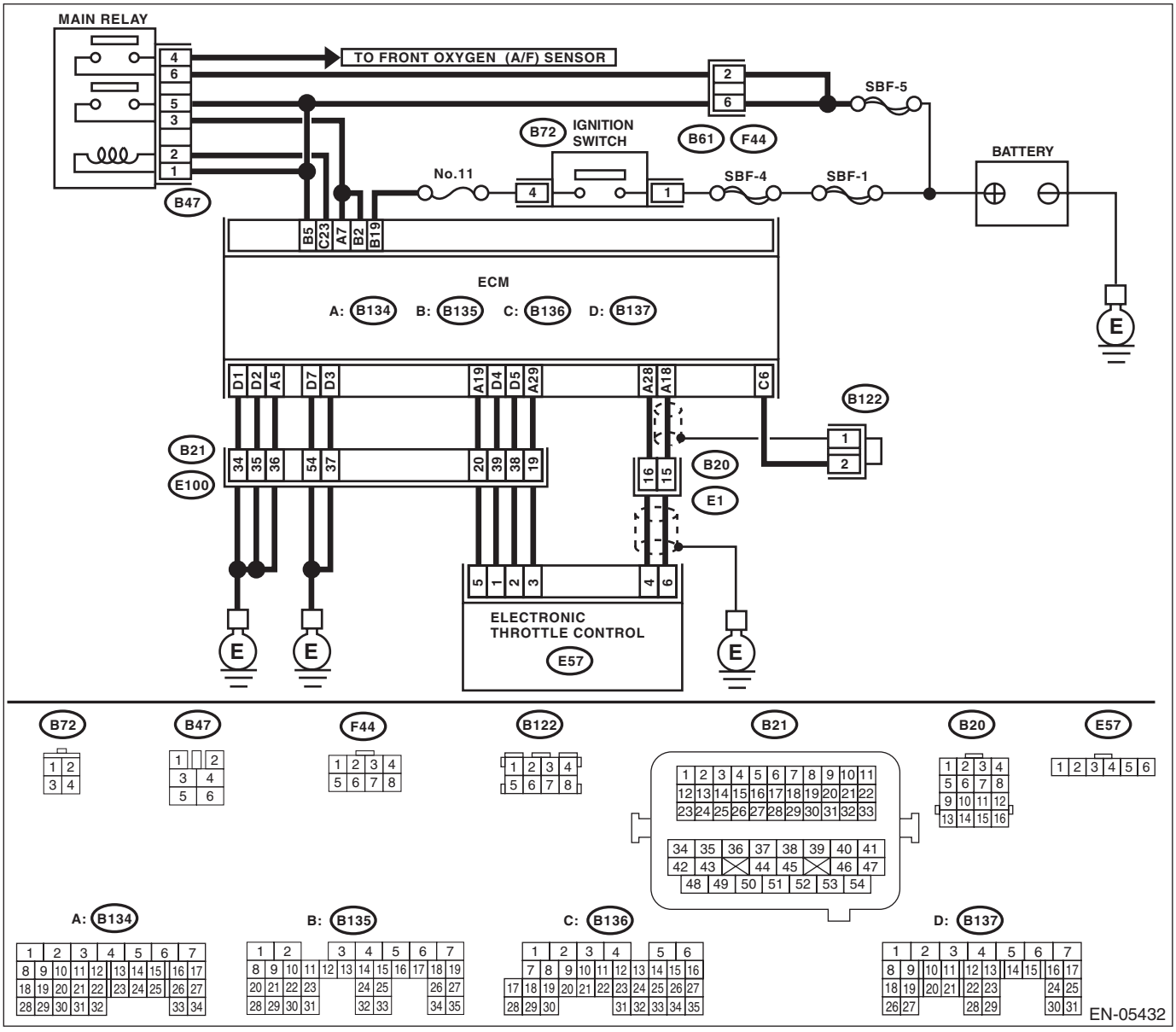
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | 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 and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 7 (+) — Chassis ground (–):***<br>***(B135) No. 2 (+) — Chassis ground (–):*** | Is the voltage 10 — 13 V? | Go to step **2**. | Repair the open or ground short circuit of power supply circuit. |
| 2 | **CHECK INPUT VOLTAGE OF ECM.**<br>1) Start the engine.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 7 (+) — Chassis ground (–):***<br>***(B135) No. 2 (+) — Chassis ground (–):*** | Is the voltage 13 — 15 V? | Go to step **3**. | Repair the open or ground short circuit of power supply circuit. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance of harness between ECM and electronic throttle control connector.<br>***Connector & terminal***<br>***(B134) No. 19 — (E57) No. 5:***<br>***(B134) No. 29 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 4 | **CHECK ECM GROUND HARNESS.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 5 (+) — 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 voltage less than 1 V? | Repair poor contact of the ECM connector. | Repair the following item.<br>• Retightening of engine ground terminals<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |

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

NOTE:
For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-330, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## CL:DTC P0691 FAN 1 CONTROL CIRCUIT LOW

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-189, DTC P0691 FAN 1 CONTROL CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Overheat

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Check the radiator fan system. <Ref. to CO(H4DOTC)-7, Radiator Main Fan System.> <Ref. to CO(H4DOTC)-13, Radiator Sub Fan System.> |

## CM:DTC P0692 FAN 1 CONTROL CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-190, DTC P0692 FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Overheat

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Check the radiator fan system. <Ref. to CO(H4DOTC)-7, Radiator Main Fan System.> <Ref. to CO(H4DOTC)-13, Radiator Sub Fan System.> |

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

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

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-192, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

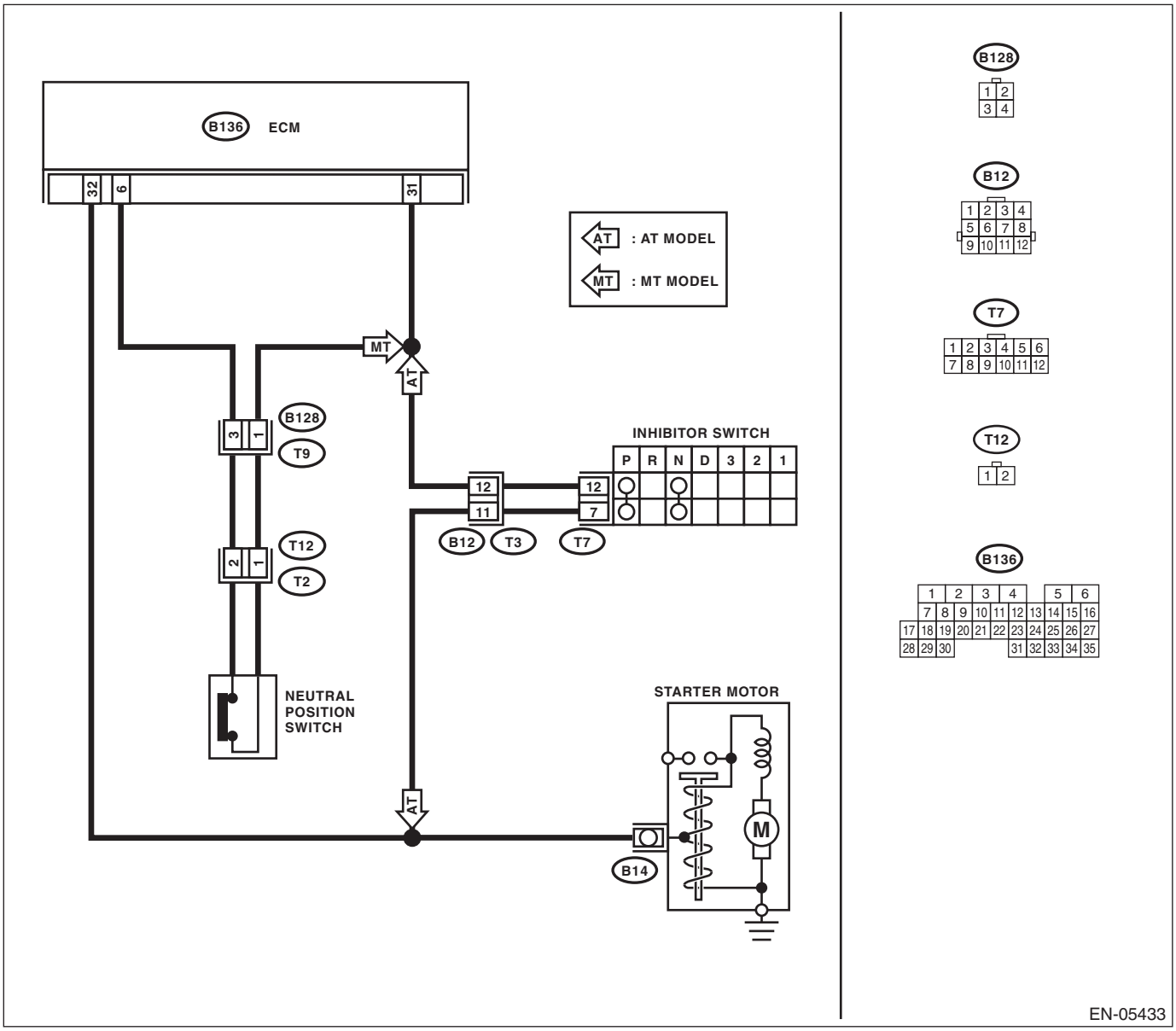
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



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

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-193, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

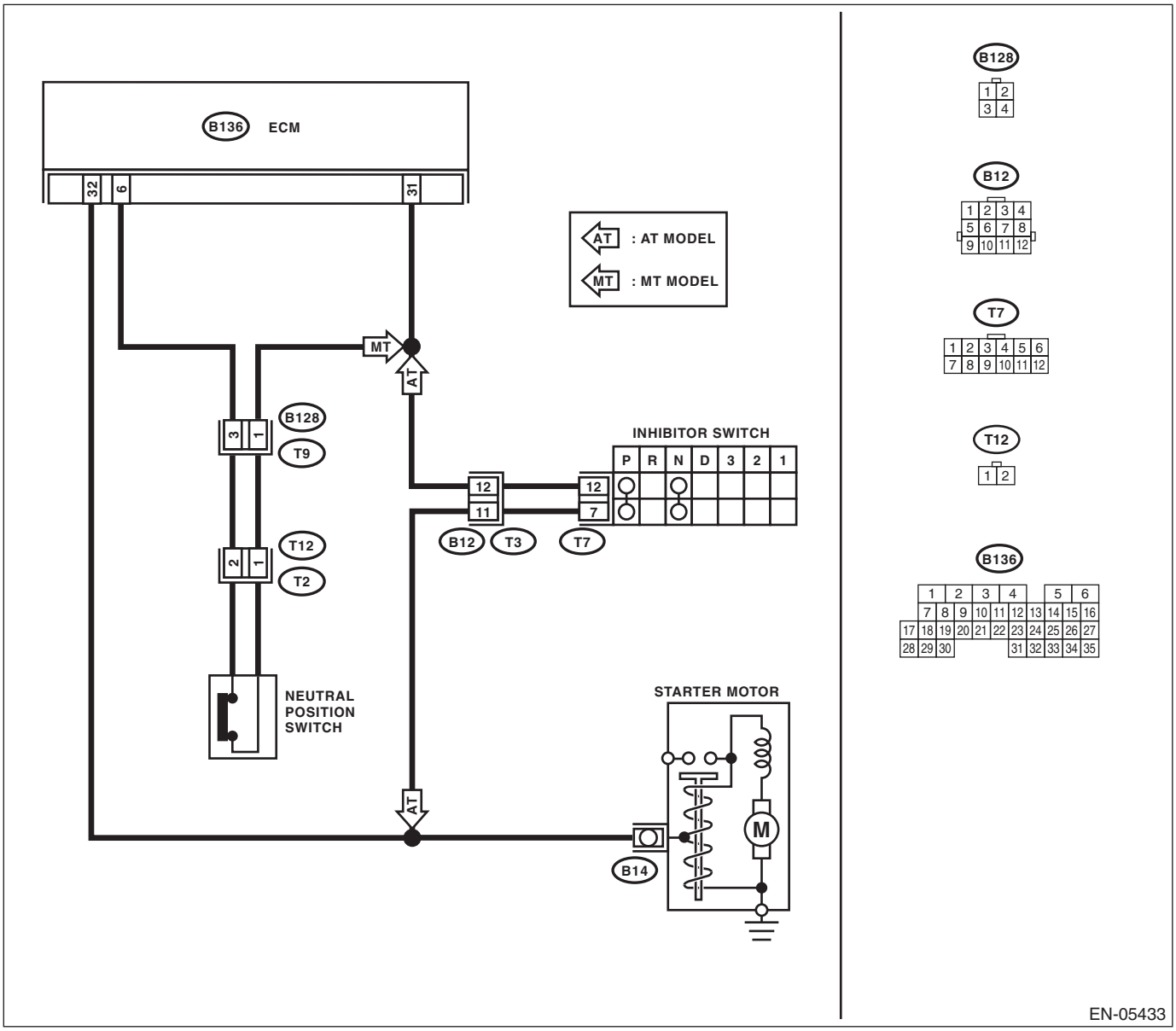
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Place the shift lever in a position except for neutral.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 31 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and transmission harness connector (T9).<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 31 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Repair the short circuit of transmission harness, or replace the neutral position switch. | Repair short circuit of the harness to ground between ECM and transmission harness connector. |

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-194, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

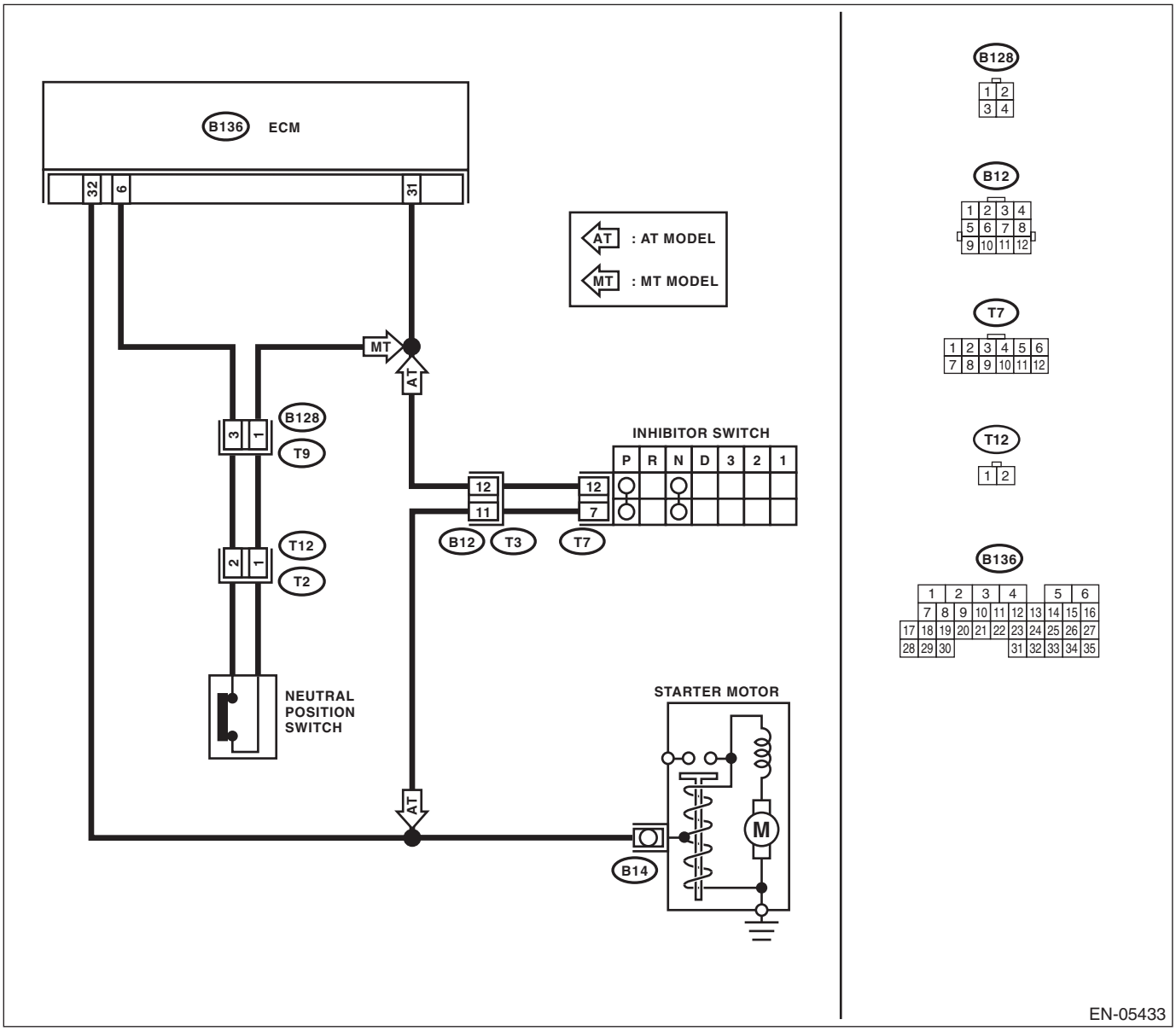
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



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

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

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-195, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

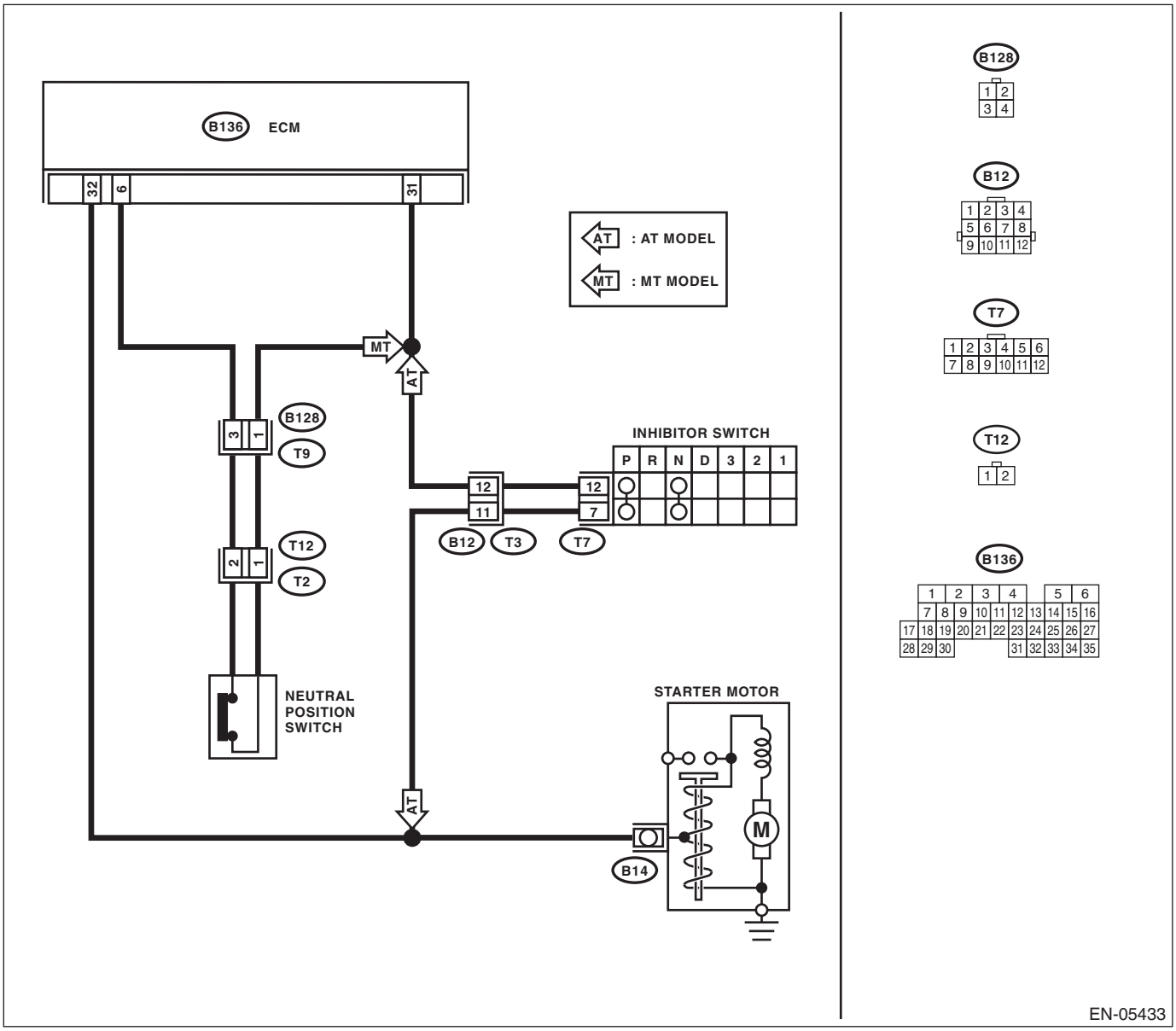
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Place the shift lever in neutral.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 31 (+) — Chassis ground (–):*** | Is the voltage less than 1 V? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND NEUTRAL SWITCH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect connectors from the ECM and transmission harness.<br>3) Measure the resistance of harness between ECM and transmission harness connector.<br>***Connector & terminal***<br>***(B136) No. 31 — (B128) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between ECM and transmission harness connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND NEUTRAL SWITCH CONNECTOR.**<br>Measure the resistance of harness between transmission harness connector and engine ground.<br>***Connector & terminal***<br>***(B128) No. 3 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between transmission harness connector and engine ground<br>• Poor contact of coupling connector |
| 4 | **CHECK NEUTRAL SWITCH.**<br>1) Place the shift lever in neutral.<br>2) Measure the resistance between transmission harness connector terminals.<br>***Connector & terminal***<br>***(T9) No. 1 — No. 3:*** | Is the resistance less than 1 Ω? | Repair the poor contact of transmission harness connector. | Repair the open circuit of transmission harness, or replace the neutral switch. |

## CS:DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK 1 SENSOR 1)

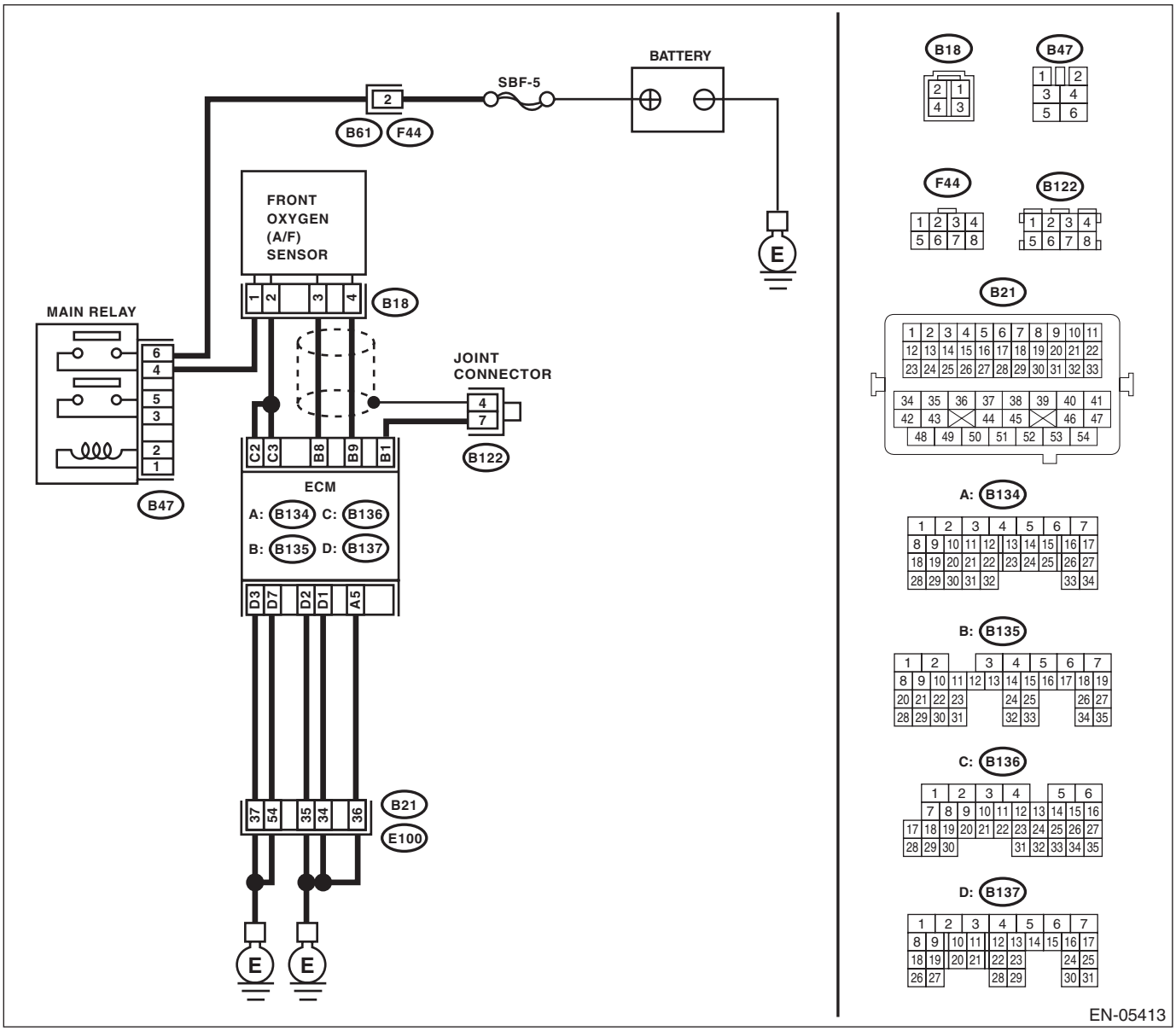
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-196, DTC P1152 O2 SENSOR CIRCUIT RANGE/ PERFORMANCE (LOW) (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the 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>***(B135) No. 9 — (B18) No. 4:***<br>***(B135) No. 8 — (B18) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<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<br>• Poor contact of coupling connector |
| 3 | **CHECK POOR CONTACT.**<br>Check poor contact of front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact of the front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |

# CT:DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK 1 SENSOR 1)

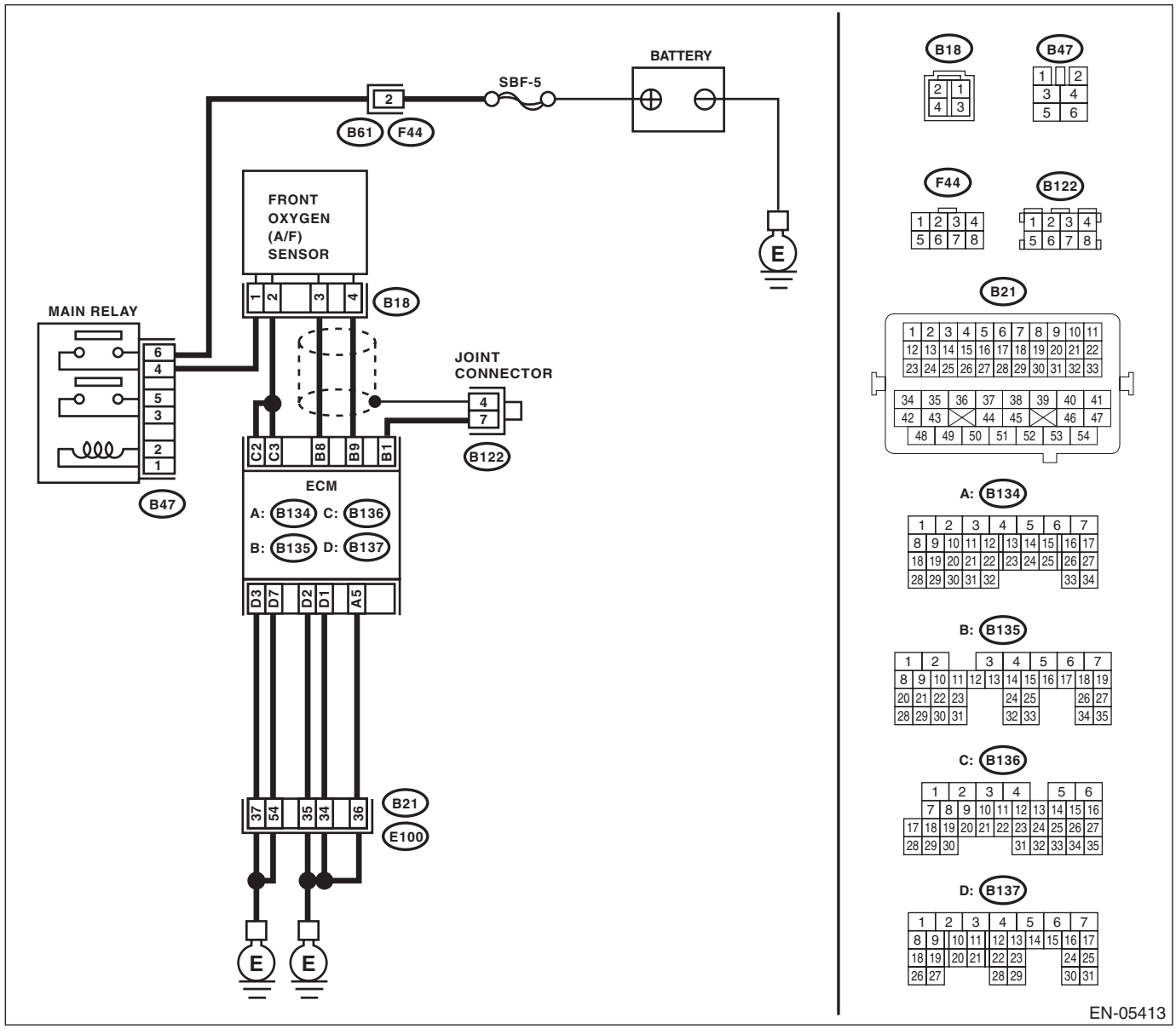
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-198, DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 9 — Chassis ground:***<br>***(B135) No. 8 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector. |
| 3 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>1) Connect the connector to ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 9 (+) — Chassis ground (–):*** | Is the voltage 4.5 V or more? | Go to step **5**. | Go to step **4**. |
| 4 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 8 (+) — Chassis ground (–):*** | Is the voltage 4.95 V or more? | Go to step **5**. | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> |
| 5 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 9 (+) — Chassis ground (–):***<br>***(B135) No. 8 (+) — Chassis ground (–):*** | Is the voltage 8 V or more? | Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> | Repair poor contact of the ECM connector. |

## CU:DTC P1160 RETURN SPRING FAILURE

NOTE:
For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-330, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

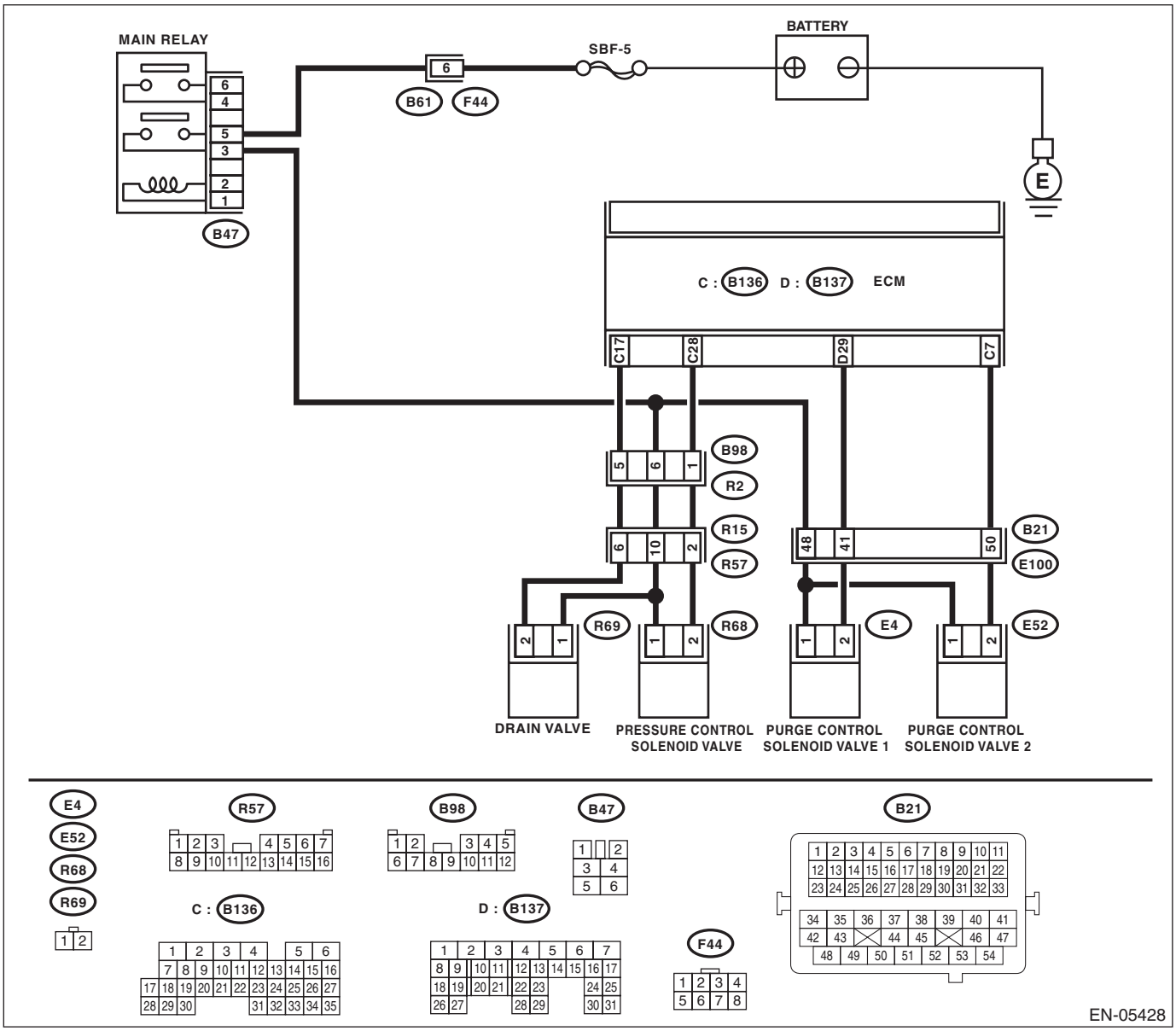
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-202, DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 28 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and pressure control solenoid valve.<br>3) Measure the resistance between pressure control solenoid valve and chassis ground.<br>***Connector & terminal***<br>***(R68) No. 2 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and pressure control solenoid valve connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE.**<br>Measure the resistance of harness between ECM and pressure control solenoid valve connector.<br>***Connector & terminal***<br>***(B136) No. 28 — (R68) No. 2:*** | 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 item:<br>• Open circuit in harness between ECM and pressure control solenoid valve connector<br>• Poor contact of coupling connector |
| 4 | **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 between 10 — 100 Ω? | Go to step **5**. | Replace the pressure control solenoid valve. <Ref. to EC(H4DOTC)-16, Pressure Control Solenoid Valve.> |
| 5 | **CHECK POWER SUPPLY TO THE 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 10 V or more? | Repair the poor contact of pressure control solenoid valve connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit in harness between main relay and pressure control solenoid valve connector<br>• Poor contact of coupling connector<br>• Poor contact of main relay connector |

## CW:DTC P1410 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN

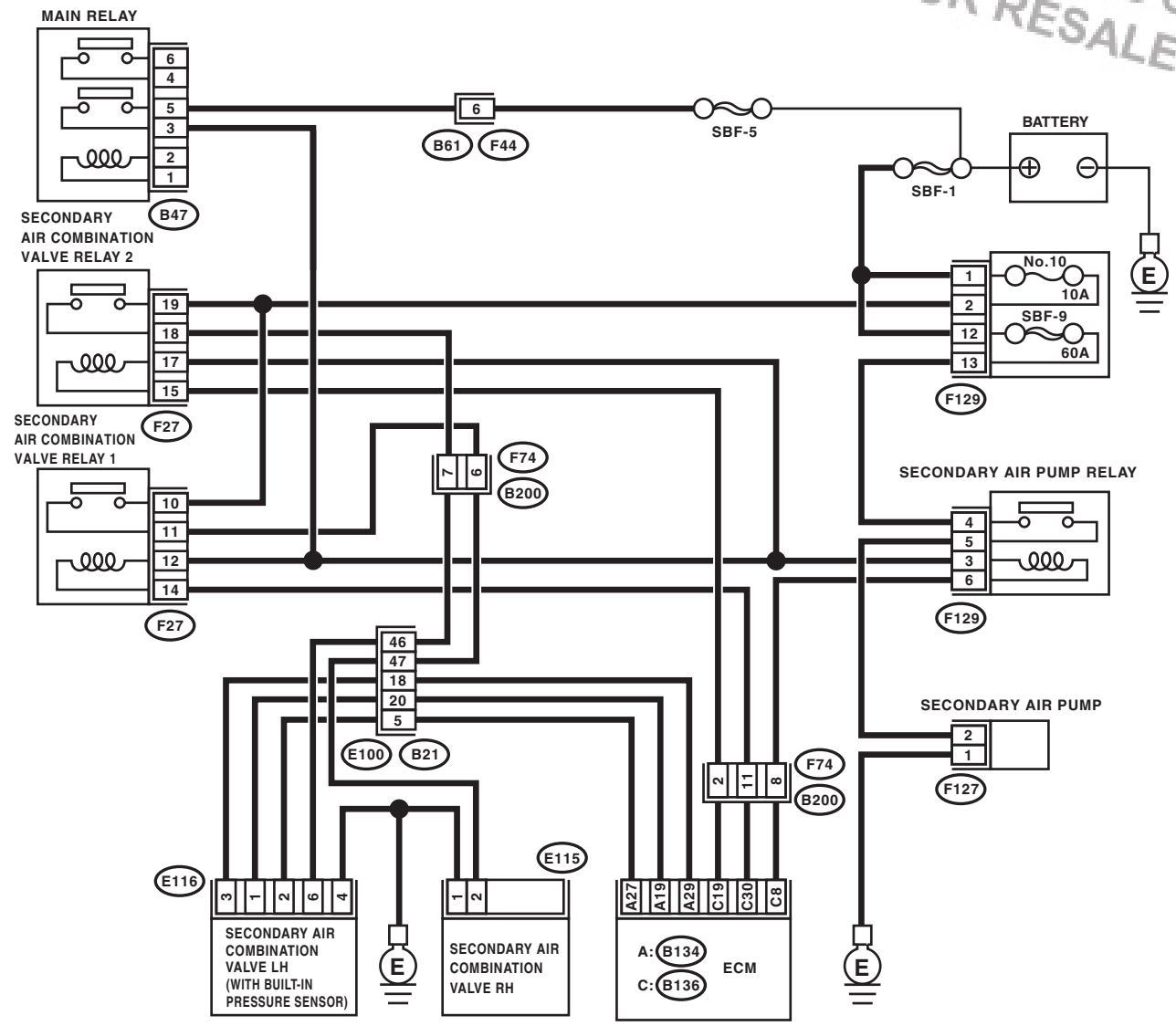
**DTC DETECTING CONDITION:**

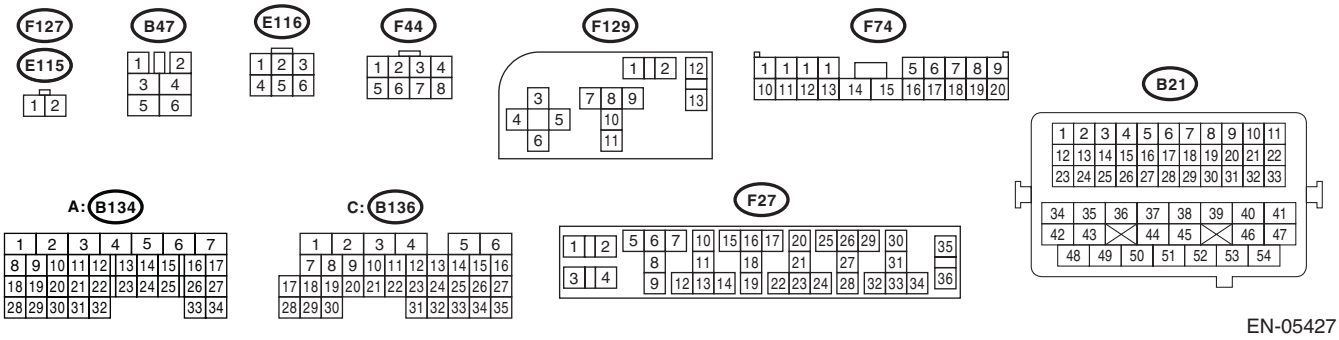
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-204, DTC P1410 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SECONDARY AIR COMBINATION VALVE.**<br>1) Remove the secondary air combination valve. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.><br>2) Blow in air from the secondary air combination valve air inlet, and check whether there are leaks at the pipe connections. | Are there air leaks from the pipe connections? | Replace the secondary air combination valve on the side with the air leak. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |

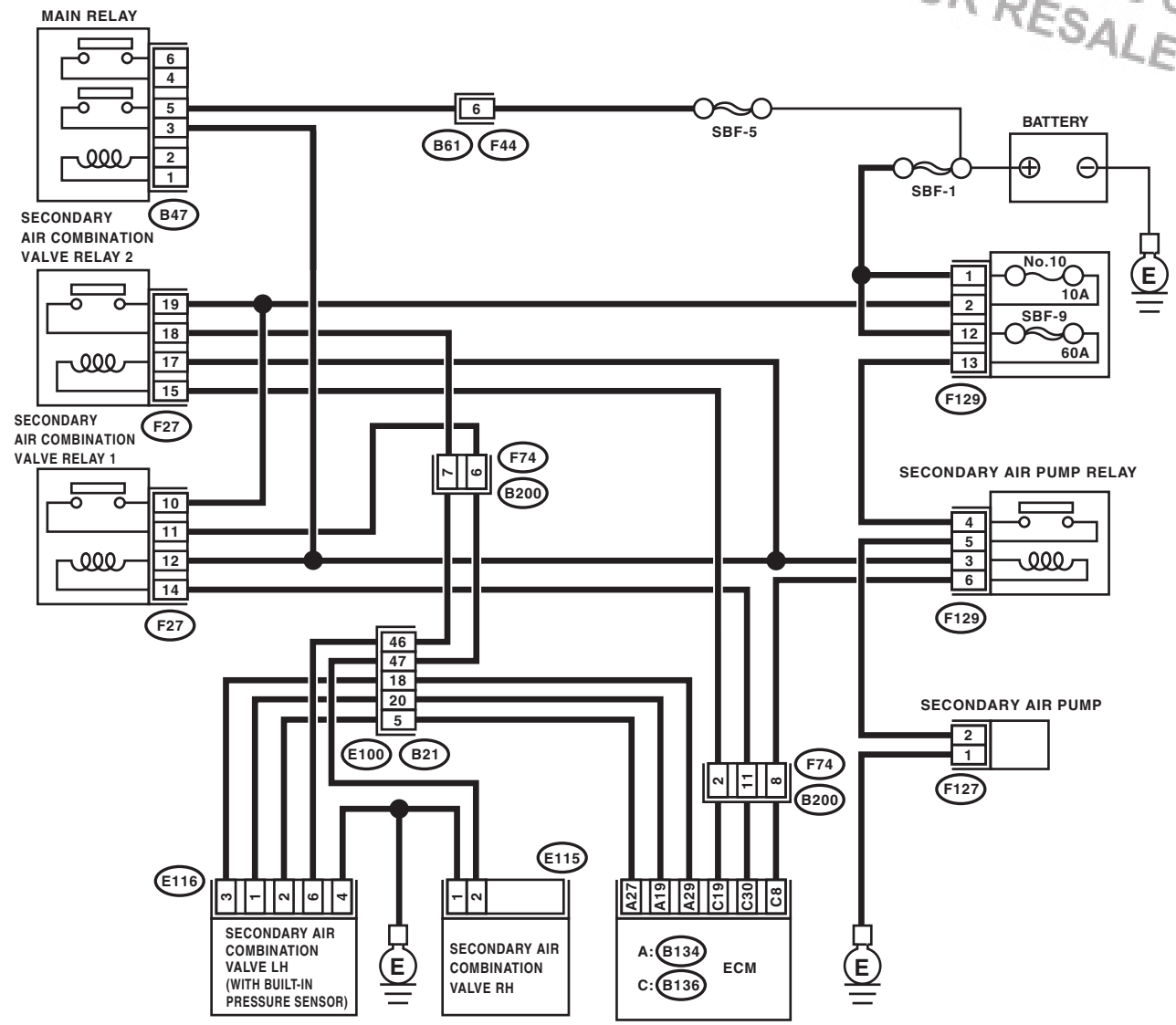
## CX:DTC P1418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT SHORTED

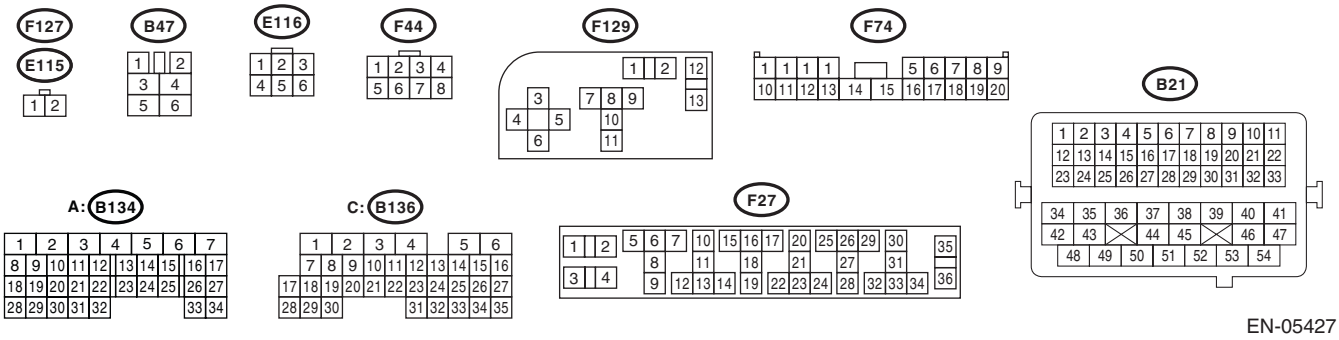
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-206, DTC P1418 SECONDARY AIR INJECTION SYSTEM CONTROL “A” CIRCUIT SHORTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and secondary air pump relay.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 8 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and secondary air pump relay. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |

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

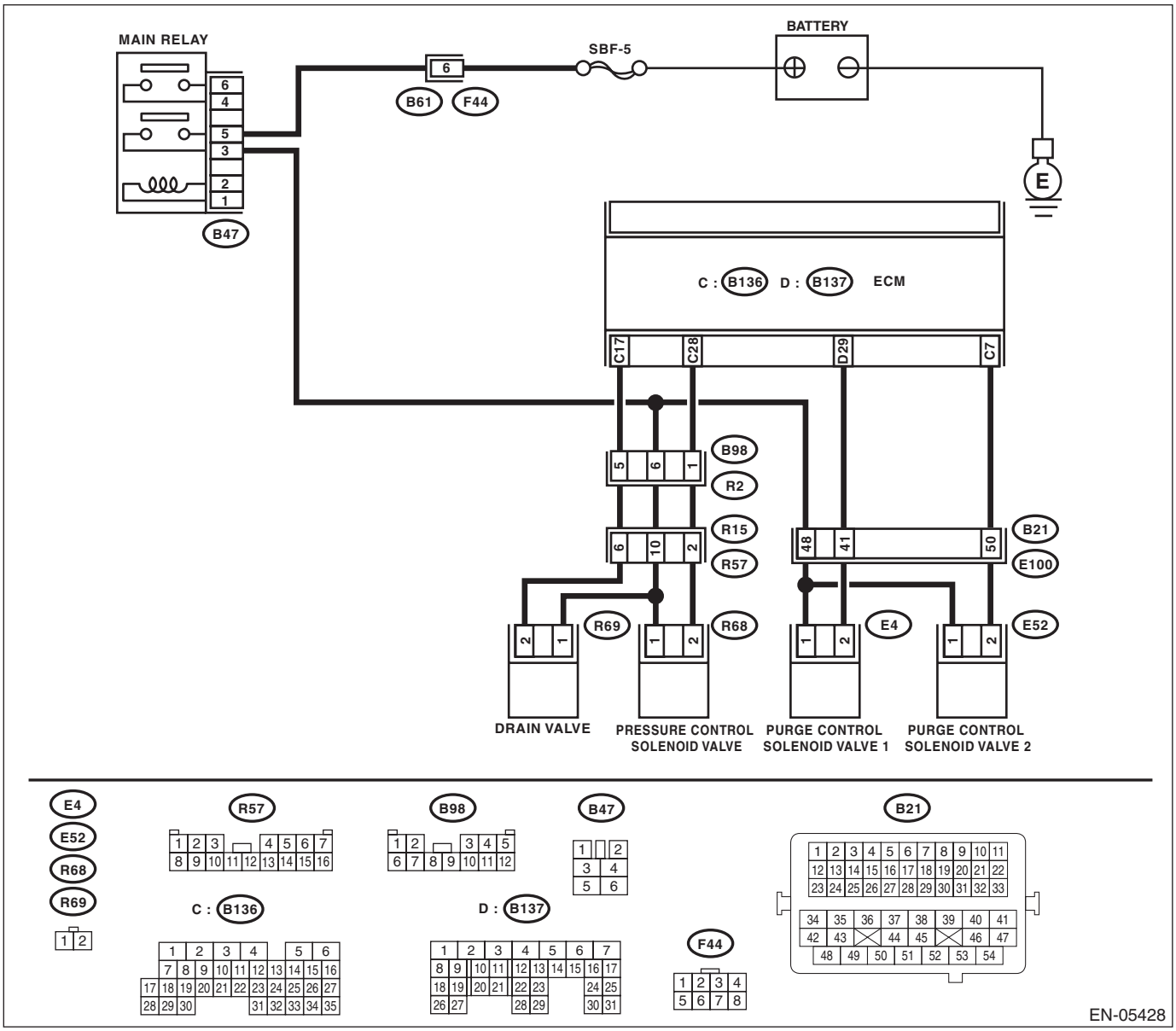
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-207, DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and 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>***(B136) No. 28 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and pressure control solenoid valve connector. | Go to step **2**. |
| 2 | **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)-16, Pressure Control Solenoid Valve.> | Repair poor contact of the ECM connector. |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-209, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

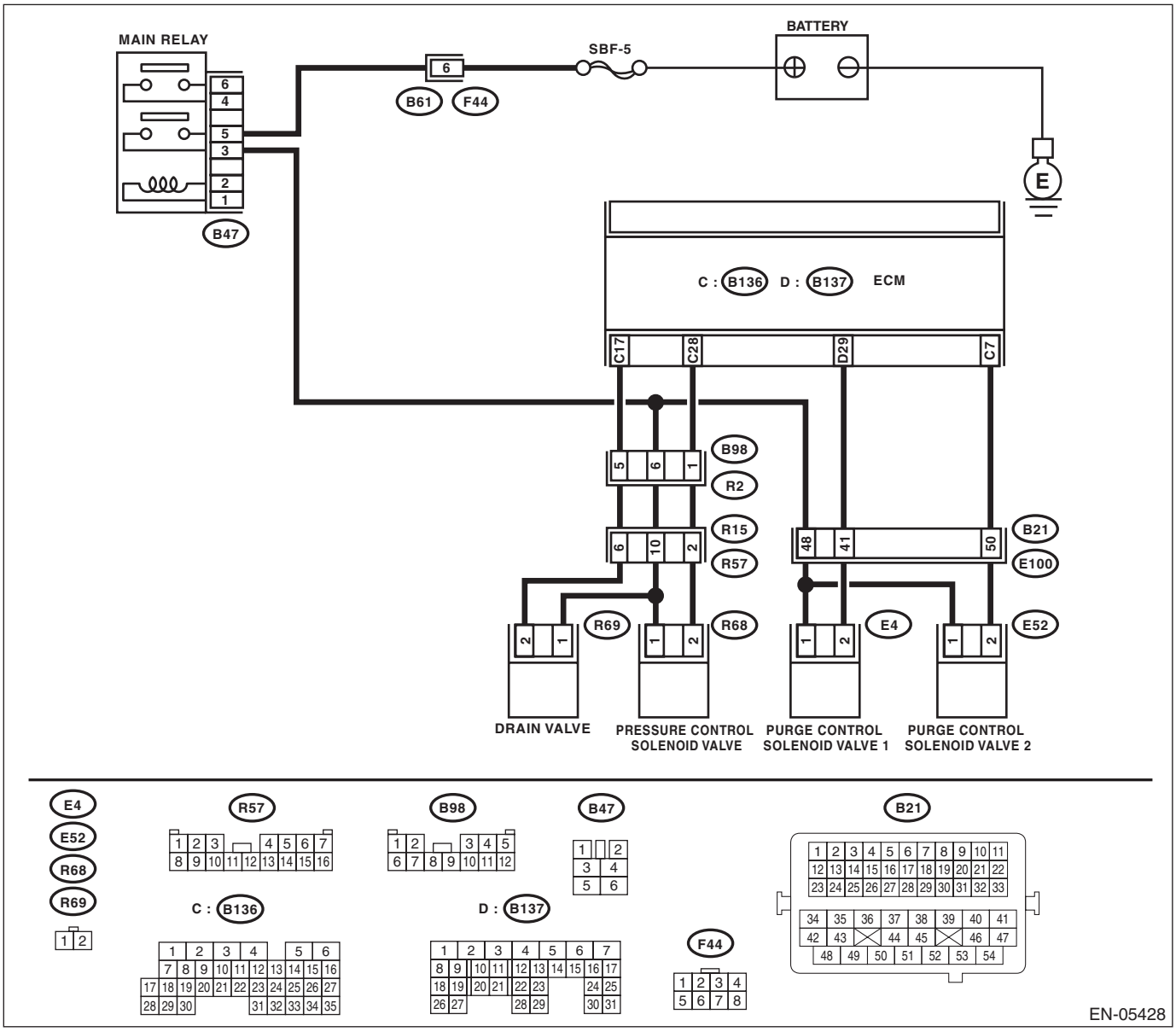
**TROUBLE SYMPTOM:**

Improper fuel supply

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK VENT LINE HOSES.**<br>Check the following items.<br>• Clogging of vent hoses between canister and drain valve<br>• Clogging of vent hose between drain valve and air filter<br>• Clogging of drain filter | Is there any fault in the vent line? | Repair or replace faulty parts. | 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 be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the drain valve operate? | Repair poor contact of the ECM connector. | Replace the drain valve. <Ref. to EC(H4DOTC)-20, Drain Valve.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-211, DTC P1491 POSITIVE CRANKCASE VENTILATION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

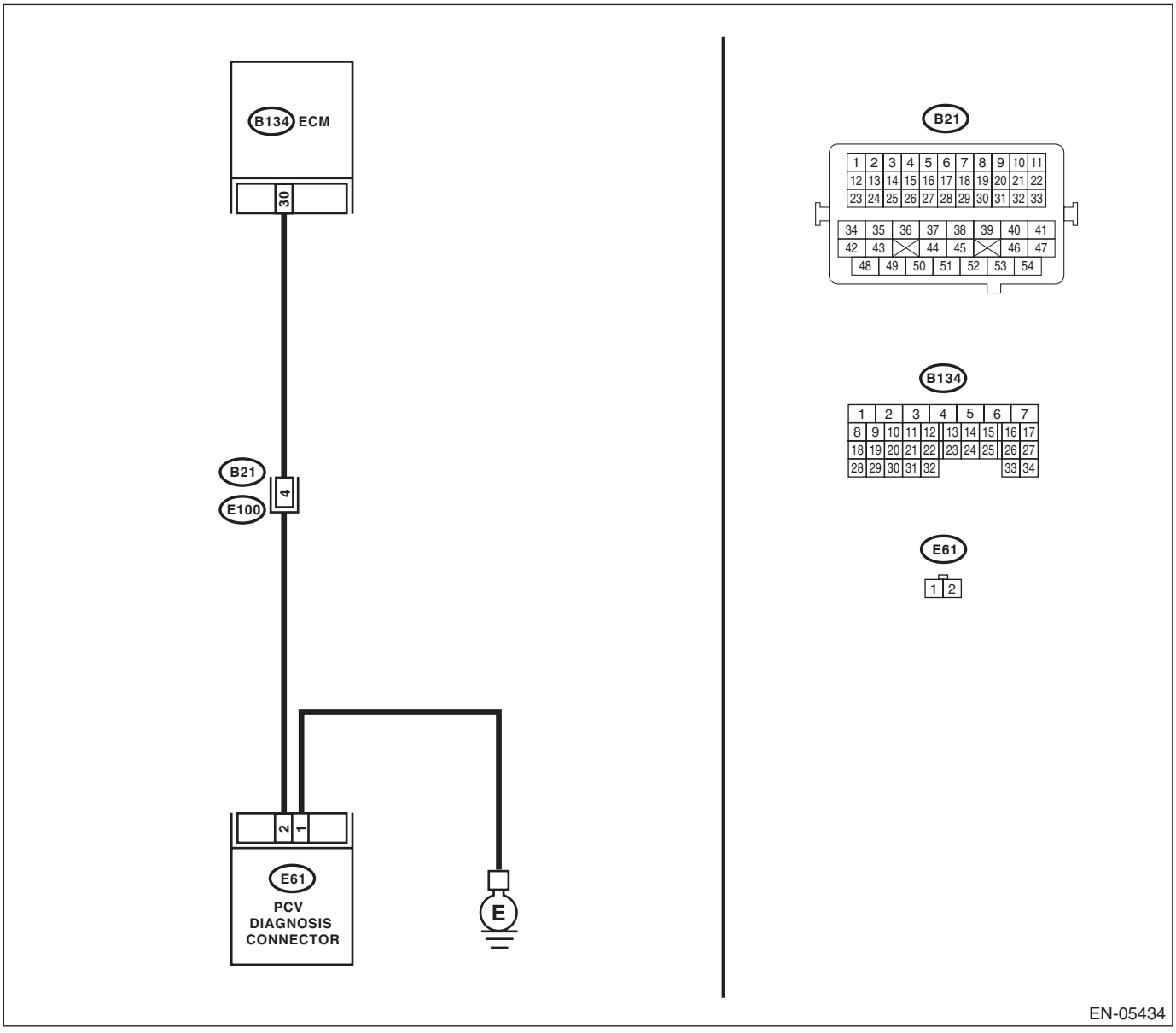
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK BLOW-BY HOSE.**<br>Check the blow-by hose condition. | Is there any disconnection or crack in blow-by hose? | Repair or replace the blow-by hose. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM and PCV hose assembly.<br>3) Measure the resistance of harness between ECM and PCV hose assembly.<br>***Connector & terminal***<br>***(B134) No. 30 — (E61) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the open circuit of harness between ECM and PCV hose assembly. |
| 3 | **CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY.**<br>Measure the resistance between PCV hose assembly and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 30 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **4**. | Repair short circuit of the harness to ground between ECM and PCV hose assembly. |
| 4 | **CHECK GROUND CIRCUIT OF PCV HOSE ASSEMBLY.**<br>Measure the resistance of harness between PCV hose assembly and engine ground.<br>***Connector & terminal***<br>***(E61) No. 1 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **5**. | Repair the open circuit of harness between PCV hose assembly and engine ground. |
| 5 | **CHECK THE PCV HOSE ASSEMBLY.**<br>Measure the resistance between the PCV hose assembly terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Repair the poor contact in ECM and PCV hose assembly connector. | Replace the PCV hose assembly. |

## DB:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-213, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

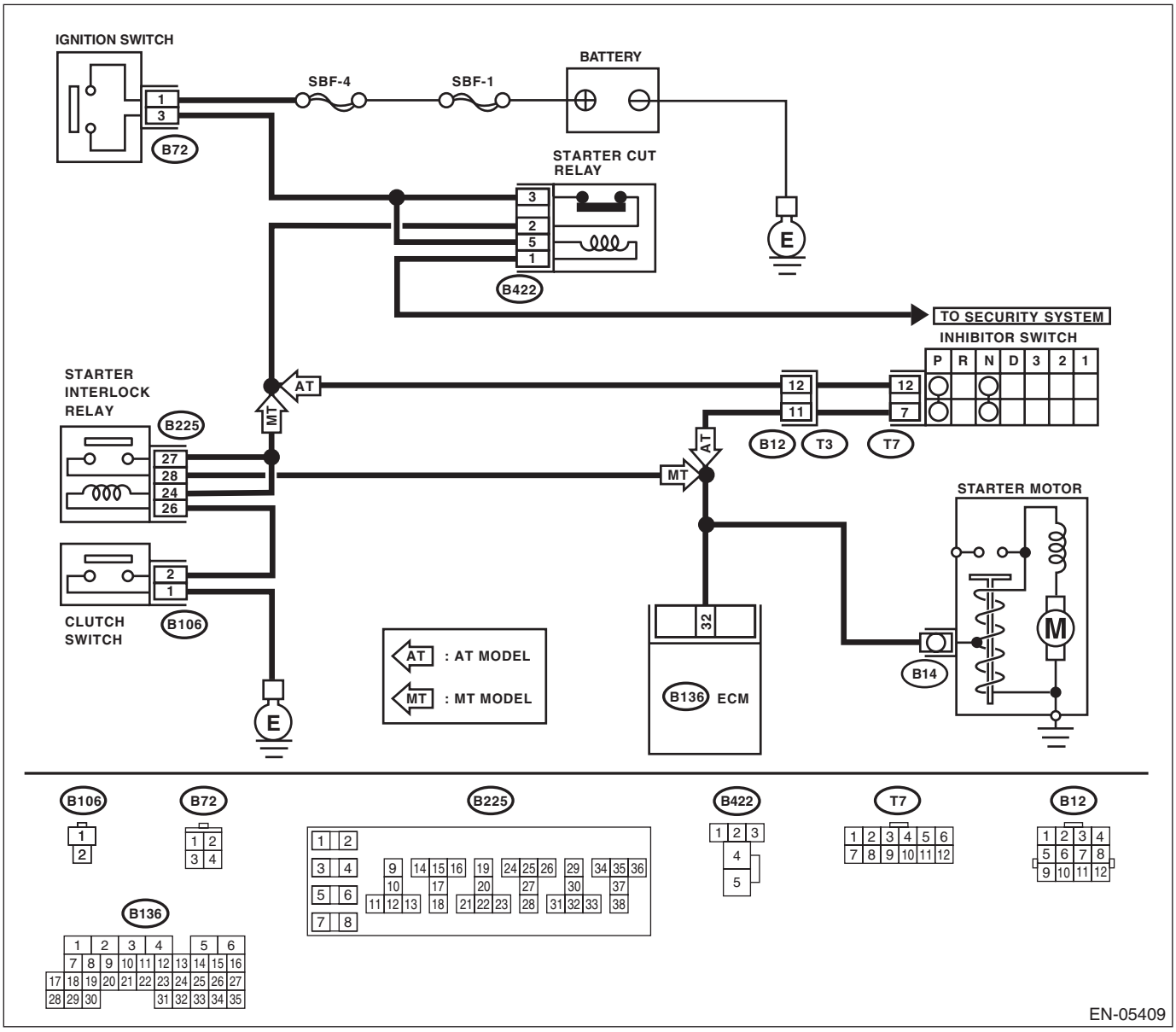
**TROUBLE SYMPTOM:**

Failure of engine to start

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from ECM and ignition switch.<br>3) Measure the resistance of harness between the ECM and ignition switch connector.<br>***Connector & terminal***<br>***(B136) No. 32 — (B72) No. 3:***<br>NOTE:<br>For the MT model, measure while depressing the clutch pedal. | Is the resistance less than 1 Ω? | Go to step **3**. | NOTE:<br>Check the following item and repair or replace if necessary.<br>• Open circuit of harness between the ECM and ignition coil switch connector<br>• Blown out of fuse (No. SBF-4)<br>• Poor contact of the clutch switch connector (MT model)<br>• Poor contact of the clutch switch (MT model) |
| 3 | **CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 32 — Chassis ground:***<br>NOTE:<br>For the MT model, measure while depressing the clutch pedal. | Is the resistance 1 MΩ or more? | Repair short circuit of the harness to ground between the ECM and ignition switch connector. | Repair poor contact of the ECM connector. |

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

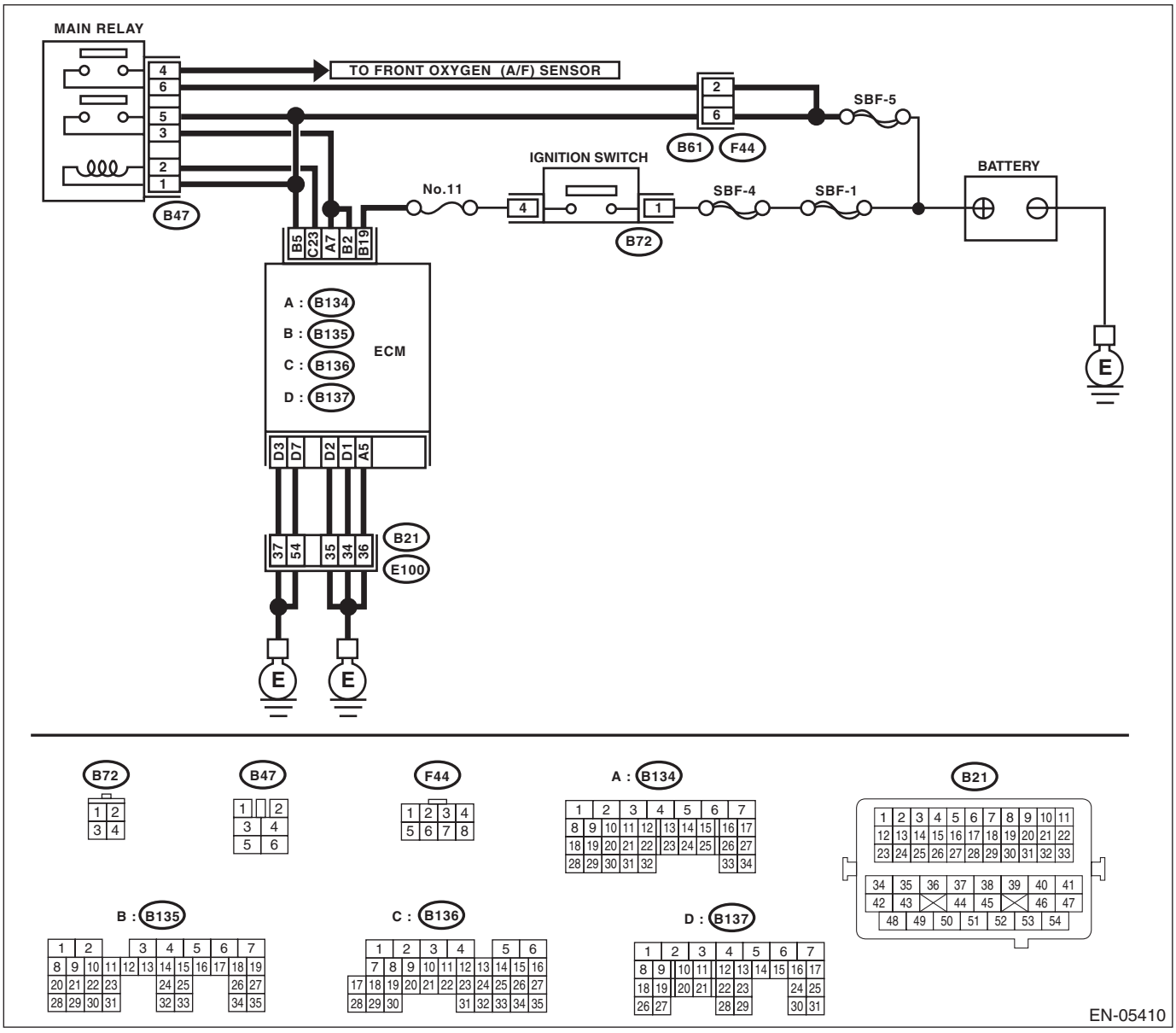
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-214, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK INPUT SIGNAL OF 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. 5 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 5 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and battery terminal. |
| 3 | **CHECK FUSE SBF-5.** | Is the fuse blown out? | Replace the fuse. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and battery<br>• Poor contact in ECM connector<br>• Poor contact of battery terminal |

## DD:DTC P1602 CONTROL MODULE PROGRAMMING ERROR

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-216, DTC P1602 CONTROL MODULE PROGRAMMING ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

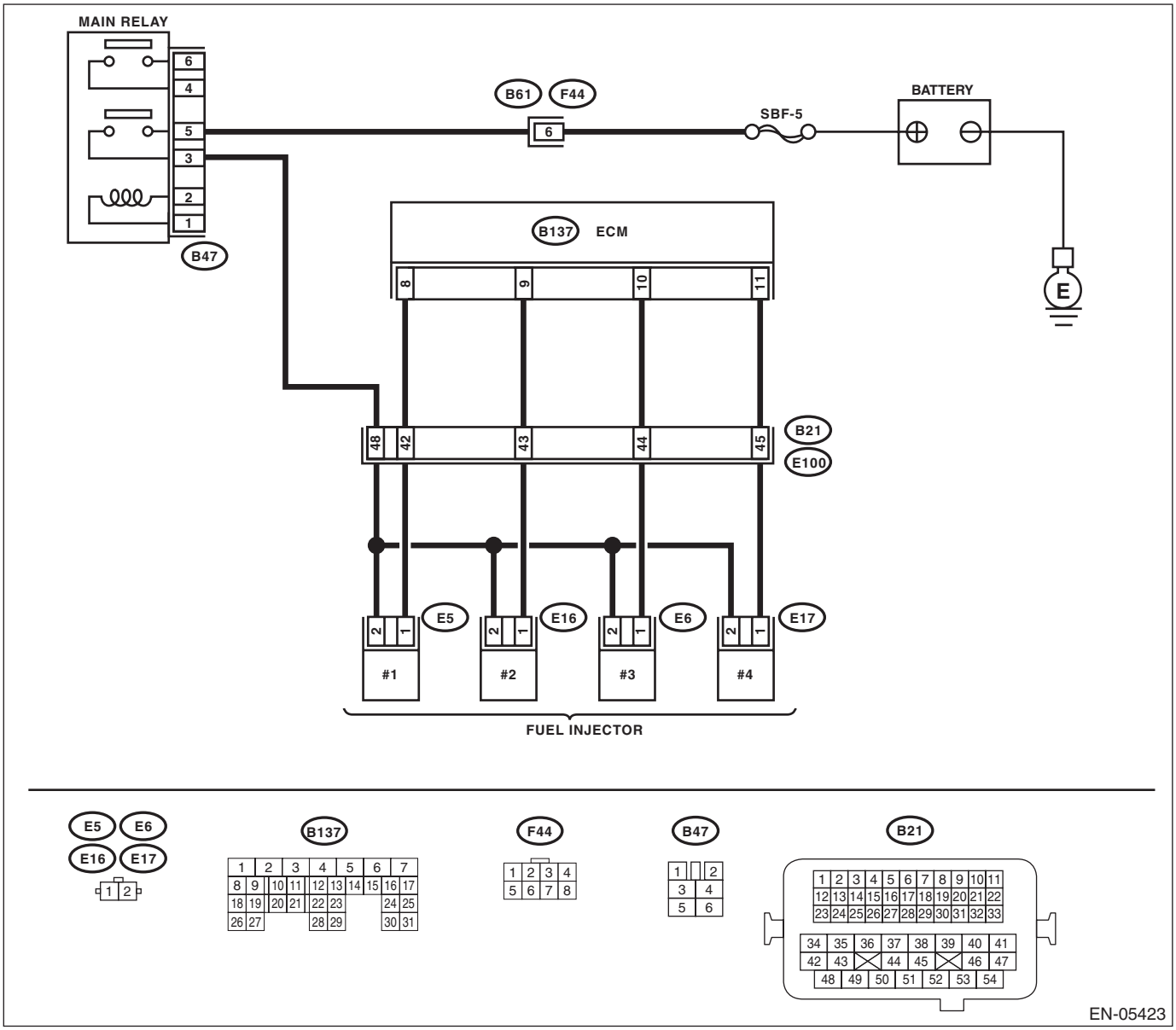
**TROUBLE SYMPTOM:**

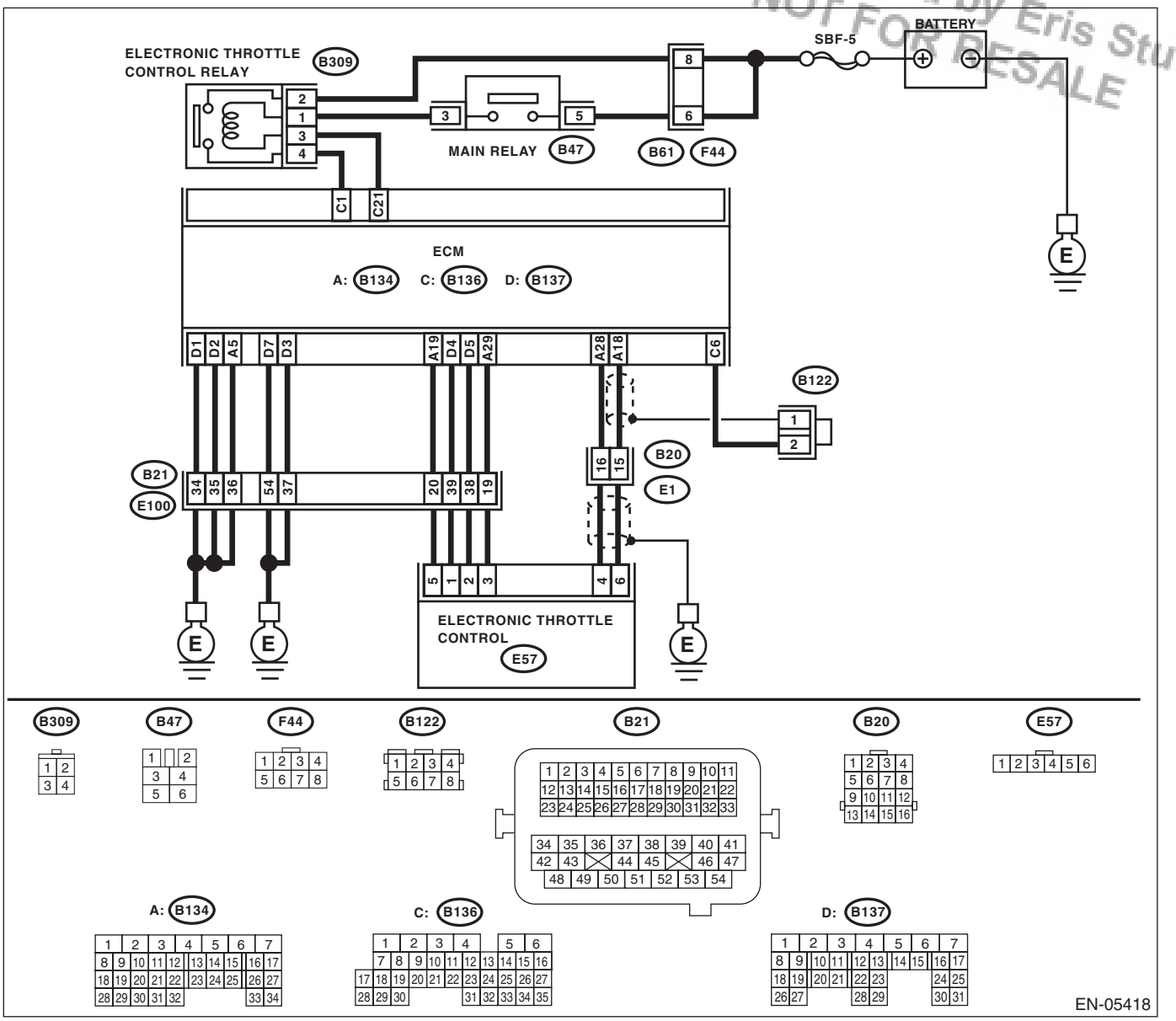
- Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- Engine stalls.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**






| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK ENGINE OIL.** | Is there a proper amount of engine oil? | Go to step **3**. | Replace the engine oil. <Ref. to LU(H4DOTC)-10, REPLACEMENT, Engine Oil.> |
| 3 | **CHECK EXHAUST SYSTEM.** | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step **4**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 4 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step **5**. |
| 5 | **CHECK FUEL PRESSURE.**<br>**WARNING:**<br>**Place "NO OPEN FLAMES" signs near the working area.**<br>**CAUTION:**<br>**Be careful not to spill fuel.**<br>Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <Ref. to ME(H4DOTC)-31, INSPECTION, Fuel Pressure.><br>**CAUTION:**<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 or 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 **6**. | Repair the following item.<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 |
| 6 | **CHECK FUEL PRESSURE.**<br>After connecting the pressure regulator vacuum hose, measure fuel pressure. <Ref. to ME(H4DOTC)-31, INSPECTION, Fuel Pressure.><br>**CAUTION:**<br>**Release fuel pressure before removing the fuel pressure gauge.**<br>NOTE:<br>• If fuel pressure does not increase, squeeze fuel return hose 2 or 3 times, then measure fuel pressure again.<br>• If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose. | Is the measured value 230 — 260 kPa (2.35 — 2.65 kg/cm$^2$, 1 — 3 psi)? | Go to step **7**. | Repair the following item.<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 |
| 7 | **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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the engine coolant temperature 75°C (167°F) or higher? | Go to step **8**. | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 8 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)? | Go to step **9**. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |
| 9 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Subtract ambient temperature from intake air temperature. Is the obtained value –10 — 50°C (–18 — 90°F)? | Go to step **10**. | Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |
| 10 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between the ECM and chassis ground for faulty cylinders.<br>***Connector & terminal***<br>***#1 (B137) No. 8 (+) — Chassis ground (–):***<br>***#2 (B137) No. 9 (+) — Chassis ground (–):***<br>***#3 (B137) No. 10 (+) — Chassis ground (–):***<br>***#4 (B137) No. 11 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **15**. | Go to step **11**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 11 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector on faulty cylinders.<br>3) Measure the resistance between the fuel injector 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 1 MΩ or more? | Go to step **12**. | Repair short circuit of the harness to ground between ECM and fuel injector. |
| 12 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.**<br>Measure the resistance of harness between the ECM and fuel injector on faulty cylinders.<br>***Connector & terminal***<br>***#1 (B137) No. 8 — (E5) No. 1:***<br>***#2 (B137) No. 9 — (E16) No. 1:***<br>***#3 (B137) No. 10 — (E6) No. 1:***<br>***#4 (B137) No. 11 — (E17) No. 1:*** | Is the resistance less than 1 Ω? | Go to step **13**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and fuel injector connector<br>• Poor contact of coupling connector |
| 13 | **CHECK FUEL INJECTOR.**<br>Measure the resistance between fuel injector terminals on faulty cylinder.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 5 — 20 Ω? | Go to step **14**. | Replace the faulty fuel injector. <Ref. to FU(H4DOTC)-37, Fuel Injector.> |
| 14 | **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 10 V or more? | Repair the poor contact of all connectors in fuel injector circuit. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the main relay and fuel injector connector on faulty cylinders<br>• Poor contact of coupling connector<br>• Poor contact of main relay connector<br>• Poor contact of fuel injector connector on faulty cylinders |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 15 | **CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from fuel injector on faulty cylinders.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between the ECM and chassis ground for faulty cylinders.<br>***Connector & terminal***<br>***#1 (B137) No. 8 (+) — Chassis ground (–):***<br>***#2 (B137) No. 9 (+) — Chassis ground (–):***<br>***#3 (B137) No. 10 (+) — Chassis ground (–):***<br>***#4 (B137) No. 11 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between the ECM and fuel injector. | Go to step **16**. |
| 16 | **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 less than 1 Ω? | Replace the faulty fuel injector. <Ref. to FU(H4DOTC)-37, Fuel Injector.> | Go to step **17**. |
| 17 | **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 **18**. |
| 18 | **CHECK CRANK SPROCKET.**<br>Remove the timing belt cover. | Is the crank sprocket rusted or does it have damaged teeth? | Replace the crank sprocket. <Ref. to ME(H4DOTC)-57, Crank Sprocket.> | Go to step **19**. |
| 19 | **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)-48, Timing Belt.> | Go to step **20**. |
| 20 | **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. 1 and No. 3 of electronic throttle control relay.<br>4) Measure the resistance between electronic throttle control relay terminals.<br>***Terminals***<br>***No. 2 — No. 4:*** | Is the resistance less than 1 Ω? | Go to step **21**. | Replace the electronic throttle control relay. <Ref. to FU(H4DOTC)-53, Electronic Throttle Control Relay.> |
| 21 | **CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 2 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **22**. | Repair the open or ground short circuit of power supply circuit. |
| 22 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Disconnect the connectors from the ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 3 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control relay. | Go to step **23**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 23 | **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 relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 3 — Chassis ground:***<br>***(B309) No. 4 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **24**. | Repair short circuit of the harness to ground between ECM and electronic throttle control relay. |
| 24 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the resistance between the ECM and electronic throttle control relay connector.<br>***Connector & terminal***<br>***(B136) No. 21 — (B309) No. 3:***<br>***(B136) No. 1 — (B309) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **25**. | Repair the open circuit of harness between ECM and electronic throttle control relay. |
| 25 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 19 — Chassis ground:***<br>***(B134) No. 18 — Chassis ground:***<br>***(B134) No. 18 — (B136) No. 6:***<br>***(B134) No. 28 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **26**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |
| 26 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance 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 resistance 1 MΩ or more? | Go to step **27**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |
| 27 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance of harness between ECM and electronic throttle control connector.<br>***Connector & terminal***<br>***(B134) No. 18 — (E57) No. 6:***<br>***(B134) No. 28 — (E57) No. 4:***<br>***(B134) No. 29 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **28**. | Repair the open circuit of harness between ECM and electronic throttle control connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 28 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 3 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **29**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 29 | **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>***(E57) No. 4 (+) — Engine ground (–):*** | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step **30**. |
| 30 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 19 — (B134) No. 18:***<br>***(B134) No. 19 — (B134) No. 28:*** | Is the resistance 1 MΩ or more? | Go to step **31**. | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |
| 31 | **CHECK SENSOR OUTPUT.**<br>1) Connect all 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>For detailed operation procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the voltage 0.81 — 0.87 V? | Go to step **32**. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> |
| 32 | **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 procedures, refer to “READ CURRENT DATA FOR ENGINE”. <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the voltage 1.64 — 1.70 V? | Go to step **33**. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 33 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance between ECM 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 **34**. | Repair the open circuit of harness between ECM and electronic throttle control. |
| 34 | **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 5 V or more? | Repair the short circuit to power in the harness between the ECM and electronic throttle control. | Go to step **35**. |
| 35 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance 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 resistance 1 MΩ or more? | Go to step **36**. | Repair short circuit of the harness to ground between the ECM and electronic throttle control. |
| 36 | **CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.**<br>Measure the resistance between the electronic throttle control connector terminals.<br>***Connector & terminal***<br>***(E57) No. 2 — (E57) No. 1:*** | Is the resistance 1 MΩ or more? | Go to step **37**. | Repair the short circuit of harness between ECM and electronic throttle control. |
| 37 | **CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 5 — 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 **38**. | Repair the open circuit of the harness between the ECM and engine ground. |
| 38 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between electronic throttle control terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 50 Ω or less? | Go to step **39**. | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> |
| 39 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>Move the throttle valve to the fully open and fully closed positions with fingers.<br>Check that the valve returns to the specified position when releasing fingers. | Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position | Repair poor contact of the ECM connector. | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-218, DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, 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. | Is there any dirt or clogging with foreign objects in the tumble generator valve? | Clean the tumble generator valve. | Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-42, Tumble Generator Valve Assembly.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-219, DTC P2005 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, 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. | Is there any dirt or clogging with foreign objects in the tumble generator valve? | Clean the tumble generator valve. | Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-42, Tumble Generator Valve Assembly.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-220, DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, 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. | Is there any dirt or clogging with foreign objects in the tumble generator valve? | Clean the tumble generator valve. | Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-42, Tumble Generator Valve Assembly.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-221, DTC P2007 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

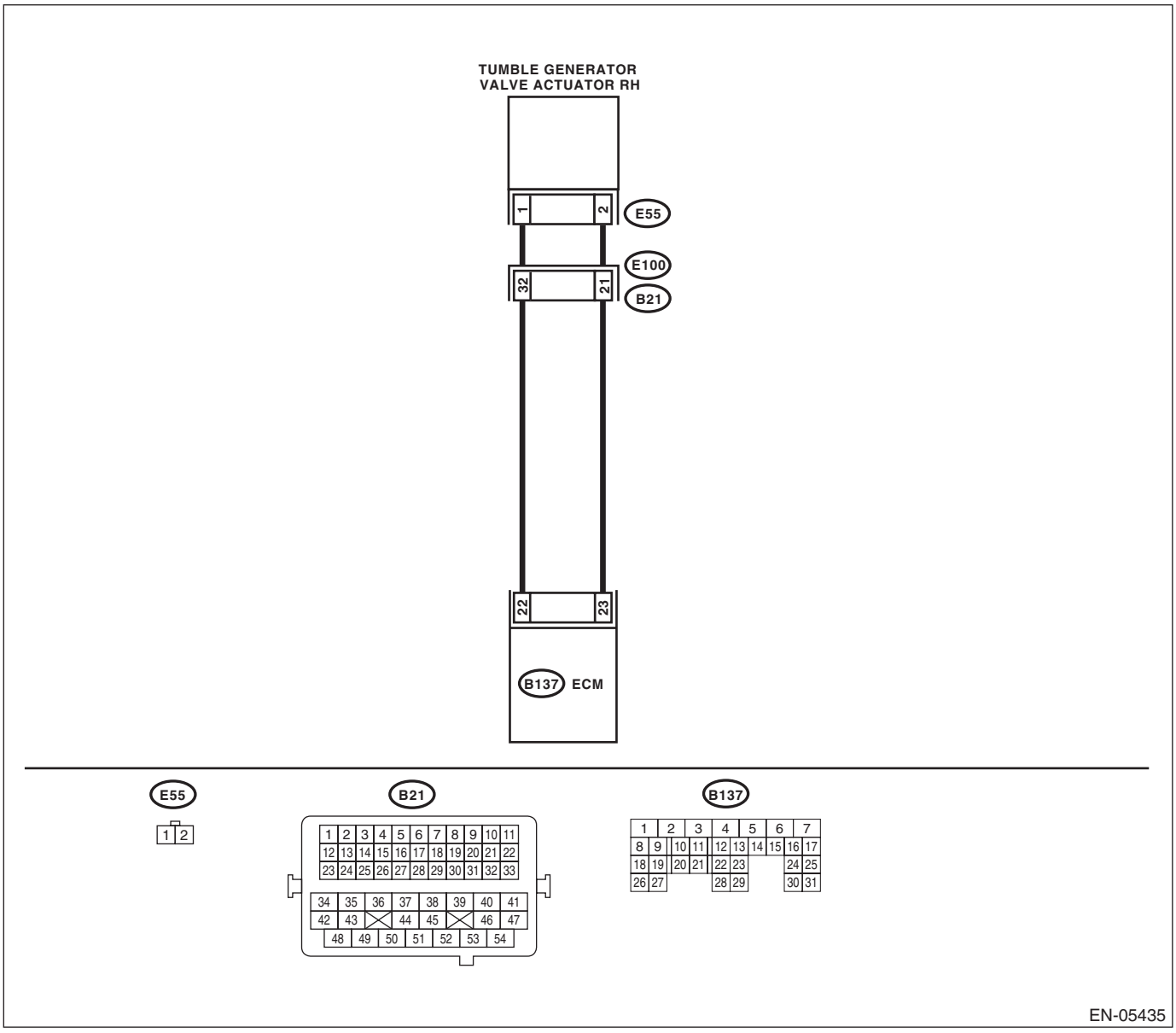
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK TUMBLE GENERATOR VALVE LH.**<br>1) Remove the tumble generator valve assembly.<br>2) Check the tumble generator valve body. | Is there any dirt or clogging with foreign objects in the tumble generator valve? | Clean the tumble generator valve. | Replace the tumble generator valve assembly. <Ref. to FU(H4DOTC)-42, Tumble Generator Valve Assembly.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-222, DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 connectors from ECM and tumble generator valve.<br>3) Measure the resistance of harness between ECM and tumble generator valve position actuator.<br>***Connector & terminal***<br>***(B137) No. 22 — (E55) No. 1:***<br>***(B137) No. 23 — (E55) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and tumble generator valve actuator connector<br>• Poor contact of coupling connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 22 — Chassis ground:***<br>***(B137) No. 23 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and tumble generator valve actuator connector. |
| 3 | **CHECK POOR CONTACT.**<br>Check for poor contact in the tumble generator valve actuator connector. | Is there poor contact in the tumble generator valve actuator connector? | Repair the poor contact of the tumble generator valve actuator connector. | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-43, Tumble Generator Valve Actuator.> |

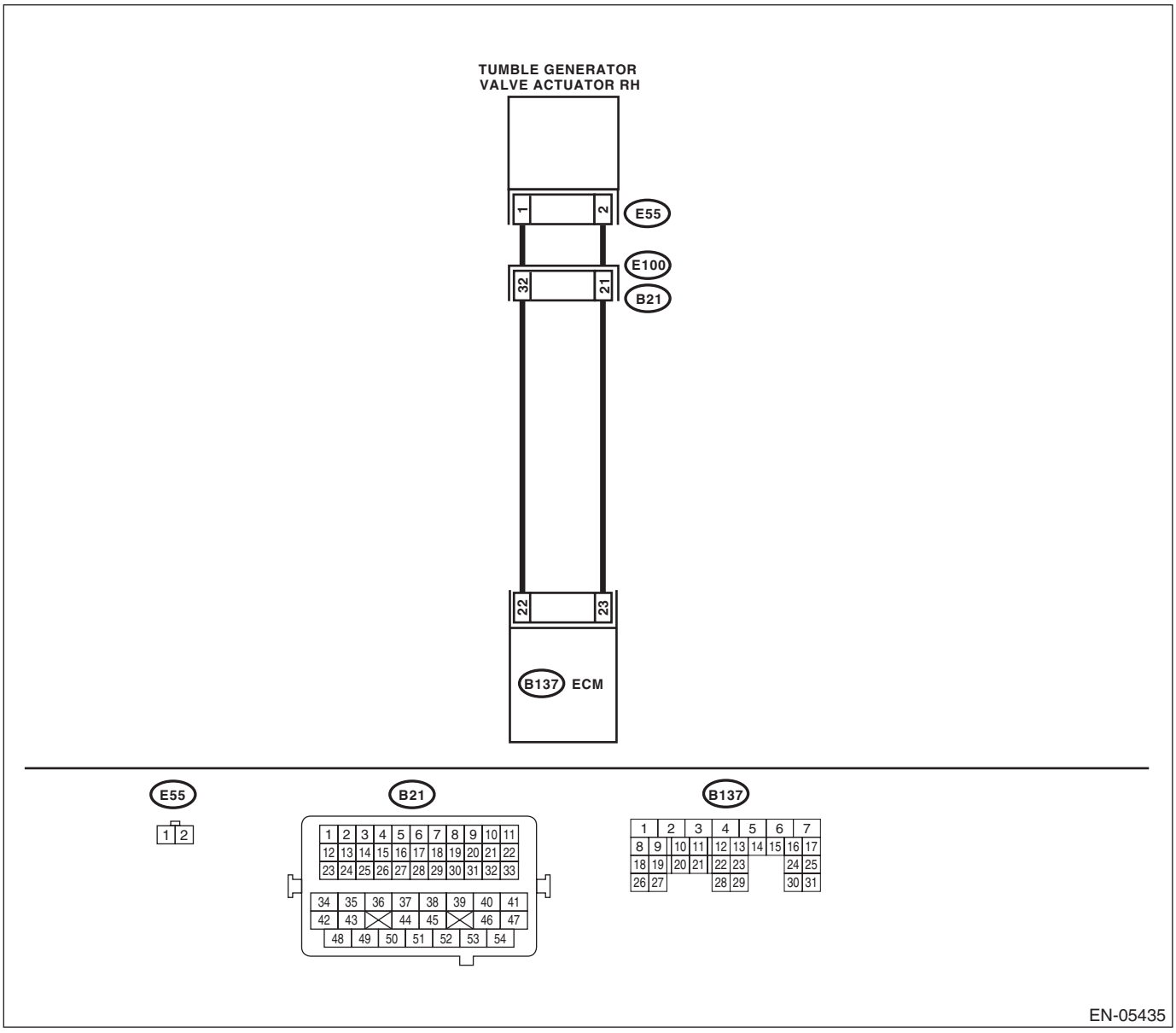
## DJ:DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1)

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-224, DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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>***(B137) No. 22 (+) — Chassis ground (–):***<br>***(B137) No. 23 (+) — Chassis ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between ECM and tumble generator valve actuator. | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-43, Tumble Generator Valve Actuator.> |

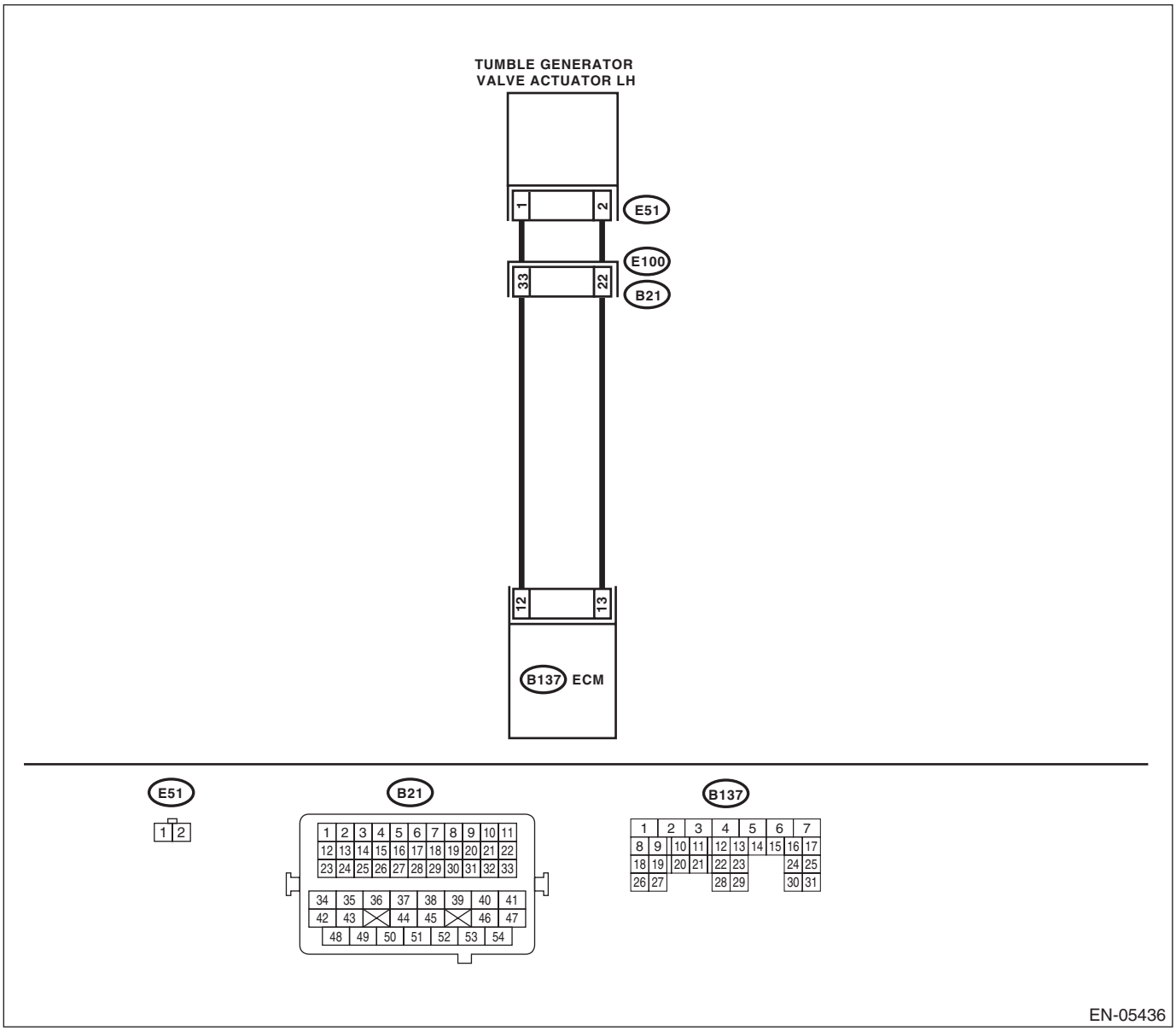
## DK:DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2)

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-226, DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



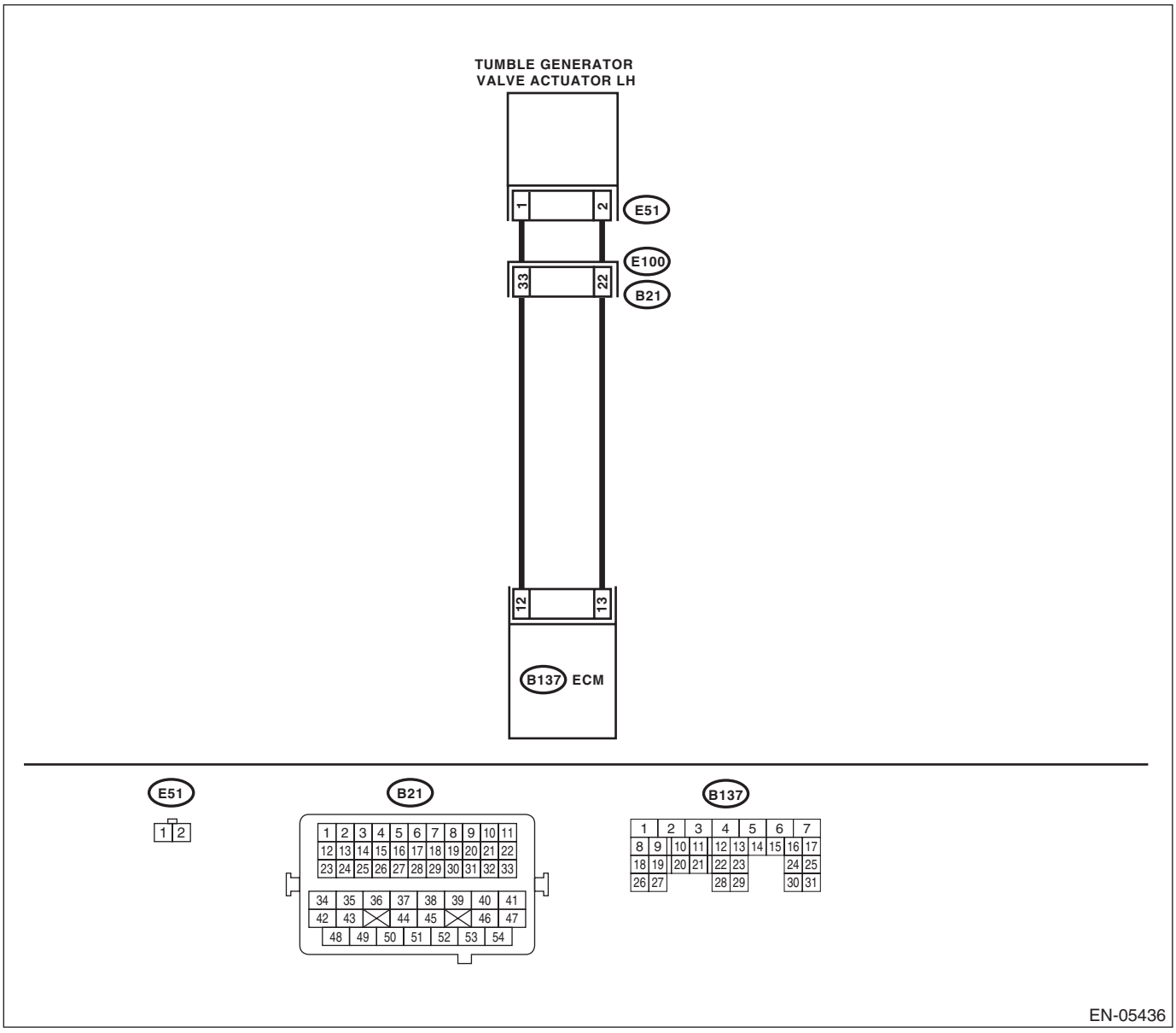
| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and tumble generator valve.<br>3) Measure the resistance of harness between ECM and tumble generator valve position actuator.<br>***Connector & terminal***<br>***(B137) No. 12 — (E51) No. 1:***<br>***(B137) No. 13 — (E51) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and tumble generator valve actuator connector<br>• Poor contact of coupling connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 12 — Chassis ground:***<br>***(B137) No. 13 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and tumble generator valve actuator connector. |
| 3 | **CHECK POOR CONTACT.**<br>Check for poor contact in the tumble generator valve actuator connector. | Is there poor contact in the tumble generator valve actuator connector? | Repair the poor contact of the tumble generator valve actuator connector. | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-43, Tumble Generator Valve Actuator.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-228, DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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>***(B137) No. 12 (+) — Chassis ground (–):***<br>***(B137) No. 13 (+) — Chassis ground (–):*** | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between ECM and tumble generator valve actuator. | Replace the tumble generator valve actuator. <Ref. to FU(H4DOTC)-43, Tumble Generator Valve Actuator.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-230, DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

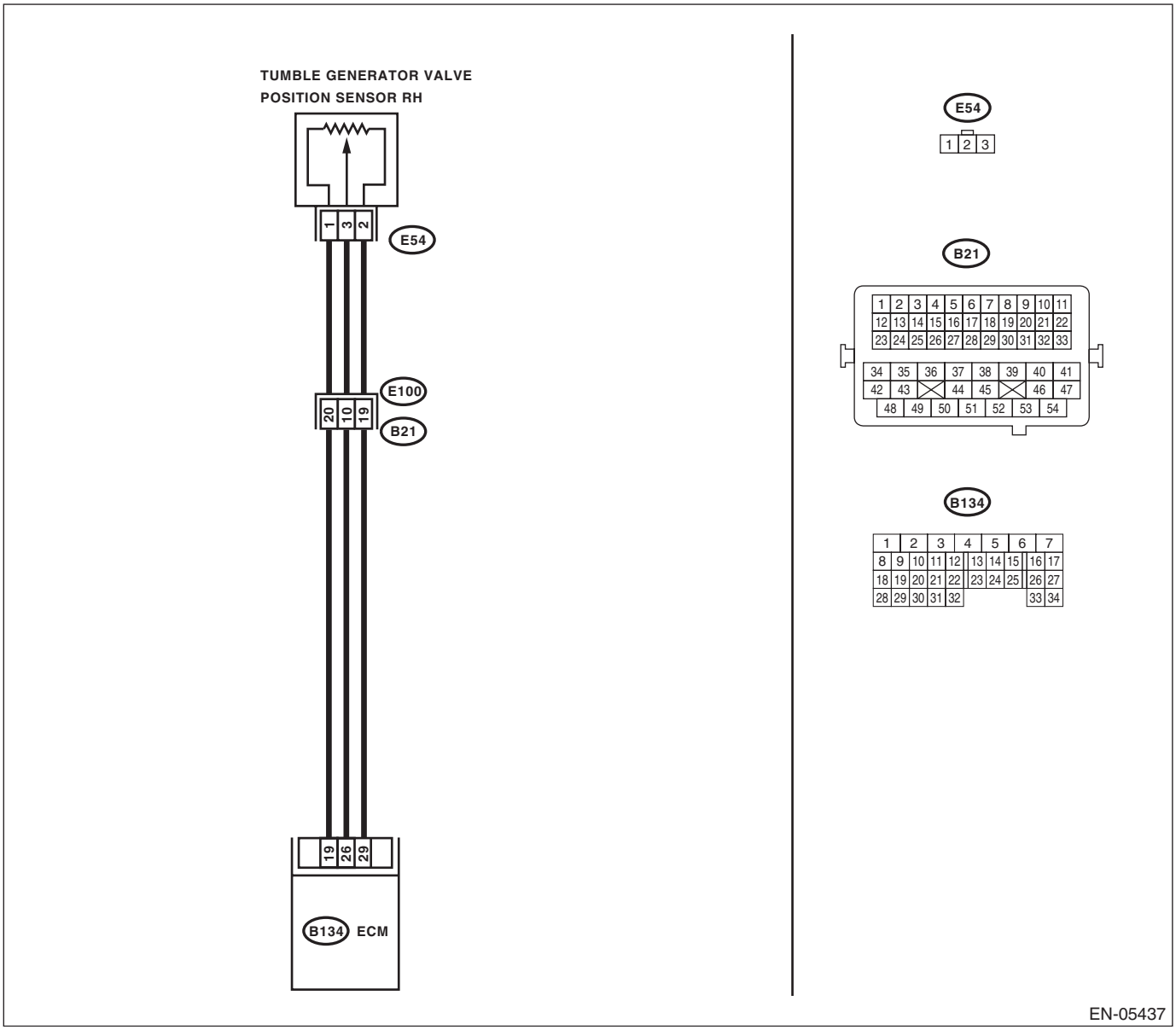
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage less than 0.2 V? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector 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>***(E54) No. 1 (+) — Engine ground (–):*** | Is the voltage 4.5 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **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 the ECM.<br>3) Measure the resistance of harness between ECM and tumble generator valve position sensor connector.<br>***Connector & terminal***<br>***(B134) No. 26 — (E54) No. 3:*** | 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 item:<br>• Open circuit of harness between ECM and tumble generator valve position sensor connector<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 26 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and tumble generator valve position sensor connector. |
| 5 | **CHECK POOR CONTACT.**<br>Check for poor contact in ECM and tumble generator valve position sensor connector. | Is there poor contact in ECM and tumble generator valve position sensor connector? | Repair the poor contact in ECM or tumble generator valve position sensor connector. | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-44, Tumble Generator Valve Position Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-232, DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

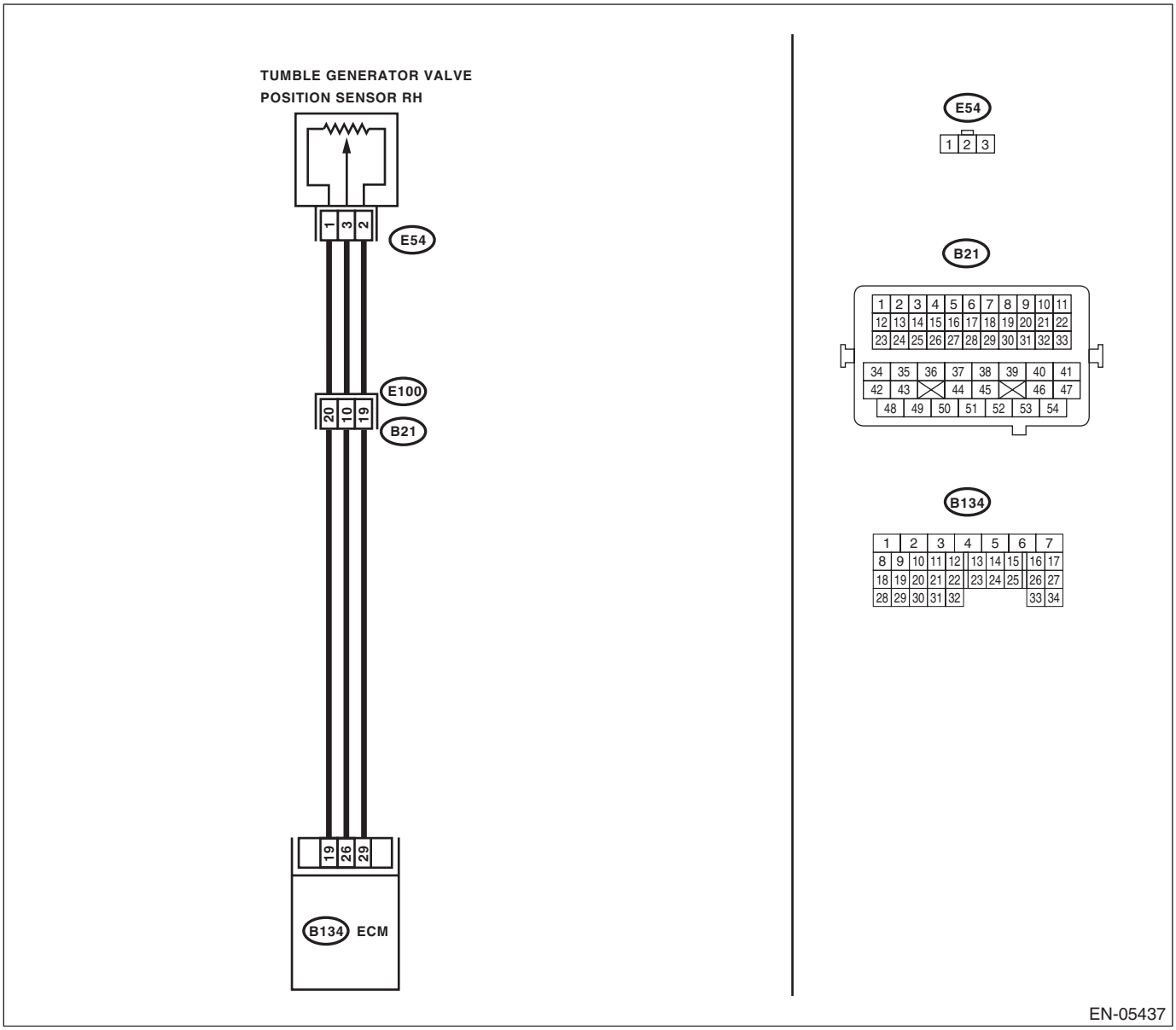
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 5 V or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve position sensor.<br>3) Start the engine.<br>4) 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between ECM and tumble generator valve position sensor connector. | Go to step **3**. |
| 3 | **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 tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E54) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 4 | **CHECK POOR CONTACT.**<br>Check for poor contact in the tumble generator valve position sensor connector. | Is there poor contact in the tumble generator valve position sensor connector? | Repair the poor contact of the tumble generator valve position sensor connector. | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-44, Tumble Generator Valve Position Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-234, DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

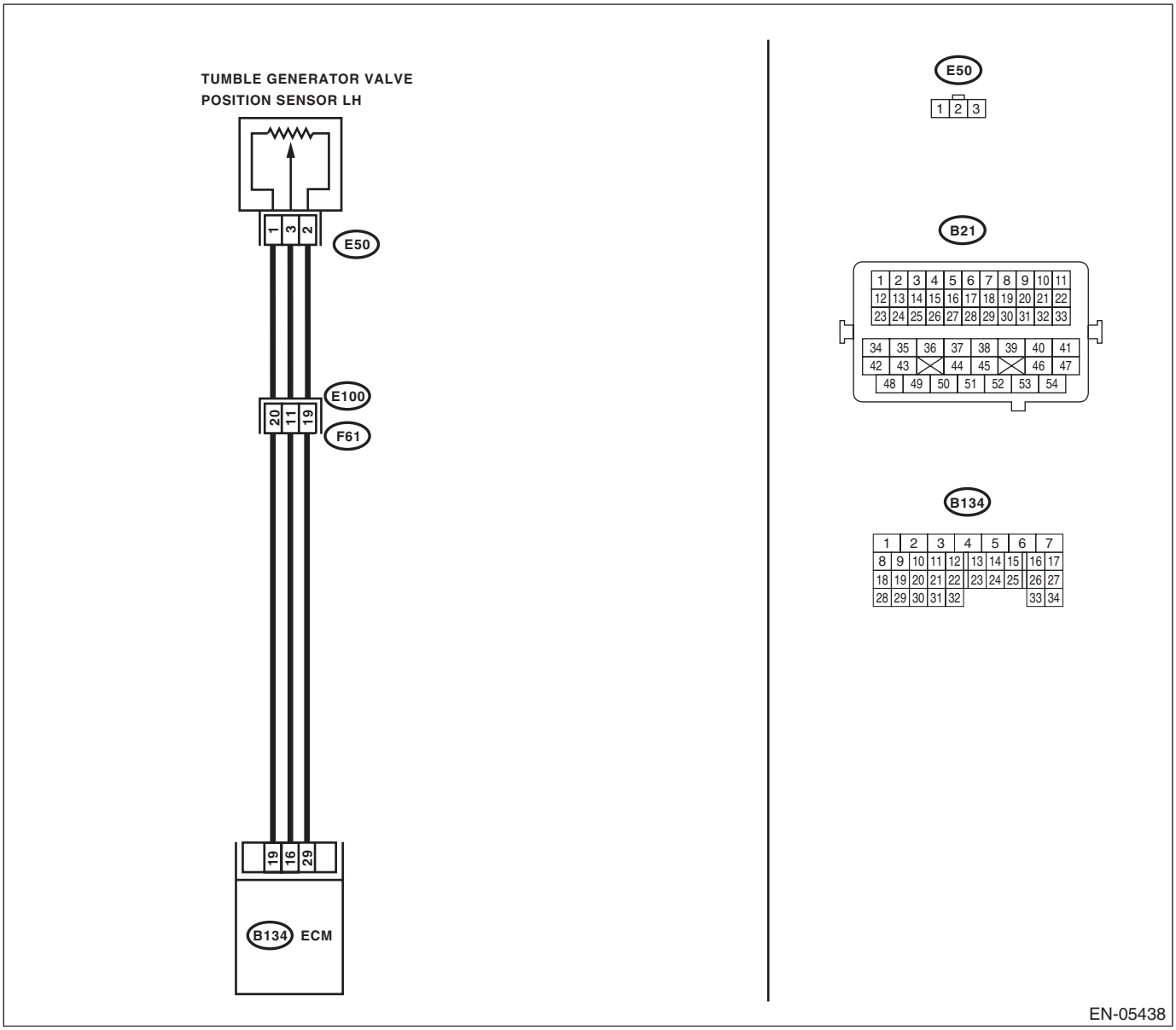
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage less than 0.2 V? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector 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>***(E50) No. 1 (+) — Engine ground (–):*** | Is the voltage 4.5 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **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 the ECM.<br>3) Measure the resistance of harness between ECM and tumble generator valve position sensor connector.<br>***Connector & terminal***<br>***(B134) No. 16 — (E50) No. 3:*** | 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 item:<br>• Open circuit of harness between ECM and tumble generator valve position sensor connector<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 16 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and tumble generator valve position sensor connector. |
| 5 | **CHECK POOR CONTACT.**<br>Check for poor contact in ECM and tumble generator valve position sensor connector. | Is there poor contact in ECM and tumble generator valve position sensor connector? | Repair the poor contact in ECM or tumble generator valve position sensor connector. | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-44, Tumble Generator Valve Position Sensor.> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-236, DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH CIRCUIT HIGH (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

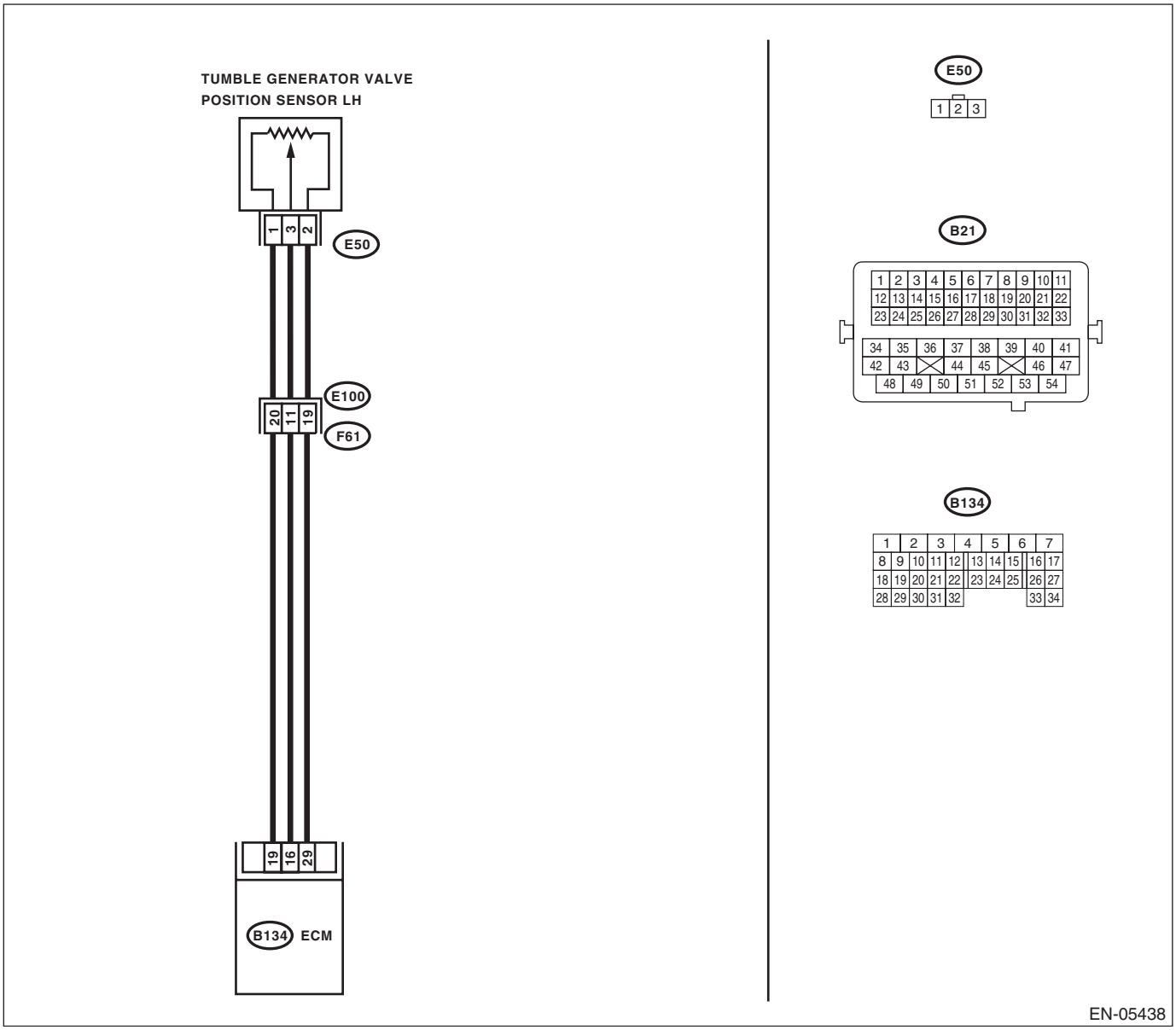
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 5 V or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from tumble generator valve position sensor.<br>3) Start the engine.<br>4) 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between ECM and tumble generator valve position sensor connector. | Go to step **3**. |
| 3 | **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 tumble generator valve position sensor connector and engine ground.<br>***Connector & terminal***<br>***(E50) No. 2 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and tumble generator valve position sensor connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 4 | **CHECK POOR CONTACT.**<br>Check for poor contact in the tumble generator valve position sensor connector. | Is there poor contact in the tumble generator valve position sensor connector? | Repair the poor contact of the tumble generator valve position sensor connector. | Replace the tumble generator valve position sensor. <Ref. to FU(H4DOTC)-44, Tumble Generator Valve Position Sensor.> |

# DQ:DTC P2088 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT LOW (BANK 1)

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-238, DTC P2088 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

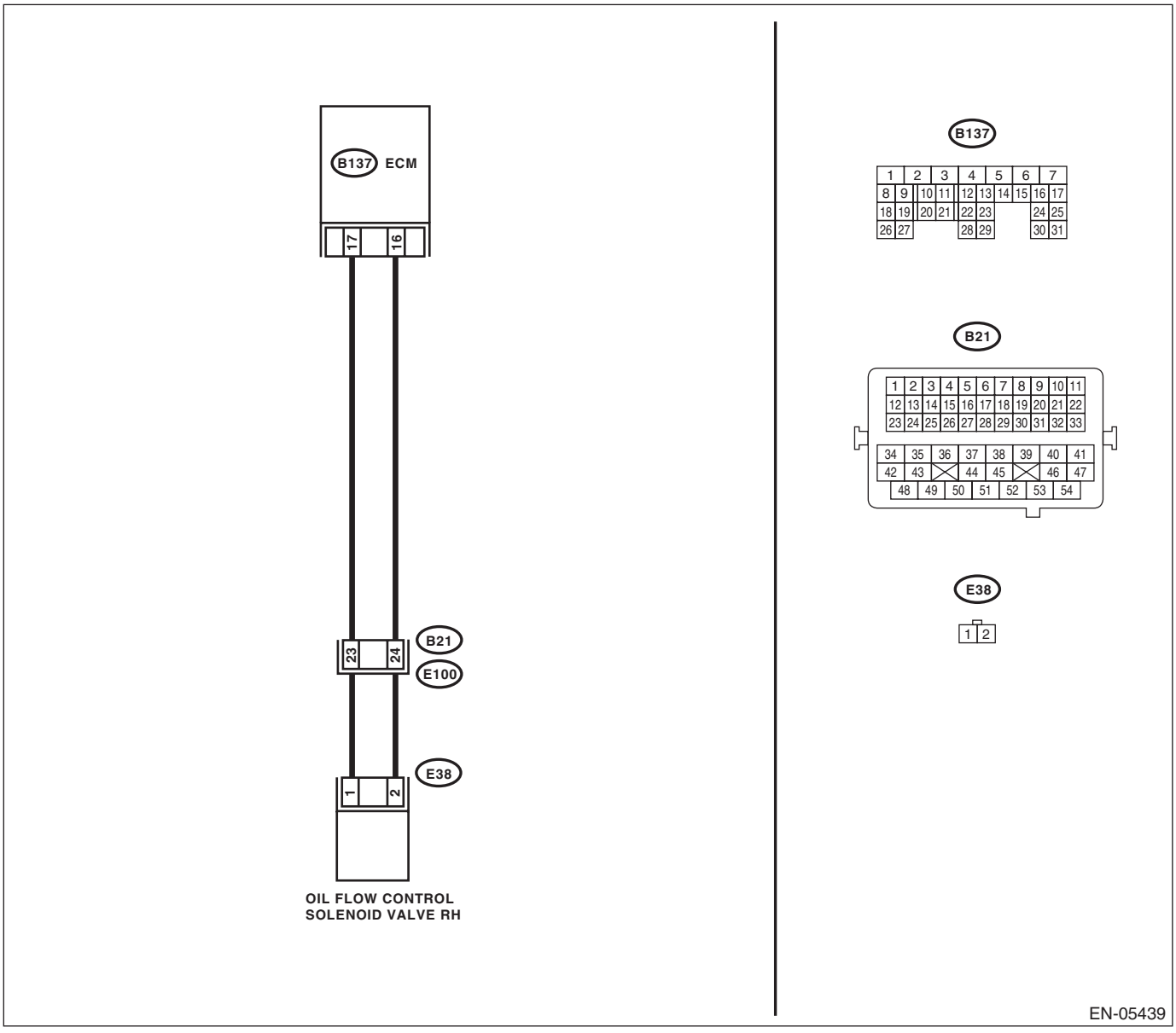
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 connectors from ECM and oil flow control solenoid valve.<br>3) Measure the resistance of harness between ECM and oil flow control solenoid valve.<br>***Connector & terminal***<br>***(B137) No. 17 — (E38) No. 1:***<br>***(B137) No. 16 — (E38) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of the harness between the ECM and oil flow control solenoid valve connector<br>• Poor contact of coupling connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 17 — Chassis ground:***<br>***(B137) No. 16 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and oil flow control solenoid valve connector. |
| 3 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 6 — 12 Ω? | Repair the poor contact of the ECM and oil flow control solenoid valve connector. | Replace the oil flow control solenoid valve. <Ref. to FU(H4DOTC)-33, Oil Flow Control Solenoid Valve.> |

# DR:DTC P2089 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 1)

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-240, DTC P2089 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

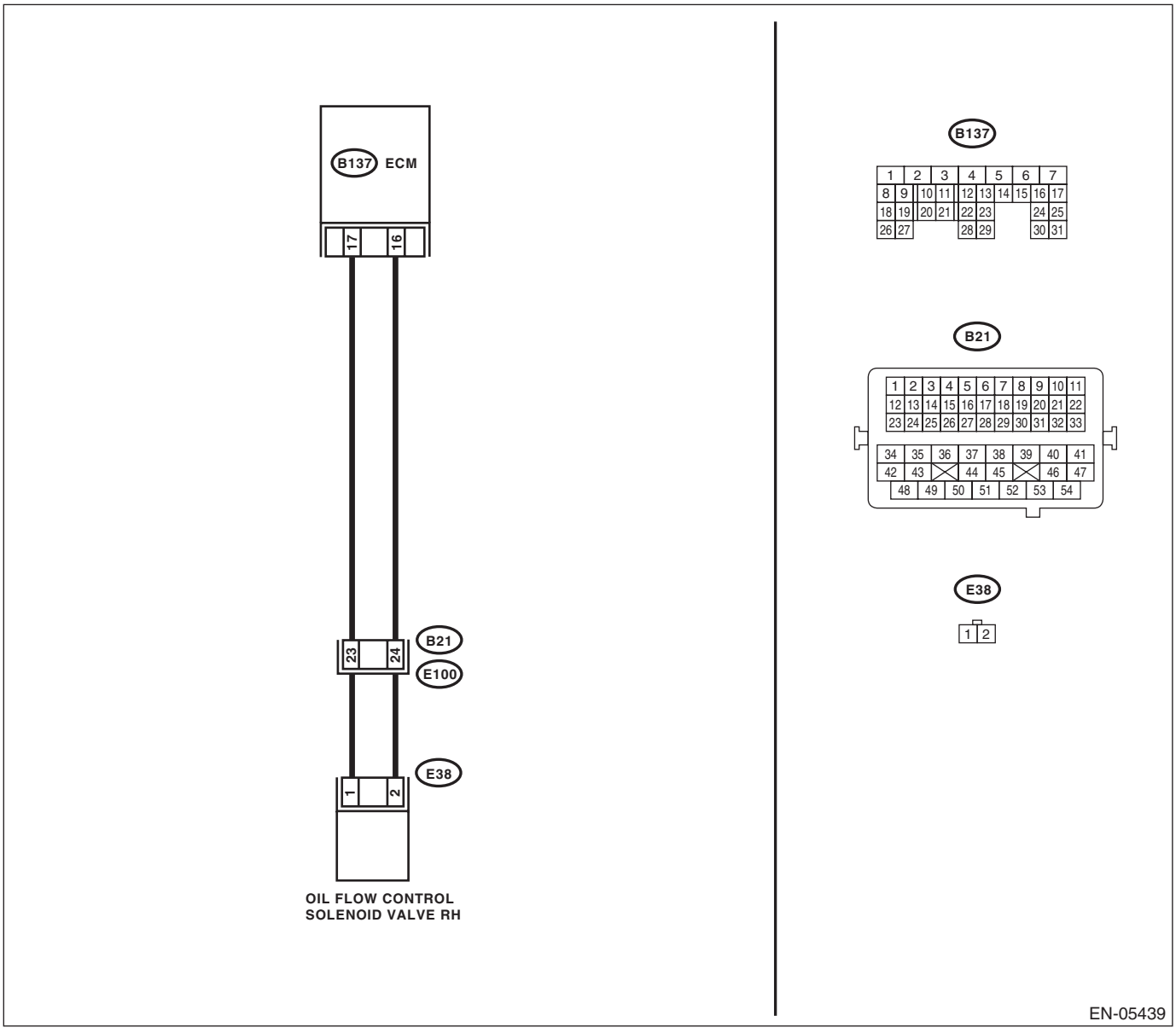
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 connectors from ECM and oil flow control solenoid valve.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 17 (+) — Chassis ground (–):***<br>***(B137) No. 16 (+) — Chassis ground (–):*** | Is the voltage less than 1 V? | Go to step **2**. | Repair the short circuit to power in the harness between the ECM and oil flow control solenoid valve connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance of harness between ECM and oil flow control solenoid valve connector.<br>***Connector & terminal***<br>***(B137) No. 17 — (E38) No. 1:***<br>***(B137) No. 16 — (E38) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of the harness between the ECM and oil flow control solenoid valve connector<br>• Poor contact of coupling connector |
| 3 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 6 — 12 Ω? | Repair the poor contact of the ECM and oil flow control solenoid valve connector. | Replace the oil flow control solenoid valve. <Ref. to FU(H4DOTC)-33, Oil Flow Control Solenoid Valve.> |

# DS:DTC P2092 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT LOW (BANK 2)

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-242, DTC P2092 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT LOW (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

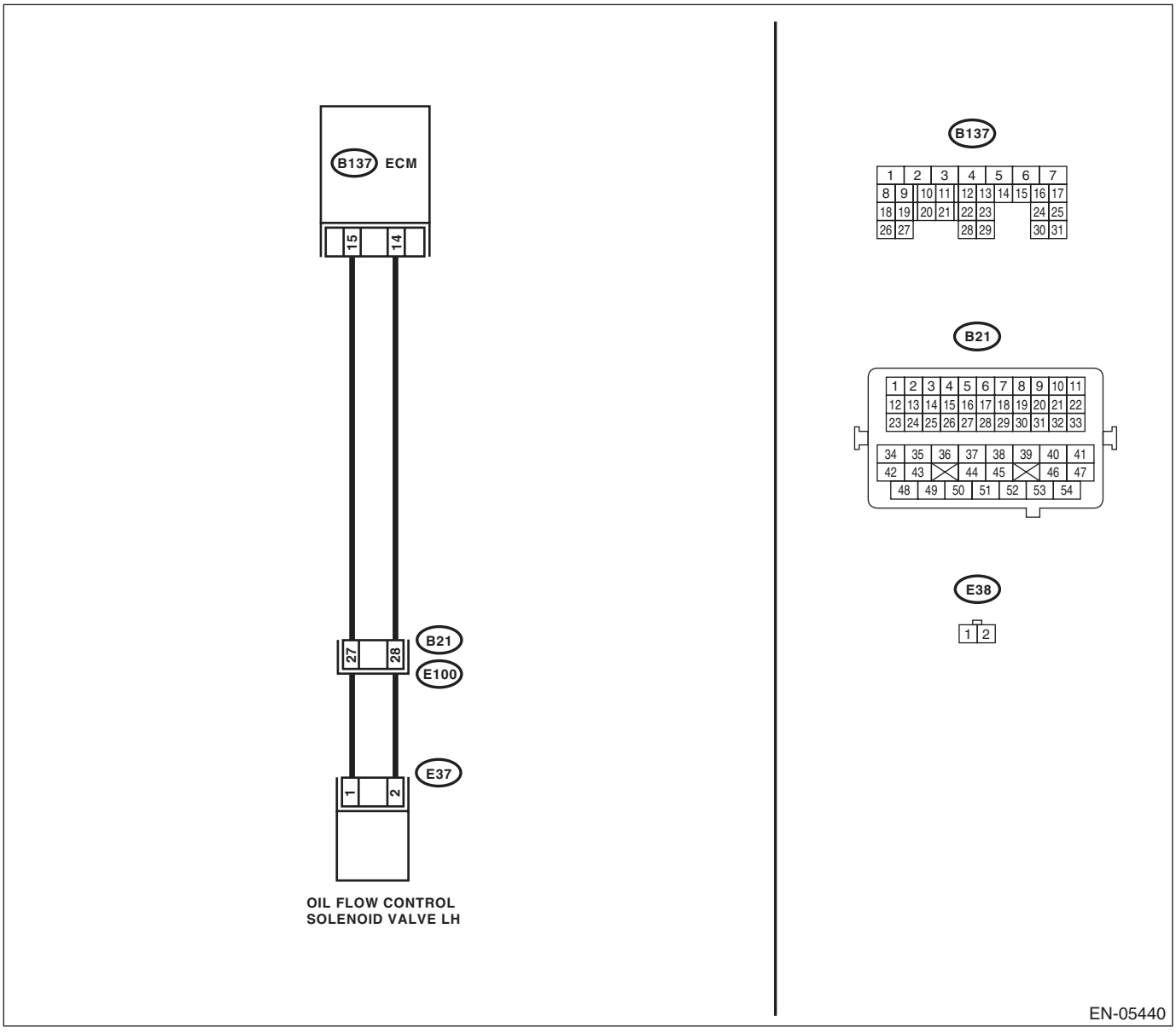
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 connectors from ECM and oil flow control solenoid valve.<br>3) Measure the resistance of harness between ECM and oil flow control solenoid valve.<br>***Connector & terminal***<br>***(B137) No. 15 — (E37) No. 1:***<br>***(B137) No. 14 — (E37) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of the harness between the ECM and oil flow control solenoid valve connector<br>• Poor contact of coupling connector |
| 2 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 15 — Chassis ground:***<br>***(B137) No. 14 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and oil flow control solenoid valve connector. |
| 3 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 6 — 12 Ω? | Repair the poor contact of the ECM and oil flow control solenoid valve connector. | Replace the oil flow control solenoid valve. <Ref. to FU(H4DOTC)-33, Oil Flow Control Solenoid Valve.> |

# DT:DTC P2093 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 2)

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-244, DTC P2093 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT HIGH (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

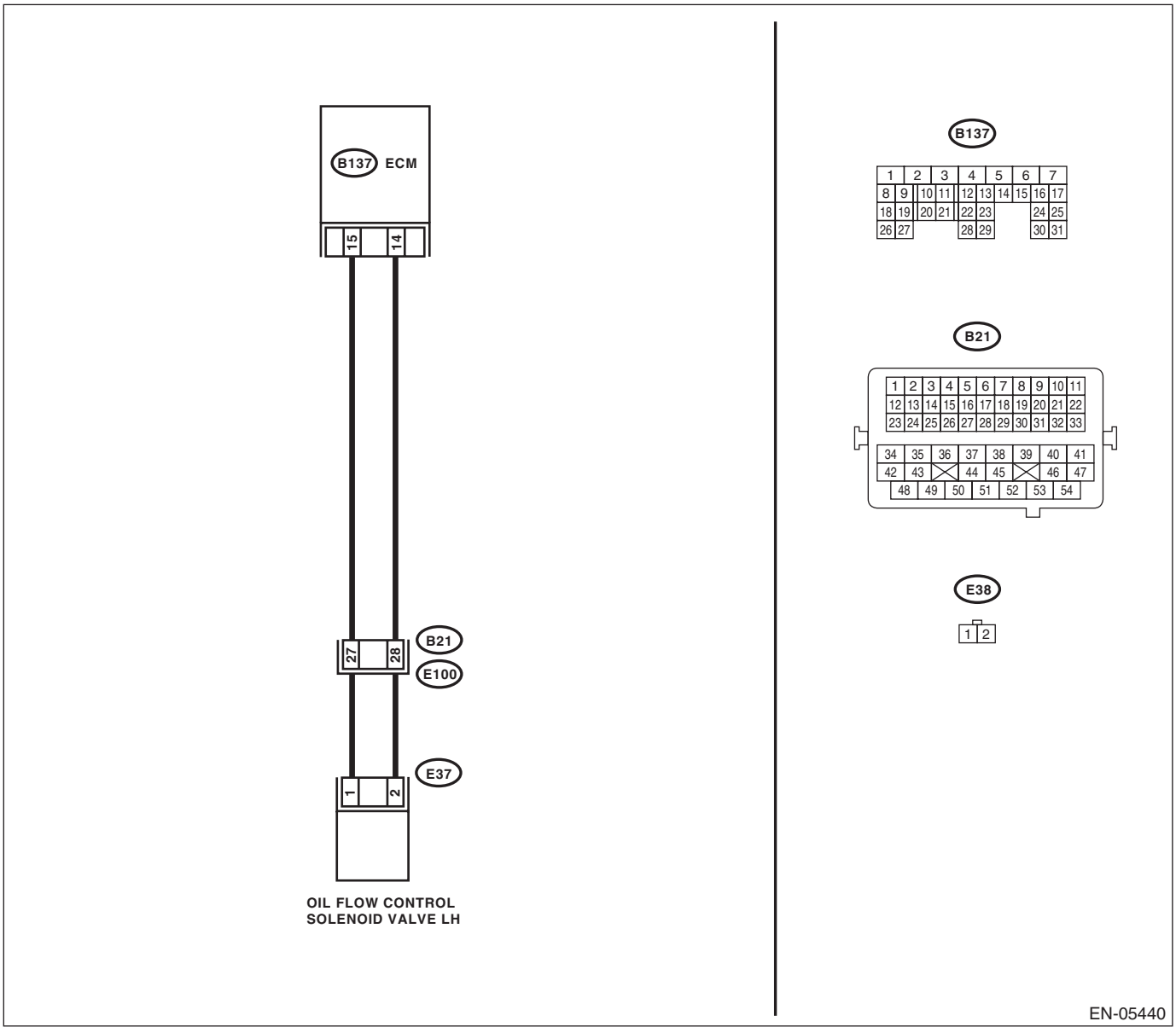
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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 connectors from ECM and oil flow control solenoid valve.<br>3) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B137) No. 15 (+) — Chassis ground (–):***<br>***(B137) No. 14 (+) — Chassis ground (–):*** | Is the voltage less than 1 V? | Go to step **2**. | Repair the short circuit to power in the harness between the ECM and oil flow control solenoid valve connector. |
| 2 | **CHECK HARNESS BETWEEN ECM AND OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance of harness between ECM and oil flow control solenoid valve connector.<br>***Connector & terminal***<br>***(B137) No. 15 — (E37) No. 1:***<br>***(B137) No. 14 — (E37) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of the harness between the ECM and oil flow control solenoid valve connector<br>• Poor contact of coupling connector |
| 3 | **CHECK OIL FLOW CONTROL SOLENOID VALVE.**<br>Measure the resistance between oil flow control solenoid valve terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 6 — 12 Ω? | Repair the poor contact of the ECM and oil flow control solenoid valve connector. | Replace the oil flow control solenoid valve. <Ref. to FU(H4DOTC)-33, Oil Flow Control Solenoid Valve.> |

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

Refer to DTC P2097 for diagnostic procedure. <Ref. to EN(H4DOTC)(diag)-324, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

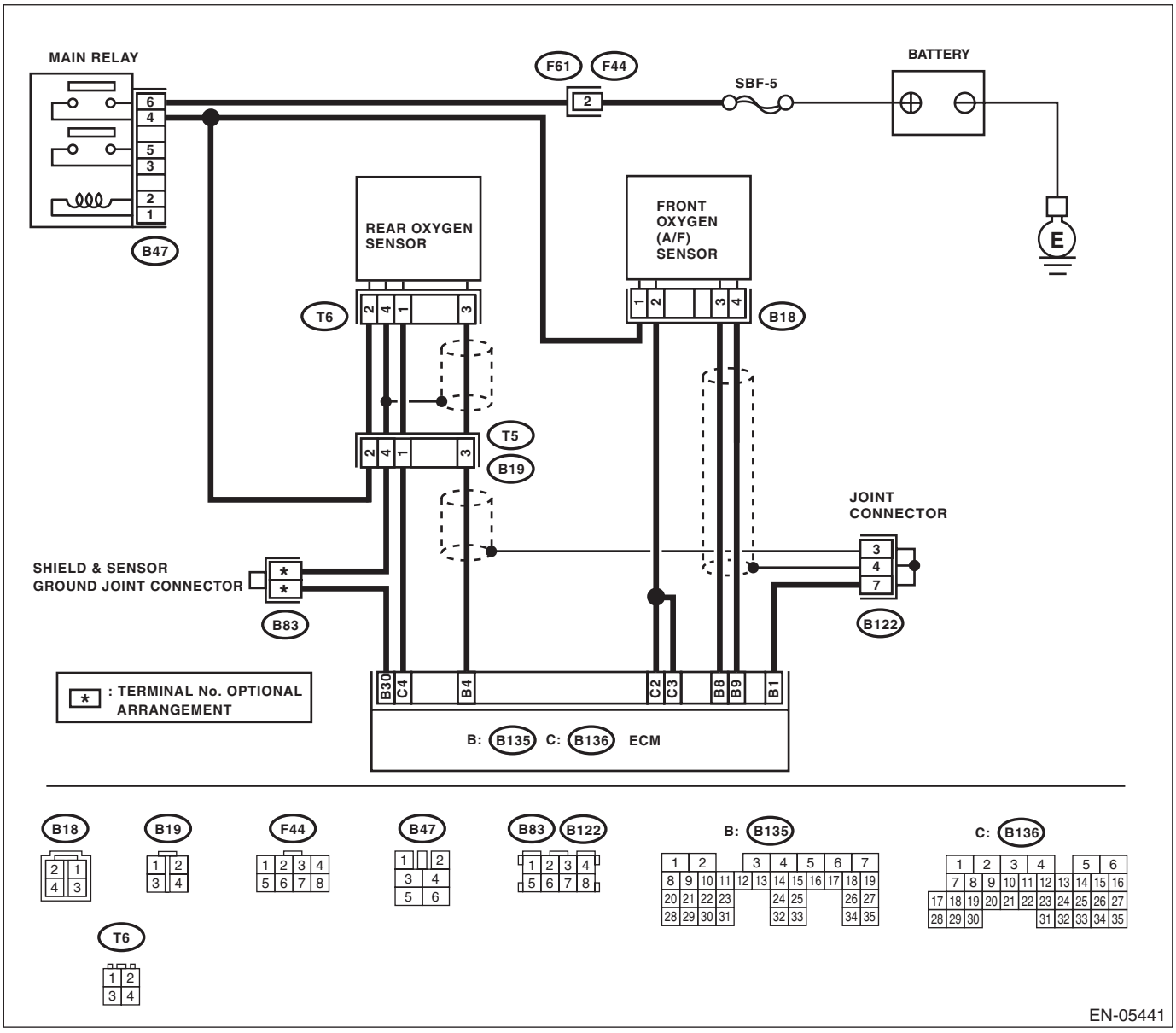
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-248, DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, 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)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the 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>***(B135) No. 9 — (B18) No. 4:***<br>***(B135) No. 8 — (B18) No. 3:*** | 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 item:<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<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 9 — Chassis ground:***<br>***(B135) No. 8 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector. |
| 5 | **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 front oxygen (A/F) sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B18) No. 4 (+) — Chassis ground (–):*** | Is the voltage 4.5 V or more? | Go to step **7**. | Go to step **6**. |
| 6 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B18) No. 3 (+) — Chassis ground (–):*** | Is the voltage 4.95 V or more? | Go to step **7**. | Go to step **8**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK OUTPUT SIGNAL FOR ECM.**<br>Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B18) No. 4 (+) — Chassis ground (–):***<br>***(B18) No. 3 (+) — Chassis ground (–):*** | Is the voltage 8 V or more? | Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> | Repair poor contact of the ECM connector. |
| 8 | **CHECK EXHAUST SYSTEM.** | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step **9**. |
| 9 | **CHECK AIR INTAKE SYSTEM.** | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step **10**. |
| 10 | **CHECK FUEL PRESSURE.**<br>**WARNING:**<br>**Place "NO OPEN FLAMES" signs near the working area.**<br>**CAUTION:**<br>**Be careful not to spill fuel.**<br>1) Connect the front oxygen (A/F) sensor connector.<br>2) Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <Ref. to ME(H4DOTC)-31, INSPECTION, Fuel Pressure.><br>**CAUTION:**<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 or 3 times, then measure fuel pressure again. | Is the measured value 284 — 314 kPa (2.9 — 3.2 kgf/cm$^2$, 41 — 46 psi)? | Go to step **11**. | Repair the following item.<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 |
| 11 | **CHECK FUEL PRESSURE.**<br>After connecting the pressure regulator vacuum hose, measure fuel pressure. <Ref. to ME(H4DOTC)-31, INSPECTION, Fuel Pressure.><br>**CAUTION:**<br>**Release fuel pressure before removing the fuel pressure gauge.**<br>NOTE:<br>• If fuel pressure does not increase, squeeze fuel return hose 2 or 3 times, then measure fuel pressure again.<br>• If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose. | Is the measured value 230 — 260 kPa (2.35 — 2.65 kgf/cm$^2$, 33 — 38 psi)? | Go to step **12**. | Repair the following item.<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 |
|---|---|---|---|---|
| 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the engine coolant temperature 75°C (167°F) or higher? | Go to step **13**. | Replace the engine coolant temperature sensor. <Ref. to FU(H4DOTC)-30, Engine Coolant Temperature Sensor.> |
| 13 | **CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)? | Go to step **14**. | Replace the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, 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 higher than 75°C (167°F).<br>2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position.<br>3) Turn the A/C switch to OFF.<br>4) Turn all the 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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Subtract ambient temperature from intake air temperature. Is the obtained value –10 — 50°C (–18 — 90°F)? | Go to step **15**. | Check the mass air flow and intake air temperature sensor. <Ref. to FU(H4DOTC)-35, Mass Air Flow and Intake Air Temperature Sensor.> |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 15 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Depress the clutch pedal for MT models.<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 490 mV or more? | Go to step **16**. | Go to step **17**. |
| 16 | **CHECK REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.<br>2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Depress the clutch pedal for MT models.<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 250 mV or less? | Go to step **18**. | Go to step **17**. |
| 17 | **CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.** | Has water entered the connector? | Completely remove any water inside. | Go to step **19**. |
| 18 | **CHECK FRONT OXYGEN (A/F) SENSOR AND REAR OXYGEN SENSOR DATA.**<br>1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.<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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is a voltage of 0.8 V or more maintained for 5 minutes or more? | Replace the front oxygen (A/F) sensor. <Ref. to FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.> | Go to step **19**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 19 | **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>***(B135) No. 4 — (T6) No. 3:***<br>***(B135) No. 30 — (T6) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **20**. | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |
| 20 | **CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.**<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. 3 (+) — Chassis ground (–):*** | Is the voltage 0.2 — 0.5 V? | Replace the rear oxygen sensor. <Ref. to FU(H4DOTC)-48, Rear Oxygen Sensor.> | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the ECM and rear oxygen sensor<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-250, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

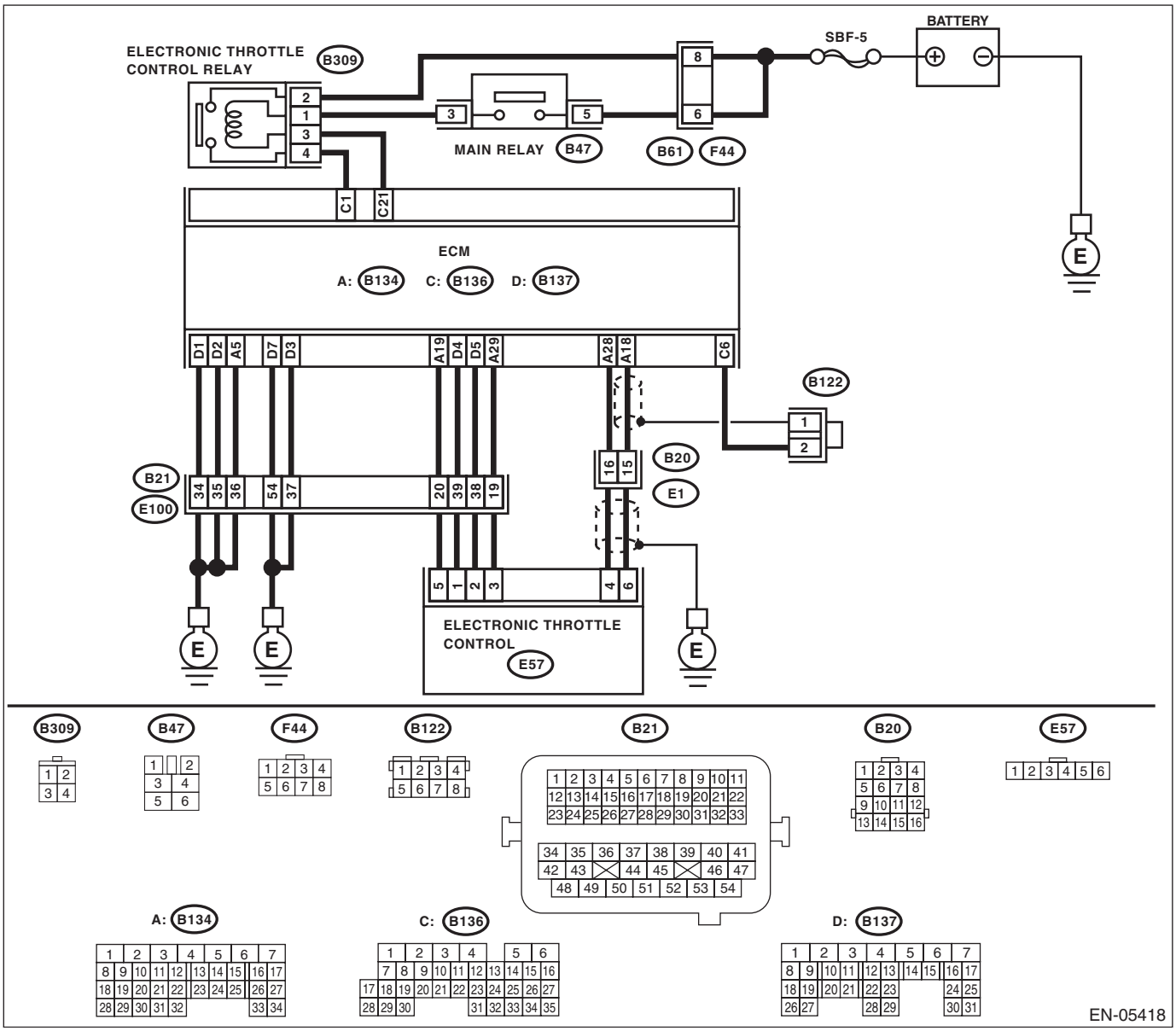
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | 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. 1 and No. 3 of electronic throttle control relay.<br>4) Measure the resistance between electronic throttle control relay terminals.<br>***Terminals***<br>***No. 2 — No. 4:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Replace the electronic throttle control relay. <Ref. to FU(H4DOTC)-53, Electronic Throttle Control Relay.> |
| 2 | **CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 2 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **3**. | Repair the open or ground short circuit of power supply circuit. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Disconnect the connectors from the ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 3 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control relay. | 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 relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 3 — Chassis ground:***<br>***(B309) No. 4 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and electronic throttle control relay. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the resistance between the ECM and electronic throttle control relay connector.<br>***Connector & terminal***<br>***(B136) No. 21 — (B309) No. 3:***<br>***(B136) No. 1 — (B309) No. 4:*** | Is the resistance less than 1 Ω? | Go to step **6**. | Repair the open circuit of harness between ECM and electronic throttle control relay. |
| 6 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from electronic throttle control.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 19 — Chassis ground:***<br>***(B134) No. 18 — Chassis ground:***<br>***(B134) No. 18 — (B136) No. 6:***<br>***(B134) No. 28 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **7**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance 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 resistance 1 MΩ or more? | Go to step **8**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |
| 8 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance of harness between ECM and electronic throttle control connector.<br>***Connector & terminal***<br>***(B134) No. 18 — (E57) No. 6:***<br>***(B134) No. 28 — (E57) No. 4:***<br>***(B134) No. 29 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **9**. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 9 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 3 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **10**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 10 | **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>***(E57) No. 4 (–) — Engine ground (–):*** | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step **11**. |
| 11 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 19 — (B134) No. 18:***<br>***(B134) No. 19 — (B134) No. 28:*** | Is the resistance 1 MΩ or more? | Go to step **12**. | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |
| 12 | **CHECK SENSOR OUTPUT.**<br>1) Connect all 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>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the voltage 0.81 — 0.87 V? | Go to step **13**. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 13 | **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 procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the voltage 1.64 — 1.70 V? | Go to step **14**. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> |
| 14 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance between ECM 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 **15**. | Repair the open circuit of harness between ECM and electronic throttle control. |
| 15 | **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 5 V or more? | Repair the short circuit to power in the harness between the ECM and electronic throttle control. | Go to step **16**. |
| 16 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance 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 resistance 1 MΩ or more? | Go to step **17**. | Repair short circuit of the harness to ground between the ECM and electronic throttle control. |
| 17 | **CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.**<br>Measure the resistance between the electronic throttle control connector terminals.<br>***Connector & terminal***<br>***(E57) No. 1 — (E57) No. 2:*** | Is the resistance 1 MΩ or more? | Go to step **18**. | Repair the short circuit of harness between ECM and electronic throttle control. |
| 18 | **CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 5 — 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 **19**. | Repair the open circuit of the harness between the ECM and engine ground. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 19 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>Measure the resistance between electronic throttle control terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance 50 Ω or less? | Go to step **20**. | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> |
| 20 | **CHECK ELECTRONIC THROTTLE CONTROL.**<br>Move the throttle valve to the fully open and fully closed positions with fingers.<br>Check that the valve returns to the specified position when releasing fingers. | Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position | Repair poor contact of the ECM connector. | Replace the electronic throttle control. <Ref. to FU(H4DOTC)-16, Throttle Body.> |

# DX:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-252, DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

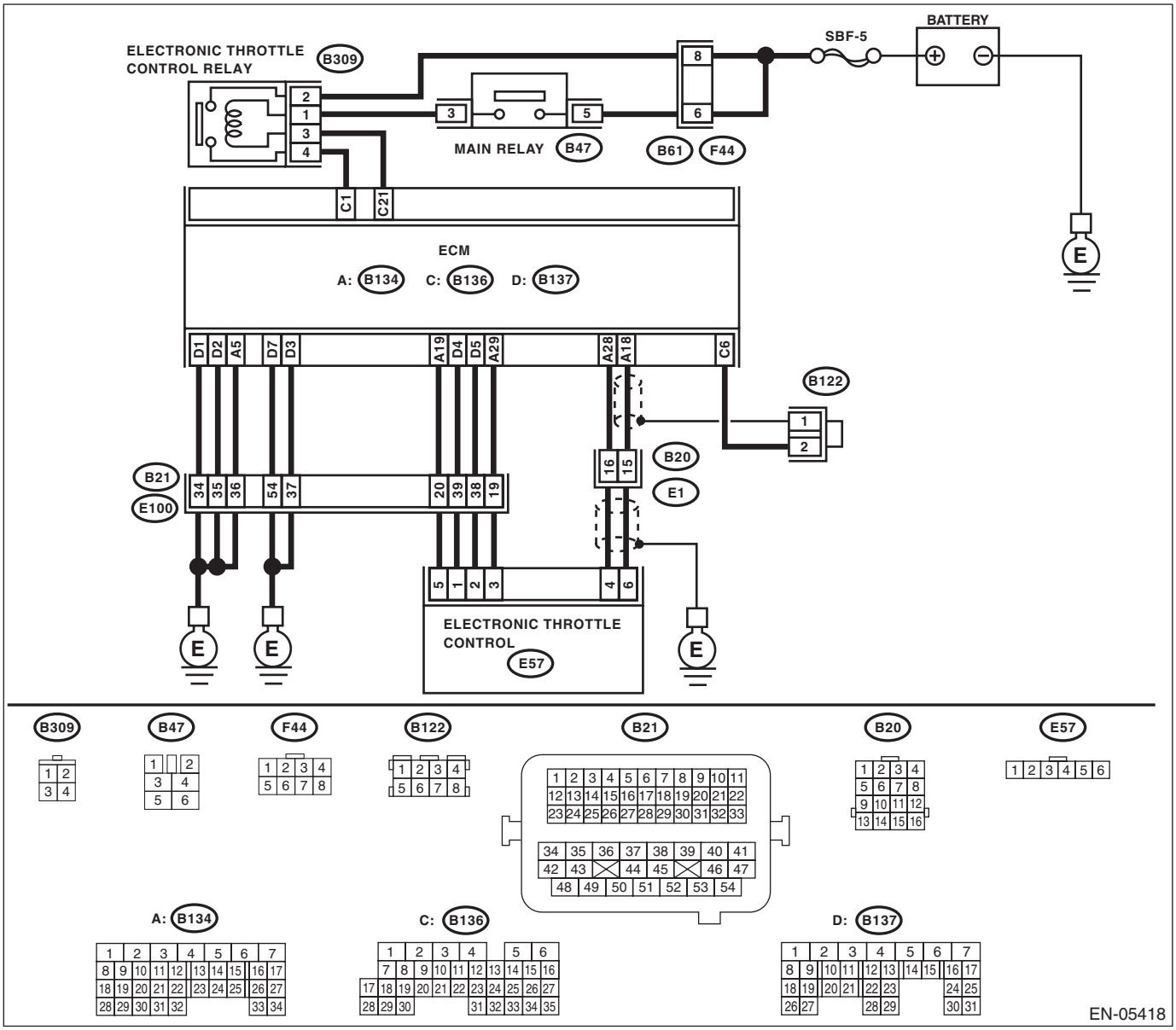
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance
- Engine stalls.

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | 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. 1 and No. 3 of electronic throttle control relay.<br>4) Measure the resistance between electronic throttle control relay terminals.<br>***Terminals***<br>***No. 2 — No. 4:*** | Is the resistance less than 1 Ω? | Go to step **2**. | Replace the electronic throttle control relay. <Ref. to FU(H4DOTC)-53, Electronic Throttle Control Relay.> |
| 2 | **CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 2 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **3**. | Repair the open or ground short circuit of power supply circuit. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Disconnect the connectors from the ECM.<br>2) Turn the ignition switch to ON.<br>3) Measure the voltage between electronic throttle control relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 3 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control relay. | 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 relay connector and chassis ground.<br>***Connector & terminal***<br>***(B309) No. 3 — Chassis ground:***<br>***(B309) No. 4 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and electronic throttle control relay. |
| 5 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>Measure the resistance between the ECM and electronic throttle control relay connector.<br>***Connector & terminal***<br>***(B136) No. 21 — (B309) No. 3:***<br>***(B136) No. 1 — (B309) No. 4:*** | Is the resistance less than 1 Ω? | Repair poor contact of the ECM connector. | Repair the open circuit of harness between ECM and electronic throttle control relay. |

# DY:DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH

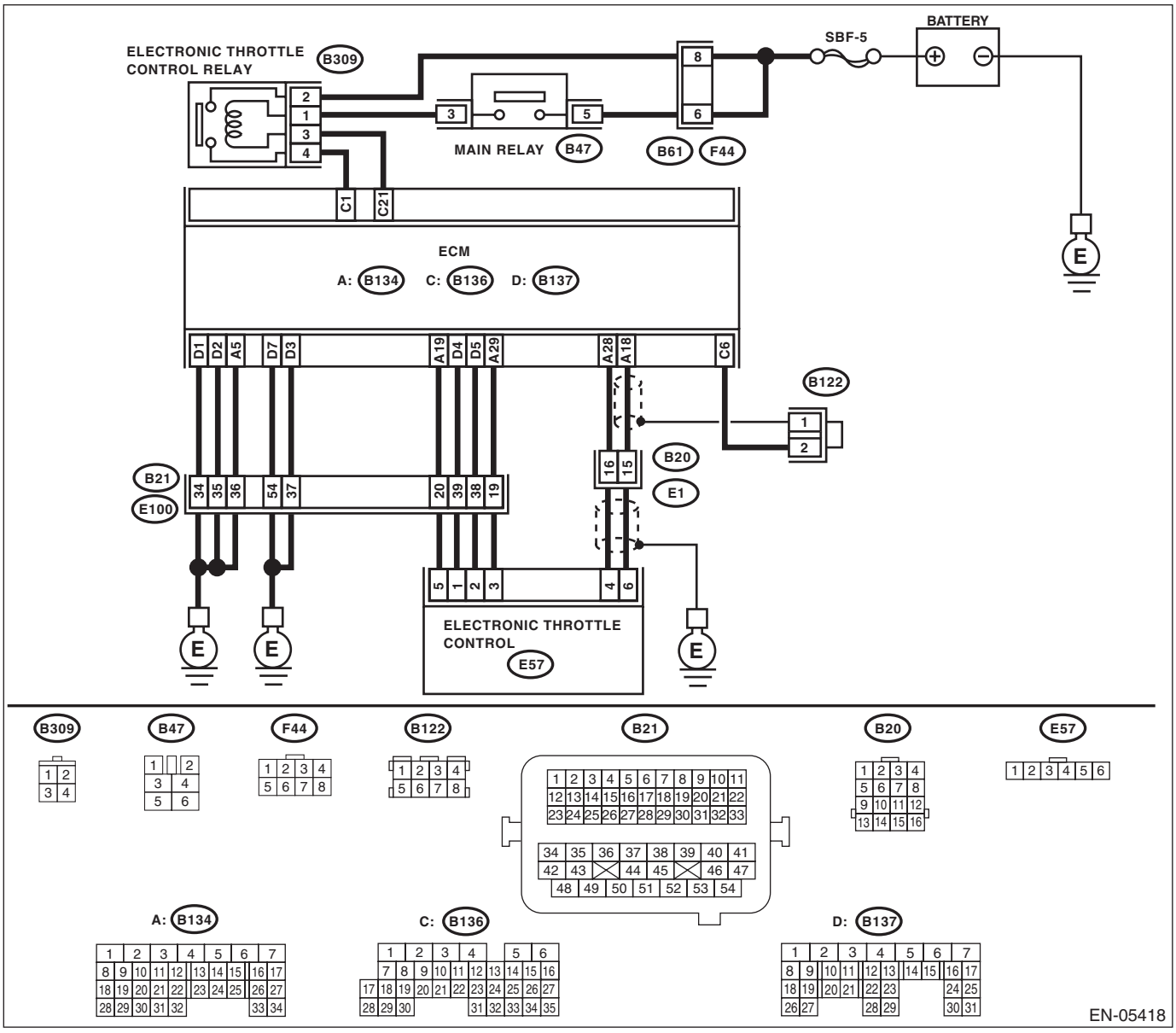
**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-254, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | 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 relay terminals.<br>***Terminals***<br>***No. 2 — No. 4:*** | Is the resistance 1 MΩ or more? | Go to step **2**. | Replace the electronic throttle control relay. <Ref. to FU(H4DOTC)-53, Electronic Throttle Control Relay.> |
| 2 | **CHECK SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY POWER SUPPLY.**<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>***(B309) No. 4 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control relay. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 21 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Repair poor contact of the ECM connector. | Repair short circuit of the harness to ground between ECM and electronic throttle control relay. |

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

NOTE:
For the diagnostic procedure, refer to DTC P2101. <Ref. to EN(H4DOTC)(diag)-330, DTC P2101 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-258, DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

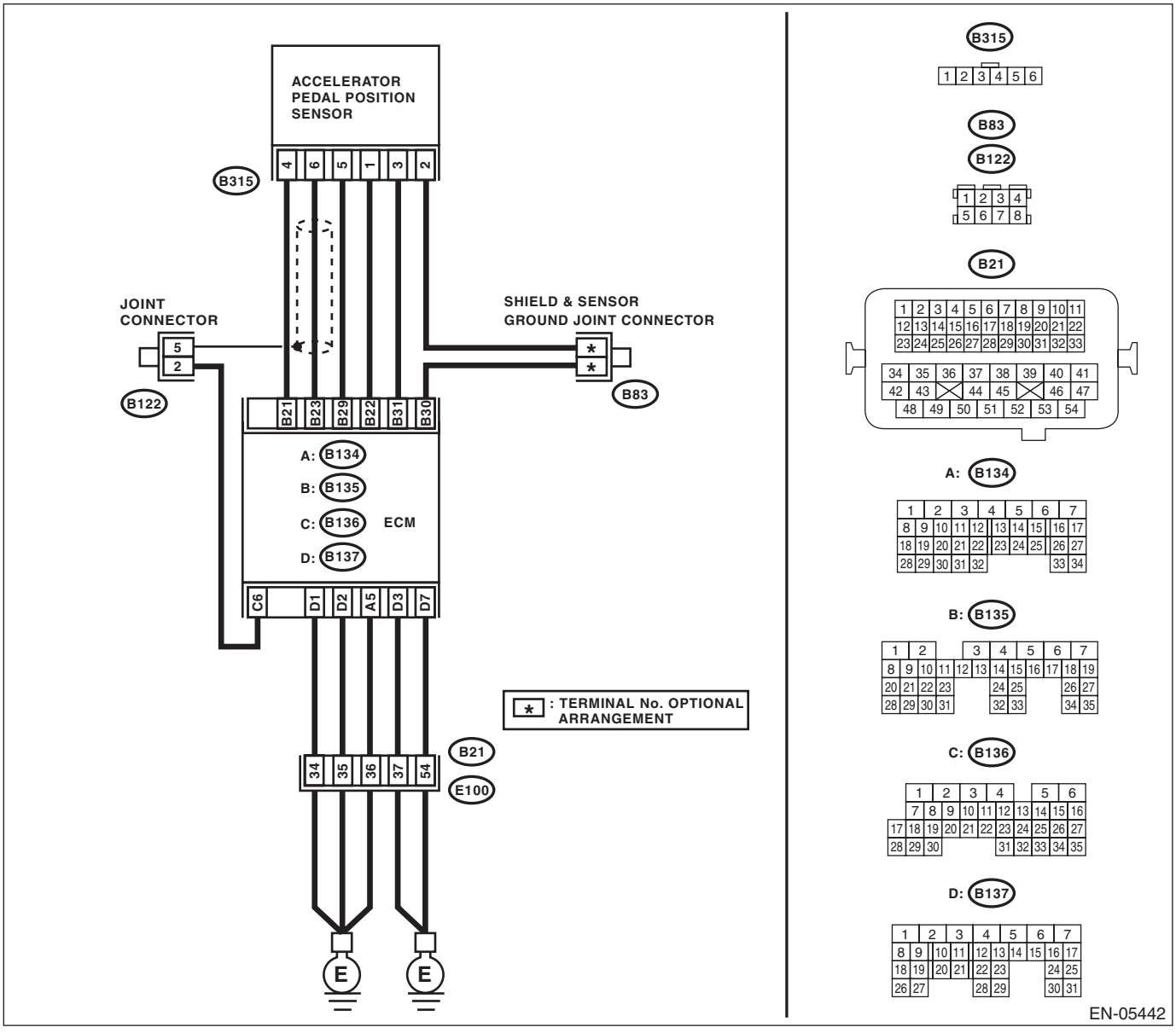
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and accelerator pedal position sensor.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 21 — Chassis ground:***<br>***(B135) No. 23 — Chassis ground:***<br>***(B135) No. 23 — (B136) No. 6:*** | Is the resistance 1 MΩ or more? | Go to step **2**. | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. |
| 2 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between accelerator pedal position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 6 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.> | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-260, DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

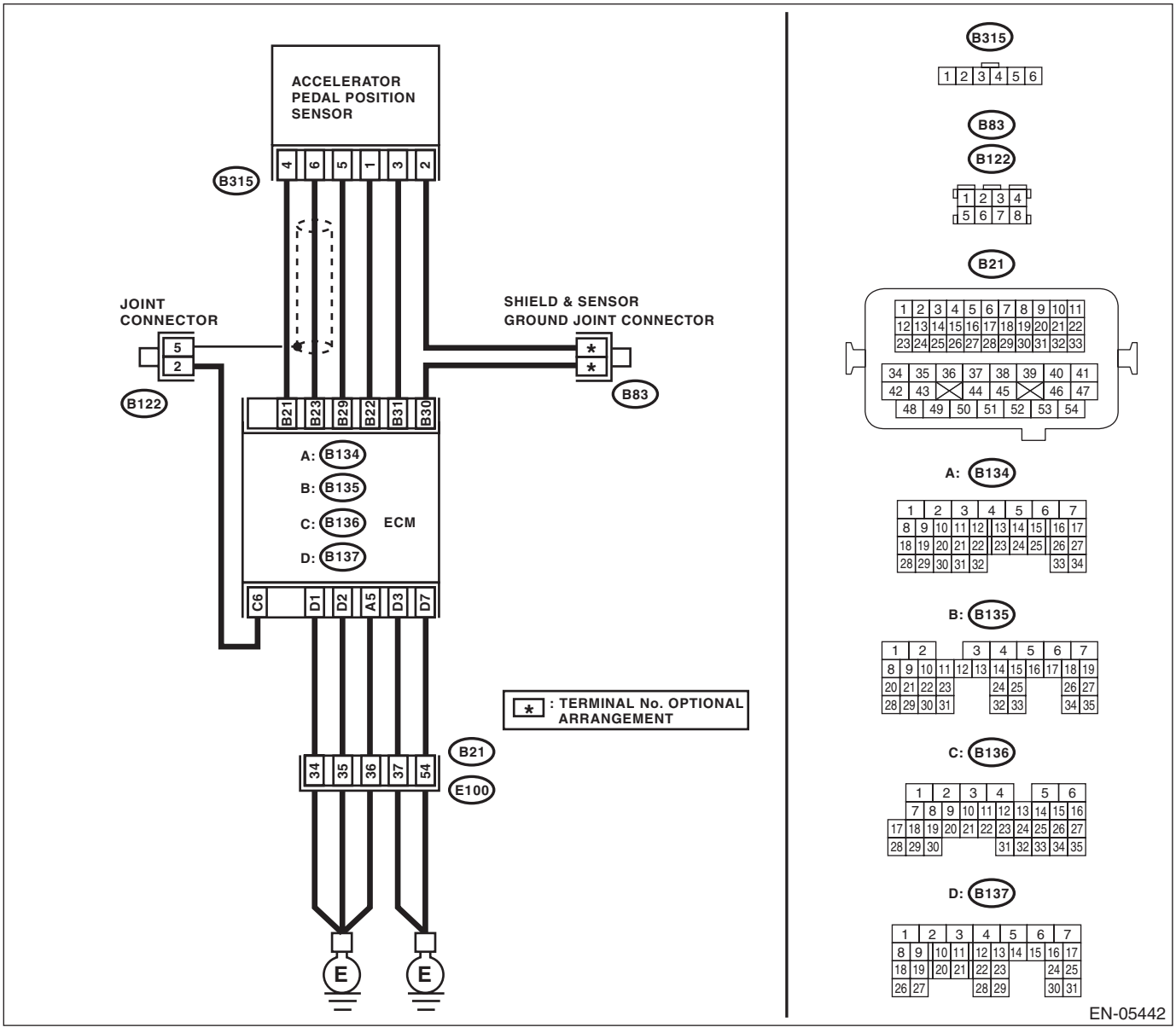
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



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

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-262, DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

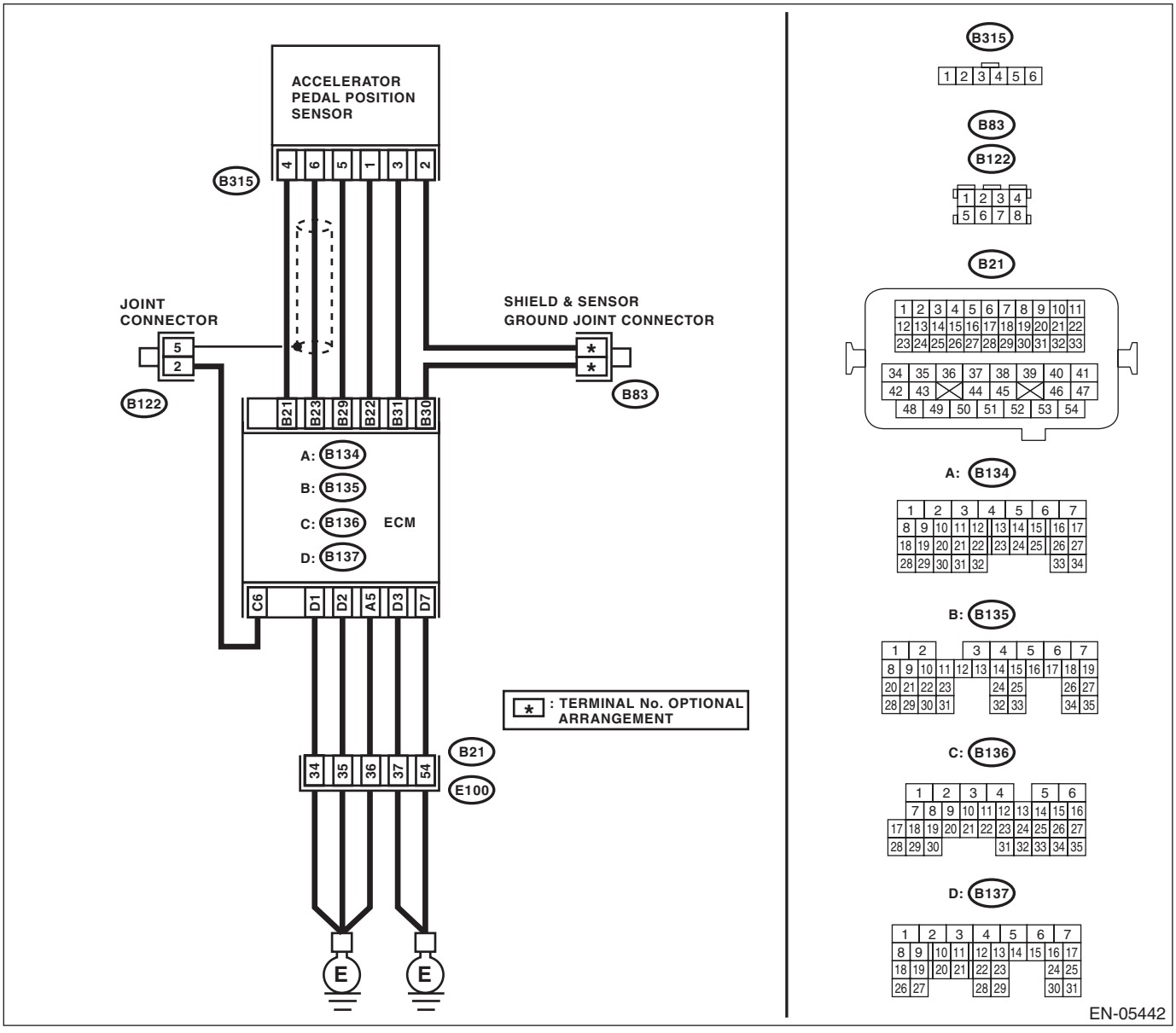
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| Step | | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the ECM and accelerator pedal position sensor.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B135) No. 22 — Chassis ground:***<br>***(B135) No. 31 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **2**. | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. |
| 2 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between accelerator pedal position sensor connector and chassis ground.<br>***Connector & terminal***<br>***(B315) No. 3 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the accelerator pedal. <Ref. to SP(H4SO)-3, Accelerator Pedal.> | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-264, DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

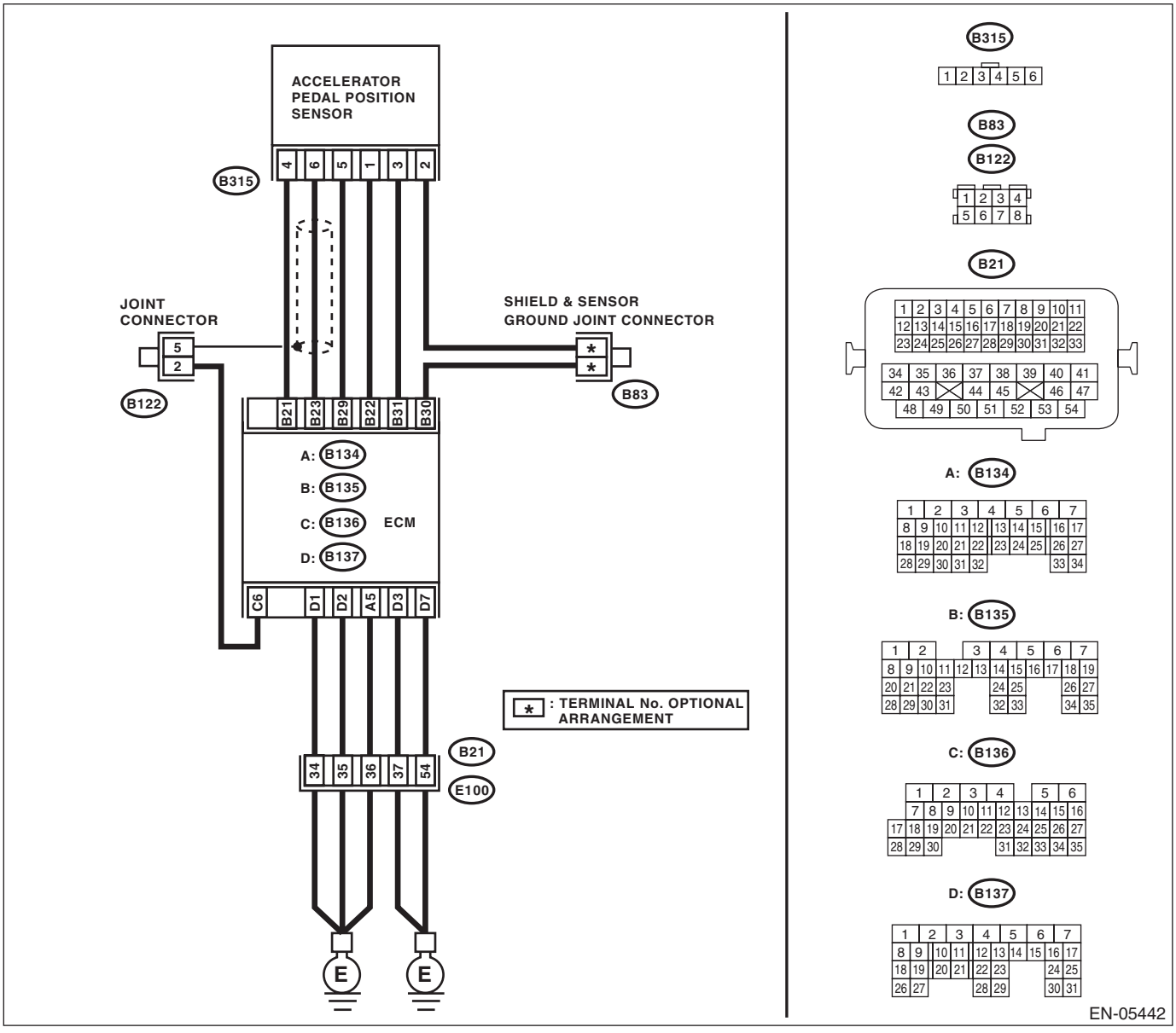
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



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

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-266, DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

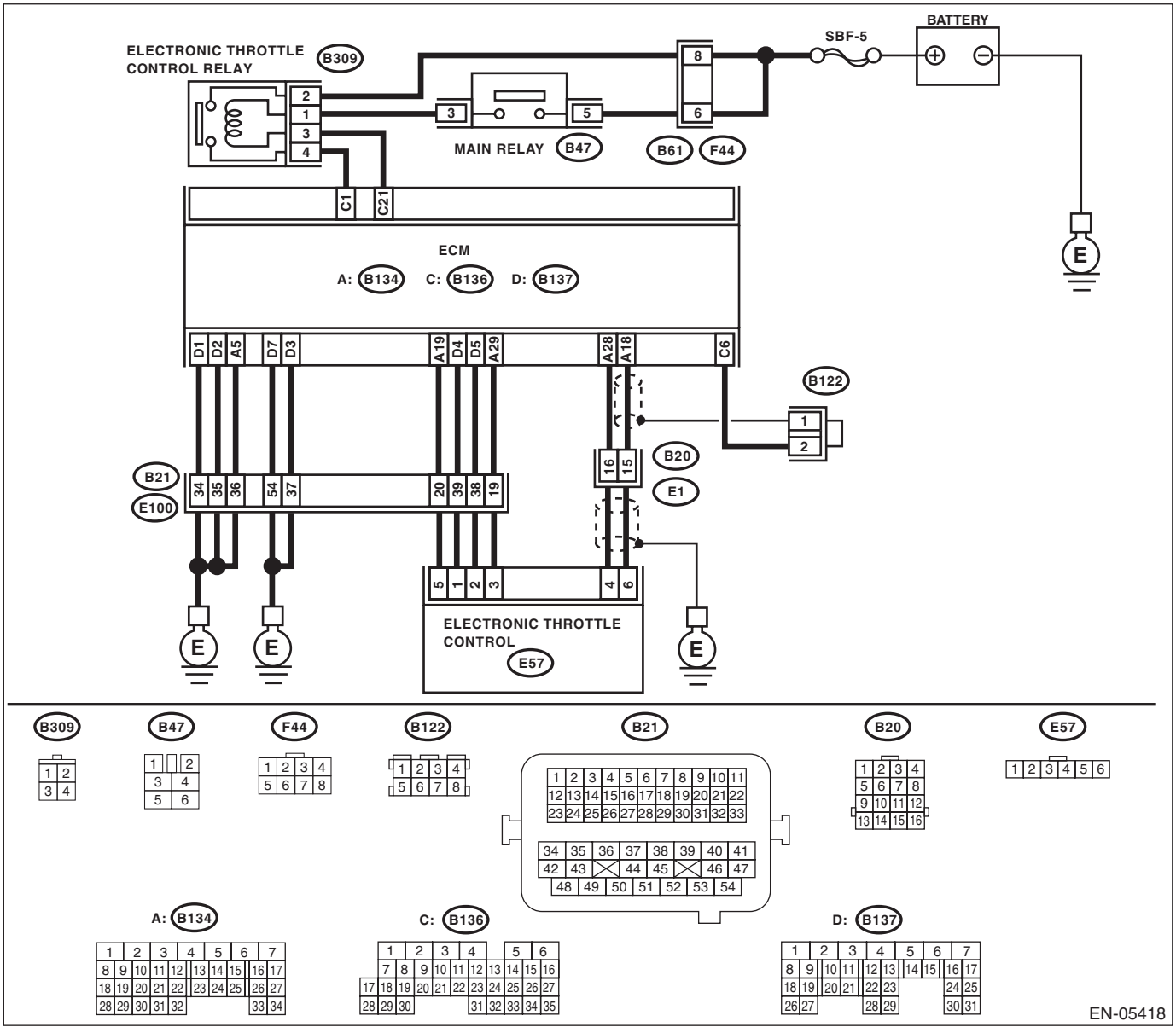
**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and electronic throttle control.<br>3) Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 19 — Chassis ground:***<br>***(B134) No. 18 — Chassis ground:***<br>***(B134) No. 18 — (B136) No. 6:***<br>***(B134) No. 28 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **2**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |
| 2 | **CHECK SHORT CIRCUIT INSIDE THE ECM.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance 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 resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).> |
| 3 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Disconnect the connectors from the ECM.<br>2) Measure the resistance of harness between ECM and electronic throttle control connector.<br>***Connector & terminal***<br>***(B134) No. 18 — (E57) No. 6:***<br>***(B134) No. 28 — (E57) No. 4:***<br>***(B134) No. 29 — (E57) No. 3:*** | Is the resistance less than 1 Ω? | Go to step **4**. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 4 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Connect the connector to ECM.<br>2) Measure the resistance between electronic throttle control connector and engine ground.<br>***Connector & terminal***<br>***(E57) No. 3 — 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 item:<br>• Open circuit of harness between ECM and engine ground<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 5 | **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>***(E57) No. 4 (+) — Engine ground (–):*** | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step **6**. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 6 | **CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance between ECM connectors.<br>***Connector & terminal***<br>***(B134) No. 19 — (B134) No. 18:***<br>***(B134) No. 19 — (B134) No. 28:*** | Is the resistance 1 MΩ or more? | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <Ref. to FU(H4DOTC)-16, Throttle Body.> | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |

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

**DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-268, DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

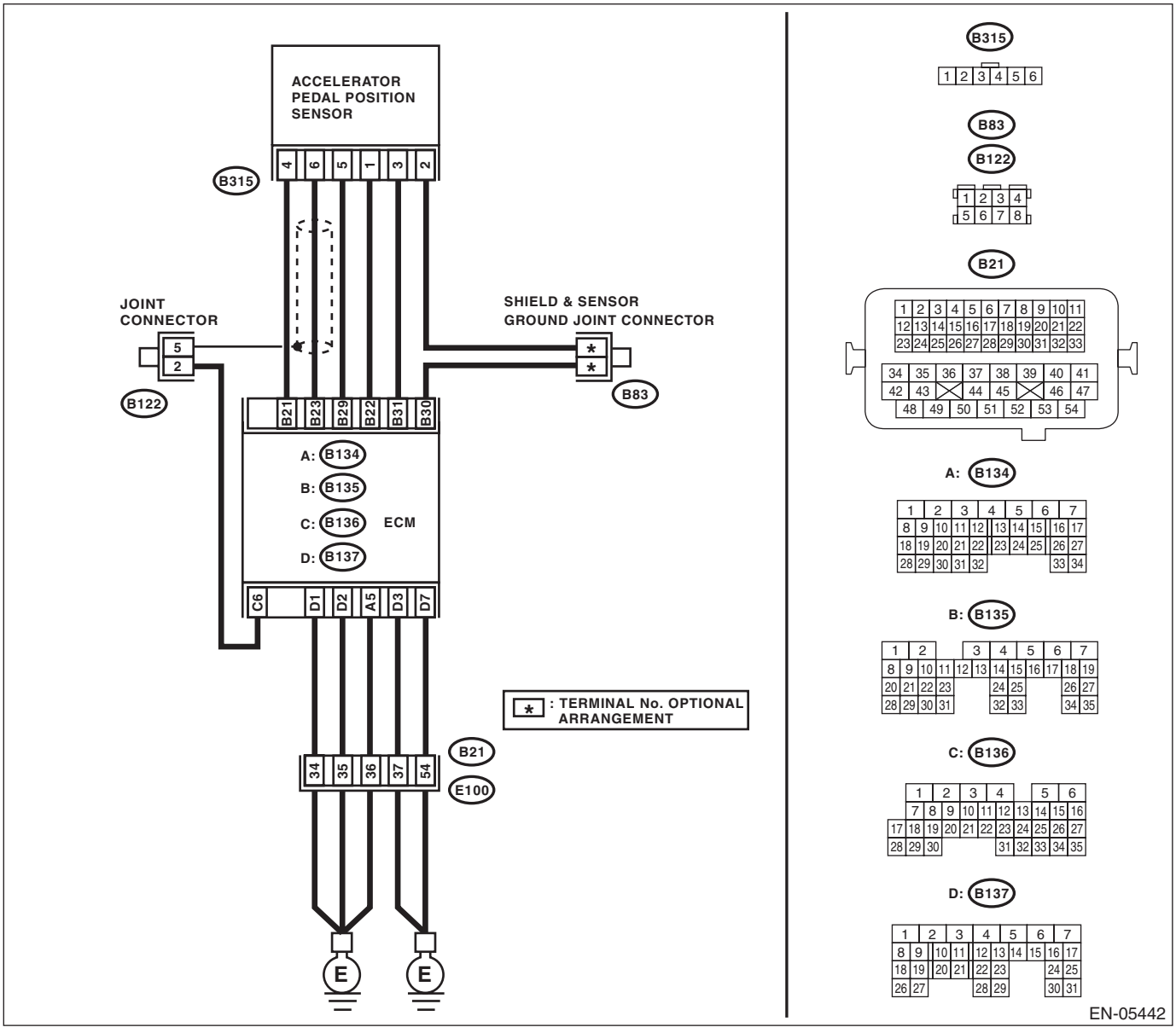
**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**TROUBLE SYMPTOM:**

- Erroneous idling
- Poor driving performance

**WIRING DIAGRAM:**



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

# EG:DTC P2419 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-270, DTC P2419 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

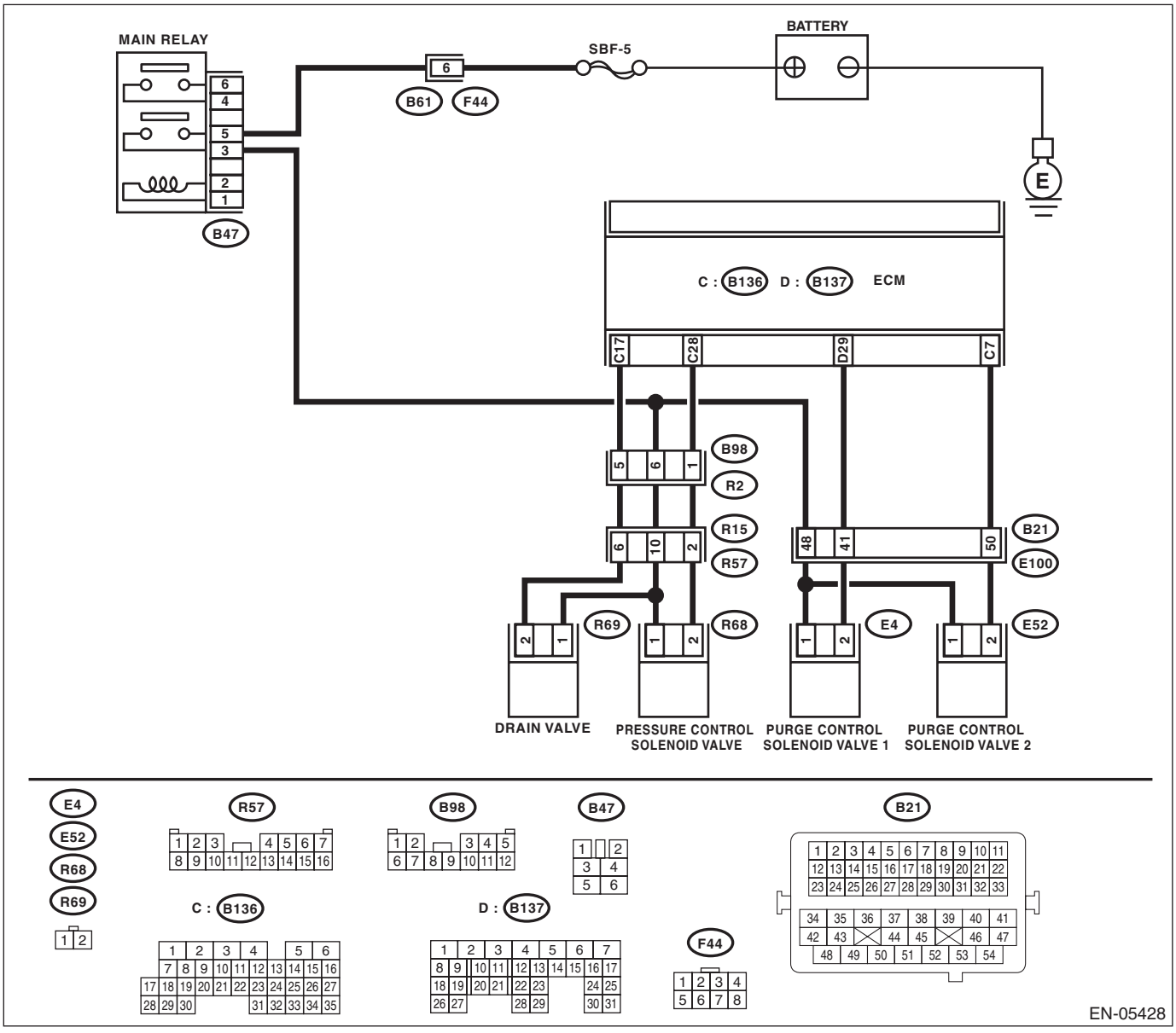
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK OUTPUT SIGNAL OF ECM.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 7 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step **2**. |
| 2 | **CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and purge control solenoid valve 2.<br>3) Measure the resistance between the purge control solenoid valve 2 connector and engine ground.<br>***Connector & terminal***<br>***(E52) No. 2 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **3**. | Repair short circuit of the harness to ground between ECM and purge control solenoid valve 2 connector. |
| 3 | **CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2.**<br>Measure the resistance of harness between ECM and purge control solenoid valve 2.<br>***Connector & terminal***<br>***(B136) No. 7 — (E52) No. 2:*** | 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 item:<br>• Open circuit of harness between ECM and purge control solenoid valve 2 connector<br>• Poor contact of coupling connector |
| 4 | **CHECK PURGE CONTROL SOLENOID VALVE 2.**<br>1) Remove the purge control solenoid valve 2.<br>2) Measure the resistance between purge control solenoid valve 2 terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance between 10 — 100 Ω? | Go to step **5**. | Replace the purge control solenoid valve 2. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> |
| 5 | **CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE 2.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between purge control solenoid valve 2 and engine ground.<br>***Connector & terminal***<br>***(E52) No. 1 (+) — Engine ground (–):*** | Is the voltage 10 V or more? | Repair the poor contact in the purge control solenoid valve 2 connector. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit of harness between the main relay and purge control solenoid valve 2<br>• Poor contact of coupling connector<br>• Poor contact of main relay connector |

## EH:DTC P2420 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH

**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-271, DTC P2420 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

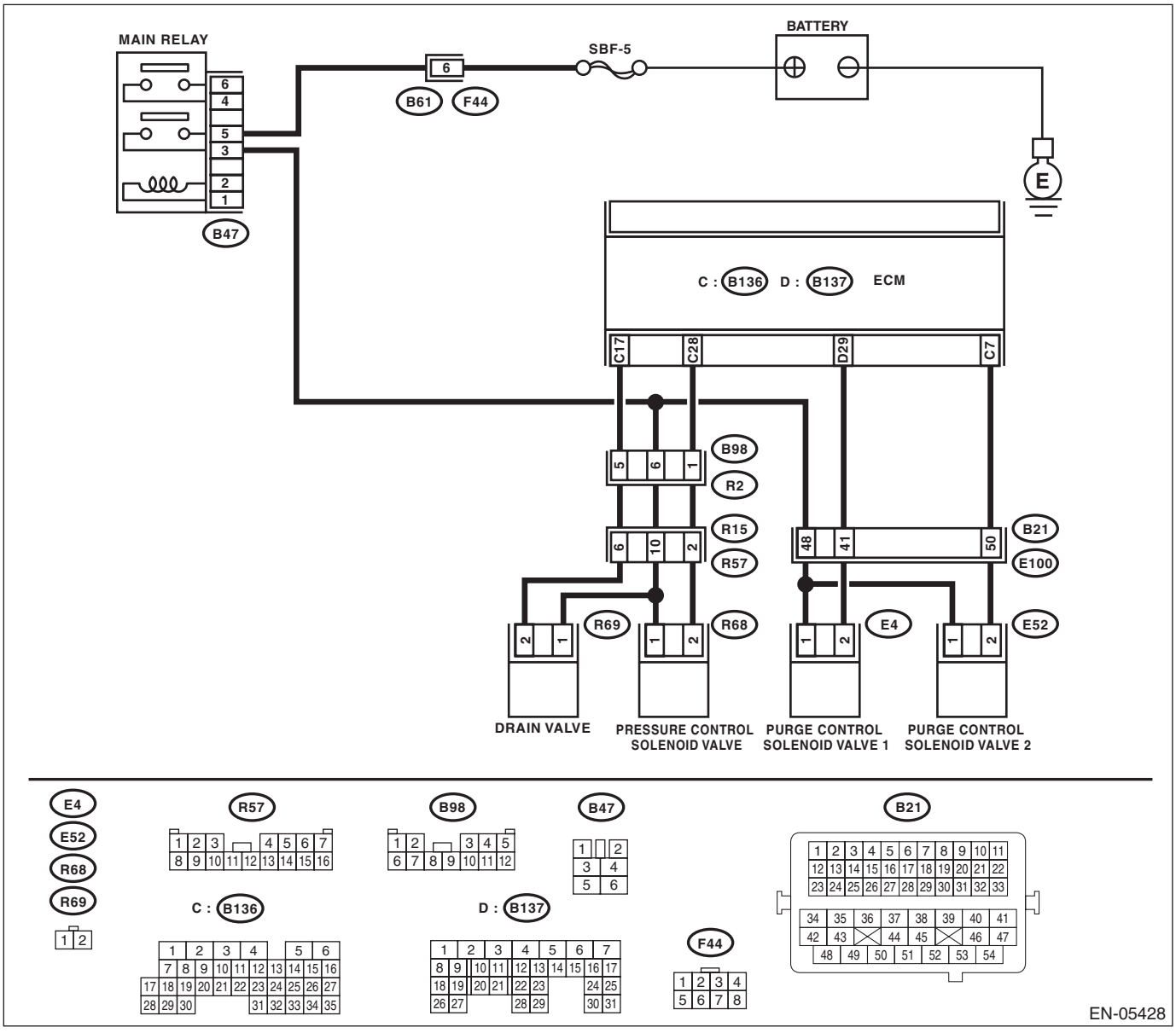
**TROUBLE SYMPTOM:**

Erroneous idling

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

**WIRING DIAGRAM:**



| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from ECM and purge control solenoid valve 2.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between ECM and chassis ground.<br>***Connector & terminal***<br>***(B136) No. 7 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Repair the short to power in the harness between ECM and purge control solenoid valve 2 connector. | Go to step **2**. |
| 2 | **CHECK PURGE CONTROL SOLENOID VALVE 2.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between purge control solenoid valve 2 terminals.<br>***Terminals***<br>***No. 1 — No. 2:*** | Is the resistance less than 1 Ω? | Replace the purge control solenoid valve 2. <Ref. to EC(H4DOTC)-8, Purge Control Solenoid Valve.> | Repair poor contact of the ECM connector. |

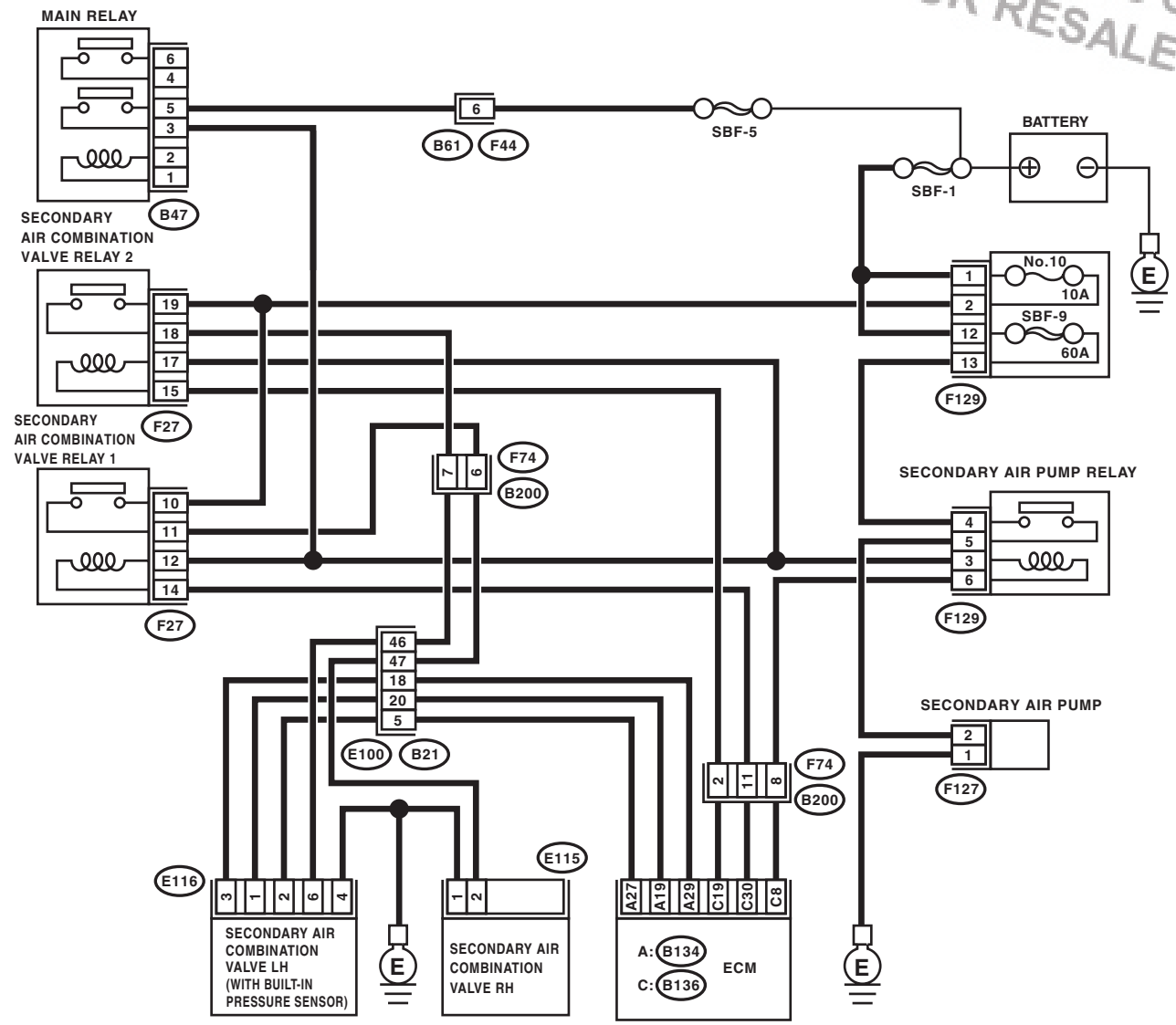
## EI: DTC P2431 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE

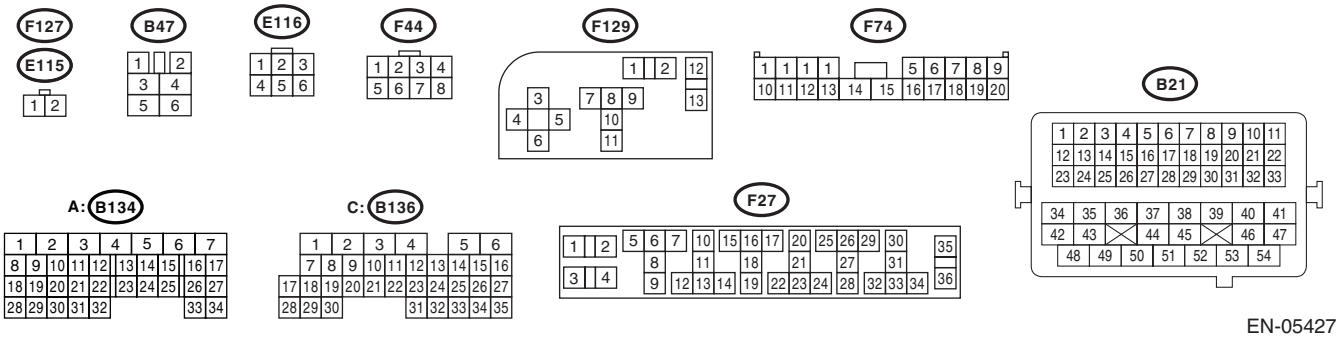
**DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-272, DTC P2431 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**
**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK FOR ANY OTHER DTC ON DISPLAY.** | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4DOTC)(diag)-76, List of Diagnostic Trouble Code (DTC).> | Go to step **2**. |
| 2 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to ON (engine OFF).<br>2) Using the Subaru Select Monitor, read secondary air piping pressure, intake pipe absolute pressure and atmospheric pressure, and compare with the actual atmospheric pressure.<br>NOTE:<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the actual difference with atmospheric pressure 200 mmHg (27 kPa, 8 inHg, 3.9 psig) or more? | Replace the secondary air combination valve LH. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |

## EJ: DTC P2432 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT LOW

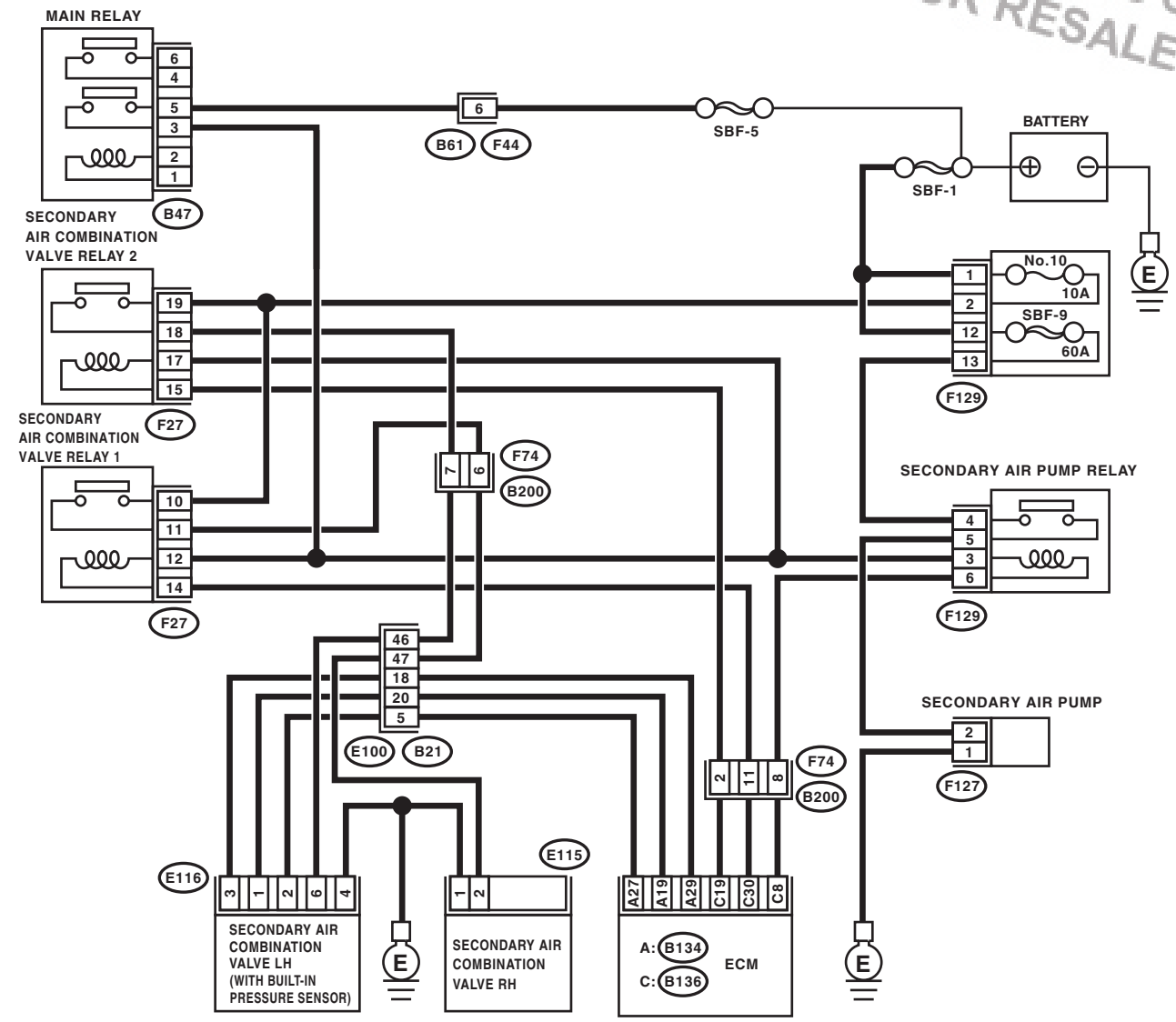
**DTC DETECTING CONDITION:**

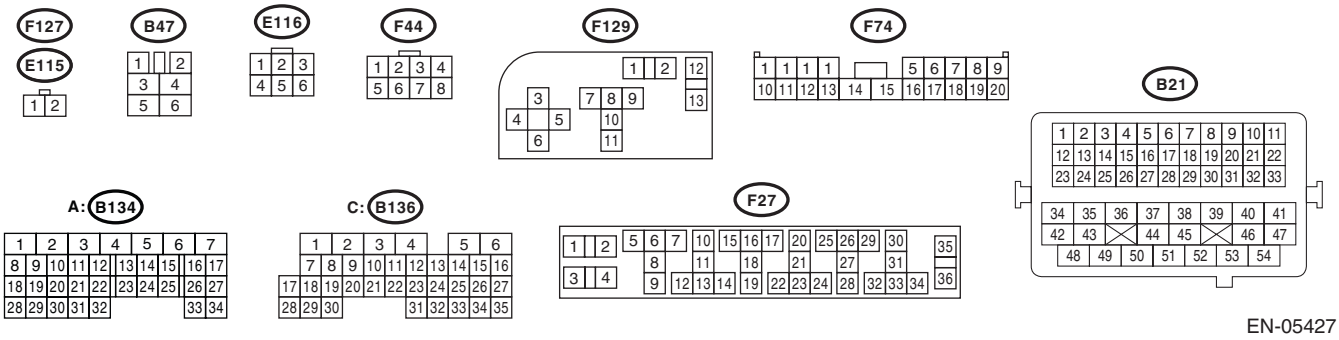
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-273, DTC P2432 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of secondary air pipe pressure signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value less than 53.3 kPa (400 mmHg, 15.8 inHg) ? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK SECONDARY AIR COMBINATION VALVE LH POWER SUPPLY.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the secondary air combination valve LH.<br>3) Turn the ignition switch to ON.<br>4) Measure the voltage between the secondary air combination valve LH connector and chassis ground.<br>***Connector & terminal***<br>***(E116) No. 1 (+) — Chassis ground (–):*** | Is the voltage 4.5 V or more? | Go to step **3**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit in harness between ECM and secondary air combination valve LH connector<br>• Poor contact in ECM connector<br>• Poor contact of coupling connector |
| 3 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connectors from the ECM.<br>3) Measure the resistance of the harness between the ECM and secondary air combination valve LH connector.<br>***Connector & terminal***<br>***(B134) No. 27 — (E116) No. 2:*** | 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 item:<br>• Open circuit in harness between ECM and secondary air combination valve LH connector<br>• Poor contact of coupling connector |
| 4 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.**<br>Measure the resistance between ECM and chassis ground.<br>***Connector & terminal***<br>***(B134) No. 27 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Go to step **5**. | Repair short circuit of the harness to ground between ECM and secondary air combination valve LH connector. |
| 5 | **CHECK POOR CONTACT.**<br>Check for poor contact in the ECM and secondary air combination valve LH connector. | Is there poor contact in the ECM or secondary air combination valve LH connector? | Repair the poor contact in the ECM or secondary air combination valve LH connector. | Replace the secondary air combination valve LH. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> |

## EK:DTC P2433 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT HIGH

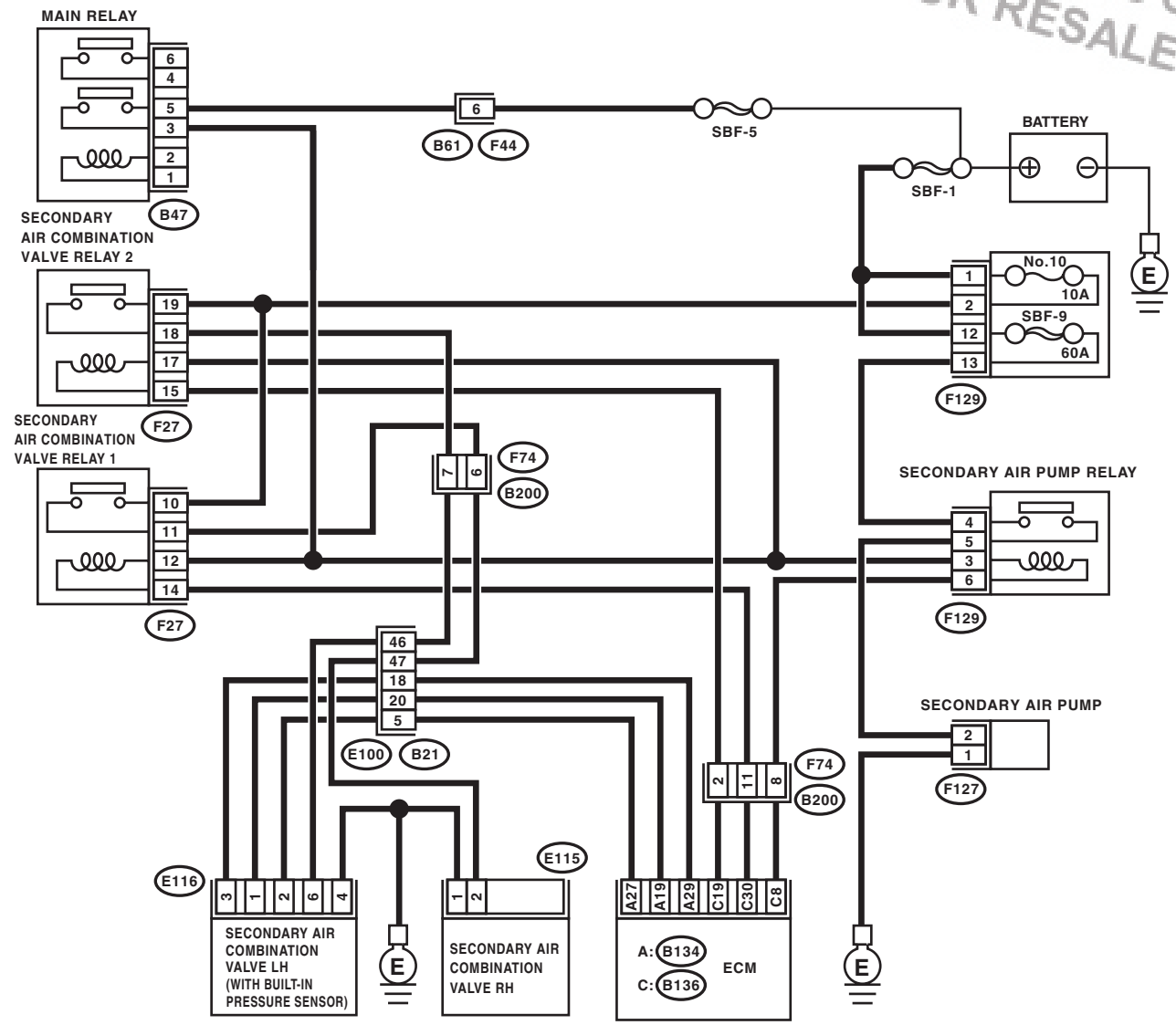
**DTC DETECTING CONDITION:**

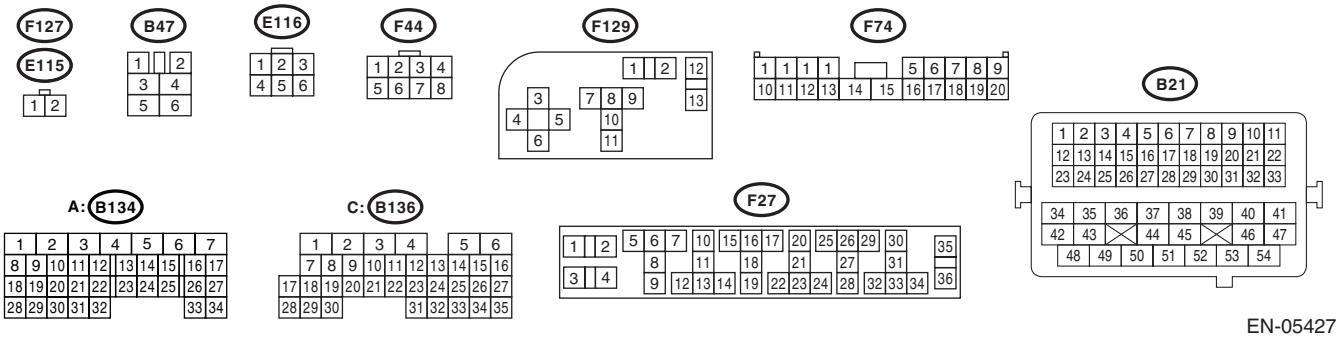
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-274, DTC P2433 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE SENSOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:




EN-05427

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK CURRENT DATA.**<br>1) Turn the ignition switch to ON.<br>2) Read the data of secondary air pipe pressure signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 133.3 kPa (1000 mmHg, 39.4 inHg) or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector from the secondary air combination valve LH.<br>3) Turn the ignition switch to ON.<br>4) Read the data of secondary air pipe pressure signal using the Subaru Select Monitor or general scan tool.<br>NOTE:<br>• Subaru Select Monitor<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.><br>• General scan tool<br>For detailed operation procedure, refer to the general scan tool operation manual. | Is the measured value 133.3 kPa (1000 mmHg, 39.4 inHg) or more? | Repair the short circuit to power in the harness between ECM and secondary air combination valve LH connectors. | Go to step **3**. |
| 3 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance of the harness between the secondary air combination valve LH connector and engine ground.<br>***Connector & terminal***<br>***(E116) No. 4 — Engine ground:*** | Is the resistance less than 5 Ω? | Go to step **4**. | Repair the harness and connector.<br>NOTE:<br>In this case, repair the following item:<br>• Open circuit in harness between ECM and secondary air combination valve LH connector<br>• Poor contact in ECM connector |
| 4 | **CHECK POOR CONTACT.**<br>Check for poor contact of the secondary air combination valve LH connector. | Is there poor contact of the secondary air combination valve LH connector? | Repair the poor contact of the secondary air combination valve RH connector. | Replace the secondary air combination valve LH. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> |

## EL:DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 1)

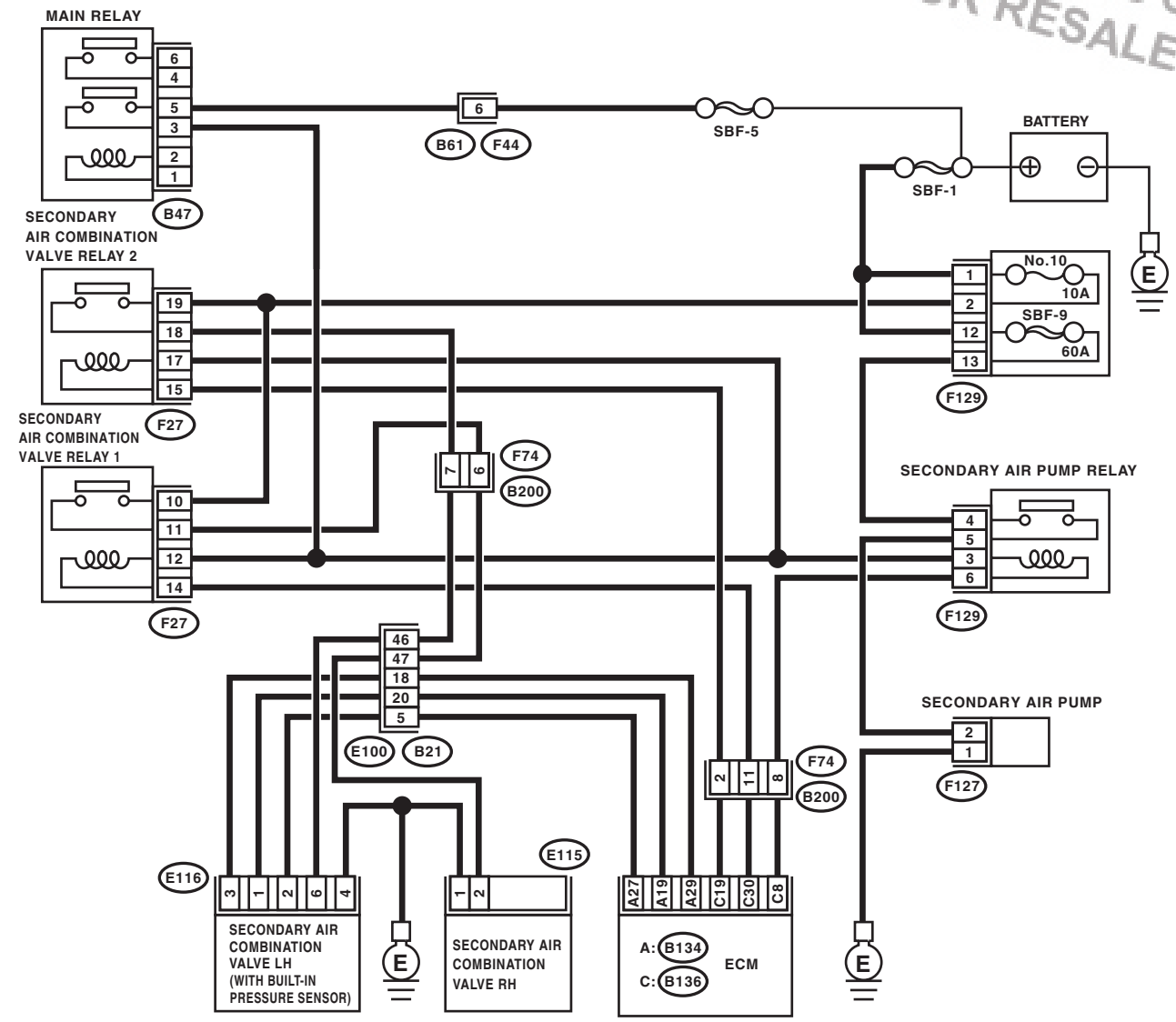
**DTC DETECTING CONDITION:**

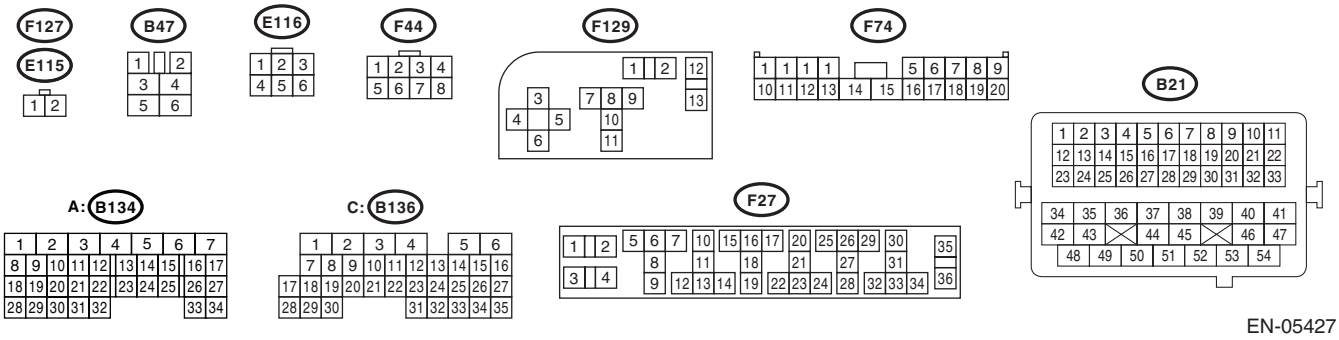
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-275, DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:

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| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SECONDARY AIR COMBINATION VALVE FUSE.**<br>Check if the secondary air combination valve fuse (10 A) is blown out. | Is the fuse blown out? | Go to step **2**. | Go to step **3**. |
| 2 | **CHECK HARNESS BETWEEN FUSE BOX AND SECONDARY AIR COMBINATION VALVE RH.**<br>1) Remove the secondary air combination valve fuse (10 A) from the fuse box.<br>2) Disconnect the connector from the secondary air combination valve RH.<br>3) Measure the resistance between the secondary air combination valve fuse and secondary air combination valve RH connector, and chassis ground.<br>***Connector & terminal***<br>***(F129) No. 2 — Chassis ground:***<br>***(E115) No. 2 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the fuse with a new part, and connect the secondary air combination valve RH connector.<br>Go to step **3**. | Repair short circuit of the harness to ground between the fuse box and the secondary air combination valve RH. |
| 3 | **CHECK SECONDARY AIR COMBINATION VALVE RH OPERATION.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Perform operation check for the secondary air combination valve RH using the Subaru Select Monitor.<br>NOTE:<br>Refer to “Compulsory Valve Operation Check Mode” for more operation procedures. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the secondary air combination valve RH repeatedly switch to ON and OFF? | Go to step **4**. | Go to step **6**. |
| 4 | **CHECK DUCT BETWEEN SECONDARY AIR PUMP AND SECONDARY AIR COMBINATION VALVE RH.**<br>Check the duct between the secondary air pump and secondary air combination valve RH. | Is there damage, clog or disconnection of the duct? | Replace, clean or connect the duct. | Go to step **5**. |
| 5 | **CHECK PIPE BETWEEN SECONDARY AIR COMBINATION VALVE RH AND CYLINDER HEAD.**<br>Check the pipe between the secondary air combination valve RH and cylinder head. | Is there damage, clog or disconnection of the pipe? | Replace, clean or connect the pipe. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 6 | **CHECK POWER SUPPLY TO SECONDARY AIR COMBINATION VALVE RH.**<br>1) Disconnect the connector from the secondary air combination valve RH.<br>2) In the condition of step 3, measure the voltage between the secondary air combination valve RH and the chassis ground.<br>***Connector & terminal***<br>***(E115) No. 2 (+) — Chassis ground (–):*** | Does the voltage repeatedly change between 10 V and 0 V? | Replace the secondary air combination valve RH. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> | Go to step **7**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE RH AND CHASSIS GROUND.**<br>Measure the resistance between the secondary air combination valve RH connector and chassis ground.<br>***Connector & terminal***<br>***(E115) No. 1 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **8**. | Repair the open circuit of harness between secondary air combination valve RH and chassis ground. |
| 8 | **CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE RELAY 1 AND SECONDARY AIR COMBINATION VALVE RH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the secondary air combination valve relay 1 from the relay box.<br>3) Measure the resistance of the harness between the secondary air combination valve relay 1 and secondary air combination valve RH connector.<br>***Connector & terminal***<br>***(F27) No. 11 — (E115) No. 2:*** | Is the resistance less than 1 Ω? | Go to step **9**. | Repair the open circuit of the harness between the secondary air combination valve relay 1 and secondary air combination valve RH connector. |
| 9 | **CHECK SECONDARY AIR COMBINATION VALVE RELAY 1.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the battery to terminals No. 12 and No. 14 of the secondary air combination valve relay 1.<br>3) Measure the resistance between the secondary air combination valve relay 1 terminals.<br>***Terminals***<br>***No. 10 — No. 11:*** | Is the resistance less than 1 Ω? | Go to step **10**. | Replace the secondary air combination valve relay 1. <Ref. to EN(H4DOTC)(diag)-8, Electrical Component Location.> |
| 10 | **CHECK SECONDARY AIR COMBINATION VALVE RELAY 1.**<br>Measure the resistance between the secondary air combination valve relay 1 terminals with the battery disconnected.<br>***Terminals***<br>***No. 10 — No. 11:*** | Is the resistance 1 MΩ or more? | Go to step **11**. | Replace the secondary air combination valve relay 1. <Ref. to EN(H4DOTC)(diag)-8, Electrical Component Location.> |
| 11 | **CHECK SECONDARY AIR COMBINATION VALVE RELAY 1 POWER SUPPLY.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between the secondary air combination valve relay 1 connector and chassis ground.<br>***Connector & terminal***<br>***(F27) No. 10 (+) — Chassis ground (–):***<br>***(F27) No. 12 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **12**. | Repair the open or ground short circuit of power supply circuit. |
| 12 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1 CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector of ECM.<br>3) Measure the resistance of harness between ECM and secondary air combination valve relay 1 connector.<br>***Connector & terminal***<br>***(B136) No. 30 — (F27) No. 14:*** | Is the resistance less than 1 Ω? | Go to step **13**. | Repair the open circuit of harness between ECM and secondary air combination valve relay 1 connector. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 13 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1 CONNECTOR.**<br>Measure the resistance between the secondary air combination valve relay 1 connector and chassis ground.<br>***Connector & terminal***<br>***(F27) No. 14 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Repair poor contact of the ECM connector. | Repair short circuit of the harness to ground between ECM and secondary air combination valve relay 1 connector. |

## EM:DTC P2441 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK CLOSED (BANK 1)

NOTE:
For the diagnostic procedure, refer to DTC P2440. <Ref. to EN(H4DOTC)(diag)-365, DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## EN:DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 2)

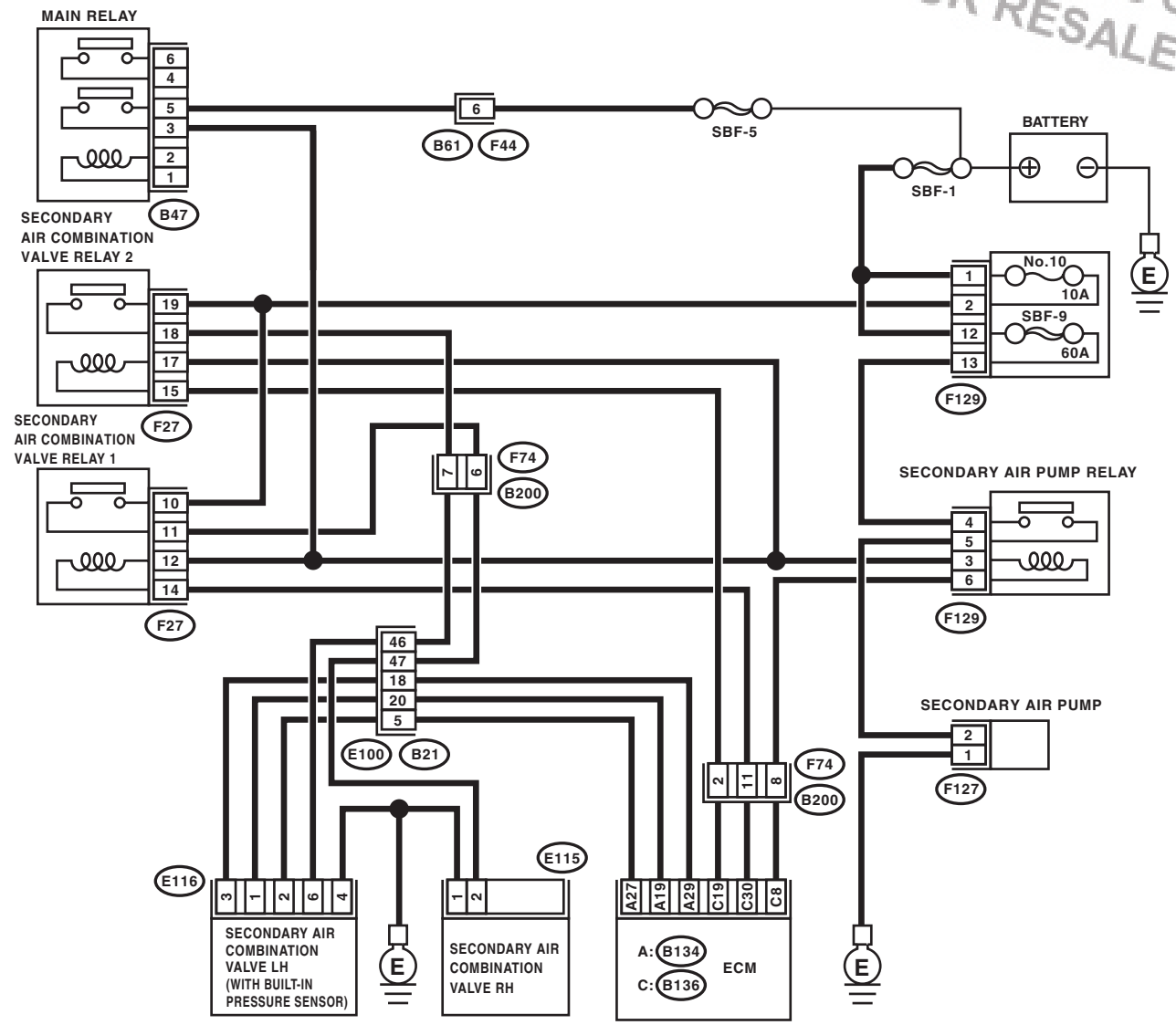
**DTC DETECTING CONDITION:**

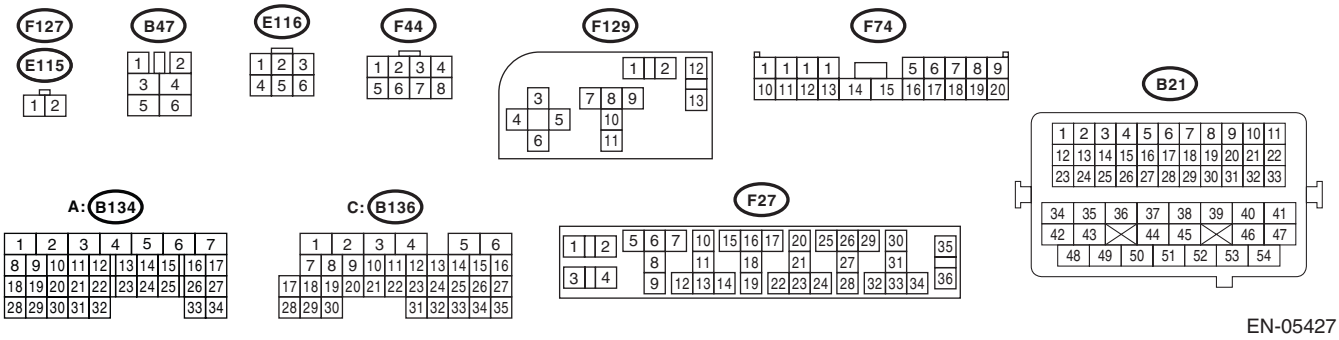
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-275, DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:

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| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SECONDARY AIR COMBINATION VALVE FUSE.**<br>Check if the secondary air combination valve fuse (10 A) is blown out. | Is the fuse blown out? | Go to step **2**. | Go to step **3**. |
| 2 | **CHECK HARNESS BETWEEN FUSE BOX AND SECONDARY AIR COMBINATION VALVE LH.**<br>1) Remove the secondary air combination valve fuse (10 A) from the fuse box.<br>2) Disconnect the connector from the secondary air combination valve LH.<br>3) Measure the resistance between the secondary air combination valve fuse and secondary air combination valve LH connector, and chassis ground.<br>***Connector & terminal***<br>***(F129) No. 2 — Chassis ground:***<br>***(E116) No. 6 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Replace the fuse with a new part, and connect the secondary air combination valve LH connector.<br>Go to step **3**. | Repair short circuit of the harness to ground between the fuse box and the secondary air combination valve LH. |
| 3 | **CHECK SECONDARY AIR COMBINATION VALVE LH OPERATION.**<br>1) Connect the test mode connector.<br>2) Turn the ignition switch to ON.<br>3) Perform operation check for the secondary air combination valve LH using the Subaru Select Monitor.<br>NOTE:<br>Refer to “Compulsory Valve Operation Check Mode” for more operation procedures. <Ref. to EN(H4DOTC)(diag)-54, Compulsory Valve Operation Check Mode.> | Does the secondary air combination valve LH repeatedly switch to ON and OFF? | Go to step **4**. | Go to step **6**. |
| 4 | **CHECK DUCT BETWEEN SECONDARY AIR PUMP AND SECONDARY AIR COMBINATION VALVE LH.**<br>Check the duct between the secondary air pump and secondary air combination valve LH. | Is there damage, clog or disconnection of the duct? | Replace, clean or connect the duct. | Go to step **5**. |
| 5 | **CHECK PIPE BETWEEN SECONDARY AIR COMBINATION VALVE LH AND CYLINDER HEAD.**<br>Check the pipe between the secondary air combination valve LH and cylinder head. | Is there damage, clog or disconnection of the pipe? | Replace, clean or connect the pipe. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 6 | **CHECK POWER SUPPLY TO SECONDARY AIR COMBINATION VALVE LH.**<br>1) Disconnect the connector from the secondary air combination valve LH.<br>2) In the condition of step 3, measure the voltage between the secondary air combination valve LH and the chassis ground.<br>***Connector & terminal***<br>***(E116) No. 6 (+) — Chassis ground (–):*** | Does the voltage repeatedly change between 10 V and 0 V? | Replace the secondary air combination valve LH. <Ref. to EC(H4DOTC)-10, Secondary Air Combination Valve.> | Go to step **7**. |

| | Step | Check | Yes | No |
|---|---|---|---|---|
| 7 | **CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE LH AND CHASSIS GROUND.**<br>Measure the resistance between the secondary air combination valve LH connector and chassis ground.<br>***Connector & terminal***<br>***(E116) No. 4 — Chassis ground:*** | Is the resistance less than 5 Ω? | Go to step **8**. | Repair the open circuit of harness between secondary air combination valve LH and chassis ground. |
| 8 | **CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE RELAY 2 AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the secondary air combination valve relay 2 from the relay box.<br>3) Measure the resistance of the harness between the secondary air combination valve relay 2 and secondary air combination valve LH connector.<br>***Connector & terminal***<br>***(F27) No. 18 — (E116) No. 6:*** | Is the resistance less than 1 Ω? | Go to step **9**. | Repair the open circuit of the harness between the secondary air combination valve relay 2 and secondary air combination valve LH connector. |
| 9 | **CHECK SECONDARY AIR COMBINATION VALVE RELAY 2.**<br>1) Turn the ignition switch to OFF.<br>2) Connect the battery to terminals No. 15 and No. 17 of the secondary air combination valve relay 2.<br>3) Measure the resistance between the secondary air combination valve relay 2 terminals.<br>***Terminals***<br>***No. 18 — No. 19:*** | Is the resistance less than 1 Ω? | Go to step **10**. | Replace the secondary air combination valve relay 2. |
| 10 | **CHECK SECONDARY AIR COMBINATION VALVE RELAY 2.**<br>Measure the resistance between the secondary air combination valve relay 2 terminals with the battery disconnected.<br>***Terminals***<br>***No. 18 — No. 19:*** | Is the resistance 1 MΩ or more? | Go to step **11**. | Replace the secondary air combination valve relay 2. |
| 11 | **CHECK SECONDARY AIR COMBINATION VALVE RELAY 2 POWER SUPPLY.**<br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between the secondary air combination valve relay 2 connector and chassis ground.<br>***Connector & terminal***<br>***(F27) No. 19 (+) — Chassis ground (–):***<br>***(F27) No. 17 (+) — Chassis ground (–):*** | Is the voltage 10 V or more? | Go to step **12**. | Repair the open or ground short circuit of power supply circuit. |
| 12 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2 CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Disconnect the connector of ECM.<br>3) Measure the resistance of harness between ECM and secondary air combination valve relay 2 connector.<br>***Connector & terminal***<br>***(B136) No. 19 — (F27) No. 15:*** | Is the resistance less than 1 Ω? | Go to step **13**. | Repair the open circuit of harness between ECM and secondary air combination valve relay 2 connector. |

| Step | | Check | Yes | No |
|---|---|---|---|---|
| 13 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2 CONNECTOR.**<br>Measure the resistance between the secondary air combination valve relay 2 connector and chassis ground.<br>***Connector & terminal***<br>***(F27) No. 15 — Chassis ground:*** | Is the resistance 1 MΩ or more? | Repair poor contact of the ECM connector. | Repair short circuit of the harness to ground between ECM and secondary air combination valve relay 2 connector. |

## EO:DTC P2443 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK CLOSED (BANK 2)

NOTE:
For the diagnostic procedure, refer to DTC P2442. <Ref. to EN(H4DOTC)(diag)-370, DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## EP:DTC P2444 SECONDARY AIR INJECTION SYSTEM PUMP STUCK ON

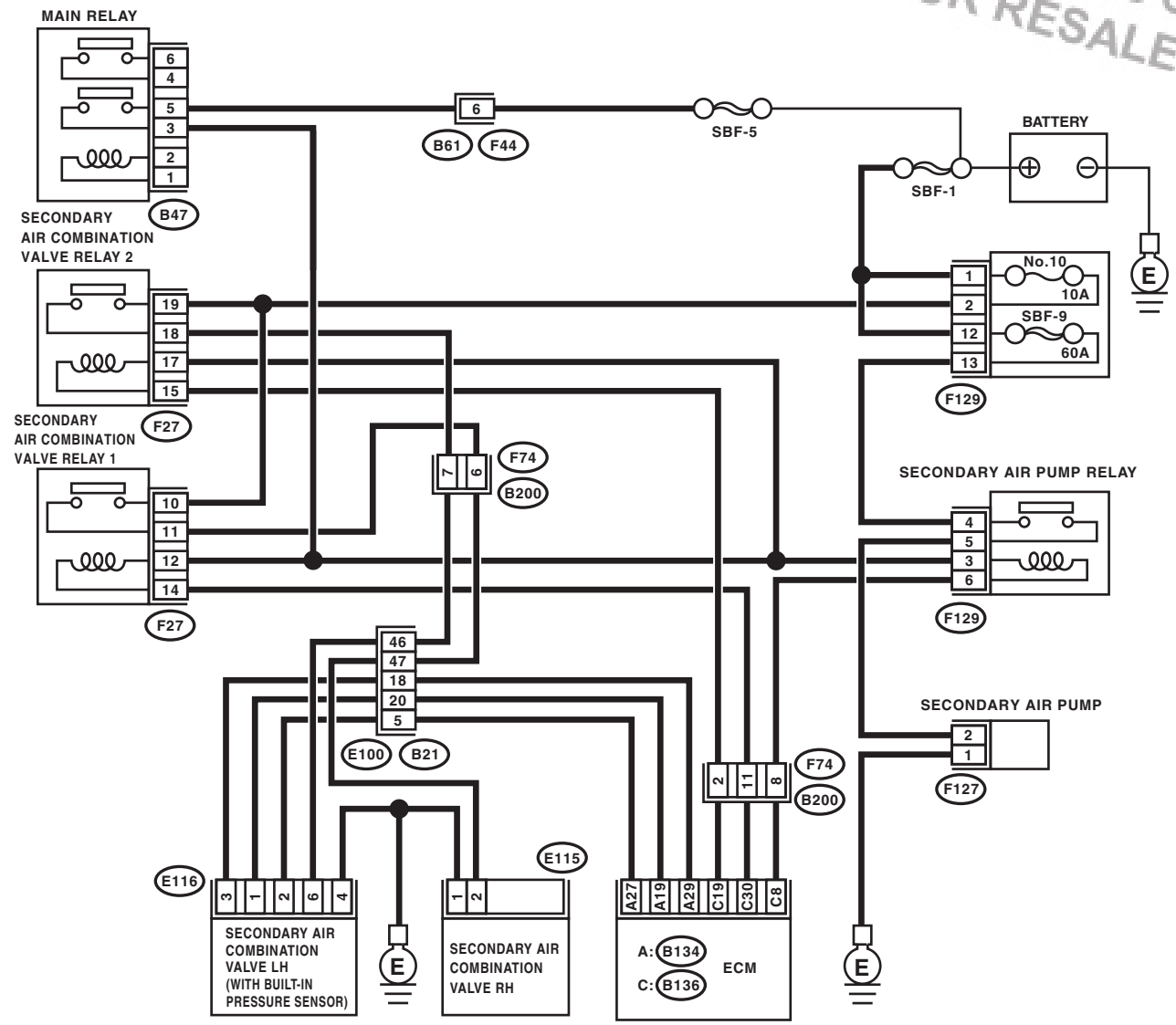
**DTC DETECTING CONDITION:**

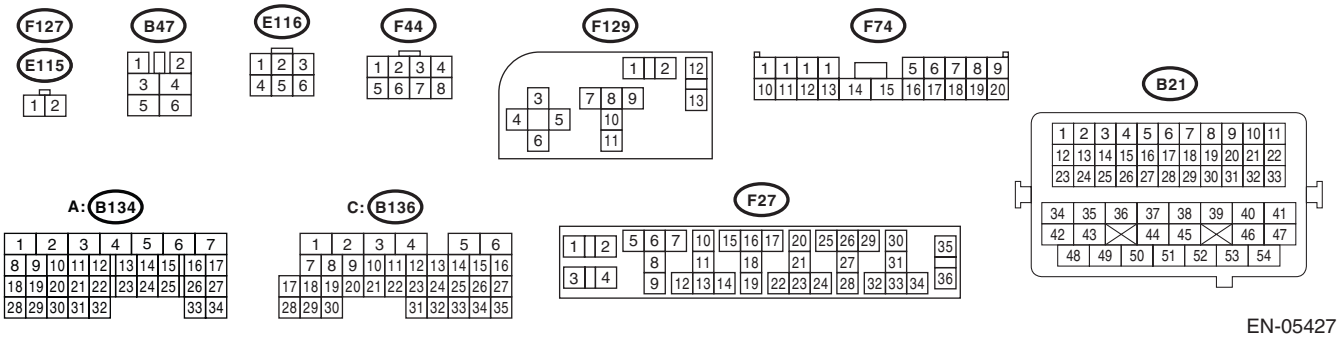
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-276, DTC P2444 SECONDARY AIR INJECTION SYSTEM PUMP STUCK ON, Diagnostic Trouble Code (DTC) Detecting Criteria.>

**CAUTION:**

**After repairing or replacing the defective parts, perform the Clear Memory Mode <Ref. to EN(H4DOTC)(diag)-53, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)(diag)-43, PROCEDURE, Inspection Mode.>.**

## WIRING DIAGRAM:

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| | Step | Check | Yes | No |
|---|---|---|---|---|
| 1 | **CHECK SECONDARY AIR PIPE PRESSURE.**<br>1) Turn the ignition switch to ON.<br>2) Using the Subaru Select Monitor, read secondary air piping pressure data, and compare with the actual barometric pressure.<br>NOTE:<br>For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> | Is the actual difference with atmospheric pressure 50 mmHg (6.7 kPa, 2.0 inHg, 0.97 psig) or more? | Go to step **2**. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check.<br>NOTE:<br>In this case, there may be a temporary connector contact failure. |
| 2 | **CHECK SECONDARY AIR PUMP.**<br>1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F).<br>2) Check whether or not the secondary air pump is operating. | Is the secondary air pump operating? | Go to step **3**. | Replace the secondary air combination valve LH. <Ref. to EC(H4DOTC)-10, INSPECTION, Secondary Air Combination Valve.> |
| 3 | **CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY CONNECTOR.**<br>1) Turn the ignition switch to OFF.<br>2) Remove the secondary air pump relay from the relay box.<br>3) Measure the resistance between the secondary air pump relay connector and engine ground terminals.<br>***Connector & terminal***<br>***(F129) No. 6 — Engine ground:*** | Is the resistance 1 MΩ or more? | Go to step **4**. | Repair short circuit of the harness to ground between ECM and secondary air pump relay connector. |
| 4 | **CHECK SECONDARY AIR PUMP RELAY.**<br>Measure the resistance between the secondary air pump relay terminals.<br>***Terminals***<br>***No. 4 — No. 5:*** | Is the resistance 1 MΩ or more? | Repair the short circuit to power in the harness between secondary air pump relay and secondary air pump connector. | Replace the secondary air pump relay. <Ref. to EN(H4DOTC)(diag)-8, Electrical Component Location.> |

# 19.General Diagnostic Table

## A: INSPECTION

NOTE:
Malfunction of parts other than those listed is also possible. <Ref. to ME(H4DOTC)-94, 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, hesitates, or sputters 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. Surging | 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.