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NOT FOR RESALE

ENGINE (DIAGNOSTICS)

1. Basic Diagnostic Procedure

A: PROCEDURE

1. ENGINE

| ENG | Basic Diaç | gnostic Procedure | tovo | | |
|------|--|---|--|--|-------|
| 1. | Basic Diagnostic Procedure | gnostic Procedure | TFORR | V Eris Stu | ldios |
| 1. 1 | ENGINE | | | LE | |
| | Step | Check | Yes | No | |
| 1 | CHECK ENGINE START FAILURE. 1) Ask the customer when and how the trouble occurred using the interview check list. <ref. check="" check,="" en(h4dotc)(diag)-3,="" for="" interview.="" list="" to=""> 2) Start the engine.</ref.> | Does the engine start? | Go to step 2. | Inspection using "Diagnostics for Engine Start Failure". <ref. -64,="" diagnostics="" en(h4dotc)(diag)="" engine="" failure.="" for="" starting="" to=""></ref.> | |
| 2 | CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT. | Does the malfunction indicator light illuminate? | Go to step 3. | Inspection using "General Diagnostic Table". <ref. -378,="" diagnostic="" en(h4dotc)(diag)="" general="" table.="" to=""></ref.> | |
| 3 | CHECK INDICATION OF DTC ON SCREEN. 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or general scan tool to data link connector. 3) Turn the ignition switch to ON, and run the Subaru Select Monitor or general scan tool. 4) Read the DTC on Subaru Select Monitor or general scan tool. | Is DTC displayed on the Subaru Select Monitor or general scan tool? | Record the DTC. Repair the trouble cause. <ref. (dtc).="" -76,="" code="" diag-="" en(h4dotc)(diag)="" list="" nostic="" of="" to="" trouble=""> Go to step 4.</ref.> | Repair the related parts. NOTE: If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnosis of malfunction indicator light circuit or combination meter. <ref. en(h4dotc)(diag)-55,="" indicator="" light.="" malfunction="" to=""></ref.> | |
| 4 | PERFORM DIAGNOSIS. 1) Perform the Clear Memory Mode. <ref. clear="" en(h4dotc)(diag)-53,="" memory="" mode.="" to=""> 2) Perform the Inspection Mode. <ref. en(h4dotc)(diag)-43,="" inspection="" mode.="" to=""></ref.></ref.> | Is DTC displayed on the Subaru Select Monitor or general scan tool? | Inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -83,="" code="" diagnostic="" en(h4dotc)(diag)="" procedure="" to="" trouble="" with=""></ref.> | | |

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 Cloudy Rainy Snowy Various/Others: | | |
| Ambient air temperature | °C (°F) | | |
| | Hot Warm Cool Cold | | |
| Place | Highway Suburbs Inner city Uphill Downhill Rough road Others: | | |
| Engine temperature | Cold Warming-up After warming-up Any temperature Others: | | |
| Engine speed | rpm | | |
| Vehicle speed | MPH | | |
| Driving conditions | Not affected At starting While idling At racing While accelerating While cruising While decelerating 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 | СВ | ON/OFF |
| Rear wiper | ON/OFF | | |

Check List for Interview

2. CHECK LIST NO. 2
Check the following item about the vehicle's state when malfunction indicator light illuminates Studios

Use copies of this page for interviewing customers.

| a) Other warning lights or indicators illuminate. Yes / No |
|--|
| Low fuel warning light |
| Charge indicator light |
| AT diagnostic indicator light |
| ABS warning light |
| Oil pressure indicator light |
| b) Fuel level |
| Lack of gasoline: Yes / No |
| Indicator position of fuel gauge: |
| 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: |
| Where: |
| f) Occurrence of noise: Yes / No |
| From where: |
| What kind: |
| g) Occurrence of smell: Yes / No |
| From where: |
| What kind: |
| h) Intrusion of water into engine compartment or passenger compartment: |
| i) Troubles occurred |
| ☐ Engine does not start. |
| Engine stalls during idling. |
| Engine stalls while driving. |
| Engine speed decreases. |
| Engine speed does not decrease. |
| Rough idling |
| Poor acceleration |
| Back fire |
| After fire |
| Does not shift. |
| Excessive shift shock |

3. General Description

A: CAUTION

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

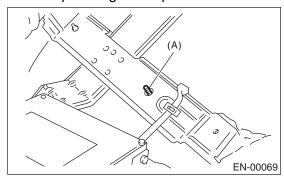
CAUTION:

- 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:

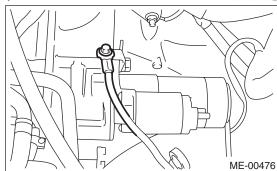
When replacing the ECM, be careful not to use the wrong spec. ECM to avoid any damage on the fuel injection system.

- 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 selfdiagnosis 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.

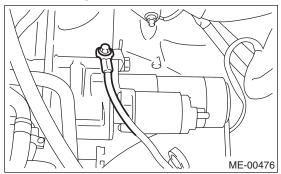
Standard voltage: 12 V

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 onboard 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

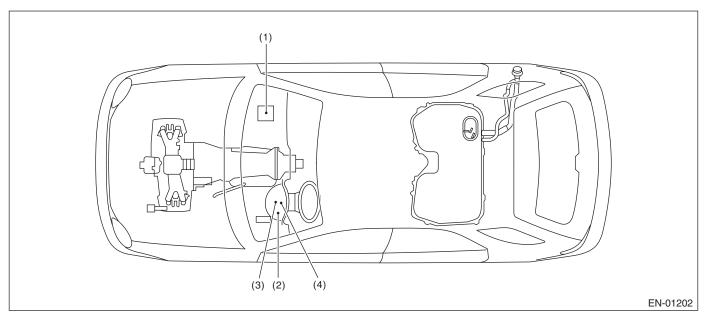
| General Description | | | | | | | | |
|---------------------|-------------|------------------------------|---|------|--|--|--|--|
| D: PREPARATION T | OOL | | NOT FOR DY Eris St. | | | | | |
| ILLUSTRATION | TOOL NUMBER | DESCRIPTION | REMARKS | dios | | | | |
| | 1B020XU0 | SUBARU SELECT MONITOR KIT | Used for troubleshooting the electrical system. | | | | | |
| ST1B020XU0 | | | | | | | | |

4. Electrical Component Location

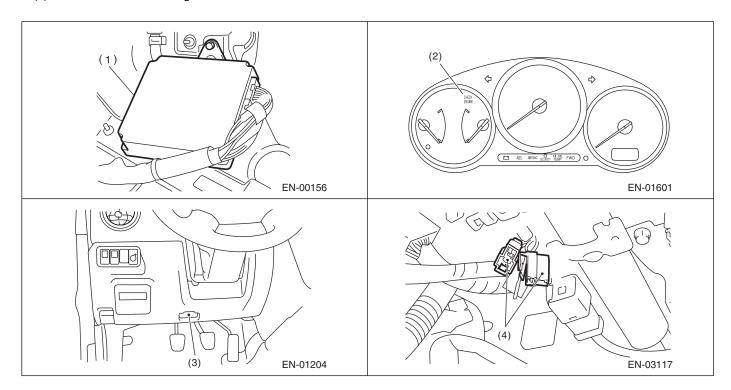
A: LOCATION

1. ENGINE

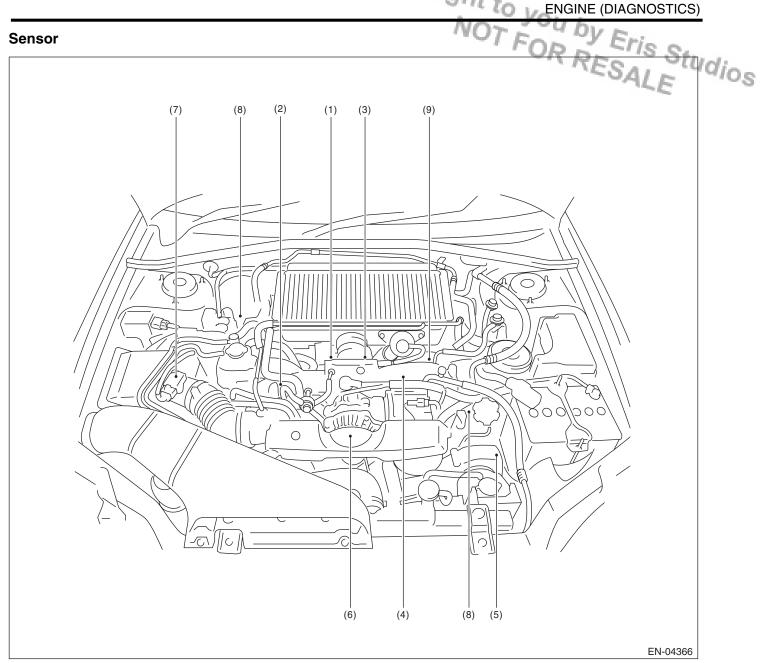
Control module



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

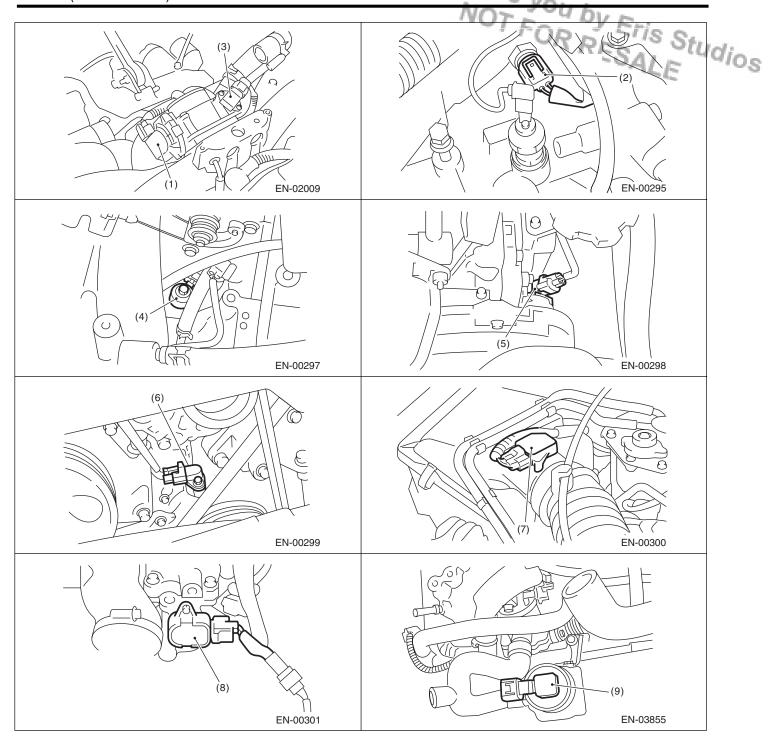


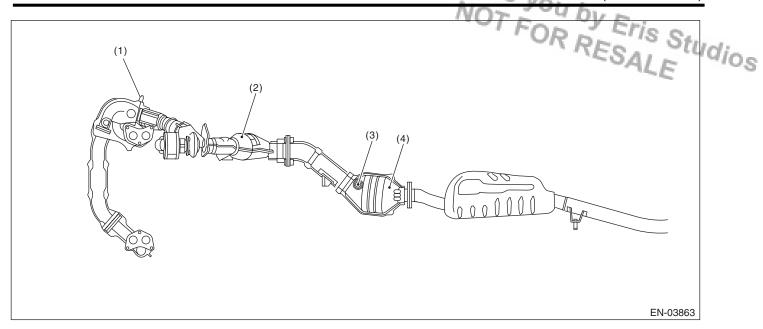
Sensor



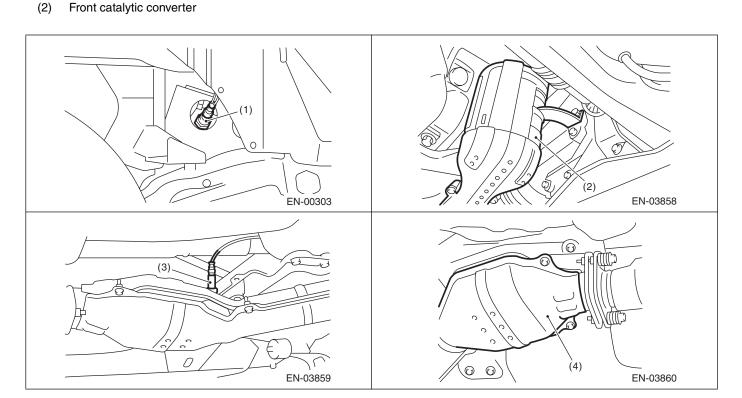
- (1) Electronic throttle control
- (2) Engine coolant temperature sensor
- (3)Manifold absolute pressure sensor
- (4) Knock sensor

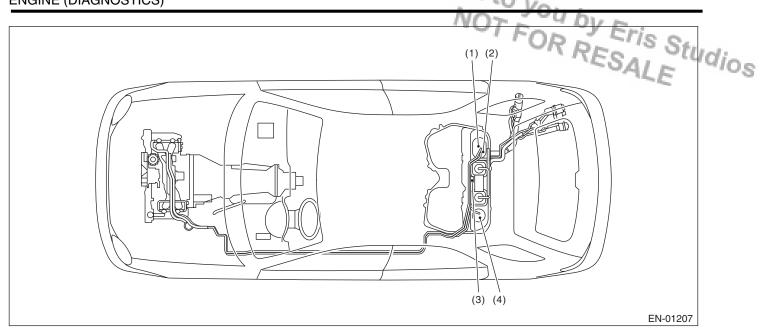
- (5) Camshaft position sensor
- (6) Crankshaft position sensor
- (7) Mass air flow and intake air temperature sensor
- (8) Tumble generator valve position sensor
- (9) Secondary air pressure sensor





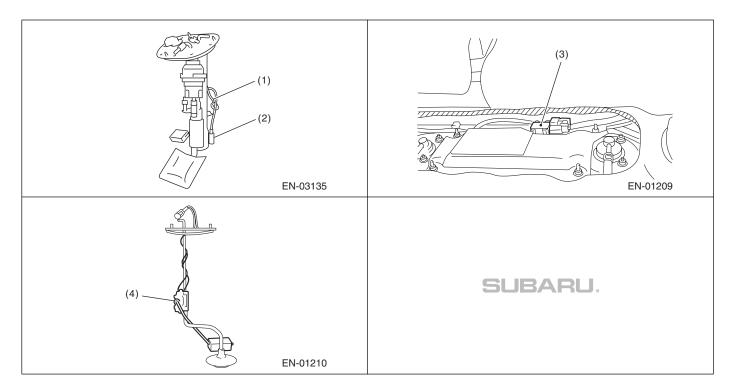
- (1) Front oxygen (A/F) sensor
- (3) Rear oxygen sensor
- (4) Rear catalytic converter



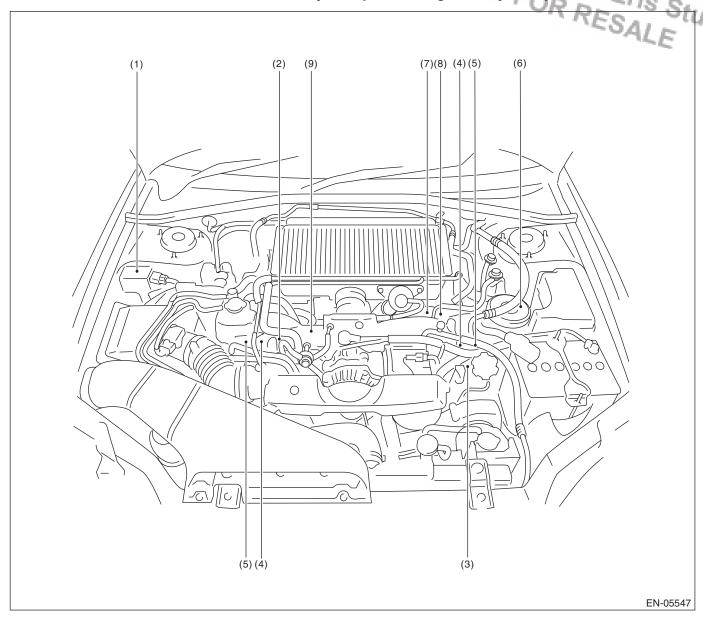


- (1) Fuel level sensor
- (3) Fuel tank pressure sensor
- (4) Fuel sub level sensor

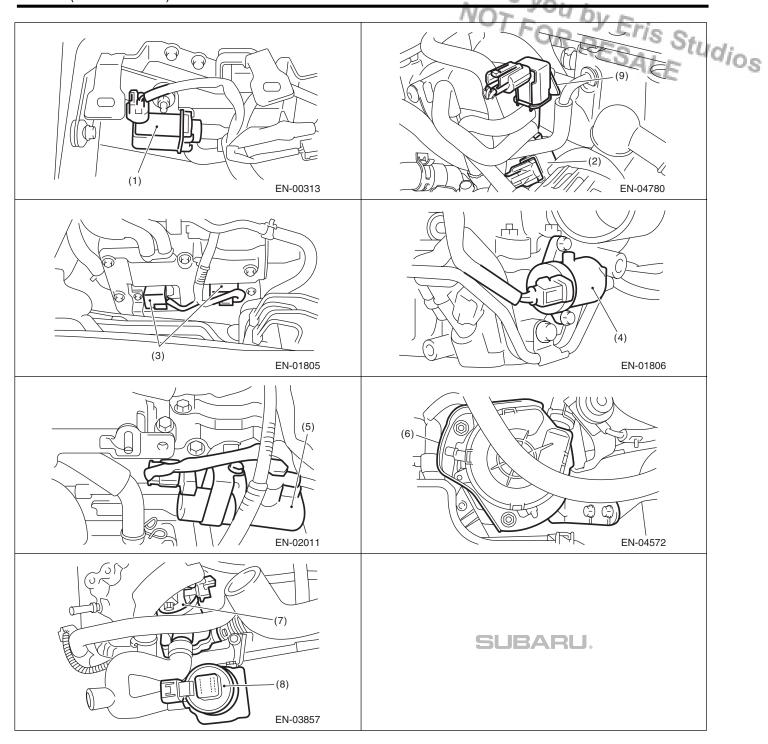
(2) Fuel temperature sensor

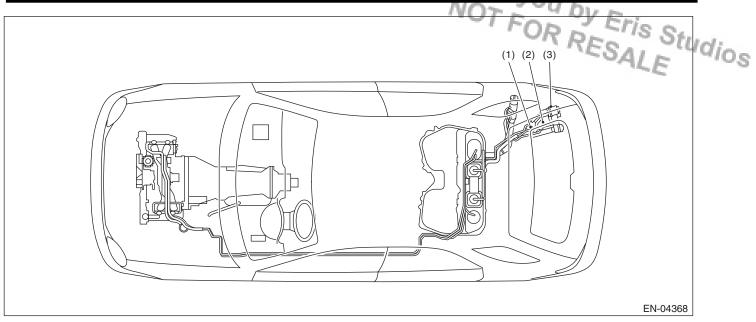


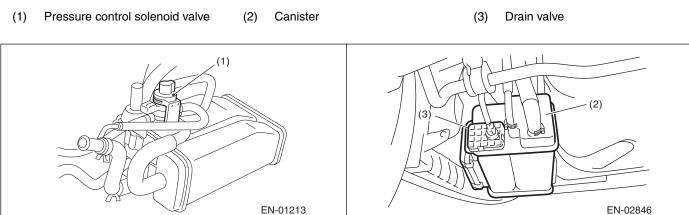
Solenoid valve, actuator, emission control system parts and ignition system parts



- (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

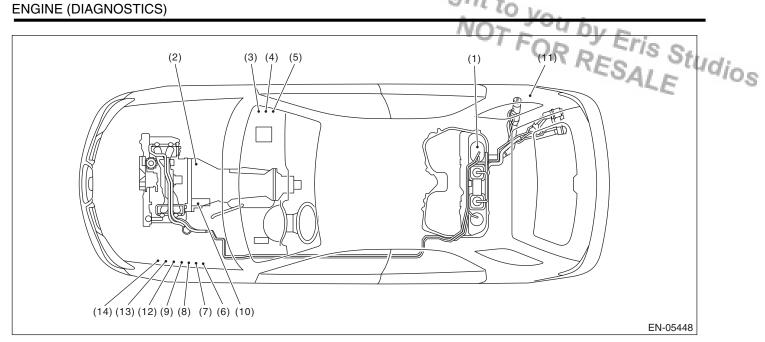




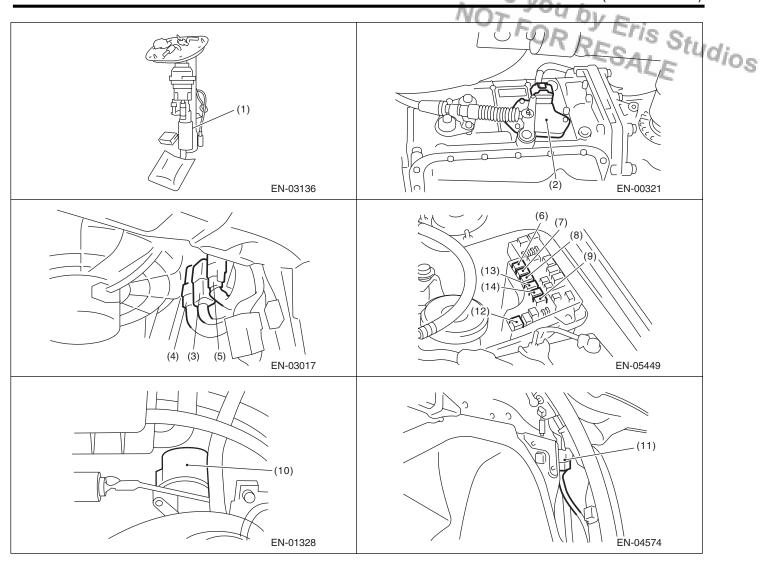


Electrical Component Location

ENGINE (DIAGNOSTICS)

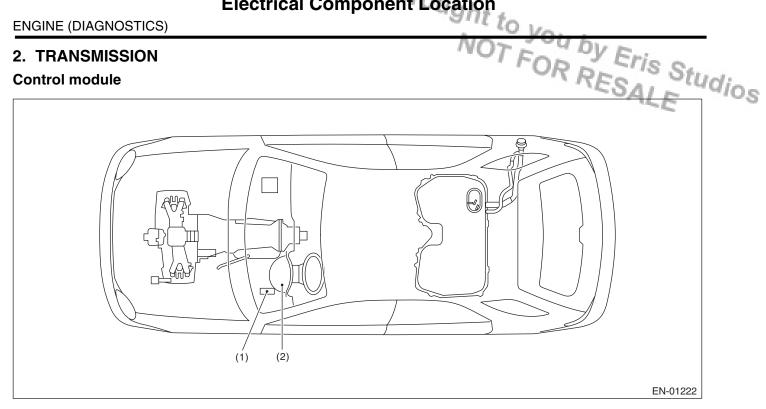


- (1) Fuel pump
- (2) Inhibitor switch
- (3) Main relay
- (4) Fuel pump relay
- (5) Electronic throttle control relay
- Radiator main fan relay 1 (6)
- (7) Radiator main fan relay 2
- (8) Radiator sub fan relay 1
- (9) Radiator sub fan relay 2
- (10)Starter
- (11) Fuel pump controller
- (12)Secondary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

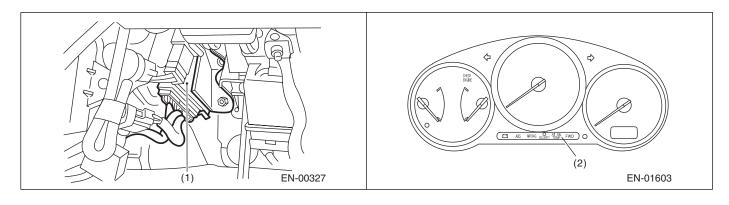


2. TRANSMISSION

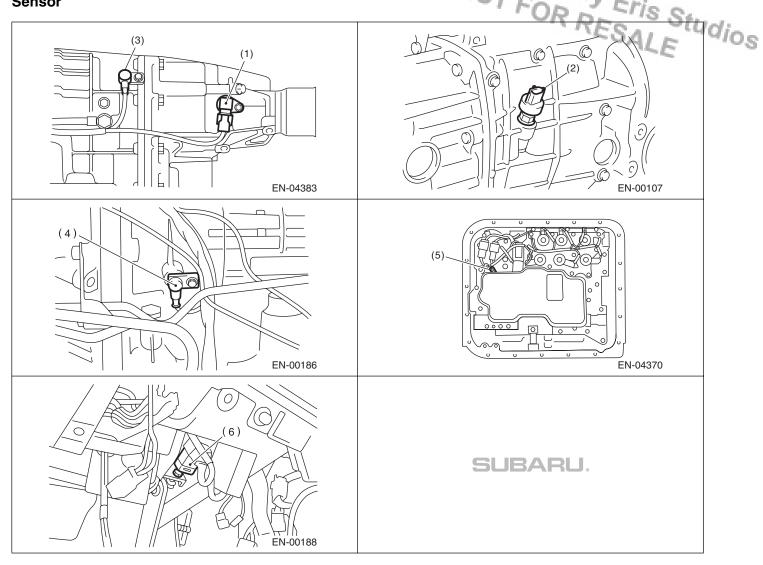
Control module



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

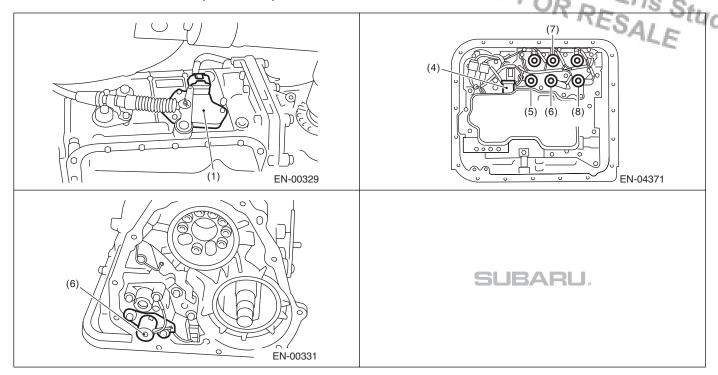


Sensor



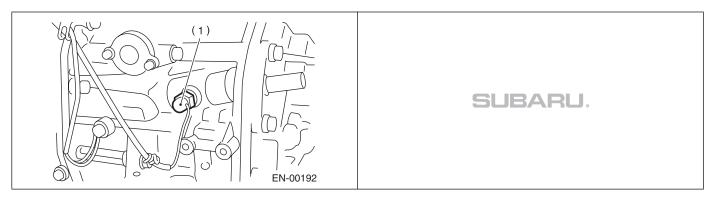
- (1) Rear vehicle speed sensor (AT model)
- (2) Front vehicle speed sensor (MT model)
- (3) Front vehicle speed sensor (AT model)
- (4) Torque converter turbine speed sensor (AT model)
- (5) ATF temperature sensor (AT model)
- (6) Brake light switch

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

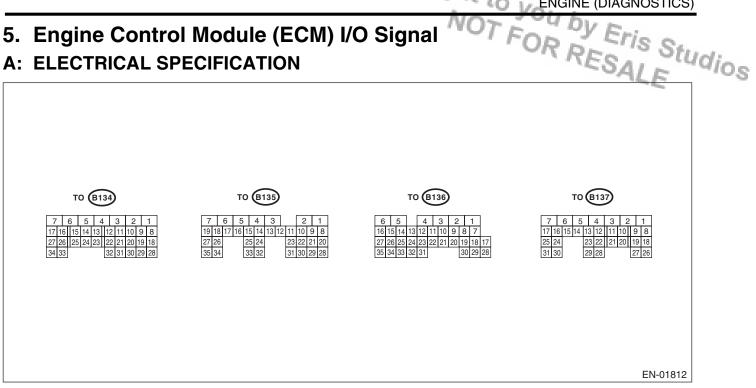
Solenoid valve and switch (MT model)



(1) Neutral position switch

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

A: ELECTRICAL SPECIFICATION



| | | | - | Sign | al (V) | |
|------------------------------|---------------|------------------|--------------|-----------------------------|------------------------------|--|
| Desc | ription | Connector No. | Terminal No. | Ignition SW ON (engine OFF) | Engine ON (idling) | Note |
| Crankshaft | Signal (+) | B134 | 13 | 0 | -7 +7 | Sensor output waveform |
| position sen- | Signal (-) | B134 | 14 | 0 | 0 | _ |
| sor | Shield | B134 | 24 | 0 | 0 | _ |
| | Signal | B135 | 4 | 0 | 0 — 0.9 | _ |
| Rear oxy- gen sensor | Shield | B135 | 1 | 0 | 0 | _ |
| gen sensor | GND (sensor) | B135 | 30 | 0 | 0 | _ |
| Frontoxygen | Signal 1 | B136 | 3 | 0 — 1.0 | _ | Sensor output waveform |
| (A/F) sensor heater | Signal 2 | B136 | 2 | 0 — 1.0 | _ | Sensor output waveform |
| Rear oxygen signal | sensor heater | B136 | 4 | 0 — 1.0 | _ | Sensor output waveform |
| Engine cool- | Signal | B134 | 34 | 1.0 — 1.4 | 1.0 — 1.4 | After engine is warmed-up. |
| ant tempera- ture sensor | GND (sensor) | B134 | 29 | 0 | 0 | After engine is warmed-up. |
| Vehicle speed | l signal | B136 | 13 | 0 or 5 | 0 or 5 | "5" and "0" are repeatedly displayed when vehicle is driven. |
| A : | Signal | B135 | 26 | _ | 0.3 — 4.5 | _ |
| Air flow sen- sor | Shield | B135 | 35 | 0 | 0 | _ |
| 301 | GND | B135 | 34 | 0 | 0 | _ |
| Intake air tem sor signal | perature sen- | B135 | 18 | 0.3 — 4.6 | 0.3 — 4.6 | _ |
| Tumble gen- erator valve | Signal | B134 | 26 | | d: 3.8 — 4.9 d: 0.2 — 0.9 | _ |
| position sen- | Power supply | B134 | 19 | 5 | 5 | _ |
| sor RH | GND (sensor) | B134 | 29 | 0 | 0 | _ |
| Tumble gen- erator valve | Signal | B134 | 16 | | d: 3.8 — 4.9 d: 0.2 — 0.9 | _ |
| position sen- | Power supply | B134 | 19 | 5 | 5 | _ |
| sor LH | GND (sensor) | B134 | 29 | 0 | 0 | _ |

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

| | | | | Signa | al (V) | by Fri- |
|-----------------------------|------------------|------------------|-----------------|---------------------------------|---------------------------------|---|
| Desc | cription | Connector No. | Terminal No. | Ignition SW ON (engine OFF) | Engine ON (idling) | R RENote Stu |
| Tumble gener (open) | ator valve RH | B137 | 22 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Tumble gener (closed) | ator valve RH | B137 | 23 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Tumble gener (open) | ator valve LH | B137 | 12 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Tumble gener (closed) | ator valve LH | B137 | 13 | 0 or 10 — 13 | 0 or 12 — 14 | Sensor output waveform |
| Wastegate co valve | ntrol solenoid | 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 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| Ignition switch | 1 | B135 | 19 | 10 — 13 | 12 — 14 | _ |
| Neutral position | on switch | B136 | 31 | ON: 10 — 13 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| Test mode co | nnector | B135 | 27 | 10 — 13 | 12 — 14 | When connected: 0 |
| Knock sen- | Signal | B134 | 15 | 2.8 | 2.8 | _ |
| sor | Shield | B134 | 25 | 0 | 0 | _ |
| Back-up powe | er supply | B135 | 5 | 10 — 13 | 12 — 14 | Ignition switch "OFF": 10 — 13 |
| Control modu | le power sup- | B134 | 7 | 10 — 13 | 12 — 14 | _ |
| ply | | B135 | 2 | 10 — 13 | 12 — 14 | _ |
| Sensor power | supply | B134 | 19 | 5 | 5 | _ |
| • | #1 | B137 | 18 | 0 | 12 — 14 | Waveform |
| Ignition con- | #2 | B137 | 19 | 0 | 12 — 14 | Waveform |
| trol | #3 | B137 | 20 | 0 | 12 — 14 | Waveform |
| | #4 | B137 | 21 | 0 | 12 — 14 | Waveform |
| | #1 | B137 | 8 | 10 — 13 | 1 — 14 | Waveform |
| | #2 | B137 | 9 | 10 — 13 | 1 — 14 | Waveform |
| Fuel injector | #3 | B137 | 10 | 10 — 13 | 1 — 14 | Waveform |
| | #4 | B137 | 11 | 10 — 13 | 1 — 14 | Waveform |
| Fuel pump | Signal 1 | B136 | 12 | 0 or 5 | 0 or 5 | _ |
| control unit | Signal 2 | B135 | 33 | 10 — 13 | 12 — 14 | _ |
| A/C relay con | trol | B136 | 9 | ON: 0.5 or less OFF: 10 — 13 | ON: 0.5 or less OFF: 12 — 14 | _ |
| Radiator fan r | elay 1 control | B136 | 18 | ON: 0.5 or less OFF: 10 — 13 | ON: 0.5 or less OFF: 12 — 14 | _ |
| Radiator fan r | elay 2 control | B136 | 29 | ON: 0.5 or less OFF: 10 — 13 | ON: 0.5 or less OFF: 12 — 14 | Model with A/C only |
| Malfunction indicator light | | B136 | 11 | _ | _ | Light "ON": 1 or less 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 OFF: 10 — 13 | ON: 1 or less OFF: 12 — 14 | Sensor output waveform |
| Purge control | solenoid valve 2 | B136 | 7 | ON: 1 or less OFF: 10 — 13 | ON: 1 or less OFF: 12 — 14 | Sensor output waveform |
| Manifold | Signal | B134 | 6 | 1.7 — 2.4 | 1.1 — 1.6 | |
| absolute | Power supply | B134 | 19 | 5 | 5 | _ |
| pressure sensor | GND (sensor) | B134 | 29 | 0 | 0 | |

| | | Engine | Contro | l Module (EC | wijiyo signal | ENGINE (DIAGNOSTICS) |
|-------------------------------------|------------------|------------------|-----------------|-----------------------------------|--|--|
| | | | | | NOS | DIV D |
| Desc | cription | Connector No. | Terminal No. | Ignition SW ON | al (V) Engine ON | R RENote Stu |
| | Signal | B135 | 32 | (engine OFF) 2.3 — 2.7 | (idling) 2.3 — 2.7 | Valve operates after remov- |
| Fuel tank | | | | | | ing fuel filler cap and install- |
| pressure sensor | Power supply | B135 | 22 | 5 | 5 | ing again. |
| | GND (sensor) | B135 | 30 | 0 | 0 | _ |
| Pressure con valve | trol solenoid | B136 | 28 | ON: 1 or less OFF: 10 — 13 | ON: 1 or less OFF: 12 — 14 | _ |
| Drain valve | | B136 | 17 | ON: 1 or less OFF: 10 — 13 | ON: 1 or less OFF: 12 — 14 | _ |
| Fuel level ser | nsor | B135 | 10 | 0.12 — 4.75 | 0.12 — 4.75 | _ |
| Fuel tempera nal | ture sensor sig- | B135 | 17 | 2.5 — 3.8 | 2.5 — 3.8 | Ambient temperature: 25°C (77°F) |
| Blow-by leak nal | diagnosis sig- | B134 | 30 | 0 | 0 | At the time of open circuit (fault): 5 |
| Small light sw | vitch | B135 | 15 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Blower fan sw | vitch | B135 | 16 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Rear defogge | er switch | B135 | 14 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Power steerin | ng oil pressure | B134 | 33 | 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Front oxygen signal (+) | (A/F) sensor | B135 | 9 | 2.8 — 3.2 | 2.8 — 3.2 | _ |
| Front oxygen signal (–) | (A/F) sensor | B135 | 8 | 2.4 — 2.7 | 2.4 — 2.7 | _ |
| Front oxygen shield | (A/F) sensor | B135 | 1 | 0 | 0 | _ |
| SSM/GST co line | mmunication | B136 | 16 | 1 ←→ 4 | 1 ←→ 4 | _ |
| Ground (engi | ne 4) | B137 | 1 | 0 | 0 | _ |
| Ground | (Ignition 1) | B137 | 26 | 0 | 0 | _ |
| | (Ignition 2) | B137 | 6 | | | |
| Ground (engi | | B137 | 2 | 0 | 0 | _ |
| Ground (engi | | B137 | 3 | 0 | 0 | _ |
| Ground (body | · | B136 B134 | 6 | 0 | 0 | _ |
| Ground (engi Ground (engi | • | B134 B137 | 5 7 | 0 | 0 | _ |
| Camshaft pos (LH) | | B134 | 21 | 0 — 0.9 | ON: 0 OFF: 4.7 — 5.3 | Sensor output waveform |
| Camshaft pos (RH) | sition sensor | B134 | 11 | 0 — 0.9 | ON: 0 OFF: 4.7 — 5.3 | Sensor output waveform |
| · · · · / | Main | B134 | 18 | 0.64 — 0.72 Fully opened: 3.96 | 0.64 — 0.72 (After engine is warmed-up.) | Fully closed: 0.6 Fully opened: 3.96 |
| Electronic throttle con- trol | Sub | B134 | 28 | 1.51 — 1.58 Fully opened: 4.17 | 1.51— 1.58 (After engine is warmed-up.) | Fully closed: 1.48 Fully opened: 4.17 |
| | Power supply | B134 | 19 | 5 | 5 | _ |
| | GND (sensor) | B134 | 29 | 0 | 0 | _ |
| Electronic thr motor (+) | ottle control | B137 | 5 | Duty waveform | Duty waveform | Drive frequency: 500 Hz |
| | | | | | | |

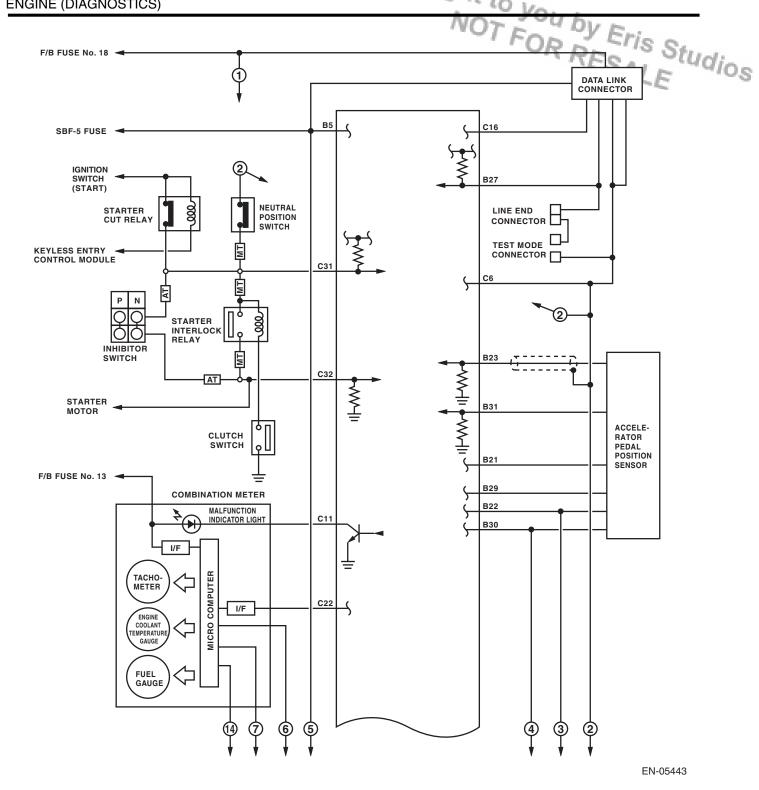
Engine Control Module (ECM) I/O Signal

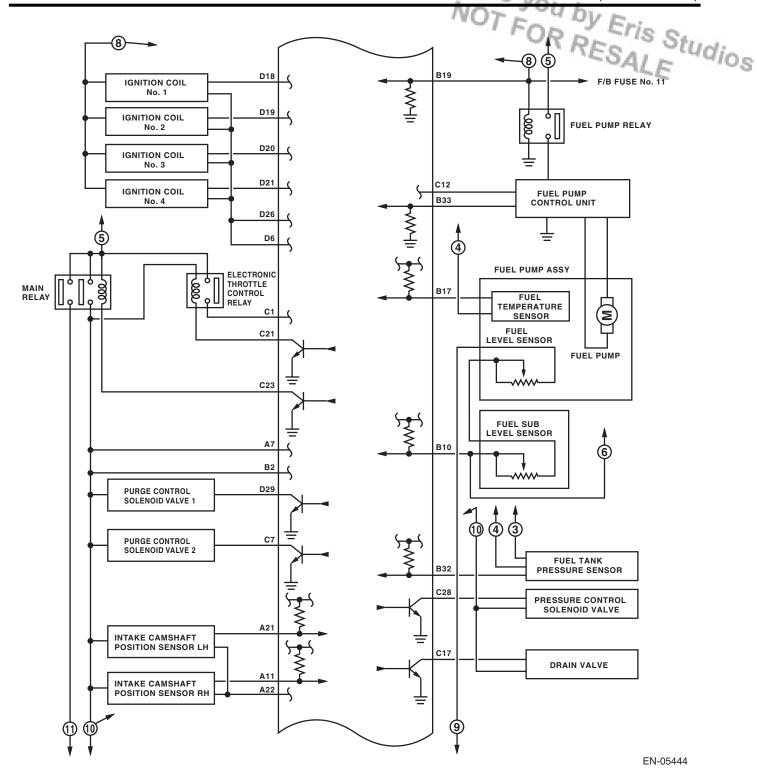
ENGINE (DIAGNOSTICS)

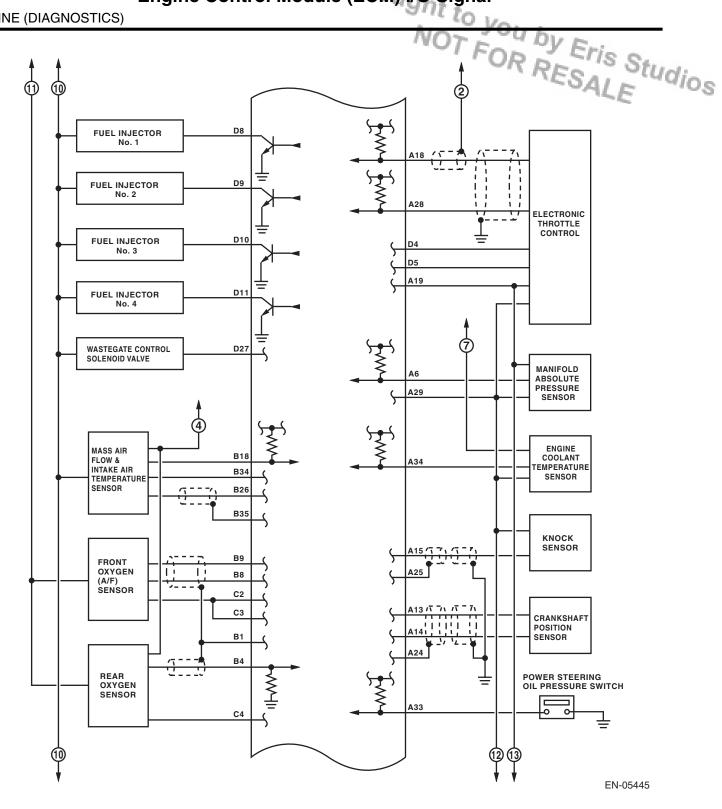
| | | | | Sign | al (V) | Dy Erica |
|--------------------------------|----------------------|------------------|-----------------|--|--|--|
| Desc | cription | Connector No. | Terminal No. | Ignition SW ON (engine OFF) | Engine ON (idling) | R RENote |
| Electronic thromotor (–) | ottle control | B137 | 4 | Duty waveform | Duty waveform | Drive frequency: 500 Hz |
| Electronic thromotor powers | | B136 | 1 | 10 — 13 | 12 — 14 | _ |
| Electronic thromotor relay | ottle control | B136 | 21 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | When ignition switch is turned to ON: ON |
| Oil flow con- trol solenoid | Signal (+) | B137 | 15 | ON: 10 — 13 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| (LH) | Signal (–) | B137 | 14 | 0 | 0 | _ |
| Oil flow con- trol solenoid | Signal (+) | B137 | 17 | ON: 10 — 13 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| (RH) | Signal (–) | B137 | 16 | 0 | 0 | _ |
| Immobilizer | Signal 1 | B136 | 26 | _ | _ | _ |
| | Signal 2 | B136 | 34 | _ | _ | _ |
| Self-shutoff co | ontrol | B136 | 23 | 0 | 0 | _ |
| AT/MT identifi | ication signal | B136 | 15 | 0 | 0 | MT model only |
| | Main sensor signal | B135 | 23 | Fully closed: 1 Fully opened: 3.5 | Fully closed: 1 Fully opened: 3.5 | _ |
| | Main power supply | B135 | 21 | 5 | 5 | _ |
| Accelerator | GND (main sensor) | B135 | 29 | 0 | 0 | _ |
| pedal posi- tion sensor | Sub sensor signal | B135 | 31 | Fully closed: 1 Fully opened: 3.5 | Fully closed: 1 Fully opened: 3.5 | _ |
| | Sub power supply | B135 | 22 | 5 | 5 | _ |
| | GND (Sub sensor) | B135 | 30 | 0 | 0 | _ |
| Cruise contro | l main light | B135 | 6 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Cruise contro | l set light | B135 | 3 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Clutch switch | | B136 | 25 | When clutch pedal is depressed: 0 When brake pedal is released: 10 — 13 | When clutch pedal is depressed: 0 When brake pedal is released: 12 — 14 | _ |
| SET/COAST | switch | B135 | 24 | ON: 10 — 13 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| RESUME/AC | C switch | B135 | 13 | ON: 10 — 13 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| Brake switch | 1 | B135 | 20 | When brake pedal is depressed: 0 When brake pedal is released: 10 — 13 | When brake pedal is depressed: 0 When brake pedal is released: 12 — 14 | _ |
| Brake switch | 2 | B135 | 28 | When brake pedal is depressed: 10 — 13 When brake pedal is released: 0 | When brake pedal is depressed: 12 — 14 When brake pedal is released: 0 | _ |
| Cruise contro | I main switch | B135 | 12 | ON: 10 — 13 OFF: 0 | ON: 12 — 14 OFF: 0 | _ |
| CAN com- | Signal (+) | B136 | 27 | Pulse | signal | |
| munication | Signal (-) | B136 | 35 | Pulse | signal | _ |

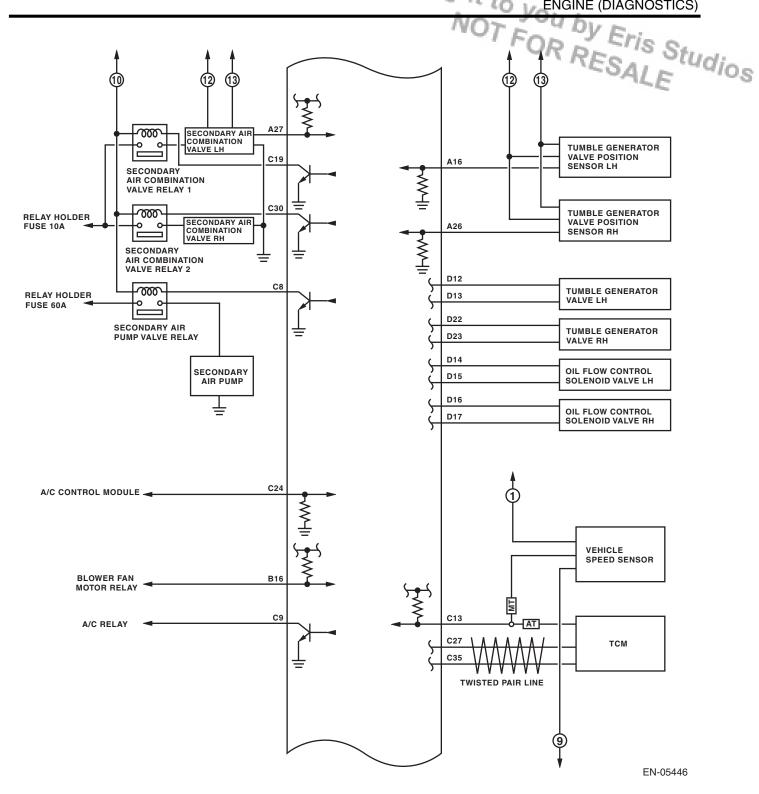
| | | Engine | Contro | l Module (EC | M) I/O Signal | ENGINE (DIAGNOSTICS) |
|----------------------------|---------------|------------------|-----------------|---|---------------------------------|----------------------|
| Desc | cription | Connector No. | Terminal No. | Signa Ignition SW ON (engine OFF) | al (V) Engine ON (idling) | R RESALE |
| Secondary | Signal | B134 | 27 | 1.7 — 2.4 | 1.1 — 1.6 | |
| air pipe | Power supply | B134 | 19 | 5 | 5 | _ |
| pressure sensor | GND (sensor) | B134 | 29 | 0 | 0 | _ |
| Secondary ai valve relay 1 | r combination | B136 | 19 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Secondary ai valve relay 2 | r combination | B136 | 30 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |
| Secondary ai | r pump relay | B136 | 8 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 12 — 14 | _ |

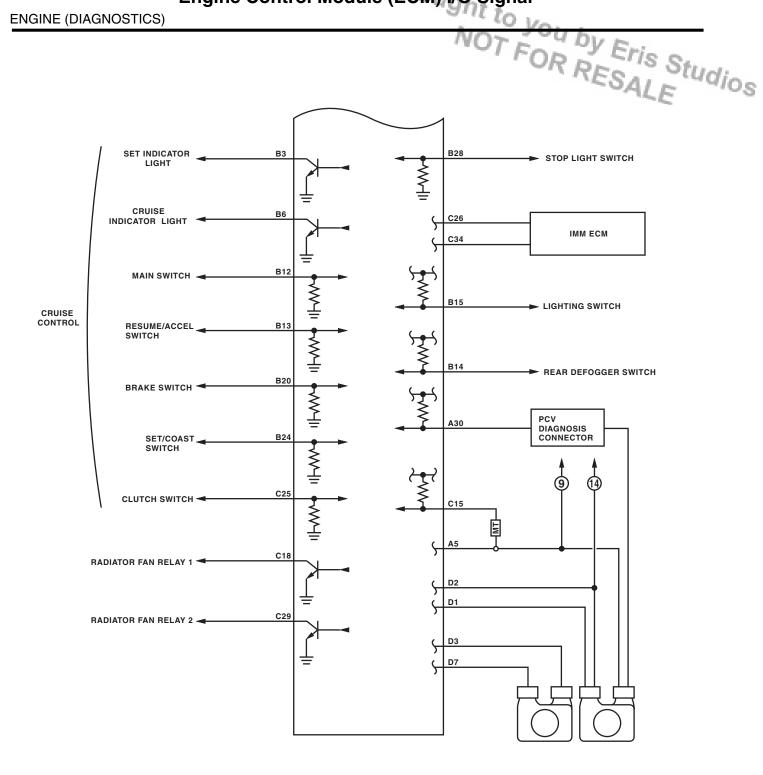
| Input/output name | Measuring condition | Waveform |
|-------------------------------|---------------------|--|
| 1. Crankshaft position sensor | During idling | ONE CRANK ROTATION EN-05322 |
| 2. Camshaft position sensor | During idling | ONE CAM ROTATION ONE CAM ROTATION ONE CAM ROTATION FN-05359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











EN-05447

6. Engine Condition Data

A: ELECTRICAL SPECIFICATION

| Engine Condition Data Lengine (DIAGNOSTICS) | | | | | | | |
|--|-----------------------------------|--|--|--|--|--|--|
| 6. Engine Condition Data A: ELECTRICAL SPECIFICATION | | | | | | | |
| Contents | Specification | | | | | | |
| Engine load | 17.6— 35.64 (%): Idling | | | | | | |
| Lingine load | 13.2— 26.73 (%): 2,500 rpm racing | | | | | | |

Measuring condition:

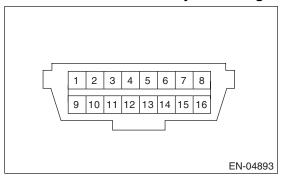
- After engine is warmed-up.
- Gear position is in neutral.
- Turn the A/C to OFF.
- Turn all the accessory switches to OFF.

7. Data Link Connector

A: NOTE

NOT FOR RESALE This connector is used both for general scan tools and the Subaru Select Monitor.

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



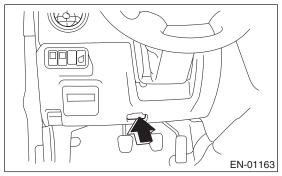
| Terminal No. | Remarks | Terminal No. | Remarks |
|--------------|---|--------------|--------------|
| 1 | Empty | 9 | Empty |
| 2 | Empty | 10 | Empty |
| 3 | Empty | 11 | Empty |
| 4 | Ground | 12 | Empty |
| 5 | Ground | 13 | Empty |
| 6 | Empty | 14 | Empty |
| 7 | Subaru Select Monitor/general 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 pow-

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)

4. MODE \$03 (EMISSION-RELATED FOWEITTIAM 2.5)

Refer to "Read Diagnostic Trouble Code" for information about data denoting emission-related powertrain

TOTAL TOTAL TOTAL COMPANY AND PROSECULAR 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 |
| | \$01 | Evaporative emission control system (0.04 inch leak) |
| | \$02 | Evaporative emission control system (0.04 inch leak) |
| ტიე | \$03 | Evaporative emission control system (0.04 inch leak) |
| \$83 | \$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) |
| φου | \$02 | Rear oxygen sensor response (bank 1 sensor 2) (lean \rightarrow rich) |
| | \$06 | Secondary air system |
| | \$07 | |
| | \$08 | |
| \$89 | \$81 | |
| φοσ | \$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

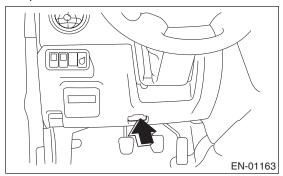
Refer to the data of vehicle specification (V.I.N., calibration ID, etc.).

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.

| A/F learning 1 A/F Learning #1 % —15 — +15% Intake manifold absolute pressure Mani. Absolute Pressure Engine speed signal Engine Speed Engine Speed Engine Speed signal Engine Speed Engine Speed Engine Speed signal Engine Speed Engine Speed in the tachometer indication) Meter vehicle Speed km/h or MPH Ignition timing signal Ignition Timing Ignitio | Remarks | Display | Unit of measure | Note (at idling) |
|---|--|-------------------------|-----------------|--|
| 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 tachome-ter indication) Meter vehicle speed signal Meter Vehicle Speed km/h or MPH 0 km/h or 0 MPH (at parking) 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°s Bear oxygen sensor voltage Pear 02 Sensor V 0 − 1.0 V Battery voltage Battery 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 Ammospheric pressure <th< td=""><td>Engine load</td><td>Engine Load</td><td>%</td><td>21.0%</td></th<> | Engine load | Engine Load | % | 21.0% |
| A/F learning 1 A/F Learning #1 % -15 — +15% Intake manifold absolute pressure Mani. Absolute Pressure mmHg, kPa, inHg or psig 8.7 – 10 inJe of 4.2 – 5.3 psig 700 rpm (Agree with the tachome-ter indication) Engine speed signal Engine Speed km/h or MPH 0 km/h or MPH (at parking) 700 rpm (Agree with the tachome-ter indication) Meter vehicle speed signal Meter Vehicle Speed km/h or MPH 0 km/h or MPH (at parking) 1 km/h or MPH 0 km/h or MPH (at parking) 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 Ib/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 Battery Voltage V 1.2 – 15 V Mass air flow voltage Air Flow Sensor Voltage V 1.0 – 1.7 V Injection 1 pulse with Fuel Injection #1 Pulse ms 1.2 – 2.2 ms Knock sensor correction Knock Correction deg 0.0 deg Atmospheric pressure Mani. Relative Pressure ImHg or psig | Engine coolant temperature signal | Coolant Temp. | °C or °F | 80 — 100°C or 176 — 212°F |
| Intake manifold absolute pressure Mani. Absolute Pressure in High or psig in | A/F correction 1 | A/F Correction #1 | % | -10 — +10% |
| Inflace manifold absolute pressure Mani. Absolute Pressure Inflg or psig 8.7 — 10 inHg or 4.2 — 5.3 psig 700 rpm (Agree with the tachometer indication) Toppm (Agree with the tachometer indication) To | A/F learning 1 | A/F Learning #1 | % | -15 — +15% |
| Engine speed signal Engine speed Engine spee | Intake manifold absolute pressure | Mani. Absolute Pressure | _ | • |
| 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 Ib/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 mmHg, kPa, inHg or psig (Atmospheric pressure) Intake manifold relative pressure Mani. Relative Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure bruel tank pressure signal Accel. Opening Angle % 0.00% Fuel tank pressure signal Accel. Opening Angle % 0.00% Fuel temperature signal Fuel Temp. °C or °F +21°C or 70°F Fuel level signal Fuel Temp. °C or °F +21°C or 70°F Fuel level signal Fuel Temp. °C or °F +21°C or 70°F Fuel generator valve RH opening signal TGV Position Sensor R V 0.44 Tumble generator valve RH opening signal TGV Position Sensor L V 0.48 Fuel pump duty ratio Fuel Pump Duty % 33% AVCS advance angle amount LH VVT Adv. Ang. Amount R deg 0 deg 0 deg Oil flow control solenoid valve duty RH (AVCS) OCV Duty R % 9.4% Oil flow control solenoid valve duty RH (AVCS) OCV Duty R MA 40 — 100 mA A/F sensor current value 1 A/F Sensor #1 Resistance A/F Sensor utput lambda 1 A/ | Engine speed signal | Engine Speed | rpm | 700 rpm (Agree with the tachometer indication) |
| Intake air temperature signal | Meter vehicle speed signal | Meter Vehicle Speed | km/h or MPH | 0 km/h or 0 MPH (at parking) |
| Amount of intake air Mass Air Flow g/s or Ib/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 June 1.5 V 1.0 – 1.7 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 Mani. Relative Pressure mmHg, kPa, inHg or psig, inHg or psig, inHg or psig (Intake manifold absolute pressure) Intake manifold relative pressure signal Fuel Tank Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure) Fuel tank pressure signal Fuel Tank Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure) Fuel temperature signal Fuel Tank Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure) Fuel temperature signal Fuel Tank Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure) Fuel temperature signal <td>Ignition timing signal</td> <td>Ignition Timing</td> <td>deg</td> <td>+17.0 deg</td> | Ignition timing signal | Ignition Timing | deg | +17.0 deg |
| Throttle opening angle signal Rear oxygen sensor voltage Rear Oz Sensor Rear oxygen sensor voltage Rear Oz Sensor Rear Oz Sen | Intake air temperature signal | Intake Air Temp. | °C or °F | 20 — 50°C or 68 — 122°F |
| 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 Mani. Relative Pressure mmHg, kPa, inHg or psig (Atmospheric pressure) Intake manifold relative pressure Mani. Relative Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure) Fuel tank pressure signal Fuel Tank Pressure mmHg, kPa, inHg or psig (Intake manifold absolute pressure) Fuel tank pressure signal Accel. Opening Angle % 0.00% Acceleration opening angle signal Fuel Temp. *C or *F +21 *C or 70*F Fuel level signal Fuel Temp. *C or *F +21 *C or 70*F Fuel level signal Pimary Control % 0.0% Purge control solenoid duty ratio CPC Valve Duty Ratio 0.0% 0.25% Tumble generator valve RH | Amount of intake air | Mass Air Flow | g/s or lb/m | 3.6 g/s or 0.48 lb/m |
| Battery Voltage | Throttle opening angle signal | Throttle Opening Angle | % | 3.0 — 3.2% |
| 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 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 (Intake manifold absolute pressure barometric pressure) Fuel tank pressure signal Fuel Tank Pressure mmHg, kPa, inHg or psig 4.8 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 | Rear oxygen sensor voltage | Rear O2 Sensor | V | 0— 1.0 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) 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% <t< td=""><td>Battery voltage</td><td>Battery Voltage</td><td>V</td><td>12— 15 V</td></t<> | Battery voltage | Battery Voltage | V | 12— 15 V |
| Knock sensor correctionKnock Correctiondeg0.0 degAtmospheric pressureAtmospheric PressuremmHg, kPa, inHg or psig(Atmospheric pressure)Intake manifold relative pressureMani. Relative PressuremmHg, kPa, inHg or psig(Intake manifold absolute pressure burney psigFuel tank pressure signalFuel Tank PressuremmHg, kPa, inHg or psig+8.8 mmHg, +1.2 kPa, +0.4 inHg or +0.2 psigAcceleration opening angle signalAccel. Opening Angle%0.00%Fuel temperature signalFuel Temp.°C or °F+21°C or 70°FFuel tevel signalFuel LevelV0—5 VPrimary supercharged pressure control signalPrimary Control%0.0%Purge control solenoid duty ratioCPC Valve Duty Ratio%0.25%Tumble generator valve RH opening signalTGV Position Sensor RV0.44Tumble generator valve LH opening signalTGV Position Sensor LV0.48Fuel pump duty ratioFuel Pump Duty%33%AVCS advance angle amount RHVYT Adv. Ang. Amount Rdeg0 degAVCS advance angle amount LHVYT Adv. Ang. Amount Ldeg0 degOil 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 LHOCV Current RmA40 — 100 mAA/F sensor duty talledA/F Sensor #1 ResistanceA/F Sensor #1 ResistanceA/F Sensor #1 ResistanceA/F Sensor #1 <td< td=""><td>Mass air flow voltage</td><td>Air Flow Sensor Voltage</td><td>V</td><td>1.0— 1.7 V</td></td<> | Mass air flow voltage | Air Flow Sensor Voltage | V | 1.0— 1.7 V |
| Atmospheric pressureAtmospheric PressuremmHg, kPa, inHg or psig inHg or psig(Atmospheric pressure)Intake manifold relative pressureMani. Relative PressuremmHg, kPa, inHg or psig inHg or psig(Intake manifold absolute pressure — barometric pressure)Fuel tank pressure signalFuel Tank PressuremmHg, kPa, inHg or psig inHg or psig+8.8 mmHg, +1.2 kPa, +0.4 inHg or +0.2 psigAcceleration opening angle signalAccel. Opening Angle%0.00%Fuel temperature signalFuel Temp.°C or °F+21°C or 70°FFuel level signalFuel LevelV0—5 VPrimary supercharged pressure control signalPrimary Control%0.0%Purge control solenoid duty ratioCPC Valve Duty Ratio%0.25%Pumble generator valve RH opening signalTGV Position Sensor RV0.44Tumble generator valve LH opening signalTGV Position Sensor LV0.48Fuel pump duty ratioFuel Pump Duty%33%AVCS advance angle amount RHVVT Adv. Ang. Amount Rdeg0 degAVCS advance angle amount LHVVT Adv. Ang. Amount Ldeg0 degOil flow control solenoid valve duty LH (AVCS)OCV Duty R%9.4%Oil flow control solenoid valve current RHOCV Current RmA40 — 100 mAOil flow control solenoid valve current LHOCV Current LmA40 — 100 mAA/F sensor current value 1A/F Sensor #1 ResistanceΩ27 — 35 ΩA/F sensor output lambda 1A/F Sensor #1- | Injection 1 pulse width | Fuel Injection #1 Pulse | ms | 1.2— 2.2 ms |
| Atmospheric Pressure Intake manifold relative pressure Mani. Relative Pressure Mani. Relative Pressure mmHg, kPa, inHg or psig mmHg, kPa, inHg or psig mHg or psig mHg or psig mHg or psig 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 R deg 0 deg Oid flow control solenoid valve duty RH (AVCS) OCV Duty R % 9.4% Oil flow control solenoid valve current RH OCV Current R MA 40 — 100 mA A/F sensor current value 1 A/F Sensor #1 Resistance A/F Sensor value lambda 1 A/F Sensor #1 Resistance A/F Sensor utput lambda 1 A/F Sensor #1 Resistance A/F Sensor utput lambda 1 A/F Sensor #1 A/F Sensor | Knock sensor correction | Knock Correction | deg | 0.0 deg |
| Fuel tank pressure signal Fuel Tank Pressure Fuel Tank Press Fuel Can Pressure Fuel Tank Press Fuel Can Pressure Fuel Tank Press Fuel Tank Press Fuel Tank Press Fuel Tank Press Fuel Pump Duty Fuel Tank Press Fuel Pump Duty Primary Control Fuel Tank Pres, Tone Fuel Tank | Atmospheric pressure | Atmospheric Pressure | | (Atmospheric pressure) |
| Fuel tank pressure signal Fuel tank pressure inHg or psig or +0.2 psig On +0.2 psig Or +0.2 psig On +2 psig On +21° C prof OF Fuel temperature signal Fuel temperature Full VV 0.5 V 0.0% On% On% On 4 On +0.00% On +0. | Intake manifold relative pressure | Mani. Relative Pressure | | |
| 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 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 Sen | Fuel tank pressure signal | Fuel Tank Pressure | | |
| 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 resistance value 1 A/F Sensor #1 Current mA -20—20 mA A/F sensor utput lambda 1 A/F Sensor #1 — 1.00 | Acceleration opening angle signal | Accel. Opening Angle | % | |
| Primary supercharged pressure control signalPrimary Control%0.0%Purge control solenoid duty ratioCPC Valve Duty Ratio%0 — 25%Tumble generator valve RH opening signalTGV Position Sensor RV0.44Tumble generator valve LH opening signalTGV Position Sensor LV0.48Fuel pump duty ratioFuel Pump Duty%33%AVCS advance angle amount RHVVT Adv. Ang. Amount Rdeg0 degAVCS advance angle amount LHVVT Adv. Ang. Amount Ldeg0 degOil 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 RHOCV Current RmA40 — 100 mAOil flow control solenoid valve current LHOCV Current LmA40 — 100 mAA/F sensor current value 1A/F Sensor #1 CurrentmA-20 — 20 mAA/F sensor resistance value 1A/F Sensor #1 ResistanceΩ27 — 35 ΩA/F sensor output lambda 1A/F Sensor #1—1.00 | Fuel temperature signal | Fuel Temp. | °C or °F | +21°C or 70°F |
| Purge control solenoid duty ratioCPC Valve Duty Ratio%0 — 25%Tumble generator valve RH opening signalTGV Position Sensor RV0.44Tumble generator valve LH opening signalTGV Position Sensor LV0.48Fuel pump duty ratioFuel Pump Duty%33%AVCS advance angle amount RHVVT Adv. Ang. Amount Rdeg0 degAVCS advance angle amount LHVVT Adv. Ang. Amount Ldeg0 degOil 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 RHOCV Current RmA40 — 100 mAOil flow control solenoid valve current LHOCV Current LmA40 — 100 mAA/F sensor current value 1A/F Sensor #1 CurrentmA-20 — 20 mAA/F sensor resistance value 1A/F Sensor #1 ResistanceΩ27 — 35 ΩA/F sensor output lambda 1A/F Sensor #1—1.00 | Fuel level signal | Fuel Level | V | 0— 5 V |
| 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 0 deg 0 deg 0 deg 0 lflow control solenoid valve duty RH (AVCS) OCV Duty R % 9.4% 0il flow control solenoid valve duty LH (AVCS) OCV Duty L % 9.4% 0il flow control solenoid valve current RH OCV Current R MA 40 — 100 mA 0il flow control solenoid valve current LH A/F sensor current value 1 A/F Sensor #1 Current MA 27 — 35 Ω A/F sensor output lambda 1 A/F Sensor #1 A/F Sensor #1 — 1.00 | Primary supercharged pressure control signal | Primary Control | % | 0.0% |
| 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 | Purge control solenoid duty ratio | CPC Valve Duty Ratio | % | 0 — 25% |
| Fuel pump duty ratioFuel Pump Duty%33%AVCS advance angle amount RHVVT Adv. Ang. Amount Rdeg0 degAVCS advance angle amount LHVVT Adv. Ang. Amount Ldeg0 degOil 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 RHOCV Current RmA40 — 100 mAOil flow control solenoid valve current LHOCV Current LmA40 — 100 mAA/F sensor current value 1A/F Sensor #1 CurrentmA-20 — 20 mAA/F sensor resistance value 1A/F Sensor #1 ResistanceΩ27 — 35 ΩA/F sensor output lambda 1A/F Sensor #1—1.00 | Tumble generator valve RH opening signal | TGV Position Sensor R | V | 0.44 |
| AVCS advance angle amount RHVVT Adv. Ang. Amount Rdeg0 degAVCS advance angle amount LHVVT Adv. Ang. Amount Ldeg0 degOil 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 RHOCV Current RmA40 — 100 mAOil flow control solenoid valve current LHOCV Current LmA40 — 100 mAA/F sensor current value 1A/F Sensor #1 CurrentmA-20 — 20 mAA/F sensor resistance value 1A/F Sensor #1 ResistanceΩ27 — 35 ΩA/F sensor output lambda 1A/F Sensor #1—1.00 | Tumble generator valve LH opening signal | TGV Position Sensor L | V | 0.48 |
| AVCS advance angle amount LH VVT Adv. Ang. Amount L deg 0 deg 0 deg 0 if flow control solenoid valve duty RH (AVCS) OCV Duty R % 9.4% 0 if flow control solenoid valve duty LH (AVCS) OCV Duty L % 9.4% 0 if flow control solenoid valve current RH OCV Current R MA 40 — 100 mA 0 if 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 | Fuel pump duty ratio | Fuel Pump Duty | % | 33% |
| 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 $40-100 \text{ mA}$ Oil flow control solenoid valve current LH OCV Current L mA $40-100 \text{ mA}$ A/F sensor current value 1 A/F Sensor #1 Current mA $-20-20 \text{ mA}$ A/F sensor resistance value 1 A/F Sensor #1 Resistance 100 mA A/F sensor output lambda 1 A/F Sensor #1 — 100 mA | AVCS advance angle amount RH | VVT Adv. Ang. Amount R | deg | 0 deg |
| 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 | AVCS advance angle amount LH | VVT Adv. Ang. Amount L | deg | 0 deg |
| Oil flow control solenoid valve current RH OCV Current R mA $40-100 \text{ mA}$ Oil flow control solenoid valve current LH OCV Current L mA $40-100 \text{ mA}$ A/F sensor current value 1 A/F Sensor #1 Current mA $-20-20 \text{ mA}$ A/F sensor resistance value 1 A/F Sensor #1 Resistance Ω $27-35 \Omega$ A/F sensor output lambda 1 A/F Sensor #1 — 1.00 | Oil flow control solenoid valve duty RH (AVCS) | OCV Duty R | % | 9.4% |
| Oil flow control solenoid valve current LH OCV Current L mA $40-100 \text{ mA}$ A/F sensor current value 1 A/F Sensor #1 Current mA $-20-20 \text{ mA}$ A/F sensor resistance value 1 A /F Sensor #1 Resistance Ω $27-35 \Omega$ A/F sensor output lambda 1 A/F Sensor #1 Ω Ω Ω | Oil flow control solenoid valve duty LH (AVCS) | OCV Duty L | % | 9.4% |
| 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 $27-35 \Omega$ A/F sensor output lambda 1 A/F Sensor #1 $-$ 1.00 | Oil flow control solenoid valve current RH | OCV Current R | mA | 40 — 100 mA |
| A/F sensor resistance value 1 | Oil flow control solenoid valve current LH | OCV Current L | mA | 40 — 100 mA |
| A/F sensor resistance value 1 $\frac{\Omega}{\Omega}$ $\frac{27-35\Omega}{\Omega}$ A/F sensor output lambda 1 A/F Sensor #1 $\frac{\Omega}{\Omega}$ 1.00 | A/F sensor current value 1 | A/F Sensor #1 Current | mA | –20 — 20 mA |
| · | A/F sensor resistance value 1 | | Ω | 27 — 35 Ω |
| A/F correction 3 A/F Correction #3 % 0.00% | A/F sensor output lambda 1 | A/F Sensor #1 | _ | 1.00 |
| | A/F correction 3 | A/F Correction #3 | % | 0.00% |

| | T | NO ₇ | DV DV D |
|--|---------------------------------------|----------------------------|---|
| 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 duiput signal | TGV Output 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 feel out 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) |

| S | Subaru Select Mo | intoght to | ENGINE (DIAGNOSTICS) |
|--|---|-----------------|----------------------|
| 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}.
- Subaru Select Montagni to you by Eris Studios

 NOT FOR RESALE 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 |
| Minfing manitoning | Minfine Manitonine | Supp | YES or NO |
| Misfire monitoring | Misfire Monitoring | Rdy | YES or NO |
| Fire levelore discussion | Fixel existence requite vises | Supp | YES or NO |
| Fuel system diagnosis | Fuel system monitoring | Rdy | YES or NO |
| Component monitoring | Component monitoring | Supp | YES or NO |
| Component monitoring | Component monitoring | Rdy | YES or NO |
| Catalyst diagnosis | Catalyst Diagnosis | Supp | YES or NO |
| Catalyst diagnosis | Catalyst Diagnosis | Rdy | YES or NO |
| Heated actalyst diagnosis | Heated actalyat | Supp | N/A |
| Heated catalyst diagnosis | Heated catalyst | Rdy | N/A |
| Evaporativo puras avatam diagnosis | Evaporative purge sys- | Supp | YES or NO |
| Evaporative purge system diagnosis | tem | Rdy | YES or NO |
| Cocondary air ayatam | Cocondory oir cyctom | Supp | YES or NO |
| Secondary air system | Secondary air system | Rdy | YES or NO |
| A/C avatam rafrigarant diagnosis | A/C ayatam rafrigarant | Supp | N/A |
| A/C system refrigerant diagnosis | A/C system refrigerant | Rdy | N/A |
| Overgon concer diagnosis | Ovugan cancer | Supp | YES or NO |
| Oxygen sensor diagnosis | Oxygen sensor | Rdy | YES or NO |
| Ovugan haatar diagnasia | O2 Hoster Diagnosia | Supp | YES or NO |
| Oxygen heater diagnosis | O2 Heater Diagnosis | Rdy | YES or NO |
| EGP diagnosis | EGP system | Supp | N/A |
| EGR diagnosis | EGR system | 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 | 0 | +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 |
| | 1 | | ļ |

| | | | A A A A A A A A A A A A A A A A A A A | - |
|---|--------------------------|-----------------|---------------------------------------|------|
| Remarks | Display | Unit of measure | Note (at idling) | |
| Air fuel ratio correction by rear oxygen sensor | Short term fuel trim #12 | % | +0.0% | Id:_ |
| On-board diagnostic system | OBD System | _ | CARB-OBD2 | 4/05 |
| 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 | 0 | _ |
| 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 MAN-UAL".
- 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.

- For detailed operation procedure, refer to the "SUBARU SELECT MONITOR OPERATION MAN-
- 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 power-

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 | <u> </u> |
| 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 | _ |

Inspection Mode ught to ye

ENGINE (DIAGNOSTICS)

| | NOT 5 | 4 DV F. |
|----------------|--|-----------|
| DTC | Item | Condition |
| P0463 | Fuel Level Sensor "A" Circuit High | REG OU |
| P0502 | Vehicle Speed Sensor "A" Circuit Low Input | TOALE |
| 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) | <u>_</u> |
| P2017 | Intake Manifold Runner Position Sensor / Switch Circuit High (Bank 1) | <u> </u> |
| P2021 | Intake Manifold Runner Position Sensor / Switch Circuit Low (Bank 2) | |
| P2022 | Intake Manifold Runner Position Sensor / Switch Circuit High (Bank 2) | _ |
| | | |
| P2088 P2089 | Intake Camshaft Position Actuator Control Circuit Low (Bank 1) | _ |
| P2089 P2092 | Intake Camshaft Position Actuator Control Circuit High (Bank 1) | _ |
| | Intake Camshaft Position Actuator Control Circuit Low (Bank 2) | _ |
| P2093 | Intake Camshaft Position Actuator Control Circuit High (Bank 2) Throttle Actuator Control Motor Circuit Banga (Parformance) | _ |
| 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 | |

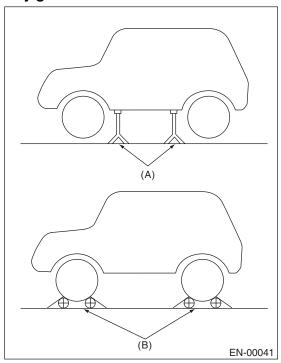
| | Inspection Mode ught to well | NGINE (DIAGNOSTICS) |
|-------|--|----------------------|
| | MA: VO | Valive (DIAGNOSTIOS) |
| DTC | Item Programme Technology | Condition |
| P2128 | Throttle/Pedal Position Sensor/Switch "E" Circuit High Input | REG Stu |
| P2135 | Throttle/Pedal Position Sensor/Switch "A"/"B" Voltage Correlation | ALE |
| 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 lmp gal)].
- 2) Lift up the vehicle using a garage jack and place it on rigid racks, or drive the vehicle onto free rollers.

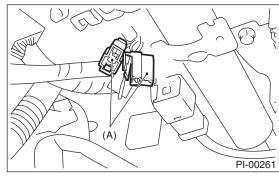
WARNING:

- · 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.



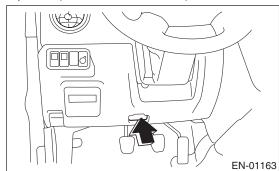
- (A) Rigid rack
- (B) Free roller

- 2. SUBARU SELECT MONITOREris Studios 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].

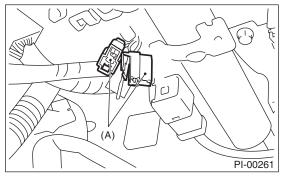
- 12) Perform subsequent procedures as instructed on the display screen.
- If trouble still remains in the memory, the corresponding DTC appears on the display screen.

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

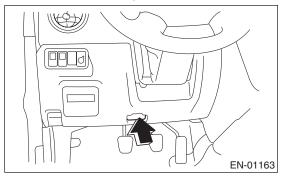
- 1) Warm-up the engine.
- 2) Connect the test mode connector (A) at the lower portion of instrument panel (on the driver's side).



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" 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).>

ENGINE (DIAGNOSTICS)

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 licted below. After the repair of the following trouble items, by tern 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 0 (5.3 10.6 US gal, 4.4 — 8.8 lmp 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.)

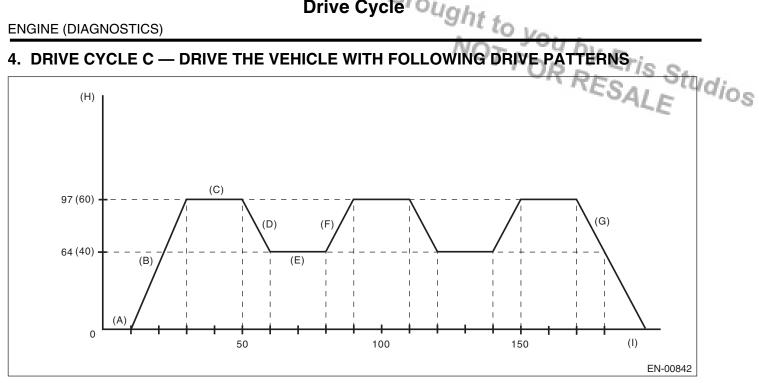
| DTC | Item | Condition |
|--------|---|---|
| *P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control | Engine coolant temperature at engine start is less than 20°C (68°F). |
| *P0128 | Coolant Thermostat (Engine Coolant Temperature Below Thermostat Regulating Temperature) | Engine coolant 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 Cycle Cycle | The Lengine (DIAGNOSTICS) |
|---------|--|--|
| 3 DRIVE | CYCLE B — 10 MINUTES IDLING | NOT ES DY EN |
| NOTE: | whicle at 10 km/h (6 MPH) or faster before diagnosis. | NOT FOR RESALE Condition |
| 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. |

Drive Cycle rought to



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

- Drive Cycle

 ENGINE (DIAGNOSTICS)

 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).

Do not let engine coolant temperature drop below 5°C (41°F).

4) Repeat the step 2) and 3) again.

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), OPER-ATION, 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 | $\leq 5^{\circ}$ C (41°F) |Engine coolant temperature — fuel temperature | $\leq 2^{\circ}C$ (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.

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

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 MAN-UAL".

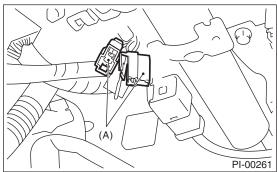
3. GENERAL SCAN TOOL

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

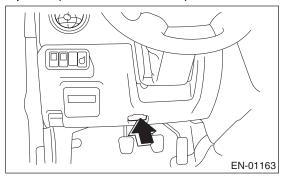
14. Compulsory Valve Operation Check Mode

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 sole- noid valve operation check | PCV solenoid |
| Compulsory drain valve operation check | Vent Control Sole- noid |
| Compulsory wastegate control sole- noid 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

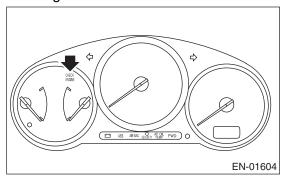
| Manufiction indicator Light | | | |
|---|---|--|--|
| | ENGINE (DIAGNOSTICS) | | |
| 15.Malfunction Indicator Light | NOT FOR RESALE | | |
| A: PROCEDURE | RESALE | | |
| 1. Activation of malfunction indicator light. <ref. en(h4dotc)(di="" indicator="" light.="" malfunction="" to=""></ref.> | | | |
| | | | |
| 2. Malfunction indicator light does not come on. <ref. come="" en(h4dot="" indicator="" light.="" malfunction="" on,="" to=""></ref.> | C)(diag)-57, MALFUNCTION INDICATOR LIGHT DOES NOT | | |
| | | | |
| 3. Malfunction indicator light does not go off. <ref. en(h4dotc="" go="" indicator="" light.="" malfunction="" off,="" to=""></ref.> |)(diag)-59, MALFUNCTION INDICATOR LIGHT DOES NOT | | |
| <u> </u> | | | |
| 4. Malfunction indicator light does not blink. <ref. en(h4dotc)(blink,="" indicator="" light.="" malfunction="" to=""></ref.> | (diag)-60, MALFUNCTION INDICATOR LIGHT DOES NOT | | |
| | | | |
| 5. Malfunction indicator light keep blinking. <ref. blinking,="" en(h4dotc)(or="" indicator="" light.="" malfunction="" to=""></ref.> | diag)-62, MALFUNCTION INDICATOR LIGHT REMAINS | | |

B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

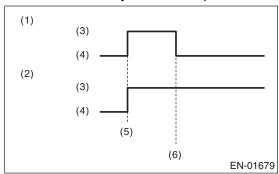
1) When the ignition switch is turned to ON (engine OFF), the malfunction indicator light in the combination meter illuminates.

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.>

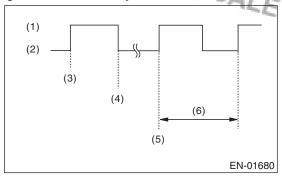


2) After starting the engine, the malfunction indicator light goes out. If it does not, either the engine or the emission control system has a problem.



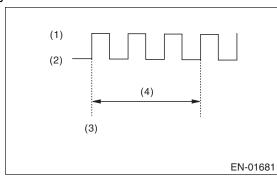
- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

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

Eris Studios

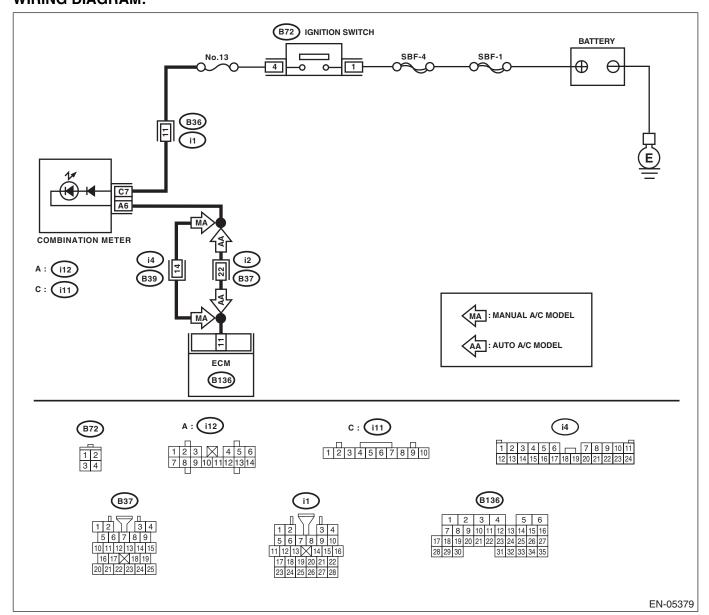
C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

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:**



| | | 110 | FRA. V | / Fire |
|---|---|--|--|--|
| | Step | Check | Yes | No |
| 1 | CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 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<br="">FU(H4DOTC)-50, Engine Control Module (ECM).></ref.> | Repair the connection of ECM connector. |
| 4 | CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR. 1) Turn the ignition switch to OFF. 2) Remove the combination meter. <ref. combination="" idi-11,="" meter.="" to=""> 3) Disconnect the connector from the ECM and combination meter. 4) Measure the resistance of harness between ECM and combination meter connector. Connector & terminal (B136) No. 11 — (i12) No. 6:</ref.> | Is the resistance less than 1 Ω ? | Go to step 5. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and combination meter connector Poor contact of coupling connector |
| 5 | CHECK POOR CONTACT. Check poor contact of combination meter connector. | Is there poor contact in combination meter connector? | Repair the poor contact of combination meter connector. | Go to step 6. |
| 6 | CHECK HARNESS BETWEEN COMBINA- TION METER AND IGNITION SWITCH CON- NECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between combination meter connector and chassis ground. Connector & terminal (i11) No. 7 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Replace the combination meter circuit board. <ref. combination="" idi-11,="" meter.="" to=""></ref.> | Check the following item and repair if necessary. NOTE: • Blown out of fuse (No. 13) • Open or short circuit of harness between fuse (No. 13) and battery terminal • Poor contact of ignition switch connector |

D: MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

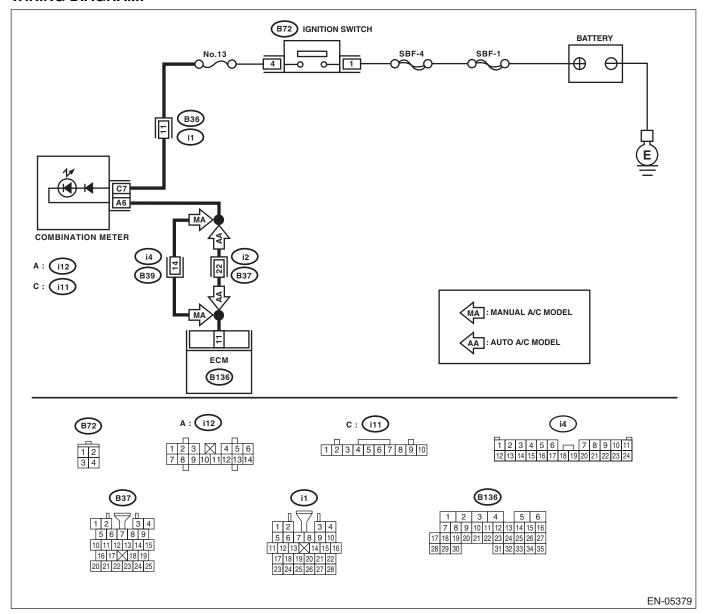
DIAGNOSIS:

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 |
|------|---|--------------------------------|--------------------|----------------------------|
| F | 1 CHECK HARNESS BETWEEN ECM AND | Does the malfunction indicator | Repair the short | Replace the ECM. |
| | COMBINATION METER CONNECTOR. | light illuminate? | circuit of harness | <ref. th="" to<=""></ref.> |
| | Turn the ignition switch to OFF. | | between ECM and | FU(H4DOTC)-50, |
| | Disconnect the connectors from the ECM. | | combination meter | Engine Control |
| L | 3) Turn the ignition switch to ON. | | connector. | Module (ECM).> |

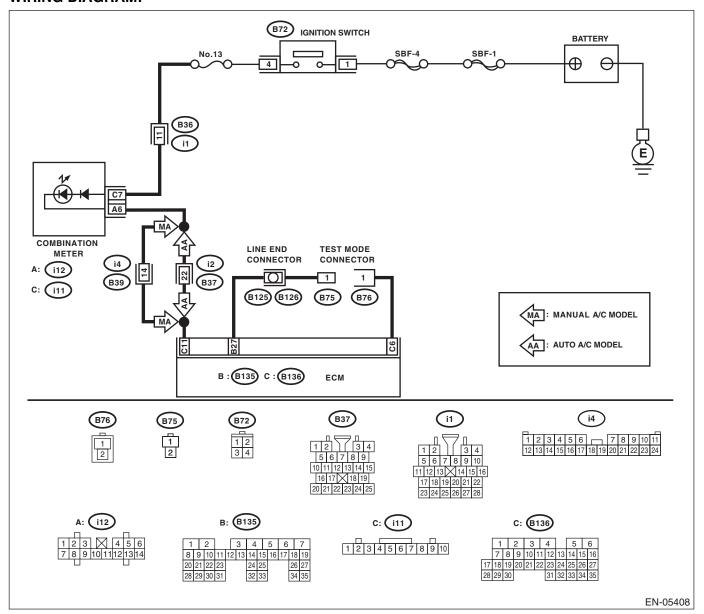
Malfunction Indicator Light to Journal ENGINE (DIAGNOSTICS) E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK FOR RESALE The shorted

- 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:



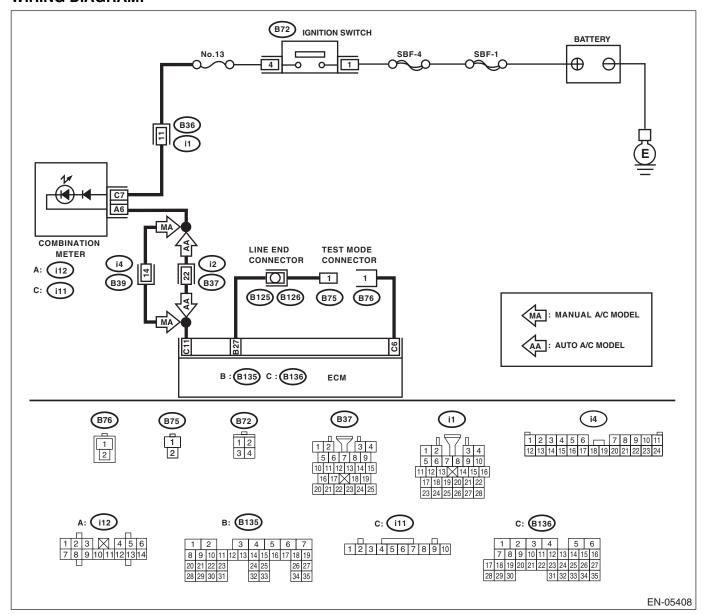
| | Malfuncti | on Indicator Light | to LENGINE | E (DIAGNOSTICS) |
|---|---|--|---|---|
| | | ΝO | Dr. Jou h | le D |
| | Step | Check | Yes | No C. |
| 1 | CHECK STATUS OF MALFUNCTION INDI- CATOR LIGHT. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector. 3) Turn the ignition switch to ON. (engine OFF) | | Go to step 2. | Repair the mal- function indicator light circuit. <ref. to<br="">EN(H4DOTC)(diag) -57, MALFUNC- TION INDICATOR LIGHT DOES NOT COME ON, Mal- function Indicator Light.></ref.> |
| 2 | CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Turn the ignition switch to ON. | Does the malfunction indicator light illuminate? | Repair the ground short circuit of harness between ECM and combination meter connector. | Go to step 3. |
| 3 | CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and test mode connector. Connector & terminal (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. Check for poor contact of the ECM connector. | Is there poor contact in ECM connector? | Repair poor contact of the ECM connector. | Go to step 5. |
| 5 | CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR. Measure the resistance of harness between ECM and test mode connector. Connector & terminal (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. 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<br="">FU(H4DOTC)-50, Engine Control Module (ECM).></ref.> |

Malfunction Indicator Light to Journal of the Malfunction Indicator

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



| | Malfunction Indicator Light | | | | |
|---|---|---|--|---|--|
| | | ÎVΩ | TEUD | V.F. | |
| | Step | Check | Yes | No C | |
| 1 | CHECK TEST MODE CONNECTOR.1) Disconnect the test mode connector.2) Turn the ignition switch to ON. | Does the malfunction indicator light blink? | Go to step 2. | System is normal. NOTE: Malfunction indicator light blinks at a cycle of 3 Hz when test mode connector is connected. | |
| 2 | CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUND TERMINAL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and chassis ground. Connector & terminal (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. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> | |

Diagnostics for Engine Starting Failure

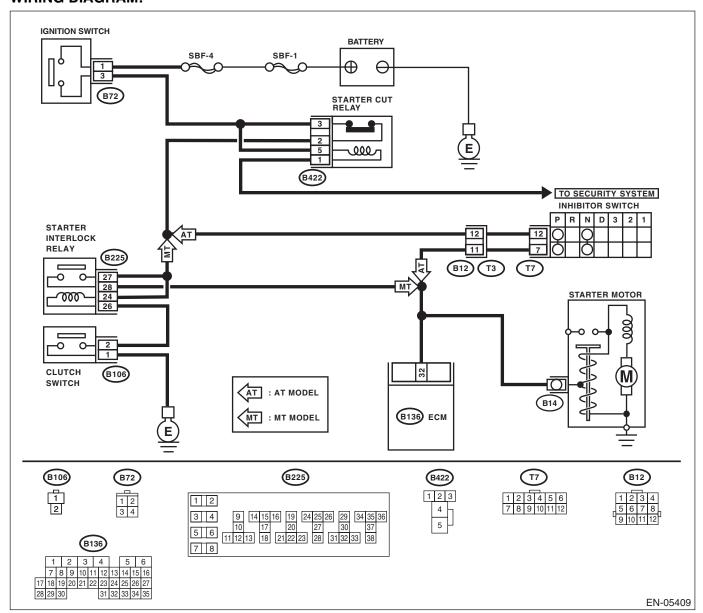
16.Diagnostics for Engine Starting Failure A: PROCEDURE

| Diagnostics for Engine Starting and the | | | |
|--|------|--|--|
| ENGINE (DIAGNOSTICS) | | | |
| 16. Diagnostics for Engine Starting Failure A: PROCEDURE 1. Check for fuel amount. | | | |
| A: PROCEDURE | dios | | |
| 1. Check for fuel amount. | | | |
| ↓ | | | |
| 2. Inspection of starter motor circuit. <ref. circuit,="" diagnostics="" en(h4dotc)(diag)-65,="" engine="" failure.="" for="" motor="" starter="" starting="" to=""></ref.> | | | |
| ↓ | | | |
| 3. Inspection of ECM power supply and ground line. <ref. (ecm),="" and="" check="" control="" diagnostics="" en(h4dotc)(diag)-68,="" engine="" failure.="" for="" ground="" line="" module="" of="" power="" starting="" supply="" to=""></ref.> | | | |
| ↓ | | | |
| 4. Inspection of ignition control system. <ref. control="" diagnostics="" en(h4dotc)(diag)-70,="" engine="" failure.="" for="" ignition="" starting="" system,="" to=""></ref.> | | | |
| ↓ | | | |
| 5. Inspection of fuel pump circuit. <ref. circuit,="" diagnostics="" en(h4dotc)(diag)-73,="" engine="" failure.="" for="" fuel="" pump="" starting="" to=""></ref.> | | | |
| ↓ | | | |
| 6. Inspection of fuel injector circuit. <ref. circuit,="" diagnostics="" en(h4dotc)(diag)-74,="" engine="" failure.="" for="" fuel="" injector="" starting="" to=""></ref.> | | | |

B: STARTER MOTOR CIRCUIT

CAUTION:

Eris Studios 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:**



| | | /VC | 7-40 | 15. |
|---|---|--|---|---|
| | Step | Check | Yes | <u>8</u> |
| 1 | CHECK BATTERY. | Is the voltage 12 V or more? | Go to step 2. | Charge or replace |
| | Check the battery voltage. | | | the battery. |
| 2 | | ' | • | Go to step 4. |
| 3 | CHECK DTC. | Is DTC displayed? | Check the appro- | Repair poor con- |
| | | <ref. en(h4dotc)(diag)-<br="" to="">42, OPERATION, Read Diag-</ref.> | priate DTC using the List of Diagnos- | tact of the ECM connector. |
| | | nostic Trouble Code (DTC).> | tic Trouble Code | connector. |
| | | | (DTC). <ref. th="" to<=""><th></th></ref.> | |
| | | | EN(H4DOTC)(diag) | |
| | | | -76, List of Diag- | |
| | | | nostic Trouble | |
| 4 | CHECK INDUT CICNAL FOR CTARTER MO | Le the veltage 10 V av man 2 | Code (DTC).> | Co to oton F |
| 4 | CHECK INPUT SIGNAL FOR STARTER MOTOR. | Is the voltage 10 V or more? | Check the starter motor. <ref. th="" to<=""><th>Go to step 5.</th></ref.> | Go to step 5. |
| | Turn the ignition switch to OFF. | | SC(H4SO)-8, | |
| | Disconnect the connector from starter motor. | | Starter.> | |
| | Turn the ignition switch to START. | | | |
| | 4) Measure the power supply voltage between | | | |
| | starter motor connector terminal and engine | | | |
| | ground. Connector & terminal | | | |
| | (B14) No. 1 (+) — Engine ground (–): | | | |
| | NOTE: | | | |
| | • For AT model, place the select lever in P or N | | | |
| | range. • For MT model, depress the clutch pedal. | | | |
| 5 | CHECK HARNESS BETWEEN BATTERY | Is the voltage 10 V or more? | Go to step 6. | Check the follow- |
| ١ | AND IGNITION SWITCH CONNECTOR. | is the voltage to v of more: | αο το στορ σ . | ing item and repair |
| | 1) Disconnect the connector from ignition | | | if necessary. |
| | switch. | | | Blown out of fuse |
| | 2) Measure the power supply voltage between | | | Open circuit of |
| | ignition switch connector and chassis ground. Connector & terminal | | | harness between ignition switch and |
| | (B72) No. 1 (+) — Chassis ground (–): | | | battery |
| 6 | CHECK IGNITION SWITCH. | Is the resistance less than 5 Ω ? | Go to step 7. | Replace the igni- |
| | 1) Disconnect the connector from ignition | | | tion switch. <ref.< th=""></ref.<> |
| | switch. | | | to SL-45, Ignition |
| | 2) Measure the resistance between ignition | | | Key Lock.> |
| | switch terminals after turning the ignition switch to START position. | | | |
| | Terminals | | | |
| | No. 1 — No. 3: | | | |
| 7 | CHECK TRANSMISSION TYPE. | Is the transmission type AT? | Go to step 8. | Go to step 10. |
| 8 | CHECK INPUT VOLTAGE OF INHIBITOR SWITCH. | Is the voltage 10 V or more? | Go to step 9. | Repair the open or ground short circuit |
| | Turn the ignition switch to OFF. | | | of harness |
| | Disconnect the connector from inhibitor | | | between inhibitor |
| | switch. | | | switch and ignition |
| | 3) Connect the connector to ignition switch. | | | switch. |
| | 4) Measure the input voltage between inhibitor | | | NOTE: |
| | switch connector and chassis ground after turn- ing the ignition switch to START position. | | | Check the security system. <ref. th="" to<=""></ref.> |
| | Connector & terminal | | | SL-21, Security |
| | (B12) No. 12 (+) — Engine ground (–): | | | System.> |

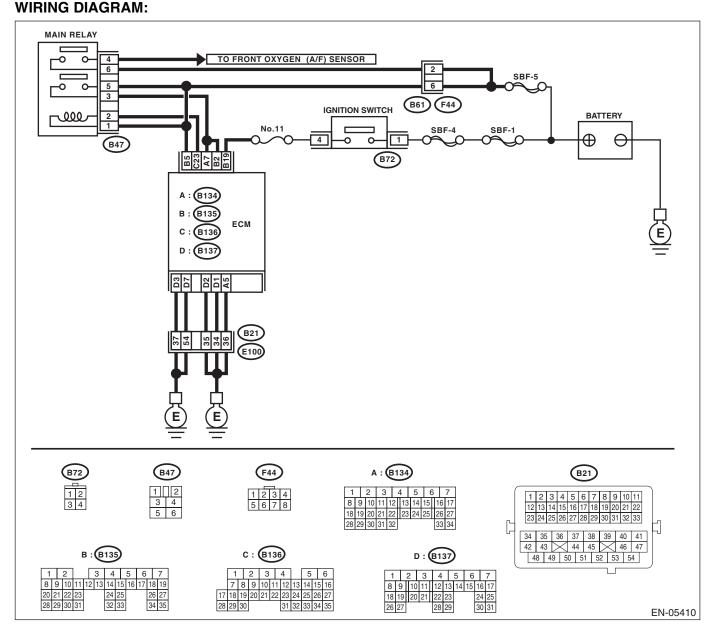
Diagnostics for Engine Starting Failure ENGINE (DIAGNOSTICS)

| | | NO | 3 V4 D | 2 3- |
|----|---|--|----------------------|-------------------------------------|
| | Step | Check | Yes | No |
| 9 | CHECK INHIBITOR SWITCH. | Is the resistance less than 1 Ω ? | Repair the open or | Replace the inhibi- |
| | Place the select lever in "P" or "N" range. | | ground short circuit | |
| | Measure the resistance between inhibitor | | of harness | 4AT-46, Inhibitor |
| | switch terminals. | | between inhibitor | Switch.> |
| | Connector & terminal | | switch and starter | |
| | (T3) No. 11 — No. 12: | | motor. | |
| 10 | CHECK INPUT VOLTAGE OF STARTER INTERLOCK RELAY. | Is the voltage 10 V or more? | Go to step 11. | Repair open or ground short circuit |
| | 1) Turn the ignition switch to OFF. | | | of harness |
| | 2) Disconnect the connector from starter inter- | | | between starter |
| | lock relay. | | | interlock relay and |
| | 3) Connect the connector to ignition switch. | | | ignition switch. |
| | 4) Measure the input voltage between starter | | | NOTE: |
| | interlock relay connector and chassis ground | | | Check the security |
| | after turning the ignition switch to START posi- | | | system. <ref. td="" to<=""></ref.> |
| | tion. | | | SL-21, Security |
| | Connector & terminal | | | System.> |
| | (B225) No. 27 (+) — Chassis ground (-): | | | |
| | (B225) No. 24 (+) — Chassis ground (–): | | | |
| 11 | CHECK STARTER INTERLOCK RELAY. | Is the resistance less than 1 Ω ? | Go to step 12. | Replace the starter |
| | 1) Connect the battery to starter interlock relay | | | interlock relay. |
| | terminals No. 26 and No. 24. | | | |
| | Measure the resistance between starter | | | |
| | interlock relay terminals. | | | |
| | Terminals | | | |
| | No. 27 — No. 28: | | | |
| 12 | CHECK GROUND CIRCUIT OF CLUTCH SWITCH. | Is the resistance less than 5 Ω ? | Go to step 13. | Repair the open circuit of ground |
| | Disconnect the connector from clutch switch. | | | cable. |
| | 2) Measure the resistance between the clutch | | | |
| | switch connector and chassis ground. | | | |
| | Connector & terminal | | | |
| 12 | (B106) No. 1 — Chassis ground: | lo the registeres less than 4 00 | Co to otor 4.4 | Donlood the street |
| 13 | CHECK CLUTCH SWITCH. | Is the resistance less than 1 Ω ? | Go to step 14. | Replace the clutch |
| | Measure the resistance between clutch switch | | | switch. <ref. td="" to<=""></ref.> |
| | terminals while depressing the clutch pedal. | | | CL-34, Clutch |
| | Terminals | | | Switch.> |
| | No. 1 — No. 2: | 1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | 5 |
| 14 | CHECK CLUTCH SWITCH CIRCUIT. | Is the resistance less than 1 Ω ? | | Repair the open |
| | Connect the connector to the clutch switch. | | short of the har- | circuit of harness |
| | 2) Measure the resistance between starter | | ness between | between the |
| | interlock relay connector and chassis ground | | starter interlock | starter interlock |
| | while depressing the clutch pedal. | | relay and starter | relay and the |
| | Connector & terminal | | motor. | clutch switch. |
| | (B225) No. 26 — Chassis ground: | | | |

C: CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MOD-Studios ULE (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.>.

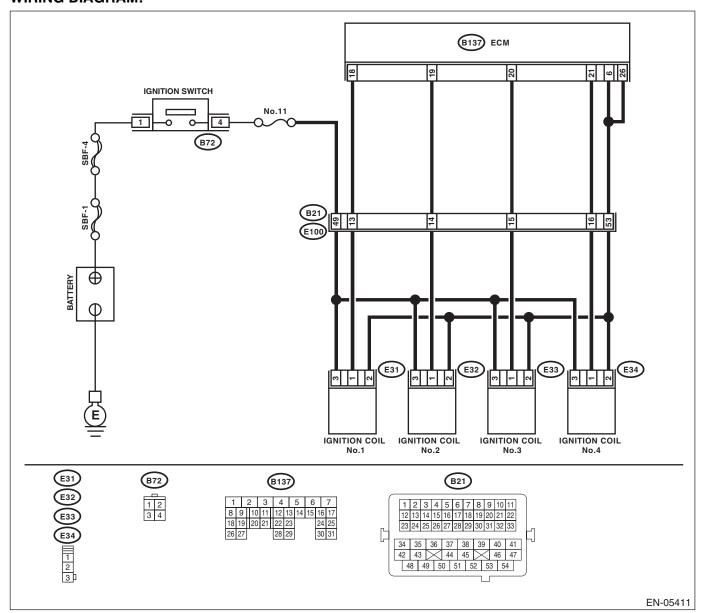


| | Diagnostics for | Engine Starting Fa | 4 | E (DIAGNOSTICS) |
|---|---|---|--|--|
| | | NO | ENGINE | (DIAGNOSTICS) |
| | | | 7 50 - 0 | / Fri |
| | Step | Check | Yes | No C |
| 1 | CHECK MAIN RELAY. 1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Connect the battery to the main relay terminals No. 1 and No. 2. 4) Measure the resistance between main relay terminals. Terminals No. 3 — No. 5: No. 4 — No. 6: | Is the resistance less than 10 Ω ? | Go to step 2. | Replace the main relay. <ref. to<br="">EN(H4DOTC)(diag) -8, Electrical Com- ponent Location.></ref.> |
| 2 | CHECK GROUND CIRCUIT FOR ECM. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 3. | Repair the open circuit of harness between the ECM and engine ground terminal. |
| 3 | CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): (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. Measure the voltage between main relay connector and chassis ground. Connector & terminal (B47) No. 1 (+) — Chassis ground (-): (B47) No. 5 (+) — Chassis ground (-): (B47) No. 6 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Go to step 5. | Repair the open or ground short circuit of harness of power supply cir- cuit. |
| 5 | CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to OFF. 2) Connect the main relay connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 7 (+) — Chassis ground (-): (B135) No. 2 (+) — Chassis ground (-): (B136) No. 23 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Check ignition control system. <ref. -70,="" control="" diagnostics="" en(h4dotc)(diag)="" engine="" failure.="" for="" ignition="" starting="" system,="" to=""></ref.> | Repair the open or ground short circuit of harness between ECM and main relay connec- tor. |

D: IGNITION CONTROL SYSTEM

CAUTION:

FOR RESAIRS to 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:**



| | Diagnostics for Engine Starting Failure | | | |
|---|---|--|--|--|
| | | - 3/1 | 4 | (DIAGNOSTICS) |
| | | NO. | IT TO DI | 15. |
| | Step | Check | Yes | No C |
| 1 | CHECK SPARK PLUG CONDITION. 1) Remove the spark plug. <ref. ig(h4dotc)-4,="" installation,="" plug.="" spark="" to=""> 2) Check the spark plug condition. <ref. ig(h4dotc)-5,="" inspection,="" plug.="" spark="" to=""></ref.></ref.> | Is the spark plug condition not- mal? | Go to step 2. | Replace the spark plug. <ref. to<br="">IG(H4DOTC)-4, Spark Plug.></ref.> |
| 2 | CHECK IGNITION SYSTEM FOR SPARKS. 1) Connect the spark plug to ignition coil. 2) Release the fuel pressure. <ref. fu(h4dotc)-55,="" fuel="" fuel.="" of="" pressure,="" procedure,="" releasing="" to=""> 3) Contact the spark plug thread portion to engine. 4) While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.</ref.> | Does spark occur at each cylinder? | Check fuel pump system. <ref. to<br="">EN(H4DOTC)(diag) -73, FUEL PUMP CIRCUIT, Diag- nostics for Engine Starting Failure.></ref.> | Go to step 3. |
| 3 | CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition coil. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between ignition coil connector and engine ground. Connector & terminal (E31) No. 3 (+) — Engine ground (-): (E32) No. 3 (+) — Engine ground (-): (E33) No. 3 (+) — Engine ground (-): (E34) No. 3 (+) — Engine ground (-): | Is the voltage 10 V or more? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ignition coil and ignition switch connector Poor contact of coupling connector |
| 4 | CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT. 1) Turn the ignition switch to OFF. 2) Measure the resistance between the ignition coil connector and the engine ground. Connector & terminal (E31) No. 2 — Engine ground: (E32) No. 2 — Engine ground: (E33) No. 2 — Engine ground: (E34) No. 2 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 5. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the ignition coil connector and engine ground terminal |
| 5 | CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR. 1) Disconnect the connectors from the ECM. 2) Disconnect the connector from ignition coil. 3) Measure the resistance of harness between the ECM and ignition coil connector. Connector & terminal (B137) No. 18 — (E31) No. 1: (B137) No. 19 — (E32) No. 1: (B137) No. 20 — (E33) No. 1: (B137) No. 21 — (E34) No. 1: | Is the resistance less than 1 Ω ? | Go to step 6. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ECM and ignition coil connector • Poor contact of coupling connector |
| 6 | CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR. Measure the resistance of harness between ECM and engine ground. Connector & terminal (B137) No. 18 — Engine ground: (B137) No. 19 — Engine ground: (B137) No. 20 — Engine ground: (B137) No. 21 — Engine ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 7. | Repair the ground short circuit of har- ness between the ECM and ignition coil connector. |

Diagnostics for Engine Starting Failure

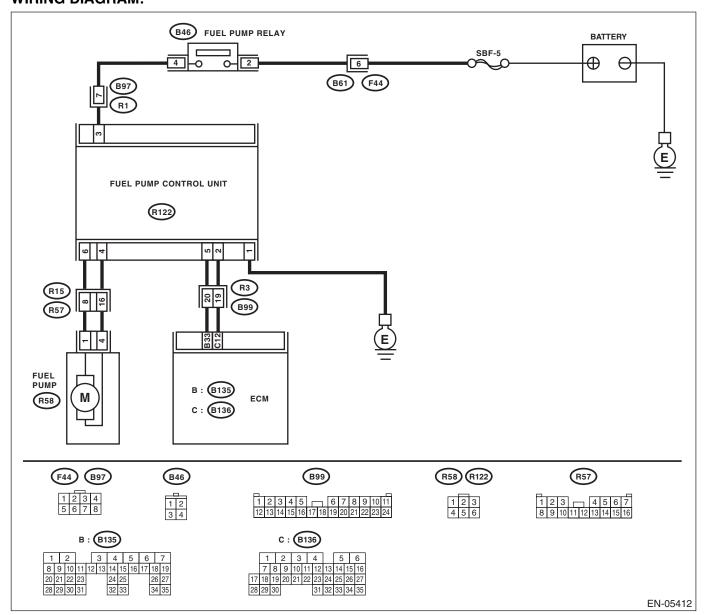
ENGINE (DIAGNOSTICS)

| | Step | Check | Yes | ETNo C. |
|---|--|-------|-----|--|
| 7 | | • | | Replace the igni- |
| | Check for poor contact of the ECM connector. | | | tion coil. <ref. ig(h4dotc)-6,<="" th="" to=""></ref.> |
| | | | | Ignition Coil.> |

E: FUEL PUMP CIRCUIT

CAUTION:

Eris Studios 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:**

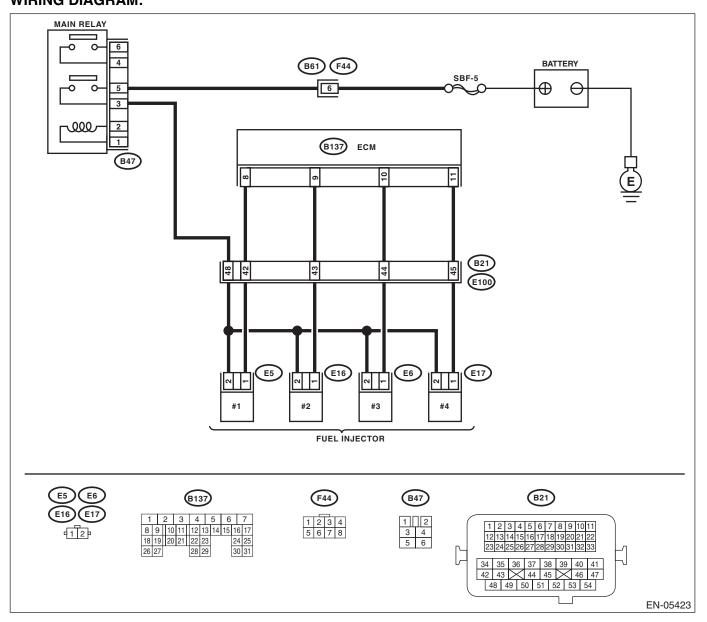


| Step | Check | Yes | No |
|--|--------|--|---|
| 1 CHECK OPERATING SOUND OF FUEL PUMP. Make sure that the fuel pump operates for two seconds when turning the ignition switch to ON NOTE: Fuel pump operation check can also be execut ed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | - - | Check the fuel injector circuit. <ref. -74,="" circuit,="" diagnostics="" en(h4dotc)(diag)="" engine="" failure.="" for="" fuel="" injector="" starting="" to=""></ref.> | Display the DTC. <ref. (dtc).="" -42,="" code="" diagnostic="" en(h4dotc)(diag)="" operation,="" read="" to="" trouble=""></ref.> |

F: FUEL INJECTOR CIRCUIT

CAUTION:

- Check or repair only faulty parts.
- T FOR RESALE • 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 | E/No C. |
|---|--|---|---|--|
| 1 | CHECK OPERATION OF EACH FUEL INJECTOR. 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. | | Check the fuel pressure. <ref. to<br="">ME(H4DOTC)-31, INSPECTION, Fuel Pressure.></ref.> | Go to step 2. |
| 2 | CHECK POWER SUPPLY TO EACH FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between fuel injector terminal and engine ground. Connector & terminal #1 (E5) No. 2 (+) — Engine ground (-): #2 (E16) No. 2 (+) — Engine ground (-): #3 (E6) No. 2 (+) — Engine ground (-): #4 (E17) No. 2 (+) — Engine ground (-): | Is the voltage 10 V or more? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between main relay and fuel injector connector Poor contact of main relay connector Poor contact of coupling connector Poor contact of fuel injector connector |
| 3 | CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and fuel injector connector. Connector & terminal (B137) No. 8 — (E5) No. 1: (B137) No. 9 — (E16) No. 1: (B137) No. 10 — (E6) No. 1: (B137) No. 11 — (E17) No. 1: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and fuel injector connector • Poor contact of coupling connector |
| 4 | CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. Measure the resistance of harness between ECM and fuel injector connector. Connector & terminal (B137) No. 8 — Chassis ground: (B137) No. 9 — Chassis ground: (B137) No. 10 — Chassis ground: (B137) No. 11 — Chassis ground: | Is the resistance less than 1 Ω ? | Repair the ground short circuit of har- ness between ECM and fuel injector connector. | Go to step 5. |
| 5 | CHECK EACH FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between each fuel injector terminals. Terminals No. 1 — No. 2: | Is the resistance between 5 — 20 Ω ? | Go to step 6. | Replace the faulty fuel injector. <ref. to FU(H4DOTC)- 37, Fuel Injector.></ref. |
| 6 | CHECK POOR CONTACT. Check for poor contact of the ECM connector. | Is there poor contact in ECM connector? | Repair poor contact of the ECM connector. | Inspection using "General Diagnostic Table". <ref. -378,="" diagnostic="" en(h4dotc)(diag)="" general="" inspec-="" table.="" tion,="" to=""></ref.> |

17.List of Diagnostic Trouble Code (DTC)

A: LIST

| | NGINE (DIAGNOSTICS) 7. List of Diagnostic Trouble Code (DTC) A: LIST DTC | | |
|-------|--|---|--|
| DTC | Item | Reference | |
| P0011 | Intake Camshaft Position - Timing Over-Advanced or System Performance (Bank 1) | ING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> | |
| P0016 | Crankshaft Position - Camshaft Position Correlation (Bank 1) | <ref. (bank="" (dtc).="" -="" 1),="" cam-shaft="" code="" correlation="" crankshaft="" diagnostic="" dtc="" en(h4dotc)(diag)-84,="" p0016="" position="" procedure="" to="" trouble="" with=""></ref.> | |
| P0018 | Crankshaft Position - Camshaft Position Correlation (Bank 2) | <ref. -="" cam-<br="" crankshaft="" dtc="" en(h4dotc)(diag)-85,="" p0018="" position="" to="">SHAFT POSITION CORRELATION (BANK2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0021 | Intake Camshaft Position - Tim- ing Over-Advanced or System Performance (Bank 2) | <ref. (bank="" (dtc).="" -="" 2),="" camshaft="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-86,="" intake="" or="" over-advanced="" p0021="" performance="" position="" procedure="" system="" tim-ing="" to="" trouble="" with=""></ref.> | |
| P0030 | HO2S Heater Control Circuit (Bank 1 Sensor 1) | <ref. (bank="" (dtc).="" 1="" 1),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-87,="" heater="" ho2s="" p0030="" procedure="" sensor="" to="" trouble="" with=""></ref.> | |
| P0031 | HO2S Heater Control Circuit Low (Bank 1 Sensor 1) | <ref. (bank="" (dtc).="" 1="" 1),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-89,="" heater="" ho2s="" low="" p0031="" procedure="" sensor="" to="" trouble="" with=""></ref.> | |
| P0032 | HO2S Heater Control Circuit High (Bank 1 Sensor 1) | <ref. circuit="" control="" dtc="" en(h4dotc)(diag)-91,="" heater="" high<br="" ho2s="" p0032="" to="">(BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0037 | HO2S Heater Control Circuit Low (Bank 1 Sensor 2) | <ref. (bank="" (dtc).="" 1="" 2),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-93,="" heater="" ho2s="" low="" p0037="" procedure="" sensor="" to="" trouble="" with=""></ref.> | |
| P0038 | HO2S Heater Control Circuit High (Bank 1 Sensor 2) | <ref. circuit="" control="" dtc="" en(h4dotc)(diag)-95,="" heater="" high<br="" ho2s="" p0038="" to="">(BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0068 | MAP/MAF - Throttle Position Correlation | <ref. (dtc).="" -="" code="" correlation,="" diagnostic="" dtc="" en(h4dotc)(diag)-97,="" maf="" map="" p0068="" position="" procedure="" throttle="" to="" trouble="" with=""></ref.> | |
| P0101 | Mass or Volume Air Flow Circuit Range/Performance | <ref. (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-99,="" flow="" mass="" or="" p0101="" performance,="" procedure="" range="" to="" trouble="" volume="" with=""></ref.> | |
| P0102 | Mass or Volume Air Flow Circuit Low Input | <ref. air="" cir-<br="" dtc="" en(h4dotc)(diag)-101,="" flow="" mass="" or="" p0102="" to="" volume="">CUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0103 | Mass or Volume Air Flow Circuit High Input | <ref. air="" cir-<br="" dtc="" en(h4dotc)(diag)-103,="" flow="" mass="" or="" p0103="" to="" volume="">CUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0107 | Manifold Absolute Pressure/ Barometric Pressure Circuit Low Input | <ref. (dtc).="" absolute="" barometric="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-105,="" input,="" low="" manifold="" p0107="" pressure="" procedure="" to="" trouble="" with=""></ref.> | |
| P0108 | Manifold Absolute Pressure/ Barometric Pressure Circuit High Input | <ref. (dtc).="" absolute="" barometric="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-107,="" high="" input,="" manifold="" p0108="" pressure="" procedure="" to="" trouble="" with=""></ref.> | |
| P0111 | Intake Air Temperature Sensor 1 Circuit Range/Performance | <ref. air="" dtc="" en(h4dotc)(diag)-109,="" intake="" p0111="" sen-<br="" temperature="" to="">SOR 1 CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0112 | Intake Air Temperature Sensor 1 Circuit Low | <ref. (dtc).="" 1="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-111,="" intake="" low,="" p0112="" procedure="" sen-sor="" temperature="" to="" trouble="" with=""></ref.> | |
| P0113 | Intake Air Temperature Sensor 1 Circuit High | <ref. (dtc).="" 1="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-113,="" high,="" intake="" p0113="" procedure="" sen-sor="" temperature="" to="" trouble="" with=""></ref.> | |
| P0117 | Engine Coolant Temperature Circuit Low | <ref. (dtc).="" circuit="" code="" coolant="" diagnostic="" dtc="" en(h4dotc)(diag)-115,="" engine="" low,="" p0117="" procedure="" temperature="" to="" trouble="" with=""></ref.> | |
| P0118 | Engine Coolant Temperature Circuit High | <ref. (dtc).="" circuit="" code="" coolant="" diagnostic="" dtc="" en(h4dotc)(diag)-117,="" engine="" high,="" p0118="" procedure="" temperature="" to="" trouble="" with=""></ref.> | |
| P0122 | Throttle/Pedal Position Sensor/ Switch "A" Circuit Low | <ref. <br="" dtc="" en(h4dotc)(diag)-119,="" p0122="" pedal="" position="" sensor="" throttle="" to="">SWITCH "A" CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |
| P0123 | Throttle/Pedal Position Sensor/ Switch "A" Circuit High | <ref. dtc="" en(h4dotc)(diag)-121,="" p0123="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "A" CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | |

| | | /// 17 4 /11, - |
|-------|--|---|
| DTC | Item | Reference |
| P0125 | Insufficient Coolant Temperature for Closed Loop Fuel Control | <ref. (dtc).="" closed="" code="" control,="" coolant="" diagnostic="" dtc="" en(h4dotc)(diag)-123,="" for="" fuel="" insufficient="" loop="" p0125="" procedure="" temper-ature="" to="" trouble="" with=""></ref.> |
| P0126 | Insufficient Engine Coolant Temperature for Stable Operation | <ref. (dtc).="" code="" coolant="" diagnostic="" dtc="" en(h4dotc)(diag)-124,="" engine="" for="" insufficient="" operation,="" p0126="" procedure="" stable="" temperature="" to="" trouble="" with=""></ref.> |
| P0128 | Coolant Thermostat (Engine Coolant Temperature Below Thermostat Regulating Tem- perature) | <ref. (dtc).="" (engine="" below="" code="" coolant="" diagnostic="" dtc="" en(h4dotc)(diag)-126,="" p0128="" procedure="" regulating="" temperature="" temperature),="" thermostat="" to="" trouble="" with=""></ref.> |
| P0131 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 1) | <ref. (bank="" (dtc).="" 1="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-127,="" low="" o2="" p0131="" procedure="" sensor="" to="" trouble="" voltage="" with=""></ref.> |
| P0132 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 1) | <ref. (bank="" (dtc).="" 1="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-129,="" high="" o2="" p0132="" procedure="" sensor="" to="" trouble="" voltage="" with=""></ref.> |
| P0133 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 1) | <ref. (bank="" (dtc).="" 1="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-131,="" o2="" p0133="" procedure="" response="" sensor="" slow="" to="" trouble="" with=""></ref.> |
| P0134 | O2 Sensor Circuit No Activity Detected (Bank 1 Sensor 1) | <ref. (bank="" (dtc).="" 1="" 1),="" activity="" circuit="" code="" detected="" diagnostic="" dtc="" en(h4dotc)(diag)-133,="" no="" o2="" p0134="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0137 | O2 Sensor Circuit Low Voltage (Bank 1 Sensor 2) | <ref. (bank="" (dtc).="" 1="" 2),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-135,="" low="" o2="" p0137="" procedure="" sensor="" to="" trouble="" voltage="" with=""></ref.> |
| P0138 | O2 Sensor Circuit High Voltage (Bank 1 Sensor 2) | <ref. (bank="" (dtc).="" 1="" 2),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-137,="" high="" o2="" p0138="" procedure="" sensor="" to="" trouble="" voltage="" with=""></ref.> |
| P0139 | O2 Sensor Circuit Slow Response (Bank 1 Sensor 2) | <ref. (bank="" (dtc).="" 1="" 2),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-139,="" o2="" p0139="" procedure="" response="" sensor="" slow="" to="" trouble="" with=""></ref.> |
| P0140 | O2 Sensor Circuit No Activity Detected (Bank1 Sensor2) | <ref. (bank="" (dtc).="" 1="" 2),="" activity="" circuit="" code="" detected="" diagnostic="" dtc="" en(h4dotc)(diag)-141,="" no="" o2="" p0140="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0171 | System Too Lean (Bank 1) | <ref. (bank="" (dtc).="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-143,="" lean="" p0171="" procedure="" system="" to="" too="" trouble="" with=""></ref.> |
| P0172 | System Too Rich (Bank 1) | <ref. (bank="" (dtc).="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-144,="" p0172="" procedure="" rich="" system="" to="" too="" trouble="" with=""></ref.> |
| P0181 | Fuel Temperature Sensor "A" Circuit Range/Performance | <ref. "a"="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-146,="" fuel="" p0181="" performance,="" procedure="" range="" sensor="" temperature="" to="" trouble="" with=""></ref.> |
| P0182 | Fuel Temperature Sensor "A" Circuit Low Input | <ref. "a"="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-148,="" fuel="" input,="" low="" p0182="" procedure="" sensor="" temperature="" to="" trouble="" with=""></ref.> |
| P0183 | Fuel Temperature Sensor "A" Circuit High Input | <ref. "a"="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-150,="" fuel="" high="" input,="" p0183="" procedure="" sensor="" temperature="" to="" trouble="" with=""></ref.> |
| P0222 | Throttle/Pedal Position Sensor/ Switch "B" Circuit Low | <ref. dtc="" en(h4dotc)(diag)-152,="" p0222="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "B" CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P0223 | Throttle/Pedal Position Sensor/ Switch "B" Circuit High | <ref. dtc="" en(h4dotc)(diag)-154,="" p0223="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "B" CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P0230 | Fuel Pump Primary Circuit | <ref. (dtc).="" circuit,="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-156,="" fuel="" p0230="" primary="" procedure="" pump="" to="" trouble="" with=""></ref.> |
| P0244 | Turbo/Super Charger Wastegate Solenoid "A" Range/Performance | <ref. "a"="" (dtc).="" charger="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-159,="" p0244="" performance,="" procedure="" range="" solenoid="" super="" to="" trouble="" turbo="" waste-gate="" with=""></ref.> |
| P0245 | Turbo/Super Charger Wastegate Solenoid "A" Low | <ref. "a"="" (dtc).="" charger="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-161,="" low,="" p0245="" procedure="" solenoid="" super="" to="" trouble="" turbo="" waste-gate="" with=""></ref.> |
| P0246 | Turbo/Super Charger Wastegate Solenoid "A" High | <ref. "a"="" (dtc).="" charger="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-163,="" high,="" p0246="" procedure="" solenoid="" super="" to="" trouble="" turbo="" waste-gate="" with=""></ref.> |

List of Diagnostic Trouble Code (DTC)

| DTC | Item | Reference |
|--------|--|---|
| P0301 | Cylinder 1 Misfire Detected | <ref. 1="" cylinder="" detected,<="" dtc="" en(h4dotc)(diag)-164,="" misfire="" p0301="" td="" to=""></ref.> |
| P0302 | Cylinder 2 Misfire Detected | Diagnostic Procedure with Diagnostic Trouble Code (DTC).> < Ref. to EN(H4DOTC)(diag)-164, DTC P0302 CYLINDER 2 MISFIRE DETECTED, |
| 1 0302 | Cylinder 2 Mishie Detected | Diagnostic Procedure with Diagnostic Trouble Code (DTC).> |
| P0303 | Cylinder 3 Misfire Detected | <ref. (dtc).="" 3="" code="" cylinder="" detected,="" diagnostic="" dtc="" en(h4dotc)(diag)-164,="" misfire="" p0303="" procedure="" to="" trouble="" with=""></ref.> |
| P0304 | Cylinder 4 Misfire Detected | <ref. (dtc).="" 4="" code="" cylinder="" detected,="" diagnostic="" dtc="" en(h4dotc)(diag)-165,="" misfire="" p0304="" procedure="" to="" trouble="" with=""></ref.> |
| P0327 | Knock Sensor 1 Circuit Low (Bank 1 or Single Sensor) | <ref. (bank="" (dtc).="" 1="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-171,="" knock="" low="" or="" p0327="" procedure="" sensor="" sensor),="" single="" to="" trouble="" with=""></ref.> |
| P0328 | Knock Sensor 1 Circuit High (Bank 1 or Single Sensor) | <ref. (bank="" (dtc).="" 1="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-173,="" high="" knock="" or="" p0328="" procedure="" sensor="" sensor),="" single="" to="" trouble="" with=""></ref.> |
| P0335 | Crankshaft Position Sensor "A" Circuit | <ref. "a"="" (dtc).="" circuit,="" code="" crankshaft="" diagnostic="" dtc="" en(h4dotc)(diag)-175,="" p0335="" position="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0336 | Crankshaft Position Sensor "A" Circuit Range/Performance | <ref. "a"="" (dtc).="" circuit="" code="" crankshaft="" diagnostic="" dtc="" en(h4dotc)(diag)-177,="" p0336="" performance,="" position="" procedure="" range="" sensor="" to="" trouble="" with=""></ref.> |
| P0340 | Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor) | <ref. "a"="" (bank="" (dtc).="" 1="" camshaft="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-179,="" or="" p0340="" position="" procedure="" sensor="" sensor),="" single="" to="" trouble="" with=""></ref.> |
| P0345 | Camshaft Position Sensor "A" Circuit (Bank 2) | <ref. "a"="" (bank="" (dtc).="" 2),="" camshaft="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-181,="" p0345="" position="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0410 | Secondary Air Injection System | <ref. (dtc).="" air="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-183,="" injection="" p0410="" procedure="" secondary="" system,="" to="" trouble="" with=""></ref.> |
| P0411 | Secondary Air Injection System Incorrect Flow Detected | <ref. (dtc).="" air="" code="" detected,="" diagnostic="" dtc="" en(h4dotc)(diag)-187,="" flow="" incorrect="" injection="" p0411="" procedure="" secondary="" system="" to="" trouble="" with=""></ref.> |
| P0413 | Secondary Air Injection System Switching Valve "A" Circuit Open | <ref. "a"="" (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-190,="" injection="" open,="" p0413="" procedure="" secondary="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P0414 | Secondary Air Injection System Switching Valve "A" Circuit Shorted | <ref. "a"="" (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-193,="" injection="" p0414="" procedure="" secondary="" shorted,="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P0416 | Secondary Air Injection System Control "A" Circuit | <ref. "b"="" (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-196,="" injection="" open,="" p0416="" procedure="" secondary="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P0417 | Secondary Air Injection System Switching Valve "B" Circuit Shorted | <ref. "b"="" (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-199,="" injection="" p0417="" procedure="" secondary="" shorted,="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P0418 | Secondary Air Injection System Control "A" Circuit Open | <ref. "a"="" (dtc).="" air="" circuit,="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-202,="" injection="" p0418="" procedure="" secondary="" system="" to="" trouble="" with=""></ref.> |
| P0420 | Catalyst System Efficiency Below Threshold (Bank 1) | <ref. (bank="" (dtc).="" 1),="" below="" catalyst="" code="" diagnostic="" dtc="" efficiency="" en(h4dotc)(diag)-205,="" p0420="" procedure="" system="" threshold="" to="" trouble="" with=""></ref.> |
| P0441 | Evaporative Emission System Incorrect Purge Flow | <ref. (dtc).="" code="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-209,="" evaporative="" flow,="" incorrect="" p0441="" procedure="" purge="" system="" to="" trouble="" with=""></ref.> |
| P0442 | Evaporative Emission Control System Leak Detected (Small Leak) | <ref. (dtc).="" (small="" code="" control="" detected="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-210,="" evaporative="" leak="" leak),="" p0442="" procedure="" system="" to="" trouble="" with=""></ref.> |
| P0447 | Evaporative Emission Control System Vent Control Circuit Open | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-213,="" evaporative="" open,="" p0447="" procedure="" system="" to="" trouble="" vent="" with=""></ref.> |

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| DTC | Item | Reference |
| P0448 | Evaporative Emission Control System Vent Control Circuit Shorted | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-215,="" evaporative="" p0448="" procedure="" shorted,="" system="" to="" trouble="" vent="" with=""></ref.> |
| P0451 | Evaporative Emission Control System Pressure Sensor | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-217,="" evaporative="" p0451="" pressure="" procedure="" sensor,="" system="" to="" trouble="" with=""></ref.> |
| P0452 | Evaporative Emission Control System Pressure Sensor Low Input | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-219,="" evaporative="" input,="" low="" p0452="" pressure="" procedure="" sensor="" system="" to="" trouble="" with=""></ref.> |
| P0453 | Evaporative Emission Control System Pressure Sensor High Input | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-221,="" evaporative="" high="" input,="" p0453="" pressure="" procedure="" sensor="" system="" to="" trouble="" with=""></ref.> |
| P0456 | Evaporative Emission Control System Leak Detected (Very Small Leak) | <ref. (dtc).="" (very="" code="" control="" detected="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-223,="" evaporative="" leak="" leak),="" p0456="" procedure="" small="" system="" to="" trouble="" with=""></ref.> |
| P0457 | Evaporative Emission Control System Leak Detected (Fuel Cap Loose/Off) | <ref. (dtc).="" (fuel="" cap="" code="" control="" detected="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-226,="" evaporative="" leak="" loose="" off),="" p0457="" procedure="" system="" to="" trouble="" with=""></ref.> |
| P0458 | Evaporative Emission System Purge Control Valve Circuit Low | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-229,="" evaporative="" low,="" p0458="" procedure="" purge="" system="" to="" trouble="" valve="" with=""></ref.> |
| P0459 | Evaporative Emission System Purge Control Valve Circuit High | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-231,="" evaporative="" high,="" p0459="" procedure="" purge="" system="" to="" trouble="" valve="" with=""></ref.> |
| P0461 | Fuel Level Sensor "A" Circuit Range/Performance | <ref. "a"="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-233,="" fuel="" level="" p0461="" performance,="" procedure="" range="" sensor="" to="" trouble="" with=""></ref.> |
| P0462 | Fuel Level Sensor "A" Circuit Low | <ref. "a"="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-234,="" fuel="" level="" low,="" p0462="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0463 | Fuel Level Sensor "A" Circuit High | <ref. "a"="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-237,="" fuel="" high,="" level="" p0463="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0464 | Fuel Level Sensor Circuit Inter- mittent | <ref. (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-240,="" fuel="" intermittent,="" level="" p0464="" procedure="" sensor="" to="" trouble="" with=""></ref.> |
| P0483 | Fan Rationality Check | <ref. (dtc).="" check,="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-242,="" fan="" p0483="" procedure="" rationality="" to="" trouble="" with=""></ref.> |
| P0502 | Vehicle Speed Sensor "A" Circuit Low Input | <ref. "a"="" (dtc).="" cir-cuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-242,="" input,="" low="" p0502="" procedure="" sensor="" speed="" to="" trouble="" vehicle="" with=""></ref.> |
| P0503 | Vehicle Speed Sensor "A" Intermittent/ Erratic/High | <ref. "a"="" (dtc).="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-243,="" erratic="" high,="" inter-mittent="" p0503="" procedure="" sensor="" speed="" to="" trouble="" vehicle="" with=""></ref.> |
| P0506 | Idle Air Control System RPM Lower Than Expected | <ref. (dtc).="" air="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-245,="" expected,="" idle="" lower="" p0506="" procedure="" rpm="" system="" than="" to="" trouble="" with=""></ref.> |
| P0507 | Idle Air Control System RPM Higher Than Expected | <ref. (dtc).="" air="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-247,="" expected,="" higher="" idle="" p0507="" procedure="" rpm="" system="" than="" to="" trouble="" with=""></ref.> |
| P0512 | Starter Request Circuit | <ref. (dtc).="" circuit,="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-249,="" p0512="" procedure="" request="" starter="" to="" trouble="" with=""></ref.> |
| P0513 | Incorrect Immobilizer Key | <ref. (dtc).="" code="" diagnostic="" dtc="" im(diag)-19,="" immobilizer="" incorrect="" key,="" p0513="" procedure="" to="" trouble="" with=""></ref.> |
| P0519 | Idle Air Control System Performance | <ref. (dtc).="" air="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-251,="" idle="" p0519="" performance,="" procedure="" system="" to="" trouble="" with=""></ref.> |
| P0600 | Serial Communication Link | <ref. (dtc).="" code="" communication="" diagnostic="" dtc="" en(h4dotc)(diag)-252,="" link,="" p0600="" procedure="" serial="" to="" trouble="" with=""></ref.> |
| P0604 | Internal Control Module Random Access Memory (RAM) Error | <ref. (dtc).="" (ram)="" access="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-254,="" error,="" internal="" memory="" module="" p0604="" procedure="" random="" to="" trouble="" with=""></ref.> |
| P0605 | Internal Control Module Read Only Memory (ROM) Error | <ref. (dtc).="" (rom)="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-255,="" error,="" internal="" memory="" module="" only="" p0605="" procedure="" read="" to="" trouble="" with=""></ref.> |

List of Diagnostic Trouble Code (DTC)

| DTC | Item | Reference FOR FILE |
|-------|--|--|
| P0607 | Control Module Performance | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-256,="" module="" p0607="" perfor-mance,="" procedure="" to="" trouble="" with=""></ref.> |
| P0638 | Throttle Actuator Control Range/Performance (Bank 1) | <ref. (bank="" (dtc).="" 1),="" actuator="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-257,="" p0638="" performance="" procedure="" range="" throttle="" to="" trouble="" with=""></ref.> |
| P0691 | Fan 1 Control Circuit Low | <ref. (dtc).="" 1="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-258,="" fan="" low,="" p0691="" procedure="" to="" trouble="" with=""></ref.> |
| P0692 | Fan 1 Control Circuit High | <ref. (dtc).="" 1="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-258,="" fan="" high,="" p0692="" procedure="" to="" trouble="" with=""></ref.> |
| P0700 | Transmission Control System (MIL Request) | <ref. (dtc).="" (mil="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-258,="" p0700="" procedure="" request),="" system="" to="" transmission="" trouble="" with=""></ref.> |
| P0851 | Park/NeutralL Switch Input Circuit Low (AT Model) | <ref. (at="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-259,="" input="" low="" model),="" neutral="" p0851="" park="" procedure="" switch="" to="" trouble="" with=""></ref.> |
| P0851 | Neutral Switch Input Circuit Low (MT Model) | <ref. (dtc).="" (mt="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-261,="" input="" low="" model),="" neutral="" p0851="" procedure="" switch="" to="" trouble="" with=""></ref.> |
| P0852 | Park/Neutral Switch Input Circuit High (AT Model) | <ref. (at="" (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-263,="" high="" input="" model),="" neutral="" p0852="" park="" procedure="" switch="" to="" trouble="" with=""></ref.> |
| P0852 | Park/Neutral Switch Input Circuit High (MT Model) | <ref. (dtc).="" (mt="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-265,="" high="" input="" model),="" neutral="" p0852="" procedure="" switch="" to="" trouble="" with=""></ref.> |
| P1152 | O2 Sensor Circuit Range/Per- formance (Low) (Bank1 Sensor1) | <ref. (bank="" (dtc).="" (low)="" 1="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-267,="" o2="" p1152="" per-formance="" procedure="" range="" sensor="" to="" trouble="" with=""></ref.> |
| P1153 | O2 Sensor Circuit Range/Per- formance (High) (Bank1 Sensor1) | <ref. (bank="" (dtc).="" (high)="" 1="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-269,="" o2="" p1153="" per-formance="" procedure="" range="" sensor="" to="" trouble="" with=""></ref.> |
| P1160 | Return Spring Failure | <ref. (dtc).="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-270,="" failure,="" p1160="" procedure="" return="" spring="" to="" trouble="" with=""></ref.> |
| P1400 | Fuel Tank Pressure Control Solenoid Valve Circuit Low | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-271,="" fuel="" low,="" p1400="" pressure="" procedure="" solenoid="" tank="" to="" trouble="" valve="" with=""></ref.> |
| P1410 | Secondary Air Injection System Switching Valve Stuck Open | <ref. (dtc).="" air="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-273,="" injection="" open,="" p1410="" procedure="" secondary="" stuck="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P1418 | Secondary Air Injection System Control "A" Circuit Shorted | <ref. "a"="" (dtc).="" air="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-276,="" injection="" p1418="" procedure="" secondary="" shorted,="" system="" to="" trouble="" with=""></ref.> |
| P1420 | Fuel Tank Pressure Control Sol. Valve Circuit High | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-279,="" fuel="" high,="" p1420="" pressure="" procedure="" sol.="" tank="" to="" trouble="" valve="" with=""></ref.> |
| P1443 | Vent Control Solenoid Valve Function Problem | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-281,="" function="" p1443="" problem,="" procedure="" solenoid="" to="" trouble="" valve="" vent="" with=""></ref.> |
| P1491 | Positive Crankcase Ventilation (Blow-by) Function Problem | <ref. crankcase="" dtc="" en(h4dotc)(diag)-283,="" p1491="" positive="" to="" ventila-<br="">TION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P1518 | Starter Switch Circuit Low Input | <ref. (dtc).="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-285,="" input,="" low="" p1518="" procedure="" starter="" switch="" to="" trouble="" with=""></ref.> |
| P1560 | Back-up Voltage Circuit Mal- function | <ref. (dtc).="" back-up="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-287,="" mal-function,="" p1560="" procedure="" to="" trouble="" voltage="" with=""></ref.> |
| P1570 | Antenna | <ref. (dtc).="" antenna,="" code="" diagnostic="" dtc="" im(diag)-20,="" p1570="" procedure="" to="" trouble="" with=""></ref.> |
| P1571 | Reference Code Incompatibility | <ref. (dtc).="" code="" diagnostic="" dtc="" im(diag)-15,="" incompatibility,="" p1571="" procedure="" reference="" to="" trouble="" with=""></ref.> |
| P1572 | IMM Circuit Failure (Except Antenna Circuit) | <ref. (dtc).="" (except="" antenna="" circuit="" circuit),="" code="" diagnostic="" dtc="" failure="" im(diag)-16,="" imm="" p1572="" procedure="" to="" trouble="" with=""></ref.> |
| P1574 | Key Communication Failure | <ref. (dtc).="" code="" communication="" diagnostic="" dtc="" failure,="" im(diag)-18,="" key="" p1574="" procedure="" to="" trouble="" with=""></ref.> |

| List of Diagnostic Trouble Code (DTC) | | | | |
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| DTC | Item | Reference | | |
| P1576 | EGI Control Module EEPROM | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" eeprom,="" egi="" im(diag)-19,="" module="" p1576="" procedure="" to="" trouble="" with=""></ref.> | | |
| P1577 | IMM Control Module EEPROM | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" eeprom,="" im(diag)-19,="" imm="" module="" p1577="" procedure="" to="" trouble="" with=""></ref.> | | |
| P1602 | Control Module Programming Error | <ref. (dtc).="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-289,="" error,="" module="" p1602="" procedure="" program-ming="" to="" trouble="" with=""></ref.> | | |
| P2004 | Intake Manifold Runner Control Stuck Open (Bank 1) | <ref. (bank="" (dtc).="" 1),="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-298,="" intake="" manifold="" open="" p2004="" procedure="" runner="" stuck="" to="" trouble="" with=""></ref.> | | |
| P2005 | Intake Manifold Runner Control Stuck Open (Bank 2) | <ref. (bank="" (dtc).="" 2),="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-298,="" intake="" manifold="" open="" p2005="" procedure="" runner="" stuck="" to="" trouble="" with=""></ref.> | | |
| P2006 | Intake Manifold Runner Control Stuck Closed (Bank 1) | <ref. (bank="" (dtc).="" 1),="" closed="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-299,="" intake="" manifold="" p2006="" procedure="" runner="" stuck="" to="" trouble="" with=""></ref.> | | |
| P2007 | Intake Manifold Runner Control Stuck Closed (Bank 2) | <ref. (bank="" (dtc).="" 2),="" closed="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-299,="" intake="" manifold="" p2007="" procedure="" runner="" stuck="" to="" trouble="" with=""></ref.> | | |
| P2008 | Intake Manifold Runner Control Circuit / Open (Bank 1) | <ref. (bank="" (dtc).="" 1),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-300,="" intake="" manifold="" open="" p2008="" procedure="" runner="" to="" trouble="" with=""></ref.> | | |
| P2009 | Intake Manifold Runner Control Circuit Low (Bank 1) | <ref. (bank="" (dtc).="" 1),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-302,="" intake="" low="" manifold="" p2009="" procedure="" runner="" to="" trouble="" with=""></ref.> | | |
| P2011 | Intake Manifold Runner Control Circuit / Open (Bank 2) | <ref. (bank="" (dtc).="" 2),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-304,="" intake="" manifold="" open="" p2011="" procedure="" runner="" to="" trouble="" with=""></ref.> | | |
| P2012 | Intake Manifold Runner Control Circuit Low (Bank 2) | <ref. (bank="" (dtc).="" 2),="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-306,="" intake="" low="" manifold="" p2012="" procedure="" runner="" to="" trouble="" with=""></ref.> | | |
| P2016 | Intake Manifold Runner Position Sensor / Switch Circuit Low (Bank 1) | <ref. (bank="" (dtc).="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-308,="" intake="" low="" manifold="" p2016="" position="" procedure="" runner="" sensor="" switch="" to="" trouble="" with=""></ref.> | | |
| P2017 | Intake Manifold Runner Position Sensor / Switch Circuit High (Bank 1) | <ref. (bank="" (dtc).="" 1),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-310,="" high="" intake="" manifold="" p2017="" position="" procedure="" runner="" sensor="" switch="" to="" trouble="" with=""></ref.> | | |
| P2021 | Intake Manifold Runner Position Sensor / Switch Circuit Low (Bank 2) | <ref. (bank="" (dtc).="" 2),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-312,="" intake="" low="" manifold="" p2021="" position="" procedure="" runner="" sensor="" switch="" to="" trouble="" with=""></ref.> | | |
| P2022 | Intake Manifold Runner Position Sensor / Switch Circuit High (Bank 2) | <ref. (bank="" (dtc).="" 2),="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-314,="" high="" intake="" manifold="" p2022="" position="" procedure="" runner="" sensor="" switch="" to="" trouble="" with=""></ref.> | | |
| P2088 | Intake Camshaft Position Actuator Control Circuit Low (Bank 1) | <ref. (bank="" (dtc).="" 1),="" actuator="" camshaft="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-316,="" intake="" low="" p2088="" position="" procedure="" to="" trouble="" with=""></ref.> | | |
| P2089 | Intake Camshaft Position Actuator Control Circuit High (Bank 1) | <ref. (bank="" (dtc).="" 1),="" actuator="" camshaft="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-318,="" high="" intake="" p2089="" position="" procedure="" to="" trouble="" with=""></ref.> | | |
| P2092 | Intake Camshaft Position Actuator Control Circuit Low (Bank 2) | <ref. (bank="" (dtc).="" 2),="" actuator="" camshaft="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-320,="" intake="" low="" p2092="" position="" procedure="" to="" trouble="" with=""></ref.> | | |
| P2093 | Intake Camshaft Position Actuator Control Circuit High (Bank 2) | <ref. (bank="" (dtc).="" 2),="" actuator="" camshaft="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-322,="" high="" intake="" p2093="" position="" procedure="" to="" trouble="" with=""></ref.> | | |
| P2096 | Post Catalyst Fuel Trim System Too Lean Bank 1 | <ref. (dtc).="" 1,="" bank="" catalyst="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-323,="" fuel="" lean="" p2096="" post="" procedure="" system="" to="" too="" trim="" trouble="" with=""></ref.> | | |
| P2097 | Post Catalyst Fuel Trim System Too Rich Bank 1 | <ref. catalyst="" dtc="" en(h4dotc)(diag)-324,="" fuel="" p2097="" post="" sys-<br="" to="" trim="">TEM TOO RICH BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> | | |

List of Diagnostic Trouble Code (DTC)

| DTC | Item | Reference FOR Eris |
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| P2101 | Throttle Actuator Control Motor Circuit Range/Performance | <ref. (dtc).="" actuator="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-330,="" motor="" p2101="" performance,="" procedure="" range="" throttle="" to="" trouble="" with=""></ref.> |
| P2102 | Throttle Actuator Control Motor Circuit Low | <ref. actuator="" control<br="" dtc="" en(h4dotc)(diag)-335,="" p2102="" throttle="" to="">MOTOR CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P2103 | Throttle Actuator Control Motor Circuit High | <ref. (dtc).="" actuator="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)-337,="" high,="" motor="" p2103="" procedure="" throttle="" to="" trouble="" with=""></ref.> |
| P2109 | Throttle/Pedal Position Sensor "A" Minimum Stop Performance | <ref. "a"="" (dtc).="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-338,="" minimum="" p2109="" pedal="" performance,="" position="" procedure="" sensor="" stop="" throttle="" to="" trouble="" with=""></ref.> |
| P2122 | Throttle/Pedal Position Sensor/ Switch "D" Circuit Low Input | <ref. dtc="" en(h4dotc)(diag)-339,="" p2122="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "D" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P2123 | Throttle/Pedal Position Sensor/ Switch "D" Circuit High Input | <ref. dtc="" en(h4dotc)(diag)-341,="" p2123="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "D" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P2127 | Throttle/Pedal Position Sensor/ Switch "E" Circuit Low Input | <ref. dtc="" en(h4dotc)(diag)-343,="" p2127="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "E" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P2128 | Throttle/Pedal Position Sensor/ Switch "E" Circuit High Input | <ref. dtc="" en(h4dotc)(diag)-345,="" p2128="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "E" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).></ref.> |
| P2135 | Throttle/Pedal Position Sensor/ Switch "A"/"B" Voltage Correla- tion | <ref. dtc="" en(h4dotc)(diag)-347,="" p2135="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "A"/"B" VOLTAGE CORRELATION, Diagnostic Procedure with Diag- nostic Trouble Code (DTC).></ref.> |
| P2138 | Throttle/Pedal Position Sensor/ Switch "D"/"E" Voltage Correla- tion | <ref. dtc="" en(h4dotc)(diag)-350,="" p2138="" pedal="" position="" sen-<br="" throttle="" to="">SOR/SWITCH "D"/"E" VOLTAGE CORRELATION, Diagnostic Procedure with Diag- nostic Trouble Code (DTC).></ref.> |
| P2419 | Evaporative Emission System Switching Valve Control Circuit Low | <ref. (dtc).="" circuit="" code="" control="" diagnostic="" dtc="" emission="" en(h4dotc)(diag)-352,="" evaporative="" low,="" p2419="" procedure="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P2420 | Evaporative Emission System Switching Valve Control Circuit High | <ref. dtc="" emission="" en(h4dotc)(diag)-354,="" evaporative="" p2420="" system<br="" to="">SWITCHING VALVE CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diag- nostic Trouble Code (DTC).></ref.> |
| P2431 | Secondary Air Injection System Air Flow /Pressure Sensor Cir- cuit Range/Performance | <ref. (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-356,="" flow="" injection="" p2431="" performance,="" pressure="" procedure="" range="" secondary="" sensor="" system="" to="" trouble="" with=""></ref.> |
| P2432 | Secondary Air Injection System Air Flow /Pressure Sensor Cir- cuit Low | <ref. (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-359,="" flow="" injection="" low,="" p2432="" pressure="" procedure="" secondary="" sensor="" system="" to="" trouble="" with=""></ref.> |
| P2433 | Secondary Air Injection System Air Flow /Pressure Sensor Cir- cuit High | <ref. (dtc).="" air="" circuit="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-362,="" flow="" high,="" injection="" p2433="" pressure="" procedure="" secondary="" sensor="" system="" to="" trouble="" with=""></ref.> |
| P2440 | Secondary Air Injection System Switching Valve Stuck Open (Bank1) | <ref. (bank="" (dtc).="" 1),="" air="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-365,="" injection="" open="" p2440="" procedure="" secondary="" stuck="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P2441 | Secondary Air Injection System Switching Valve Stuck Closed (Bank1) | <ref. (bank="" (dtc).="" 1),="" air="" closed="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-369,="" injection="" p2441="" procedure="" secondary="" stuck="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P2442 | Secondary Air Injection System Switching Valve Stuck Open (Bank2) | <ref. (bank="" (dtc).="" 2),="" air="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-370,="" injection="" open="" p2442="" procedure="" secondary="" stuck="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P2443 | Secondary Air Injection System Switching Valve Stuck Closed (Bank2) | <ref. (bank="" (dtc).="" 2),="" air="" closed="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-374,="" injection="" p2443="" procedure="" secondary="" stuck="" switching="" system="" to="" trouble="" valve="" with=""></ref.> |
| P2444 | Secondary Air Injection System Pump Stuck On | <ref. (dtc).="" air="" code="" diagnostic="" dtc="" en(h4dotc)(diag)-375,="" injection="" on,="" p2444="" procedure="" pump="" secondary="" stuck="" system="" to="" trouble="" with=""></ref.> |

ENGINE (DIAGNOSTICS)

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 TIM-ING 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. 1) Start the engine and let it idle. 2) Measure the AVCS system operating angle using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | Is the AVCS system operating angle approx. 0°? | Go to step 2. | Check the following item and repair or replace if necessary. Oil pipe (clog) Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring) Intake camshaft (dirt, damage of camshaft) |
| 2 | CHECK CURRENT DATA. 1) Drive (accelerate or decelerate) the vehicle at 80 km/h (50 MPH) or less. NOTE: Drive the vehicle so that duty output of the oil flow control solenoid valve increases. 2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Check the following item and repair or replace if necessary. Oil pipe (clog) Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring) Intake camshaft (dirt, damage of camshaft) | Perform the following procedures, and clean the oil routing. Replace the engine oil and idle the engine for 5 minutes, then replace the oil filter and engine oil. <ref. engine="" lu(h4dotc)-10,="" oil.="" replacement,="" to=""> <ref. engine="" filter.="" lu(h4dotc)-25,="" oil="" to=""></ref.></ref.> |

ENGINE (DIAGNOSTICS)

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. 1) Start the engine and let it idle. 2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool. | Is the AVCS system operating angle approx. 0°, and oil flow control solenoid valve duty output approx. 10%? | Perform the follow- ing procedures, and clean the oil routing. Replace the engine oil and idle the engine for 5 | Check the following item and repair or replace if necessary. Oil pipe (clog) Oil flow control solenoid valve |
| | NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | minutes, then replace the oil filter and engine oil. <ref. engine="" lu(h4dotc)-10,="" oil.="" replacement,="" to=""> <ref. engine="" filter.="" lu(h4dotc)-25,="" oil="" to=""></ref.></ref.> | (clog or dirt of oil routing, setting of spring) Intake camshaft (dirt, damage of camshaft) Timing belt (matching of timing mark) |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-11, DTC P0018 CRANKSHAFT POSITION CAM-SHAFT 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. | Is the AVCS system operating | Perform the follow- | Check the follow- |
| | Start the engine and let it idle. | angle approx. 0°, and oil flow | ing procedures, | ing item and repair |
| | 2) Measure the AVCS system operating angle | control solenoid valve duty out- | and clean the oil | or replace if neces- |
| | and oil flow control solenoid valve duty output | put approx. 10%? | routing. | sary. |
| | using Subaru Select Monitor or general scan | | Replace the | Oil pipe (clog) |
| | tool. | | engine oil and idle | Oil flow control |
| | NOTE: | | the engine for 5 | solenoid valve |
| | Subaru Select Monitor | | minutes, then | (clog or dirt of oil |
| | For detailed operation procedures, refer to | | replace the oil filter | routing, setting of |
| | "READ CURRENT DATA FOR ENGINE". < Ref. | | and engine oil. | spring) |
| | to EN(H4DOTC)(diag)-36, Subaru Select Moni- | | <ref. td="" to<=""><td> Intake camshaft </td></ref.> | Intake camshaft |
| | tor.> | | LU(H4DOTC)-10, | (dirt, damage of |
| | General scan tool | | REPLACEMENT, | camshaft) |
| | For detailed operation procedure, refer to the | | Engine Oil.> <ref.< td=""><td> Timing belt </td></ref.<> | Timing belt |
| | general scan tool operation manual. | | to LU(H4DOTC)- | (matching of timing |
| | • | | 25, Engine Oil Fil- | mark) |
| | | | ter.> | |

ENGINE (DIAGNOSTICS)

D: DTC P0021 INTAKE CAMSHAFT POSITION - TIMING OVER-ADVANCED OR Studios **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.>.

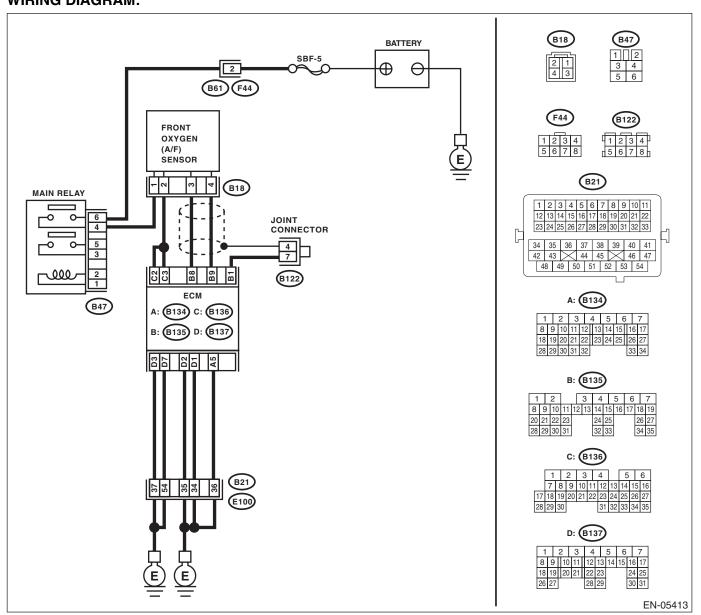
| | Step | Check | Yes | No |
|---|--|-------|---|---|
| 1 | CHECK CURRENT DATA. 1) Start the engine and let it idle. 2) Measure the AVCS system operating angle using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Check the following item and repair or replace if necessary. Oil pipe (clog) Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring) Intake camshaft (dirt, damage of camshaft) |
| 2 | CHECK CURRENT DATA. 1) Drive (accelerate or decelerate) the vehicle at 80 km/h (50 MPH) or less. NOTE: Drive the vehicle so that duty output of the oil flow control solenoid valve increases. 2) Measure the AVCS system operating angle and oil flow control solenoid valve duty output using Subaru Select Monitor or general scan tool. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Check the following item and repair or replace if necessary. Oil pipe (clog) Oil flow control solenoid valve (clog or dirt of oil routing, setting of spring) Intake camshaft (dirt, damage of camshaft) | |

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

- 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:



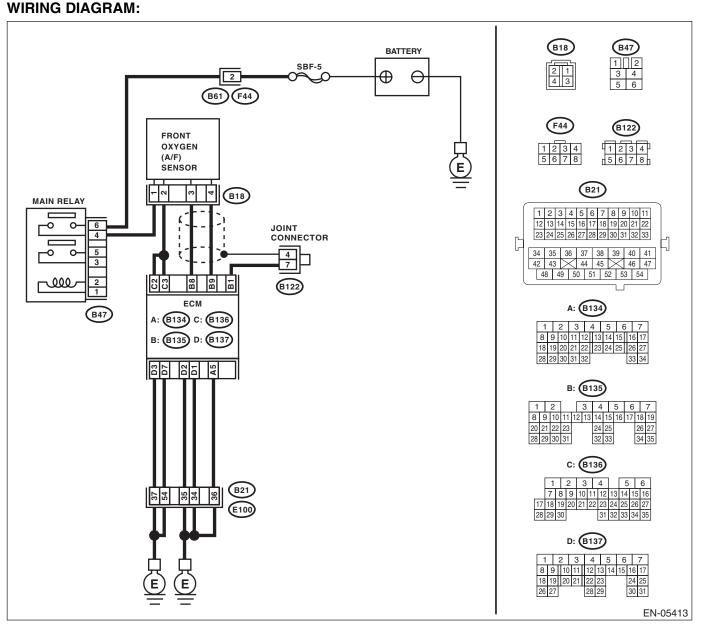
| | | 74() | T - 4 0 | 15 |
|---|---|--|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Start and warm-up the engine. 2) Turn the ignition switch to OFF. 3) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 4) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B136) No. 3 — (B18) No. 2: (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. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B135) No. 9 — (B18) No. 4: (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. Measure the resistance between front oxygen (A/F) sensor connector terminals. Terminals No. 1 — No. 2: | Is the resistance less than 5 Ω ? | Go to step 4. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |
| 4 | CHECK POOR CONTACT. Check poor contact of ECM and front oxygen (A/F) sensor connector. | Is there poor contact in ECM or front oxygen (A/F) sensor con- nector? | Repair the poor contact of ECM or front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |

F: DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1) Studios **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.>.



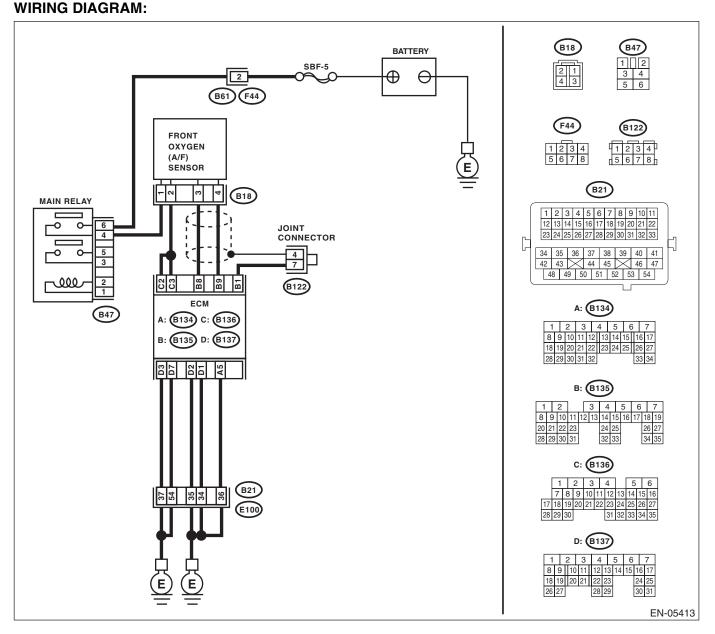
| | | 14() | ThU | V.B. |
|---|--|--|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK POWER SUPPLY TO FRONT OXY-GEN (A/F) SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from front oxygen (A/F) sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between front oxygen (A/F) sensor connector and engine ground. Connector & terminal (B18) No. 1 (+) — Engine ground (-): | Is the voltage 10 V or more? | Go to step 2. | Repair the power supply line. NOTE: In this case, repair the following item: • Open circuit of harness between main relay and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact of main relay connector |
| 2 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B136) No. 3 — (B18) No. 2: (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. Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector Poor contact of coupling connector |
| 4 | CHECK FRONT OXYGEN (A/F) SENSOR. Measure the resistance between front oxygen (A/F) sensor connector terminals. Terminals No. 1 — No. 2: | Is the resistance between 2 — 3 Ω ? | Repair poor contact of the ECM connector. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |

G: DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1) Studios **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.>.



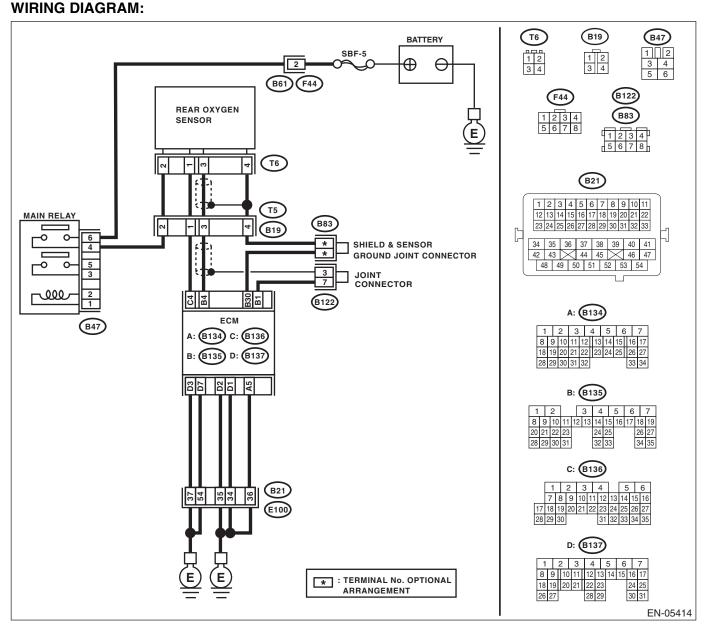
| | | 146 | | |
|---|---|--|---------------------|----------------------|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND | Is the voltage 10 V or more? | Repair the short | Go to step 2. |
| | FRONT OXYGEN (A/F) SENSOR. | | circuit to power in | ALE |
| | Turn the ignition switch to OFF. | | the harness | |
| | Measure the voltage between ECM and | | between the ECM | |
| | chassis ground. | | and front oxygen | |
| | Connector & terminal | | (A/F) sensor con- | |
| | (B136) No. 3 (+) — Chassis ground (–): | | nector. | |
| | (B136) No. 2 (+) — Chassis ground (–): | | | |
| 2 | CHECK GROUND CIRCUIT FOR ECM. | Is the resistance less than 5 Ω ? | Repair poor con- | Repair the harness |
| | Disconnect the connectors from the ECM. | | tact of the ECM | and connector. |
| | 2) Measure the resistance between ECM and | | connector. | NOTE: |
| | chassis ground. | | | In this case, repair |
| | Connector & terminal | | | the following item: |
| | (B134) No. 5 — Chassis ground: | | | Open circuit of |
| | (B137) No. 1 — Chassis ground: | | | harness between |
| | (B137) No. 2 — Chassis ground: | | | ECM and engine |
| | (B137) No. 3 — Chassis ground: | | | ground |
| | (B137) No. 7 — Chassis ground: | | | Poor contact in |
| | | | | ECM connector |
| | | | | Poor contact of |
| | | | | coupling connector |

H: DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2) Studios **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.>.



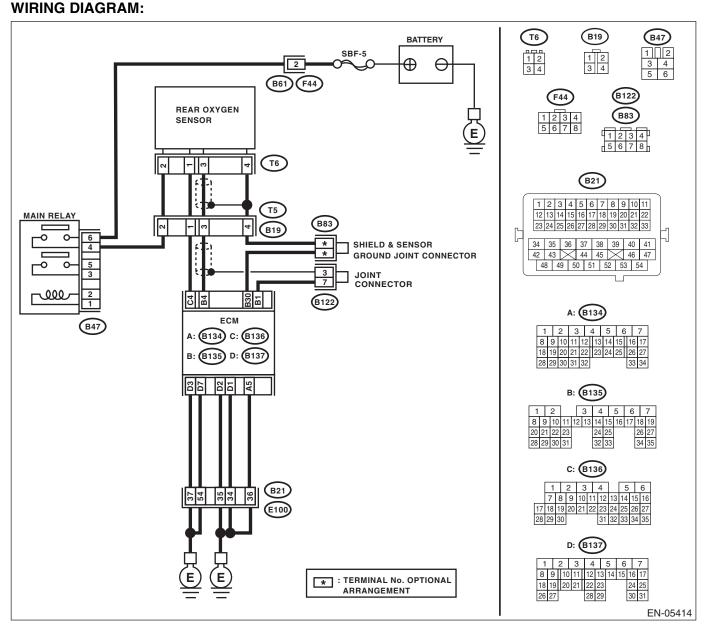
| | | 140 | 7 - 40 | V.F. |
|---|---|--|---|--|
| | Step | Check | Yes | No |
| 1 | CHECK POWER SUPPLY TO REAR OXY-GEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and engine ground. Connector & terminal (T6) No. 2 (+) — Engine ground (-): | Is the voltage 10 V or more? | Go to step 2. | Repair the power supply line. NOTE: In this case, repair the following item: • Open circuit of harness between main relay and rear oxygen sensor • Poor contact of the rear oxygen sensor • Poor contact of main relay connector |
| 2 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and oxygen sensor connector. Connector & terminal (B136) No. 4 — (T6) No. 1: | Is the resistance less than 1 Ω ? | Go to step 3. | Repair the open circuit of the har- ness between ECM and rear oxy- gen sensor. |
| 3 | CHECK GROUND CIRCUIT FOR ECM. Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B135) No. 30 — Chassis ground: (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector Poor contact of coupling connector |
| 4 | CHECK REAR OXYGEN SENSOR. Measure the resistance between rear oxygen sensor connector terminals. Terminals 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<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> |

DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2) Studios **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.>.



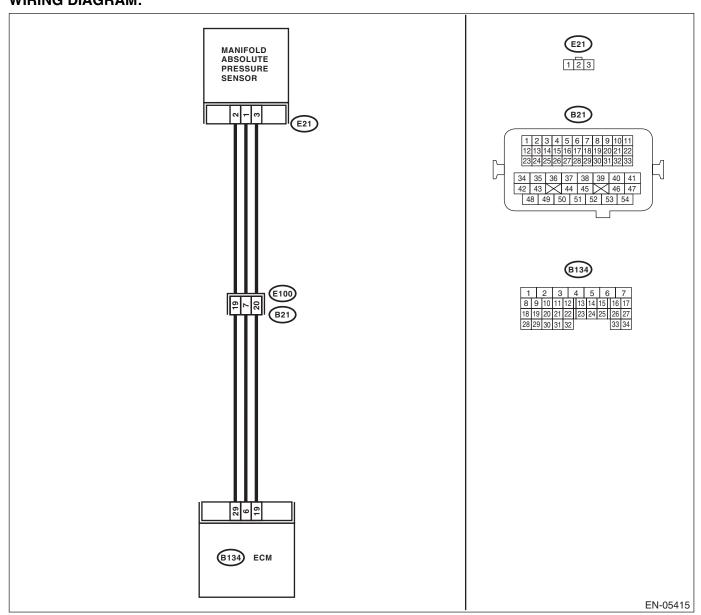
| | | / Y () | IT - U | V - |
|---|---|--|--|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 4 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and rear oxygen sensor connector. | Go to step 2. |
| 2 | CHECK GROUND CIRCUIT FOR ECM. 1) Disconnect the connectors from the ECM. 2) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 30 — Chassis ground: (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground: | Is the resistance less than 5 Ω ? | Repair poor contact of the ECM connector. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector 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.
- Eris Studios 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 | E No C |
|---|---|---|---|---|
| 1 | CHECK AIR INTAKE SYSTEM. | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step 2. |
| 2 | CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is higher than 70°C (158°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Read the data of intake manifold pressure sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".</ref.> | | Go to step 3. | Replace the manifold absolute pressure sensor. <ref. absolute="" fu(h4dotc)-36,="" manifold="" pressure="" sensor.="" to=""></ref.> |
| 3 | CHECK THROTTLE OPENING ANGLE. Read the data of throttle position signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".</ref.> | Is the measured value less than 5% when throttle is fully closed? | | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |
| 4 | CHECK THROTTLE OPENING ANGLE. | Is the measured value 85% or more when throttle is fully open? | Replace the manifold absolute pressure sensor. <ref. absolute="" fu(h4dotc)-36,="" manifold="" pressure="" sensor.="" to=""></ref.> | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |

ENGINE (DIAGNOSTICS)

K: DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE Studios **DTC DETECTING CONDITION:**

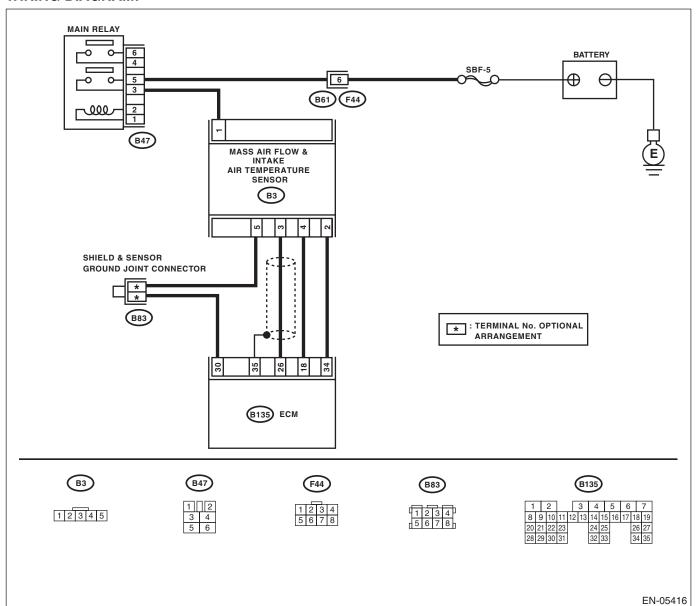
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-24, DTC P0101 MASS OR VOLUME AIR FLOW CIR- CUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

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:



| | | 144.7 | IT N " WI | / - |
|---|-------------------------------------|-----------------------------|--|------------------------------------|
| | Step | Check | Yes | No C |
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check the appro- | Replace the mass |
| | | | priate DTC using | air flow and intake |
| | | | the "List of Diag- | air temperature |
| | | | nostic Trouble | sensor. <ref. th="" to<=""></ref.> |
| | | | Code (DTC)". | FU(H4DOTC)-35, |
| | | | <ref. th="" to<=""><th>Mass Air Flow and</th></ref.> | Mass Air Flow and |
| | | | EN(H4DOTC)(diag) | Intake Air Temper- |
| | | | -76, List of Diag- | ature Sensor.> |
| | | | nostic Trouble | |
| | | | Code (DTC).> | |

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

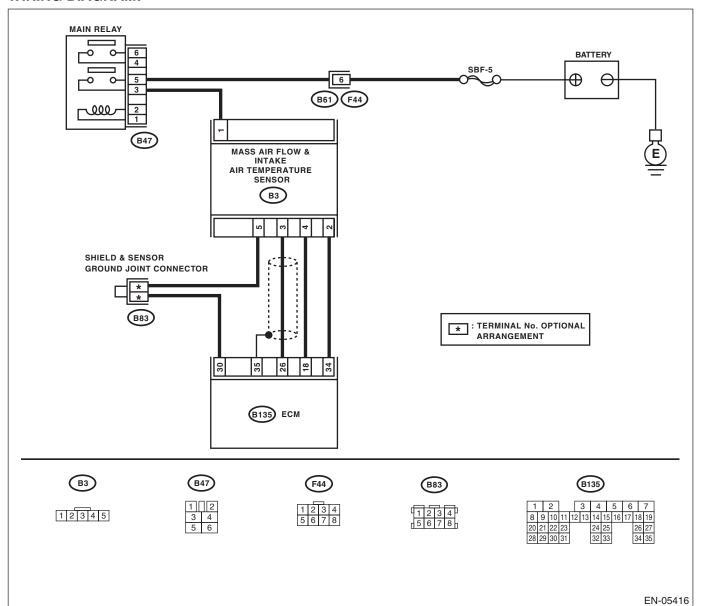
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-27, DTC P0102 MASS OR VOLUME AIR FLOW CIR-CUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

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:



| | | NOTEY | DV P |
|---|---|-------------------------------|--|
| Step | Check | Yes | No C |
| CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of air flow sensor sig the Subaru Select Monitor or general sensor Subaru Select Monitor For detailed operation procedures, "READ CURRENT DATA FOR ENGING to EN(H4DOTC)(diag)-36, Subaru Seletor.> General scan tool For detailed operation procedure, refigeneral scan tool operation manual. | refer to E". <ref. ect="" moni-<="" th=""><th>0.2 V? Go to step 2.</th><th>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure.</th></ref.> | 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. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 CHECK POWER SUPPLY OF MASS FLOW AND INTAKE AIR TEMPERA'S ENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the flow and intake air temperature sensor 3) Turn the ignition switch to ON. 4) Measure the voltage between mas and intake air temperature sensor con and engine ground. Connector & terminal (B3) No. 1 (+) — Engine ground (-) | mass air : : s air flow nector | ore? Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors • Poor contact in ECM connector |
| THE MASS AIR FLOW AND INTAKE TEMPERATURE SENSOR CONNEC 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from th 3) Measure the resistance of harness ECM and mass air flow and intake air ture sensor connectors. Connector & terminal (B135) No. 26 — (B3) No. 3: | AIR TORS. e ECM. between | an 1 Ω? Go to step 4 . | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors |
| 4 CHECK HARNESS BETWEEN ECM THE MASS AIR FLOW AND INTAKE TEMPERATURE SENSOR CONNEC Measure the resistance between ECM chassis ground. Connector & terminal (B135) No. 26 — Chassis ground | AIR more? TORS. and | 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. Check for any poor contact between the and the mass air flow and intake air tem sensor connectors. | | w and contact between | air temperature sensor. <ref. td="" to<=""></ref.> |

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

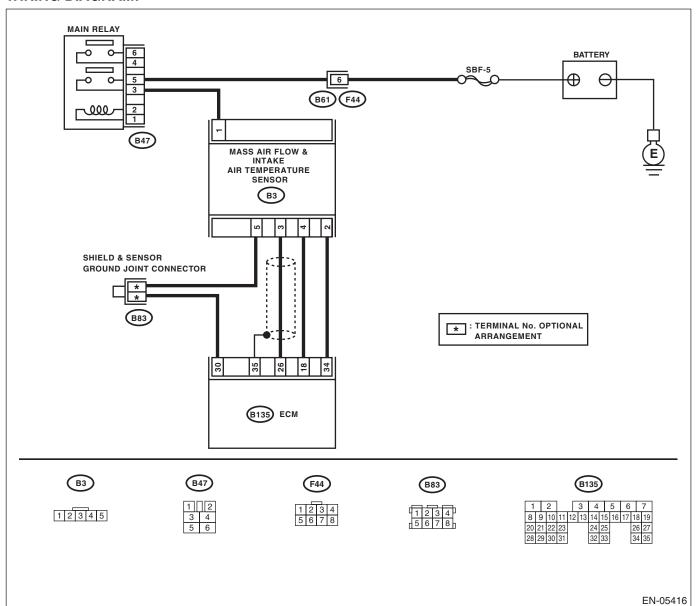
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-29, DTC P0103 MASS OR VOLUME AIR FLOW CIR-CUIT HIGH INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

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:



| | /VO | TEUDI | 15 |
|---|--|--|--|
| Step | Check | Yes | L No C |
| CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the mass air flow and intake air temperature sensor. 3) Start the engine. 4) Read the data of air flow sensor signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | 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. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B3) No. 2 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and the mass air flow and intake air temperature sensor connectors • Poor contact in ECM connector |
| air flow and intake air temperature sensor con- | 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<br="">FU(H4DOTC)-35, Mass Air Flow and Intake Air Temper- ature Sensor.></ref.> |

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

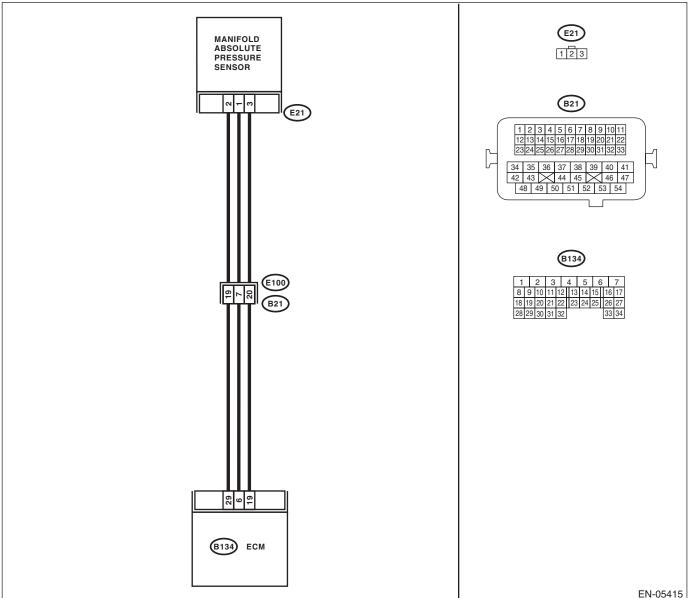
DTC DETECTING CONDITION:

- 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:



| | /VO | TOUD | V.F. |
|--|--|--|--|
| Step | Check | Yes | No C |
| CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | 13.3 kPa (100 mmHg, 3.94 inHg) ? | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 CHECK POWER SUPPLY OF THE MANIFOLD ABSOLUTE PRESSURE SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. Connector & terminal (E21) No. 3 (+) — Engine ground (-): | Is the voltage 4.5 V or more? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and manifold absolute pressure sensor connector. • Poor contact in ECM connector • Poor contact of coupling connector |
| 3 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector. Connector & terminal (B134) No. 6 — (E21) No. 1: | Is the resistance less than 1 $\Omega?$ Is the resistance 1 $M\Omega$ or | Go to step 4 . Go to step 5 . | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and manifold absolute pressure sensor connector. • Poor contact of coupling connector Repair short cir- |
| MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 6 — Chassis ground: | more? | | cuit of the harness to ground between ECM and manifold absolute pressure sensor connector. |
| 5 CHECK POOR CONTACT. Check for poor contact between the ECM and manifold pressure sensor connector. | Is there poor contact in the ECM or manifold absolute pressure sensor connector? | Repair the poor contact in the ECM or manifold absolute pressure sensor connector. | Replace the manifold absolute pressure sensor. <ref. absolute="" fu(h4dotc)-36,="" manifold="" pressure="" sensor.="" to=""></ref.> |

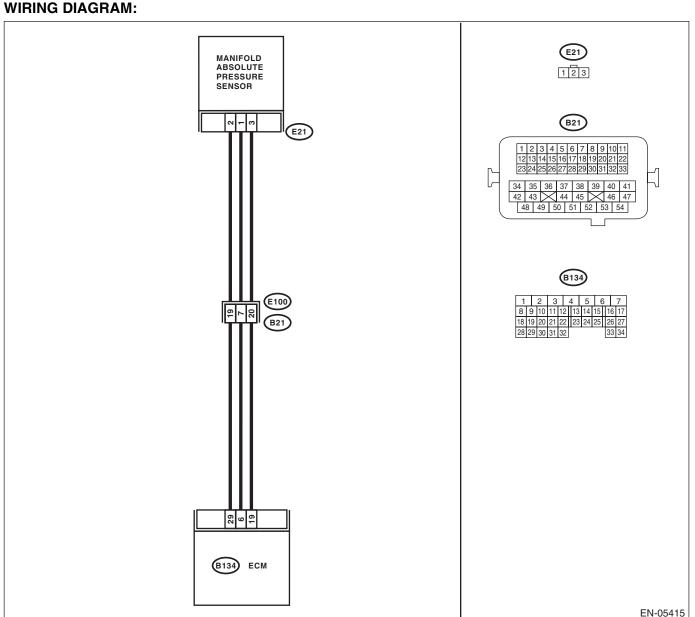
O: DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE s Studios CIRCUIT HIGH INPUT

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.>.



| | | - IVO | TEGO | 15 |
|---|---|---|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from manifold absolute pressure sensor. 3) Start the engine. 4) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | 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. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground. Connector & terminal (E21) No. 2 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and manifold absolute pressure sensor connector. Poor contact in ECM connector Poor contact of coupling connector |
| 4 | CHECK POOR CONTACT. 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. absolute="" fu(h4dotc)-36,="" manifold="" pressure="" sensor.="" to=""></ref.> |

P: DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PER-Studios **FORMANCE**

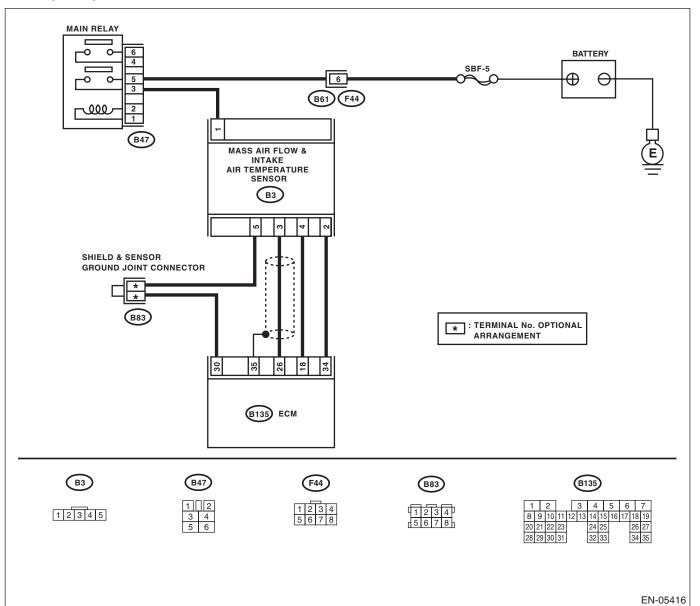
DTC DETECTING CONDITION:

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

TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

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.>.



| | | 111 | 1 200 | / 5 |
|---|---|---|--|--|
| | Step | Check | Yes | No C |
| 1 | Step CHECK ENGINE COOLANT TEMPERATURE. 1) Start the engine and warm-up completely. 2) Measure the engine coolant temperature using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to | Is the engine coolant temperature 75°C (167°F) or higher? | Replace the mass air flow and intake air temperature sensor. <ref. to<br="">FU(H4DOTC)-35,</ref.> | No Check DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> |
| | "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | | Code (D10).2 |

Q: DTC P0112 INTAKE AIR TEMPERATURE SENSOR TCIRCUIT LOW ris Studios

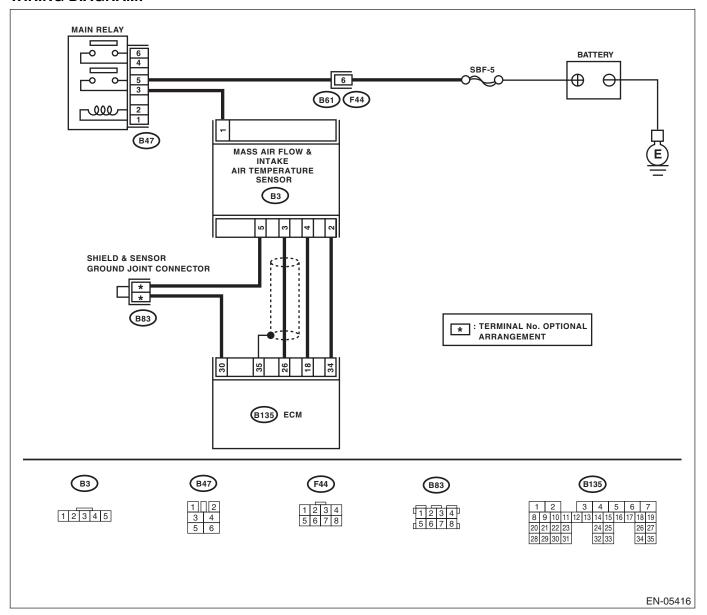
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-37, DTC P0112 INTAKE AIR TEMPERATURE SEN-SOR 1 CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 140 | 7- 40 | 15 |
|---|---|--|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTORS. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and the mass air flow and intake air temperature sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 18 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the mass air flow and intake air temperature sensor. <ref. to<br="">FU(H4DOTC)-35, Mass Air Flow and Intake Air Temper- ature Sensor.></ref.> | 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 I CIRCUIT HIGH SENSOR I

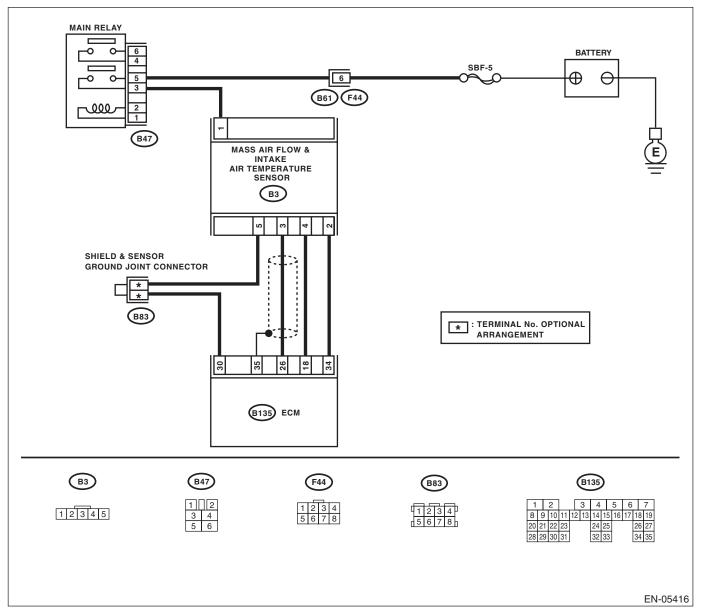
- · Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-39, DTC P0113 INTAKE AIR TEMPERATURE SEN-SOR 1 CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | ./٧() | 7 - 4 0 | / b |
|---|--|---|--|--|
| | Step | Check | Yes | <u>8</u> |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK POOR CONTACT. Repair any poor contact between the ECM and 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and the mass air flow and intake air temperature sensor. 3) Measure the resistance of harness between ECM and the mass air flow and intake air temperature sensor connector and engine ground. Connector & terminal (B135) No. 18 — (B3) No. 4: (B135) No. 30 — (B3) No. 5: | Is the resistance less than 1 Ω ? | Go to step 4. | Open circuit of har- ness 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. 1) Connect all connectors. 2) Turn the ignition switch to OFF. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (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<br="">FU(H4DOTC)-35, Mass Air Flow and Intake Air Temper- ature Sensor.></ref.> |

S: DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW

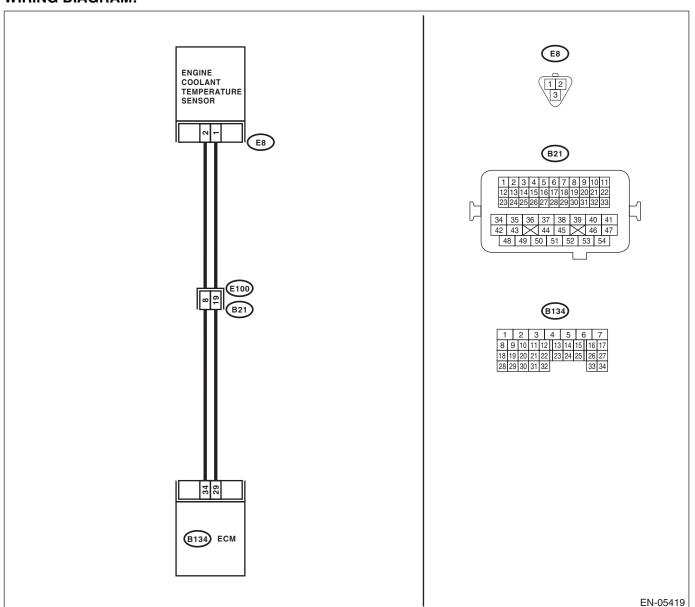
DTC DETECTING CONDITION:

- Immediately at fault recognition
- Eris Studios • 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 idlina
- Poor driving performance

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.>.



| | | / / / () | IT - U | V F . |
|---|--|--|---|--|
| | Step | Check | Yes | No S |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and engine coolant temperature sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 34 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-30,="" sensor.="" temperature="" to=""></ref.> | Repair short circuit of the harness to ground between the ECM and engine coolant temperature sensor. |

T: DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH

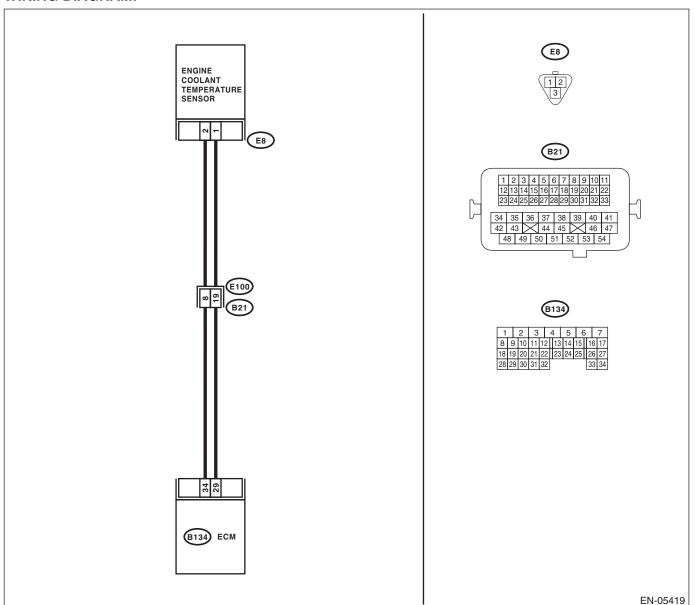
DTC DETECTING CONDITION:

- Immediately at fault recognition
- Eris Studios • 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

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.>.



| | | / Y L | IT - U | V F |
|---|--|---|---|--|
| | Step | Check | Yes | No |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK POOR CONTACT. Repair any poor contact between the ECM and 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and engine coolant temperature sensor. 3) Measure the resistance of the harness between the ECM and engine coolant temperature sensor connector. Connector & terminal (B134) No. 34 — (E8) No. 2: (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. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (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 sen- sor connector. | Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-30,="" sensor.="" temperature="" to=""></ref.> |

ENGINE (DIAGNOSTICS)

U: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW DTC DETECTING CONDITION:

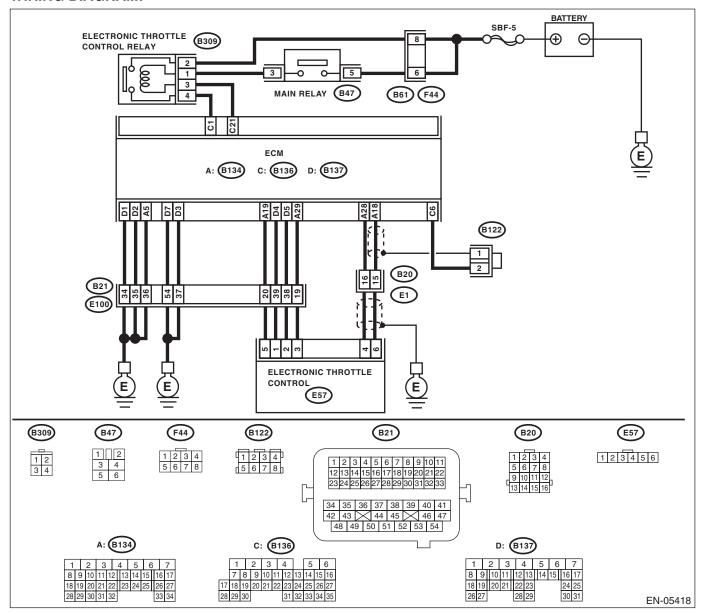
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-45, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 140 | 7- 40 | 15 |
|---|---|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6: | Is the resistance 1 $M\Omega$ or more? | Go to step 2. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |
| 2 | CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground: | Is the resistance 1 $M\Omega$ or more? | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <ref. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> |

ENGINE (DIAGNOSTICS)

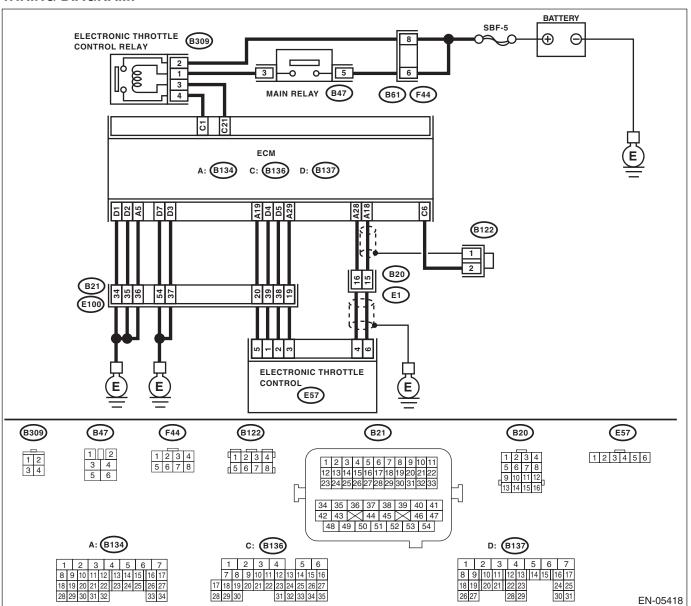
V: DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH Studios **DTC DETECTING CONDITION:**

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

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

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.>.



| | | 14() | Thu | 15 |
|---|--|--|--|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 29 — (E57) No. 3: | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 2 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector Poor contact of coupling connector |
| 3 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 18: | Is the resistance 1 $M\Omega$ or more? | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |

ENGINE (DIAGNOSTICS)

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 TEMPER-ATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Trouble Code (DTC) Detecting Criteria.> TROUBLE SYMPTOM:

Engine does not return to idle.

CAUTION:

| | Step | Check | Yes | No |
|---|--|---|---|---|
| 1 | CHECK TIRE SIZE. | Is the tire size as specified? and the same size as other three wheels? | Go to step 2. | Replace the tire. |
| 2 | CHECK ENGINE COOLANT. Check the following items: | Is the engine coolant normal? | Go to step 3. | Fill or replace the engine coolant. <ref. co(h4dotc)-20,="" coolant.="" engine="" inspection,="" to=""></ref.> |
| 3 | CHECK THERMOSTAT. | Does the thermostat remain opened? | Replace the ther- mostat. <ref. to<br="">CO(H4DOTC)-23, Thermostat.></ref.> | Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-30,="" sensor.="" temperature="" to=""></ref.> |

X: DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE Studios **OPERATION**

DTC DETECTING CONDITION:

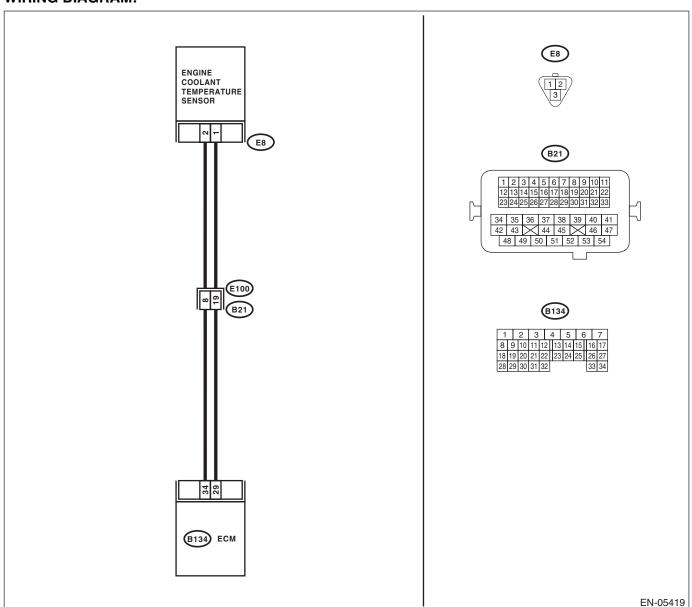
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-52, DTC P0126 INSUFFICIENT ENGINE COOLANT TEMPERATURE FOR STABLE OPERATION, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | 1 1 1 1 | | |
|---|--|--|------------|---|
| | Step | Check | Yes | No C |
| 1 | CHECK ENGINE COOLANT TEMPERATURE SENSOR. | • | | Replace the engine coolant |
| | Measure the resistance between engine coolant temperature sensor terminals when the engine coolant is cold and after warmed-up. Terminals No. 1 — No. 2: | ent between when engine coolant is cold and after warmed-up? | connector. | temperature sen- sor. <ref. to<br="">FU(H4DOTC)-30, Engine Coolant Temperature Sen-</ref.> |
| | | | | sor.> |

ENGINE (DIAGNOSTICS)

Y: DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE Studios **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.

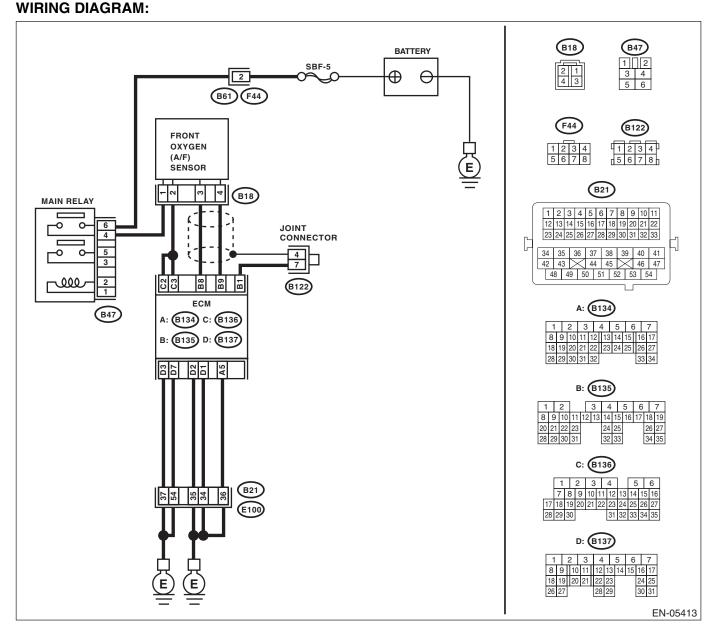
CAUTION:

| | Step | Check | Yes | No |
|---|---|--|---|---|
| 1 | CHECK ENGINE COOLANT. | Are the coolant level and mix- ture ratio of engine coolant to anti-freeze solution correct? | Go to step 2. | Replace the engine coolant. <ref. co(h4dotc)-19,="" coolant.="" engine="" replacement,="" to=""></ref.> |
| 2 | CHECK RADIATOR FAN. 1) Start the engine. 2) Check the radiator fan operation. | Does the radiator fan continuously rotate for 3 minutes or more during idling? | Repair radiator fan circuit. <ref. and="" co(h4dotc)-30,="" fan="" main="" motor.="" radiator="" to=""> and <ref. and="" co(h4dotc)-32,="" fan="" motor.="" radiator="" sub="" to=""></ref.></ref.> | mostat. <ref. co(h4dotc)-23,<="" td="" to=""></ref.> |

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

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

CAUTION:

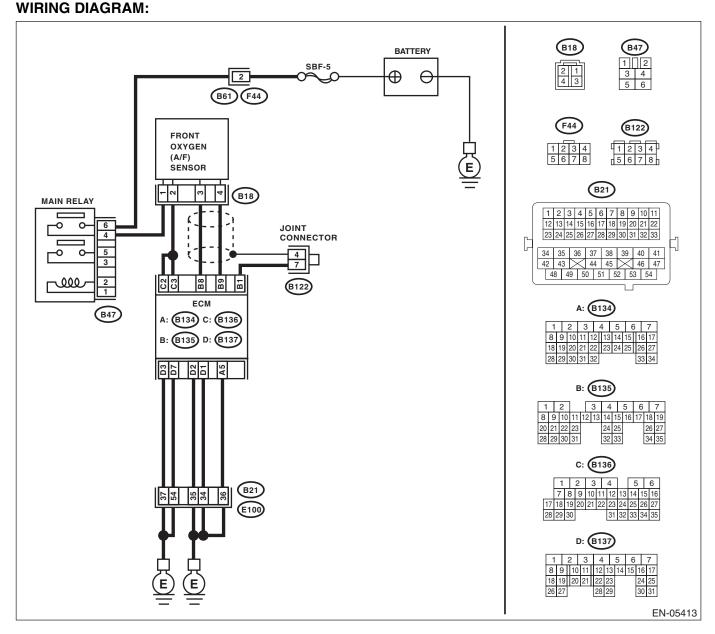


| | | 110 | 17 ~ 0 | / - |
|---|---|---|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR. | Has water entered the connector? | Completely remove any water inside. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 9 — Chassis ground: (B135) No. 8 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 3. | Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector. |
| 3 | CHECK POOR CONTACT. Check poor contact of front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact of the front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |

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

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

CAUTION:



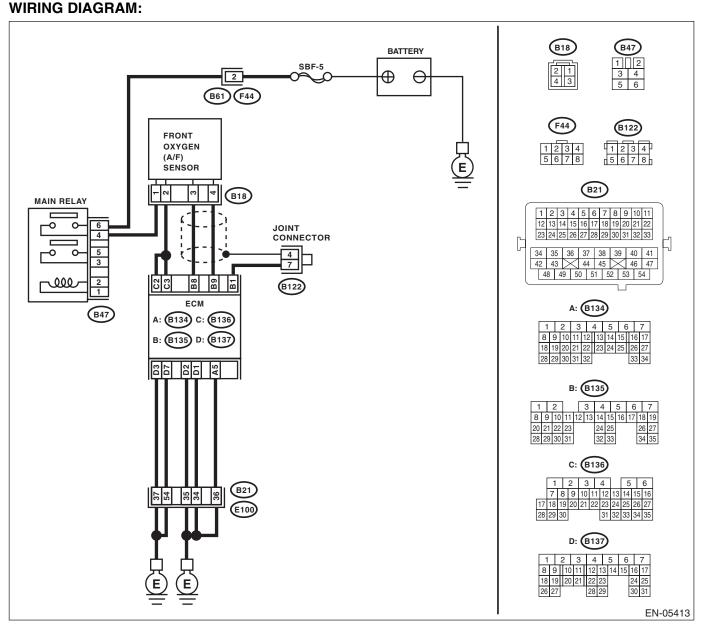
| | | | | / / / |
|---|--|-------------------------------|---------------------|---------------------------------|
| | Step | Check | Yes | No C |
| 1 | CHECK FRONT OXYGEN (A/F) SENSOR | Has water entered the connec- | Completely | Go to step 2. |
| | CONNECTOR AND COUPLING CONNEC- | tor? | remove any water | MLE |
| | TOR. | | inside. | |
| 2 | CHECK HARNESS BETWEEN ECM AND | Is the voltage 8 V or more? | Repair the short | Replace the front |
| | FRONT OXYGEN (A/F) SENSOR CONNEC- | | circuit to power in | oxygen (A/F) sen- |
| | TOR. | | the harness | sor. <ref. th="" to<=""></ref.> |
| | Turn the ignition switch to OFF. | | between the ECM | FU(H4DOTC)-46, |
| | 2) Disconnect the connector from front oxygen | | and front oxygen | Front Oxygen (A/F) |
| | (A/F) sensor. | | (A/F) sensor con- | Sensor.> |
| | Turn the ignition switch to ON. | | nector. | |
| | 4) Measure the voltage between ECM and | | | |
| | chassis ground. | | | |
| | Connector & terminal | | | |
| | (B135) No. 9 (+) — Chassis ground (–): | | | |
| | (B135) No. 8 (+) — Chassis ground (–): | | | |

ENGINE (DIAGNOSTICS)

AB:DTC P0133 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1) Studios **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 RE-SPONSE (BANK 1 SENSOR 1), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:



| | Step | Check | Yes | No C |
|---|--|-------------------------------|--------------------|---------------------------------|
| 1 | CHECK EXHAUST SYSTEM. | Is there any fault in exhaust | Repair the exhaust | Replace the front |
| | NOTE: | system? | system. | oxygen (A/F) sen- |
| | Check the following items. | | | sor. <ref. td="" to<=""></ref.> |
| | Loose installation of front portion of exhaust | | | FU(H4DOTC)-46, |
| | pipe onto cylinder heads | | | Front Oxygen (A/F) |
| | Loose connection between front exhaust pipe | | | Sensor.> |
| | and front catalytic converter | | | |
| | Damage of exhaust pipe resulting in a hole | | | |

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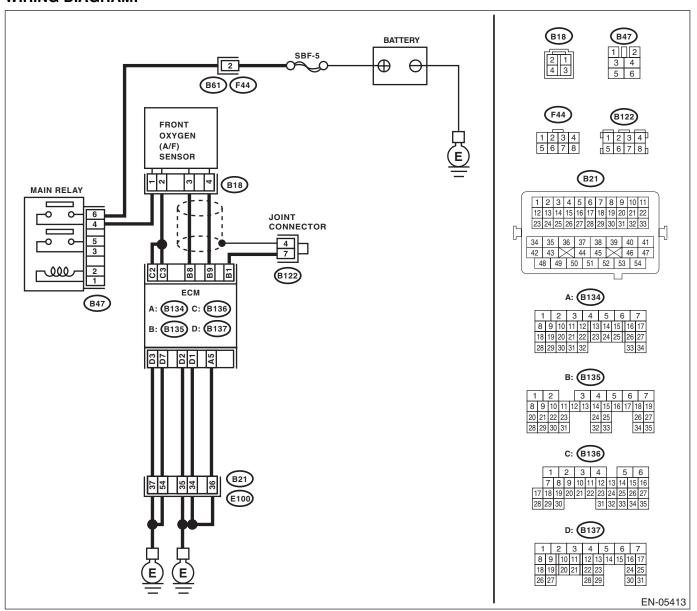
AC:DTC P0134 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1)

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.>.

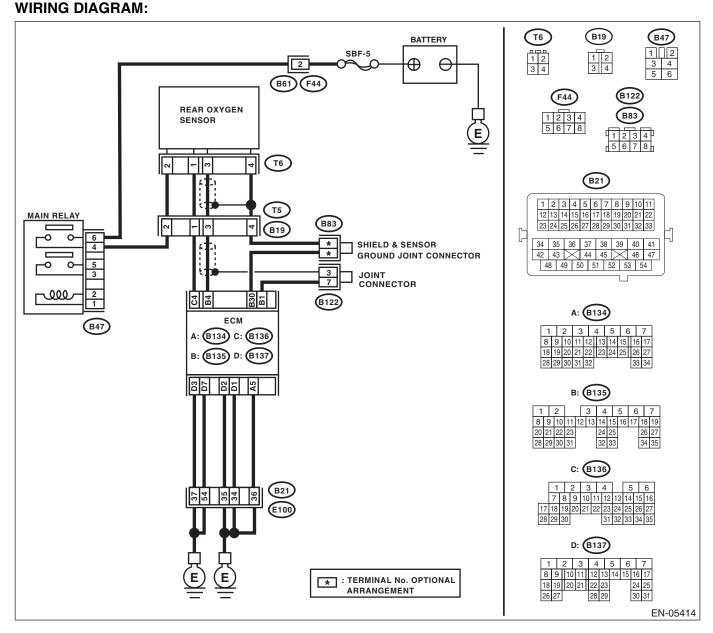


| | | 140 | 7 - 40 | 15 |
|---|--|---|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B135) No. 9 — (B18) No. 4: (B135) No. 8 — (B18) No. 3: | | | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and front oxygen (A/F) sensor connector Poor contact in front oxygen (A/F) sensor connector Poor contact in front oxygen (A/F) sensor connector Poor contact in ECM connector |
| 2 | CHECK POOR CONTACT. Check poor contact of front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact of the front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |

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

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

CAUTION:

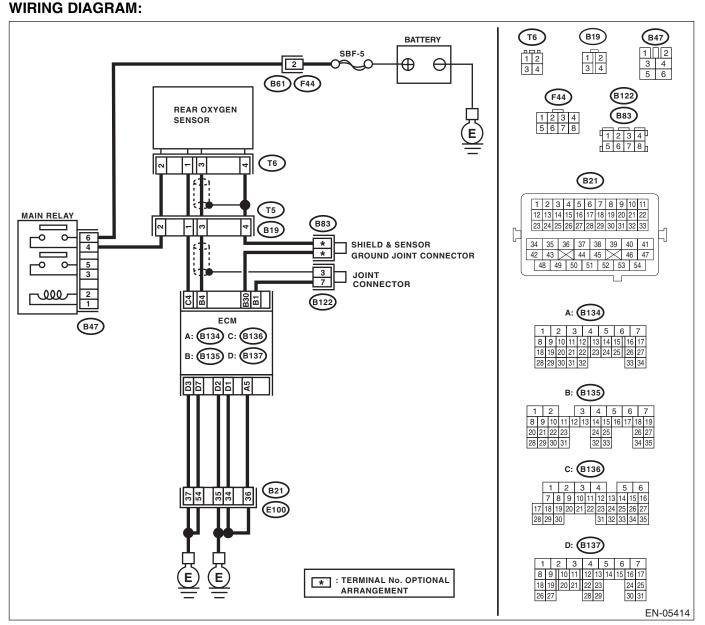


| | /// // | アニックロ | 15 |
|---|--|-------------------------------------|--|
| Step | Check | Yes | No C |
| CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 70°C (158°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 5 . | Go to step 2. |
| 2 CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR. | Has water entered the connector? | Completely remove any water inside. | Go to step 3. |
| 3 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (T6) No. 3: (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (T6) No. 3 (+) — Chassis ground (-): | Is the voltage 0.2 — 0.5 V? | Rear Oxygen Sensor.> | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the ECM and rear oxygen sensor Poor contact of the rear oxygen sensor connector Poor contact in ECM connector |
| CHECK EXHAUST SYSTEM. Check exhaust system parts. NOTE: Check the following items. Loose part and incomplete installation of exhaust system Damage (crack, hole etc.) of parts Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor | | Repair or replace faulty parts. | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> |

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

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

CAUTION:



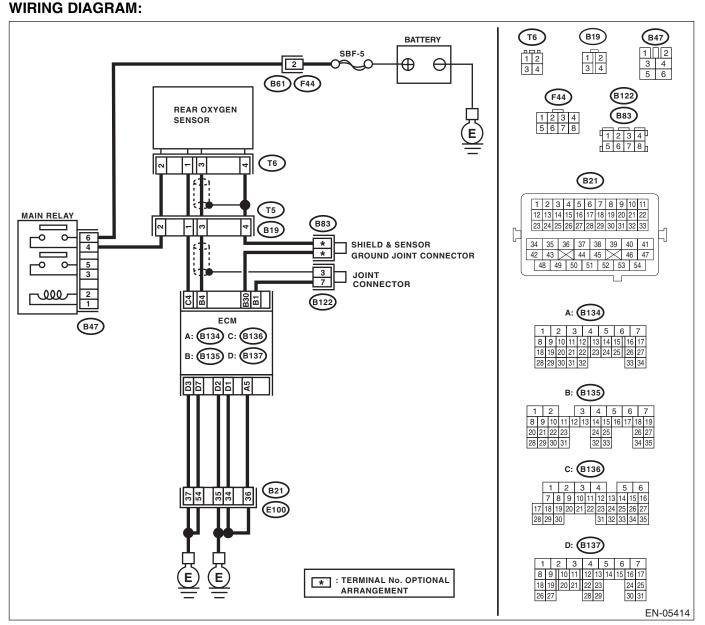
| | /VO | TEUDI | 15. |
|---|--|--|--|
| Step | Check | Yes | No C |
| Warm-up the engine until engine coolant temperature is higher than 70°C (158°F), and rapidly reduce the engine speed from 3,000 rpm. Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | Is the voltage 250 mV or less? | | Go to step 2. |
| | Has water entered the connector? | Completely remove any water inside. | Go to step 3. |
| 3 CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (T6) No. 3: (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. |
| REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (T6) No. 3 (+) — Chassis ground (-): | Is the voltage 0.2 — 0.5 V? | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between the ECM and rear oxygen sensor • Poor contact of the rear oxygen sensor connector • Poor contact in ECM connector |
| | Is there any fault in exhaust system? | Repair or replace faulty parts. | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> |

ENGINE (DIAGNOSTICS)

AF:DTC P0139 O2 SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2) Studios **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 RE-SPONSE (BANK 1 SENSOR 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:



| | | 14() | 7- 40 | 15 |
|---|--|--|--|--|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (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. Measure the resistance between rear oxygen sensor connector and chassis ground. Connector & terminal (T6) No. 3 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between rear oxygen sensor terminals. Terminals No. 3 — No. 4 | Is the resistance less than 1 Ω ? | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |

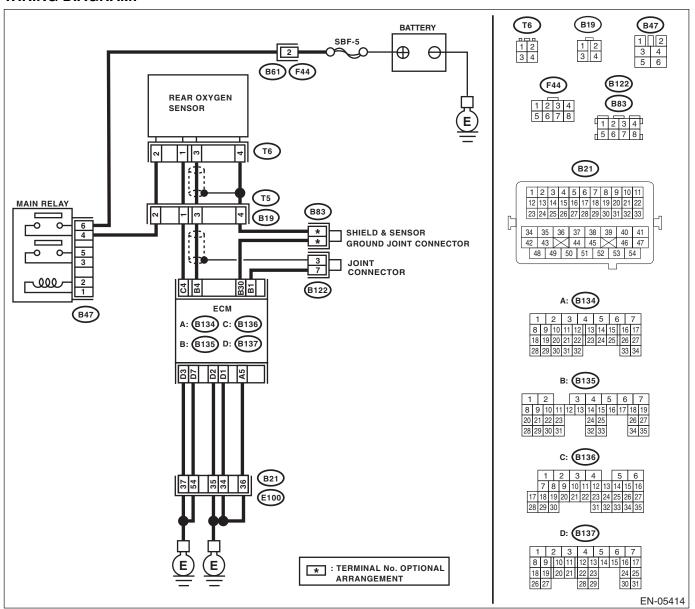
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AG:DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BETTER RESALE

- 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.>.



| | | -/VO | 7 - 4 0 | 15. |
|---|---|--|--|--|
| | Step | Check | Yes | No C |
| 1 | CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 6. | Go to step 2. |
| 2 | CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 6. | Go to step 3. |
| 3 | CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR. | Has water entered the connector? | Completely remove any water inside. | Go to step 4. |
| 4 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (T6) No. 3: (B135) No. 30 — (T6) No. 4: | Is the resistance less than 1 Ω ? | | Repair the open circuit of harness between ECM and rear oxygen sensor connector. |
| 5 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (T6) No. 3 (+) — Chassis ground (-): | Is the voltage 0.2 — 0.5 V? | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the ECM and rear oxygen sensor Poor contact of the rear oxygen sensor connector Poor contact in ECM connector |

ENGINE (DIAGNOSTICS)

| | | | | | _ |
|---|------|-------|---------------------------------|--|-------------------|
| | Step | Check | Yes | CTNo C | |
| 6 | | | Repair or replace faulty parts. | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> | ^{Id} ios |

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).>

ENGINE (DIAGNOSTICS)

- 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 (DTO) Patenting Oritoria. nostic Trouble Code (DTC) Detecting Criteria.>

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

| | Step | Check | Yes | No |
|---|---|---|-------------------------------|---|
| 1 | CHECK EXHAUST SYSTEM. | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step 2. |
| 2 | CHECK AIR INTAKE SYSTEM. | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step 3. |
| 3 | CHECK FUEL PRESSURE. WARNING: Place "NO OPEN FLAMES" signs near the working area. CAUTION: Be careful not to spill fuel. Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <ref. fuel="" inspection,="" me(h4dotc)-31,="" pressure.="" to=""> CAUTION: Release fuel pressure before removing the fuel pressure gauge. NOTE: If fuel pressure does not increase, squeeze the fuel return hose 2 or 3 times, then measure fuel pressure again.</ref.> | | Go to step 4. | Repair the following item. Fuel pressure is too high: Clogged fuel return line or bent hose Fuel pressure is too low: Improper fuel pump discharge Clogged fuel supply line |
| 4 | CHECK FUEL PRESSURE. After connecting the pressure regulator vacuum hose, measure fuel pressure. <ref. fuel="" inspection,="" me(h4dotc)-31,="" pressure.="" to=""> CAUTION: Release fuel pressure before removing the fuel pressure gauge. NOTE: If fuel pressure does not increase, squeeze fuel return hose 2 or 3 times, then measure fuel pressure again. If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose.</ref.> | | Go to step 5. | Repair the following item. Fuel pressure is too high: Faulty pressure regulator Clogged fuel return line or bent hose Fuel pressure is too low: Faulty pressure regulator Improper fuel pump discharge Clogged fuel supply line |

| | Step | Check | Yes | E No o |
|---|--|-------|---|--|
| 5 | CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the</ref.> | | Go to step 6. | Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-30,="" sensor.="" temperature="" to=""></ref.> |
| 6 | CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 7. | Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-35,="" intake="" mass="" sensor.="" temperature="" to=""></ref.> |
| 7 | CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Open the front hood. 6) Measure the ambient temperature. 7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Repair poor contact of the ECM connector. | Check the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-35,="" intake="" mass="" sensor.="" temperature="" to=""></ref.> |

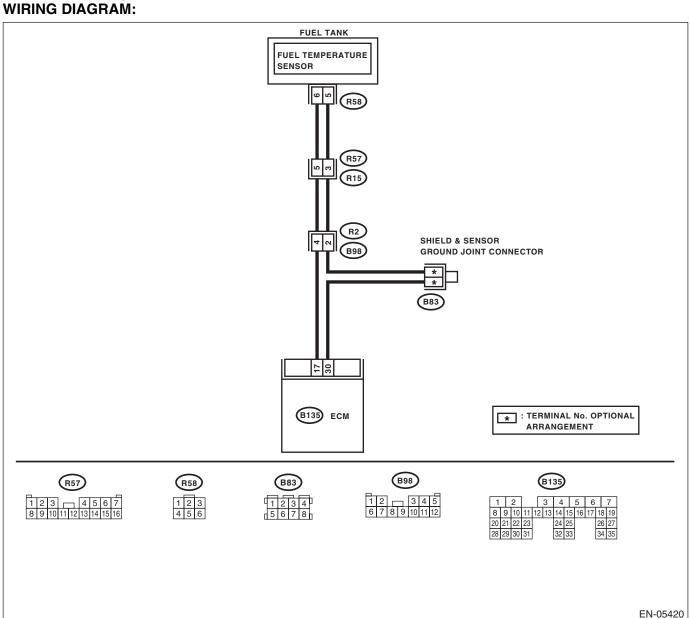
AJ:DTC P0181 FUEL TEMPERATURE SENSOR "A" **CIRCUIT RANGE/PERFOR-**Studios MANCE

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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

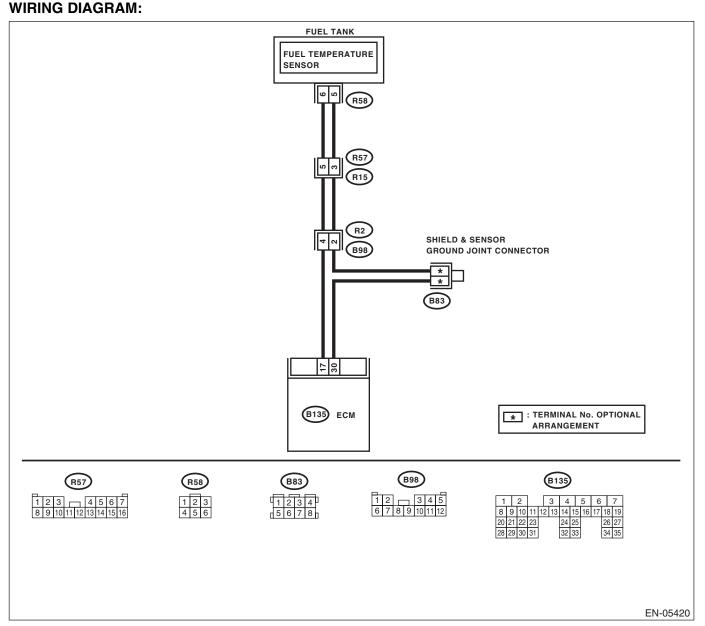
| | * | | |
|---------------------------------------|---|------------------|--|
| Step | Check | Yes | No C |
| 1 CHECK FOR ANY OTHER DTC ON DISPLAY. | | priate DTC using | Replace the fuel temperature sen- sor. <ref. to<br="">EC(H4DOTC)-13, Fuel Temperature Sensor.></ref.> |

CIRCUIT LOW INPUT Studios **AK:DTC P0182 FUEL TEMPERATURE SENSOR "A" 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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

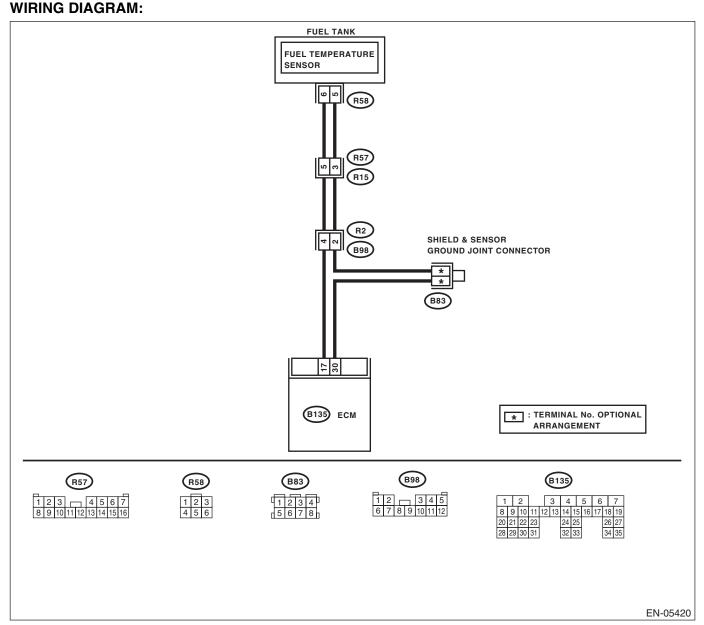
| | | 171 | IT m " U | / 5 |
|---|--|--|--|--|
| | Step | Check | Yes | No C |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of fuel temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and fuel temperature sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 17 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the fuel temperature sen- sor. <ref. to<br="">EC(H4DOTC)-13, Fuel Temperature Sensor.></ref.> | Repair short circuit of the harness to ground between ECM and fuel pump. |

CIRCUIT HIGHINPUT Studios **AL:DTC P0183 FUEL TEMPERATURE SENSOR "A" 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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | 1467 | IT m - U | / - |
|---|--|---|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of fuel temperature sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | Is the temperature less than – 40°C (–40°F)? | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK POOR CONTACT. Repair any poor contact between the ECM and fuel temperature sensor connectors. | Is there poor contact in the ECM or fuel temperature sensor connectors? | Repair any poor contact between the ECM and fuel temperature sensor connectors. | Go to step 3. |
| 3 | CHECK HARNESS BETWEEN ECM AND FUEL TEMPERATURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and fuel temperature sensor. 3) Measure the resistance of the harness between the ECM and fuel temperature sensor connector. Connector & terminal (B135) No. 17 — (R58) No. 6: (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. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (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 tempera- ture sensor con- nector. | Replace the fuel temperature sen- sor. <ref. to<br="">EC(H4DOTC)-13, Fuel Temperature Sensor.></ref.> |

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

DTC DETECTING CONDITION:

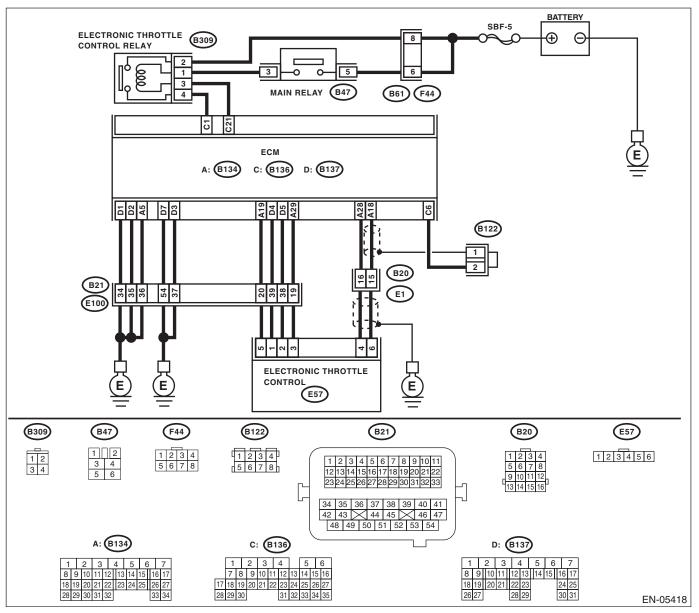
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-88, DTC P0222 THROTTLE/PEDAL POSITION SEN-SOR/SWITCH "B" CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | 1467 | | / /- |
|---|--|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 28 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 2. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |
| 2 | CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 4 — Engine ground: | Is the resistance 1 $M\Omega$ or more? | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. Replace the ECM if defective. <ref. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> |

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

DTC DETECTING CONDITION:

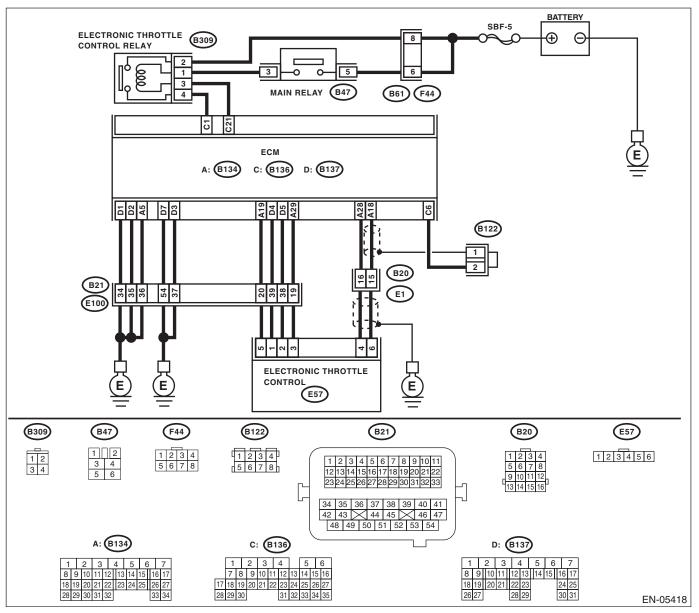
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-90, DTC P0223 THROTTLE/PEDAL POSITION SEN-SOR/SWITCH "B" CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | 740 | T p " U | / 5- |
|---|--|--|--|---|
| | Step | Check | Yes | No |
| 1 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3: | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 2 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector |
| 3 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 4 (+) — Engine ground (-): | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step 4. |
| 4 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 28: | Is the resistance 1 $M\Omega$ or more? | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. |

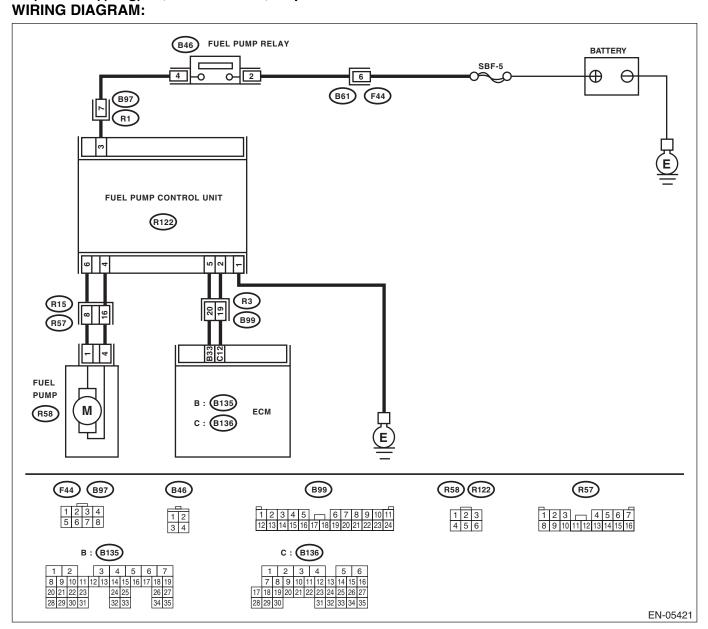
AO:DTC P0230 FUEL PUMP PRIMARY CIRCUIT

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- R RESALE • 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.>.



| | | 110 | FE-U | / 6= |
|---|---|--|---------------|--|
| | Step | Check | Yes | No |
| 1 | CHECK POWER SUPPLY CIRCUIT TO FUEL PUMP CONTROL UNIT. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel pump control unit. 3) Turn the ignition switch to ON. 4) Measure the voltage between fuel pump control unit and chassis ground. Connector & terminal (R122) No. 3 (+) — Chassis ground (-): | C | Go to step 2. | Repair the power supply circuit. NOTE: In this case, repair the following item: Open or ground short circuit of harness between fuel pump relay and fuel pump control unit Poor contact of fuel pump control unit connector Poor contact of fuel pump relay connector |
| 2 | CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between fuel pump control unit and chassis ground. Connector & terminal (R122) No. 1 — Chassis ground: | Is the resistance less than 5 Ω ? | · | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit between fuel pump control unit and chassis ground Poor contact of fuel pump control unit connector |
| 3 | CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR. 1) Disconnect the connector from fuel pump. 2) Measure the resistance of harness between fuel pump control unit and fuel pump connector. Connector & terminal (R122) No. 4 — (R58) No. 4: (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. Measure the resistance between fuel pump control unit and chassis ground. Connector & terminal (R122) No. 4 — Chassis ground: (R122) No. 6 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of the harness between the ECM and fuel pump control unit. Connector & terminal (B136) No. 12 — (R122) No. 2: (B135) No. 33 — (R122) No. 5: | Is the resistance less than 1 Ω ? | Go to step 6. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit between the ECM and fuel pump control unit • Poor contact between ECM and fuel pump control unit |

| | | IVIC | 3 - 4 0 | at the |
|---|--|--|--|--|
| | Step | Check | Yes | ETNo C |
| 6 | CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT. Measure the resistance between fuel pump control unit and chassis ground. Connector & terminal (R122) No. 2 — Chassis ground: (R122) No. 5 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 7. | Repair short cir- cuit of the harness to ground between ECM and fuel pump control unit. |
| 7 | CHECK POOR CONTACT. 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. NOTE: DTC may be recorded as a result of fuel pump idling while running out of fuel. | Replace the fuel pump control unit. <ref. to<br="">FU(H4DOTC)-54, Fuel Pump Control Unit.></ref.> |

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

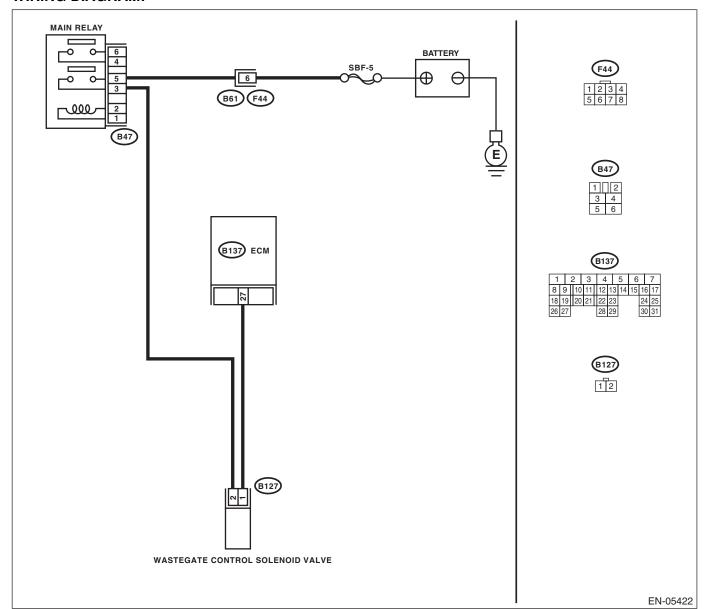
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-94, DTC P0244 TURBO/SUPER CHARGER WASTE-GATE 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.>.



| | | **** | I Pour Total | |
|---|-------------------------------------|-------|--------------------------------------|--|
| | Step | Check | Yes | No C |
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | | 7.0 | Replace the wastegate control sole- |
| | | | the "List of Diag- nostic Trouble | noid valve. <ref. fu(h4dotc)-45,<="" th="" to=""></ref.> |
| | | | | Wastegate Control Solenoid Valve.> |
| | | | EN(H4DOTC)(diag) -76, List of Diag- | Colonold valve.> |
| | | | nostic Trouble Code (DTC).> | |

AQ:DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW Studios

DTC DETECTING CONDITION:

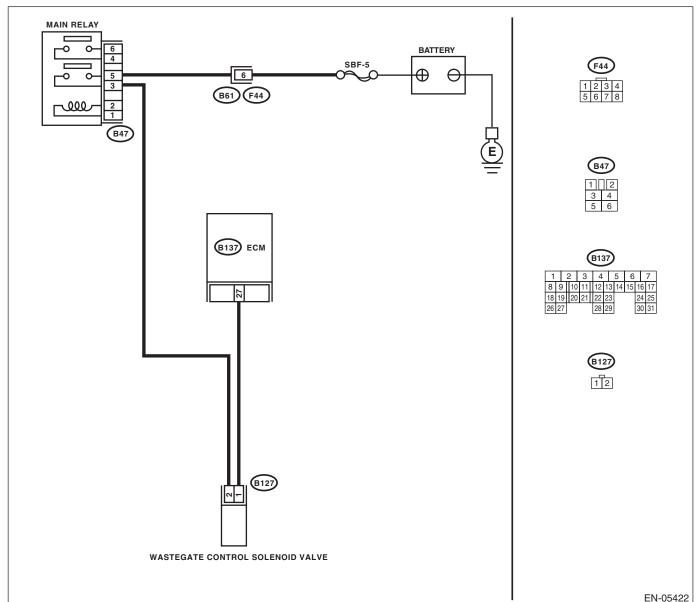
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-96, DTC P0245 TURBO/SUPER CHARGER WASTE-GATE SOLENOID "A" LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | /VO | 7 2 4 0 | 15. |
|---|---|---|--|---|
| | Step | Check | Yes | No |
| 1 | CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and wastegate control solenoid valve. 3) Measure the resistance between wastegate control solenoid valve connector and engine ground. Connector & terminal (B127) No. 1 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance of harness between ECM and wastegate control solenoid valve connector. Connector & terminal (B137) No. 27 — (B127) No. 1: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and wastegate control solenoid valve connector |
| 4 | CHECK WASTEGATE CONTROL SOLE-NOID VALVE. 1) Remove the wastegate control solenoid valve. 2) Measure the resistance between wastegate control solenoid valve terminals. Terminals No. 1 — No. 2: | Is the resistance between 10 — 100 Ω ? | Go to step 5. | Replace the waste- gate control sole- noid valve. <ref. to<br="">FU(H4DOTC)-45, Wastegate Control Solenoid Valve.></ref.> |
| 5 | CHECK POWER SUPPLY TO WASTEGATE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to ON. 2) Measure the voltage between wastegate control solenoid valve and engine ground. Connector & terminal (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. NOTE: In this case, repair the following item: • Open circuit of harness between main relay and wastegate control solenoid valve connector • Poor contact of main relay connector |

AR:DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH Studios

DTC DETECTING CONDITION:

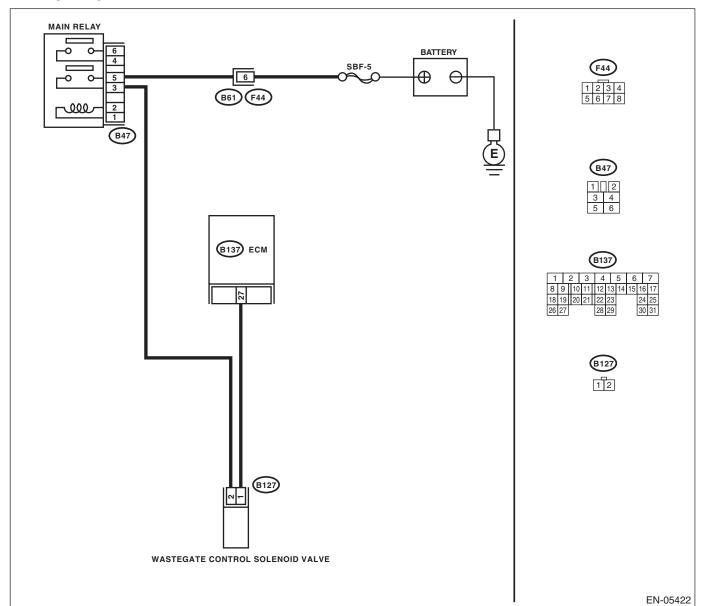
- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-98, DTC P0246 TURBO/SUPER CHARGER WASTE-GATE SOLENOID "A" HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



ENGINE (DIAGNOSTICS)

| | | 1467 | F 30 10 | / 5 | |
|---|---|--|--|-----------------|-------------------|
| | Step | Check | Yes | No C | 0.0000-1 |
| 1 | CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and wastegate control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B137) No. 27 (+) — Chassis ground (-): | | cuit to power in the harness between ECM and waste- gate control sole- noid valve connector. | | ^{Id} ios |
| 2 | CHECK WASTEGATE CONTROL SOLE-NOID VALVE. 1) Turn the ignition switch to OFF. 2) Measure the resistance between wastegate control solenoid valve terminals. Terminals No. 1 — No. 2: | Is the resistance less than 1 Ω ? | Replace the waste- gate control sole- noid valve. <ref. to<br="">FU(H4DOTC)-45, Wastegate Control Solenoid Valve.></ref.> | tact of the ECM | |

AS:DTC P0301 CYLINDER 1 MISFIRE DETECTED

NOTE:

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

AV:DTC P0304 CYLINDER 4 MISFIRE DETECTED

DTC DETECTING CONDITION:

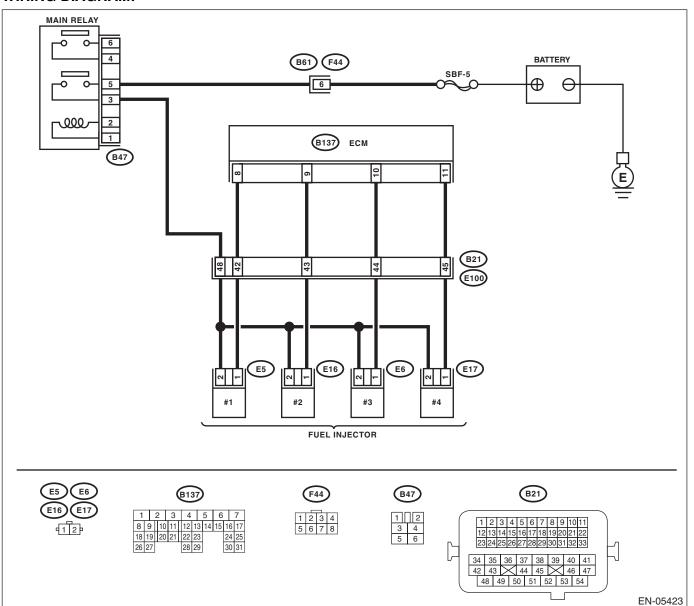
- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)
- OR RESALE GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-105, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | /VO | 7 - 40 | 15. |
|---|---|--|---------------------|--------------------------------------|
| | Step | Check | Yes | No |
| 1 | CHECK OUTPUT SIGNAL OF ECM. | Is the voltage 10 V or more? | Go to step 6. | Go to step 2. |
| | Turn the ignition switch to ON. | | | TALF |
| | 2) Measure the voltage between the ECM and | | | |
| | chassis ground for faulty cylinders. | | | |
| | Connector & terminal | | | |
| | #1 (B137) No. 8 (+) — Chassis ground (-): | | | |
| | #2 (B137) No. 9 (+) — Chassis ground (-): #3 (B137) No. 10 (+) — Chassis ground (-): | | | |
| | #4 (B137) No. 11 (+) — Chassis ground (–): | | | |
| 2 | CHECK HARNESS BETWEEN ECM AND | Is the resistance 1 M Ω or | Go to step 3. | Repair short cir- |
| | FUEL INJECTOR. | more? | do to step 3. | cuit of the harness |
| | Turn the ignition switch to OFF. | | | to ground between |
| | 2) Disconnect the connector from fuel injector | | | ECM and fuel |
| | on faulty cylinders. | | | injector. |
| | 3) Measure the resistance between the fuel | | | |
| | injector connector and engine ground on faulty | | | |
| | cylinders. | | | |
| | Connector & terminal | | | |
| | #1 (E5) No. 1 — Engine ground: | | | |
| | #2 (E16) No. 1 — Engine ground: | | | |
| | #3 (E6) No. 1 — Engine ground: | | | |
| | #4 (E17) No. 1 — Engine ground: CHECK HARNESS BETWEEN ECM AND | La the vesistance less than 1 00 | Co to oto a 4 | Danaiutha hausaaa |
| 3 | FUEL INJECTOR. | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. |
| | Measure the resistance of harness between the | | | |
| | ECM and fuel injector on faulty cylinders. | | | NOTE: In this case, repair |
| | Connector & terminal | | | the following item: |
| | #1 (B137) No. 8 — (E5) No. 1: | | | Open circuit of |
| | #2 (B137) No. 9 — (E16) No. 1: | | | harness between |
| | #3 (B137) No. 10 — (E6) No. 1: | | | ECM and fuel in- |
| | #4 (B137) No. 11 — (E17) No. 1: | | | jector connector |
| | | | | Poor contact of |
| | | | | coupling connector |
| 4 | CHECK FUEL INJECTOR. | Is the resistance between 5 — | Go to step 5. | Replace the faulty |
| | Measure the resistance between fuel injector | 20 Ω? | | fuel injector. <ref.< th=""></ref.<> |
| | terminals on faulty cylinder. | | | to FU(H4DOTC)- |
| | Terminals | | | 37, Fuel Injector.> |
| | No. 1 — No. 2: | | | |
| 5 | CHECK POWER SUPPLY LINE. | Is the voltage 10 V or more? | Repair the poor | Repair the harness |
| | 1) Turn the ignition switch to ON. | | contact of all con- | and connector. |
| | Measure the voltage between fuel injector and engine ground on foulty evilinders. | | nectors in fuel | NOTE: |
| | and engine ground on faulty cylinders. Connector & terminal | | injector circuit. | In this case, repair |
| | #1 (E5) No. 2 (+) — Engine ground (–): | | | the following item: Open circuit of |
| | #2 (E16) No. 2 (+) — Engine ground (-): | | | harness between |
| | #3 (E6) No. 2 (+) — Engine ground (–): | | | the main relay and |
| | #4 (E17) No. 2 (+) — Engine ground (–): | | | fuel injector con- |
| | () () | | | nector on faulty |
| | | | | cylinders |
| | | | | Poor contact of |
| | | | | coupling connector |
| | | | | Poor contact of |
| | | | | main relay connec- |
| | | | | tor |
| | | | | Poor contact of |
| | | | | fuel injector con- |
| | | | | nector on faulty |
| | | | | cylinders |

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | | 7 5 4 0 | V.E. |
|----|---|---|---|--|
| | Step | Check | Yes | C No |
| 7 | CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Turn the ignition switch to ON. 4) Measure the voltage between the ECM and chassis ground for faulty cylinders. Connector & terminal #1 (B137) No. 8 (+) — Chassis ground (-): #2 (B137) No. 9 (+) — Chassis ground (-): #3 (B137) No. 10 (+) — Chassis ground (-): #4 (B137) No. 11 (+) — Chassis ground (-): CHECK FUEL INJECTOR. | | Repair the short circuit to power in the harness between the ECM and fuel injector. | Go to step 7. Go to step 8. |
| , | Turn the ignition switch to OFF. Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2: | To the resistance less than 1 32. | fuel injector. <ref. fu(h4dotc)-37,="" fuel="" injector.="" to=""></ref.> | do to stop o . |
| 8 | CHECK INSTALLATION OF CAMSHAFT PO- SITION SENSOR/CRANKSHAFT POSITION SENSOR. | or crankshaft position sensor loosely installed? | Tighten the cam- shaft position sen- sor or crankshaft position sensor. | Go to step 9. |
| 9 | CHECK CRANK SPROCKET. Remove the timing belt cover. | Is the crank sprocket rusted or does it have damaged teeth? | Replace the crank sprocket. <ref. to<br="">ME(H4DOTC)-57, Crank Sprocket.></ref.> | Go to step 10. |
| 10 | CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block. | Is the timing belt dislocated from its proper position? | Repair the installa- tion condition of timing belt. <ref. to<br="">ME(H4DOTC)-48, Timing Belt.></ref.> | 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 indi- cation is higher than the "Lower" level. After replen- ishing fuel, Go to step 12. |
| 12 | CHECK STATUS OF MALFUNCTION INDI- CATOR LIGHT. 1) Clear the memory using the Subaru Select Monitor or general scan tool. <ref. clear="" en(h4dotc)(diag)-53,="" memory="" mode.="" to=""> NOTE: • Subaru Select Monitor <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool Refer to operating manuals for the general scan tool. 2) Start the engine, and drive the vehicle 10 minutes or more.</ref.></ref.> | | Go to step 14. | Go to step 13. |

| | | | 7 5 4 0 | / E' |
|----|--|---|--|--|
| | Step | Check | Yes | C No |
| 13 | CHECK CAUSE OF MISFIRE. | Has the cause of misfire been detected while running the engine? | Finish diagnostics operation, if the engine has no abnormality. | Repair the poor contact of connector. NOTE: In this case, repair the following item: • Poor contact of ignition coil connector • Poor contact of fuel injector connector on faulty cylinders • Poor contact in ECM connector • Poor contact of coupling connector |
| 14 | CHECK AIR INTAKE SYSTEM. | Is there any fault in air intake system? | Repair the air intake system. NOTE: Check the following items. • Are there air leaks or air suction caused by loose or dislocated nuts and bolts? • Are there cracks or any disconnection of hoses? | Go to step 15. |
| 15 | CHECK MISFIRE SYMPTOM. 1) Turn the ignition switch to ON. 2) Read the DTC. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | 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. |

| | | | 7 74 6 | V |
|----|-------------------------------|--|---|--|
| | Step | Check | Yes | C No |
| 20 | ONLY ONE CYLINDER. | Is there any fault in the cylinder? | Repair or replace faulty parts. NOTE: Check the following items. Spark plug Spark plug cord Fuel injector Compression ratio | Go to DTC P0171. <ref. (bank="" (dtc).="" -143,="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)="" lean="" p0171="" procedure="" system="" to="" too="" trouble="" with=""></ref.> |
| 21 | GROUP OF #1 AND #2 CYLINDERS. | Are there any faults in #1 and #2 cylinders? | Repair or replace faulty parts. NOTE: Check the following items. Spark plug Fuel injector Ignition coil Compression ratio If no fault is found, check the "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <ref. control="" diagnostics="" en(h4dotc)(diag)-70,="" engine="" failure.="" for="" ignition="" starting="" system,="" to=""></ref.> | Go to DTC P0171. <ref. (bank="" (dtc).="" -143,="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)="" lean="" p0171="" procedure="" system="" to="" too="" trouble="" with=""></ref.> |
| 22 | GROUP OF #3 AND #4 CYLINDERS. | Are there any faults in #3 and #4 cylinders? | Repair or replace faulty parts. NOTE: Check the following items. Spark plug Fuel injector Ignition coil Compression ratio If no fault is found, check the "IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <ref. control="" diagnostics="" en(h4dotc)(diag)-70,="" engine="" failure.="" for="" ignition="" starting="" system,="" to=""></ref.> | Go to DTC P0171. <ref. (bank="" (dtc).="" -143,="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)="" lean="" p0171="" procedure="" system="" to="" too="" trouble="" with=""></ref.> |

| | Step | Check | Yes | Erio |
|----|-------------------------------|--|--|--|
| 00 | • | ******* | 1. J. David . Dres. | THE RESERVE SHAPE AND ADDRESS OF THE PARTY AND |
| 23 | GROUP OF #1 AND #3 CYLINDERS. | Are there any faults in #1 and #3 cylinders? | Repair or replace faulty parts. NOTE: Check the following items. Spark plug Fuel injector Compression ratio Skipping timing belt teeth | Go to DTC P0171. <ref. (bank="" (dtc).="" -143,="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)="" lean="" p0171="" procedure="" system="" to="" too="" trouble="" with=""></ref.> |
| 24 | GROUP OF #2 AND #4 CYLINDERS. | Are there any faults in #2 and #4 cylinders? | Repair or replace faulty parts. NOTE: Check the following items. Spark plug Fuel injector Compression ratio Skipping timing belt teeth | Go to DTC P0171. <ref. (dtc).="" -123,="" closed="" code="" control,="" coolant="" diagnostic="" dtc="" en(h4dotc)(diag)="" for="" fuel="" insufficient="" loop="" p0125="" perature="" procedure="" tem-="" to="" trouble="" with=""></ref.> |
| 25 | CYLINDER AT RANDOM. | Is the engine idle rough? | Go to DTC P0171. <ref. (bank="" (dtc).="" -143,="" 1),="" code="" diagnostic="" dtc="" en(h4dotc)(diag)="" lean="" p0171="" procedure="" system="" to="" too="" trouble="" with=""></ref.> | Repair or replace faulty parts. NOTE: Check the following items. • Spark plug • Fuel injector • Compression ratio |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

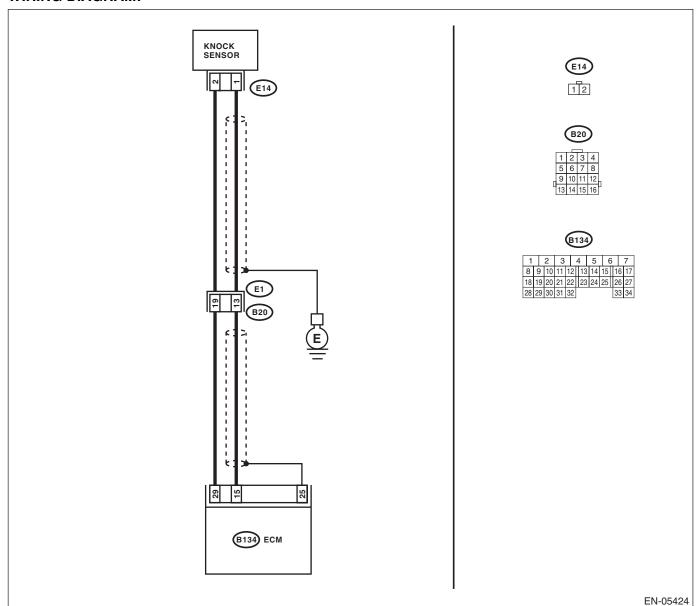
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-106, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 7.7.1 | IT - U | V F . |
|---|---|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 15 — (B134) No. 29: | Is the resistance 600 $k\Omega$ or more? | Go to step 2. | Repair poor contact of the ECM connector. |
| 2 | CHECK KNOCK SENSOR. 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor terminals. Terminals No. 1 — No. 2: | Is the resistance 600 $k\Omega$ or more? | Replace the knock sensor. <ref. to<br="">FU(H4DOTC)-34, Knock Sensor.></ref.> | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and knock sensor Poor contact of knock sensor connector Poor contact of coupling connector |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

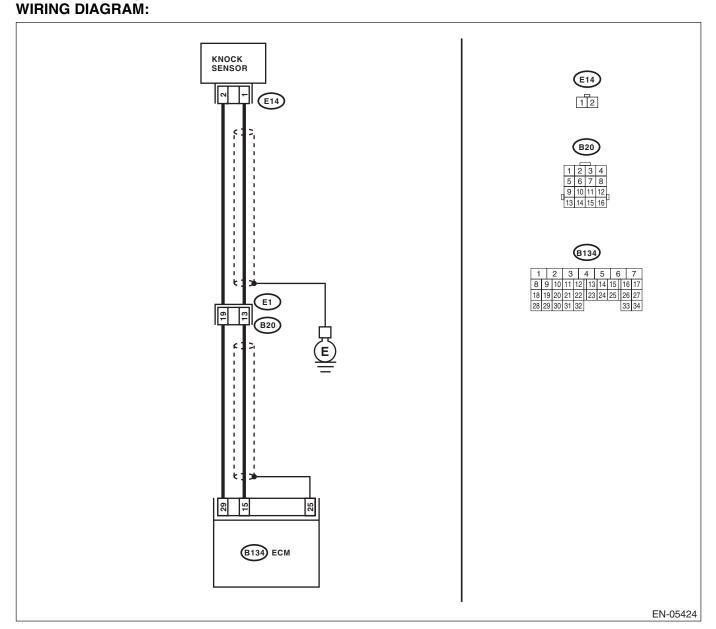
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-108, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 110 | F - 10 | / 6- |
|---|---|--|--|---|
| | Step | Check | Yes | No |
| 1 | CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 15 — (B134) No. 29: | Is the resistance less than 500 $\mbox{k}\Omega ?$ | Go to step 2. | Go to step 3. |
| 2 | CHECK KNOCK SENSOR. 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connectors. Terminals No. 1 — No. 2: | Is the resistance less than 500 $\mbox{k}\Omega ?$ | Replace the knock sensor. <ref. to<br="">FU(H4DOTC)-34, Knock Sensor.></ref.> | Repair short circuit of the harness to ground between the ECM and knock sensor connector. NOTE: The harness between both connectors are shielded. Repair the short circuit of harness covered with shield. |
| 3 | CHECK INPUT SIGNAL OF ECM. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 15 (+) — Chassis ground (-): | Is the voltage 2 V or more? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. | Repair poor contact of the ECM connector. |

AY:DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

DTC DETECTING CONDITION:

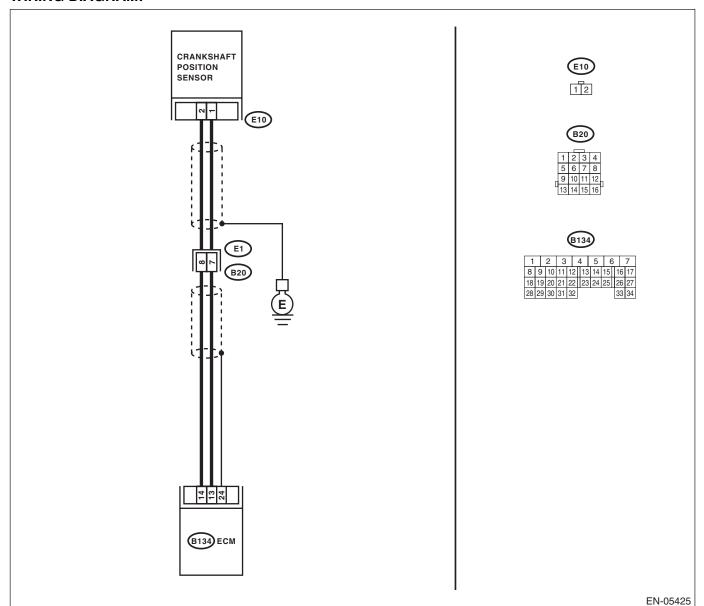
- Immediately at fault recognition
- Eris Studios • GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-110, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 140 | 7- 40 | 15 |
|---|--|---|--|---|
| | Step | Check | Yes | No C |
| 1 | CHECK CONDITION OF CRANKSHAFT PO- SITION SENSOR. | Is the crankshaft position sensor installation bolt tightened securely? | Go to step 2. | Tighten the crank- shaft position sen- sor installation bolt securely. |
| 2 | CHECK CRANKSHAFT POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Remove the crankshaft position sensor. 3) Measure the resistance between connector terminals of crankshaft position sensor. Terminals No. 1 — No. 2: | Is the resistance between 1 — 4 $k\Omega?$ | Go to step 3. | Replace the crank- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-31, Crankshaft Posi- tion Sensor.></ref.> |
| 3 | CHECK HARNESS BETWEEN ECM AND CRANK SHAFT POSITION SENSOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between the ECM and crankshaft position sensor connector. Connector & terminal (B134) No. 13 — (E10) No. 1: (B134) No. 14 — (E10) No. 2: | Is the resistance less than 1 Ω ? | Repair the poor contact of the ECM and crankshaft position sensor connector. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and crankshaft position sensor connector Poor contact of coupling connector |

AZ:DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PER-Studios **FORMANCE**

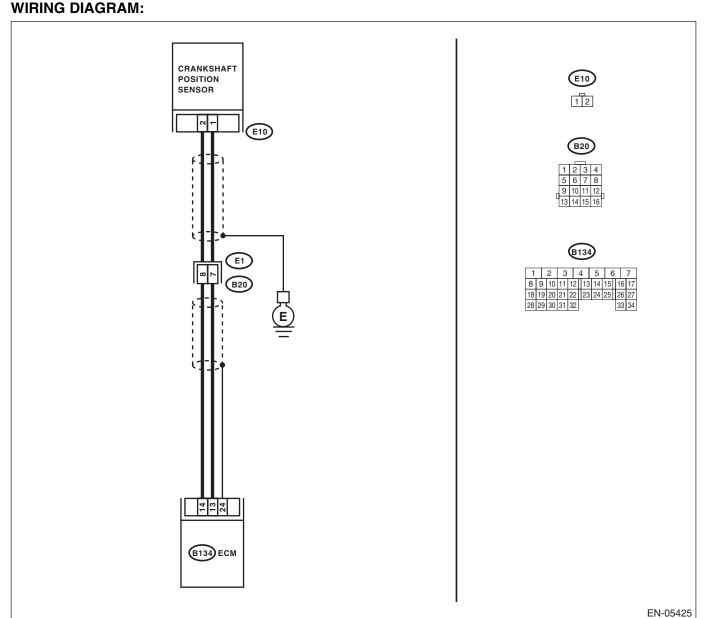
DTC DETECTING CONDITION:

- 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

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 C |
|---|--|---|---|--|
| 1 | CHECK CONDITION OF CRANKSHAFT PO- SITION SENSOR. Turn the ignition switch to OFF. | Is the crankshaft position sensor installation bolt tightened securely? | Go to step 2. | Tighten the crank- shaft position sen- sor installation bolt securely. |
| 2 | CHECK CRANK SPROCKET. Remove the timing belt cover. | Are crank sprocket teeth cracked or damaged? | Replace the crank sprocket. <ref. to<br="">ME(H4DOTC)-57, Crank Sprocket.></ref.> | Go to step 3. |
| 3 | CHECK INSTALLATION CONDITION OF TIMING BELT. Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block. | Is the timing belt dislocated from its proper position? | Repair the installa- tion condition of timing belt. <ref. to<br="">ME(H4DOTC)-48, Timing Belt.></ref.> | Replace the crank- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-31, Crankshaft Posi- tion Sensor.></ref.> |

Eris Studios

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

DTC DETECTING CONDITION:

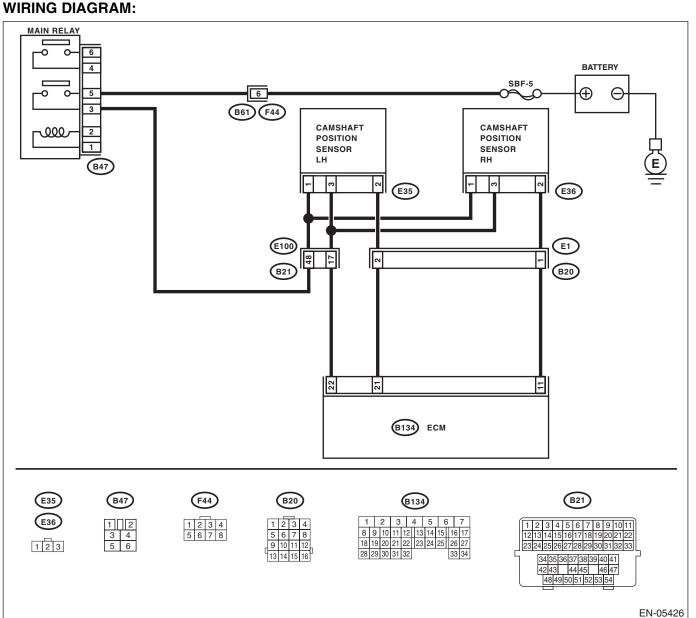
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-114, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | /// () | TEUD | V.B., |
|---|--|---|--|--|
| | Step | Check | Yes | No |
| 1 | CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the camshaft position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between camshaft position sensor connector and engine ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between the ECM and camshaft position sensor connector. Connector & terminal (B134) No. 11 — (E36) No. 2: (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. Measure the resistance between camshaft position sensor connector and engine ground. Connector & terminal (E36) No. 2 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the voltage between camshaft position sensor connector and engine ground. Connector & terminal (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 cam- shaft position sen- sor installation bolt securely. |
| 6 | CHECK CAMSHAFT POSITION SENSOR. Check the waveform of the camshaft position sensor. <ref. (ecm)="" control="" en(h4dotc)(diag)-21,="" engine="" i="" module="" o="" signal.="" to=""></ref.> | Is there any abnormality in waveform? | Replace the cam- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-32, Camshaft Position Sensor.></ref.> | Repair the connector. NOTE: In this case, repair the following item: Poor contact in ECM connector Poor contact in camshaft position sensor connector Poor contact of coupling connector |

CIRCUIT (BANK 2) is Studios **BB:DTC P0345 CAMSHAFT POSITION SENSOR "A"**

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.>

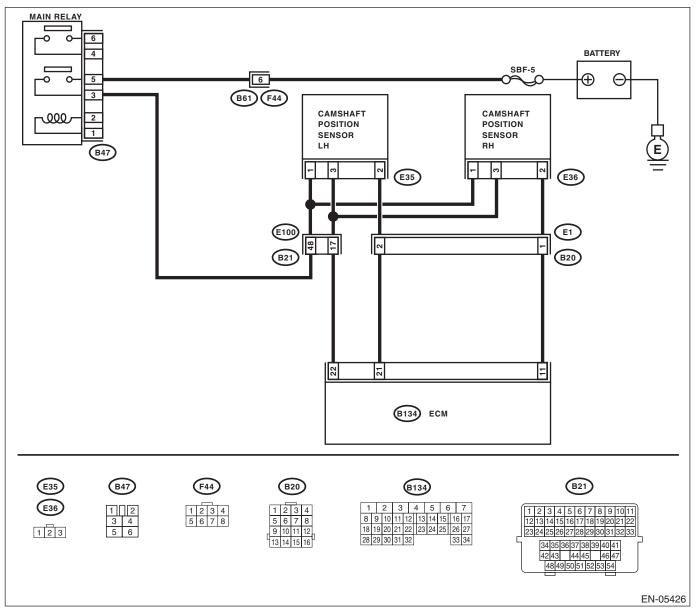
TROUBLE SYMPTOM:

- 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:



| | | /// () | TEUD | V.B., |
|---|--|---|--|---|
| | Step | Check | Yes | No |
| 1 | CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the camshaft position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between camshaft position sensor connector and engine ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between the ECM and camshaft position sensor connector. Connector & terminal (B134) No. 21 — (E35) No. 2: (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. Measure the resistance between camshaft position sensor connector and engine ground. Connector & terminal (E35) No. 2 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the voltage between camshaft position sensor connector and engine ground. Connector & terminal (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 cam- shaft position sen- sor installation bolt securely. |
| 6 | CHECK CAMSHAFT POSITION SENSOR. Check the waveform of the camshaft position sensor. <ref. (ecm)="" control="" en(h4dotc)(diag)-21,="" engine="" i="" module="" o="" signal.="" to=""></ref.> | Is there any abnormality in waveform? | Replace the cam- shaft position sen- sor. <ref. to<br="">FU(H4DOTC)-32, Camshaft Position Sensor.></ref.> | Repair the connector. NOTE: In this case, repair the following item: • Poor contact in ECM connector • Poor contact in camshaft position sensor connector • Poor contact of coupling connector |

ENGINE (DIAGNOSTICS)

BC:DTC P0410 SECONDARY AIR INJECTION SYSTEM

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- R RESALE • GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-116, DTC P0410 SECONDARY AIR INJECTION SYS-TEM, 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.>.

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 9 12 13 14 19 22 23 24 28 32 33 34 36

EN-05427

3 4

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| Step | | Check Yes No | | |
|------|--|--|---|--|
| 1 | CHECK SECONDARY AIR PUMP FUSE. | Is the fuse blown out? | Go to step 2. | Go to step 3. |
| | Check if the secondary air pump fuse (60 A) is blown out. | lo the race blown out. | GO to stop 2. | POALE |
| 2 | CHECK HARNESS BETWEEN FUSE BOX AND SECONDARY AIR PUMP. 1) Remove the secondary air pump fuse from the fuse box. 2) Disconnect the secondary air pump connector. 3) Measure the resistance between the secondary air pump fuse and secondary air pump connector, and chassis ground. Connector & terminal (F129) No. 5 — Chassis ground: (F127) No. 2 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Perform the Clear Memory Mode. 4) Perform operation check for the secondary air pump using the Subaru Select Monitor. NOTE: • Subaru Select Monitor For detailed operation procedure, refer to Clear Memory Mode <ref. clear="" en(h4dotc)(diag)-53,="" memory="" mode.="" to="">and Compulsory Valve Operation Check Mode <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve="">. • 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.</ref.></ref.> | | Go to step 4. | Go to step 5. |
| 4 | CHECK DUCT BETWEEN SECONDARY AIR PUMP AND COMBINATION VALVE. Inspection of the duct between the secondary air pump and combination valve. | Is there damage, clog or dis- connection of the duct? | Replace, clean or connect the duct. | Replace the sec- ondary air combi- nation valve LH. <ref. to<br="">EC(H4DOTC)-10, Secondary Air Combination Valve.></ref.> |
| 5 | CHECK POWER SUPPLY TO SECONDARY AIR PUMP. 1) Perform the Clear Memory Mode. 2) Turn the ignition switch to OFF. 3) Disconnect the secondary air pump connector. 4) In the condition of step 3, measure the voltage between the secondary air pump connector and the chassis ground. NOTE: For detailed procedures, refer to Clear Memory Mode. <ref. clear="" en(h4dotc)(diag)-53,="" memory="" mode.="" to=""> Connector & terminal (F127) No. 2 (+) — Chassis ground (-):</ref.> | | Replace the sec- ondary air pump. <ref. to<br="">EC(H4DOTC)-9, Secondary Air Pump.></ref.> | Go to step 6. |

| | | /// | 7 - 4 0 | |
|----|--|--|---|---|
| | Step | Check | Yes | C/No |
| 6 | CHECK HARNESS BETWEEN SECONDARY AIR PUMP RELAY AND SECONDARY AIR PUMP CONNECTOR. 1) Turn the ignition switch to OFF. 2) Remove the secondary air pump relay. 3) Measure the resistance of harness between secondary air pump relay and secondary air pump connector. Connector & terminal (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. Measure the resistance of the harness between secondary air pump connector and chassis ground. Connector & terminal (F127) No. 1 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 8. | Repair the open circuit of the har- ness between sec- ondary air pump connector and chassis ground. |
| 8 | CHECK SECONDARY AIR PUMP RELAY. 1) Connect the battery to terminals No. 3 and No. 6 of the secondary air pump relay. 2) Measure the resistance between secondary air pump relay terminals. Terminals No. 4 — No. 5: | Is the resistance less than 1 Ω ? | Go to step 9. | Replace the sec- ondary air pump relay. <ref. to<br="">EN(H4DOTC)(diag) -8, Electrical Com- ponent Location.></ref.> |
| 9 | CHECK SECONDARY AIR PUMP RELAY POWER SUPPLY. 1) Turn the ignition switch to ON. 2) Measure the voltage between the secondary air pump relay connector and chassis ground. Connector & terminal (F129) No. 4 (+) — Chassis ground (-): (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connector of ECM. 3) Measure the resistance of harness between ECM and secondary air pump relay connector. Connector & terminal (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. |

ENGINE (DIAGNOSTICS)

BD:DTC P0411 SECONDARY AIR INJECTION SYSTEM INCORRECT FLOW DE-Studios **TECTED**

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-123, DTC P0411 SECONDARY AIR INJECTION SYS-TEM 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.>.

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

3 4

9 12 13 14 19 22 23 24 28 32 33 34 36

EN-05427

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | | | / - |
|---|--|---|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK SECONDARY AIR COMBINATION VALVE. 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. Race the engine at 2,000 rpm to check whether or not the exhaust leak is heard. | Is there any exhaust leak? | | Repair poor contact of the ECM connector. |

ENGINE (DIAGNOSTICS)

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.>.

EN-05427

T FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 യ ⊕ Θ 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) (E116) F129 (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 3 4 9 12 13 14 19 22 23 24 28 32 33 34 36

| | | 74() | 7 - 4 0 | VF. |
|---|--|--|--|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and secondary air combination valve relay 1. 3) Measure the resistance of harness between ECM and secondary air combination valve relay 1. Connector & terminal (B136) No. 30 — (F27) No. 14: | | 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. Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 30 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. | cuit of the harness to ground between |

ENGINE (DIAGNOSTICS)

BF:DTC P0414 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE "A" Studios CIRCUIT SHORTED

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-125, DTC P0414 SECONDARY AIR INJECTION SYS-TEM 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.>.

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 9 12 13 14 19 22 23 24 28 32 33 34 36 3 4

EN-05427

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | | 1 1 1 mg 1 mg 1 | / [7] |
|---|--|------------------------------|------------------|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 1. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and secondary air combination valve relay 1. 3) Measure the voltage between ECM and | Is the voltage 10 V or more? | Repair the short | Repair poor contact of the ECM connector. |
| | chassis ground. Connector & terminal (B136) No. 30 (+) — Chassis ground (-): | | | |

ENGINE (DIAGNOSTICS)

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 SYS-TEM 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.>.

EN-05427

T FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 യ ⊕ Θ 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) (E116) F129 (F127) (B47) F44 (F74) 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 3 4 9 12 13 14 19 22 23 24 28 32 33 34 36

| | | 110 | The "D | / - |
|---|--|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE RELAY 2. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and secondary air combination valve relay 2. 3) Measure the resistance of harness between ECM and secondary air combination valve relay 2. Connector & terminal (B136) No. 19 — (F27) No. 15: | | 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. Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 19 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | tion indicator light illuminates, the cir- cuit has returned to | cuit of the harness to ground between |

ENGINE (DIAGNOSTICS)

BH:DTC P0417 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE "B" s Studios **CIRCUIT SHORTED**

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-126, DTC P0417 SECONDARY AIR INJECTION SYS- TEM 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.>.

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 ىرووق 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6

3 4

9 12 13 14 19 22 23 24 28 32 33 34 36

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

48 49 50 51 52 53 54

EN-05427

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

ENGINE (DIAGNOSTICS)

BI: DTC P0418 SECONDARY AIR INJECTION SYSTEM CONTROL "A" CIRCUIT Studios **DTC DETECTING CONDITION:**

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-127, DTC P0418 SECONDARY AIR INJECTION SYS-TEM 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.>.

EN-05427

T FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 യ ⊕ Θ 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) (E116) F129 (F127) (B47) F44 (F74) 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 3 4 9 12 13 14 19 22 23 24 28 32 33 34 36

| | | / Y L . | IT M TU | / - |
|---|--|--|----------------------|--|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and secondary air pump relay. 3) Measure the resistance of harness between ECM and secondary air pump relay. Connector & terminal (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. Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 8 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | cuit has returned to | cuit of the harness to ground between |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

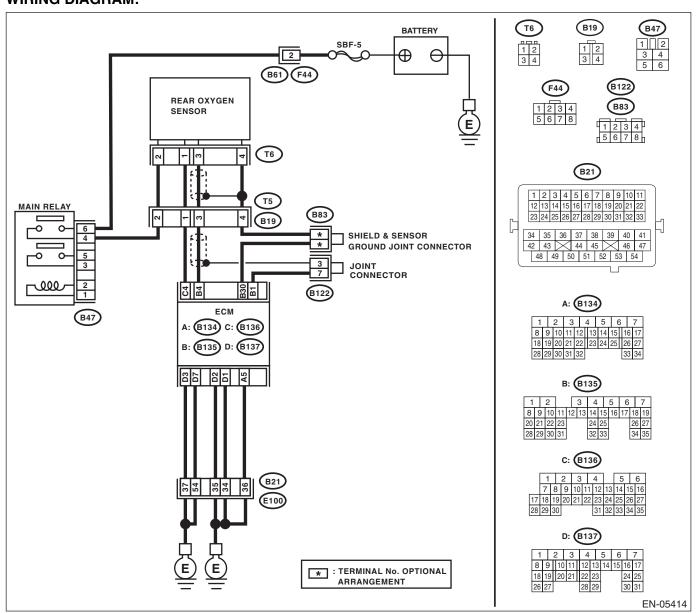
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-128, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.> TROUBLE SYMPTOM:

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:



| | | -110 | I Fa. V | Fig. |
|--|---|---------------------------------|--|---------------|
| | Step | Check | Yes | No C |
| loose or disloca hole at exhaust NOTE: Check the follov • Between cyli pipe • Between front converter • Between front catalytic convert • Loose or imp | eaks or air suction caused by ted nuts and bolts, and open pipes. wing positions. nder head and front exhaust texhaust pipe and front catalytic at catalytic converter and rear | | Repair or replace the exhaust sys- tem. <ref. to<br="">EX(H4DOTC)-2, General Descrip- tion.></ref.> | Go to step 2. |
| 2 CHECK WAVE RU SELECT M 1) Drive at a co 112 km/h (50 — 2) After 5 minu tion of step 1), u while still driving REAR OXYGEN SENSOR TIME[S] REAR OXYGEN SENSOR | FORM DATA ON THE SUBA- ONITOR (WHILE DRIVING). onstant speed between 80 — | 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. NOTE: In this case, there may be a temporary connector contact failure. | Go to step 3. |
| | EN-04895 | | | |

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | NO | 3 7 4 P | 1 5 |
|---|---|--|--|--|
| | Step | Check | Yes | No |
| 3 | CHECK WAVEFORM DATA ON THE SUBA- RU SELECT MONITOR (WHILE IDLING). 1) Run the engine at idle. 2) In the condition of step 1), use the Subaru Select Monitor to read the waveform data. | Is a normal waveform displayed? | Go to step 4. | Go to step 5. |
| | REAR OXYGEN SENSOR | | | |
| | | | | |
| | REAR OXYGEN SENSOR | | | |
| | TIME(S) Ø 10 20 30 40 EN-04896 | | | |
| 4 | CHECK CATALYTIC CONVERTER. | Is the catalytic converter damaged? | Replace the catalytic converter. <ref. catalytic="" converter.="" ec(h4dotc)-6,="" rear="" to=""></ref.> | 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (T6) No. 3: (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. |

| | | NO | D U D | a man |
|---|---|--|--|---|
| | Step | Check | Yes | LINO |
| 7 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (T6) No. 3 (+) — Chassis ground (-): | Is the voltage 0.2 — 0.5 V? | Go to step 8. | Repair the harness and connector. NOTE: Repair the following locations. • Open circuit of harness between the ECM and rear oxygen sensor • Poor contact of the ECM and rear oxygen sensor • Poor contact in ECM connector |
| 8 | CHECK REAR OXYGEN SENSOR SHIELD. 1) Turn the ignition switch to OFF. 2) Expose the rear oxygen sensor connector body side harness sensor shield. 3) Measure the resistance between the sensor shield and chassis ground. | Is the resistance less than 1 Ω ? | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> | Repair the open circuit in the rear oxygen sensor harness. |

ENGINE (DIAGNOSTICS)

BK:DTC P0441 EVAPORATIVE EMISSION SYSTEM INCORRECT PURGE FLOW Studios **DTC DETECTING CONDITION:**

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-130, DTC P0441 EVAPORATIVE EMISSION SYS-TEM 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.>.

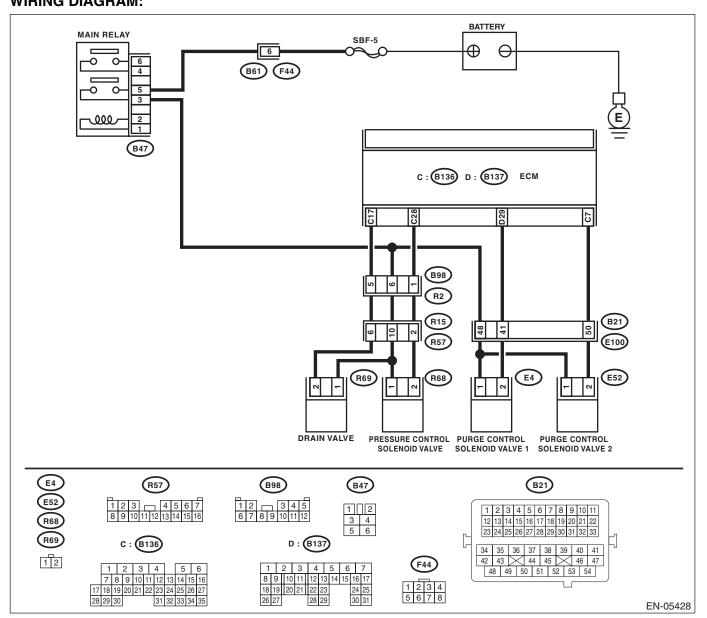
| | Step | Check | Yes | No |
|---|--|-----------------------------|---|---|
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK PURGE LINE OF THE PURGE CONTROL SOLENOID VALVE 2. | | Repair or replace the purge line of purge control sole- noid valve 2. | Go to step 3. |
| 3 | CHECK PURGE CONTROL SOLENOID VALVE 2. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the purge control solenoid valve 2 using the Subaru Select Monitor. NOTE: Purge control solenoid valve 2 can be operated using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Repair poor contact of the ECM connector. | Replace the purge control solenoid valve 2. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |

BL:DTC P0442 EVAPORATIVE EMISSION CONTROL SYSTEM LEAK DETECTED Studios (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 CON-TROL 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.

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:



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | Step | Check | Yes | E No C |
|---|---|---|---|---|
| 1 | CHECK FUEL FILLER CAP. | | Go to step 2. | Tighten fuel filler |
| 1 | 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening. | Is the fuel filler cap tightened securely? | GO to step 2. | 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<br="">FU(H4DOTC)-59, Fuel Filler Pipe.></ref.> | Go to step 4. |
| 4 | CHECK DRAIN VALVE. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve using the Subaru Select Monitor. NOTE: Drain valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | Does the drain valve operate? | Go to step 5. | Replace the drain valve. <ref. to<br="">EC(H4DOTC)-20, Drain Valve.></ref.> |
| 5 | CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve using the Subaru Select Monitor. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | Does the purge control sole- noid valve operate? | Go to step 6. | Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |
| 6 | CHECK PRESSURE CONTROL SOLENOID VALVE. Operate the pressure control solenoid valve using the Subaru Select Monitor. NOTE: The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | Does the pressure control sole- noid valve operate? | Go to step 7. | Replace the pressure control sole- noid valve. <ref. to<br="">EC(H4DOTC)-16, Pressure Control Solenoid Valve.></ref.> |
| 7 | CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector. | Is there any hole of more than 1.0 mm (0.04 in) dia. on evaporation line? | Repair or replace the evaporation line. <ref. to<br="">FU(H4DOTC)-70, Fuel Delivery, Return and Evapo- ration Lines.></ref.> | Go to step 8. |

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| | Step | Check | Yes | CTNo C |
| 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.></ref. | Go to step 9. |
| 9 | CHECK FUEL TANK. Remove the fuel tank. <ref. 56,="" fu(h4dotc)-="" fuel="" tank.="" to=""></ref.> | 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.></ref. | 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 emis- sion control system? | Repair or replace the hoses or pipes. | Repair poor contact of the ECM connector. |

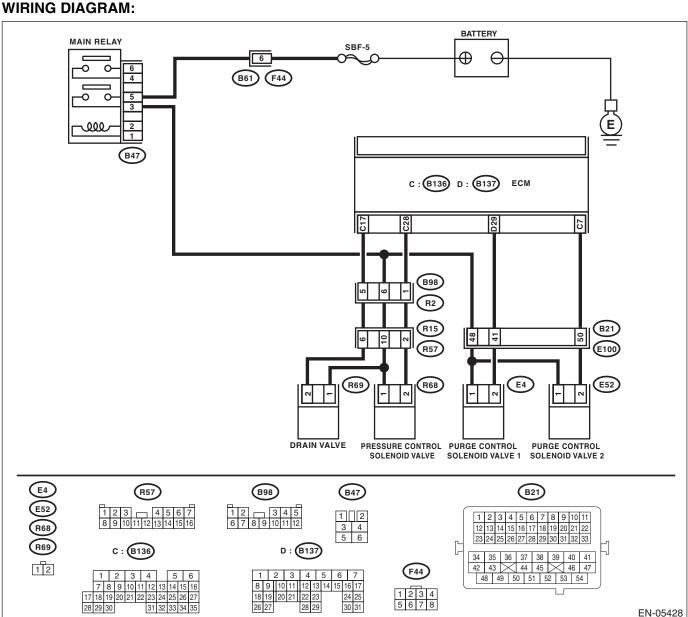
BM:DTC P0447 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL Studios CIRCUIT OPEN

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-145, DTC P0447 EVAPORATIVE EMISSION CON-TROL 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.>.



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|---|---|---|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 17 (+) — Chassis ground (-): | 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and drain valve. 3) Measure the resistance between the drain valve connector and chassis ground. Connector & terminal (R69) No. 2 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance of harness between ECM and drain valve connector. Connector & terminal (B136) No. 17 — (R69) No. 2: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and drain valve connector • Poor contact of coupling connector |
| 4 | CHECK DRAIN VALVE. Measure the resistance between drain valve terminals. Terminals No. 1 — No. 2: | Is the resistance between 10 — 100 Ω ? | Go to step 5. | Replace the drain valve. <ref. to<br="">EC(H4DOTC)-20, Drain Valve.></ref.> |
| 5 | CHECK POWER SUPPLY TO DRAIN VALVE. 1) Turn the ignition switch to ON. 2) Measure the voltage between drain valve and chassis ground. Connector & terminal (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. NOTE: In this case, repair the following item: • Open circuit of harness between main relay and drain valve • Poor contact of coupling connector • Poor contact of main relay connector |

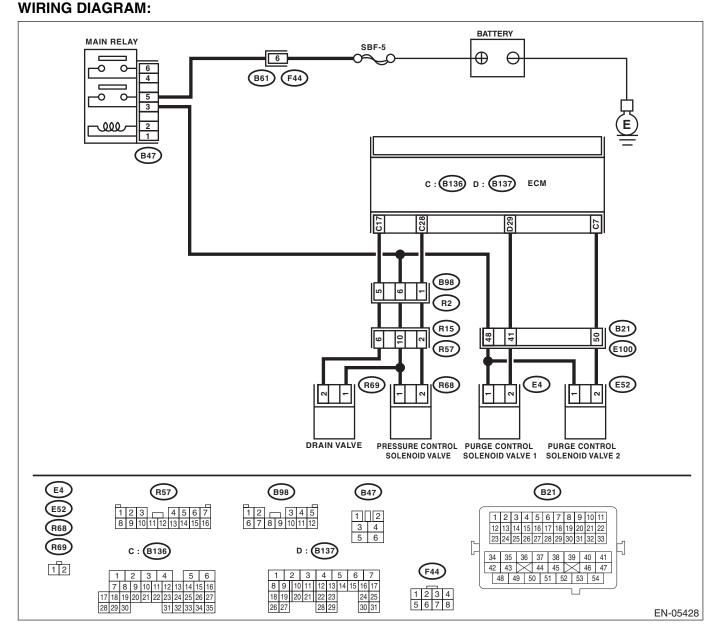
BN:DTC P0448 EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL Studios CIRCUIT SHORTED

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-147, DTC P0448 EVAPORATIVE EMISSION CON-TROL 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.>.



| | | 110 | 1 1 10 | |
|---|--|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND DRAIN VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and drain valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 17 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair the short circuit to power in the harness between ECM and drain valve connector. | Go to step 2. |
| 2 | CHECK DRAIN VALVE. 1) Turn the ignition switch to OFF. 2) Measure the resistance between drain valve terminals. Terminals No. 1 — No. 2: | Is the resistance less than 1 Ω ? | Replace the drain valve. <ref. to<br="">EC(H4DOTC)-20, Drain Valve.></ref.> | Repair poor contact of the ECM connector. |

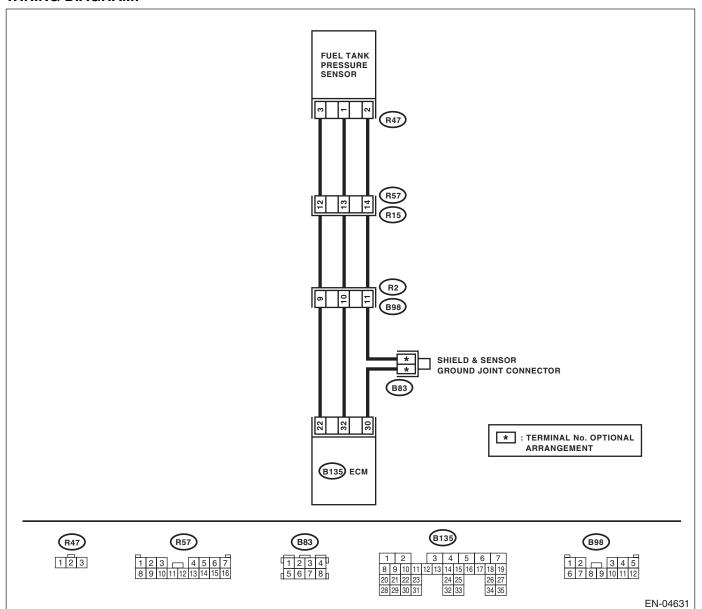
BO:DTC P0451 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-149, DTC P0451 EVAPORATIVE EMISSION CON- TROL 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.>.



| | | | IT - U | V |
|---|---|--|--|--|
| | Step | Check | Yes | No C |
| 1 | CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Open the fuel flap. | Is the fuel filler cap tightened securely? | Go to step 2. | Tighten fuel filler cap securely. |
| 2 | CHECK PRESSURE VACUUM LINE. NOTE: Check the following items. • Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank • Disconnection, leakage and clogging of the air ventilation hoses and pipes between fuel filler pipe and fuel tank | | Repair or replace the hoses and pipes. | Replace the fuel tank pressure sen- sor. <ref. to<br="">EC(H4DOTC)-15, Fuel Tank Pres- sure Sensor.></ref.> |

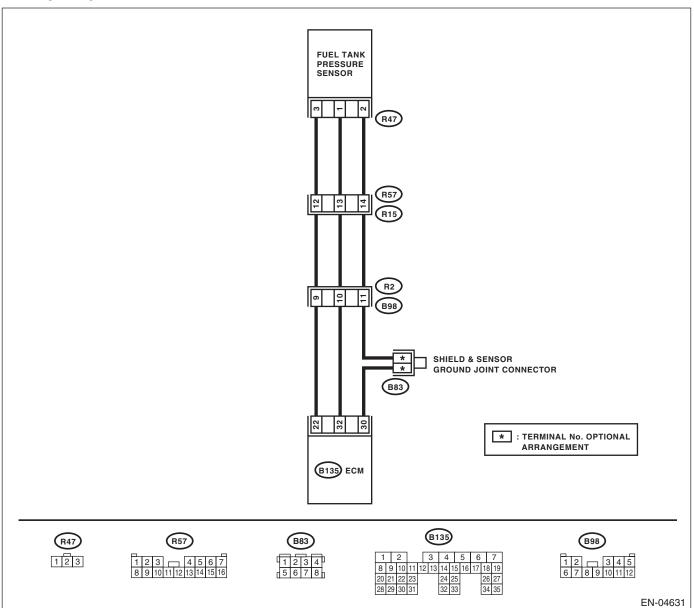
BP:DTC P0452 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE Studios

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-151, DTC P0452 EVAPORATIVE EMISSION CON- TROL 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.>.



| | | /VO | TEUD | V.F. |
|---|--|--|--|--|
| | Step | Check | Yes | No |
| 1 | CHECK CURRENT DATA. 1) Turn the ignition switch to ON. 2) Read the data of fuel tank pressure sensor signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | –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. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK FUEL TANK PRESSURE SENSOR POWER SUPPLY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the fuel tank pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between the fuel tank pressure sensor connector and chassis ground. Connector & terminal (R47) No. 3 (+) — Chassis ground (-): | Is the voltage 4.5 V or more? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and fuel tank pressure sensor connector • Poor contact in ECM connector • Poor contact of coupling connector |
| 3 | CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between the ECM and fuel tank pressure sensor connector. Connector & terminal (B135) No. 32 — (R47) No. 1: | Is the resistance less than 1 Ω ? | · | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and fuel tank pressure sensor connector Poor contact of coupling connector |
| 4 | CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 32 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 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 sen- sor. <ref. to<br="">EC(H4DOTC)-15, Fuel Tank Pres- sure Sensor.></ref.> |

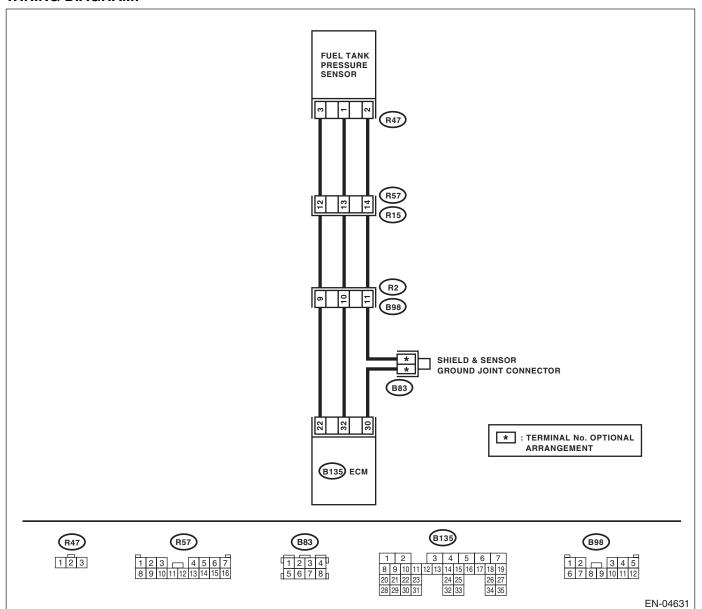
BQ:DTC P0453 EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-153, DTC P0453 EVAPORATIVE EMISSION CON- TROL 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.>.



| | | | Though | 16. |
|---|--|---|---|--|
| | Step | Check | Yes | No C |
| 1 2 s e N • F "f to | CHECK CURRENT DATA.) Turn the ignition switch to ON. P) Read the data of fuel tank pressure sensor ignal using the Subaru Select Monitor or general scan tool. NOTE: Subaru Select Monitor For detailed operation procedures, refer to READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | (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. NOTE: In this case, there may be a temporary connector contact failure. |
| FT 1 2 pp 3 4 s e N • F "I to | CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the fuel tank pressure sensor. 3) Turn the ignition switch to ON. 4) Read the data of fuel tank pressure sensor ignal using the Subaru Select Monitor or general scan tool. NOTE: Subaru Select Monitor For detailed operation procedures, refer to READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" of="" select="" subaru=""> General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | (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 C F T 1 2 ft | CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR. Turn the ignition switch to OFF. Measure the resistance of harness between uel tank pressure sensor connector and engine ground. Connector & terminal (R47) No. 2 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and fuel tank pressure sensor connector Poor contact in ECM connector Poor contact of coupling connector |
| C | CHECK POOR CONTACT. Check for poor contact of the fuel tank pressure tensor 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. ec(h4dotc)-15,="" fuel="" pressure="" sensor.="" tank="" to=""></ref.> |

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

DTC DETECTING CONDITION:

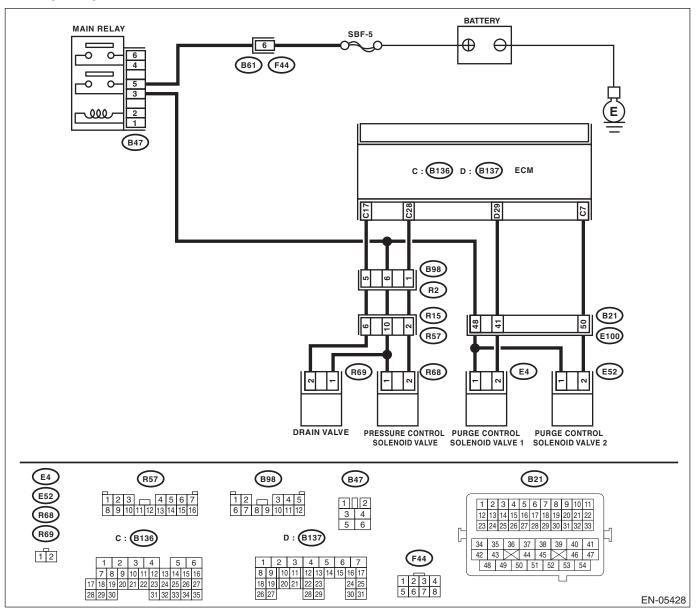
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-154, DTC P0456 EVAPORATIVE EMISSION CON- TROL SYSTEM LEAK DETECTED (VERY SMALL LEAK), Diagnostic Trouble Code (DTC) Detecting Crite-

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.>.



| | | . VO | 7 2 4 0 | V.F. |
|---|---|---|---|---|
| | Step | Check | Yes | No |
| 1 | CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening. | | 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<br="">FU(H4DOTC)-59, Fuel Filler Pipe.></ref.> | Go to step 4. |
| 4 | CHECK DRAIN VALVE. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve using the Subaru Select Monitor. NOTE: Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 5. | Replace the drain valve. <ref. to<br="">EC(H4DOTC)-20, Drain Valve.></ref.> |
| 5 | CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve using the Subaru Select Monitor. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 6. | Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |
| 6 | CHECK PRESSURE CONTROL SOLENOID VALVE. Operate the pressure control solenoid valve using the Subaru Select Monitor. NOTE: The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 7. | Replace the pressure control sole- noid valve. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |
| 7 | CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector. | Is there any hole of more than 0.5 mm (0.020 in) dia. on evaporation line? | Repair or replace the evaporation line. <ref. to<br="">FU(H4DOTC)-70, Fuel Delivery, Return and Evapo- ration Lines.></ref.> | Go to step 8. |

| | | | | At the second |
|----|---|--|--|---|
| | Step | Check | Yes | ETNo C |
| 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.></ref. | Go to step 9. |
| 9 | CHECK FUEL TANK. Remove the fuel tank. <ref. 56,="" fu(h4dotc)-="" fuel="" tank.="" to=""></ref.> | 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.></ref. | 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 Studios (FUEL CAP LOOSE/OFF)

DTC DETECTING CONDITION:

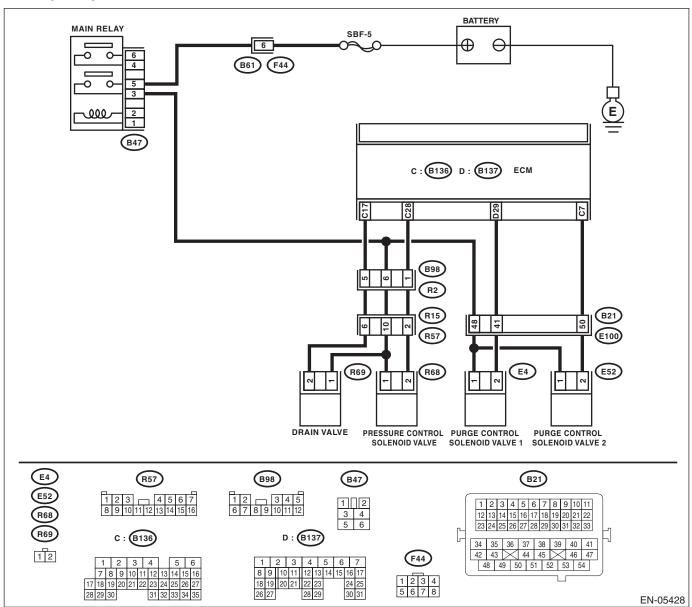
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-154, DTC P0457 EVAPORATIVE EMISSION CON- TROL SYSTEM LEAK DETECTED (FUEL CAP LOOSE/OFF), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | Step | Check | Yes | No C |
|---|---|---|---|---|
| 1 | CHECK FUEL FILLER CAP. 1) Turn the ignition switch to OFF. 2) Check the fuel filler cap. NOTE: The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening. | | 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<br="">FU(H4DOTC)-59, Fuel Filler Pipe.></ref.> | Go to step 4. |
| 4 | CHECK DRAIN VALVE. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Operate the drain valve using the Subaru Select Monitor. NOTE: Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 5. | Replace the drain valve. <ref. to<br="">EC(H4DOTC)-20, Drain Valve.></ref.> |
| 5 | CHECK PURGE CONTROL SOLENOID VALVE. Operate the purge control solenoid valve using the Subaru Select Monitor. NOTE: Purge control solenoid valve operation can be executed using Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 6. | Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |
| 6 | CHECK PRESSURE CONTROL SOLENOID VALVE. Operate the pressure control solenoid valve using the Subaru Select Monitor. NOTE: The pressure control solenoid valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 7. | Replace the pressure control sole- noid valve. <ref. to<br="">EC(H4DOTC)-16, Pressure Control Solenoid Valve.></ref.> |
| 7 | CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector. | Is there any disconnection, damage or clogging on the evaporation line? | Repair or replace the evaporation line. <ref. to<br="">FU(H4DOTC)-70, Fuel Delivery, Return and Evapo- ration Lines.></ref.> | Go to step 8. |

| | | | 12 4 01 | at the |
|----|---|---|--|---|
| | Step | Check | Yes | E No |
| 8 | CHECK CANISTER. | Is the canister damaged? | Repair or replace the canister. <ref. to EC(H4DOTC)-7, Canister.></ref. | Go to step 9. |
| 9 | CHECK FUEL TANK. Remove the fuel tank. <ref. 56,="" fu(h4dotc)-="" fuel="" tank.="" to=""></ref.> | Is the fuel tank damaged? | Repair or replace the fuel tank. <ref. to FU(H4DOTC)- 56, Fuel Tank.></ref. | Go to step 10. |
| 10 | CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM. | Are there holes, cracks, clog- ging, or disconnections, mis- connection 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 Studios CIRCUIT LOW

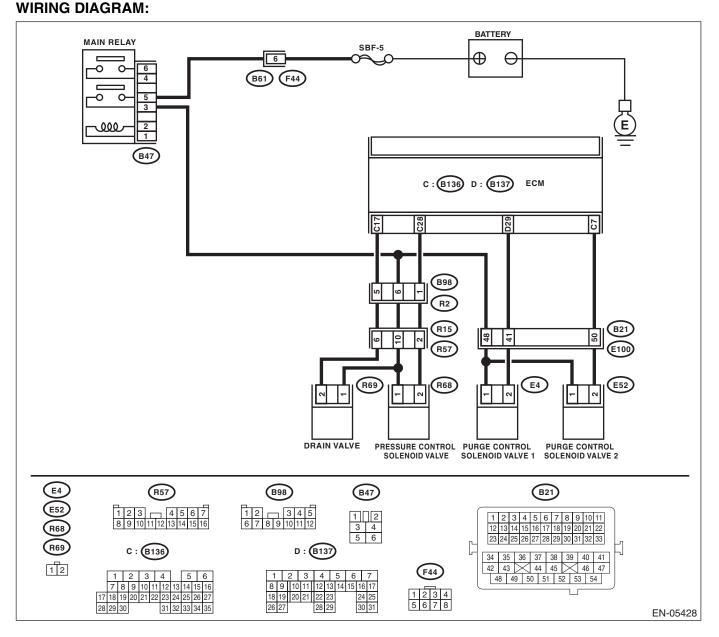
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-155, DTC P0458 EVAPORATIVE EMISSION SYS- TEM 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.>.



| | | - IVO | 7 2 4 0 | 15 |
|---|---|---|--|--|
| | Step | Check | Yes | No . |
| 1 | CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and purge control solenoid valve. 3) Measure the resistance between the purge control solenoid valve connector and engine ground. Connector & terminal (E4) No. 2 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance of harness between ECM and purge control solenoid valve. Connector & terminal (B137) No. 29 — (E4) No. 2: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and purge control solenoid valve connector Poor contact of coupling connector |
| 4 | CHECK PURGE CONTROL SOLENOID VALVE. 1) Remove the purge control solenoid valve. 2) Measure the resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2: | Is the resistance between 10 — 100 Ω ? | Go to step 5. | Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |
| 5 | CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to ON. 2) Measure the voltage between purge control solenoid valve and engine ground. Connector & terminal (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. NOTE: In this case, repair the following item: • Open circuit of harness between the main relay and purge control solenoid valve • Poor contact of coupling connector • Poor contact of main relay connector |

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

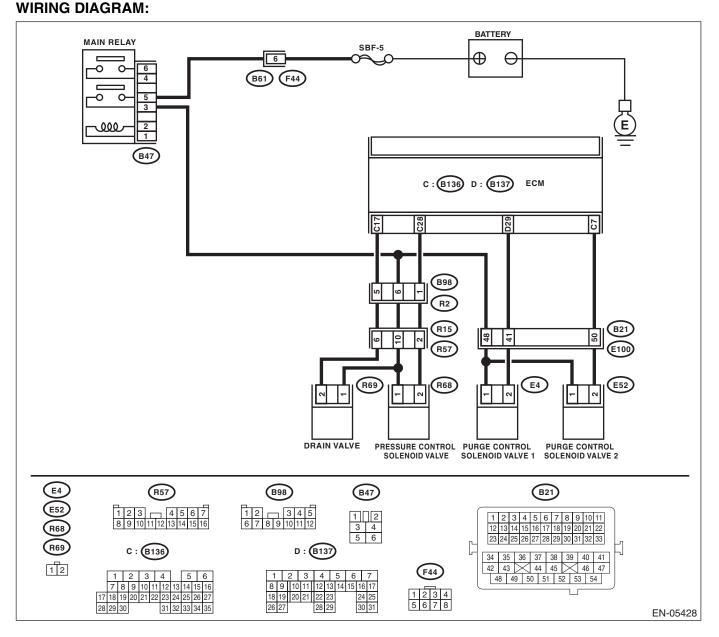
DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-157, DTC P0459 EVAPORATIVE EMISSION SYS- TEM 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.>.



| | | *** | 1 P 3 10 | / 5 |
|---|--|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and purge control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Measure the resistance between purge control solenoid valve terminals. Terminals No. 1 — No. 2: | Is the resistance less than 1 Ω ? | Replace the purge control solenoid valve. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> | Repair poor contact of the ECM connector. |

ENGINE (DIAGNOSTICS)

BV:DTC P0461 FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE Studios **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.>.

| Γ | Step | Check | Yes | No |
|---|-------------------------------------|-----------------------------|--|----------------------------------|
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check the appro- | Replace the fuel |
| | | | priate DTC using | level sensor and |
| | | | the "List of Diag- | fuel sub level sen- |
| | | | nostic Trouble | sor. <ref. th="" to<=""></ref.> |
| | | | Code (DTC)". | FU(H4DOTC)-65, |
| | | | <ref. th="" to<=""><th>Fuel Level Sen-</th></ref.> | Fuel Level Sen- |
| | | | EN(H4DOTC)(diag) | sor.> <ref. th="" to<=""></ref.> |
| | | | -76, List of Diag- | FU(H4DOTC)-66, |
| | | | nostic Trouble | Fuel Sub Level |
| | | | Code (DTC).> | Sensor.> |

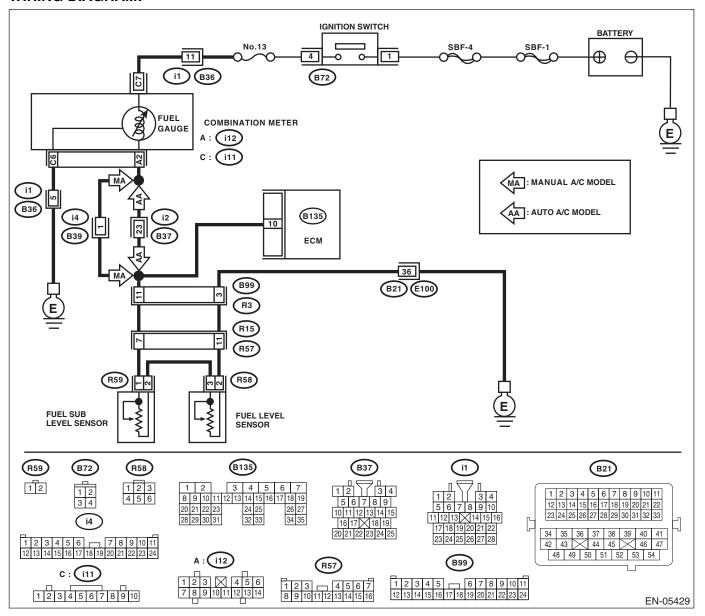
BW:DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- by Eris Studios • 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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | 21 | 740 | TEOL | Frie |
|---|--|--|---|---|
| | Step STEP ATION OF SPEEDOMETER | 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. idi-<br="" to="">3, Combination Meter System.></ref.> |
| 2 | CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-): | Is the voltage less than 0.04 V? | Go to step 4. | Go to step 3. |
| 3 | CHECK INPUT SIGNAL OF ECM (USING SUBARU SELECT MONITOR). Read the data of fuel level sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | 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. NOTE: In this case, there may be a temporary connector contact failure. |
| 4 | CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the fuel tank cord connector (R57) from the rear wiring harness connector (R15). 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-): | Is the voltage less than 0.04 V? | Go to step 5. | Go to step 6. |
| 5 | CHECK HARNESS BETWEEN ECM AND COMBINATION METER. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and combination meter connector (i12). 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 10 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Repair or replace the combination meter. <ref. idi-<br="" to="">3, Combination Meter System.></ref.> | Repair the harness. NOTE: In this case, repair the following item: • Short circuit of the harness to ground between the ECM and combination meter connector. • Short circuit of the harness to ground between the ECM and fuel tank cord connector. |

| | | NO | 7 4 0 | 7 Pm |
|---|---|--|---|--|
| | Step | Check | Yes | C/No C |
| 6 | CHECK FUEL TANK CORD. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the fuel sub level sensor. 3) Measure the resistance between the fuel sub level sensor and chassis ground. Connector & terminal (R59) No. 1 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 7. | Repair short cir- cuit of the harness to ground of the fuel tank cord. |
| 7 | CHECK FUEL TANK CORD. 1) Disconnect the connector from fuel pump assembly. 2) Measure the resistance between fuel pump assembly and chassis ground. Connector & terminal (R59) No. 2 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 8. | Repair short circuit of the harness to ground of the fuel tank cord. |
| 8 | CHECK FUEL LEVEL SENSOR. 1) Remove the fuel pump assembly. <ref. fu(h4dotc)-63,="" fuel="" pump.="" to=""> 2) Measure the resistance between fuel level sensor and terminals with float set at full position. Terminals No. 2 — No. 3:</ref.> | 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 Sen- sor.></ref. |
| 9 | CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <ref. fu(h4dotc)-66,="" fuel="" level="" sensor.="" sub="" to=""> 2) Measure the resistance between fuel sub level sensor and terminals with float set at full position. Terminals No. 1 — No. 2:</ref.> | 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<br="">FU(H4DOTC)-66, Fuel Sub Level Sensor.></ref.> |

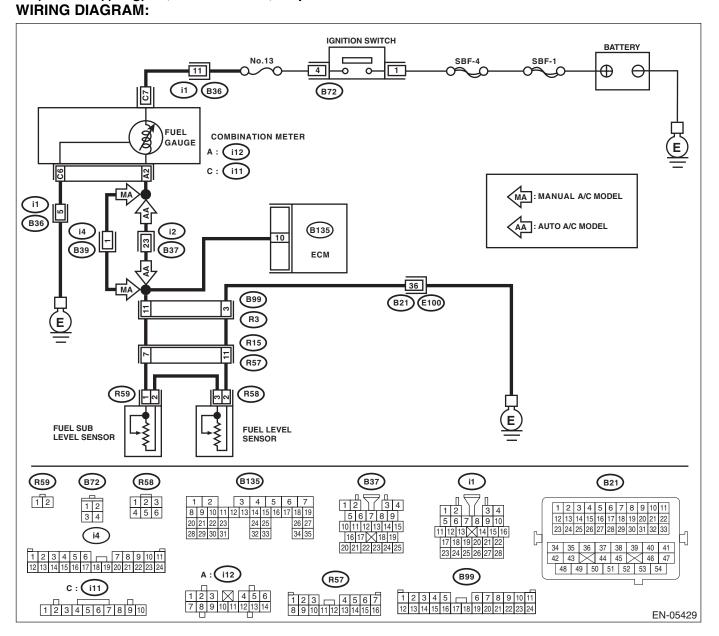
BX:DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- Eris Studios 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.>.



| | | /// | 7-40 | 15. |
|---|--|--|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK OPERATION OF SPEEDOMETER AND TACHOMETER. | Are speedometer and tachometer operate normally? | Go to step 2. | Repair or replace the combination meter. <ref. idi-<br="" to="">3, Combination Meter System.></ref.> |
| 2 | CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-): | Is the voltage 4.9 V or more? | Go to step 4. | Go to step 3. |
| 3 | CHECK INPUT SIGNAL OF ECM (USING SUBARU SELECT MONITOR). Read the data of fuel level sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | | Repair poor contact of the ECM connector. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 4 | CHECK INPUT VOLTAGE OF ECM. Turn the ignition switch to OFF. Disconnect the ECM and combination meter connector (i12). Turn the ignition switch to ON. Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 10 (+) — Chassis ground (-): | Is the voltage 4.9 V or more? | Repair the short circuit to power of harness between ECM and combination meter connector. | Go to step 5. |
| 5 | CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD. 1) Turn the ignition switch to OFF. 2) Disconnect the fuel tank cord connector (R57) from the rear wiring harness connector (R15). 3) Measure the resistance between ECM and fuel tank cord. Connector & terminal (B135) No. 10 — (R15) No. 7: | Is the resistance less than 1 Ω ? | Go to step 6. | Repair the open circuit between ECM and fuel tank cord. |
| 6 | CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND. Measure the resistance between fuel tank cord and chassis ground. Connector & terminal (R15) No. 11 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 7. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between fuel tank cord and chassis ground Poor contact of coupling connector |

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | NO | 7 4 h | E 200 |
|----|---|--|--|--|
| | Step | Check | Yes | C/No C |
| 7 | CHECK FUEL TANK CORD. 1) Disconnect the connector from the fuel level sensor. 2) Measure the resistance between the fuel level sensor and coupling connector. Connector & terminal (R57) No. 11 — (R58) No. 2: | Is the resistance less than 1 Ω ? | Go to step 8. | Repair the open circuit between the coupling connector and fuel level sensor. |
| 8 | CHECK FUEL TANK CORD. 1) Disconnect the connector from the fuel sub level sensor. 2) Measure the resistance between the fuel level sensor and fuel sub level sensor. Connector & terminal (R58) No. 3 — (R59) No. 2: | Is the resistance less than 1 Ω ? | Go to step 9. | Repair the open circuit between the fuel level sensor and fuel sub level sensor. |
| 9 | CHECK FUEL TANK CORD. Measure the resistance between the fuel level sensor and coupling connector. Connector & terminal (R57) No. 7 — (R59) No. 1: | Is the resistance less than 1 Ω ? | Go to step 10. | Repair the open circuit of harness between the coupling connector and fuel level sensor. |
| 10 | CHECK FUEL LEVEL SENSOR. 1) Remove the fuel pump assembly. <ref. fu(h4dotc)-63,="" fuel="" pump.="" to=""> 2) Measure the resistance between fuel level sensor terminals moving the fuel level sensor float up and down. Terminals No. 2 — No. 3:</ref.> | Is the resistance 52 Ω or more? | level sensor. <ref. to FU(H4DOTC)- 65, Fuel Level Sen- sor.></ref. | Go to step 11. |
| 11 | CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <ref. fu(h4dotc)-66,="" fuel="" level="" sensor.="" sub="" to=""> 2) Measure the resistance between fuel sub level sensor terminals moving the fuel sub level sensor float up and down. Terminals No. 1 — No. 2:</ref.> | Is the resistance 44 Ω or more? | Replace the fuel sub level sensor. <ref. to<br="">FU(H4DOTC)-66, Fuel Sub Level Sensor.></ref.> | Check the combination meter. <ref. combination="" idi-11,="" meter.="" to=""></ref.> |

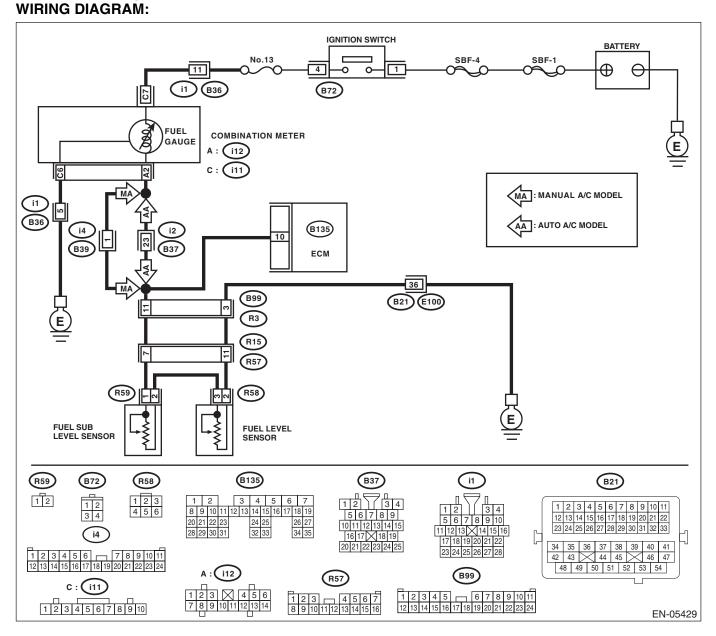
BY:DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- Eris Studios GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-165, DTC P0464 FUEL LEVEL SENSOR CIRCUIT IN-TERMITTENT, 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.>.



| | | 110 | I'm "U | |
|---|--|--------------------------------------|--|--|
| | Step | Check | Yes | L No C |
| 1 | CHECK FUEL LEVEL SENSOR. 1) Remove the fuel pump assembly. <ref. fu(h4dotc)-63,="" fuel="" pump.="" to=""> 2) Check if the resistance between fuel level sensor terminals changes smoothly when moving the fuel level sensor float up and down. Terminals No. 2 — No. 3:</ref.> | Does the resistance change smoothly? | Go to step 2. | Replace the fuel level sensor. <ref. to FU(H4DOTC)- 65, Fuel Level Sen- sor.></ref. |
| 2 | CHECK FUEL SUB LEVEL SENSOR. 1) Remove the fuel sub level sensor. <ref. fu(h4dotc)-66,="" fuel="" level="" sensor.="" sub="" to=""> 2) Check if the resistance between fuel level sensor terminals changes smoothly when moving the fuel sub level sensor float up and down. Terminals No. 1 — No. 2:</ref.> | Does the resistance change smoothly? | Repair the connector. NOTE: In this case, repair the following item: • Poor contact in ECM connector • Poor contact in combination meter connector • Poor contact of coupling connector | sub level sensor. <ref. to<br="">FU(H4DOTC)-66, Fuel Sub Level Sensor.></ref.> |

ENGINE (DIAGNOSTICS)

- 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.>.

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 appro- | Check radiator fan, |
| | | priate DTC using | fan motor and ther- |
| | | the "List of Diag- | mostat and if ther- |
| | | nostic Trouble | mostat is stuck, |
| | | Code (DTC)". | replace thermo- |
| | | <ref. th="" to<=""><th>stat. <ref. th="" to<=""></ref.></th></ref.> | stat. <ref. th="" to<=""></ref.> |
| | | EN(H4DOTC)(diag) | CO(H4DOTC)-30, |
| | | -76, List of Diag- | Radiator Main Fan |
| | | nostic Trouble | and Fan Motor.> |
| | | Code (DTC).> | <ref. th="" to<=""></ref.> |
| | | | CO(H4DOTC)-32, |
| | | | Radiator Sub Fan |
| | | | and Fan Motor.> |

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

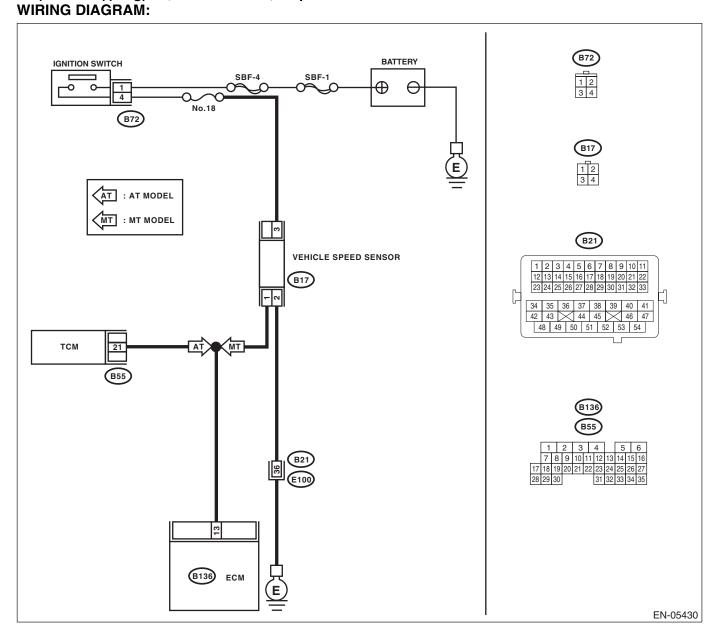
For the diagnostic procedure, refer to DTC P0503. <Ref. to EN(H4DOTC)(diag)-243, DTC P0503 VEHICLE SPEED SENSOR "A" INTERMITTENT/ERRATIC/HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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.>.



| | | VO | 7 2 4 0 | 15 |
|----|--|--|--|---|
| | Step | Check | Yes | No Ca |
| 1 | CHECK TRANSMISSION TYPE. | Is the transmission type AT? | Go to step 2. | Go to step 6. |
| 2 | CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance of harness between ECM and TCM connector. Connector & terminal (B136) No. 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 | Is the resistance 1 M Ω or | Go to step 4. | Repair short cir- |
| | TCM CONNECTOR. Measure the resistance between TCM connector and chassis ground. Connector & terminal (B55) No. 21 — Chassis ground: | more? | | cuit of the harness to ground between ECM and TCM connector. |
| 4 | CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 21 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair the short circuit to power of harness between ECM and TCM connector. | Go to step 5. |
| 5 | CHECK POOR CONTACT. Check for poor contact of the TCM connector. | Is there poor contact of TCM connector? | Repair the poor contact of TCM connector. | Repair poor contact of the ECM connector. |
| 6 | CHECK POWER OF VEHICLE SPEED SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between vehicle speed sensor connector and chassis ground. Connector & terminal (B17) No. 3 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Go to step 7. | Repair the open or ground short circuit of power supply circuit. |
| 7 | CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and vehicle speed sensor. 3) Measure the resistance of the harness between the ECM and vehicle speed sensor connector. Connector & terminal (B136) No. 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. Measure the resistance between vehicle speed sensor connector and chassis ground. Connector & terminal (B17) No. 1 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 9. | Repair short circuit of the harness to ground between ECM and vehicle speed sensor. |
| 9 | CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between vehicle speed sensor connector and chassis ground. Connector & terminal (B17) No. 1 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair the short circuit to power of harness between ECM and vehicle speed sensor. | Go to step 10. |
| 10 | CHECK POOR CONTACT. Check poor contact of vehicle speed sensor connector. | Is there poor contact of vehicle speed sensor connector? | Repair the poor contact of vehicle speed sensor connector. | Replace the vehicle speed sensor. < Ref. to 5MT-37, Vehicle Speed Sensor.> |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

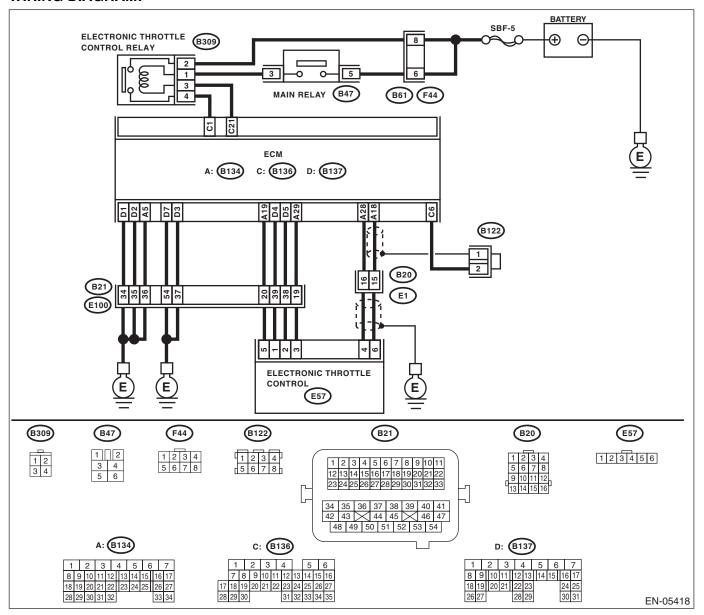
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-173, DTC P0506 IDLE AIR CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | /V() | 17- 40 | 15 |
|---|---|--|---|--|
| | Step | Check | Yes | No C |
| 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK AIR CLEANER ELEMENT. 1) Turn the ignition switch to OFF. 2) Check the air cleaner element. | Is there excessive clogging on air cleaner element? | Replace the air cleaner element. <ref. to<br="">IN(H4DOTC)-9, Air Cleaner Element.></ref.> | Go to step 3. |
| 3 | CHECK ELECTRONIC THROTTLE CONTROL. 1) Remove the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""> 2) Check the electronic throttle control.</ref.> | Are foreign matter found inside electronic throttle control? | Remove foreign matter from elec- tronic throttle con- trol. | Perform the diagnosis of DTC P2101. <ref. (dtc).="" -330,="" actuator="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)="" motor="" p2101="" performance,="" procedure="" range="" throttle="" to="" trouble="" with=""></ref.> |

ENGINE (DIAGNOSTICS)

CD:DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED Studios **DTC DETECTING CONDITION:**

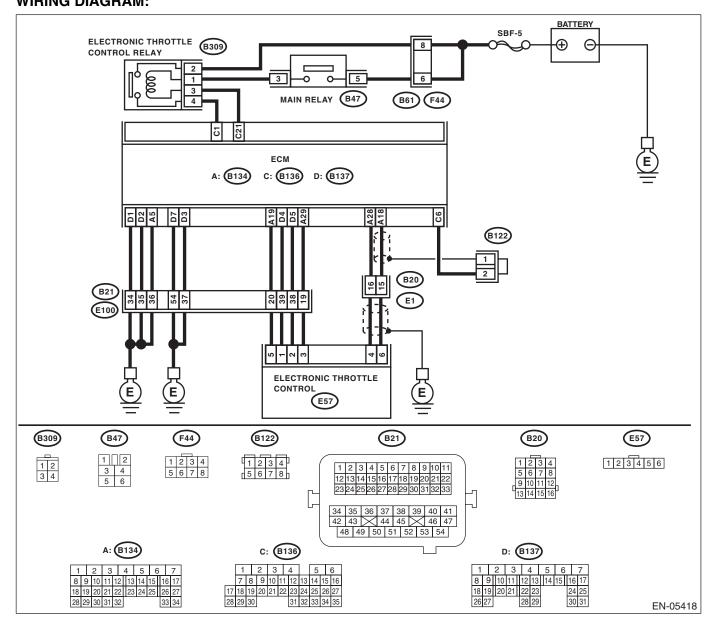
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-175, DTC P0507 IDLE AIR CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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:



| | | 140 | 7 - 40 | 15 |
|---|--|--|---|--|
| | Step | Check | Yes | No C |
| 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK AIR INTAKE SYSTEM. 1) Start and idle the engine. 2) Check the following items. • Loose installation of intake manifold and throttle body • Cracks of intake manifold gasket and throttle body gasket • Disconnection of vacuum hoses | Is there any fault in air intake system? | Repair air suction and leaks. | Go to step 3. |
| 3 | CHECK ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""> 3) Check the electronic throttle control.</ref.> | Are foreign matter found inside electronic throttle control? | Remove foreign matter from elec- tronic throttle con- trol. | Perform the diagnosis of DTC P2101. <ref. (dtc).="" -330,="" actuator="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)="" motor="" p2101="" performance,="" procedure="" range="" throttle="" to="" trouble="" with=""></ref.> |

CE:DTC P0512 STARTER REQUEST CIRCUIT

DTC DETECTING CONDITION:

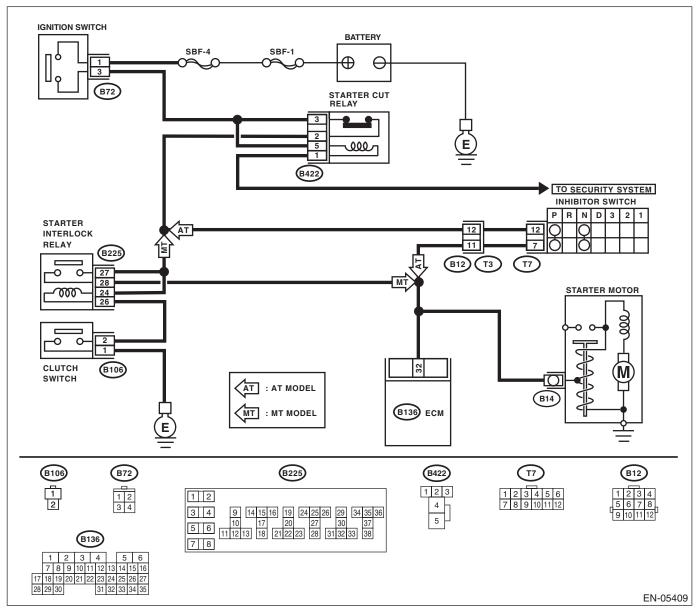
- Detected when two consecutive driving cycles with fault occur.
- Eris Studios • GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-177, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 171 | IT m " U | / - |
|---|---|------------------------------|---|---|
| | Step | Check | Yes | No C |
| 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 32 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair the short circuit to power of the harness between ECM and ignition switch. | Repair poor contact of the ECM connector. |

ENGINE (DIAGNOSTICS)

CF:DTC P0519 IDLE AIR CONTROL SYSTEM PERFORMANCE

DTC DETECTING CONDITION:

- Immediately at fault recognition
- Eris Studios • GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-179, DTC P0519 IDLE AIR CONTROL SYSTEM PER-FORMANCE, 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK AIR INTAKE SYSTEM. 1) Start and idle the engine. 2) Check the following items. • Loose installation of intake manifold and throttle body • Cracks of intake manifold gasket and throttle body gasket • Disconnection of vacuum hoses | Is there any fault in air intake system? | Repair air suction and leaks. | Go to step 3. |
| 3 | CHECK ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control. < Ref. to FU(H4DOTC)-16, Throttle Body.> 3) Check the electronic throttle control. | Are foreign matter found inside electronic throttle control? | Remove foreign matter from elec- tronic throttle con- trol. | Perform the diagnosis of DTC P2101. <ref. (dtc).="" -330,="" actuator="" circuit="" code="" control="" diagnostic="" dtc="" en(h4dotc)(diag)="" motor="" p2101="" performance,="" procedure="" range="" throttle="" to="" trouble="" with=""></ref.> |

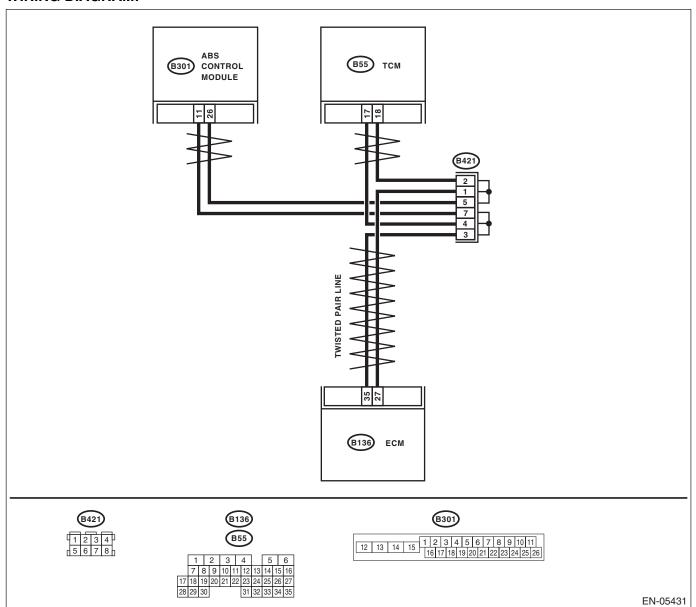
CG:DTC P0600 SERIAL COMMUNICATION LINK

DTC DETECTING CONDITION:

- Immediately at fault recognition
- R RESALE • 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.>.



Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | 140 | The "U | V.E., |
|---|--|--|-----------------------|---|
| | Step | Check | Yes | No |
| 1 | CHECK HARNESS BETWEEN ECM AND TCM. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance between ECM and TCM connector. Connector & terminal (B136) No. 27 — (B55) No. 18: (B136) No. 35 — (B55) No. 17: | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and TCM connector Poor contact of joint connector |
| 2 | CHECK HARNESS BETWEEN ECM AND ABSCM&H/U. 1) Disconnect the connector from the ABSCM&H/U. 2) Measure the resistance between ECM and ABSCM&H/U. Connector & terminal (B136) No. 27 — (B301) No. 26: (B136) No. 35 — (B301) No. 11: | Is the resistance less than 1 Ω ? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and AB-SCM&H/U Poor contact of joint connector |
| 3 | CHECK HARNESS BETWEEN ECM, TCM AND ABSCM&H/U. Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 27 — Chassis ground: (B136) No. 35 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between ECM connectors. Connector & terminal (B136) No. 27 — (B136) No. 35: | Is the resistance 1 $M\Omega$ or more? | Go to step 5. | Repair the short circuit of harness between ECM, TCM AND ABSCM&H/U. |
| 5 | CHECK AT SYSTEM CONDITION. 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. 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 S_{tudios} (RAM) ERROR

DTC DETECTING CONDITION:

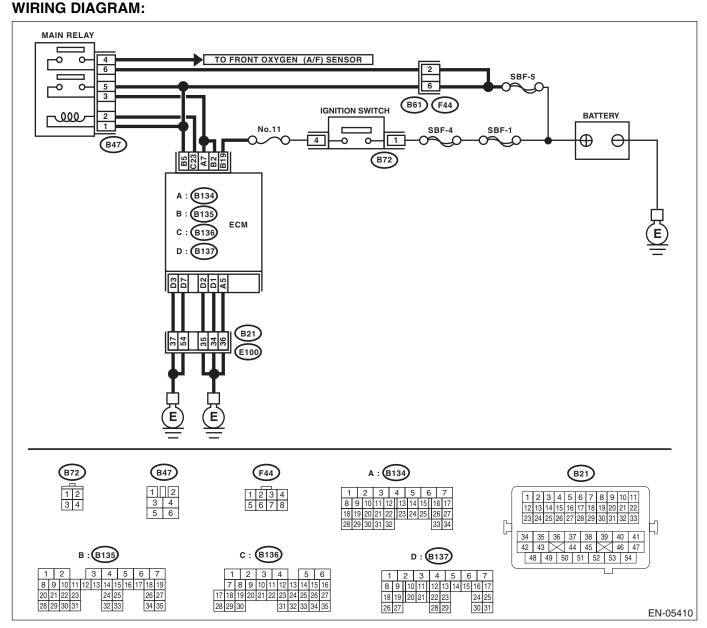
- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-181, DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



ENGINE (DIAGNOSTICS)

| Step | Check | Yes | LINO C |
|---------------------------------------|-----------------------------|---|-----------------------|
| 1 CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check the appro- | Even if the malfunc- |
| | | priate DTC using | tion indicator light |
| | | the "List of Diag- | illuminates, the cir- |
| | | nostic Trouble | cuit has returned to |
| | | Code (DTC)". | a normal condition |
| | I I | <ref. th="" to<=""><th>at this time. Repro-</th></ref.> | at this time. Repro- |
| | | EN(H4DOTC)(diag) | duce the fault con- |
| | | -76, List of Diag- | dition, and |
| | | nostic Trouble | reperform the |
| | | Code (DTC).> | check. |
| | | | NOTE: |
| | | | In this case, there |
| | | | may be a tempo- |
| | | | rary 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:

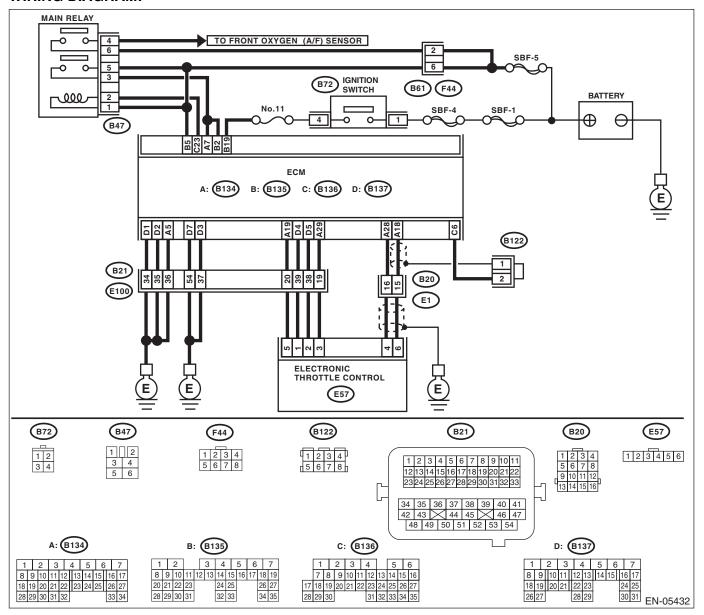
- Immediately at fault recognition
- OR RESALEOR • GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-183, DTC P0607 CONTROL MODULE PERFOR-MANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



ENGINE (DIAGNOSTICS)

| | | 140 | I'F - U | V. E | |
|---|--|--|---|--|------|
| | Step | Check | Yes | No C | |
| 1 | CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 7 (+) — Chassis ground (-): (B135) No. 2 (+) — Chassis ground (-): | Is the voltage 10 — 13 V? | Go to step 2. | Repair the open or ground short circuit of power supply circuit. | dios |
| 2 | CHECK INPUT VOLTAGE OF ECM. 1) Start the engine. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 7 (+) — Chassis ground (-): (B135) No. 2 (+) — Chassis ground (-): | Is the voltage 13 — 15 V? | Go to step 3. | Repair the open or ground short circuit of power supply circuit. | |
| 3 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 19 — (E57) No. 5: (B134) No. 29 — (E57) No. 3: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the open circuit of harness between ECM and electronic throttle control connector. | |
| 4 | CHECK ECM GROUND HARNESS. Measure the voltage between ECM and chassis ground. Connector & terminal (B134) No. 5 (+) — Chassis ground (-): (B137) No. 1 (+) — Chassis ground (-): (B137) No. 2 (+) — Chassis ground (-): (B137) No. 3 (+) — Chassis ground (-): (B137) No. 7 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Repair poor contact of the ECM connector. | Repair the following item. Retightening of engine ground terminals Poor contact in ECM connector 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 THROT-TLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

ENGINE (DIAGNOSTICS)

CL:DTC P0691 FAN 1 CONTROL CIRCUIT LOW

DTC DETECTING CONDITION:

- Detected when two consecutive driving cycles with fault occur.
- OR RESALE • 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 | Check the radiator |
| | | | "List of Diagnostic | fan system. <ref.< th=""></ref.<> |
| | | | Trouble Code | to CO(H4DOTC)- |
| | | | (DTC)". <ref. th="" to<=""><th>7, Radiator Main</th></ref.> | 7, Radiator Main |
| | | | EN(H4DOTC)(diag) | Fan System.> |
| | | | -76, List of Diag- | <ref. th="" to<=""></ref.> |
| | | | nostic Trouble | CO(H4DOTC)-13, |
| | | | Code (DTC).> | 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. | | "List of Diagnostic Trouble Code (DTC)". <ref. to<br="">EN(H4DOTC)(diag) -76, List of Diag-</ref.> | Check the radiator fan system. <ref. to CO(H4DOTC)- 7, Radiator Main Fan System.> <ref. to<br="">CO(H4DOTC)-13, Radiator Sub Fan System.></ref.></ref. |

CN:DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

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)

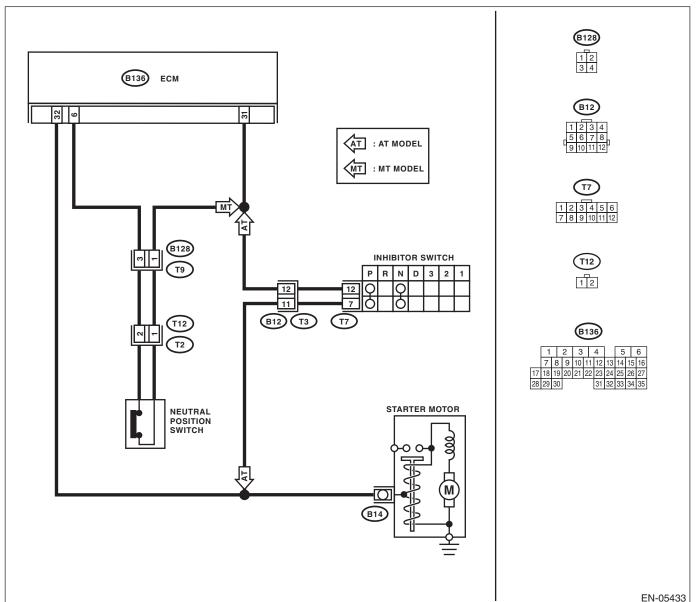
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-192, DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 14() | T - 4 0 | 15 |
|---|--|---|--|--|
| | Step | Check | Yes | - No C |
| 1 | CHECK SELECT CABLE. | Are there any faults in the select cable? | Repair or adjust the select cable. <ref. cs-27,<br="" to="">Select Cable.></ref.> | Go to step 2. |
| 2 | CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Place the select lever other than "N" and "P" range. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 31 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step 3. |
| 3 | CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T3). 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 31 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 4. | Repair short circuit of the harness to ground between ECM and transmission harness connector. |
| 4 | CHECK TRANSMISSION HARNESS CONNECTOR. 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance between the transmission harness connector and engine ground. Connector & terminal (T3) No. 12 — Engine ground: | Is the resistance 1 $M\Omega$ or more? | Replace the inhibitor switch. <ref. 4at-46,="" inhibitor="" switch.="" to=""></ref.> | 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) Studios

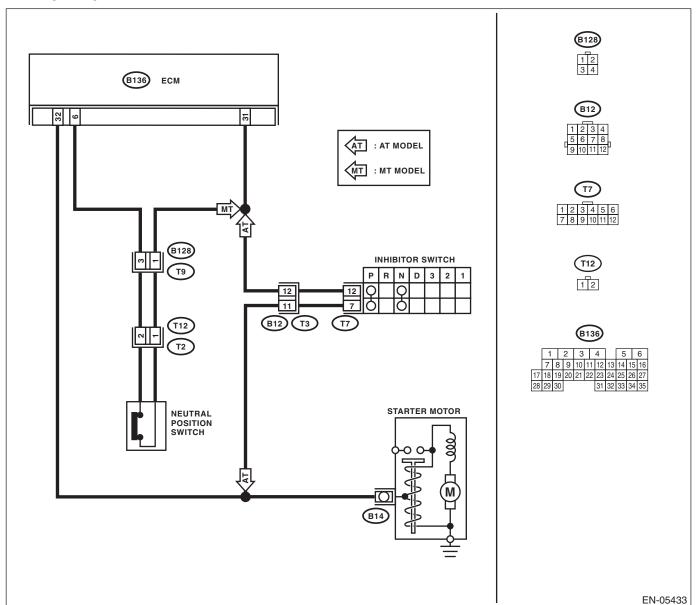
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-193, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | *** | 1 20 1.0 | / [** |
|---|--|--|---|---|
| | Step | Check | Yes | No |
| 1 | CHECK INPUT SIGNAL OF ECM. Turn the ignition switch to ON. Place the shift lever in a position except for neutral. Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 31 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T9). 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 31 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Repair the short circuit of transmis- sion harness, or replace the neutral position switch. | Repair short circuit of the harness to ground between ECM and transmission harness connector. |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

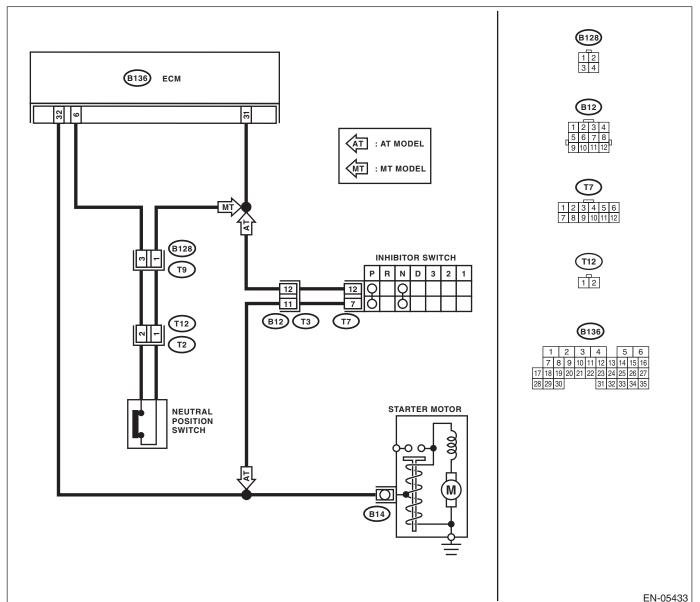
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-194, DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 1467 | The TU | V 15 |
|---|--|---|--|--|
| | Step | Check | Yes | No |
| 1 | CHECK SELECT CABLE. | Are there any faults in the select cable? | Repair or adjust the select cable. <ref. cs-27,<br="" to="">Select Cable.></ref.> | Go to step 2. |
| 2 | CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground with select lever at "N" and "P" range. Connector & terminal (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 IN- HIBITOR SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and inhibitor switch. 3) Measure the resistance of harness between ECM and inhibitor switch connector. Connector & terminal (B136) No. 31 — (T7) No. 12: | Is the resistance less than 1 Ω ? | · | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between ECM and inhibitor switch connector Poor contact of coupling connector |
| 4 | CHECK INHIBITOR SWITCH GROUND LINE. Measure the resistance of harness between inhibitor switch connector and engine ground. Connector & terminal (T7) No. 12 — Engine ground: | Is the resistance less than 5 Ω ? | Replace the inhibitor switch. <ref. 4at-46,="" inhibitor="" switch.="" to=""></ref.> | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between inhibitor switch connector and starter motor ground line Poor contact of coupling connector Poor contact in starter motor connector Poor contact in starter motor ground Starter motor ground Starter motor |

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

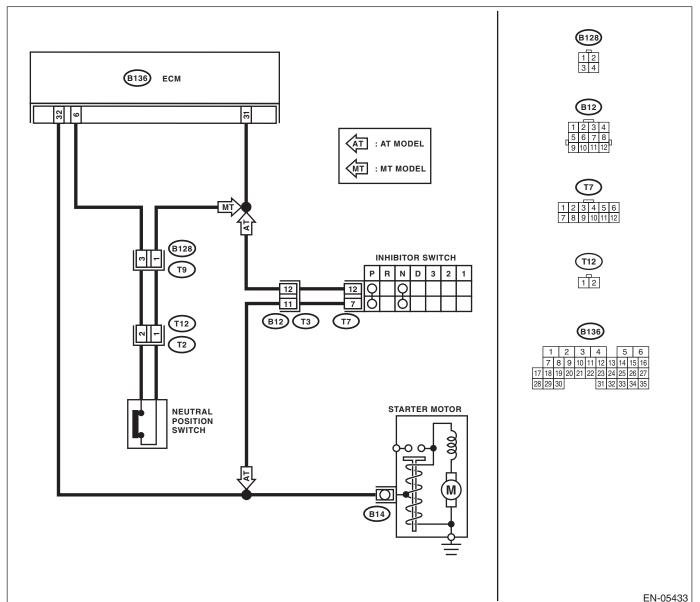
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-195, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | /YC | 7 ~ 4 0 | 15 |
|---|--|--|--|--|
| | Step | Check | Yes | No C |
| 1 | CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Place the shift lever in neutral. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 31 (+) — Chassis ground (-): | Is the voltage less than 1 V? | Repair poor con- tact of the ECM connector. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND NEUTRAL SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect connectors from the ECM and transmission harness. 3) Measure the resistance of harness between ECM and transmission harness connector. Connector & terminal (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. Measure the resistance of harness between transmission harness connector and engine ground. Connector & terminal (B128) No. 3 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between transmission harness connector and engine ground Poor contact of coupling connector |
| 4 | CHECK NEUTRAL SWITCH. 1) Place the shift lever in neutral. 2) Measure the resistance between transmission harness connector terminals. Connector & terminal (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 transmis- sion harness, or replace the neutral switch. |

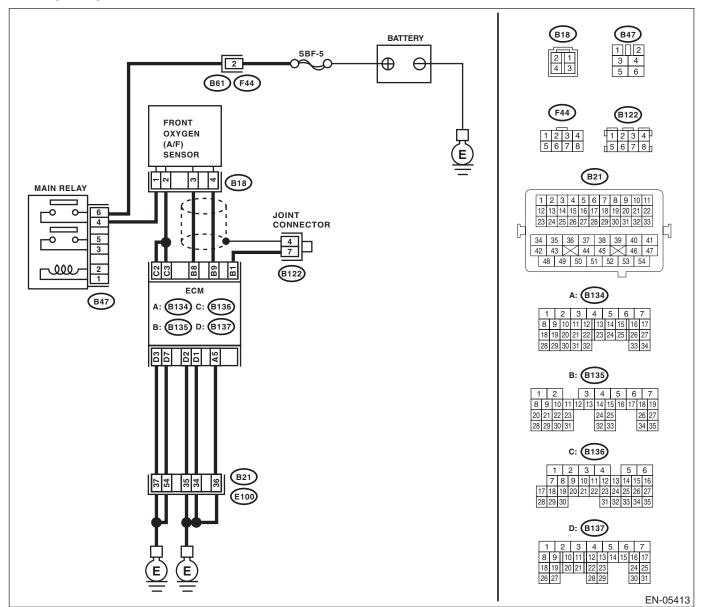
CS:DTC P1152 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) Fris Studios

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.>.



| | | 110 | The TU | / - |
|---|--|---|---|---|
| | Step | Check | Yes | No |
| 1 | CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR. | Has water entered the connector? | Completely remove any water inside. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B135) No. 9 — (B18) No. 4: (B135) No. 8 — (B18) No. 3: | Is the resistance less than 1 Ω ? | | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between ECM and front oxygen (A/F) sensor connector Poor contact in front oxygen (A/F) sensor connector Poor contact in ECM connector Poor contact in ECM connector outpling connector |
| 3 | CHECK POOR CONTACT. Check poor contact of front oxygen (A/F) sensor connector. | Is there poor contact in front oxygen (A/F) sensor connector? | Repair the poor contact of the front oxygen (A/F) sensor connector. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |

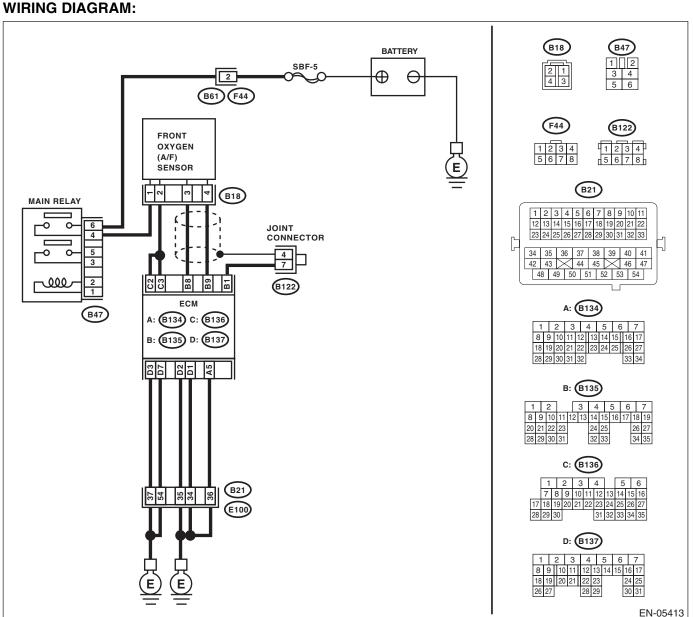
CT:DTC P1153 O2 SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) ris Studios

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.>.



ENGINE (DIAGNOSTICS)

| | | / Y L . | IT - U | 15 |
|---|--|--|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR. | Has water entered the connector? | Completely remove any water inside. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 9 — Chassis ground: (B135) No. 8 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 3. | Repair short circuit of the harness to ground between ECM and front oxygen (A/F) sensor connector. |
| 3 | CHECK OUTPUT SIGNAL FOR ECM. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-): | Is the voltage 4.5 V or more? | Go to step 5. | Go to step 4. |
| 4 | CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 8 (+) — Chassis ground (-): | Is the voltage 4.95 V or more? | Go to step 5. | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> |
| 5 | CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 9 (+) — Chassis ground (-): (B135) No. 8 (+) — Chassis ground (-): | Is the voltage 8 V or more? | Repair the short circuit to power in the harness between the ECM and front oxygen (A/F) sensor connector. After repair, replace the ECM. <ref. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> | 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 THROT-TLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

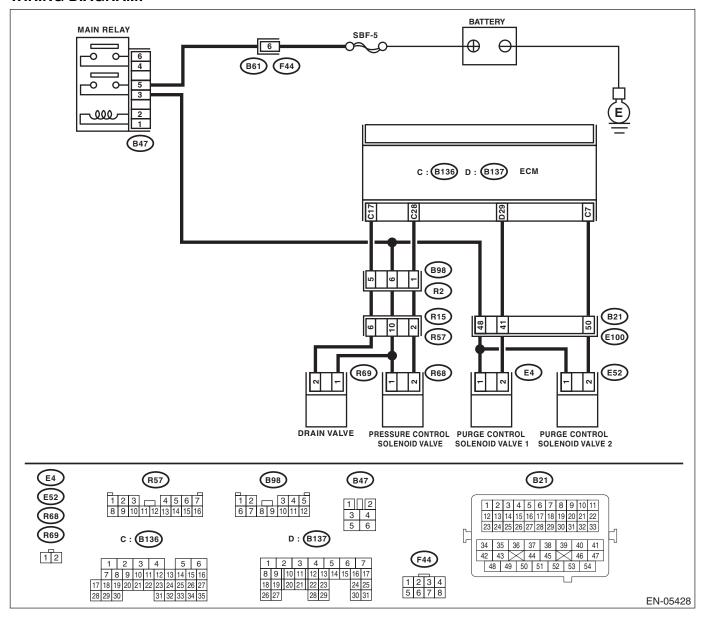
CV:DTC P1400 FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT Studios LOW

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.>.



| | | /VC | アニュロ | 15. |
|---|--|--|--------------------------------------|---|
| | Step | Check | Yes | No C |
| 1 | CHECK OUTPUT SIGNAL OF ECM. | Is the voltage 10 V or more? | Repair poor con- | Go to step 2. |
| | Turn the ignition switch to ON. | | tact of the ECM | TALF |
| | 2) Measure the voltage between ECM and | | connector. | |
| | chassis ground. | | | |
| | Connector & terminal | | | |
| | (B136) No. 28 (+) — Chassis ground (–): | | | |
| 2 | CHECK HARNESS BETWEEN ECM AND | Is the resistance 1 M Ω or | Go to step 3. | Repair short cir- |
| | PRESSURE CONTROL SOLENOID VALVE. | more? | | cuit of the harness |
| | 1) Turn the ignition switch to OFF. | | | to ground between |
| | Disconnect the connector from the ECM and pressure control solenoid valve. | | | ECM and pressure control solenoid |
| | 3) Measure the resistance between pressure | | | valve connector. |
| | control solenoid valve and chassis ground. | | | valve connector. |
| | Connector & terminal | | | |
| | (R68) No. 2 — Chassis ground: | | | |
| 3 | CHECK HARNESS BETWEEN ECM AND | Is the resistance less than 1 Ω ? | Go to sten 4 | Repair the harness |
| | PRESSURE CONTROL SOLENOID VALVE. | 13 the resistance less than 1 22: | GO 10 310p 4. | and connector. |
| | Measure the resistance of harness between | | | NOTE: |
| | ECM and pressure control solenoid valve con- | | | In this case, repair |
| | nector. | | | the following item: |
| | Connector & terminal | | | Open circuit in |
| | (B136) No. 28 — (R68) No. 2: | | | harness between |
| | | | | ECM and pressure |
| | | | | control solenoid |
| | | | | valve connector |
| | | | | Poor contact of |
| | | | | coupling connector |
| 4 | CHECK PRESSURE CONTROL SOLENOID | | Go to step 5. | Replace the pres- |
| | VALVE. | 100 Ω? | | sure control sole- |
| | Measure the resistance between pressure con- | | | noid valve. <ref. th="" to<=""></ref.> |
| | trol solenoid valve terminals. Terminals | | | EC(H4DOTC)-16, Pressure Control |
| | No. 1 — No. 2: | | | Solenoid Valve.> |
| _ | | la tha waltaga 10 M ay may 2 | Danainthanan | |
| 5 | CHECK POWER SUPPLY TO THE PRES- SURE CONTROL SOLENOID VALVE. | Is the voltage 10 V or more? | Repair the poor | Repair the harness |
| | Turn the ignition switch to ON. | | contact of pressure control solenoid | and connector. |
| | 2) Measure the voltage between pressure con- | | valve connector. | NOTE: |
| | trol solenoid valve and chassis ground. | | valve connector. | In this case, repair the following item: |
| | Connector & terminal | | | Open circuit in |
| | (R68) No. 1 (+) — Chassis ground (–): | | | harness between |
| | (, (, | | | main relay and |
| | | | | pressure control |
| | | | | solenoid valve |
| | | | | connector |
| | | | | Poor contact of |
| | | | | coupling connector |
| | | | | Poor contact of |
| | | | | main relay connec- |
| | | | | tor |
| | | | | connector • Poor contact of coupling connector • Poor contact of main relay connec- |

CW:DTC P1410 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-204, DTC P1410 SECONDARY AIR INJECTION SYS- TEM 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.>.

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54

3 4

9 12 13 14 19 22 23 24 28 32 33 34 36

EN-05427

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | The state of the s | V 17 |
|--|-------|--|--|
| Step | Check | Yes | No C |
| 1 CHECK SECONDARY AIR COMBINATION VALVE. 1) Remove the secondary air combination valve. <ref. air="" combination="" ec(h4dotc)-10,="" secondary="" to="" valve.=""> 2) Blow in air from the secondary air combination valve air inlet, and check whether there are leaks at the pipe connections.</ref.> | | Replace the sec- ondary air combi- nation valve on the side with the air leak. <ref. to<br="">EC(H4DOTC)-10, Secondary Air Combination Valve.></ref.> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |

ENGINE (DIAGNOSTICS)

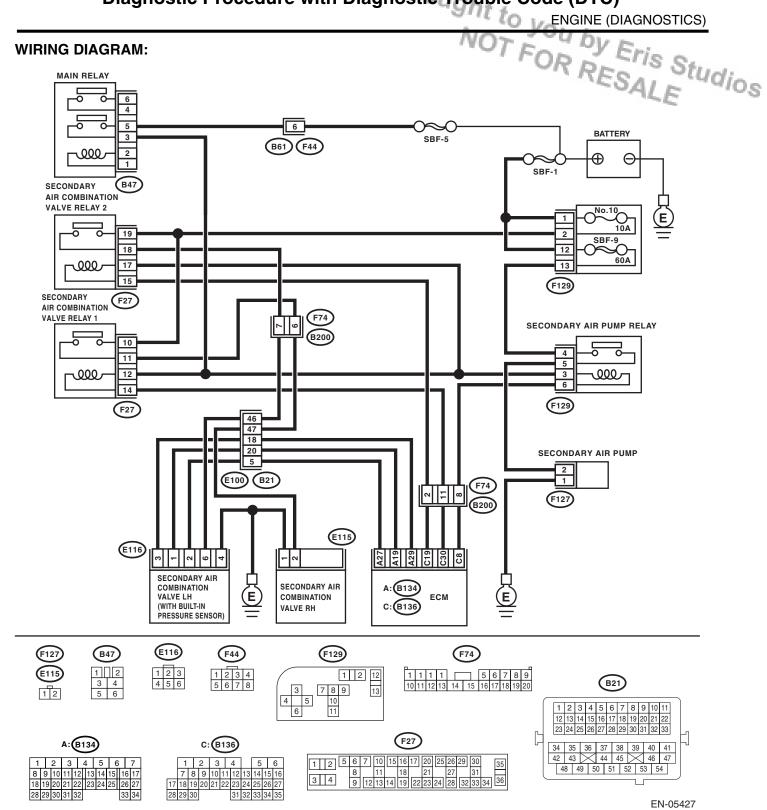
CX:DTC P1418 SECONDARY AIR INJECTION SYSTEM CONTROL "A" CIRCUIT SHORTED

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.>.



| | * Y L | IT - U | V P |
|--|------------------------------|--|--|
| Step | Check | Yes | No. |
| 1 CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and secondary air pump relay. 3) Measure the voltage between ECM and chassis ground. Connector & terminal (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. NOTE: In this case, there may be a temporary connector contact failure. |

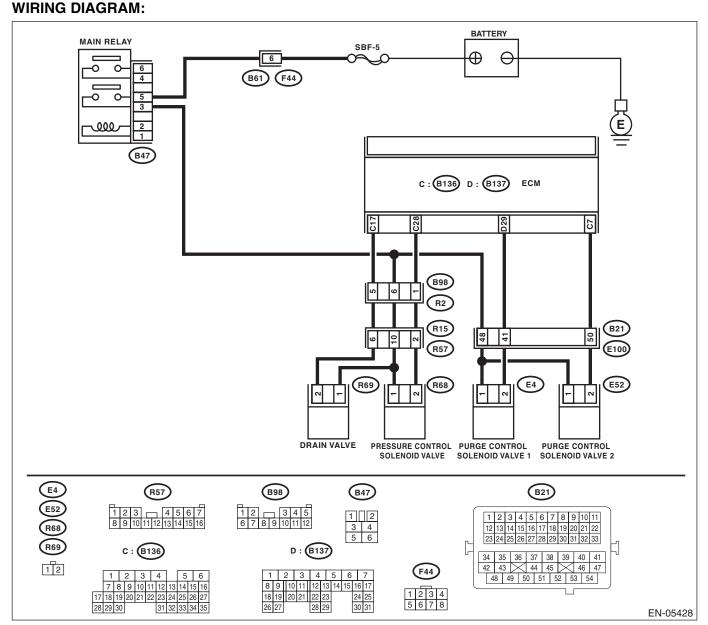
ENGINE (DIAGNOSTICS)

CY:DTC P1420 FUEL TANK PRESSURE CONTROL SOL. VALVE CIRCUIT HIGH Studios **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.>.



| | | 141 | The TU | / - |
|---|---|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND PRESSURE CONTROL SOLENOID VALVE. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and pressure control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Measure the resistance between pressure control solenoid valve terminals. Terminals No. 1 — No. 2: | Is the resistance less than 1 Ω ? | Replace the pressure control sole- noid valve. <ref. to<br="">EC(H4DOTC)-16, Pressure Control Solenoid Valve.></ref.> | Repair poor contact of the ECM connector. |

CZ:DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM

DTC DETECTING CONDITION:

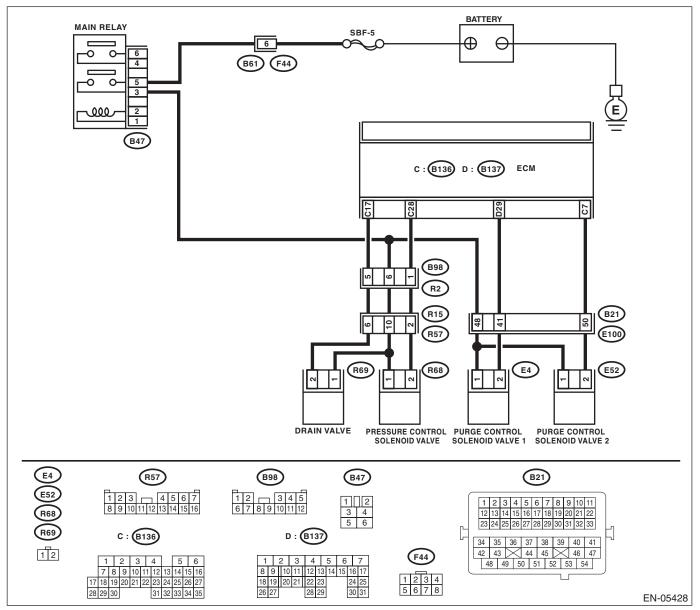
- · Immediately at fault recognition
- S_{tudios} GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-209, DTC P1443 VENT CONTROL SOLENOID VALVE FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | /VC. | IT - 4 U | 15 |
|---|--|--------------------------------------|---|---|
| | Step | Check | Yes | No C |
| 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK VENT LINE HOSES. Check the following items. Clogging of vent hoses between canister and drain valve Clogging of vent hose between drain valve and air filter 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. 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side). 3) Turn the ignition switch to ON. 4) Operate the drain valve. NOTE: Drain valve operation can be executed using the Subaru Select Monitor. Regarding the procedures, refer to "Compulsory Valve Operation Check Mode". <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Repair poor contact of the ECM connector. | Replace the drain valve. <ref. to<br="">EC(H4DOTC)-20, Drain Valve.></ref.> |

EN-05434

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

DTC DETECTING CONDITION:

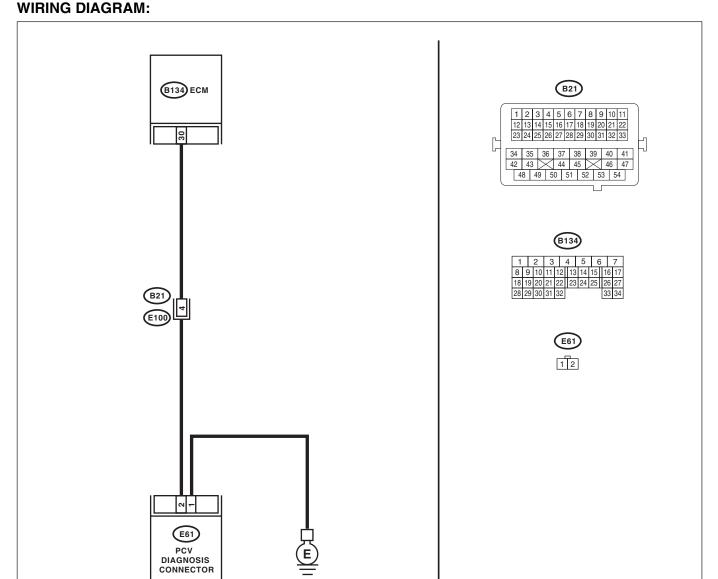
- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-211, DTC P1491 POSITIVE CRANKCASE VENTILA- TION (BLOW-BY) FUNCTION PROBLEM, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | 140 | The "D | V 5- |
|---|--|--|---|---|
| | Step | Check | Yes | No |
| 1 | CHECK BLOW-BY HOSE. | Is there any disconnection or | Repair or replace | Go to step 2. |
| | Check the blow-by hose condition. | crack in blow-by hose? | the blow-by hose. | TALF |
| 2 | CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and PCV hose assembly. 3) Measure the resistance of harness between ECM and PCV hose assembly. Connector & terminal (B134) No. 30 — (E61) No. 2: | | Go to step 3. | Repair the open circuit of harness between ECM and PCV hose assembly. |
| 3 | CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY. Measure the resistance between PCV hose assembly and chassis ground. Connector & terminal (B134) No. 30 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 4. | Repair short circuit of the harness to ground between ECM and PCV hose assembly. |
| 4 | CHECK GROUND CIRCUIT OF PCV HOSE ASSEMBLY. Measure the resistance of harness between PCV hose assembly and engine ground. Connector & terminal (E61) No. 1 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 5. | Repair the open circuit of harness between PCV hose assembly and engine ground. |
| 5 | CHECK THE PCV HOSE ASSEMBLY. Measure the resistance between the PCV hose assembly terminals. Terminals No. 1 — No. 2: | Is the resistance less than 1 Ω ? | Repair the poor contact in ECM and PCV hose assembly connector. | Replace the PCV hose assembly. |

DB:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT

DTC DETECTING CONDITION:

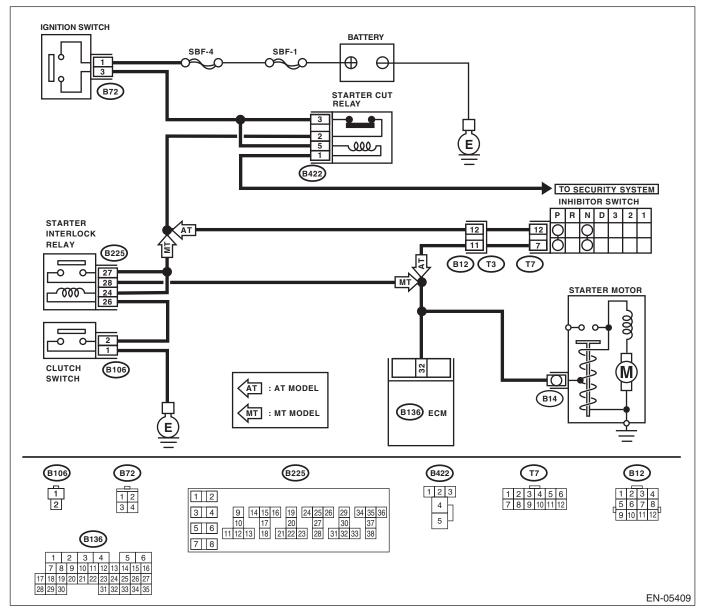
- Detected when two consecutive driving cycles with fault occur.
- Eris Studios • GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-213, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Trouble Code (DTC) Detecting Criteria.>

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.>.



| | | / Y C J | 7 - 4 0 | / - |
|---|--|-----------------------------|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and ignition switch. 3) Measure the resistance of harness between the ECM and ignition switch connector. Connector & terminal (B136) No. 32 — (B72) No. 3: NOTE: For the MT model, measure while depressing the clutch pedal. | | · · | NOTE: Check the following item and repair or replace if necessary. Open circuit of harness between the ECM and ignition coil switch connector Blown out of fuse (No. SBF-4) Poor contact of the clutch switch connector (MT model) Poor contact of the clutch switch (MT model) |
| 3 | CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH. Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 32 — Chassis ground: NOTE: For the MT model, measure while depressing the clutch pedal. | more? | Repair short circuit of the harness to ground between the ECM and ignition switch connector. | Repair poor contact of the ECM connector. |

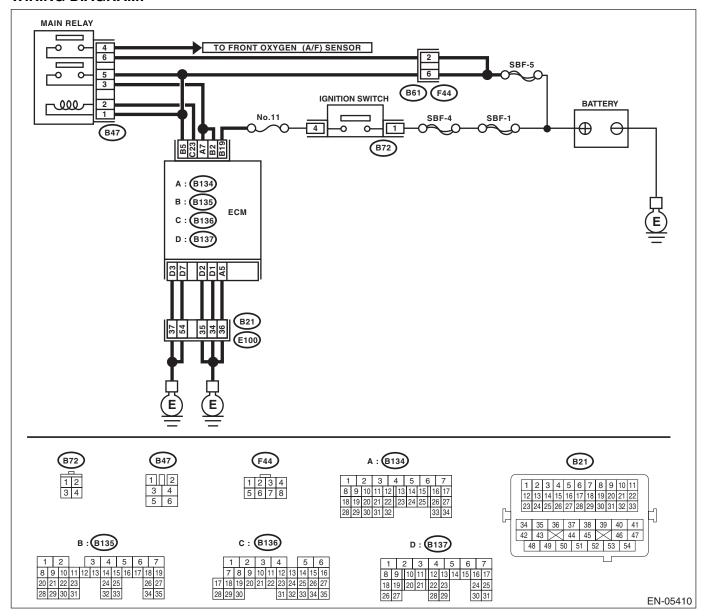
DC:DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION

DTC DETECTING CONDITION:

- · Immediately at fault recognition
- Eris Studios • GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-214, DTC P1560 BACK-UP VOLTAGE CIRCUIT MAL-FUNCTION, 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.>.



| | | / Y C . | IT ~ U | 15 |
|---|--|--|---|---|
| | Step | Check | Yes | C No C |
| 1 | CHECK INPUT SIGNAL OF ECM. 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Repair poor contact of the ECM connector. | Go to step 2. |
| 2 | CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR. 1) Disconnect the connectors from the ECM. 2) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 5 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 3. | Repair short circuit of the harness to ground between ECM and battery terminal. |
| 3 | CHECK FUSE SBF-5. | Is the fuse blown out? | Replace the fuse. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and battery Poor contact in ECM connector Poor contact of battery terminal |

DD:DTC P1602 CONTROL MODULE PROGRAMMING ERROR

DTC DETECTING CONDITION:

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

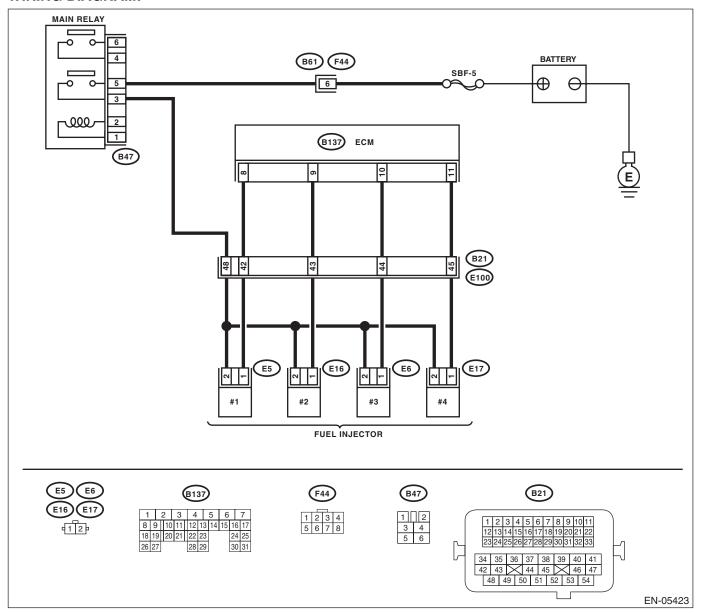
TROUBLE SYMPTOM:

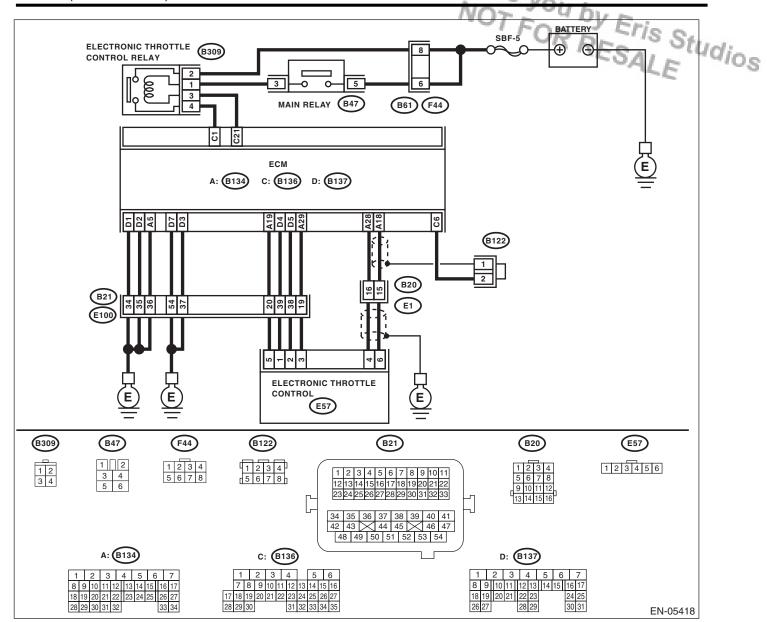
- · Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- · Engine stalls.

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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | 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. engine="" lu(h4dotc)-10,="" oil.="" replacement,="" to=""></ref.> |
| 3 | CHECK EXHAUST SYSTEM. | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | Go to step 4. |

| | | /V.C | 7 - 40 | / P |
|---|--|---|-------------------------------|---|
| | Step | Check | Yes | C 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. WARNING: Place "NO OPEN FLAMES" signs near the working area. CAUTION: Be careful not to spill fuel. Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <ref. fuel="" inspection,="" me(h4dotc)-31,="" pressure.="" to=""> CAUTION: Release fuel pressure before removing the fuel pressure gauge. NOTE: If fuel pressure does not increase, squeeze the fuel return hose 2 or 3 times, then measure fuel pressure again.</ref.> | | Go to step 6. | Repair the following item. Fuel pressure is too high: Clogged fuel return line or bent hose Fuel pressure is too low: Improper fuel pump discharge Clogged fuel supply line |
| 6 | CHECK FUEL PRESSURE. After connecting the pressure regulator vacuum hose, measure fuel pressure. <ref. fuel="" inspection,="" me(h4dotc)-31,="" pressure.="" to=""> CAUTION: Release fuel pressure before removing the fuel pressure gauge. NOTE: If fuel pressure does not increase, squeeze fuel return hose 2 or 3 times, then measure fuel pressure again. If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose.</ref.> | | Go to step 7. | Repair the following item. Fuel pressure is too high: Faulty pressure regulator Clogged fuel return line or bent hose Fuel pressure is too low: Faulty pressure regulator Improper fuel pump discharge Clogged fuel supply line |
| 7 | CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | ture 75°C (167°F) or higher? | Go to step 8. | Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-30,="" sensor.="" temperature="" to=""></ref.> |

| | | NC | 7 2 4 5 | V F |
|----|---|---------------------------------|----------------|--------------------------------------|
| | Step | Check | Yes | C No C |
| 8 | CHECK MASS AIR FLOW AND INTAKE AIR | Is the measured value 2.0 — | Go to step 9. | Replace the mass |
| | TEMPERATURE SENSOR. | 5.0 g/s (0.26 — 0.66 lb/m)? | | air flow and intake |
| | 1) Start the engine and warm-up engine until | | | air temperature |
| | coolant temperature is higher than 75°C (167°F). | | | sensor. <ref. th="" to<=""></ref.> |
| | 2) For AT models, set the select lever to the "P" | | | FU(H4DOTC)-35, |
| | or "N" range, and for MT models, place the shift lever in the neutral position. | | | Mass Air Flow and Intake Air Temper- |
| | 3) Turn the A/C switch to OFF. | | | ature Sensor.> |
| | 4) Turn all the accessory switches to OFF. | | | ature Serisor.> |
| | 5) Read the data of mass air flow and intake air | | | |
| | temperature sensor signal using Subaru Select | | | |
| | Monitor or general scan tool. | | | |
| | NOTE: | | | |
| | Subaru Select Monitor | | | |
| | For detailed operation procedures, refer to | | | |
| | "READ CURRENT DATA FOR ENGINE". < Ref. | | | |
| | to EN(H4DOTC)(diag)-36, Subaru Select Moni- | | | |
| | tor.> | | | |
| | General scan tool | | | |
| | For detailed operation procedure, refer to the | | | |
| | general scan tool operation manual. | | | |
| 9 | CHECK MASS AIR FLOW AND INTAKE AIR | Subtract ambient temperature | Go to step 10. | Check the mass air |
| | TEMPERATURE SENSOR. | from intake air temperature. Is | | flow and intake air |
| | 1) Start the engine and warm-up engine until | the obtained value –10 — 50°C | | temperature sen- |
| | coolant temperature is higher than 75°C | (–18 — 90°F)? | | sor. <ref. th="" to<=""></ref.> |
| | (167°F). | | | FU(H4DOTC)-35, |
| | For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift | | | Mass Air Flow and Intake Air Temper- |
| | lever in the neutral position. | | | ature Sensor.> |
| | 3) Turn the A/C switch to OFF. | | | ature Serisor.> |
| | 4) Turn all the accessory switches to OFF. | | | |
| | 5) Open the front hood. | | | |
| | Measure the ambient temperature. | | | |
| | 7) Read the data of mass air flow and intake air | | | |
| | temperature sensor signal using Subaru Select | | | |
| | Monitor or general scan tool. | | | |
| | NOTE: | | | |
| | Subaru Select Monitor | | | |
| | For detailed operation procedures, refer to | | | |
| | "READ CURRENT DATA FOR ENGINE". <ref.< th=""><th></th><th></th><th></th></ref.<> | | | |
| | to EN(H4DOTC)(diag)-36, Subaru Select Moni- | | | |
| | tor.> | | | |
| | General scan tool For detailed a position presenting refer to the | | | |
| | For detailed operation procedure, refer to the | | | |
| 10 | general scan tool operation manual. | lo the veltage 10 V as sees 2 | Co to oto:: 15 | Co to oto - 11 |
| 10 | CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. | Is the voltage 10 V or more? | Go to step 15. | Go to step 11. |
| | 2) Measure the voltage between the ECM and | | | |
| | chassis ground for faulty cylinders. | | | |
| | Connector & terminal | | | |
| | #1 (B137) No. 8 (+) — Chassis ground (–): | | | |
| | #2 (B137) No. 9 (+) — Chassis ground (-): | | | |
| | #3 (B137) No. 10 (+) — Chassis ground (-): | | | |
| | #4 (B137) No. 11 (+) — Chassis ground (–): | | | |

| | | NO | V4 D | 1 - |
|----|--|---|---|--|
| | Step | Check | Yes | No |
| 11 | CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinders. 3) Measure the resistance between the fuel injector connector and engine ground on faulty cylinders. Connector & terminal #1 (E5) No. 1 — Engine ground: #2 (E16) No. 1 — Engine ground: #3 (E6) No. 1 — Engine ground: #4 (E17) No. 1 — Engine ground: | Is the resistance 1 M Ω or more? | Go to step 12. | Repair short cir- cuit of the harness to ground between ECM and fuel injector. |
| 12 | CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR. Measure the resistance of harness between the ECM and fuel injector on faulty cylinders. Connector & terminal #1 (B137) No. 8 — (E5) No. 1: #2 (B137) No. 9 — (E16) No. 1: #3 (B137) No. 10 — (E6) No. 1: #4 (B137) No. 11 — (E17) No. 1: | Is the resistance less than 1 Ω ? | | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and fuel injector connector • Poor contact of coupling connector |
| 13 | CHECK FUEL INJECTOR. Measure the resistance between fuel injector terminals on faulty cylinder. Terminals No. 1 — No. 2: | Is the resistance between 5 — 20 Ω ? | Go to step 14. | Replace the faulty fuel injector. <ref. to FU(H4DOTC)- 37, Fuel Injector.></ref. |
| 14 | CHECK POWER SUPPLY LINE. 1) Turn the ignition switch to ON. 2) Measure the voltage between fuel injector and engine ground on faulty cylinders. Connector & terminal #1 (E5) No. 2 (+) — Engine ground (-): #2 (E16) No. 2 (+) — Engine ground (-): #3 (E6) No. 2 (+) — Engine ground (-): #4 (E17) No. 2 (+) — Engine ground (-): | Is the voltage 10 V or more? | Repair the poor contact of all connectors in fuel injector circuit. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the main relay and fuel injector connector on faulty cylinders Poor contact of coupling connector Poor contact of main relay connector Poor contact of fuel injector connector on faulty cylinders |

| | | NO | 7 74 6 | / |
|-----|---|---|---|--|
| | Step | Check | Yes | C No |
| 15 | CHECK HARNESS BETWEEN ECM AND | Is the voltage 10 V or more? | Repair the short | Go to step 16. |
| | FUEL INJECTOR. | | circuit to power in | TALE |
| | Turn the ignition switch to OFF. | | the harness | |
| | 2) Disconnect the connector from fuel injector | | between the ECM | |
| | on faulty cylinders. | | and fuel injector. | |
| | 3) Turn the ignition switch to ON.4) Measure the voltage between the ECM and | | | |
| | chassis ground for faulty cylinders. | | | |
| | Connector & terminal | | | |
| | #1 (B137) No. 8 (+) — Chassis ground (–): | | | |
| | #2 (B137) No. 9 (+) — Chassis ground (-): | | | |
| | #3 (B137) No. 10 (+) — Chassis ground (-): | | | |
| | #4 (B137) No. 11 (+) — Chassis ground (-): | | | |
| 16 | CHECK FUEL INJECTOR. | Is the resistance less than 1 Ω ? | Replace the faulty | Go to step 17. |
| | Turn the ignition switch to OFF. | | fuel injector. <ref.< th=""><th></th></ref.<> | |
| | 2) Measure the resistance between fuel injec- | | to FU(H4DOTC)- | |
| | tor terminals on faulty cylinder. | | 37, Fuel Injector.> | |
| | Terminals | | | |
| | No. 1 — No. 2: | | | |
| 17 | CHECK INSTALLATION OF CAMSHAFT PO- | Is the camshaft position sensor | Tighten the cam- | Go to step 18. |
| | SITION SENSOR/CRANKSHAFT POSITION | or crankshaft position sensor | shaft position sen- | |
| | SENSOR. | loosely installed? | sor or crankshaft position sensor. | |
| 10 | CUECK CDANK CDDOCKET | la tha avant any alsat weets day | • | Cata step 10 |
| 18 | CHECK CRANK SPROCKET. Remove the timing belt cover. | Is the crank sprocket rusted or does it have damaged teeth? | Replace the crank sprocket. <ref. td="" to<=""><td>Go to step 19.</td></ref.> | Go to step 19. |
| | hemove the tilling belt cover. | does it have damaged teetin? | ME(H4DOTC)-57, | |
| | | | Crank Sprocket.> | |
| 19 | CHECK INSTALLATION CONDITION OF | Is the timing belt dislocated | Repair the installa- | Go to step 20. |
| '3 | TIMING BELT. | from its proper position? | tion condition of | αο το στερ 20 . |
| | Turn the crankshaft, and align alignment mark | Trom to proper position: | timing belt. <ref. th="" to<=""><th></th></ref.> | |
| | on crank sprocket with alignment mark on cylin- | | ME(H4DOTC)-48, | |
| | der block. | | Timing Belt.> | |
| 20 | CHECK ELECTRONIC THROTTLE CON- | Is the resistance less than 1 Ω ? | Go to step 21. | Replace the elec- |
| | TROL RELAY. | | - | tronic throttle con- |
| | Turn the ignition switch to OFF. | | | trol relay. <ref. td="" to<=""></ref.> |
| | 2) Remove the electronic throttle control relay. | | | FU(H4DOTC)-53, |
| | 3) Connect the battery to terminals No. 1 and | | | Electronic Throttle |
| | No. 3 of electronic throttle control relay. | | | Control Relay.> |
| | 4) Measure the resistance between electronic | | | |
| | throttle control relay terminals. | | | |
| | Terminals No. 2 — No. 4: | | | |
| 21 | CHECK POWER SUPPLY OF ELECTRONIC | Is the voltage 10 V or more? | Go to step 22. | Repair the open or |
| [] | THROTTLE CONTROL RELAY. | is the voltage to v of filole? | ωυ ιυ δι ο μ ΖΖ . | ground short circuit |
| | Measure the voltage between electronic throttle | | | of power supply |
| | control relay connector and chassis ground. | | | circuit. |
| | Connector & terminal | | | |
| | (B309) No. 2 (+) — Chassis ground (–): | | | |
| 22 | CHECK HARNESS BETWEEN ECM AND | Is the voltage 10 V or more? | Repair the short | Go to step 23. |
| | ELECTRONIC THROTTLE CONTROL RE- | | circuit to power in | |
| | LAY. | | the harness | |
| | 1) Disconnect the connectors from the ECM. | | between ECM and | |
| | 2) Turn the ignition switch to ON. | | electronic throttle | |
| | Measure the voltage between electronic | | control relay. | |
| | throttle control relay connector and chassis | | | |
| | ground. | | | |
| | Connector & terminal | | | |
| | (B309) No. 3 (+) — Chassis ground (–): | | | |

| | | /// | 7 7 4 0 | 1/ 1- |
|----|--|--|----------------|---|
| | Step | Check | Yes | No |
| 23 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RE-LAY. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground. Connector & terminal (B309) No. 3 — Chassis ground: (B309) No. 4 — Chassis ground: | Is the resistance 1 $M\Omega$ 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 RE-LAY. Measure the resistance between the ECM and electronic throttle control relay connector. Connector & terminal (B136) No. 21 — (B309) No. 3: (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6: (B134) No. 28 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground: | Is the resistance 1 $M\Omega$ 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. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> |
| 27 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3: | Is the resistance less than 1 Ω ? | Go to step 28. | Repair the open circuit of harness between ECM and electronic throttle control connector. |

| | | NO | 12 JUL 1 | 1 - |
|----|---|--|--|---|
| | Step | Check | Yes | E No C |
| 28 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 29. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of coupling connector |
| 29 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-): | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step 30. |
| 30 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 18: (B134) No. 19 — (B134) No. 28: | Is the resistance 1 $M\Omega$ 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. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | | Go to step 32. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |
| 32 | CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | | Go to step 33. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |

| | | N/C | 3 - V4 D | 2 Pm |
|----|---|--|--|---|
| | Step | Check | Yes | CINO C |
| 33 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and allocation is throttle control. | Is the resistance less than 1 Ω ? | Go to step 34. | Repair the open circuit of harness between ECM and electronic throttle control. |
| | electronic throttle control. 3) Measure the resistance between ECM and electronic throttle control connector. Connector & terminal (B137) No. 5 — (E57) No. 2: (B137) No. 4 — (E57) No. 1: | | | |
| 34 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 2 (+) — Engine ground (-): (E57) No. 1 (+) — Engine ground (-): | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and electronic throttle control. | Go to step 35. |
| 35 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 2 — Engine ground: (E57) No. 1 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between the electronic throttle control connector terminals. Connector & terminal (E57) No. 2 — (E57) No. 1: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 38. | Repair the open circuit of the harness between the ECM and engine ground. |
| 38 | CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle control terminals. Terminals No. 1 — No. 2: | Is the resistance 50 Ω or less? | Go to step 39. | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |
| 39 | CHECK ELECTRONIC THROTTLE CONTROL. Move the throttle valve to the fully open and fully closed positions with fingers. Check that the valve returns to the specified position when releasing fingers. | Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position | Repair poor contact of the ECM connector. | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |

ENGINE (DIAGNOSTICS)

DE:DTC P2004 INTAKE MANIFOLD RUNNER CONTROL STUCK OPEN (BANK 1) S_{tudios} DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-218, DTC P2004 INTAKE MANIFOLD RUNNER CON-TROL 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK TUMBLE GENERATOR VALVE RH.1) Remove the tumble generator valve assembly.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 tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-42, Tumble Generator Valve Assembly.></ref.> |

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 CON- TROL STUCK OPEN (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

| | 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK TUMBLE GENERATOR VALVE LH. 1) Remove the tumble generator valve assembly. 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 tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-42, Tumble Generator Valve Assembly.></ref.> |

DG:DTC P2006 INTAKE MANIFOLD RUNNER CONTROL STUCK CLOSED Studios

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-220, DTC P2006 INTAKE MANIFOLD RUNNER CON- TROL 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. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK TUMBLE GENERATOR VALVE RH.1) Remove the tumble generator valve assembly.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 tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-42, Tumble Generator Valve Assembly.></ref.> |

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 CON- TROL STUCK CLOSED (BANK 2), Diagnostic Trouble Code (DTC) Detecting Criteria.>

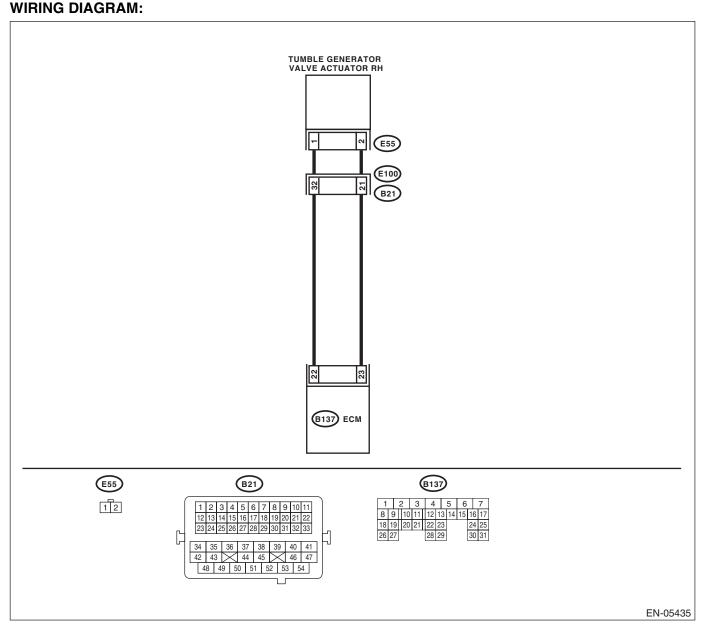
| | Step | Check | Yes | No |
|---|---|---|---|--|
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK TUMBLE GENERATOR VALVE LH.1) Remove the tumble generator valve assembly.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 tum- ble generator valve assembly. <ref. to<br="">FU(H4DOTC)-42, Tumble Generator Valve Assembly.></ref.> |

ENGINE (DIAGNOSTICS)

DI: DTC P2008 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT / OPEN (BANK 1) Studios **DTC DETECTING CONDITION:**

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

CAUTION:



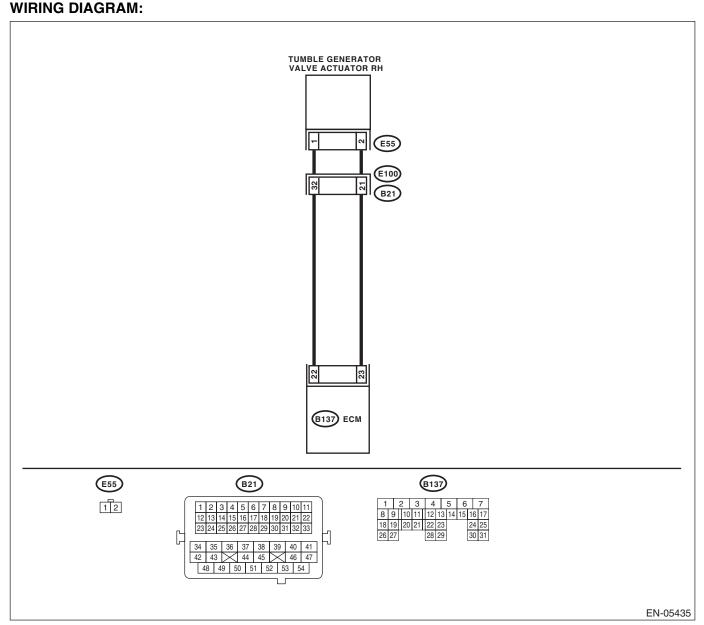
| | | **** | 1 1 10 | |
|---|--|--|---------------------|-------------------------------------|
| | Step | Check | Yes | No Ca |
| 1 | CHECK HARNESS BETWEEN ECM AND | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the harness |
| | TUMBLE GENERATOR VALVE ACTUATOR | | | and connector. |
| | CONNECTOR. | | | NOTE: |
| | Turn the ignition switch to OFF. | | | In this case, repair |
| | Disconnect the connectors from ECM and | | | the following item: |
| | tumble generator valve. | | | Open circuit of |
| | 3) Measure the resistance of harness between | | | harness between |
| | ECM and tumble generator valve position actu- | | | ECM and tumble |
| | ator. | | | generator valve |
| | Connector & terminal | | | actuator connector |
| | (B137) No. 22 — (E55) No. 1: | | | Poor contact of |
| | (B137) No. 23 — (E55) No. 2: | | | coupling connector |
| 2 | CHECK HARNESS BETWEEN ECM AND | Is the resistance 1 $M\Omega$ or | Go to step 3. | Repair short cir- |
| | TUMBLE GENERATOR VALVE ACTUATOR | more? | | cuit of the harness |
| | CONNECTOR. | | | to ground between |
| | Measure the resistance between ECM and | | | ECM and tumble |
| | chassis ground. | | | generator valve |
| | Connector & terminal | | | actuator connec- |
| | (B137) No. 22 — Chassis ground: | | | tor. |
| | (B137) No. 23 — Chassis ground: | | | |
| 3 | CHECK POOR CONTACT. | Is there poor contact in the tum- | Repair the poor | Replace the tum- |
| | Check for poor contact in the tumble generator | ble generator valve actuator | contact of the tum- | ble generator valve |
| | valve actuator connector. | connector? | ble generator valve | |
| | | | actuator connec- | FU(H4DOTC)-43, |
| | | | tor. | Tumble Generator |
| | | | | Valve Actuator.> |

ENGINE (DIAGNOSTICS)

DJ:DTC P2009 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 1) Studios **DTC DETECTING CONDITION:**

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

CAUTION:



| | | | 1 1 1 mg 1 mg 1 | A CONTRACTOR OF THE PARTY OF TH |
|---|--|-----------------------------|------------------|--|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve connector. 3) Measure the voltage between tumble generator valve actuator and chassis ground. Connector & terminal (B137) No. 22 (+) — Chassis ground (-): | Is the voltage 5 V or more? | Repair the short | Replace the tum- ble generator valve actuator. <ref. to<br="">FU(H4DOTC)-43, Tumble Generator Valve Actuator.></ref.> |
| | (B137) No. 22 (+) — Chassis ground (–): (B137) No. 23 (+) — Chassis ground (–): | | | |

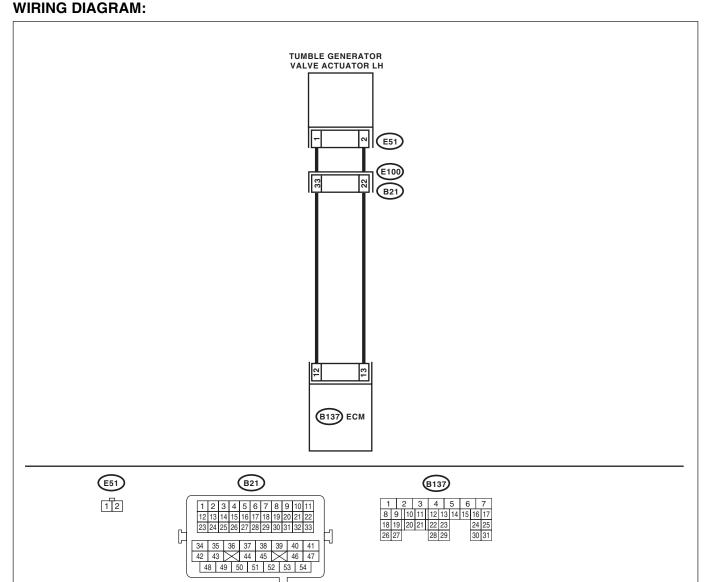
DK:DTC P2011 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT/OPEN Studios

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION < Ref. to GD(H4DOTC)-226, DTC P2011 INTAKE MANIFOLD RUNNER CON-TROL 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.>.



EN-05436

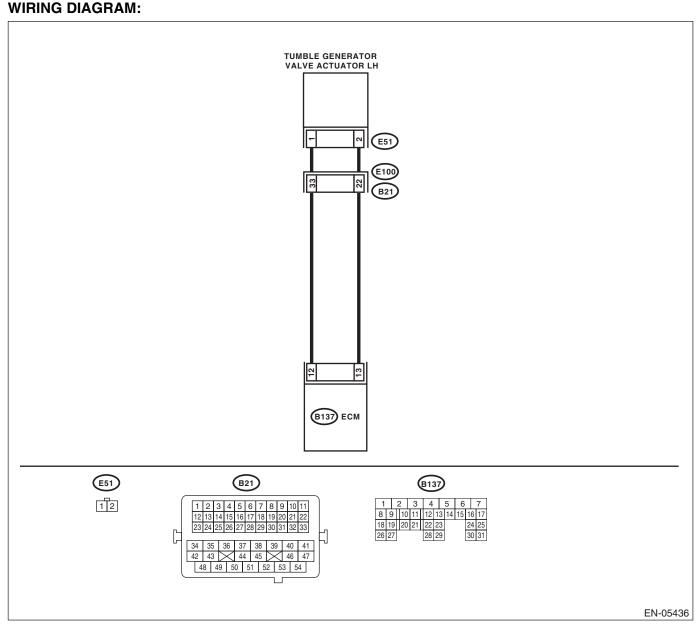
| | | 140 | 7- 40 | 15 |
|---|--|---|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and tumble generator valve. 3) Measure the resistance of harness between ECM and tumble generator valve position actu- | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and tumble |
| | ator. Connector & terminal (B137) No. 12 — (E51) No. 1: (B137) No. 13 — (E51) No. 2: | | | generator valve actuator connector • Poor contact of coupling connector |
| 2 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B137) No. 12 — Chassis ground: (B137) No. 13 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. Check for poor contact in the tumble generator valve actuator connector. | Is there poor contact in the tum- ble generator valve actuator connector? | Repair the poor contact of the tum- ble generator valve actuator connec- tor. | Replace the tum- ble generator valve actuator. <ref. to<br="">FU(H4DOTC)-43, Tumble Generator Valve Actuator.></ref.> |

ENGINE (DIAGNOSTICS)

DL:DTC P2012 INTAKE MANIFOLD RUNNER CONTROL CIRCUIT LOW (BANK 2) Studios **DTC DETECTING CONDITION:**

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

CAUTION:



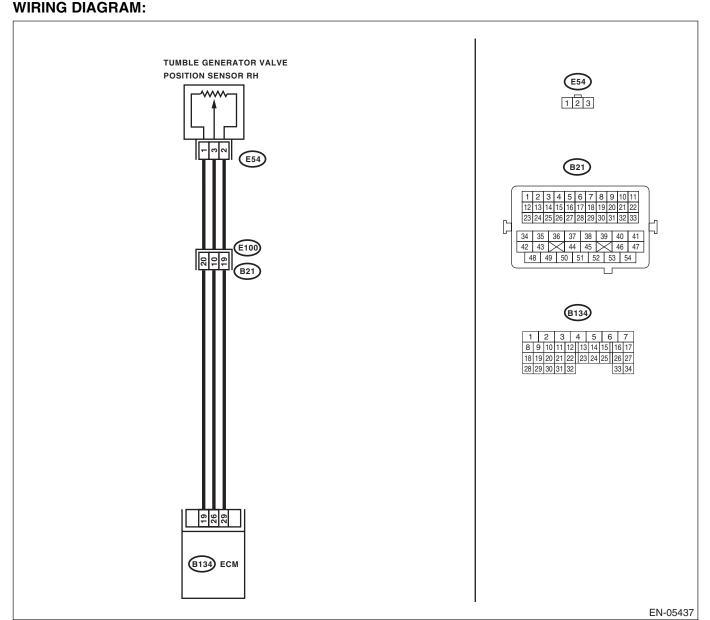
| | | **** | 1 30 10 | / 50 |
|---|---|-----------------------------|---------------------|--------------------------------------|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND | Is the voltage 5 V or more? | Repair the short | Replace the tum- |
| | TUMBLE GENERATOR VALVE ACTUATOR | | circuit to power in | ble generator valve |
| | CONNECTOR. | | the harness | actuator. <ref. th="" to<=""></ref.> |
| | Turn the ignition switch to OFF. | | between ECM and | FU(H4DOTC)-43, |
| | 2) Disconnect the connector from tumble gen- | | tumble generator | Tumble Generator |
| | erator valve connector. | | valve actuator. | Valve Actuator.> |
| | Measure the voltage between tumble gener- | | | |
| | ator valve actuator and chassis ground. | | | |
| | Connector & terminal | | | |
| | (B137) No. 12 (+) — Chassis ground (–): | | | |
| | (B137) No. 13 (+) — Chassis ground (–): | | | |

DM:DTC P2016 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH

DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-230, DTC P2016 INTAKE MANIFOLD RUNNER PO-SITION SENSOR / SWITCH CIRCUIT LOW (BANK 1), Diagnostic Trouble Code (DTC) Detecting Criteria.> TROUBLE SYMPTOM:
- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:



| | 6 - | | TERRE | V Fri. |
|----------|--|--|---|--|
| <u> </u> | Step | Check | Yes | No S |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between tumble generator valve position sensor connector and engine ground. Connector & terminal (E54) No. 1 (+) — Engine ground (-): | Is the voltage 4.5 V or more? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and tumble generator valve position sensor connector Poor contact in ECM connector Poor contact of coupling connector |
| 3 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and tumble generator valve position sensor connector. Connector & terminal (B134) No. 26 — (E54) No. 3: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and tumble generator valve position sensor connector Poor contact of coupling connector |
| 4 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 26 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 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. fu(h4dotc)-44,="" generator="" position="" sensor.="" to="" tumble="" valve=""></ref.> |

DN:DTC P2017 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH (RANK 1)

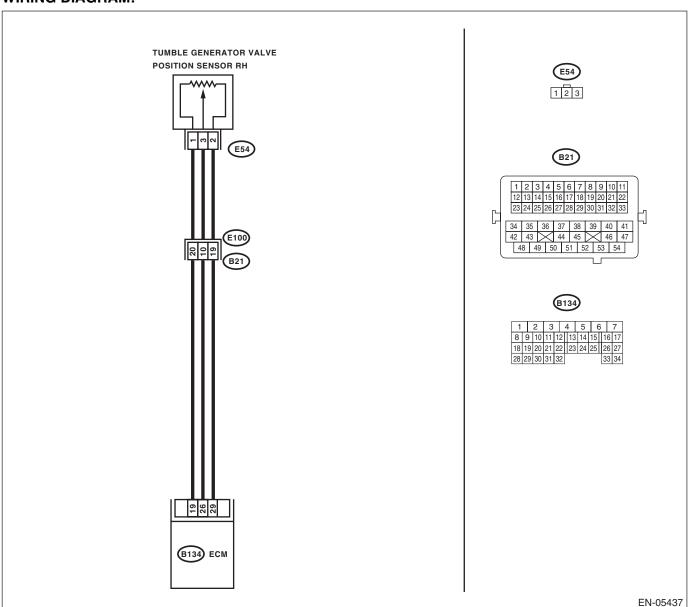
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-232, DTC P2017 INTAKE MANIFOLD RUNNER PO- SITION 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:



| | 0 1 | 740 | TEOL | Frie - |
|---|--|--|--|--|
| | Step | Check | Yes | No |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve position sensor. 3) Start the engine. 4) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | 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. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground. Connector & terminal (E54) No. 2 — Engine ground: | | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact of coupling connector |
| 4 | CHECK POOR CONTACT. Check for poor contact in the tumble generator valve position sensor connector. | Is there poor contact in the tum- ble generator valve position sensor connector? | Repair the poor contact of the tumble generator valve position sensor connector. | Replace the tum- ble generator valve |

DO:DTC P2021 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH

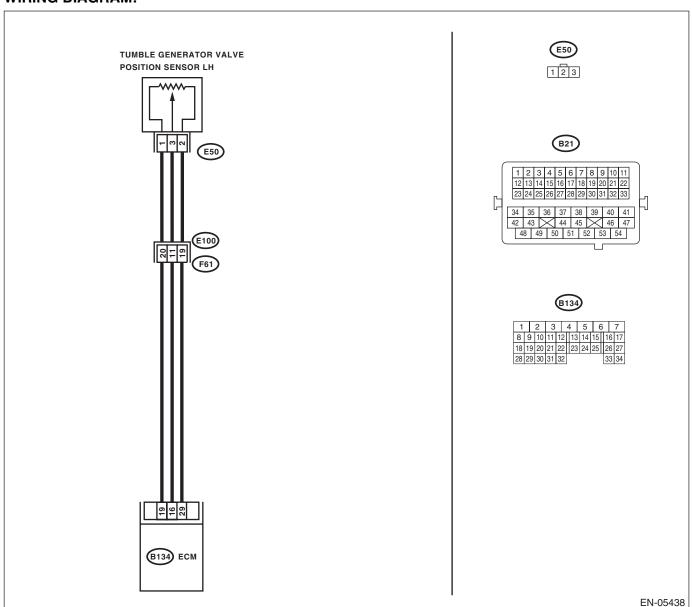
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-234, DTC P2021 INTAKE MANIFOLD RUNNER PO-SITION 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:



| | | 740 | TENT U | V Far: |
|---|--|--|---|--|
| | Step | Check | Yes | No No |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve position sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between tumble generator valve position sensor connector and engine ground. Connector & terminal (E50) No. 1 (+) — Engine ground (-): | | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact of coupling connector |
| 3 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of harness between ECM and tumble generator valve position sensor connector. Connector & terminal (B134) No. 16 — (E50) No. 3: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and tumble generator valve position sensor connector Poor contact of coupling connector |
| 4 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 16 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 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 sen- sor connector. | Replace the tumble generator valve position sensor. <ref. fu(h4dotc)-44,="" generator="" position="" sensor.="" to="" tumble="" valve=""></ref.> |

DP:DTC P2022 INTAKE MANIFOLD RUNNER POSITION SENSOR / SWITCH (RANK 2)

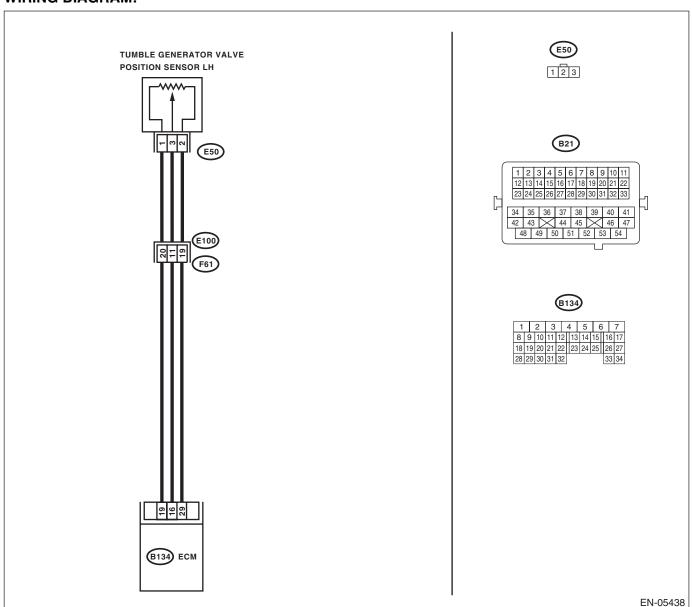
DTC DETECTING CONDITION:

- Immediately at fault recognition
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-236, DTC P2022 INTAKE MANIFOLD RUNNER PO- SITION 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:



| | 0.4 | Objects | TERE | Eria - |
|---|--|--|--|--|
| 4 | Step | Check | Yes | No Figs if the area Was |
| 1 | CHECK CURRENT DATA. 1) Start the engine. 2) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE POSITION SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from tumble generator valve position sensor. 3) Start the engine. 4) Read the data of tumble generator valve position sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | 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. 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between tumble generator valve position sensor connector and engine ground. Connector & terminal (E50) No. 2 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and tumble generator valve position sensor connector • Poor contact in ECM connector • Poor contact of coupling connector |
| 4 | CHECK POOR CONTACT. Check for poor contact in the tumble generator valve position sensor connector. | Is there poor contact in the tum- ble generator valve position sensor connector? | Repair the poor contact of the tumble generator valve position sensor connector. | Replace the tum- ble generator valve |

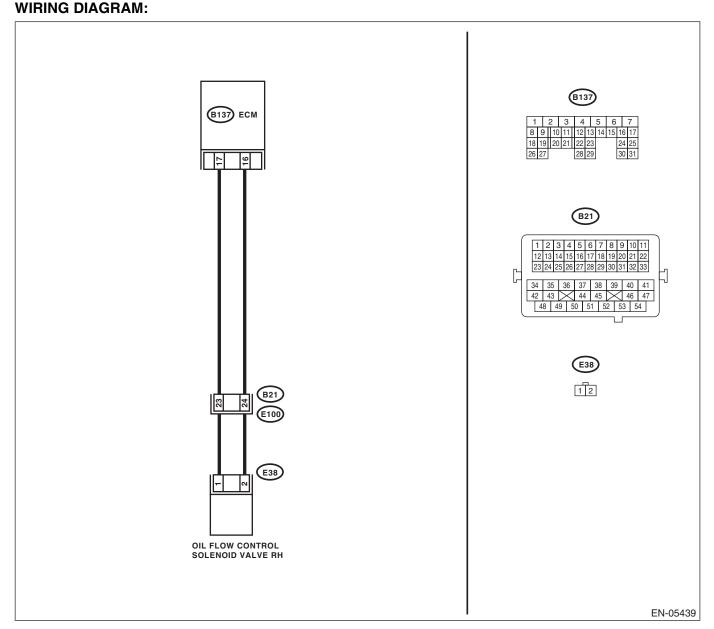
DQ:DTC P2088 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT s Studios LOW (BANK 1)

DTC DETECTING CONDITION:

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

Erroneous idling

CAUTION:



| | | 140 | The GU | 15 |
|---|--|--|----------------------|----------------------|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND OIL | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the harness |
| | FLOW CONTROL SOLENOID VALVE. | | | and connector. |
| | Turn the ignition switch to OFF. | | | NOTE: |
| | Disconnect the connectors from ECM and | | | In this case, repair |
| | oil flow control solenoid valve. | | | the following item: |
| | 3) Measure the resistance of harness between | | | Open circuit of |
| | ECM and oil flow control solenoid valve. | | | the harness be- |
| | Connector & terminal | | | tween the ECM |
| | (B137) No. 17 — (E38) No. 1: | | | and oil flow control |
| | (B137) No. 16 — (E38) No. 2: | | | solenoid valve |
| | | | | connector |
| | | | | Poor contact of |
| | | | | coupling connector |
| 2 | CHECK HARNESS BETWEEN ECM AND OIL | Is the resistance 1 $M\Omega$ or | Go to step 3. | Repair short cir- |
| | FLOW CONTROL SOLENOID VALVE. | more? | | cuit of the harness |
| | Measure the resistance between ECM and | | | to ground between |
| | chassis ground. | | | ECM and oil flow |
| | Connector & terminal | | | control solenoid |
| | (B137) No. 17 — Chassis ground: | | | valve connector. |
| | (B137) No. 16 — Chassis ground: | | | |
| 3 | CHECK OIL FLOW CONTROL SOLENOID | Is the resistance between 6 — | Repair the poor | Replace the oil |
| | VALVE. | 12 Ω? | contact of the ECM | |
| | Measure the resistance between oil flow control | | and oil flow control | |
| | solenoid valve terminals. | | solenoid valve con- | |
| | Terminals | | nector. | Oil Flow Control |
| | No. 1 — No. 2: | | | Solenoid Valve.> |

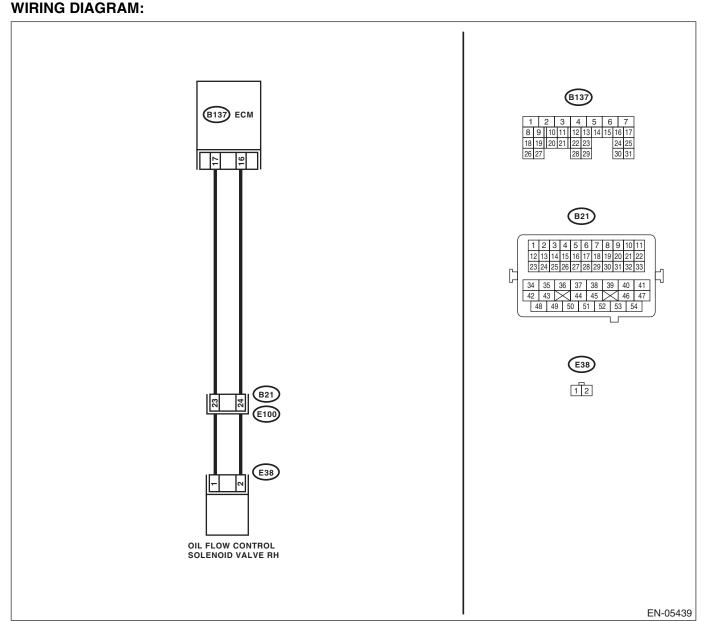
DR:DTC P2089 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT s Studios HIGH (BANK 1)

DTC DETECTING CONDITION:

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

Erroneous idling

CAUTION:



| | | | 160. | F-1 (m) |
|------------------------|------------------------------|--|----------------------|--|
| Step | 1 | Check | Yes | No |
| 1 CHECK HARNESS | BETWEEN ECM AND OIL | Is the voltage less than 1 V? | Go to step 2. | Repair the short |
| FLOW CONTROL S | OLENOID VALVE. | | | circuit to power in |
| 1) Turn the ignition : | switch to OFF. | | | the harness |
| 2) Disconnect the c | onnectors from ECM and | | | between the ECM |
| oil flow control solen | oid valve. | | | and oil flow control |
| 3) Measure the volt | age between ECM and | | | solenoid valve con- |
| chassis ground. | | | | nector. |
| Connector & term | ninal | | | |
| (B137) No. 17 (+) |) — Chassis ground (–): | | | |
| (B137) No. 16 (+) |) — Chassis ground (–): | | | |
| 2 CHECK HARNESS | BETWEEN ECM AND OIL | Is the resistance less than 1 Ω ? | Go to step 3. | Repair the harness |
| FLOW CONTROL S | OLENOID VALVE. | | - | and connector. |
| Measure the resistar | nce of harness between | | | NOTE: |
| ECM and oil flow con | trol solenoid valve connec- | | | In this case, repair |
| tor. | | | | the following item: |
| Connector & term | ninal | | | Open circuit of |
| (B137) No. 17 — | (E38) No. 1: | | | the harness be- |
| (B137) No. 16 — | (E38) No. 2: | | | tween the ECM |
| | | | | and oil flow control |
| | | | | solenoid valve |
| | | | | connector |
| | | | | Poor contact of |
| | | | | coupling connector |
| 3 CHECK OIL FLOW | CONTROL SOLENOID | Is the resistance between 6 — | Repair the poor | Replace the oil |
| VALVE. | | 12 Ω? | | flow control sole- |
| Measure the resistar | nce between oil flow control | | and oil flow control | noid valve. <ref. th="" to<=""></ref.> |
| solenoid valve termir | nals. | | solenoid valve con- | FU(H4DOTC)-33, |
| Terminals | | | nector. | Oil Flow Control |
| No. 1 — No. 2: | | | | Solenoid Valve.> |

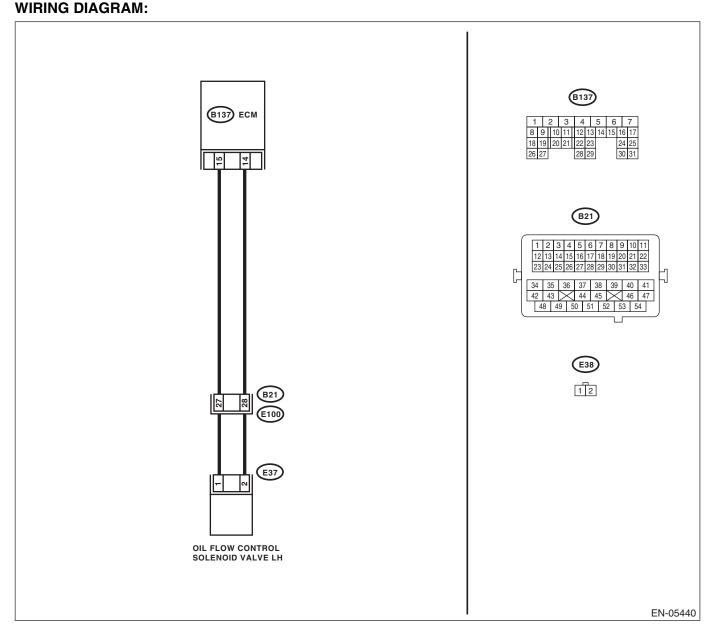
DS:DTC P2092 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT s Studios LOW (BANK 2)

DTC DETECTING CONDITION:

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

Erroneous idling

CAUTION:



| | | 140 | The GU | 15 |
|---|--|--|----------------------|----------------------|
| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND OIL | Is the resistance less than 1 Ω ? | Go to step 2. | Repair the harness |
| | FLOW CONTROL SOLENOID VALVE. | | | and connector. |
| | Turn the ignition switch to OFF. | | | NOTE: |
| | Disconnect the connectors from ECM and | | | In this case, repair |
| | oil flow control solenoid valve. | | | the following item: |
| | 3) Measure the resistance of harness between | | | Open circuit of |
| | ECM and oil flow control solenoid valve. | | | the harness be- |
| | Connector & terminal | | | tween the ECM |
| | (B137) No. 15 — (E37) No. 1: | | | and oil flow control |
| | (B137) No. 14 — (E37) No. 2: | | | solenoid valve |
| | | | | connector |
| | | | | Poor contact of |
| | | | | coupling connector |
| 2 | CHECK HARNESS BETWEEN ECM AND OIL | Is the resistance 1 $M\Omega$ or | Go to step 3. | Repair short cir- |
| | FLOW CONTROL SOLENOID VALVE. | more? | | cuit of the harness |
| | Measure the resistance between ECM and | | | to ground between |
| | chassis ground. | | | ECM and oil flow |
| | Connector & terminal | | | control solenoid |
| | (B137) No. 15 — Chassis ground: | | | valve connector. |
| | (B137) No. 14 — Chassis ground: | | | |
| 3 | CHECK OIL FLOW CONTROL SOLENOID | Is the resistance between 6 — | Repair the poor | Replace the oil |
| | VALVE. | 12 Ω? | contact of the ECM | flow control sole- |
| | Measure the resistance between oil flow control | | and oil flow control | |
| | solenoid valve terminals. | | solenoid valve con- | |
| | Terminals | | nector. | Oil Flow Control |
| | No. 1 — No. 2: | | | Solenoid Valve.> |

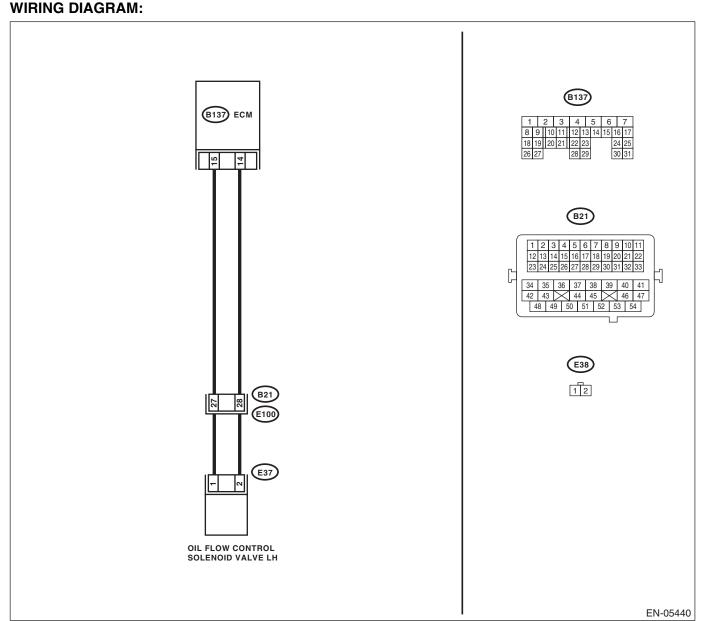
DT:DTC P2093 INTAKE CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT s Studios HIGH (BANK 2)

DTC DETECTING CONDITION:

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

Erroneous idling

CAUTION:



ENGINE (DIAGNOSTICS)

| | | - 11 | 1 5 | V 6- | 1 |
|---|---|--|---|--|-------------------|
| Step | | Check | Yes | No | 0222-2 |
| FLOW CONTROL SOL 1) Turn the ignition swi 2) Disconnect the conr oil flow control solenoid 3) Measure the voltage chassis ground. Connector & termina (B137) No. 15 (+) | tch to OFF. nectors from ECM and valve. be between ECM and | 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 con- nector. | ^{Id} ios |
| | TWEEN ECM AND OIL .ENOID VALVE. of harness between I solenoid valve connec- | Is the resistance less than 1 Ω ? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of the harness between the ECM and oil flow control solenoid valve connector Poor contact of coupling connector | |
| 3 CHECK OIL FLOW CO VALVE. Measure the resistance solenoid valve terminals Terminals No. 1 — No. 2: | between oil flow control | 12 Ω? | Repair the poor contact of the ECM and oil flow control solenoid valve connector. | noid valve. <ref. th="" to<=""><th></th></ref.> | |

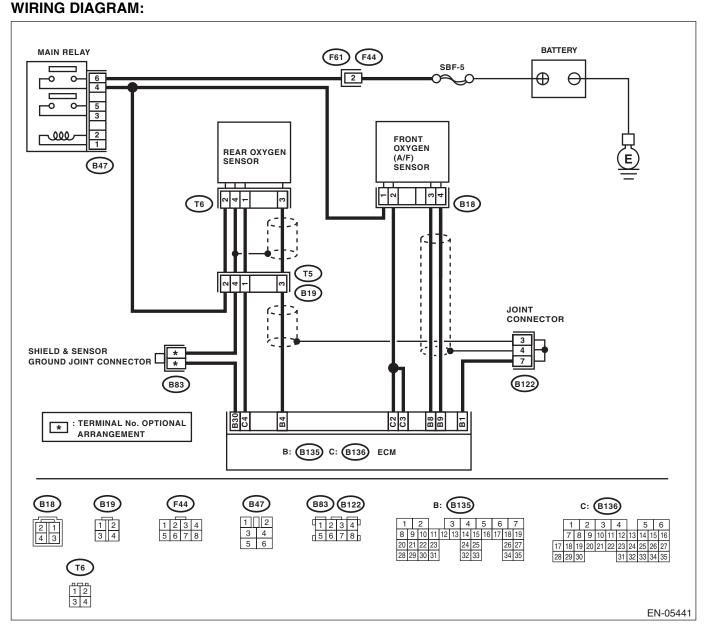
DU:DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

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

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

CAUTION:



| | | -/VC | 7-40 | / P |
|---|--|--|---|---|
| | Step | Check | Yes | No C |
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check DTC using "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR. | Has water entered the connector? | Completely remove any water inside. | Go to step 3. |
| 3 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM and front oxygen (A/F) sensor. 3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector. Connector & terminal (B135) No. 9 — (B18) No. 4: (B135) No. 8 — (B18) No. 3: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between ECM and front oxygen (A/F) sensor connector Poor contact in front oxygen (A/F) sensor connector Poor contact in ECM connector Poor contact in ECM connector Poor contact of coupling connector |
| 4 | CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 9 — Chassis ground: (B135) No. 8 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. Connector & terminal (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. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. Connector & terminal (B18) No. 3 (+) — Chassis ground (-): | Is the voltage 4.95 V or more? | Go to step 7. | Go to step 8. |

| | | NO | 7 7 4 6 | 4.5 |
|----|---|---|---|---|
| | Step | Check | Yes | C No |
| 7 | CHECK OUTPUT SIGNAL FOR ECM. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground. | Is the voltage 8 V or more? | Repair the short circuit to power in the harness | Repair poor contact of the ECM connector. |
| | Connector & terminal (B18) No. 4 (+) — Chassis ground (–): (B18) No. 3 (+) — Chassis ground (–): | | between the ECM and front oxygen (A/F) sensor con- nector. After repair, replace the ECM. <ref. to<br="">FU(H4DOTC)-50,</ref.> | |
| | | | Engine Control Module (ECM).> | |
| 8 | CHECK EXHAUST SYSTEM. | Are there holes or loose bolts on exhaust system? | Repair the exhaust system. | · |
| 9 | CHECK AIR INTAKE SYSTEM. | Are there holes, loose bolts or disconnection of hose on air intake system? | Repair the air intake system. | Go to step 10. |
| 10 | CHECK FUEL PRESSURE. WARNING: Place "NO OPEN FLAMES" signs near the working area. CAUTION: Be careful not to spill fuel. 1) Connect the front oxygen (A/F) sensor connector. 2) Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold. <ref. fuel="" inspection,="" me(h4dotc)-31,="" pressure.="" to=""> CAUTION: Release fuel pressure before removing the fuel pressure gauge. NOTE: If fuel pressure does not increase, squeeze the fuel return hose 2 or 3 times, then measure fuel pressure again.</ref.> | | Go to step 11. | Repair the following item. Fuel pressure is too high: Clogged fuel return line or bent hose Fuel pressure is too low: Improper fuel pump discharge Clogged fuel supply line |
| 11 | CHECK FUEL PRESSURE. After connecting the pressure regulator vacuum hose, measure fuel pressure. <ref. fuel="" inspection,="" me(h4dotc)-31,="" pressure.="" to=""> CAUTION: Release fuel pressure before removing the fuel pressure gauge. NOTE: If fuel pressure does not increase, squeeze fuel return hose 2 or 3 times, then measure fuel pressure again. If the measured value at this step is out of specification, check or replace pressure regulator and pressure regulator vacuum hose.</ref.> | 33 — 38 psi)? | Go to step 12. | Repair the following item. Fuel pressure is too high: Faulty pressure regulator Clogged fuel return line or bent hose Fuel pressure is too low: Faulty pressure regulator Improper fuel pump discharge Clogged fuel supply line |

| | Step | Check | Yes | ETNo C. |
|----|--|------------------------------|----------------|--|
| 12 | CHECK ENGINE COOLANT TEMPERATURE SENSOR. 1) Start the engine and warm-up completely. 2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | ture 75°C (167°F) or higher? | Go to step 13. | Replace the engine coolant temperature sensor. <ref. coolant="" engine="" fu(h4dotc)-30,="" sensor.="" temperature="" to=""></ref.> |
| 13 | CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 14. | Replace the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-35,="" intake="" mass="" sensor.="" temperature="" to=""></ref.> |
| 14 | CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR. 1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) For AT models, set the select lever to the "P" or "N" range, and for MT models, place the shift lever in the neutral position. 3) Turn the A/C switch to OFF. 4) Turn all the accessory switches to OFF. 5) Open the front hood. 6) Measure the ambient temperature. 7) Read the data of mass air flow and intake air temperature sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Go to step 15. | Check the mass air flow and intake air temperature sensor. <ref. air="" and="" flow="" fu(h4dotc)-35,="" intake="" mass="" sensor.="" temperature="" to=""></ref.> |

| | | NO | In Journ | |
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| | Step | Check | Yes | C No |
| 15 | CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum) 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Depress the clutch pedal for MT models. • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | Is the voltage 490 mV or more? | Go to step 16. | Go to step 17. |
| 16 | CHECK REAR OXYGEN SENSOR DATA. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Depress the clutch pedal for MT models. • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | 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. 1) Warm-up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | Replace the front oxygen (A/F) sen- sor. <ref. to<br="">FU(H4DOTC)-46, Front Oxygen (A/F) Sensor.></ref.> | Go to step 19. |

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| | Step | Check | Yes | C/No C |
| 19 | CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance of harness between ECM and rear oxygen sensor connector. Connector & terminal (B135) No. 4 — (T6) No. 3: (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. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between rear oxygen sensor connector and chassis ground. Connector & terminal (T6) No. 3 (+) — Chassis ground (-): | Is the voltage 0.2 — 0.5 V? | Replace the rear oxygen sensor. <ref. to<br="">FU(H4DOTC)-48, Rear Oxygen Sen- sor.></ref.> | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the ECM and rear oxygen sensor Poor contact in ECM connector Poor contact of coupling connector |

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

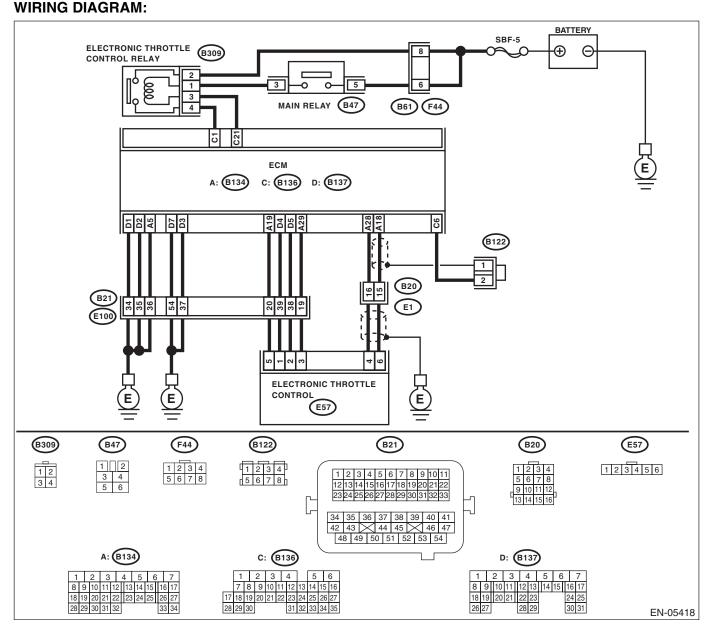
DTC DETECTING CONDITION:

- 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:



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|---|--|--|--|---|
| | Step | Check | Yes | No C |
| 1 | CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals. Terminals | Is the resistance less than 1 Ω ? | Go to step 2. | Replace the electronic throttle control relay. <ref. control="" electronic="" fu(h4dotc)-53,="" relay.="" throttle="" to=""></ref.> |
| | No. 2 — No. 4: | | | |
| 2 | CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY. Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (B309) No. 2 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Go to step 3. | Repair the open or ground short circuit of power supply circuit. |
| 3 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. 1) Disconnect the connectors from the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (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 RE-LAY. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground. Connector & terminal (B309) No. 3 — Chassis ground: (B309) No. 4 — Chassis ground: | Is the resistance 1 $M\Omega$ 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 RE-LAY. Measure the resistance between the ECM and electronic throttle control relay connector. Connector & terminal (B136) No. 21 — (B309) No. 3: (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from electronic throttle control. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6: (B134) No. 28 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 7. | Repair short circuit of the harness to ground between ECM and electronic throttle control connector. |

| | | NO | 7 2 4 6 | 1 |
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| | Step | Check | Yes | No |
| 7 | CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 8. | Repair short cir- cuit of the harness to ground between ECM and elec- tronic throttle con- trol connector. Replace the ECM if |
| | (===, ================================= | | | defective. <ref. to<br="">FU(H4DOTC)-50, Engine Control Module (ECM).></ref.> |
| 8 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Disconnect the connectors from the ECM. 2) Measure the resistance of harness between ECM and electronic throttle control connector. Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3: | Is the resistance less than 1 Ω ? | · | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 9 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the connector to ECM. 2) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 3 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 10. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector Poor contact of coupling connector |
| 10 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (-) — Engine ground (-): | Is the voltage 4.85 V or more? | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step 11. |
| 11 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B134) No. 19 — (B134) No. 18: (B134) No. 19 — (B134) No. 28: | Is the resistance 1 $M\Omega$ 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. 1) Connect all connectors. 2) Turn the ignition switch to ON. 3) Read the data of main throttle sensor signal using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | 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. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |

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| | Step | Check | Yes | No |
| 13 | CHECK SENSOR OUTPUT. Read the data of sub throttle sensor signal using Subaru Select Monitor. NOTE: Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | | Go to step 14. | Repair poor contact of the electronic throttle control connector. Replace the electronic throttle control if defective. <ref. fu(h4dotc)-16,<="" th="" to=""></ref.> |
| | 101.7 | | | Throttle Body.> |
| 14 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and electronic throttle control. 3) Measure the resistance between ECM and electronic throttle control connector. Connector & terminal (B137) No. 5 — (E57) No. 2: (B137) No. 4 — (E57) No. 1: | Is the resistance less than 1 Ω ? | Go to step 15. | Repair the open circuit of harness between ECM and electronic throttle control. |
| 15 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 2 (+) — Engine ground (-): (E57) No. 1 (+) — Engine ground (-): | Is the voltage 5 V or more? | Repair the short circuit to power in the harness between the ECM and electronic throttle control. | Go to step 16. |
| 16 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between electronic throttle control connector and engine ground. Connector & terminal (E57) No. 2 — Engine ground: (E57) No. 1 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between the electronic throttle control connector terminals. Connector & terminal (E57) No. 1 — (E57) No. 2: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 5 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 3 — Chassis ground: (B137) No. 7 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 19. | Repair the open circuit of the harness between the ECM and engine ground. |

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| | Step | Check | Yes | ETNo C |
| 19 | CHECK ELECTRONIC THROTTLE CONTROL. Measure the resistance between electronic throttle control terminals. Terminals No. 1 — No. 2: | Is the resistance 50 Ω or less? | Go to step 20. | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |
| 20 | CHECK ELECTRONIC THROTTLE CONTROL. Move the throttle valve to the fully open and fully closed positions with fingers. Check that the valve returns to the specified position when releasing fingers. | Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position | Repair poor contact of the ECM connector. | Replace the electronic throttle control. <ref. body.="" fu(h4dotc)-16,="" throttle="" to=""></ref.> |

DX:DTC P2102 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT LOW

DTC DETECTING CONDITION:

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

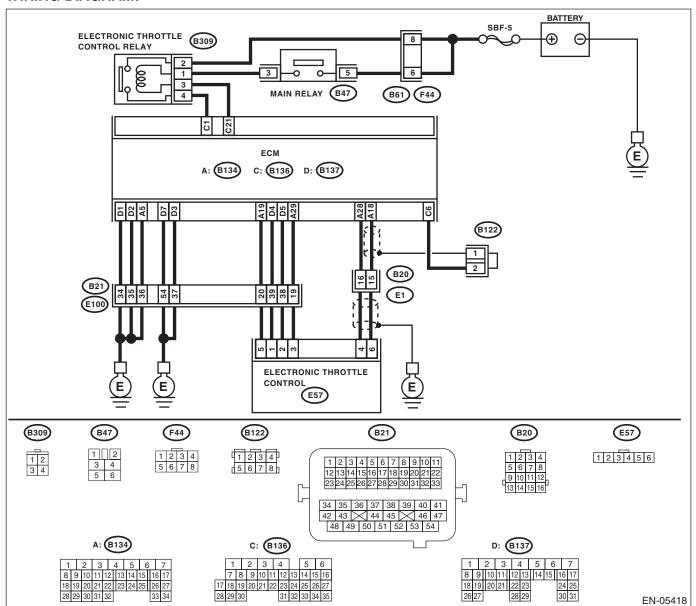
TROUBLE SYMPTOM:

- 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:



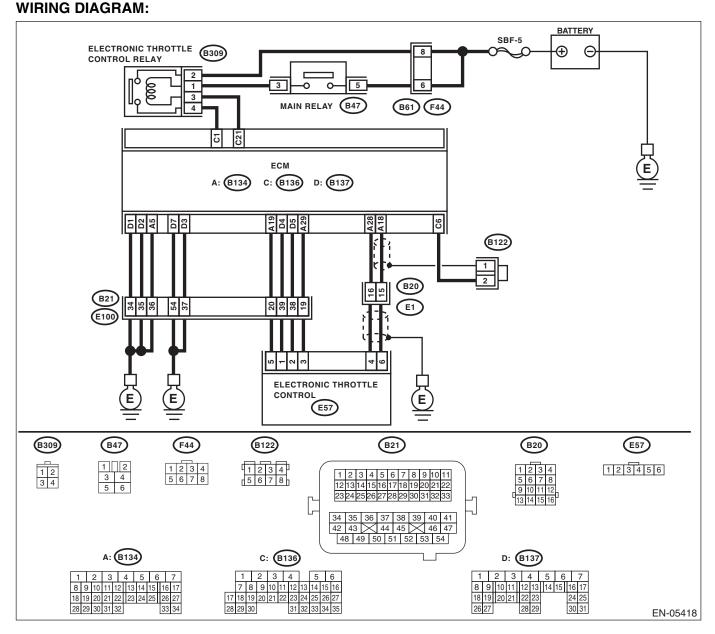
| | | 111 | F - 13 | / 6=- |
|---|---|--|--|---|
| | Step | Check | Yes | No C |
| 1 | CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Connect the battery to terminals No. 1 and No. 3 of electronic throttle control relay. 4) Measure the resistance between electronic throttle control relay terminals. Terminals No. 2 — No. 4: | Is the resistance less than 1 Ω ? | | Replace the electronic throttle control relay. <ref. control="" electronic="" fu(h4dotc)-53,="" relay.="" throttle="" to=""></ref.> |
| 2 | CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY. Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (B309) No. 2 (+) — Chassis ground (-): | Is the voltage 10 V or more? | Go to step 3. | Repair the open or ground short circuit of power supply circuit. |
| 3 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RE-LAY. 1) Disconnect the connectors from the ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Measure the resistance between electronic throttle control relay connector and chassis ground. Connector & terminal (B309) No. 3 — Chassis ground: (B309) No. 4 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 5. | Repair short circuit of the harness to ground between ECM and electronic throttle control relay. |
| 5 | CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY. Measure the resistance between the ECM and electronic throttle control relay connector. Connector & terminal (B136) No. 21 — (B309) No. 3: (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
- Studios • GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-254, DTC P2103 THROTTLE ACTUATOR CONTROL MOTOR CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:



ENGINE (DIAGNOSTICS)

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| | Step | Check | Yes | No | 00000- |
| 1 | CHECK ELECTRONIC THROTTLE CONTROL RELAY. 1) Turn the ignition switch to OFF. 2) Remove the electronic throttle control relay. 3) Measure the resistance between electronic throttle control relay terminals. Terminals No. 2 — No. 4: | Is the resistance 1 $M\Omega$ or more? | Go to step 2. | Replace the electronic throttle control relay. <ref. control="" electronic="" fu(h4dotc)-53,="" relay.="" throttle="" to=""></ref.> | ^{Id} ios |
| 2 | CHECK SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY POWER SUPPLY. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control relay connector and chassis ground. Connector & terminal (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 RE-LAY. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B136) No. 21 — Chassis ground: | Is the resistance 1 M Ω 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 THROT-TLE ACTUATOR CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

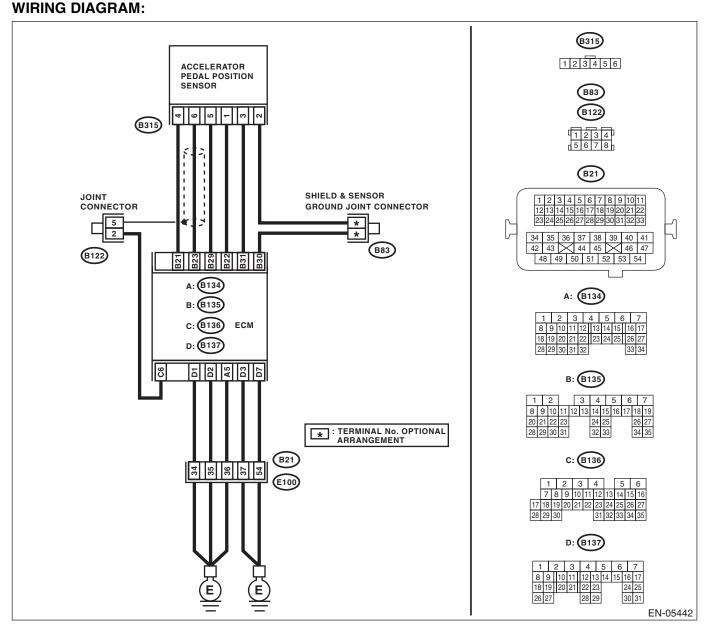
"D" CIRCUIT EA:DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH Studios **LOW INPUT**

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



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| | Step | Check | Yes | - No C |
| 1 | CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 21 — Chassis ground: (B135) No. 23 — Chassis ground: (B135) No. 23 — (B136) No. 6: | Is the resistance 1 $M\Omega$ or more? | Go to step 2. | Repair short cir- cuit of the harness to ground between the ECM and accelerator pedal position sensor connector. |
| 2 | CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the connector to ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 6 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the accelerator pedal. <ref. accelerator="" pedal.="" sp(h4so)-3,="" to=""></ref.> | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <ref. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> |

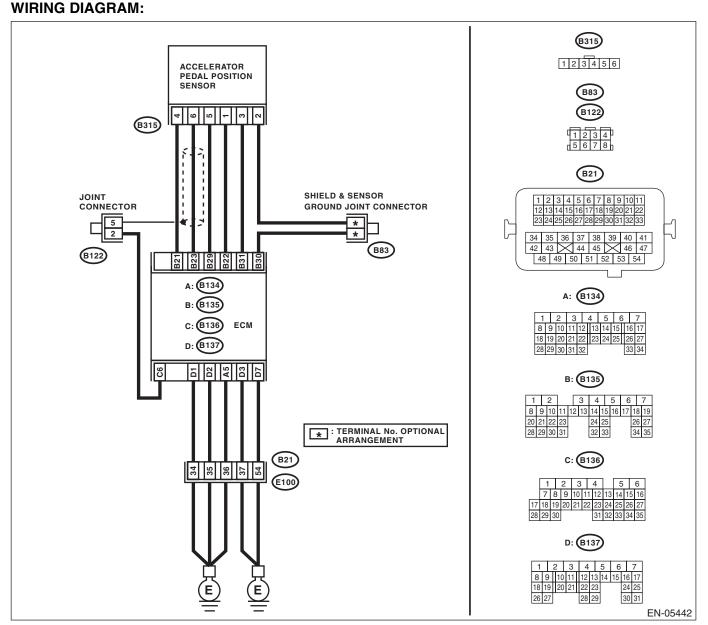
"D" CIRCUIT EB:DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH Studios **HIGH INPUT**

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



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|---|---|--|---|--|
| | Step | Check | Yes | No No |
| 1 | CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance of harness between ECM and accelerator pedal position sensor connector. Connector & terminal (B135) No. 23 — (B315) No. 6: (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. 1) Connect the connector to ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 5 — Chassis ground: | Is the resistance less than 5 Ω ? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector |
| 3 | CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B135) No. 21 — (B135) No. 23: | Is the resistance 1 $M\Omega$ or more? | Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. <ref. accelerator="" pedal.="" sp(h4so)-3,="" to=""></ref.> | Repair the short circuit to power source in the harness between the ECM and accelerator pedal position sensor connector. |

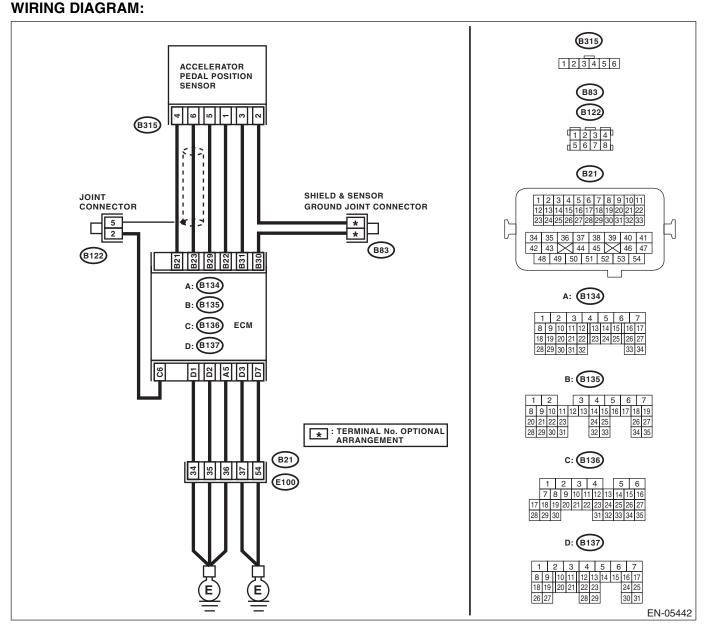
"E" CIRCUIT EC:DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH Studios **LOW INPUT**

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



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| | Step | Check | Yes | No C |
| 1 | CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance between ECM and chassis ground. Connector & terminal (B135) No. 22 — Chassis ground: (B135) No. 31 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Go to step 2. | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. |
| 2 | CHECK SHORT CIRCUIT INSIDE THE ECM. 1) Connect the connector to ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 3 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the accelerator pedal. <ref. accelerator="" pedal.="" sp(h4so)-3,="" to=""></ref.> | Repair short circuit of the harness to ground between the ECM and accelerator pedal position sensor connector. Replace the ECM if defective. <ref. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> |

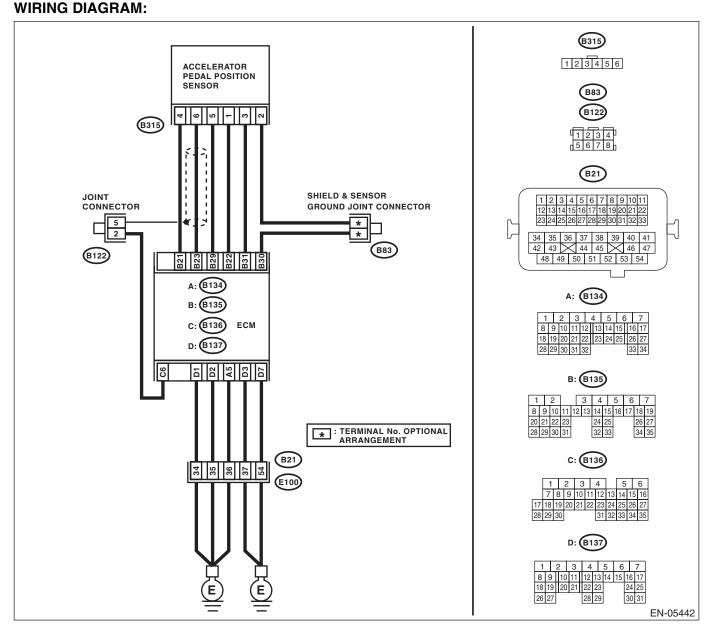
"E" CIRCUIT ED:DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH Studios **HIGH INPUT**

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



| | | /VC | Thu | / b |
|---|---|--|---|--|
| | Step | Check | Yes | L No St |
| 1 | CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the ECM and accelerator pedal position sensor. 3) Measure the resistance of harness between ECM and accelerator pedal position sensor connector. Connector & terminal (B135) No. 31 — (B315) No. 3: (B135) No. 30 — (B315) No. 2: | 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. 1) Connect the connector to ECM. 2) Measure the resistance between accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 2 — Chassis ground: | Is the resistance less than 1 Ω ? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between ECM and engine ground • Poor contact in ECM connector • Poor contact of joint connector |
| 3 | CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 3 — Chassis ground (-): | | 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance between ECM connectors. Connector & terminal (B135) No. 22 — (B135) No. 31: | Is the resistance 1 $M\Omega$ or more? | Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. <ref. accelerator="" pedal.="" sp(h4so)-3,="" to=""></ref.> | Repair the short circuit to power source in the harness between the ECM and accelerator pedal position sensor connector. |

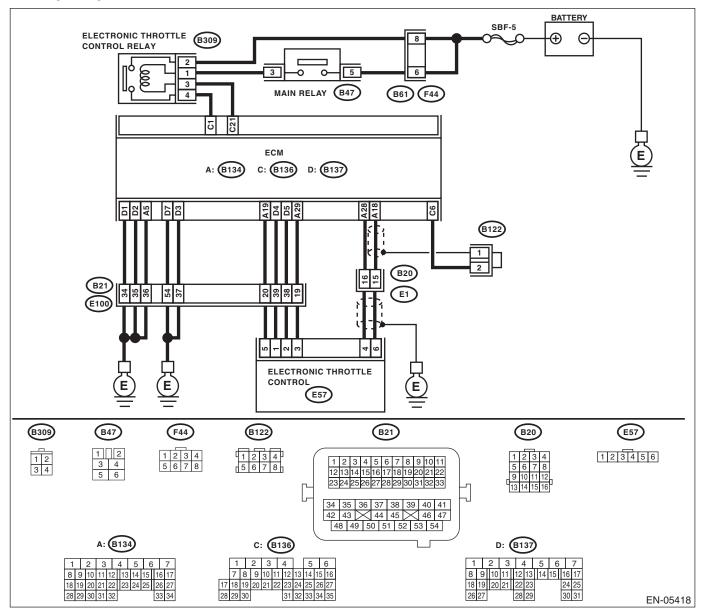
EE:DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH S_{tudios} AGE CORRELATION

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

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:



| | /\(C |) アニーリ り | V.F. |
|---|-------|---|--|
| Step | Check | Yes | No C |
| 1 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM ar electronic throttle control. 3) Measure the resistance between ECM a chassis ground. Connector & terminal (B134) No. 19 — Chassis ground: (B134) No. 18 — Chassis ground: (B134) No. 18 — (B136) No. 6: (B134) No. 28 — Chassis ground: | | 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 EC 1) Connect the connector to ECM. 2) Measure the resistance between electro throttle control connector and engine ground Connector & terminal (E57) No. 6 — Engine ground: (E57) No. 4 — Engine ground: | 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. (ecm).="" control="" engine="" fu(h4dotc)-50,="" module="" to=""></ref.> |
| 3 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Disconnect the connectors from the ECI 2) Measure the resistance of harness betwee ECM and electronic throttle control connector Connector & terminal (B134) No. 18 — (E57) No. 6: (B134) No. 28 — (E57) No. 4: (B134) No. 29 — (E57) No. 3: | een | Go to step 4. | Repair the open circuit of harness between ECM and electronic throttle control connector. |
| 4 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Connect the connector to ECM. 2) Measure the resistance between electro throttle control connector and engine ground Connector & terminal (E57) No. 3 — Engine ground: | | Go to step 5. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and engine ground Poor contact in ECM connector Poor contact of coupling connector |
| 5 CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL. 1) Turn the ignition switch to ON. 2) Measure the voltage between electronic throttle control connector and engine ground Connector & terminal (E57) No. 6 (+) — Engine ground (-): (E57) No. 4 (+) — Engine ground (-): | | Repair the short circuit to power in the harness between ECM and electronic throttle control connector. | Go to step 6. |

| | | 191 | 75 4 7 11 | St. Steel |
|---|---|----------------------------------|-------------------------------------|---------------------|
| | Step | Check | Yes | No |
| 6 | CHECK HARNESS BETWEEN ECM AND | Is the resistance 1 $M\Omega$ or | Repair poor con- | Repair the short |
| | ELECTRONIC THROTTLE CONTROL. | more? | tact of the elec- | circuit to power in |
| | Turn the ignition switch to OFF. | | tronic throttle | the harness |
| | Disconnect the connectors from the ECM. | | control connector. | between ECM and |
| | 3) Measure the resistance between ECM con- | | Replace the elec- | electronic throttle |
| | nectors. | | tronic throttle con- | control connector. |
| | Connector & terminal | | trol if defective. | |
| | (B134) No. 19 — (B134) No. 18: | | <ref. th="" to<=""><th></th></ref.> | |
| | (B134) No. 19 — (B134) No. 28: | | FU(H4DOTC)-16, | |
| | | | Throttle Body.> | |

EF:DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH Studios AGE 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.>

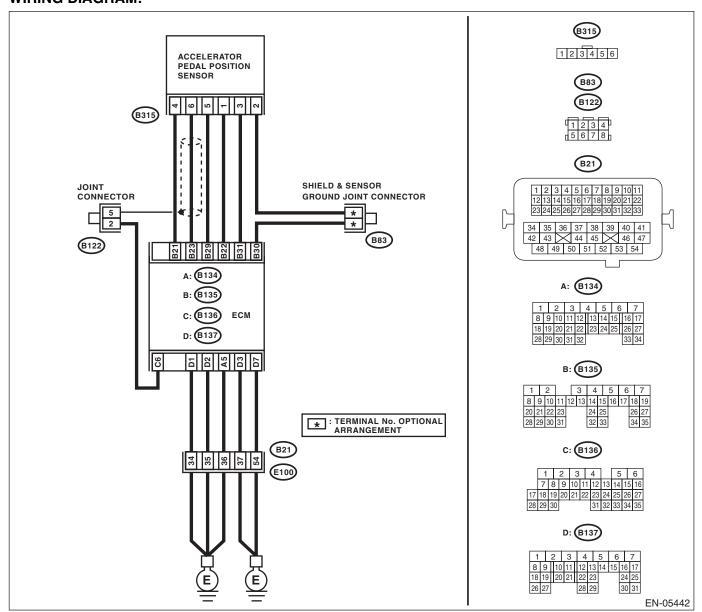
CAUTION:

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:



| | 140 | IT - U | V. E |
|--|--|--|--|
| Step | Check | Yes | No C |
| 1 CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal Main accelerator pedal position sensor signal (B135) No. 23 (+) — Chassis ground (-Sub accelerator pedal position sensor signal (B135) No. 31 (+) — Chassis ground (- | 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. Measure the voltage between accelerator ped position sensor connector and chassis ground Connector & terminal (B315) No. 6 (+) — Chassis ground (-): (B315) No. 3 (+) — Chassis ground (-): | Is the difference in measured values for the main accelerator pedal position sensor signal | Replace the accelerator pedal. <ref. accelerator="" pedal.="" sp(h4so)-3,="" to=""></ref.> | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the ECM and accelerator pedal position sensor connector. Short circuit of the harness to ground between the ECM and accelerator pedal position sensor connectors |
| 3 CHECK HARNESS BETWEEN ECM AND A CELERATOR PEDAL POSITION SENSOR CONNECTOR. Check the resistance of harness between the accelerator pedal position sensor connector and chassis ground. Connector & terminal (B315) No. 5 — Chassis ground: (B315) No. 2 — Chassis ground: | | Repair poor contact of the ECM connector. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the ECM and accelerator pedal position sensor connector. Open circuit of harness between ECM and engine ground Poor contact of coupling connector |

EG:DTC P2419 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CON-Studios TROL CIRCUIT LOW

DTC DETECTING CONDITION:

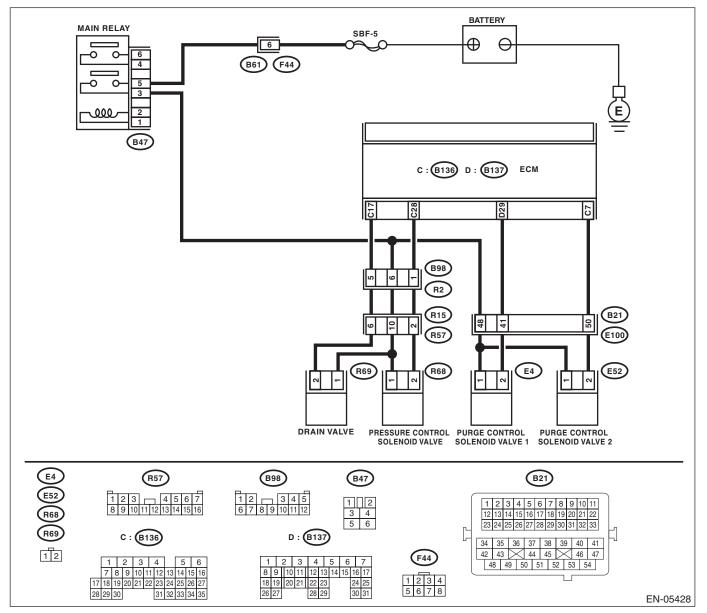
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-270, DTC P2419 EVAPORATIVE EMISSION SYS- TEM SWITCHING VALVE CONTROL CIRCUIT LOW, Diagnostic Trouble Code (DTC) Detecting Criteria.> TROUBLE SYMPTOM:

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:



| | | 140 | T - 4 U | V 5 |
|---|--|---|---|--|
| | Step | Check | Yes | No |
| 1 | CHECK OUTPUT SIGNAL OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. Connector & terminal (B136) No. 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. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and purge control solenoid valve 2. 3) Measure the resistance between the purge control solenoid valve 2 connector and engine ground. Connector & terminal (E52) No. 2 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance of harness between ECM and purge control solenoid valve 2. Connector & terminal (B136) No. 7 — (E52) No. 2: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between ECM and purge control solenoid valve 2 connector Poor contact of coupling connector |
| 4 | CHECK PURGE CONTROL SOLENOID VALVE 2. 1) Remove the purge control solenoid valve 2. 2) Measure the resistance between purge control solenoid valve 2 terminals. Terminals No. 1 — No. 2: | Is the resistance between 10 — 100 Ω ? | Go to step 5 . | Replace the purge control solenoid valve 2. <ref. to<br="">EC(H4DOTC)-8, Purge Control Solenoid Valve.></ref.> |
| 5 | CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE 2. 1) Turn the ignition switch to ON. 2) Measure the voltage between purge control solenoid valve 2 and engine ground. Connector & terminal (E52) No. 1 (+) — Engine ground (-): | Is the voltage 10 V or more? | Repair the poor contact in the purge control sole-noid valve 2 connector. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit of harness between the main relay and purge control solenoid valve 2 Poor contact of coupling connector Poor contact of main relay connector |

EH:DTC P2420 EVAPORATIVE EMISSION SYSTEM SWITCHING VALVE CON-Studios TROL CIRCUIT HIGH

DTC DETECTING CONDITION:

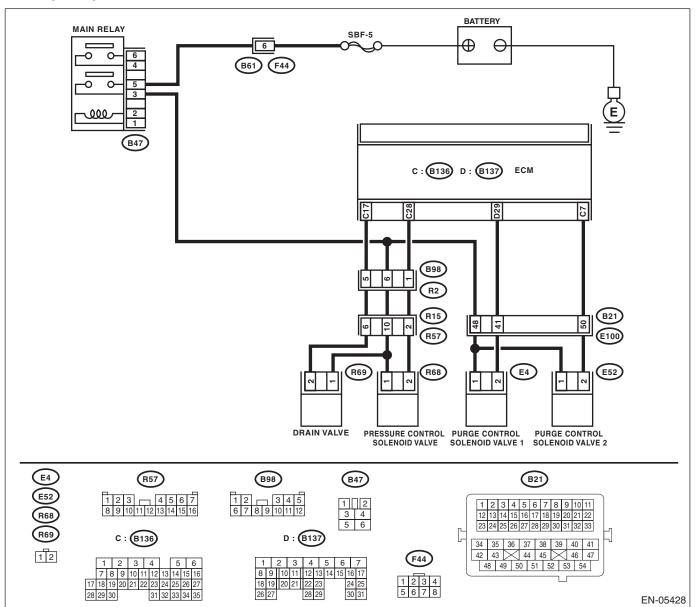
- Detected when two consecutive driving cycles with fault occur.
- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-271, DTC P2420 EVAPORATIVE EMISSION SYS- TEM SWITCHING VALVE CONTROL CIRCUIT HIGH, Diagnostic Trouble Code (DTC) Detecting Criteria.> TROUBLE SYMPTOM:

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

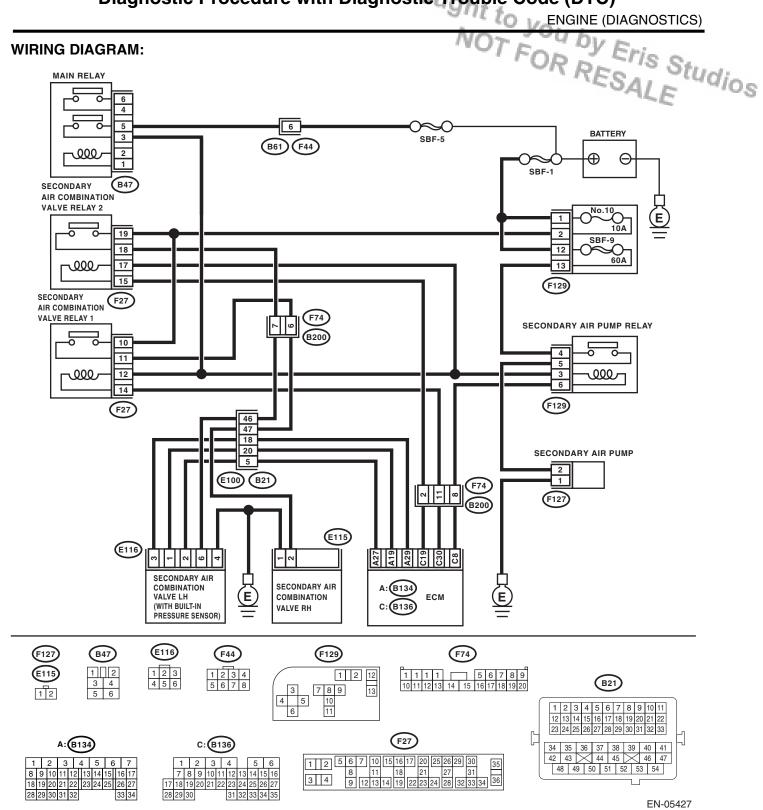
ENGINE (DIAGNOSTICS)

EI: DTC P2431 SECONDARY AIR INJECTION SYSTEM AIR FLOW /PRESSURE Studios 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 SYS-TEM AIR FLOW /PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:



| | | ** T. | IT ~ U | V F . |
|---|---|---|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK FOR ANY OTHER DTC ON DISPLAY. | Is any other DTC displayed? | Check the appro-in priate DTC using the "List of Diagnostic Trouble Code (DTC)". <ref. (dtc).="" -76,="" code="" diagnostic="" en(h4dotc)(diag)="" list="" of="" to="" trouble=""></ref.> | Go to step 2. |
| 2 | CHECK CURRENT DATA. 1) Turn the ignition switch to ON (engine OFF). 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. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | mmHg (27 kPa, 8 inHg, 3.9 psig) or more? | Replace the sec- ondary air combi- nation valve LH. <ref. to<br="">EC(H4DOTC)-10, Secondary Air Combination Valve.></ref.> | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

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

CAUTION:

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54

3 4

9 12 13 14 19 22 23 24 28 32 33 34 36

EN-05427

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | /YC | TENTU | / Fam: |
|---|--|---|---|--|
| | Step | Check | Yes | - No C |
| 1 | CHECK CURRENT DATA. 1) Turn the ignition switch to ON. 2) Read the data of secondary air pipe pressure signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | 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. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK SECONDARY AIR COMBINATION VALVE LH POWER SUPPLY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the secondary air combination valve LH. 3) Turn the ignition switch to ON. 4) Measure the voltage between the secondary air combination valve LH connector and chassis ground. Connector & terminal (E116) No. 1 (+) — Chassis ground (-): | Is the voltage 4.5 V or more? | Go to step 3. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between ECM and secondary air combination valve LH connector Poor contact in ECM connector Poor contact of coupling connector |
| 3 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from the ECM. 3) Measure the resistance of the harness between the ECM and secondary air combination valve LH connector. Connector & terminal (B134) No. 27 — (E116) No. 2: | Is the resistance less than 1 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between ECM and secondary air combination valve LH connector Poor contact of coupling connector |
| 4 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR. Measure the resistance between ECM and chassis ground. Connector & terminal (B134) No. 27 — Chassis ground: | Is the resistance 1 $M\Omega$ 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. 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. air="" combination="" ec(h4dotc)-10,="" secondary="" to="" valve.=""></ref.> |

ENGINE (DIAGNOSTICS)

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

DTC DETECTING CONDITION:

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

CAUTION:

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T FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 യ ⊕ Θ 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) (E116) F129 (F127) (B47) F44 (F74) 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6 48 49 50 51 52 53 54 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 3 4 9 12 13 14 19 22 23 24 28 32 33 34 36

| | IVO | 7 - 40 | 15 |
|---|--|---|--|
| Step | Check | Yes | No C |
| CHECK CURRENT DATA. 1) Turn the ignition switch to ON. 2) Read the data of secondary air pipe pressure signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". < Ref. to EN(H4DOTC)(diag)-36, Subaru Select Monitor.> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual. | | Go to step 2. | Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Reproduce the fault condition, and reperform the check. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 CHECK HARNESS BETWEEN ECM AND SECONDARY AIR COMBINATION VALVE LH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the secondary air combination valve LH. 3) Turn the ignition switch to ON. 4) Read the data of secondary air pipe pressure signal using the Subaru Select Monitor or general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""> • General scan tool For detailed operation procedure, refer to the general scan tool operation manual.</ref.> | | 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. 1) Turn the ignition switch to OFF. 2) Measure the resistance of the harness between the secondary air combination valve LH connector and engine ground. Connector & terminal (E116) No. 4 — Engine ground: | Is the resistance less than 5 Ω ? | Go to step 4. | Repair the harness and connector. NOTE: In this case, repair the following item: Open circuit in harness between ECM and secondary air combination valve LH connector Poor contact in ECM connector |
| CHECK POOR CONTACT. Check for poor contact of the secondary air combination valve LH connector. | Is there poor contact of the sec- ondary air combination valve LH connector? | Repair the poor contact of the sec- ondary air combi- nation valve RH connector. | Replace the sec- ondary air combi- nation valve LH. <ref. to<br="">EC(H4DOTC)-10, Secondary Air Combination Valve.></ref.> |

EL:DTC P2440 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE Studios

DTC DETECTING CONDITION:

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

CAUTION:

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 ىرووق 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6

3 4

9 12 13 14 19 22 23 24 28 32 33 34 36

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

48 49 50 51 52 53 54

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| | | /VO | TEUD | 15. |
|---|--|--|--|--|
| | Step | Check | Yes | No |
| V/ CI | HECK SECONDARY AIR COMBINATION ALVE FUSE. Theck if the secondary air combination valve use (10 A) is blown out. | Is the fuse blown out? | Go to step 2. | Go to step 3. |
| All Value 1) value 2) ar 3) or ar ch | HECK HARNESS BETWEEN FUSE BOX ND SECONDARY AIR COMBINATION ALVE RH.) Remove the secondary air combination alve fuse (10 A) from the fuse box.) Disconnect the connector from the secondary air combination valve RH.) Measure the resistance between the secondary air combination valve fuse and secondary air combination valve RH connector, and hassis ground. Connector & terminal (F129) No. 2 — Chassis ground: (E115) No. 2 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the fuse with a new part, and connect the secondary air combination valve RH connector. Go to step 3. | Repair short circuit of the harness to ground between the fuse box and the secondary air combination valve RH. |
| V2 1) 2) 3) ai Se N(Re M | HECK SECONDARY AIR COMBINATION ALVE RH OPERATION.) Connect the test mode connector.) Turn the ignition switch to ON.) Perform operation check for the secondary ir combination valve RH using the Subaru elect Monitor. OTE: lefer to "Compulsory Valve Operation Check Mode" for more operation procedures. <ref. check="" compulsory="" mode.="" n(h4dotc)(diag)-54,="" operation="" to="" valve=""></ref.> | Does the secondary air combination valve RH repeatedly switch to ON and OFF? | Go to step 4. | Go to step 6. |
| PI TI CI | HECK DUCT BETWEEN SECONDARY AIR UMP AND SECONDARY AIR COMBINA- ION VALVE RH. Theck the duct between the secondary air ump and secondary air combination valve RH. | Is there damage, clog or dis- connection of the duct? | Replace, clean or connect the duct. | Go to step 5. |
| CI HI CI bi | HECK PIPE BETWEEN SECONDARY AIR COMBINATION VALVE RH AND CYLINDER EAD. Theck the pipe between the secondary air comination 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. NOTE: In this case, there may be a temporary connector contact failure. |
| Al 1) ar 2) aç va | HECK POWER SUPPLY TO SECONDARY IR COMBINATION VALVE RH. Disconnect the connector from the second- ry air combination valve RH. In the condition of step 3, measure the volt- ge between the secondary air combination alve RH and the chassis ground. Connector & terminal (E115) No. 2 (+) — Chassis ground (-): | Does the voltage repeatedly change between 10 V and 0 V? | Replace the sec- ondary air combi- nation valve RH. <ref. to<br="">EC(H4DOTC)-10, Secondary Air Combination Valve.></ref.> | Go to step 7. |

| | | NO | 12 JUL 1 | |
|----|--|--|----------------|--|
| | Step | Check | Yes | C/No - |
| 7 | CHECK HARNESS BETWEEN SECONDARY | Is the resistance less than 5 Ω ? | Go to step 8. | Repair the open |
| | AIR COMBINATION VALVE RH AND CHAS- | | | circuit of harness |
| | SIS GROUND. | | | between second- |
| | Measure the resistance between the secondary | | | ary air combination |
| | air combination valve RH connector and chas- | | | valve RH and |
| | sis ground. | | | chassis ground. |
| | Connector & terminal | | | |
| | (E115) No. 1 — Chassis ground: | | | |
| 8 | CHECK HARNESS BETWEEN SECONDARY | Is the resistance less than 1 Ω ? | Go to step 9. | Repair the open |
| | AIR COMBINATION VALVE RELAY 1 AND | | | circuit of the har- |
| | SECONDARY AIR COMBINATION VALVE | | | ness between the |
| | RH CONNECTOR. | | | secondary air com- |
| | Turn the ignition switch to OFF. | | | bination valve relay |
| | 2) Remove the secondary air combination | | | 1 and secondary |
| | valve relay 1 from the relay box. | | | air combination |
| | 3) Measure the resistance of the harness | | | valve RH connec- |
| | between the secondary air combination valve | | | tor. |
| | relay 1 and secondary air combination valve RH | | | |
| | connector. | | | |
| | Connector & terminal | | | |
| | (F27) No. 11 — (E115) No. 2: | | 0 1 1 10 | D 1 11 |
| 9 | CHECK SECONDARY AIR COMBINATION VALVE RELAY 1. | Is the resistance less than 1 Ω ? | Go to step 10. | Replace the sec- |
| | | | | ondary air combi- |
| | 1) Turn the ignition switch to OFF. | | | nation valve relay 1. <ref. td="" to<=""></ref.> |
| | 2) Connect the battery to terminals No. 12 and No. 14 of the secondary air combination valve | | | EN(H4DOTC)(diag) |
| | relay 1. | | | -8, Electrical Com- |
| | 3) Measure the resistance between the sec- | | | ponent Location.> |
| | ondary air combination valve relay 1 terminals. | | | poneni Location.> |
| | Terminals | | | |
| | No. 10 — No. 11: | | | |
| 10 | CHECK SECONDARY AIR COMBINATION | Is the resistance 1 M Ω or | Go to step 11. | Replace the sec- |
| - | VALVE RELAY 1. | more? | Sit it it it | ondary air combi- |
| | Measure the resistance between the secondary | | | nation valve relay |
| | air combination valve relay 1 terminals with the | | | 1. <ref. td="" to<=""></ref.> |
| | battery disconnected. | | | EN(H4DOTC)(diag) |
| | Terminals | | | -8, Electrical Com- |
| | No. 10 — No. 11: | | | ponent Location.> |
| 11 | CHECK SECONDARY AIR COMBINATION | Is the voltage 10 V or more? | Go to step 12. | Repair the open or |
| | VALVE RELAY 1 POWER SUPPLY. | | , | ground short circuit |
| | Turn the ignition switch to ON. | | | of power supply |
| | 2) Measure the voltage between the second- | | | circuit. |
| | ary air combination valve relay 1 connector and | | | |
| | chassis ground. | | | |
| | Connector & terminal | | | |
| | (F27) No. 10 (+) — Chassis ground (-): | | | |
| | (F27) No. 12 (+) — Chassis ground (–): | | | |
| 12 | CHECK HARNESS BETWEEN ECM AND | Is the resistance less than 1 Ω ? | Go to step 13. | Repair the open |
| | SECONDARY AIR COMBINATION VALVE | | | circuit of harness |
| | RELAY 1 CONNECTOR. | | | between ECM and |
| | 1) Turn the ignition switch to OFF. | | | secondary air com- |
| | 2) Disconnect the connector of ECM. | | | bination valve relay |
| | 3) Measure the resistance of harness between | | | 1 connector. |
| | ECM and secondary air combination valve relay | | | |
| | 1 connector. Connector & terminal | | | |
| | | | | |
| | (B136) No. 30 — (F27) No. 14: | | | |

ENGINE (DIAGNOSTICS)

| | | | | 1.7 200 | _ |
|----|--|----------------------------------|------------------|---------------------|-------|
| | Step | Check | Yes | ETNo C | |
| 13 | CHECK HARNESS BETWEEN ECM AND | Is the resistance 1 $M\Omega$ or | Repair poor con- | Repair short cir- | lel:_ |
| | SECONDARY AIR COMBINATION VALVE | more? | tact of the ECM | cuit of the harness | 2014 |
| | RELAY 1 CONNECTOR. | | connector. | to ground between | - |
| | Measure the resistance between the secondary | | | ECM and second- | |
| | air combination valve relay 1 connector and | | | ary air combination | |
| | chassis ground. | | | valve relay 1 con- | |
| | Connector & terminal | | | nector. | |
| | (F27) No. 14 — Chassis ground: | | | | |

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

NOTE:

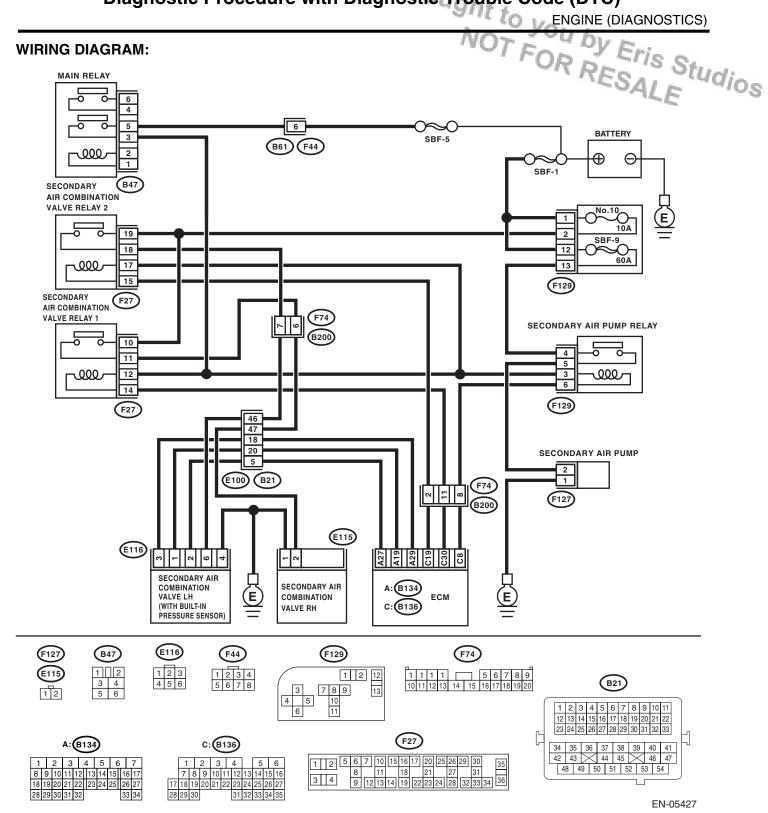
For the diagnostic procedure, refer to DTC P2440. <Ref. to EN(H4DOTC)(diag)-365, DTC P2440 SECOND-ARY AIR INJECTION SYSTEM SWITCHING VALVE STUCK OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

EN:DTC P2442 SECONDARY AIR INJECTION SYSTEM SWITCHING VALVE STUDIOS

DTC DETECTING CONDITION:

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

CAUTION:



| | | /VO | TEUD | 15 |
|---|--|--|--|--|
| | Step | Check | Yes | - No C |
| 1 | CHECK SECONDARY AIR COMBINATION VALVE FUSE. | Is the fuse blown out? | Go to step 2. | Go to step 3. |
| | Check if the secondary air combination valve fuse (10 A) is blown out. | | | |
| 2 | CHECK HARNESS BETWEEN FUSE BOX AND SECONDARY AIR COMBINATION VALVE LH. 1) Remove the secondary air combination valve fuse (10 A) from the fuse box. 2) Disconnect the connector from the secondary air combination valve LH. 3) Measure the resistance between the secondary air combination valve fuse and secondary air combination valve LH connector, and chassis ground. Connector & terminal (F129) No. 2 — Chassis ground: (E116) No. 6 — Chassis ground: | Is the resistance 1 $M\Omega$ or more? | Replace the fuse with a new part, and connect the secondary air combination valve LH connector. 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. 1) Connect the test mode connector. 2) Turn the ignition switch to ON. 3) Perform operation check for the secondary air combination valve LH using the Subaru Select Monitor. NOTE: Refer to "Compulsory Valve Operation Check Mode" for more operation procedures. <ref. check="" compulsory="" en(h4dotc)(diag)-54,="" mode.="" operation="" to="" valve=""></ref.> | | Go to step 4. | Go to step 6. |
| 4 | CHECK DUCT BETWEEN SECONDARY AIR PUMP AND SECONDARY AIR COMBINA- TION VALVE LH. Check the duct between the secondary air pump and secondary air combination valve LH. | Is there damage, clog or dis- connection 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. Check the pipe between the secondary air combination valve LH and cylinder head. | | 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. NOTE: In this case, there may be a temporary connector contact failure. |
| 6 | CHECK POWER SUPPLY TO SECONDARY AIR COMBINATION VALVE LH. 1) Disconnect the connector from the secondary air combination valve LH. 2) In the condition of step 3, measure the voltage between the secondary air combination valve LH and the chassis ground. Connector & terminal (E116) No. 6 (+) — Chassis ground (-): | Does the voltage repeatedly change between 10 V and 0 V? | Replace the sec- ondary air combi- nation valve LH. <ref. to<br="">EC(H4DOTC)-10, Secondary Air Combination Valve.></ref.> | Go to step 7. |

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | 740 | 7 - 41 | V E |
|----|--|--|----------------|--|
| | Step | Check | Yes | - No |
| 7 | CHECK HARNESS BETWEEN SECONDARY AIR COMBINATION VALVE LH AND CHAS- SIS GROUND. Measure the resistance between the secondary air combination valve LH connector and chassis ground. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Remove the secondary air combination valve relay 2 from the relay box. 3) Measure the resistance of the harness between the secondary air combination valve relay 2 and secondary air combination valve relay 2 and secondary air combination valve LH connector. Connector & terminal (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. 1) Turn the ignition switch to OFF. 2) Connect the battery to terminals No. 15 and No. 17 of the secondary air combination valve relay 2. 3) Measure the resistance between the secondary air combination valve relay 2 terminals. Terminals 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. Measure the resistance between the secondary air combination valve relay 2 terminals with the battery disconnected. Terminals No. 18 — No. 19: | Is the resistance 1 $M\Omega$ or more? | Go to step 11. | Replace the secondary air combination valve relay 2. |
| 11 | CHECK SECONDARY AIR COMBINATION VALVE RELAY 2 POWER SUPPLY. 1) Turn the ignition switch to ON. 2) Measure the voltage between the secondary air combination valve relay 2 connector and chassis ground. Connector & terminal (F27) No. 19 (+) — Chassis ground (-): (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. 1) Turn the ignition switch to OFF. 2) Disconnect the connector of ECM. 3) Measure the resistance of harness between ECM and secondary air combination valve relay 2 connector. Connector & terminal (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. |

ENGINE (DIAGNOSTICS)

| | | /40 | 7 7 11 | V-5 | 1 |
|----|--|----------------------------------|------------------|---------------------|------|
| | Step | Check | Yes | C No | |
| 13 | CHECK HARNESS BETWEEN ECM AND | Is the resistance 1 $M\Omega$ or | Repair poor con- | Repair short cir- | let. |
| | SECONDARY AIR COMBINATION VALVE | more? | tact of the ECM | cuit of the harness | 141 |
| | RELAY 2 CONNECTOR. | | connector. | to ground between | |
| | Measure the resistance between the secondary | | | ECM and second- | |
| | air combination valve relay 2 connector and | | | ary air combination | |
| | chassis ground. | | | valve relay 2 con- | |
| | Connector & terminal | | | nector. | |
| | (F27) No. 15 — Chassis ground: | | | | |

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 SECOND-ARY 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 SETUCIOS

- GENERAL DESCRIPTION <Ref. to GD(H4DOTC)-276, DTC P2444 SECONDARY AIR INJECTION SYS-TEM PUMP STUCK ON, Diagnostic Trouble Code (DTC) Detecting Criteria.>

CAUTION:

NOT FOR RESALE **WIRING DIAGRAM:** MAIN RELAY 6 4 5 **BATTERY** 3 SBF-5 B61 F44 ىھى ⊕ Э 1 SBF-1 B47 SECONDARY No.10 10A AIR COMBINATION **VALVE RELAY 2** 19 SBF-9 18 12 ىس 17 15 (F129) SECONDARY AIR COMBINATION F27 VALVE RELAY 1 SECONDARY AIR PUMP RELAY 10 11 5 ىمە 12 3 -رووي 14 (F129) F27 46 47 18 20 SECONDARY AIR PUMP 5 E100 (B21) 8 1 5 (F127) (E115) (E116) A27 A19 C19 C30 C8 E | - | 2 | 9 | 4 SECONDARY AIR SECONDARY AIR A: (B134 COMBINATION VALVE LH E COMBINATION ECM (WITH BUILT-IN VALVE RH PRESSURE SENSOR) F129 (E116) (F127) (B47) F44 F74 1 2 1 2 3 1 2 3 4 5 6 7 8 1 1 1 1 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 1 2 12 9 13 (B21) 3 7 8 9 4 5 10 11 12 13 14 15 16 17 18 19 20 21 (F27) A: B134 C: B136 34 35 36 37 38 39 40 41 42 43 44 45 46 47 1 2 5 6 7 10 15 16 17 20 25 26 29 30 11 18 21 27 31 1 2 3 4 1 2 3 4 5 6 7 5 6

3 4

9 12 13 14 19 22 23 24 28 32 33 34 36

7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

48 49 50 51 52 53 54

EN-05427

Diagnostic Procedure with Diagnostic Trouble Code (DTC) ENGINE (DIAGNOSTICS)

| | | -770 | TEST M | / File: |
|---|--|--|---|--|
| | Step | Check | Yes | No C |
| 1 | CHECK SECONDARY AIR PIPE PRESSURE. 1) Turn the ignition switch to ON. 2) Using the Subaru Select Monitor, read secondary air piping pressure data, and compare with the actual barometric pressure. NOTE: For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". <ref. en(h4dotc)(diag)-36,="" monitor.="" select="" subaru="" to=""></ref.> | 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. NOTE: In this case, there may be a temporary connector contact failure. |
| 2 | CHECK SECONDARY AIR PUMP. 1) Start the engine and warm-up engine until coolant temperature is higher than 75°C (167°F). 2) Check whether or not the secondary air pump is operating. | Is the secondary air pump operating? | Go to step 3. | Replace the sec- ondary air combi- nation valve LH. <ref. to<br="">EC(H4DOTC)-10, INSPECTION, Secondary Air Combination Valve.></ref.> |
| 3 | CHECK HARNESS BETWEEN ECM AND SECONDARY AIR PUMP RELAY CONNECTOR. 1) Turn the ignition switch to OFF. 2) Remove the secondary air pump relay from the relay box. 3) Measure the resistance between the secondary air pump relay connector and engine ground terminals. Connector & terminal (F129) No. 6 — Engine ground: | Is the resistance 1 $M\Omega$ 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. Measure the resistance between the secondary air pump relay terminals. Terminals No. 4 — No. 5: | Is the resistance 1 $M\Omega$ or more? | Repair the short circuit to power in the harness between secondary air pump relay and secondary air pump connector. | Replace the sec- ondary air pump relay. <ref. to<br="">EN(H4DOTC)(diag) -8, Electrical Com- ponent Location.></ref.> |

19. General Diagnostic Table **A: INSPECTION**

NOTE:

General Diagnostic wayynt to you by Eris Studios Malfunction of parts other than those listed is also possible. <Ref. to ME(H4DOTC)-94, Engine Trouble in General.>

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

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

- *1: Check ignition coil 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.

