

**ENGINE SECTION 1**

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

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

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

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

**FUEL INJECTION (FUEL SYSTEM) FU(H4SO)**

**EMISSION CONTROL (AUX. EMISSION CONTROL DEVICE) EC(H4SO)**

**INTAKE (INDUCTION) IN(H4SO)**

**MECHANICAL ME(H4SO)**

**EXHAUST EX(H4SO)**

**COOLING CO(H4SO)**

**LUBRICATION LU(H4SO)**

**SPEED CONTROL SYSTEM SP(H4SO)**

**IGNITION IG(H4SO)**

**STARTING/CHARGING SYSTEM SC(H4SO)**

**ENGINE (DIAGNOSTIC) EN(H4SO)**

# ENGINE (DIAGNOSTIC)

# *EN(H4SO)*

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# Basic Diagnostics Procedure

ENGINE (DIAGNOSTIC)

## 1. Basic Diagnostics Procedure

### A: PROCEDURE

#### 1. ENGINE

Step	Check	Yes	No
<b>1 CHECK ENGINE START FAILURE.</b> 1) Ask the customer when and how the trouble occurred using the interview check list. <Ref. to EN(H4SO)-4, INSPECTION, Check List for Interview.> 2) Start the engine.	Does the engine start?	Go to step 2.	Inspection using "Diagnostics for Engine Starting Failure". <Ref. to EN(H4SO)-57, Diagnostics for Engine Starting Failure.>
<b>2 CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.</b>	Does malfunction indicator light illuminate?	Go to step 3.	Inspection using "General Diagnostic Table". <Ref. to EN(H4SO)-255, INSPECTION, General Diagnostic Table.>
<b>3 CHECK INDICATION OF DTC ON DISPLAY</b> 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector. 3) Turn the ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON. 4) Read the DTC on the Subaru Select Monitor or OBD-II general scan tool.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Record the DTC. Repair the trouble cause. <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).> Go to step 4.	Repair the related parts. NOTE: If DTC is not shown on display although the engine warning light illuminates, perform the diagnostics of engine warning light circuit or combination meter. <Ref. to EN(H4SO)-47, Malfunction Indicator Light.>
<b>4 PERFORM THE DIAGNOSIS.</b> 1) Perform the Clear Memory Mode. <Ref. to EN(H4SO)-44, Clear Memory Mode.> 2) Perform the Inspection Mode. <Ref. to EN(H4SO)-37, Inspection Mode.>	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Check on "Diagnostic Procedure with Diagnostic Trouble Code (DTC)" <Ref. to EN(H4SO)-78, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Finish the diagnosis.

## 2. AUTOMATIC TRANSMISSION

When the DTC about automatic transmission is shown on display, carry out the following basic check. After that, carry out the replacement or repair work.

- 1) ATF level check <Ref. to 4AT-30, Automatic Transmission Fluid.>
- 2) Differential gear oil level check <Ref. to 4AT-31, Differential Gear Oil.>
- 3) ATF leak check <Ref. to 4AT-30, Automatic Transmission Fluid.>
- 4) Differential gear oil level check <Ref. to 4AT-31, Differential Gear Oil.>
- 5) Stall Test <Ref. to 4AT-33, Stall Test.>
- 6) Line Pressure Test <Ref. to 4AT-36, Line Pressure Test.>
- 7) Transfer Clutch Pressure Test <Ref. to 4AT-38, Transfer Clutch Pressure Test.>
- 8) Time Lag Test <Ref. to 4AT-35, Time Lag Test.>
- 9) Road Test <Ref. to 4AT-32, Road Test.>
- 10) Shift characteristics <Ref. to 4AT-38, Transfer Clutch Pressure Test.>

## Check List for Interview

ENGINE (DIAGNOSTIC)

### 2. Check List for Interview

#### A: INSPECTION

##### 1. CHECK LIST No. 1

Check the following items when problem has occurred.

NOTE:

Use copies of this page for interviewing customers.

Customer's name		Engine No.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km
V.I.N.			miles
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Others:		
Ambient air temperature	°C (°F)		
	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold		
Place	<input type="checkbox"/> Highway <input type="checkbox"/> Suburbs <input type="checkbox"/> Inner city <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Rough road <input type="checkbox"/> Others:		
Engine temperature	<input type="checkbox"/> Cold <input type="checkbox"/> Warming-up <input type="checkbox"/> After warming-up <input type="checkbox"/> Any temperature <input type="checkbox"/> Others:		
Engine speed	rpm		
Vehicle speed	km/h (MPH)		
Driving conditions	<input type="checkbox"/> Not affected <input type="checkbox"/> At starting <input type="checkbox"/> While idling <input type="checkbox"/> At racing <input type="checkbox"/> While accelerating <input type="checkbox"/> While cruising <input type="checkbox"/> While decelerating <input type="checkbox"/> While turning (RH/LH)		
Headlight	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Rear defogger	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Blower	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Audio	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
A/C compressor	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Car phone	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Radiator fan	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Front wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Rear wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		

# Check List for Interview

ENGINE (DIAGNOSTIC)

## 2. CHECK LIST No. 2

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

NOTE:

Use copies of this page for interviewing customers.

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

# General Description

ENGINE (DIAGNOSTIC)

## 3. General Description

### A: CAUTION

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

#### CAUTION:

- All air bag system wiring harnesses and connectors are yellow. Do not use the electrical test equipment on these circuits.
- Be careful not to damage the Airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.

2) Never connect the battery in reverse polarity.

- The ECM will be destroyed immediately.
- The fuel injector and other part will be damaged.

3) Do not disconnect the battery terminals while the engine is running.

A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM, etc.

4) Before disconnecting the connectors of each sensor and the ECM, be sure to turn the ignition switch to OFF.

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

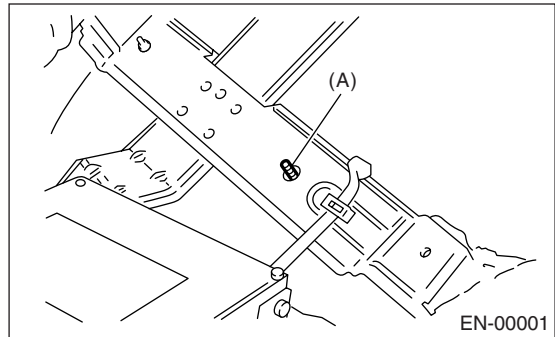
6) Remove the ECM from the located position after disconnecting two cables on battery. Otherwise, the ECM may be damaged.

#### CAUTION:

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

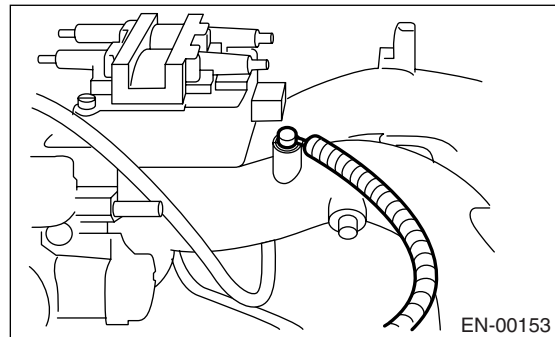
7) Connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a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

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

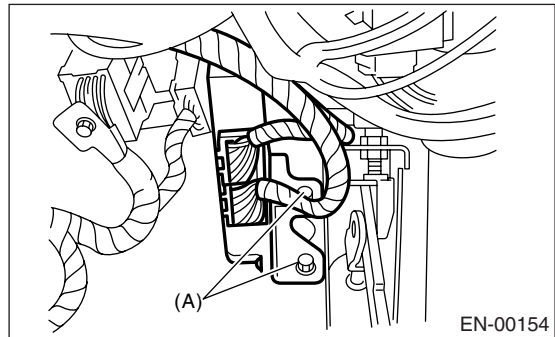


(A) Stud bolt

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



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



(A) Stud bolt

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

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

#### CAUTION:

- The antenna must be kept as far apart as possible from the control unit. (The ECM is located under the steering column, inside of the instrument panel lower trim panel.)

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

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

14) Problems in the electronic-controlled automatic transmission may be caused by failure of the engine, the electronic control system, the transmission proper, or by a combination of these. These three causes must be distinguished clearly when performing diagnostics.

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

16) In AT models, do not continue the stall for more than five seconds. (from closed throttle, fully open throttle to stall engine speed.)

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

## B: INSPECTION

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

### 1. BATTERY

1) Measure battery voltage and specific gravity of electrolyte.

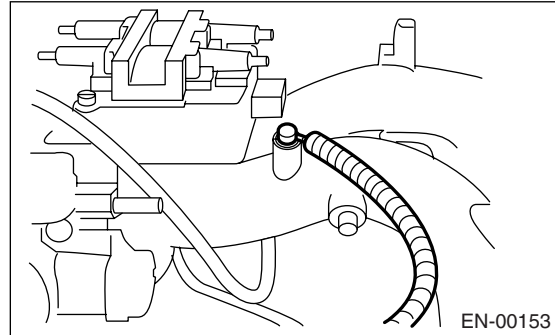
**Standard voltage: 12 V**

**Specific gravity: Above 1.260**

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

## 2. ENGINE GROUND

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



## C: NOTE

### 1. GENERAL DESCRIPTION

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



## General Description

### ENGINE (DIAGNOSTIC)

- The OBD-II diagnostics procedure is different from the usual diagnosis procedure. When troubleshooting the OBD-II models, connect Subaru Select Monitor or the OBD-II general scan tool to the vehicle.

### 2. ENGINE AND EMISSION CONTROL SYSTEM

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

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

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

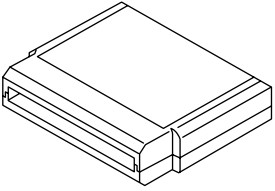

The MFI system also has the following features:

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

### 3. AUTOMATIC TRANSMISSION AND ELECTRONIC-HYDRAULIC CONTROL SYSTEM

The electronic-hydraulic control system consists of various sensors and switches, TCM and the hydraulic controller including solenoid valves. The system controls the transmission body including shift control, lock-up control, overrunning clutch control, line pressure control and shift timing control. It also controls the AWD transfer clutch. In other words, the system detects various operating conditions from various input signals and sends output signals to shift solenoids 1, 2 and low clutch timing solenoid and 2-4 brake timing solenoid, line pressure duty solenoid, lock-up duty solenoid, transfer duty solenoid and 2-4 brake duty solenoid (a total of eight solenoids).

### D: PREPARATION TOOL

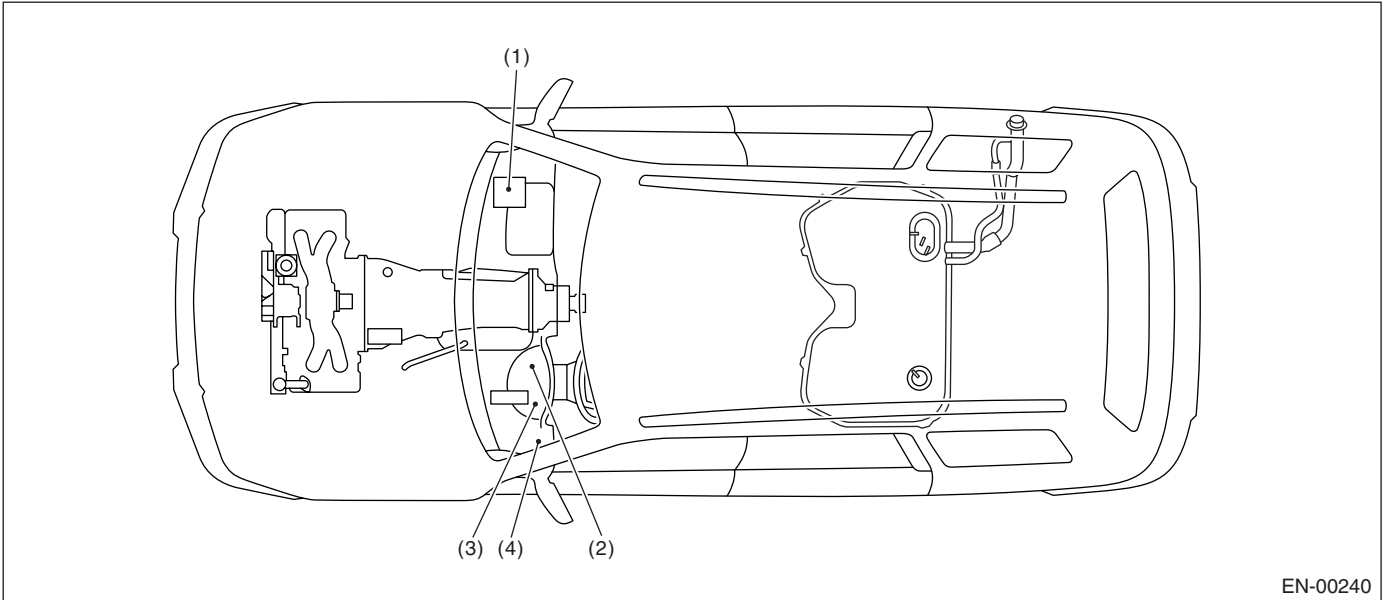
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST24082AA230	24082AA230 (Newly adopted tool)	CARTRIDGE	Troubleshooting for electrical system.
 ST22771AA030	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical system. <ul style="list-style-type: none"> <li>• English: 22771AA030 (Without printer)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

## 4. Electrical Component Location

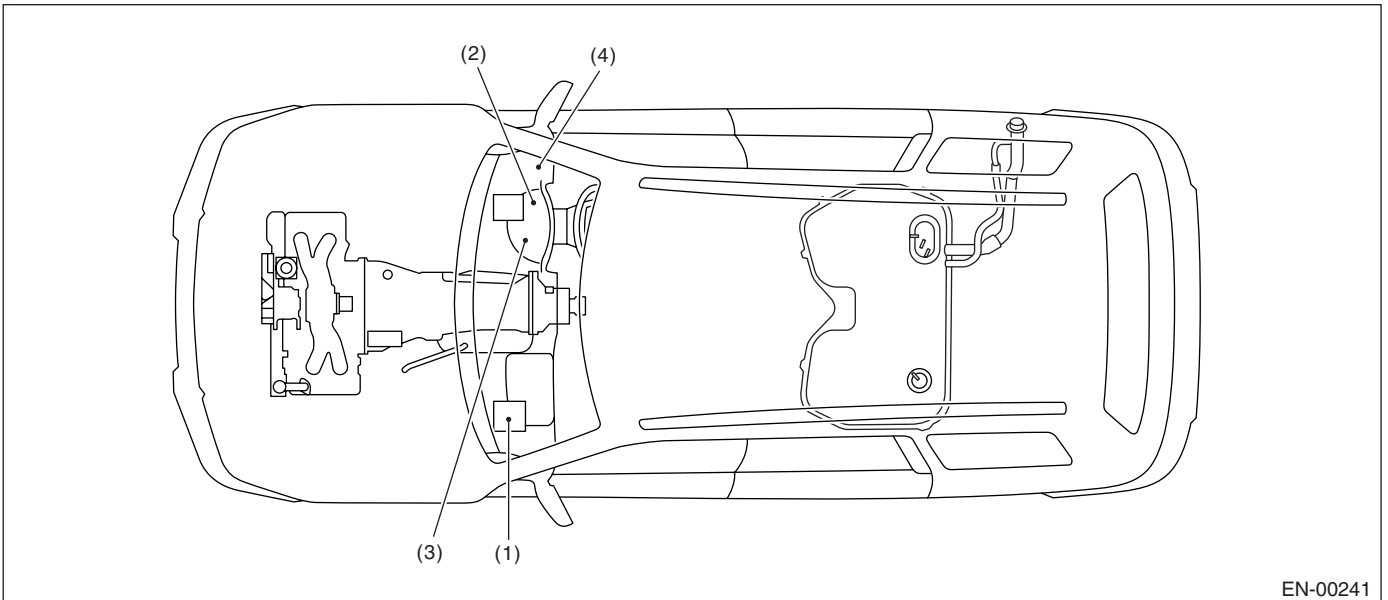
### A: LOCATION

#### 1. ENGINE

- CONTROL MODULE
- LHD MODEL



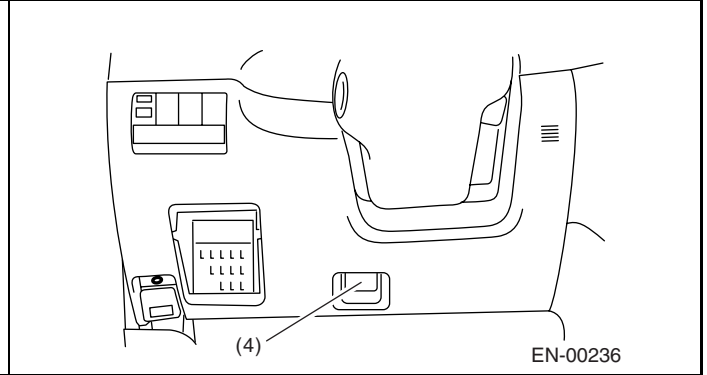
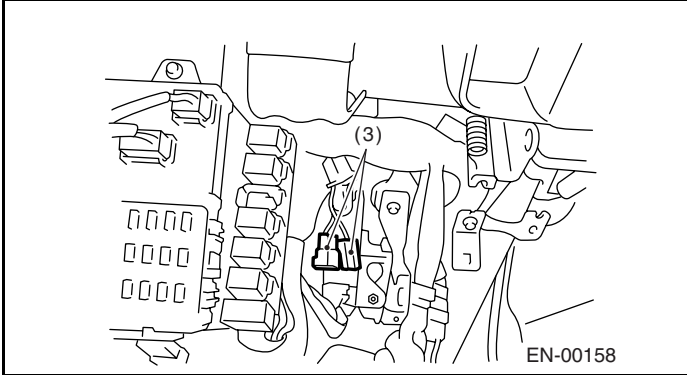
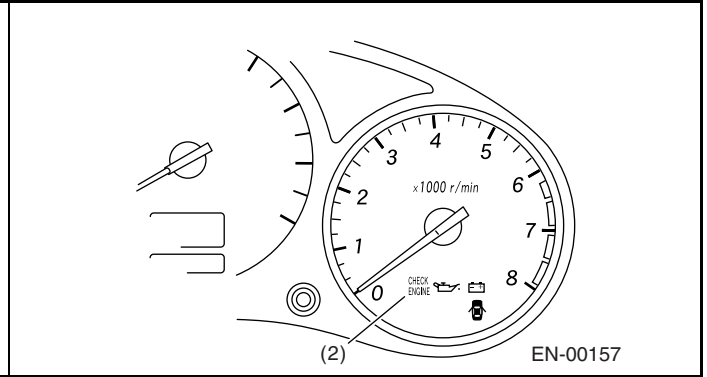
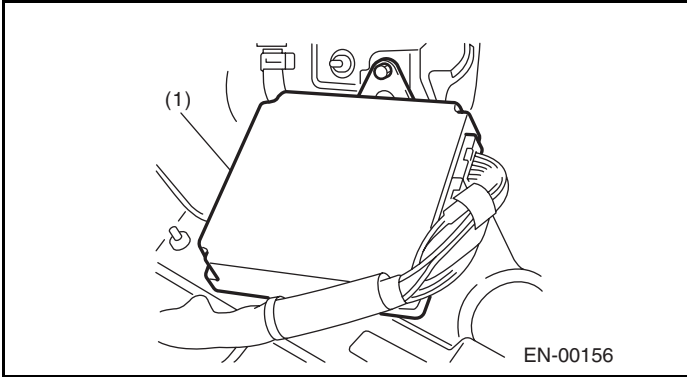
- RHD MODEL



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

# Electrical Component Location

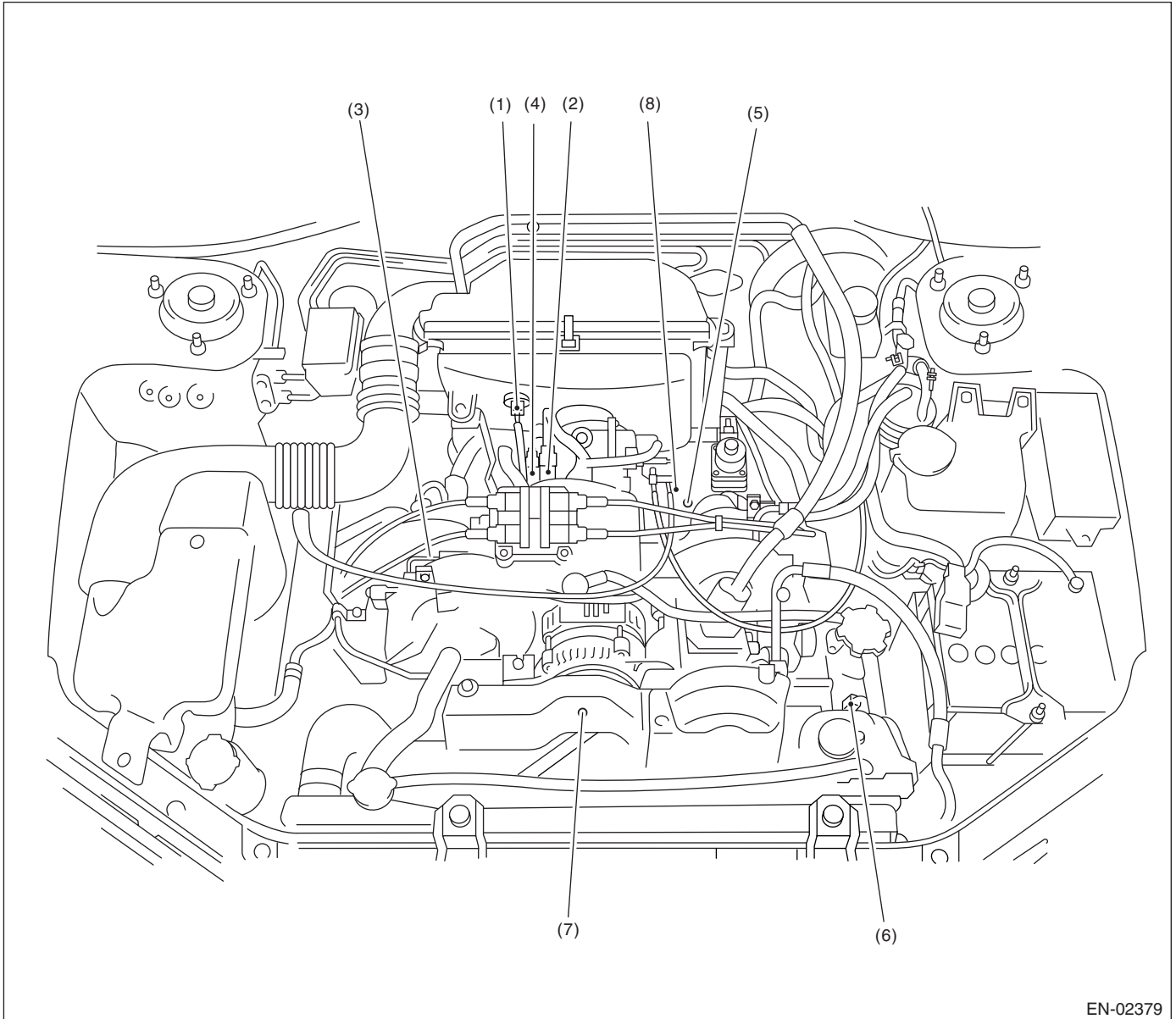
## ENGINE (DIAGNOSTIC)



# Electrical Component Location

ENGINE (DIAGNOSTIC)

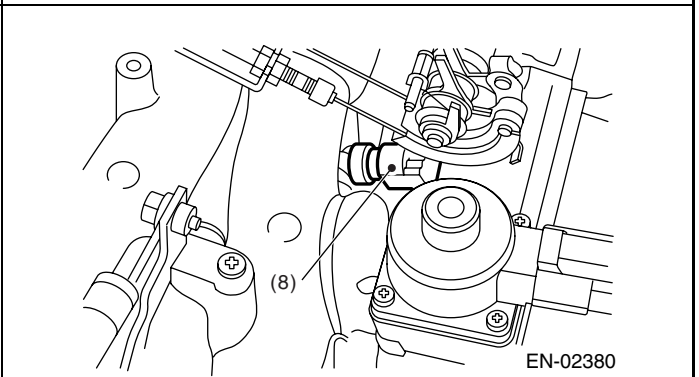
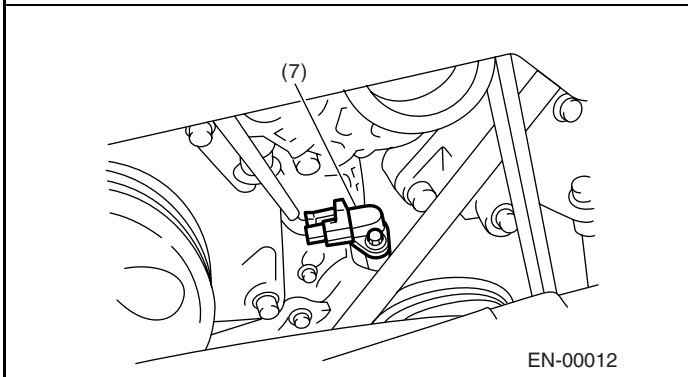
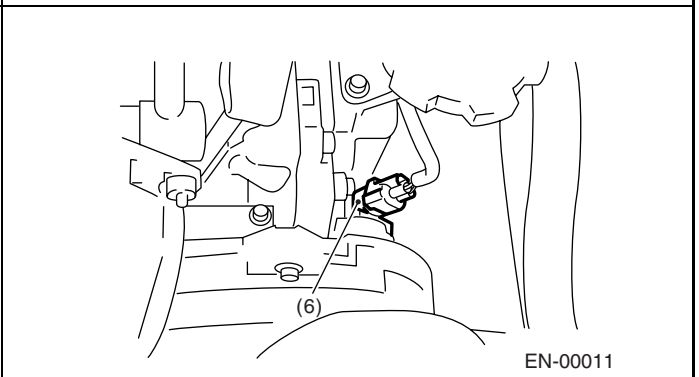
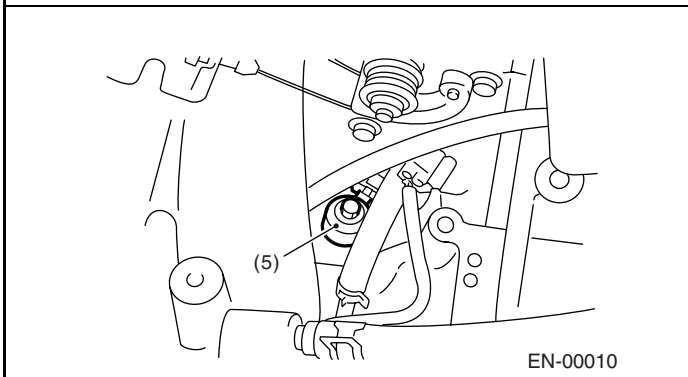
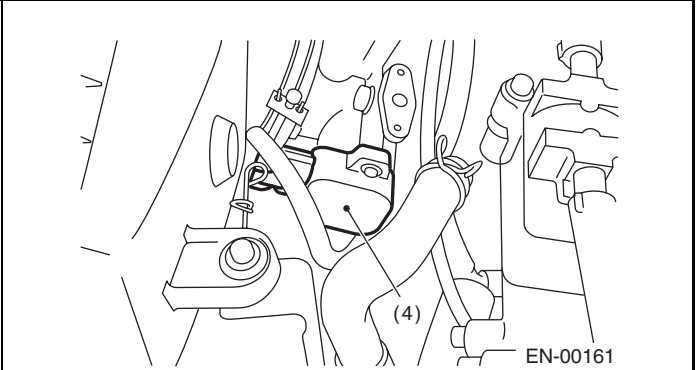
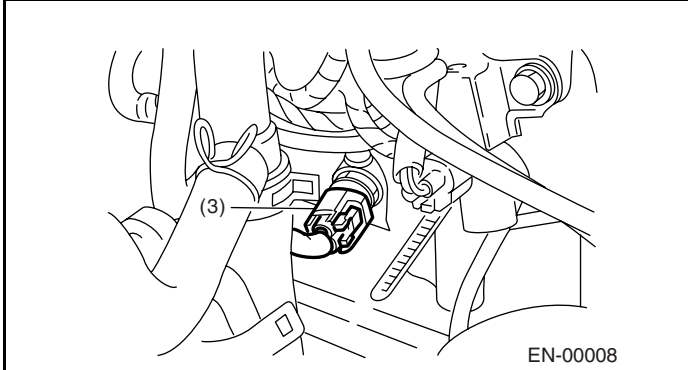
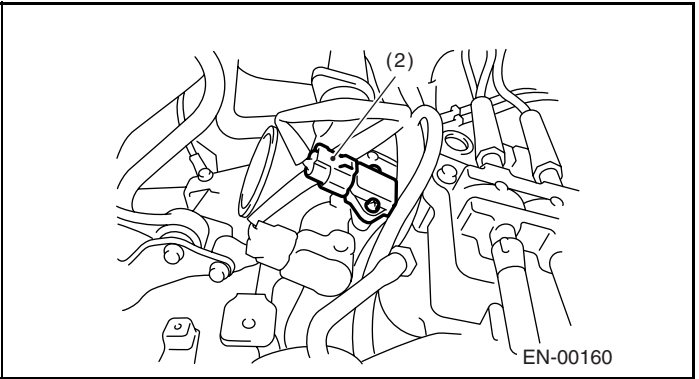
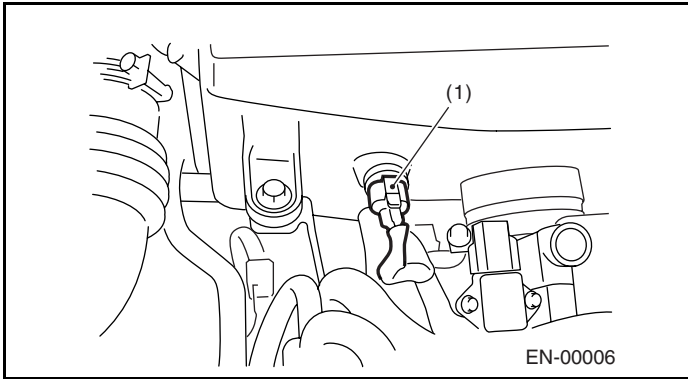
## • SENSOR



- |   |                                |  |
|---|--------------------------------|--|
| (1) Intake air temperature sensor                         | (4) Throttle position sensor   | (8) Engine coolant temperature sensor (with AT warmer) |
| (2) Manifold absolute pressure sensor                     | (5) Knock sensor               |  |
| (3) Engine coolant temperature sensor (without AT warmer) | (6) Camshaft position sensor   |  |
|   | (7) Crankshaft position sensor |  |

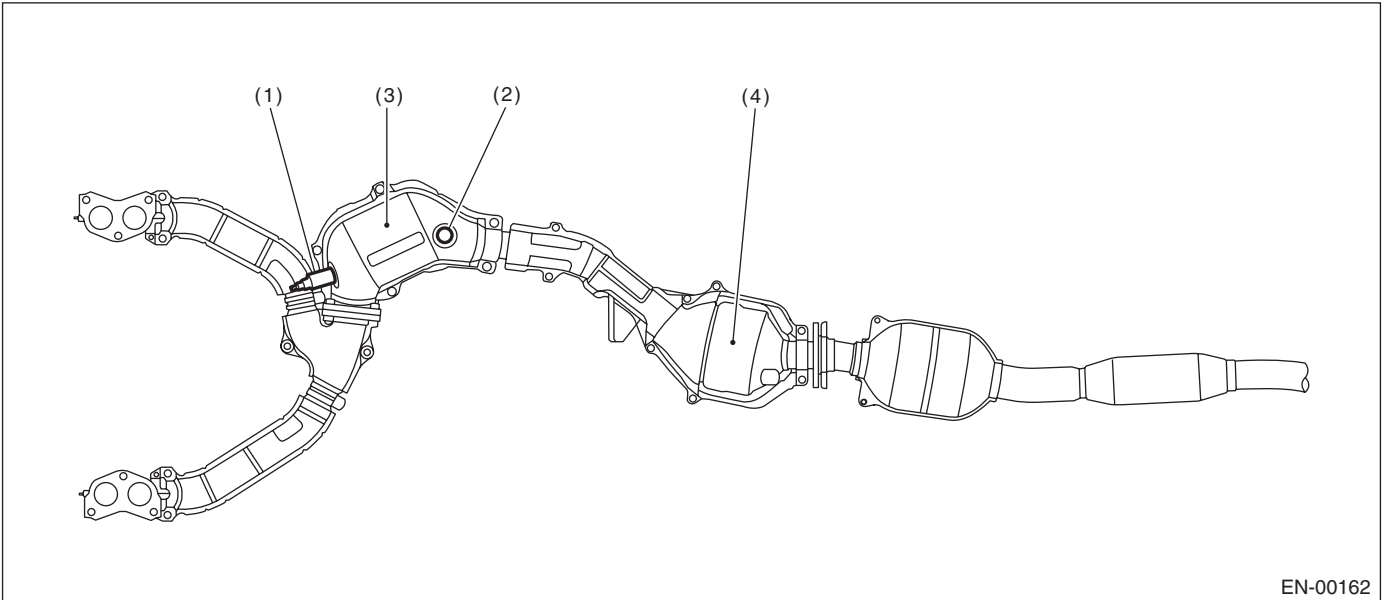
# Electrical Component Location

ENGINE (DIAGNOSTIC)



# Electrical Component Location

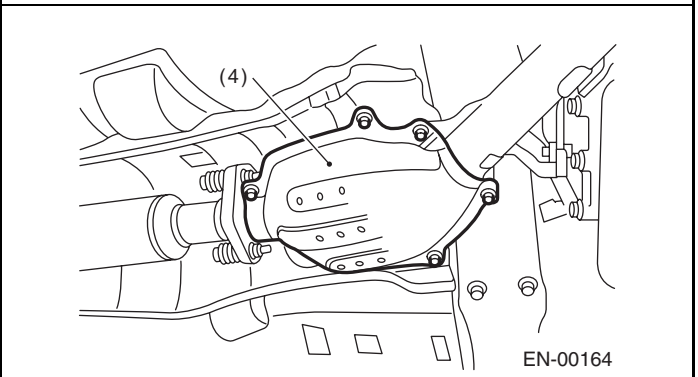
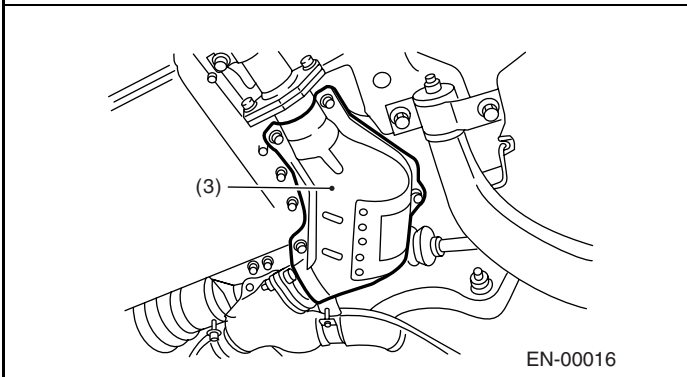
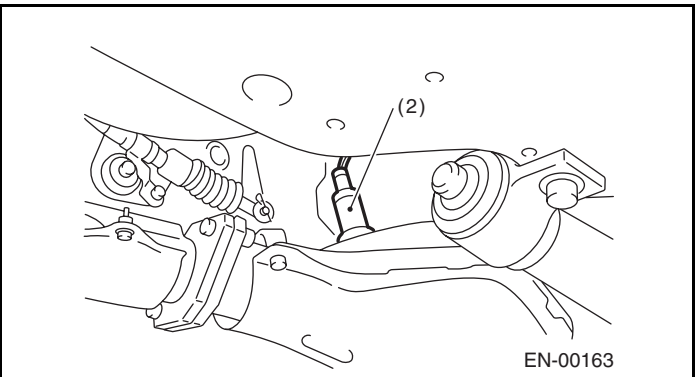
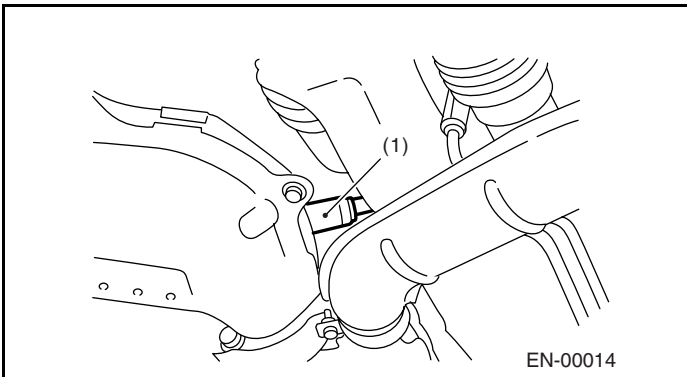
ENGINE (DIAGNOSTIC)



(1) Front oxygen (A/F) sensor  
(2) Rear oxygen sensor

(3) Front catalytic converter

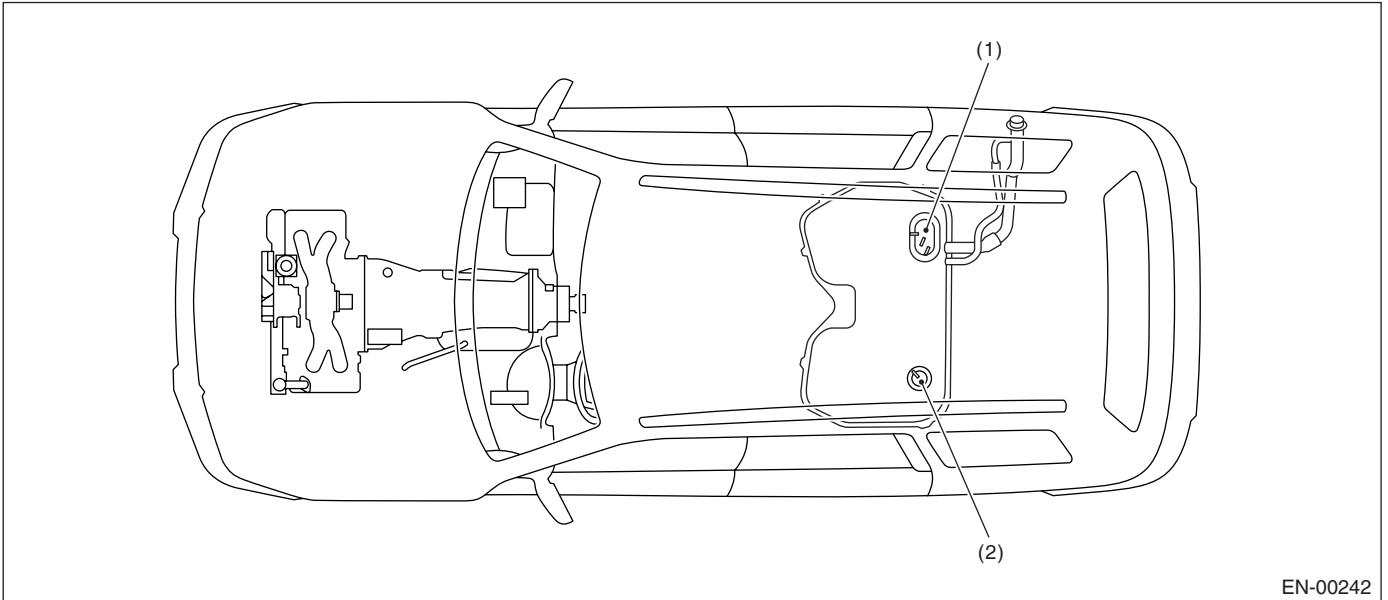
(4) Rear catalytic converter



# Electrical Component Location

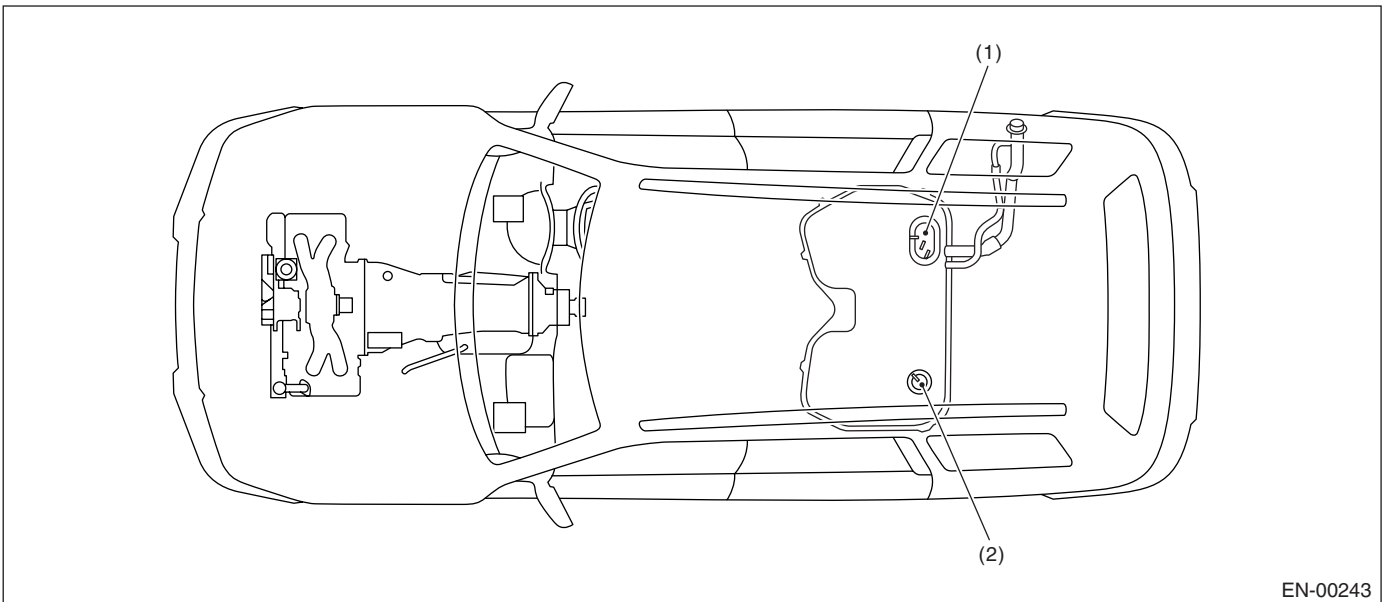
ENGINE (DIAGNOSTIC)

- LHD MODEL



EN-00242

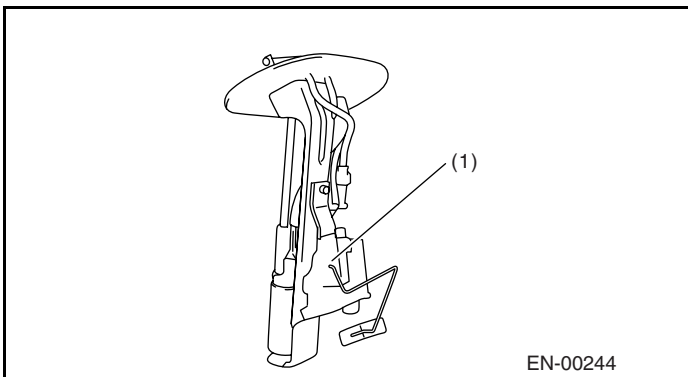
- RHD MODEL



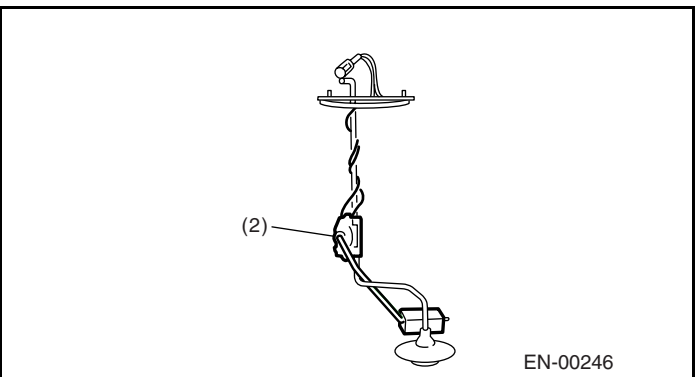
EN-00243

(1) Fuel level sensor

(2) Fuel sub level sensor



EN-00244

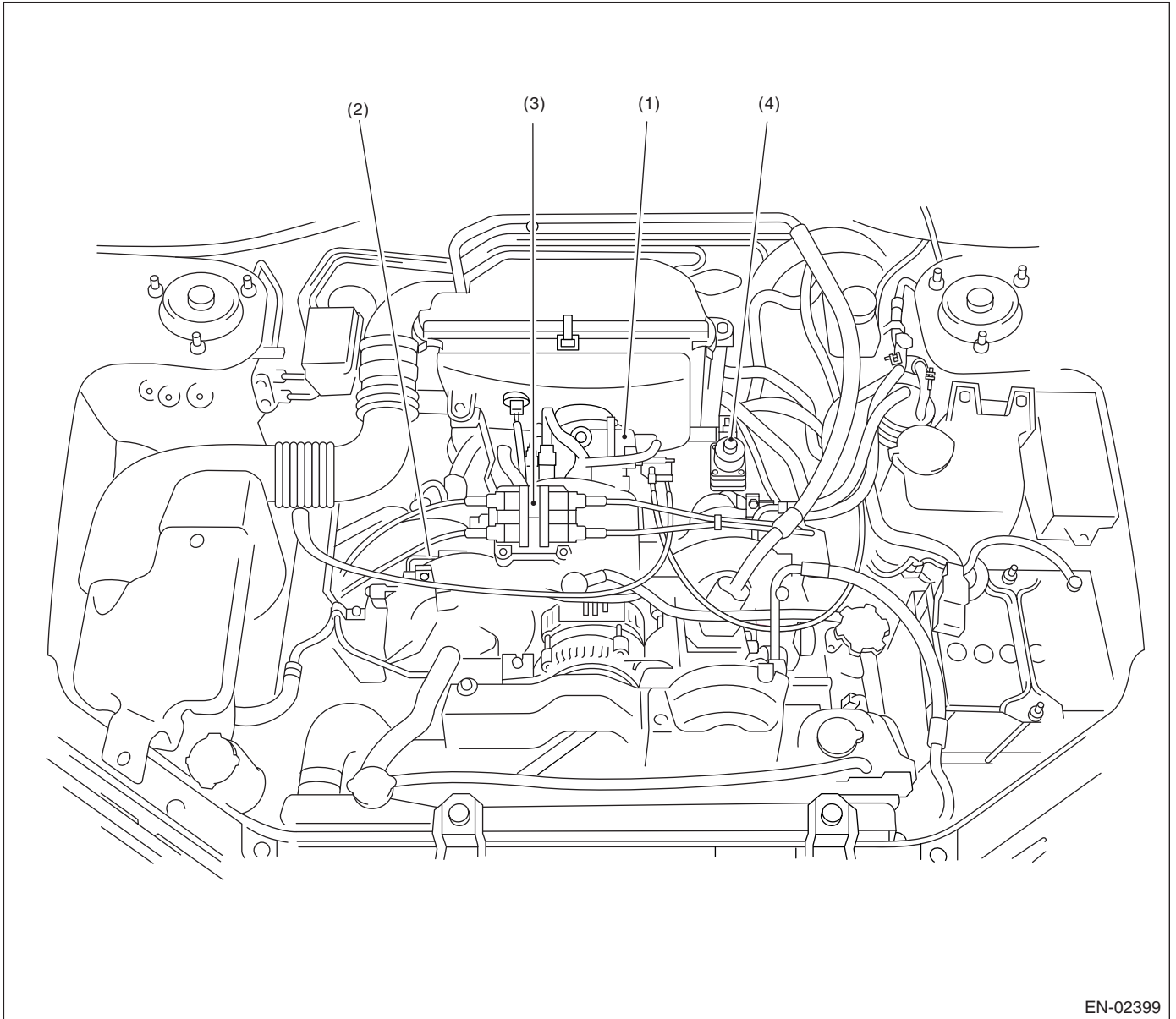


EN-00246

# Electrical Component Location

ENGINE (DIAGNOSTIC)

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

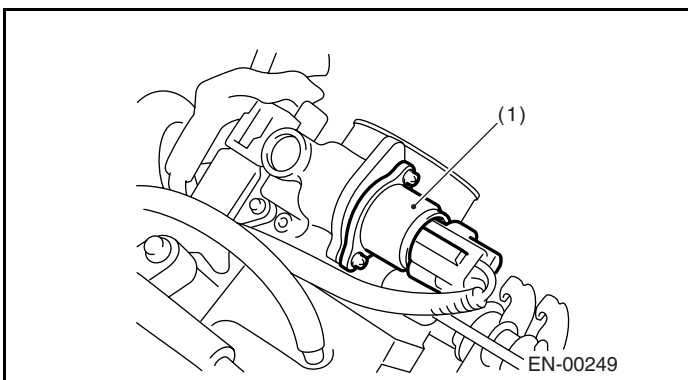


EN-02399

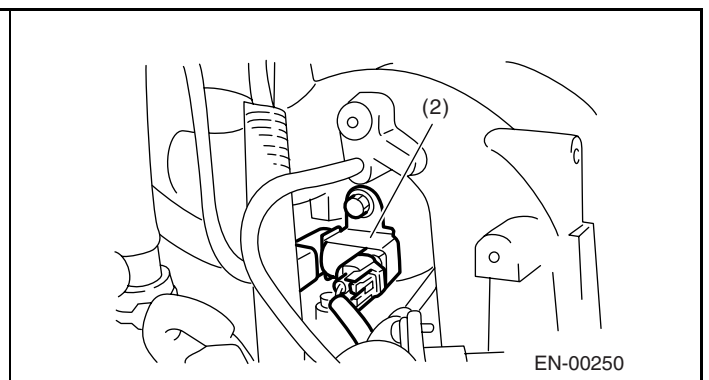
- (1) Idle air control solenoid valve
- (2) Purge control solenoid valve

- (3) Ignition coil & ignitor ASSY

- (4) EGR Valve



EN-00249

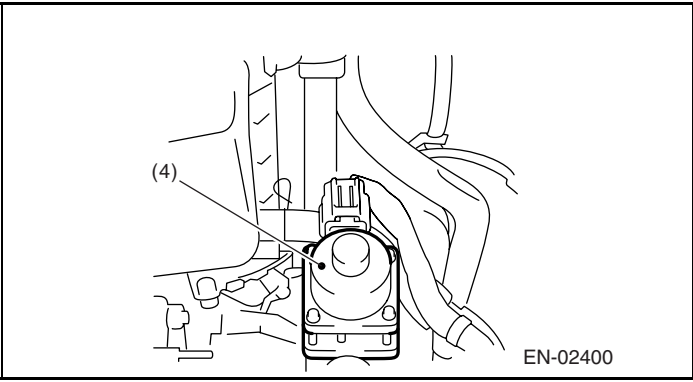
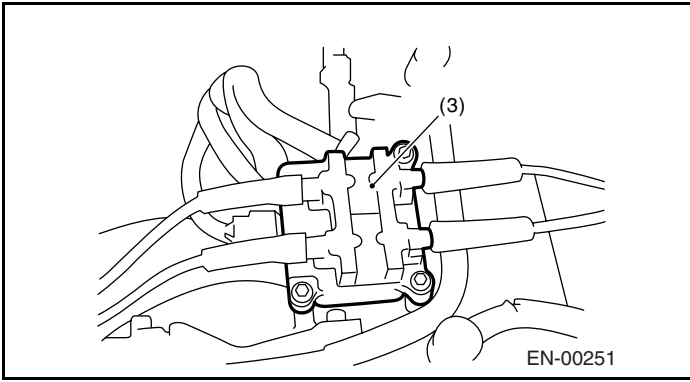


EN-00250

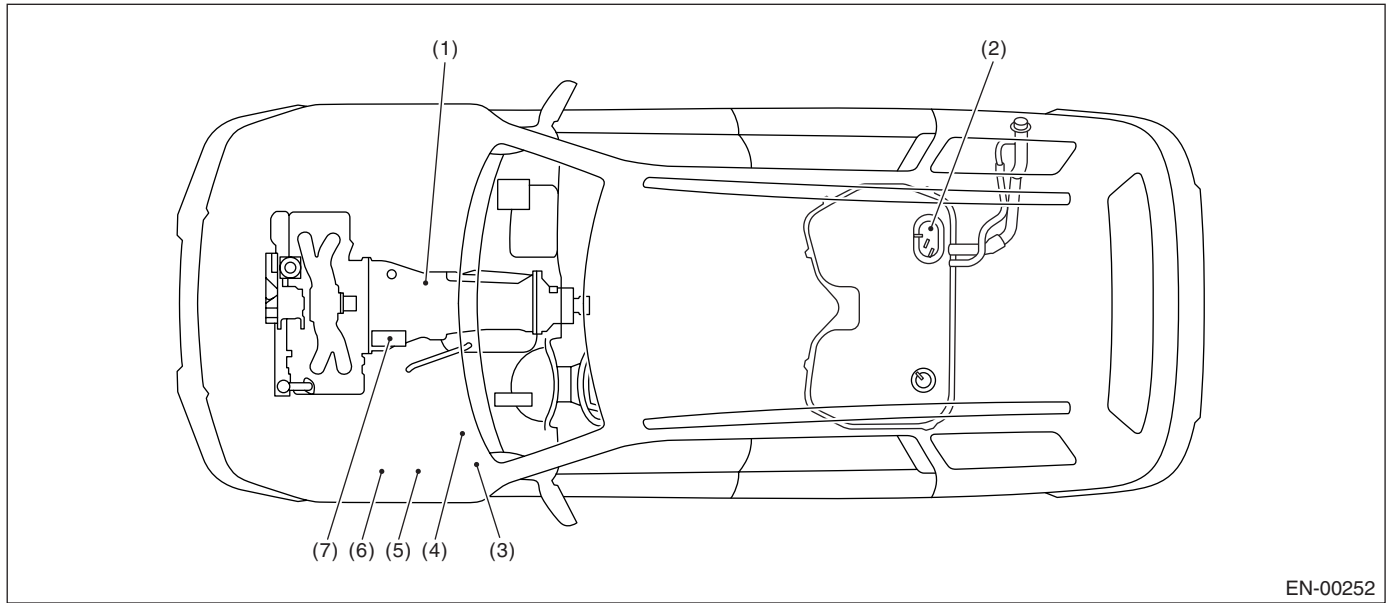


# Electrical Component Location

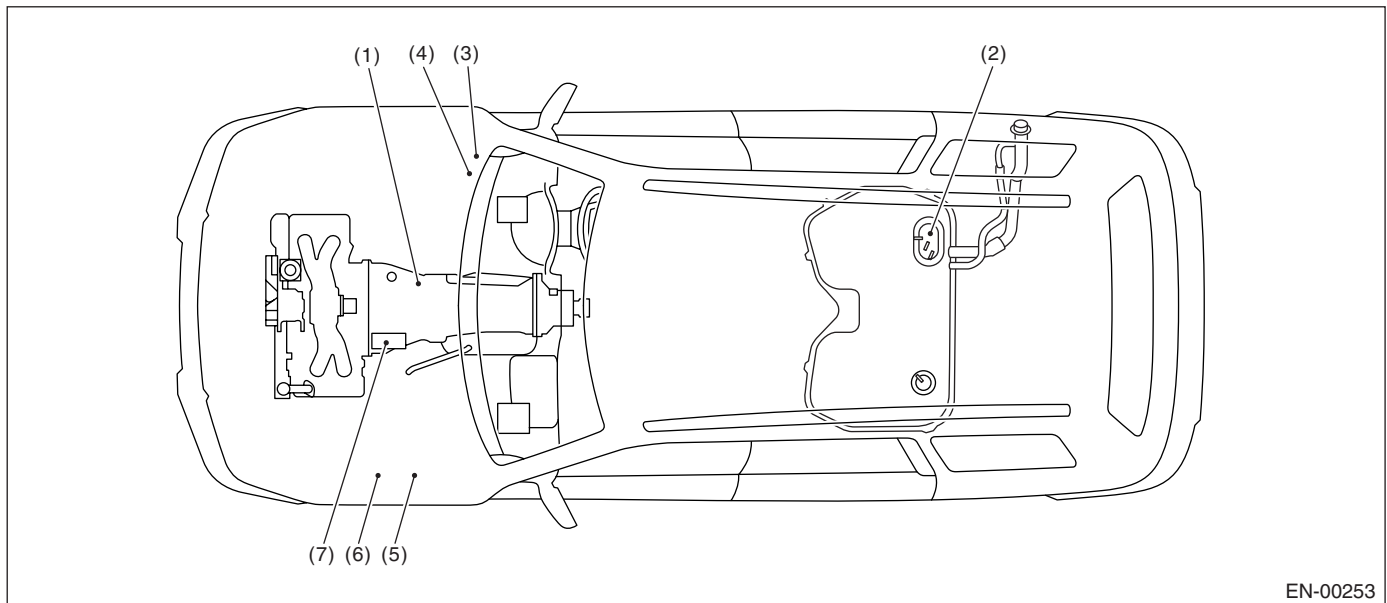
ENGINE (DIAGNOSTIC)



• LHD MODEL



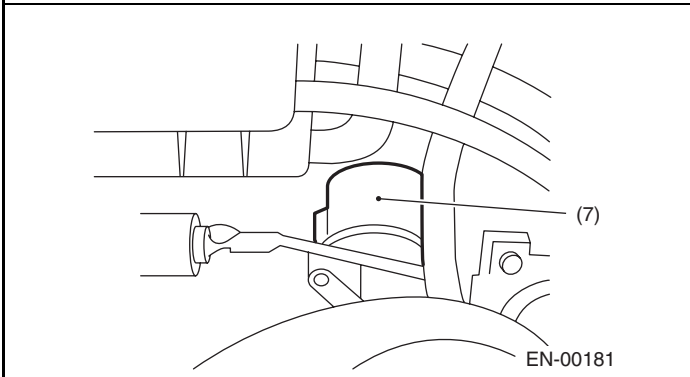
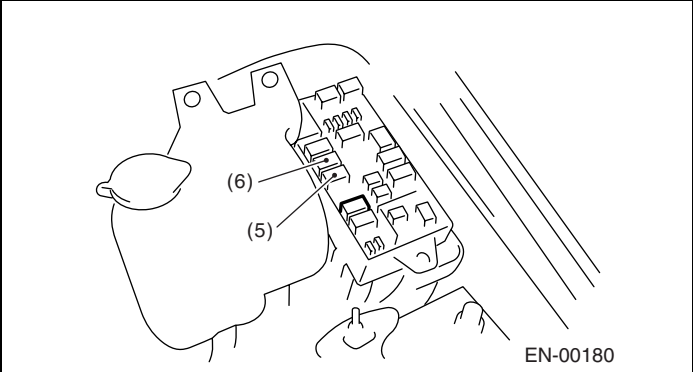
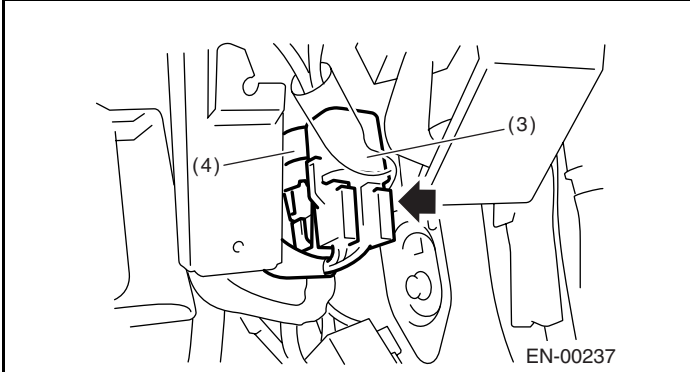
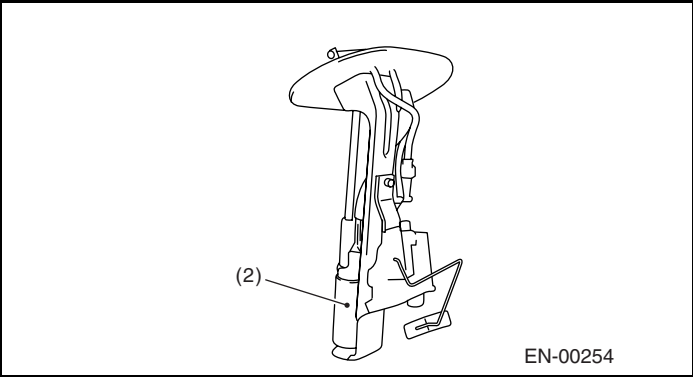
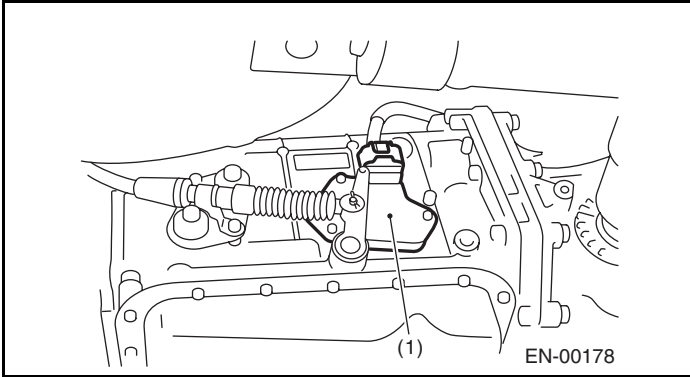
• RHD MODEL



- |                      |                             |             |
|----------------------|-----------------------------|-------------|
| (1) Inhibitor switch | (4) Fuel pump relay         | (7) Starter |
| (2) Fuel pump        | (5) Radiator main fan relay |             |
| (3) Main relay       | (6) Radiator sub fan relay  |             |

# Electrical Component Location

ENGINE (DIAGNOSTIC)

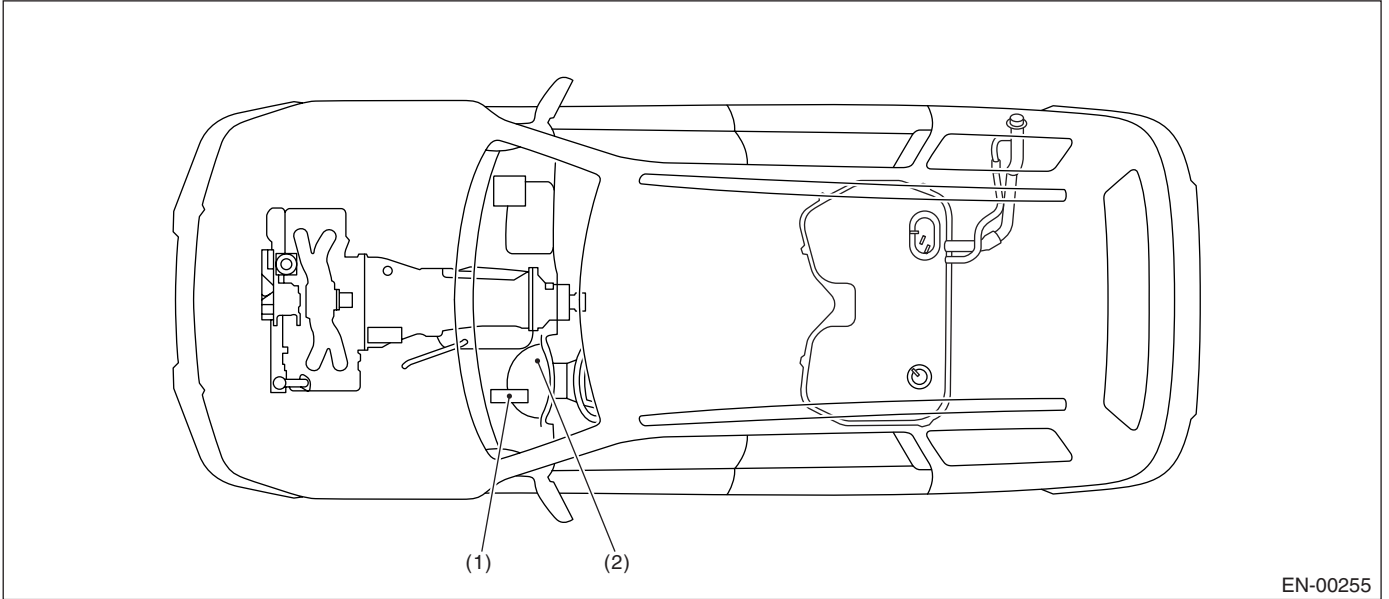


# Electrical Component Location

ENGINE (DIAGNOSTIC)

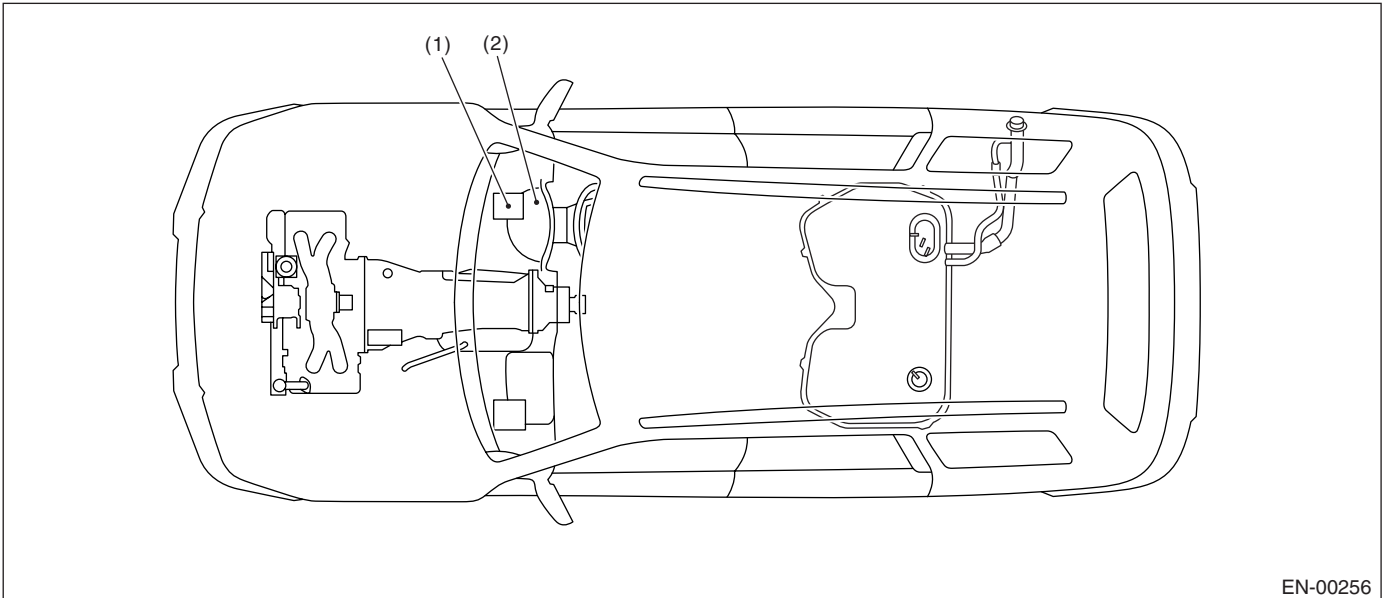
## 2. TRANSMISSION

- CONTROL MODULE
- LHD MODEL



EN-00255

- RHD MODEL



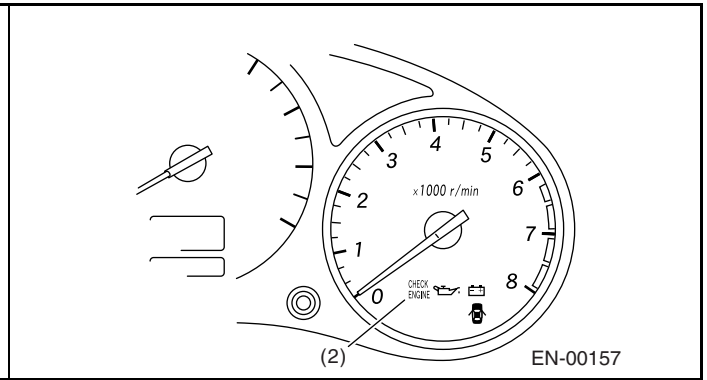
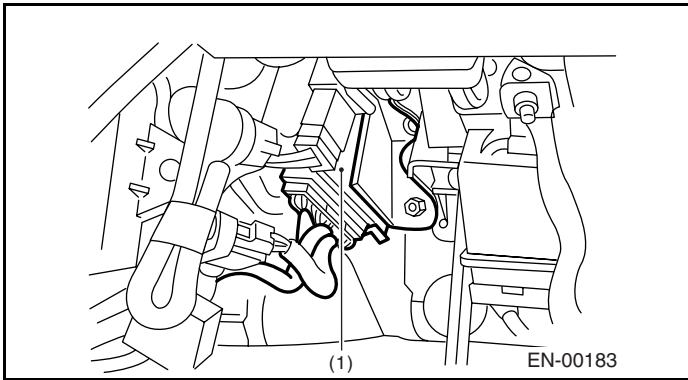
EN-00256

(1) Transmission control module (TCM) (AT model)

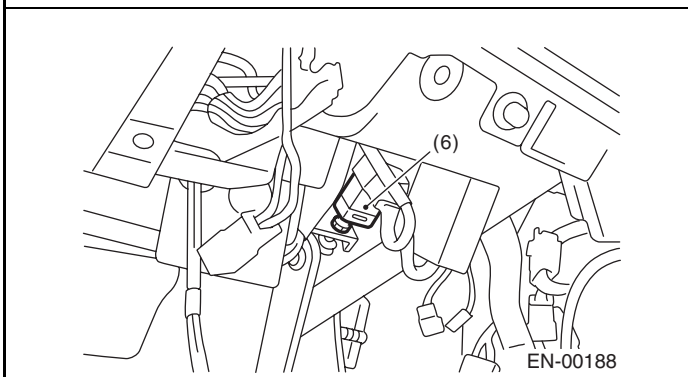
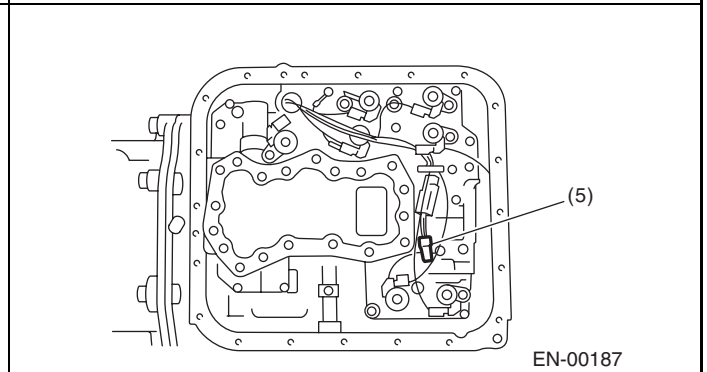
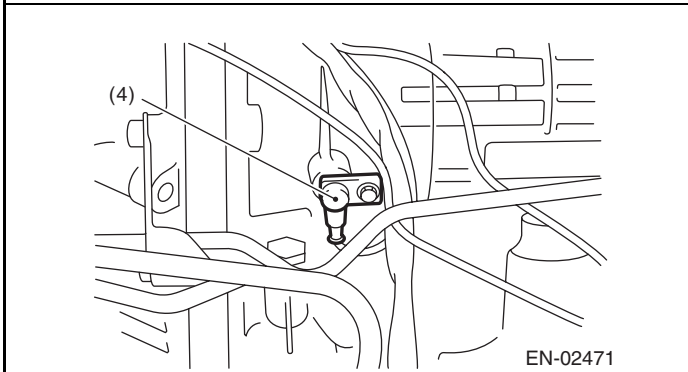
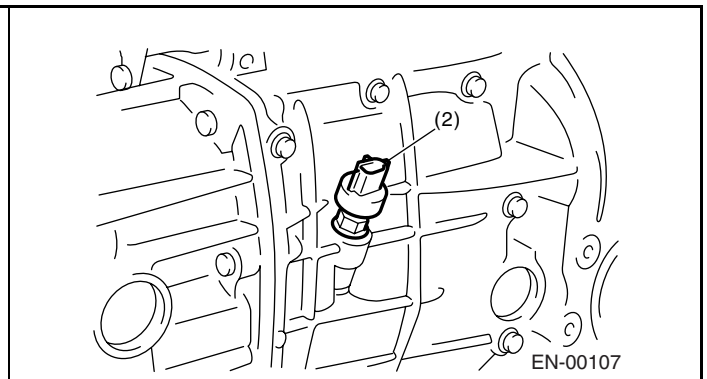
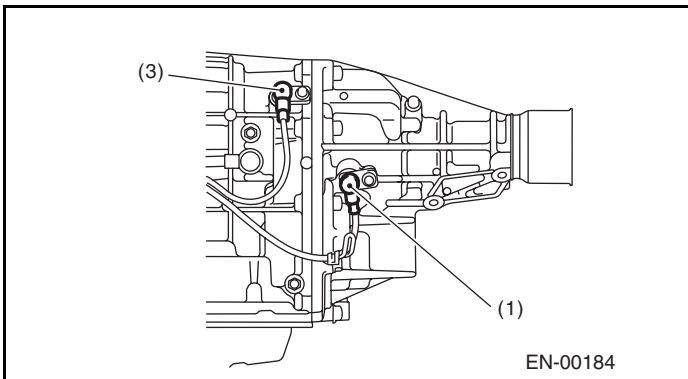
(2) AT diagnostic indicator light (AT model)

# Electrical Component Location

ENGINE (DIAGNOSTIC)



## • SENSOR



- (1) Rear vehicle speed sensor (AT model)
- (2) Front vehicle speed sensor (MT model)

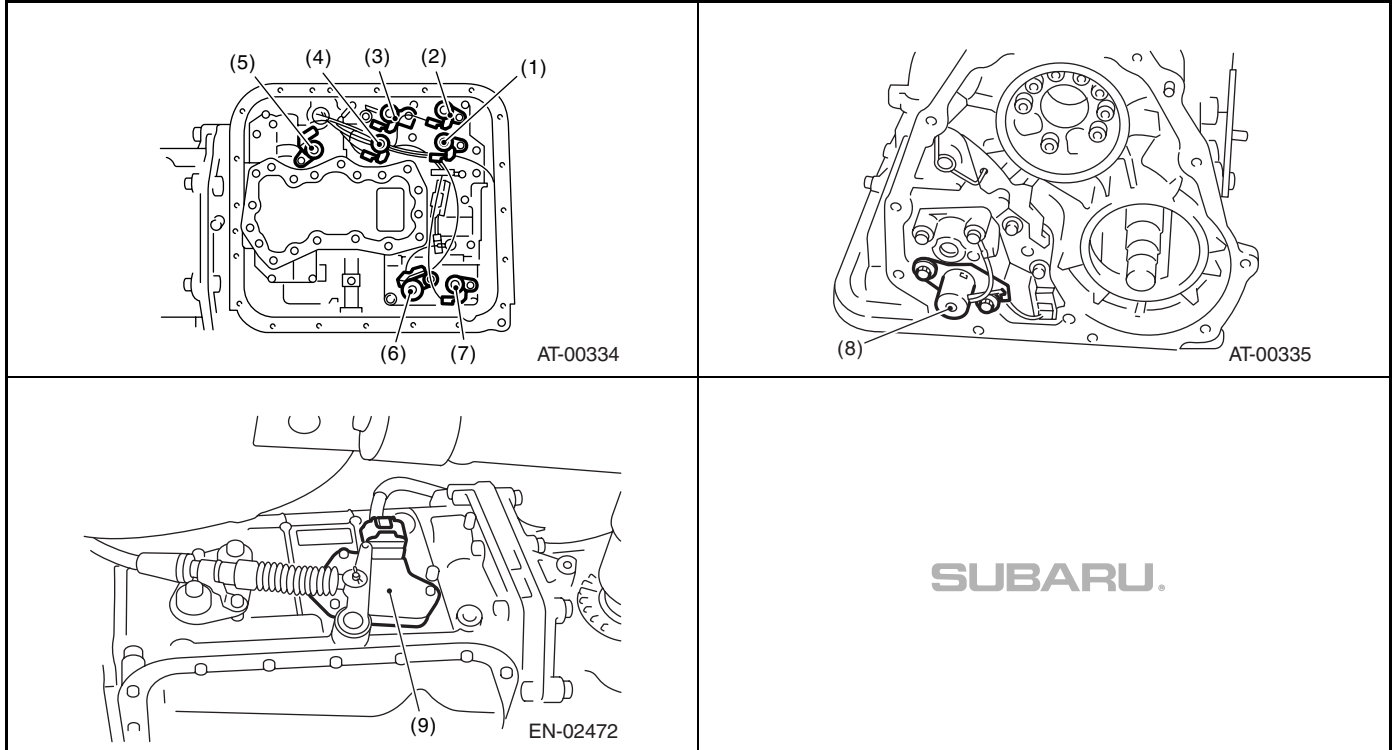
- (3) Front vehicle speed sensor (AT model)
- (4) Torque converter turbine speed sensor

- (5) ATF temperature sensor (AT model)
- (6) Brake light switch

# Electrical Component Location

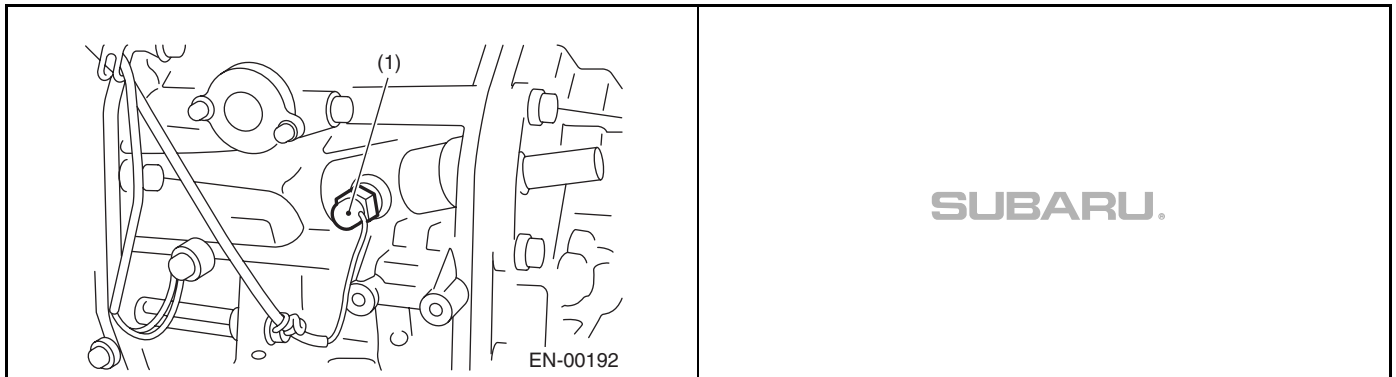
ENGINE (DIAGNOSTIC)

## • SOLENOID VALVE & SWITCH (AT model)



- |                                 |                                |                               |
|---------------------------------|--------------------------------|-------------------------------|
| (1) Shift solenoid valve 1      | (4) Low clutch timing solenoid | (7) 2-4 brake timing solenoid |
| (2) Shift solenoid valve 2      | (5) Lock-up duty solenoid      | (8) Transfer duty solenoid    |
| (3) Line pressure duty solenoid | (6) 2-4 brake duty solenoid    | (9) Inhibitor switch          |

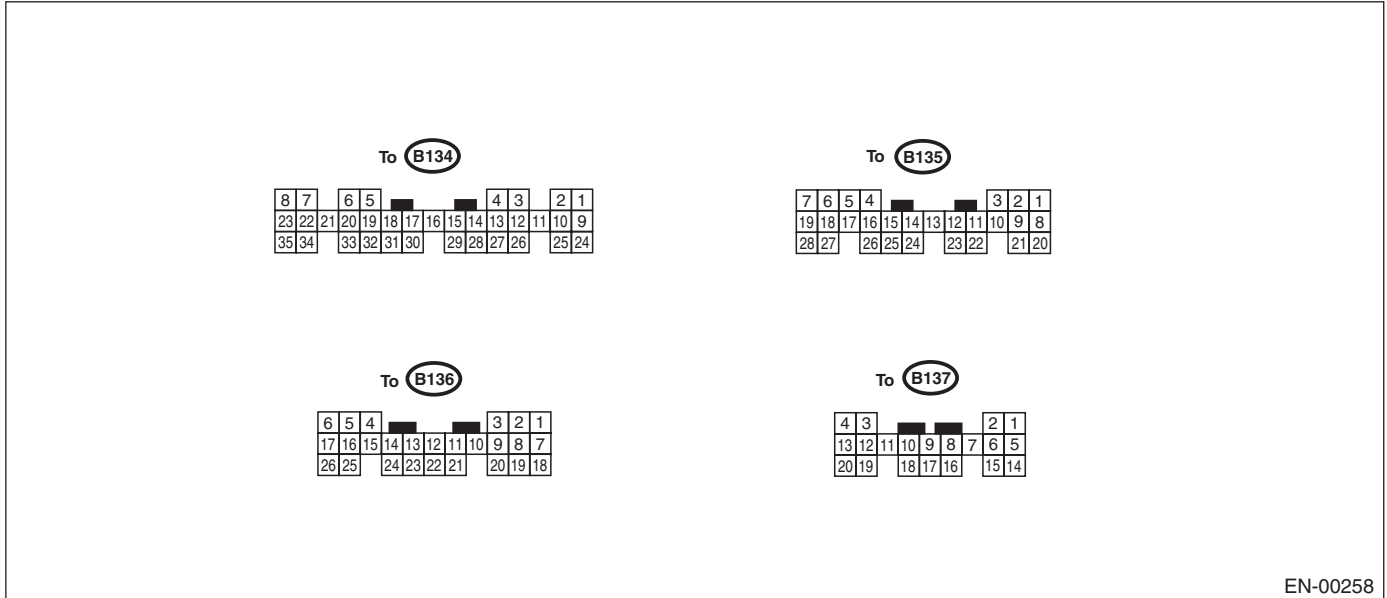
## • SOLENOID VALVE & SWITCH (MT model)



- (1) Neutral position switch

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

### A: ELECTRICAL SPECIFICATION



EN-00258

DESCRIPTION		Connector No.	Terminal No.	Signal (V)		NOTE
				Ignition SW ON (engine OFF)	Engine ON (Idling)	
Crank- shaft position sensor	Signal (+)	B135	6	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	17	0	0	—
	Shield	B135	28	0	0	—
Camshaft position sensor	Signal (+)	B135	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	18	0	0	—
	Shield	B135	28	0	0	—
Throttle position sensor	Signal	B135	13	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B135	3	5	5	—
	GND (sensor)	B135	19	0	0	—
Rear oxy- gen sensor	Signal	B135	14	0	0 — 0.9	—
	Shield	B137	15	0	0	—
	GND (sensor)	B135	19	0	0	—
Front oxy- gen (A/F) sensor heater	Signal 1	B136	13	0 — 1.0	0 — 1.0	—
	Signal 2	B136	22	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B136	4	0 — 1.0	0 — 1.0	—
Engine coolant tempera- ture sen- sor	Signal	B135	12	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.
	GND (sensor)	B135	19	0	0	After engine is warmed-up.
Vehicle speed signal		B137	10	0 or 5	0 or 5	“5” and “0” are repeatedly displayed when vehicle is driven.
Starter switch		B136	20	0	0	Cranking: 8 — 14

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

ENGINE (DIAGNOSTIC)

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE	
			Ignition SW ON (engine OFF)	Engine ON (Idling)		
A/C switch	B136	11	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—	
Ignition switch	B136	10	10 — 13	12 — 14	—	
Neutral Position Switch	MT	B136	ON: 12±0.5 OFF: 0		Switch is ON when gear is in neutral position.	
	AT	B136	ON: 0 OFF: 12±0.5		Switch is ON when shifted into "P" or "N" range.	
Test Mode Connector	B136	3	5	5	When connected: 0	
Knock sensor	Signal	B135	16	2.8	2.8	—
	Shield	B135	27	0	0	—
Back-up power supply	B135	9	10 — 13	12 — 14	Ignition switch "OFF": 10 — 13	
Control module power supply	B135	1	10 — 13	12 — 14	—	
	B135	2	10 — 13	12 — 14	—	
Sensor power supply	B135	3	5	5	—	
Ignition control	#1, #2	B134	33	0	1 — 3.4	Waveform
	#3, #4	B134	32	0	1 — 3.4	Waveform
Fuel injector	#1	B134	34	10 — 13	1 — 14	Waveform
	#2	B134	23	10 — 13	1 — 14	Waveform
	#3	B134	22	10 — 13	1 — 14	Waveform
	#4	B134	8	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	Signal 1	B134	20	—	1 — 13	Waveform
	Signal 2	B134	6	—	1 — 13	Waveform
	Signal 3	B134	5	—	1 — 13	Waveform
	Signal 4	B134	19	—	1 — 13	Waveform
	Power supply	B135	2	10 — 13	12 — 14	—
Fuel pump relay control	B134	2	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—	
A/C relay control	B134	9	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 12 — 14	—	
Heater cock solenoid	B134	11	10 — 13	12 — 14	—	
Radiator fan relay 1 control	B134	14	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 12 — 14	—	
Radiator fan relay 2 control	B134	13	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 12 — 14	Model with A/C	
Self-shutoff control	B136	12	10 — 13	12 — 14	—	
Malfunction indicator light	B134	28	—	—	Light "ON": 1, or less Light "OFF": 10 — 14	
Engine speed output	B134	10	—	0 — 13, or more	Waveform	
Torque control 1 signal	B136	1	5	5	—	
Torque control 2 signal	B136	18	5	5	—	
Torque control cut signal	B136	15	8	8	—	
Purge control solenoid valve	B134	29	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 12 — 14	—	
Fuel level sensor	B135	25	0.12 — 4.75	0.12 — 4.75	—	
EGR valve	Signal 1	B134	18	0 or 10 — 13	0 or 10 — 13	—
	Signal 2	B134	17	0 or 10 — 13	0 or 10 — 13	—
	Signal 3	B134	16	0 or 10 — 13	0 or 10 — 13	—
	Signal 4	B134	15	0 or 10 — 13	0 or 10 — 13	—
AT diagnosis input signal	B137	19	Less than 1 ←→ More than 4	Less than 1 ←→ More than 4	Waveform	

# Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTIC)

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE
			Ignition SW ON (engine OFF)	Engine ON (Idling)	
Small light switch	B137	20	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Blower fan switch	B137	13	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Rear defogger switch	B137	4	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Front oxygen (A/F) sensor signal 1	B136	13	—	2.05 — 2.25	—
Front oxygen (A/F) sensor signal 2	B136	22	—	1.75 — 1.95	—
Manifold absolute pressure sensor	B135	15	4.0 — 4.8	1.1 — 1.9	—
Intake air temperature sensor	B137	6	3.15 — 3.33	3.15 — 3.33	Intake air temperature: 25°C (75°F)
SSM/GST communication line	B137	16	Less than 1↔ More than 4	Less than 1↔ More than 4	—
GND (sensor)	B136	19	0	0	—
GND (injector)	B134	35	0	0	—
GND (ignition system)	B136	26	0	0	—
GND (power supply)	B134	7	0	0	—
GND (control system)	B137	14	0	0	—
	B135	21	0	0	—
GND (oxygen sensor heater 1)	B136	5	0	0	—
GND (oxygen sensor heater 2)	B136	16	0	0	—



# Engine Condition Data

ENGINE (DIAGNOSTIC)

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## 6. Engine Condition Data

### A: ELECTRICAL SPECIFICATION

Remarks	Specification
Engine load	1.6 — 2.9 (%): Idling
	6.4 — 12.8 (%): 2,500 rpm Racing

Measuring condition:

- After engine is warmed-up.
- Gear position is in “N” or “P” range.
- Turn off the A/C.
- Turn all accessory switches to OFF.

### 7. Transmission Control Module (TCM) I/O Signal

#### A: ELECTRICAL SPECIFICATION

For the electrical specification of TCM I/O signal, refer to 4AT(H4SO) section. <Ref. to 4AT(H4SO)-12, ELECTRICAL SPECIFICATION, Transmission Control Module (TCM) I/O Signal.>

# Data Link Connector

ENGINE (DIAGNOSTIC)

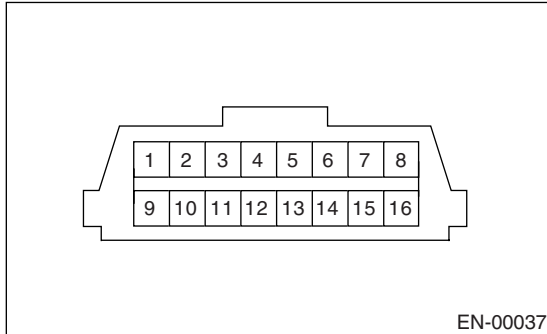
## 8. Data Link Connector

### A: NOTE

- This connector is used both for the Subaru Select Monitor and OBD-II general scan tools.
- Terminal No. 4 to No. 6 of the data link connector is used for the Subaru Select Monitor signal.

### CAUTION:

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



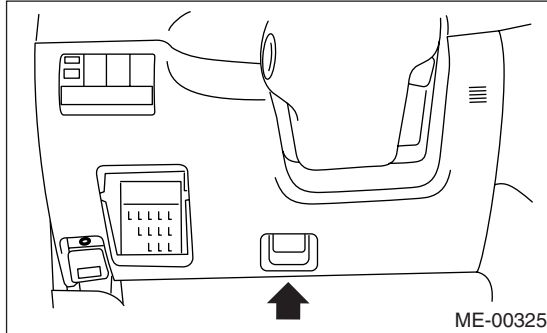
Terminal No.	Remarks	Terminal No.	Remarks
1	Power supply	9	Empty
2	Empty	10	K line of ISO 9141 CARB
3	Empty	11	Empty
4	Empty	12	Ground
5	Empty	13	Ground
6	Line end check signal	14	Empty
7	Empty	15	Empty
8	Empty	16	Empty

## 9. OBD-II General Scan Tool

### A: OPERATION

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

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



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

OBD-II general scan tool functions consist of:

- (1) MODE \$01: Current powertrain diagnostic data
- (2) MODE \$02: Powertrain freeze frame data
- (3) MODE \$03: Emission-related powertrain DTC
- (4) MODE \$04: Clear/Reset emission-related diagnostic information

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

**NOTE:**

For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

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

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

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

PID	Data	Unit of measure
01	Number of emission-related powertrain DTC and malfunction indicator light status	ON/OFF
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	°
10	Air flow rate of manifold absolute pressure sensor	g/sec
11	Throttle valve opening angle	%
13	Check whether oxygen sensor is installed.	—
14	Oxygen sensor output voltage and short term fuel trim — bank 1 associated with oxygen sensor	V and%
15	Oxygen sensor output voltage and short term fuel trim — bank 2 associated with oxygen sensor	V and %
1C	On-board diagnostic system	—

**NOTE:**

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

# OBD-II General Scan Tool

ENGINE (DIAGNOSTIC)

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

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

PID	Data	Unit of measure
02	DTC that caused CARB required freeze frame data storage	—
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine speed	rpm
0D	Vehicle speed	km/h

NOTE:

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

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. <Ref. to EN(H4SO)-36, Read Diagnostic Trouble Code (DTC).>

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

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

NOTE:

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

## 10. Subaru Select Monitor

### A: OPERATION

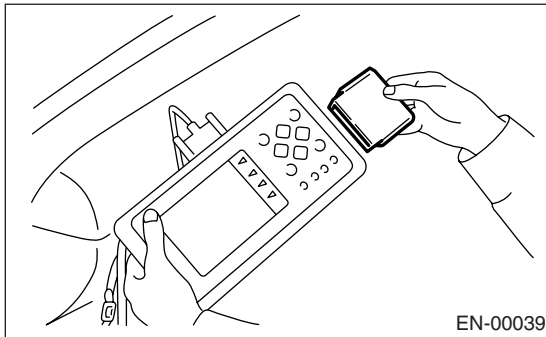
#### 1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)-8, PREPARATION TOOL, General Description.>



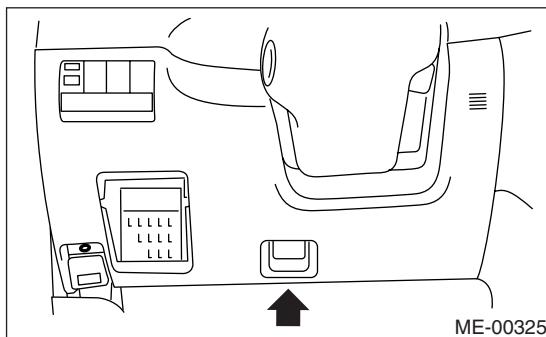
2) Connect the diagnosis cable to Subaru Select Monitor.

3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4SO)-8, PREPARATION TOOL, General Description.>



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

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

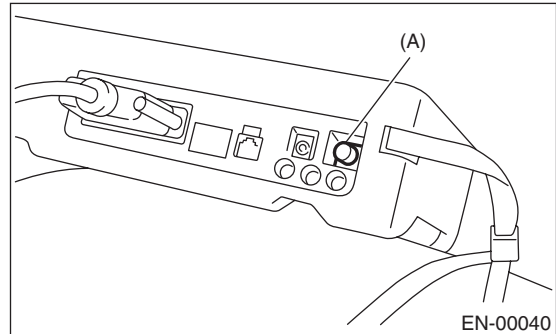


(2) Connect the diagnosis cable to data link connector.

#### CAUTION:

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

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



(A) Power switch

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

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to indicate DTC. <Ref. to EN(H4SO)-36, Read Diagnostic Trouble Code (DTC).>

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to indicate DTC. <Ref. to EN(H4SO)-36, Read Diagnostic Trouble Code (DTC).>

# Subaru Select Monitor

## ENGINE (DIAGNOSTIC)

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

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Engine} and press the [YES] key.
  - 3) Press the [YES] key after the information of engine type was displayed.
  - 4) On the «Engine Diagnosis» display screen, select the {Current Data Display/Save}, and then press the [YES] key.
  - 5) On the «Data Display Menu» display screen, select the {Data Display} and press the [YES] key.
  - 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.

Description	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed signal	Meter vehicle speed	km/h or MPH
Engine speed signal	Engine speed	rpm
Engine coolant temperature signal	Engine coolant temperature	°C or (°F)
Ignition timing signal	Ignition timing	deg
Throttle position signal	Amount of intake air	%
Throttle position signal	Throttle Sensor Voltage	V
Injection pulse width	Fuel injection pulse width	ms
Idle air control signal	ISC Steps	STEP
Engine load data	Engine load	%
Front oxygen (A/F) sensor resistance	A/F sensor resistance value 1	ohm
Front oxygen (A/F) sensor output signal	A/F sensor current value 1	—
Rear oxygen sensor output signal	Rear oxygen sensor voltage value	V
Short term fuel trim	A/F Compensation 1	%
Knock sensor signal	Knock Correction	deg
Atmospheric absolute pressure signal	Atmospheric pressure	mmHg, kPa, inHg or psi
Intake manifold relative pressure signal	Mani. Relative Pressure	mmHg, kPa, inHg or psi
Intake manifold absolute pressure signal	Intake manifold absolute pressure	mmHg, kPa, inHg or psi
A/F correction (short term fuel trim) by rear oxygen sensor	A/F Compensation 3	%
Long term whole fuel trim	A/F learning 1	%
Front oxygen (A/F) sensor heater current	Front O2 heater current value	A
Rear oxygen sensor heater current	Rear O2 heater current value	A
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Fuel level signal	Fuel level voltage	V
Intake air temperature signal	Intake air temperature	°C or (°F)
Learned ignition timing	Ignition learning value	deg
EGR signal	EGR Steps	STEP
Ignition switch signal	Ignition SW	ON or OFF
Test mode connector signal	Test mode signal	ON or OFF
Neutral position switch signal	Neutral SW	ON or OFF
Air conditioning switch signal	A/C SW	ON or OFF
Air conditioning compressor signal	A/C Compressor Signal	ON or OFF
Radiator main fan relay signal	Radiator fan relay 1	ON or OFF
Fuel pump relay signal	Fuel pump relay	ON or OFF
Knocking signal	Knock signal	ON or OFF
Radiator sub fan relay signal	Radiator fan relay 2	ON or OFF
Power steering switch signal	Power steering SW input signal	ON or OFF
Engine torque control signal #1	AT coordinate request signal 1	ON or OFF
Engine torque control signal #2	AT coordinate request signal 2	ON or OFF

# Subaru Select Monitor

ENGINE (DIAGNOSTIC)

Description	Display	Unit of measure
Engine torque control permission signal	AT coordinate permission signal	ON or OFF
Rear oxygen sensor rich signal	Rear O2 monitor	ON or OFF
Starter switch signal	Starter SW	ON or OFF
Idle switch signal	Soft idle SW	ON or OFF
Crankshaft position sensor signal	Crankshaft position signal	ON or OFF
Camshaft position sensor signal	Camshaft position signal	ON or OFF
Rear defogger switch signal	Rear defogger SW	ON or OFF
Blower fan switch signal	Blower fan SW	ON or OFF
Small light switch signal	Light SW	ON or OFF
AT vehicle ID signal	AT/MT identification terminal	AT or MT
A/C middle pressure switch signal	A/C middle pressure SW	ON or OFF

**NOTE:**

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



# Subaru Select Monitor

## ENGINE (DIAGNOSTIC)

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

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Engine} and press the [YES] key.
  - 3) Press the [YES] key after the information of engine type was displayed.
  - 4) On the «Engine Diagnosis» display screen, select the {OBD system} and press the [YES] key.
  - 5) On the «OBD Menu» display screen, select the {Current Data Display & Save}, and press the [YES] key.
  - 6) On the «Data Display Menu» display screen, select the {Data Display} and press the [YES] key.
  - 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.

Description	Display	Unit of measure
Number of DTC	Number of diagnosis code	—
Condition of malfunction indicator light	MI (MIL)	ON or OFF
Monitoring test of misfire	Misfire Monitoring	Complete or incomplete
Monitoring test of fuel system	Fuel System Diagnosis	Complete or incomplete
Monitoring test of comprehensive component	Component Diagnosis	Complete or incomplete
Test of catalyst	Catalyst diagnosis	Complete or incomplete
Test of heating-type catalyst	Heated catalyst diagnosis	No support
Test of evaporative emission purge control system	Evap. purge diagnosis	Complete or incomplete
Test of secondary air system	Secondary air diagnosis	No support
Test of air conditioning system refrigerant	A/C refrigerant diagnosis	No support
Test of oxygen sensor	O2 sensor diagnosis	Complete or incomplete
Test of oxygen sensor heater	O2 heater diagnosis	Complete or incomplete
Test of EGR system	EGR diagnosis	—
Air fuel ratio control system for bank 1	Fuel System for bank 1	—
Engine load data	Engine load	%
Engine coolant temperature signal	Engine coolant temperature	°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	Intake manifold absolute pressure	mmHg, kPa, inHg or psi
Engine speed signal	Engine speed	rpm
Vehicle speed signal	Meter vehicle speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition timing adv. #1	°
Intake air temperature signal	Intake air temperature	°C or (°F)
Amount of intake air	Amount of intake air	g/s
Throttle position signal	Throttle valve angle	%
Rear oxygen sensor output signal	O2 sensor #12	V
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%
On-board diagnostic system	OBD system	—
Oxygen sensor #11	O2 sensor #11	With support
Oxygen sensor #12	O2 sensor #12	With support
A/F sensor #11	A/F sensor #11	—

#### NOTE:

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

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

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

Description	Display	Unit of measure
DTC of freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank 1	ON or OFF
Engine load data	Engine load	%
Engine coolant temperature signal	Engine coolant temperature	°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	Intake manifold absolute pressure	mmHg, kPa, inHg or psi
Engine speed signal	Engine speed	rpm
Vehicle speed signal	Meter vehicle speed	km/h or MPH

**NOTE:**

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

# Subaru Select Monitor

## ENGINE (DIAGNOSTIC)

### 7. LED OPERATION MODE FOR ENGINE

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Engine} and press the [YES] key.
  - 3) Press the [YES] key after the information of engine type was displayed.
  - 4) On the «Engine Diagnosis» display screen, select the {Current Data Display/Save}, and then press the [YES] key.
  - 5) On the «Data Display Menu» display screen, select the {Data & LED Display} and press the [YES] key.
  - 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.

Description	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition SW	ON or OFF	When ignition switch is ON
Test mode connector signal	Test mode signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral SW	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C SW	ON or OFF	When air conditioning switch is ON
Air conditioning relay signal	A/C Compressor Relay	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator fan relay 1	ON or OFF	When radiator main fan relay is in function.
Fuel pump relay signal	Fuel pump relay	ON or OFF	When fuel pump relay is in function.
Knocking signal	Knock signal	ON or OFF	When knocking signal is input.
Radiator sub fan relay signal	Radiator fan relay 2	ON or OFF	When radiator sub fan relay is in function.
Engine torque control signal #1	AT coordinate request signal 1	ON or OFF	When engine torque control signal 1 is entered
Engine torque control signal #2	AT coordinate request signal 2	ON or OFF	When engine torque control signal 2 is entered
Engine torque control permission signal	AT coordinate permission signal	ON or OFF	When engine torque control permission signal is entered.
Front oxygen (A/F) sensor rich signal	Front O2 Rich Signal #1	ON or OFF	When front oxygen (A/F) sensor mixture ratio is rich.
Rear oxygen sensor rich signal	RrO2 monitor	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Starter switch signal	Starter SW	ON or OFF	When starter switch signal is entered.
Idle switch signal	Idle Switch Signal	ON or OFF	When idle switch signal is entered.
Crankshaft position sensor signal	Crankshaft position signal	ON or OFF	When crankshaft position sensor signal is input.
Camshaft position sensor signal	Camshaft position signal	ON or OFF	When camshaft position sensor signal is entered.

**NOTE:**

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

## 8. READ CURRENT DATA FOR AT

- 1) On the «Main Menu» display screen, select the {Each System Check} and press the [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Transmission} and press the [YES] key.
  - 3) Press the [YES] key after the information of transmission type is displayed.
  - 4) On the «Transmission Diagnosis» display screen, select the {Current Data Display & Save} and press the [YES] key.
  - 5) On the «Transmission Diagnosis» display screen, select the {Data Display} and press the [YES] key.
  - 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.

Description	Display	Unit of measure
Battery voltage	Battery Voltage	V
Rear vehicle speed sensor signal	Rear Wheel Speed	km/h or MPH
Front vehicle speed sensor signal	Front Wheel Speed	km/h or MPH
Engine speed signal	Engine speed	rpm
ATF temperature signal	ATF Temp.	°C or °F
Throttle position sensor	Throttle Sensor Voltage	V
Gear Position	Gear position	—
Line pressure control duty ratio	Line pressure duty	%
Lock up clutch control duty ratio	L/U Duty	%
Transfer clutch control duty ratio	AWD duty	%
Throttle position sensor power supply	Throttle sensor power supply	V
Turbine revolution signal	Turbine Revolution Speed	rpm
2-4 Brake timing pressure control duty ratio	2-4 B Pressure Duty	%
Intake manifold pressure sensor voltage	Mani. Relative Voltage	V
FWD switch signal	FWD SW	ON or OFF
Kick down switch signal	Kick Down Switch	ON or OFF
Stop light switch signal	Stop Light SW	ON or OFF
Anti lock brake system signal	ABS signal	ON or OFF
Cruise control system signal	Cruise Control Signal	ON or OFF
Neutral/Parking range signal	N/P range	ON or OFF
Reverse range signal	R Range	ON or OFF
Drive range signal	D Range	ON or OFF
3rd range signal	3rd Range Signal	ON or OFF
2nd range signal	2nd Range Signal	ON or OFF
1st range signal	1st Range Signal	ON or OFF
Shift control solenoid A	Shift Solenoid #1	ON or OFF
Shift control solenoid B	Shift Solenoid #2	ON or OFF
Torque control output signal #1	Torque control output signal 1	ON or OFF
Torque control output signal #2	Torque control output signal 2	ON or OFF
Torque control cut signal	Torque Control Cut Sig	ON or OFF
2-4 brake timing control solenoid valve	2-4B Timing Solenoid	ON or OFF
Low clutch timing control solenoid valve	L/C timing solenoid	ON or OFF
Automatic transmission diagnosis light output signal	Diagnosis Lamp	ON or OFF

# Read Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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## 11. Read Diagnostic Trouble Code (DTC)

### A: OPERATION

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

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

NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTC, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

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

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

NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTC, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

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

Refers to data denoting emission-related powertrain DTC.

For details concerning DTC, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

NOTE:

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

## 12. Inspection Mode

### A: OPERATION

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

Refer to the item of drive cycle when perform the diagnosis not on the “Diagnosis Trouble Codes (DTC) List” below. <Ref. to EN(H4SO)-42, Drive Cycle.>

DTC	Item
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)
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)
P0068	Manifold Pressure Sensor Range/Performance
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input
P0112	Intake Air Temperature Circuit Low Input
P0113	Intake Air Temperature Circuit High Input
P0117	Engine Coolant Temperature Circuit Low Input
P0118	Engine Coolant Temperature Circuit High Input
P0122	Throttle/Pedal Position Sensor/Switch “A” Circuit Low Input
P0123	Throttle/Pedal Position Sensor/Switch “A” Circuit High Input
P0129	Barometric Pressure Too Low
P0131	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 1)
P0132	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 1)
P0134	O <sub>2</sub> Sensor Circuit No Activity Detected (Bank 1 Sensor 1)
P0137	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 2)
P0138	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 2)
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)
P0335	Crankshaft Position Sensor “A” Circuit
P0336	Crankshaft Position Sensor “A” Circuit Range/Performance
P0340	Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor)
P0341	Camshaft Position Sensor “A” Circuit Range/Performance (Bank 1 or Single Sensor)
P0458	Evaporative Emission Control System Purge Control Valve Circuit Low
P0462	Fuel Level Sensor Circuit Low Input
P0463	Fuel Level Sensor Circuit High Input
P0502	Vehicle Speed Sensor Circuit Low Input
P0503	Vehicle Speed Sensor Intermittent/Erratic/High
P0512	Starter Request Circuit
P0513	Incorrect Immobilizer Key
P0519	Idle Control System Malfunction (Fail-Safe)
P0565	Cruise Control On Signal
P0604	Internal Control Module Random Access Memory (RAM) Error
P0703	Torque Converter/Brake Switch “B” Circuit
P0705	Transmission Range Sensor Circuit (PRNDL Input)
P0710	Transmission Fluid Temperature Sensor Circuit
P0716	Torque converter turbine speed sensor
P0720	AT Vehicle Speed Sensor Circuit Malfunction
P0726	Engine Speed Input Circuit Malfunction
P0731	Gear 1 Incorrect Ratio
P0732	Gear 2 Incorrect Ratio
P0733	Gear 3 Incorrect Ratio

## Inspection Mode

### ENGINE (DIAGNOSTIC)

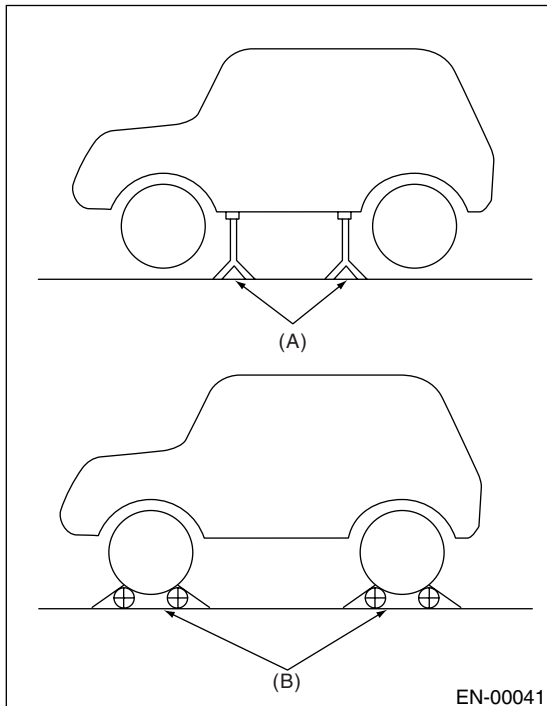
DTC	Item
P0734	Gear 4 Incorrect Ratio
P0741	Torque Converter Clutch Circuit Performance or Stuck Off
P0743	Torque Converter Clutch Circuit Electrical
P0748	Pressure Control Solenoid "A" Electrical
P0753	Shift Solenoid "A" Electrical
P0758	Shift Solenoid "B" Electrical
P0771	Low clutch timing solenoid
P0778	Pressure Control Solenoid "B" Electrical
P0785	Shift/Timing Solenoid
P0851	Neutral Switch Input Circuit Low
P0852	Neutral Switch Input Circuit High
P0864	TCM Communication Circuit Range/Performance
P0865	TCM Communication Circuit Low
P0866	TCM Communication Circuit Low
P1110	Atmospheric Pressure Sensor Circuit Malfunction (Low Input)
P1111	Atmospheric Pressure Sensor Circuit Malfunction (High Input)
P1492	EGR Valve Signal #1 Circuit Malfunction (Low Input)
P1493	EGR Valve Signal #1 Circuit Malfunction (High Input)
P1494	EGR Valve Signal #2 Circuit Malfunction (Low Input)
P1495	EGR Valve Signal #2 Circuit Malfunction (High Input)
P1496	EGR Valve Signal #3 Circuit Malfunction (Low Input)
P1497	EGR Valve Signal #3 Circuit Malfunction (High Input)
P1498	EGR Valve Signal #4 Circuit Malfunction (Low Input)
P1499	EGR Valve Signal #4 Circuit Malfunction (High Input)
P1510	ISC Solenoid Valve Signal #1 Circuit Malfunction (Low Input)
P1511	ISC Solenoid Valve Signal #1 Circuit Malfunction (High Input)
P1512	ISC Solenoid Valve Signal #2 Circuit Malfunction (Low Input)
P1513	ISC Solenoid Valve Signal #2 Circuit Malfunction (High Input)
P1514	ISC Solenoid Valve Signal #3 Circuit Malfunction (Low Input)
P1515	ISC Solenoid Valve Signal #3 Circuit Malfunction (High Input)
P1516	ISC Solenoid Valve Signal #4 Circuit Malfunction (Low Input)
P1517	ISC Solenoid Valve Signal #4 Circuit Malfunction (High Input)
P1518	Starter Switch Circuit Low Input
P1560	Back-Up Voltage Circuit Malfunction
P1570	Antenna
P1571	Reference Code Incompatibility
P1572	EGI — Immobilizer Communication
P1574	Key — Communication Failure
P1576	EGI Control Module EEPROM
P1577	IMM Control Module EEPROM
P1698	Engine Torque Control Cut Signal Circuit Malfunction (Low Input)
P1699	Engine Torque Control Cut Signal Circuit Malfunction (High Input)
P1700	Throttle Position Sensor Circuit Malfunction For AT
P1711	Engine Torque Control Signal #1 Circuit Malfunction
P1712	Engine Torque Control Signal #2 Circuit Malfunction

## 1. PREPARATION FOR THE INSPECTION MODE

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

**WARNING:**

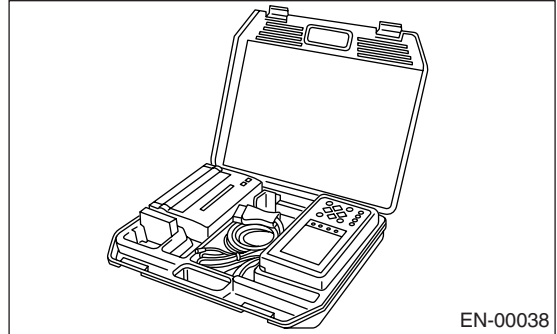
- Before lifting-up the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a rigid rack.
- Secure a rope or wire to the front or rear towing hooks to prevent the lateral runout of front wheels.
- Do not abruptly depress/release clutch pedal or accelerator pedal during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



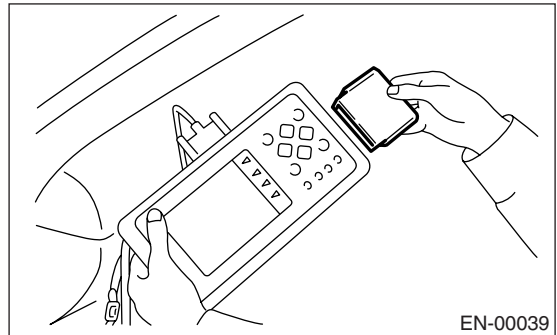
- (A) Rigid rack
- (B) Free rollers

## 2. SUBARU SELECT MONITOR

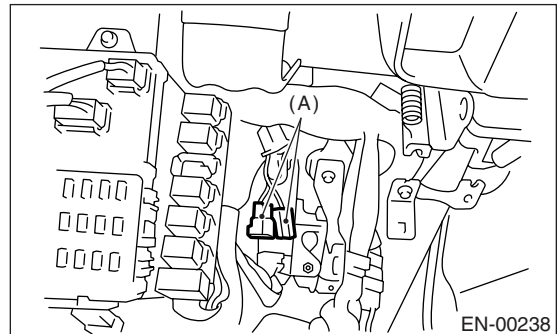
- 1) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)-44, Clear Memory Mode.>
- 2) Idle the engine.
- 3) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)-8, PREPARATION TOOL, General Description.>



- 4) Connect the diagnosis cable to Subaru Select Monitor.
- 5) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4SO)-8, PREPARATION TOOL, General Description.>



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



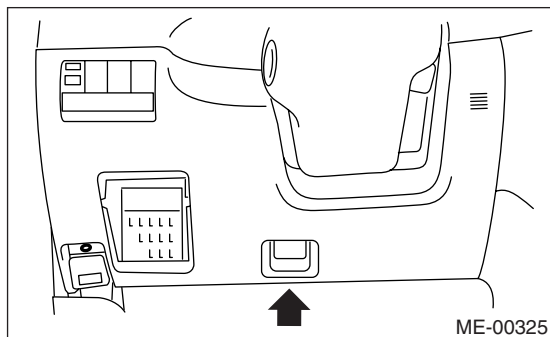


## Inspection Mode

### ENGINE (DIAGNOSTIC)

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

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

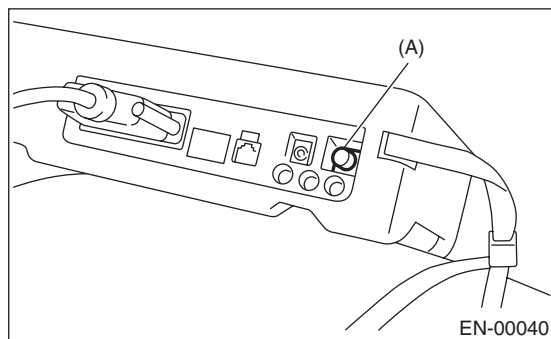


(2) Connect the diagnosis cable to data link connector.

#### CAUTION:

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

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



(A) Power switch

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

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

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

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

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

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

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

#### NOTE:

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

- For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

- Release the parking brake.

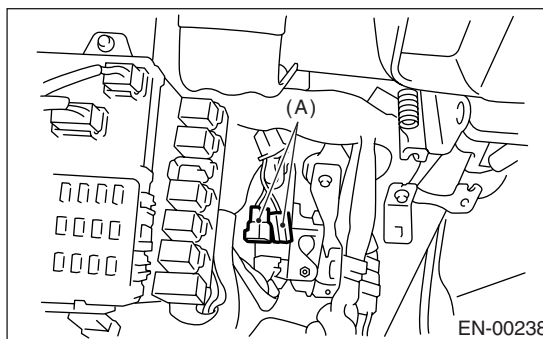
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function.

### 3. OBD-II GENERAL SCAN TOOL

1) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)-44, Clear Memory Mode.>

2) Idle the engine.

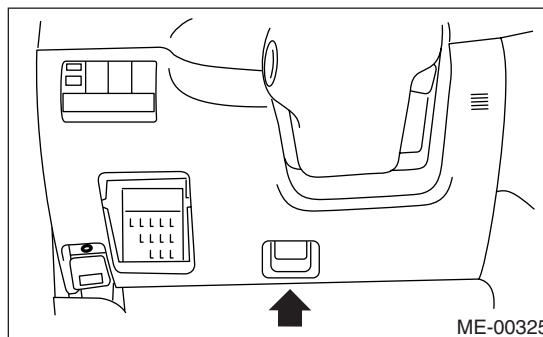
3) Connect the test mode connector (A) located at the lower portion of instrument panel (on the driver's side).



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

#### CAUTION:

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



5) Start the engine.

#### NOTE:

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

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

6) Using the selector lever or shift lever, turn the "P" range switch and the "N" range switch to ON.

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

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

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

**NOTE:**

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

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

**NOTE:**

- For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.
- For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

# Drive Cycle

ENGINE (DIAGNOSTIC)

## 13. Drive Cycle

### A: OPERATION

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

#### 1. PREPARATION FOR DRIVE CYCLE

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

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

2) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4SO)-44, Clear Memory Mode.>

3) Separate the test mode connector.

#### NOTE:

- Be sure to perform the diagnosis after idling from starting the cooled engine except when the engine coolant temperature is specified.
- Perform the diagnosis twice when the DTC is marked with \*. After the completion of first diagnosis, stop the engine and perform the second diagnosis on same condition.

DTC	Item	On condition
*P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	—
*P0111	Intake Air Temperature Sensor Circuit Range/Performance Problem	Engine coolant temperature at start is less than 30°C (86°F)
*P0125	Insufficient coolant temperature for closed loop fuel control	Engine coolant temperature at start is less than 20°C (68°F)
*P0130	O <sub>2</sub> Sensor Circuit (Bank 1 Sensor 1)	—
*P0133	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 1)	—
*P0420	Catalyst System Efficiency Below Threshold (Bank 1)	—
P0459	Evaporative Emission Control System Purge Control Valve Circuit High	—
*P0461	Fuel Level Sensor Circuit Range/Performance	—
*P0464	Fuel Level Sensor Circuit Intermittent	—
*P1137	O <sub>2</sub> Sensor Circuit (Bank 1 Sensor 1)	—

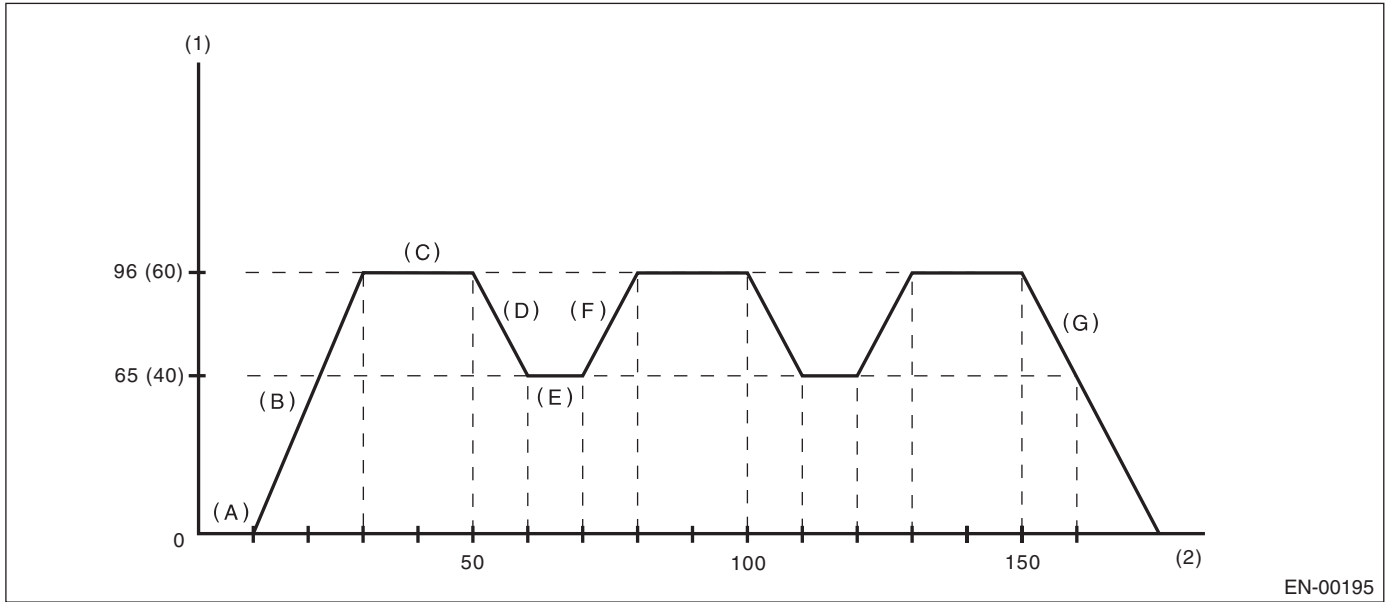
#### 3. 10 MINUTES IDLING

#### NOTE:

Drive the vehicle more than 4 km/h (6 MPH) before diagnosis.

DTC	Item	On condition
*P0483	Cooling Fan Rationality Check	—
*P0506	Idle Control System RPM Lower Than Expected	—
*P0507	Idle Control System RPM Higher Than Expected	—

## 4. DRIVE THE VEHICLE WITH FOLLOWING DRIVE PATTERNS



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

(1) Vehicle speed km/h (MPH)                      (2) Seconds

DTC	Item	On condition
*P0121	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	—
*P0139	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 2)	—
*P0171	System too Lean (Bank 1)	—
*P0172	System too Rich (Bank 1)	—
*P0301	Cylinder 1 Misfire Detected	—
*P0302	Cylinder 2 Misfire Detected	—
*P0303	Cylinder 3 Misfire Detected	—
*P0304	Cylinder 4 Misfire Detected	—
*P0400	Exhaust Gas Recirculation Flow	—

## 14. Clear Memory Mode

### A: OPERATION

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

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

#### NOTE:

- After the memory has been cleared, the idle air control solenoid valve must be initialized. To do this, turn the ignition switch to the ON position. Wait 3 seconds before starting the engine.
- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

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

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

#### NOTE:

- After the memory has been cleared, the idle air control solenoid valve must be initialized. To do this, turn the ignition switch to the ON position. Wait 3 seconds before starting the engine.
- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.

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

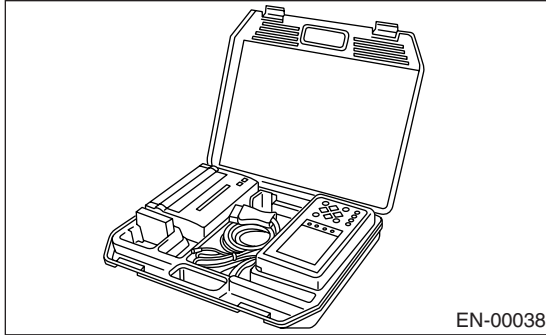
For clear memory procedures using the OBD-II general scan tool, refer to the OBD-II General Scan Tool Instruction Manual.

After the memory has been cleared, the idle air control solenoid valve must be initialized. To do this, turn the ignition switch to the ON position. Wait 3 seconds before starting the engine.

## 15. Compulsory Valve Operation Check Mode

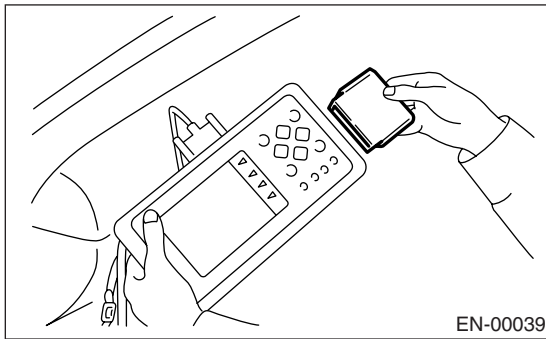
### A: OPERATION

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4SO)-8, PREPARATION TOOL, General Description.>

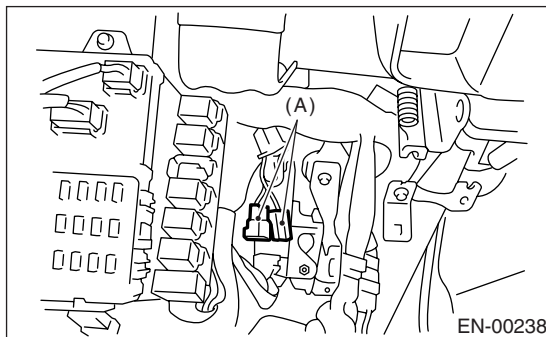


2) Connect the diagnosis cable to Subaru Select Monitor.

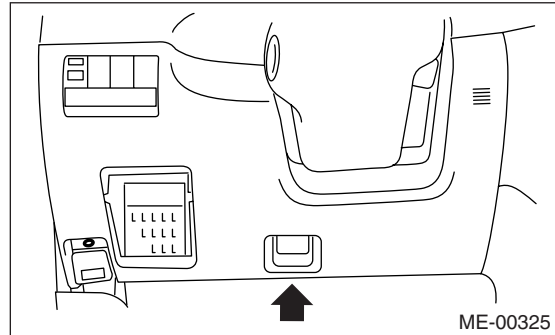
3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4SO)-8, PREPARATION TOOL, General Description.>



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



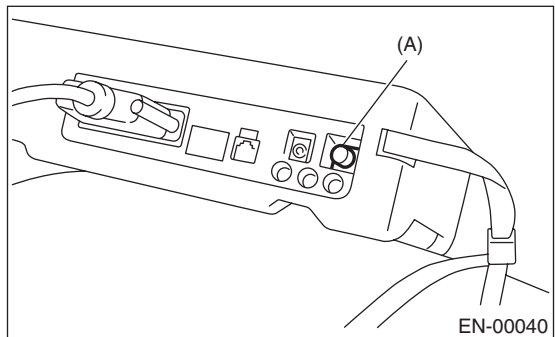
5) Connect the Subaru Select Monitor to data link connector located in the lower portion of the instrument panel (on the driver's side).



### CAUTION:

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

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



(A) Power switch

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

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

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

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

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

12) Select the desired compulsory actuator on the «Actuator ON/OFF Operation» display screen and press the [YES] key.

13) Pressing the [NO] key completes the compulsory valve operation check mode. The display will then return to the «Actuator ON/OFF Operation» screen.

# Compulsory Valve Operation Check Mode

## ENGINE (DIAGNOSTIC)

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

Description	Display
Compulsory fuel pump relay operation check	Fuel Pump
Compulsory radiator fan relay operation check	Radiator Fan Relay
Compulsory air conditioning relay operation check	A/C Compressor Relay
Compulsory purge control solenoid valve operation check	CPC Solenoid

### NOTE:

- “EGR solenoid” is not indicated but EGR solenoid valve is installed to the vehicle.
- The following parts will be displayed but not functional because vehicle are not equipped with them.

Display
ASV Solenoid
FICD Solenoid
Pressure switching solenoid 1
Pressure switching solenoid 2
PCV Solenoid
Vent Control Solenoid
Atmospheric pressure switching solenoid

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

## 16. Malfunction Indicator Light

### A: PROCEDURE

1. Activation of malfunction indicator light. <Ref. to EN(H4SO)-47, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.>
↓
2. Check that the malfunction indicator light does not come on. <Ref. to EN(H4SO)-49, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
↓
3. Check that the malfunction indicator light does not go off. <Ref. to EN(H4SO)-52, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF., Malfunction Indicator Light.>
↓
4. Check that the malfunction indicator light does not blink. <Ref. to EN(H4SO)-53, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK., Malfunction Indicator Light.>
↓
5. Check that the malfunction indicator light remains blinking. <Ref. to EN(H4SO)-55, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING., Malfunction Indicator Light.>

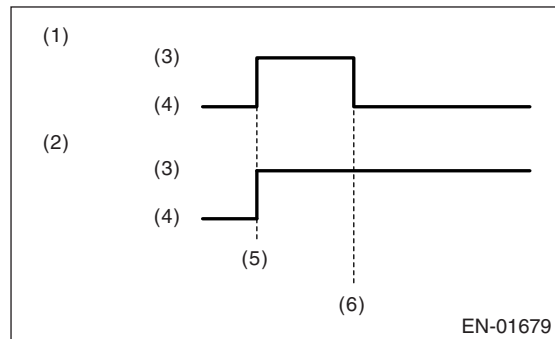
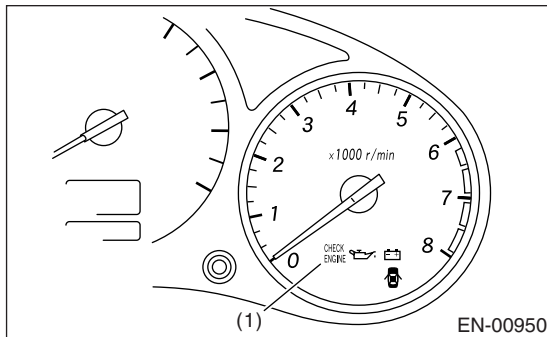
### B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

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

**NOTE:**

If the malfunction indicator light does not illuminate, perform the diagnosis of malfunction indicator light circuit or the combination meter circuit. <Ref. to EN(H4SO)-49, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>

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



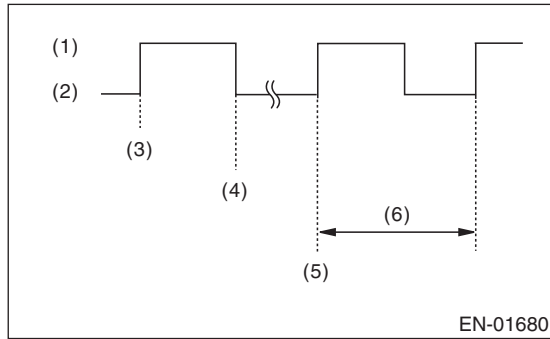
- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start



# Malfunction Indicator Light

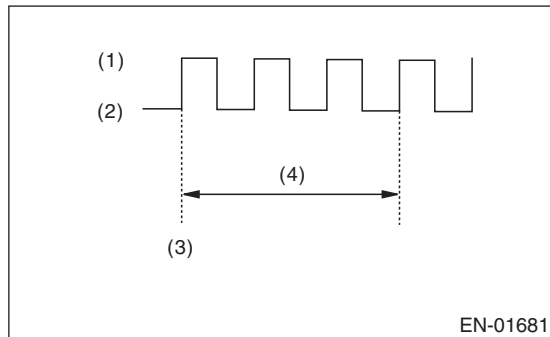
## ENGINE (DIAGNOSTIC)

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



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

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



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

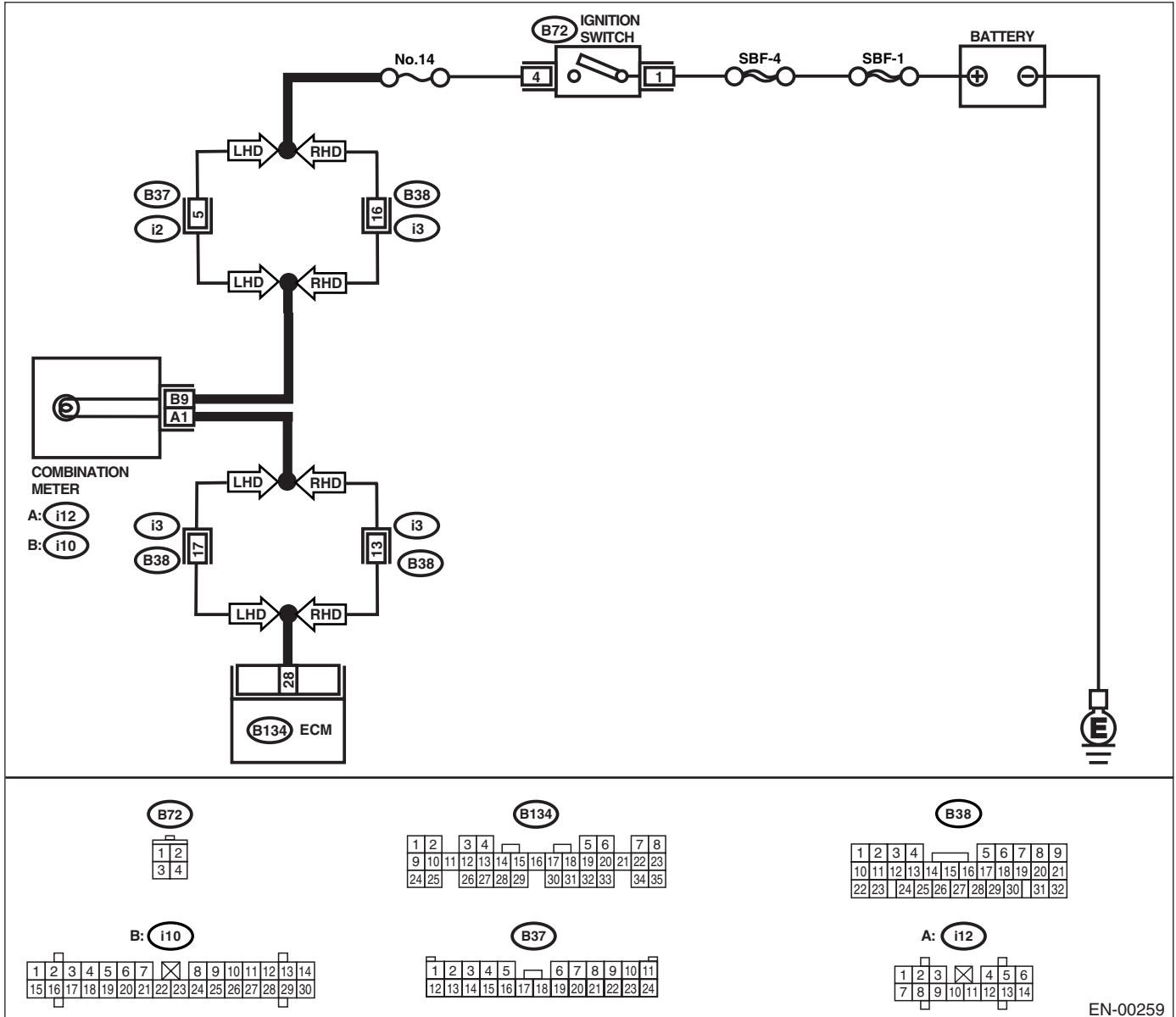
## C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON DIAGNOSIS:

The malfunction indicator light circuit is open or shorted.

### TROUBLE SYMPTOM:

When the ignition switch is turned ON (engine OFF), malfunction indicator light does not come on.

### WIRING DIAGRAM:



EN-00259

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 28 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 4.	Go to step 2.
<b>2 CHECK POOR CONTACT.</b> Check for poor connection when shaking or pulling ECM connector and harness.	Does malfunction indicator light illuminate?	Repair the poor contact in ECM connector.	Go to step 3.
<b>3 CHECK ECM CONNECTOR.</b> Check the connection of ECM connector.	Is the ECM connector correctly connected?	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Repair the connection of ECM connector.
<b>4 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Remove the combination meter. <Ref. to IDI-10, Combination Meter Assembly.> 3) Disconnect the connector from ECM and combination meter. 4) Measure the resistance of harness between ECM and combination meter connector. <b>Connector &amp; terminal</b> <b>(B134) No. 28 — (i12) No. 1:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and combination meter connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>5 CHECK POOR CONTACT.</b> Check poor contact in combination meter connector.	Is there poor contact in combination meter connector?	Repair poor contact in combination meter connector.	Go to step 6.

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON. 2) Measure the voltage between combination meter connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(i12) No. 9 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Check the following and repair if necessary.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Broken down ignition relay.</li> <li>• Blown out fuse (No. 5)</li> <li>• If replaced fuse (No. 5) blows easily, check the harness for short circuit of harness between fuse (No. 5) and ignition relay connector.</li> <li>• Open or short circuit in harness between fuse (No. 5) and battery terminal</li> <li>• Open circuit in harness between fuse (No. 5) and ignition relay connector</li> <li>• Poor contact in ignition relay connector</li> <li>• Poor contact in ignition switch connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK BULB.</b></p>	<p>Is the malfunction indicator light bulb OK?</p>	<p>Repair combination meter connector.</p>	<p>Replace the bulb.</p>

# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

## D: MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF.

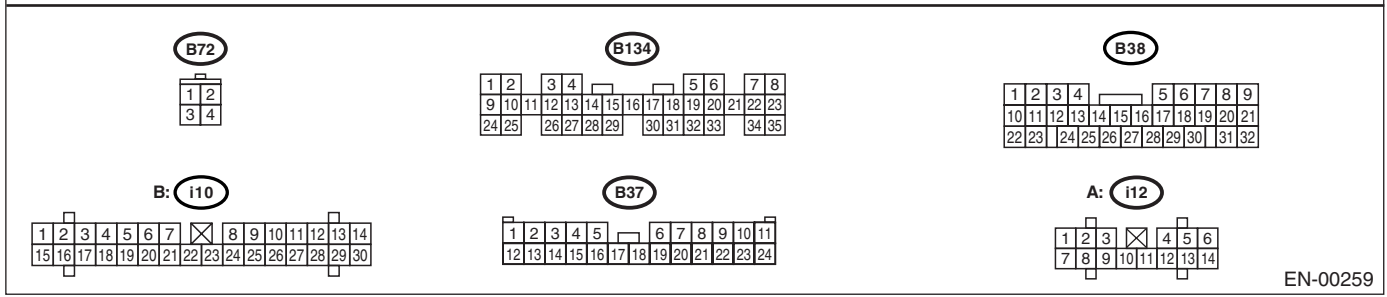
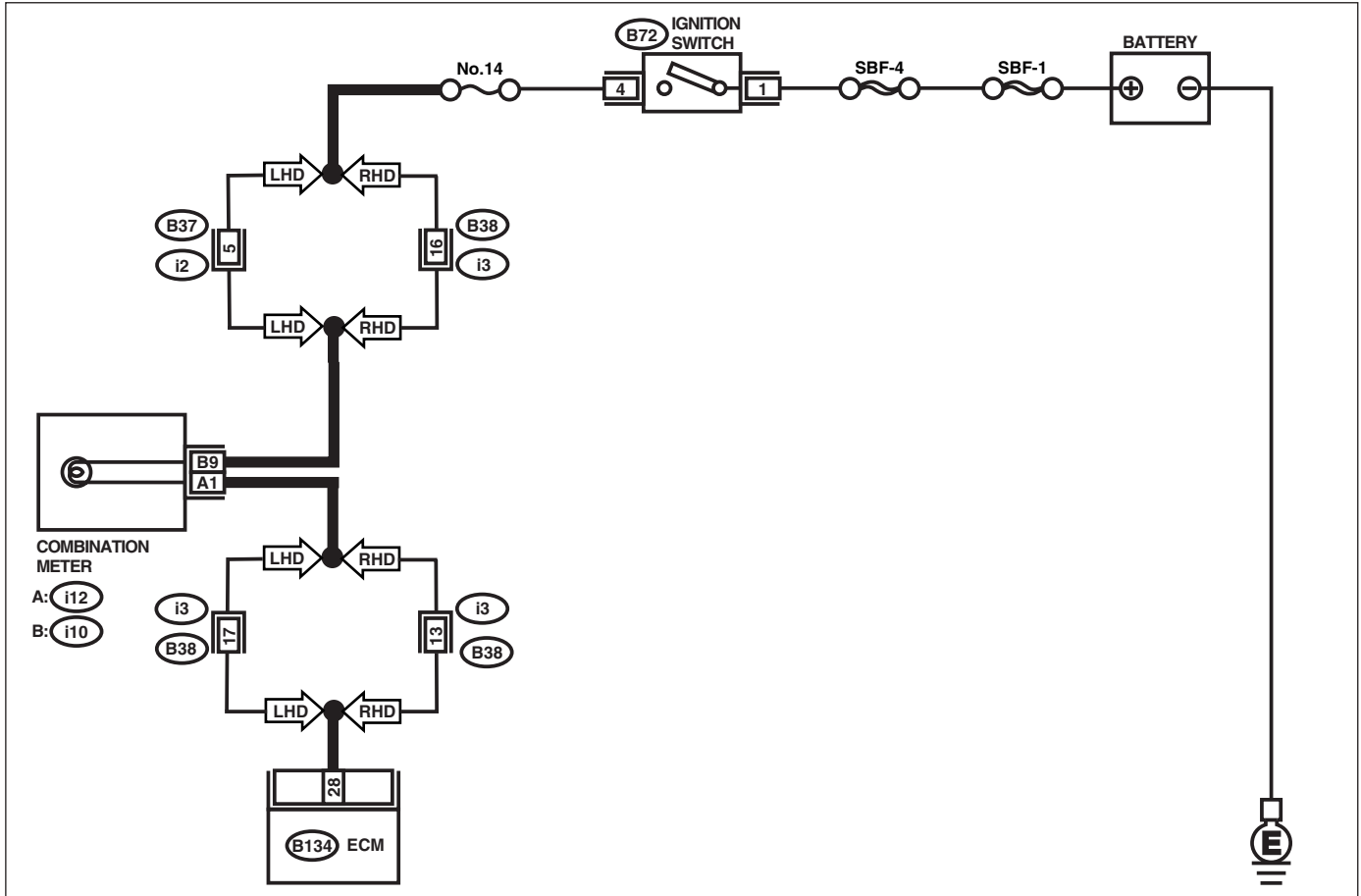
### DIAGNOSIS:

The malfunction indicator light circuit is shorted.

### TROUBLE SYMPTOM:

Although malfunction indicator light comes on when the engine runs, DTC is not shown on the Subaru Select Monitor display.

### WIRING DIAGRAM:



EN-00259

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON.	Does malfunction indicator light illuminate?	Repair short circuit in harness between combination meter and ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

## E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK.

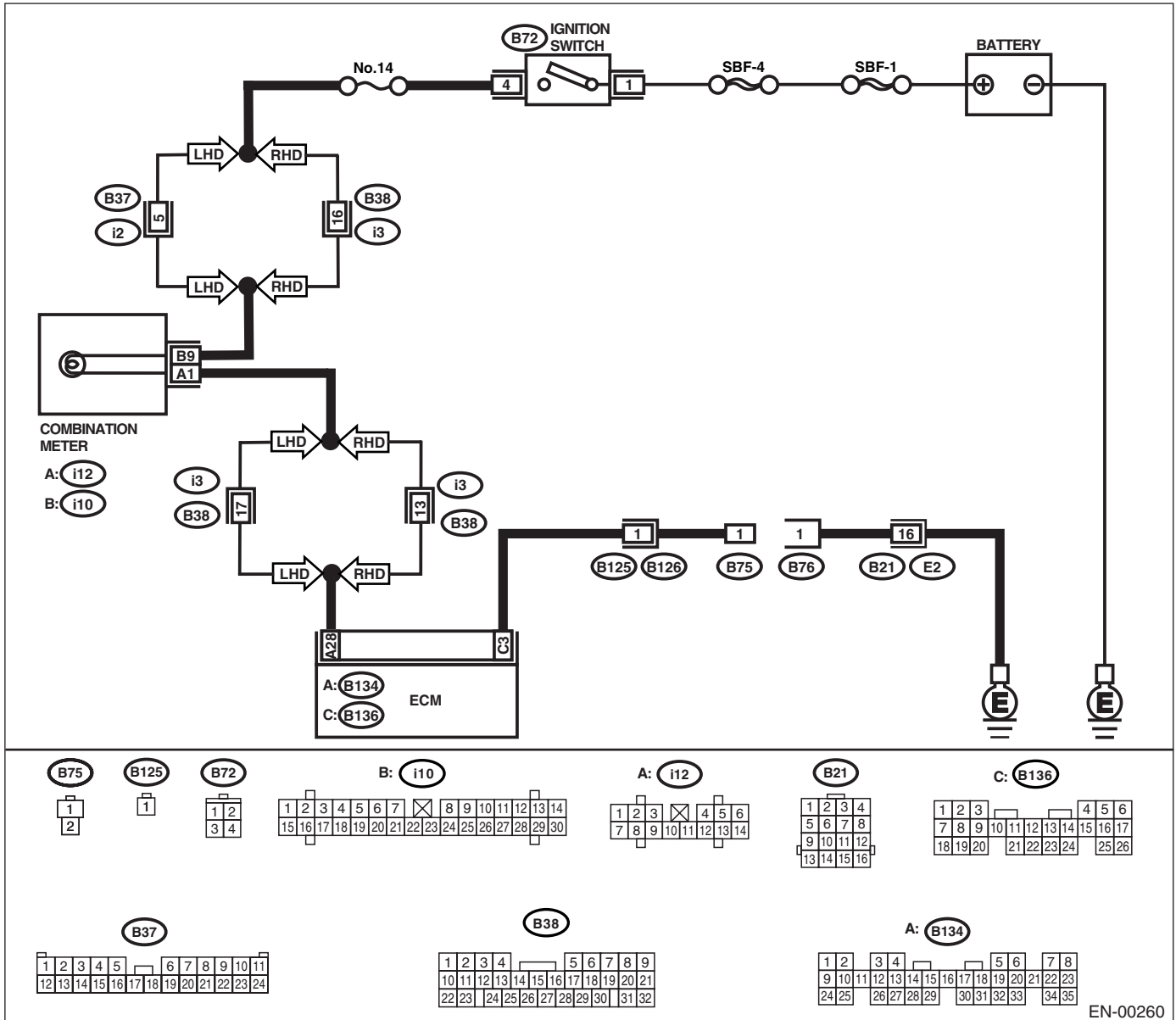
### DIAGNOSIS:

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

### TROUBLE SYMPTOM:

Malfunction indicator light does not blink during inspection mode.

### WIRING DIAGRAM:



# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connectors 3) Turn the ignition switch to ON. (engine OFF)	Does malfunction indicator light illuminate?	Go to step 2.	Repair the malfunction indicator light circuit. <Ref. to EN(H4SO)-49, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
<b>2 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON.	Does malfunction indicator light illuminate?	Repair short circuit in harness between combination meter and ECM connector.	Go to step 3.
<b>3 CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND CHASSIS GROUND.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between test mode connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B76) No. 1 — Chassis ground:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair harness and connector. NOTE: In this case repair the following: • Open circuit in harness between test mode connector and chassis ground
<b>4 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Go to step 5.
<b>5 CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.</b> 1) Connect the test mode connector. 2) Measure the resistance of harness between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 3 — Chassis ground:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair open circuit in harness between ECM and test mode connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

## F: MALFUNCTION INDICATOR LIGHT REMAINS BLINKING.

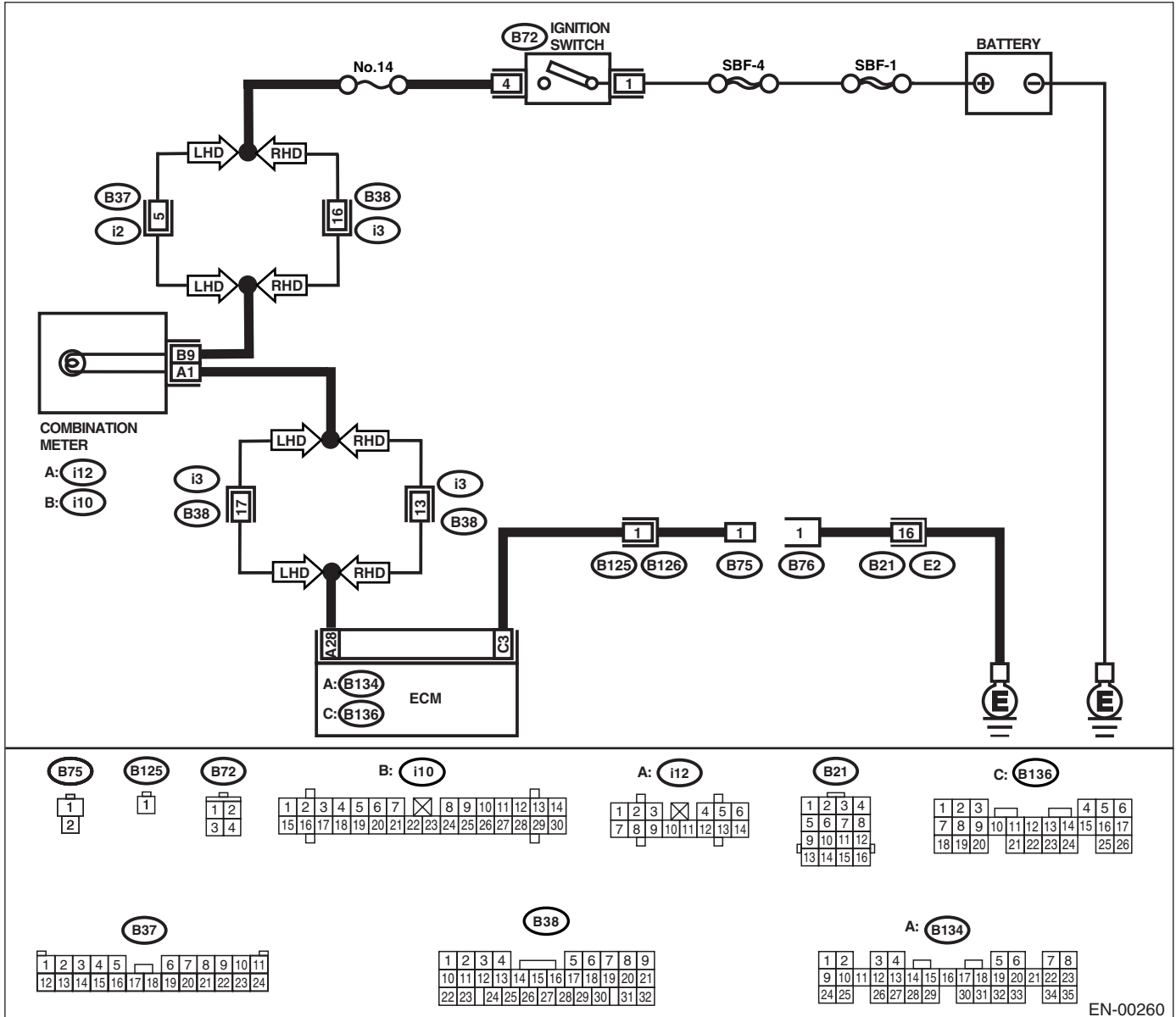
### DIAGNOSIS:

Test mode connector circuit is shorted.

### TROUBLE SYMPTOM:

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

### WIRING DIAGRAM:



EN-00260



# Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK TEST MODE CONNECTOR.</b> 1) Disconnect the test mode connectors 2) Turn the ignition switch to ON.	Does the malfunction indicator light blink?	Go to step 2.	System is in good order.  NOTE: Malfunction indicator light blinks at a cycle of 3 Hz when test mode connector is connected.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM CONNECTOR AND CHASSIS GROUNDING TERMINAL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 3 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Repair the short circuit in harness between ECM and test mode connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

## 17. Diagnostics for Engine Starting Failure

### A: PROCEDURE

1. Check for fuel amount.
↓
2. Inspection of starter motor circuit. <Ref. to EN(H4SO)-58, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ECM power supply and ground line. <Ref. to EN(H4SO)-61, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>
↓
4. Inspection of ignition control system. <Ref. to EN(H4SO)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel pump circuit. <Ref. to EN(H4SO)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
6. Inspection of fuel injector circuit. <Ref. to EN(H4SO)-70, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostics for Engine Starting Failure

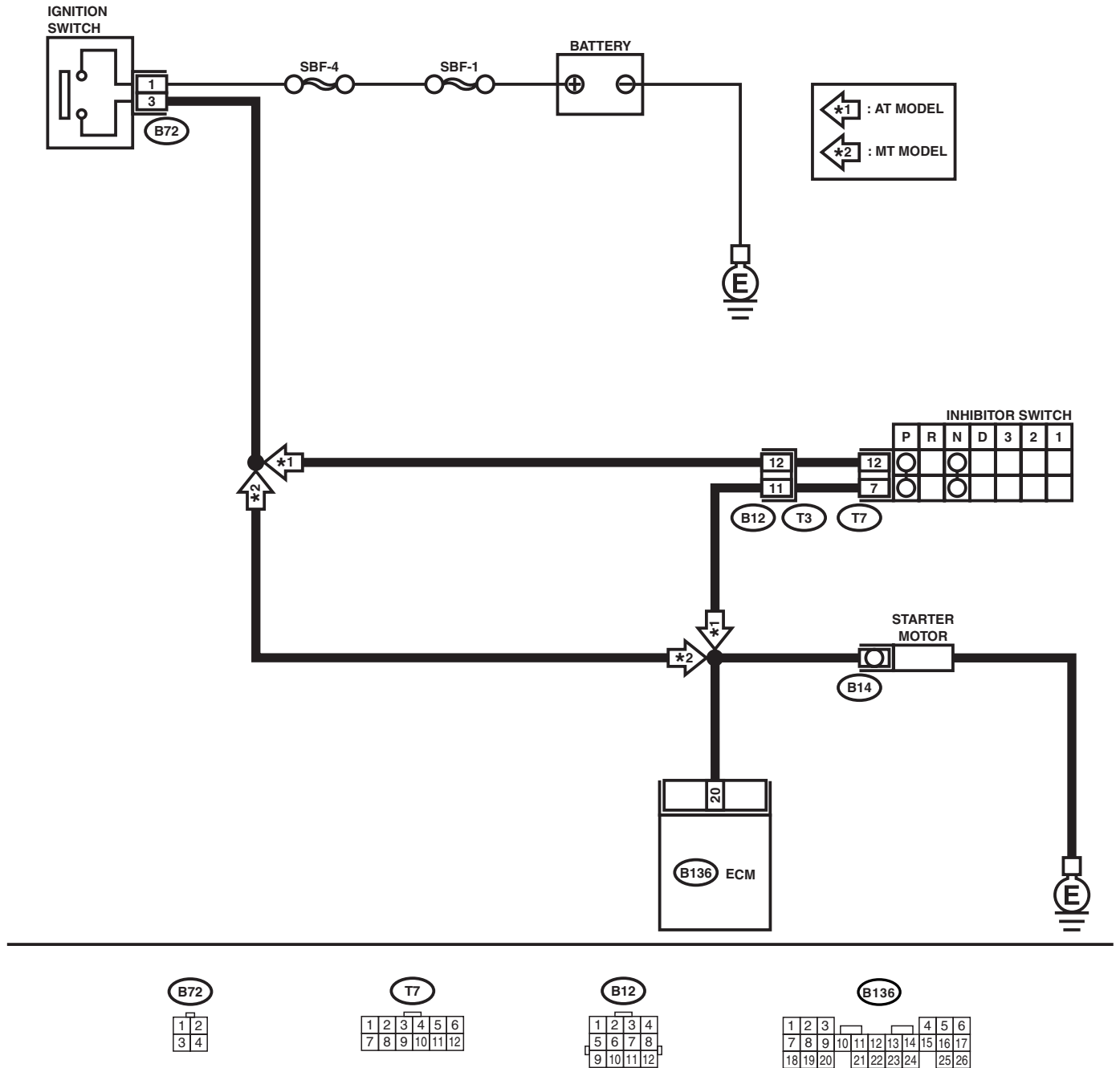
ENGINE (DIAGNOSTIC)

## B: STARTER MOTOR CIRCUIT

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00261

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK BATTERY.</b> Check the battery voltage.	Is the voltage more than 12 V?	Go to step 2.	Charge or replace the battery.
<b>2 CHECK INPUT SIGNAL FOR STARTER MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter motor. 3) Turn the ignition switch to START. 4) Measure the power supply voltage between starter motor connector terminal and engine ground. <b>Connector &amp; terminal</b> <b>(B14) No. 1 (+) — Engine ground (-):</b> NOTE: • For AT model, shift the select lever to “P” or “N” range. • For MT model, depress the clutch pedal.	Is the voltage more than 10 V?	Go to step 3.	Go to step 4.
<b>3 CHECK GROUND CIRCUIT OF STARTER MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the ground cable terminal from starter motor. 3) Measure the resistance of ground cable between ground cable terminal and engine ground.	Is the resistance less than 5 Ω?	Check the starter motor. <Ref. to SC(H4SO)-6, Starter.>	Repair open circuit of ground cable.
<b>4 CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.</b> 1) Disconnect the connector from ignition switch. 2) Measure the power supply voltage between ignition switch connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B72) No. 1 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 5.	Repair open circuit in harness between ignition switch and battery, and check fuse SBF No. 4 and SBF No. 1.
<b>5 CHECK IGNITION SWITCH.</b> 1) Disconnect the connector from ignition switch. 2) Measure the resistance between ignition switch terminals while turning the ignition switch to START position. <b>Terminals</b> <b>No. 1 — No. 3:</b>	Is the resistance less than 5 Ω?	Go to step 6.	Replace the ignition switch.
<b>6 CHECK TRANSMISSION TYPE.</b>	Is the transmission type AT?	Go to step 7.	Temporary poor contact occurs. Check poor contact in each connectors.
<b>7 CHECK INHIBITOR SWITCH INPUT VOLTAGE.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from inhibitor switch. 3) Connect the connector to ignition switch. 4) Measure the input voltage between inhibitor switch connector terminal and engine ground while turning the ignition switch to START position. <b>Connector &amp; terminal</b> <b>(B12) No. 12 (+) — Engine ground (-):</b>	Is the voltage more than 10 V?	Go to step 8.	Repair open or ground short circuit in harness between inhibitor switch and ignition switch. NOTE: Check security system (if equipped).

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

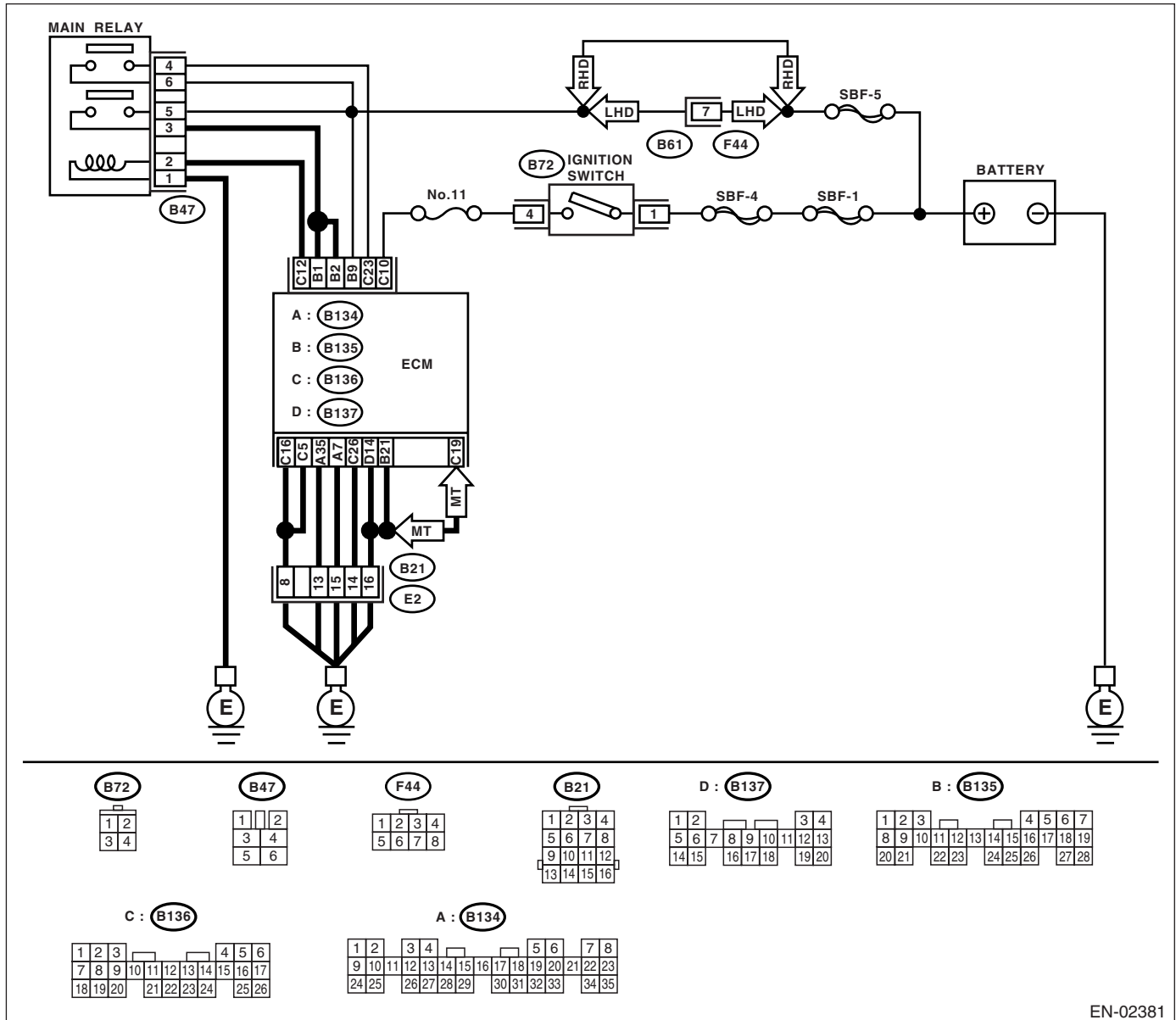
	Step	Check	Yes	No
<b>8</b> <b>CHECK INHIBITOR SWITCH.</b> 1) Shift the select lever in the "P" or "N" range. 2) Measure the resistance between inhibitor switch terminals. <b>Connector &amp; terminal</b> <b>(T3) No. 11 — No. 12:</b>	Is the resistance less than 1 $\Omega$ ?	Repair open or ground short circuit in harness between inhibitor switch and starter motor.	Replace inhibitor switch. <Ref. to 4AT-51, Inhibitor Switch.>	

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

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



# Diagnostics for Engine Starting Failure

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK MAIN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Connect the battery to main relay terminals No. 1 and No. 2. 4) Measure the resistance between main relay terminals. <i>Terminals</i> <i>No. 3 — No. 5:</i> <i>No. 4 — No. 6:</i>	Is the resistance less than 10 $\Omega$ ?	Go to step 2.	Replace the main relay.
<b>2 CHECK GROUND CIRCUIT FOR ECM.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 7 — Chassis ground:</i> <i>(B134) No. 35 — Chassis ground:</i> <i>(B135) No. 21 — Chassis ground:</i> <i>(B136) No. 5 — Chassis ground:</i> <i>(B136) No. 16 — Chassis ground:</i> <i>(B136) No. 19 — Chassis ground: (MT model)</i> <i>(B136) No. 26 — Chassis ground:</i> <i>(B137) No. 14 — Chassis ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair open circuit in harness between ECM connector and engine ground terminal.
<b>3 CHECK INPUT VOLTAGE OF ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B135) No. 9 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 4.	Repair open or ground short circuit of power supply circuit.
<b>4 CHECK INPUT VOLTAGE OF ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 10 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 5.	Repair open or ground short circuit of power supply circuit.
<b>5 CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 12 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair ground short circuit in harness between ECM connector and main relay connector, then replace the ECM.
<b>6 CHECK OUTPUT VOLTAGE FROM ECM.</b> 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 12 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 7.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>
<b>7 CHECK INPUT VOLTAGE OF MAIN RELAY.</b> Measure the voltage between main relay connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B47) No. 2 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Go to step 8.	Repair open circuit in harness between ECM connector and main relay connector.

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>8</b> <b>CHECK GROUND CIRCUIT OF MAIN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between main relay connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B47) No. 1 — Chassis ground:</b></i>	Is the resistance less than 5 $\Omega$ ?	Go to step 9.	Repair open circuit between main relay and chassis ground.
<b>9</b> <b>CHECK INPUT VOLTAGE OF MAIN RELAY.</b> Measure the voltage between main relay connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B47) No. 5 (+) — Chassis ground (-):</b></i> <i><b>(B47) No. 6 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Go to step 10.	Repair open or ground short circuit in harness of power supply circuit.
<b>10</b> <b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Connect the main relay connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 1 (+) — Chassis ground (-):</b></i> <i><b>(B135) No. 2 (+) — Chassis ground (-):</b></i> <i><b>(B136) No. 23 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Check ignition control system. <Ref. to EN(H4SO)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair open or ground short circuit in harness between ECM connector and main relay connector.



# Diagnostics for Engine Starting Failure

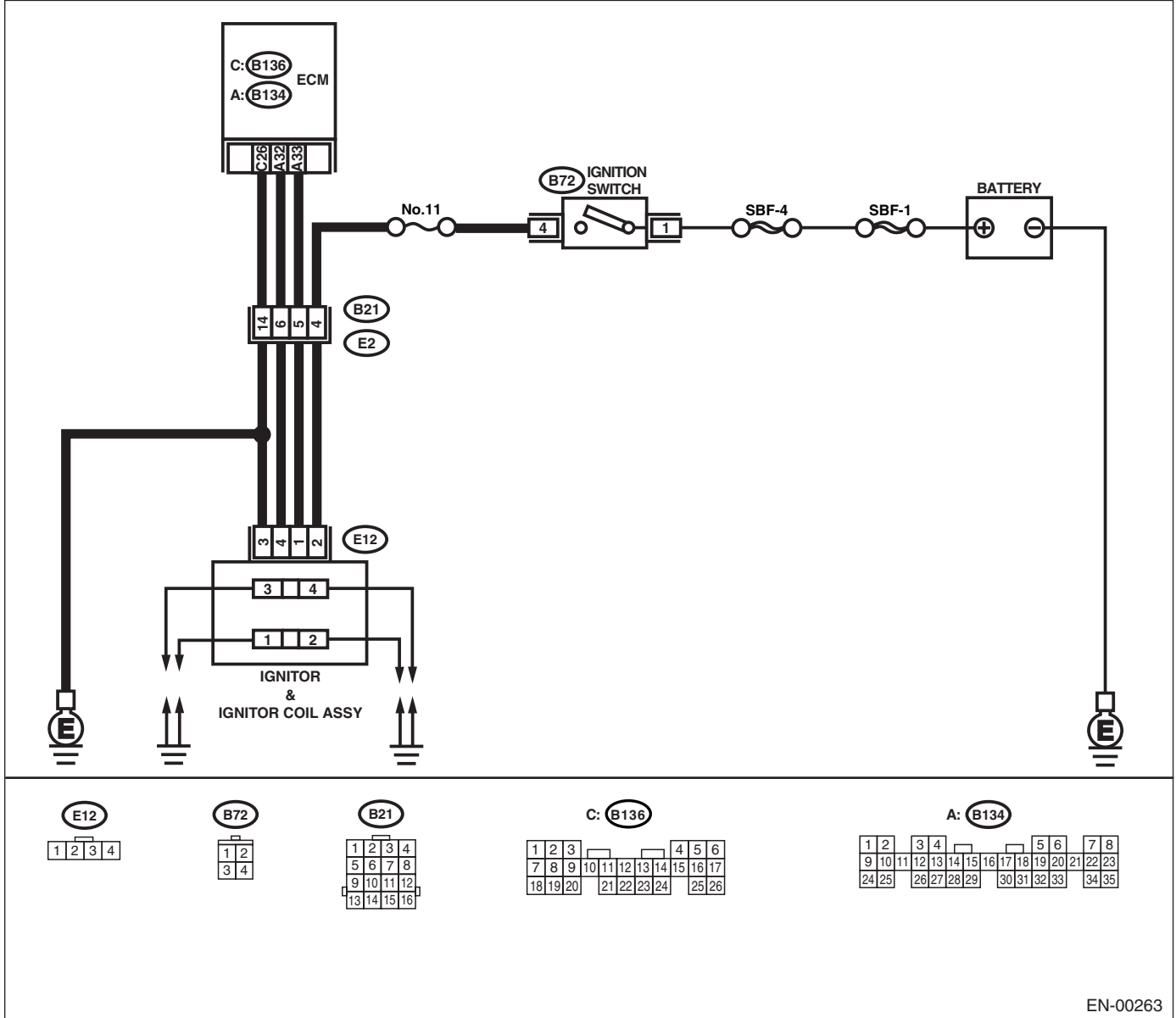
ENGINE (DIAGNOSTIC)

## D: IGNITION CONTROL SYSTEM

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK IGNITION SYSTEM FOR SPARKS.</b>                      1) Remove the plug cord cap from each spark plug.                      2) Install the new spark plug on plug cord cap.</p> <p><b>CAUTION:</b>  <b>Do not remove the spark plug from engine.</b></p> <p>3) Contact the spark plug's thread portion on engine.                      4) While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.</p>	Does spark occur at each cylinder?	Check fuel pump system. <Ref. to EN(H4SO)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 2.
<p><b>2</b></p> <p><b>CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL &amp; IGNITOR ASSY.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ignition coil &amp; ignitor ASSY.                      3) Turn the ignition switch to ON.                      4) Measure the power supply voltage between ignition coil &amp; ignitor ASSY connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E12) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 3.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between ignition coil & ignitor ASSY, and main relay connector • Poor contact in coupling connector • Blown out fuse
<p><b>3</b></p> <p><b>CHECK HARNESS OF IGNITION COIL &amp; IGNITOR ASSY GROUND CIRCUIT.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between ignition coil &amp; ignitor ASSY connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E12) No. 3 — Engine ground:</b></p>	Is the resistance less than 5 $\Omega$ ?	Go to step 4.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between ignition coil & ignitor ASSY connector and engine ground terminal
<p><b>4</b></p> <p><b>CHECK IGNITION COIL &amp; IGNITOR ASSY.</b>                      1) Remove the spark plug cords.                      2) Measure the resistance between spark plug cord contact portions to check secondary coil.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b>  <b>No. 3 — No. 4:</b></p>	Is the resistance 10 — 15 k $\Omega$ ?	Go to step 5.	Replace the ignition coil & ignitor ASSY. <Ref. to IG(H4SO)-8, Ignition Coil & Ignitor Assembly.>
<p><b>5</b></p> <p><b>CHECK INPUT SIGNAL FOR IGNITION COIL &amp; IGNITOR ASSY.</b>                      1) Connect the connector to ignition coil &amp; ignitor ASSY.                      2) Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignition coil &amp; ignitor ASSY connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E12) No. 1 (+) — Engine ground (-):</b>  <b>(E12) No. 4 (+) — Engine ground (-):</b></p>	Does the voltage vary more than 10 V?	Go to step 6.	Replace the ignition coil & ignitor ASSY. <Ref. to IG(H4SO)-8, Ignition Coil & Ignitor Assembly.>

## Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

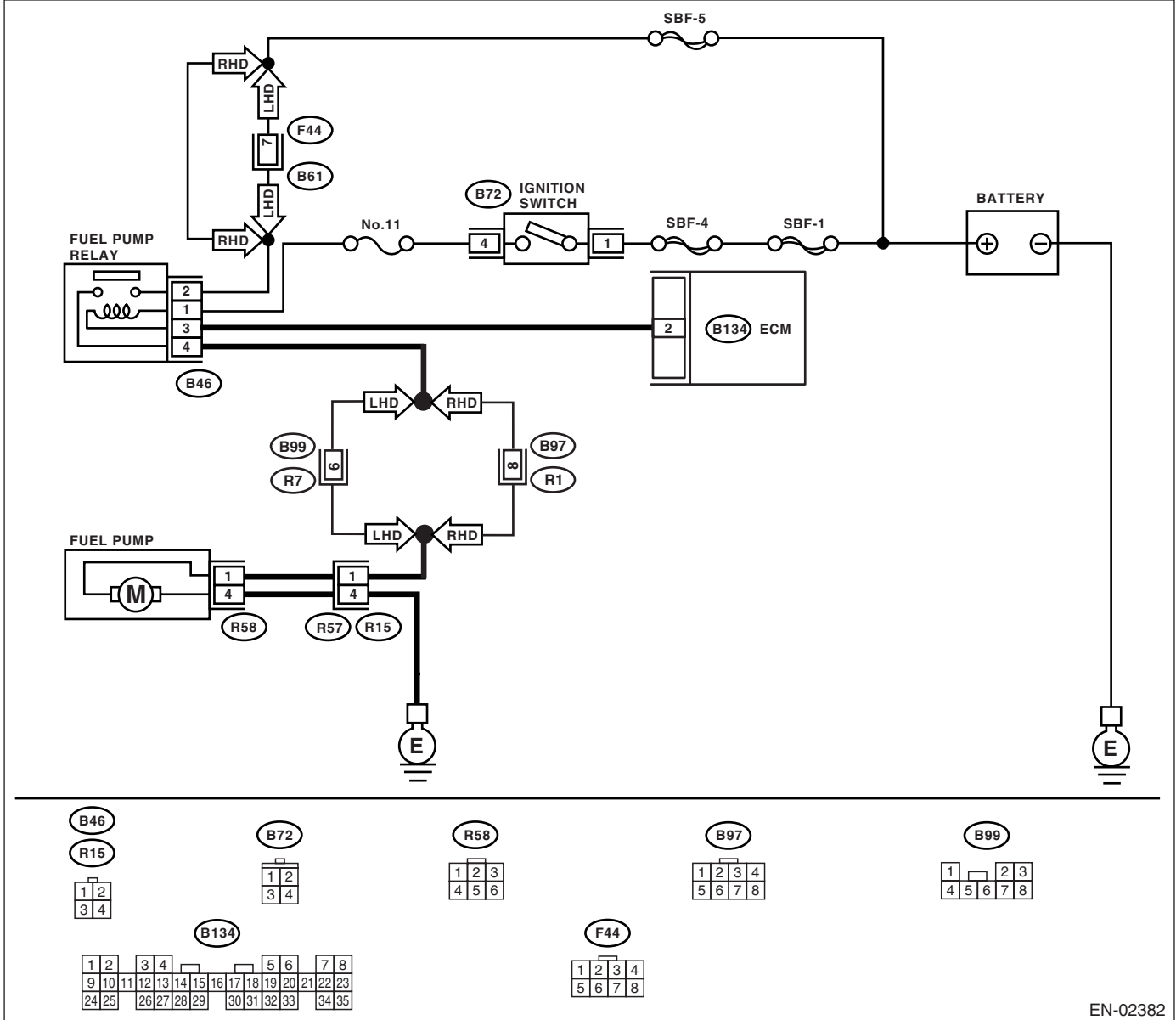
Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSY CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Disconnect the connector from ignition coil &amp; ignitor ASSY.                      4) Measure the resistance of harness between ECM and ignition coil &amp; ignitor ASSY connector.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 32 — (E12) No. 1:                      (B134) No. 32 — (E12) No. 4:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 7.</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and ignition coil &amp; ignitor ASSY connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSY CONNECTOR.</b></p> <p>Measure the resistance of harness between ECM and engine ground.</p> <p><b>Connector &amp; terminal:</b>                      (B134) No. 32 — Engine ground:</p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair ground short circuit in harness between ECM and ignition coil &amp; ignitor ASSY connector.</p>
<p><b>8</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in ECM connector.</p>	<p>Is there poor contact in ECM connector?</p>	<p>Repair the poor contact in ECM connector.</p>	<p>Check fuel pump circuit. &lt;Ref. to EN(H4SO)-67, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.&gt;</p>

## E: FUEL PUMP CIRCUIT

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-02382

## Diagnostics for Engine Starting Failure

### ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK OPERATING SOUND OF FUEL PUMP.</b> Check that the fuel pump is in operation for two seconds when turning the ignition switch to ON.</p> <p>NOTE: Fuel pump operation can also be executed using Subaru Select Monitor. Refer to "Compulsory Valve Operation Check Mode" for procedures. &lt;Ref. to EN(H4SO)-45, Compulsory Valve Operation Check Mode.&gt;</p>	Does the fuel pump produce operating sound?	Check the fuel injector circuit. <Ref. to EN(H4SO)-70, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 2.
<p><b>2 CHECK GROUND CIRCUIT OF FUEL PUMP.</b> 1) Turn the ignition switch to OFF. 2) Remove the fuel pump access hole lid. 3) Disconnect the connector from fuel pump. 4) Measure the resistance of harness connector between fuel pump and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 4 — Chassis ground:</b></p>	Is the resistance less than 5 $\Omega$ ?	Go to step 3.	Repair harness and connector.  NOTE: In this case repair the following: • Open circuit in harness between fuel pump connector and chassis grounding terminal • Poor contact in coupling connector
<p><b>3 CHECK POWER SUPPLY TO FUEL PUMP.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage of power supply circuit between fuel pump connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 1 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Replace the fuel pump. <Ref. to FU(H4SO)-55, Fuel Pump.>	Go to step 4.
<p><b>4 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness connector between fuel pump and fuel pump relay.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 1 — (B46) No. 4:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair harness and connector.  NOTE: In this case repair the following: • Open circuit in harness between fuel pump connector and chassis grounding terminal • Poor contact in coupling connector
<p><b>5 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.</b> Measure the resistance of harness between fuel pump and fuel pump relay connector.</p> <p><b>Connector &amp; terminal</b> <b>(R58) No. 1 — Chassis ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair short circuit in harness between fuel pump and fuel pump relay connector.
<p><b>6 CHECK FUEL PUMP RELAY.</b> 1) Disconnect the connectors from fuel pump relay and main relay. 2) Remove the fuel pump relay and main relay with bracket. 3) Connect the battery to fuel pump relay connector terminals No. 1 and No. 3. 4) Measure the resistance between connector terminals of fuel pump relay.</p> <p><b>Terminals</b> <b>No. 2 — No. 4:</b></p>	Is the resistance less than 10 $\Omega$ ?	Go to step 7.	Replace the fuel pump relay. <Ref. to FU(H4SO)-55, Fuel Pump.>

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7</b> <b>CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and fuel pump relay connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 26 — (B46) No. 3:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step <b>8</b> .	Repair open circuit in harness between ECM and fuel pump relay connector.
<b>8</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Check the fuel injector circuit. <Ref. to EN(H4SO)-70, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostics for Engine Starting Failure

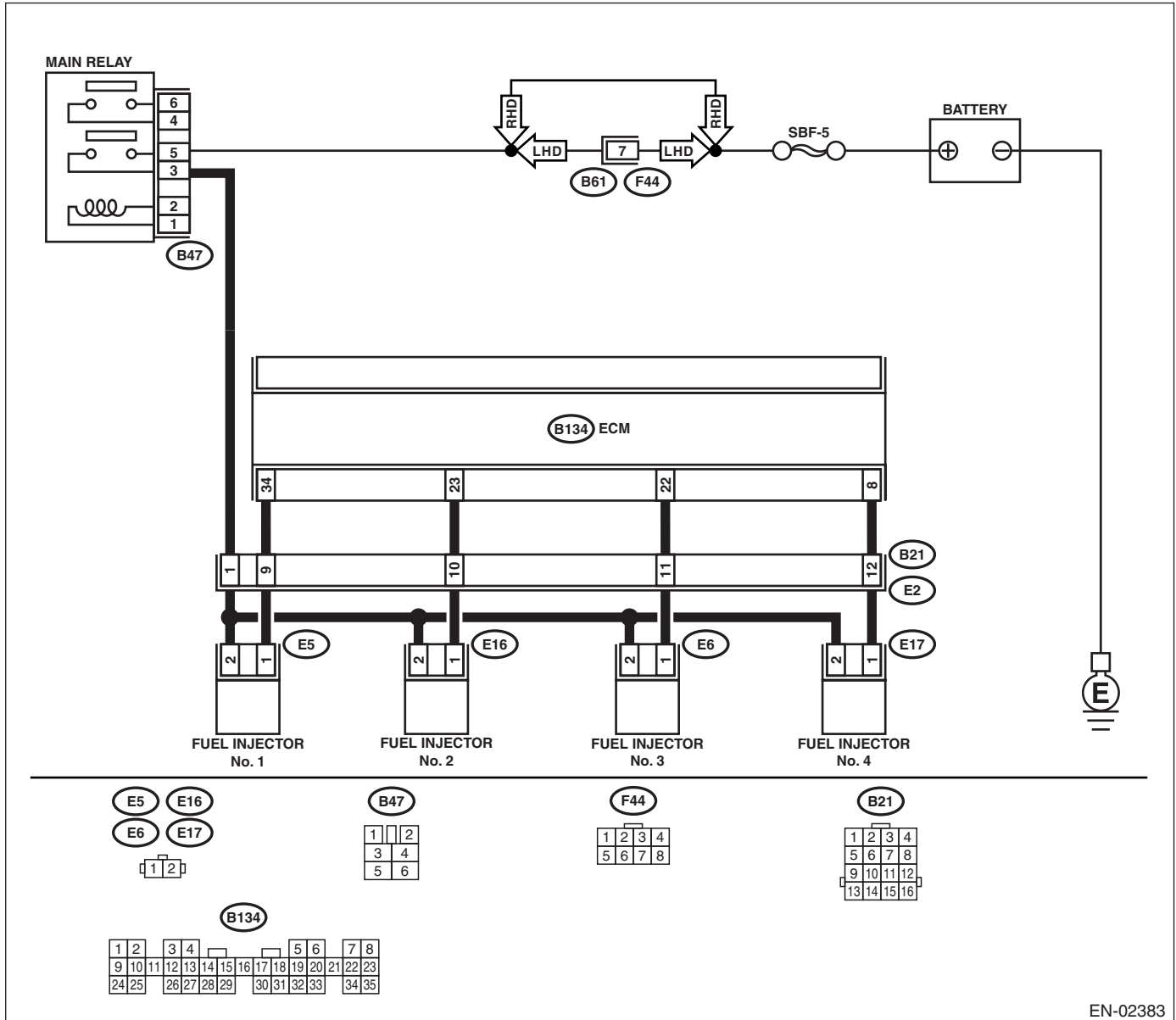
ENGINE (DIAGNOSTIC)

## F: FUEL INJECTOR CIRCUIT

### CAUTION:

- Check or repair only faulty parts.
- After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02383

# Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK OPERATION OF EACH FUEL INJECTOR.</b> While cranking the engine, check that each fuel injector emits operating sound. Use a sound scope or apply a screwdriver to the injector for this check.</p>	Does the fuel pump emit operating sound?	Check the fuel pressure. <Ref. to ME(H4SO)-30, INSPECTION, Fuel Pressure.>	Go to step 2.
<p><b>2</b></p> <p><b>CHECK POWER SUPPLY TO EACH FUEL INJECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between fuel injector terminal and engine ground. <b>Connector &amp; terminal</b> <b>#1 (E5) No. 2 (+) — Engine ground (-):</b> <b>#2 (E16) No. 2 (+) — Engine ground (-):</b> <b>#3 (E6) No. 2 (+) — Engine ground (-):</b> <b>#4 (E17) No. 2 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 3.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between main relay and fuel injector connector • Poor contact in main relay connector • Poor contact in coupling connector • Poor contact in fuel injector connector
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and fuel injector connector. <b>Connector &amp; terminal</b> <b>#1 (B134) No. 34 — (E5) No. 1:</b> <b>#2 (B134) No. 23 — (E16) No. 1:</b> <b>#3 (B134) No. 22 — (E6) No. 1:</b> <b>#4 (B134) No. 8 — (E17) No. 1:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between ECM and fuel injector connector • Poor contact in coupling connector
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.</b> Measure the resistance of harness between ECM and fuel injector connector. <b>Connector &amp; terminal</b> <b>#1 (B134) No. 34 — Chassis ground:</b> <b>#2 (B134) No. 23 — Chassis ground:</b> <b>#3 (B134) No. 22 — Chassis ground:</b> <b>#4 (B134) No. 8 — Chassis ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair ground short circuit in harness between ECM and fuel injector connector.
<p><b>5</b></p> <p><b>CHECK EACH FUEL INJECTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between each fuel injector terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b></p>	Is the resistance 5 — 20 $\Omega$ ?	Go to step 6.	Replace the faulty fuel injector.
<p><b>6</b></p> <p><b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.</p>	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Inspection using “General Diagnostic Table” <Ref. to EN(H4SO)-255, INSPECTION, General Diagnostic Table.>



## List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

#### A: LIST

DTC	Item	NOTE
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-78, DTC P0030 HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0031	HO2S Heater Control Circuit Low (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-80, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0032	HO2S Heater Control Circuit High (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-83, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0037	HO2S Heater Control Circuit Low (Bank 1 Sensor 2)	<Ref. to EN(H4SO)-85, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0038	HO2S Heater Control Circuit High (Bank 1 Sensor 2)	<Ref. to EN(H4SO)-88, DTC P0038 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0068	Manifold Pressure Sensor Range/Performance	<Ref. to EN(H4SO)-90, DTC P0068 MANIFOLD PRESSURE SENSOR RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input	<Ref. to EN(H4SO)-92, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input	<Ref. to EN(H4SO)-95, DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0111	Intake Air Temperature Circuit Range/Performance	<Ref. to EN(H4SO)-98, DTC P0111 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0112	Intake Air Temperature Circuit Low Input	<Ref. to EN(H4SO)-100, DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0113	Intake Air Temperature Circuit High Input	<Ref. to EN(H4SO)-102, DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0117	Engine Coolant Temperature Circuit Low Input	<Ref. to EN(H4SO)-105, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0118	Engine Coolant Temperature Circuit High Input	<Ref. to EN(H4SO)-107, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0121	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	<Ref. to EN(H4SO)-110, DTC P0121 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low Input	<Ref. to EN(H4SO)-112, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High Input	<Ref. to EN(H4SO)-115, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0125	Insufficient Coolant Temperature For Closed Loop Fuel Control	<Ref. to EN(H4SO)-117, DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0129	Barometric Pressure Too Low	<Ref. to EN(H4SO)-119, DTC P0129 BAROMETRIC PRESSURE TOO LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0130	O <sub>2</sub> Sensor Circuit (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-120, DTC P0130 O <sub>2</sub> SENSOR CIRCUIT (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0131	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-123, DTC P0131 O <sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0132	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-125, DTC P0132 O <sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0133	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-127, DTC P0133 O <sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0134	O <sub>2</sub> Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-129, DTC P0134 O <sub>2</sub> SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0137	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4SO)-131, DTC P0137 O <sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0138	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4SO)-134, DTC P0138 O <sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0139	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 2)	<Ref. to EN(H4SO)-137, DTC P0139 O <sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0171	System Too Lean (Bank 1)	<Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0172	System Too Rich (Bank 1)	<Ref. to EN(H4SO)-139, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0301	Cylinder 1 Misfire Detected	<Ref. to EN(H4SO)-141, DTC P0301 CYLINDER 1 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0302	Cylinder 2 Misfire Detected	<Ref. to EN(H4SO)-141, DTC P0302 CYLINDER 2 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0303	Cylinder 3 Misfire Detected	<Ref. to EN(H4SO)-141, DTC P0303 CYLINDER 3 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0304	Cylinder 4 Misfire Detected	<Ref. to EN(H4SO)-142, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)-148, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)-150, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0335	Crankshaft Position Sensor "A" Circuit	<Ref. to EN(H4SO)-152, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0336	Crankshaft Position Sensor "A" Circuit Range/Performance	<Ref. to EN(H4SO)-154, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)-156, DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0341	Camshaft Position Sensor "A" Circuit Range/Performance (Bank 1 or Single Sensor)	<Ref. to EN(H4SO)-158, DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0400	Exhaust Gas Recirculation Flow	<Ref. to EN(H4SO)-161, DTC P0400 EXHAUST GAS RECIRCULATION FLOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## List of Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0420	Catalyst System Efficiency Below Threshold (Bank 1)	<Ref. to EN(H4SO)-164, DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0458	Evaporative Emission Control System Purge Control Valve Circuit Low	<Ref. to EN(H4SO)-166, DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0459	Evaporative Emission Control System Purge Control Valve Circuit High	<Ref. to EN(H4SO)-169, DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0461	Fuel Level Sensor Circuit Range/Performance	<Ref. to EN(H4SO)-171, DTC P0461 FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel Level Sensor Circuit Low Input	<Ref. to EN(H4SO)-173, DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel Level Sensor Circuit High Input	<Ref. to EN(H4SO)-176, DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0464	Fuel Level Sensor Circuit Intermittent	<Ref. to EN(H4SO)-179, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0483	Cooling Fan Rationality Check	<Ref. to EN(H4SO)-181, DTC P0483 COOLING FAN RATIONALITY CHECK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0502	Vehicle Speed Sensor Circuit Low Input	<Ref. to EN(H4SO)-184, DTC P0502 VEHICLE SPEED SENSOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0503	Vehicle Speed Sensor Intermittent/Erratic/High	<Ref. to EN(H4SO)-185, DTC P0503 VEHICLE SPEED SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0506	Idle Control System RPM Lower Than Expected	<Ref. to EN(H4SO)-187, DTC P0506 IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0507	Idle Control System RPM Higher Than Expected	<Ref. to EN(H4SO)-189, DTC P0507 IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0512	Starter Request Circuit	<Ref. to EN(H4SO)-191, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0513	Incorrect Immobilizer Key	<Ref. to IM-20, DTC P0513 INCORRECT IMMOBILIZER KEY, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P0519	Idle Control System Malfunction (Fail-Safe)	<Ref. to EN(H4SO)-194, DTC P0519 IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0565	Cruise Control On Signal	<Ref. to EN(H4SO)-196, DTC P0565 CRUISE CONTROL ON SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0604	Internal Control Module Random Access Memory (RAM) Error	<Ref. to EN(H4SO)-198, DTC P0604 INTERNAL CONTROL MODULE READ ACCESS MEMORY (RAM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0691	Cooling Fan 1 Control Circuit Low	<Ref. to EN(H4SO)-200, DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0692	Cooling Fan 1 Control Circuit High	<Ref. to EN(H4SO)-203, DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0703	Torque Converter/Brake Switch "B" Circuit	<Ref. to EN(H4SO)-206, DTC P0703 TORQUE CONVERTER/BRAKE SWITCH "B" CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0705	Transmission Range Sensor Circuit (PRNDL Input)	<Ref. to 4AT(H4SO)-95, CHECK INHIBITOR SWITCH, Diagnostic Procedure without Diagnostic Trouble Code (DTC).>
P0710	Transmission Fluid Temperature Sensor Circuit	<Ref. to 4AT(H4SO)-38, DTC 27 ATF TEMPERATURE SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0716	Torque converter turbine speed sensor	<Ref. to 4AT(H4SO)-49, DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0720	AT Vehicle Speed Sensor Circuit Malfunction	<Ref. to 4AT(H4SO)-45, DTC 33 FRONT VEHICLE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0726	Engine Speed Input Circuit Malfunction	<Ref. to 4AT(H4SO)-36, DTC 11 ENGINE SPEED SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0731	Gear 1 Incorrect Ratio	<Ref. to EN(H4SO)-208, DTC P0731 GEAR 1 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0732	Gear 2 Incorrect Ratio	<Ref. to EN(H4SO)-208, DTC P0732 GEAR 2 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0733	Gear 3 Incorrect Ratio	<Ref. to EN(H4SO)-208, DTC P0733 GEAR 3 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0734	Gear 4 Incorrect Ratio	<Ref. to EN(H4SO)-209, DTC P0734 GEAR 4 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0741	Torque Converter Clutch Circuit Performance or Stuck Off	<Ref. to EN(H4SO)-210, DTC P0741 TORQUE CONVERTER CLUTCH CIRCUIT PERFORMANCE OR STUCK OFF, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0743	Torque Converter Clutch Circuit Electrical	<Ref. to 4AT(H4SO)-74, DTC 77 LOCK-UP DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0748	Pressure Control Solenoid "A" Electrical	<Ref. to 4AT(H4SO)-68, DTC 75 LINE PRESSURE DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0753	Shift Solenoid "A" Electrical	<Ref. to 4AT(H4SO)-56, DTC 71 SHIFT SOLENOID 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0758	Shift Solenoid "B" Electrical	<Ref. to 4AT(H4SO)-59, DTC 72 SHIFT SOLENOID 2, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0771	Low clutch timing solenoid	<Ref. to 4AT(H4SO)-62, DTC 73 LOW CLUTCH TIMING SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0778	Pressure Control Solenoid "B" Electrical	<Ref. to 4AT(H4SO)-71, DTC 76 2-4 BRAKE DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0785	Shift/Timing Solenoid	<Ref. to 4AT(H4SO)-65, DTC 74 2-4 BRAKE TIMING SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0851	Neutral Switch Input Circuit Low	<Ref. to EN(H4SO)-212, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> or <Ref. to EN(H4SO)-214, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0852	Neutral Switch Input Circuit High	<Ref. to EN(H4SO)-217, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0864	TCM Communication Circuit Range/Performance	<Ref. to EN(H4SO)-220, DTC P0864 TCM COMMUNICATION CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0865	TCM Communication Circuit Low	<Ref. to EN(H4SO)-222, DTC P0865 TCM COMMUNICATION CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0866	TCM Communication Circuit High	<Ref. to EN(H4SO)-224, DTC P0866 TCM COMMUNICATION CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1110	Atmospheric Pressure Sensor Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-226, DTC P1110 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1111	Atmospheric Pressure Sensor Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-226, DTC P1111 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1134	A/F Sensor Micro-Computer Problem	<Ref. to EN(H4SO)-227, DTC P1134 A/F SENSOR MICRO-COMPUTER PROBLEM, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1137	O <sub>2</sub> Sensor Circuit (Lambda= 1) (Bank 1 Sensor 1)	<Ref. to EN(H4SO)-229, DTC P1137 O <sub>2</sub> SENSOR CIRCUIT (LAMBDA=1) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1492	EGR Valve Signal #1 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-232, DTC P1492 EGR VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## List of Diagnostic Trouble Code (DTC)

### ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P1493	EGR Valve Signal #1 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-232, DTC P1493 EGR VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1494	EGR Valve Signal #2 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-232, DTC P1494 EGR VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1495	EGR Valve Signal #2 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-232, DTC P1495 EGR VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1496	EGR Valve Signal #3 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-232, DTC P1496 EGR VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1497	EGR Valve Signal #3 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-232, DTC P1497 EGR VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1498	EGR Valve Signal #4 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-233, DTC P1498 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1499	EGR Valve Signal #4 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-235, DTC P1499 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1510	ISC Solenoid Valve Signal #1 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-237, DTC P1510 ISC SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1511	ISC Solenoid Valve Signal #1 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-237, DTC P1511 ISC SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1512	ISC Solenoid Valve Signal #2 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-237, DTC P1512 ISC SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1513	ISC Solenoid Valve Signal #2 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-237, DTC P1513 ISC SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1514	ISC Solenoid Valve Signal #3 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-237, DTC P1514 ISC SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1515	ISC Solenoid Valve Signal #3 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-237, DTC P1515 ISC SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1516	ISC Solenoid Valve Signal #4 Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-238, DTC P1516 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1517	ISC Solenoid Valve Signal #4 Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-240, DTC P1517 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1518	Starter Switch Circuit Low Input	<Ref. to EN(H4SO)-242, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1560	Back-Up Voltage Circuit Malfunction	<Ref. to EN(H4SO)-245, DTC P1560 BACK-UP VOLTAGE CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1570	ANTENNA	<Ref. to IM-21, DTC P1570 ANTENNA, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1571	Reference Code Incompatibility	<Ref. to IM-15, DTC P1571 REFERENCE CODE INCOMPATIBILITY, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1572	IMM Circuit Failure	<Ref. to IM-16, DTC P1572 IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT), Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1574	Key IMM Circuit Failure	<Ref. to IM-19, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>

# List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P1576	EGI Control Module EEPROM	<Ref. to IM-20, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1577	IMM Control Module EEPROM	<Ref. to IM-20, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1698	Engine Torque Control Cut Signal Circuit Malfunction (Low Input)	<Ref. to EN(H4SO)-247, DTC P1698 ENGINE TORQUE CONTROL CUT SIGNAL CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1699	Engine Torque Control Cut Signal Circuit Malfunction (High Input)	<Ref. to EN(H4SO)-249, DTC P1699 ENGINE TORQUE CONTROL CUT SIGNAL CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1700	Throttle Position Sensor Circuit Malfunction For AT	<Ref. to 4AT(H4SO)-41, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1711	Engine Torque Control Signal #1 Circuit Malfunction	<Ref. to EN(H4SO)-251, DTC P1711 ENGINE TORQUE CONTROL SIGNAL #1 CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1712	Engine Torque Control Signal #2 Circuit Malfunction	<Ref. to EN(H4SO)-253, DTC P1712 ENGINE TORQUE CONTROL SIGNAL #2 CIRCUIT MALFUNCTION, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

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

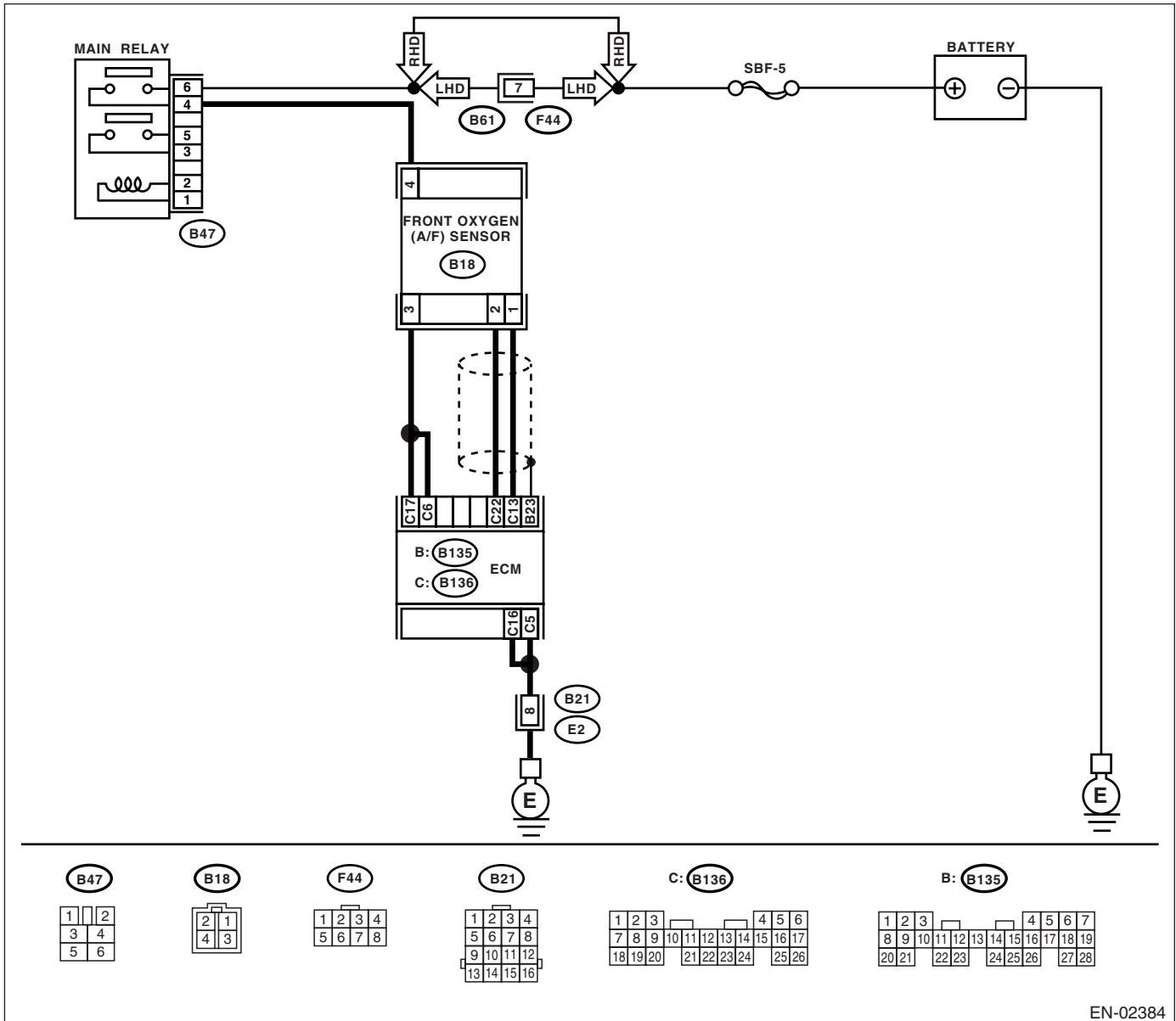
#### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

#### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Start the engine, and warm-up the engine.                      2) Turn the ignition switch to OFF.                      3) Disconnect the connector from ECM and front oxygen (A/F) sensor.                      4) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p><b>Connector &amp; terminal</b>                      (B136) No. 6 — (B18) No. 3:                      (B136) No. 17 — (B18) No. 3:</p>	Is the resistance less than 1 $\Omega$ ?	Go to step 2.	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.
<p><b>2 CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p><b>Connector &amp; terminal</b>                      (B136) No. 13 — (B18) No. 1:                      (B136) No. 22 — (B18) No. 2:</p>	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.
<p><b>3 CHECK HARNESS BETWEEN MAIN RELAY AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>Measure the resistance of harness between main relay and front oxygen (A/F) sensor connector.</p> <p><b>Connector &amp; terminal</b>                      (B47) No. 4 — (B18) No. 4:</p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit in harness between ECM and front oxygen (A/F) sensor connector.
<p><b>4 CHECK FRONT OXYGEN (A/F) SENSOR.</b></p> <p>Measure the resistance between front oxygen (A/F) sensor connector terminals.</p> <p><b>Terminals</b>                      No. 3 — No. 4:</p>	Is the resistance less than 5 $\Omega$ ?	Go to step 5.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>
<p><b>5 CHECK POOR CONTACT.</b></p> <p>Check poor contact in ECM and front oxygen (A/F) sensor connector.</p>	Is there poor contact in ECM or front oxygen (A/F) sensor connector?	Repair poor contact in ECM or front oxygen (A/F) sensor connector.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

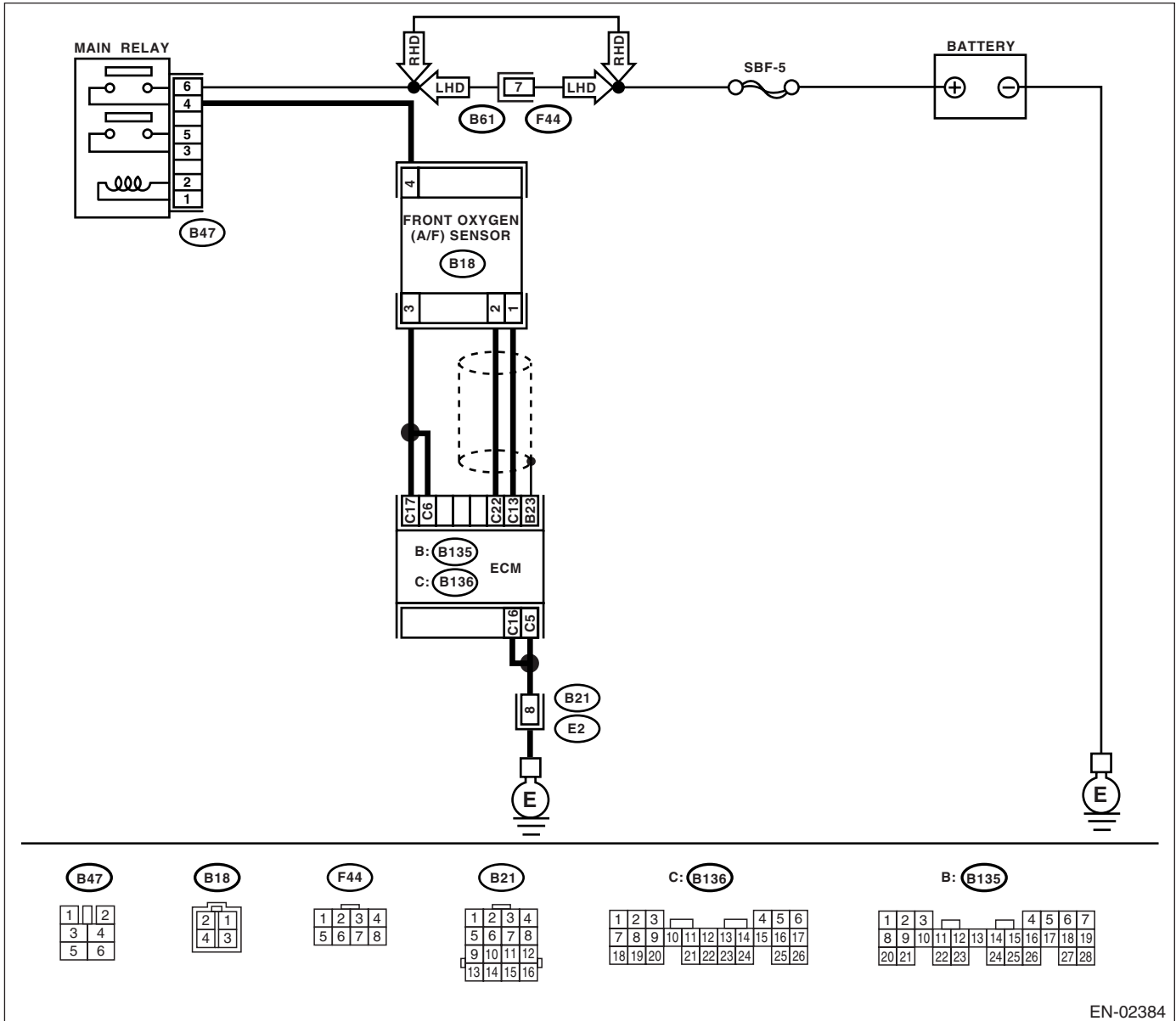
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Go to step 2.	Go to step 5.
2	<b>CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.</b> 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. <b>Connector &amp; terminal</b> <b>(B18) No. 4 (+) — Engine ground (-):</b>	Go to step 3.	Repair the power supply line. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between main relay and front oxygen (A/F) sensor connector • Poor contact in front oxygen (A/F) sensor connector • Poor contact in main relay connector
3	<b>CHECK GROUND CIRCUIT FOR ECM.</b> Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 5 — Chassis ground:</b> <b>(B136) No. 16 — Chassis ground:</b>	Go to step 4.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between ECM and engine ground terminal • Poor contact in ECM connector. • Poor contact in coupling connector
4	<b>CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool. <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Repair poor contact connector. <b>NOTE:</b> In this case repair the following: • Poor contact in front oxygen (A/F) sensor connector • Poor contact in ECM connector.	Go to step 5.
5	<b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Start and idle the engine. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 6 (+) — Chassis ground (-):</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b>	Go to step 7.	Go to step 6.
6	<b>CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 6 (+) — Chassis ground (-):</b> <b>(B136) No. 17 (+) — Chassis ground (-):</b>	Repair the poor contact in ECM connector.	Go to step 7.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p>7</p> <p><b>CHECK FRONT OXYGEN (A/F) SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance between front oxygen (A/F) sensor connector terminals.</p> <p><b>Terminals</b></p> <p><b>No. 3 — No. 4:</b></p>	<p>Is the resistance less than 10 <math>\Omega</math>?</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"><li>• Open or ground short circuit in harness between front oxygen (A/F) sensor and ECM connector</li><li>• Poor contact in front oxygen (A/F) sensor connector</li><li>• Poor contact in ECM connector.</li></ul>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4SO)-47, Fuel.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

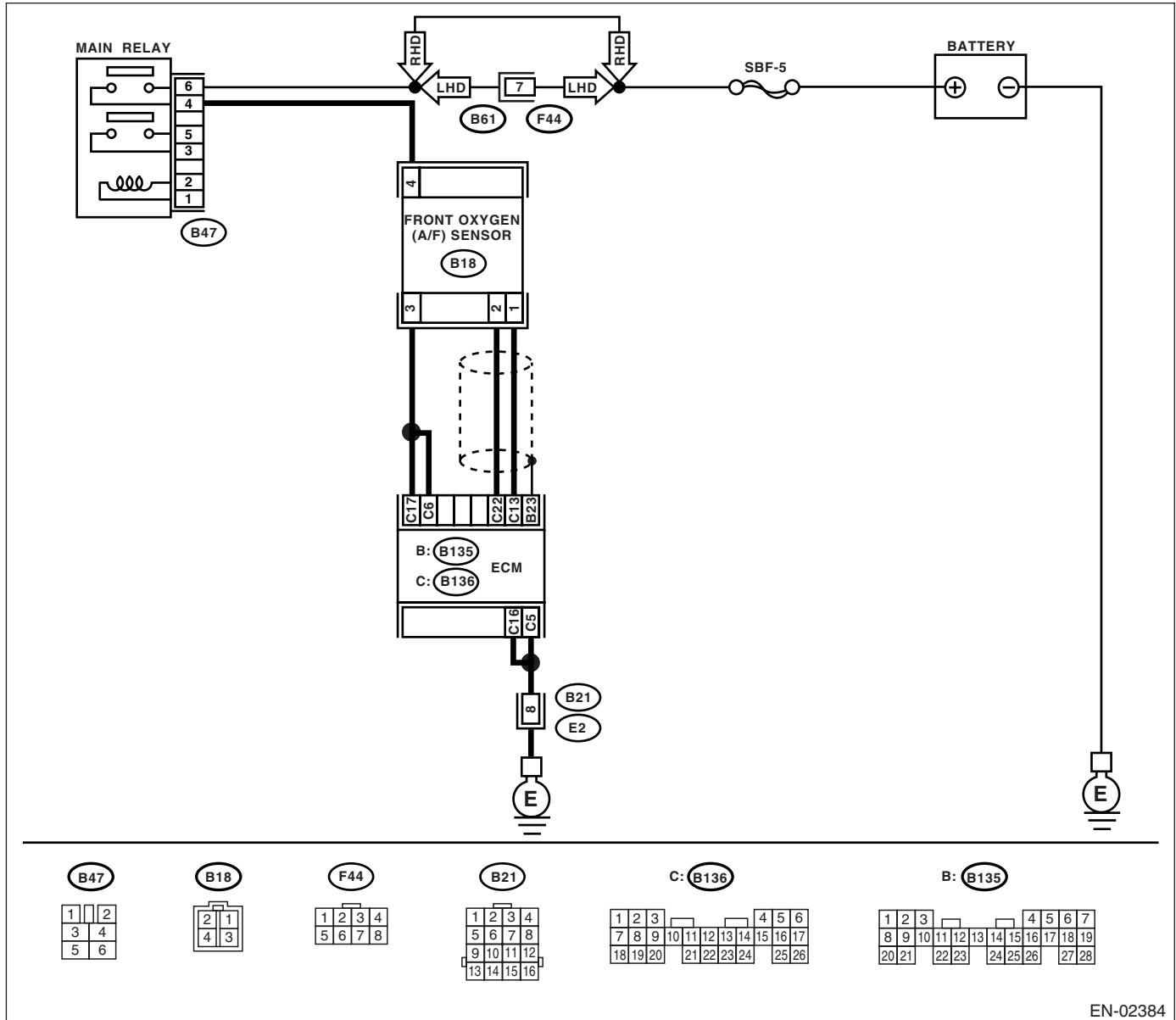
### DTC DETECTING CONDITION:

Detect as soon as the malfunction occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B136) No. 6 (+) — Chassis ground (-):</i> <i>(B136) No. 17 (+) — Chassis ground (-):</i>	Is the voltage more than 8 V?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK FRONT OXYGEN (A/F) SENSOR HEATER CURRENT.</b> 1) Turn the ignition switch to OFF. 2) Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector. 3) Turn the ignition switch to ON. 4) Read the data of front oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool. <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the current more than 2.3 A?	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	END.
<b>3</b> <b>CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B136) No. 6 (+) — Chassis ground (-):</i> <i>(B136) No. 17 (+) — Chassis ground (-):</i>	Is the voltage more than 8 V by shaking the ECM harness and connector?	Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.	END.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

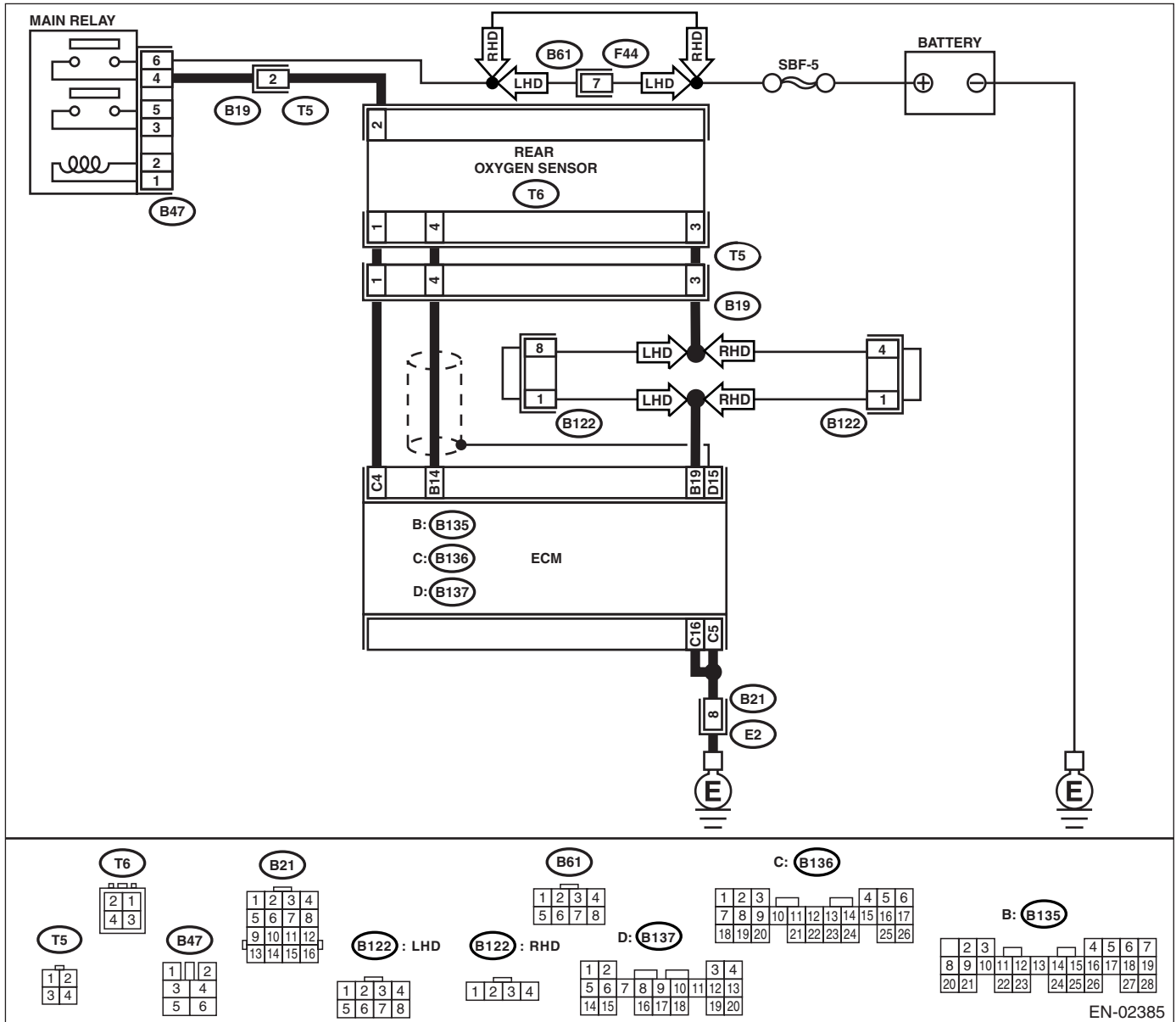
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02385

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK GROUND CIRCUIT FOR ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 16 — Chassis ground:</b> <b>(B136) No. 5 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 2.	Repair harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine ground terminal</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<b>2 CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of rear oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool.  NOTE: <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the current more than 0.2 A?	Repair the connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in rear oxygen sensor connecting harness connector</li> <li>• Poor contact in ECM connector.</li> </ul>	Go to step 3.
<b>3 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Start and idle the engine. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 4 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 6.	Go to step 4.
<b>4 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 4 (+) — Chassis ground (-):</b>	Does the voltage change within the range of 1 V by shaking the ECM harness and connector while monitoring the value of voltage meter?	Repair the poor contact in ECM connector.	Go to step 5.
<b>5 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Disconnect the connector from rear oxygen sensor. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 4 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Repair battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from rear oxygen sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between rear oxygen sensor connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(T6) No. 2 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Go to step 7.</p>	<p>Repair the power supply line.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between main relay and rear oxygen sensor connector</li> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK REAR OXYGEN SENSOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance between rear oxygen (A/F) sensor connector terminals.</p> <p><b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	<p>Is the resistance less than 30 <math>\Omega</math>?</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between rear oxygen sensor and ECM connector</li> <li>• Poor contact in rear oxygen sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	<p>Replace the rear oxygen sensor.                      &lt;Ref. to FU(H4SO)-42, Rear Oxygen Sensor.&gt;</p>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

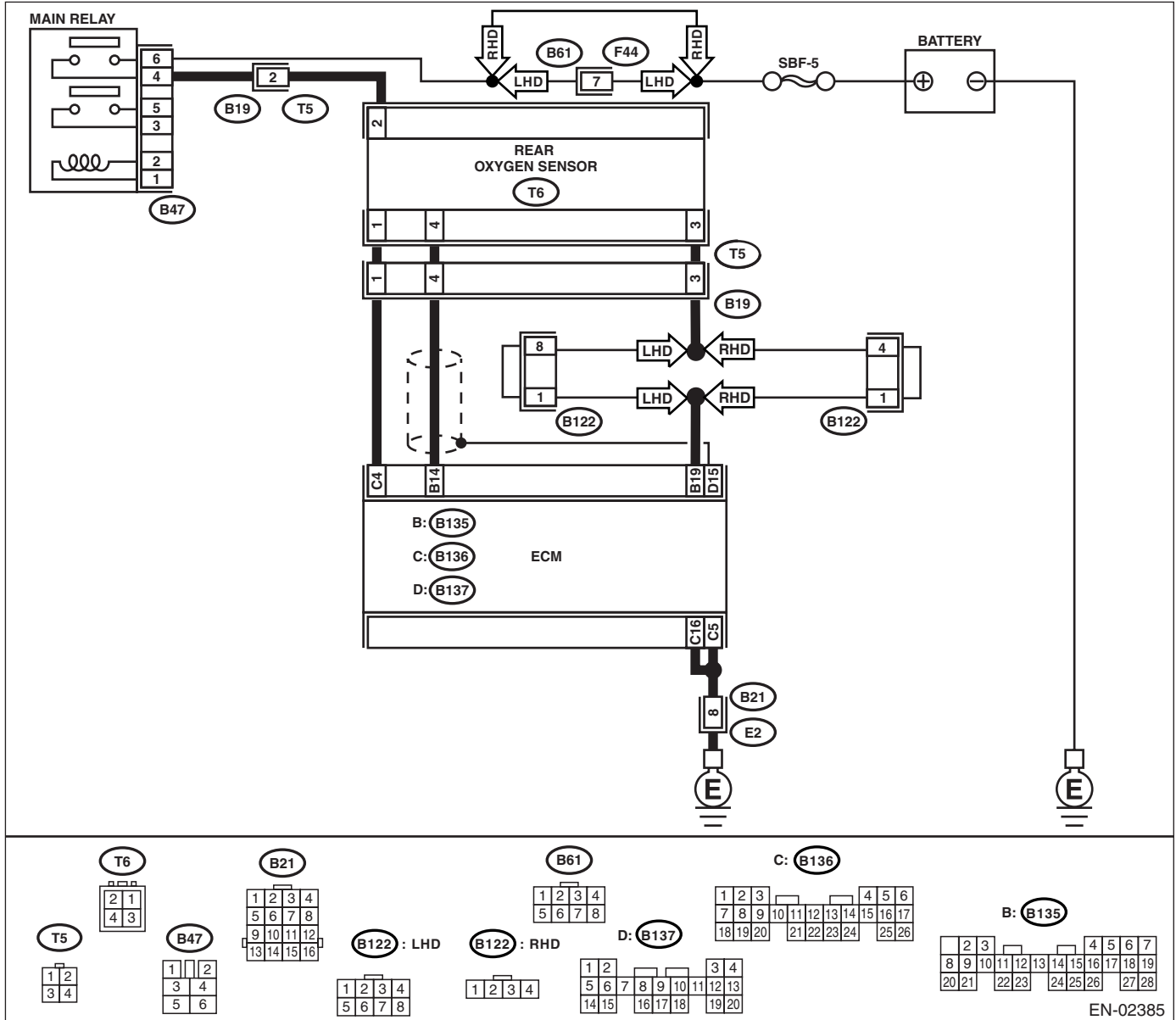
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02385

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 4 (+) — Chassis ground (-):</b></i>	Is the voltage more than 8 V?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK CURRENT DATA.</b> 1) Turn the ignition switch to OFF. 2) Repair battery short circuit in harness between ECM and rear oxygen sensor connector. 3) Turn the ignition switch to ON. 4) Read the data of rear oxygen (A/F) sensor heater current using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the current more than 7 A?	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	END.
<b>3</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	END.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No	
<b>1</b>	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b>	<b>CHECK AIR INTAKE SYSTEM.</b>	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair air intake system.	Go to step 3.
<b>3</b>	<b>CHECK PRESSURE SENSOR.</b> 1) Start and warm-up the engine until engine coolant temperature is greater than 60°C (140°F). 2) Shift the select lever in the "P" or "N" range. 3) Turn the A/C switch to OFF. 4) Turn all accessory switches to OFF. 5) Read the data of manifold absolute pressure sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the measured value at Ignition ON: 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) Idling: 20.0 — 46.7 kPa (150 — 310 mmHg, 5.91 — 12.20 inHg)?	Go to step 4.	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-31, Manifold Absolute Pressure Sensor.>
<b>4</b>	<b>CHECK THROTTLE POSITION.</b> Read the data of throttle position signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the value less than 5% when the throttle fully closed?	Go to step 5.	Adjust or replace the throttle position sensor. <Ref. to FU(H4SO)-29, Throttle Position Sensor.>
<b>5</b>	<b>CHECK THROTTLE POSITION.</b>	Is the value more than 85% when the throttle fully opens?	Replace the manifold absolute pressure sensor. <Ref. to FU(H4SO)-31, Manifold Absolute Pressure Sensor.>	Replace the throttle position sensor. <Ref. to FU(H4SO)-29, Throttle Position Sensor.>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.	Is the value less than 13.3 kPa (100 mmHg, 3.94 inHg)?	Go to step 3.	Go to step 2.
<b>2 CHECK POOR CONTACT.</b> Check poor contact in ECM and manifold pressure sensor connector.	Is there poor contact in ECM or manifold pressure sensor connector?	Repair poor contact in ECM or manifold pressure sensor connector.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.
<b>3 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B135) No. 3 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 5.	Go to step 4.
<b>4 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B135) No. 3 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V by shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Contact the SUBARU dealer. NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>5 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B135) No. 15 (+) — Chassis ground (-):</i>	Is the voltage less than 0.2 V?	Go to step 7.	Go to step 6.
<b>6 CHECK INPUT SIGNAL FOR ECM (WITH SUBARU SELECT MONITOR).</b> Read the data of barometric absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.>	Is the value more than 13.3 kPa (100 mmHg, 3.94 inHg) when shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Go to step 7.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from the manifold absolute pressure sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between manifold absolute pressure sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E21) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 8.</p>	<p>Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.</p>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B135) No. 19 — (E20) No. 1:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 9.</p>	<p>Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.</p>
<p><b>9</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact in manifold absolute pressure sensor connector.</p>	<p>Is there poor contact in manifold absolute pressure sensor connector?</p>	<p>Repair poor contact in manifold absolute pressure sensor connector.</p>	<p>Replace the manifold absolute pressure sensor. &lt;Ref. to FU(H4SO)-31, Manifold Absolute Pressure Sensor.&gt;</p>

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

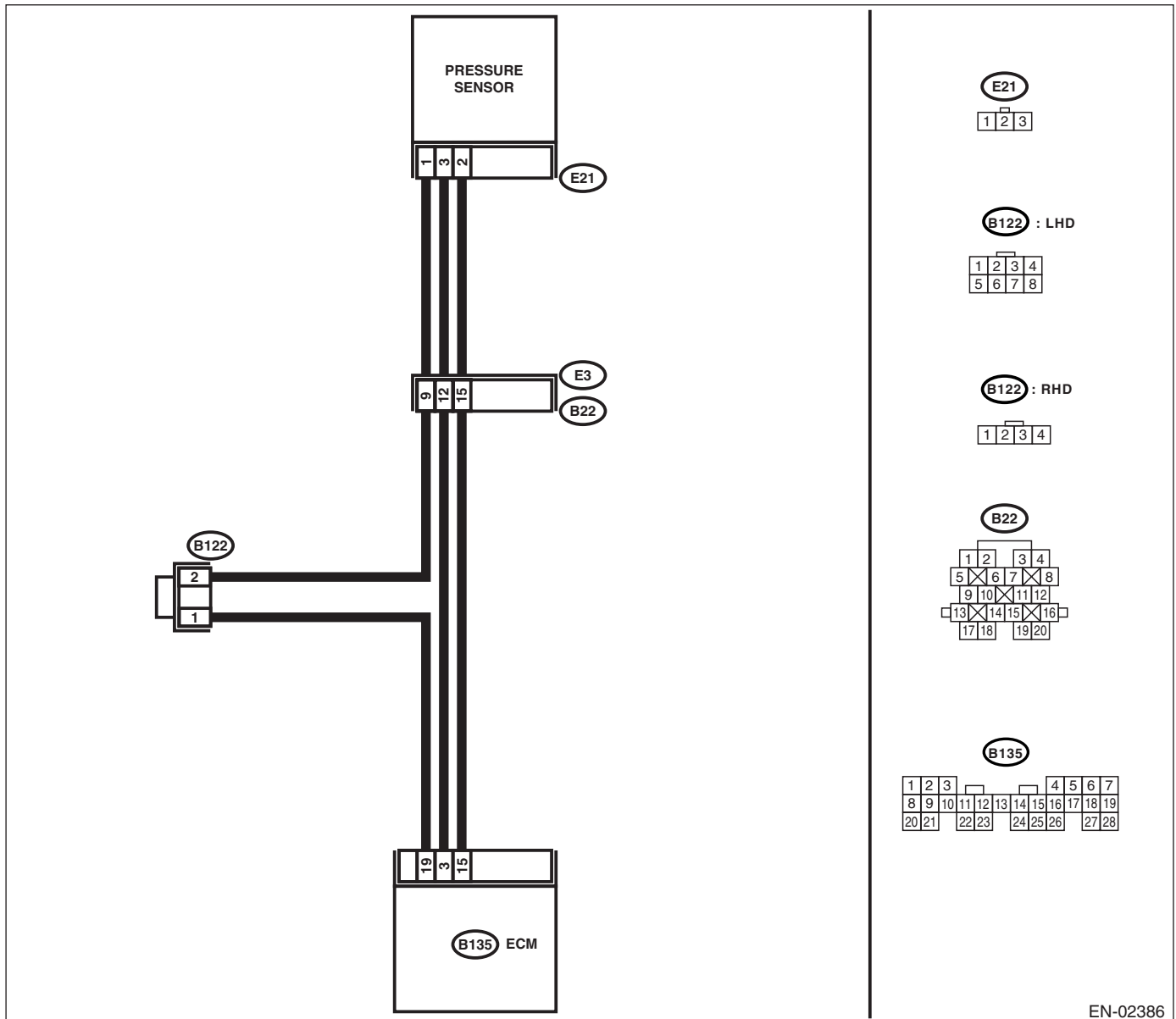
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02386



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.	Is the value more than 119.5 kPa (896.5 mmHg, 35.29 inHg)?	Go to step 10.	Go to step 2.
<b>2 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 3 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
<b>3 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 3 (+) — Chassis ground (-):</b>	Is the voltage more than 4.5 V by shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Contact the SUBARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 15 (+) — Chassis ground (-):</b>	Is the voltage less than 0.2 V?	Go to step 6.	Go to step 5.
<b>5 CHECK INPUT SIGNAL FOR ECM (WITH SUBARU SELECT MONITOR).</b> Read the data of atmospheric absolute pressure signal using Subaru Select Monitor.  NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.>	Is the value more than 13.3 kPa (100 mmHg, 3.94 inHg) when shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Go to step 6.
<b>6 CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the manifold absolute pressure sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between manifold absolute pressure sensor connector and engine ground. <b>Connector &amp; terminal</b> <b>(E21) No. 3 (+) — Engine ground (-):</b>	Is the voltage more than 4.5 V?	Go to step 7.	Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 15 — (E21) No. 2:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step <b>8</b>.</p>	<p>Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.</p>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b></p> <p>Measure the resistance of harness between ECM and manifold absolute pressure sensor connector.</p> <p><b>Connector &amp; terminal</b> <b>(B135) No. 19 — (E21) No. 1:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step <b>9</b>.</p>	<p>Repair the open circuit in harness between ECM and manifold absolute pressure sensor connector.</p>
<p><b>9</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in manifold absolute pressure sensor connector.</p>	<p>Is there poor contact in manifold absolute pressure sensor connector?</p>	<p>Repair poor contact in manifold absolute pressure sensor connector.</p>	<p>Replace the manifold absolute pressure sensor. &lt;Ref. to FU(H4SO)-31, Manifold Absolute Pressure Sensor.&gt;</p>
<p><b>10</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF. 2) Disconnect the connector from the manifold absolute pressure sensor. 3) Turn the ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON. 4) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is the value more than 119.5 kPa (896.5 mmHg, 35.29 inHg)?</p>	<p>Repair battery short in harness between ECM and manifold pressure sensor connector.</p>	<p>Replace the manifold absolute pressure sensor. &lt;Ref. to FU(H4SO)-31, Manifold Absolute Pressure Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

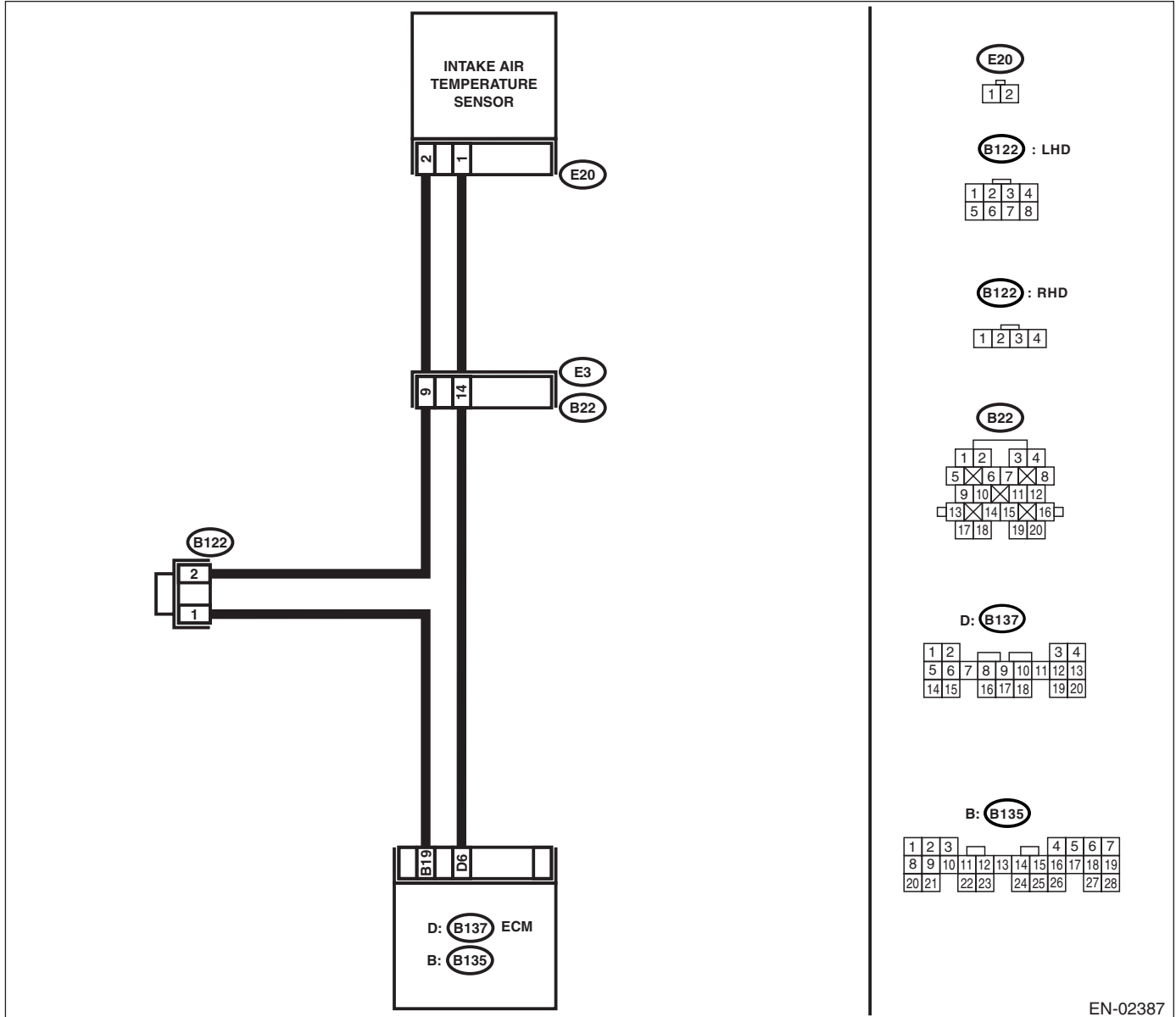
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02387

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).> NOTE: In this case, it is not necessary to inspect DTC P0111.	Go to step 2.
<b>2 CHECK ENGINE COOLANT.</b> 1) Start the engine and warm-up completely. 2) Measure the engine coolant temperature using Subaru Select Monitor or OBD-II general scan tool. NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the engine coolant temperature 75 — 95°C (167 — 203°F)?	Replace the intake air temperature sensor. <Ref. to FU(H4SO)-32, Intake Air Temperature Sensor.>	Inspect the DTC P0125 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

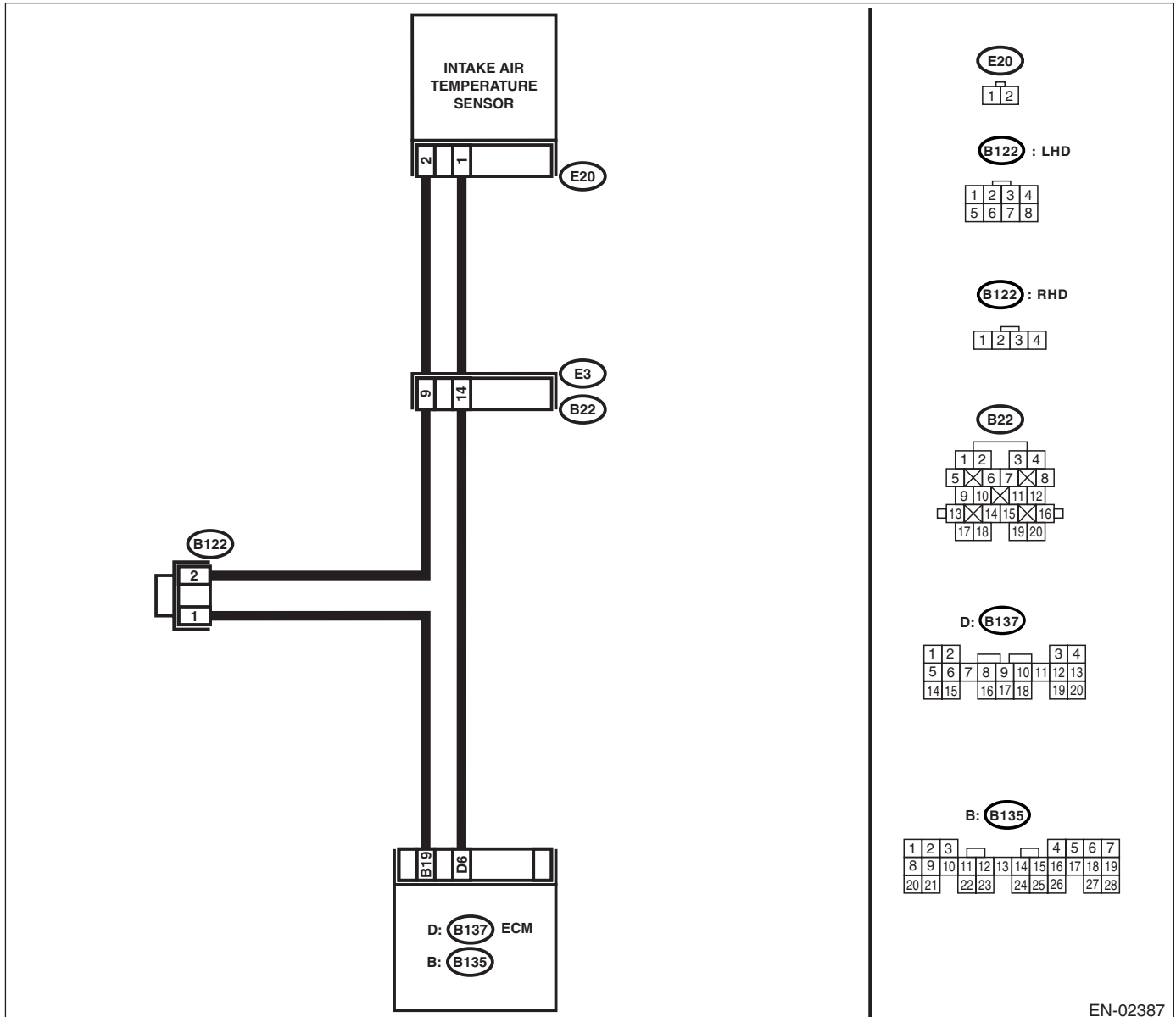
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02387

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is the intake air temperature more than 120°C (248°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector intake air temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is the intake air temperature less than -40°C (-40°F)?</p>	<p>Replace the intake air temperature sensor. &lt;Ref. to FU(H4SO)-32, Intake Air Temperature Sensor.&gt;</p>	<p>Repair ground short circuit in harness between intake air temperature sensor and ECM connector.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

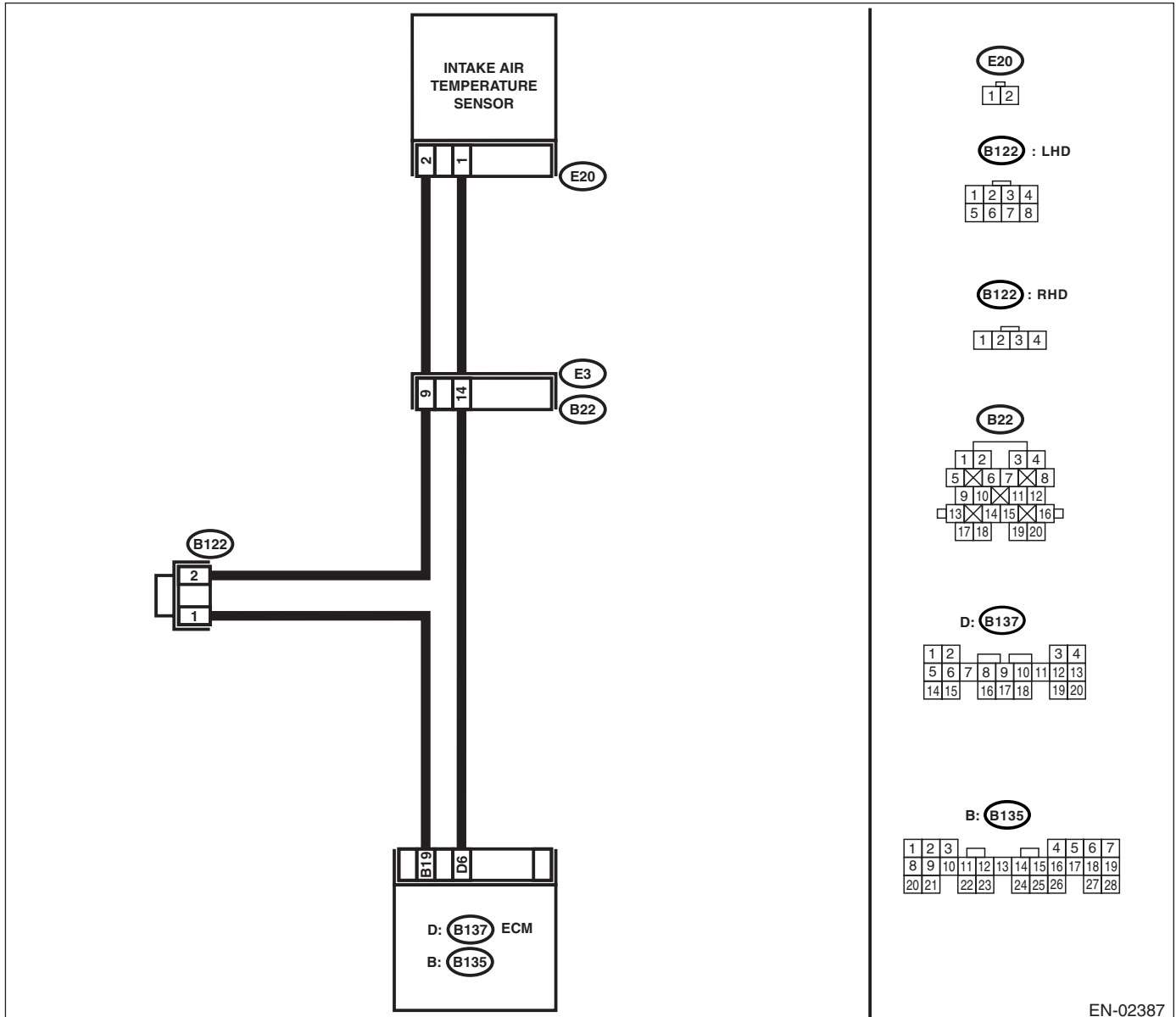
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02387

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of intake air temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is the intake air temperature less than <math>-40^{\circ}\text{C}</math> (<math>-40^{\circ}\text{F}</math>)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector intake air temperature sensor.</p> <p>3) Measure the voltage between intake air temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E20) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between intake air temperature sensor and ECM connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between intake air temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E20) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between intake air temperature sensor and ECM connector.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between intake air temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E20) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 3 V?</p>	<p>Go to step 5.</p>	<p>Repair harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector</li> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN INTAKE AIR TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between intake air temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E20) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Replace the intake air temperature sensor. &lt;Ref. to FU(H4SO)-32, Intake Air Temperature Sensor.&gt;</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between mass air flow and intake air temperature sensor and ECM connector</li> <li>• Poor contact in mass air flow and intake air temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in joint connector</li> </ul>

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

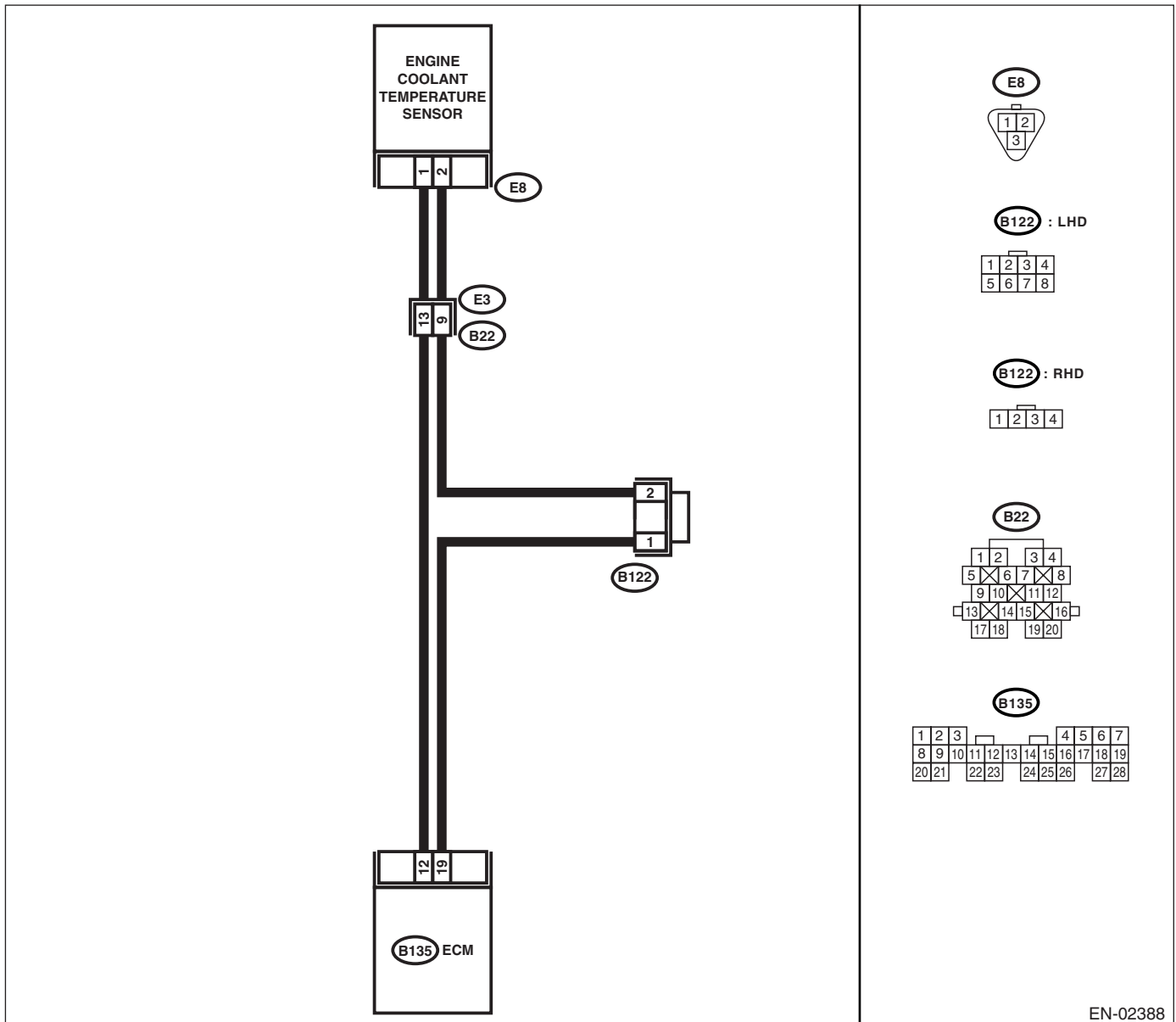
### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02388

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is engine coolant temperature more than 150°C (302°F)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in engine coolant temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the engine coolant temperature sensor.</p> <p>3) Turn the ignition switch to ON.</p> <p>4) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is engine coolant temperature less than -40°C (-40°F)?</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4SO)-25, Engine Coolant Temperature Sensor.&gt;</p>	<p>Repair ground short circuit in harness between engine coolant temperature sensor and ECM connector.</p>

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

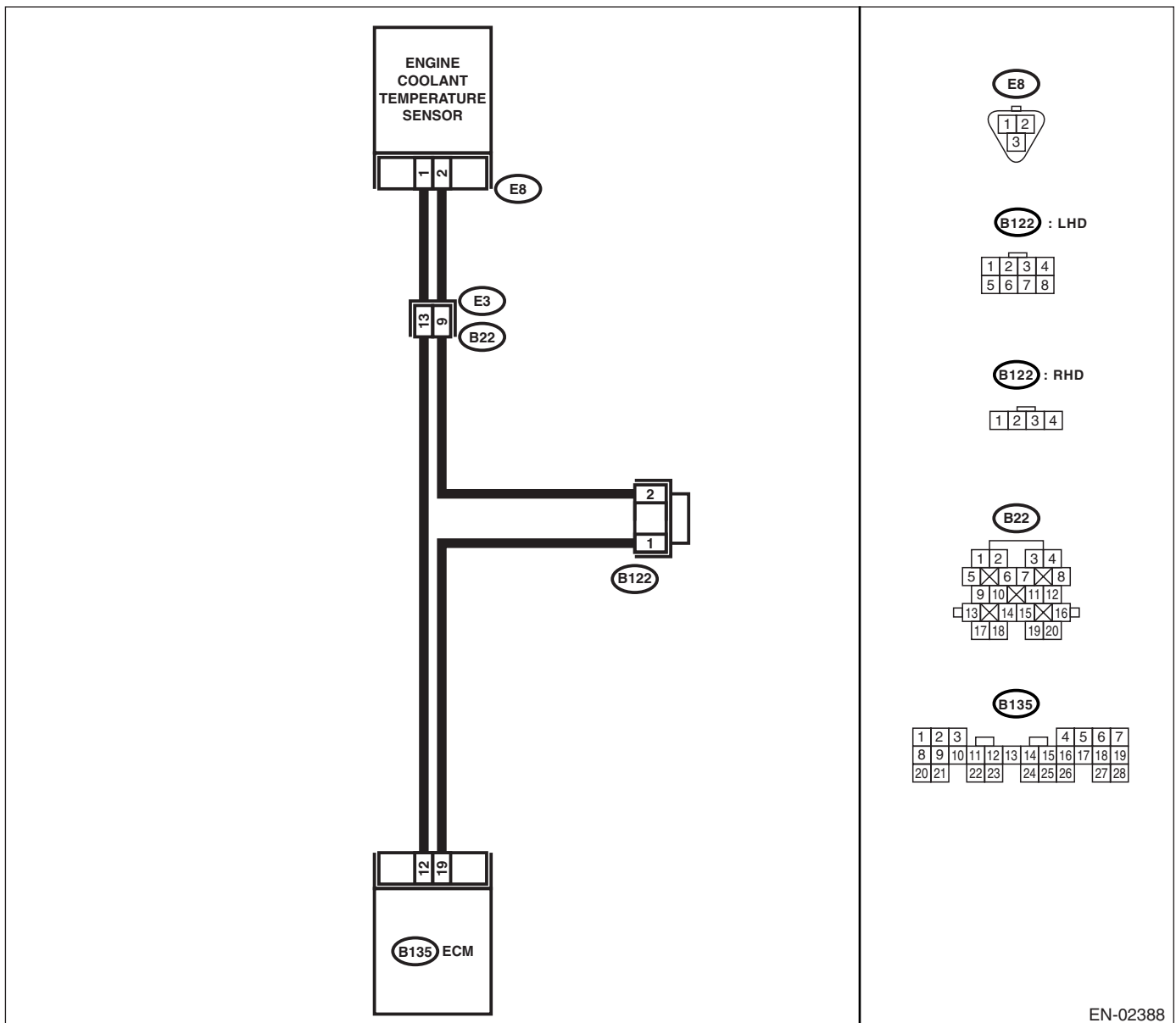
### TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02388

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is engine coolant temperature less than <math>-40^{\circ}\text{C}</math> (<math>-40^{\circ}\text{F}</math>)?</p>	<p>Go to step 2.</p>	<p>Repair the poor contact.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in engine coolant temperature sensor</li> <li>• Poor contact in ECM</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from the engine coolant temperature sensor.</p> <p>3) Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 10 V?</p>	<p>Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the voltage between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 1 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4 V?</p>	<p>Go to step 5.</p>	<p>Repair harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine coolant temperature sensor connector</li> <li>• Poor contact in engine coolant temperature sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p>5</p> <p><b>CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Measure the resistance of harness between engine coolant temperature sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E8) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4SO)-25, Engine Coolant Temperature Sensor.&gt;</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b> In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and engine coolant temperature sensor connector</li> <li>• Poor contact in engine coolant temperature sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## N: DTC P0121 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

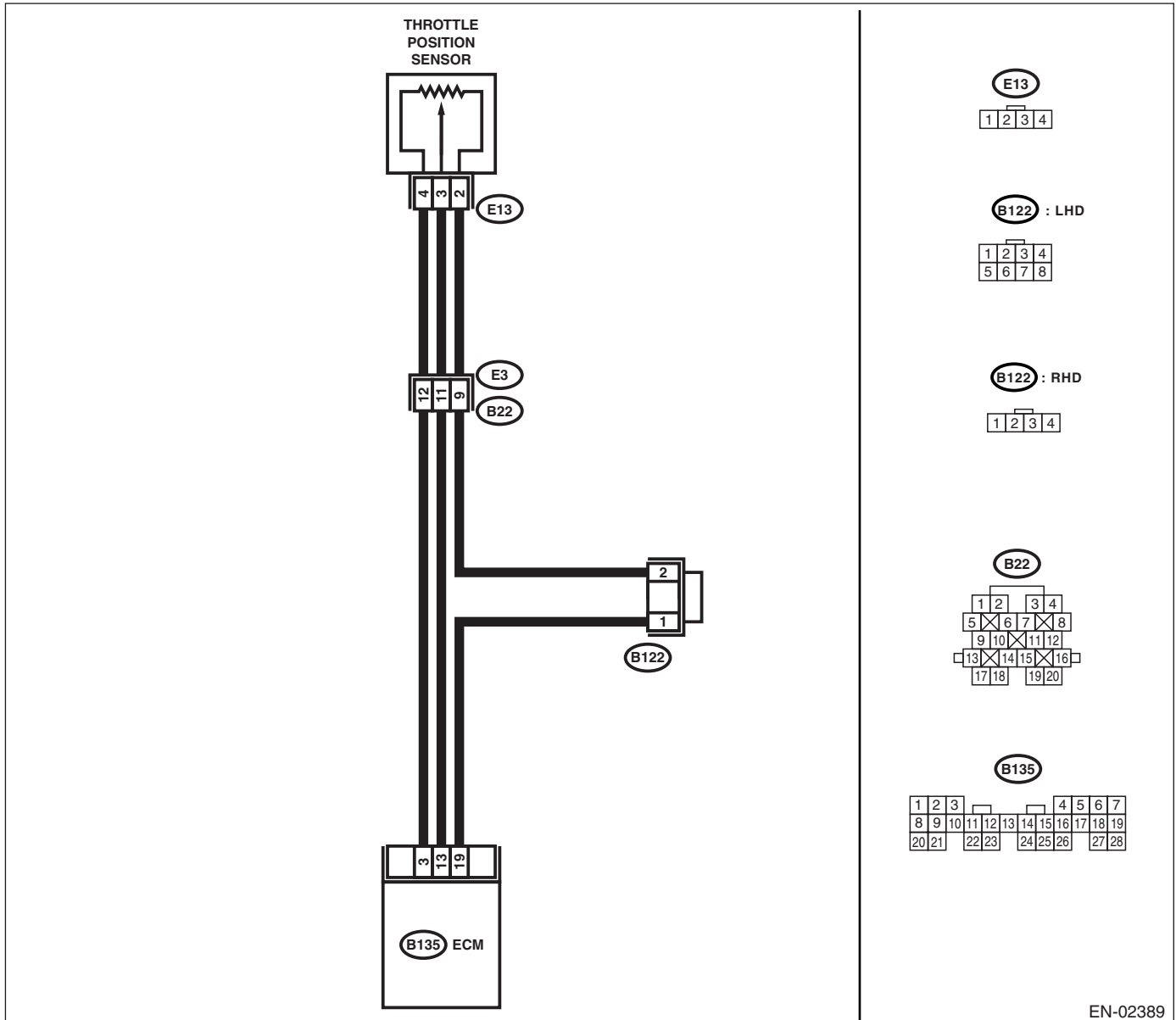
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02389

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC P0122 or P0123 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0121.	Replace the throttle position sensor. <Ref. to FU(H4SO)-29, Throttle Position Sensor.>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## O: DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW INPUT

### DTC DETECTING CONDITION:

Immediately at fault recognition

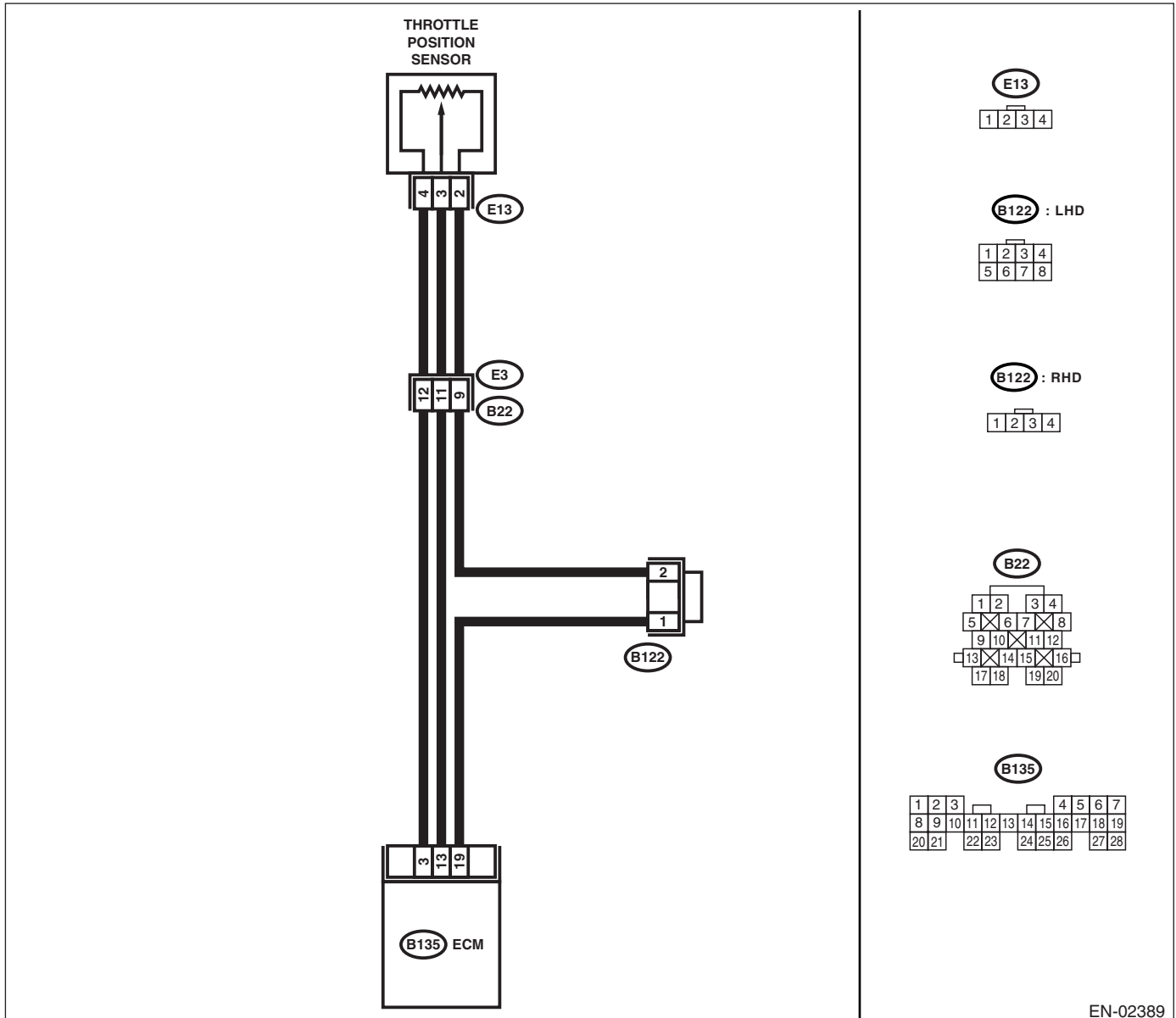
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls
- Poor driving performance

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the voltage less than 0.1 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case repair the following: • Poor contact in throttle position sensor connector • Poor contact in ECM connector. • Poor contact in coupling connector
<b>2 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground while throttle valve is fully closed.  <i>Connector &amp; terminal</i> <i>(B135) No. 3 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 4.	Go to step 3.
<b>3 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B135) No. 3 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V by shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Contact the SUBARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>4 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B135) No. 13 (+) — Chassis ground (-):</i>	Is the voltage less than 0.1 V?	Go to step 6.	Go to step 5.
<b>5 CHECK INPUT SIGNAL FOR ECM (WITH SUBARU SELECT MONITOR).</b> Measure the voltage between ECM connector and chassis ground.  <i>Connector &amp; terminal</i> <i>(B135) No. 13 (+) — Chassis ground (-):</i>	Is the voltage more than 0.1 V by shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Go to step 6.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from throttle position sensor.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E13) No. 4 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.5 V?</p>	<p>Go to step 7.</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between throttle position sensor and ECM connector</li> <li>• Poor contact in throttle position sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance of harness between ECM connector and throttle position sensor connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B135) No. 13 — (E13) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between throttle position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in throttle position sensor connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>8</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.</b></p> <p>Measure the resistance of harness between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b>  <b>(E13) No. 3 — Engine ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 9.</p>	<p>Repair ground short circuit in harness between throttle position sensor and ECM connector.</p>
<p><b>9</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in throttle position sensor connector.</p>	<p>Is there poor contact in throttle position sensor?</p>	<p>Repair poor contact in throttle position sensor connector.</p>	<p>Replace the throttle position sensor. &lt;Ref. to FU(H4SO)-29, Throttle Position Sensor.&gt;</p>

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

**DTC DETECTING CONDITION:**

Immediately at fault recognition

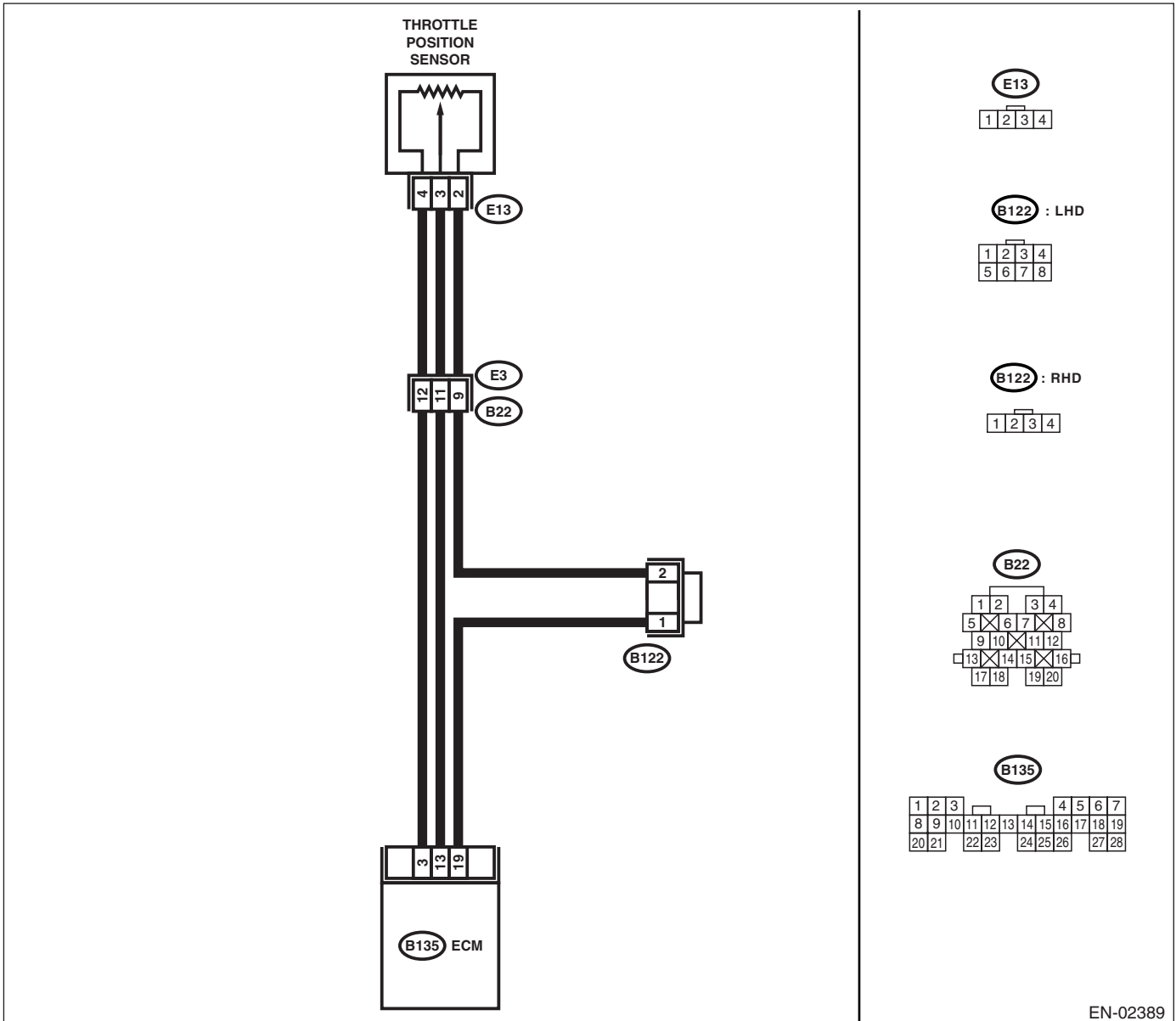
**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls
- Poor driving performance

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK CURRENT DATA.</b></p> <p>1) Start the engine.</p> <p>2) Read the data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.</p> <p>NOTE:</p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II general scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.</p>	<p>Is the voltage more than 4.9 V?</p>	<p>Go to step 2.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Poor contact in throttle position sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connectors from throttle position sensor.</p> <p>3) Measure the resistance of harness between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E13) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair harness and connector.</p> <p>NOTE:</p> <p>In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between throttle position sensor and ECM connector</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in joint connector</li> </ul>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON.</p> <p>2) Measure the voltage between throttle position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E13) No. 3 (+) — Engine ground (-):</b></p>	<p>Is the voltage more than 4.9 V?</p>	<p>Repair the battery short circuit in harness between throttle position sensor and ECM connector. After repair, replace the ECM. &lt;Ref. to FU(H4SO)-44, Engine Control Module (ECM).&gt;</p>	<p>Replace the throttle position sensor. &lt;Ref. to FU(H4SO)-29, Throttle Position Sensor.&gt;</p>

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

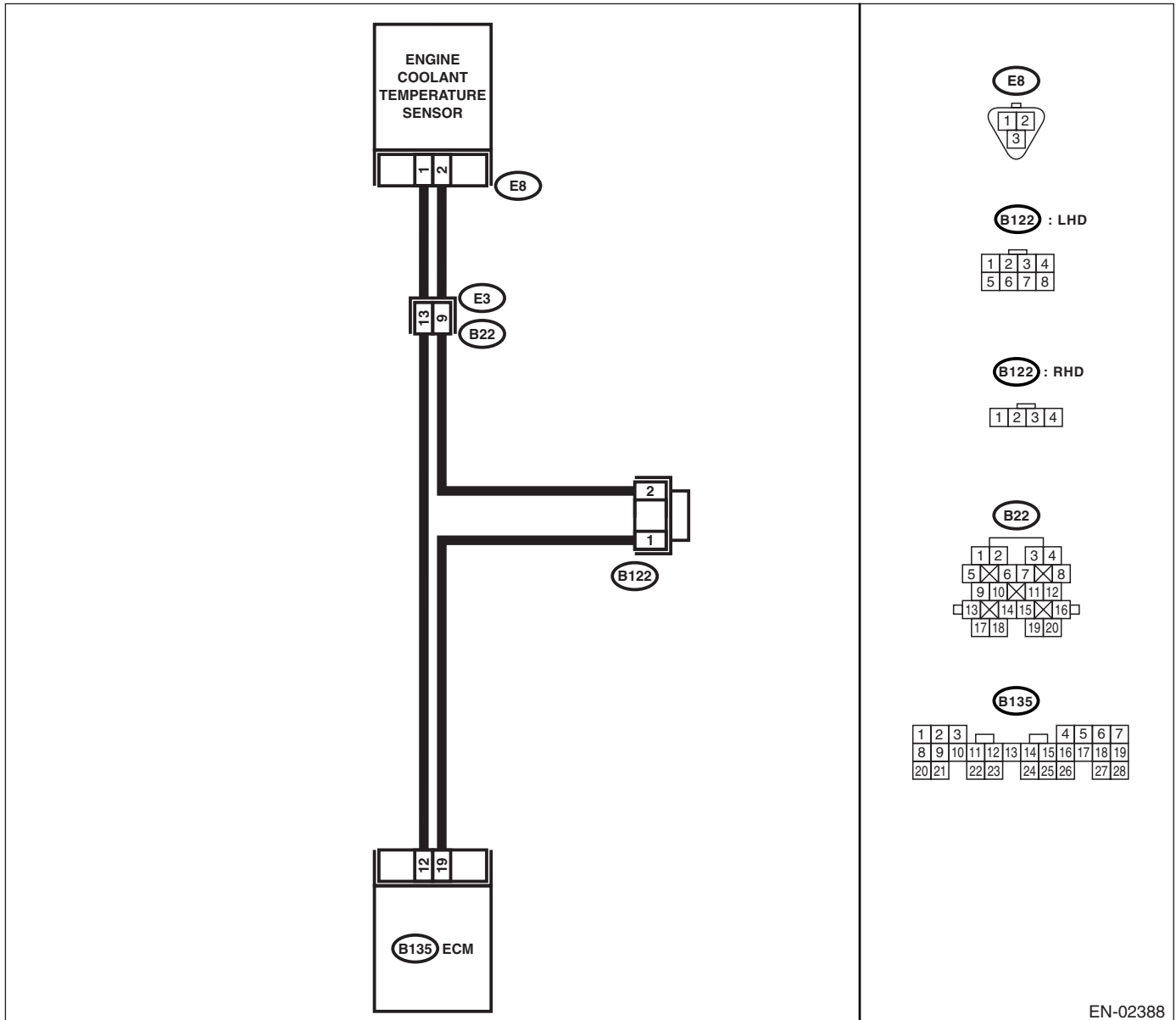
### TROUBLE SYMPTOM:

Engine would not return to idling.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02388

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).> <b>NOTE:</b> In this case, it is not necessary to inspect DTC P0125.	Go to step 2.
2 <b>CHECK THERMOSTAT.</b>	Does the thermostat remain opened?	Replace the thermostat. <Ref. to CO(H4SO)-26, Thermostat.>	Replace the engine coolant temperature sensor. <Ref. to FU(H4SO)-25, Engine Coolant Temperature Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## R: DTC P0129 BAROMETRIC PRESSURE TOO LOW

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0129.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## S: DTC P0130 O<sub>2</sub> SENSOR CIRCUIT (BANK 1 SENSOR 1)

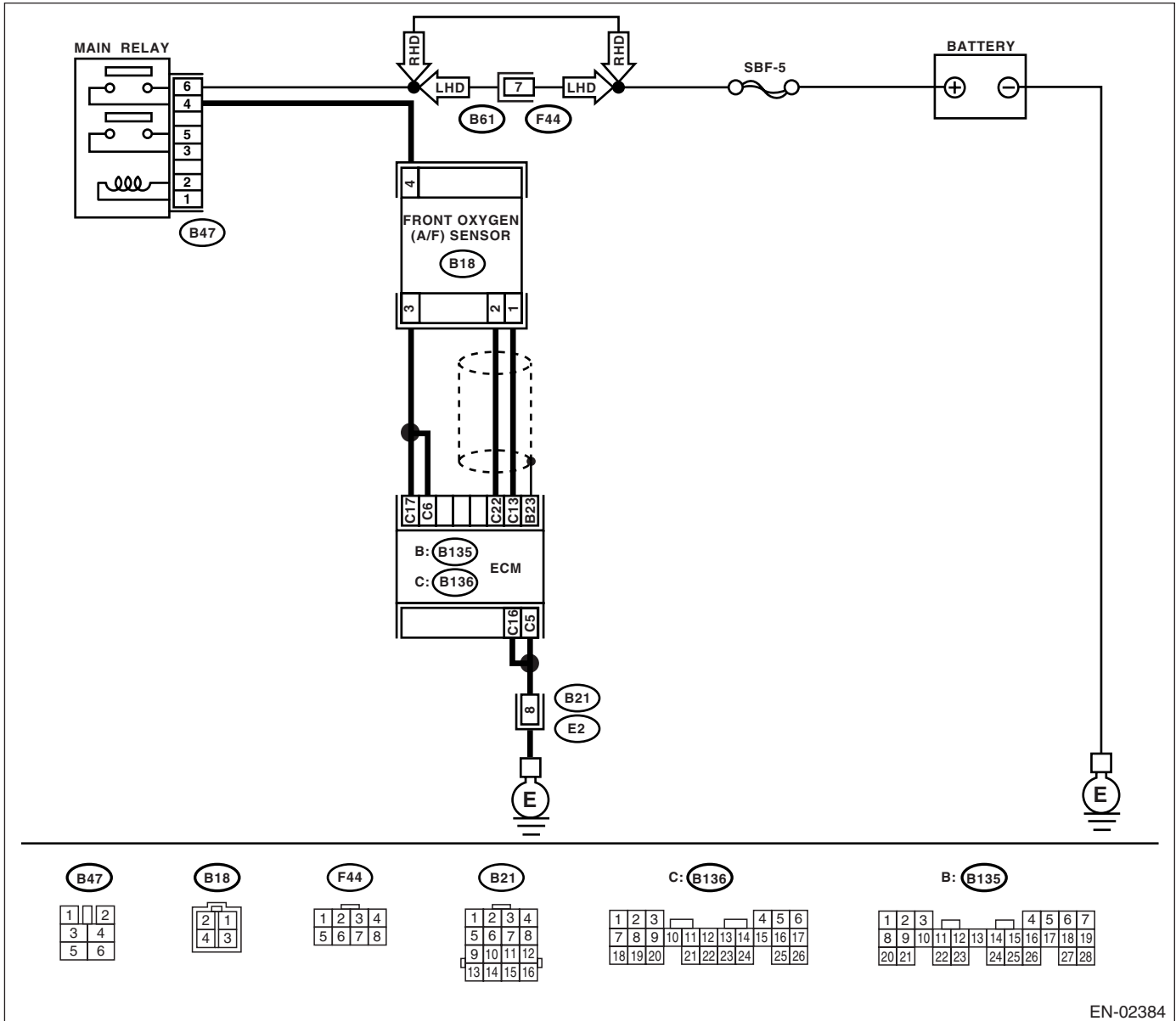
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK FRONT (A/F) OXYGEN SENSOR DATA.</b> 1) Start the engine. 2) While observing the Subaru Select Monitor or OBD-II general scan tool screen, warm-up the engine until coolant temperature is above 70°C (160°F). If the engine is already warmed-up, operate at idle speed for at least 1 minute. 3) Read the data of front oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II general scan tool.  <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the voltage 0.85 — 1.15 V?	Go to step 3.	Go to step 4.
<b>3</b> <b>CHECK FRONT (A/F) OXYGEN SENSOR DATA.</b> 1) Race the engine at speeds from idling to 5,000 rpm for a total of 5 cycles. 2) Read the data of front oxygen (A/F) sensor signal at racing using Subaru Select Monitor or OBD-II general scan tool.  <b>NOTE:</b> • Normally the air fuel ratio be rich at racing. • To increase engine speed to 5,000 rpm, slowly depress accelerator pedal, taking approximately 5 seconds, and quickly release accelerator pedal to decrease engine speed.	Is the voltage more than 1.1 V?	Go to step 6.	Go to step 4.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance between ECM and front oxygen (A/F) sensor. <b>Connector &amp; terminal</b> <b>(B136) No. 13 — (B18) No. 1:</b> <b>(B136) No. 22 — (B18) No. 2:</b>	Is the resistance less than 5 Ω?	Go to step 5.	Repair open circuit between ECM and front oxygen (A/F) sensor.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</b> Measure the resistance between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 13 — Chassis ground:</b> <b>(B136) No. 22 — Chassis ground:</b>	Is the resistance more than 1 MΩ?	Go to step 6.	Repair ground short circuit between ECM and front oxygen (A/F) sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>6</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"><li>• Loose installation of portions</li><li>• Damage (crack, hole etc.) of parts</li><li>• Looseness of front oxygen (A/F) sensor</li><li>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor</li></ul>	Is there a fault in exhaust system?	Repair or replace the faulty part.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

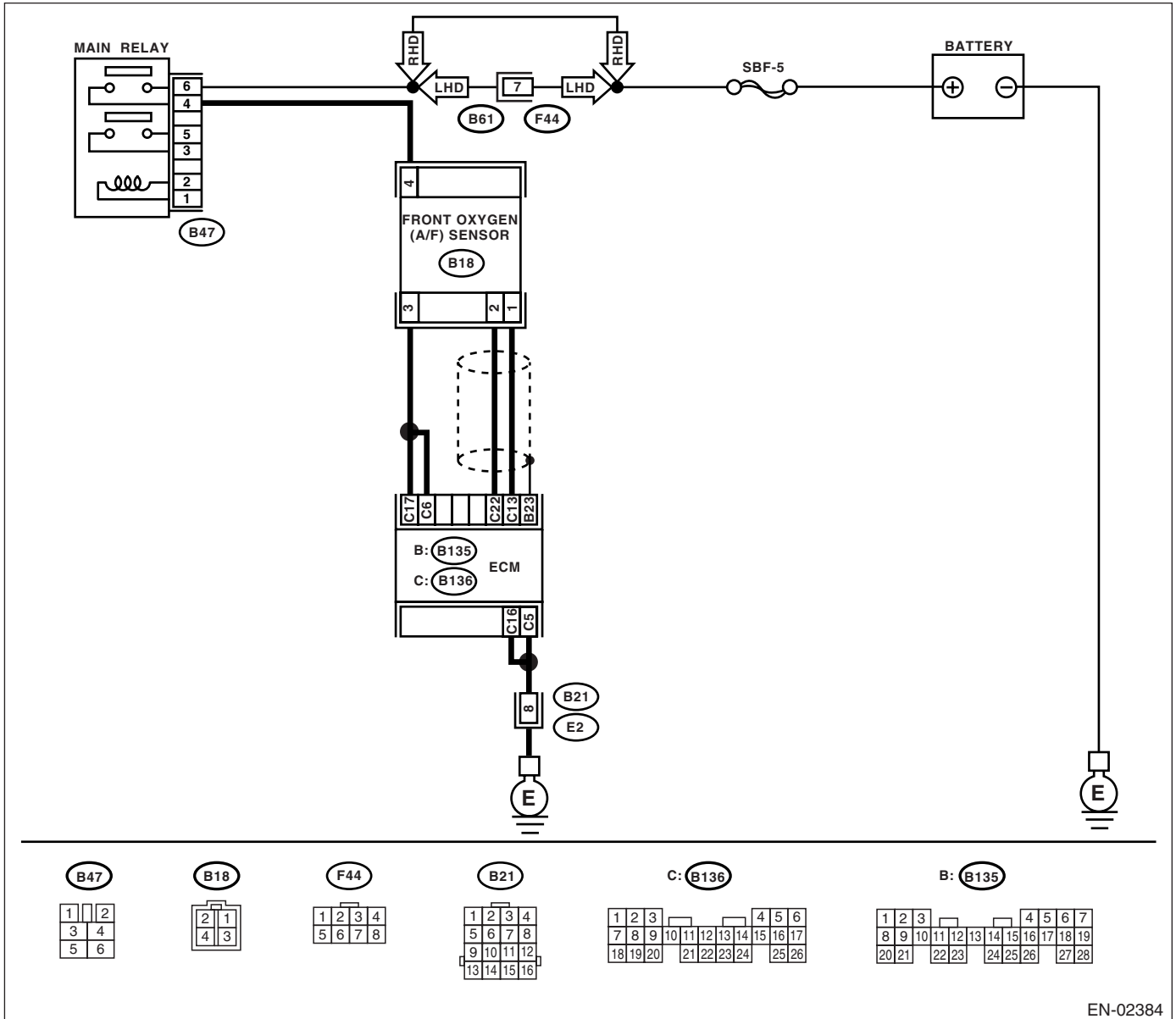
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance of harness between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 13 — Chassis ground:</b> <b>(B136) No. 22 — Chassis ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.&gt;</p>	<p>Repair ground short circuit in harness between ECM and front oxygen (A/F) sensor connector.</p>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b>    <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to ON. 2) Disconnect the connector from front oxygen (A/F) sensor. 3) Measure the voltage of harness between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(B136) No. 13 (+) — Chassis ground (-):</b> <b>(B136) No. 22 (+) — Chassis ground (-):</b></p>	Is the voltage more than 8 V?	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>	Repair battery short circuit in harness between ECM and front oxygen (A/F) sensor connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## V: DTC P0133 O<sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1)

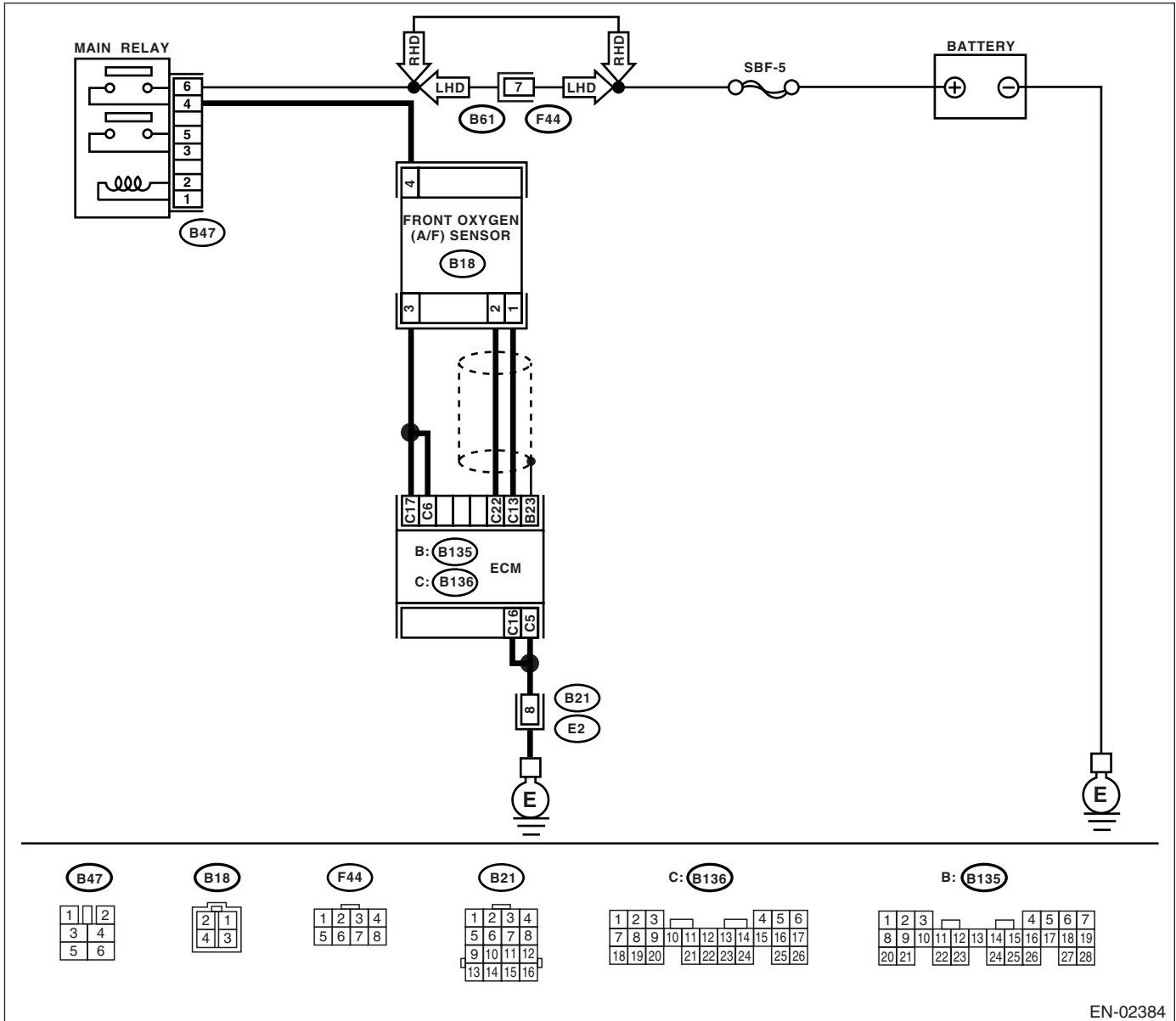
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).> <b>NOTE:</b> In this case, it is not necessary to inspect DTC P0133.	Go to step 2.
<b>2</b> <b>CHECK EXHAUST SYSTEM.</b> <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"><li>• Loose installation of front portion of exhaust pipe onto cylinder heads</li><li>• Loose connection between front exhaust pipe and front catalytic converter</li><li>• Damage of exhaust pipe resulting in a hole</li></ul>	Is there a fault in exhaust system?	Repair exhaust system.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>

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

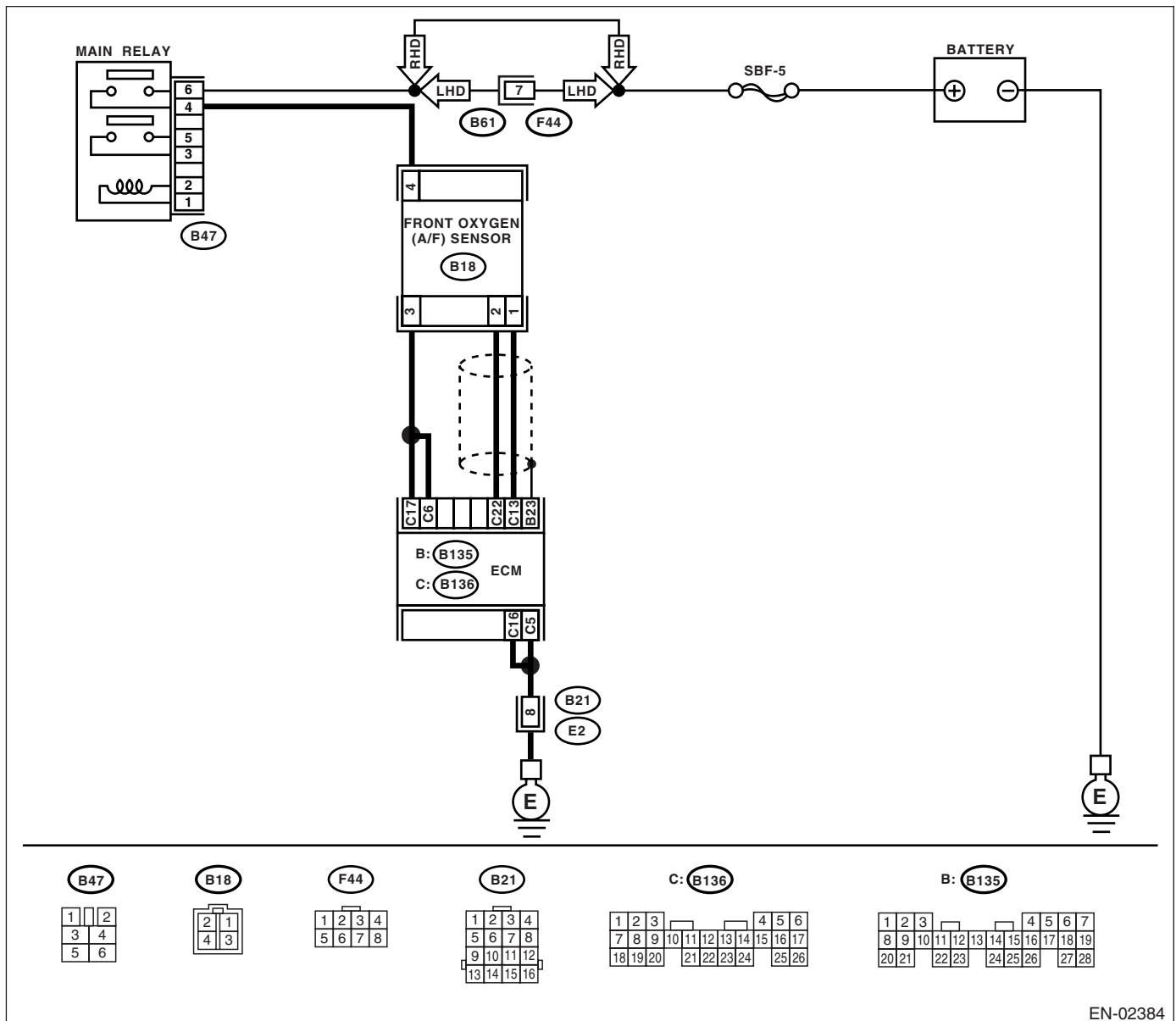
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector.                      3) Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.</p> <p><b>Connector &amp; terminal</b>  <i>(B136) No. 13 — (E18) No. 1:</i>  <i>(B136) No. 22 — (E18) No. 2:</i></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair harness and connector.</p> <p><b>NOTE:</b>                      In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and front oxygen (A/F) sensor connector</li> <li>• Poor contact in front oxygen (A/F) sensor connector</li> <li>• Poor contact in ECM connector.</li> </ul>
<p><b>2</b></p> <p><b>CHECK POOR CONTACT.</b>                      Check poor contact in front oxygen (A/F) sensor connector.</p>	<p>Is there poor contact in front oxygen (A/F) sensor connector?</p>	<p>Repair the poor contact in front oxygen (A/F) sensor connector.</p>	<p>Replace the front oxygen (A/F) sensor. &lt;Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

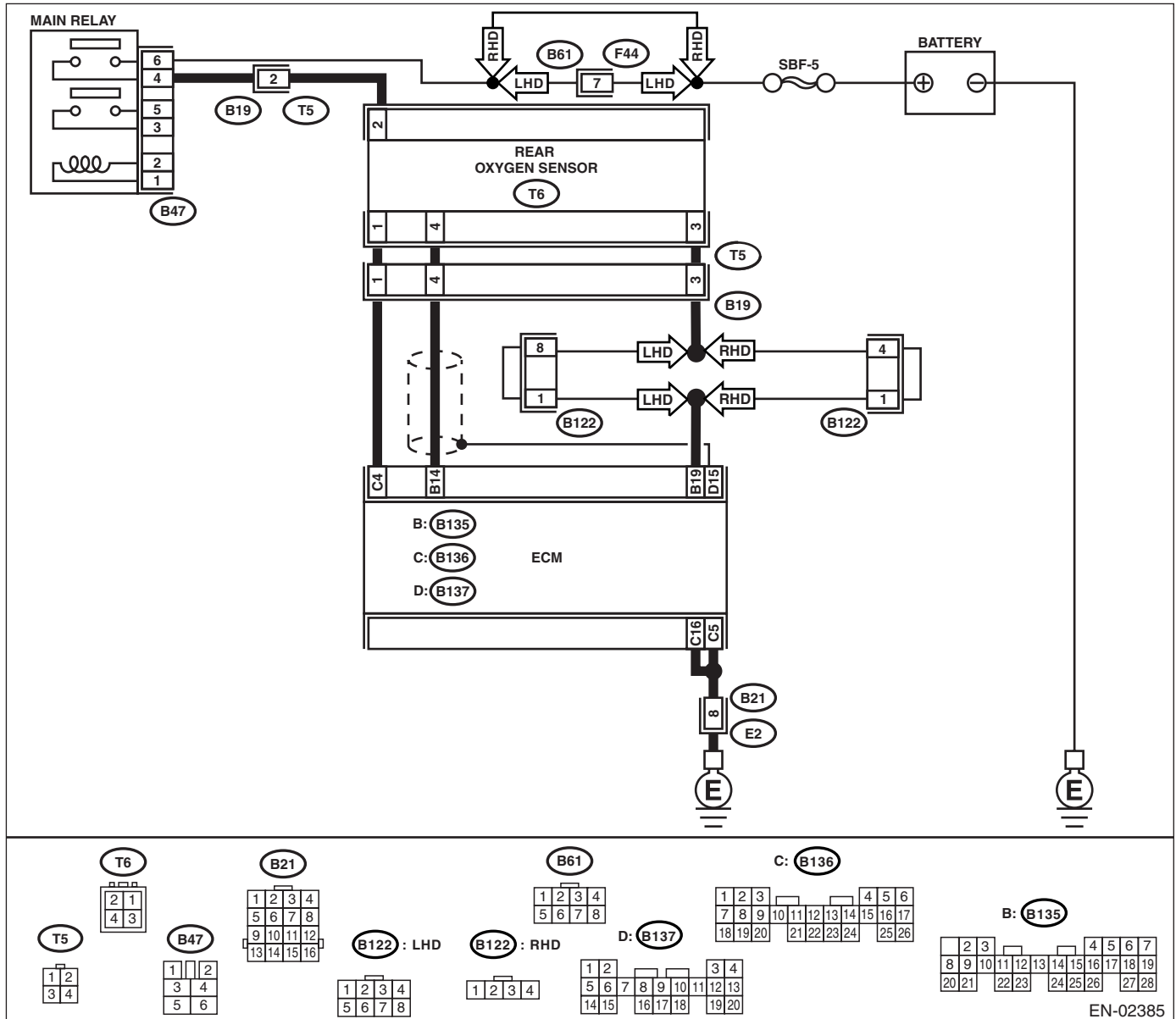
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02385

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0137.	Go to step 2.
<b>2</b> <b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and keep the engine speed at 5,000 rpm. 2) Read the data of rear oxygen sensor signal using Subaru Select Monitor or the OBD-II scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II scan tool For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.	Is the voltage more than 490 mV?	Go to step 5.	Go to step 3.
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance in harness between ECM and rear oxygen sensor connector.  <b>Connector &amp; terminal</b> <b>(B135) No. 14 — (T6) No. 4:</b> <b>(B135) No. 19 — (T6) No. 3:</b>	Is the resistance more than 3 Ω?	Repair open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 4.
<b>4</b> <b>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor harness connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(T6) No. 4 (+) — Chassis ground (-):</b>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>	Repair harness and connector.  NOTE: In this case repair the following: • Open circuit in harness between rear oxygen sensor and ECM connector • Poor contact in rear oxygen sensor connector • Poor contact in ECM connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>5</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"><li>• Loose part of exhaust system and incomplete installation</li><li>• Damage (crack, hole etc.) of parts</li><li>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor</li></ul>	Is there a fault in exhaust system?	Repair or replace the faulty part.	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

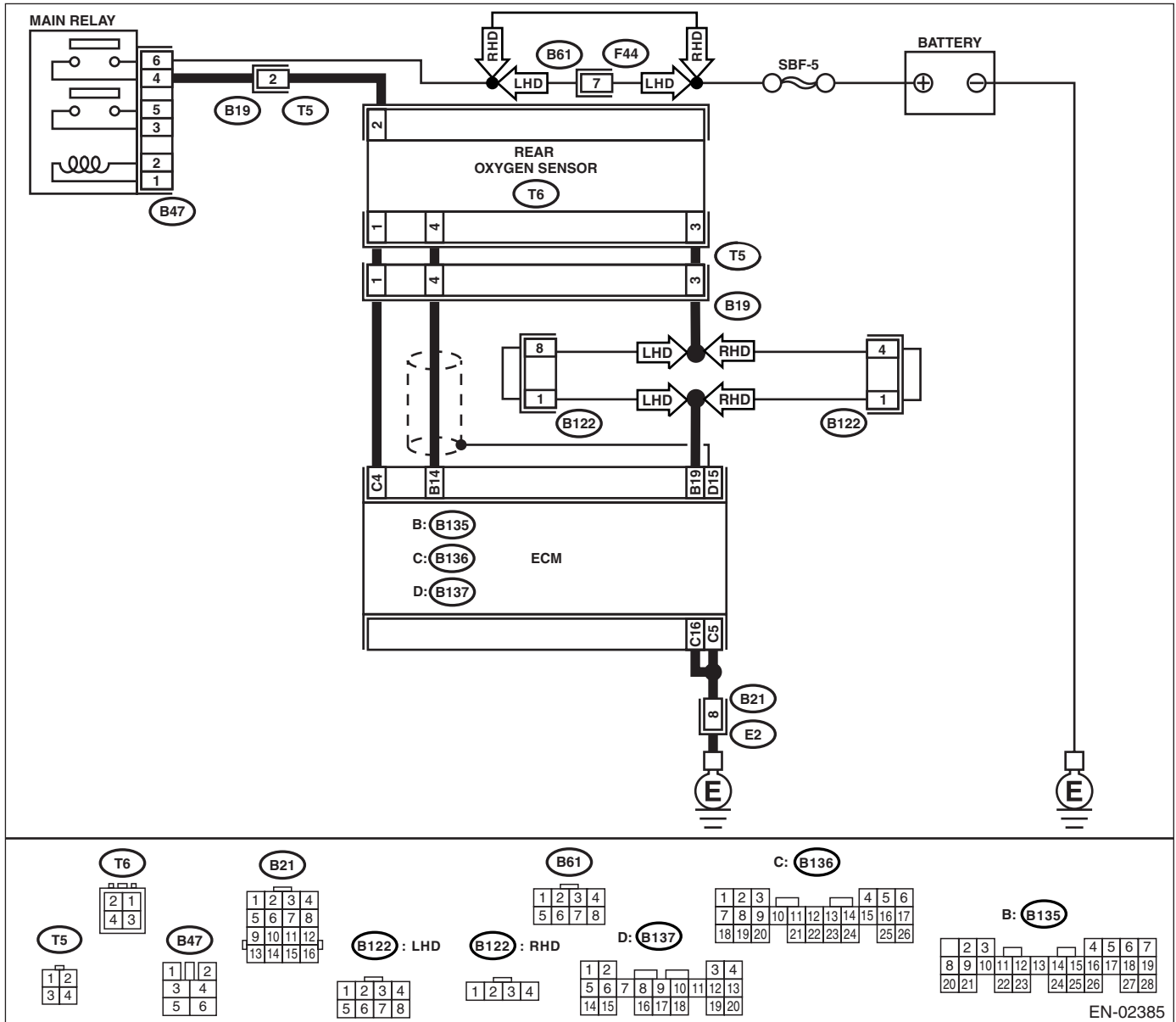
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02385

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0138.	Go to step 2.
<b>2</b> <b>CHECK REAR OXYGEN SENSOR DATA.</b> 1) Warm-up the engine until engine coolant temperature is above 70°C (158°F), and lower the engine speed rapidly from 5,000 rpm. 2) Read the data of rear oxygen (A/F) sensor signal using Subaru Select Monitor or OBD-II scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II scan tool For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.	Does the voltage vary from 250 mV?	Go to step 5.	Go to step 3.
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and rear oxygen sensor. 3) Measure the resistance in harness between ECM and rear oxygen sensor connector.  <b>Connector &amp; terminal</b> <b>(B135) No. 14 — (T6) No. 4:</b> <b>(B135) No. 19 — (T6) No. 3:</b>	Is the resistance more than 3 Ω?	Repair open circuit in harness between ECM and rear oxygen sensor connector.	Go to step 4.
<b>4</b> <b>CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from rear oxygen sensor. 3) Turn the ignition switch to ON. 4) Measure the voltage between rear oxygen sensor harness connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(T6) No. 4 (+) — Chassis ground (-):</b>	Is the voltage 0.2 — 0.5 V?	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>	Repair harness and connector.  NOTE: In this case repair the following: • Open circuit in harness between rear oxygen sensor and ECM connector • Poor contact in rear oxygen sensor connector • Poor contact in ECM connector.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>5</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"><li>• Loose part of exhaust system and incomplete installation</li><li>• Damage (crack, hole etc.) of parts</li><li>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor</li></ul>	Is there a fault in exhaust system?	Repair or replace the faulty part.	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## Z: DTC P0139 O<sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2)

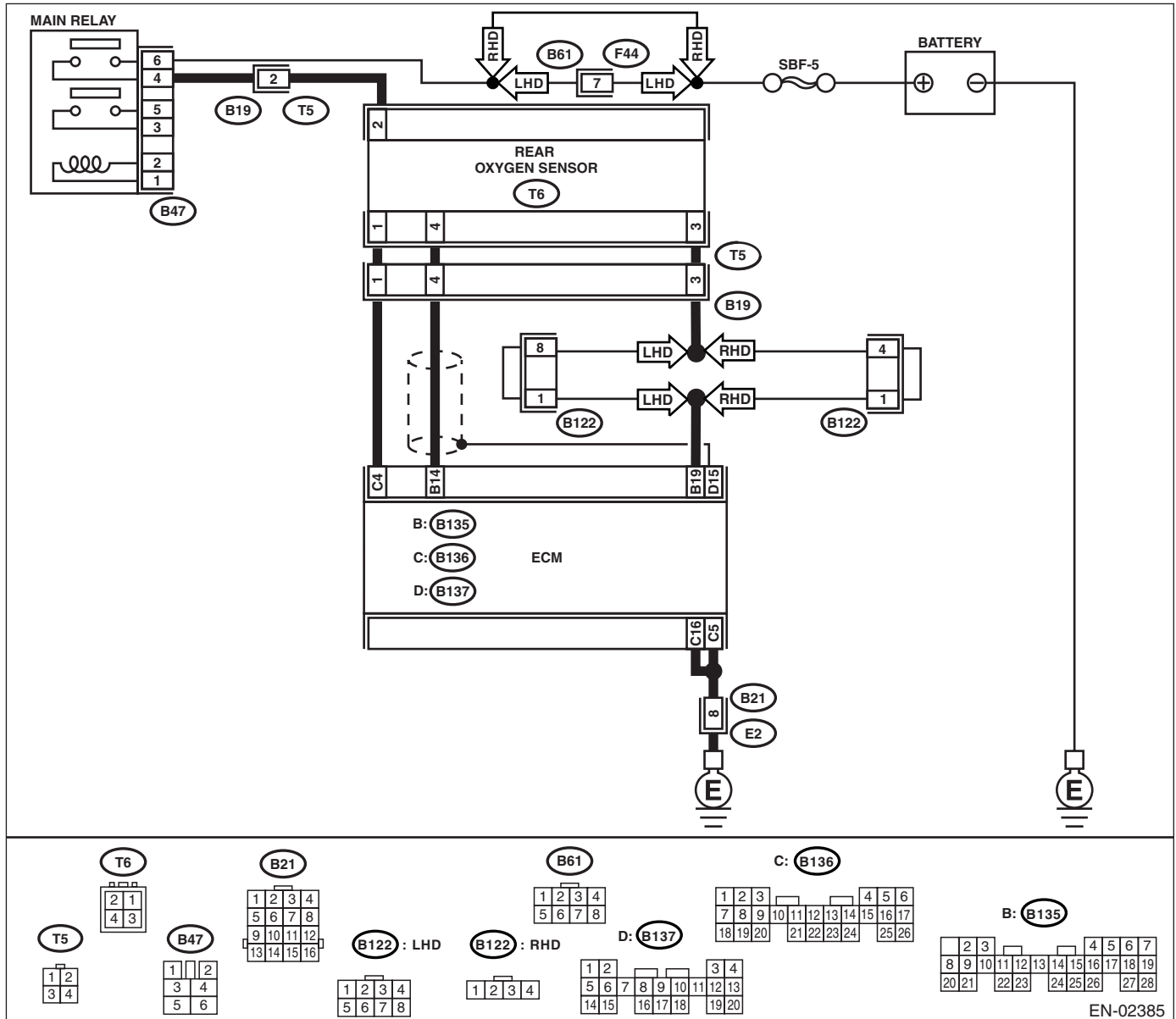
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02385

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0139.	Replace the rear oxygen sensor. <Ref. to FU(H4SO)-42, Rear Oxygen Sensor.>

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

Refer to DTC P0172 for diagnostic procedure. <Ref. to EN(H4SO)-139, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

### CAUTION:

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.**

Step	Check	Yes	No	
1	<b>CHECK EXHAUST SYSTEM.</b>	Are there holes or loose bolts on exhaust system?	Repair exhaust system. Go to step 2.	
2	<b>CHECK EGR VALVE.</b>	Is the EGR valve stuck?	Replace the EGR valve. Go to step 3.	
3	<b>CHECK AIR INTAKE SYSTEM.</b>	Are there holes, loose bolts or disconnection of hose on air intake system?	Repair air intake system. Go to step 4.	
4	<b>CHECK PURGE CONTROL SOLENOID VALVE.</b>	Is the purge control solenoid valve stuck?	Replace the purge control solenoid valve. Go to step 5.	
5	<b>CHECK PCV VALVE.</b>	Is the PCV valve stuck?	Replace the PCV valve. Go to step 6.	
6	<b>CHECK FUEL PRESSURE.</b> <b>Warning:</b> <ul style="list-style-type: none"> <li>• Place "NO FIRE" signs near the working area.</li> <li>• Be careful not to spill fuel.</li> </ul> <ol style="list-style-type: none"> <li>1) Release the fuel pressure.                             <ol style="list-style-type: none"> <li>(1) Disconnect the connector from fuel pump relay.</li> <li>(2) Start the engine and run it until it stalls.</li> <li>(3) After the engine stalls, crank it for five more seconds.</li> <li>(4) Turn the ignition switch to OFF.</li> </ol> </li> <li>2) Connect the connector to fuel pump relay.</li> <li>3) Disconnect the fuel delivery hose, and connect the fuel pressure gauge.</li> <li>4) Install the fuel filler cap.</li> <li>5) Start the engine and idle while gear position is neutral.</li> <li>6) Measure the fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.</li> </ol> <b>Warning:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b> <b>NOTE:</b> If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.	Is measured value 284 — 314 kPa (2.9 — 3.2 kg/cm <sup>2</sup> , 41 — 46 psi)?	Go to step 7.	Repair the following items. Fuel pressure is too high: <ul style="list-style-type: none"> <li>• Clogged fuel return line or bent hose</li> </ul> Fuel pressure is too low: <ul style="list-style-type: none"> <li>• Improper fuel pump discharge</li> <li>• Clogged fuel supply line</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>7</b></p> <p><b>CHECK FUEL PRESSURE.</b> After connecting the pressure regulator vacuum hose, measure fuel pressure.</p> <p><b>Warning:</b> <b>Release fuel pressure before removing the fuel pressure gauge.</b></p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.</li> <li>• If out of specification as measured at this step, check or replace pressure regulator and pressure regulator vacuum hose.</li> </ul>	<p>Is measured value 206 — 235 kPa (2.1 — 2.4 kg/cm<sup>2</sup>, 30 — 34 psi)?</p>	<p>Go to step 8.</p>	<p>Repair the following items.</p> <p>Fuel pressure is too high:</p> <ul style="list-style-type: none"> <li>• Faulty pressure regulator</li> <li>• Clogged fuel return line or bent hose</li> </ul> <p>Fuel pressure is too low:</p> <ul style="list-style-type: none"> <li>• Faulty pressure regulator</li> <li>• Improper fuel pump discharge</li> <li>• Clogged fuel supply line</li> </ul>
<p><b>8</b></p> <p><b>CHECK ENGINE COOLANT TEMPERATURE SENSOR.</b></p> <ol style="list-style-type: none"> <li>1) Start the engine and warm-up completely.</li> <li>2) Read the data of engine coolant temperature sensor signal using Subaru Select Monitor or the OBD-II scan tool.</li> </ol> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is the engine coolant temperature 70 — 100°C (158 — 212°F)?</p>	<p>Go to step 9.</p>	<p>Replace the engine coolant temperature sensor. &lt;Ref. to FU(H4SO)-25, Engine Coolant Temperature Sensor.&gt;</p>
<p><b>9</b></p> <p><b>CHECK MANIFOLD PRESSURE SENSOR SIGNAL.</b></p> <ol style="list-style-type: none"> <li>1) Start and warm-up the engine until engine coolant temperature is greater than 60°C (140°F).</li> <li>2) Shift the select lever to "N" or "P" range.</li> <li>3) Turn the A/C switch to OFF.</li> <li>4) Turn all accessory switches to OFF.</li> <li>5) Read the data of manifold absolute pressure sensor signal using Subaru Select Monitor or OBD-II scan tool.</li> </ol> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• Subaru Select Monitor</li> </ul> <p>For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <ul style="list-style-type: none"> <li>• OBD-II scan tool</li> </ul> <p>For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.</p>	<p>Is the measurement value at idling: 24.0 — 41.3 kPa (180 — 310 mmHg, 7.09 — 12.20 inHg), at ignition ON: 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg)?</p>	<p>Contact the SUBARU dealer.</p> <p><b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.</p>	<p>Replace the manifold absolute pressure sensor. &lt;Ref. to FU(H4SO)-31, Manifold Absolute Pressure Sensor.&gt;</p>

## **AC:DTC P0301 CYLINDER 1 MISFIRE DETECTED**

**NOTE:**

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)-142, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **AD:DTC P0302 CYLINDER 2 MISFIRE DETECTED**

**NOTE:**

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)-142, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **AE:DTC P0303 CYLINDER 3 MISFIRE DETECTED**

**NOTE:**

For the diagnostic procedure, refer to DTC P0304. <Ref. to EN(H4SO)-142, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AF:DTC P0304 CYLINDER 4 MISFIRE DETECTED

### DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

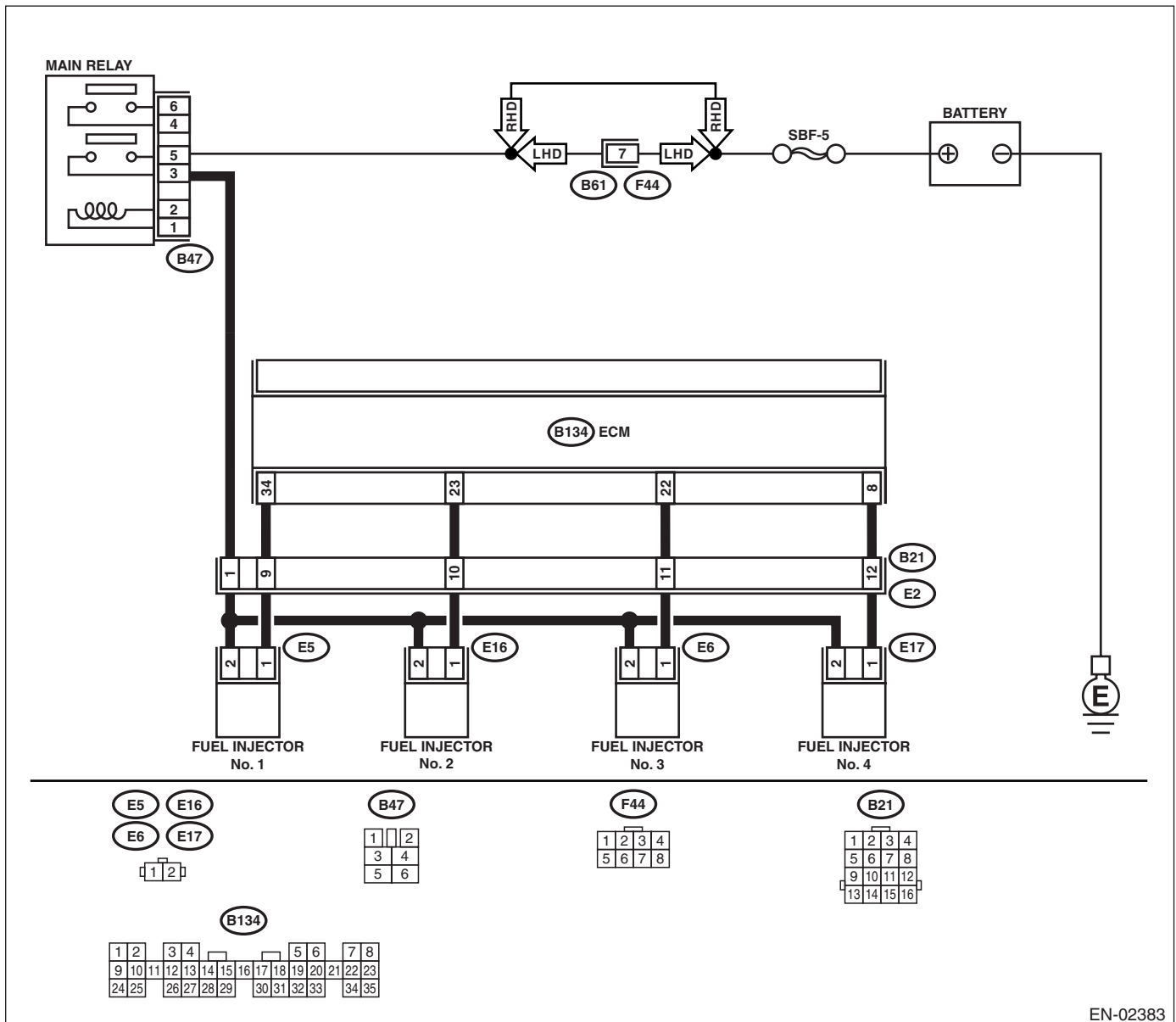
### TROUBLE SYMPTOM:

- Engine stalls
- Erroneous idling
- Rough driving

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02383

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0301, P0302, P0303 and P0304.	Go to step 2.
2	<b>CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground on faulty cylinders. <b>Connector &amp; terminal</b> #1 (B134) No. 34 (+) — Chassis ground (-): #2 (B134) No. 23 (+) — Chassis ground (-): #3 (B134) No. 22 (+) — Chassis ground (-): #4 (B134) No. 8 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 7.	Go to step 3.
3	<b>CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinder. 3) Measure the voltage between ECM connector and engine ground on faulty cylinders. <b>Connector &amp; terminal</b> #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 more than 1 MΩ?	Go to step 4.	Repair ground short circuit in harness between fuel injector and ECM connector.
4	<b>CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.</b> Measure the resistance of harness connector between ECM connector and fuel injector on faulty cylinders. <b>Connector &amp; terminal</b> #1 (B134) No. 34 — (E5) No. 1: #2 (B134) No. 23 — (E16) No. 1: #3 (B134) No. 22 — (E6) No. 1: #4 (B134) No. 8 — (E17) No. 1:	Is the resistance less than 1 Ω?	Go to step 5.	Repair harness and connector.  NOTE: In this case repair the following: • Open circuit in harness between ECM and fuel injector connector • Poor contact in coupling connector
5	<b>CHECK FUEL INJECTOR.</b> Measure the resistance between fuel injector terminals on faulty cylinder. <b>Terminals</b> No. 1 — No. 2:	Is the resistance 5 — 20 Ω?	Go to step 6.	Replace the faulty fuel injector. <Ref. to FU(H4SO)-35, Fuel Injector.>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>6 CHECK POWER SUPPLY LINE.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between fuel injector and engine ground on faulty cylinders. <b>Connector &amp; terminal</b> <i>#1 (E5) No. 2 (+) — Engine ground (-):</i> <i>#2 (E16) No. 2 (+) — Engine ground (-):</i> <i>#3 (E6) No. 2 (+) — Engine ground (-):</i> <i>#4 (E17) No. 2 (+) — Engine ground (-):</i>	Is the voltage more than 10 V?	Repair poor contact in all connectors in fuel injector circuit.	Repair harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between main relay and fuel injector connector on faulty cylinders</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in main relay connector</li> <li>• Poor contact in fuel injector connector on faulty cylinders</li> </ul>
<b>7 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector on faulty cylinder. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground on faulty cylinders. <b>Connector &amp; terminal</b> <i>#1 (B134) No. 34 (+) — Chassis ground (-):</i> <i>#2 (B134) No. 23 (+) — Chassis ground (-):</i> <i>#3 (B134) No. 22 (+) — Chassis ground (-):</i> <i>#4 (B134) No. 8 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and fuel injector. After repair, replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 8.
<b>8 CHECK FUEL INJECTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between fuel injector terminals on faulty cylinder. <b>Terminals</b> <i>No. 1 — No. 2:</i>	Is the resistance less than 1 $\Omega$ ?	Replace the faulty fuel injector<Ref. to FU(H4SO)-35, Fuel Injector.> and ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 9.
<b>9 CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.</b>	Is the installation of camshaft position sensor or crankshaft position sensor loosened?	Tighten camshaft position sensor or crankshaft position sensor.	Go to step 10.
<b>10 CHECK CRANK SPROCKET.</b> Remove the timing belt cover.	Is the crank sprocket rusted or does it have broken teeth?	Replace the crank sprocket. <Ref. to ME(H4SO)-55, Crank Sprocket.>	Go to step 11.
<b>11 CHECK INSTALLATION CONDITION OF TIMING BELT.</b> Turn the crankshaft using ST, and align alignment mark on crank sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is the timing belt dislocated from its proper position?	Repair installation condition of timing belt. <Ref. to ME(H4SO)-48, Timing Belt.>	Go to step 12.
<b>12 CHECK FUEL LEVEL.</b>	Is the fuel meter indication higher than the "Lower" level?	Go to step 13.	Replenish fuel so fuel meter indication is higher than the "Lower" level. After replenishing fuel, Go to step 13.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>13 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.</b> 1) Clear the memory using Subaru Select Monitor. <Ref. to EN(H4SO)-44, Clear Memory Mode.> 2) Start the engine, and drive the vehicle more than 10 minutes.	Does the malfunction indicator light illuminate or blink?	Go to step 15.	Go to step 14.
<b>14 CHECK CAUSE OF MISFIRE DIAGNOSED.</b>	Was the cause of misfire diagnosed when the engine is running? Ex. Removed spark plug cord, etc.	Finish diagnostics operation, if the engine has no abnormality.	1. Repair the poor contact. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in ignitor connector</li> <li>• Poor contact in ignition coil connector</li> <li>• Poor contact in fuel injector connector on faulty cylinders</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul> 2. If there is no poor contact, check the following items and contact SUBARU dealer. <ul style="list-style-type: none"> <li>• Fuel condition</li> <li>• Contained additive</li> <li>• Plug condition</li> <li>• Plug cord condition</li> <li>• Engine oil condition</li> </ul>
<b>15 CHECK AIR INTAKE SYSTEM.</b>	Is there any fault in air intake system?	Repair air intake system. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"> <li>• Are there air leaks or air suction caused by loose or dislocated nuts and bolts?</li> <li>• Are there cracks or any disconnection of hoses?</li> </ul>	Go to step 16.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>16 CHECK MISFIRE SYMPTOM.</b> 1) Turn the ignition switch to ON. 2) READ DTC. <ul style="list-style-type: none"> <li>• Subaru Select Monitor &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</li> <li>• OBD-II scan tool</li> </ul> For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual. <b>NOTE:</b> Perform diagnosis according to the items listed below.	Does the Subaru Select Monitor or OBD-II general scan tool indicate a DTC?	Go to step <b>21</b> .	Go to step <b>17</b> .
<b>17 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is DTC P0301 and P0302 displayed?	Go to step <b>22</b> .	Go to step <b>18</b> .
<b>18 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is DTC P0303 and P0304 displayed?	Go to step <b>23</b> .	Go to step <b>19</b> .
<b>19 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is DTC P0301 and P0303 displayed?	Go to step <b>24</b> .	Go to step <b>20</b> .
<b>20 CHECK ANY OTHER DTC ON DISPLAY.</b>	Is DTC P0302 and P0304 displayed?	Go to step <b>25</b> .	Go to step <b>26</b> .
<b>21 ONLY ONE CYLINDER.</b>	Is there a fault in that cylinder?	Repair or replace the faulty part. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"> <li>• Spark plug</li> <li>• Spark plug cord</li> <li>• Fuel injector</li> <li>• Compression ratio</li> </ul>	Go to DTC P0171. <Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
<b>22 GROUP OF #1 AND #2 CYLINDERS.</b>	Are there faults in #1 and #2 cylinders?	Repair or replace the faulty part. <b>NOTE:</b> <ul style="list-style-type: none"> <li>• Check the following items:               <ul style="list-style-type: none"> <li>• Spark plug</li> <li>• Fuel injector</li> <li>• Ignition coil</li> <li>• Compression ratio</li> </ul> </li> <li>• If no abnormal is discovered, check for "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. &lt;Ref. to EN(H4SO)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.&gt;</li> </ul>	Go to DTC P0171. <Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
23 <b>GROUP OF #3 AND #4 CYLINDERS.</b>	Are there faults in #3 and #4 cylinders?	Repair or replace the faulty part. NOTE: • Check the following items: • Spark plug • Fuel injector • Ignition coil • If no abnormal is discovered, check for "16. D: IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to EN(H4SO)-64, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Go to DTC P0171. <Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
24 <b>GROUP OF #1 AND #3 CYLINDERS.</b>	Are there faults in #1 and #3 cylinders?	Repair or replace the faulty part. NOTE: Check the following items: • Spark plug • Fuel injector • Skipping timing belt teeth	Go to DTC P0171. <Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
25 <b>GROUP OF #2 AND #4 CYLINDERS.</b>	Are there faults in #2 and #4 cylinders?	Repair or replace the faulty part. NOTE: Check the following items: • Spark plug • Fuel injector • Compression ratio • Skipping timing belt teeth	Go to DTC P0171. <Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
26 <b>CYLINDER AT RANDOM.</b>	Is the engine idle rough?	Go to DTC P0171. <Ref. to EN(H4SO)-138, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Repair or replace the faulty part. NOTE: Check the following items: • Spark plug • Fuel injector • Compression ratio

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

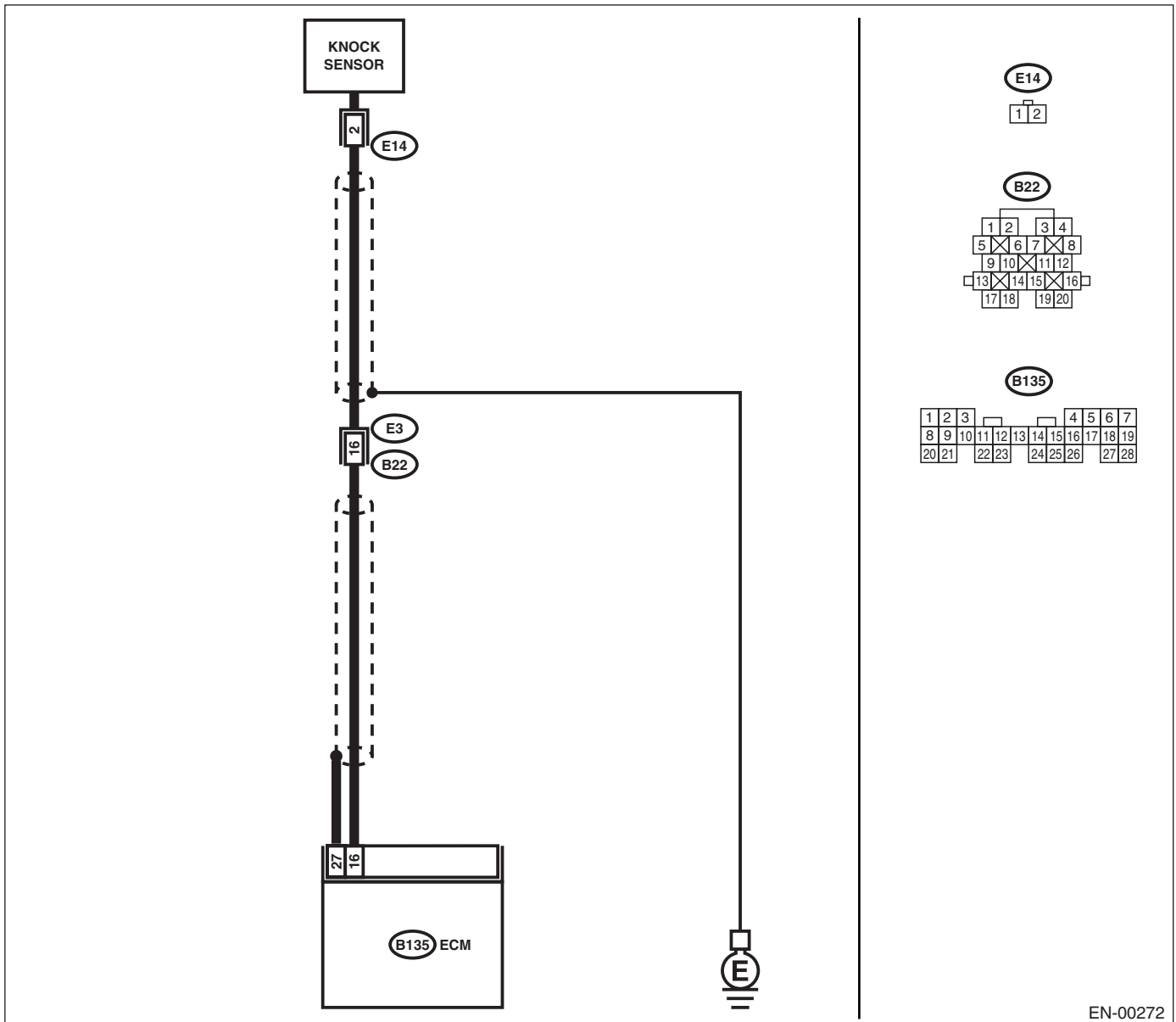
### TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00272

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance between ECM harness connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 16 — Chassis ground:</b></i>	Is the resistance more than 700 k $\Omega$ ?	Go to step 2.	Repair harness and connector. NOTE: In this case repair the following: • Open circuit in harness between knock sensor and ECM connector • Poor contact in knock sensor connector • Poor contact in coupling connector
<b>2</b> <b>CHECK KNOCK SENSOR.</b> 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. <i><b>Terminal</b></i> <i><b>No. 2 — Engine ground:</b></i>	Is the resistance more than 700 k $\Omega$ ?	Go to step 3.	Repair harness and connector. NOTE: In this case repair the following: • Poor contact in knock sensor connector
<b>3</b> <b>CHECK CONDITION OF KNOCK SENSOR INSTALLATION.</b>	Is the knock sensor installation bolt tightened securely?	Replace the knock sensor. <Ref. to FU(H4SO)-28, Knock Sensor.>	Tighten knock sensor installation bolt securely.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

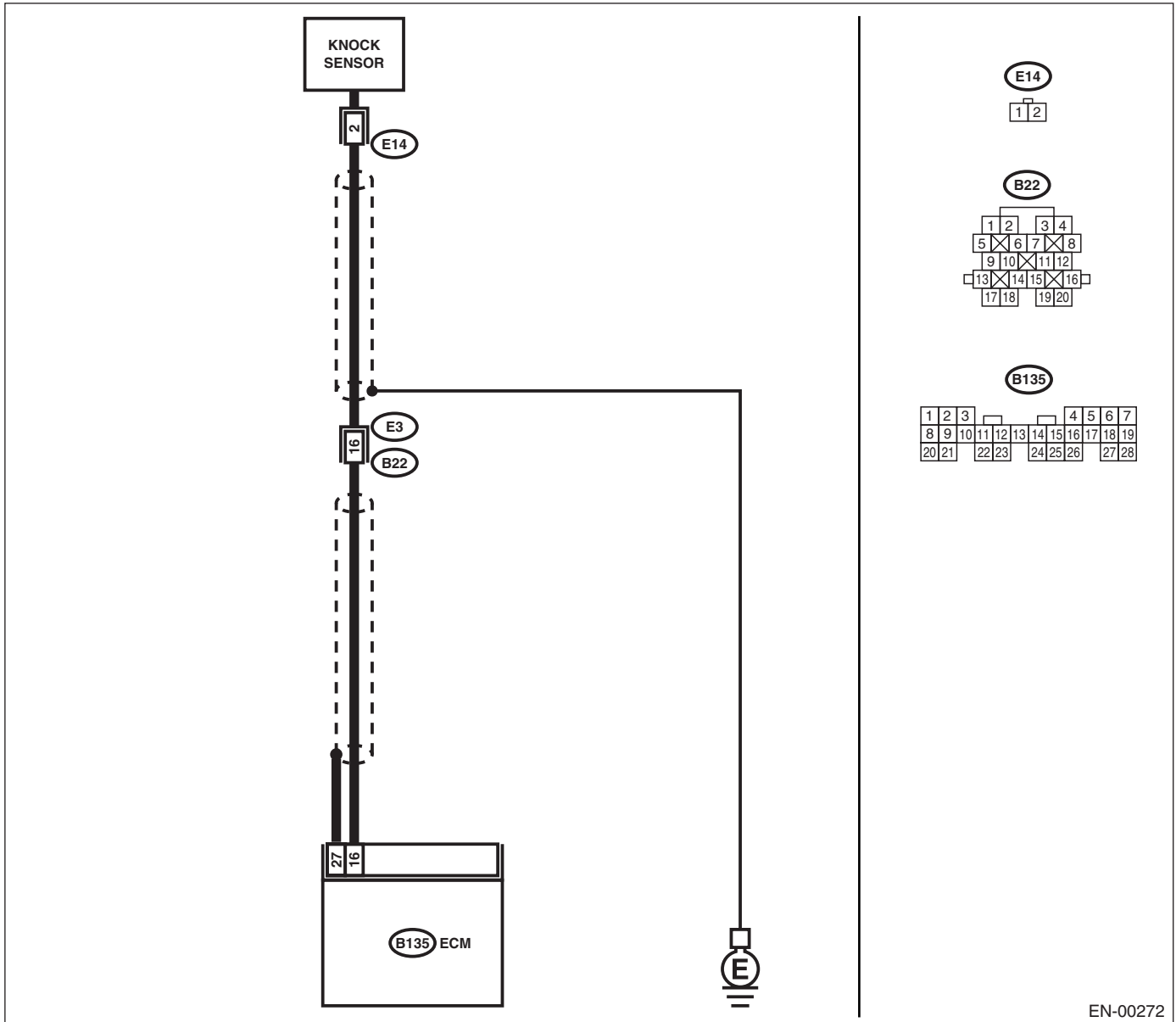
### TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00272

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.</b> Measure the resistance of harness between ECM connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 16 — Chassis ground:</b></i>	Is the resistance less than 400 k $\Omega$ ?	Go to step 2.	Go to step 3.
<b>2</b> <b>CHECK KNOCK SENSOR.</b> 1) Disconnect the connector from knock sensor. 2) Measure the resistance between knock sensor connector terminal and engine ground. <i><b>Terminals</b></i> <i><b>No. 2 — Engine ground:</b></i>	Is the resistance less than 400 k $\Omega$ ?	Replace the knock sensor. <Ref. to FU(H4SO)-28, Knock Sensor.>	Repair ground short circuit in harness between knock sensor connector and ECM connector.  NOTE: The harness between both connectors are shielded. Repair short circuit in harness covered with shield.
<b>3</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Connect the connectors to ECM and knock sensor. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 16 (+) — Chassis ground (-):</b></i>	Is the voltage more than 2 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in knock sensor connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	Repair the poor contact in ECM connector.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

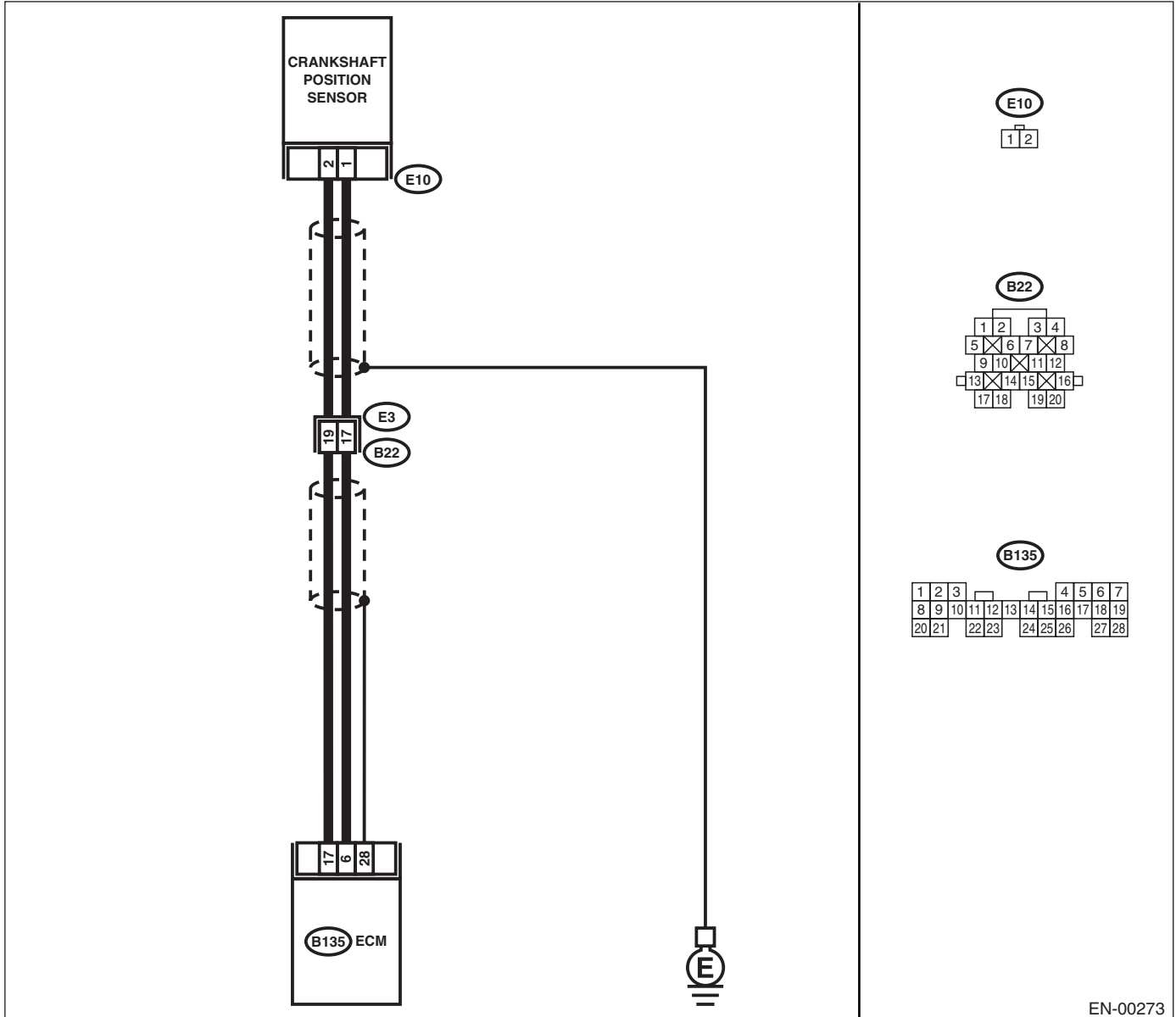
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from the crankshaft position sensor. 3) Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 100 k<math>\Omega</math>?</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between crankshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	<p>Go to step 2.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 1 — Engine ground:</b></p>	<p>Is the resistance less than 10 <math>\Omega</math>?</p>	<p>Repair ground short circuit in harness between crankshaft position sensor and ECM connector.</p> <p>NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between crankshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E10) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 4.</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between crankshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>4</b></p> <p><b>CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.</b></p>	<p>Is the crankshaft position sensor installation bolt tightened securely?</p>	<p>Go to step 5.</p>	<p>Tighten the crankshaft position sensor installation bolt securely.</p>
<p><b>5</b></p> <p><b>CHECK CRANKSHAFT POSITION SENSOR.</b></p> <p>1) Remove the crankshaft position sensor. 2) Measure the resistance between connector terminals of crankshaft position sensor.</p> <p><b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance 1 — 4 k<math>\Omega</math>?</p>	<p>Repair poor contact in crankshaft position sensor connector.</p>	<p>Replace the crankshaft position sensor. &lt;Ref. to FU(H4SO)-26, Crankshaft Position Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AJ:DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

### DTC DETECTING CONDITION:

Immediately at fault recognition

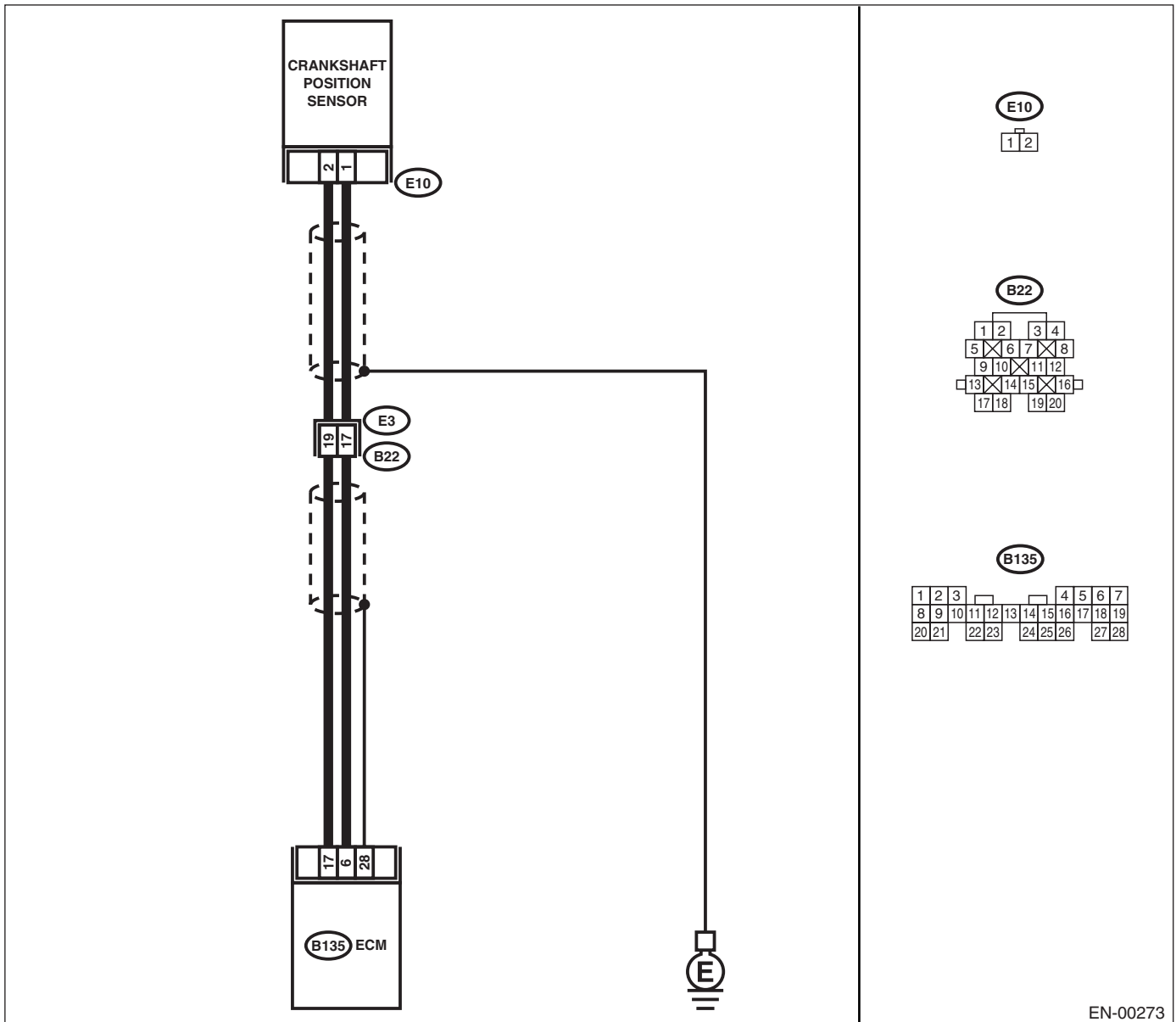
### TROUBLE SYMPTOM:

- Engine stalls
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00273

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step <b>2</b> .
<b>2</b> <b>CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.</b> Turn the ignition switch to OFF.	Is the crankshaft position sensor installation bolt tightened securely?	Go to step <b>3</b> .	Tighten the crankshaft position sensor installation bolt securely.
<b>3</b> <b>CHECK CRANK SPROCKET.</b> Remove the front belt cover.	Are crank sprocket teeth cracked or damaged?	Replace the crank sprocket. <Ref. to ME(H4SO)-55, Crank Sprocket.>	Go to step <b>4</b> .
<b>4</b> <b>CHECK INSTALLATION CONDITION OF TIMING BELT.</b> Turn the crankshaft using ST, and align alignment mark on crank sprocket with alignment mark on cylinder block. ST 499987500 CRANKSHAFT SOCKET	Is the timing belt dislocated from its proper position?	Repair installation condition of timing belt. <Ref. to ME(H4SO)-48, Timing Belt.>	Replace the crankshaft position sensor. <Ref. to FU(H4SO)-26, Crankshaft Position Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

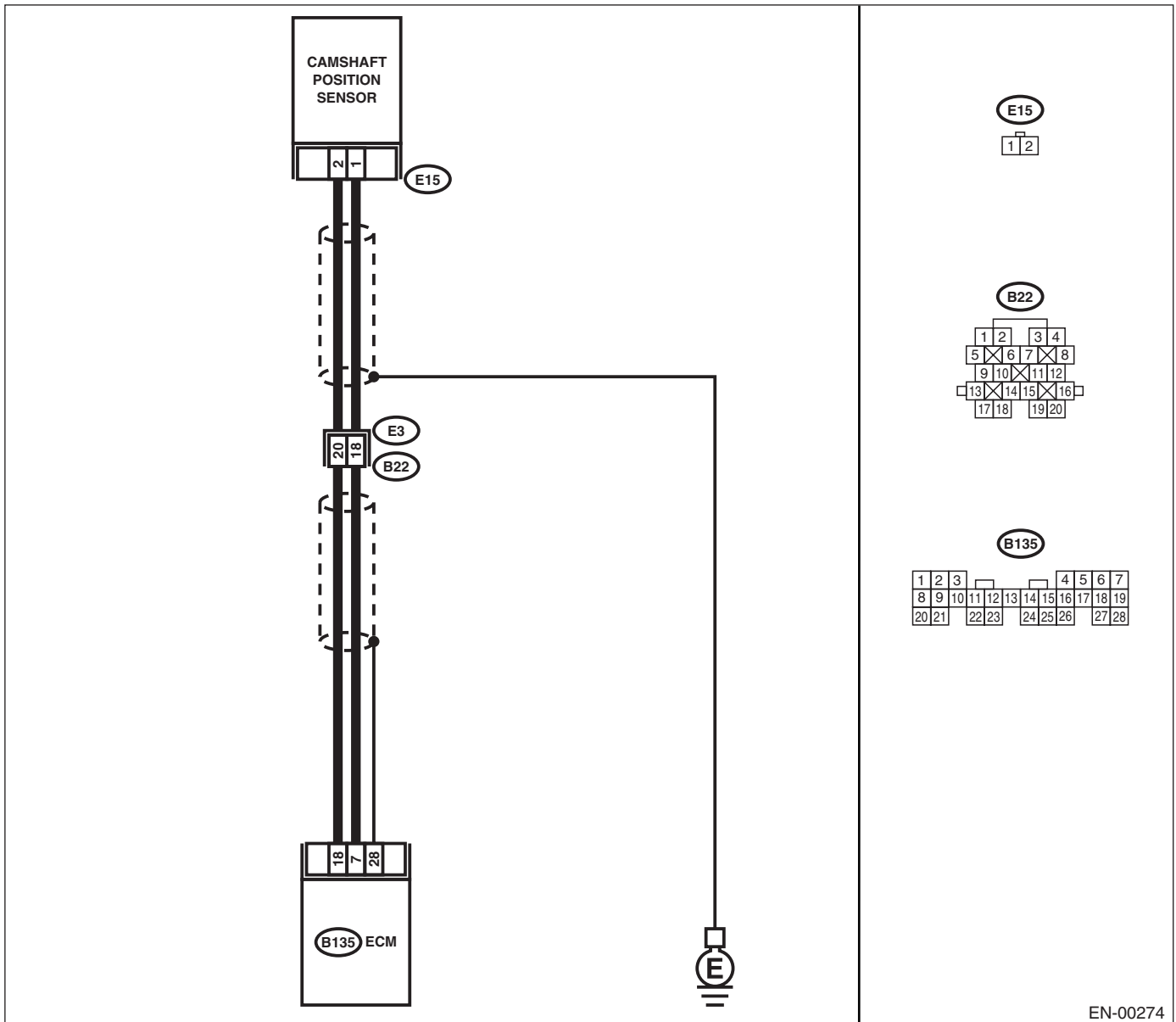
### TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00274

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the resistance of harness between camshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E15) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 100 k<math>\Omega</math>?</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between camshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	<p>Go to step 2.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between camshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E15) No. 1 — Engine ground:</b></p>	<p>Is the resistance less than 10 <math>\Omega</math>?</p>	<p>Repair ground short circuit in harness between camshaft position sensor and ECM connector.</p> <p>NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.</p>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between camshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E15) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 4.</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between camshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>4</b></p> <p><b>CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b></p>	<p>Is the camshaft position sensor installation bolt tightened securely?</p>	<p>Go to step 5.</p>	<p>Tighten the camshaft position sensor installation bolt securely.</p>
<p><b>5</b></p> <p><b>CHECK CAMSHAFT POSITION SENSOR.</b></p> <p>1) Remove the camshaft position sensor. 2) Measure the resistance between connector terminals of camshaft position sensor.</p> <p><b>Terminals</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance 1 — 4 k<math>\Omega</math>?</p>	<p>Repair poor contact in camshaft position sensor connector.</p>	<p>Replace the camshaft position sensor. &lt;Ref. to FU(H4SO)-27, Camshaft Position Sensor.&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AL:DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR)

### DTC DETECTING CONDITION:

Immediately at fault recognition

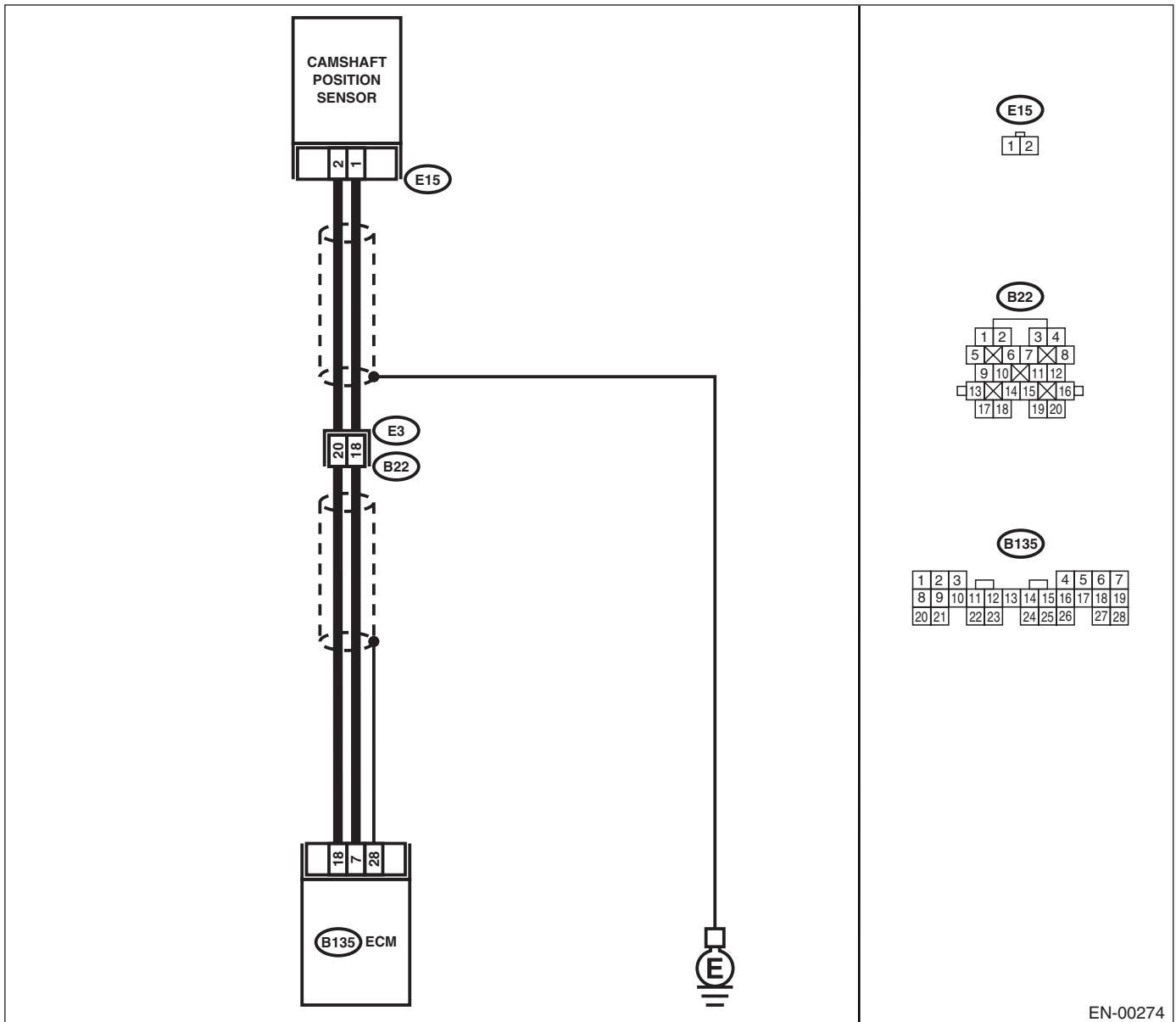
### TROUBLE SYMPTOM:

- Engine stalls
- Failure of engine to start

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00274

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK ANY OTHER DTC ON DISPLAY.</b></p>	<p>Is any other DTC displayed?</p>	<p>Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". &lt;Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).&gt;</p>	<p>Go to step 2.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from camshaft position sensor. 3) Measure the resistance of harness between camshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E15) No. 1 — Engine ground:</b></p>	<p>Is the resistance more than 100 k<math>\Omega</math>?</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between camshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>	<p>Go to step 3.</p>
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between camshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E15) No. 1 — Engine ground:</b></p>	<p>Is the resistance less than 10 <math>\Omega</math>?</p>	<p>Repair ground short circuit in harness between camshaft position sensor and ECM connector.</p> <p>NOTE: The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.</p>	<p>Go to step 4.</p>
<p><b>4</b></p> <p><b>CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between camshaft position sensor connector and engine ground.</p> <p><b>Connector &amp; terminal</b> <b>(E15) No. 2 — Engine ground:</b></p>	<p>Is the resistance less than 5 <math>\Omega</math>?</p>	<p>Go to step 5.</p>	<p>Repair harness and connector.</p> <p>NOTE: In this case repair the following:</p> <ul style="list-style-type: none"> <li>• Open circuit in harness between camshaft position sensor and ECM connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>5</b></p> <p><b>CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b></p>	<p>Is the camshaft position sensor installation bolt tightened securely?</p>	<p>Go to step 6.</p>	<p>Tighten the camshaft position sensor installation bolt securely.</p>
<p><b>6</b></p> <p><b>CHECK CAMSHAFT POSITION SENSOR.</b></p> <p>1) Remove the camshaft position sensor. 2) Measure the resistance between connector terminals of camshaft position sensor.</p> <p><b>Terminal</b> <b>No. 1 — No. 2:</b></p>	<p>Is the resistance 1 — 4 k<math>\Omega</math>?</p>	<p>Go to step 7.</p>	<p>Replace the camshaft position sensor. &lt;Ref. to FU(H4SO)-27, Camshaft Position Sensor.&gt;</p>



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7</b> <b>CHECK CONDITION OF CAMSHAFT POSITION SENSOR.</b> Turn the ignition switch to OFF.	Is the camshaft position sensor installation bolt tightened securely?	Go to step <b>8</b> .	Tighten the camshaft position sensor installation bolt securely.
<b>8</b> <b>CHECK CAMSHAFT SPROCKET.</b> Remove the front belt cover. <Ref. to ME(H4SO)-47, Timing Belt Cover.>	Are cam sprocket teeth cracked or damaged?	Replace the cam sprocket. <Ref. to ME(H4SO)-53, Cam Sprocket.>	Go to step <b>9</b> .
<b>9</b> <b>CHECK INSTALLATION CONDITION OF TIMING BELT.</b> Turn the camshaft using ST, and align alignment mark on cam sprocket with alignment mark on timing belt cover LH. ST 499207100 CAM SPROCKET WRENCH	Is the timing belt dislocated from its proper position?	Repair installation condition of timing belt. <Ref. to ME(H4SO)-48, Timing Belt.>	Replace the camshaft position sensor. <Ref. to FU(H4SO)-27, Camshaft Position Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AM:DTC P0400 EXHAUST GAS RECIRCULATION FLOW

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

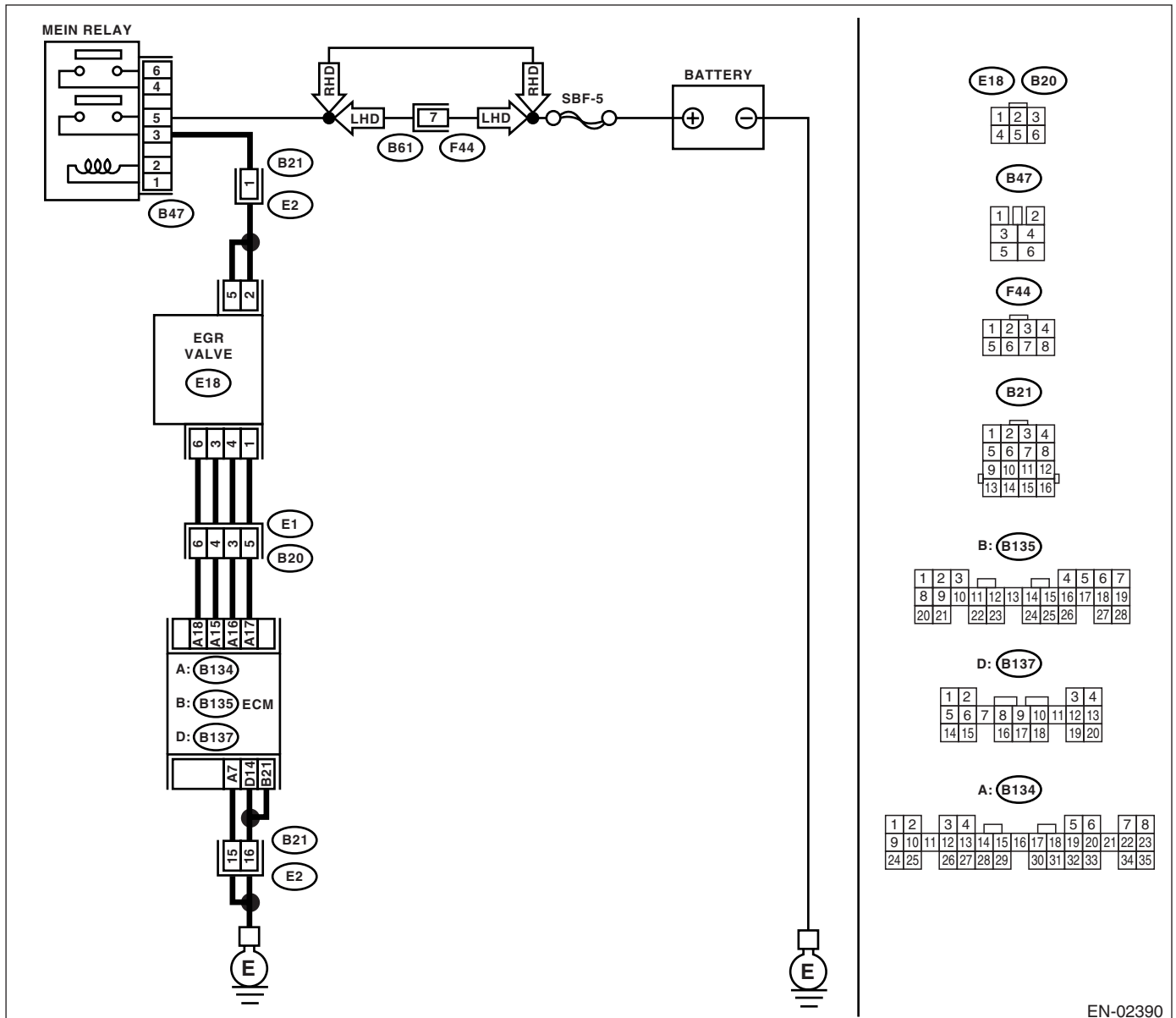
### TROUBLE SYMPTOM:

- Movement performance problem when engine low speed
- Erroneous idling
- Movement performance problem

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02390

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK CURRENT DATA.</b> 1) Start the engine. 2) Read the data of intake manifold absolute pressure sensor signal using Subaru Select Monitor or OBD-II scan tool.  NOTE: • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II scan tool For detailed operation procedures, refer to the OBD-II Scan Tool Instruction Manual.	Is the value more than 53.3 kPa (400 mmHg, 15.75 inHg)?	Make sure that the EGR valve, manifold absolute pressure sensor and throttle body are tightened firmly.	Go to step 3.
<b>3</b> <b>CHECK THE POWER SUPPLY OF EGR VALVE.</b> 1) Disconnect the connector from EGR valve. 2) Turn the ignition switch to ON. 3) Measure the voltage between EGR valve and engine ground.  <b>Connector &amp; terminal</b> <b>(E18) No. 2 — Engine ground:</b> <b>(E18) No. 5 — Engine ground:</b>	Is the voltage more than 10 V?	Go to step 4.	Repair open circuit in harness between main relay and EGR valve connector.
<b>4</b> <b>CHECK EGR VALVE.</b> Measure the resistance between EGR valve terminals.  NOTE: Make sure there is no foreign material between EGR valve and valve seat.  <b>Terminals</b> <b>No. 1 — No. 2:</b> <b>No. 3 — No. 2:</b> <b>No. 4 — No. 5:</b> <b>No. 6 — No. 5:</b>	Is the resistance 20 — 30 Ω?	Go to step 5.	Replace the EGR valve. <Ref. to FU(H4SO)-34, EGR Valve.>
<b>5</b> <b>OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Connect the connector to ECM and EGR valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b> <b>(B134) No. 15 (+) — Chassis ground (-):</b> <b>(B134) No. 16 (+) — Chassis ground (-):</b> <b>(B134) No. 17 (+) — Chassis ground (-):</b> <b>(B134) No. 18 (+) — Chassis ground (-):</b>	Is the voltage 0 — 10 V?	Repair poor contact portion in ECM connector.	Go to step 6.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN EGR VALVE AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Detach the connector from EGR valve and ECM.                      3) Measure the resistance of harness between EGR valve and ECM connector.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 18 — (E18) No. 6:                      (B134) No. 17 — (E18) No. 1:                      (B134) No. 16 — (E18) No. 4:                      (B134) No. 15 — (E18) No. 3:</p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 7.</p>	<p>Repair open circuit in harness between ECM and EGR valve connector.</p>
<p><b>7</b></p> <p><b>CHECK HARNESS BETWEEN EGR VALVE AND ECM CONNECTOR.</b></p> <p>Measure the resistance of harness between EGR valve and chassis ground.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 15 — Chassis ground:                      (B134) No. 16 — Chassis ground:                      (B134) No. 17 — Chassis ground:                      (B134) No. 18 — Chassis ground:</p>	<p>Is the resistance more than 1 <math>M\Omega</math>?</p>	<p>Go to step 8.</p>	<p>Repair short circuit in harness between main relay and EGR valve connector.</p>
<p><b>8</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check that the poor contact of ECM and EGR valve connector.</p>	<p>Is there poor contact of ECM and EGR valve connector?</p>	<p>Repair the poor contact portion of ECM and EGR valve connector.</p>	<p>Even if the malfunction indicator light illuminates, the circuit has returned to a specified condition at this time.</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

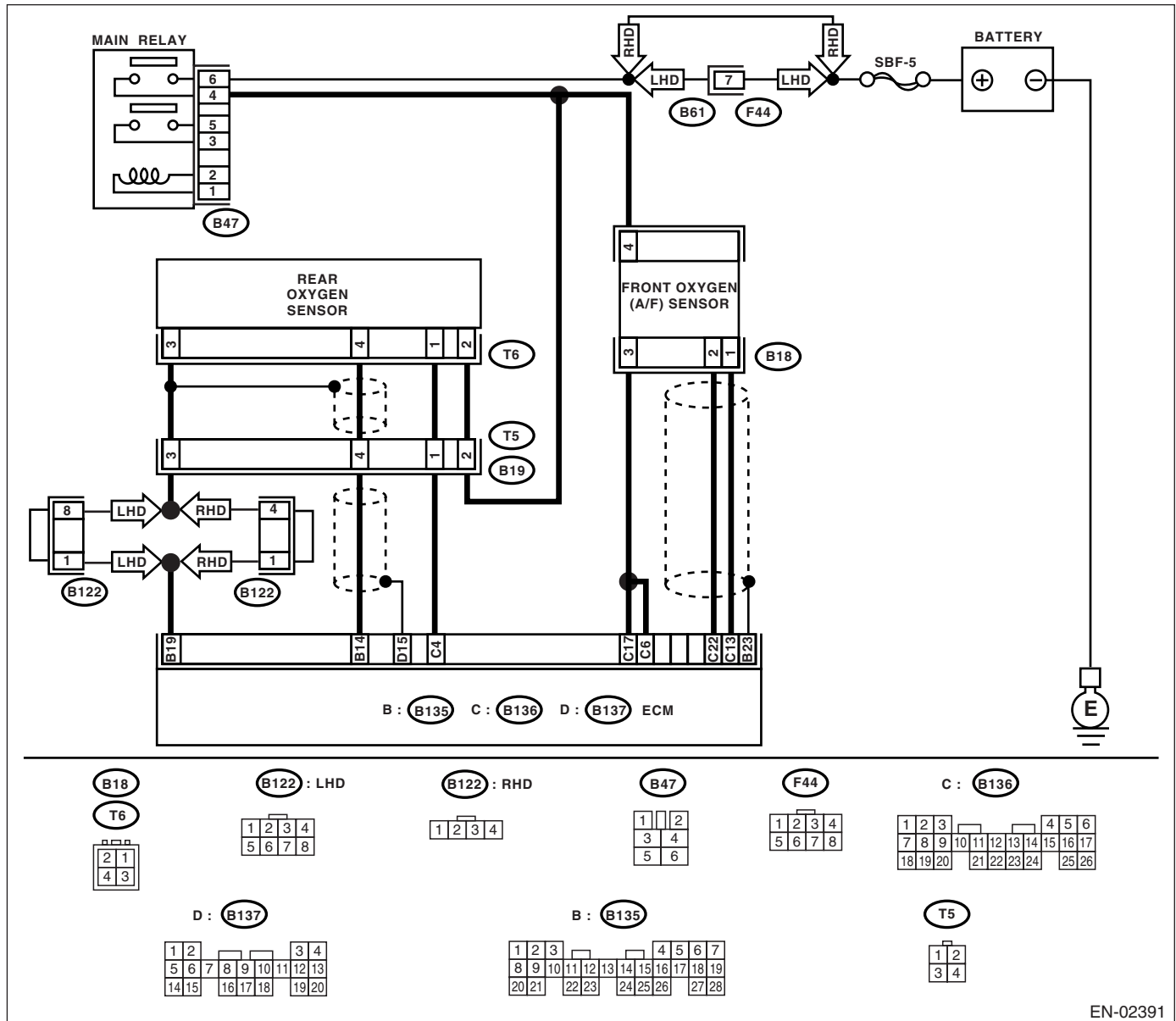
### TROUBLE SYMPTOM:

- Engine stalls
- Idle mixture is out of specifications.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02391

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0420.	Go to step 2.
<b>2</b> <b>CHECK EXHAUST SYSTEM.</b> Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.  NOTE: Check the following positions. <ul style="list-style-type: none"> <li>• Between cylinder head and front exhaust pipe</li> <li>• Between front exhaust pipe and front catalytic converter</li> <li>• Between front catalytic converter and rear catalytic converter</li> </ul>	Is there a fault in exhaust system?	Repair or replace the exhaust system. <Ref. to EX(H4SO)-2, General Description.>	Go to step 3.
<b>3</b> <b>CHECK CATALYTIC CONVERTER.</b>	Is there damage at rear face or front face of catalytic converter?	Replace catalytic converter. <Ref. to EC(H4SO)-3, Front Catalytic Converter.>	Go to step 4.
<b>4</b> <b>CHECK REAR OXYGEN SENSOR CIRCUIT MALFUNCTION.</b> 1) Disconnect the connector from rear oxygen sensor and ECM. 2) Measure the resistance between rear oxygen sensor connector and ECM connector. <b>Connector &amp; terminal</b> <b>(T6) No. 3 — (B135) No. 19:</b>	Is the resistance less than 1 Ω?	Go to step 5.	Repair battery open circuit in harness between ECM and rear oxygen sensor.
<b>5</b> <b>CHECK SHIELD WIRE.</b>	Is the shield wire opened?	Repair the shield wire.	Contact the SUBARU dealer.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

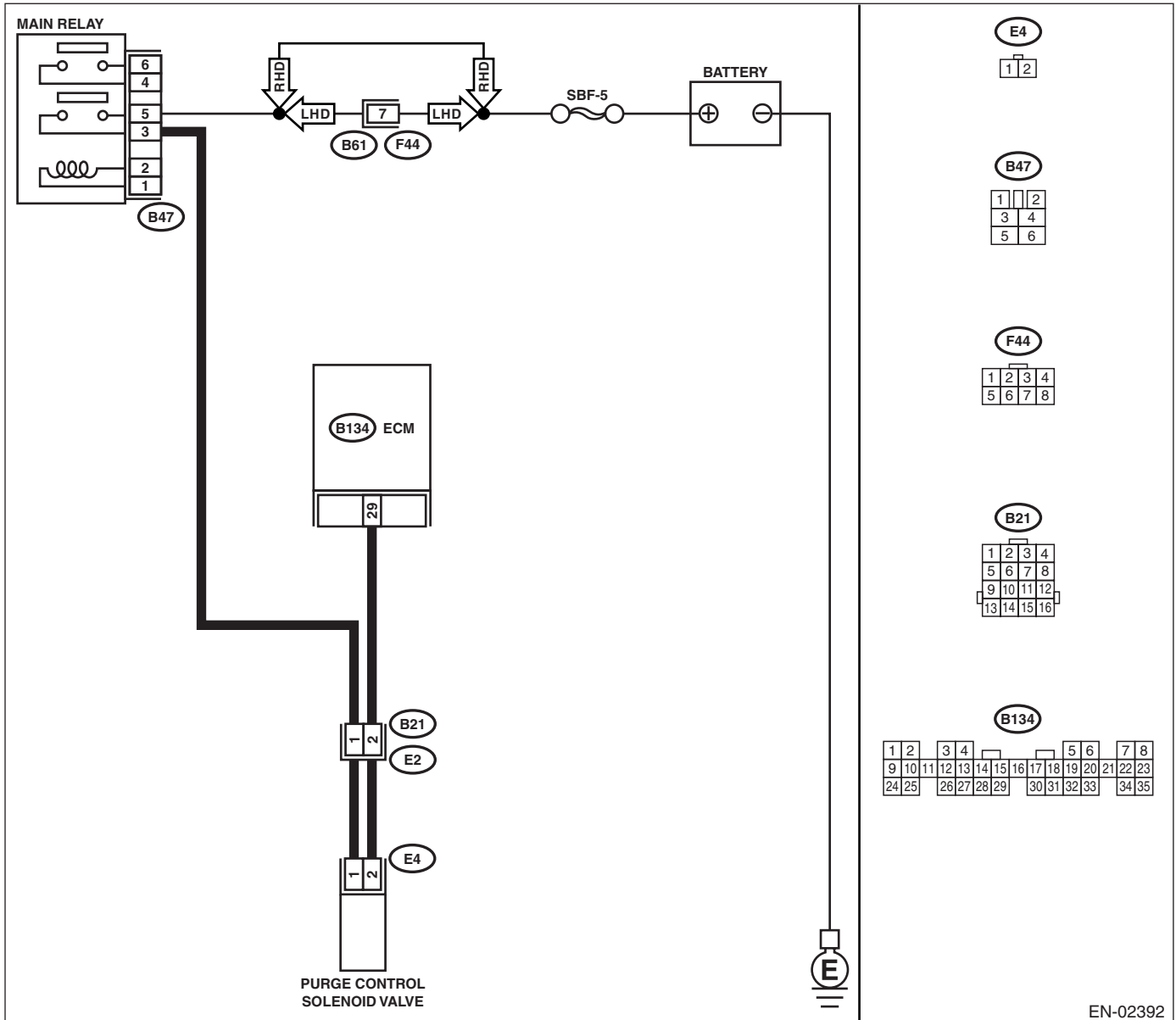
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02392

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK OUTPUT SIGNAL FROM ECM.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b>  <b>(B134) No. 29 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. Contact the SUBARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.	Go to step 2.
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connectors from purge control solenoid valve and ECM.                      3) Measure the resistance of harness between purge control solenoid valve connector and engine ground.  <b>Connector &amp; terminal</b>  <b>(E4) No. 2 — Engine ground:</b></p>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair ground short circuit in harness between ECM and purge control solenoid valve connector.
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b>                      Measure the resistance of harness between ECM and purge control solenoid valve of harness connector.  <b>Connector &amp; terminal</b>  <b>(B134) No. 29 — (E4) No. 2:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 4.	Repair open circuit in harness between ECM and purge control solenoid valve connector.  NOTE: In this case repair the following: • Open circuit in harness between ECM and purge control solenoid valve connector • Poor contact in coupling connector
<p><b>4</b></p> <p><b>CHECK PURGE CONTROL SOLENOID VALVE.</b>                      1) Remove the purge control solenoid valve.                      2) Measure the resistance between purge control solenoid valve terminals.  <b>Terminals</b>  <b>No. 1 — No. 2:</b></p>	Is the resistance 10 — 100 $\Omega$ ?	Go to step 5.	Replace the purge control solenoid valve. <Ref. to EC(H4SO)-9, Purge Control Solenoid Valve.>
<p><b>5</b></p> <p><b>CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.</b>                      1) Turn the ignition switch to ON.                      2) Measure the voltage between purge control solenoid valve and engine ground.  <b>Connector &amp; terminal</b>  <b>(E4) No. 1 (+) — Engine ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 6.	Repair open circuit in harness between main relay and purge control solenoid valve connector.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>6</b> <b>CHECK POOR CONTACT.</b> Check poor contact in purge control solenoid valve connector.	Is there poor contact in purge control solenoid valve connector?	Repair poor contact in purge control solenoid valve connector.	Contact the SUBARU dealer. <b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

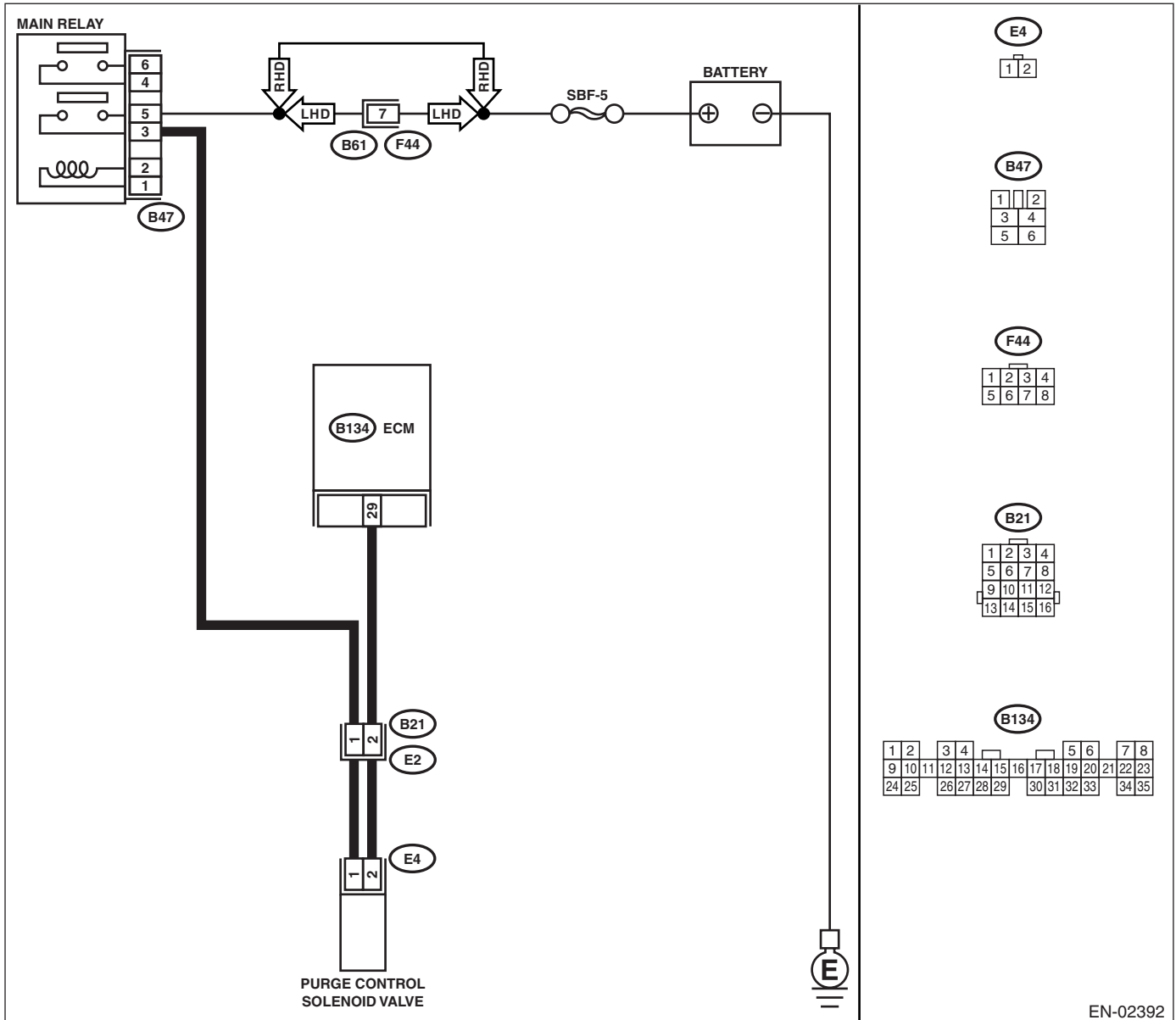
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02392

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side). 3) Turn the ignition switch to ON. 4) While operating the purge control solenoid valve, measure voltage between ECM and chassis ground.  <b>NOTE:</b> Purge control solenoid valve operation can be executed using Subaru Select Monitor. Refer to "Compulsory Valve Operation Check Mode" for procedures. <Ref. to EN(H4SO)-45, Compulsory Valve Operation Check Mode.>  <b>Connector &amp; terminal</b> <b>(B134) No. 29 (+) — Chassis ground (-):</b>	Is the voltage 0 — 10 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.
<b>2 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b> <b>(B137) No. 29 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 4.	Go to step 3.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>
<b>4 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from purge control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground.  <b>Connector &amp; terminal</b> <b>(B134) No. 29 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 5.
<b>5 CHECK PURGE CONTROL SOLENOID VALVE.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between purge control solenoid valve terminals.  <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the purge control solenoid valve <Ref. to EC(H4SO)-9, Purge Control Solenoid Valve.> and ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 6.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

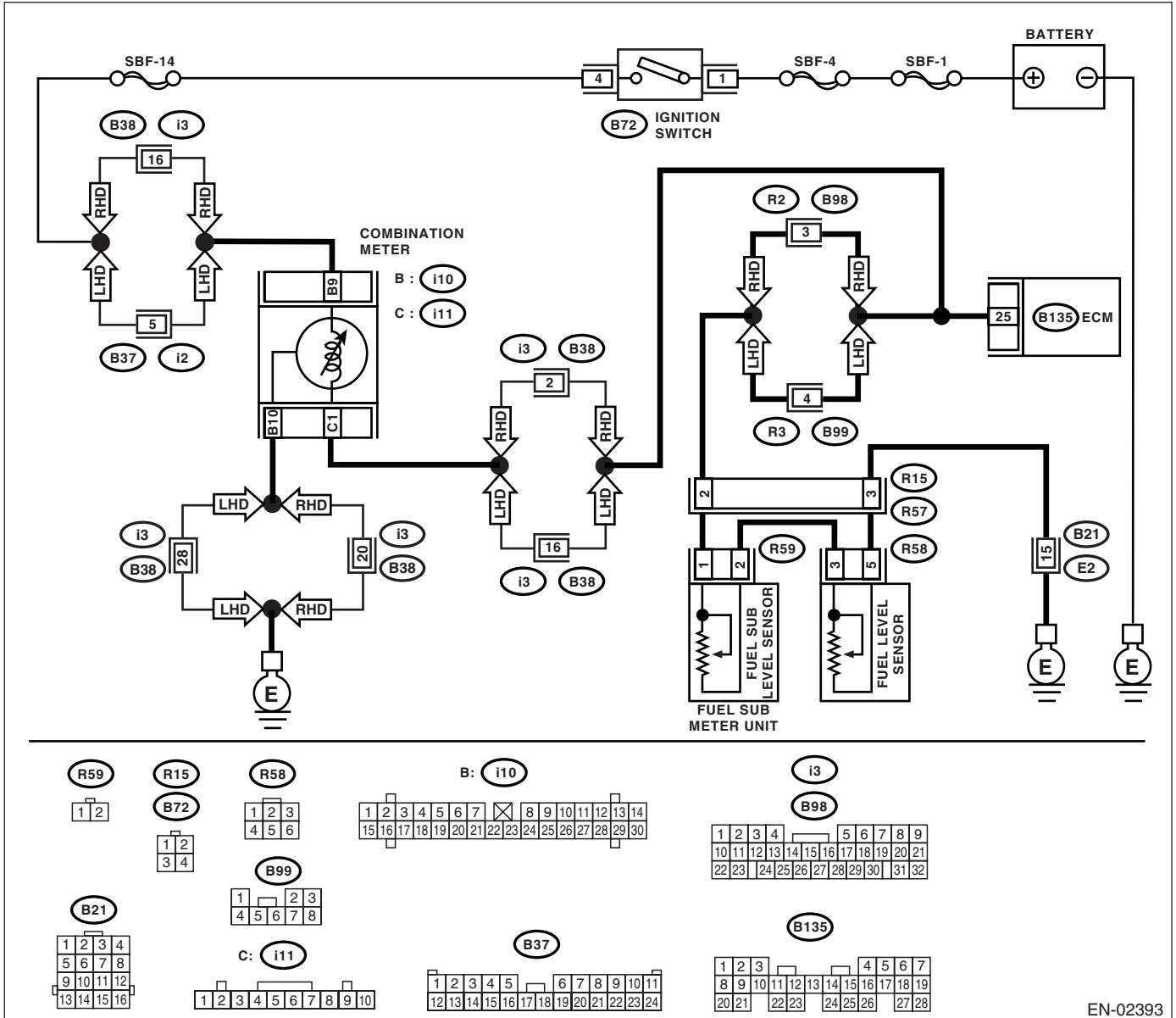
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02393

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).> <b>NOTE:</b> In this case, it is not necessary to inspect DTC P0420.	Replace the fuel level sensor. <Ref. to FU(H4SO)-57, Fuel Level Sensor.> and fuel sub level sensor. <Ref. to FU(H4SO)-58, Fuel Sub Level Sensor.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

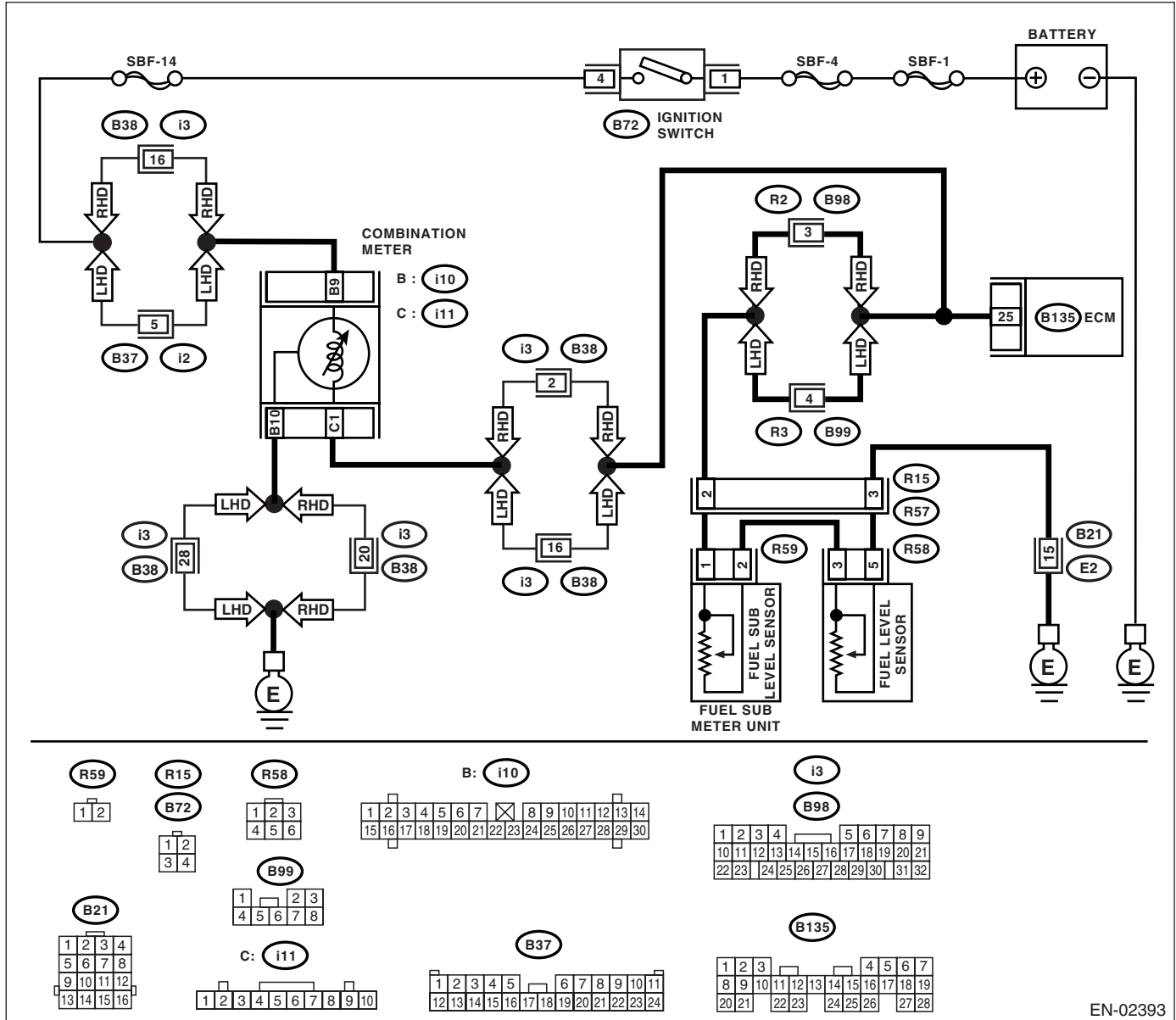
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02393

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.</b>	Does the speedometer and tachometer operate normally?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>
<b>2</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b>	Is the voltage less than 0.12 V?	Go to step 4.	Go to step 3.
<b>3</b> <b>CHECK INPUT SIGNAL FOR ECM (WITH SUBARU SELECT MONITOR).</b> Read the data of fuel level sensor signal using Subaru Select Monitor.  NOTE: For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.>	Is the voltage less than 0.12 V by shaking the ECM harness and connector?	Repair the poor contact in ECM connector.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in combination meter connector</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<b>4</b> <b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Turn the ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Turn the ignition switch to ON. 4) Measure the voltage of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b>	Is the voltage more than 0.12 V?	Go to step 5.	Go to step 6.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from connector (i10) and ECM connector. 3) Measure the resistance between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 25 — Chassis ground:</b>	Is the resistance more than 1 MΩ?	Go to step 7.	Repair the ground short in harness between ECM and combination meter connector.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER.</b> Measure the resistance between ECM and combination meter connector. <b>Connector &amp; terminal</b> <b>(B135) No. 25 — (i11) No. 1:</b>	Is the resistance less than 10 Ω?	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>	Repair open circuit between ECM and combination meter connector.  NOTE: In this case repair the following: Poor contact in coupling connector

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7</b> <b>CHECK FUEL TANK CORD.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel sub level sensor. 3) Measure the resistance between fuel sub level sensor and chassis ground. <b>Connector &amp; terminal</b> <b>(R59) No. 1 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 8.	Repair ground short circuit in fuel tank cord.
<b>8</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel pump assembly. 2) Measure the resistance between fuel pump assembly and chassis ground. <b>Connector &amp; terminal</b> <b>(R59) No. 2 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 9.	Repair ground short circuit in fuel tank cord.
<b>9</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-57, Fuel Level Sensor.> 2) Measure the resistance between fuel level sensor and terminals with its float set to the full position. <b>Terminals</b> <b>No. 3 — No. 5:</b>	Is the resistance 0.5 — 2.5 $\Omega$ ?	Go to step 10.	Replace the fuel level sensor.
<b>10</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-58, Fuel Sub Level Sensor.> 2) Measure the resistance between fuel sub level sensor and terminals with its float set to the full position. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the resistance 0.5 — 2.5 $\Omega$ ?	Repair poor contact in harness between ECM and combination meter connector.	Replace the fuel sub level sensor.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

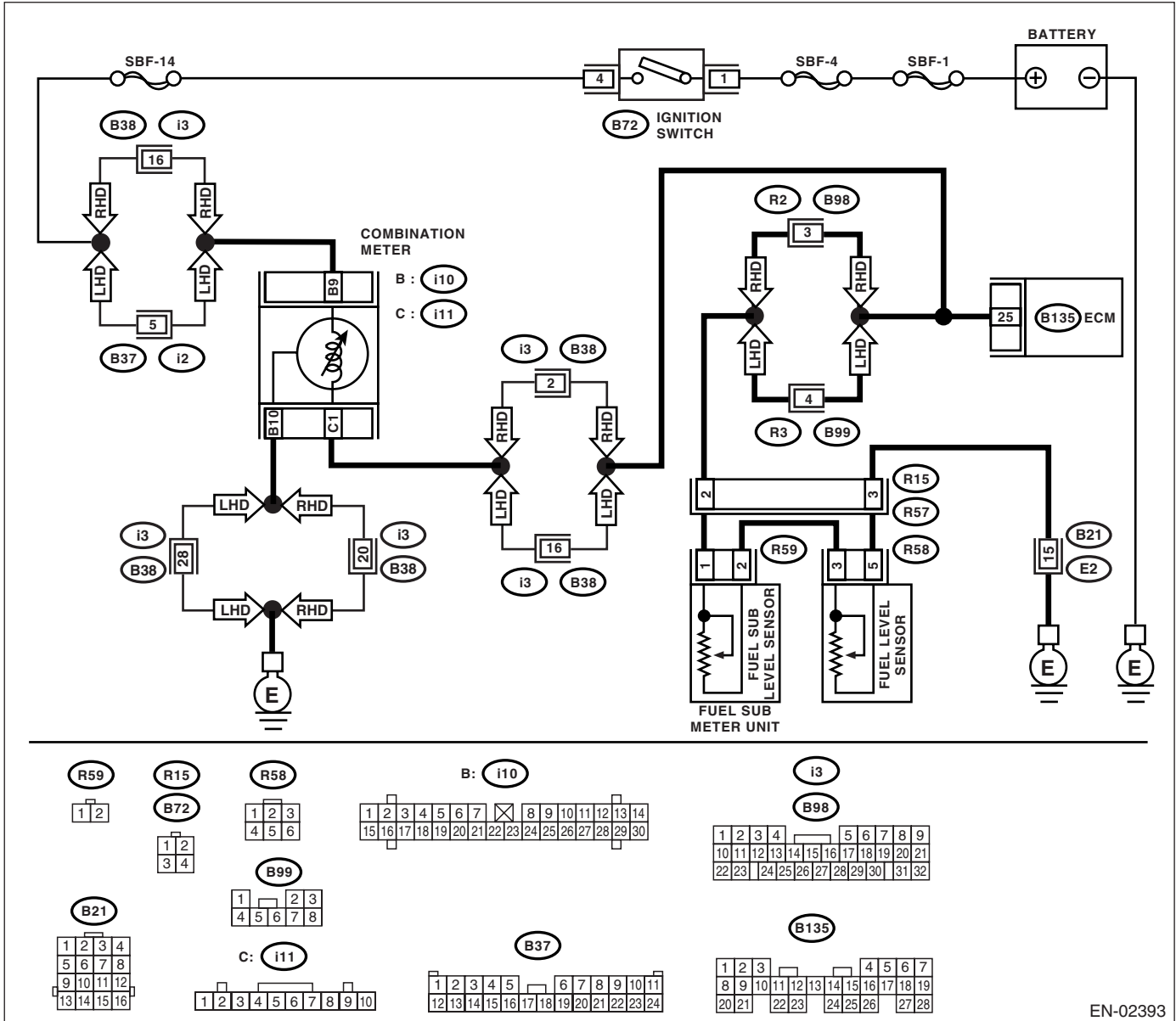
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02393

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1	<b>CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.</b>	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-3, Combination Meter System.>
2	<b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. (engine OFF) 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b>	Go to step 3.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.  <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in fuel pump connector</li> <li>• Poor contact in coupling connector</li> </ul>
3	<b>CHECK INPUT VOLTAGE OF ECM.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the combination meter connector (i11) and ECM connector. 3) Turn the ignition switch to ON. 4) Measure the voltage of harness between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B135) No. 25 (+) — Chassis ground (-):</b>	Go to step 4.	Repair battery short circuit between ECM and combination meter connector.
4	<b>CHECK HARNESS BETWEEN ECM AND FUEL TANK CORD.</b> 1) Turn the ignition switch to OFF. 2) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15). 3) Measure the resistance between ECM and fuel tank cord. <b>Connector &amp; terminal</b> <b>(B135) No. 25 — (R15) No. 2:</b>	Go to step 5.	Repair open circuit between ECM and fuel tank cord.
5	<b>CHECK HARNESS BETWEEN FUEL TANK CORD AND CHASSIS GROUND.</b> Measure the resistance between fuel tank cord and chassis ground. <b>Connector &amp; terminal</b> <b>(R15) No. 3 — Chassis ground:</b>	Go to step 6.	Repair open circuit between fuel tank cord and chassis ground.  <b>NOTE:</b> In this case repair the following: Poor contact in coupling connector.
6	<b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel level sensor. 2) Measure the resistance between fuel level sensor and coupler connector. <b>Connector &amp; terminal</b> <b>(R57) No. 3 — (R58) No. 5:</b>	Go to step 7.	Repair open circuit between coupling connector and fuel level sensor.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>7</b> <b>CHECK FUEL TANK CORD.</b> 1) Disconnect the connector from fuel sub level sensor. 2) Measure the resistance between fuel level sensor and fuel sub level sensor. <i><b>Connector &amp; terminal</b></i> <i><b>(R58) No. 3 — (R59) No. 2:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step <b>8</b> .	Repair open circuit between fuel level sensor and fuel sub level sensor.
<b>8</b> <b>CHECK FUEL TANK CORD.</b> Measure the resistance between fuel level sensor and coupler connector. <i><b>Connector &amp; terminal</b></i> <i><b>(R57) No. 2 — (R59) No. 1:</b></i>	Is the resistance less than 10 $\Omega$ ?	Go to step <b>9</b> .	Repair open circuit between coupling connector and fuel level sensor.
<b>9</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-57, Fuel Level Sensor.> 2) While moving the fuel level sensor float up and down, measure resistance between fuel level sensor terminals. <i><b>Terminals</b></i> <i><b>No. 3 — No. 5:</b></i>	Is the resistance more than 54.5 $\Omega$ ?	Replace the fuel level sensor. <Ref. to FU(H4SO)-57, Fuel Level Sensor.>	Go to step <b>10</b> .
<b>10</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-58, Fuel Sub Level Sensor.> 2) While moving the fuel sub level sensor float up and down, measure resistance between fuel sub level sensor terminals. <i><b>Terminals</b></i> <i><b>No. 1 — No. 2:</b></i>	Is the resistance more than 41.5 $\Omega$ ?	Replace the fuel sub level sensor. <Ref. to FU(H4SO)-58, Fuel Sub Level Sensor.>	Replace the combination meter. <Ref. to IDI-10, Combination Meter Assembly.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AT:DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT

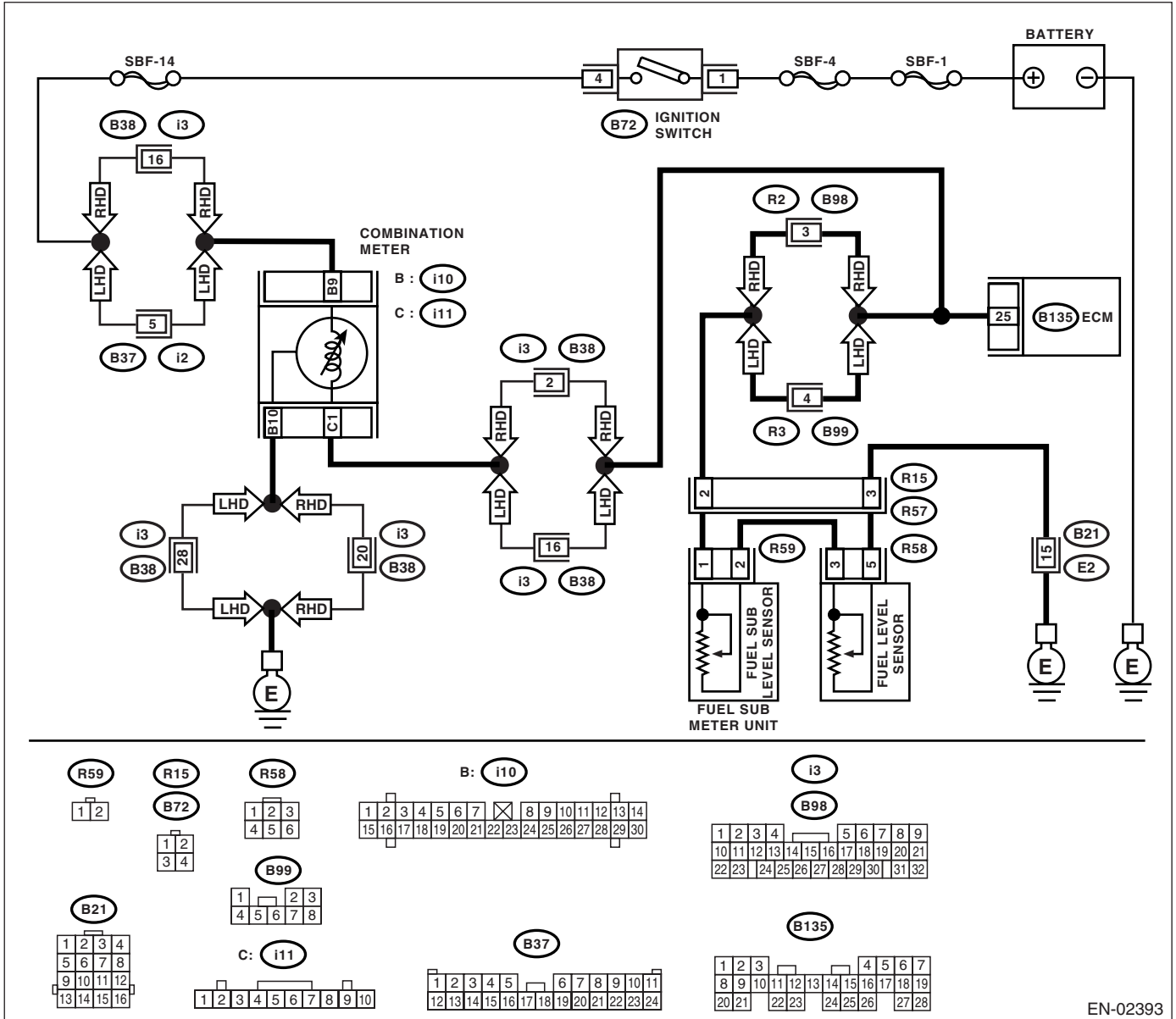
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02393

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC P0462 or P0463 using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK FUEL LEVEL SENSOR.</b> 1) Remove the fuel pump assembly. <Ref. to FU(H4SO)-55, Fuel Pump.> 2) While moving the fuel level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly. <i>Terminals</i> <b>No. 3 — No. 5:</b>	Does the resistance change slowly?	Go to step 3.	Replace the fuel level sensor. <Ref. to FU(H4SO)-57, Fuel Level Sensor.>
<b>3</b> <b>CHECK FUEL SUB LEVEL SENSOR.</b> 1) Remove the fuel sub level sensor. <Ref. to FU(H4SO)-57, Fuel Level Sensor.> 2) While moving the fuel sub level sensor float up and down, make sure that the resistance between fuel level sensor terminals changes smoothly. <i>Terminals</i> <b>No. 1 — No. 2:</b>	Does the resistance change slowly?	Repair poor contact in ECM, combination meter and coupling connectors.	Replace the fuel sub level sensor. <Ref. to FU(H4SO)-58, Fuel Sub Level Sensor.>

## **AU:DTC P0483 COOLING FAN RATIONALITY CHECK**

### **DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

### **TROUBLE SYMPTOM:**

- Occurrence of noise
- Over-heating

### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.**

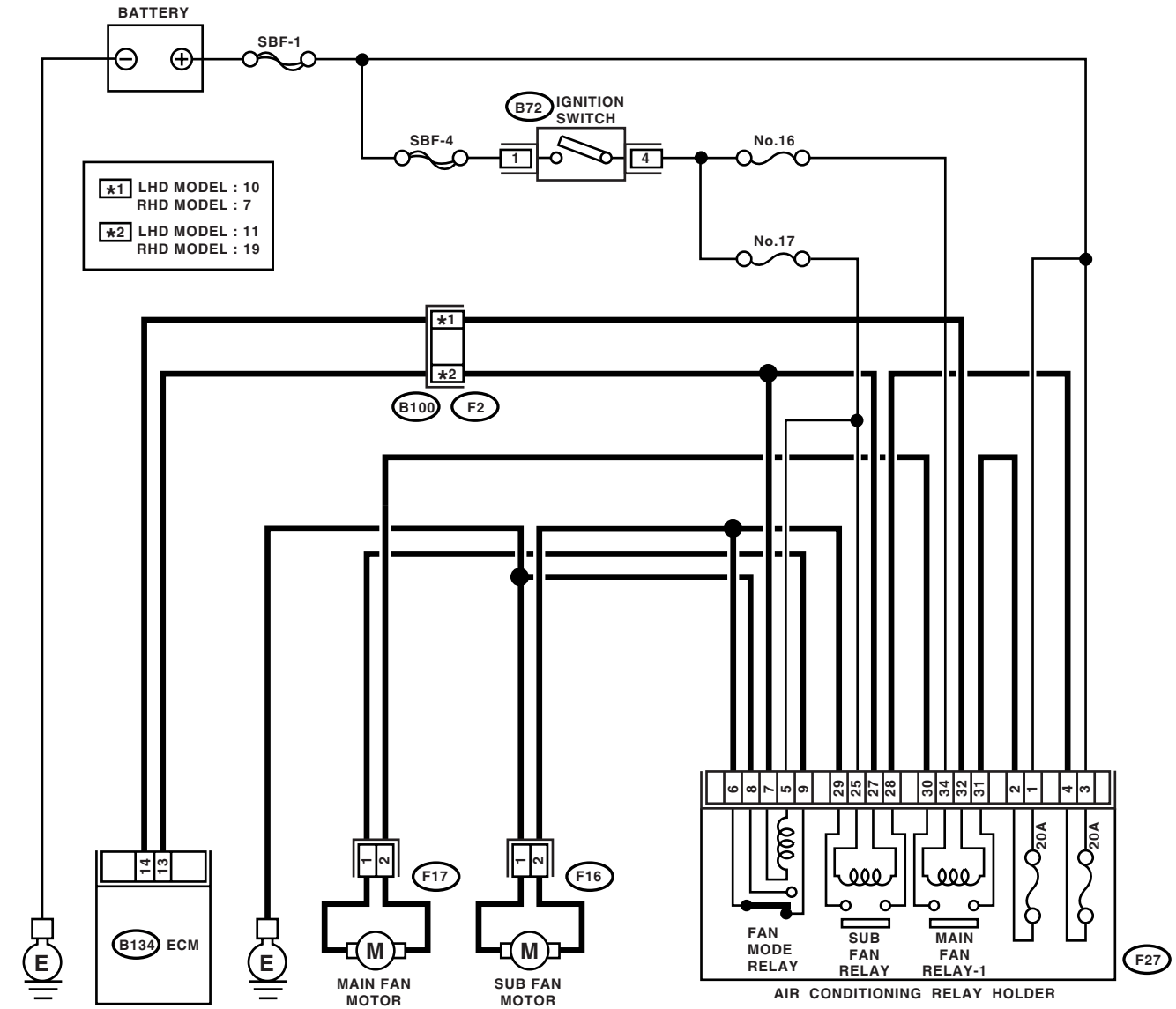
### **NOTE:**

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

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



**F16**

**B72**

**F2** : LHD

**F27**

**F17**

1	2
3	4

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

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

**B134**

**F2** : RHD

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

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

EN-02394

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Check radiator fan and fan motor, and poor contact in connectors. <Ref. to CO(H4SO)-35, Radiator Main Fan and Fan Motor.> <Ref. to CO(H4SO)-40, Radiator Sub Fan and Fan Motor.>



## **Diagnostic Procedure with Diagnostic Trouble Code (DTC)**

ENGINE (DIAGNOSTIC)

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### **AV:DTC P0502 VEHICLE SPEED SENSOR CIRCUIT LOW INPUT**

**NOTE:**

For the diagnostic procedure, refer to DTC P0503. <Ref. to EN(H4SO)-185, DTC P0503 VEHICLE SPEED SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## AW:DTC P0503 VEHICLE SPEED SENSOR CIRCUIT HIGH INPUT

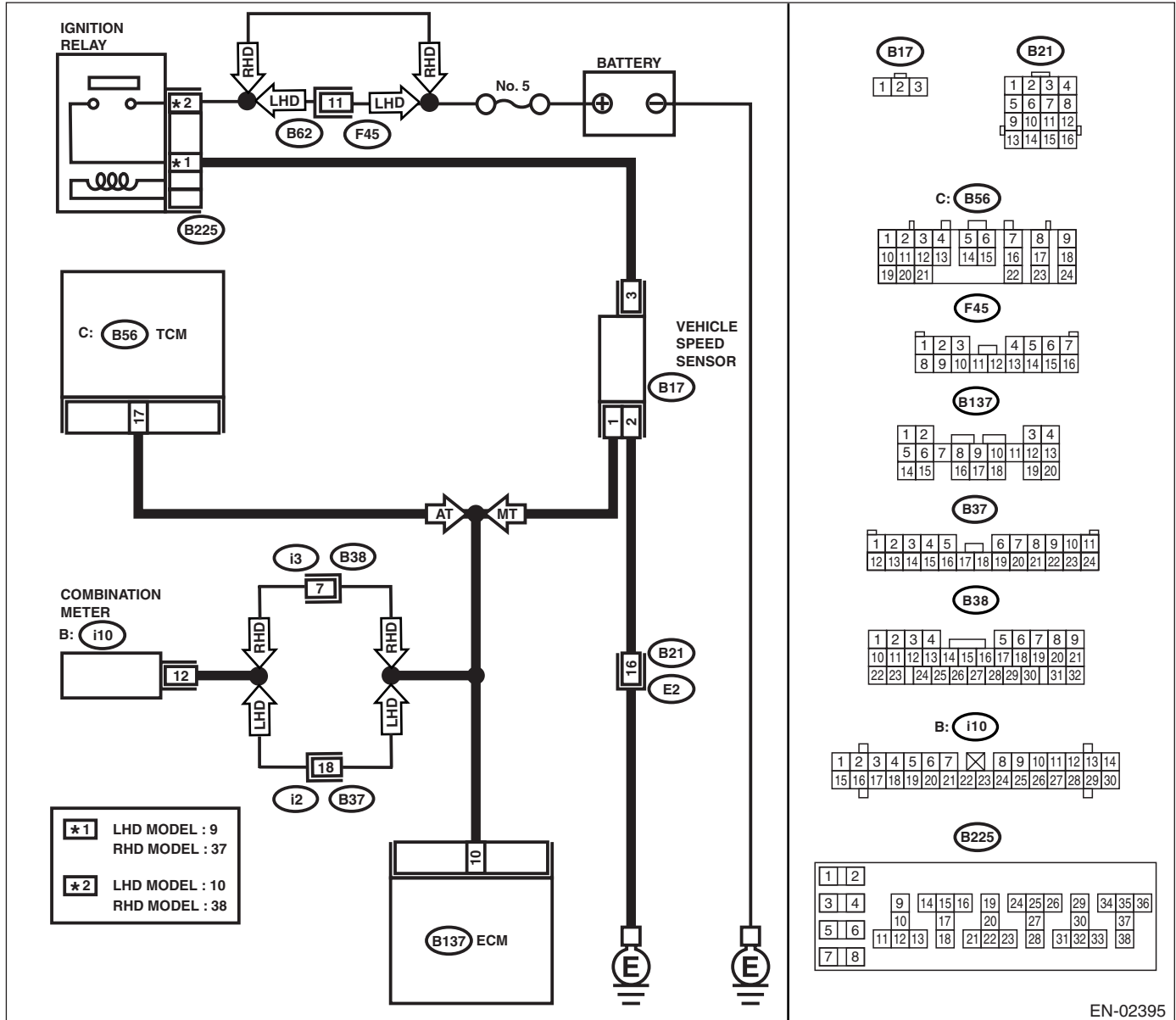
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02395

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1	<b>CHECK TRANSMISSION TYPE.</b>	Is the transmission type AT?	Go to step 2.
2	<b>CHECK DTC P0720 ON DISPLAY.</b>	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC P0720?	Go to step 3.
3	<b>CHECK SPEEDOMETER OPERATION IN COMBINATION METER.</b>	Does speedometer operate normally?	Go to step 4.
4	<b>CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the combination meter. 3) Measure the resistance between ECM and combination meter connector. <b>Connector &amp; terminal</b> <b>(B137) No. 10 — (i10) No. 12:</b>	Is the resistance less than 10 Ω?	Repair the poor contact in ECM connector.
			Check speedometer and vehicle speed sensor. <Ref. to IDI-13, Speedometer.> <Ref. to 4AT-55, Front Vehicle Speed Sensor.> <Ref. to 4AT-59, Rear Vehicle Speed Sensor.> <Ref. to 4AT-60, Torque Converter Turbine Speed Sensor.>
			Repair harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between ECM and combination meter connector • Poor contact in ECM connector. • Poor contact in combination meter connector • Poor contact in coupling connector

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

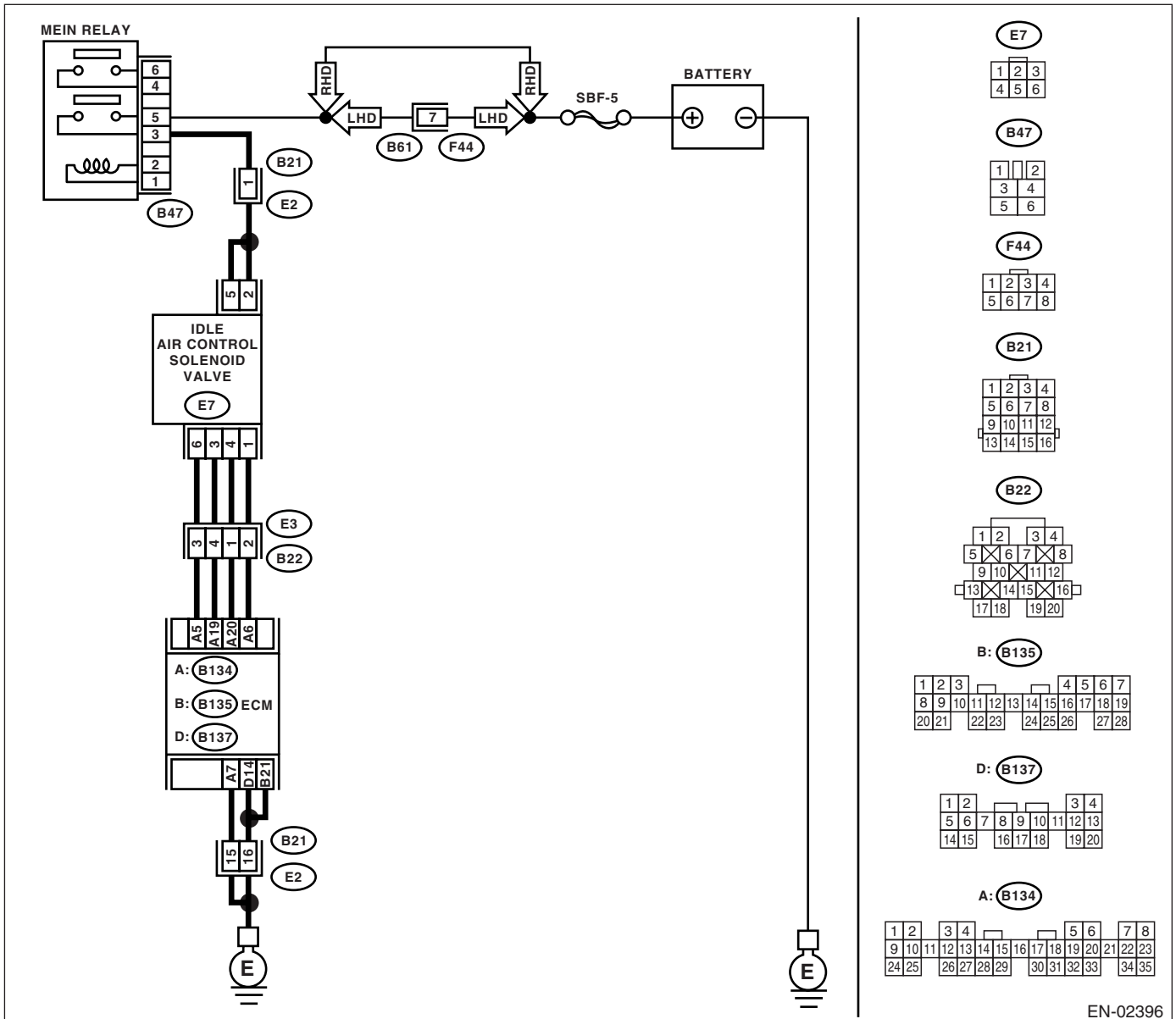
### TROUBLE SYMPTOM:

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

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02396

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).> <b>NOTE:</b> In this case, it is not necessary to inspect DTC P0506.	Go to step 2.
<b>2</b> <b>CHECK AIR BY-PASS LINE.</b> 1) Turn the ignition switch to OFF. 2) Remove the idle air control solenoid valve from the throttle body. <Ref. to FU(H4SO)-33, REMOVAL, Idle Air Control Solenoid Valve.> 3) Remove the throttle body to intake manifold. <Ref. to FU(H4SO)-13, REMOVAL, Throttle Body.> 4) Using an air gun, force air into the idle air control solenoid valve installation area. Confirm that forced air subsequently escapes from throttle body.	Does air flow out?	Replace the idle air control solenoid valve. <Ref. to FU(H4SO)-33, INSTALLATION, Idle Air Control Solenoid Valve.>	Replace the throttle body. <Ref. to FU(H4SO)-13, INSTALLATION, Throttle Body.>

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

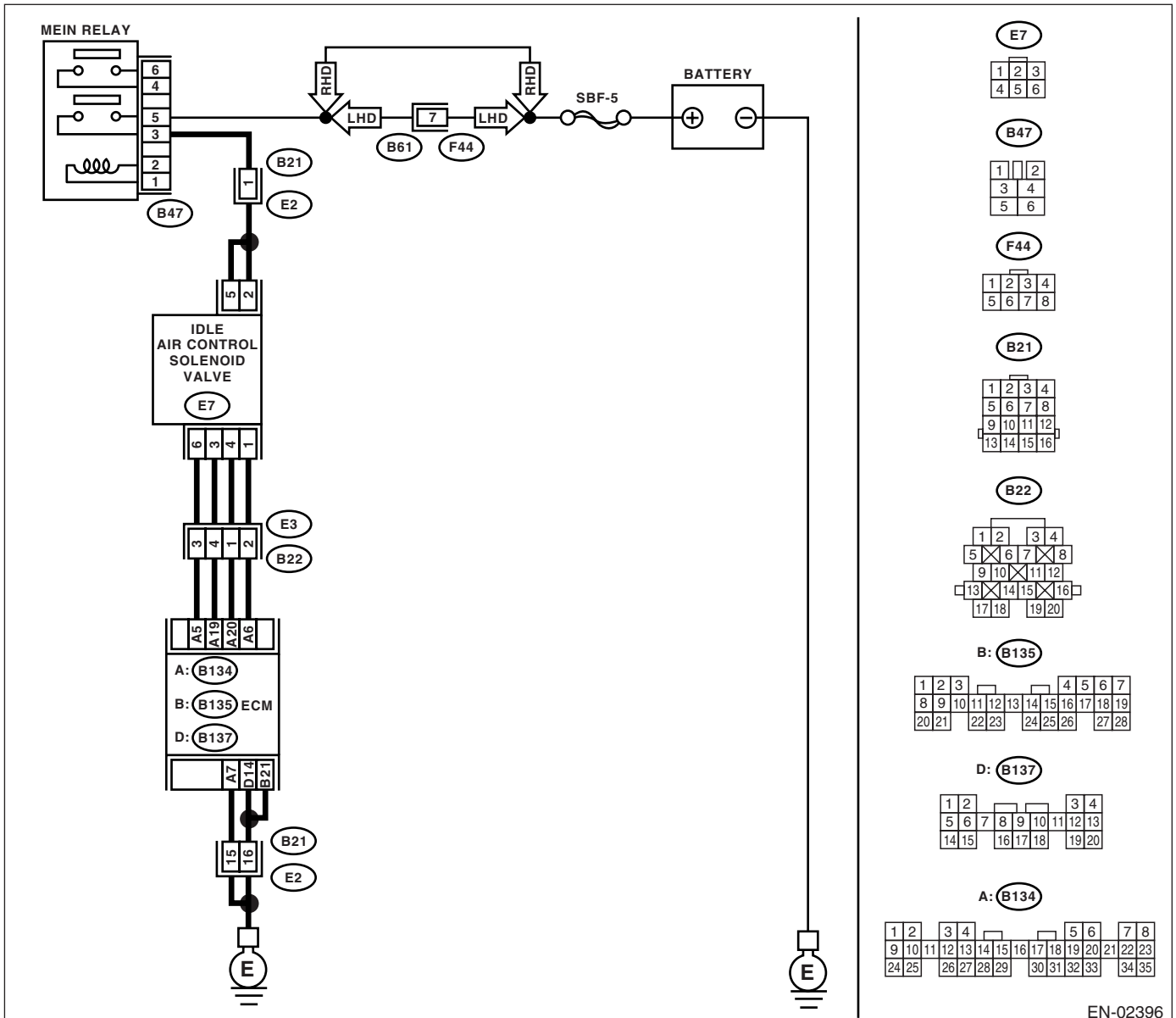
### TROUBLE SYMPTOM:

Engine keeps running at higher revolution than specified idling revolution.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02396

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0507.	Go to step 2.
<b>2</b> <b>CHECK AIR INTAKE SYSTEM.</b> 1) Turn the ignition switch to ON. 2) Start and idle the engine. 3) Check the following items: <ul style="list-style-type: none"> <li>• Loose installation of intake manifold, idle air control solenoid valve and throttle body</li> <li>• Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket</li> <li>• Disconnections of vacuum hoses</li> </ul>	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
<b>3</b> <b>CHECK THROTTLE CABLE.</b>	Is the free play of throttle cable appropriate?	Go to step 4.	Adjust throttle cable. <Ref. to SP(H4SO)-9, INSTALLATION, Accelerator Control Cable.>
<b>4</b> <b>CHECK AIR BY-PASS LINE.</b> 1) Turn the ignition switch to OFF. 2) Remove the idle air control solenoid valve from the throttle body. <Ref. to FU(H4SO)-33, REMOVAL, Idle Air Control Solenoid Valve.> 3) Confirm that there are no foreign particles in air by-pass line.	Are foreign particles in air by-pass line?	Remove foreign particles from air by-pass line.	Replace the idle air control solenoid valve. <Ref. to FU(H4SO)-33, INSTALLATION, Idle Air Control Solenoid Valve.>

**AZ:DTC P0512 STARTER REQUEST CIRCUIT**

**DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

**TROUBLE SYMPTOM:**

Failure of engine to start

**CAUTION:**

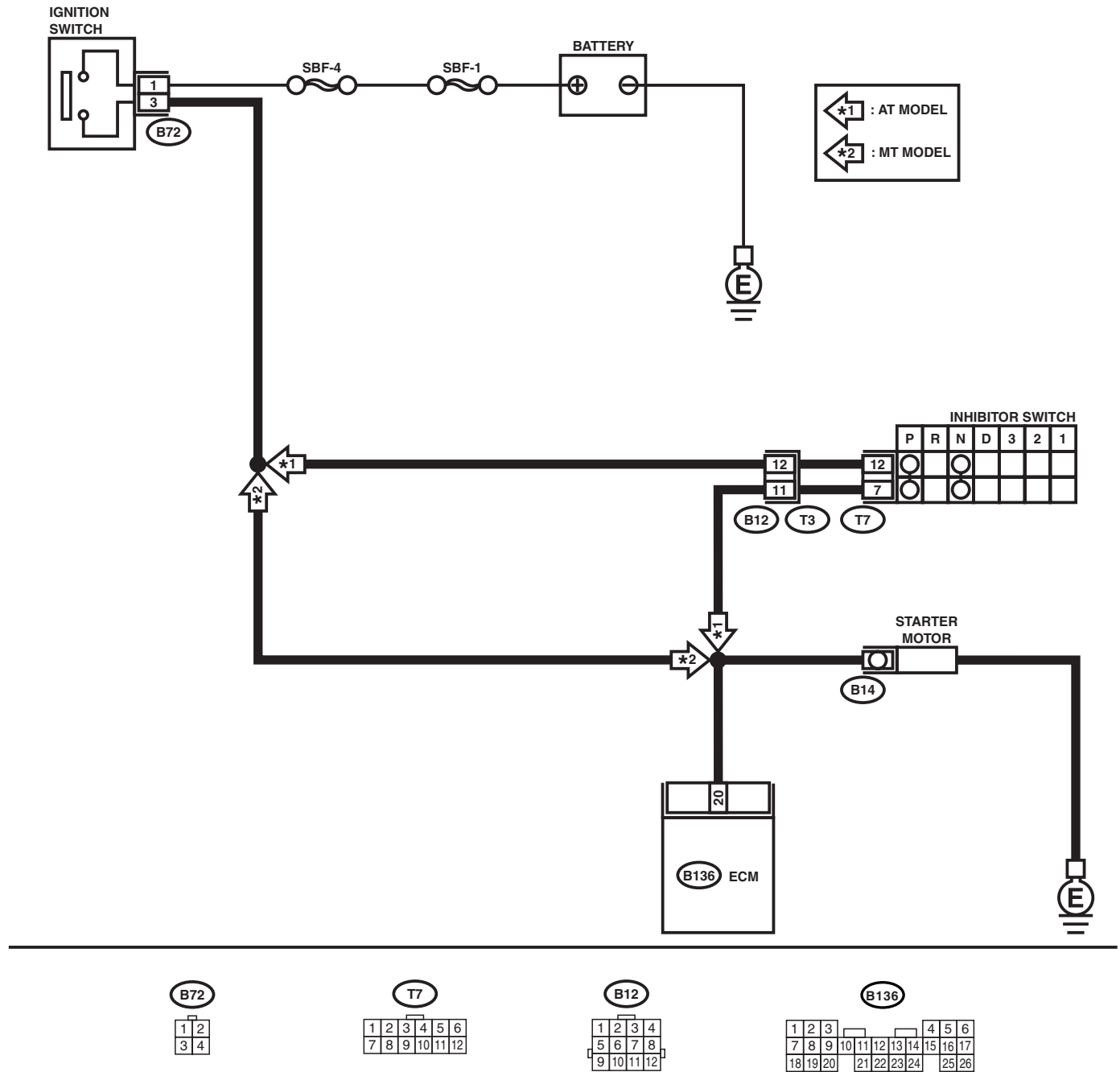
After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-00261

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK OPERATION OF STARTER MOTOR.</b> Turn the ignition switch to ON. <b>NOTE:</b> <ul style="list-style-type: none"><li>Place the inhibitor switch in each position. (At model)</li><li>Depress the clutch pedal. (MT model)</li></ul>	Does the starter motor operate?	Repair battery short circuit in starter motor circuit.	Check starter motor circuit. <Ref. to EN(H4SO)-58, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

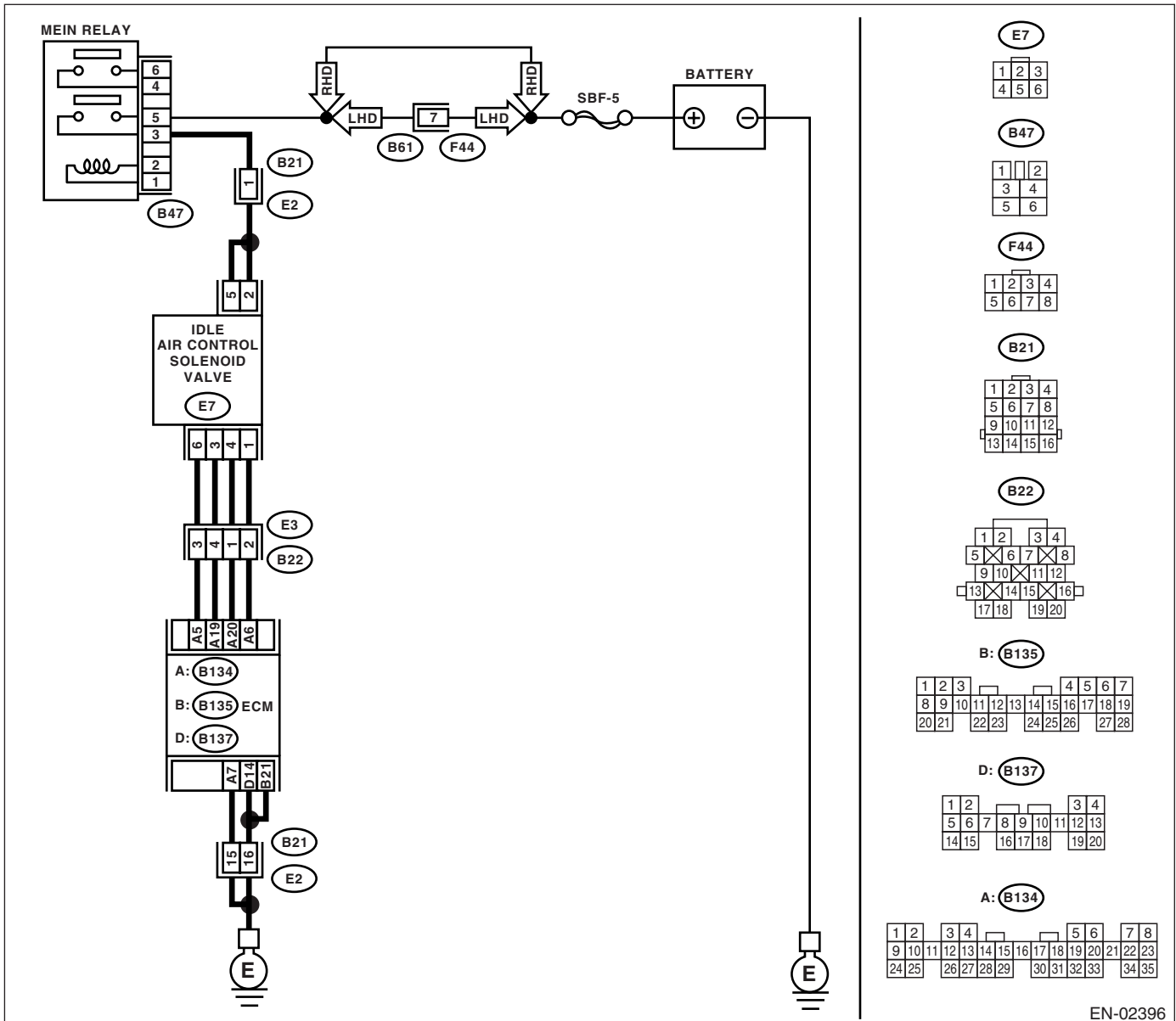
### TROUBLE SYMPTOM:

Engine keeps running at higher revolution than specified idling revolution.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02396

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: In this case, it is not necessary to inspect DTC P0519.	Go to step 2.
<b>2</b> <b>CHECK AIR INTAKE SYSTEM.</b> 1) Turn the ignition switch to ON. 2) Start the engine, and idle it. 3) Check the following items: <ul style="list-style-type: none"> <li>• Loose installation of intake manifold, idle air control solenoid valve and throttle body</li> <li>• Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket</li> <li>• Disconnections of vacuum hoses</li> </ul>	Is there any fault in air intake system?	Repair air suction and leaks.	Go to step 3.
<b>3</b> <b>CHECK THROTTLE CABLE.</b>	Is the free play of throttle cable appropriate?	Go to step 4.	Adjust throttle cable. <Ref. to SP(H4SO)-9, INSTALLATION, Accelerator Control Cable.>
<b>4</b> <b>CHECK AIR BY-PASS LINE.</b> 1) Turn the ignition switch to OFF. 2) Remove the idle air control solenoid valve from the throttle body. <Ref. to FU(H4SO)-33, Idle Air Control Solenoid Valve.> 3) Confirm that there are no foreign particles in air by-pass line.	Are foreign particles in air by-pass line?	Remove foreign particles from air by-pass line.	Replace the idle air control solenoid valve. <Ref. to FU(H4SO)-33, Idle Air Control Solenoid Valve.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BB:DTC P0565 CRUISE CONTROL ON SIGNAL

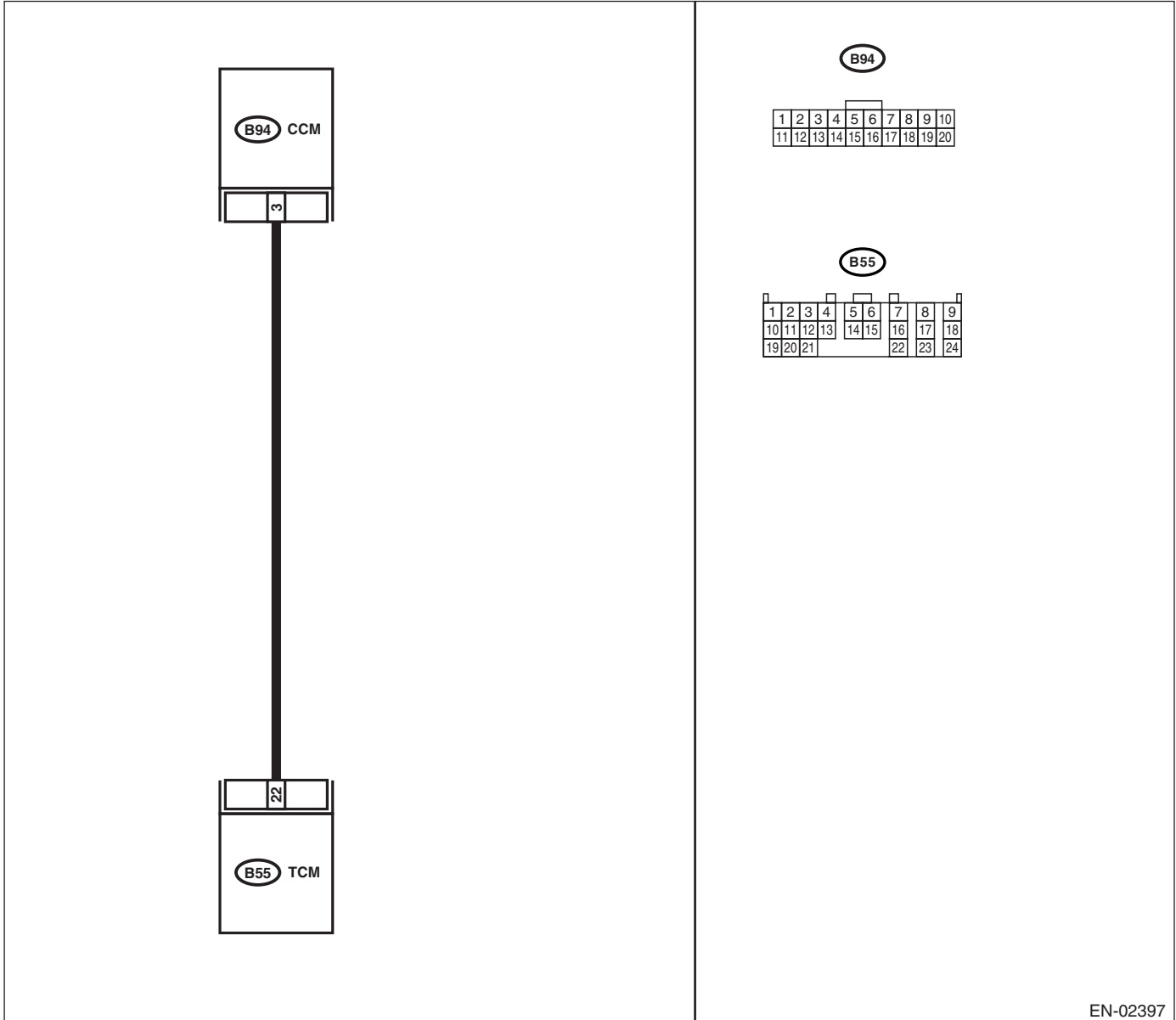
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02397

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK HARNESS BETWEEN TCM AND CRUISE CONTROL UNIT CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from TCM and cruise control unit.                      3) Measure the resistance of harness between TCM and cruise control unit connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B55) No. 22 — (B94) No. 3:</b></p>	<p>Is the resistance less than 1 <math>\Omega</math>?</p>	<p>Go to step 2.</p>	<p>Repair open circuit in harness between cruise control unit and TCM connector.</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN TCM AND CRUISE CONTROL UNIT CONNECTOR.</b></p> <p>Measure the resistance of harness between TCM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B55) No. 22 — Chassis ground:</b></p>	<p>Is the resistance more than 1 M<math>\Omega</math>?</p>	<p>Go to step 3.</p>	<p>Repair the short circuit of harness between TCM and cruise control unit connector.</p>
<p><b>3</b></p> <p><b>CHECK INPUT SIGNAL FOR TCM.</b></p> <p>1) Connect the connectors to TCM and cruise control unit.                      2) Lift up the vehicle or set it to the free roller.</p> <p><b>CAUTION:</b>  <b>For AWD model, all wheels up from floor.</b></p> <p>3) Start the engine.                      4) Turn the cruise control main switch to ON.                      5) Shift the select lever to "D" range and slowly increase the vehicle speed to 50 km/h (31 MPH).                      6) Turn the cruise control command switch to ON.                      7) Measure the voltage between TCM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B55) No. 22 (+) — Chassis ground (-):</b></p>	<p>Is the voltage less than 1 V?</p>	<p>Go to step 4.</p>	<p>Check cruise control command switch circuit.                      &lt;Ref. to CC-9, INSPECTION, Cruise Control Command Switch.&gt;</p>
<p><b>4</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in TCM connector.</p>	<p>Is there poor contact in TCM connector?</p>	<p>Repair poor contact in TCM connector.</p>	<p>Replace the TCM.                      &lt;Ref. to 4AT-77, Transmission Control Module (TCM).&gt;</p>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BC:DTC P0604 INTERNAL CONTROL MODULE READ ACCESS MEMORY (RAM) ERROR

### DTC DETECTING CONDITION:

Immediately at fault recognition

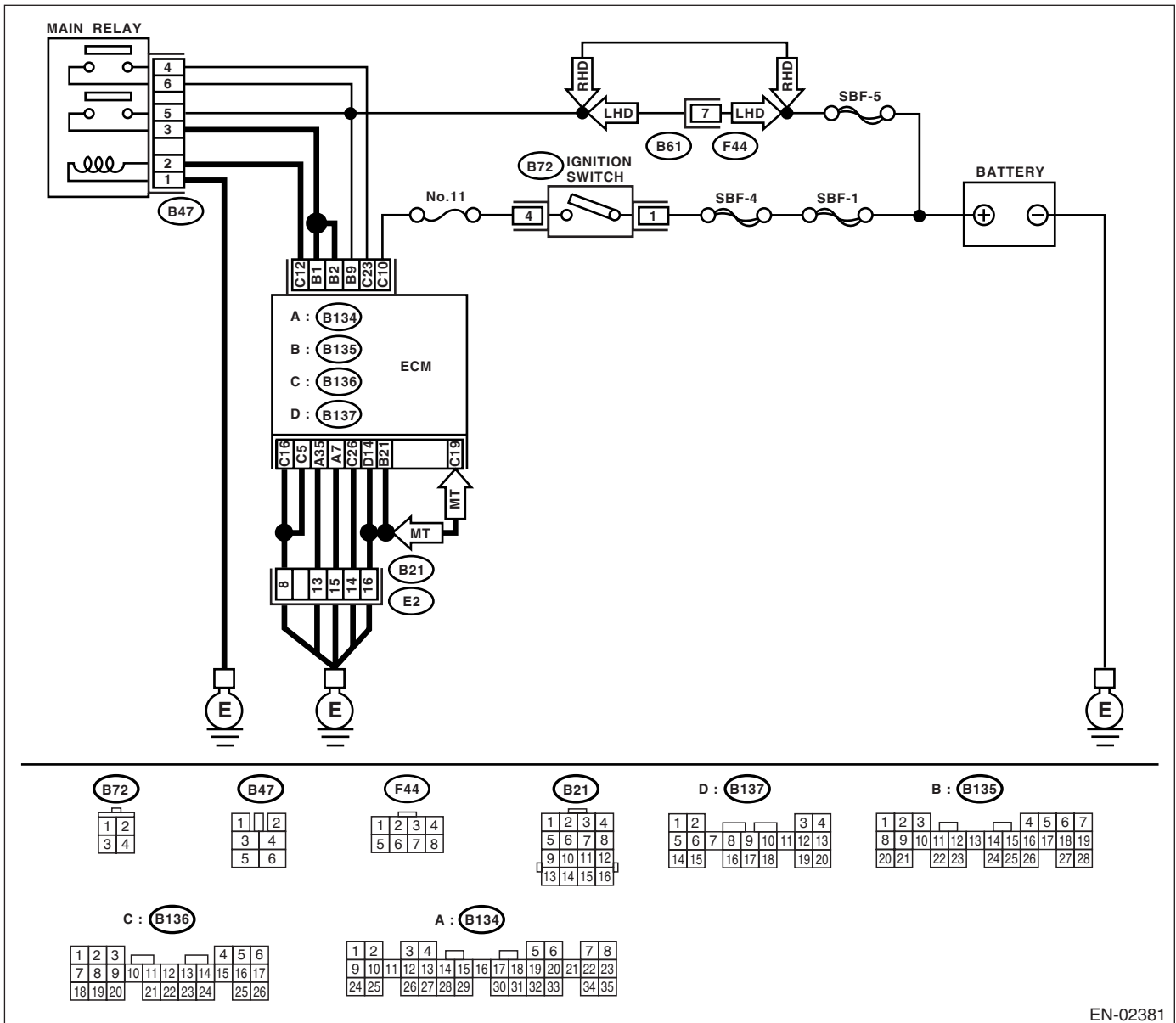
### TROUBLE SYMPTOM:

- Engine does not start.
- Engine stalls

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02381

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

	Step	Check	Yes	No
1	CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	It is not necessary to inspect DTC P0601.



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

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

Two consecutive driving cycles with fault

#### **TROUBLE SYMPTOM:**

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

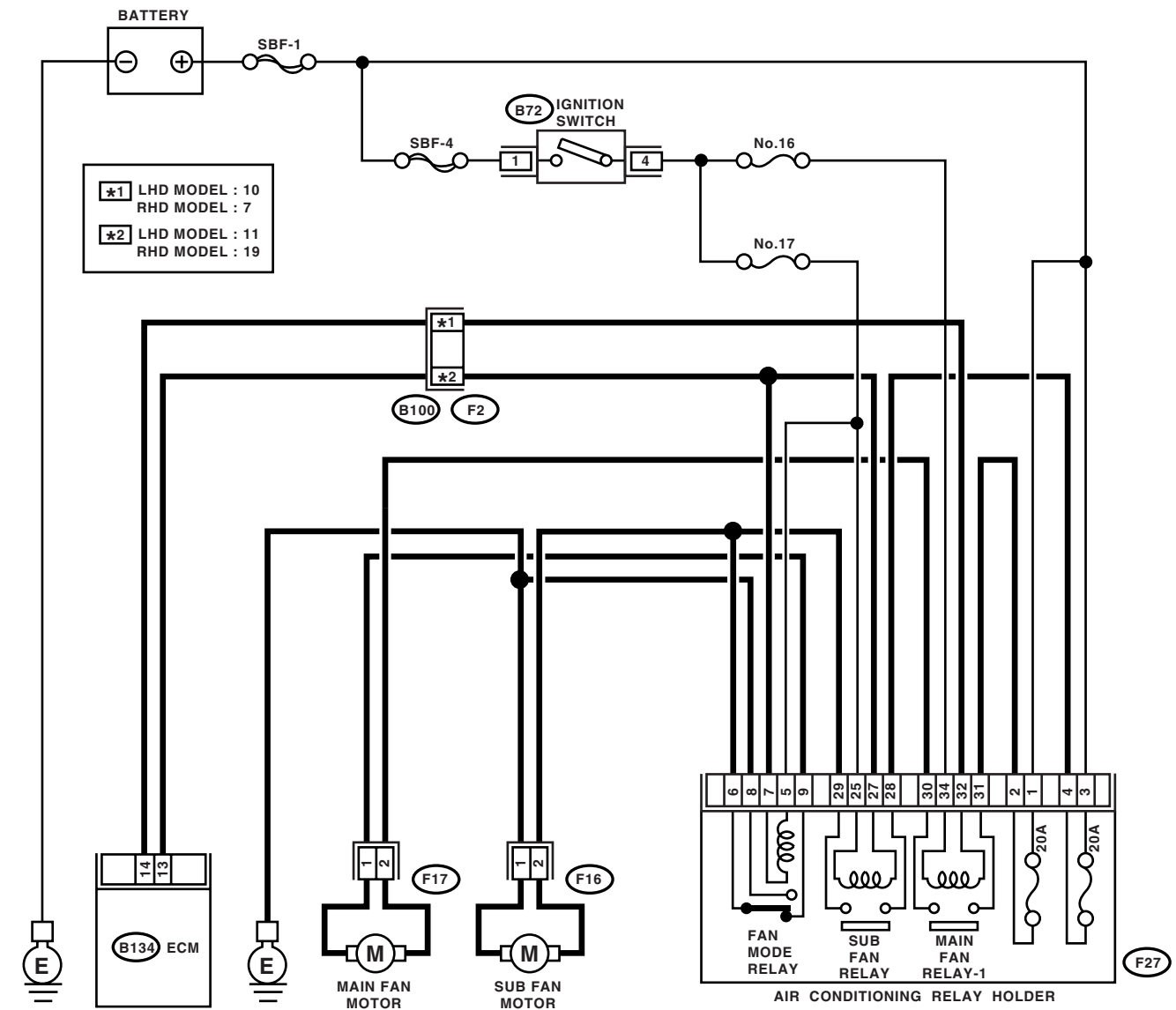
#### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



**F16**

**B72**

**F2** : LHD

**F27**

**F17**

1	2
3	4

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

1	2		5	6	7		10		15	16	17		20		25	26	27		30		35		
			8		11		18		21		28		31		38		41		44		47		50
3	4		9		12	13	14		19		22	23	24		29		32	33	34		36		39

**B134**

**F2** : RHD

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

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

EN-02394

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK OUTPUT SIGNAL FROM ECM.</b>                      1) Turn the ignition switch to OFF.                      2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).                      3) Turn the ignition switch to ON.                      4) While operating the radiator fan relay, measure the voltage between ECM and chassis ground.</p> <p>NOTE:                      Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". &lt;Ref. to EN(H4SO)-29, Subaru Select Monitor.&gt;</p> <p><b>Connector &amp; terminal</b>  <b>(B134) No. 14 (+) — Chassis ground (-):</b></p>	Is the voltage 0 — 10 V?	Repair the poor contact in ECM connector.	Go to step 2.
<p><b>2 CHECK GROUND SHORT CIRCUIT IN RADIATOR MAIN FAN RELAY CONTROL CIRCUIT.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Measure the resistance of harness between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B134) No. 14 — Chassis ground:</b></p>	Is the resistance less than 10 $\Omega$ ?	Repair the ground short circuit in radiator main fan relay control circuit.	Go to step 3.
<p><b>3 CHECK POWER SUPPLY FOR RELAY.</b>                      1) Remove the main fan relay from A/C relay holder.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between fuse and relay box (F/B) connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(F27) No. 34 (+) — Chassis ground (-):</b></p>	Is the voltage more than 10 V?	Go to step 4.	Repair open circuit in harness between ignition switch and fuse and relay box (F/B) connector.
<p><b>4 CHECK MAIN FAN RELAY.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between main fan relay terminals.</p> <p><b>Terminals</b>  <b>No. 32 — No. 34:</b></p>	Is the resistance 87 — 107 $\Omega$ ?	Go to step 5.	Replace the main fan relay.
<p><b>5 CHECK OPEN CIRCUIT IN MAIN FAN RELAY CONTROL CIRCUIT.</b>                      Measure the resistance of harness between ECM and main fan relay connector.</p> <p><b>Connector &amp; terminal</b>  <b>(B134) No. 14 — (F27) No. 32:</b></p>	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair harness and connector. NOTE: In this case repair the following: • Open circuit in harness between ECM and main fan relay connector • Poor contact in coupling connector
<p><b>6 CHECK POOR CONTACT.</b>                      Check poor contact in ECM or main fan relay connector.</p>	Is there poor contact in ECM or main fan relay connector?	Repair the poor contact in ECM or main fan relay connector.	Contact the SUBARU dealer.

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

### **DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

### **TROUBLE SYMPTOM:**

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

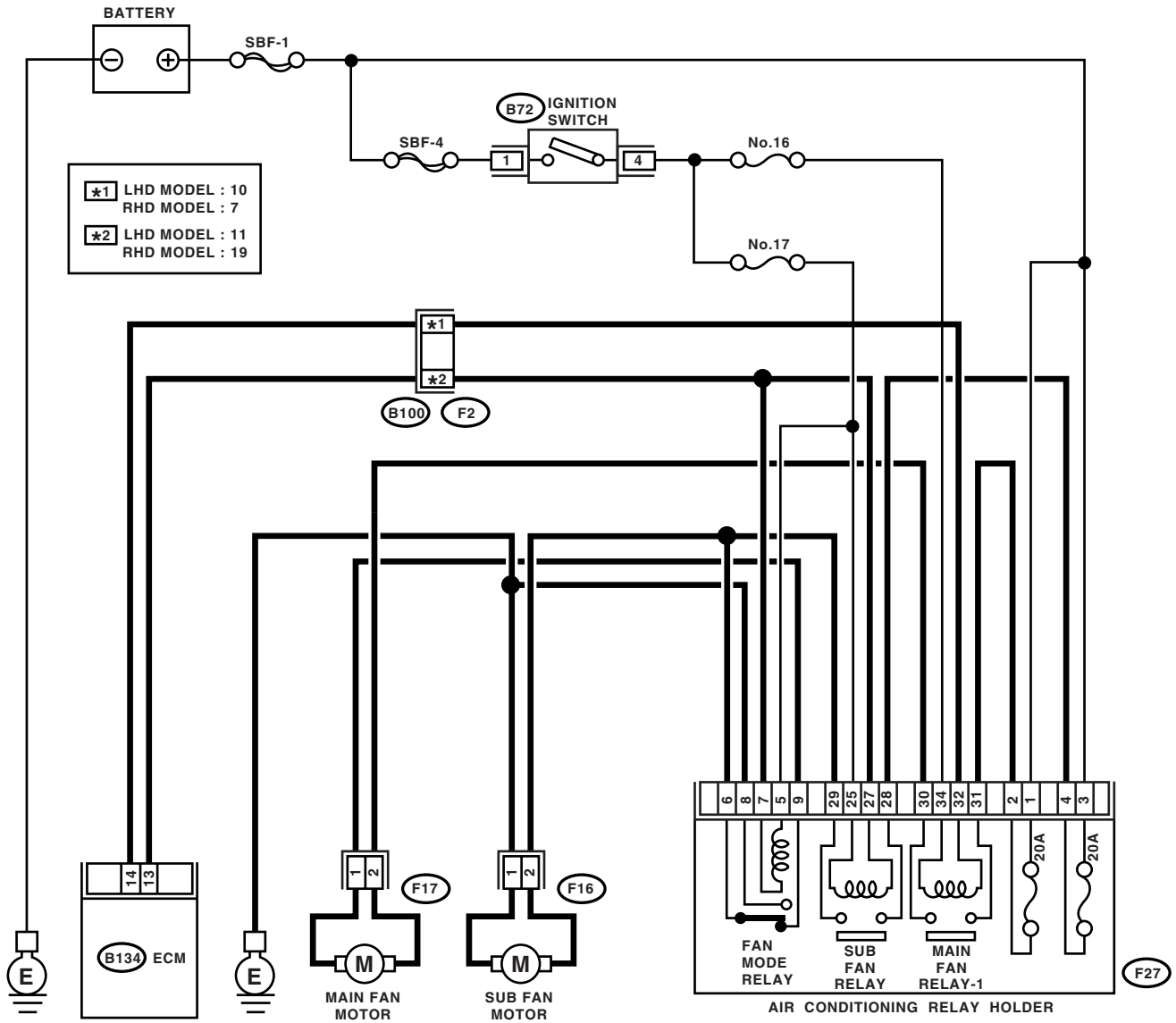
### **CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.**

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



F16

B72

F2 : LHD

F27

F17

1	2
3	4

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

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

B134

F2 : RHD

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

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

EN-02394

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1 CHECK OUTPUT SIGNAL FROM ECM.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Connect the test mode connector at the lower portion of instrument panel (on the driver's side).                      3) Turn the ignition switch to ON.                      4) While operating the radiator fan relay, measure the voltage between ECM and chassis ground.</p> <p>NOTE:                      Radiator fan relay operation can be executed using Subaru Select Monitor. For procedure, refer to "Compulsory Valve Operation Check Mode". &lt;Ref. to EN(H4SO)-45, Compulsory Valve Operation Check Mode.&gt;</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 14 (+) — Chassis ground (-):                      (B134) No. 13 (+) — Chassis ground (-):</p>	Is the voltage 0 — 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.	Go to step 2.
<p><b>2 CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY CONTROL CIRCUIT.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Remove the main fan relay and sub fan relay. (model with A/C)                      3) Disconnect the test mode connectors                      4) Turn the ignition switch to ON.                      5) Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>                      (B134) No. 14 (+) — Chassis ground (-):                      (B134) No. 13 (+) — Chassis ground (-):</p>	Is the voltage more than 10 V?	Repair battery short circuit in radiator fan relay control circuit. After repair, replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 3.
<p><b>3 CHECK MAIN FAN RELAY.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Remove the main fan relay.                      3) Measure the resistance between main fan relay terminals.</p> <p><b>Terminals</b>                      No. 30 — No. 31:</p>	Is the resistance less than 1 $\Omega$ ?	Replace the main fan relay and ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 4.
<p><b>4 CHECK SUB FAN RELAY.</b></p> <p>1) Remove the sub fan relay.                      2) Measure the resistance between sub fan relay terminals.</p> <p><b>Terminals</b>                      No. 28 — No. 29:</p>	Is the resistance less than 1 $\Omega$ ?	Replace the sub fan relay and ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Go to step 5.
<p><b>5 CHECK POOR CONTACT.</b></p> <p>Check poor contact in ECM connector.</p>	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BF:DTC P0703 TORQUE CONVERTER/BRAKE SWITCH "B" CIRCUIT

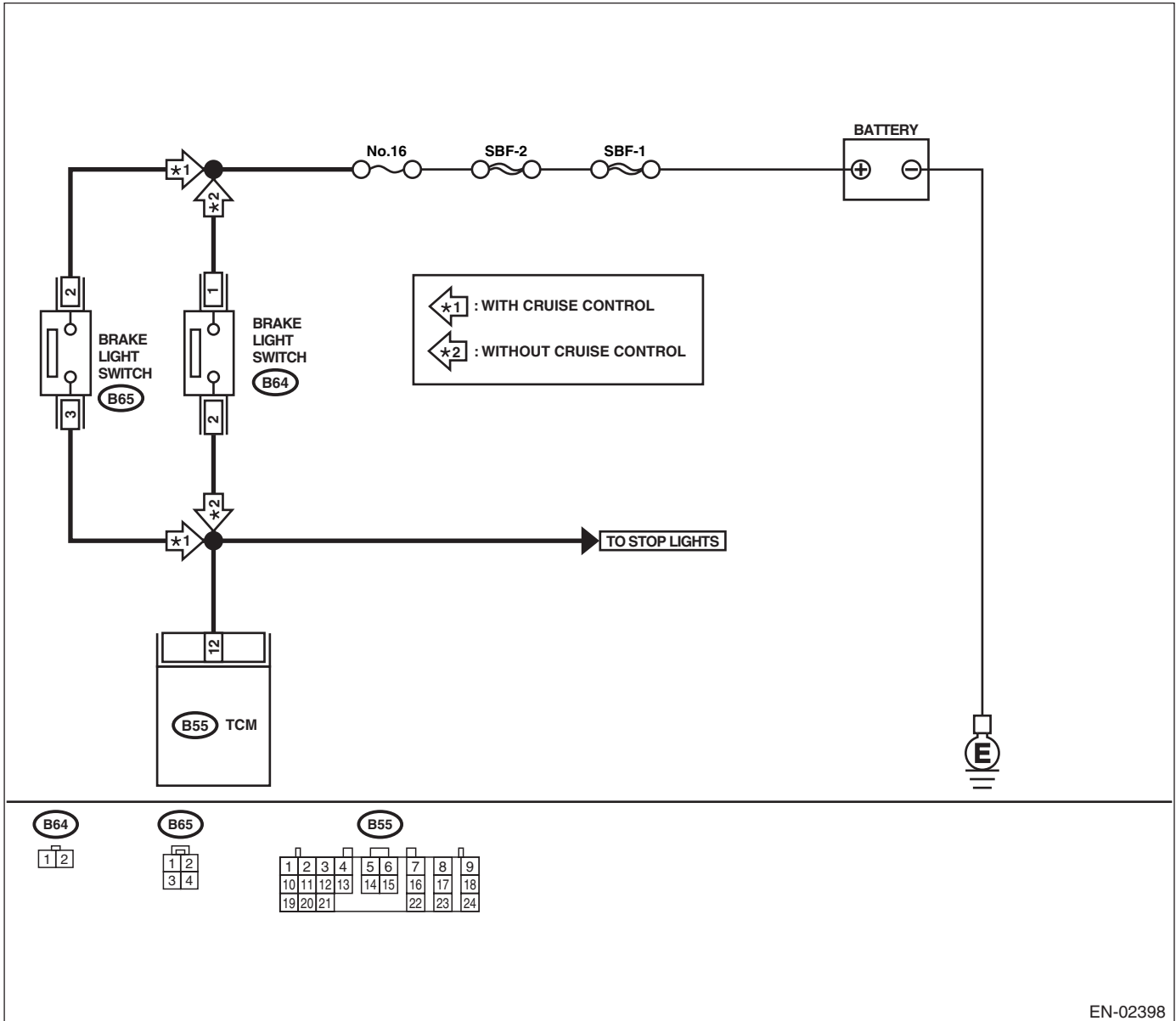
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1	<b>CHECK OPERATION OF BRAKE LIGHT.</b>	Go to step 2.	Repair or replace the brake light circuit.
2	<b>CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR.</b> 1) Disconnect the connectors from TCM and brake light switch. 2) Measure the resistance of harness between TCM and brake light switch connector. <b>Connector &amp; terminal</b> <b>WITHOUT CRUISE CONTROL</b> <b>(B55) No. 12 — (B64) No. 2:</b> <b>WITH CRUISE CONTROL</b> <b>(B55) No. 12 — (B65) No. 3:</b>	Go to step 3.	Repair or replace the harness and connector. <b>NOTE:</b> In this case repair the following: • Open circuit in harness between TCM and brake light switch connector • Poor contact in TCM connector • Poor contact in brake light switch connector
3	<b>CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR.</b> Measure the resistance of harness between TCM and chassis ground. <b>Connector &amp; terminal</b> <b>(B55) No. 12 — Chassis ground:</b>	Go to step 4.	Repair ground short circuit in harness between TCM and brake light switch connector.
4	<b>CHECK INPUT SIGNAL FOR TCM.</b> 1) Connect the connectors to TCM and brake light switch. 2) Measure the voltage between TCM and chassis ground. <b>Connector &amp; terminal</b> <b>(B55) No. 12 (+) — Chassis ground (-):</b>	Go to step 5.	Adjust or replace the brake light switch. <Ref. to LI-8, STOP LIGHT SWITCH, INSPECTION, Stop Light System.>
5	<b>CHECK INPUT SIGNAL FOR TCM.</b> Measure the voltage between TCM and chassis ground. <b>Connector &amp; terminal</b> <b>(B55) No. 12 (+) — Chassis ground (-):</b>	Go to step 6.	Adjust or replace the brake light switch. <Ref. to LI-8, STOP LIGHT SWITCH, INSPECTION, Stop Light System.>
6	<b>CHECK POOR CONTACT.</b> Check poor contact in TCM connector.	Repair poor contact in TCM connector.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **BG:DTC P0731 GEAR 1 INCORRECT RATIO**

NOTE:

For the diagnostic procedure, refer to DTC P0734. <Ref. to EN(H4SO)-209, DTC P0734 GEAR 4 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **BH:DTC P0732 GEAR 2 INCORRECT RATIO**

NOTE:

For the diagnostic procedure, refer to DTC P0734. <Ref. to EN(H4SO)-209, DTC P0734 GEAR 4 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **BI: DTC P0733 GEAR 3 INCORRECT RATIO**

NOTE:

For the diagnostic procedure, refer to DTC P0734. <Ref. to EN(H4SO)-209, DTC P0734 GEAR 4 INCORRECT RATIO, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BJ:DTC P0734 GEAR 4 INCORRECT RATIO

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### TROUBLE SYMPTOM:

- Shift point too high or too low.
- Engine brake not effected in 3rd range.
- Excessive shift shock.
- Excessive tight corner braking.

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

Step	Check	Yes	No	
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
2	<b>CHECK THROTTLE POSITION SENSOR CIRCUIT.</b> Check the throttle position sensor circuit. <Ref. to 4AT(H4SO)-41, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in throttle position sensor circuit?	Repair or replace the throttle position sensor circuit.	Go to step 3.
3	<b>CHECK FRONT VEHICLE SPEED SENSOR CIRCUIT.</b> Check front vehicle speed sensor circuit. <Ref. to 4AT(H4SO)-45, DTC 33 FRONT VEHICLE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in front vehicle speed sensor circuit?	Repair or replace the front vehicle speed sensor circuit.	Go to step 4.
4	<b>CHECK TORQUE CONVERTER TURBINE SPEED SENSOR CIRCUIT.</b> Check torque converter turbine speed sensor circuit. <Ref. to 4AT(H4SO)-49, DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in torque converter turbine speed sensor circuit?	Repair or replace the torque converter turbine speed sensor circuit.	Go to step 5.
5	<b>CHECK POOR CONTACT.</b> Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Go to step 6.
6	<b>CHECK MECHANICAL TROUBLE.</b> Check mechanical trouble in automatic transmission.	Is there any mechanical trouble in automatic transmission?	Repair or replace the automatic transmission. <Ref. to 4AT-32, INSPECTION, Road Test.>	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

### BK:DTC P0741 TORQUE CONVERTER CLUTCH CIRCUIT PERFORMANCE OR STUCK OFF

**DTC DETECTING CONDITION:**

Two consecutive driving cycles with fault

**TROUBLE SYMPTOM:**

- No lock-up (after engine warm-up)
- No shift or excessive tight corner “braking”

**CAUTION:**

**After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.**

Step	Check	Yes	No
<b>1</b>	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the relevant DTC using “List of Diagnostic Trouble Code (DTC)”. <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>
<b>2</b>	<b>CHECK LOCK-UP DUTY SOLENOID CIRCUIT.</b> Check lock-up duty solenoid circuit. <Ref. to 4AT(H4SO)-74, DTC 77 LOCK-UP DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in lock-up duty solenoid circuit?	Repair or replace the lock-up duty solenoid circuit.
<b>3</b>	<b>CHECK THROTTLE POSITION SENSOR CIRCUIT.</b> Check the throttle position sensor circuit. <Ref. to 4AT(H4SO)-41, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in throttle position sensor circuit?	Repair or replace the throttle position sensor circuit.
<b>4</b>	<b>CHECK TORQUE CONVERTER TURBINE SPEED SENSOR CIRCUIT.</b> Check torque converter turbine speed sensor circuit. <Ref. to 4AT(H4SO)-49, DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in torque converter turbine speed sensor circuit?	Repair or replace the torque converter turbine speed sensor circuit.
<b>5</b>	<b>CHECK ENGINE SPEED INPUT CIRCUIT.</b> Check engine speed input circuit. <Ref. to 4AT(H4SO)-36, DTC 11 ENGINE SPEED SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in engine speed input circuit?	Repair or replace the engine speed input circuit.
<b>6</b>	<b>CHECK INHIBITOR SWITCH CIRCUIT.</b> Check inhibitor switch circuit. <Ref. to 4AT(H4SO)-95, CHECK INHIBITOR SWITCH, Diagnostic Procedure without Diagnostic Trouble Code (DTC).>	Is there any trouble in inhibitor switch circuit?	Repair or replace the inhibitor switch circuit.
<b>7</b>	<b>CHECK BRAKE LIGHT SWITCH CIRCUIT.</b> Check brake light switch circuit. <Ref. to 4AT(H4SO)-88, CHECK BRAKE SWITCH, Diagnostic Procedure without Diagnostic Trouble Code (DTC).>	Is there any trouble in brake light switch circuit?	Repair or replace the brake light switch circuit.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>8</b> <b>CHECK ATF TEMPERATURE SENSOR CIRCUIT.</b> Check ATF temperature sensor circuit. <Ref. to 4AT(H4SO)-38, DTC 27 ATF TEMPERATURE SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble in ATF temperature sensor circuit?	Repair or replace the ATF temperature sensor circuit.	Go to step <b>9</b> .
<b>9</b> <b>CHECK POOR CONTACT.</b> Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Go to step <b>10</b> .
<b>10</b> <b>CHECK MECHANICAL TROUBLE.</b> Check mechanical trouble in automatic transmission.	Is there any mechanical trouble in automatic transmission?	Repair or replace the automatic transmission. <Ref. to 4AT-32, INSPECTION, Road Test.>	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BL:DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

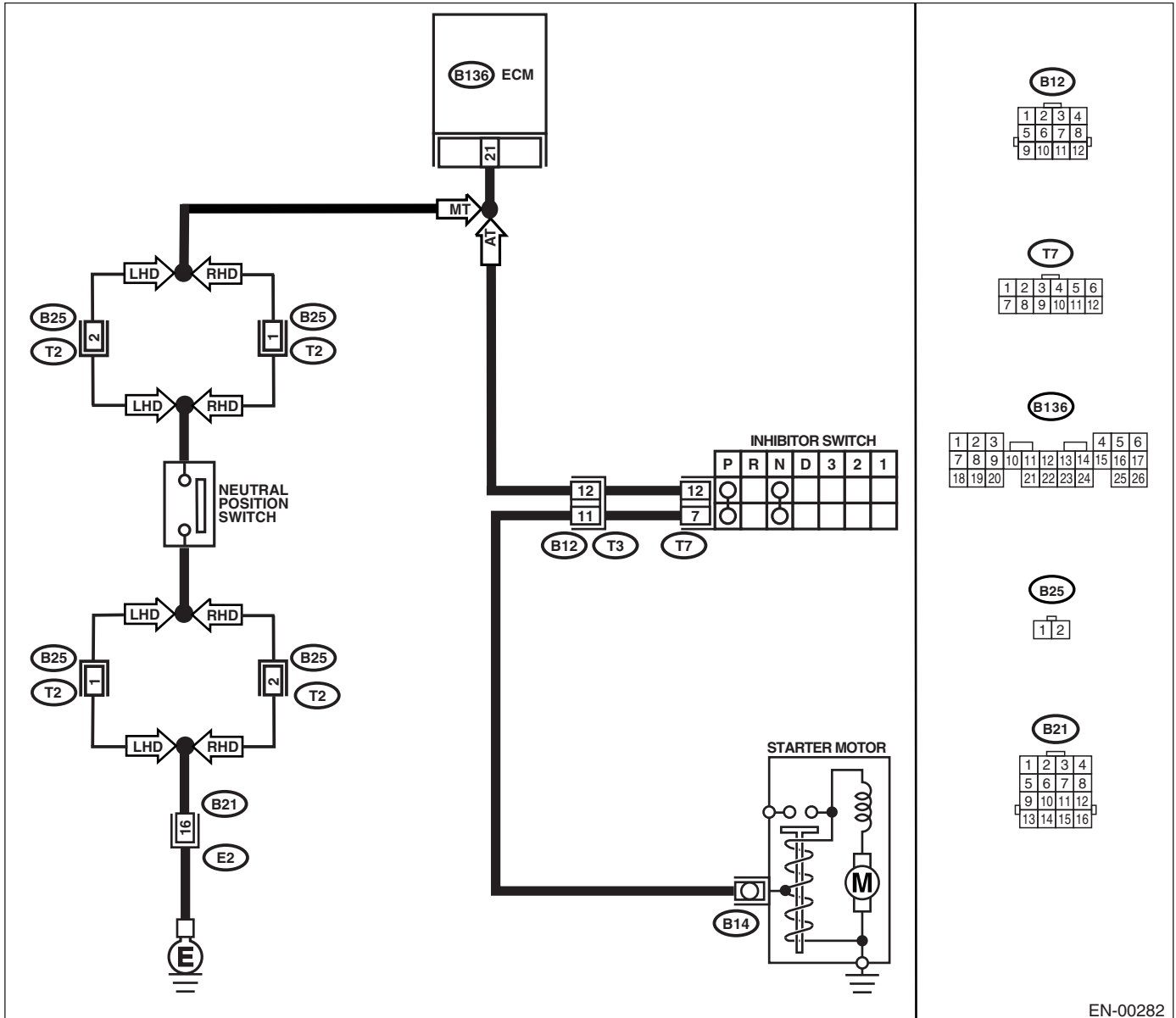
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00282

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1	<b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is DTC P0705 displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>
2	<b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Shift the select lever to other than "N" and "P" ranges. 3) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 21 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.
3	<b>CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and transmission harness connector (T3). 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 21 — Chassis ground:</b>	Is the resistance more than 1 MΩ?	Go to step 4.
4	<b>CHECK TRANSMISSION HARNESS CONNECTOR.</b> 1) Disconnect the connector from inhibitor switch. 2) Measure the resistance of harness between transmission harness connector and engine ground. <b>Connector &amp; terminal</b> <b>(T3) No. 12 — Engine ground:</b>	Is the resistance more than 1 MΩ?	Go to step 5.
5	<b>CHECK INHIBITOR SWITCH.</b> Measure the resistance between inhibitor switch connector receptacle's terminals with select lever at other than "N" and "P" range. <b>Terminals</b> <b>No. 7 — No. 12:</b>	Is the resistance more than 1 MΩ?	Go to step 6.
6	<b>CHECK SELECTOR CABLE CONNECTION.</b>	Is there any fault in selector cable connection to inhibitor switch?	Repair the select cable connection. <Ref. to CS-14, INSPECTION, Select Cable.>
			Go to step 2.  Go to step 3.  Repair ground short circuit in harness between ECM and transmission harness connector.  Repair ground short circuit in harness between transmission harness and inhibitor switch connector.  Replace inhibitor switch. <Ref. to 4AT-51, Inhibitor Switch.>  Contact the SUBARU dealer. <b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

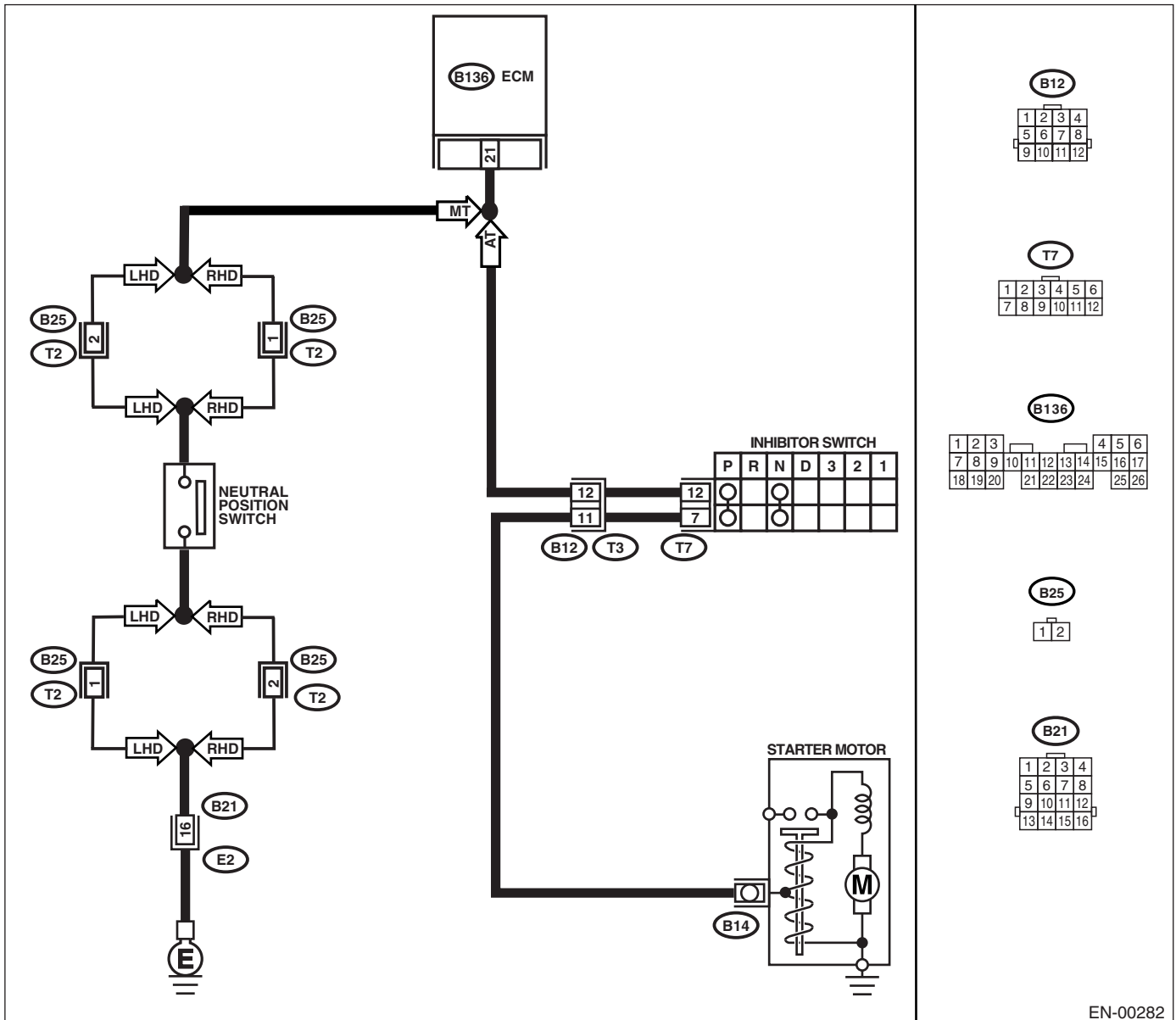
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Place the shift lever in neutral. 3) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 21 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> 1) Place the shift lever except in neutral. 2) Measure the voltage between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 21 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 3.	Go to step 4.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Contact the SUB-ARU dealer.
<b>4 CHECK NEUTRAL POSITION SWITCH.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from transmission harness. 3) Place the shift lever in neutral. 4) Measure the resistance between transmission harness and connector terminals. <b>Connector &amp; terminal</b> <b>(T2) No. 1 — No. 2:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 5.	Repair short circuit in transmission harness or replace the neutral position switch.
<b>5 CHECK NEUTRAL POSITION SWITCH.</b> 1) Place the shift lever except in neutral. 2) Measure the resistance between transmission harness connector terminals.	Is the resistance less than 1 $\Omega$ ?	Go to step 6.	Repair short circuit in transmission harness or replace the neutral position switch.
<b>6 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> Measure the resistance between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 21 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 7.	Repair ground short circuit in harness between ECM and transmission harness connector.
<b>7 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and transmission harness connector. <b>Connector &amp; terminal</b> <b>LHD MODEL</b> <b>(B136) No. 21 — (B25) No. 1:</b> <b>RHD MODEL</b> <b>(B136) No. 21 — (B25) No. 2:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 8.	Repair open circuit in harness between ECM and transmission harness connector.



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>8</b> <b>CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.</b> Measure the resistance of harness between transmission harness connector and engine ground. <i>Connector &amp; terminal</i> <i>LHD MODEL</i> <i>(B25) No. 2 — Engine ground:</i> <i>RHD MODEL</i> <i>(B25) No. 1 — Engine ground:</i>	Is the resistance less than 5 $\Omega$ ?	Go to step <b>9</b> .	Repair open circuit between transmission harness connector and engine ground terminal.
<b>9</b> <b>CHECK POOR CONTACT.</b> Check poor contact in transmission harness connector.	Is there poor contact in transmission harness connector?	Repair poor contact in transmission harness connector.	Contact the SUBARU dealer.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BN:DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

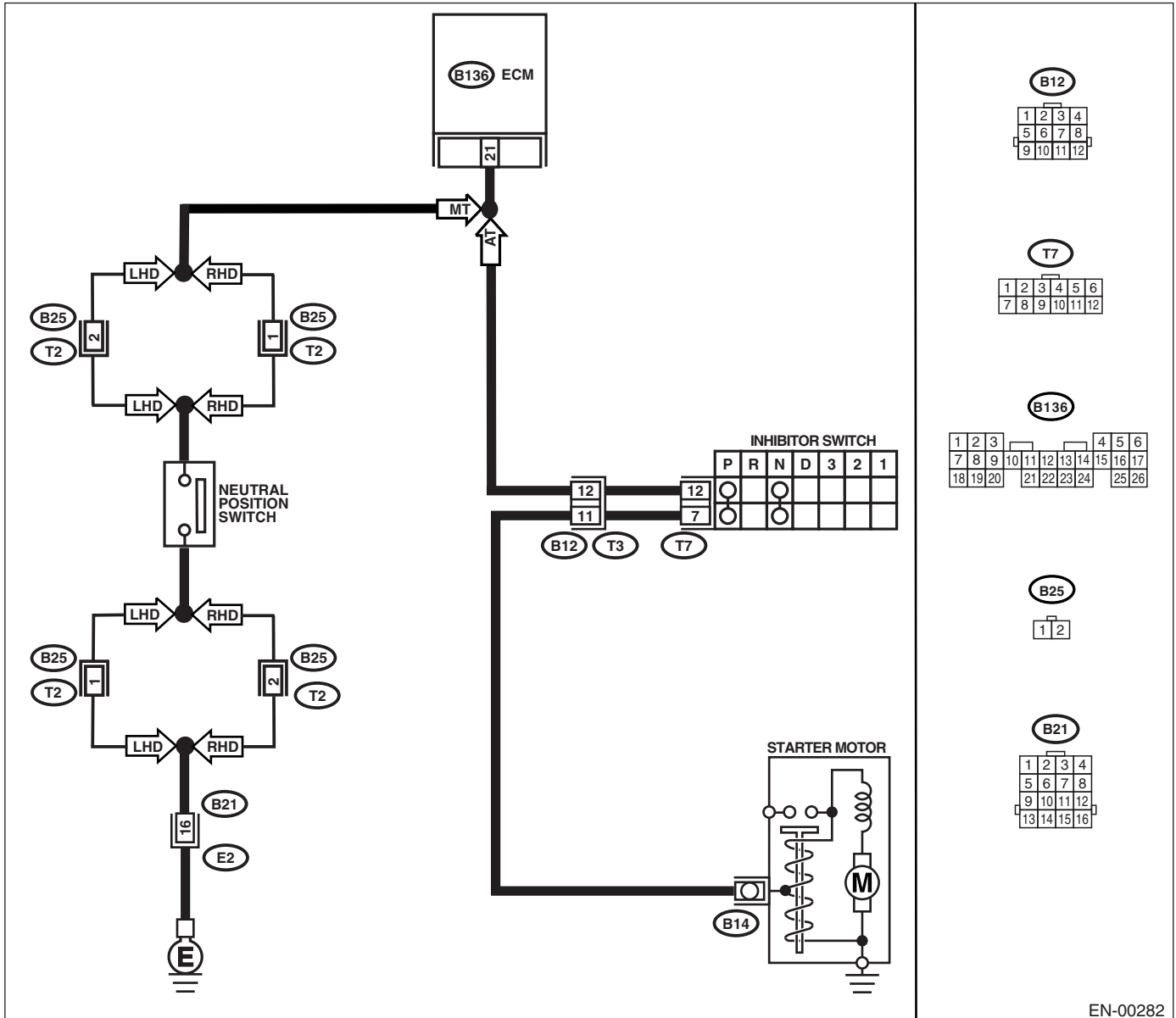
### TROUBLE SYMPTOM:

Erroneous idling

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00282

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground with select lever at "N" and "P" ranges.  <i>Connector &amp; terminal</i> <b>(B136) No. 21 (+) — Chassis ground (-):</b>	Is the voltage less than 1 V?	Go to step 3.	Go to step 5.
<b>3</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground with select lever at except "N" and "P" ranges.  <i>Connector &amp; terminal</i> <b>(B136) No. 21 (+) — Chassis ground (-):</b>	Is the voltage between 4.5 — 5.5 V?	Go to step 4.	Go to step 5.
<b>4</b> <b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>
<b>5</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground.  <i>Connector &amp; terminal</i> <b>(B136) No. 21 (+) — Chassis ground (-):</b>	Is the voltage more than 10 V?	Repair the battery short circuit in harness between ECM and inhibitor switch connector.	Go to step 6.
<b>6</b> <b>CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from ECM and inhibitor switch. 3) Measure the resistance of harness between ECM and inhibitor switch connector.  <i>Connector &amp; terminal</i> <b>(B136) No. 21 — (T7) No. 12:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 7.	Repair harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and inhibitor switch connector.</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in inhibitor switch connector</li> <li>• Poor contact in ECM connector.</li> </ul>
<b>7</b> <b>CHECK INHIBITOR SWITCH GROUND LINE.</b> Measure the resistance of harness between inhibitor switch connector and engine ground.  <i>Connector &amp; terminal</i> <b>(T7) No. 7 — Engine ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 8.	Repair open circuit in harness between inhibitor switch connector and ground line.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between inhibitor switch connector and ground line</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>8</b> <b>CHECK INHIBITOR SWITCH.</b> Measure the resistance between inhibitor switch connector receptacle's terminals with select lever at "N" and "P" ranges. <b>Terminals</b> <b>No. 7 — No. 12:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 9.	Replace inhibitor switch. <Ref. to 4AT-51, Inhibitor Switch.>
<b>9</b> <b>CHECK SELECTOR CABLE CONNECTION.</b>	Is there any fault in selector cable connection to inhibitor switch?	Repair selector cable connection. <Ref. to CS-14, INSPECTION, Select Cable.>	Contact the SUB-ARU dealer. <b>NOTE:</b> Inspection by DTM is required, because probable cause is deterioration of multiple parts.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BO:DTC P0864 TCM COMMUNICATION CIRCUIT RANGE/PERFORMANCE

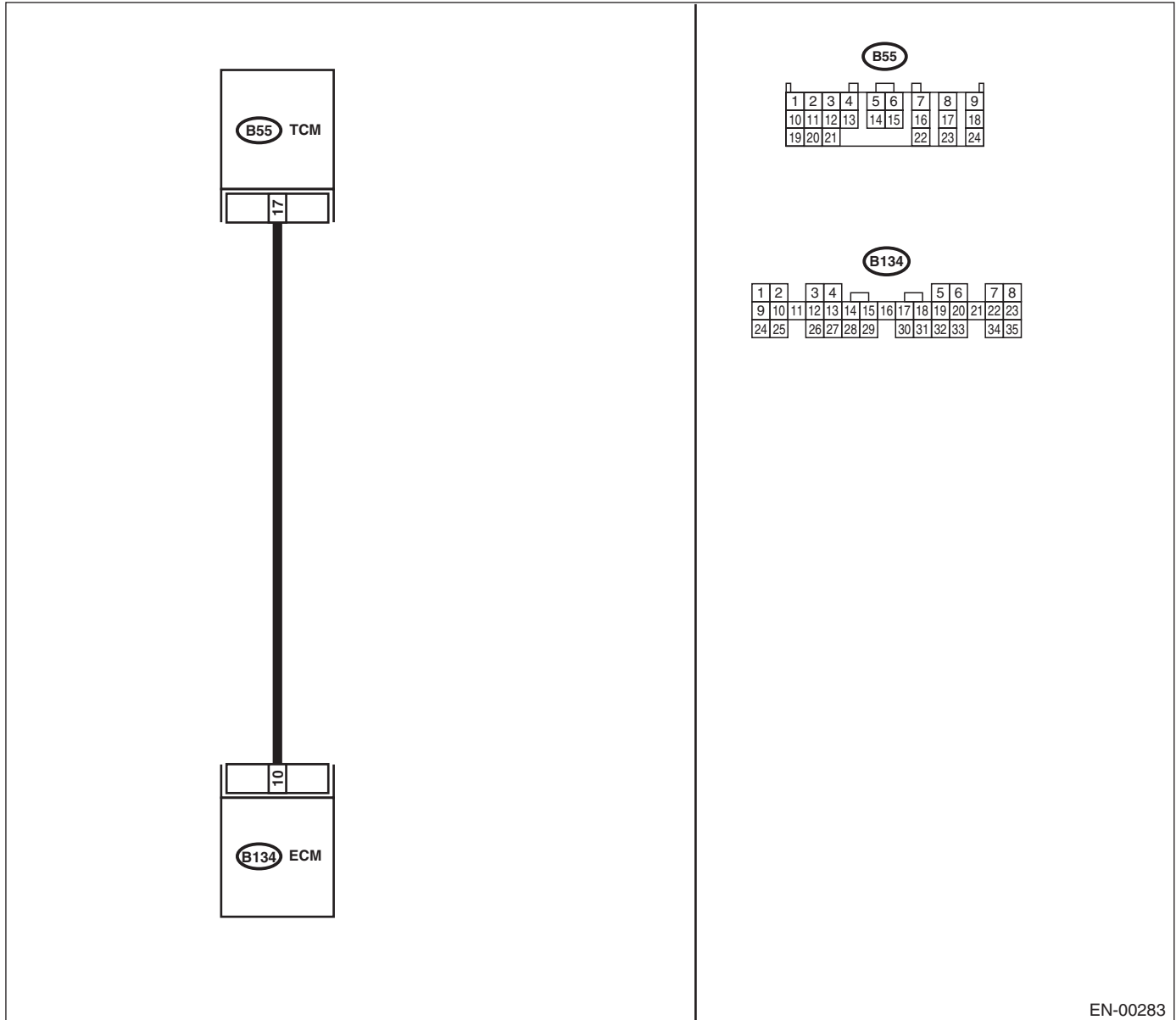
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00283

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK DRIVING CONDITION.</b> 1) Start and warm-up the engine until the radiator fan makes one complete rotation. 2) Drive the vehicle.	Is the AT shift control functioning properly?	Go to step 2.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>
<b>2</b> <b>CHECK ACCESSORY.</b>	Are car phone/CB installed on vehicle?	Repair grounding line of car phone or CB system.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BP:DTC P0865 TCM COMMUNICATION CIRCUIT LOW

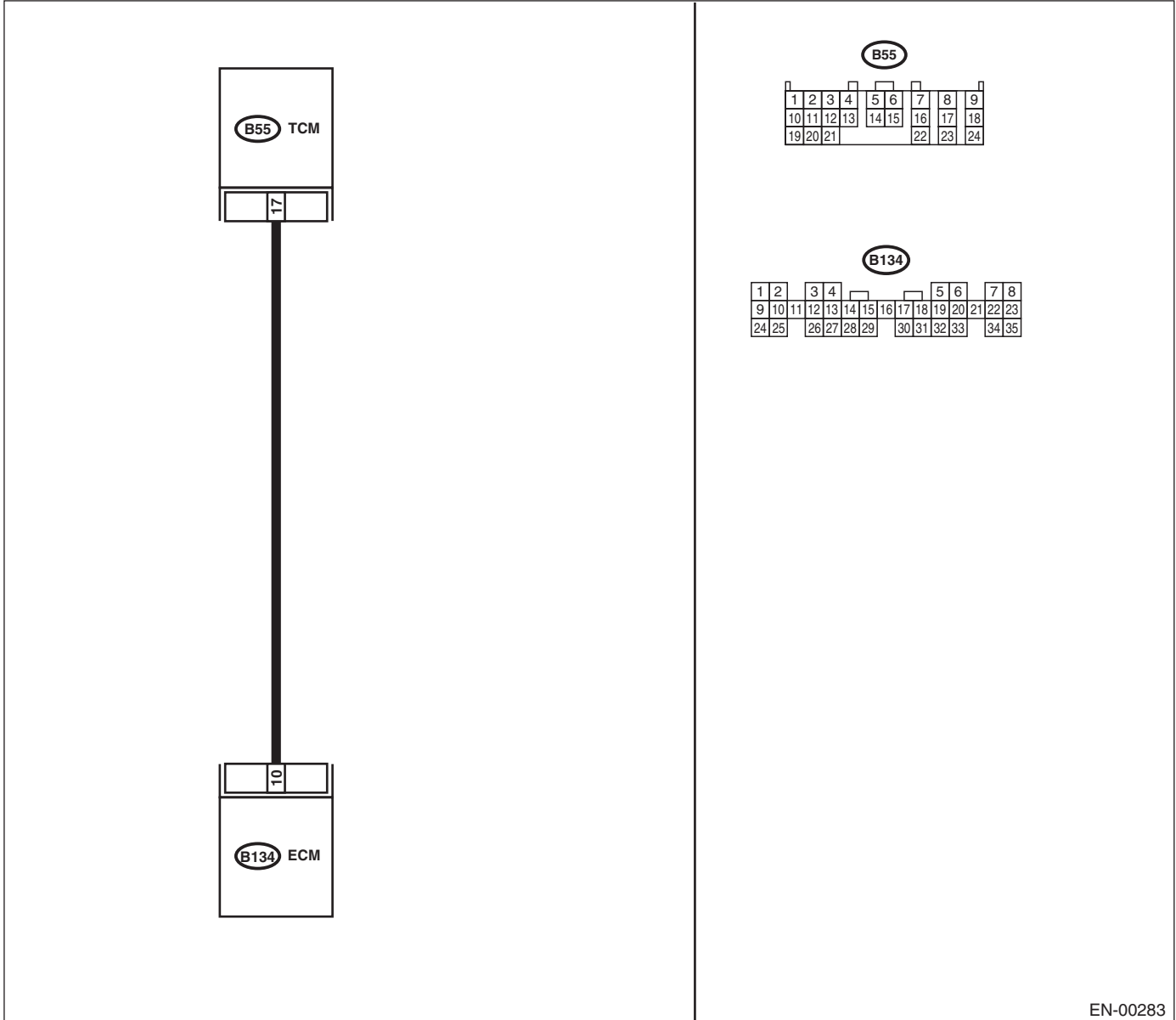
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00283

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 10 (+) — Chassis ground (-):</b></i>	Is the voltage less than 1 V?	Go to step 2.	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.  <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in TCM connector</li> </ul>
<b>2 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance of harness between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 10 — Chassis ground:</b></i>	Is the resistance more than 1 MΩ?	Go to step 3.	Repair ground short circuit in harness between ECM and TCM connector.
<b>3 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Connect the connector to ECM. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 10 (+) — Chassis ground (-):</b></i>	Is the voltage more than 5 V?	Go to step 4.	Repair the poor contact in ECM connector.
<b>4 CHECK DTC FOR AUTOMATIC TRANSMISSION.</b> Read DTC for automatic transmission. <Ref. to 4AT(H4SO)-20, Read Diagnostic Trouble Code (DTC).>	Does the DTC appear for automatic transmission?	Check the DTC for automatic transmission. <Ref. to 4AT(H4SO)-36, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BQ:DTC P0866 TCM COMMUNICATION CIRCUIT HIGH

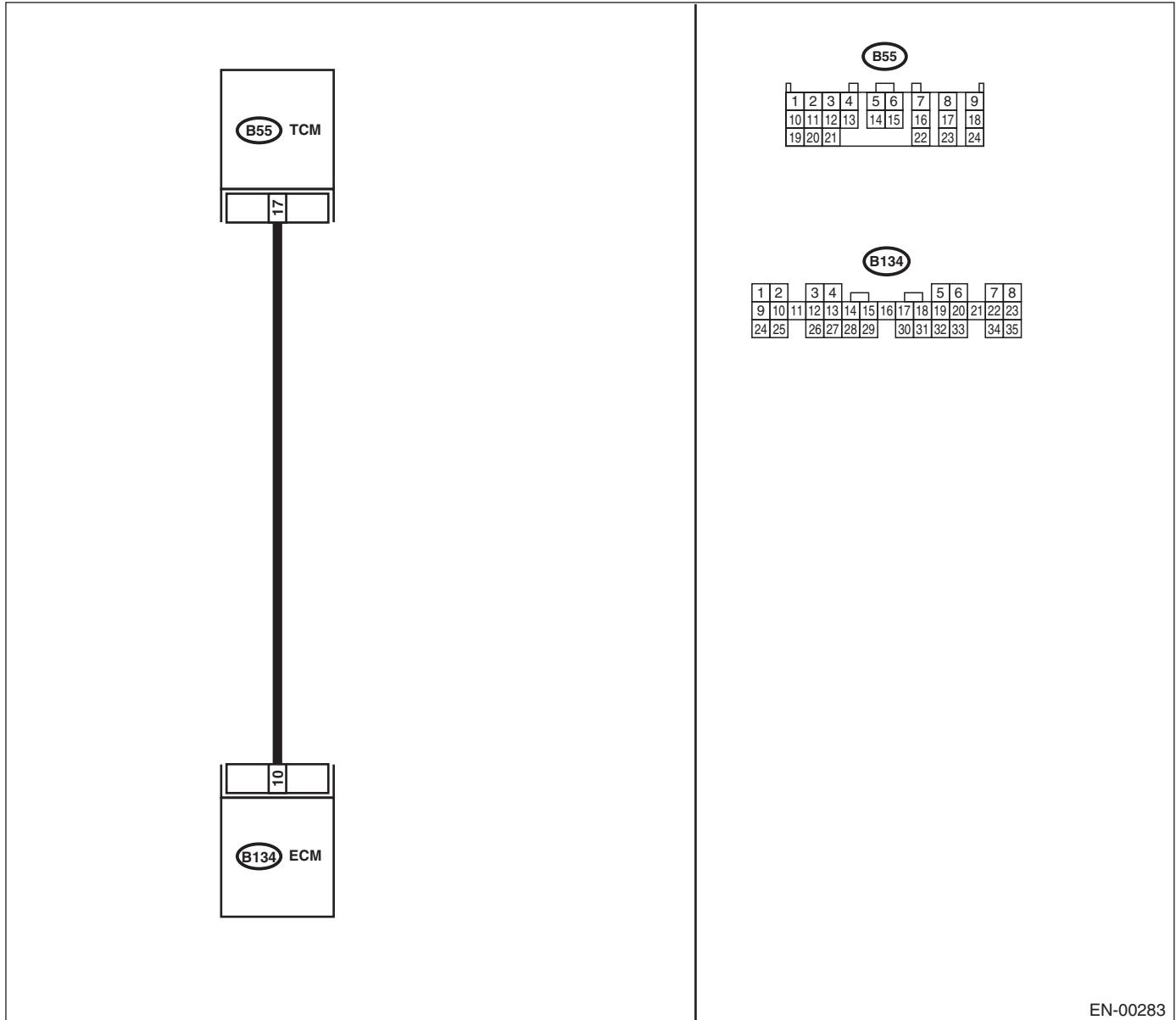
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00283

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 10 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and TCM connector.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 10 (+) — Chassis ground (-):</i>	Is the voltage more than 4 V?	Go to step 5.	Go to step 3.
<b>3 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> Measure the voltage between ECM connector and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 10 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Repair the poor contact in ECM connector.	Go to step 4.
<b>4 CHECK OUTPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B134) No. 10 (+) — Chassis ground (-):</i>	Is the voltage 1 — 4 V?	Even if the malfunction indicator light illuminates, the circuit has returned to a normal condition at this time.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in TCM connector</li> </ul>	Contact the SUB-ARU dealer.  NOTE: Inspection by DTM is required, because probable cause is deterioration of multiple parts.
<b>5 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> Measure the voltage between TCM and chassis ground. <i>Connector &amp; terminal</i> <i>(B55) No. 17 (+) — Chassis ground (-):</i>	Is the voltage more than 4 V?	Go to step 6.	Repair the open circuit in harness between ECM and TCM connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Check TCM power supply line and grounding line.

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

#### DTC DETECTING CONDITION:

Immediately at fault recognition

#### TROUBLE SYMPTOM:

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: It is not necessary to inspect DTC P1110.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

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

#### DTC DETECTING CONDITION:

Immediately at fault recognition

#### TROUBLE SYMPTOM:

#### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

Step	Check	Yes	No
1 CHECK ANY OTHER DTC ON DISPLAY.	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: It is not necessary to inspect DTC P1111.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BT:DTC P1134 A/F SENSOR MICRO-COMPUTER PROBLEM

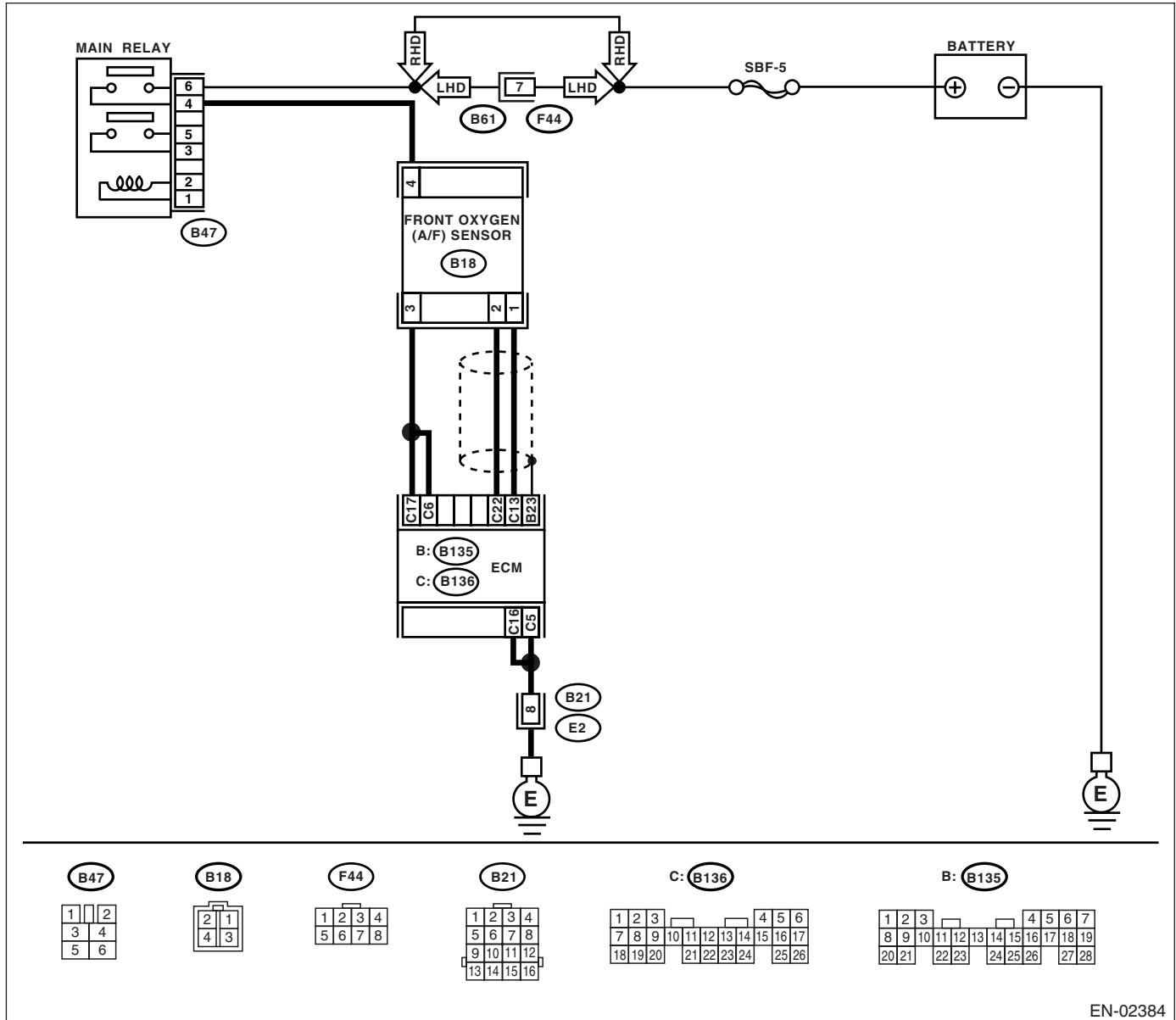
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>  NOTE: It is not necessary to inspect DTC P1134.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## BU:DTC P1137 O<sub>2</sub> SENSOR CIRCUIT (LAMBDA=1) (BANK 1 SENSOR 1)

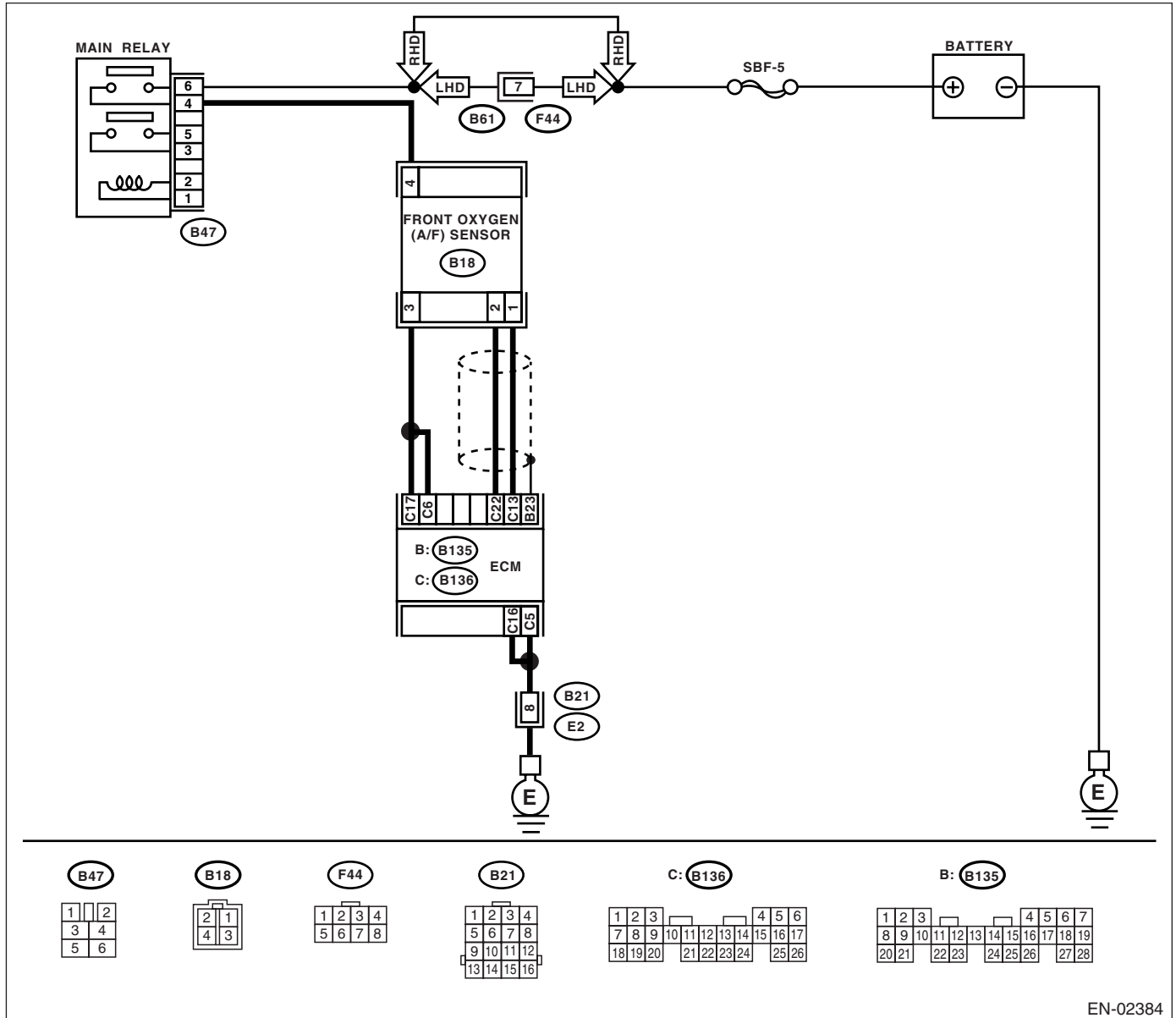
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02384

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK FRONT (A/F) OXYGEN SENSOR DATA.</b> 1) Start the engine. 2) While observing the Subaru Select Monitor or OBD-II general scan tool screen, warm-up the engine until coolant temperature is above 70°C (160°F). If the engine is already warmed-up, operate at idle speed for at least 1 minute. 3) Read the data of front oxygen (A/F) sensor signal at idling using Subaru Select Monitor or OBD-II general scan tool.  <b>NOTE:</b> • Subaru Select Monitor For detailed operation procedure, refer to the "READ CURRENT DATA FOR ENGINE". <Ref. to EN(H4SO)-29, Subaru Select Monitor.> • OBD-II general scan tool For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.	Is the voltage 0.85 — 1.15 V?	Go to step 3.	Go to step 4.
<b>3</b> <b>CHECK FRONT (A/F) OXYGEN SENSOR DATA.</b> Race the engine at speeds from idling to 5,000 rpm for a total of 5 cycles.  <b>NOTE:</b> • Normally the air fuel ratio be rich at racing. • To increase engine speed to 5,000 rpm, slowly depress accelerator pedal, taking approximately 5 seconds, and quickly release accelerator pedal to decrease engine speed.	Is the voltage more than 1.1 V?	Go to step 6.	Go to step 4.
<b>4</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and front oxygen (A/F) sensor connector. 3) Measure the resistance between ECM and front oxygen (A/F) sensor. <b>Connector &amp; terminal</b> <b>(B136) No. 13 — (B18) No. 1:</b> <b>(B136) No. 22 — (B18) No. 2:</b>	Is the resistance less than 5 Ω?	Go to step 5.	Repair open circuit between ECM and front oxygen (A/F) sensor.
<b>5</b> <b>CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR.</b> Measure the resistance between ECM and chassis ground. <b>Connector &amp; terminal</b> <b>(B136) No. 13 — Chassis ground:</b> <b>(B136) No. 22 — Chassis ground:</b>	Is the resistance more than 1 MΩ?	Go to step 6.	Repair ground short circuit between ECM and front oxygen (A/F) sensor.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>6</b> <b>CHECK EXHAUST SYSTEM.</b> Check exhaust system parts. <b>NOTE:</b> Check the following items: <ul style="list-style-type: none"><li>• Loose installation of portions</li><li>• Damage (crack, hole etc.) of parts</li><li>• Looseness of front oxygen (A/F) sensor</li><li>• Looseness and ill fitting of parts between front oxygen (A/F) sensor and rear oxygen sensor</li></ul>	Is there a fault in exhaust system?	Repair or replace the faulty part.	Replace the front oxygen (A/F) sensor. <Ref. to FU(H4SO)-40, Front Oxygen (A/F) Sensor.>



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **BV:DTC P1492 EGR VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT)**

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO)-233, DTC P1498 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **BW:DTC P1493 EGR VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT)**

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO)-235, DTC P1499 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **BX:DTC P1494 EGR VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT)**

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO)-233, DTC P1498 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **BY:DTC P1495 EGR VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT)**

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO)-235, DTC P1499 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **BZ:DTC P1496 EGR VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT)**

NOTE:

For the diagnostic procedure, refer to DTC P1498. <Ref. to EN(H4SO)-233, DTC P1498 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

### **CA:DTC P1497 EGR VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT)**

NOTE:

For the diagnostic procedure, refer to DTC P1499. <Ref. to EN(H4SO)-235, DTC P1499 EGR VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

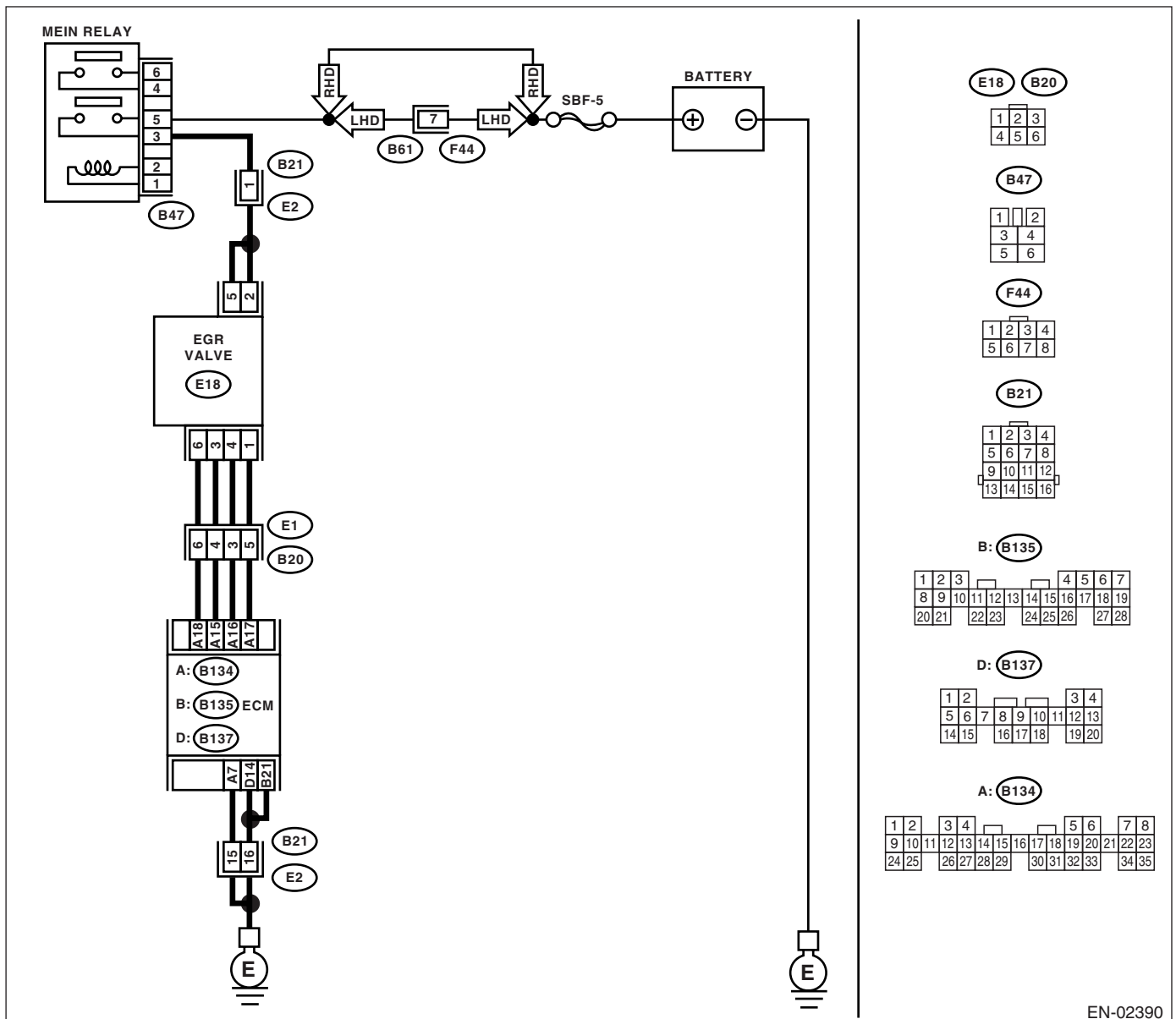
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine breathing

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02390

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

## ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK POWER SUPPLY TO EGR VALVE.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from EGR valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between EGR valve connector and engine ground. <b>Connector &amp; terminal</b> <b>(E18) No. 2 (+) — Engine ground (-):</b> <b>(E18) No. 5 (+) — Engine ground (-):</b>	Is the voltage more than 10 V?	Go to step 2.	Repair harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between EGR valve and main relay connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>2 CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and EGR valve connector. <b>Connector &amp; terminal</b> <b>DTC P1492; (B134) No. 18 — (E18) No. 6:</b> <b>DTC P1494; (B134) No. 17 — (E18) No. 1:</b> <b>DTC P1496; (B134) No. 16 — (E18) No. 4:</b> <b>DTC P1498; (B134) No. 15 — (E18) No. 3:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair harness and connector.  NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and EGR valve connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<b>3 CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>DTC P1492; (B134) No. 18 — Chassis ground:</b> <b>DTC P1494; (B134) No. 17 — Chassis ground:</b> <b>DTC P1496; (B134) No. 16 — Chassis ground:</b> <b>DTC P1498; (B134) No. 15 — Chassis ground:</b>	Is the resistance more than 1 M $\Omega$ ?	Go to step 4.	Repair ground short in harness between ECM and EGR valve connector.
<b>4 CHECK POOR CONTACT.</b> Check poor contact in ECM connector and EGR valve connector.	Is there poor contact in ECM connector or EGR valve connector?	Repair poor contact in ECM connector or EGR valve connector.	Replace the EGR valve. <Ref. to FU(H4SO)-34, EGR Valve.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

### DTC DETECTING CONDITION:

Immediately at fault recognition

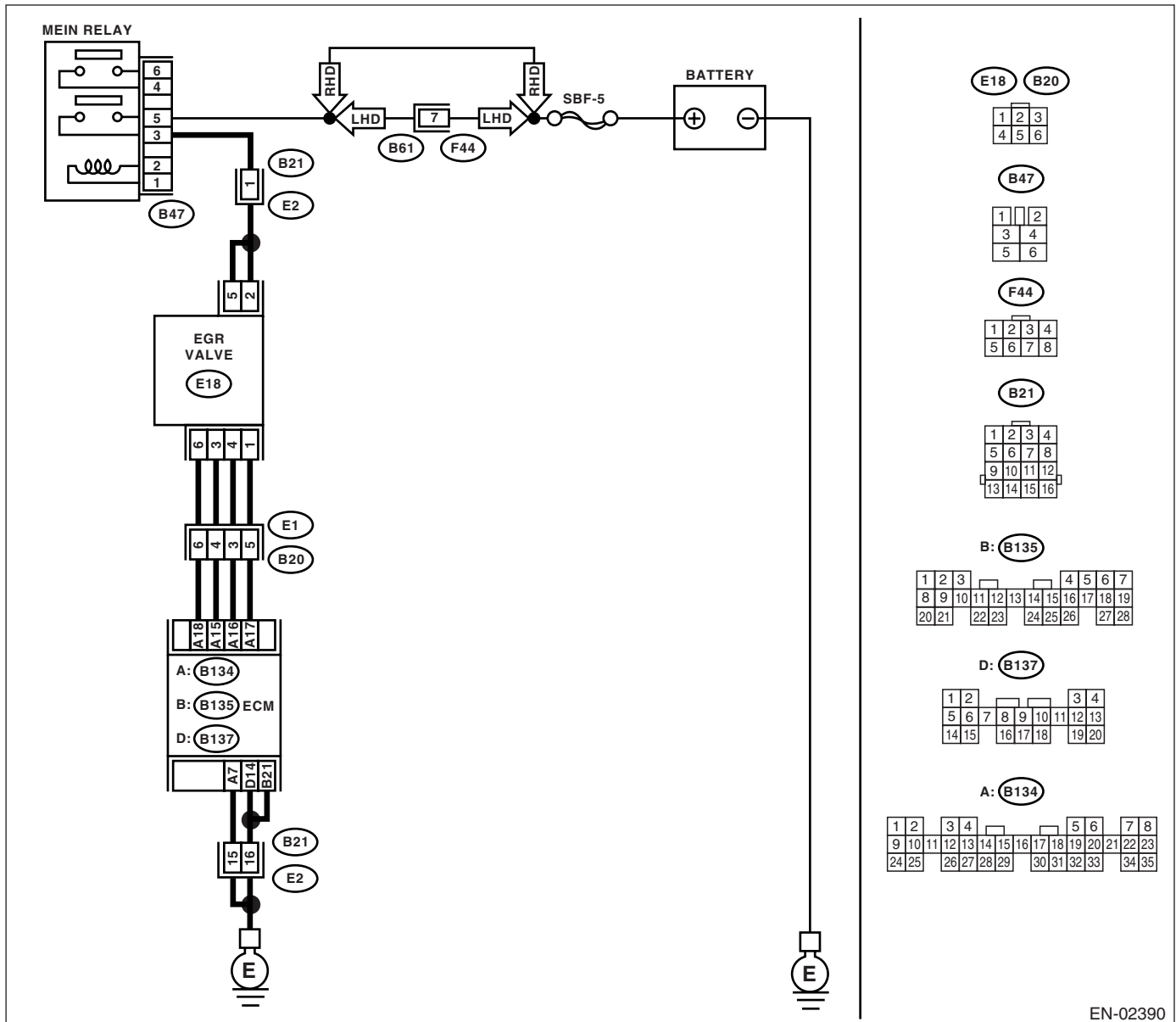
### TROUBLE SYMPTOM:

- Erroneous idling
- Poor driving performance
- Engine breathing

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02390

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK GROUND CIRCUIT FOR ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 7 — Chassis ground:</i> <i>(B135) No. 21 — Chassis ground:</i> <i>(B137) No. 14 — Chassis ground:</i>	Is the resistance less than 5 Ω?	Go to step 3.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM connector and engine ground terminal</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND EGR VALVE CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from EGR valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>DTC P1493; (B134) No. 18 (+) — Chassis ground (-):</i> <i>DTC P1495; (B134) No. 17 (+) — Chassis ground (-):</i> <i>DTC P1497; (B134) No. 16 (+) — Chassis ground (-):</i> <i>DTC P1499; (B134) No. 15 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair battery short in harness between ECM and EGR valve connector. After repair, replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

## **CD:DTC P1510 ISC SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (LOW INPUT)**

**NOTE:**

For the diagnostic procedure, refer to DTC P1516. <Ref. to EN(H4SO)-238, DTC P1516 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **CE:DTC P1511 ISC SOLENOID VALVE SIGNAL #1 CIRCUIT MALFUNCTION (HIGH INPUT)**

**NOTE:**

For the diagnostic procedure, refer to DTC P1517. <Ref. to EN(H4SO)-240, DTC P1517 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **CF:DTC P1512 ISC SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (LOW INPUT)**

**NOTE:**

For the diagnostic procedure, refer to DTC P1516. <Ref. to EN(H4SO)-238, DTC P1516 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **CG:DTC P1513 ISC SOLENOID VALVE SIGNAL #2 CIRCUIT MALFUNCTION (HIGH INPUT)**

**NOTE:**

For the diagnostic procedure, refer to DTC P1517. <Ref. to EN(H4SO)-240, DTC P1517 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **CH:DTC P1514 ISC SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (LOW INPUT)**

**NOTE:**

For the diagnostic procedure, refer to DTC P1516. <Ref. to EN(H4SO)-238, DTC P1516 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## **CI: DTC P1515 ISC SOLENOID VALVE SIGNAL #3 CIRCUIT MALFUNCTION (HIGH INPUT)**

**NOTE:**

For the diagnostic procedure, refer to DTC P1517. <Ref. to EN(H4SO)-240, DTC P1517 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## CJ:DTC P1516 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (LOW INPUT)

### DTC DETECTING CONDITION:

Immediately at fault recognition

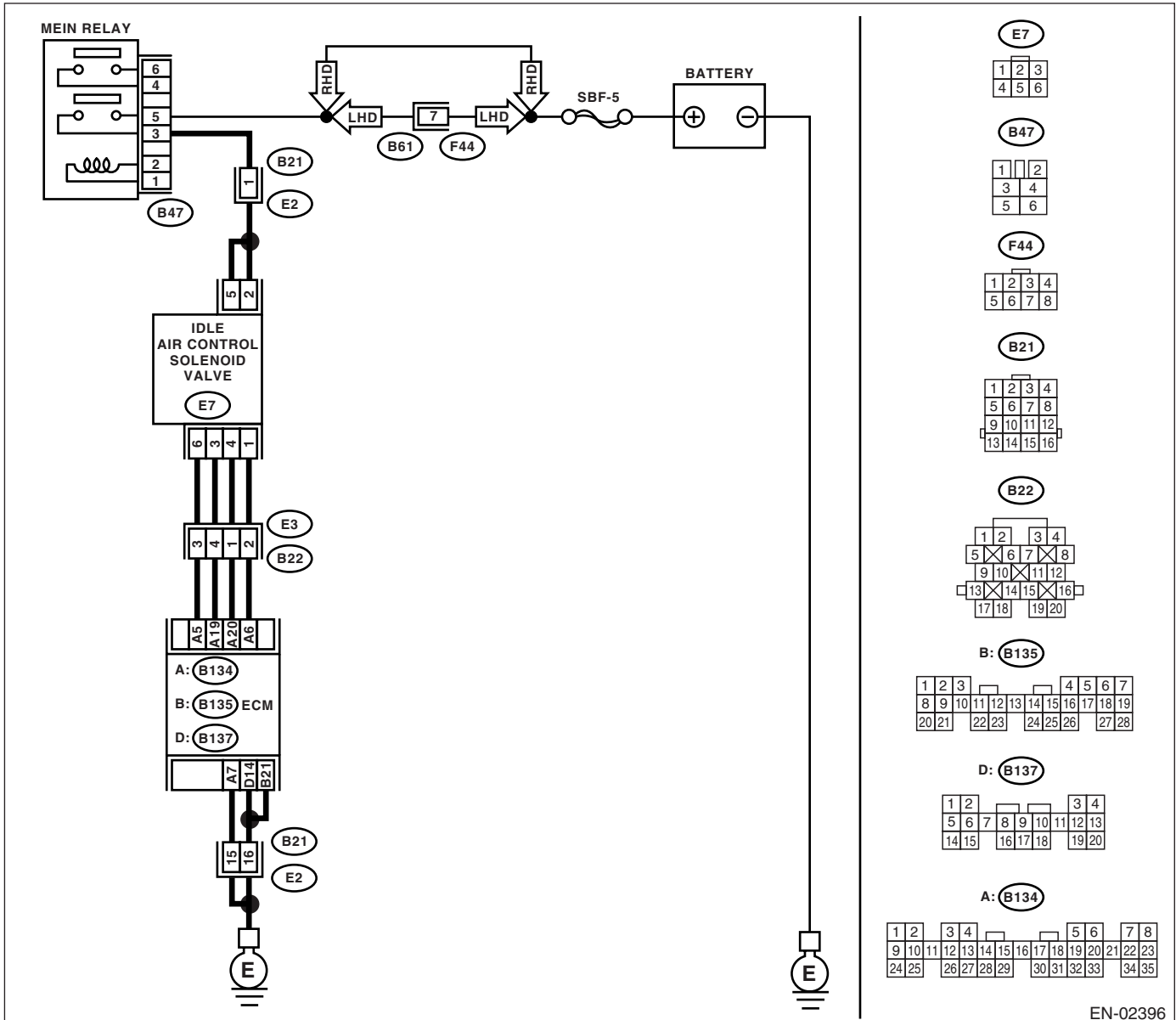
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls
- Engine breathing

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02396

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from idle air control solenoid valve.                      3) Turn the ignition switch to ON.                      4) Measure the voltage between idle air control solenoid valve connector and engine ground.</p> <p><b>Connector &amp; terminal</b>                      (E7) No. 2 (+) — Engine ground (-):                      (E7) No. 5 (+) — Engine ground (-):</p>	Is the voltage more than 10 V?	Go to step 2.	Repair harness and connector. NOTE: In this case repair the following: • Open circuit in harness between idle air control solenoid valve and main relay connector • Poor contact in coupling connector
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance between ECM and idle air control solenoid valve connector.</p> <p><b>Connector &amp; terminal</b>                      DTC P1510; (B134) No. 20 — (E7) No. 4:                      DTC P1512; (B134) No. 6 — (E7) No. 1:                      DTC P1514; (B134) No. 5 — (E7) No. 6:                      DTC P1516; (B134) No. 19 — (E7) No. 3:</p>	Is the resistance less than 1 Ω?	Go to step 3.	Repair harness and connector. NOTE: In this case repair the following: • Open circuit in harness between ECM and idle air control solenoid valve connector • Poor contact in coupling connector
<p><b>3</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.</b></p> <p>1) Disconnect the connector from ECM.                      2) Measure the resistance between ECM connector and chassis ground.</p> <p><b>Connector &amp; terminal</b>                      DTC P1510; (B134) No. 20 — Chassis ground:                      DTC P1512; (B134) No. 6 — Chassis ground:                      DTC P1514; (B134) No. 5 — Chassis ground:                      DTC P1516; (B134) No. 19 — Chassis ground:</p>	Is the resistance more than 1 MΩ?	Go to step 4.	Repair ground short circuit in harness between ECM and idle air control solenoid valve connector.
<p><b>4</b></p> <p><b>CHECK POOR CONTACT.</b></p> <p>Check poor contact in ECM connector and idle air control solenoid valve connector.</p>	Is there poor contact in ECM connector or idle air control solenoid valve connector?	Repair the poor contact in ECM connector or idle air control solenoid valve connector.	Replace the idle air control solenoid valve. <Ref. to FU(H4SO)-33, Idle Air Control Solenoid Valve.>



# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## CK:DTC P1517 ISC SOLENOID VALVE SIGNAL #4 CIRCUIT MALFUNCTION (HIGH INPUT)

### DTC DETECTING CONDITION:

Immediately at fault recognition

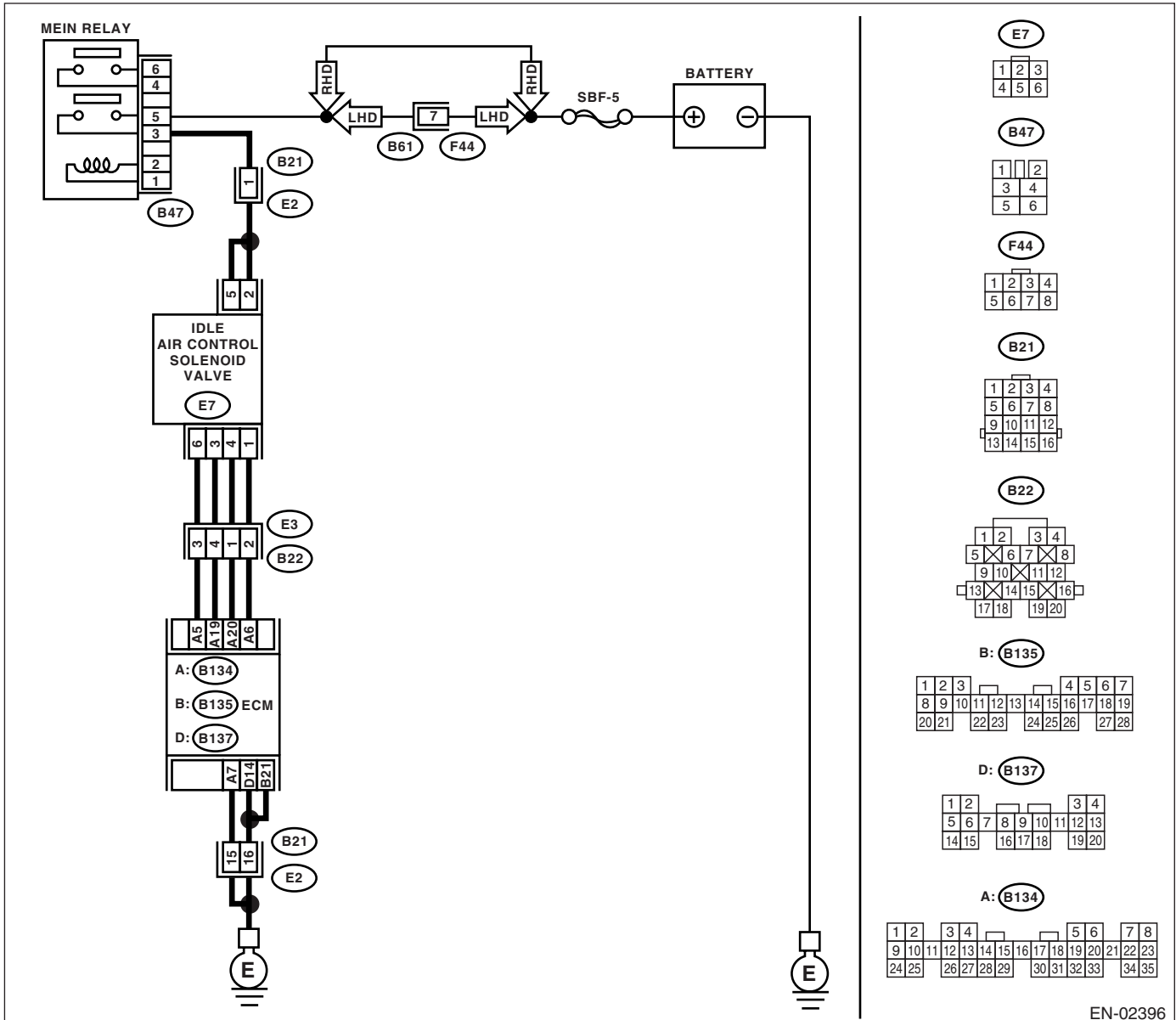
### TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls
- Engine breathing

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02396

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK ANY OTHER DTC ON DISPLAY.</b>	Is any other DTC displayed?	Inspect the DTC using "List of Diagnostic Trouble Code (DTC)". <Ref. to EN(H4SO)-72, List of Diagnostic Trouble Code (DTC).>	Go to step 2.
<b>2</b> <b>CHECK GROUND CIRCUIT FOR ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B134) No. 7 — Chassis ground:</i> <i>(B135) No. 21 — Chassis ground:</i> <i>(B137) No. 14 — Chassis ground:</i>	Is the resistance less than 5 Ω?	Go to step 3.	Repair harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM connector and engine ground terminal</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in coupling connector</li> </ul>
<b>3</b> <b>CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from idle air control solenoid valve. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <i>DTC P1511; (B134) No. 20 (+) — Chassis ground (-):</i> <i>DTC P1513; (B134) No. 6 (+) — Chassis ground (-):</i> <i>DTC P1515; (B134) No. 5 (+) — Chassis ground (-):</i> <i>DTC P1517; (B134) No. 19 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and idle air control solenoid valve connector. After repair, replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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### **CL:DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT**

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

Two consecutive driving cycles with fault

#### **TROUBLE SYMPTOM:**

Failure of engine to start

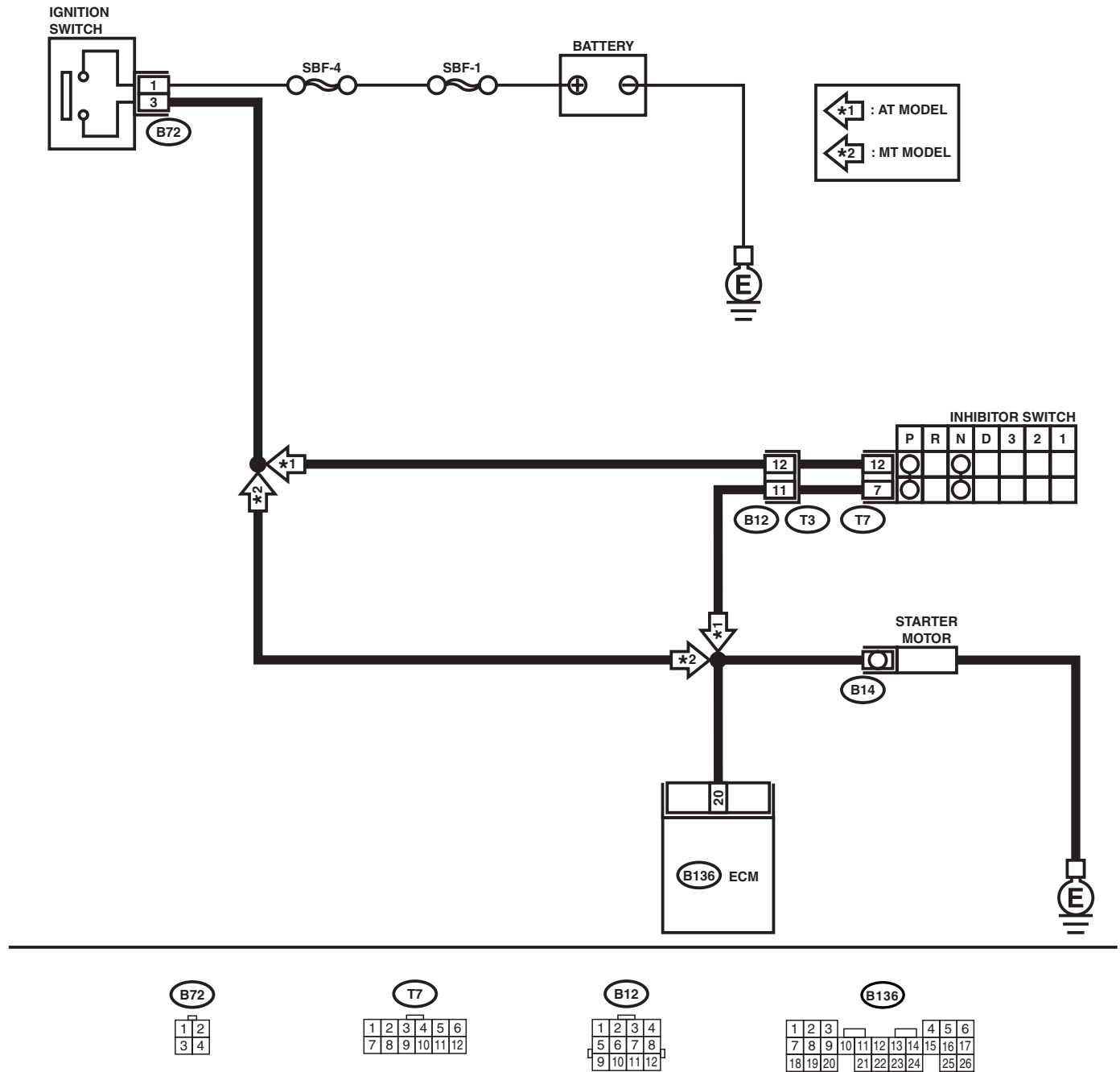
#### **CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## WIRING DIAGRAM:



EN-00261

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK OPERATION OF STARTER MOTOR.</b> <ul style="list-style-type: none"><li>Place the inhibitor switch in the "P" or "N" range. (AT model)</li><li>Depress the clutch pedal. (MT model)</li></ul>	Does the starter motor operate when ignition switch to START?	Repair harness and connector. <b>NOTE:</b> In this case repair the following: <ul style="list-style-type: none"><li>Open or ground short circuit in harness between ECM and starter motor connector.</li><li>Poor contact in ECM connector.</li></ul>	Check starter motor circuit. <Ref. to EN(H4SO)-58, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

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

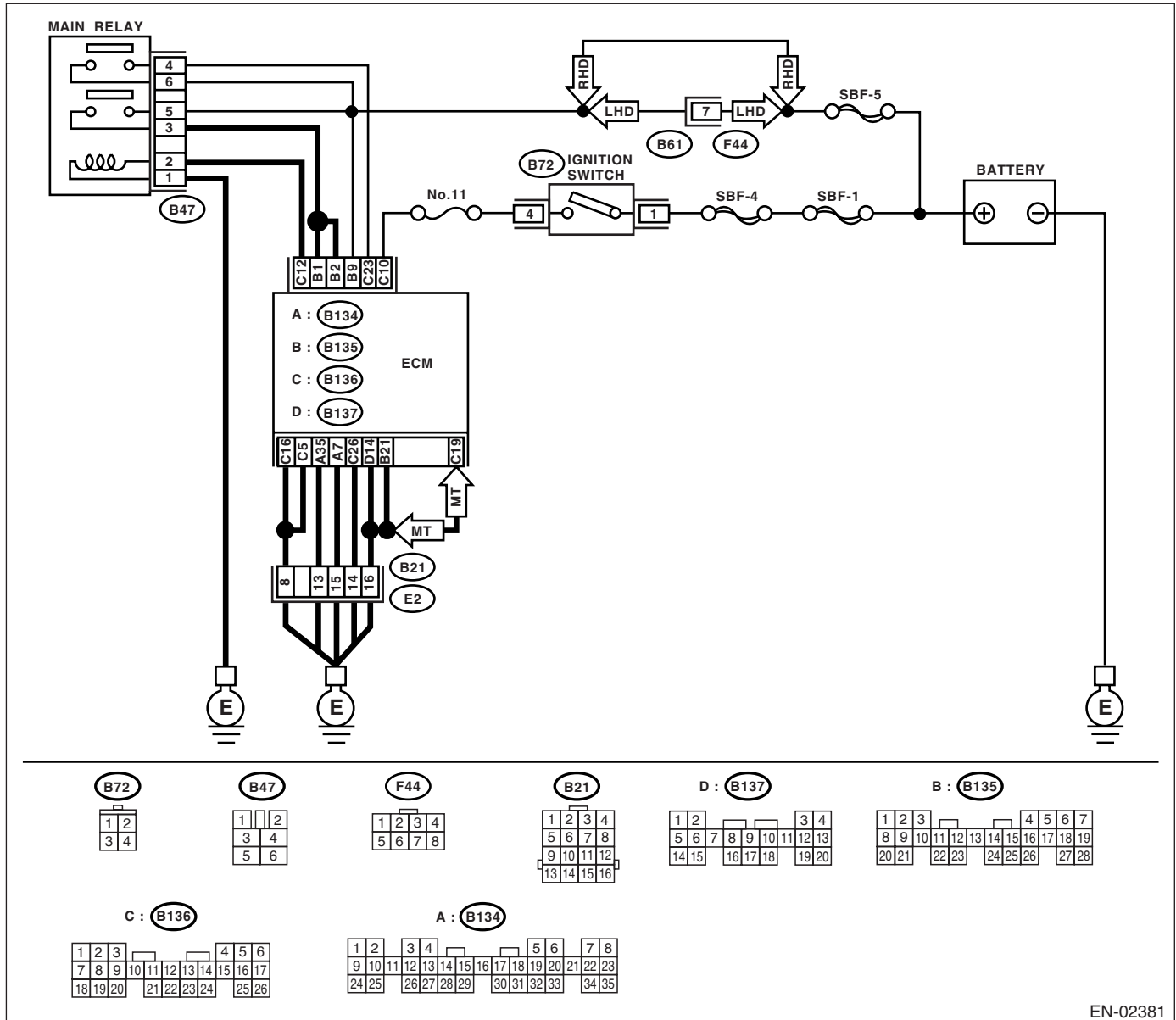
### DTC DETECTING CONDITION:

Immediately at fault recognition

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-02381

## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1</b> <b>CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to OFF. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 9 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Repair the poor contact in ECM connector.	Go to step 2.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.</b> 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B135) No. 9 — Chassis ground:</b></i>	Is the resistance less than 10 $\Omega$ ?	Repair ground short circuit in harness between ECM connector and battery terminal.	Go to step 3.
<b>3</b> <b>CHECK FUSE SBF-5.</b>	Is the fuse blown out?	Replace the fuse.	Repair harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and battery</li> <li>• Poor contact in ECM connector.</li> <li>• Poor contact in battery terminal</li> </ul>

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## CN:DTC P1698 ENGINE TORQUE CONTROL CUT SIGNAL CIRCUIT MALFUNCTION (LOW INPUT)

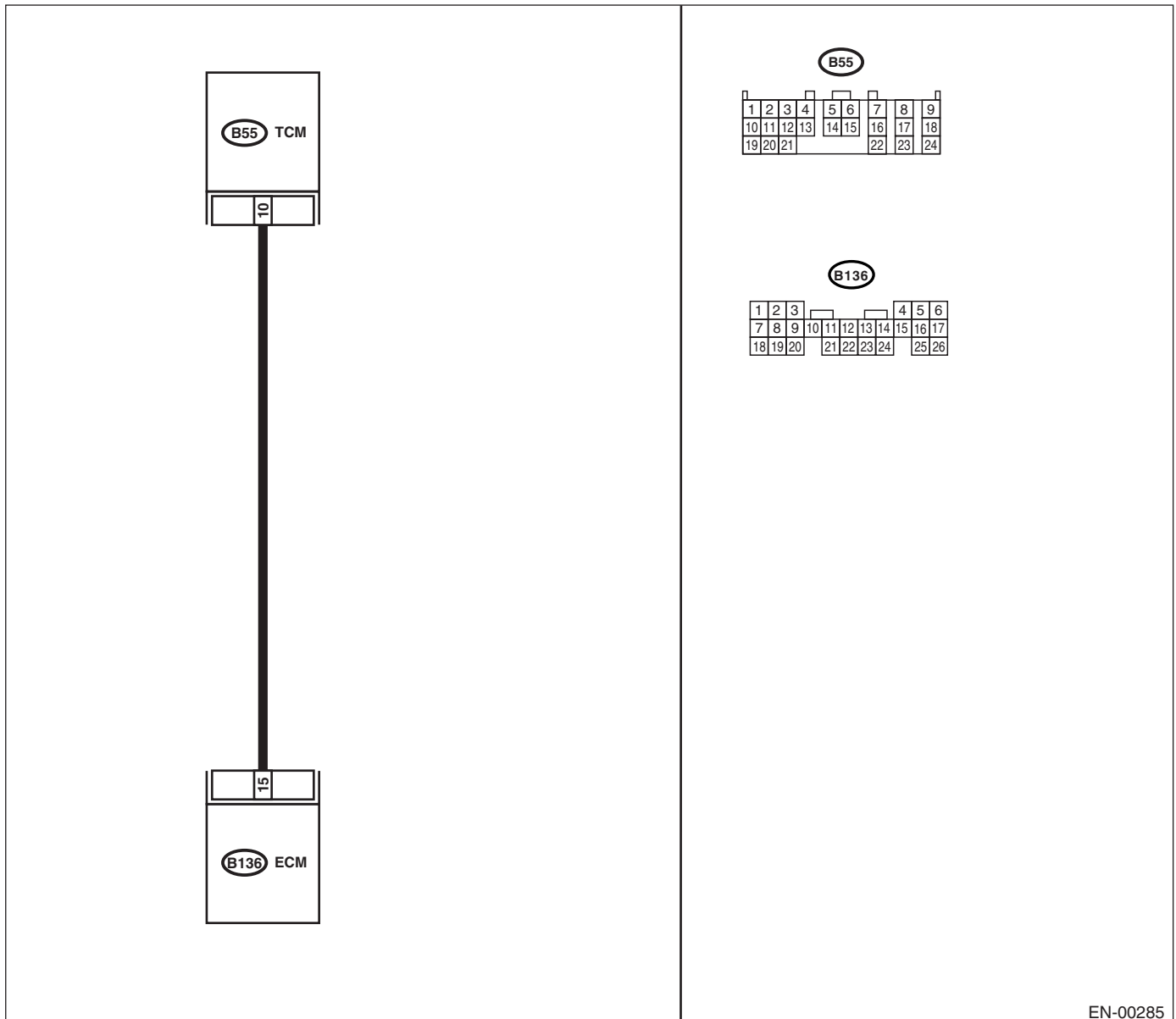
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00285



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Start the engine, and warm-up the engine. 2) Turn the ignition switch to OFF. 3) Turn the ignition switch to ON. 4) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 15 (+) — Chassis ground (-):</i>	Is the voltage more than 3 V?	Repair the poor contact in ECM connector.	Go to step 2.
<b>2 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance of harness between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 15 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 3.	Repair ground short circuit in harness between ECM and TCM connector.
<b>3 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> Measure the resistance of harness between TCM and ECM connector. <i>Connector &amp; terminal</i> <i>(B136) No. 15 — (B55) No. 10:</i>	Is the resistance less than 1 $\Omega$ ?	Repair the poor contact in ECM or TCM connector.	Repair the open circuit in harness between ECM and TCM connector.

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

## CO:DTC P1699 ENGINE TORQUE CONTROL CUT SIGNAL CIRCUIT MALFUNCTION (HIGH INPUT)

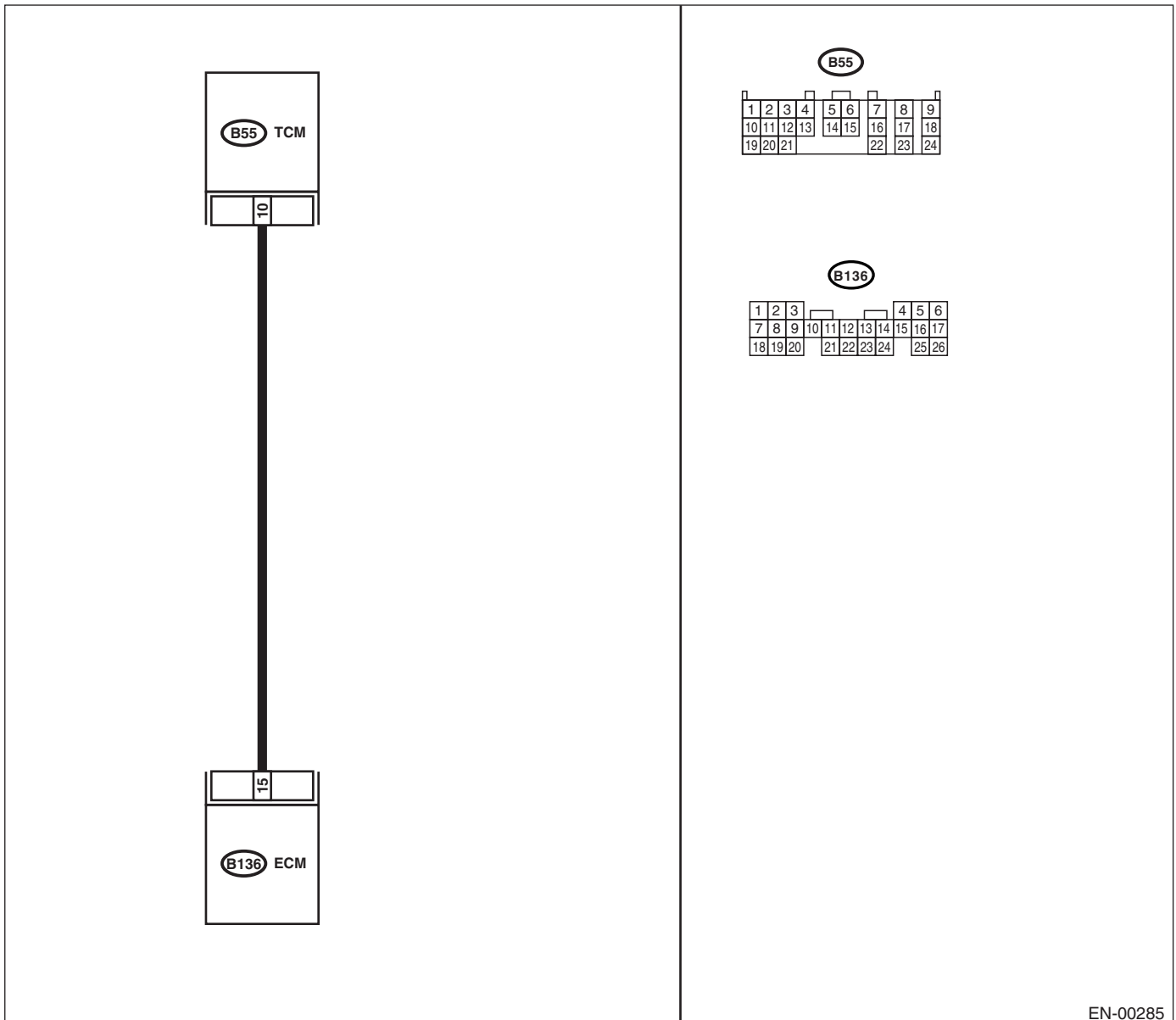
### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



EN-00285

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p><b>1</b></p> <p><b>CHECK OUTPUT SIGNAL FROM ECM.</b></p> <p>1) Start the engine, and warm-up the engine.                  2) Turn the ignition switch to OFF.                  3) Disconnect the connector from TCM.                  4) Turn the ignition switch to ON.                  5) Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 15 (+) — Chassis ground (-):</b></p>	<p>Is the voltage less than 3 V?</p>	<p>Go to step 2.</p>	<p>Repair battery short circuit in harness between ECM and TCM connector. After repair, replace the ECM. &lt;Ref. to FU(H4SO)-44, Engine Control Module (ECM).&gt;</p>
<p><b>2</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                  2) Measure the voltage between ECM and chassis ground.</p> <p><b>Connector &amp; terminal</b>  <b>(B136) No. 15 (+) — Chassis ground (-):</b></p>	<p>Is the voltage more than 10 V by shaking the ECM harness and connector?</p>	<p>Repair the battery short circuit in harness between ECM and TCM connector. After repair, replace the ECM. &lt;Ref. to FU(H4SO)-44, Engine Control Module (ECM).&gt;</p>	<p>Contact the SUB-ARU dealer.</p> <p><b>NOTE:</b>                  Inspection by DTM is required, because probable cause is deterioration of multiple parts.</p>

## CP:DTC P1711 ENGINE TORQUE CONTROL SIGNAL #1 CIRCUIT MALFUNCTION

**DTC DETECTING CONDITION:**

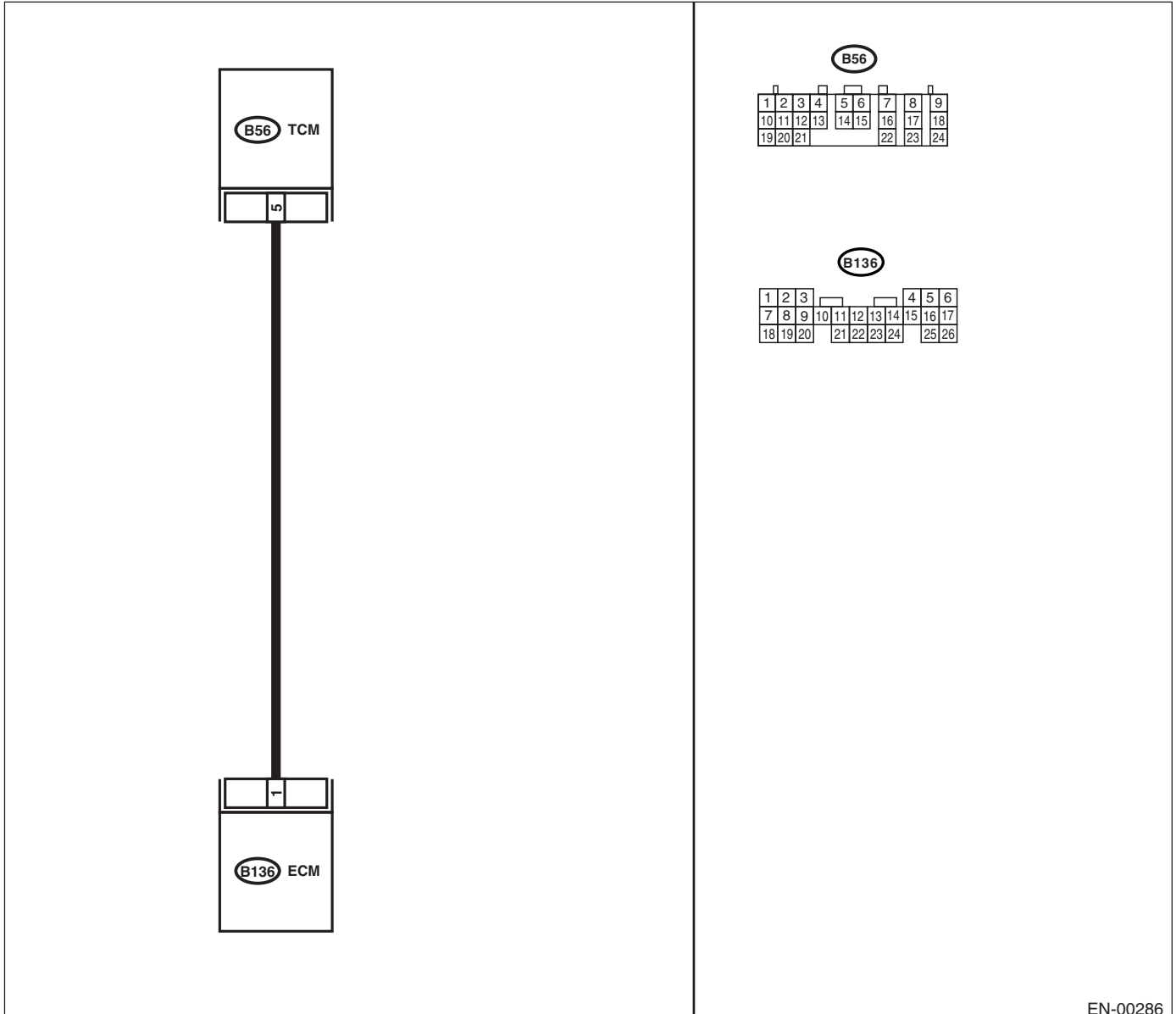
**TROUBLE SYMPTOM:**

Excessive shift shock

**CAUTION:**

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

**WIRING DIAGRAM:**



EN-00286

# Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 1 (+) — Chassis ground (-):</i>	Is the voltage more than 4.5 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 1 (+) — Chassis ground (-):</i>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and TCM connector.	Go to step 3.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>
<b>4 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance of harness between TCM and ECM connector. <i>Connector &amp; terminal</i> <i>(B136) No. 1 — (B56) No. 5:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit in harness between ECM and TCM connector.
<b>5 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> Measure the resistance of harness between ECM and chassis ground. <i>Connector &amp; terminal</i> <i>(B136) No. 1 — Chassis ground:</i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair ground short circuit in harness between ECM and TCM connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>

## CQ:DTC P1712 ENGINE TORQUE CONTROL SIGNAL #2 CIRCUIT MALFUNCTION

### DTC DETECTING CONDITION:

Two consecutive driving cycles with fault

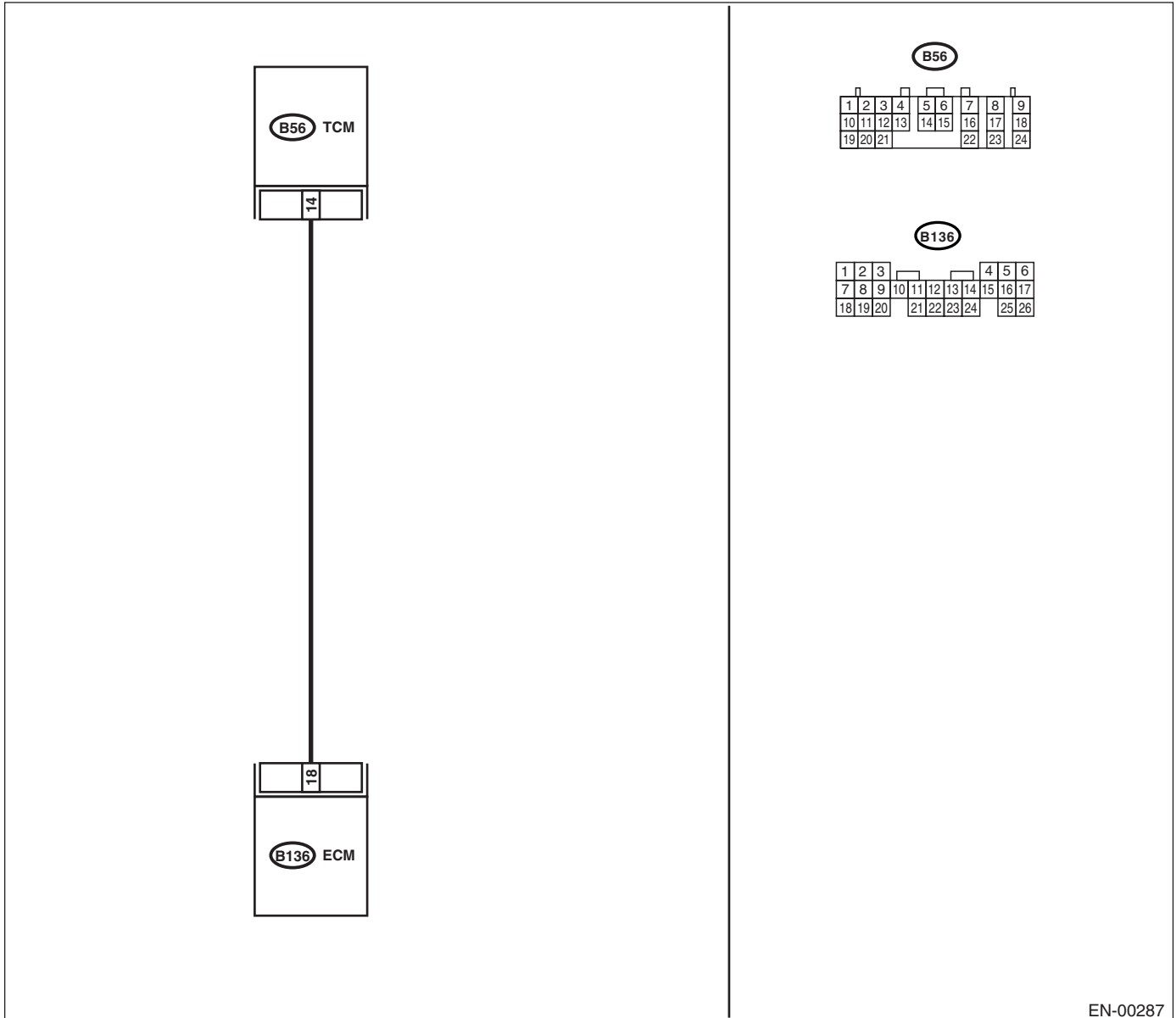
### TROUBLE SYMPTOM:

Excessive shift shock

### CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4SO)-44, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4SO)-37, OPERATION, Inspection Mode.>.

### WIRING DIAGRAM:



## Diagnostic Procedure with Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<b>1 CHECK INPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 18 (+) — Chassis ground (-):</b></i>	Is the voltage more than 4.5 V?	Go to step 2.	Go to step 4.
<b>2 CHECK INPUT SIGNAL FROM ECM.</b> Measure the voltage between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 18 (+) — Chassis ground (-):</b></i>	Is the voltage more than 10 V?	Repair battery short circuit in harness between ECM and TCM connector.	Go to step 3.
<b>3 CHECK POOR CONTACT.</b> Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4SO)-44, Engine Control Module (ECM).>
<b>4 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM and TCM. 3) Measure the resistance of harness between TCM and ECM connector. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 18 — (B56) No. 14:</b></i>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit in harness between ECM and TCM connector.
<b>5 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b> Measure the resistance of harness between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B136) No. 18 — Chassis ground:</b></i>	Is the resistance more than 1 M $\Omega$ ?	Go to step 6.	Repair ground short circuit in harness between ECM and TCM connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in TCM connector.	Is there poor contact in TCM connector?	Repair poor contact in TCM connector.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>

## 20. General Diagnostic Table

### A: INSPECTION

#### 1. ENGINE

**NOTE:**

Malfunction of parts other than those listed is also possible. <Ref. to ME(H4SO)-91, Engine Trouble in General.>

Symptom	Problem parts
1. Engine stalls during idling.	1) Idle air control solenoid valve 2) Manifold absolute pressure sensor 3) 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) Idle air control solenoid valve 2) Manifold absolute pressure sensor 3) 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) Throttle position sensor 9) Crankshaft position sensor (*3) 10) Camshaft position sensor (*3) 11) Oxygen sensor 12) Fuel pump and fuel pump relay
3. Engine does not return to idle.	1) Idle air control solenoid valve 2) Engine coolant temperature sensor 3) Accelerator cable (*6) 4) Throttle position sensor 5) Manifold absolute pressure sensor 6) Intake air temperature sensor
4. Poor acceleration	1) Manifold absolute pressure sensor 2) Intake air temperature sensor 3) Throttle position sensor 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay 6) Engine coolant temperature sensor (*2) 7) Crankshaft position sensor (*3) 8) Camshaft position sensor (*3) 9) A/C switch and A/C cut relay 10) Engine torque control signal circuit 11) Ignition parts (*1)
5. Engine stalls or engine sags or hesitates at acceleration.	1) Manifold absolute pressure sensor 2) 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) Throttle position sensor 9) Fuel pump and fuel pump relay



## General Diagnostic Table

### ENGINE (DIAGNOSTIC)

Symptom	Problem parts
6. Surging	1) Intake manifold pressure sensor 2) Intake air temperature sensor 3) Manifold absolute pressure sensor 4) Engine coolant temperature sensor (*2) 5) Crankshaft position sensor (*3) 6) Camshaft position sensor (*3) 7) Fuel injection parts (*4) 8) Throttle position sensor 9) Fuel pump and fuel pump relay
7. Spark knock	1) Intake manifold pressure sensor 2) Intake air temperature sensor 3) Manifold absolute pressure sensor 4) Engine coolant temperature sensor 5) Knock sensor 6) Fuel injection parts (*4) 7) Fuel pump and fuel pump relay
8. After burning in exhaust system	1) Intake manifold pressure sensor 2) Intake air temperature sensor 3) Manifold absolute pressure sensor 4) Engine coolant temperature sensor (*2) 5) Fuel injection parts (*4) 6) Fuel pump and fuel pump relay

\*1: Check ignition coil & ignitor ASSY and spark plug.

\*2: Indicate the symptom occurring only in cold temperatures.

\*3: Ensure the secure installation.

\*4: Check fuel injector, fuel pressure regulator and fuel filter.

\*5: Inspect air leak in air intake system.

\*6: Adjust the accelerator cable.

## 2. AUTOMATIC TRANSMISSION

### NOTE:

Check general diagnostics table with non-conformity symptom for automatic transmission. <Ref. to 4AT(H4SO)-2, Basic Diagnostic Procedure.>