

ENGINE SECTION 2

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

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

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

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

FUEL INJECTION (FUEL SYSTEM) FU(H4DOTC)

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

INTAKE (INDUCTION) IN(H4DOTC)

MECHANICAL ME(H4DOTC)

EXHAUST EX(H4DOTC)

COOLING CO(H4DOTC)

LUBRICATION LU(H4DOTC)

SPEED CONTROL SYSTEM SP(H4DOTC)

IGNITION IG(H4DOTC)

STARTING/CHARGING SYSTEM SC(H4DOTC)

ENGINE (DIAGNOSTIC) EN(H4DOTC)

ENGINE (DIAGNOSTIC)

EN(H4DOTC)

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Basic Diagnostics Procedure

ENGINE (DIAGNOSTIC)

1. Basic Diagnostics Procedure

A: PROCEDURE

1. ENGINE

Step	Check	Yes	No
1 CHECK ENGINE START FAILURE. 1) Ask the customer when and how the trouble occurred using the interview check list. <Ref. to EN(H4DOTC)-4, INSPECTION, Check List for Interview.> 2) Start the engine.	Does the engine start?	Go to step 2.	Inspection using "Diagnostics for Engine Start Failure". <Ref. to EN(H4DOTC)-59, Diagnostics for Engine Starting Failure.>
2 CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.	Does malfunction indicator light illuminate?	Go to step 3.	Inspection using "General Diagnostic Table". <Ref. to EN(H4DOTC)-295, General Diagnostic Table.>
3 CHECK INDICATION OF DTC ON DISPLAY. 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector. 3) Turn the ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON. 4) Read the DTC on the Subaru Select Monitor or OBD-II general scan tool.	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Record the DTC. Repair the trouble cause. <Ref. to EN(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).> Go to step 4.	Repair the related parts. NOTE: If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnostics for malfunction indicator light circuit or combination meter. <Ref. to EN(H4DOTC)-50, Malfunction Indicator Light.>
4 PERFORM THE DIAGNOSIS. 1) Perform clear memory mode. <Ref. to EN(H4DOTC)-47, Clear Memory Mode.> 2) Perform the "INSPECTION MODE". <Ref. to EN(H4DOTC)-40, Inspection Mode.>	Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	Check on "Diagnostic Chart with Diagnostic Trouble Code (DTC)" <Ref. to EN(H4DOTC)-80, 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 leak 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	Radio	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
A/C compressor	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	CD/Cassette	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Radiator fan	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Car phone	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Front wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	CB	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Rear Wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		

Check List for Interview

ENGINE (DIAGNOSTIC)

2. CHECK LIST NO. 2

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

NOTE:

Use copies of this page for interviewing customers.

a) Other warning lights or indicators turn on. <input type="checkbox"/> Yes / <input type="checkbox"/> No
<input type="checkbox"/> Low fuel warning light <input type="checkbox"/> Charge indicator light <input type="checkbox"/> AT diagnostic indicator light <input type="checkbox"/> ABS Warning Light <input type="checkbox"/> Oil pressure indicator light
b) Fuel level
<ul style="list-style-type: none">• Lack of gasoline: <input type="checkbox"/> Yes / <input type="checkbox"/> No• Indicator position of fuel gauge:• Had run out of gas before: <input type="checkbox"/> Yes / <input type="checkbox"/> No
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">• What:
d) Intentional connecting or disconnecting of hoses: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none">• What:
e) Installing of other parts except genuine parts: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none">• What:• Where:
f) Occurrence of noise: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none">• From where:• What kind:
g) Occurrence of smell: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none">• From where:• What kind:
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 airbag system wiring harness and connectors are all colored yellow. Do not use the electrical test equipment on these circuits.
- Be careful not to damage the Airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.

2) Never connect the battery in reverse polarity.

- The ECM will be destroyed immediately.
 - The fuel injector and other part will be damaged.
- 3) Do not disconnect the battery terminals while the engine is running.

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

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

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

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

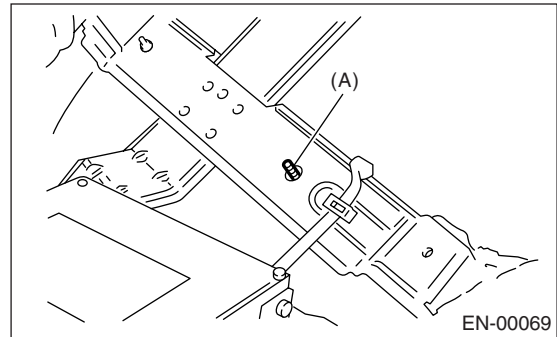
- Otherwise, the ECM may be damaged.

CAUTION:

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

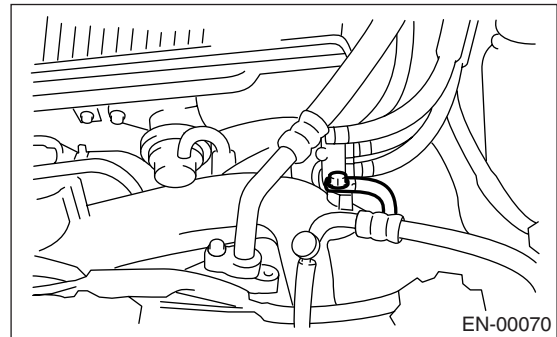
7) Connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.

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

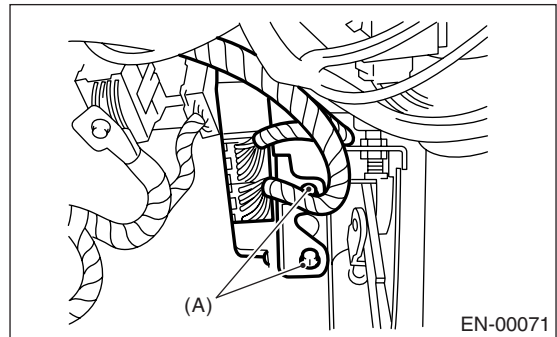


(A) Stud bolt

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



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

B: INSPECTION

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

1. BATTERY

1) Measure battery voltage and specific gravity of electrolyte.

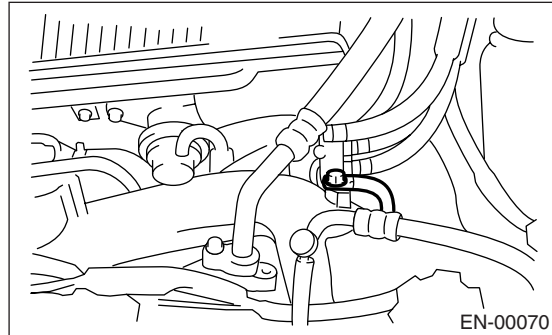
Standard voltage: 12 V

Specific gravity: Above 1.260

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

2. ENGINE GROUND

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



C: NOTE

1. GENERAL DESCRIPTION

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

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

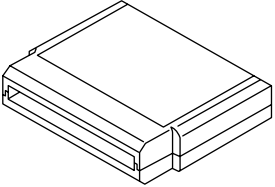

of operation. In actual operation, the injection quantity is determined by the duration of an electric signal applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

- 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 3warm-up performance by the correction of engine coolant temperature and intake air temperature.

D: PREPARATION TOOL

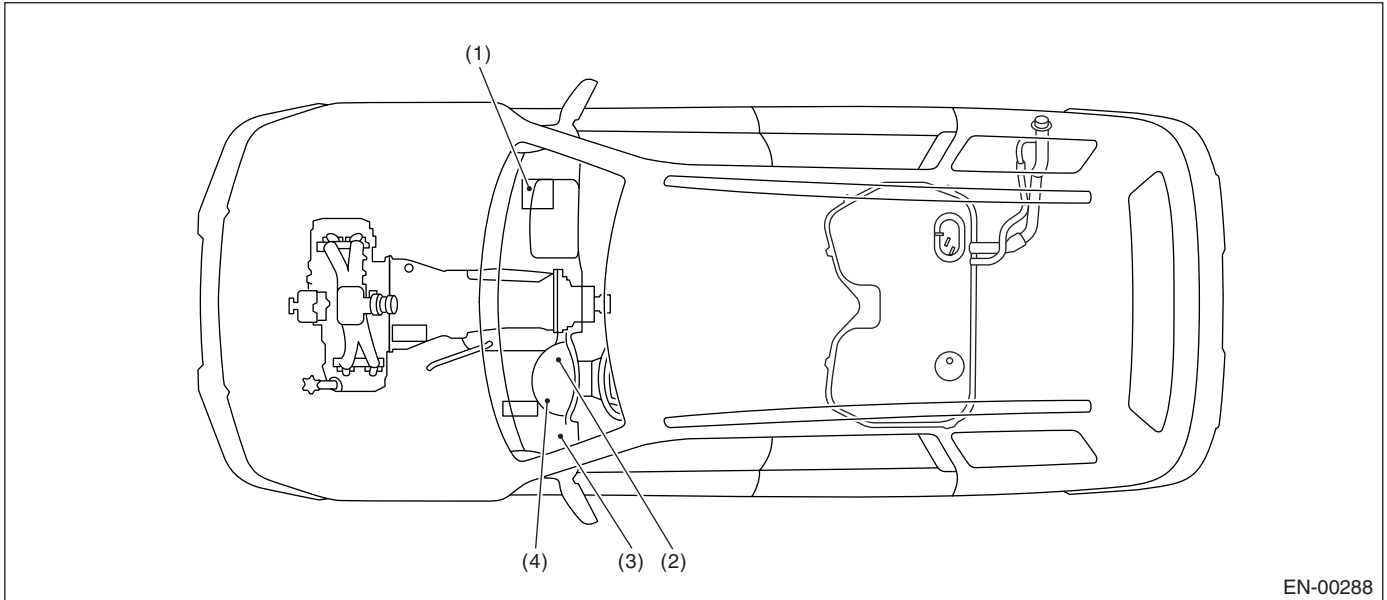
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST24082AA230</p>	24082AA230 (Newly adopted tool)	CARTRIDGE	Troubleshooting for electrical system.
 <p>ST22771AA030</p>	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical system. <ul style="list-style-type: none"> English: 22771AA030 (Without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

4. Electrical Component Location

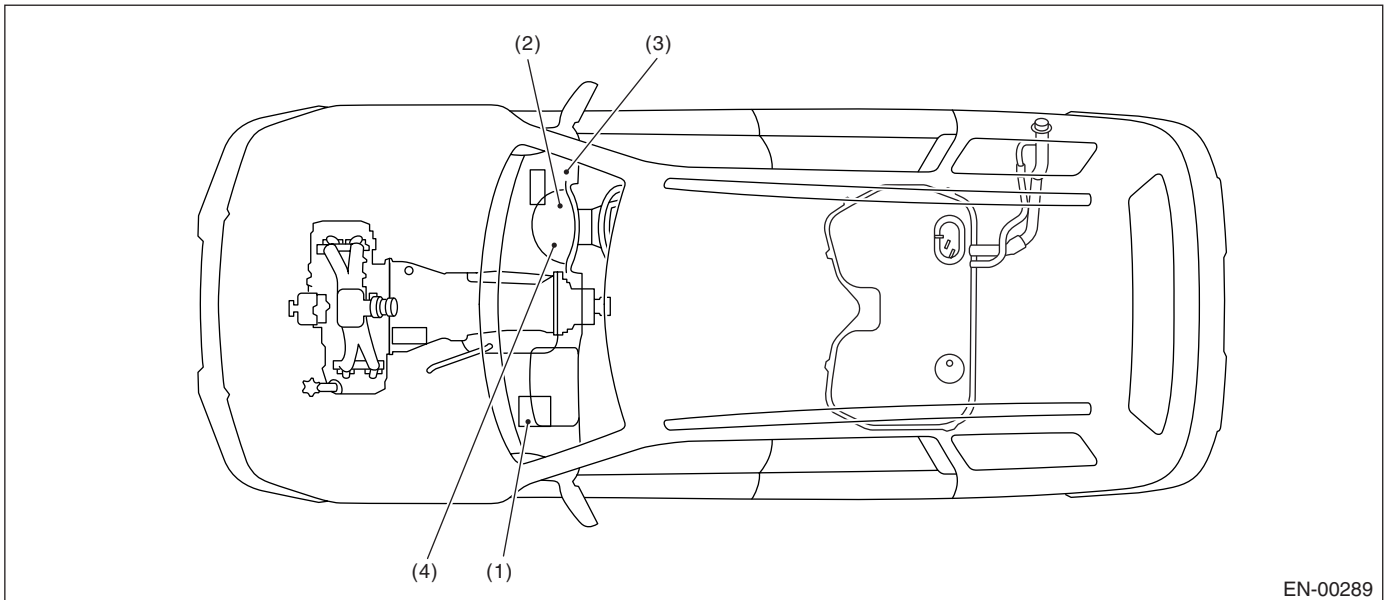
A: LOCATION

1. ENGINE

- CONTROL MODULE
- LHD MODEL



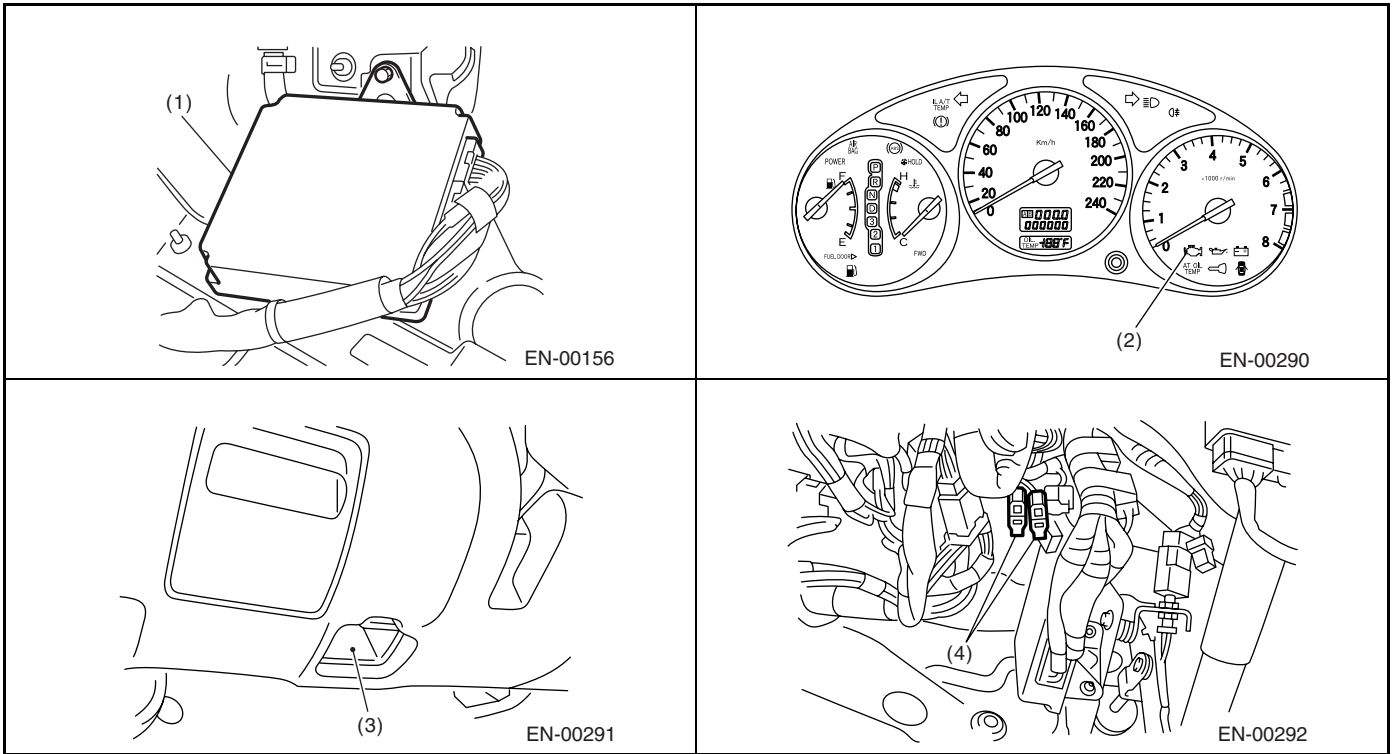
- RHD MODEL



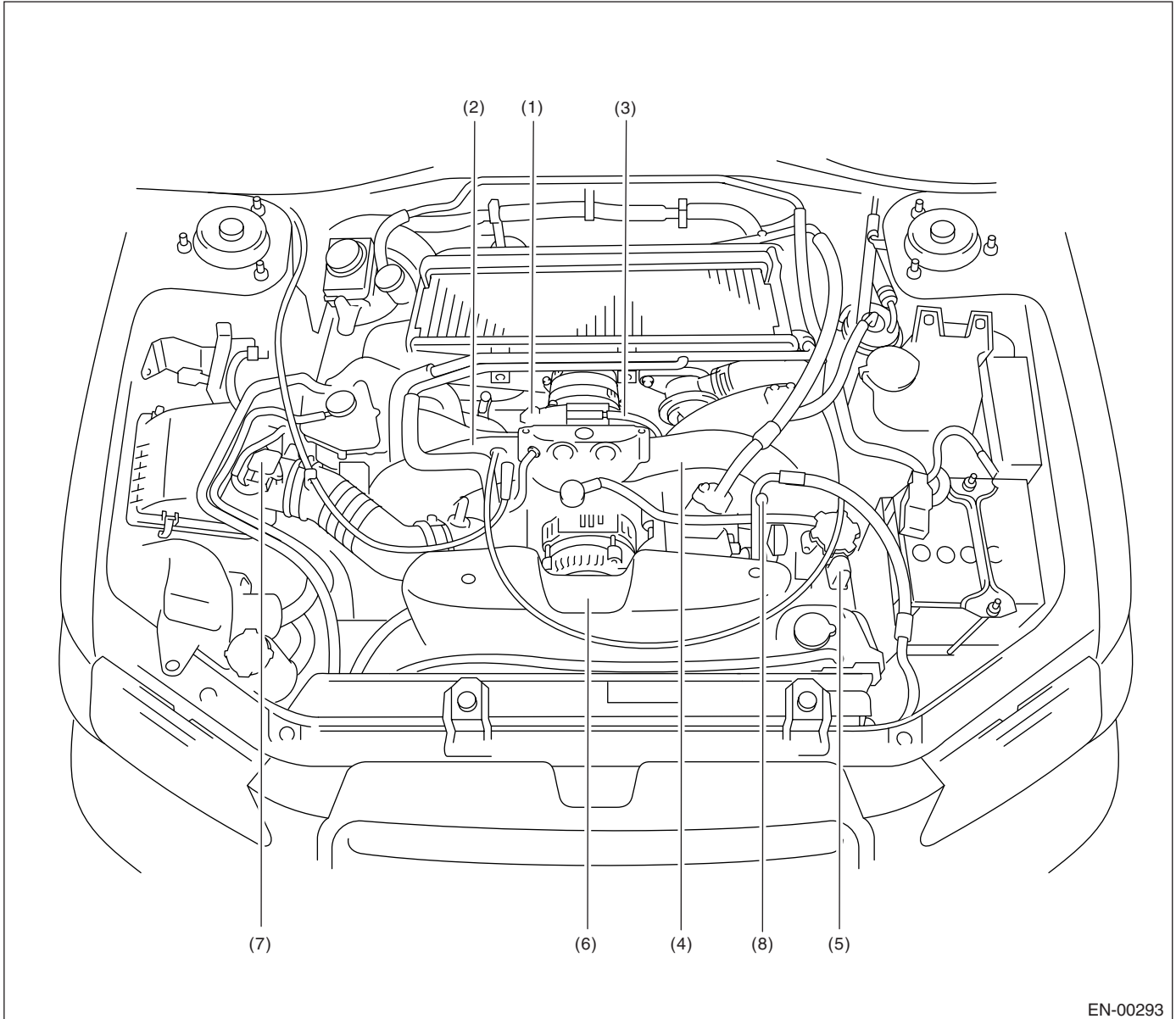
- | | | |
|---------------------------------|-------------------------|-------------------------|
| (1) Engine control module (ECM) | (3) Data link connector | (4) Test Mode Connector |
| (2) Malfunction indicator light | | |

Electrical Component Location

ENGINE (DIAGNOSTIC)



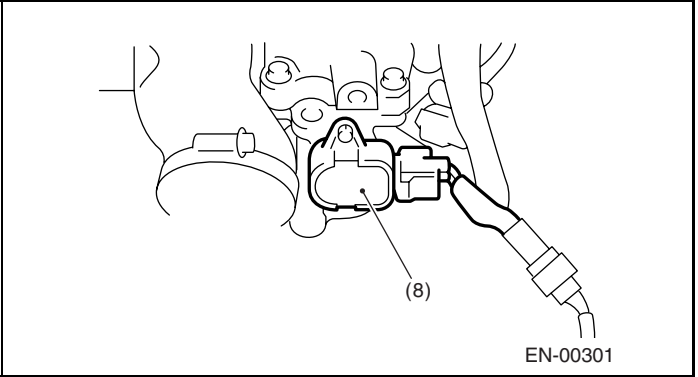
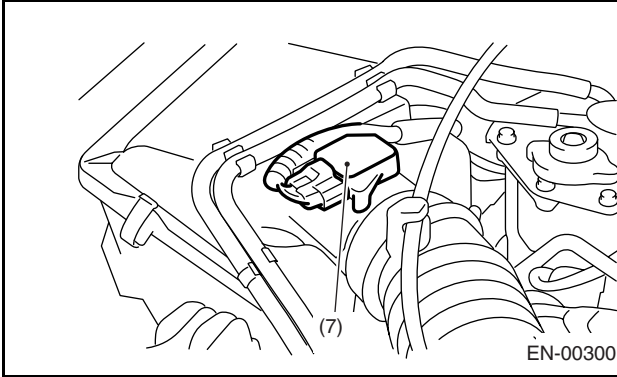
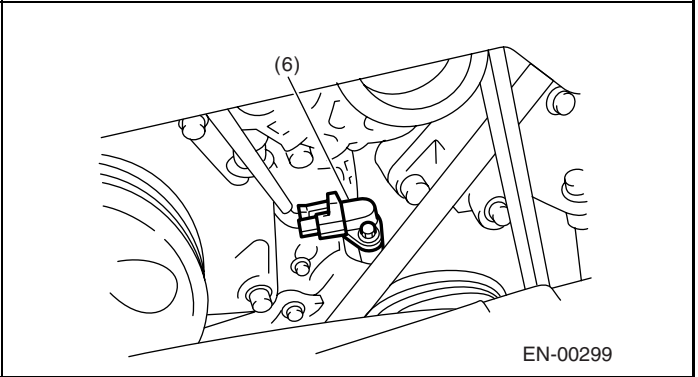
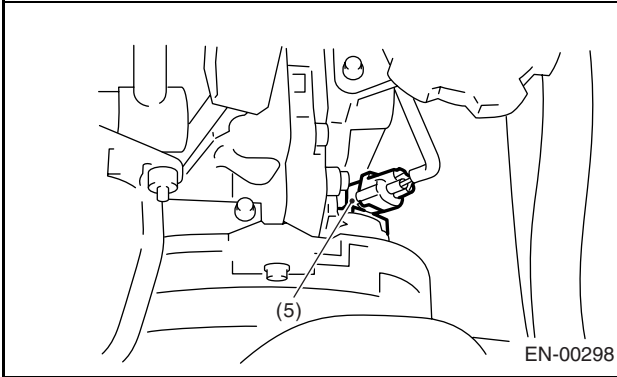
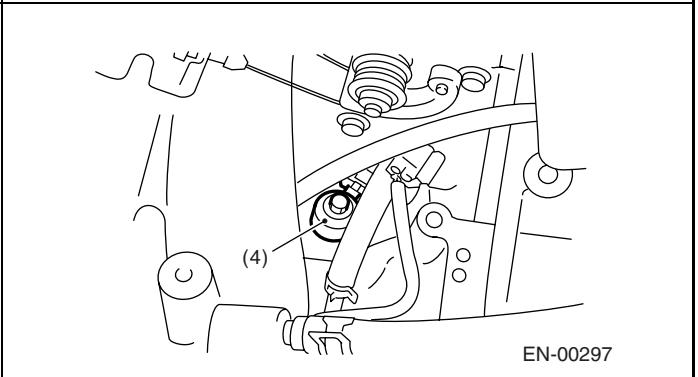
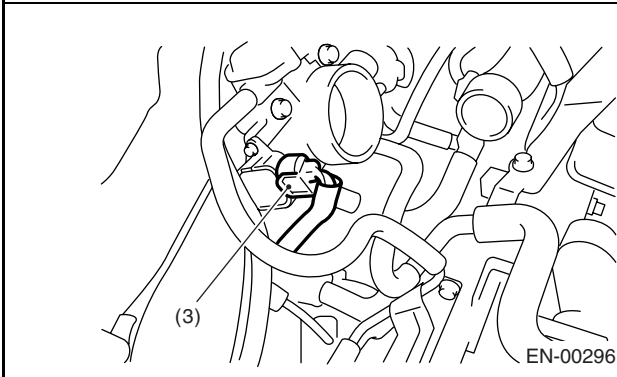
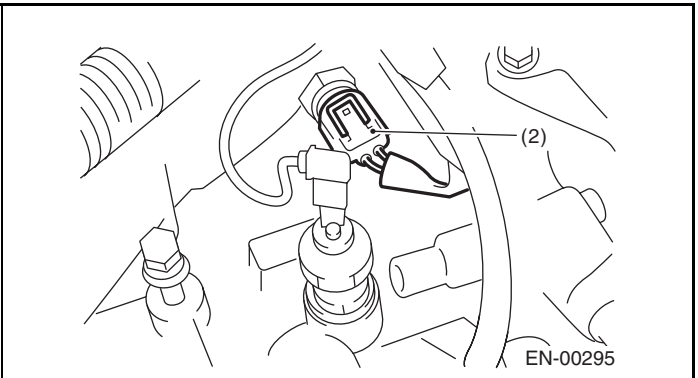
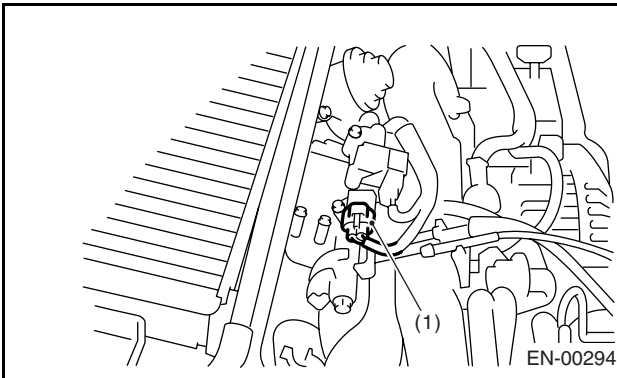
• SENSOR



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

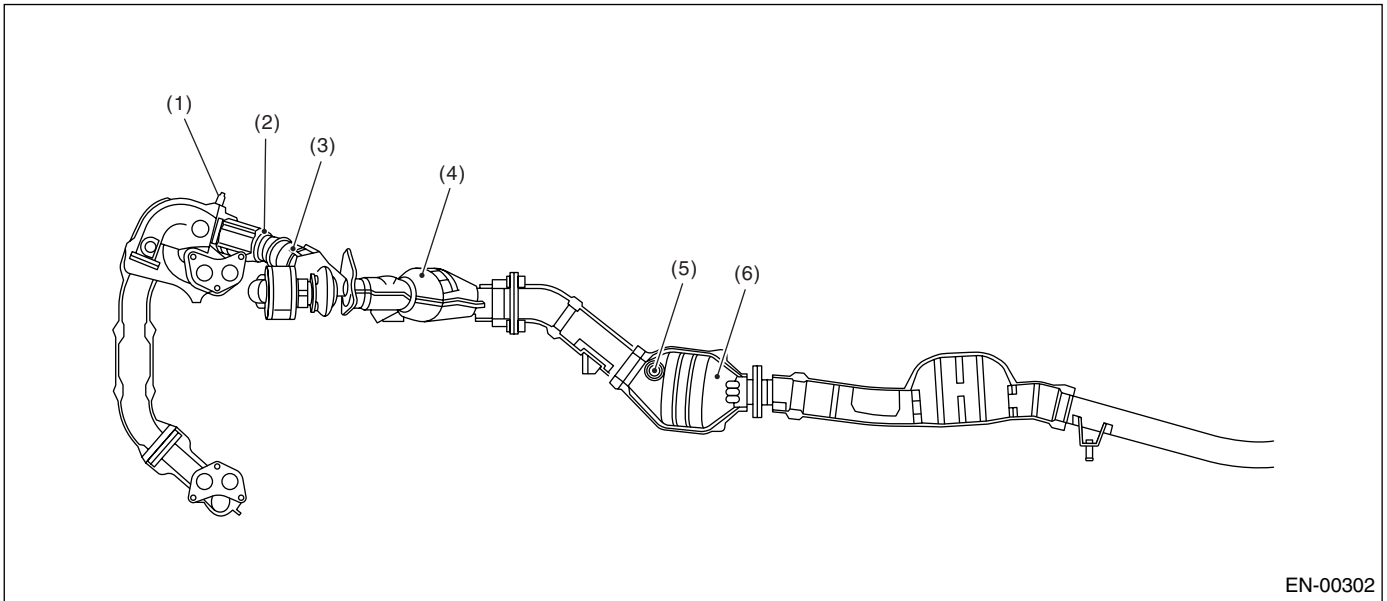
Electrical Component Location

ENGINE (DIAGNOSTIC)



Electrical Component Location

ENGINE (DIAGNOSTIC)



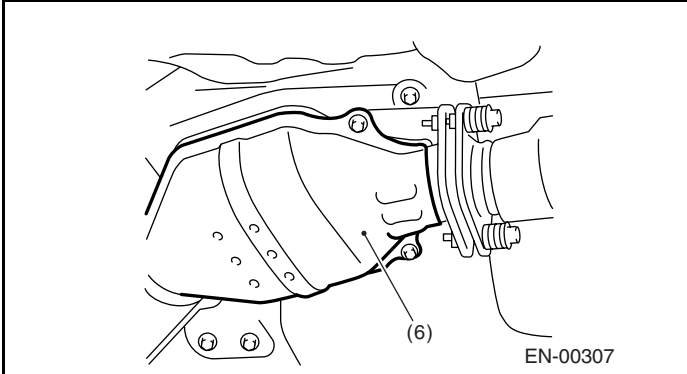
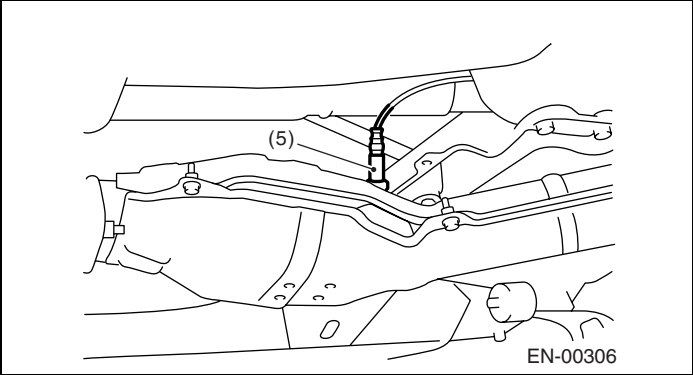
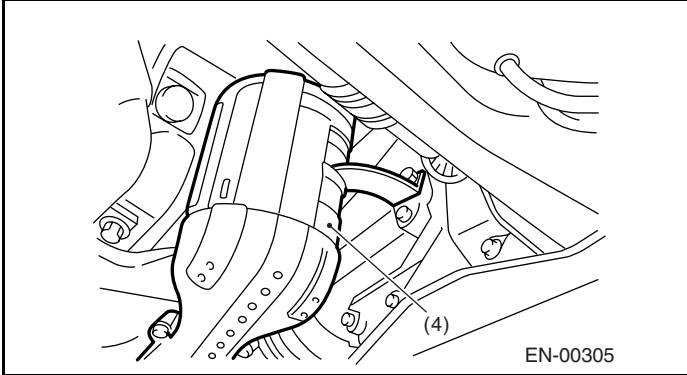
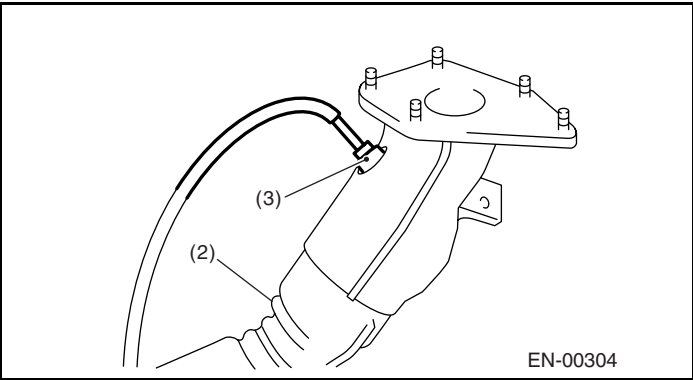
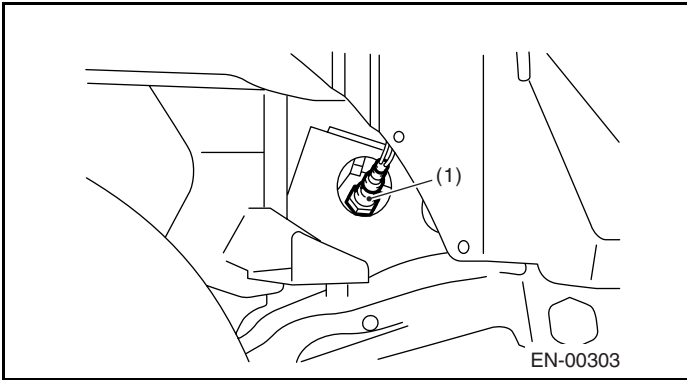
(1) Front oxygen (A/F) sensor
(2) Precatalytic converter

(3) Exhaust gas temperature sensor
(4) Front catalytic converter

(5) Rear Oxygen Sensor
(6) Rear catalytic converter

Electrical Component Location

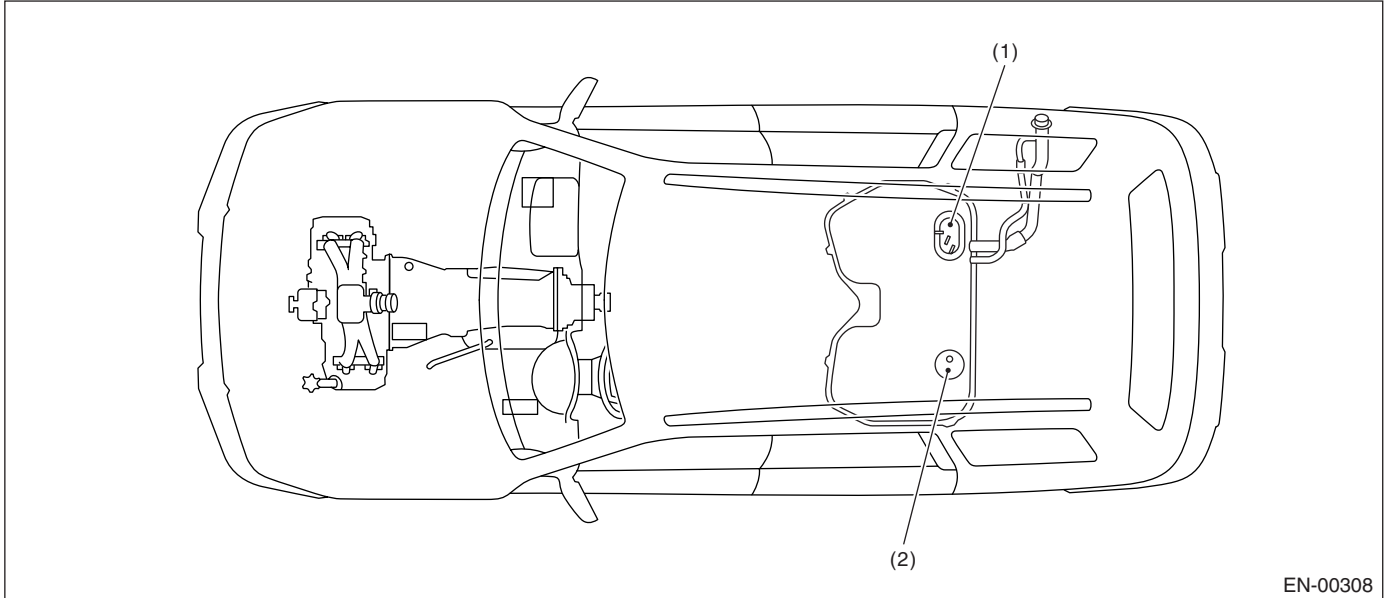
ENGINE (DIAGNOSTIC)



Electrical Component Location

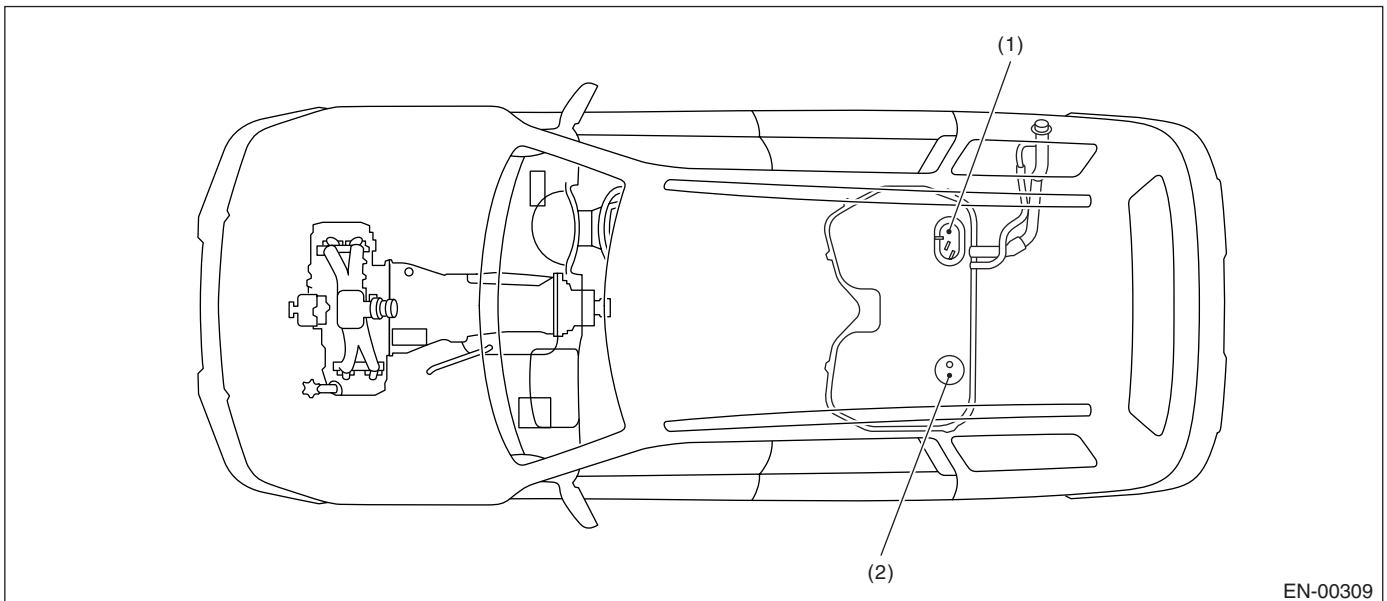
ENGINE (DIAGNOSTIC)

- LHD MODEL



EN-00308

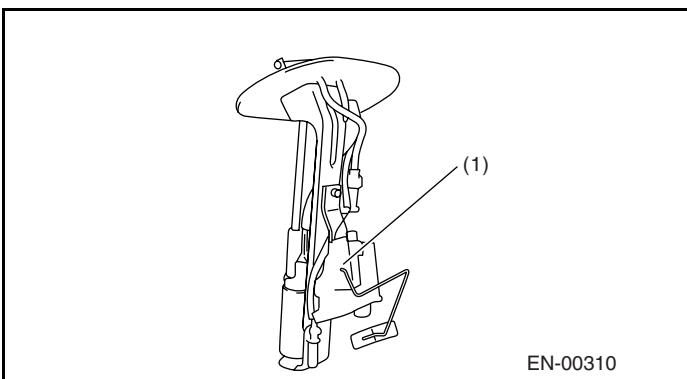
- RHD MODEL



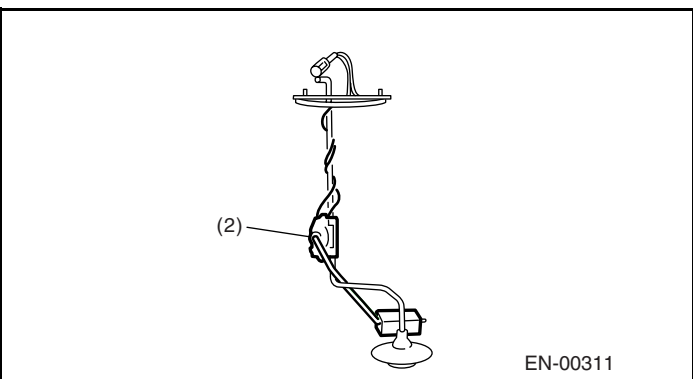
EN-00309

(1) Fuel level sensor

(2) Fuel sub level sensor



EN-00310

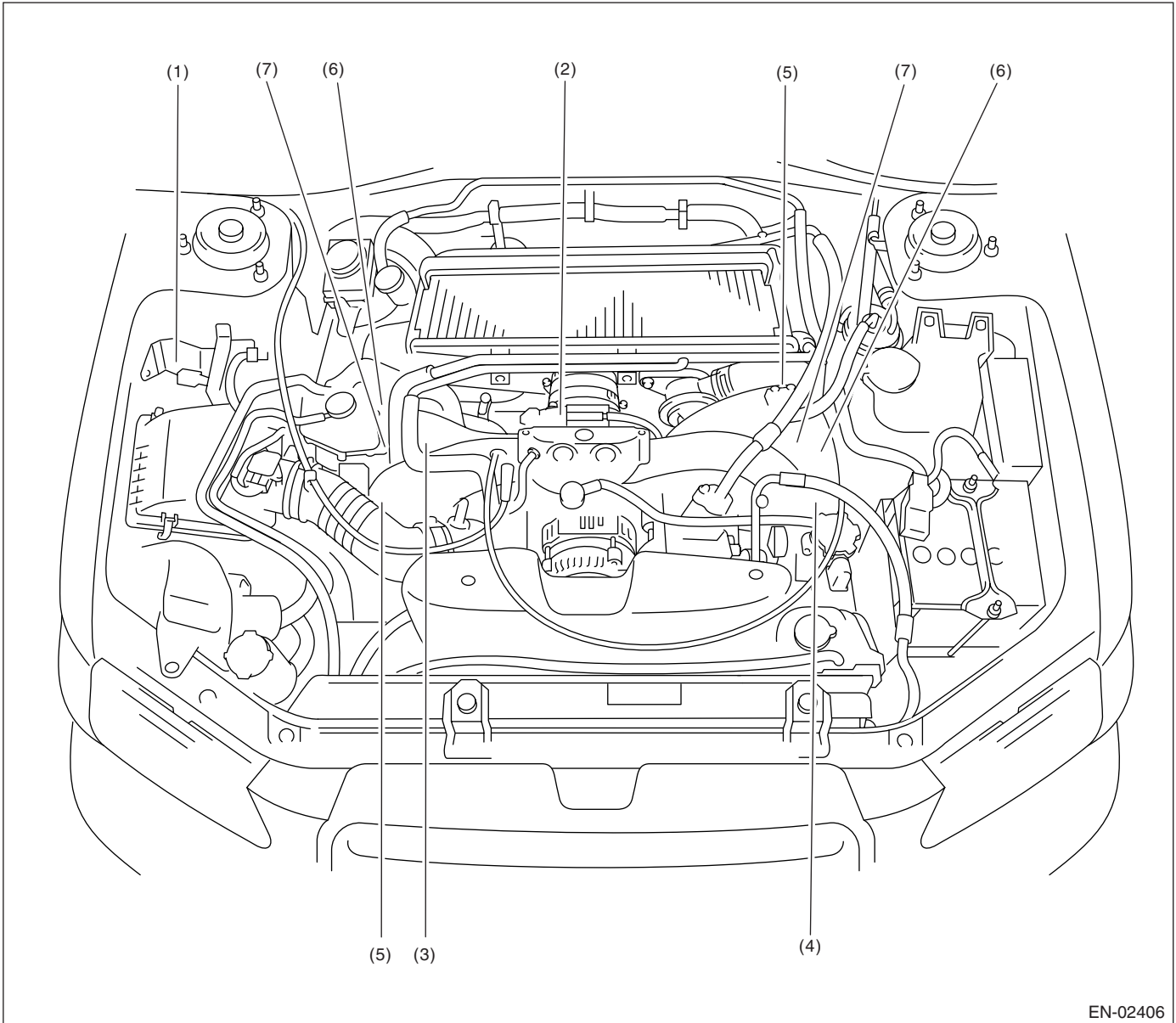


EN-00311

Electrical Component Location

ENGINE (DIAGNOSTIC)

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

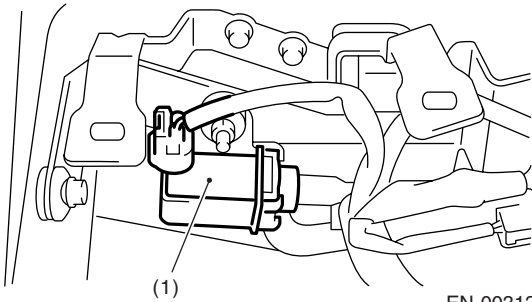


EN-02406

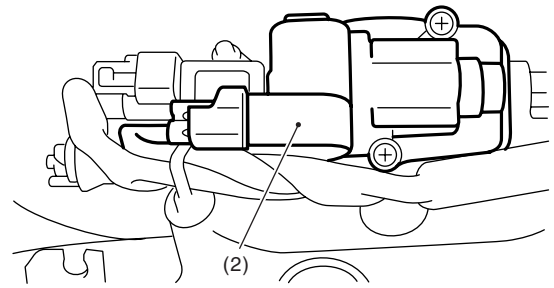
- | | | |
|--------------------------------------|-------------------------------------|--------------|
| (1) Wastegate control solenoid valve | (4) Ignition coil | (7) Injector |
| (2) Idle air control solenoid valve | (5) Tumble generator valve actuator | |
| (3) Purge control solenoid valve | (6) Oil flow control solenoid valve | |

Electrical Component Location

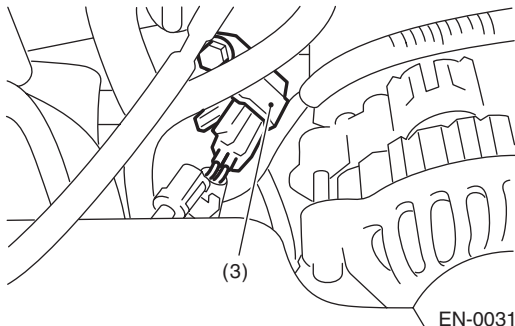
ENGINE (DIAGNOSTIC)



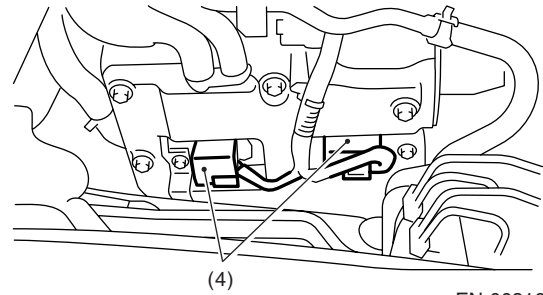
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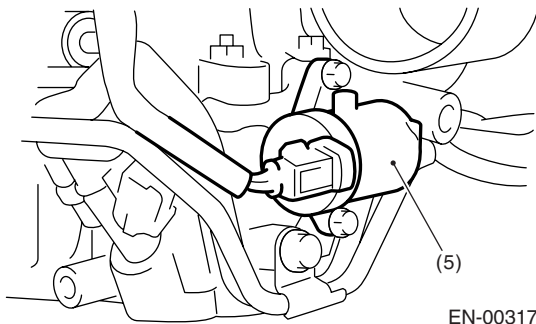
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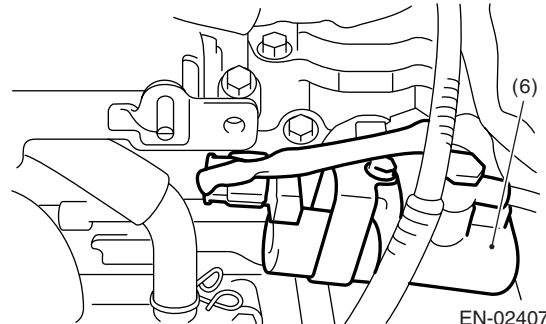
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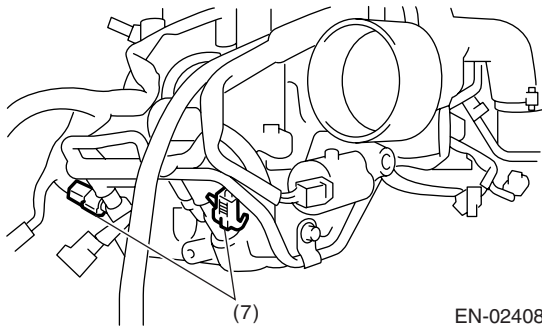
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EN-00317



EN-02407



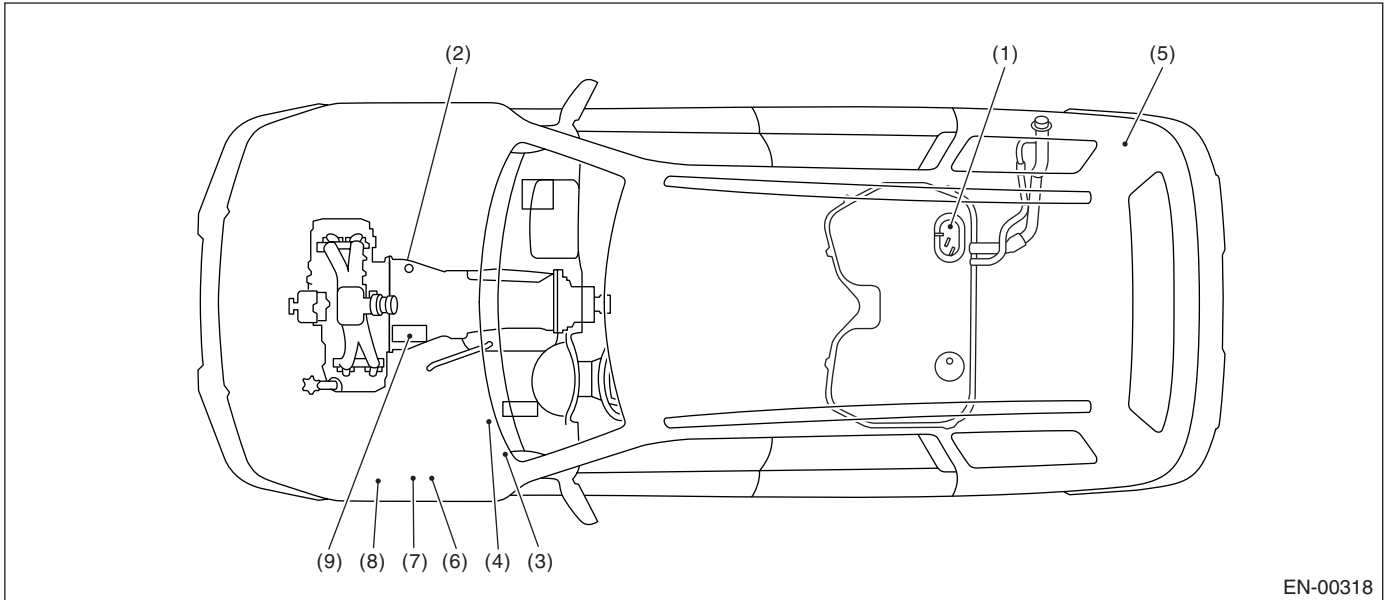
EN-02408

SUBARU.

Electrical Component Location

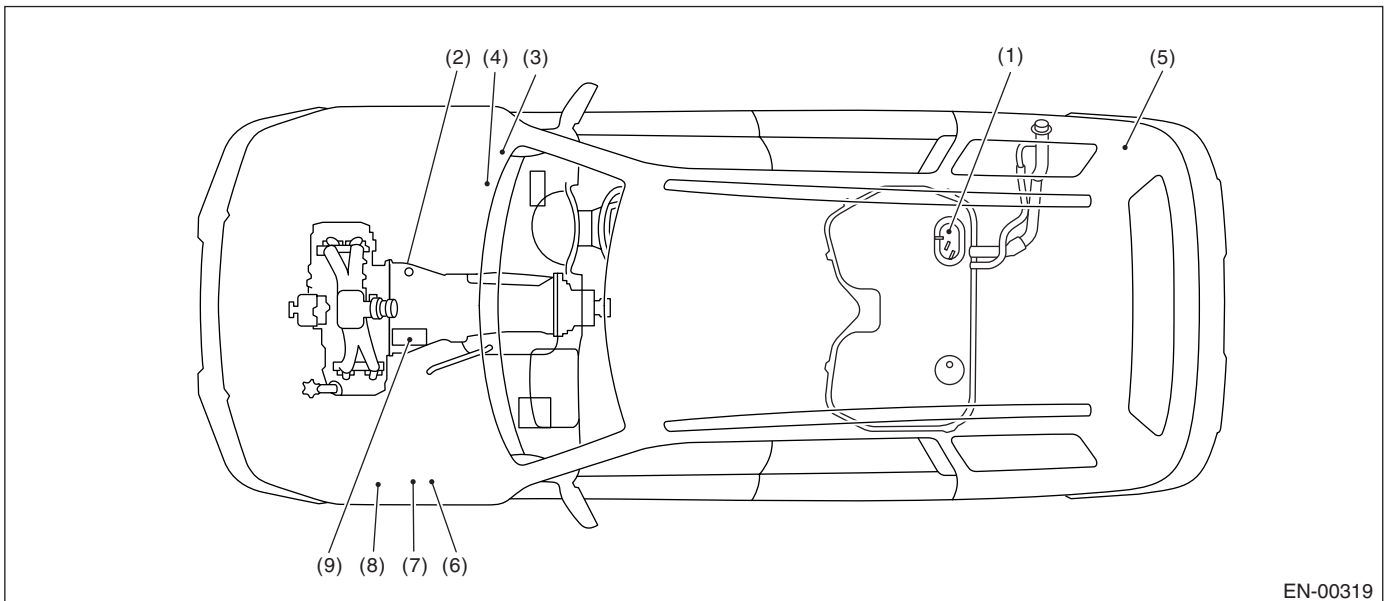
ENGINE (DIAGNOSTIC)

• LHD MODEL



EN-00318

• RHD MODEL

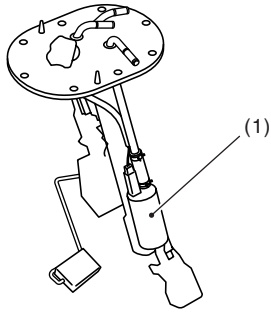


EN-00319

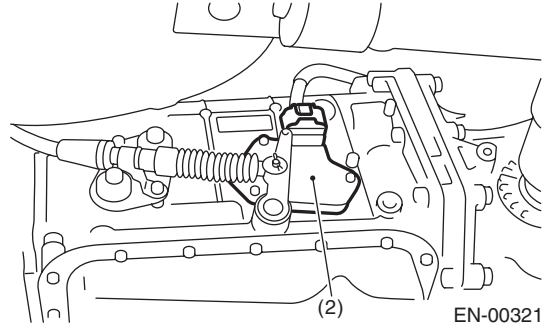
- | | | |
|----------------------|-----------------------------|-----------------------------|
| (1) Fuel pump | (4) Fuel pump relay | (7) Radiator sub fan relay |
| (2) Inhibitor switch | (5) Fuel pump control unit | (8) Radiator fan mode relay |
| (3) Main relay | (6) Radiator main fan relay | (9) Starter |

Electrical Component Location

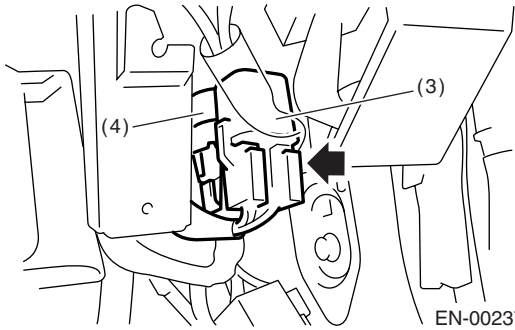
ENGINE (DIAGNOSTIC)



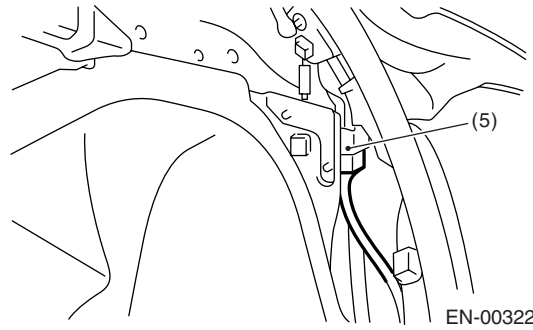
EN-00320



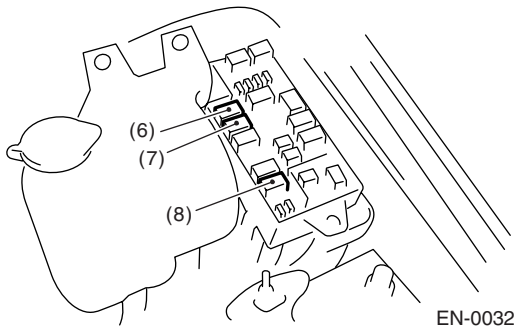
EN-00321



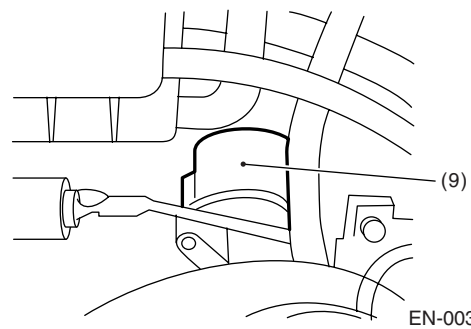
EN-00237



EN-00322



EN-00323



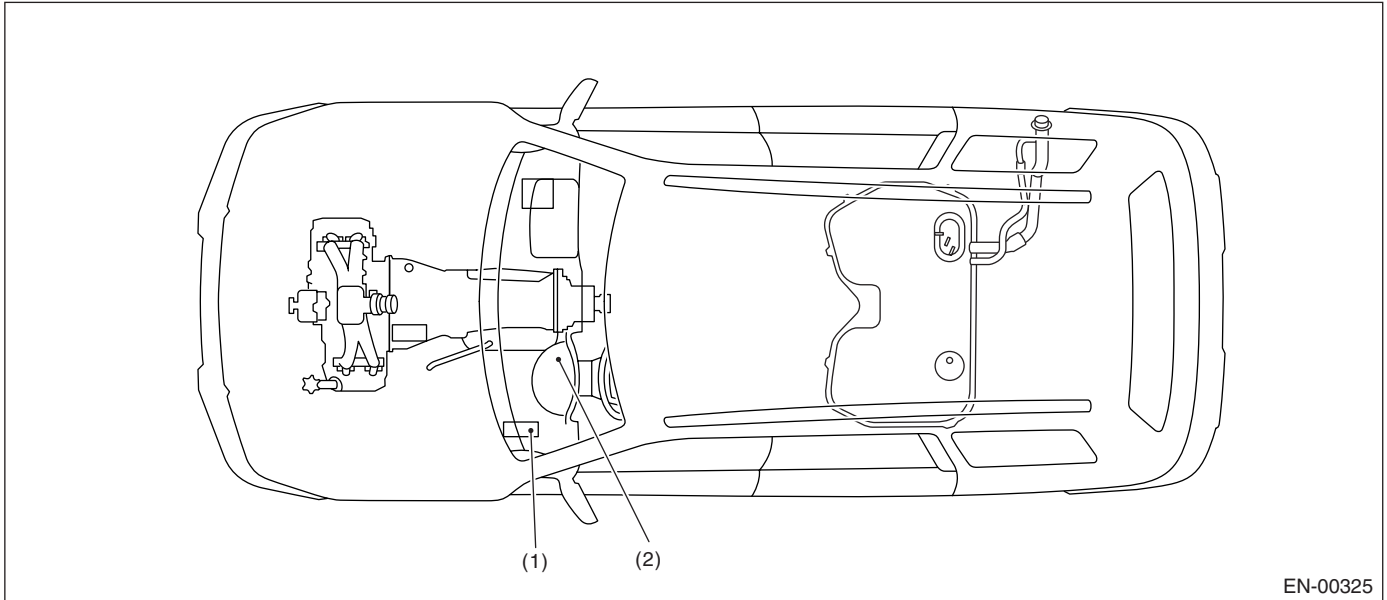
EN-00324

Electrical Component Location

ENGINE (DIAGNOSTIC)

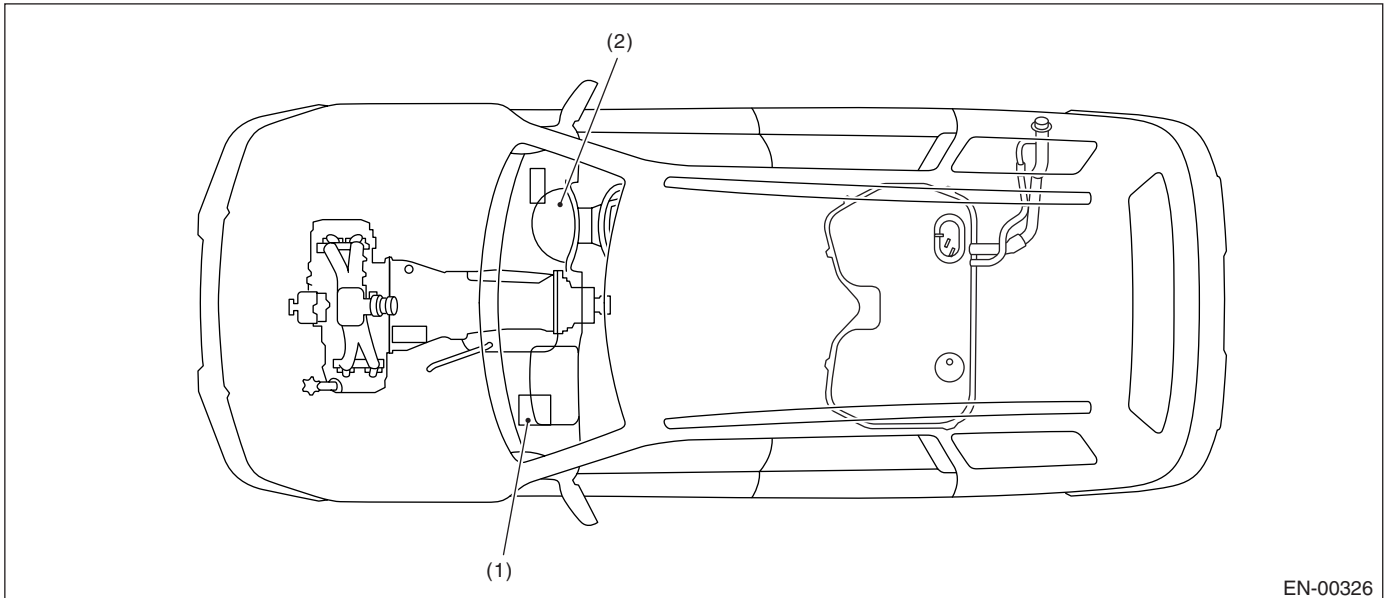
2. TRANSMISSION

- UNIT
- LHD MODEL



EN-00325

- RHD MODEL



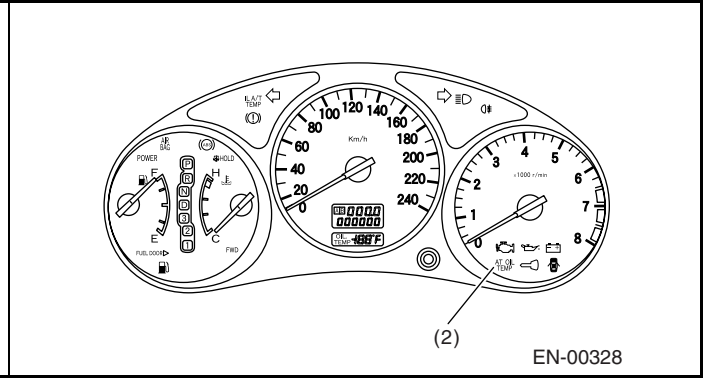
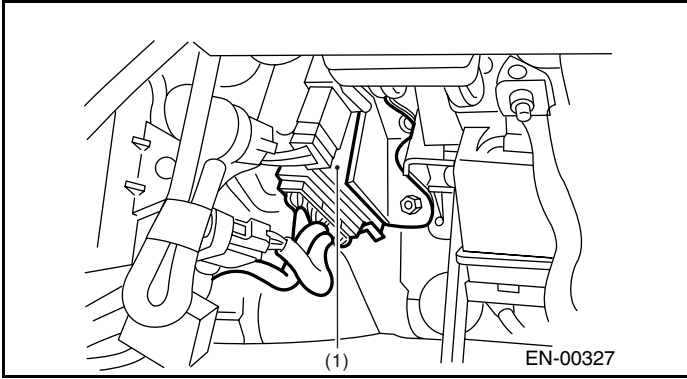
EN-00326

(1) Transmission Control Module (TCM) (for AT model)

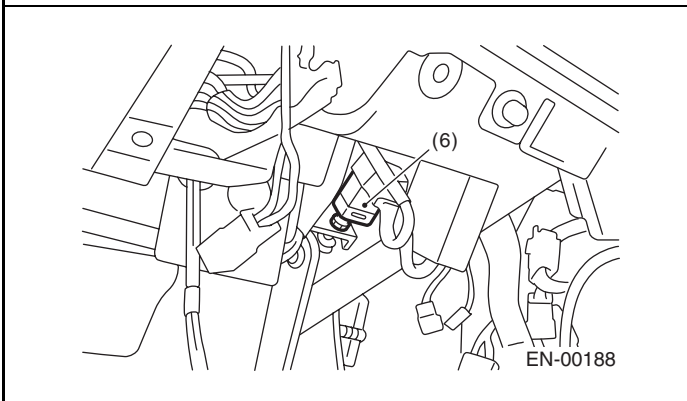
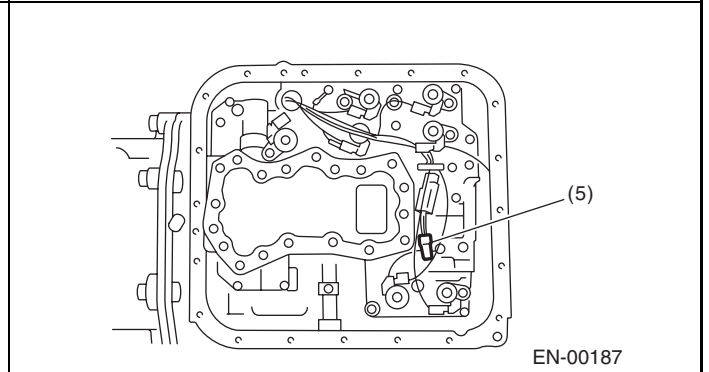
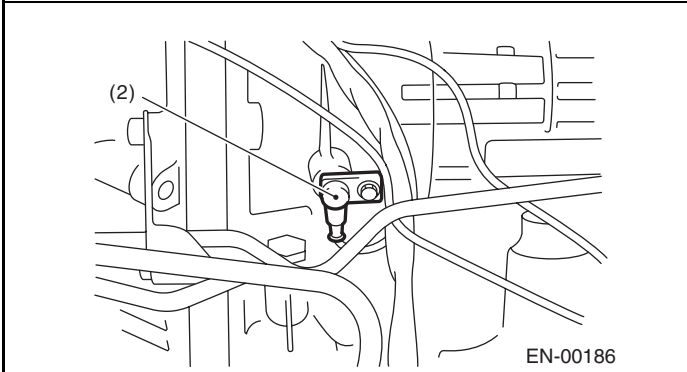
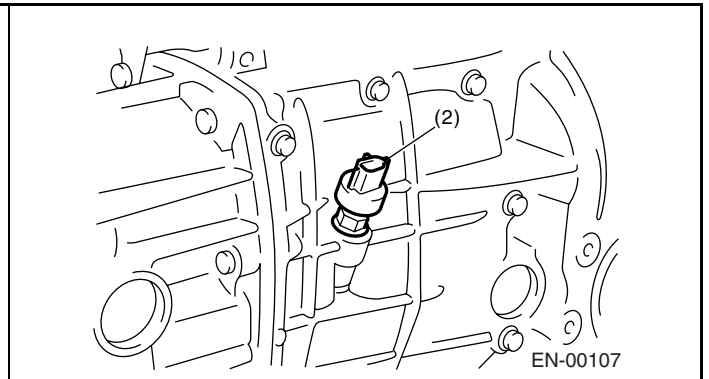
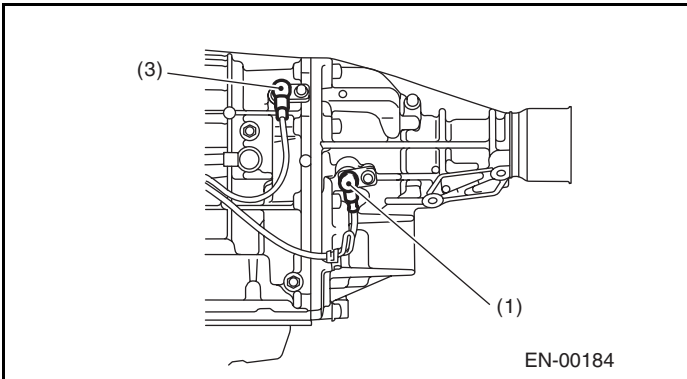
(2) AT diagnostic indicator light (for AT model)

Electrical Component Location

ENGINE (DIAGNOSTIC)



• SENSOR



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

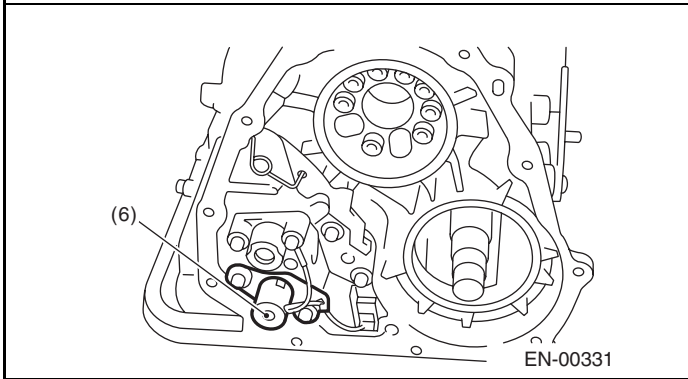
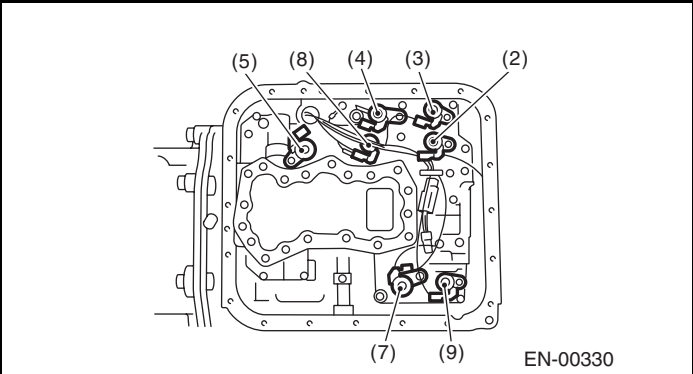
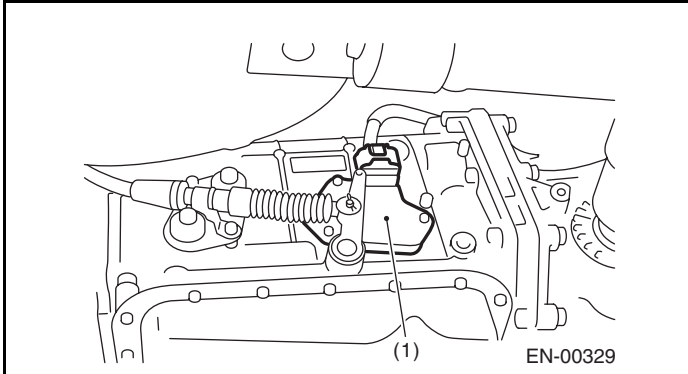
- (3) Front vehicle speed sensor (AT model)
- (4) Torque converter turbine speed sensor (AT model)

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

Electrical Component Location

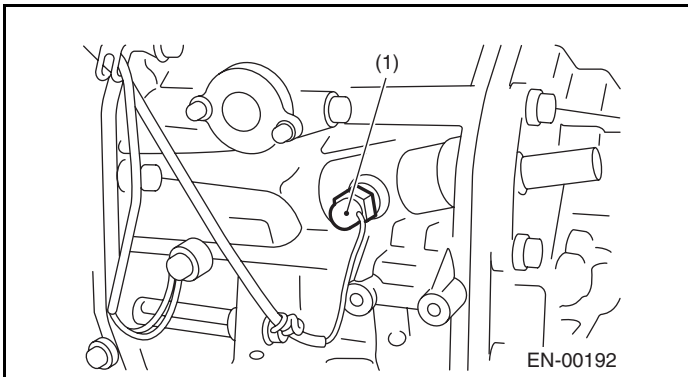
ENGINE (DIAGNOSTIC)

• SOLENOID VALVE & SWITCH (AT model)



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

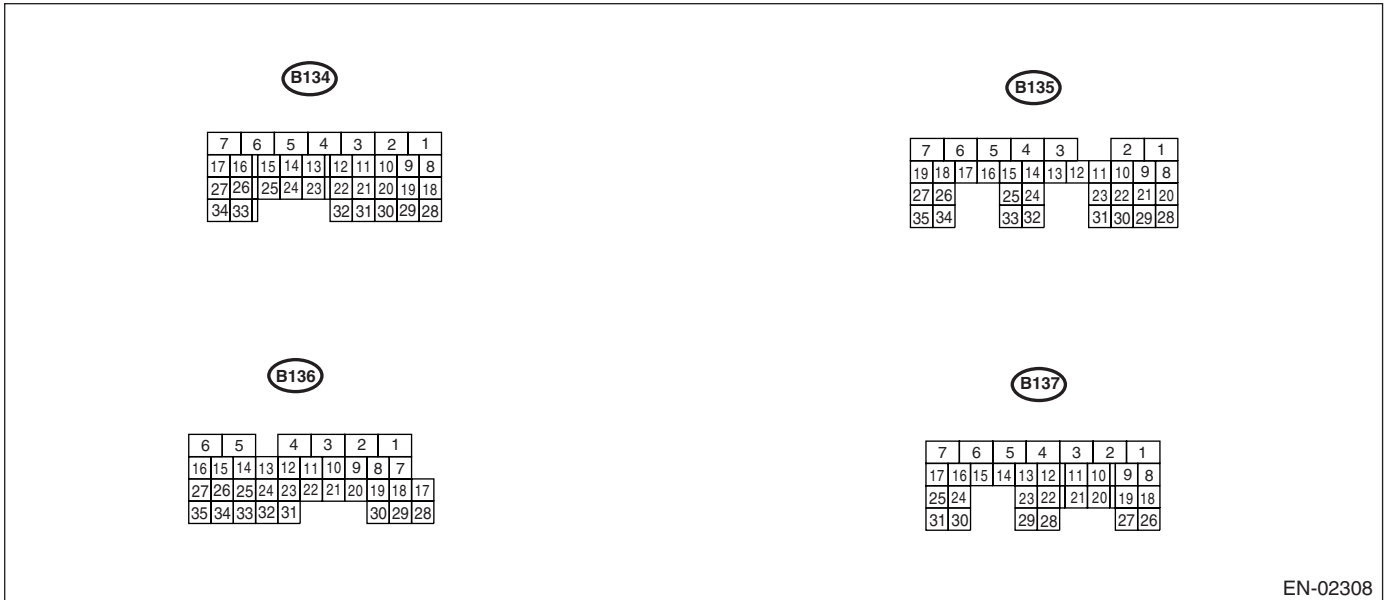
• SOLENOID VALVE & SWITCH (MT model)



- (1) Neutral Position Switch

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

A: ELECTRICAL SPECIFICATION



EN-02308

DESCRIPTION	Connector No.	Terminal No.	Signal (V)		NOTE	
			Ignition SW ON (engine OFF)	Engine ON (Idling)		
Crank-shaft position sensor	Signal (+)	B135	10	0	-7 — +7	Waveform
	Signal (-)	B135	22	0	0	—
	Shield	B135	31	0	0	—
Camshaft position sensor	Signal (+)	B135	11	0	-7 — +7	Waveform
	Signal (-)	B135	23	0	0	—
	Shield	B135	31	0	0	—
Throttle position sensor	Signal	B136	18	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B136	16	5	5	—
	GND (sensors)	B136	35	0	0	—
Rear Oxygen Sensor	Signal	B137	25	0	0 — 0.9	—
	Shield	B137	31	0	0	—
	GND (sensors)	B136	35	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B134	3	0 — 1.0	0 — 1.0	Waveform
	Signal 2	B134	2	0 — 1.0	0 — 1.0	Waveform
Rear oxygen sensor heater signal	B135	2	0 — 1.0	0 — 1.0	Waveform	
Engine coolant temperature sensor	Signal	B136	14	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.
	GND (sensors)	B136	35	0	0	After engine is warmed-up.
Vehicle speed signal	B135	26	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.	

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)	
AVCS camshaft position sensor RH	Signal (+)	B135	21	0	-7 — +7	Waveform
	Signal (-)	B135	29	0	0	—
	Shield	B135	30	0	0	—
AVCS camshaft position sensor LH	Signal (+)	B135	20	0	-7 — +7	Waveform
	Signal (-)	B135	28	0	0	—
	Shield	B135	30	0	0	—
Generator signal		B134	22	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 10 — 13	Waveform
Air flow sensor	Signal	B136	23	—	0.3 — 4.5	—
	Shield	B136	32	0	0	—
	GND	B136	31	0	0	—
Intake air temperature sensor signal		B136	13	0.3 — 4.6	0.3 — 4.6	—
Exhaust gas tem- perature sensor	Signal	B136	24	—	—	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve posi- tion sen- sor RH	Signal	B136	27	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve posi- tion sen- sor LH	Signal	B136	26	Fully closed: 3.8 — 4.9 Fully opened: 0.2 — 0.9		—
	Power supply	B136	16	5	5	—
	GND (sensor)	B136	35	0	0	—
Tumble generator valve RH (open)		B134	9	0 or 10 — 13	0 or 13 — 14	Waveform
Tumble generator valve RH (close)		B134	8	0 or 10 — 13	0 or 13 — 14	Waveform
Tumble generator valve LH (open)		B134	11	0 or 10 — 13	0 or 13 — 14	Waveform
Tumble generator valve LH (close)		B134	10	0 or 10 — 13	0 or 13 — 14	Waveform
Wastegate control sole- noid valve		B134	32	0 or 10 — 13	0 or 13 — 14	—
Starter switch		B137	8	0	0	Cranking: 8 — 14
A/C switch		B137	17	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B137	14	10 — 13	13 — 14	—
Neutral Position Switch		B137	9	ON: 12±0.5 OFF: 0		Switch is ON when gear is in neutral position.
Test Mode Connector		B137	15	10 — 13	13 — 14	When connected: 0
Knock sensor	Signal	B136	25	2.8	2.8	—
	Shield	B136	33	0	0	—
Back-up power supply		B135	19	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control module power supply		B135	5	10 — 13	13 — 14	—
		B135	6	10 — 13	13 — 14	—

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)	
Sensor power supply	B136	16	5	5	—
Oil flow control solenoid valve RH	Signal (+)	B134	18	18	—
	Signal (-)	B134	28	28	—
Oil flow control solenoid valve LH	Signal (+)	B134	19	19	—
	Signal (-)	B134	29	29	—
Ignition control	#1	B135	18	18	Waveform
	#2	B135	17	17	Waveform
	#3	B135	16	16	Waveform
	#4	B135	15	15	Waveform
Fuel injector	#1	B136	6	6	Waveform
	#2	B136	5	5	Waveform
	#3	B136	4	4	Waveform
	#4	B136	3	3	Waveform
Idle air control solenoid valve	Signal	B134	27	27	Waveform
Fuel pump control unit	Diagnosis signal	B137	28	28	Waveform
	Control signal	B135	27	27	—
A/C relay control	B135	33	33	33	—
Radiator fan relay 1 control	B135	25	25	25	—
Radiator fan relay 2 control	B135	24	24	24	Model with A/C
Malfunction indicator light	B134	17	17	17	Light "ON": 1, or less Light "OFF": 10 — 14
Engine speed output	B134	23	23	23	Waveform
Purge control solenoid valve	B134	14	14	14	Waveform
Manifold absolute pressure sensor	Signal	B136	22	22	—
	Power supply	B136	16	16	
	GND (sensors)	B136	35	35	
Fuel level sensor	B136	20	20	20	—
Small light switch	B137	12	12	12	—
Blower fan switch	B137	13	13	13	—
Rear defogger switch	B137	11	11	11	—
Power steering oil pressure switch	B137	10	10	10	—
Wiper switch	B137	23	23	23	—

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)	
Front oxygen (A/F) sensor signal (+)	B134	33	2.8 — 3.2	2.8 — 3.2	—
Front oxygen (A/F) sensor signal (-)	B134	26	2.4 — 2.7	2.4 — 2.7	—
Front oxygen (A/F) sensor shield	B134	25	0	0	—
SSM/GST communication line	B137	20	Less than 1↔ More than 4	Less than 1↔ More than 4	—
CAN Communication (+)	B137	18	Pulse signal	Pulse signal	
CAN Communication (-)	B137	26	Pulse signal	Pulse signal	
GND (sensor)	B136	35	0	0	—
GND (injector)	B137	7	0	0	—
GND (ignition system)	B135	12	0	0	—
GND (power supply)	B135	1	0	0	—
	B135	4	0	0	—
GND (control system)	B137	1	0	0	—
	B137	2	0	0	—
GND (oxygen sensor heater 1)	B134	7	0	0	—
GND (oxygen sensor heater 2)	B134	6	0	0	—

6. Engine Condition Data

A: ELECTRICAL SPECIFICATION

Remarks	Specification
Engine load	1.3 — 2.6 (%): Idling
	4.4 — 9.6 (%): 2,500 rpm racing

Measuring condition:

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

Transmission Control Module (TCM) I/O Signal

ENGINE (DIAGNOSTIC)

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

A: ELECTRICAL SPECIFICATION

<Ref. to 4AT(H4SO)-12, Transmission Control Module (TCM) I/O Signal.>

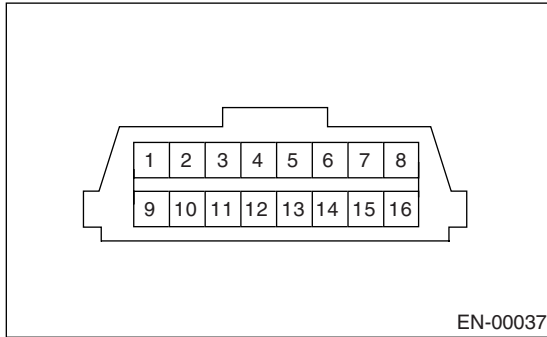
8. Data Link Connector

A: NOTE

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

CAUTION:

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



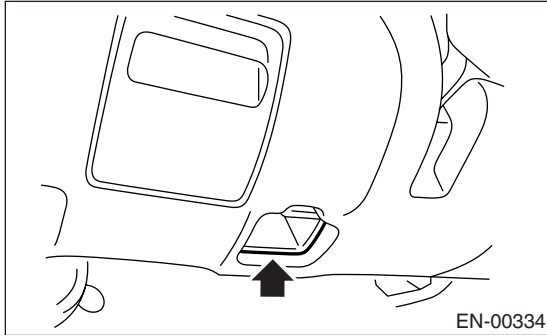
Terminal No.	Remarks	Terminal No.	Remarks
1	Power supply	9	Empty
2	Empty	10	Subaru Select Monitor signal
3	Empty	11	Empty
4	Empty	12	Ground
5	Empty	13	Ground
6	Empty	14	Empty
7	Empty	15	Empty
8	Empty	16	Empty

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) Open the cover and connect the OBD-II general scan tool to the data link connector located in the lower portion of the instrument panel (on the driver's side).



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

OBD-II general scan tool functions consist of:

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

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

NOTE:

For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)-74, 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 Diagnosis support data	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 whole fuel trim	%
0B	Intake manifold absolute pressure	kPa, mmHg
0C	Engine revolution	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate of manifold absolute pressure sensor	g/sec
11	Throttle valve opening angle	%
13	Check whether oxygen sensor is installed.	—
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor — bank 1	V and %
1C	On-board diagnostic system	—
21	MI illuminating process	—
24	A/F sensor 1 output voltage and short term fuel trim associated with A/F sensor 1	V and %
34	A/F sensor 1 current and lambda	A and —

NOTE:

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

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

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

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

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

NOTE:

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

OBD-II General Scan Tool

ENGINE (DIAGNOSTIC)

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

Refer to “Read Diagnostic Trouble Code (DTC)” for information about data denoting emission-related powertrain diagnostic trouble codes. <Ref. to EN(H4DOTC)-39, 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:

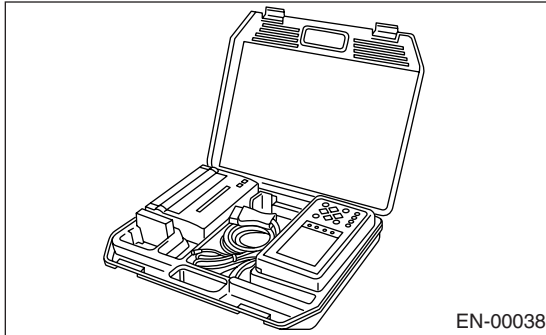
Refer to OBD-II general scan tool manufacturer’s instruction manual to clear or reset emission-related diagnostic information (MODE \$04).

10. Subaru Select Monitor

A: OPERATION

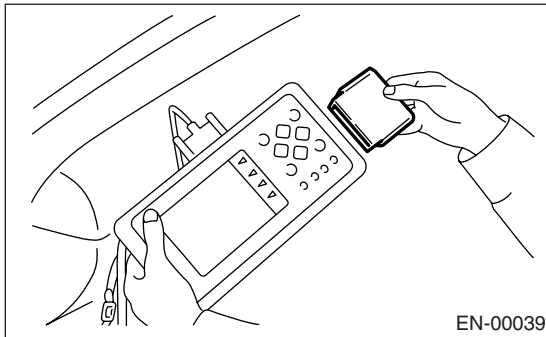
1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)-8, PREPARATION TOOL, General Description.>



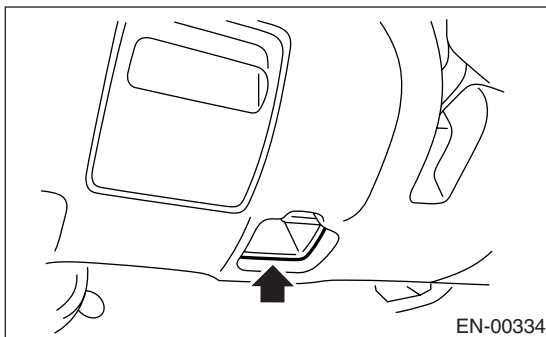
2) Connect the diagnosis cable to Subaru Select Monitor.

3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC)-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).

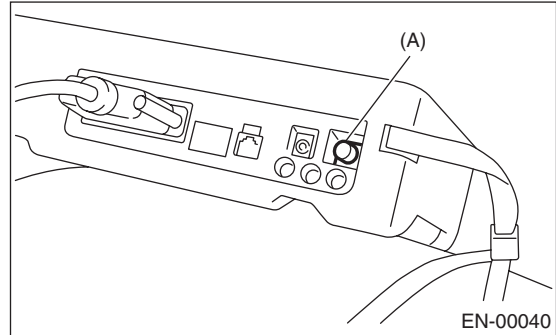


(2) Connect the diagnosis cable to data link connector.

CAUTION:

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

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



(A) Power switch

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

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to indicate DTC. <Ref. to EN(H4DOTC)-39, Read Diagnostic Trouble Code (DTC).>

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

Refer to "Read Diagnostic Trouble Code (DTC)" for information about how to indicate DTC. <Ref. to EN(H4DOTC)-39, Read Diagnostic Trouble Code (DTC).>

Subaru Select Monitor

ENGINE (DIAGNOSTIC)

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

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

Remarks	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed signal	Vehicle Speed	km/h or MPH
Engine speed signal	Engine Speed	rpm
Engine coolant temperature signal	Coolant Temp.	°C or °F
Ignition timing signal	Ignition Timing	deg
Throttle position signal	Throttle Opening Angle	%
Throttle position signal	Throttle Sensor Voltage	V
Injection pulse width	Fuel Injection #1 Pulse	ms
Idle air control signal	ISC Valve Duty Ratio	%
generated duty control signal	ALT Duty	%
Fuel pump duty control signal	Fuel Pump Duty	%
A/F sensor current	A/F Sensor #1 Current	mA
A/F sensor resistance	A/F Sensor #1 Resistance	Ω
Front oxygen (A/F) sensor output signal	A/F Sensor #1	—
Rear oxygen sensor output signal	Rear O ₂ Sensor	V
Short term fuel trim	A/F Correction #1	%
Knock sensor correction	Knocking Correction	deg
Atmospheric pressure signal	Atmosphere Pressure	mmHg, kPa, inHg or psi
Intake manifold relative pressure signal	Mani. Relative Pressure	mmHg, kPa, inHg or psi
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psi
A/F correction (short term fuel trim) by rear oxygen sensor	A/F Correction #3	%
Long term whole fuel trim	A/F Learning #1	%
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Primary supercharged pressure control signal	Primary Control	%
Tumble generated valve position sensor signal (RH side)	TGV Position Sensor R	V
Tumble generated valve position sensor signal (LH side)	TGV Position Sensor L	V
Tumble generated valve drive signal	TGV Drive	OPEN or CLOSE
Fuel level signal	Fuel Level Voltage	V
Intake air temperature signal	Intake Air Temp.	°C or °F
Mass air flow sensor signal	Mass Air Flow	g/s
Mass air flow sensor signal	Air Flow Sensor Voltage	V
Valve Timing Signal	VVT Adv. Ang. amount R	deg
Valve Timing Signal	VVT Adv. Ang. amount L	deg
Oil flow control solenoid valve signal	OCV Duty R	%
Oil flow control solenoid valve signal	OCV Duty L	%
Oil flow control solenoid valve current	OCV current R	mA
Oil flow control solenoid valve current	OCV Current L	mA
AT/MT identification signal	AT Vehicle ID Signal	AT or MT
Test Mode Signal	Test Mode Signal	ON or OFF
Load switch signal	Electric Load Signal	ON or OFF
Ignition switch signal	Ignition Switch	ON or OFF
Neutral position switch signal	Neutral Position Switch	ON or OFF
Air conditioning switch signal	A/C Switch	ON or OFF

Subaru Select Monitor

ENGINE (DIAGNOSTIC)

Remarks	Display	Unit of measure
Air conditioning signal	A/C Compressor Signal	ON or OFF
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF
Knocking signal	Knocking Signal	ON or OFF
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF
Power steering switch signal	P/S Switch	ON or OFF
Engine torque control permission signal	Torque Permission Signal	ON or OFF
Rear oxygen sensor rich signal	Rear Oxygen Rich Signal	ON or OFF
Starter switch signal	Starter Switch	ON or OFF
Idle switch signal	Idle Switch	ON or OFF
Crankshaft position sensor signal	Crankshaft Position Sig.	ON or OFF
Camshaft position sensor signal	Camshaft Position Sig.	ON or OFF
Rear defogger switch signal	Rear Defogger SW	ON or OFF
Blower fan switch signal	Blower Fan SW	ON or OFF
Small light switch signal	Light Switch	ON or OFF
Tumble generated valve output signal	TGV Output	ON or OFF
Exhaust temperature signal	Exhaust Gas Temperature	°C
Estimated cumulative driving distance	Odd Meter	km
Roughness Monitor for #1 cylinder	Roughness Monitor #1	—
Roughness Monitor for #2 cylinder	Roughness Monitor #2	—
Roughness Monitor for #3 cylinder	Roughness Monitor #3	—
Roughness Monitor for #4 cylinder	Roughness Monitor #4	—
Wiper switch signal	Wiper Switch	ON or OFF
A/C middle pressure switch signal	A/C Mid pressure switch	ON or OFF
AT retard angle demand signal	Retard Signal from AT	ON or OFF
AT fuel cut demand signal	Fuel Cut Signal from AT	ON or OFF

NOTE:

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

5. READ CURRENT DATA FOR ENGINE (OBD MODE)

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

Description	Display	Unit of measure
Number of diagnosis code	Number of Diag. Code	—
Condition of malfunction indicator light	MI (MIL)	ON or OFF
Monitoring test of misfire	Misfire monitoring	Complete or incomplete
Monitoring test of fuel system	Fuel system monitoring	Complete or incomplete
Monitoring test of comprehensive component	Component monitoring	Complete or incomplete
Test of catalyst	Catalyst Diagnosis	Complete or incomplete
Test of heating-type catalyst	Heated catalyst	No support
Test of evaporative emission purge control system	Evaporative purge system	No support
Test of secondary air system	Secondary air system	No support
Test of air conditioning system refrigerant	A/C system refrigerant	No support
Test of oxygen sensor	Oxygen sensor	Complete or incomplete
Test of oxygen sensor heater	Oxygen Heater Diagnosis	Complete or incomplete
Test of EGR system	EGR system	No support

Subaru Select Monitor

ENGINE (DIAGNOSTIC)

Description	Display	Unit of measure
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—
Engine load data	Calculated load value	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg, kPa, inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition timing adv. #1	°
Intake air temperature signal	Intake Air Temp.	°C or °F
Amount of intake air	Mass Air Flow	g/s
Throttle position signal	Throttle Opening Angle	%
Rear oxygen sensor output signal	Oxygen Sensor #12	V
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%
On-board diagnostic system	OBD System	—
Rear oxygen sensor signal	Oxygen Sensor #11	—
Rear oxygen sensor signal	Oxygen Sensor #12	—
Malfunction indicator light illuminating process	Lighted MI Lamp History	—
A/F sensor output signal (voltage)	A/F sensor #11	V
A/F lambda signal	A/F sensor #11	—
A/F sensor lambda signal	A/F sensor #11	—
A/F sensor signal (power supply)	A/F sensor #11	mA

NOTE:

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

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

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

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

NOTE:

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

7. LED OPERATION MODE FOR ENGINE

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

Description	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is ON.
Test mode connector signal	Test Mode Signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral Position Switch	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is ON.
Air conditioning relay signal	A/C Compressor Signal	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF	When radiator main fan relay is in function.
Knocking signal	Knocking Signal	ON or OFF	When knocking signal is input.
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF	When radiator sub fan relay is in function.
Engine torque control permission signal	Torque Control Permission	ON or OFF	When engine torque control permission signal is entered.
Rear oxygen sensor rich signal	Rear O ₂ Rich Signal	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Starter switch signal	Starter Switch	ON or OFF	When starter switch signal is entered.
Idle switch signal	Idle Switch	ON or OFF	When idle switch signal is entered.
Crankshaft position sensor signal	Crankshaft Position Signal	ON or OFF	When crankshaft position sensor signal is input.
Camshaft position sensor signal	Camshaft Position Signal	ON or OFF	When camshaft position sensor signal is entered.
Power steering switch signal	P/S Switch	ON or OFF	When power steering switch is entered.
Rear defogger switch signal	Rear Defogger Switch	ON or OFF	When rear defogger switch is ON.
Blower fan switch signal	Blower Fan Switch	ON or OFF	When blower fan switch is ON.
Light switch signal	Light Switch	ON or OFF	When small light switch is ON.
Wiper switch signal	Wiper Switch	ON or OFF	When wiper switch is ON.
A/C middle pressure switch signal	A/C Mid Pressure Switch	ON or OFF	When A/C switch is ON.
AT retard angle demand signal	Retard Signal from AT	ON or OFF	When AT retard angle demand signal exists.
AT fuel cut demand signal	Fuel Cut Signal from AT	ON or OFF	When AT fuel cut demand signal exists.
AT/MT identification signal	AT Vehicle ID Signal	ON or OFF	For AT model
Tumble generated valve actuator signal	TGV Output	ON or OFF	When TGV actuator signal is output.
Tumble generated valve drive signal	TGV Drive	OPEN or CLOSE	When TGV moves and valve opens.

NOTE:

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

Subaru Select Monitor

ENGINE (DIAGNOSTIC)

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 displayed the information of transmission type.
- 4) On the «Transmission Diagnosis» screen, select the {Current Data Display/Save}, and then press the [YES] key.
- 5) On the «Data Display Menu» screen, select the {Data Display} and press the [YES] key.
- 6) Using the scroll key, move the display screen up or down until the desired data is shown.
 - A list of the support data is shown in the following table.

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
Mass air flow sensor signal	Air Flow Sensor Voltage	V
Throttle position signal	Throttle Sensor Voltage	V
Gear Position	Gear position	—
Line pressure control duty ratio	Line Pressure Duty Ratio	%
Lock up clutch control duty ratio	Lock Up Duty Ratio	%
Transfer clutch control duty ratio	Transfer Duty Ratio	%
Throttle position sensor power supply	Throttle Sensor Power	V
Turbine revolution signal	Turbine Revolution Speed	rpm
2-4 Brake timing pressure control duty ratio	Brake Clutch Duty Ratio	%
Stop light switch signal	Stop Light Switch	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 Signal	ON or OFF
Reverse range signal	R Range Signal	ON or OFF
Drive range signal	D Range Signal	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 Signal #1	ON or OFF
Torque control output signal #2	Torque Control Signal #2	ON or OFF
Torque control cut signal	Torque Control Cut Sig.	ON or OFF
2-4 brake timing control solenoid valve	2-4 Brake Timing Sol.	ON or OFF
Low clutch timing control solenoid valve	Low Clutch Timing Sol.	ON or OFF
Automatic transmission diagnosis indicator lamp	Diagnosis Lamp	ON or OFF

NOTE:

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

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 DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).>

2. SUBARU SELECT MONITOR (OBD MODE)

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

NOTE:

- For detailed operation procedure, refer to the “SUBARU SELECT MONITOR OPERATION MANUAL”.
- For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).>

3. OBD-II GENERAL SCAN TOOL

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

For details concerning DTCs, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).>

NOTE:

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

Inspection Mode

ENGINE (DIAGNOSTIC)

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(H4DOTC)-45, Drive Cycle.>

DTC	Item	On condition
P0011	A Camshaft Position-Timing Over-Advanced or System Performance (Bank 1)	—
P0021	A Camshaft Position-Timing Over-Advanced or System Performance (Bank 2)	—
P0031	HO2S Sensor Circuit Low Voltage (Bank 1 Sensor 1)	—
P0032	HO2S Sensor Circuit High Voltage (Bank 1 Sensor 1)	—
P0037	HO2S Sensor Circuit Low Voltage (Bank 1 Sensor 2)	—
P0038	HO2S Sensor Circuit High Voltage (Bank 1 Sensor 2)	—
P0102	Mass or Volume Air Flow Circuit Low Input	—
P0103	Mass or Volume Air Flow Circuit High Input	—
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input	—
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input	—
P0112	Intake Air Temperature Circuit Low Input	—
P0113	Manifold Absolute Pressure/Barometric Pressure 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	—
P0130	O ₂ Sensor Circuit (Bank 1 Sensor 1)	—
P0131	O ₂ Sensor Circuit Low Voltage (Bank 1 Sensor 1)	—
P0132	O ₂ Sensor Circuit High Voltage (Bank 1 Sensor 1)	—
P0134	O ₂ Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	—
P0137	O ₂ Sensor Circuit Low Voltage (Bank 1 Sensor 2)	—
P0138	O ₂ Sensor Circuit High Voltage (Bank 1 Sensor 2)	—
P0171	System Too Lean (Bank 1)	—
P0172	System Too Rich (Bank 1)	—
P0230	Fuel Pump Primary Circuit	—
P0245	Turbo/Super Charger Wastegate Solenoid “A” Low	—
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	—
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)	—
P0335	Crankshaft Position Sensor “A” Circuit	—
P0336	Crankshaft Position Sensor “A” Circuit Range/Performance	—
P0340	Camshaft Position Sensor “A” Circuit (Bank 1 or Single Sensor)	—
P0341	Camshaft Position Sensor “A” Circuit Range/Performance (Bank 1 or Single Sensor)	—
P0365	Camshaft Position Sensor “B” Circuit (Bank 1)	—
P0390	Camshaft Position Sensor “B” Circuit (Bank 2)	—
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	—
P0509	Idle Control System Circuit High	—
P0512	Starter Request Circuit	—
P0513	Incorrect Immobilizer Key	—
P0519	Idle Control System Malfunction (Fail-Safe)	—

Inspection Mode

ENGINE (DIAGNOSTIC)

DTC	Item	On condition
P0545	Exhaust Gas Temperature Sensor Circuit Low - Bank 1	—
P0558	Generator Circuit Low Input	—
P0559	Generator Circuit High Input	—
P0565	Cruise Control On Signal	—
P0600	Serial Communication Link	—
P0604	Internal Control Module Random Access Memory (RAM) Error	—
P0691	Cooling Fan 1 Control Circuit Low	—
P0692	Cooling Fan 1 Control Circuit High	—
P0700	Transmission Control System (MIL Request)	—
P0851	Neutral Switch Input Circuit Low	—
P0852	Neutral Switch Input Circuit High	—
P1086	Tumble Generated Valve Position Sensor 2 Circuit Low	—
P1087	Tumble Generated Valve Position Sensor 2 Circuit High	—
P1088	Tumble Generated Valve Position Sensor 1 Circuit Low	—
P1089	Tumble Generated Valve Position Sensor 1 Circuit High	—
P1091	Tumble Generated Valve System 1 (Valve Close)	—
P1093	Tumble Generated Valve System 2 (Valve Close)	—
P1094	Tumble Generated Valve Signal 1 Circuit Malfunction (Open)	—
P1095	Tumble Generated Valve Signal 1 Circuit Malfunction (Short)	—
P1096	Tumble Generated Valve Signal 2 Circuit Malfunction (Open)	—
P1097	Tumble Generated Valve Signal 2 Circuit Malfunction (Short)	—
P1110	Atmospheric Pressure Sensor Circuit Malfunction (Low Input)	—
P1111	Atmospheric Pressure Sensor Circuit Malfunction (High Input)	—
P1152	O ₂ Sensor Circuit Range/Performance (Low) (Bank 1 Sensor 1)	—
P1153	O ₂ Sensor Circuit Range/Performance (High) (Bank 1 Sensor 1)	—
P1306	OCV Solenoid Valve Signal 1 Circuit Malfunction (Open)	—
P1307	OCV Solenoid Valve Signal 1 Circuit Malfunction (Short)	—
P1308	OCV Solenoid Valve Signal 2 Circuit Malfunction (Open)	—
P1309	OCV Solenoid Valve Signal 2 Circuit Malfunction (Short)	—
P1518	Starter Switch Circuit Low Input	—
P1544	Exhaust Gas Temperature Too High	—
P1560	Back-Up Voltage Circuit Malfunction	—
P1570	ANTENNA	—
P1571	Reference Code Incompatibility	—
P1572	IMM Circuit Failure (Except Antenna Circuit)	—
P1574	Key Communication Failure	—
P1576	EGI Control Module EEPROM	—
P1577	IMM Control Module EEPROM	—

Inspection Mode

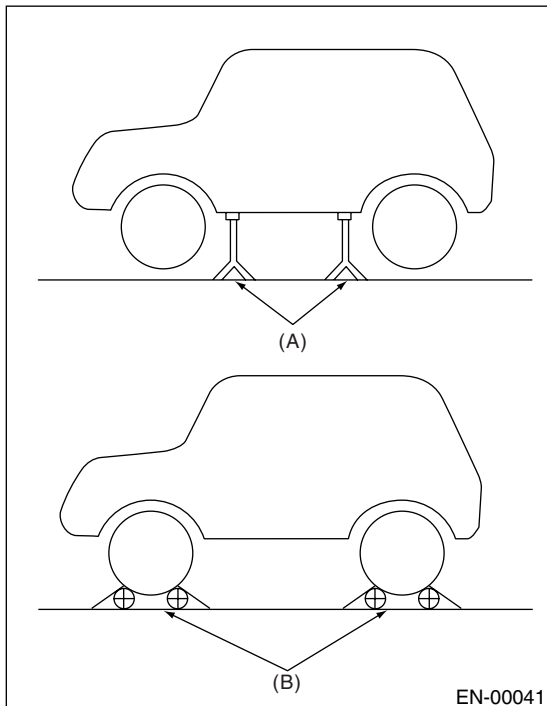
ENGINE (DIAGNOSTIC)

1. PREPARATION FOR THE INSPECTION MODE

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

WARNING:

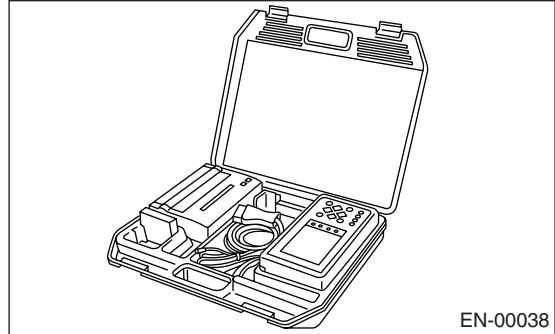
- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a rigid rack.
- Secure a rope or wire to the front or rear towing hooks to prevent the lateral runout of front wheels.
- Do not abruptly depress/release clutch pedal or accelerator pedal during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



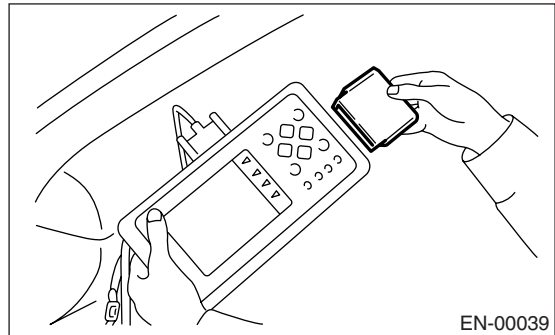
- (A) Rigid rack
(B) Free rollers

2. SUBARU SELECT MONITOR

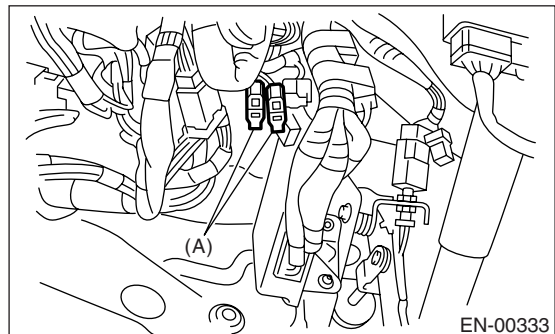
- 1) After clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4DOTC)-47, Clear Memory Mode.>
- 2) Idle the engine.
- 3) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)-8, PREPARATION TOOL, General Description.>



- 4) Connect the diagnosis cable to Subaru Select Monitor.
- 5) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC)-8, PREPARATION TOOL, General Description.>



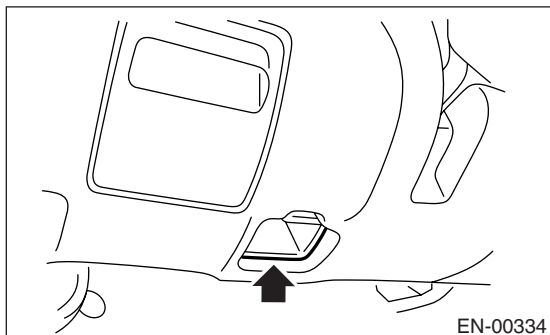
- 6) Connect the test mode connector (A) located at the lower portion of instrument panel (on the driver's side).



- (A) Test mode connector

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).

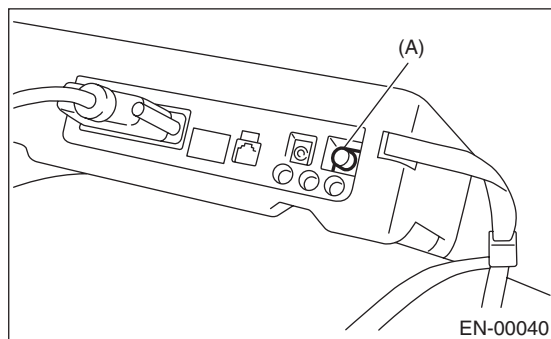


(2) Connect the diagnosis cable to data link connector.

CAUTION:

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

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



(A) Power switch

9) On the «Main Menu» display screen, select the {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(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).>

- Release the parking brake.

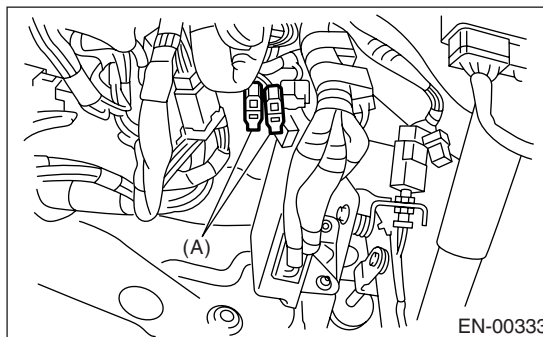
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis function.

3. OBD-II GENERAL SCAN TOOL

1) After performing the diagnostics and clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4DOTC)-47, Clear Memory Mode.>

2) Idle the engine.

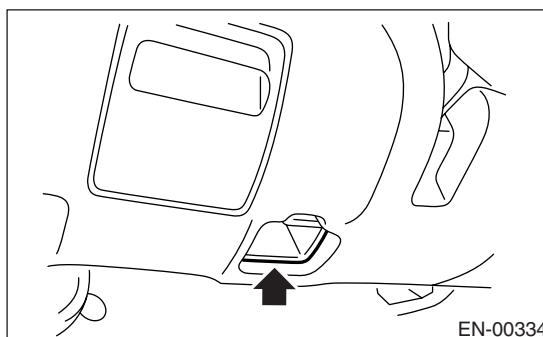
3) Connect the test mode connector (A) located at the lower portion of instrument panel (on the driver's side).



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

CAUTION:

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



Inspection Mode

ENGINE (DIAGNOSTIC)

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 function.

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(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).>

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) After performing the diagnostics and clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(H4DOTC)-47, 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 * and after the completion of first diagnosis, stop the engine and perform the second diagnosis in the same condition.

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

DTC	Item	On condition
*P0125	Insufficient Coolant Temperature For Closed Loop Fuel Control	Engine coolant temperature at start is less than 20°C (68°F)
*P0133	O ₂ 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	—
P0546	Exhaust Gas Temperature Sensor Circuit High - Bank 1	—
P1312	Exhaust Gas Temperature Sensor Malfunction	Engine coolant temperature at start is less than 30°C (86°F)

3. 10 MINUTES IDLING

NOTE:

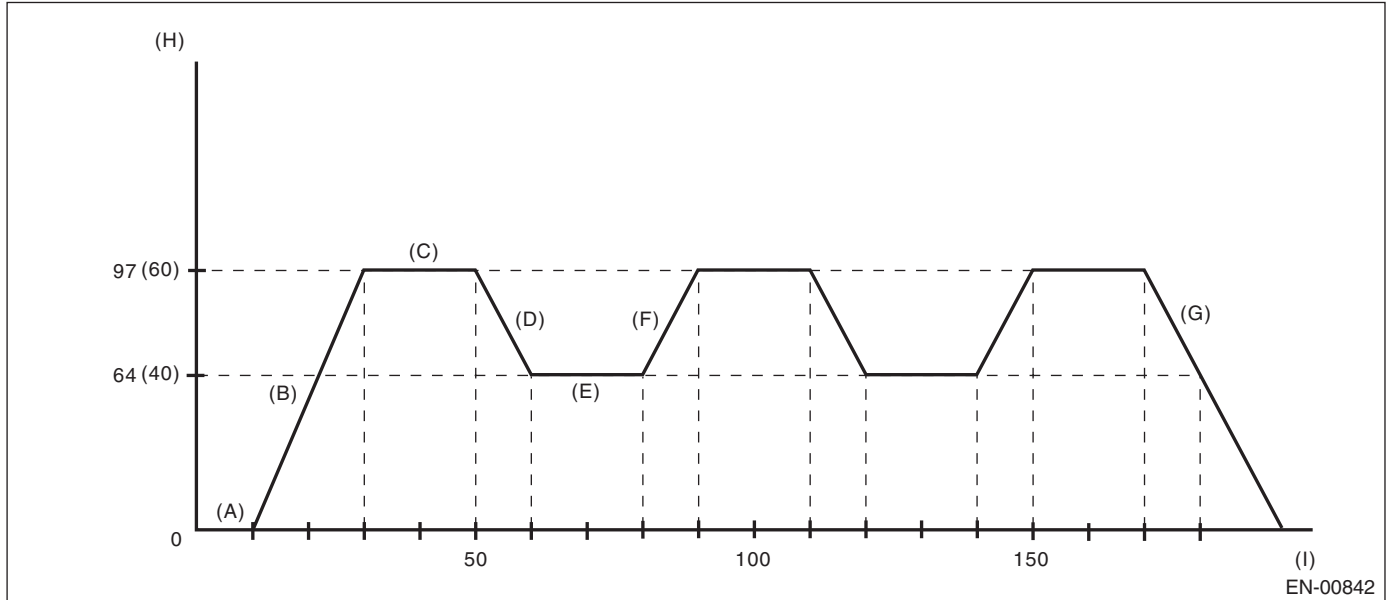
Drive the vehicle more than 10 km/h (6 MPH) before diagnosis.

DTC	Item	On condition
P0111	Intake Air Temperature Circuit Range/Performance	—
P0464	Fuel Level Sensor Circuit Intermittent	—
P0508	Idle Control System Circuit Low	—
*P0483	Cooling Fan Rationality Check	—
*P0506	Idle Control System RPM Lower Than Expected	—
*P0507	Idle Control System RPM Higher Than Expected	—

Drive Cycle

ENGINE (DIAGNOSTIC)

4. DRIVE THE VEHICLE WITH FOLLOWING DRIVE PATTERNS



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

DTC	Item	On condition
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	—
P0068	Manifold Pressure Sensor Range/Performance	—
P0246	Turbo/Super Charger Wastegate Solenoid "A" High	—
P1090	Tumble Generated Valve System 1 (Valve Open)	Engine coolant temperature at start is $-5 - 5^{\circ}\text{C}$ ($-41 - 41^{\circ}\text{F}$)
P1092	Tumble Generated Valve System 2 (Valve Open)	Engine coolant temperature at start is $-5 - 5^{\circ}\text{C}$ ($-41 - 41^{\circ}\text{F}$)
*P0121	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	—
*P0139	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 2)	—
*P0301	Cylinder 1 Misfire Detected	Diagnosis may be completed at once
*P0302	Cylinder 2 Misfire Detected	Diagnosis may be completed at once
*P0303	Cylinder 3 Misfire Detected	Diagnosis may be completed at once
*P0304	Cylinder 4 Misfire Detected	Diagnosis may be completed at once
*P0101	Mass or Volume Air Flow Circuit Range/Performance	—
P0244	Turbo/Super Charger Wastegate Solenoid "A" Range/Performance	—
P1301	Misfire Detected (High Temperature Exhaust Gas)	—

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” are shown on the display screen, turn the Subaru Select Monitor to OFF after turning the ignition switch to OFF.

NOTE:

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

2. SUBARU SELECT MONITOR (OBD MODE)

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

NOTE:

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

3. OBD-II GENERAL SCAN TOOL

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

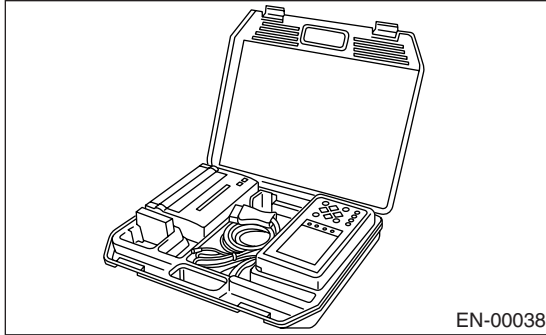
Compulsory Valve Operation Check Mode

ENGINE (DIAGNOSTIC)

15. Compulsory Valve Operation Check Mode

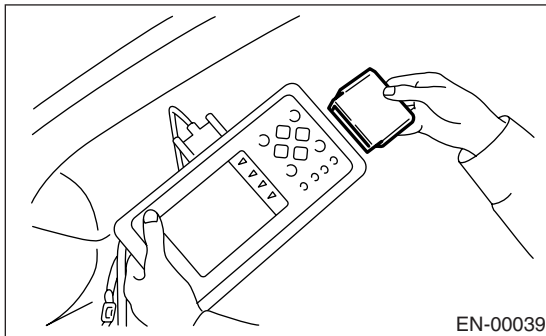
A: OPERATION

1) Prepare the Subaru Select Monitor kit. <Ref. to EN(H4DOTC)-8, PREPARATION TOOL, General Description.>

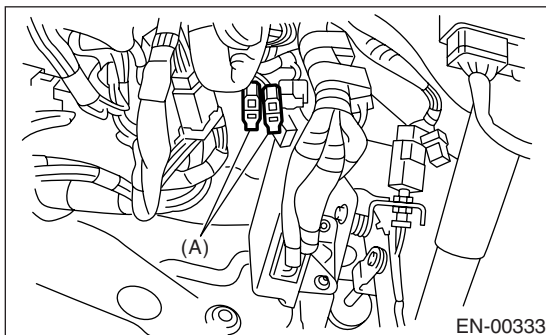


2) Connect the diagnosis cable to Subaru Select Monitor.

3) Insert the cartridge to Subaru Select Monitor. <Ref. to EN(H4DOTC)-8, PREPARATION TOOL, General Description.>

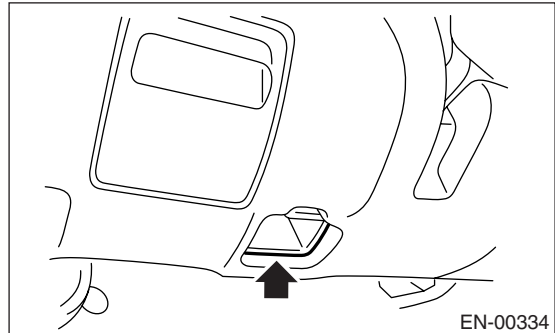


4) Connect the test mode connector (A) located at the lower portion of instrument panel (on the driver's side).



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

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

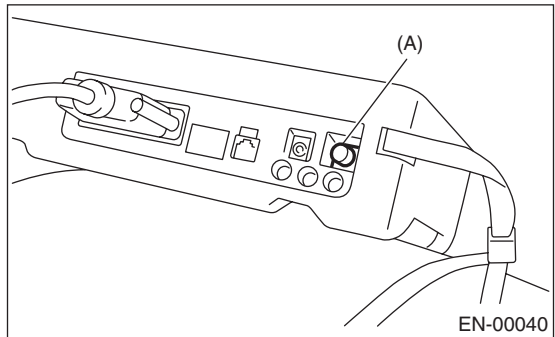


(2) Connect the diagnosis cable to data link connector.

CAUTION:

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

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



(A) Power switch

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

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

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

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

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

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

Compulsory Valve Operation Check Mode

ENGINE (DIAGNOSTIC)

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

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

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

NOTE:

- The following parts will be displayed but not functional.

Display
EGR Solenoid
ASV Solenoid
PCV Solenoid
Vent Control Solenoid
FICD Solenoid
Pressure Switching Solenoid1
Pressure Switching Solenoid2
EXH. Bypass Control Permit Flag
AAI Solenoid
Atmospheric pressure switching solenoid

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

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

16. Malfunction Indicator Light

A: PROCEDURE

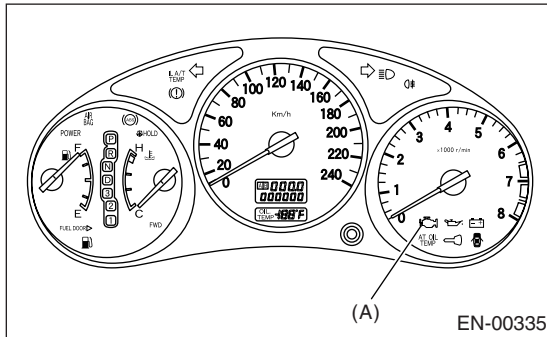
1. Activation of malfunction indicator light. <Ref. to EN(H4DOTC)-51, ACTIVATION OF MALFUNCTION INDICATOR LIGHT, Malfunction Indicator Light.>
↓
2. Check that the malfunction indicator light does not come on. <Ref. to EN(H4DOTC)-52, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
↓
3. Check that the malfunction indicator light does not go off. <Ref. to EN(H4DOTC)-54, MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF, Malfunction Indicator Light.>
↓
4. Malfunction indicator light does not blink at a cycle of 3 Hz. <Ref. to EN(H4DOTC)-55, MALFUNCTION INDICATOR LIGHT DOES NOT BLINK AT A CYCLE OF 3 HZ, Malfunction Indicator Light.>
↓
5. Malfunction indicator light remains blinking at a cycle of 3 Hz. <Ref. to EN(H4DOTC)-57, MALFUNCTION INDICATOR LIGHT REMAINS BLINKING AT A CYCLE OF 3 HZ, Malfunction Indicator Light.>

B: ACTIVATION OF MALFUNCTION INDICATOR LIGHT

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

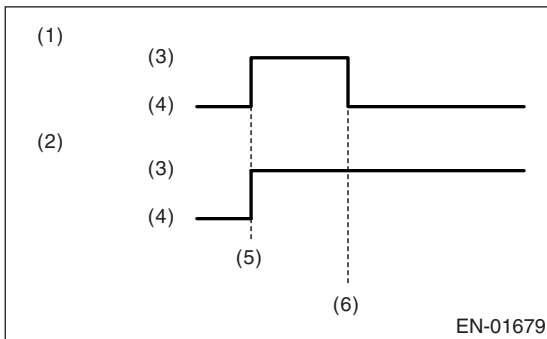
NOTE:

If the malfunction indicator light does not illuminate, perform the diagnosis of malfunction indicator light circuit or the combination meter circuit. <Ref. to EN(H4DOTC)-52, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>



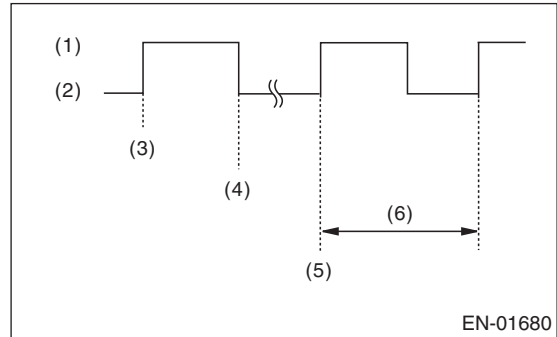
(A) Malfunction indicator light

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.



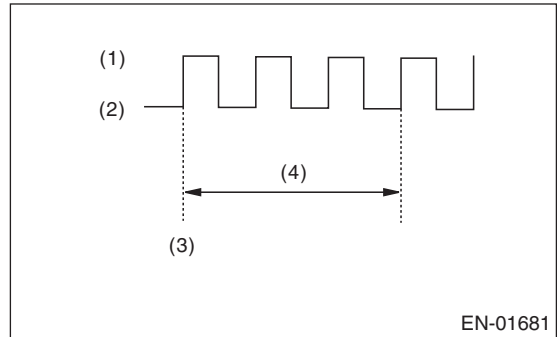
- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

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



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

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



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

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

C: MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

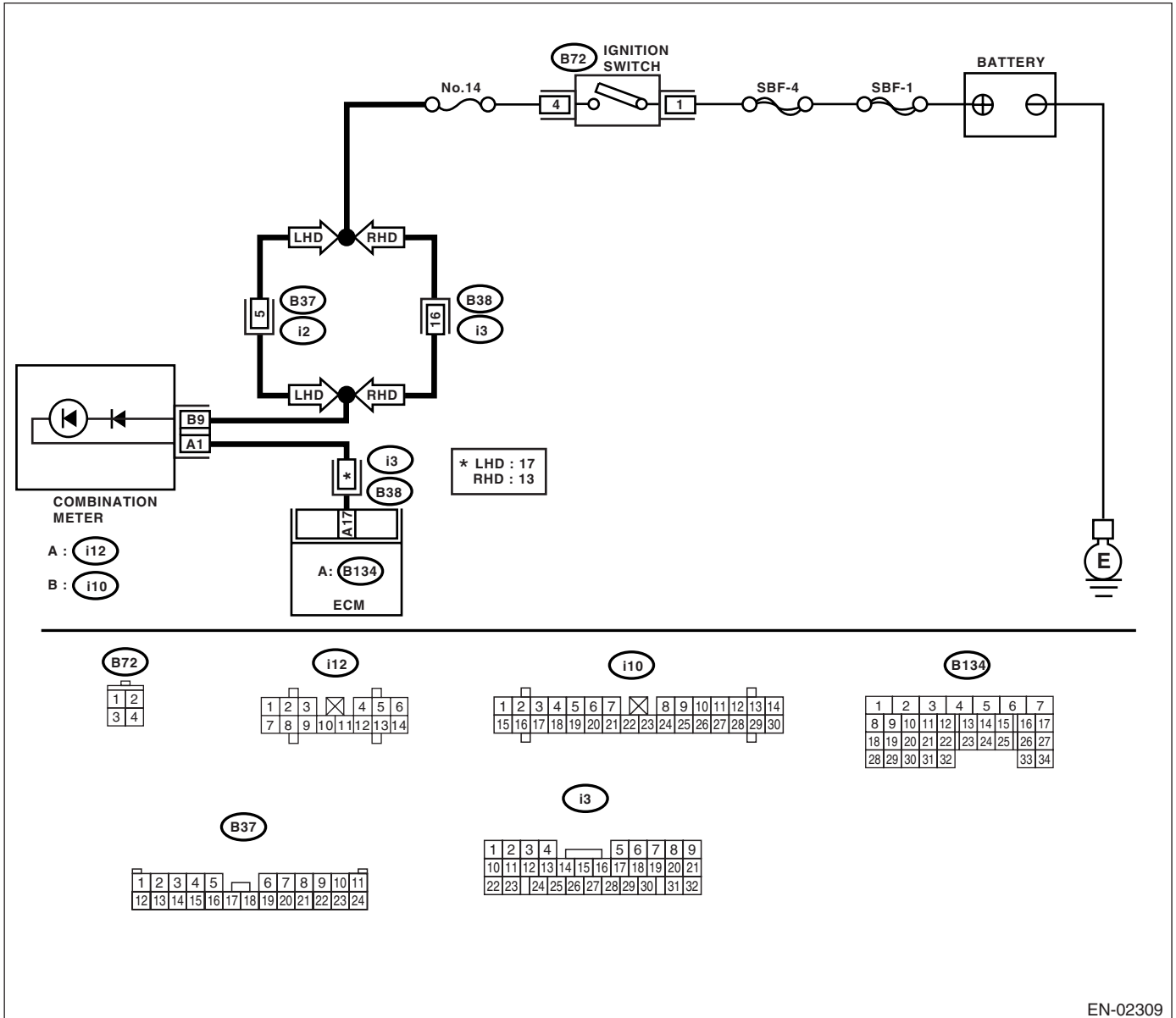
DIAGNOSIS:

The malfunction indicator light circuit is open or shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 CHECK OUTPUT SIGNAL FROM ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B134) No. 17 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Go to step 4.	Go to step 2.
2 CHECK POOR CONTACT.	Does the malfunction indicator light come on when shaking or pulling the ECM connector and harness?	Repair the poor contact in ECM connector.	Go to step 3.
3 CHECK ECM CONNECTOR.	Is the ECM connector correctly connected?	Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).>	Repair the connection of ECM connector.
4 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 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. Connector & terminal (B134) No. 17 — (i12) No. 1:	Is the resistance less than 1 Ω ?	Go to step 5.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and combination meter connector • Poor contact in coupling connector
5 CHECK POOR CONTACT. 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.
6 CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR. 1) Turn the ignition switch to ON. 2) Measure the voltage between combination meter connector and chassis ground. Connector & terminal (i10) No. 9 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Replace the board of combination meter. <Ref. to IDI-10, Combination Meter Assembly.>	Check the following and repair if necessary. NOTE: <ul style="list-style-type: none"> • Blown out of fuse (No. 14) • Open or short circuit in harness between fuse (No. 14) and battery terminal • Poor contact in ignition switch connector

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

D: MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

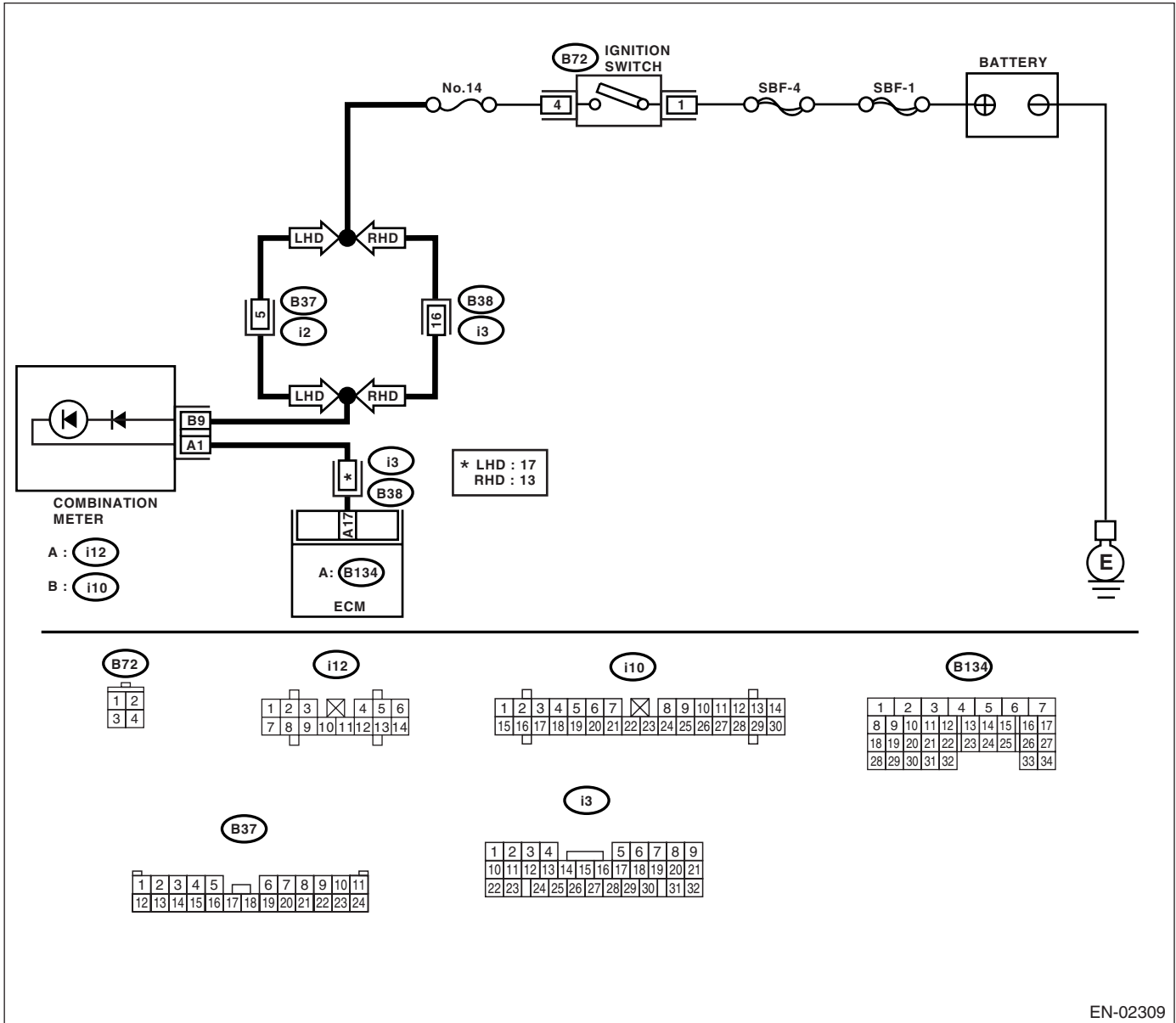
DIAGNOSIS:

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 or OBD-II general scan tool display.

WIRING DIAGRAM:



Step	Check	Yes	No	
1	CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 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(H4DOTC)-50, Engine Control Module (ECM).>

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

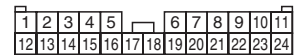
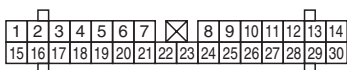
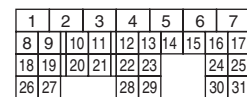
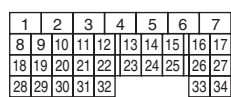
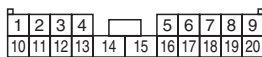
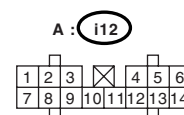
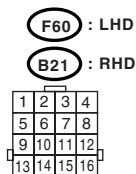
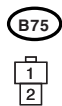
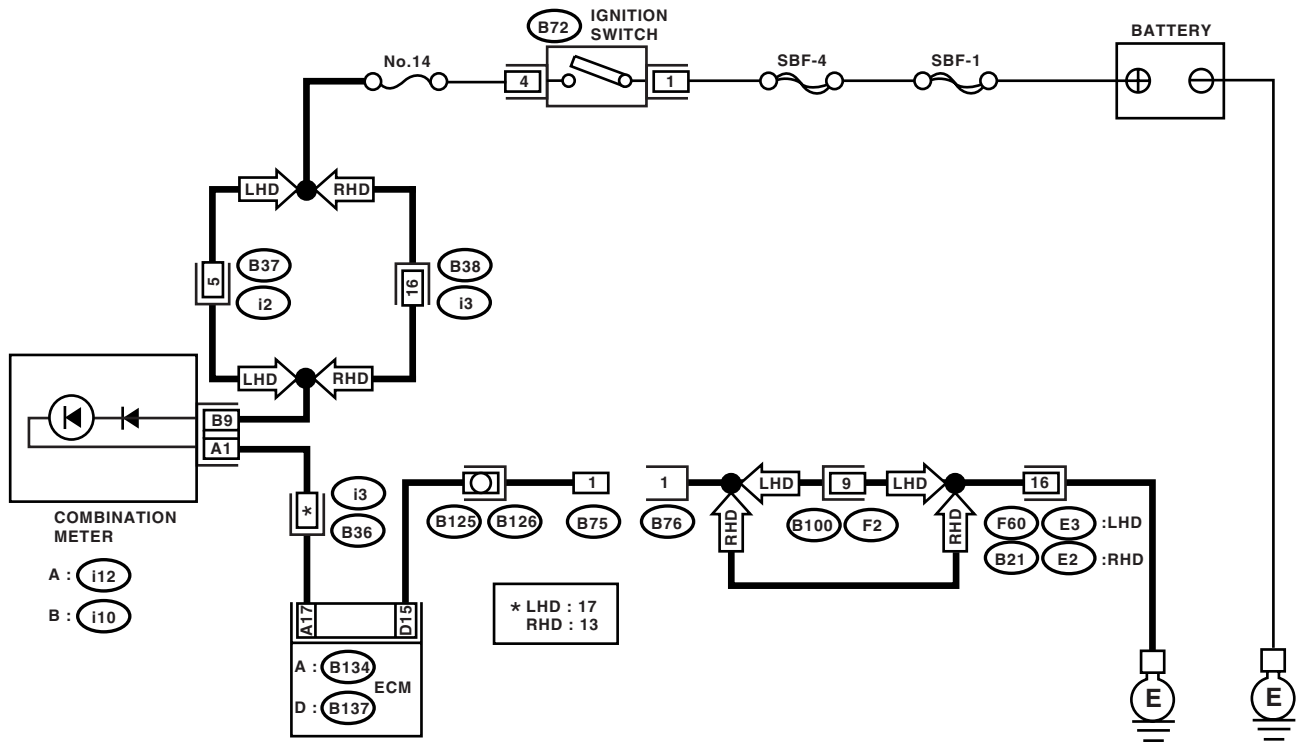
E: MALFUNCTION INDICATOR LIGHT DOES NOT BLINK AT A CYCLE OF 3 Hz DIAGNOSIS:

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

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



EN-02310

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 CHECK STATUS OF MALFUNCTION INDICATOR LIGHT. 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connectors 3) Turn the ignition switch to ON.(engine OFF)	Does malfunction indicator light illuminate?	Go to step 2.	Repair the malfunction indicator light circuit. <Ref. to EN(H4DOTC)-52, MALFUNCTION INDICATOR LIGHT DOES NOT COME ON, Malfunction Indicator Light.>
2 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON.	Does malfunction indicator light illuminate?	Repair ground short circuit in harness between combination meter and ECM connector.	Go to step 3.
3 CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND CHASSIS GROUND. 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 & terminal (B76) No. 1 — Chassis ground:</i>	Is the resistance less than 1 Ω ?	Go to step 4.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • Open circuit in harness between test mode connector and chassis ground
4 CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Go to step 5.
5 CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR. 1) Connect the test mode connector. 2) Measure the resistance of harness between ECM and chassis ground. <i>Connector & terminal (B137) No. 15 — Chassis ground:</i>	Is the resistance less than 1 Ω ?	Go to step 6.	Repair open circuit in harness between ECM and test mode connector.
6 CHECK POOR CONTACT. Check poor contact in ECM connector.	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).>

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

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

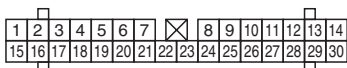
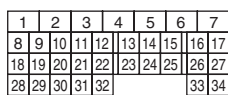
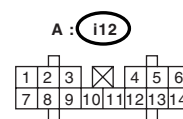
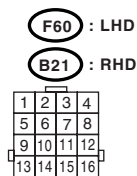
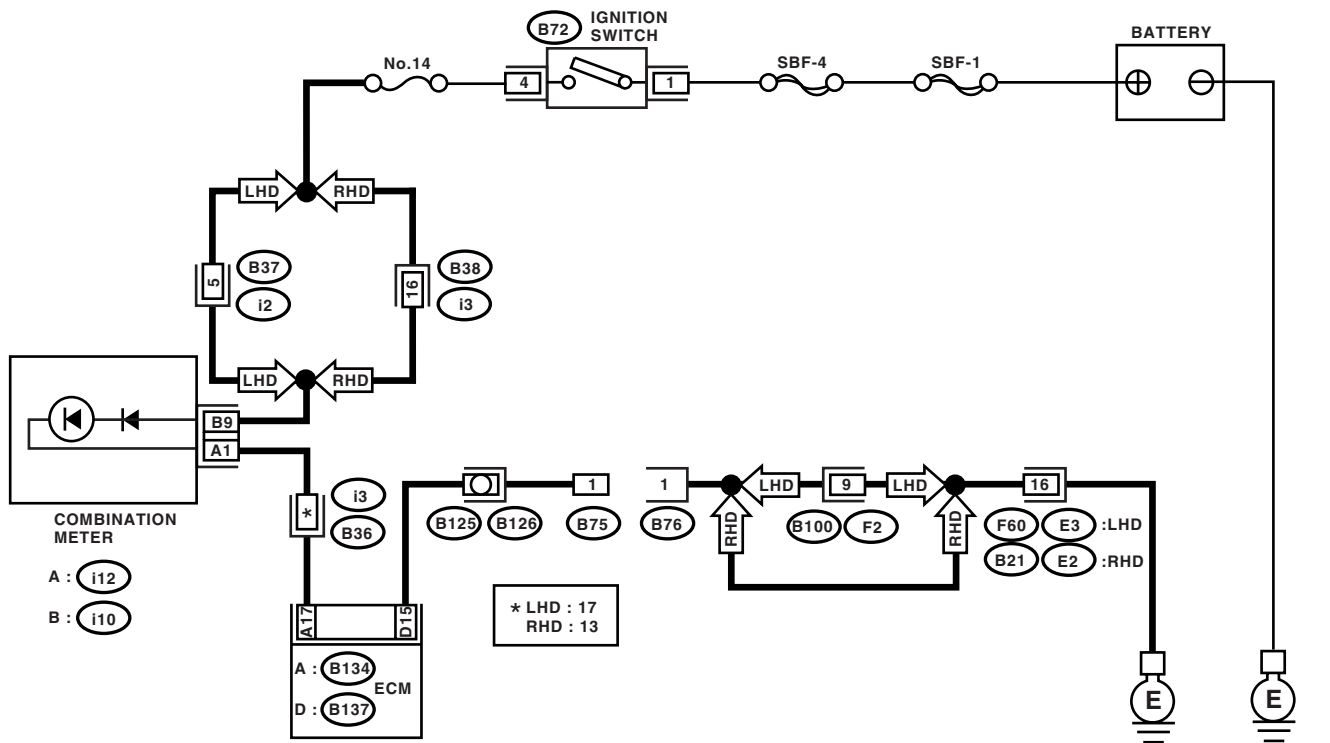
DIAGNOSIS:

Test mode connector circuit is shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



EN-02310

Malfunction Indicator Light

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 CHECK TEST MODE CONNECTOR. 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.
2 CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUND TERMINAL. 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. Connector & terminal (B137) No. 15 — Chassis ground:	Is the resistance less than 5 Ω ?	Repair the short circuit in harness between ECM and test mode connector.	Replace the ECM. <Ref. to FU(H4DOTC)-50, Engine Control Module (ECM).>

17. Diagnostics for Engine Starting Failure

A: PROCEDURE

1. Inspection of starter motor circuit. <Ref. to EN(H4DOTC)-60, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
2. Inspection of ECM power supply and ground line. <Ref. to EN(H4DOTC)-62, CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM), Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ignition control system. <Ref. to EN(H4DOTC)-65, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
4. Inspection of fuel pump circuit. <Ref. to EN(H4DOTC)-69, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel injector circuit. <Ref. to EN(H4DOTC)-71, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

Diagnostics for Engine Starting Failure

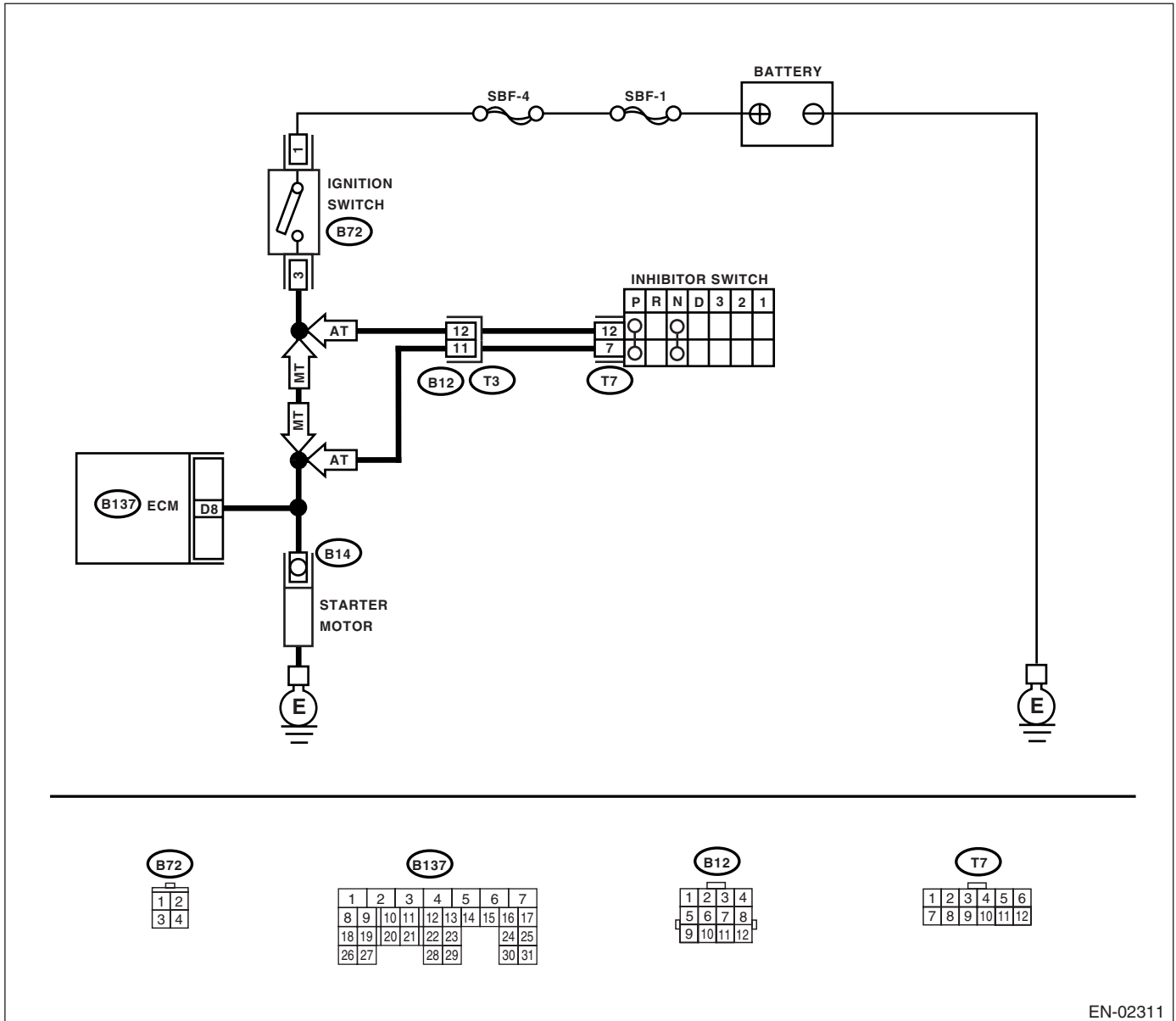
ENGINE (DIAGNOSTIC)

B: STARTER MOTOR CIRCUIT

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-40, Inspection Mode.>.

WIRING DIAGRAM:



EN-02311

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1	CHECK OPERATION OF STARTER MOTOR.	Does the starter motor operate?	Go to step 2. Go to step 3.
2	CHECK DTC.	Is DTC displayed? <Ref. to EN(H4DOTC)-39, OPERATION, Read Diagnostic Trouble Code (DTC).>	Inspect the relevant DTC using List of Diagnostic Trouble Code (DTC). <Ref. to EN(H4DOTC)-74, List of Diagnostic Trouble Code (DTC).> Go to step 3.
3	CHECK INPUT SIGNAL FOR STARTER MOTOR. 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. Connector & terminal (B14) No. 1 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 4. Go to step 5.
4	CHECK GROUND CIRCUIT OF STARTER MOTOR. 1) Turn the ignition switch to OFF. 2) 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.
5	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition switch. 3) Measure the power supply voltage between ignition switch connector and chassis ground. Connector & terminal (B72) No. 1 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 6. Check the following and repair if necessary. • Brown out fuse • Open circuit in harness between ignition switch and battery.
6	CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR. 1) Connect the connector to ignition switch. 2) Turn the ignition switch to START. 3) Measure the voltage between ignition switch and chassis ground. Connector & terminal (B72) No. 3 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Repair open circuit between ignition switch and starter motor circuit. Go to step 7.
7	CHECK POOR CONTACT. Check poor contact in ignition switch connector.	Is there poor contact in ignition switch connector?	Repair poor contact in ignition switch connector. Replace the ignition switch.

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

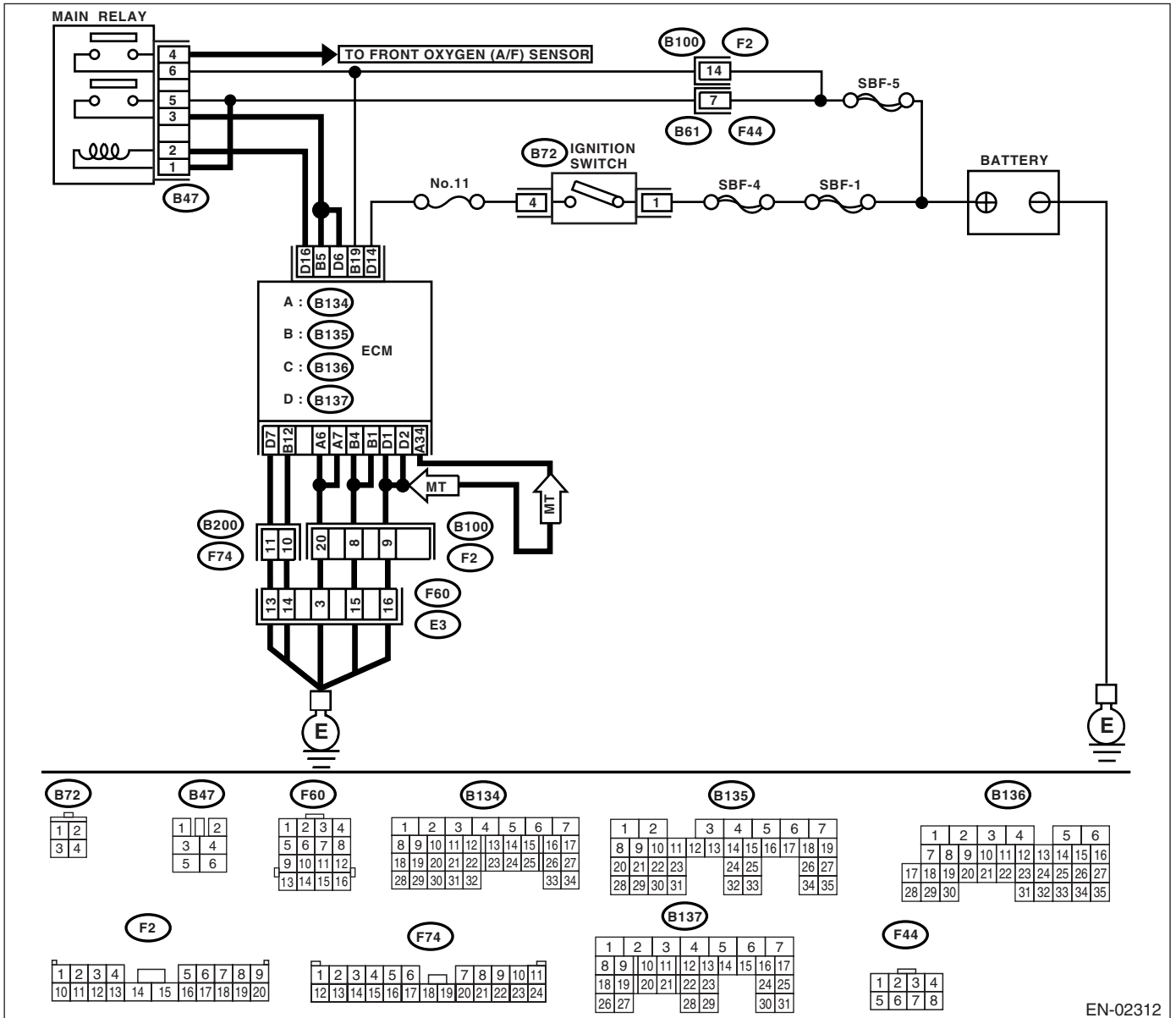
C: CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-40, Inspection Mode.>

WIRING DIAGRAM:

- LHD model

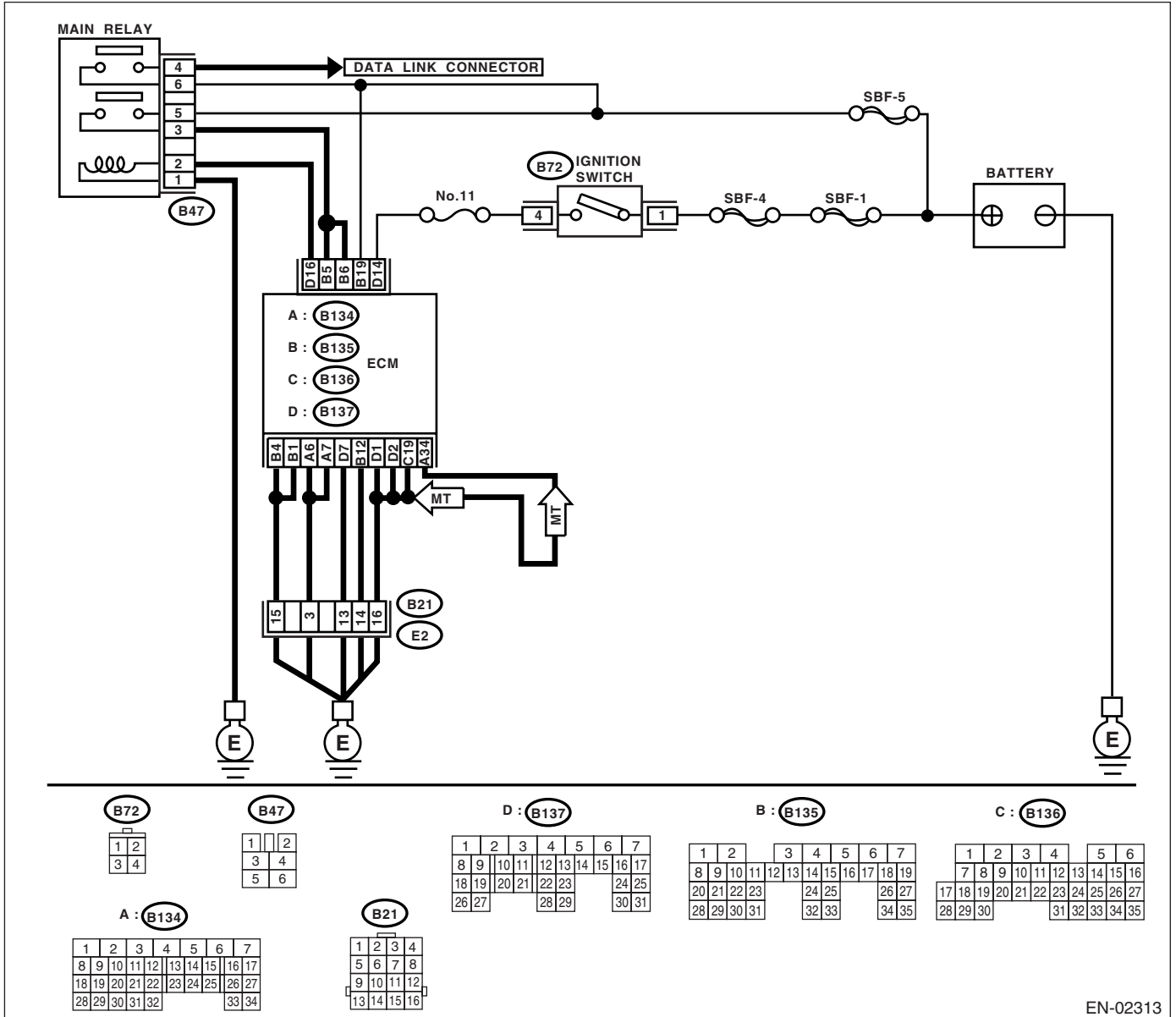


EN-02312

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

- RHD model



EN-02313

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 CHECK MAIN RELAY. 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. Terminals No. 3 — No. 5: No. 4 — No. 6:	Is the resistance less than 10 Ω ?	Go to step 2.	Replace the main relay.
2 CHECK GROUND CIRCUIT FOR ECM. 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and chassis ground. Connector & terminal (B134) No. 6 — Chassis ground: (B134) No. 7 — Chassis ground: (B134) No. 34 — Chassis ground: (B135) No. 1 — Chassis ground: (B135) No. 12 — Chassis ground: (B137) No. 1 — Chassis ground: (B137) No. 2 — Chassis ground: (B137) No. 7 — Chassis ground: (B134) No. 34 — Chassis ground: (MT model)	Is the resistance less than 5 Ω ?	Go to step 3.	Repair open circuit in harness between ECM connector and engine ground terminal.
3 CHECK INPUT VOLTAGE OF ECM. Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 19 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair open or ground short circuit of power supply circuit.
4 CHECK INPUT VOLTAGE OF ECM. 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B137) No. 14 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 5.	Repair open or ground short circuit of power supply circuit.
5 CHECK INPUT VOLTAGE OF MAIN RELAY. Measure the voltage between main relay connector and chassis ground. Connector & terminal (B47) No. 1 (+) — Chassis ground (-): (B47) No. 5 (+) — Chassis ground (-): (B47) No. 6 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Go to step 6.	Repair open or ground short circuit of power supply circuit.
6 CHECK INPUT VOLTAGE OF ECM. 1) Connect the main relay and ECM connector. 2) Turn the ignition switch to ON. 3) Measure the voltage between ECM connector and chassis ground. Connector & terminal (B135) No. 5 (+) — Chassis ground (-): (B135) No. 6 (+) — Chassis ground (-): (B137) No. 16 (+) — Chassis ground (-):	Is the voltage more than 10 V?	Check ignition control system. <Ref. to EN(H4DOTC)-65, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair open or ground short circuit in harness between ECM connector and main relay connector.

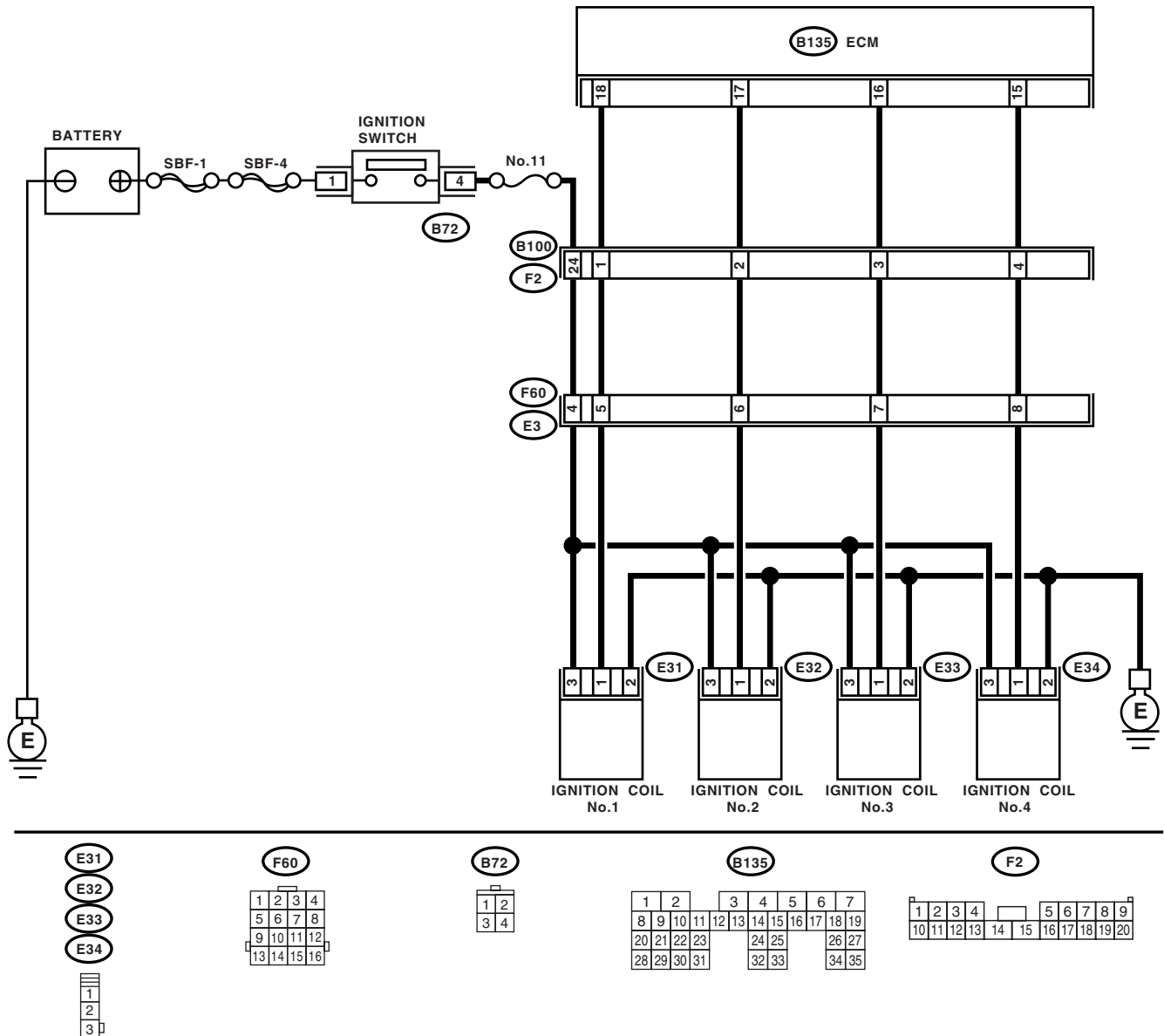
D: IGNITION CONTROL SYSTEM

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-40, Inspection Mode.>.

WIRING DIAGRAM:

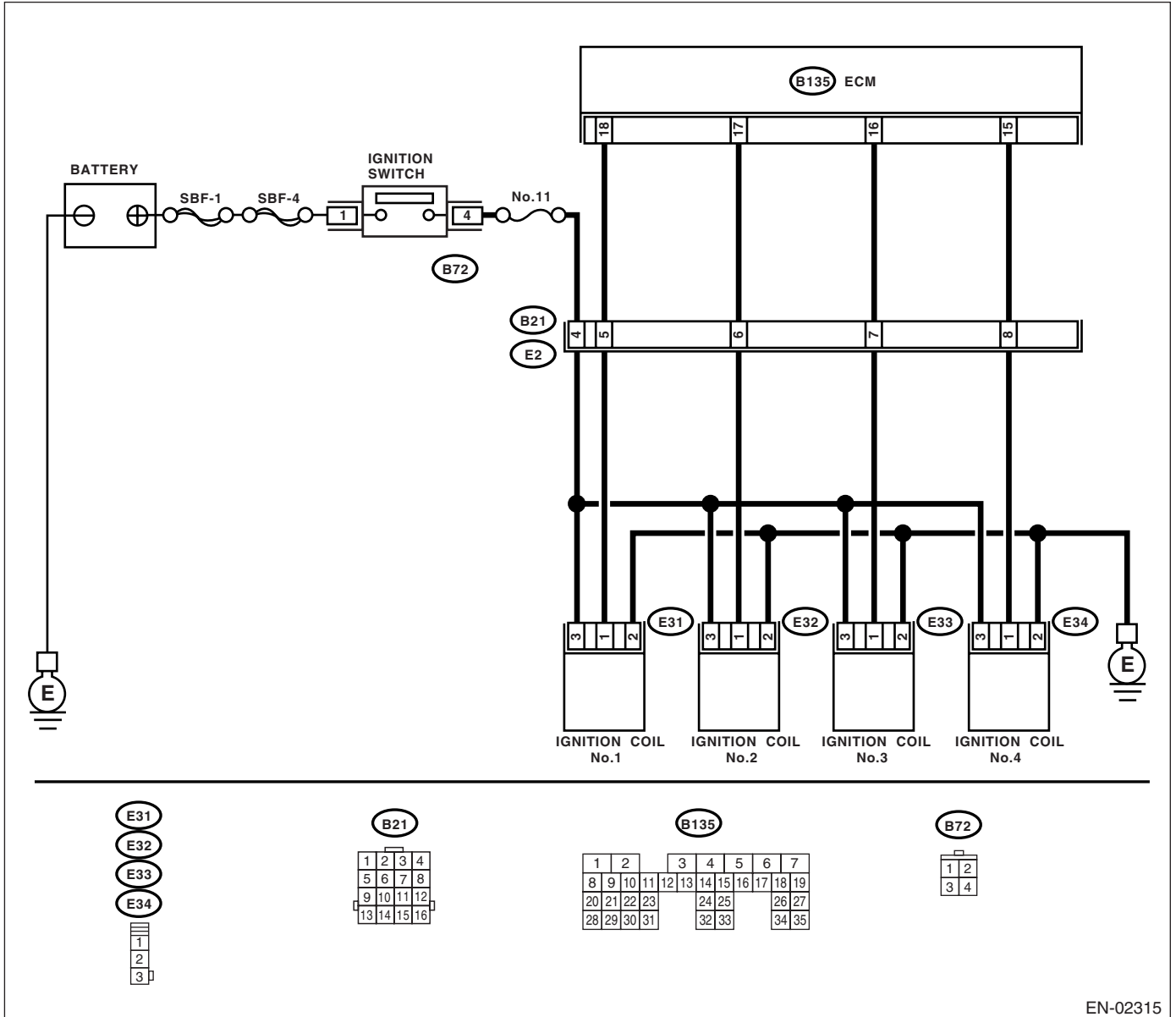
- LHD model



Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

- RHD model



EN-02315

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
1 CHECK SPARK PLUG CONDITION. 1) Remove the spark plug. <Ref. to IG(H4DOTC)-5, REMOVAL, Spark Plug.> 2) Check the spark plug condition. <Ref. to IG(H4DOTC)-6, INSPECTION, Spark Plug.>	Is the spark plug's status OK?	Go to step 2.	Replace the spark plug.
2 CHECK IGNITION SYSTEM FOR SPARKS. 1) Connect the spark plug to ignition coil. 2) Release the fuel pressure. <Ref. to FU(H4DOTC)-54, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.> 3) Contact the spark plug's thread portion on engine. 4) While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.	Does spark occur at each cylinder?	Check fuel pump system. <Ref. to EN(H4DOTC)-69, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 3.
3 CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL & IGNITOR ASSY. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ignition coil & ignitor ASSY. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between ignition coil & ignitor ASSY connector and engine ground. <i>Connector & terminal</i> (E31) No. 3 (+) — Engine ground (-): (E32) No. 3 (+) — Engine ground (-): (E33) No. 3 (+) — Engine ground (-): (E34) No. 3 (+) — Engine ground (-):	Is the voltage more than 10 V?	Go to step 4.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ignition coil & ignitor ASSY, and ignition switch connector • Poor contact in coupling connector
4 CHECK HARNESS OF IGNITION COIL & IGNITOR ASSY GROUND CIRCUIT. 1) Turn the ignition switch to OFF. 2) Measure the resistance between ignition coil & ignitor ASSY connector and engine ground. <i>Connector & terminal</i> (E31) No. 2 — Engine ground: (E32) No. 2 — Engine ground: (E33) No. 2 — Engine ground: (E34) No. 2 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 5.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ignition coil & ignitor ASSY connector and engine ground terminal
5 CHECK HARNESS BETWEEN ECM AND IGNITION COIL & IGNITOR ASSY CONNECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Disconnect the connector from ignition coil & ignitor ASSY. 4) Measure the resistance of harness between ECM and ignition coil & ignitor ASSY connector. <i>Connector & terminal</i> (B135) No. 15 — (E34) No. 1: (B135) No. 16 — (E33) No. 1: (B135) No. 17 — (E32) No. 1: (B135) No. 18 — (E31) No. 1:	Is the resistance less than 1 Ω ?	Go to step 6.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • OPEN CIRCUIT IN HARNESS BETWEEN ECM AND IGNITION COIL & IGNITOR ASSY CONNECTOR. • Poor contact in coupling connector

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

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

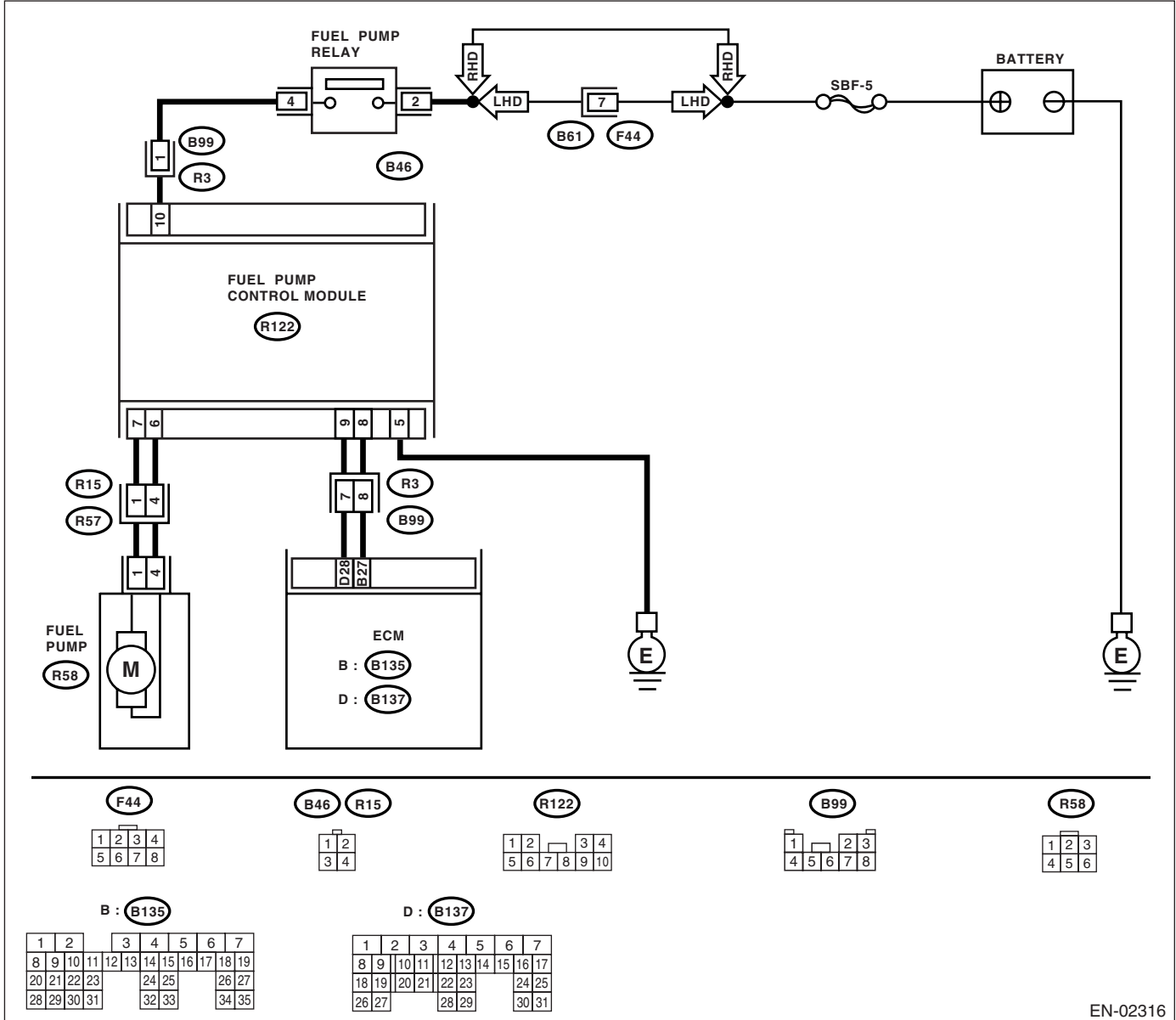
E: FUEL PUMP CIRCUIT

CAUTION:

After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-40, Inspection Mode.>.

WIRING DIAGRAM:

- LHD model

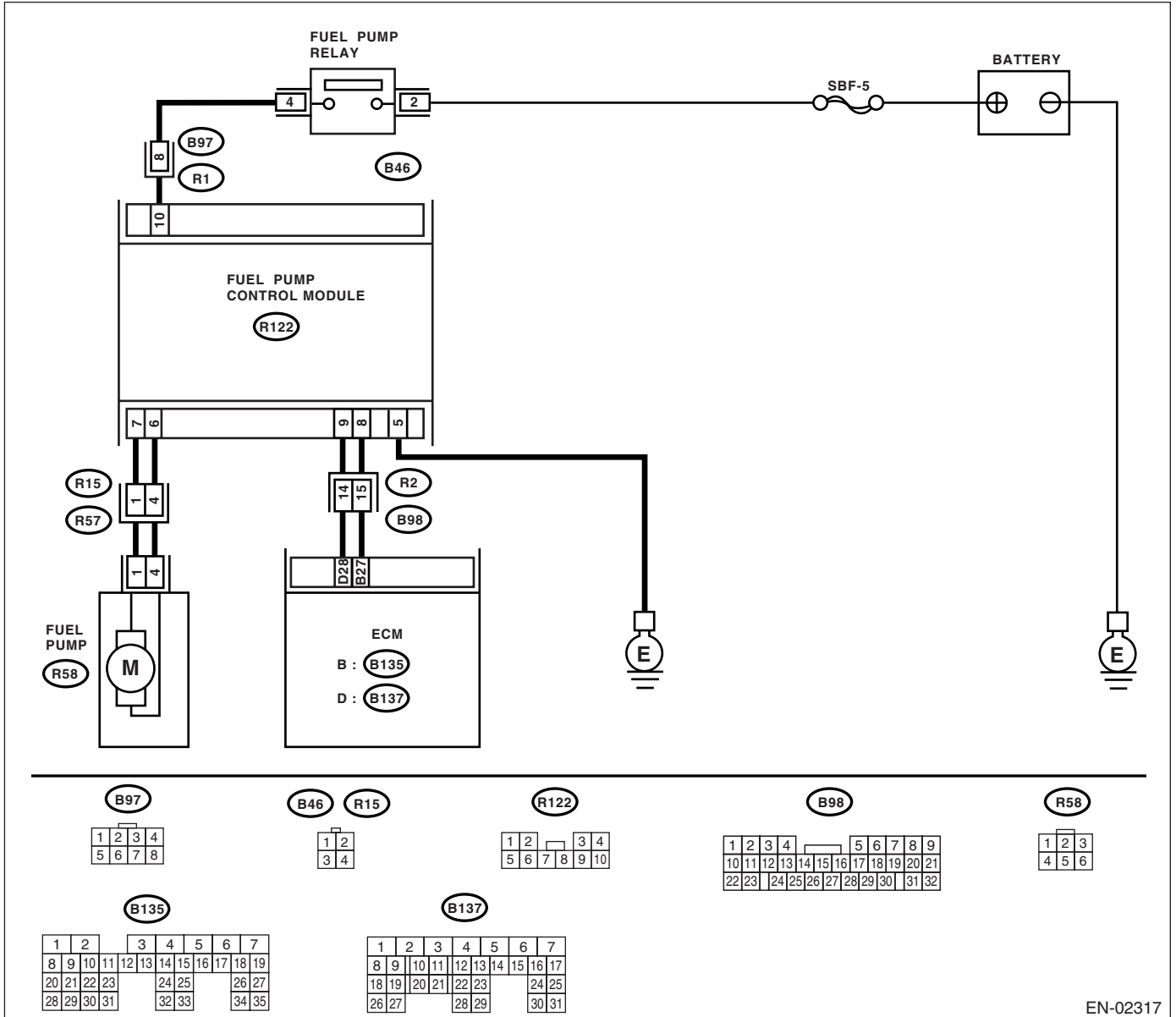


EN-02316

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

• RHD model



EN-02317

Step	Check	Yes	No
<p>1</p> <p>CHECK OPERATING SOUND OF FUEL PUMP.</p> <p>Make sure that fuel pump is in operation for two seconds when turning the ignition switch to ON.</p> <p>NOTE: Fuel pump operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". <Ref. to EN(H4DOTC)-48, Compulsory Valve Operation Check Mode.></p>	<p>Does the fuel pump produce operating sound?</p>	<p>Check the fuel injector circuit. <Ref. to EN(H4DOTC)-71, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.></p>	<p>Display DTC. <Ref. to EN(H4DOTC)-39, OPERATION, Read Diagnostic Trouble Code (DTC).></p>

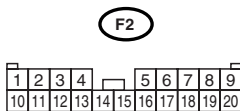
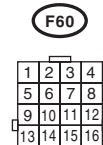
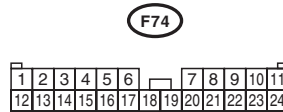
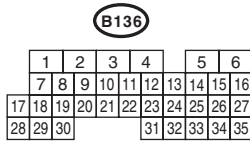
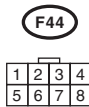
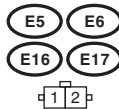
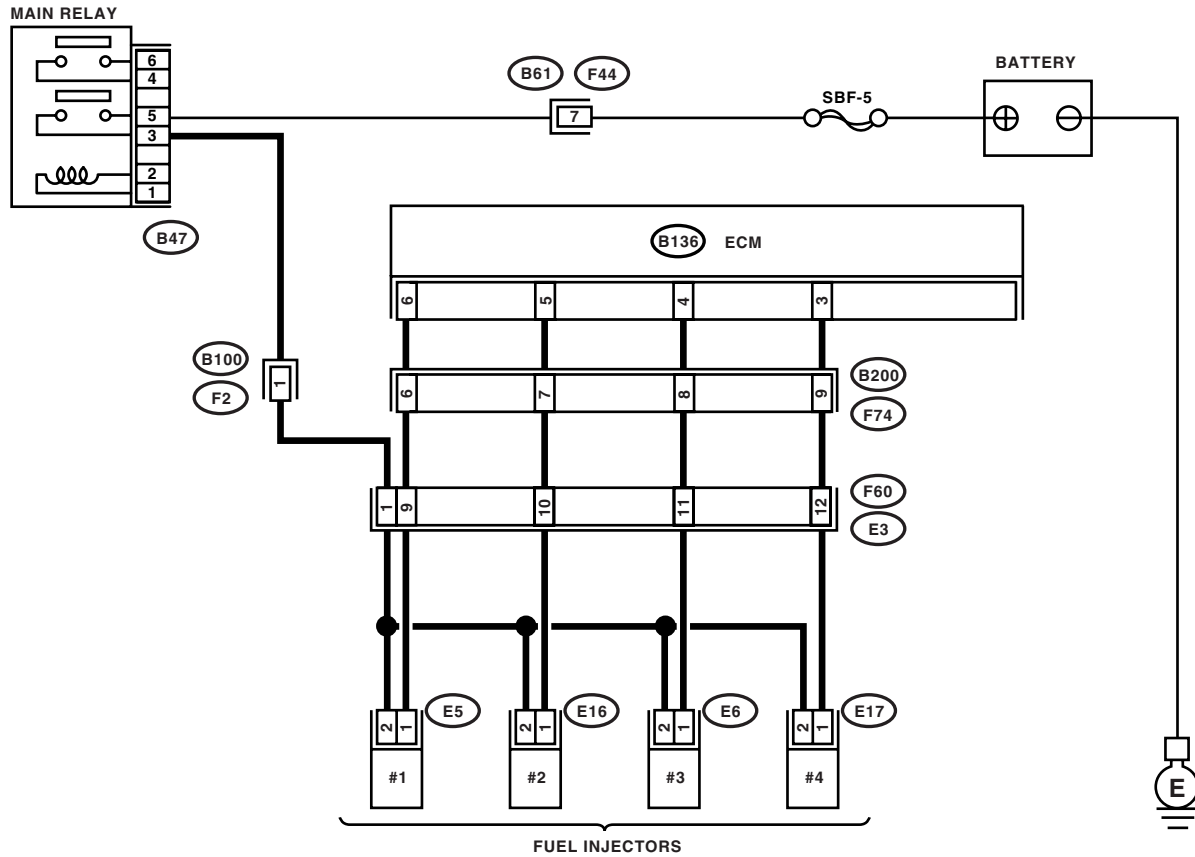
F: FUEL INJECTOR CIRCUIT

CAUTION:

- Check or repair only faulty parts.
- After repair or replacement of faulty parts, conduct Clear Memory Mode <Ref. to EN(H4DOTC)-47, OPERATION, Clear Memory Mode.> and Inspection Mode <Ref. to EN(H4DOTC)-40, Inspection Mode.>.

WIRING DIAGRAM:

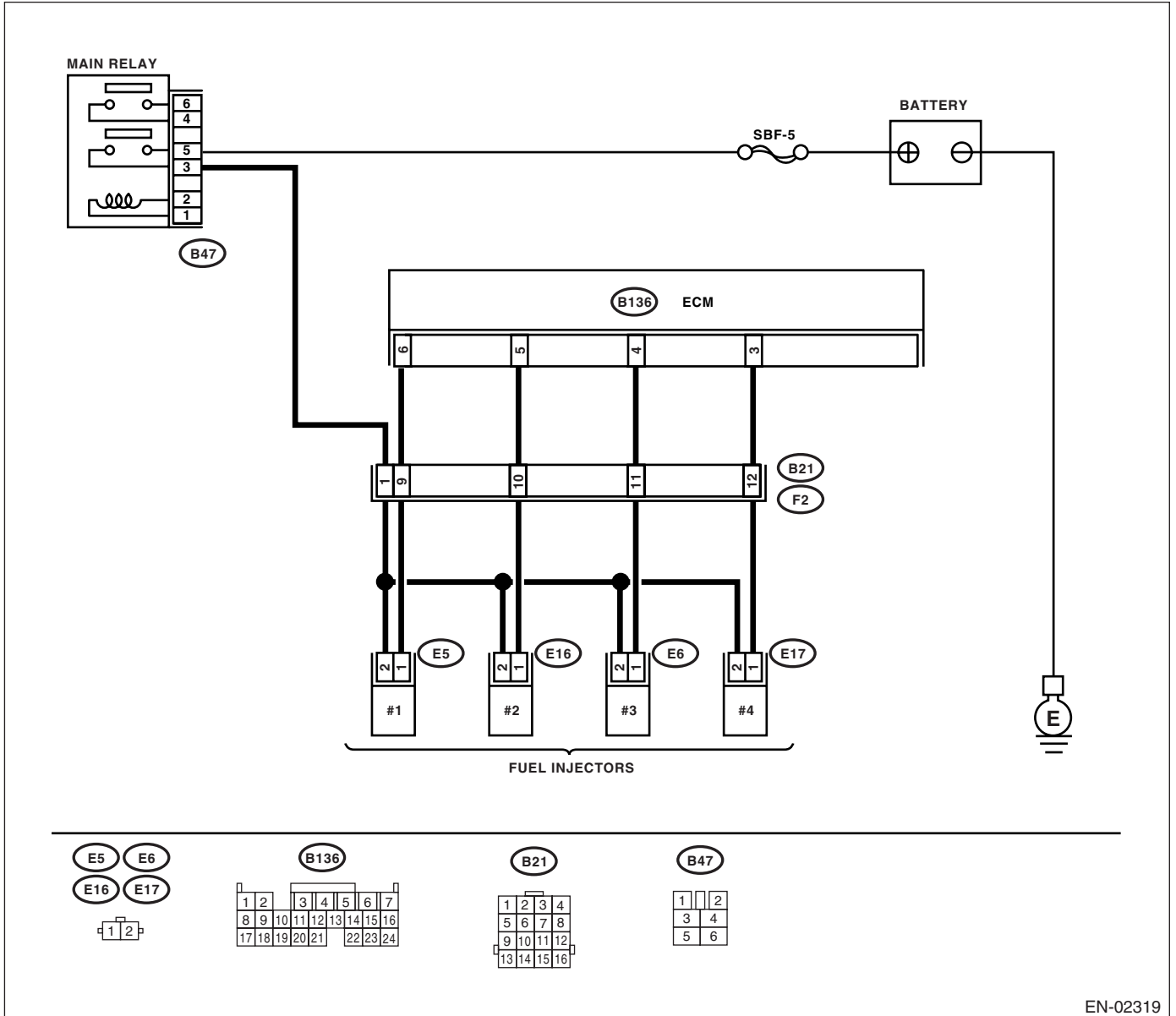
- LHD model



Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

- RHD model



EN-02319

Diagnostics for Engine Starting Failure

ENGINE (DIAGNOSTIC)

Step	Check	Yes	No
<p>1</p> <p>CHECK OPERATION OF EACH FUEL INJECTOR. While cranking the engine, check that each fuel injector emits operating sound. Use a sound scope or attach a screwdriver to the injector for this check.</p>	Does the fuel pump produce operating sound?	Check the fuel pressure. <Ref. to ME(H4DOTC)-36, INSPECTION, Fuel Pressure.>	Go to step 2.
<p>2</p> <p>CHECK POWER SUPPLY TO EACH FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel injector. 3) Turn the ignition switch to ON. 4) Measure the power supply voltage between fuel injector terminal and engine ground. Connector & terminal #1 (E5) No. 2 (+) — Engine ground (-): #2 (E16) No. 2 (+) — Engine ground (-): #3 (E6) No. 2 (+) — Engine ground (-): #4 (E17) No. 2 (+) — Engine ground (-):</p>	Is the voltage more than 10 V?	Go to step 3.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • 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>3</p> <p>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. 1) Disconnect the connector from ECM. 2) Measure the resistance of harness between ECM and fuel injector connector. Connector & terminal (B136) No. 6 — (E5) No. 1: (B136) No. 5 — (E16) No. 1: (B136) No. 4 — (E6) No. 1: (B136) No. 3 — (E6) No. 1:</p>	Is the resistance less than 1 Ω ?	Go to step 4.	Repair the harness and connector. NOTE: In this case repair the following: <ul style="list-style-type: none"> • Open circuit in harness between ECM and fuel injector connector • Poor contact in coupling connector
<p>4</p> <p>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR. Measure the resistance of harness between ECM and fuel injector connector. Connector & terminal (B136) No. 6 — Chassis ground: (B136) No. 5 — Chassis ground: (B136) No. 4 — Chassis ground: (B136) No. 3 — Chassis ground:</p>	Is the resistance less than 1 Ω ?	Repair ground short circuit in harness between ECM and fuel injector connector.	Go to step 5.
<p>5</p> <p>CHECK EACH FUEL INJECTOR. 1) Turn the ignition switch to OFF. 2) Measure the resistance between each fuel injector terminals. Terminals No. 1 — No. 2:</p>	Is the resistance 5 — 20 Ω ?	Go to step 6.	Replace the faulty fuel injector.
<p>6</p> <p>CHECK POOR CONTACT. Check poor contact in ECM connector.</p>	Is there poor contact in ECM connector?	Repair the poor contact in ECM connector.	Inspection using "General Diagnostic Table" <Ref. to EN(H4DOTC)-295, INSPECTION, General Diagnostic Table.>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

18. List of Diagnostic Trouble Code (DTC)

A: LIST

DTC	Item	NOTE
P0011	A Camshaft Position-Timing Over-Advanced or System Performance (Bank 1)	<Ref. to EN(H4DOTC)-80, DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER - ADVANCED OR SYSTEM PERFORMANCE (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0021	A Camshaft Position-Timing Over-Advanced or System Performance (Bank 2)	<Ref. to EN(H4DOTC)-81, DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER - ADVANCED OR SYSTEM PERFORMANCE (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-82, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0031	HO2S Sensor Circuit Low Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-84, DTC P0031 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0032	HO2S Sensor Circuit High Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-87, DTC P0032 HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0037	HO2S Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC)-89, DTC P0037 HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0038	HO2S Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC)-92, 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(H4DOTC)-94, DTC P0068 MANIFOLD PRESSURE SENSOR RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0101	Mass or Volume Air Flow Circuit Range/Performance	<Ref. to EN(H4DOTC)-97, DTC P0101 MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0102	Mass or Volume Air Flow Circuit Low Input	<Ref. to EN(H4DOTC)-99, DTC P0102 MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0103	Mass or Volume Air Flow Circuit High Input	<Ref. to EN(H4DOTC)-102, DTC P0103 MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input	<Ref. to EN(H4DOTC)-104, DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input	<Ref. to EN(H4DOTC)-107, DTC P0108 INTAKE AIR PRESSURE SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0111	Intake Air Temperature Circuit Range/Performance	<Ref. to EN(H4DOTC)-110, DTC P0111 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0112	Intake Air Temperature Circuit Low Input	<Ref. to EN(H4DOTC)-112, DTC P0112 INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0113	Manifold Absolute Pressure/Barometric Pressure Circuit High Input	<Ref. to EN(H4DOTC)-114, DTC P0113 INTAKE AIR TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0117	Engine Coolant Temperature Circuit Low Input	<Ref. to EN(H4DOTC)-117, DTC P0117 ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0118	Engine Coolant Temperature Circuit High Input	<Ref. to EN(H4DOTC)-119, DTC P0118 ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0121	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	<Ref. to EN(H4DOTC)-122, 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(H4DOTC)-124, DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High Input	<Ref. to EN(H4DOTC)-128, DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0125	Insufficient Coolant Temperature For Closed Loop Fuel Control	<Ref. to EN(H4DOTC)-131, 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(H4DOTC)-132, DTC P0129 BAROMETRIC PRESSURE TOO LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0131	O ₂ Sensor Circuit Low Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-133, DTC P0131 O ₂ SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0132	O ₂ Sensor Circuit High Voltage (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-135, DTC P0132 O ₂ SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0133	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-137, DTC P0133 O ₂ SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0134	O ₂ Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-139, DTC P0134 O ₂ SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0137	O ₂ Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC)-141, DTC P0137 O ₂ SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0138	O ₂ Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC)-144, DTC P0138 O ₂ SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0139	O ₂ Sensor Circuit Slow Response (Bank 1 Sensor 2)	<Ref. to EN(H4DOTC)-147, DTC P0139 O ₂ SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0171	System Too Lean (Bank 1)	<Ref. to EN(H4DOTC)-148, DTC P0171 SYSTEM TOO LEAN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0172	System Too Rich (Bank 1)	<Ref. to EN(H4DOTC)-149, DTC P0172 SYSTEM TOO RICH (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0230	Fuel Pump Primary Circuit	<Ref. to EN(H4DOTC)-152, DTC P0230 FUEL PUMP PRIMARY CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0244	Turbo/Super Charger Wastegate Solenoid "A" Range/Performance	<Ref. to EN(H4DOTC)-156, DTC P0244 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0245	Turbo/Super Charger Wastegate Solenoid "A" Low	<Ref. to EN(H4DOTC)-158, DTC P0245 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0246	Turbo/Super Charger Wastegate Solenoid "A" High	<Ref. to EN(H4DOTC)-160, DTC P0246 TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0301	Cylinder 1 Misfire Detected	<Ref. to EN(H4DOTC)-162, DTC P0301 CYLINDER 1 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0302	Cylinder 2 Misfire Detected	<Ref. to EN(H4DOTC)-162, DTC P0302 CYLINDER 2 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0303	Cylinder 3 Misfire Detected	<Ref. to EN(H4DOTC)-162, DTC P0303 CYLINDER 3 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

List of Diagnostic Trouble Code (DTC)

ENGINE (DIAGNOSTIC)

DTC	Item	NOTE
P0304	Cylinder 4 Misfire Detected	<Ref. to EN(H4DOTC)-163, DTC P0304 CYLINDER 4 MISFIRE DETECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	<Ref. to EN(H4DOTC)-169, DTC P0327 KNOCK SENSOR 1 CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)	<Ref. to EN(H4DOTC)-171, DTC P0328 KNOCK SENSOR 1 CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0335	Crankshaft Position Sensor "A" Circuit	<Ref. to EN(H4DOTC)-173, DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0336	Crankshaft Position Sensor "A" Circuit Range/Performance	<Ref. to EN(H4DOTC)-175, DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)	<Ref. to EN(H4DOTC)-177, 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(H4DOTC)-179, DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0365	Camshaft Position Sensor "B" Circuit (Bank 1)	<Ref. to EN(H4DOTC)-182, DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0390	Camshaft Position Sensor "B" Circuit (Bank 2)	<Ref. to EN(H4DOTC)-184, DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0420	Catalyst System Efficiency Below Threshold (Bank 1)	<Ref. to EN(H4DOTC)-186, 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(H4DOTC)-188, DTC P0458 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0459	Evaporative Emission Control System Purge Control Valve Circuit High	<Ref. to EN(H4DOTC)-190, DTC P0459 EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0461	Fuel Level Sensor Circuit Range/Performance	<Ref. to EN(H4DOTC)-192, DTC P0461 FUEL LEVEL SENSOR CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0462	Fuel Level Sensor Circuit Low Input	<Ref. to EN(H4DOTC)-194, DTC P0462 FUEL LEVEL SENSOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0463	Fuel Level Sensor Circuit High Input	<Ref. to EN(H4DOTC)-197, DTC P0463 FUEL LEVEL SENSOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0464	Fuel Level Sensor Circuit Intermittent	<Ref. to EN(H4DOTC)-200, DTC P0464 FUEL LEVEL SENSOR CIRCUIT INTERMITTENT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0483	Cooling Fan Rationality Check	<Ref. to EN(H4DOTC)-202, DTC P0483 COOLING FAN RATIONALITY CHECK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0502	Vehicle Speed Sensor Circuit Low Input	<Ref. to EN(H4DOTC)-205, DTC P0502 VEHICLE SPEED SENSOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0503	Vehicle Speed Sensor Intermittent/Erratic/High	<Ref. to EN(H4DOTC)-207, 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(H4DOTC)-209, DTC P0506 IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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DTC	Item	NOTE
P0507	Idle Control System RPM Higher Than Expected	<Ref. to EN(H4DOTC)-211, DTC P0507 IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0508	Idle Control System Circuit Low	<Ref. to EN(H4DOTC)-213, DTC P0508 IDLE CONTROL SYSTEM CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0509	Idle Control System Circuit High	<Ref. to EN(H4DOTC)-215, DTC P0509 IDLE CONTROL SYSTEM CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0512	Starter Request Circuit	<Ref. to EN(H4DOTC)-217, DTC P0512 STARTER REQUEST CIRCUIT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0513	Incorrect Immobilizer Key	<Ref. to IM-20, DTC P0513 INCORRECT IMMOBILIZER KEY, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P0519	Idle Control System Malfunction (Fail-Safe)	<Ref. to EN(H4DOTC)-219, DTC P0519 IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0545	Exhaust Gas Temperature Sensor Circuit Low - Bank 1	<Ref. to EN(H4DOTC)-221, DTC P0545 EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW - BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0546	Exhaust Gas Temperature Sensor Circuit High - Bank 1	<Ref. to EN(H4DOTC)-223, DTC P0546 EXHAUST GAS TEMPERATURE SENSOR HIGH - BANK 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0558	Generator Circuit Low Input	<Ref. to EN(H4DOTC)-225, DTC P0558 GENERATOR CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0559	Generator Circuit High Input	<Ref. to EN(H4DOTC)-226, DTC P0559 GENERATOR CIRCUIT HIGH INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0600	Serial Communication Link	<Ref. to EN(H4DOTC)-228, DTC P0600 SERIAL COMMUNICATION LINK, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0604	Internal Control Module Random Access Memory (RAM) Error	<Ref. to EN(H4DOTC)-230, DTC P0604 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0691	Cooling Fan 1 Control Circuit Low	<Ref. to EN(H4DOTC)-232, DTC P0691 COOLING FAN 1 CONTROL CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0692	Cooling Fan 1 Control Circuit High	<Ref. to EN(H4DOTC)-236, DTC P0692 COOLING FAN 1 CONTROL CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0700	Transmission Control System (MIL Request)	<Ref. to EN(H4DOTC)-238, DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0851	Neutral Switch Input Circuit Low	<Ref. to EN(H4DOTC)-239, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> or <Ref. to EN(H4DOTC)-241, DTC P0851 NEUTRAL SWITCH INPUT CIRCUIT LOW (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0852	Neutral Switch Input Circuit High	<Ref. to EN(H4DOTC)-243, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).> or <Ref. to EN(H4DOTC)-246, DTC P0852 NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT MODEL), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1086	Tumble Generated Valve Position Sensor 2 Circuit Low	<Ref. to EN(H4DOTC)-248, DTC P1086 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1087	Tumble Generated Valve Position Sensor 2 Circuit High	<Ref. to EN(H4DOTC)-252, DTC P1087 TUMBLE GENERATED VALVE POSITION SENSOR 2 CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1088	Tumble Generated Valve Position Sensor 1 Circuit Low	<Ref. to EN(H4DOTC)-255, DTC P1088 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

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DTC	Item	NOTE
P1089	Tumble Generated Valve Position Sensor 1 Circuit High	<Ref. to EN(H4DOTC)-259, DTC P1089 TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1090	Tumble Generated Valve System 1 (Valve Open)	<Ref. to EN(H4DOTC)-262, DTC P1090 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1091	Tumble Generated Valve System 1 (Valve Close)	<Ref. to EN(H4DOTC)-262, DTC P1091 TUMBLE GENERATED VALVE SYSTEM 1 (VALVE CLOSE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1092	Tumble Generated Valve System 2 (Valve Open)	<Ref. to EN(H4DOTC)-263, DTC P1092 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1093	Tumble Generated Valve System 2 (Valve Close)	<Ref. to EN(H4DOTC)-263, DTC P1093 TUMBLE GENERATED VALVE SYSTEM 2 (VALVE CLOSE), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1094	Tumble Generated Valve Signal 1 Circuit Malfunction (Open)	<Ref. to EN(H4DOTC)-264, DTC P1094 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1095	Tumble Generated Valve Signal 1 Circuit Malfunction (Short)	<Ref. to EN(H4DOTC)-266, DTC P1095 TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (SHORT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1096	Tumble Generated Valve Signal 2 Circuit Malfunction (Open)	<Ref. to EN(H4DOTC)-268, DTC P1096 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (OPEN), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1097	Tumble Generated Valve Signal 2 Circuit Malfunction (Short)	<Ref. to EN(H4DOTC)-270, DTC P1097 TUMBLE GENERATED VALVE SIGNAL 2 CIRCUIT MALFUNCTION (SHORT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1110	Atmospheric Pressure Sensor Circuit Malfunction (Low Input)	<Ref. to EN(H4DOTC)-271, DTC P1110 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (LOW INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1111	Atmospheric Pressure Sensor Circuit Malfunction (High Input)	<Ref. to EN(H4DOTC)-271, DTC P1111 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1152	O ₂ Sensor Circuit Range/Performance (Low) (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-272, DTC P1152 O ₂ SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1153	O ₂ Sensor Circuit Range/Performance (High) (Bank 1 Sensor 1)	<Ref. to EN(H4DOTC)-274, DTC P1153 O ₂ SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK 1 SENSOR 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1301	Misfire Detected (High Temperature Exhaust Gas)	<Ref. to EN(H4DOTC)-276, DTC P1301 MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1312	Exhaust Gas Temperature Sensor Malfunction	<Ref. to EN(H4DOTC)-278, DTC P1312 INTAKE AIR TEMPERATURE CIRCUIT RANGE/PERFORMANCE, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1518	Starter Switch Circuit Low Input	<Ref. to EN(H4DOTC)-280, DTC P1518 STARTER SWITCH CIRCUIT LOW INPUT, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1544	Exhaust Gas Temperature Too High	<Ref. to EN(H4DOTC)-282, DTC P1544 EXHAUST GAS TEMPERATURE TOO HIGH, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1560	Back-Up Voltage Circuit Malfunction	<Ref. to EN(H4DOTC)-284, 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).>

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DTC	Item	NOTE
P1572	IMM Circuit Failure (Except Antenna Circuit)	<Ref. to IM-19, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1574	Key Communication Failure	<Ref. to IM-19, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1576	EGI Control Module EEPROM	<Ref. to IM-20, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P1577	IMM Control Module EEPROM	<Ref. to IM-20, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostics Procedure with Diagnostic Trouble Code (DTC).>
P2088	OCV Solenoid Valve Signal A Circuit Open (Bank 1)	<Ref. to EN(H4DOTC)-287, DTC P2088 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2089	OCV Solenoid Valve Signal A Circuit Short (Bank 1)	<Ref. to EN(H4DOTC)-289, DTC P2089 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 1), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2092	OCV Solenoid Valve Signal A Circuit Open (Bank 2)	<Ref. to EN(H4DOTC)-291, DTC P2092 OCV SOLENOID VALVE SIGNAL A CIRCUIT OPEN (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P2093	OCV Solenoid Valve Signal A Circuit Short (Bank 2)	<Ref. to EN(H4DOTC)-293, DTC P2093 OCV SOLENOID VALVE SIGNAL A CIRCUIT SHORT (BANK 2), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>