

# ENGINE (DIAGNOSTICS)

# *EN(TURBO)*

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# BASIC DIAGNOSTIC PROCEDURE

ENGINE (DIAGNOSTICS)

## 1. Basic Diagnostic Procedure

### A: PROCEDURE

#### 1. ENGINE

Step	Check	Yes	No
<b>1 CHECK ENGINE START FAILURE.</b> 1) Ask the customer when and how trouble occurred using the interview check list. <Ref. to EN(TURBO)-4, CHECK, Check List for Interview.> 2) Start the engine. Does the engine start?	Engine starts.	Go to step 2.	Inspection using "Diagnostics for Engine Start Failure". <Ref. to EN(TURBO)-61, Diagnostics for Engine Starting Failure.>
<b>2 CHECK ILLUMINATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).</b> Does the CHECK ENGINE malfunction indicator lamp illuminate?	CHECK ENGINE warning light illuminates.	Go to step 3.	Inspection using "General Diagnostics Table". <Ref. to EN(TURBO)-308, General Diagnostic Table.>
<b>3 CHECK INDICATION OF DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.</b> 1) Turn the ignition switch to OFF. 2) Connect the Subaru Select Monitor or 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 Subaru Select Monitor or OBD-II general scan tool. Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	DTC is displayed.	Record the DTC code. Repair the trouble cause. <Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).> Go to step 4.	Repair the related parts. NOTE: If a DTC is not shown on display although MIL illuminates, perform diagnostics of MIL (CHECK ENGINE malfunction indicator lamp) circuit or combination meter. <Ref. to EN(TURBO)-52, Engine Malfunction Indicator Lamp (MIL).>
<b>4 PERFORM THE DIAGNOSIS.</b> 1) Perform the clear memory mode. <Ref. to EN(TURBO)-49, Clear Memory Mode.> 2) Perform the inspection mode. <Ref. to EN(TURBO)-42, Inspection Mode.> Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?	DTC is displayed.	Inspect using "Diagnostics Procedure with Diagnostic Trouble Code (DTC)". <Ref. to EN(TURBO)-84, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Complete the diagnosis.

## 2. AUTOMATIC TRANSMISSION

When the diagnostic trouble code (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 AT-29, Automatic Transmission Fluid.>
- 2) Differential gear oil level check <Ref. to AT-30, Differential Gear Oil.>
- 3) ATF leak check <Ref. to AT-29, Automatic Transmission Fluid.>
- 4) Differential gear oil leak check <Ref. to AT-30, Differential Gear Oil.>
- 5) Stall test <Ref. to AT-32, Stall Test.>
- 6) Line pressure test <Ref. to AT-35, Line Pressure Test.>
- 7) Transfer clutch pressure test <Ref. to AT-37, Transfer Clutch Pressure Test.>
- 8) Time lag test <Ref. to AT-34, Time Lag Test.>
- 9) Road test <Ref. to AT-31, Road Test.>
- 10) Shift characteristics <Ref. to AT-37, Transfer Clutch Pressure Test.>

# CHECK LIST FOR INTERVIEW

ENGINE (DIAGNOSTICS)

## 2. Check List for Interview

### A: CHECK

#### 1. CHECK LIST NO. 1

Check the following items when problem has occurred.

NOTE:

Use copies of this page for interviewing customers.

Customer's name		Engine No.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km
Vin No.			miles
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Others:		
Outdoor 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	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
Cooling 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 (DIAGNOSTICS)

## 2. CHECK LIST NO. 2

Check the following items about the vehicle's state when MIL 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 diagnostics indicator light <input type="checkbox"/> ABS warning light <input type="checkbox"/> Engine oil pressure warning light
b) Fuel level
<ul style="list-style-type: none"><li>• Lack of gasoline: <input type="checkbox"/> Yes/<input type="checkbox"/> No</li><li>• Indicator position of fuel gauge:</li></ul>
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: <input type="checkbox"/> Yes/ <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• What:</li></ul>
d) Intentional connecting or disconnecting of hoses: <input type="checkbox"/> Yes/ <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• What:</li></ul>
e) Installing of parts other than genuine parts: <input type="checkbox"/> Yes/ <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• What:</li><li>• Where:</li></ul>
f) Occurrence of noise: <input type="checkbox"/> Yes/ <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• From where:</li><li>• What kind:</li></ul>
g) Occurrence of smell: <input type="checkbox"/> Yes/ <input type="checkbox"/> No
<ul style="list-style-type: none"><li>• From where:</li><li>• What kind:</li></ul>
h) Intrusion of water into engine compartment or passenger compartment: <input type="checkbox"/> Yes/ <input type="checkbox"/> No
i) Troubles occurred
<input type="checkbox"/> Engine does not start. <input type="checkbox"/> Engine stalls during idling. <input type="checkbox"/> Engine stalls while driving. <input type="checkbox"/> Engine speed decreases. <input type="checkbox"/> Engine speed does not decrease. <input type="checkbox"/> Rough idling <input type="checkbox"/> Poor acceleration <input type="checkbox"/> Back fire <input type="checkbox"/> After fire <input type="checkbox"/> No shift <input type="checkbox"/> Excessive shift shock

# GENERAL DESCRIPTION

## ENGINE (DIAGNOSTICS)

### 3. General Description

#### A: CAUTION

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

#### CAUTION:

- All airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage the airbag system wiring harness when servicing the engine control module (ECM), transmission control module (TCM), main relay and fuel pump relay.

2) Never connect the battery in reverse polarity.

- The ECM will be destroyed instantly.
- The fuel injector and other part will be damaged in just a few minutes more.

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

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

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

5) Poor contact has been identified as a primary cause of this problem. To measure the voltage and/or resistance of individual sensors or all electrical control modules at the harness side connector, use 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) Before removing the ECM from located position, disconnect two cables on battery.

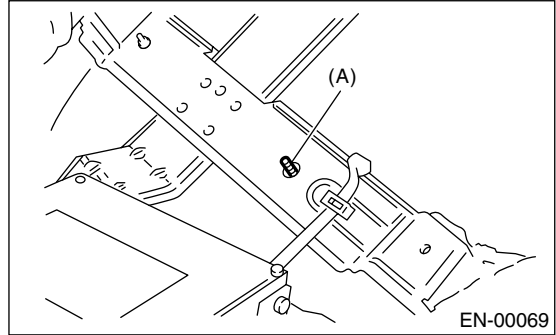
- Otherwise, the ECM may be damaged.

#### CAUTION:

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

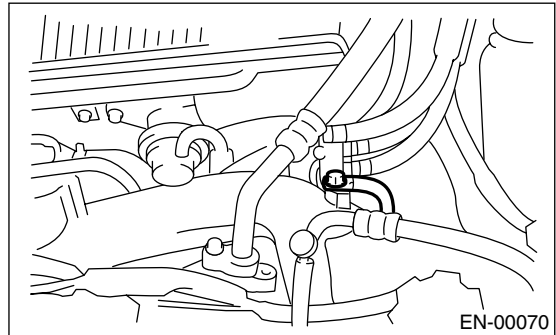
7) The connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on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

8) Use the ECM mounting stud bolt at the body head grounding points when measuring voltage and resistance inside the passenger compartment.

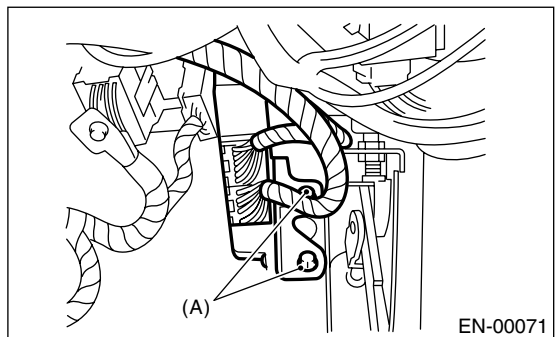


(A) Stud bolt

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



10) Use the TCM mounting stud bolts at the body head 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 5 seconds to release pressure in the fuel system. If the engine starts during this operation, run it until it stops.

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

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

16) On ABS vehicle, 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 system.

## B: INSPECTION

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

### 1. BATTERY

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

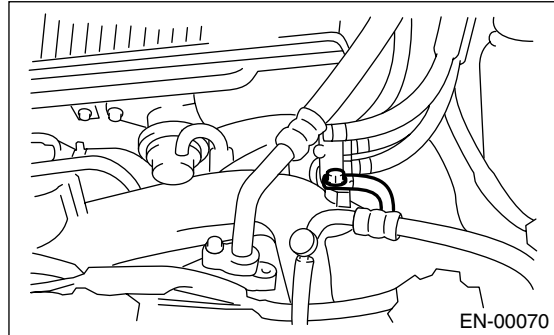
**Standard voltage: 12 V**

**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 GROUNDING

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



## C: NOTE

### 1. DESCRIPTION

- The on-board diagnostics (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. CHECK ENGINE malfunction indicator lamp (MIL) 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, MIL illuminates. At the same time of the MIL illumination or blinking, a diagnostic trouble code (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, MIL 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.
- The OBD-II diagnostics procedure is different from the usual diagnostics procedure. When troubleshooting OBD-II vehicles, connect Subaru Select Monitor or the OBD-II general scan tool to the vehicle.

# GENERAL DESCRIPTION

## ENGINE (DIAGNOSTICS)

### 2. ENGINE AND EMISSION CONTROL SYSTEM

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

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

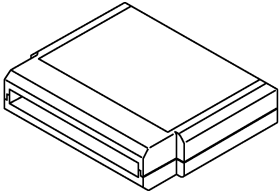

pulse applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

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

The MFI system also has the following features:

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

### D: PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST24082AA210</p>	24082AA210	CARTRIDGE	Troubleshooting for electrical systems.
 <p>ST22771AA030</p>	22771AA030	SUBARU SELECT MONITOR KIT	Troubleshooting for electrical systems. <ul style="list-style-type: none"> <li>• English: 22771AA030 (Without printer)</li> <li>• German: 22771AA070 (Without printer)</li> <li>• French: 22771AA080 (Without printer)</li> <li>• Spanish: 22771AA090 (Without printer)</li> </ul>

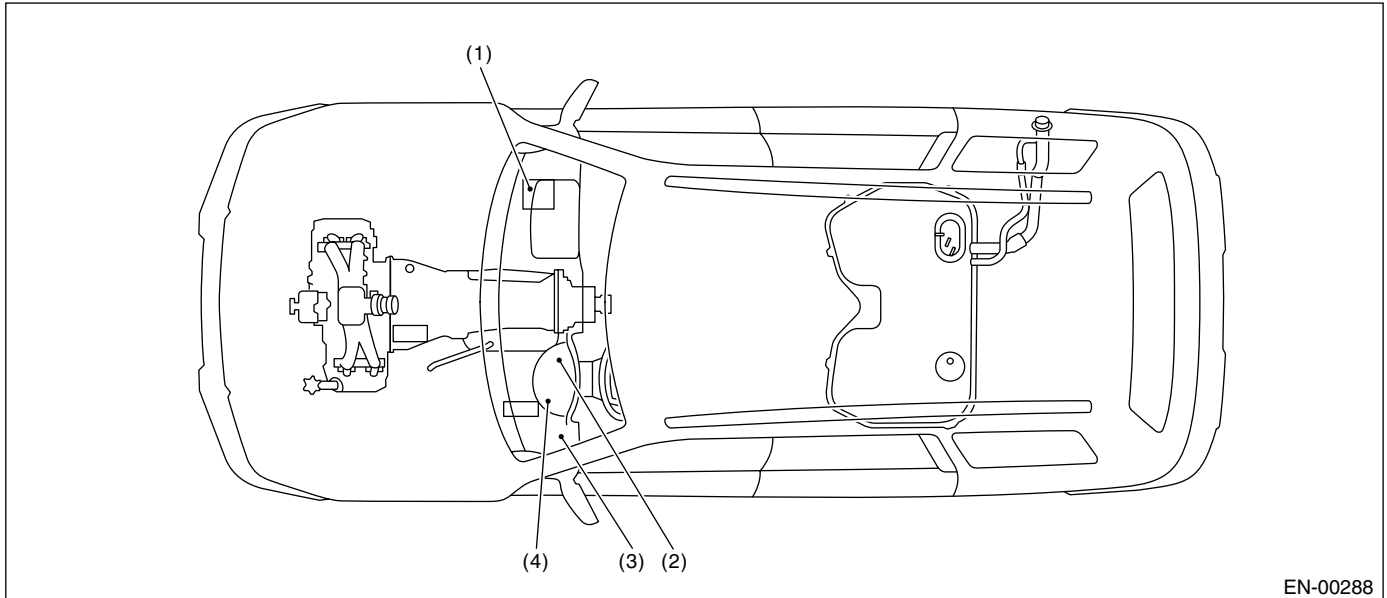


## 4. Electrical Components Location

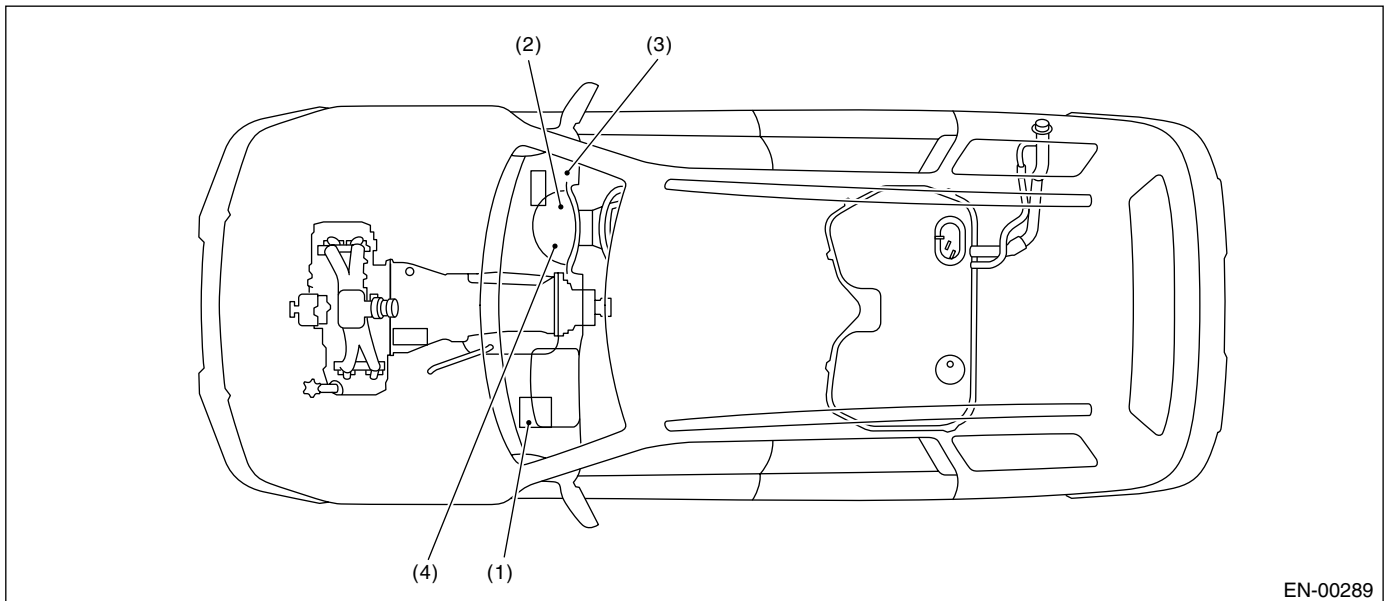
### A: LOCATION

#### 1. ENGINE

- Module



EN-00288

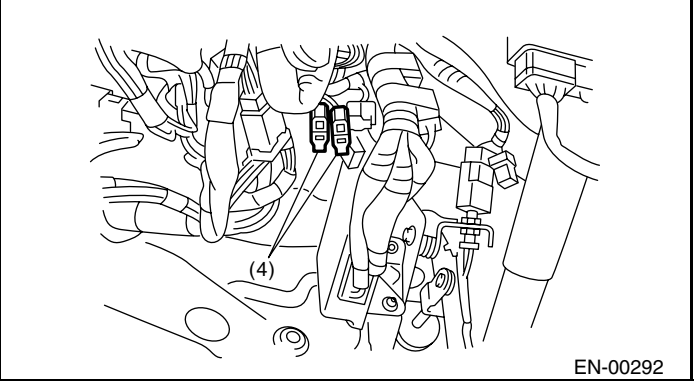
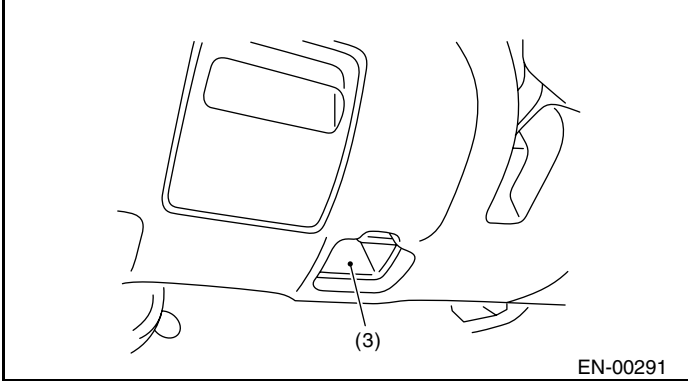
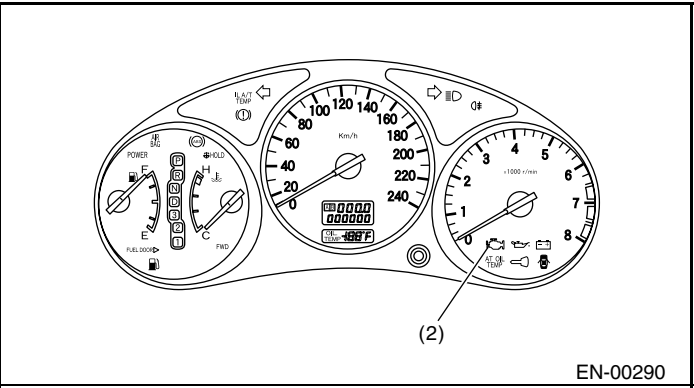
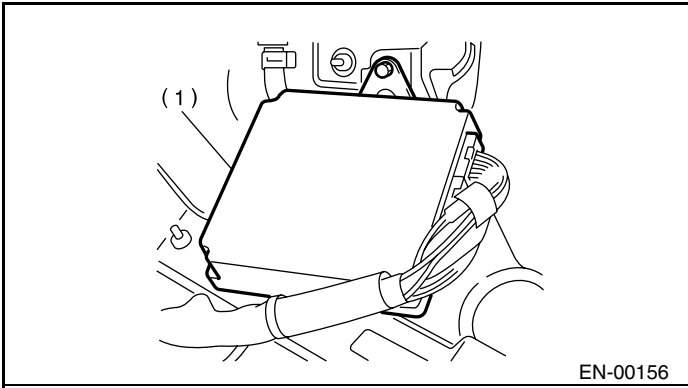


EN-00289

- (1) Engine control module (ECM)
- (2) CHECK ENGINE malfunction indicator lamp (MIL)
- (3) Data link connector
- (4) Test mode connector

# ELECTRICAL COMPONENTS LOCATION

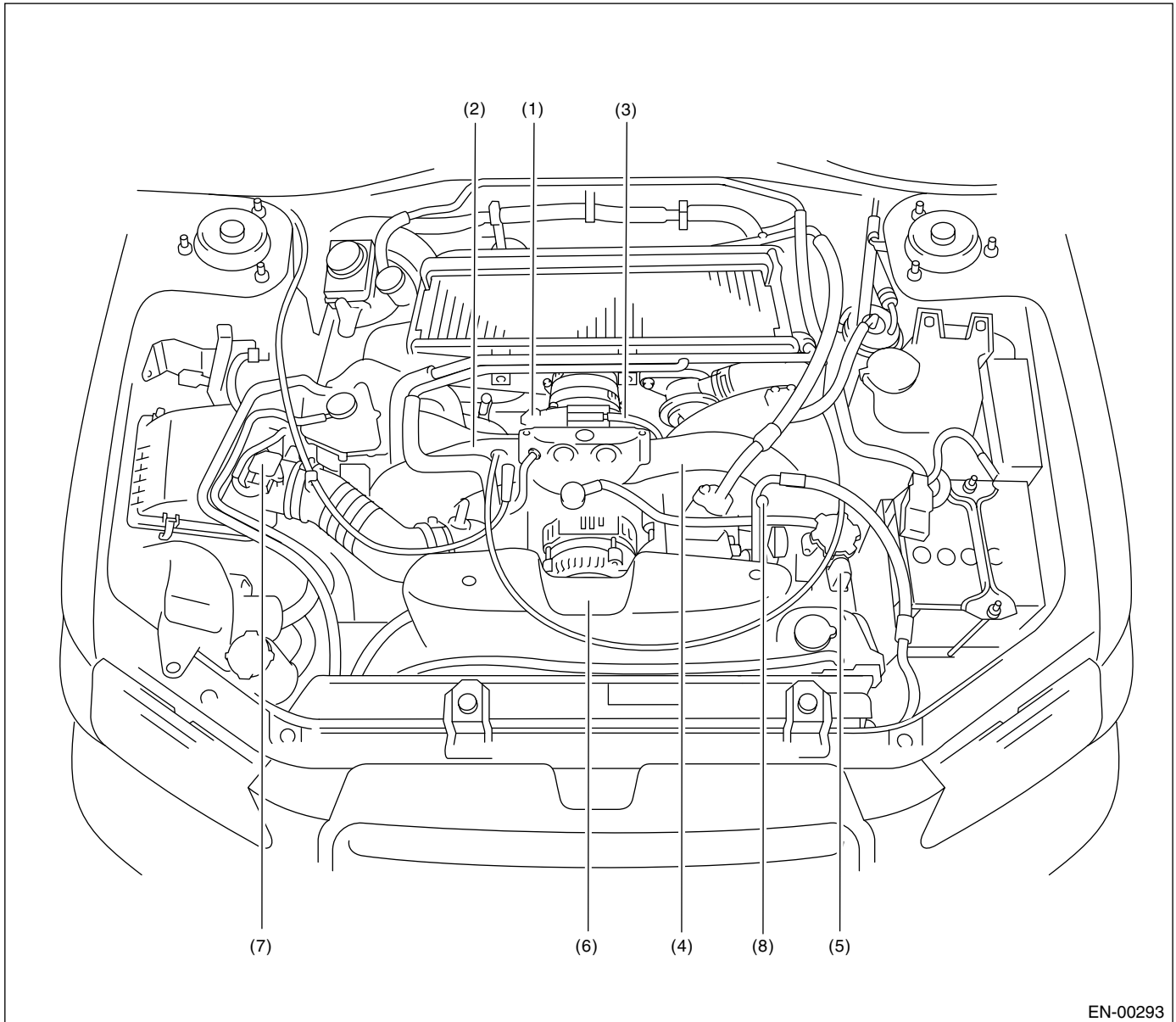
## ENGINE (DIAGNOSTICS)



# ELECTRICAL COMPONENTS LOCATION

ENGINE (DIAGNOSTICS)

## • Sensor

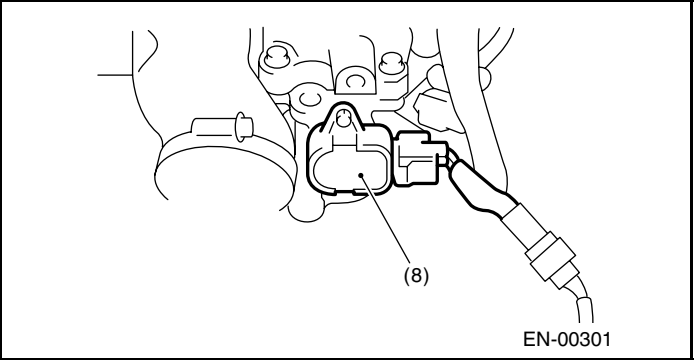
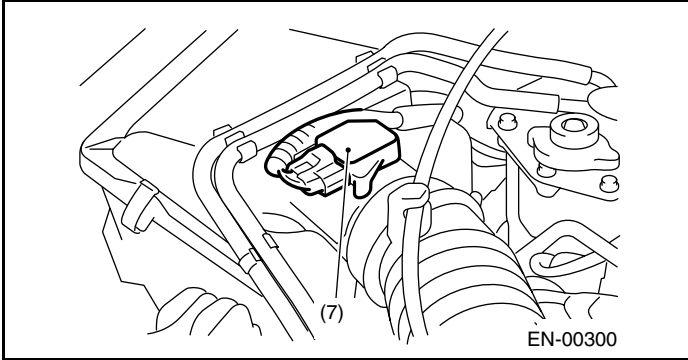
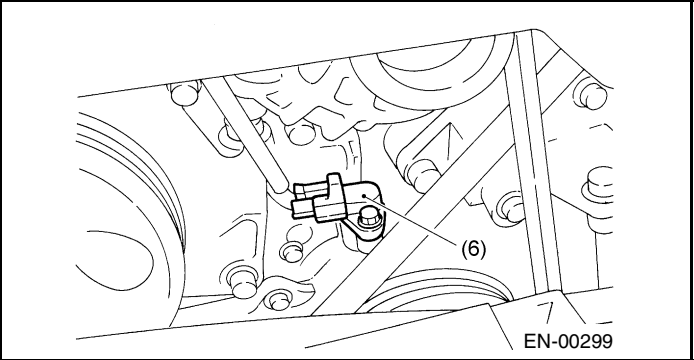
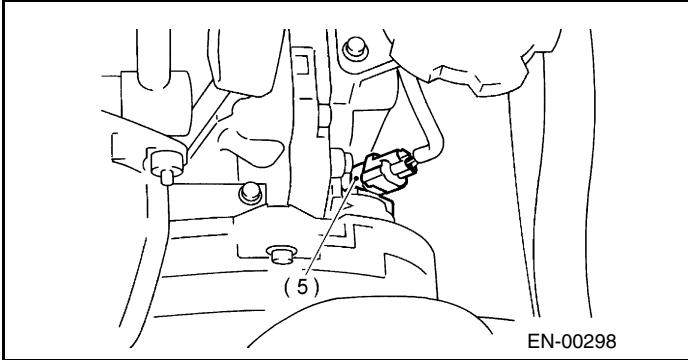
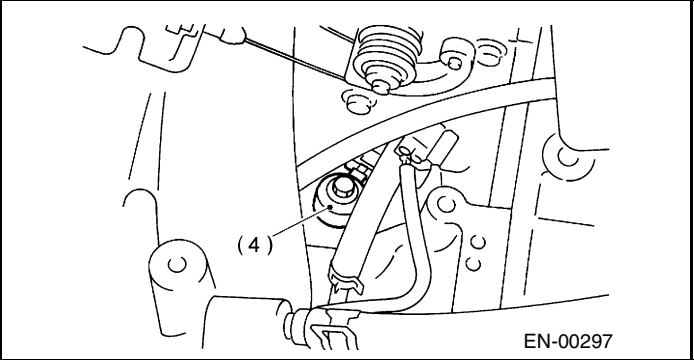
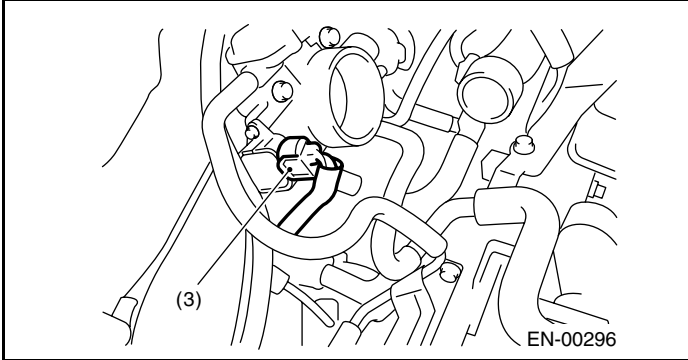
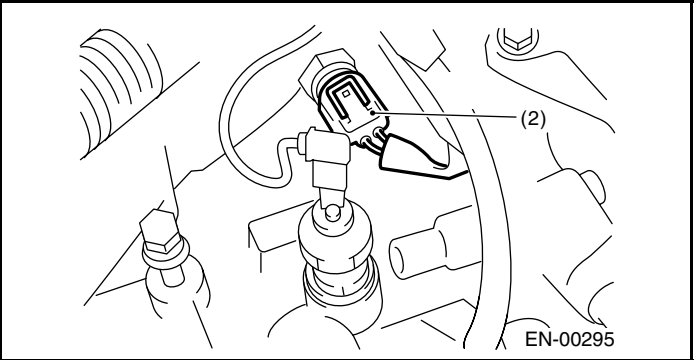
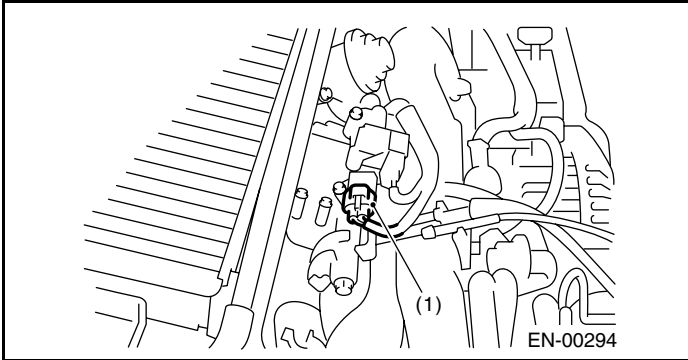


EN-00293

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

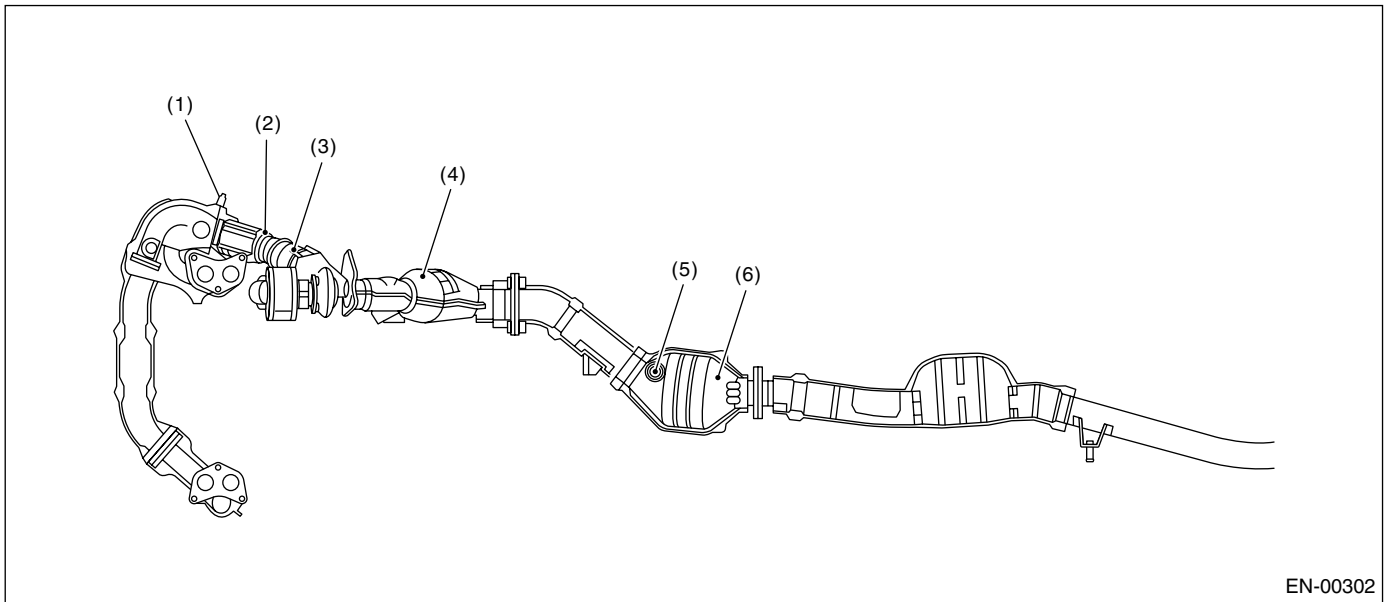
# ELECTRICAL COMPONENTS LOCATION

## ENGINE (DIAGNOSTICS)

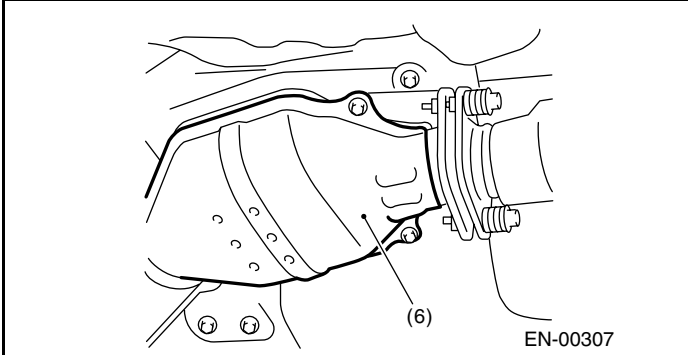
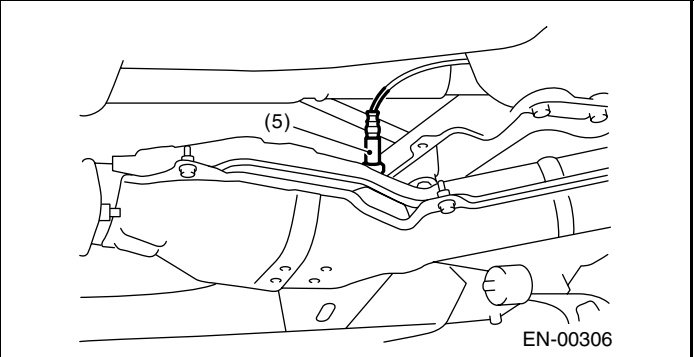
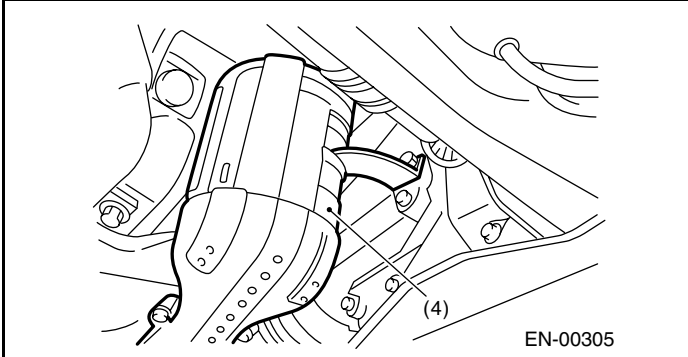
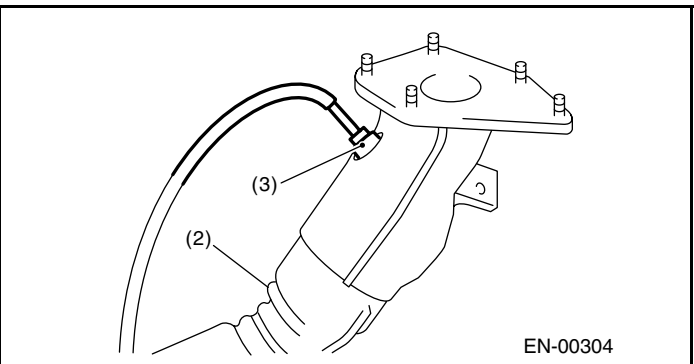
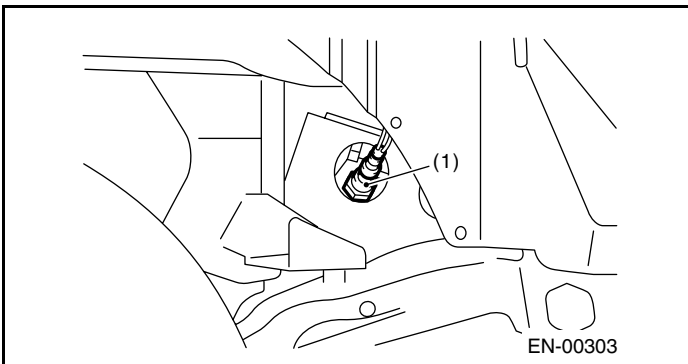


# ELECTRICAL COMPONENTS LOCATION

ENGINE (DIAGNOSTICS)

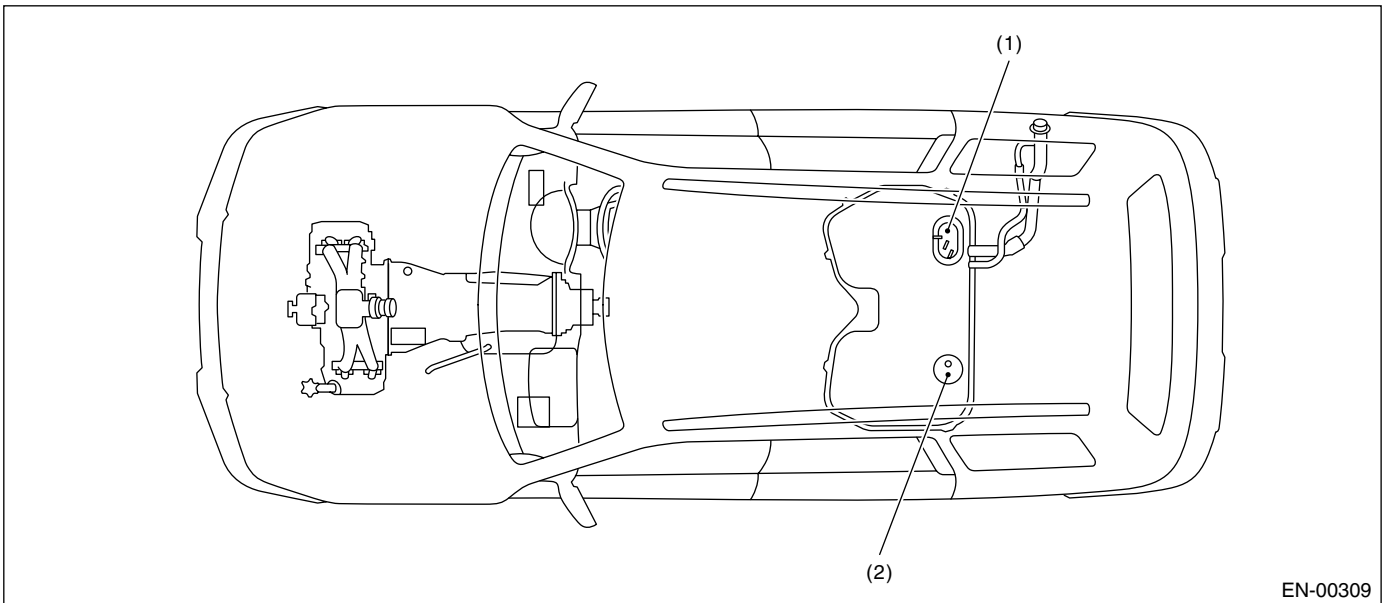
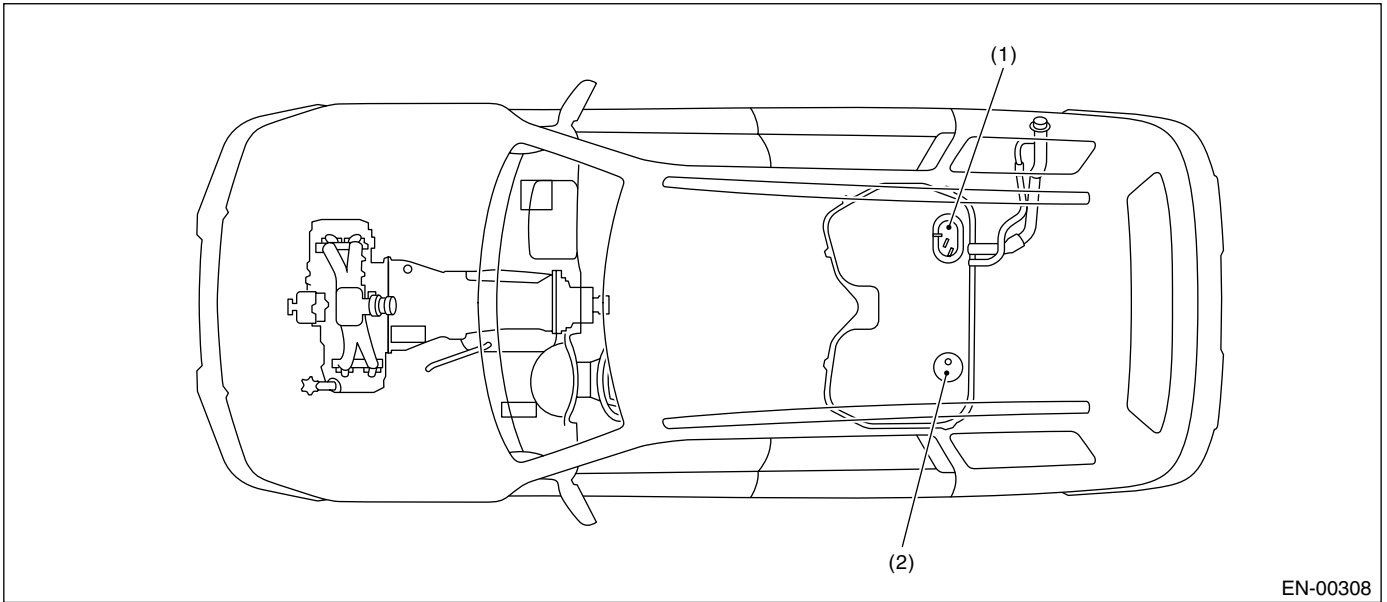


- |                               |                                |                              |
|-------------------------------|--------------------------------|------------------------------|
| (1) Front oxygen (A/F) sensor | (3) Exhaust temperature sensor | (5) Rear oxygen sensor       |
| (2)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



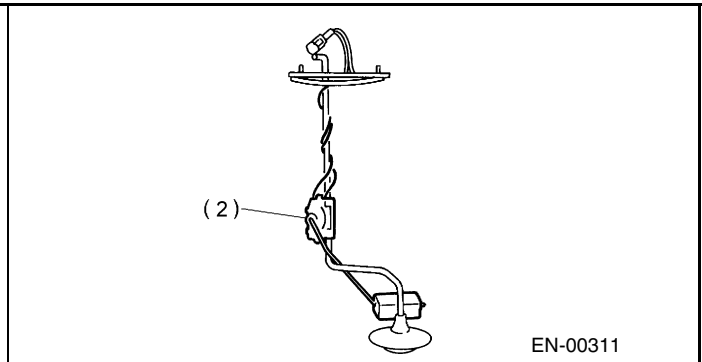
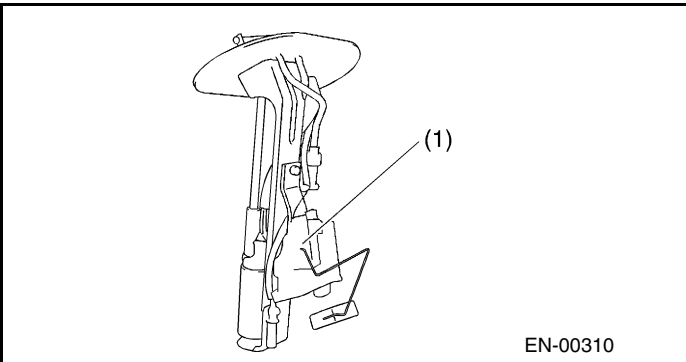
# ELECTRICAL COMPONENTS LOCATION

## ENGINE (DIAGNOSTICS)



(1) Fuel level sensor

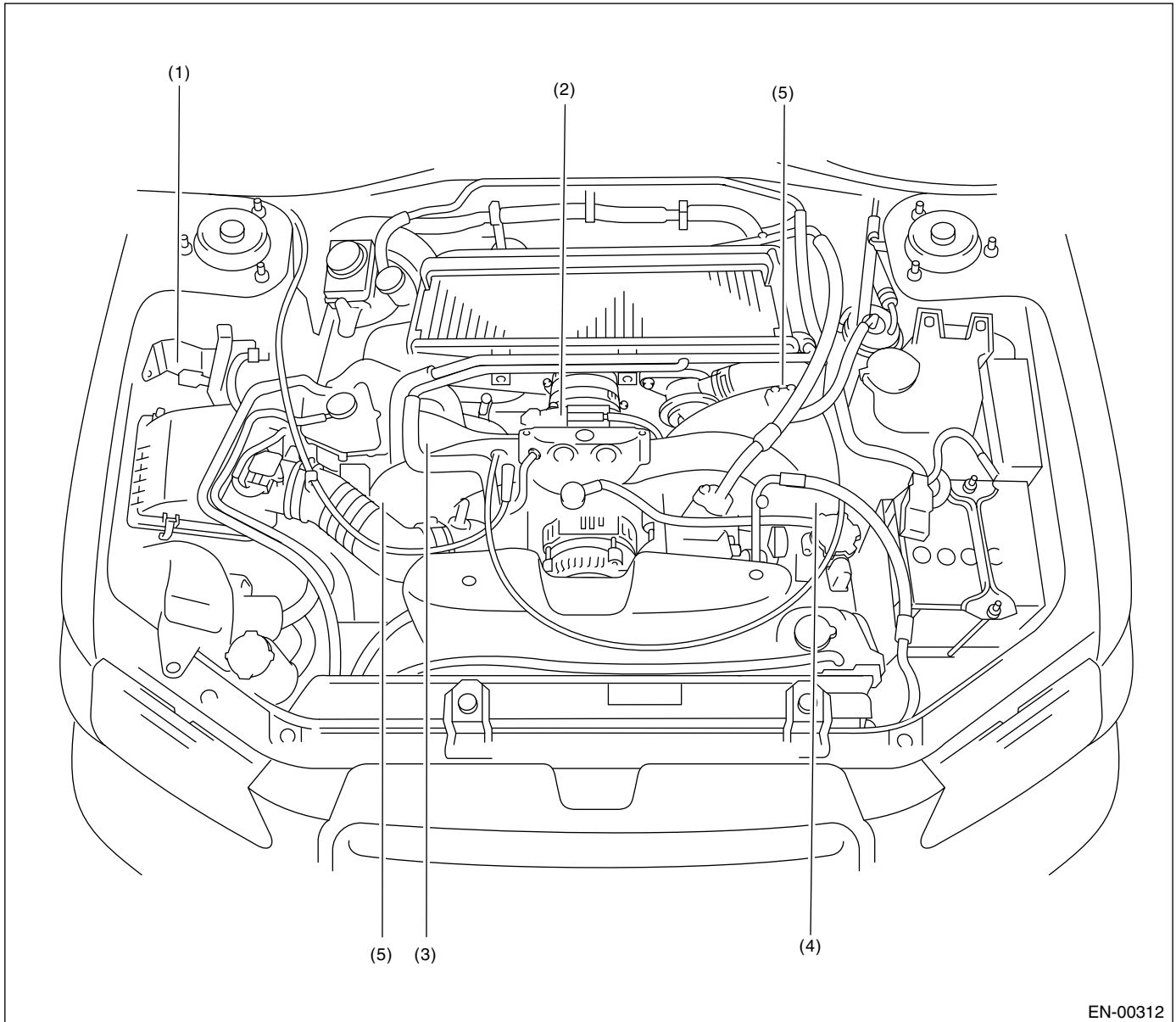
(2) Fuel sub level sensor



# ELECTRICAL COMPONENTS LOCATION

ENGINE (DIAGNOSTICS)

## • Solenoid Valve, Actuator, Emission Control System Parts and Ignition System Parts



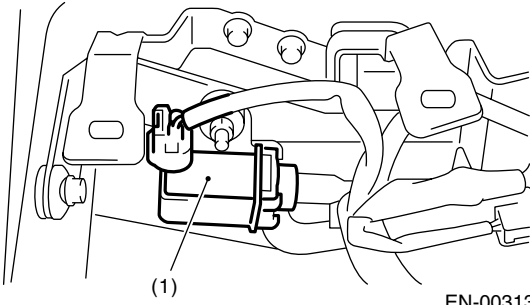
(1) Wastegate control solenoid valve  
(2) Idle air control solenoid valve

(3) Purge control solenoid valve  
(4) Ignition coil

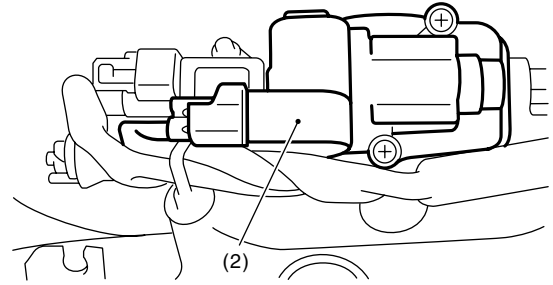
(5) Tumble generator valve actuator

# ELECTRICAL COMPONENTS LOCATION

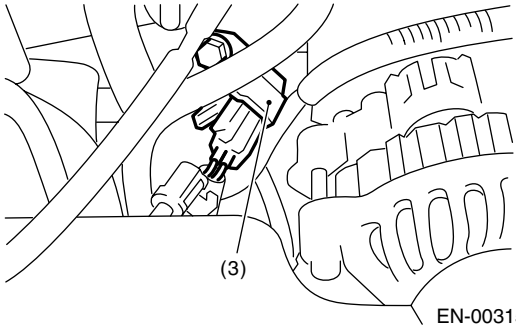
## ENGINE (DIAGNOSTICS)



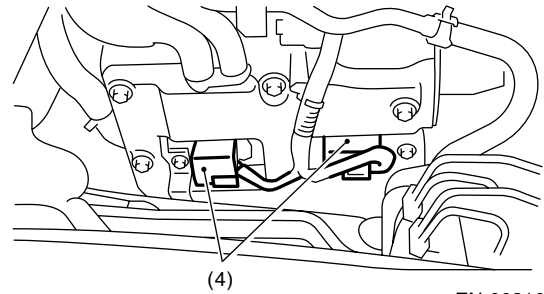
EN-00313



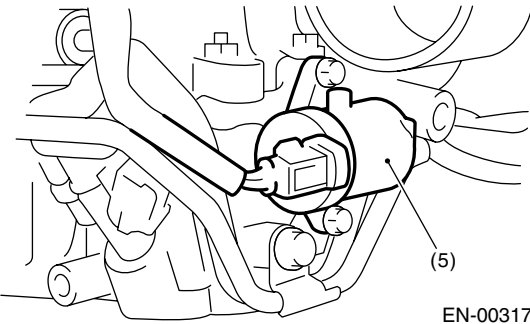
EN-00314



EN-00315



EN-00316



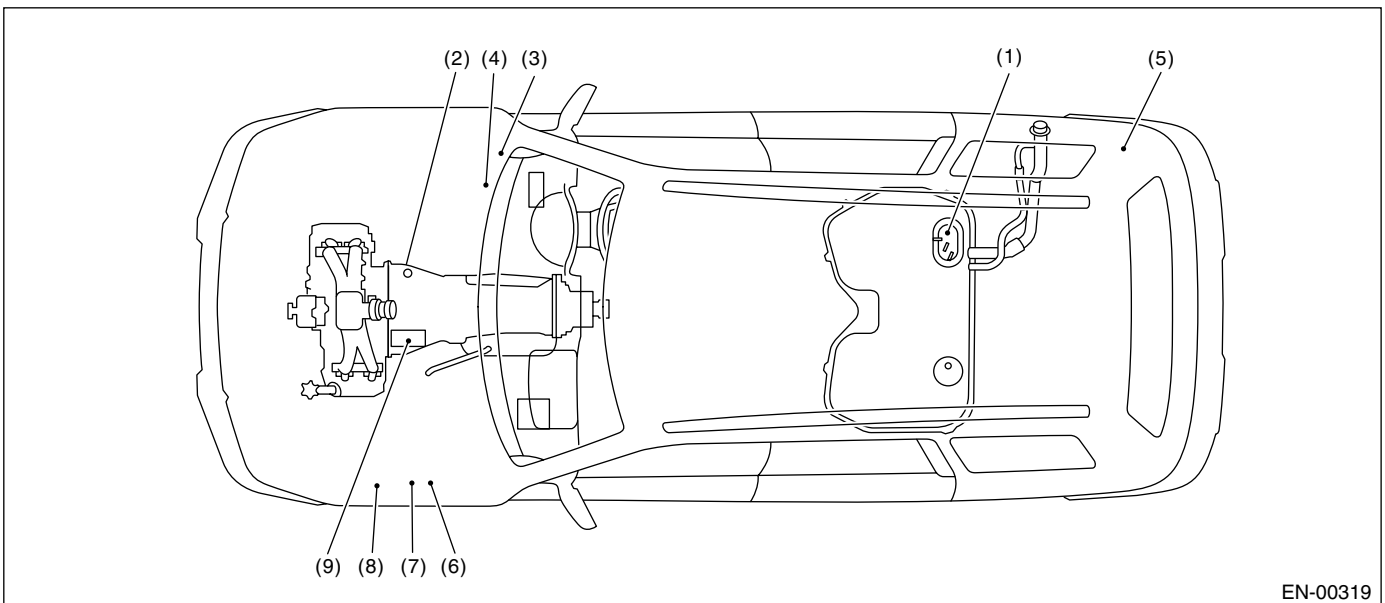
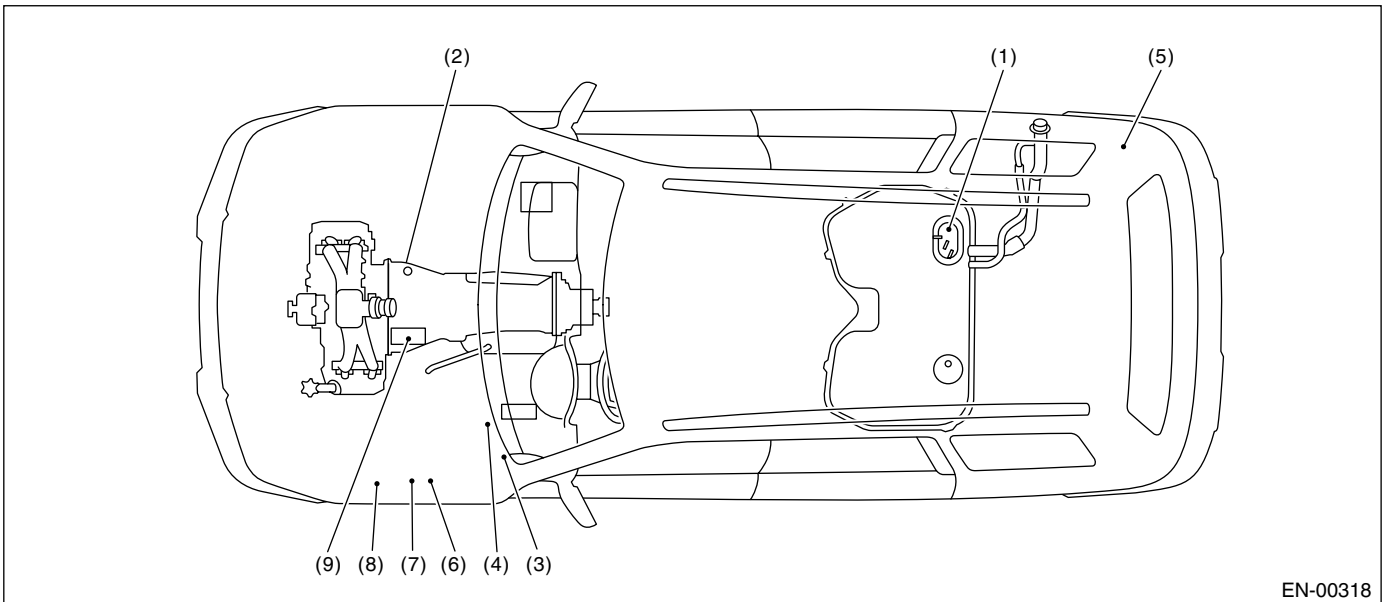
EN-00317

**SUBARU.**



# ELECTRICAL COMPONENTS LOCATION

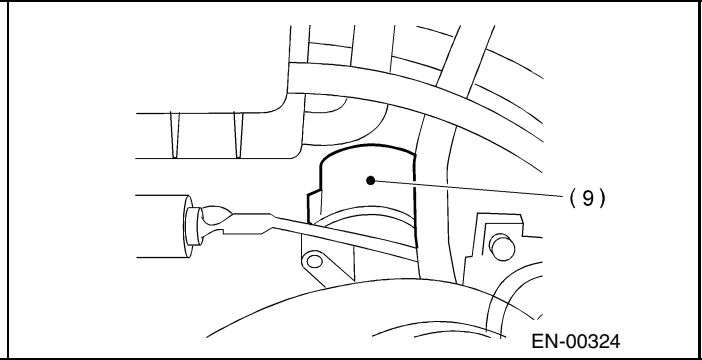
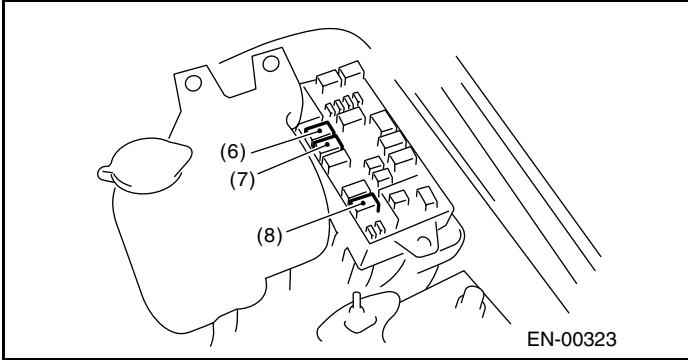
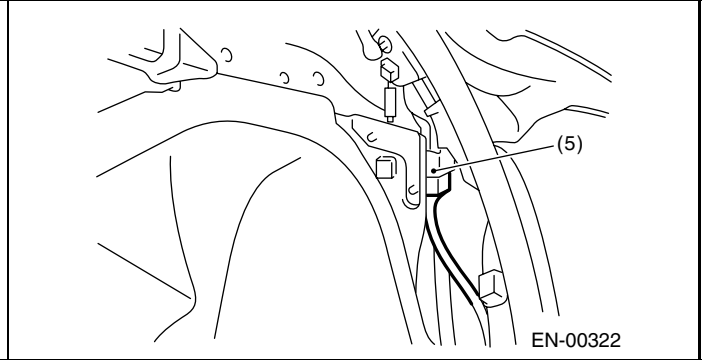
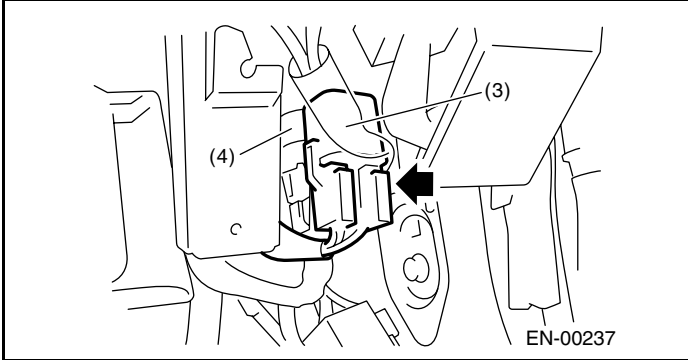
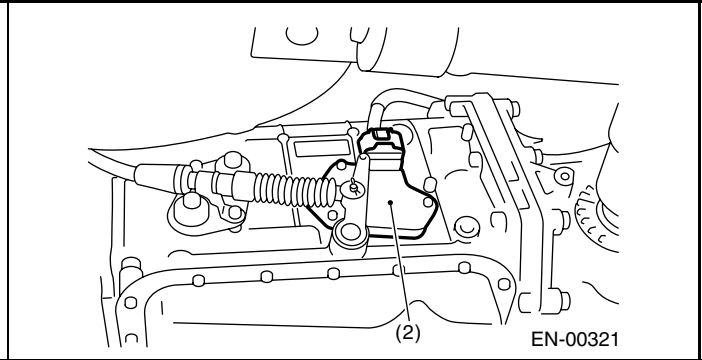
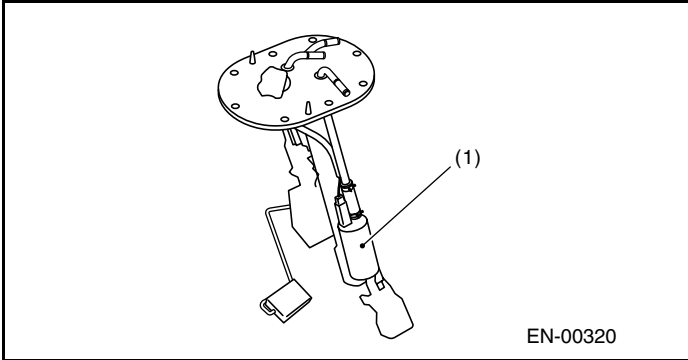
ENGINE (DIAGNOSTICS)



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

# ELECTRICAL COMPONENTS LOCATION

## ENGINE (DIAGNOSTICS)

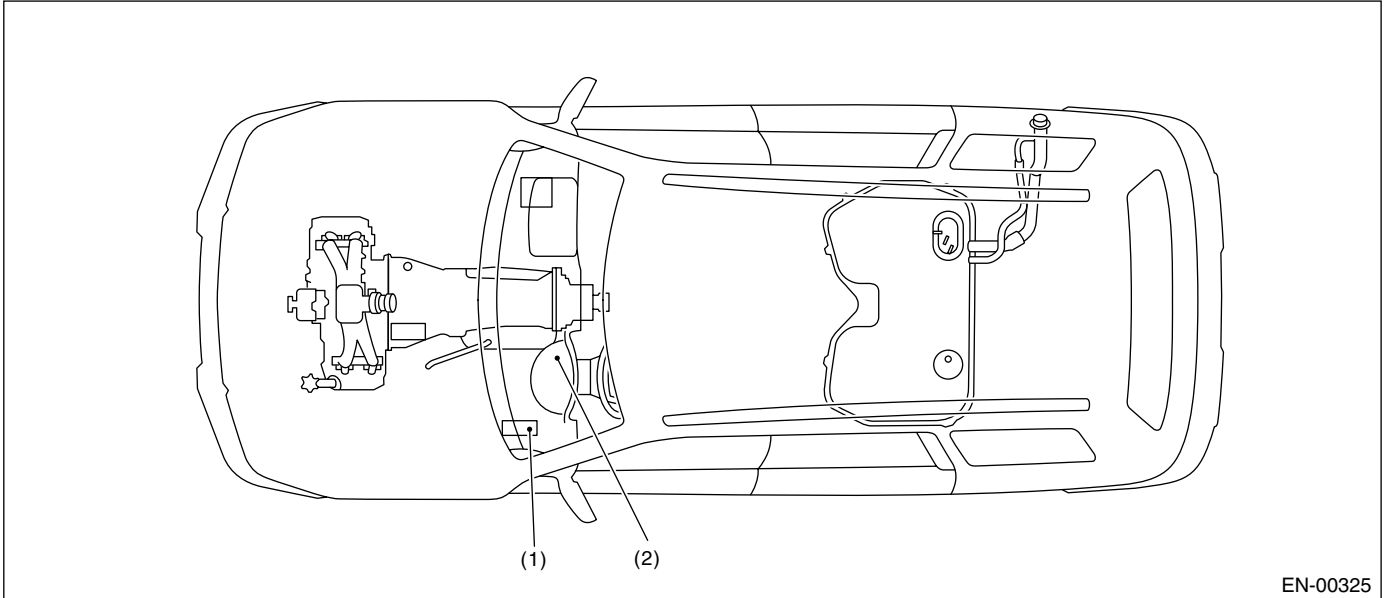


# ELECTRICAL COMPONENTS LOCATION

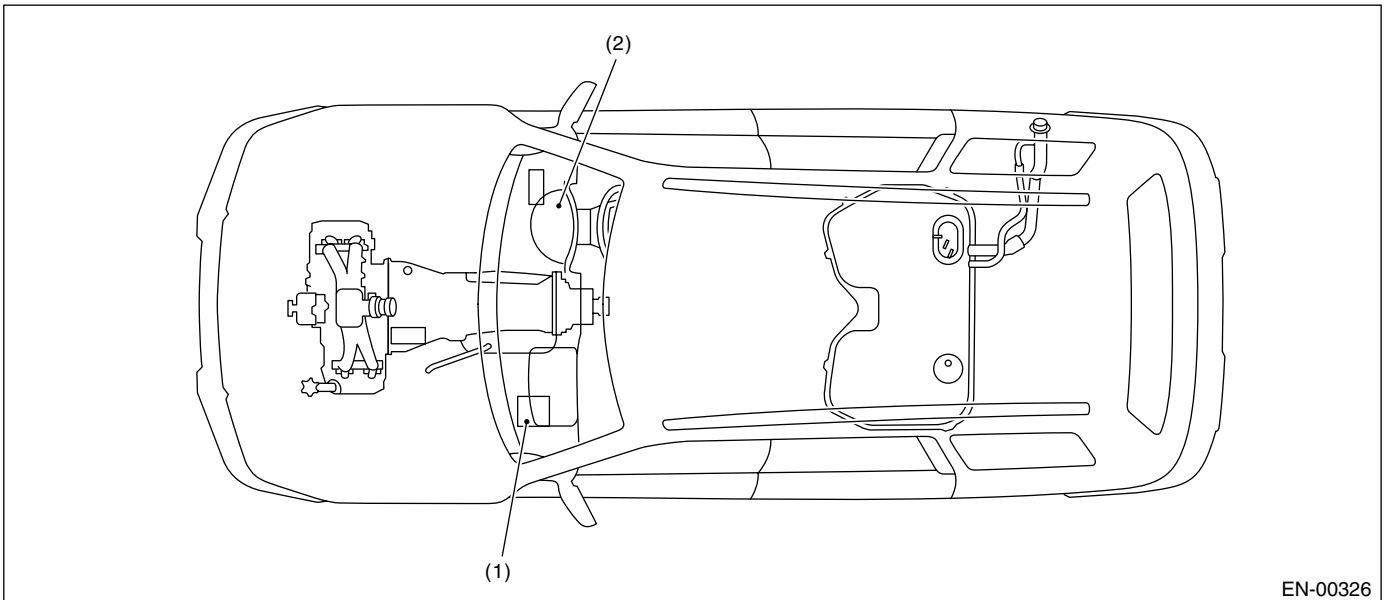
ENGINE (DIAGNOSTICS)

## 2. TRANSMISSION

### • Module



EN-00325



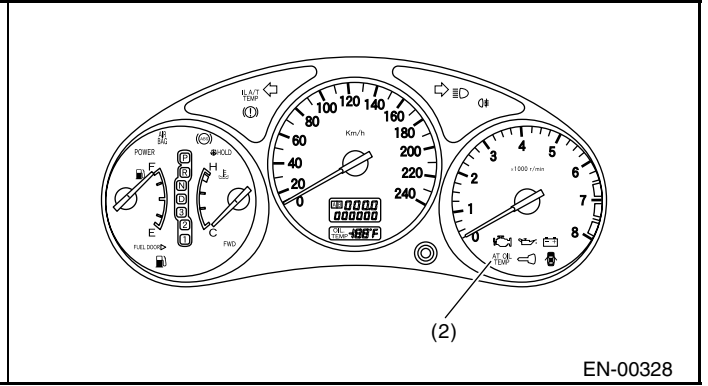
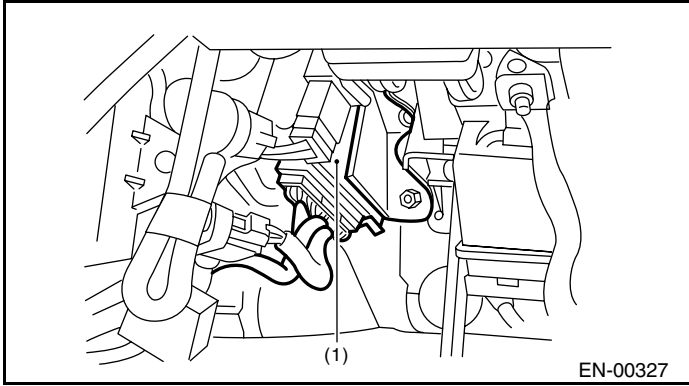
EN-00326

(1) Transmission control module (TCM) (for AT vehicles)

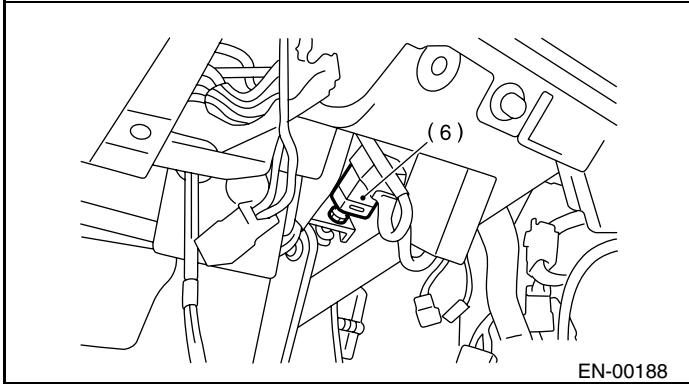
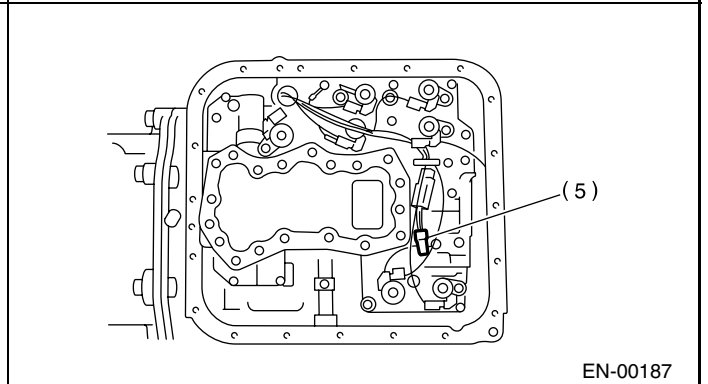
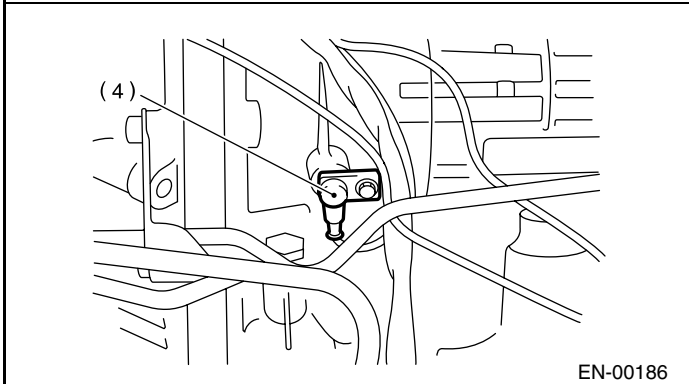
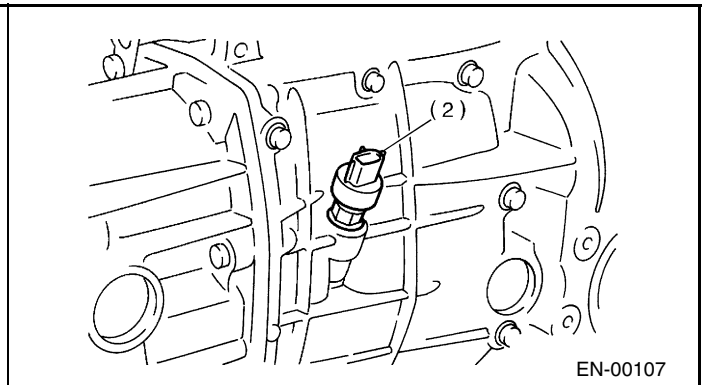
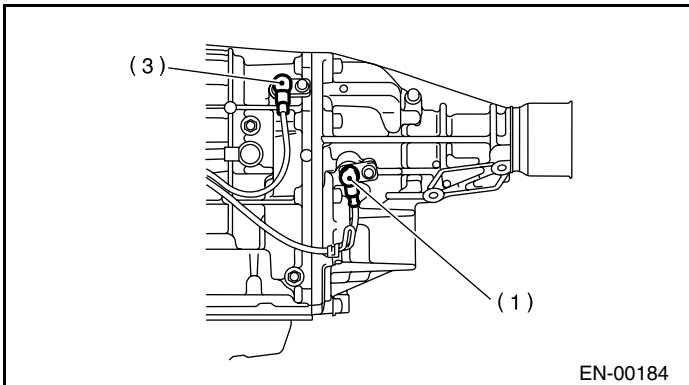
(2) AT diagnostic indicator light (for AT vehicles)

# ELECTRICAL COMPONENTS LOCATION

## ENGINE (DIAGNOSTICS)



### • Sensor

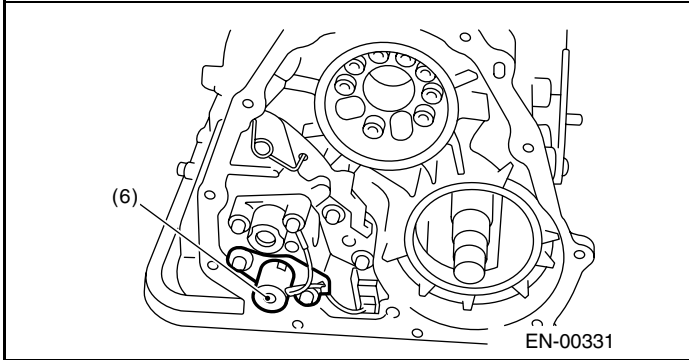
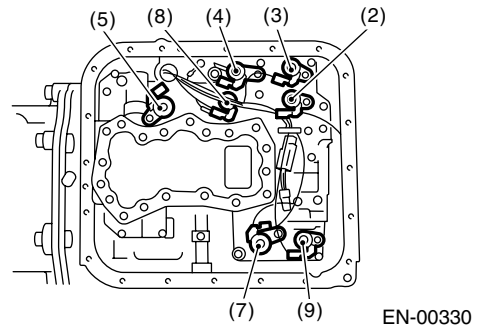
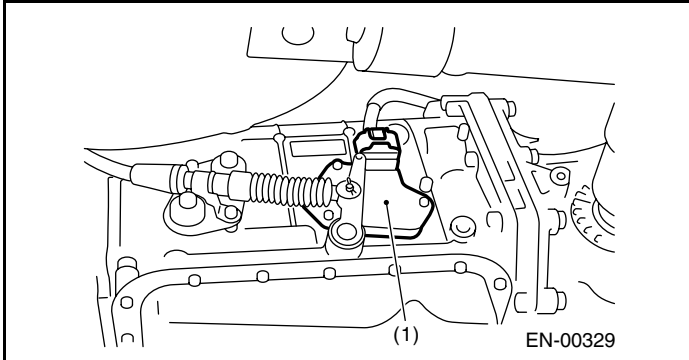


- (1) Rear vehicle speed sensor (for AT vehicles)
- (2) Front vehicle speed sensor (for MT vehicles)
- (3) Front vehicle speed sensor (for AT vehicles)
- (4) Torque converter turbine speed sensor (for AT vehicles)
- (5) ATF temperature sensor (for AT vehicles)
- (6) Brake light switch

# ELECTRICAL COMPONENTS LOCATION

ENGINE (DIAGNOSTICS)

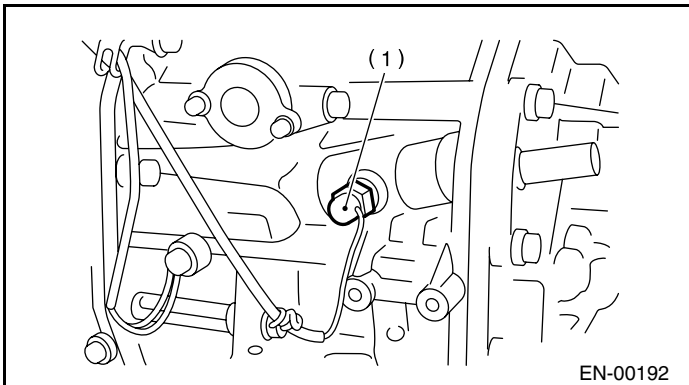
## • Solenoid Valve and Switch (AT Vehicles)



SUBARU.

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

## • Solenoid Valve and Switch (MT Vehicles)



SUBARU.

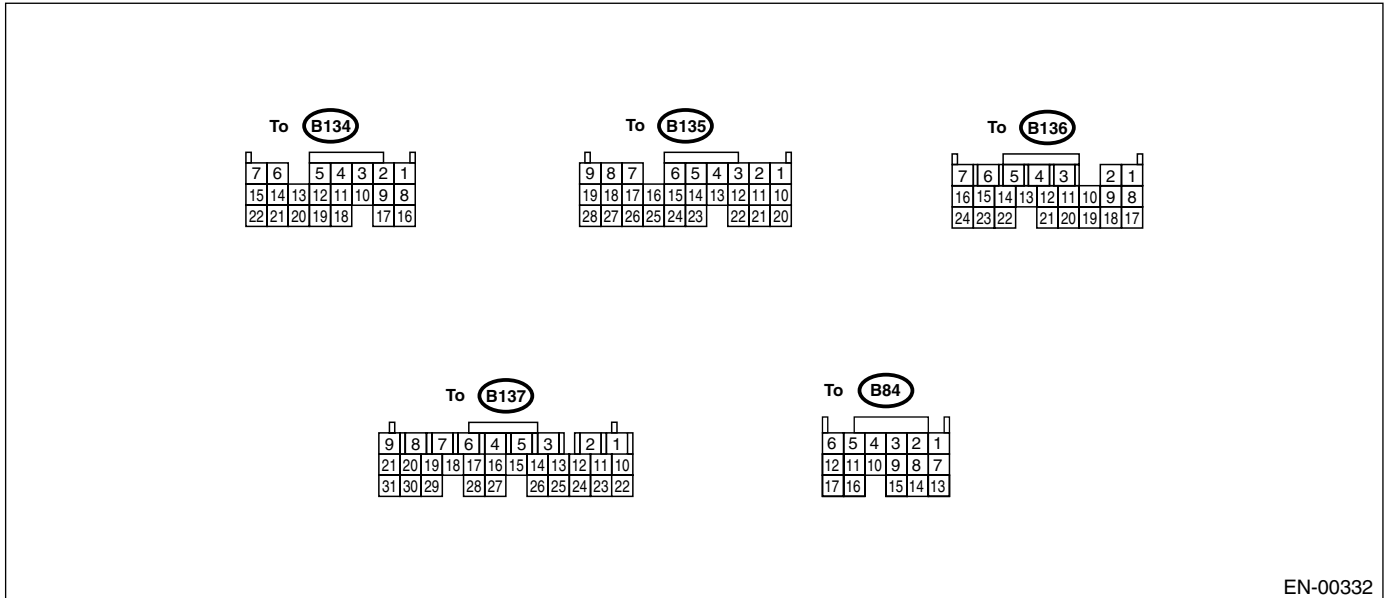
- (1) Neutral position switch

# ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

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

### A: ELECTRICAL SPECIFICATION



EN-00332

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crank- shaft position sensor	Signal (+)	B135	2	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	11	0	0	—
	Shield	B135	21	0	0	—
Camshaft position sensor	Signal (+)	B135	1	0	-7 — +7	Sensor output waveform
	Signal (-)	B135	10	0	0	—
	Shield	B135	21	0	0	—
Throttle position sensor	Signal	B135	7	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B135	9	5	5	—
	GND (sensor)	B135	19	0	0	—
Rear oxygen sensor	Signal	B135	17	0	0 — 0.9	—
	Shield	B135	26	0	0	—
	GND (sensor)	B135	19	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B137	5	0 — 1.0	0 — 1.0	—
	Signal 2	B137	4	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B136	13	0 — 1.0	0 — 1.0	—
Engine coolant temperature sensor	Signal	B135	18	1.0 — 1.4	1.0 — 1.4	After warm-up the engine.
	GND (sensor)	B135	19	0	0	After warm-up the engine.
Vehicle speed signal		B134	1	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.

# ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Content	Con- nector No.	Termi- nal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Generator signal	B137	11	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 10 — 13	Waveform	
Mass air flow sen- sor	Signal	B84	13	—	0.3 — 4.5	—
	Shield	B84	8	0	0	—
	GND	B84	7	0	0	—
Intake air temperature sensor signal	B135	27	—	—	—	
Exhaust gas tem- perature sensor	Signal	B135	16	—	—	—
	GND (sensor)	B135	19	0	0	—
Tumble generator valve posi- tion sensor RH	Signal	B135	23	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B135	9	5	5	—
	GND (sensor)	B135	19	0	0	—
Tumble generator valve posi- tion sensor LH	Signal	B135	13	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B135	9	5	5	—
	GND (sensor)	B135	19	0	0	—
Tumble generator valve RH (open)	B84	4	0 or 5	0 or 5	—	
Tumble generator valve RH (close)	B84	5	0 or 5	0 or 5	—	
Tumble generator valve LH (open)	B84	10	0 or 5	0 or 5	—	
Tumble generator valve LH (close)	B84	11	0 or 5	0 or 5	—	
Wastegate control sole- noid valve	B137	24	10 — 13	13 — 14	—	
Starter switch	B134	16	0	0	Cranking: 8 — 14	
A/C switch	B134	6	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—	
Ignition switch	B134	14	10 — 13	13 — 14	—	
Neutral position switch	B134	8	ON: 12±0.5 OFF: 0		Switch is ON when gear is in neutral position.	
Test mode connector	B134	5	5	5	When connected: 0	
Knock sensor	Signal	B135	4	2.8	2.8	—
	Shield	B135	22	0	0	—
Back-up power supply	B137	10	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13	
Control unit power sup- ply	B137	2	10 — 13	13 — 14	—	
	B137	3	10 — 13	13 — 14	—	
Sensor power supply	B135	9	5	5	—	
Line end check 1	B134	10	0	0	—	
Ignition control	#1	B136	24	0	13 — 14	Waveform
	#2	B136	23	0	13 — 14	Waveform
	#3	B136	22	0	13 — 14	Waveform
	#4	B136	21	0	13 — 14	Waveform

# ENGINE CONTROL MODULE (ECM) I/O SIGNAL

## ENGINE (DIAGNOSTICS)

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Fuel injec- tor	#1	B137	1	10 — 13	1 — 14	Waveform
	#2	B136	6	10 — 13	1 — 14	Waveform
	#3	B136	5	10 — 13	1 — 14	Waveform
	#4	B136	4	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	Signal	B136	10	0 or 13 — 14	0 or 13 — 14	Waveform
Fuel pump controller	Signal 1	B134	13	—	—	—
	Signal 2	B136	16	—	—	—
A/C relay control		B137	27	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		B137	17	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control		B137	28	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Malfunction indicator lamp		B137	15	—	—	Light "ON": 1, or less Light "OFF": 10 — 14
Engine speed output		B136	9	—	0 — 13, or more	Waveform
Purge control solenoid valve		B137	16	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Pressure sensor	Signal	B135	8	1.7 — 2.4	1.1 — 1.6	—
	Power supply	B135	9	5	5	
	GND (sen- sor)	B135	19	0	0	
Fuel level sensor		B135	25	0.12 — 4.75	0.12 — 4.75	—
Small light switch		B134	17	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Blower fan switch		B134	9	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Rear defogger switch		B134	3	ON: 0 OFF: 10 — 13	ON: 0 OFF: 13 — 14	—
Power steering oil pres- sure switch		B135	24	10 — 13	ON: 0 OFF: 13 — 14	—
Front oxygen (A/F) sen- sor signal (+)		B137	29	2.8 — 3.2	2.8 — 3.2	—
Front oxygen (A/F) sen- sor signal (-)		B137	19	2.4 — 2.7	2.4 — 2.7	—
Front oxygen (A/F) sen- sor shield		B137	18	0	0	—
SSM/GST communica- tion line		B134	21	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	—
Torque control 1 signal		B134	19	More than 4	More than 4	—
Torque control 2 signal		B134	18	More than 4	More than 4	—
Torque control cut sig- nal		B136	14	8	8	—
AT diagnosis input sig- nal		B135	20	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
AT load signal		B135	28	4.3 — 4.4	0.9 — 1.4	—
GND (sensors)		B135	19	0	0	—
GND (injectors)		B136	8	0	0	—
GND (ignition system)		B136	18	0	0	—



# ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Content	Con- nector No.	Termi- nal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
GND (power supply)	B136	17	0	0	—
	B134	22	0	0	—
GND (control systems)	B134	7	0	0	—
	B134	15	0	0	—
GND (oxygen sensor heater 1)	B137	9	0	0	—
GND (oxygen sensor heater 2)	B137	8	0	0	—

# ENGINE CONDITION DATA

ENGINE (DIAGNOSTICS)

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## 6. Engine Condition Data

### A: ELECTRICAL SPECIFICATION

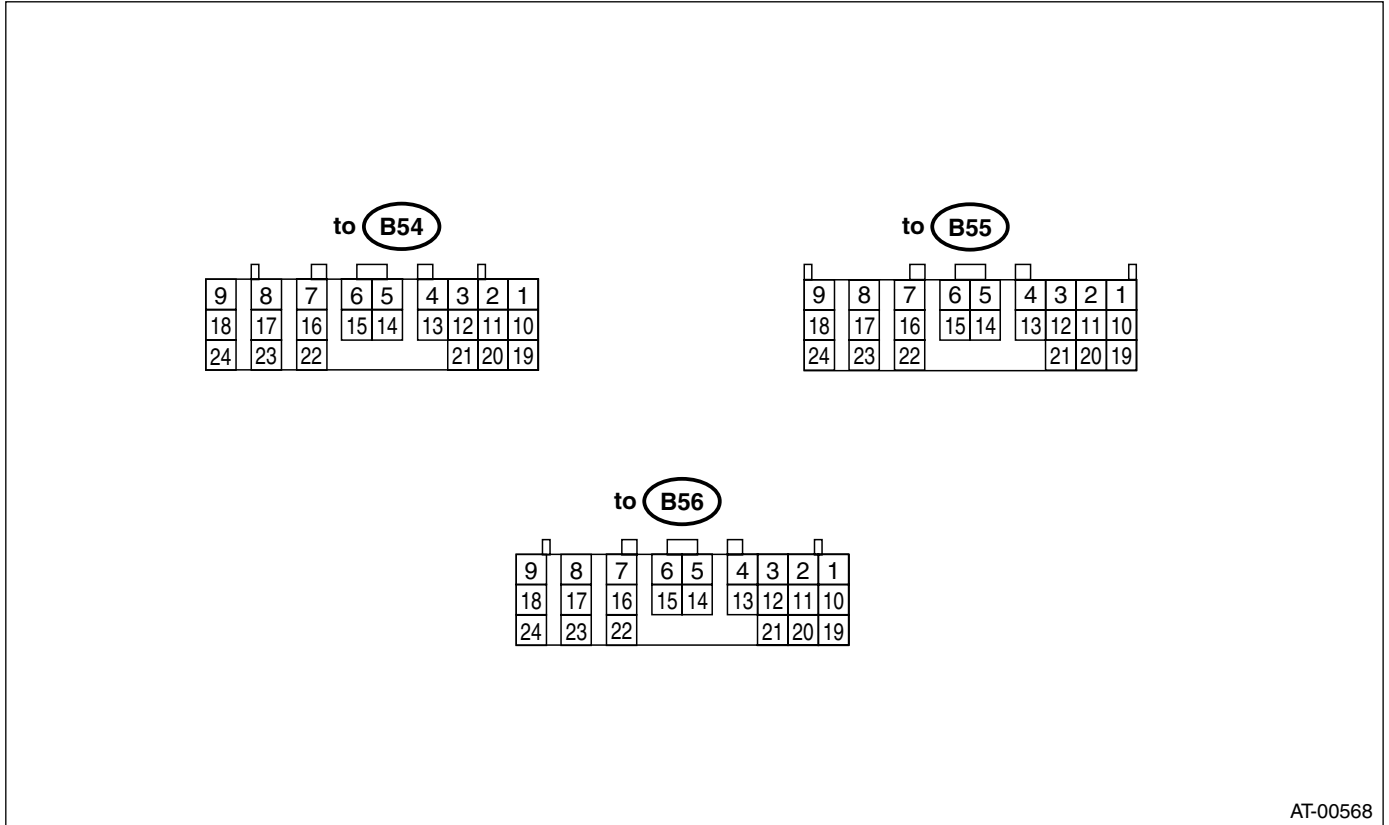
Content	Specified data
Engine load	1.6 — 2.9 (%): Idling
	6.4 — 12.8 (%): 2,500 rpm racing

Measuring condition:

- After warm-up the engine.
- Gear position is in neutral position.
- A/C is turned to OFF.
- All accessory switches are turned to OFF.

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

### A: ELECTRICAL SPECIFICATION



**NOTE:**  
Check with ignition switch ON.

Check with ignition switch ON.					
Content	Con- nector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to chassis ground (Ω)
Back-up power supply	B56	1	Ignition switch OFF	10 — 13	—
Ignition power supply	B54	23	Ignition switch ON (with engine OFF)	10 — 13	—
	B54	24			

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Check with ignition switch ON.						
Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to chassis ground ( $\Omega$ )
Inhibitor switch	"P" range switch	B55	1	Select lever in "P" range	Less than 1	—
				Select lever in any other than "P" range (except "N" range)	More than 8	
	"N" range switch	B55	14	Select lever in "N" range	Less than 1	—
				Select lever in any other than "N" range (except "P" range)	More than 8	
	"R" range switch	B55	3	Select lever in "R" range	Less than 1	—
				Select lever in any other than "R" range	More than 8	
	"D" range switch	B55	4	Select lever in "D" range	Less than 1	—
				Select lever in any other than "D" range	More than 8	
	"3" range switch	B55	5	Select lever in "3" range	Less than 1	—
				Select lever in any other than "3" range	More than 8	
	"2" range switch	B55	6	Select lever in "2" range	Less than 1	—
				Select lever in any other than "2" range	More than 8	
	"1" range switch	B55	7	Select lever in "1" range	Less than 1	—
				Select lever in any other than "1" range	More than 8	
Brake switch	B55	12	Brake pedal depressed.	More than 10.5	—	
			Brake pedal released.	Less than 1		
Kick-down switch	B55	11	Throttle fully opened.	Less than 1	—	
			Throttle fully closed.	More than 6.5		
AT OIL TEMP warning light	B56	10	Light ON	Less than 1	—	
			Light OFF	More than 9		
Throttle position sensor	B54	3	Throttle fully closed.	0.2 — 1.0	—	
			Throttle fully open.	4.2 — 4.7		
Throttle position sensor power supply	B54	2	Ignition switch ON (with engine OFF)	4.8 — 5.3	—	
ATF temperature sensor	B54	11	ATF temperature 20°C (68°F)	1.6 — 2.0	2.1 k — 2.9 k	
			ATF temperature 80°C (176°F)	0.4 — 0.9	275 — 375	
Rear vehicle speed sensor	B55	24	Vehicle stopped.	0	450 — 650	
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)		
Front vehicle speed sensor	B55	18	Vehicle stopped.	0	450 — 650	
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)		
Torque converter turbine speed sensor	B55	8	Engine idling after warm-up. (D range)	0	450 — 650	
			Engine idling after warm-up. (N range)	More than 1 (AC range)		
Vehicle speed output signal	B56	17	Vehicle speed at most 10 km/h (6 MPH)	Less than 1 ← → More than 4	—	

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Check with ignition switch ON.					
Content	Con- nector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to chassis ground (Ω)
Engine speed signal	B55	17	Ignition switch ON (with engine OFF)	More than 10.5	—
			Ignition switch ON (with engine ON)	8 — 11	
Cruise set signal	B55	22	When cruise control is set. (SET lamp ON)	Less than 1	—
			When cruise control is not set. (SET lamp OFF)	More than 6.5	
Torque control signal 1	B56	5	Ignition switch ON (with engine ON)	More than 4	—
Torque control signal 2	B56	14	Ignition switch ON (with engine ON)	More than 4	—
Torque control cut signal	B55	10	Ignition switch ON	8	—
Intake manifold pressure signal (Non-turbo model)	B54	1	Engine idling after warm-up.	0.4 — 1.6	—
Mass air flow signal (Turbo model)	B54	1	Engine idling after warm-up.	0.9 — 1.4	—
Shift solenoid 1	B54	22	1st or 4th gear	More than 9	10 — 16
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B54	5	1st or 2nd gear	More than 9	10 — 16
			3rd or 4th gear	Less than 1	
Line pressure duty solenoid	B54	9	Ignition switch ON (with engine OFF) Throttle fully closed after warm-up.	1.5 — 4.0	2.0 — 4.5
			Ignition switch ON (with engine OFF) Throttle fully open after warm-up.	Less than 0.5	
Lock-up duty solenoid	B54	7	When lock up occurs.	More than 8.5	10 — 17
			When lock up is released.	Less than 0.5	
Transfer duty solenoid (Non-turbo model)	B54	6	Fuse on FWD switch	More than 8.5	10 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Transfer duty solenoid (Turbo model)	B54	6	Throttle fully closed.	More than 8.5	10 — 17
			Throttle fully open.	Less than 0.5	
2-4 brake duty solenoid	B54	18	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 5.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
2-4 brake timing solenoid	B54	16	1st gear	Less than 1	10 — 16
			3rd gear	More than 9	
Low clutch timing solenoid	B54	15	2nd gear	Less than 1	10 — 16
			4th gear	More than 9	
Hold switch	B55	16	Hold switch ON	Less than 1	—
			Hold switch OFF	More than 8	—
Power switch	B55	23	Power switch ON	Less than 1	—
			Power switch OFF	More than 10	—

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

Check with ignition switch ON.					
Content	Con- nector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to chassis ground ( $\Omega$ )
Power indicator light	B56	11	Light ON	Less than 1	—
			Light OFF	More than 9	—
FWD switch	B55	20	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	—
FWD indicator light	B56	2	Fused ON FWD switch	Less than 1	—
			Fuse removed from FWD switch.	More than 9	—
ABS signal	B55	21	ABS switch ON	Less than 1	—
			ABS switch OFF	6.5 — 15	—
Sensor ground line 1	B54	20	—	0	Less than 1
Sensor ground line 2	B55	9	—	0	Less than 1
System ground line	B56	19	—	0	Less than 1
	B54	21			
Sensor ground line 3	B54	10	—	0	Less than 1
Sensor ground line 4	B54	19	—	0	Less than 1
AT diagnosis signal	B56	21	Ignition switch ON	Less than 1 ← → More than 4	—
Data link signal (Subaru Select Monitor)	B56	15	—	—	—

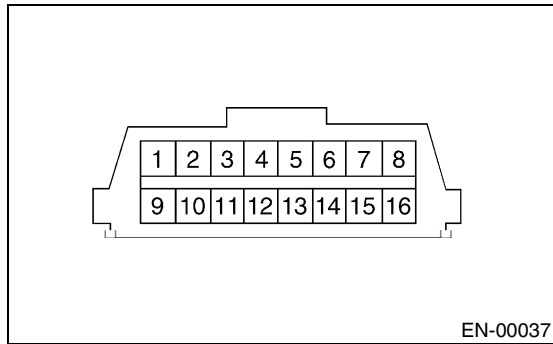
## 8. Data Link Connector

### A: NOTE

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

### CAUTION:

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



Terminal No.	Contents	Terminal No.	Contents
1	Power supply	9	Blank
2	Blank	10	K line of ISO 9141 CARB
3	Blank	11	Blank
4	Subaru Select Monitor signal (ECM to Subaru Select Monitor)*	12	Ground
5	Subaru Select Monitor signal (Subaru Select Monitor to ECM)*	13	Ground
6	Line end check signal 1	14	Blank
7	Blank	15	Blank
8	Line end check signal 2	16	Blank

\*: Circuit only for Subaru Select Monitor

# OBD-II GENERAL SCAN TOOL

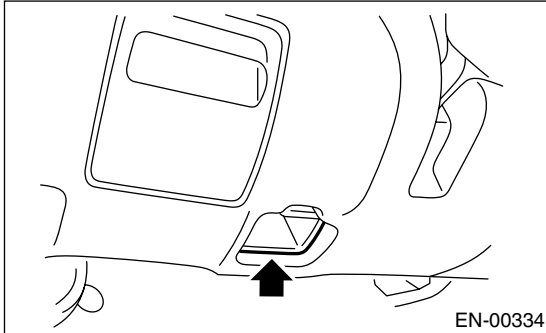
ENGINE (DIAGNOSTICS)

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



#### 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 trouble codes and MIL status	ON/OFF
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
0F	Intake air temperature	°C
10	Air flow rate from 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 2	V and %
24	A/F sensor 1 output voltage and short term fuel trim associated with A/F sensor 1	V and %
1C	On-board diagnosis system	—

#### NOTE:

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

3) Using the OBD-II general scan tool, call up diagnostic trouble code(s) (DTC(s)) 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 the data according to repair procedures. (For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.)

#### NOTE:

For details concerning diagnostic trouble codes (DTCs), refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>



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

**NOTE:**

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

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

Refer to Read Diagnostic Trouble Code for information about data denoting emission-related powertrain diagnostic trouble codes. <Ref. to EN(TURBO)-41, Read Diagnostic Trouble Code.>

**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).

# SUBARU SELECT MONITOR

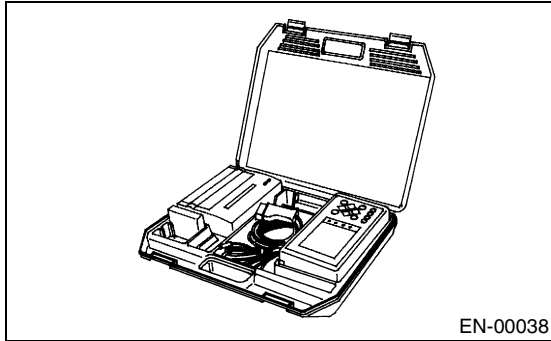
ENGINE (DIAGNOSTICS)

## 10. Subaru Select Monitor

### A: OPERATION

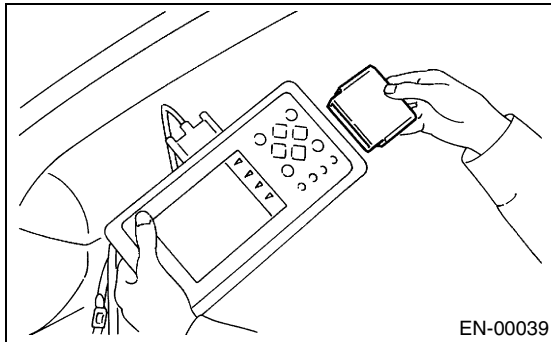
#### 1. HOW TO USE SUBARU SELECT MONITOR

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



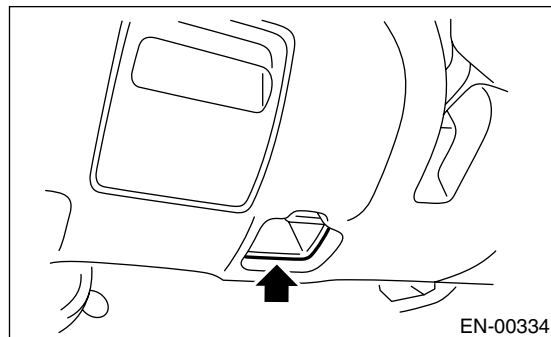
2) Connect the diagnosis cable to Subaru Select Monitor.

3) Insert the cartridge into Subaru Select Monitor. <Ref. to EN(TURBO)-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 instrument panel (on the driver's side).

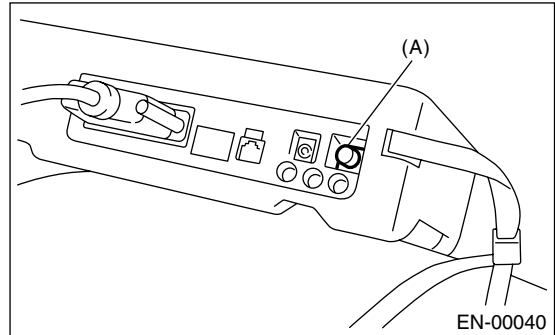


(2) Connect the diagnosis cable to data link connector.

#### 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 diagnostic trouble code(s) (DTC(s)) and various data, then record them.

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

Refer to Read Diagnostic Trouble Code for information about how to indicate DTC. <Ref. to EN(TURBO)-41, Read Diagnostic Trouble Code.>

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

Refer to Read Diagnostic Trouble Code for information about how to indicate DTC. <Ref. to EN(TURBO)-41, Read Diagnostic Trouble Code.>

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

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

Contents	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	%
Alternator 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 <sub>2</sub> Sensor	V
Short term fuel trim	A/F Correction #1	%
Knock sensor signal	Knocking Correction	deg
Atmospheric absolute pressure signal	Atmosphere Pressure	mmHg or kPa or inHg or psi
Intake manifold relative pressure signal	Mani. Relative Pressure	mmHg or kPa or inHg or psi
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or 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	%
Front oxygen (A/F) sensor heater current	A/F Heater Current 1	A
Rear oxygen sensor heater voltage	Rear O <sub>2</sub> Heater Voltage	V
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Primary supercharged pressure control signal	Primary Control	%
Tumble generator valve position sensor signal (right side)	TGV Position Sensor R	V
Tumble generator valve position sensor signal (left side)	TGV Position Sensor L	V
Tumble generator valve drive signal	TGV Drive	OPEN or CLOSE
Fuel level signal	Fuel Level	V
Intake air temperature signal	Intake Air Temp.	°C or °F
Learned ignition timing	Learned Ignition Timing	deg
Mass air flow sensor signal	Mass Air Flow	g/s
Mass air flow sensor signal	Air Flow Sensor Voltage	V
Ignition switch signal	Ignition Switch	ON or OFF
Test mode connector signal	Test Mode Signal	ON or OFF
Neutral position switch signal	Neutral Position Switch	ON or OFF
Air conditioning switch signal	A/C Switch	ON or OFF
Air conditioning signal	A/C Compressor Signal	ON or OFF

# SUBARU SELECT MONITOR

## ENGINE (DIAGNOSTICS)

Contents	Display	Unit of measure
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF
Fuel pump relay signal	Fuel Pump Relay	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 signal #1	Torque Control Signal #1	ON or OFF
Engine torque control signal #2	Torque Control Signal #2	ON or OFF
Engine torque control permission signal	Torque Permission Signal	ON or OFF
Rear oxygen sensor rich signal	Rear O <sub>2</sub> 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 generator valve output signal	TGV Output	ON or OFF
A/C middle pressure signal	A/C Mid Pressure Switch	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 [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press [YES] key.
  - 3) Press the [YES] key after displayed the information of engine type.
  - 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press [YES] key.
  - 5) On the «OBD Menu» display screen, select the {Current Data Display & Save} and press [YES] key.
  - 6) On the «Data Display Menu» display screen, select the {Data Display} and press [YES] key.
  - 7) Using the scroll key, move the display screen up or down until desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Number of diagnosis code	Number of Diagnosis Code	—
Malfunction indicator lamp status	MI (MIL)	Complete or incomplete
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	No support
Test of heated 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	O <sub>2</sub> Heater Diagnosis	Complete or incomplete
Test of EGR system	EGR system	No support
Air fuel ratio control system for bank 1	Fuel System for Bank 1	—
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 or kPa or 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
Intake air amount	Mass Air Flow	g/s
Throttle position signal	Throttle Opening Angle	%
A/F sensor equipment	A/F sensor	ON or OFF
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	—

**NOTE:**

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

# SUBARU SELECT MONITOR

## ENGINE (DIAGNOSTICS)

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

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

Contents	Display	Unit of measure
Diagnostic trouble code (DTC) for freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	ON or OFF
Engine load data	Engine Load	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen (A/F) sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen (A/F) sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or inHg or psi
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH

#### NOTE:

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

### 7. READ OXYGEN SENSOR MONITORING TEST RESULTS DATA FOR ENGINE. (OBD MODE)

- 1) On the «Main Menu» display screen, select the {Each System Check} and press [YES] key.
  - 2) On the «System Selection Menu» display screen, select the {Engine Control System} and press [YES] key.
  - 3) Press the [YES] key after displayed the information of engine type.
  - 4) On the «Engine Diagnosis» display screen, select the {OBD System} and press [YES] key.
  - 5) On the «OBD Menu» display screen, select the {O<sub>2</sub> Sensor Monitor} and press [YES] key.
  - 6) On the «O<sub>2</sub> Sensor Select» display screen, select the {Bank 1-Sensor1} or {Bank 1-Sensor2} and press [YES] key.
- Bank 1-Sensor1 indicates the front oxygen or A/F sensor, and Bank 1-Sensor2 indicates the rear oxygen sensor.
  - A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Oxygen sensor for monitoring test	<O <sub>2</sub> Sensor Monitor (-----)>	—
Rich to lean oxygen sensor threshold voltage	Rich to lean sensor volt	V
Lean to rich oxygen sensor threshold voltage	Lean to rich sensor volt	V
Low oxygen sensor voltage for switch time calculation	Low sensor voltage	V
High oxygen sensor voltage for switch time calculation	High sensor voltage	V
Rich to lean oxygen sensor switch time	Rich to lean switch time	sec
Lean to rich oxygen sensor switch time	Lean to rich switch time	sec
Maximum oxygen sensor voltage for test cycle	Maximum sensor Voltage	V
Minimum oxygen sensor voltage for test cycle	Minimum sensor Voltage	V

#### NOTE:

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

## 8. LED OPERATION MODE FOR ENGINE

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

Contents	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is turned to ON.
Test mode connector signal	Test Mode Signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral SW	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C SW	ON or OFF	When air conditioning switch is turned ON.
Air conditioning relay signal	A/C Relay	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF	When radiator main fan relay is in function.
Knocking signal	Knocking Signal	ON or OFF	When knocking signal is entered.
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF	When radiator sub fan relay is in function.
Engine torque control signal #1	Torque Control Signal #1	ON or OFF	When engine torque control signal 1 is entered.
Engine torque control signal #2	Torque Control Signal #2	ON or OFF	When engine torque control signal 2 is entered.
Engine torque control permission signal	Torque Control Permit	ON or OFF	When engine torque control permission signal is entered.
Rear oxygen sensor rich signal	Rear O <sub>2</sub> Rich Signal	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Starter switch signal	Starter Switch Signal	ON or OFF	When starter switch signal is entered.
Idle switch signal	Idle Switch Signal	ON or OFF	When idle switch signal is entered.
Crankshaft position sensor signal	Crankshaft Position Sig.	ON or OFF	When crankshaft position sensor signal is entered.
Camshaft position sensor signal	Camshaft Position Sig.	ON or OFF	When camshaft position sensor signal is entered.
Power steering switch signal	P/S SW	ON or OFF	When power steering switch is entered.
Rear defogger switch signal	Rear Defogger SW	ON or OFF	When rear defogger switch is turned ON.
Blower fan switch signal	Blower Fan SW	ON or OFF	When blower fan switch is turned ON.
Light switch signal	Light SW	ON or OFF	When small light switch is turned ON.
Tumble generator valve actuator signal	TGV Signal	ON or OFF	When TGV actuator signal is entered.
Tumble generator valve drive signal	TGV Drive	ON or OFF	When TGV moves and valve opens.

**NOTE:**

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

# SUBARU SELECT MONITOR

## ENGINE (DIAGNOSTICS)

### 9. READ CURRENT DATA FOR AT

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

Contents	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
Automatic transmission fluid 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	%
Power supply for throttle position sensor	Throttle Sensor Power	V
Torque converter turbine speed signal	Turbine Revolution Speed	rpm
2-4 brake timing pressure control duty ratio	Brake Clutch Duty Ratio	%
Stop lamp 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

### A: OPERATION

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

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

#### NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For detailed concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>

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

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

#### NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For detailed concerning diagnostic trouble codes (DTCs), refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>

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

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

For details concerning diagnostic trouble codes (DTCs), refer to the List of Diagnostic Trouble Code (DTC). <Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>

#### NOTE:

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

# INSPECTION MODE

ENGINE (DIAGNOSTICS)

## 12. Inspection Mode

### A: OPERATION

Carry out trouble diagnosis shown in the following DTC table.

When performing trouble diagnosis which is not shown in the DTC table, refer to the next item Drive cycle.

<Ref. to EN(TURBO)-47, Drive Cycle.>

DTC No.	Item	Condition
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	—
P0031	HO2S Heater Control Circuit Low (Bank 1 Sensor 1)	—
P0032	HO2S Heater Control Circuit High (Bank 1 Sensor 1)	—
P0037	HO2S Heater Control Circuit Low (Bank 1 Sensor 2)	—
P0038	HO2S Heater Control Circuit High (Bank 1 Sensor 2)	—
P0068	Manifold Absolute Pressure/Barometric Pressure Circuit Range/Performance	—
P0102	Mass or Volume Air Flow Circuit Low Input	—
P0103	Mass or Volume Air Flow Circuit High Input	—
P0107	Manifold Absolute Pressure/Barometric Pressure Circuit Low Input	—
P0108	Manifold Absolute Pressure/Barometric Pressure Circuit High Input	—
P0112	Intake Air Temperature Circuit Low Input	—
P0113	Intake Air Temperature Circuit High Input	—
P0117	Engine Coolant Temperature Circuit Low Input	—
P0118	Engine Coolant Temperature Circuit High Input	—
P0122	Throttle/Pedal Position Sensor/Switch "A" Circuit Low Input	—
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High Input	—
P0129	Atmospheric Pressure Sensor Circuit Range/Performance	—
P0130	O <sub>2</sub> Sensor Circuit (Bank 1 Sensor 1)	—
P0134	O <sub>2</sub> Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	—
P0137	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 2)	—
P0138	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 2)	—
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	—
P0246	Turbo/Super Charger Wastegate Solenoid "A" High	—
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	—
P0328	Knock Sensor 1 Circuit High Input (Bank 1 or Single Sensor)	—
P0335	Crankshaft Position Sensor "A" Circuit	—
P0336	Crankshaft Position Sensor "A" Circuit Range/Performance	—
P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)	—
P0341	Camshaft Position Sensor "A" Circuit Range/Performance (Bank 1 or Single Sensor)	—
P0458	Evaporative Emission Control System Purge Control Valve Circuit Low	—
P0462	Fuel Level Sensor Circuit Low Input	—
P0463	Fuel Level Sensor Circuit High Input	—
P0502	Vehicle Speed Sensor Circuit Low Input	—
P0503	Vehicle Speed Sensor Intermittent/Erratic/High	—
P0508	Idle Control System Circuit Low	—
P0509	Idle Control System Circuit High	—
P0512	Starter Switch Circuit High Input	—
P0518	Starter Switch Circuit Low Input	—
P0519	Idle Control System Malfunction (Fail-safe)	—

# INSPECTION MODE

ENGINE (DIAGNOSTICS)

DTC No.	Item	Condition
P0558	Generator Circuit Low Input	—
P0559	Generator Circuit High Input	—
P0604	Internal Control Module Random Access Memory (RAM) Error	—
P0691	Cooling Fan 1 Control Circuit Low	—
P0692	Cooling Fan 1 Control Circuit High	—
P0851	Neutral Switch Input Circuit Low	—
P0852	Neutral Switch Input Circuit High	—
P0864	TCM Communication Circuit Range/Performance	—
P0865	AT Diagnosis Input Signal Circuit Low Input	—
P0866	AT Diagnosis Input Signal Circuit High Input	—
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	—
P1090	Tumble Generated Valve System 1 (Valve Open)	Engine coolant temperature is $-5 \text{ — } 5^{\circ}\text{C}$ ( $-41 \text{ — } 41^{\circ}\text{F}$ ) at engine start.
P1091	Tumble Generated Valve System 1 (Valve Close)	—
P1092	Tumble Generated Valve System 2 (Valve Open)	Engine coolant temperature is $-5 \text{ — } 5^{\circ}\text{C}$ ( $-41 \text{ — } 41^{\circ}\text{F}$ ) at engine start.
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)	—
P1134	A/F sensor Micro-computer problem	—
P1152	O <sub>2</sub> Sensor Circuit Range/Performance (Low) (Bank1 Sensor1)	—
P1153	O <sub>2</sub> Sensor Circuit Range/Performance (High) (Bank1 Sensor1)	—
P1560	Back-up Voltage Circuit Malfunction	—

# INSPECTION MODE

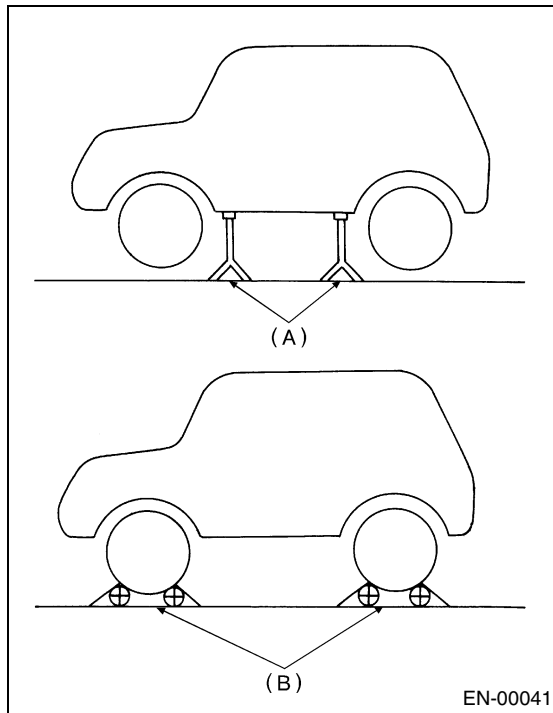
## ENGINE (DIAGNOSTICS)

### 1. PREPARATION FOR THE INSPECTION MODE

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

#### WARNING:

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

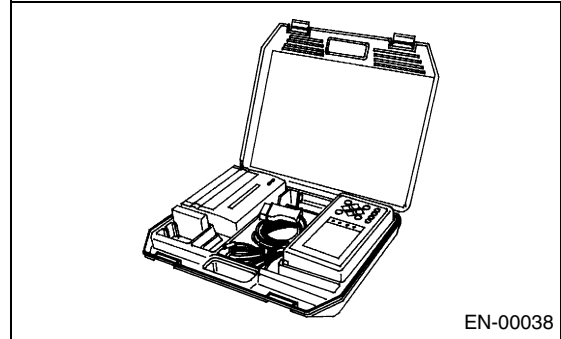


EN-00041

- (A) Safety stand  
(B) Free rollers

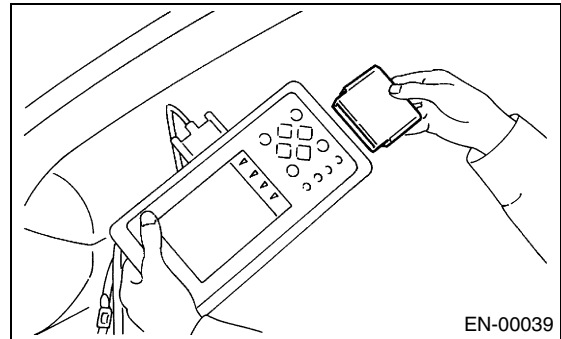
### 2. SUBARU SELECT MONITOR

- 1) After performing the diagnostics and clearing the memory, check for any remaining unresolved trouble data. <Ref. to EN(TURBO)-49, Clear Memory Mode.>
- 2) Warm up the engine.
- 3) Prepare the Subaru Select Monitor kit. <Ref. to EN(TURBO)-8, PREPARATION TOOL, General Description.>



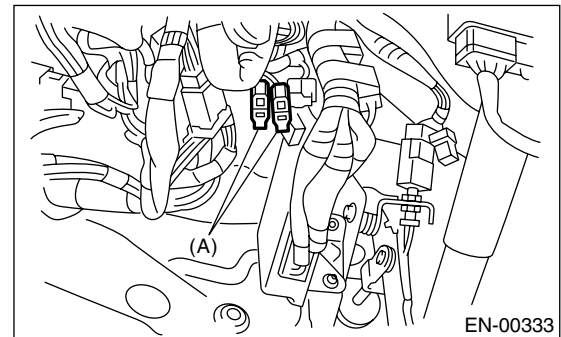
EN-00038

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



EN-00039

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

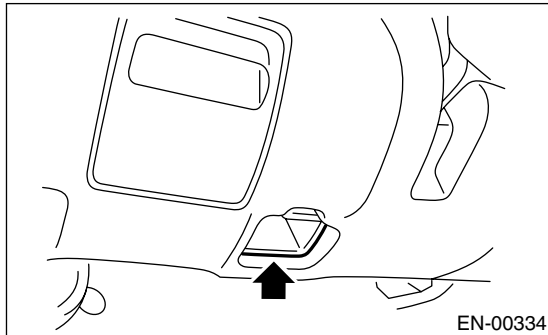


EN-00333

- (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).

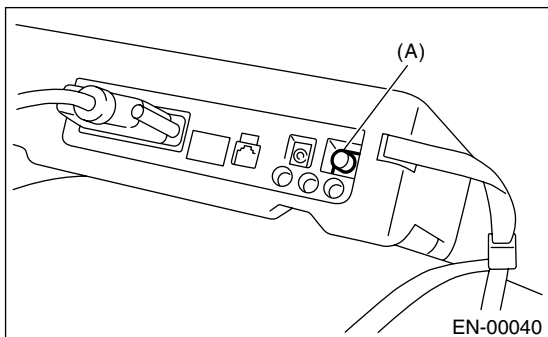


- (2) Connect the diagnosis cable to data link connector.

**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

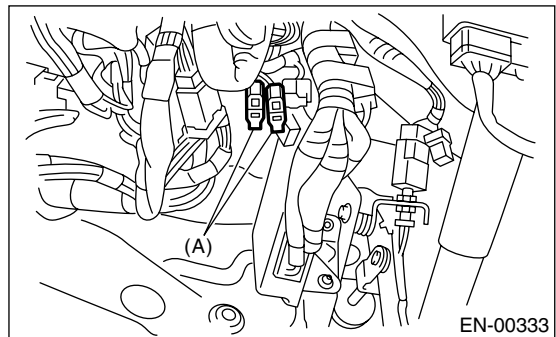
- 9) On the «Main Menu» display screen, select the {2. Each System Check} and press the [YES] key.
- 10) On the «System Selection Menu» display screen, select the {Engine Control System} and press the [YES] key.
- 11) Press the [YES] key after displayed the information of engine type.
- 12) On the «Engine Diagnosis» display screen, select the {Dealer Check Mode Procedure} and press the [YES] key.
- 13) When the “Perform Inspection (Dealer Check) Mode?” is shown on the display screen, press the [YES] key.
- 14) Perform subsequent procedures as instructed on the display screen.
  - If trouble still remains in the memory, the corresponding diagnostic trouble code (DTC) appears on the display screen.

**NOTE:**

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For detailed concerning the diagnostic trouble codes (DTCs), refer to the List of Diagnostic Trouble Code (DTC).  
<Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>
- Release the parking brake.
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When the engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

### 3. OBD-II GENERAL SCAN TOOL

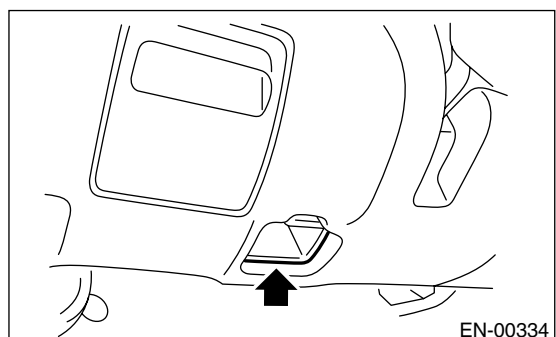
- 1) After performing the diagnostics and clearing memory, check for any remaining unresolved trouble data: <Ref. to EN(TURBO)-49, Clear Memory Mode.>
- 2) Warm up the engine.
- 3) Connect the test mode connector (A) at the lower side of instrument panel (on the driver's side).



- 4) Connect the OBD-II general scan tool to its data link connector in the lower portion of 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.**



- 5) Start the engine.

## INSPECTION MODE

### ENGINE (DIAGNOSTICS)

---

#### NOTE:

- Ensure the selector lever is placed in “P” position before starting. (AT vehicles)
- Depress the clutch pedal when starting engine. (MT vehicles)

6) Using the selector lever or shift lever, turn the “P” position switch and “N” position switch to ON.

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

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

9) Place the selector lever or shift lever in “D” position (AT vehicles) or “1st” gear (MT vehicles) 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 ABS warning light, but this indicates no malfunctions. When the engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

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

#### NOTE:

- For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.
- For detailed concerning diagnostic trouble codes, refer to the List of Diagnostic Trouble Code (DTC).

<Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>

## 13. Drive Cycle

### A: OPERATION

There are three drive patterns for the trouble diagnosis. Driving in the specified pattern allows to diagnose malfunctioning items listed below. After the malfunctioning items listed below are repaired, always check whether they correctly resume their functions by driving in the required drive pattern.

#### 1. PREPARATION FOR THE DRIVE CYCLE

- 1) Make sure that the fuel remains approx. half amount [20 — 40 ℓ (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)], and battery voltage is 12V or more.
- 2) After performing the diagnostics and cleaning memory, check for any remaining unresolved trouble data. <Ref. to EN(TURBO)-49, Clear Memory Mode.>
- 3) Separate the test mode connector.

**NOTE:**

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

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

DTC No.	Item	Condition
*P0125	Insufficient Coolant Temperature for Closed Loop Fuel Control	Engine coolant temperature is less than 20°C (68°F) at engine start.
*P0133	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 1)	—
*P0420	Catalyst System Efficiency Below Threshold (Bank 1)	—
P0459	Evaporative Emission Control System Purge Control Valve Circuit High	—
P0461	Fuel Level Sensor Circuit Range/Performance	—
P0545	Exhaust Gas Temperature Sensor Circuit Low-Bank1	—
P0546	Exhaust Gas Temperature Sensor Circuit High-Bank1	—
P1312	Exhaust Gas Temperature Sensor Malfunction	Engine coolant temperature is less than 30°C (86°F) at engine start.

# DRIVE CYCLE

## ENGINE (DIAGNOSTICS)

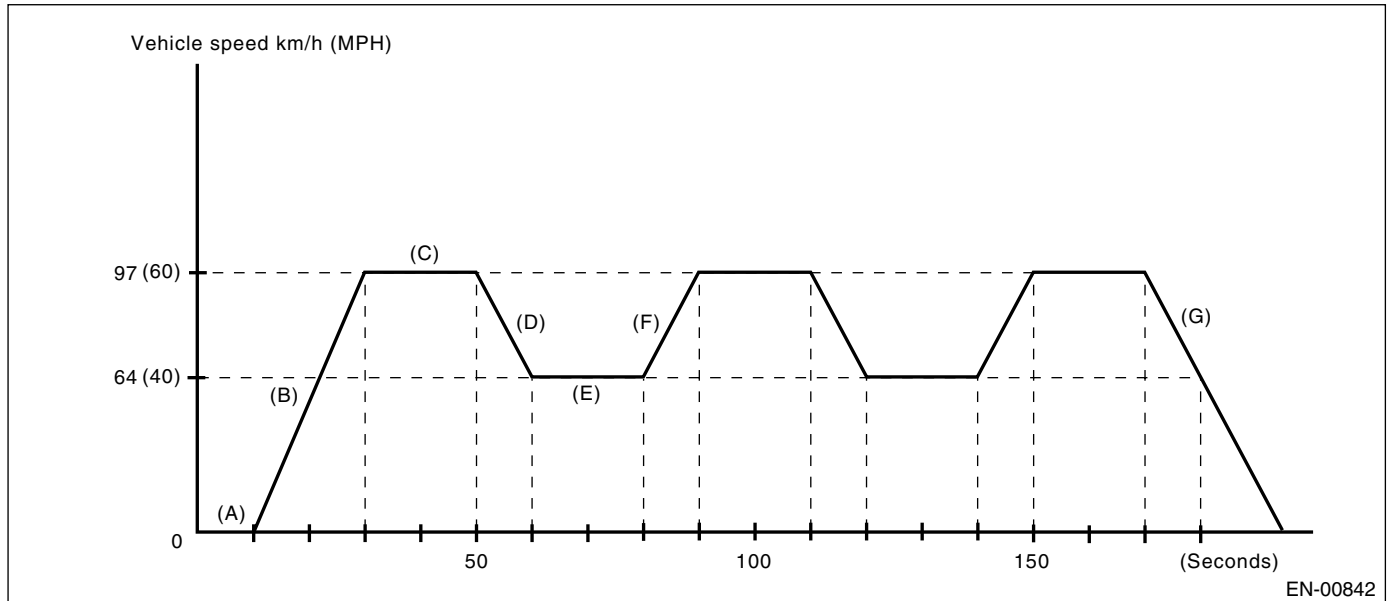
### 3. IDLE FOR 10 MINUTES

**NOTE:**

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

DTC No.	Item	Condition
*P0483	Cooling fan function problem	—
*P0506	Idle control system RPM lower than expected	—
*P0507	Idle control system RPM higher than expected	—

### 4. DRIVE ACCORDING TO THE FOLLOWING DRIVE PATTERN



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

DTC No.	Item	Condition
*P0121	Throttle position sensor circuit range/performance problem (high input)	—
*P0139	Rear oxygen sensor circuit slow response	—
*P0301	Cylinder 1 misfire detected	In some cases, diagnosis may complete at once.
*P0302	Cylinder 2 misfire detected	In some cases, diagnosis may complete at once.
*P0303	Cylinder 3 misfire detected	In some cases, diagnosis may complete at once.
*P0304	Cylinder 4 misfire detected	In some cases, diagnosis may complete 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)	—
P1544	Exhaust Gas Temperature Too High	—



## 14. Clear Memory Mode

### A: OPERATION

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

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

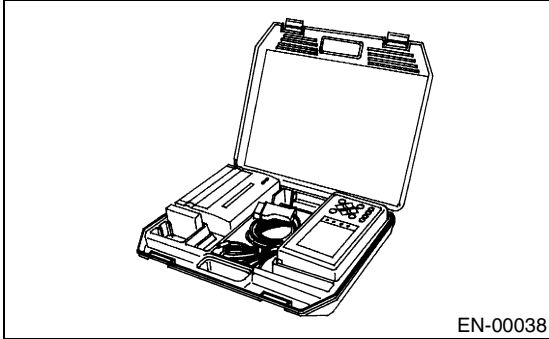
# COMPULSORY VALVE OPERATION CHECK MODE

ENGINE (DIAGNOSTICS)

## 15. Compulsory Valve Operation Check Mode

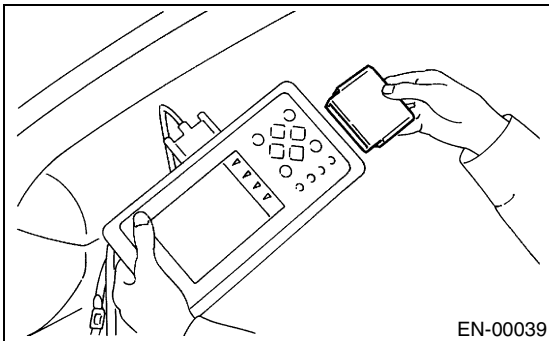
### A: OPERATION

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

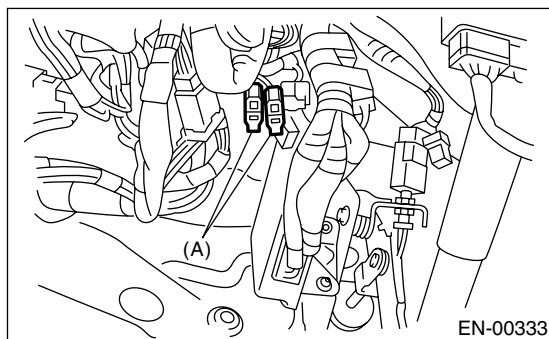


2) Connect the diagnosis cable to Subaru Select Monitor.

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

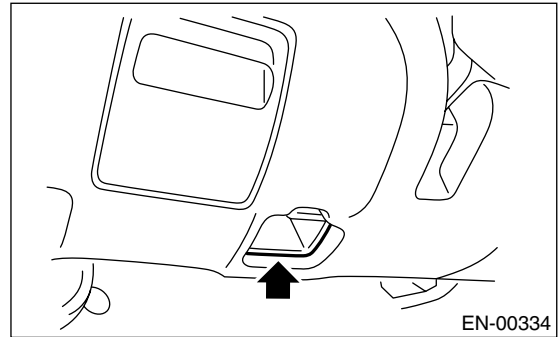


4) Connect the test mode connector (A) at the lower portion of instrument panel (on the driver's side).



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 instrument panel (on the driver's side).

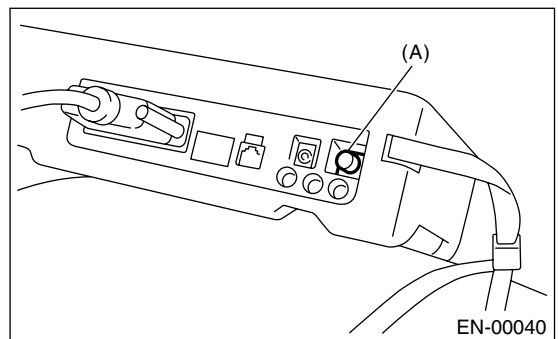


(2) Connect the diagnosis cable to data link connector.

### CAUTION:

**Do not connect scan tools except for the 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 {2. Each System Check} and press [YES] key.

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

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

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

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

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

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

# COMPULSORY VALVE OPERATION CHECK MODE

ENGINE (DIAGNOSTICS)

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

Contents	Display
Compulsory fuel pump relay operation check	Fuel Pump Relay
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 Valve

## NOTE:

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

Display
EGR Solenoid Valve
ASV Solenoid Valve
PCV Solenoid Valve
Vent Control Solenoid Valve
FICD Solenoid
Pressure Switching Sol. 1
Pressure Switching Sol. 2
AAI Solenoid Valve
Fuel Tank Sensor Control Valve

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

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

## 16.Engine Malfunction Indicator Lamp (MIL)

### A: PROCEDURE

1. Activation of check engine malfunction indicator lamp (MIL). <Ref. to EN(TURBO)-53, ACTIVATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL), Engine Malfunction Indicator Lamp (MIL).>
↓
2. Check that the engine malfunction indicator lamp (MIL) does not come on. <Ref. to EN(TURBO)-54, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON., Engine Malfunction Indicator Lamp (MIL).>
↓
3. Check that the engine malfunction indicator lamp (MIL) does not go off. <Ref. to EN(TURBO)-56, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT GO OFF., Engine Malfunction Indicator Lamp (MIL).>
↓
4. Check that the engine malfunction indicator lamp (MIL) does not blink at a cycle of 3 Hz. <Ref. to EN(TURBO)-57, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 HZ., Engine Malfunction Indicator Lamp (MIL).>
↓
5. Check that the engine malfunction indicator lamp (MIL) remains blinking at a cycle of 3 Hz. <Ref. to EN(TURBO)-59, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) REMAINS BLINKING AT A CYCLE OF 3 HZ., Engine Malfunction Indicator Lamp (MIL).>

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

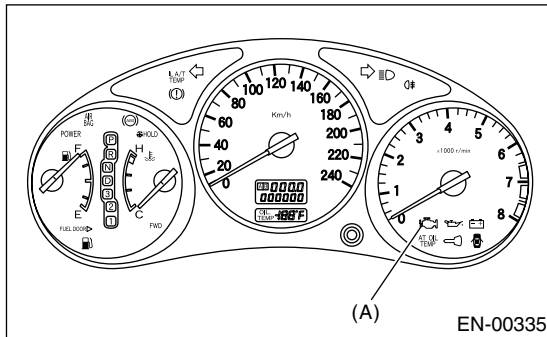
## B: ACTIVATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

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

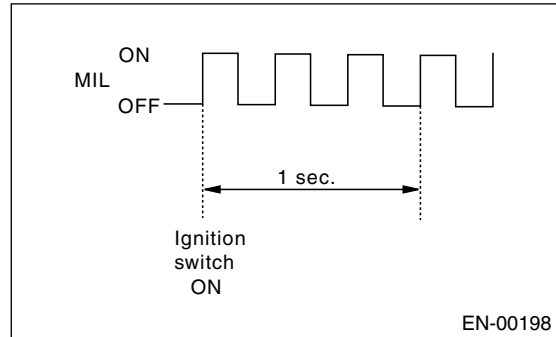
### NOTE:

If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Ref. to EN(TURBO)-54, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON., Engine Malfunction Indicator Lamp (MIL).>

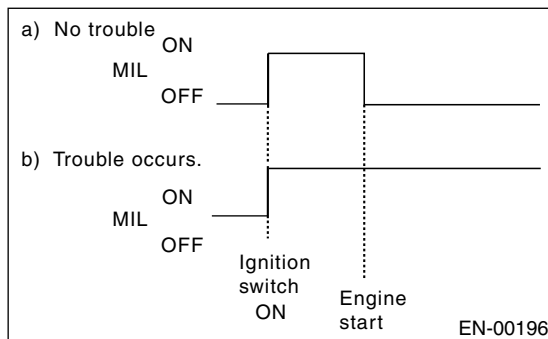
4) When the ignition switch is turned to ON (engine off) or to START with the test mode connector connected, the MIL blinks at a cycle of 3 Hz.



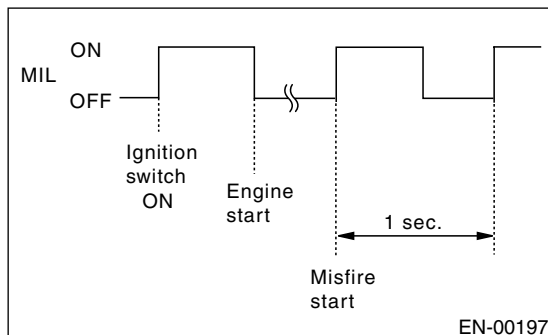
(A) CHECK ENGINE malfunction indicator lamp (MIL)



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



3) If the diagnosis system senses a misfire which could damage the catalyzer, the MIL will blink at a cycle of 1 Hz.



# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

## C: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON.

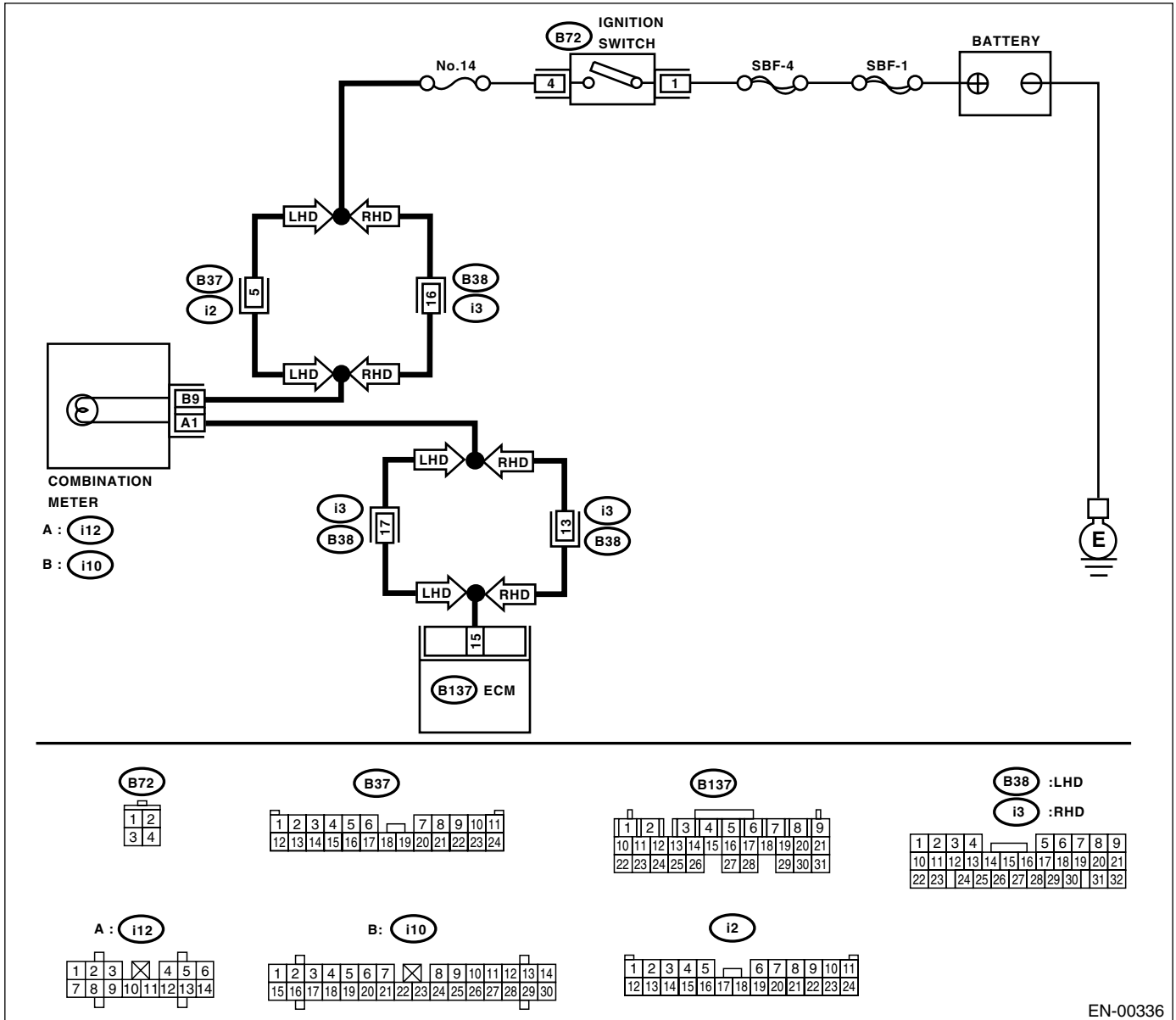
### • DIAGNOSIS:

- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.

### • TROUBLE SYMPTOM:

- When the ignition switch is turned to ON (engine OFF), MIL does not come on.

### • WIRING DIAGRAM:



Step	Check	Yes	No
<b>1</b> <b>CHECK OUTPUT SIGNAL FROM ECM.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B137) No. 15 (+) — Chassis ground (-):</b> Is the measured value less than specified value?	1 V	Go to step 4.	Go to step 2.

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>2</b> <b>CHECK POOR CONTACT.</b> Does the MIL come on when shaking or pulling ECM connector and harness?	MIL illuminates.	Repair the poor contact in ECM connector.	Go to step <b>3</b> .
<b>3</b> <b>CHECK ECM CONNECTOR.</b> Is the ECM connector correctly connected?	Connectors is correctly connected.	Replace the ECM. <Ref. to FU(TURBO)-48, Engine Control Module.>	Repair the connection of ECM connector.
<b>4</b> <b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1)Turn the ignition switch to OFF. 2)Remove the combination meter. <Ref. to IDI-12, Combination Meter Assembly.> 3)Disconnect the connector from ECM and combination meter. 4)Measure the resistance of harness between ECM and combination meter connector. <b>Connector &amp; terminal</b> <b>(B137) No. 15 — (i12) No. 1:</b> Is the measured value less than specified value?	1 Ω	Go to step <b>5</b> .	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and combination meter connector</li> <li>• Poor contact in coupling connector</li> </ul>
<b>5</b> <b>CHECK POOR CONTACT.</b> Check poor contact in combination meter connector. Is there poor contact in combination meter connector?	Poor contact occurs.	Repair the poor contact in combination meter connector.	Go to step <b>6</b> .
<b>6</b> <b>CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.</b> 1)Turn the ignition switch to ON. 2)Measure the voltage between combination meter connector and chassis ground. <b>Connector &amp; terminal</b> <b>(i10) No. 9 (+) — Chassis ground (-):</b> Is the measured value more than specified value?	10 V	Replace the combination meter circuit board. <Ref. to IDI-12, Combination Meter Assembly.>	Check the following and repair if necessary. NOTE: <ul style="list-style-type: none"> <li>• Blown out fuse (No. 14)</li> <li>• Open or short circuit in harness between fuse (No. 14) and battery terminal</li> <li>• Poor contact in ignition switch connector</li> </ul>

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

## D: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT GO OFF.

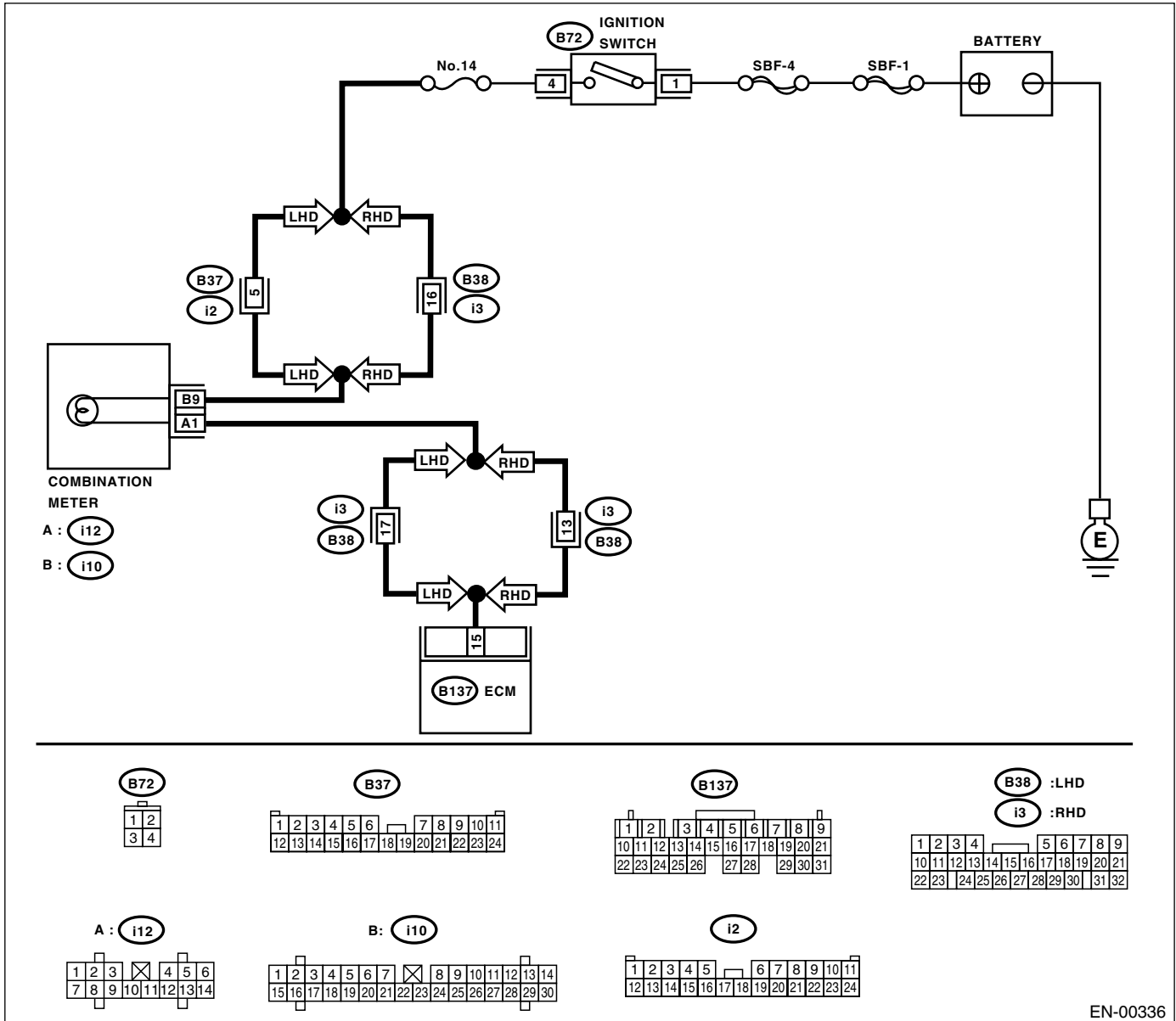
### • DIAGNOSIS:

- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.

### • TROUBLE SYMPTOM:

- Although MIL comes on when engine runs, but trouble code is not shown on Subaru Select Monitor or OBD-II general scan tool display.

### • WIRING DIAGRAM:



Step	Check	Yes	No
1	<p><b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON. Does the MIL come on?</p>	MIL illuminates.	<p>Repair the short circuit in harness between combination meter and ECM connector.</p> <p>Replace the ECM. &lt;Ref. to FU(TURBO)-48, Engine Control Module.&gt;</p>



# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

## E: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 HZ.

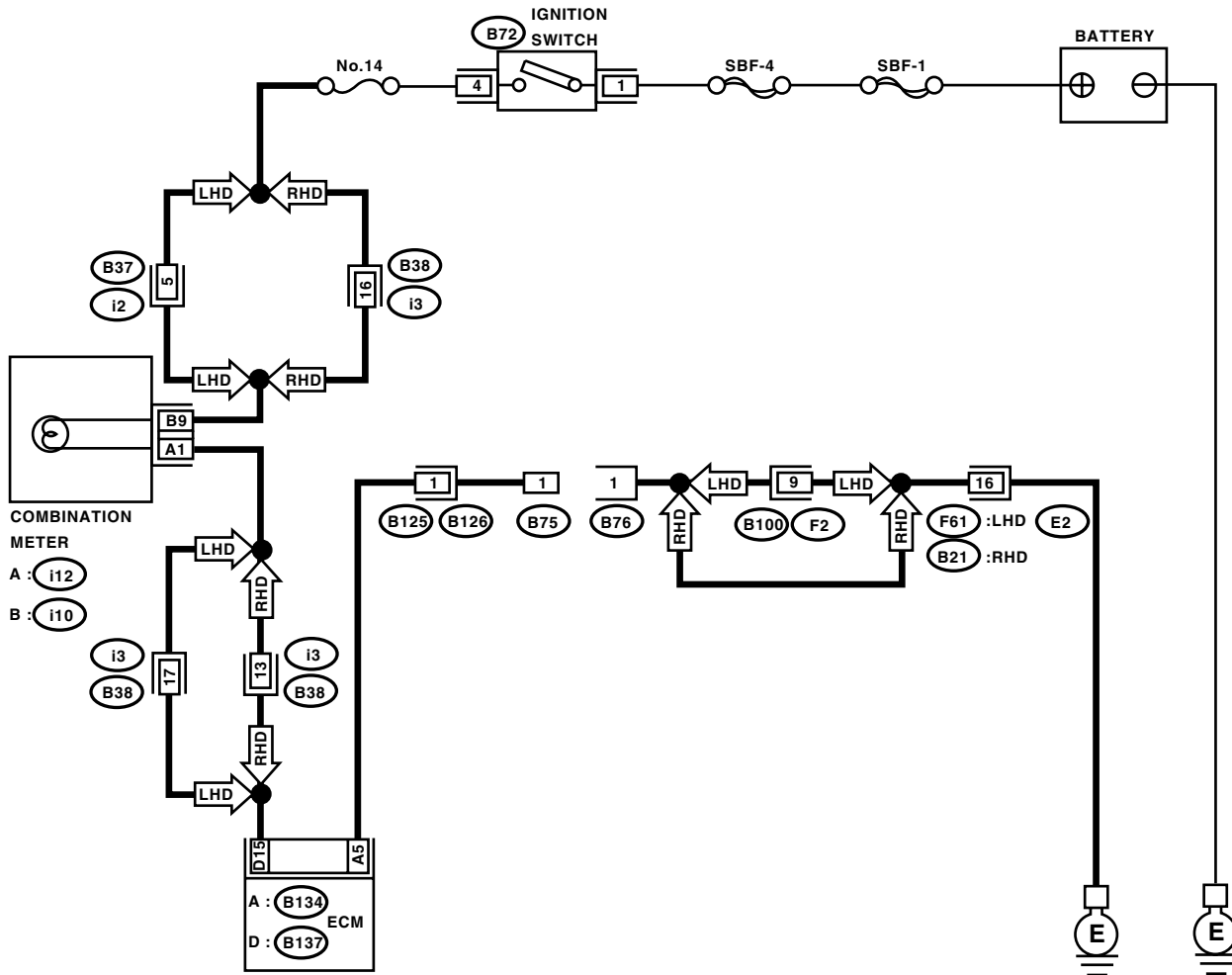
### • DIAGNOSIS:

- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- Test mode connector circuit is open.

### • TROUBLE SYMPTOM:

- During inspection mode, MIL does not blink at a cycle of 3 Hz.

### • WIRING DIAGRAM:



B75



B76

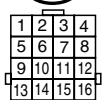


B72

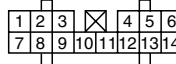


F61 : LHD

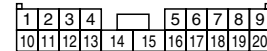
B21 : RHD



A : i12

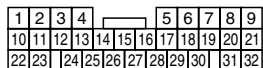


F2

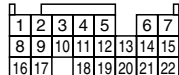


B38 :LHD

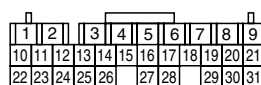
i3 :RHD



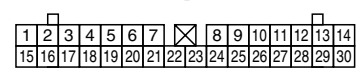
A : B134



D : B137



B : i10



EN-00337

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

## ENGINE (DIAGNOSTICS)

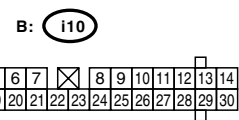
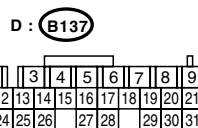
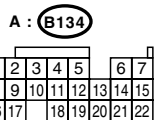
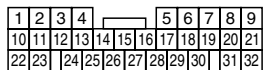
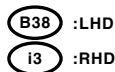
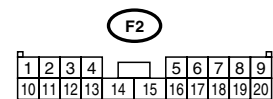
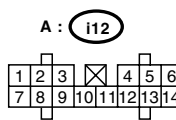
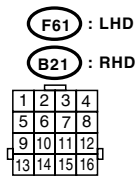
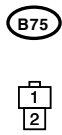
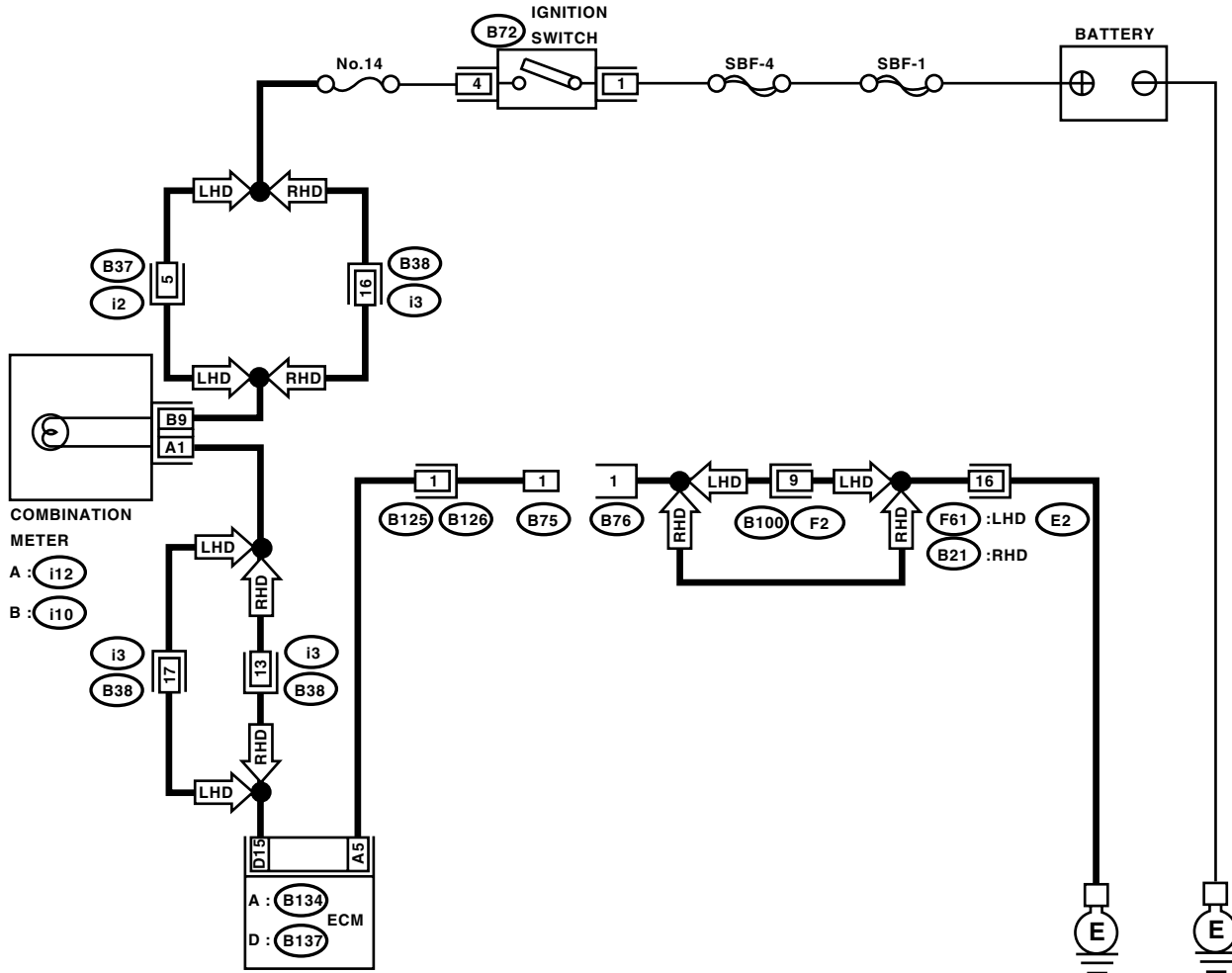
Step	Check	Yes	No
<b>1 CHECK STATUS OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).</b> 1) Turn the ignition switch to OFF. 2) Disconnect the test mode connector. 3) Turn the ignition switch to ON. (engine OFF) Does the MIL come on?	MIL illuminates.	Go to step 2.	Repair the MIL circuit. <Ref. to EN(TURBO)-54, CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON., Engine Malfunction Indicator Lamp (MIL).>
<b>2 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Turn the ignition switch to ON. Does the MIL come on?	MIL illuminates.	Repair the ground short circuit in harness between combination meter and ECM connector.	Go to step 3.
<b>3 CHECK HARNESS BETWEEN TEST MODE CONNECTOR AND CHASSIS GROUND.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between test mode connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B76) No. 1 — Chassis ground:</b></i> Is the measured value less than specified value?	1 Ω	Go to step 4.	Repair the harness and connector.  NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between test mode connector and chassis ground</li> </ul>
<b>4 CHECK POOR CONTACT.</b> Check poor contact in ECM connector. Is there poor contact in ECM connector?	Poor contact occurs.	Repair the poor contact in ECM connector.	Go to step 5.
<b>5 CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.</b> 1) Connect the test mode connector. 2) Measure the resistance of harness between ECM and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B134) No. 5 — Chassis ground:</b></i> Is the measured value less than specified value?	1 Ω	Go to step 6.	Repair the open circuit in harness between ECM and test mode connector.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in ECM connector. Is there poor contact in ECM connector?	Poor contact occurs.	Repair the poor contact in ECM connector.	Replace the ECM. <Ref. to FU(TURBO)-48, Engine Control Module.>

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

ENGINE (DIAGNOSTICS)

## F: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) REMAINS BLINKING AT A CYCLE OF 3 HZ.

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



EN-00337

# ENGINE MALFUNCTION INDICATOR LAMP (MIL)

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK TEST MODE CONNECTOR.</b> 1) Disconnect the test mode connector. 2) Turn the ignition switch to ON. Does the MIL flash on and off?	MIL illuminates.	Go to step 2.	System is in good order.  NOTE: MIL blinks at a cycle of 3 Hz when test mode connector is connected.
<b>2</b> <b>CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUNDING TERMINAL.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B134) No. 5 — Chassis ground:</b> Is the measured value less than specified value?	5 Ω	Repair the short circuit in harness between ECM and test mode connector.	Replace the ECM. <Ref. to FU(TURBO)-48, Engine Control Module.>

## 17. Diagnostics for Engine Starting Failure

### A: PROCEDURE

1. Inspection of starter motor circuit. <Ref. to EN(TURBO)-62, STARTER MOTOR CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
2. Inspection of ECM power supply and ground line. <Ref. to EN(TURBO)-64, CONTROL MODULE POWER SUPPLY AND GROUND LINE, Diagnostics for Engine Starting Failure.>
↓
3. Inspection of ignition control system. <Ref. to EN(TURBO)-68, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>
↓
4. Inspection of fuel pump circuit. <Ref. to EN(TURBO)-72, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>
↓
5. Inspection of fuel injector circuit. <Ref. to EN(TURBO)-74, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

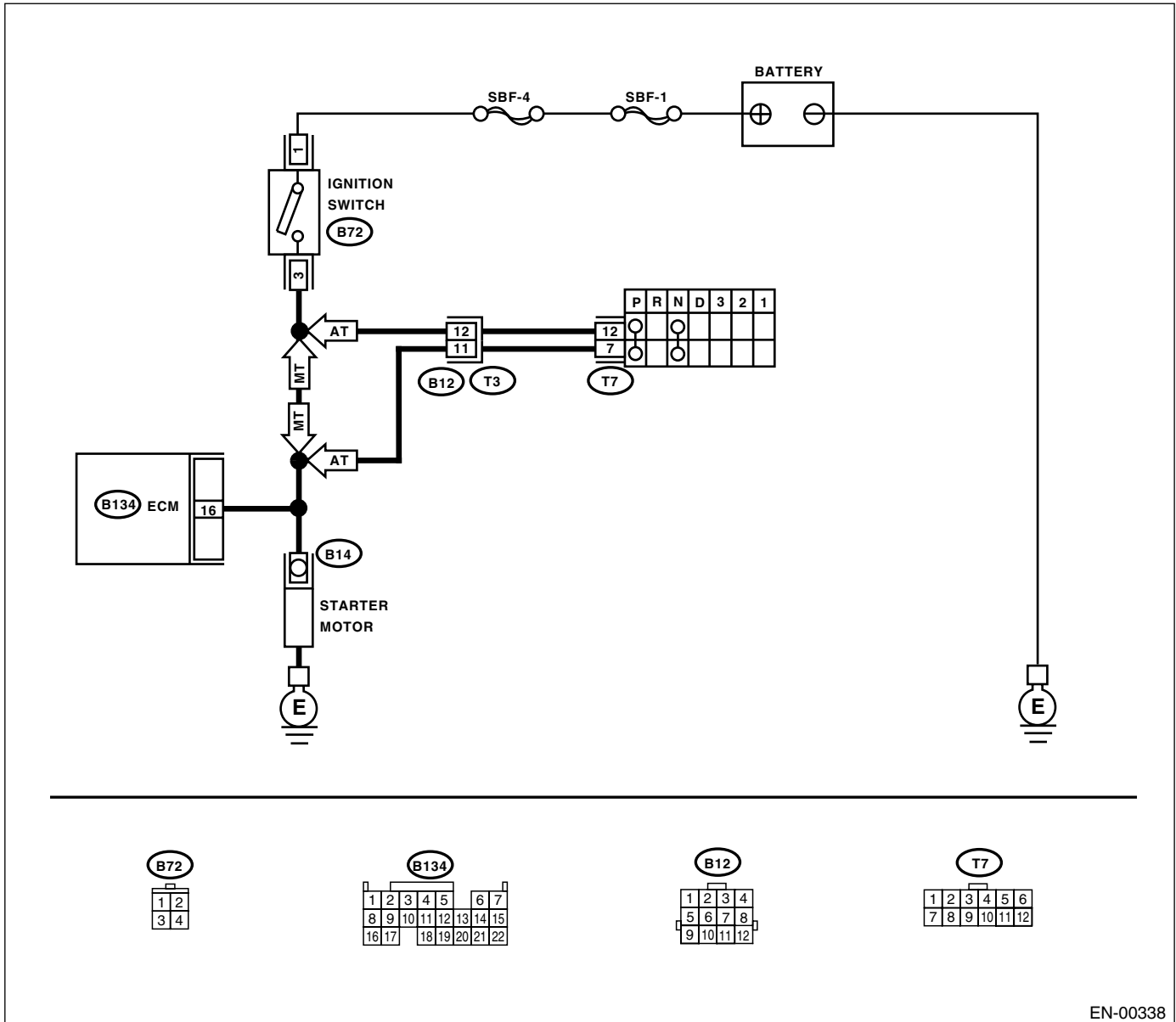
ENGINE (DIAGNOSTICS)

## B: STARTER MOTOR CIRCUIT

### CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(TURBO)-49, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN(TURBO)-42, Inspection Mode.> .

### • WIRING DIAGRAM:



Step	Check	Yes	No
1	<b>CHECK OPERATION OF STARTER MOTOR.</b> Does the starter motor operate when the switch starts?	Go to step 2.	Go to step 3.
2	<b>CHECK DIAGNOSTIC TROUBLE CODE (DTC).</b> <Ref. to EN(TURBO)-41, OPERATION, Read Diagnostic Trouble Code.> Is the DTC displayed?	Using the list of diagnostic trouble code (DTC), check the appropriate DTC. <Ref. to EN(TURBO)-77, List of Diagnostic Trouble Code (DTC).>	Go to step 3.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<b>3 CHECK INPUT SIGNAL FOR STARTER MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from starter motor. 3) Turn the ignition switch to START. 4) Measure the power supply voltage between starter motor connector terminal and engine ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B14) No. 1 (+) — Engine ground (-):</b></i> Is the measured value more than specified value?	10 V	Go to step 4.	Go to step 5.
<b>4 CHECK GROUND CIRCUIT OF STARTER MOTOR.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance of ground cable between ground cable terminal and engine ground. Is the measured value less than specified value?	5 Ω	Check the starter motor. <Ref. to SC(SOHC)-6, Starter.>	Repair the open circuit of ground cable.
<b>5 CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.</b> 1) Ignition the switch to OFF. 2) Disconnect the connector from ignition switch. 3) Measure the power supply voltage between ignition switch connector and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B72) No. 1 (+) — Chassis ground (-):</b></i> Is the measured value more than specified value?	10 V	Go to step 6.	Check the following, repair if necessary. <ul style="list-style-type: none"> <li>• Fuse is blown out.</li> <li>• Open circuit in harness between ignition switch and battery.</li> </ul>
<b>6 CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.</b> 1) Connect the connector to ignition switch. 2) Turn the ignition switch to START. 3) Measure the voltage between ignition switch and chassis ground. <i><b>Connector &amp; terminal</b></i> <i><b>(B72) No. 3 (+) — Chassis ground (-):</b></i> Is the measured value more than specified value?	10 V	Repair the open circuit between ignition switch and starter motor circuit.	Go to step 7.
<b>7 CHECK POOR CONTACT.</b> Check poor contact in ignition switch connector. Is there poor contact in ignition switch connector?	Poor contact occurs.	Repair the poor contact in ignition switch connector.	Replace the ignition switch.

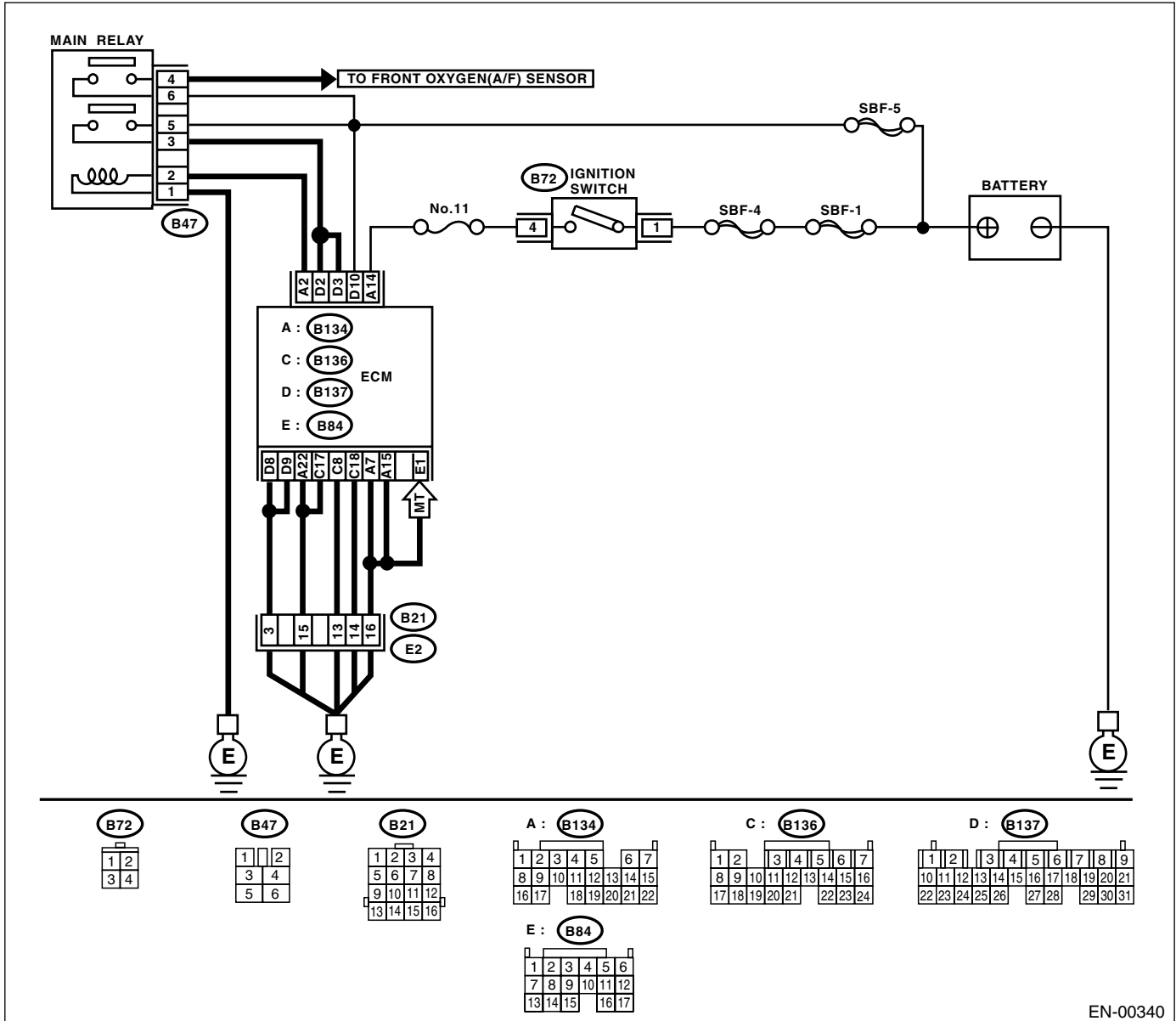




# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

## • RHD model



Step	Check	Yes	No
<b>1</b> <b>CHECK MAIN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the main relay. 3) Connect the battery to main relay terminals No. 1 and No. 2. 4) Measure the resistance between main relay terminals. <b>Terminals</b> <b>No. 3 — No. 5:</b> <b>No. 4 — No. 6:</b> Is the measured value less than specified value?	10 Ω	Go to step 2.	Replace the main relay.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>2 CHECK GROUND CIRCUIT OF ECM.</b>                      1) Disconnect the connector from ECM.                      2) Measure the resistance of harness between ECM and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B134) No. 7 — Chassis ground:</i>  <i>(B134) No. 15 — Chassis ground:</i>  <i>(B134) No. 22 — Chassis ground:</i>  <i>(B136) No. 8 — Chassis ground:</i>  <i>(B136) No. 17 — Chassis ground:</i>  <i>(B136) No. 18 — Chassis ground:</i>  <i>(B137) No. 8 — Chassis ground:</i>  <i>(B137) No. 9 — Chassis ground:</i>  <i>(B84) No. 1 — Chassis ground:</i></p> <p>Is the measured value less than specified value?</p>	5 Ω	Go to step 3.	Repair the open circuit in harness between ECM connector and engine grounding terminal.
<p><b>3 CHECK INPUT VOLTAGE OF ECM.</b>                      Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B137) No. 10 (+) — Chassis ground (-):</i>  <i>(B134) No. 14 (+) — Chassis ground (-):</i></p> <p>Is the measured value more than specified value?</p>	10 V	Go to step 4.	Repair the open or ground short circuit of power supply circuit.
<p><b>4 CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between ECM and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B134) No. 2 — Chassis ground:</i></p> <p>Is the measured value more than specified value?</p>	1 MΩ	Go to step 5.	Repair the ground short circuit in harness between ECM connector and main relay connector, then replace ECM.
<p><b>5 CHECK OUTPUT VOLTAGE FROM ECM.</b>                      1) Connect the connector to ECM.                      2) Turn the ignition switch to ON.                      3) Measure the voltage between ECM connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B134) No. 2 (+) — Chassis ground (-):</i></p> <p>Is the measured value more than specified value?</p>	10 V	Go to step 6.	Replace the ECM. <Ref. to FU(TURBO)-48, Engine Control Module.>
<p><b>6 CHECK INPUT VOLTAGE OF MAIN RELAY.</b>                      Check the voltage between main relay connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B47) No. 2 (+) — Chassis ground (-):</i></p> <p>Is the measured value more than specified value?</p>	10 V	Go to step 7.	Repair the open circuit in harness between ECM connector and main relay connector.
<p><b>7 CHECK GROUND CIRCUIT OF MAIN RELAY.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between main relay connector and chassis ground.  <b>Connector &amp; terminal</b>  <i>(B47) No. 1 — Chassis ground:</i></p> <p>Is the measured value less than specified value?</p>	5 Ω	Go to step 8.	Repair the open circuit between main relay and chassis ground.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>8</b>      <b>CHECK INPUT VOLTAGE OF MAIN RELAY.</b>                      Measure the voltage between main relay connector and chassis ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B47) No. 5 (+) — Chassis ground (-):</b></i>  <i><b>(B47) No. 6 (+) — Chassis ground (-):</b></i>                      Is the measured value more than specified value?</p>	10 V	Go to step 9.	Repair the open or ground short circuit in harness of power supply circuit.
<p><b>9</b>      <b>CHECK INPUT VOLTAGE OF ECM.</b>                      1)Connect the main relay connector.                      2)Turn the ignition switch to ON.                      3)Measure the voltage between ECM connector and chassis ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B137) No. 2 (+) — Chassis ground (-):</b></i>  <i><b>(B137) No. 3 (+) — Chassis ground (-):</b></i>                      Is the measured value more than specified value?</p>	10 V	Check the ignition control system. <Ref. to EN(TURBO)-68, IGNITION CONTROL SYSTEM, Diagnostics for Engine Starting Failure.>	Repair the open or ground short circuit in harness between ECM connector and main relay connector.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

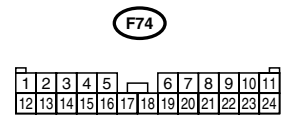
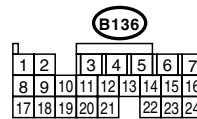
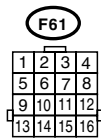
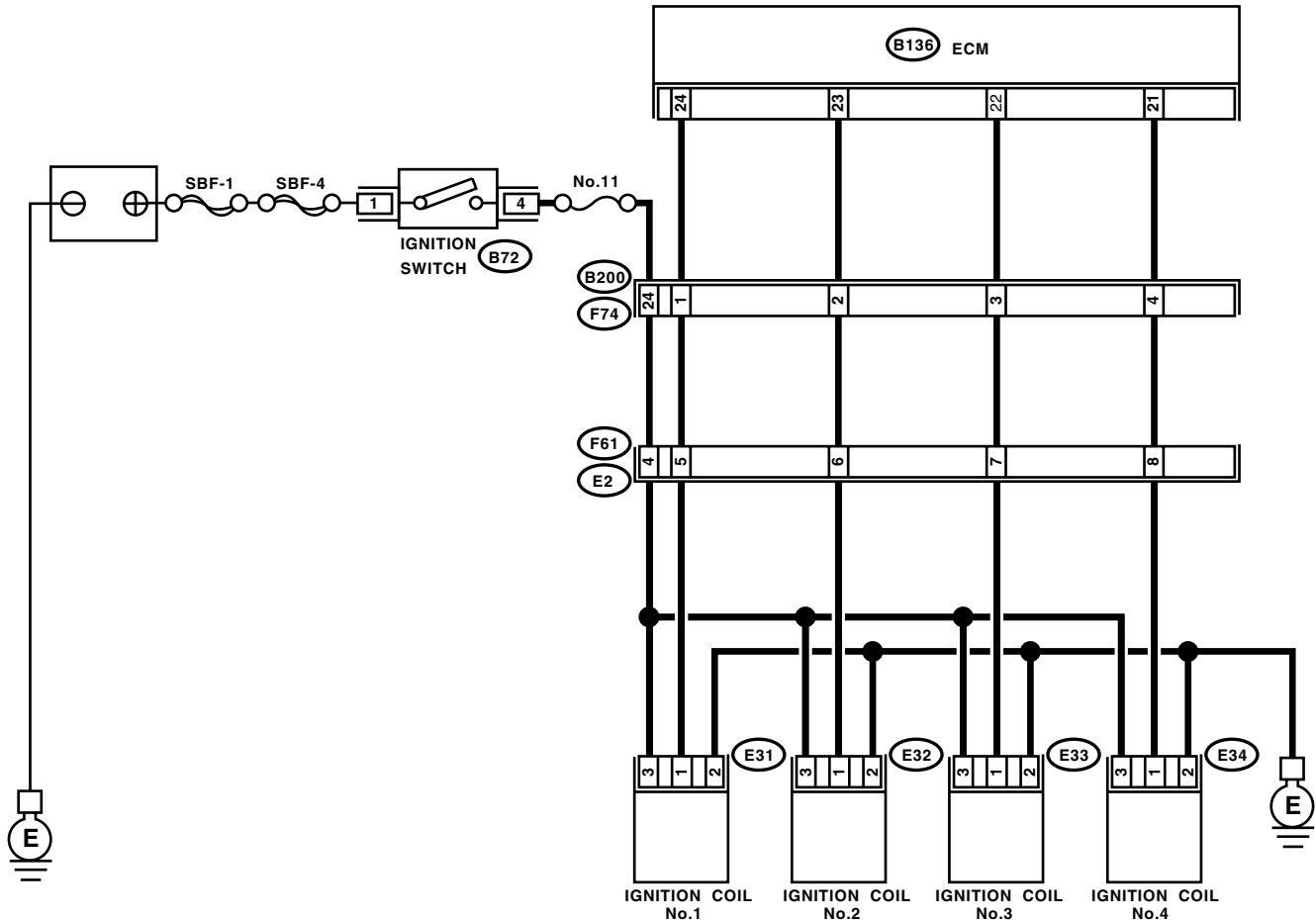
ENGINE (DIAGNOSTICS)

## D: IGNITION CONTROL SYSTEM

### CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(TURBO)-49, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN(TURBO)-42, Inspection Mode.> .

- WIRING DIAGRAM:
- LHD model

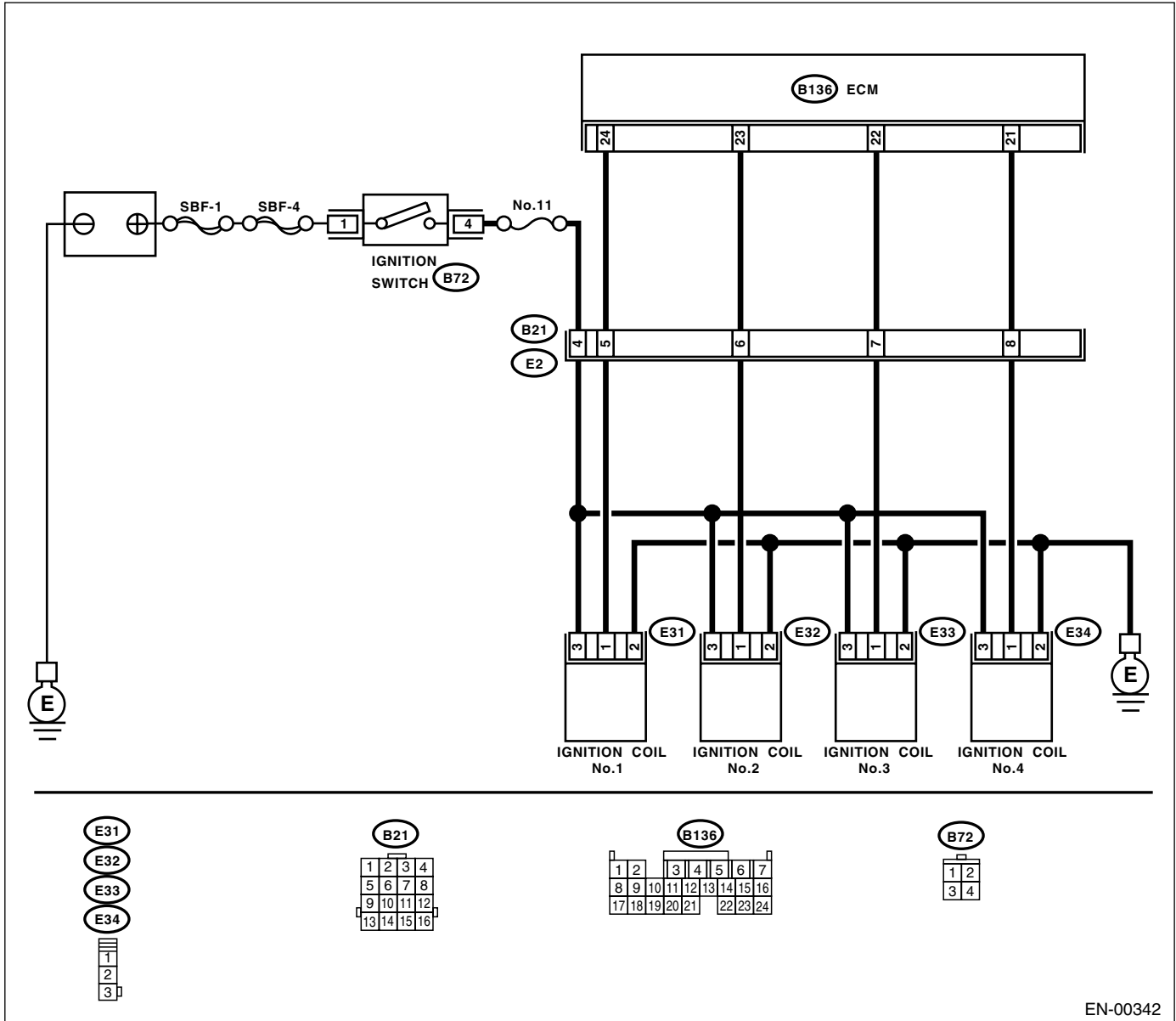


EN-00341

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

• RHD model



EN-00342

Step	Check	Yes	No
<b>1 CHECK SPARK PLUG CONDITION.</b> 1) Remove the spark plug. <Ref. to IG(TURBO)-6, INSTALLATION, Spark Plug.> 2) Check the spark plug condition. <Ref. to IG(TURBO)-6, INSPECTION, Spark Plug.> Is the spark plug's status OK?	Spark plug is OK.	Go to step 2.	Replace the spark plug.
<b>2 CHECK IGNITION SYSTEM FOR SPARKS.</b> 1) Connect the spark plug to ignition coil. 2) Release the fuel pressure. <Ref. to FU(TURBO)-52, RELEASING OF FUEL PRESSURE, OPERATION, Fuel.> 3) Contact the spark plug's thread portion on engine. 4) While opening the throttle valve fully, crank engine to check that spark occurs at each cylinder. Does spark occur at each cylinder?	Spark occurs.	Check the fuel pump system. <Ref. to EN(TURBO)-72, FUEL PUMP CIRCUIT, Diagnostics for Engine Starting Failure.>	Go to step 3.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>3</b></p> <p><b>CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL &amp; IGNITOR ASSEMBLY.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ignition coil &amp; ignitor assembly.                      3) Turn the ignition switch to ON.                      4) Measure the power supply voltage between ignition coil &amp; ignitor assembly connector and engine ground.</p> <p><b>Connector &amp; terminal</b>                      (E31) No. 3 (+) — Engine ground (-):                      (E32) No. 3 (+) — Engine ground (-):                      (E33) No. 3 (+) — Engine ground (-):                      (E34) No. 3 (+) — Engine ground (-):</p> <p>Is the measured value more than specified value?</p>	10 V	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ignition coil &amp; ignitor assembly, and ignition switch connector</li> <li>• Poor contact in coupling connectors</li> </ul>
<p><b>4</b></p> <p><b>CHECK HARNESS OF IGNITION COIL &amp; IGNITOR ASSEMBLY GROUND CIRCUIT.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Measure the resistance between ignition coil &amp; ignitor assembly connector and engine ground.</p> <p><b>Connector &amp; terminal</b>                      (E31) No. 2 — Engine ground:                      (E32) No. 2 — Engine ground:                      (E33) No. 2 — Engine ground:                      (E34) No. 2 — Engine ground:</p> <p>Is the measured value less than specified value?</p>	5 Ω	Go to step 5.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ignition coil &amp; ignitor assembly connector and engine grounding terminal</li> </ul>
<p><b>5</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSEMBLY CONNECTOR.</b></p> <p>1) Turn the ignition switch to OFF.                      2) Disconnect the connector from ECM.                      3) Disconnect the connector from ignition coil &amp; ignitor assembly.                      4) Measure the resistance of harness between ECM and ignition coil &amp; ignitor assembly connector.</p> <p><b>Connector &amp; terminal</b>                      (B136) No. 21 — (E34) No. 1:                      (B136) No. 22 — (E33) No. 1:                      (B136) No. 23 — (E32) No. 1:                      (B136) No. 24 — (E31) No. 1:</p> <p>Is the measured value less than specified value?</p>	1 Ω	Go to step 6.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and ignition coil &amp; ignitor assembly connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>6</b></p> <p><b>CHECK HARNESS BETWEEN ECM AND IGNITION COIL &amp; IGNITOR ASSEMBLY CONNECTOR.</b></p> <p>Measure the resistance of harness between ECM and engine ground.</p> <p><b>Connector &amp; terminal:</b>                      (B136) No. 21 — Engine ground:                      (B136) No. 22 — Engine ground:                      (B136) No. 23 — Engine ground:                      (B136) No. 24 — Engine ground:</p> <p>Is the measured value more than specified value?</p>	1 MΩ	Go to step 7.	Repair the ground short circuit in harness between ECM and ignition coil & ignitor assembly connector.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
7	<b>CHECK POOR CONTACT.</b> Check poor contact in ECM connector. Is there poor contact in ECM connector?	Poor contact occurs.	Repair the poor contact in ECM connector.	Replace the ignition coil and ignitor assembly.

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

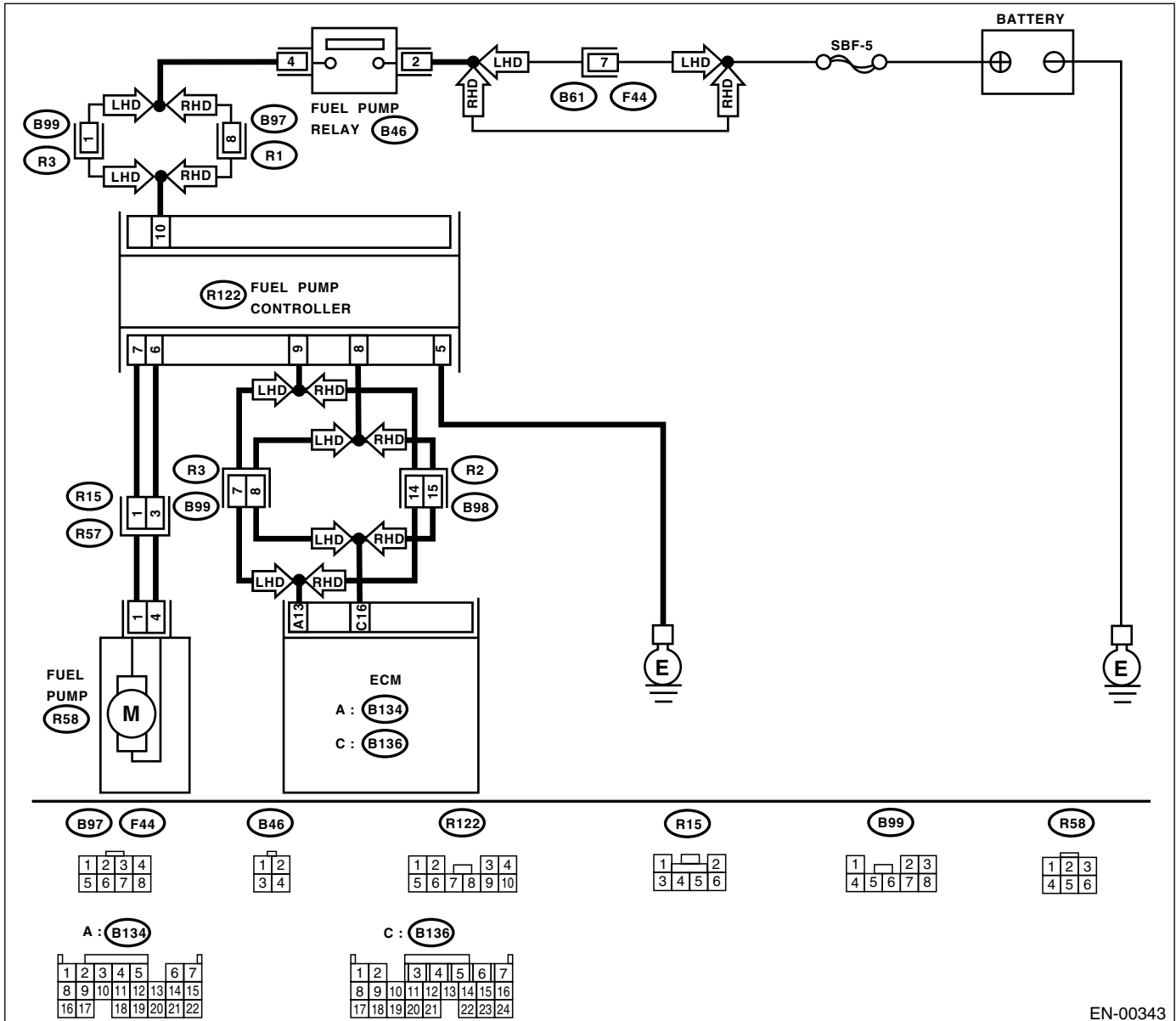
ENGINE (DIAGNOSTICS)

## E: FUEL PUMP CIRCUIT

### CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to EN(TURBO)-49, Clear Memory Mode.> and INSPECTION MODE <Ref. to EN(TURBO)-42, Inspection Mode.> .

### • WIRING DIAGRAM:



EN-00343



# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

	Step	Check	Yes	No
1	<p><b>CHECK OPERATING SOUND OF FUEL PUMP.</b> Make sure that the fuel pump is in operation for 2 seconds when turning ignition switch to ON. NOTE: Fuel pump operation check can also be executed using the Subaru Select Monitor. For the procedure, refer to "Compulsory Valve Operation Check Mode". &lt;Ref. to EN(TURBO)-50, Compulsory Valve Operation Check Mode.&gt; Does the fuel pump produce "operating" sound?</p>	"Operating" sound occurs.	Check the fuel injector circuit. <Ref. to EN(TURBO)-74, FUEL INJECTOR CIRCUIT, Diagnostics for Engine Starting Failure.>	Display the DTC. <Ref. to EN(TURBO)-41, OPERATION, Read Diagnostic Trouble Code.>

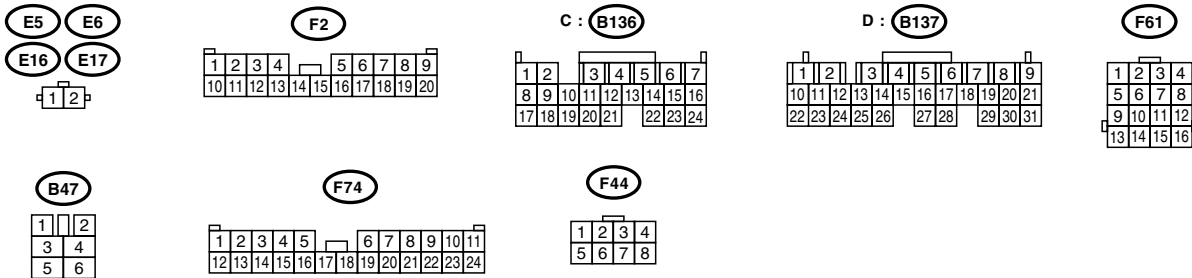
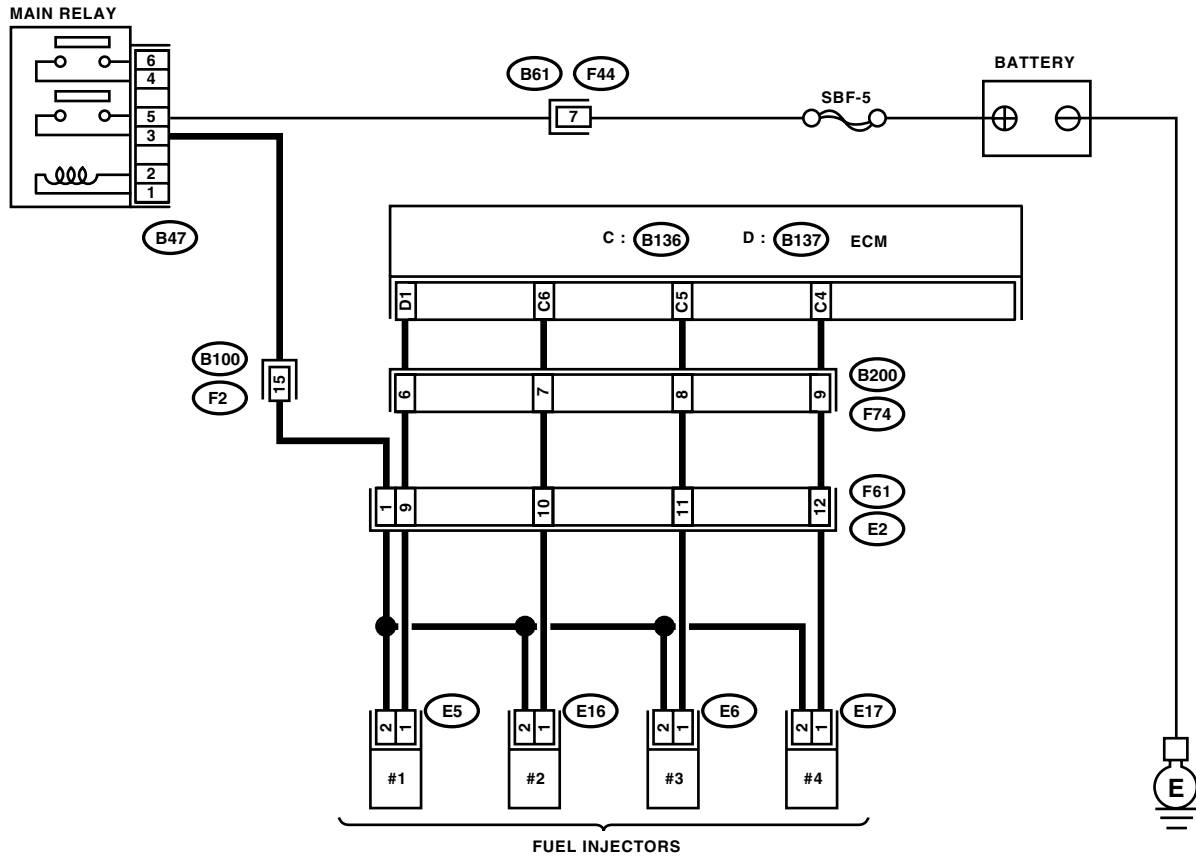
# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

## 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(TURBO)-49, Clear Memory Mode.> and INSPECTION MODE. <Ref. to EN(TURBO)-42, Inspection Mode.>
- WIRING DIAGRAM:
- LHD model

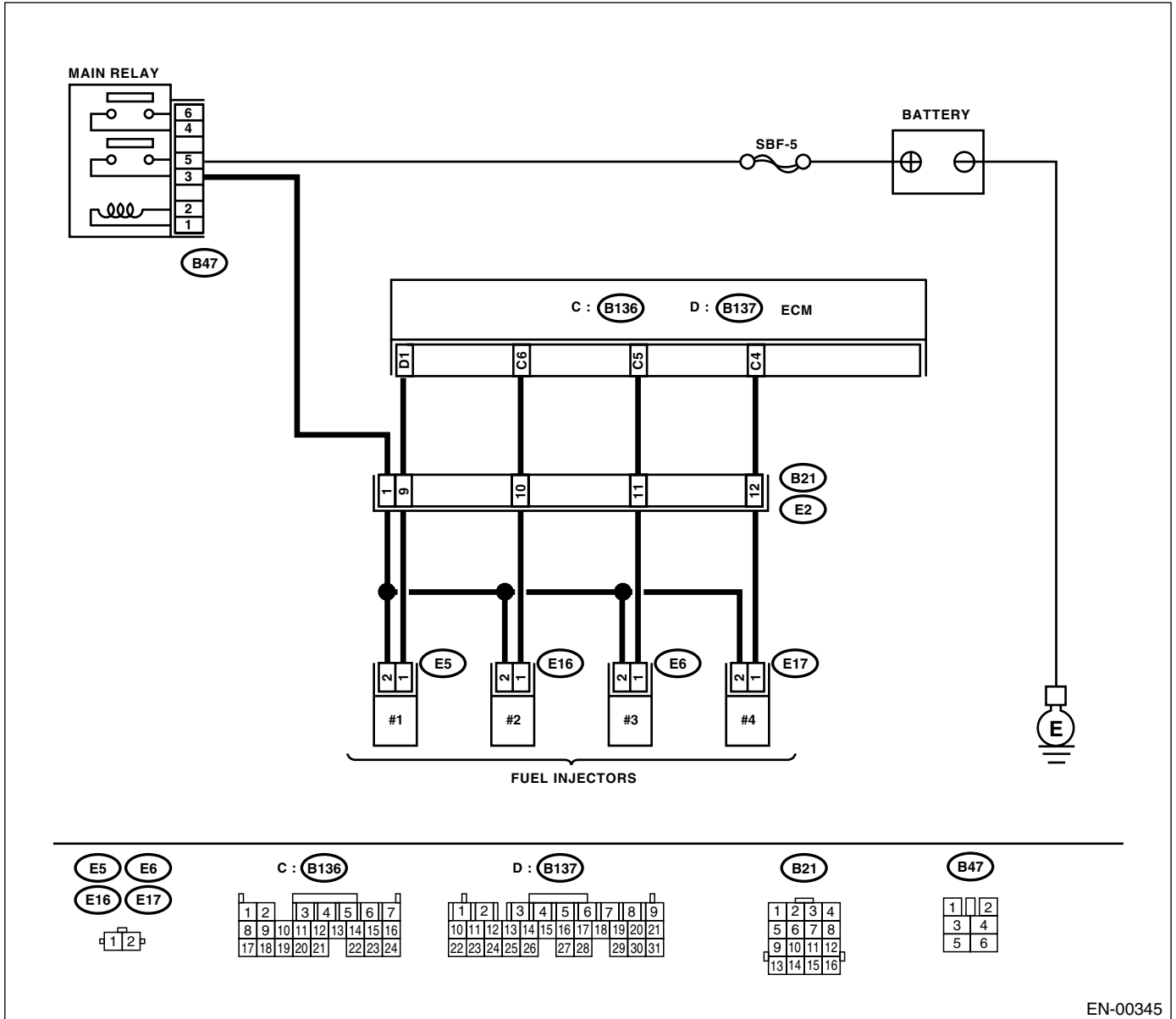


EN-00344

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

ENGINE (DIAGNOSTICS)

• RHD model



EN-00345

Step	Check	Yes	No
1	<p><b>CHECK OPERATION OF EACH FUEL INJECTOR.</b></p> <p>While cranking the engine, check that each fuel injector emits “operating” sound. Use a sound scope or attach a screwdriver to injector for this check.</p> <p>Does the fuel injector emit “operating” sound?</p>	<p>“Operating” sound occurs.</p> <p>Check the fuel pressure. &lt;Ref. to ME(TURBO)-28, INSPECTION, Fuel Pressure.&gt;</p>	<p>Go to step 2.</p>

# DIAGNOSTICS FOR ENGINE STARTING FAILURE

## ENGINE (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>2</b>      <b>CHECK POWER SUPPLY TO EACH FUEL INJECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Disconnect the connector from fuel injector.                      3) Turn the ignition switch to ON.                      4) Measure the power supply voltage between the fuel injector terminal and engine ground.  <i><b>Connector &amp; terminal</b></i>  <i><b>#1 (E5) No. 2 (+) — Engine ground (-):</b></i>  <i><b>#2 (E16) No. 2 (+) — Engine ground (-):</b></i>  <i><b>#3 (E6) No. 2 (+) — Engine ground (-):</b></i>  <i><b>#4 (E17) No. 2 (+) — Engine ground (-):</b></i>                      Is the measured value more than specified value?</p>	10 V	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between main relay and fuel injector connector</li> <li>• Poor contact in main relay connector</li> <li>• Poor contact in coupling connector</li> <li>• Poor contact in fuel injector connector</li> </ul>
<p><b>3</b>      <b>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.</b>                      1) Disconnect the connector from ECM.                      2) Measure the resistance of harness between ECM and fuel injector connector.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B137) No. 1 — (E5) No. 1:</b></i>  <i><b>(B136) No. 6 — (E16) No. 1:</b></i>  <i><b>(B136) No. 5 — (E6) No. 1:</b></i>  <i><b>(B136) No. 4 — (E6) No. 1:</b></i>                      Is the measured value less than specified value?</p>	1 Ω	Go to step 4.	Repair the harness and connector. NOTE: In this case, repair the following: <ul style="list-style-type: none"> <li>• Open circuit in harness between ECM and fuel injector connector</li> <li>• Poor contact in coupling connector</li> </ul>
<p><b>4</b>      <b>CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.</b>                      Measure the resistance of harness between ECM and fuel injector connector.  <i><b>Connector &amp; terminal</b></i>  <i><b>(B137) No. 1 — Chassis ground:</b></i>  <i><b>(B136) No. 6 — Chassis ground:</b></i>  <i><b>(B136) No. 5 — Chassis ground:</b></i>  <i><b>(B136) No. 4 — Chassis ground:</b></i>                      Is the measured value less than specified value?</p>	1 Ω	Repair the ground short circuit in harness between ECM and fuel injector connector.	Go to step 5.
<p><b>5</b>      <b>CHECK EACH FUEL INJECTOR.</b>                      1) Turn the ignition switch to OFF.                      2) Measure the resistance between each fuel injector terminals.  <i><b>Terminals</b></i>  <i><b>No. 1 — No. 2:</b></i>                      Is the measured value within specified value?</p>	5 — 20 Ω	Go to step 6.	Replace the faulty fuel injector.
<p><b>6</b>      <b>CHECK POOR CONTACT.</b>                      Check poor contact in ECM connector.                      Is there poor contact in ECM connector?</p>	Poor contact occurs.	Repair the poor contact in ECM connector.	Inspection using "General Diagnostic Table". <Ref. to EN(TURBO)-308, INSPECTION, General Diagnostic Table.>

# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

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

### A: LIST

DTC No.	Item	Index
P0030	HO2S Heater Control Circuit (Bank 1 Sensor 1)	<Ref. to EN(TURBO)-84, DTC P0030 — HO2S HEATER CONTROL CIRCUIT (BANK 1 SENSOR 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0031	HO2S Heater Control Circuit Low (Bank 1 Sensor 1)	<Ref. to EN(TURBO)-86, DTC P0031 — HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0032	HO2S Heater Control Circuit High (Bank 1 Sensor 1)	<Ref. to EN(TURBO)-89, DTC P0032 — HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0037	HO2S Heater Control Circuit Low (Bank 1 Sensor 2)	<Ref. to EN(TURBO)-91, DTC P0037 — HO2S HEATER CONTROL CIRCUIT LOW (BANK 1 SENSOR 2) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0038	HO2S Heater Control Circuit High (Bank 1 Sensor 2)	<Ref. to EN(TURBO)-94, DTC P0038 — HO2S HEATER CONTROL CIRCUIT HIGH (BANK 1 SENSOR 2) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0068	Manifold Absolute Pressure/Barometric Pressure Circuit Range/Performance	<Ref. to EN(TURBO)-96, DTC P0068 — MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0101	Mass or Volume Air Flow Circuit Range/Performance	<Ref. to EN(TURBO)-99, DTC P0101 — MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0102	Mass or Volume Air Flow Circuit Low Input	<Ref. to EN(TURBO)-101, DTC P0102 — MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0103	Mass or Volume Air Flow Circuit High Input	<Ref. to EN(TURBO)-104, 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(TURBO)-106, 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(TURBO)-109, DTC P0108 — MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0112	Intake Air Temperature Circuit Low Input	<Ref. to EN(TURBO)-112, DTC P0112 — INTAKE AIR TEMPERATURE CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0113	Intake Air Temperature Circuit High Input	<Ref. to EN(TURBO)-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(TURBO)-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(TURBO)-119, DTC P0118 — ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0121	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	<Ref. to EN(TURBO)-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(TURBO)-124, DTC P0122 — THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

### ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P0123	Throttle/Pedal Position Sensor/Switch "A" Circuit High Input	<Ref. to EN(TURBO)-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(TURBO)-131, DTC P0125 — INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0129	Atmospheric Pressure Sensor Circuit Range/Performance	<Ref. to EN(TURBO)-132, DTC P0129 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0130	O <sub>2</sub> Sensor Circuit (Bank 1 Sensor 1)	<Ref. to EN(TURBO)-133, DTC P0130 — O <sub>2</sub> SENSOR CIRCUIT (BANK 1 SENSOR 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0133	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 1)	<Ref. to EN(TURBO)-135, DTC P0133 — O <sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0134	O <sub>2</sub> Sensor Circuit No Activity Detected (Bank 1 Sensor 1)	<Ref. to EN(TURBO)-136, DTC P0134 — O <sub>2</sub> SENSOR CIRCUIT NO ACTIVITY DETECTED (BANK 1 SENSOR 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0137	O <sub>2</sub> Sensor Circuit Low Voltage (Bank 1 Sensor 2)	<Ref. to EN(TURBO)-137, DTC P0137 — O <sub>2</sub> SENSOR CIRCUIT LOW VOLTAGE (BANK 1 SENSOR 2) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0138	O <sub>2</sub> Sensor Circuit High Voltage (Bank 1 Sensor 2)	<Ref. to EN(TURBO)-140, DTC P0138 — O <sub>2</sub> SENSOR CIRCUIT HIGH VOLTAGE (BANK 1 SENSOR 2) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0139	O <sub>2</sub> Sensor Circuit Slow Response (Bank 1 Sensor 2)	<Ref. to EN(TURBO)-143, DTC P0139 — O <sub>2</sub> SENSOR CIRCUIT SLOW RESPONSE (BANK 1 SENSOR 2) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0171	System too Lean (Bank 1)	<Ref. to EN(TURBO)-144, DTC P0171 — SYSTEM TOO LEAN (BANK 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0172	System too Rich (Bank 1)	<Ref. to EN(TURBO)-145, DTC P0172 — SYSTEM TOO RICH (BANK 1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0230	Fuel Pump Primary Circuit	<Ref. to EN(TURBO)-148, 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(TURBO)-151, 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(TURBO)-153, 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(TURBO)-156, DTC P0246 — TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" HIGH —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0301	Cylinder 1 misfire detected	<Ref. to EN(TURBO)-158, DTC P0301 — CYLINDER 1 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0302	Cylinder 2 misfire detected	<Ref. to EN(TURBO)-158, DTC P0302 — CYLINDER 2 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0303	Cylinder 3 misfire detected	<Ref. to EN(TURBO)-158, DTC P0303 — CYLINDER 3 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0304	Cylinder 4 misfire detected	<Ref. to EN(TURBO)-159, DTC P0304 — CYLINDER 4 MISFIRE DETECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P0327	Knock Sensor 1 Circuit Low Input (Bank 1 or Single Sensor)	<Ref. to EN(TURBO)-166, 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(TURBO)-168, 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(TURBO)-170, 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(TURBO)-172, 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(TURBO)-174, 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(TURBO)-176, DTC P0341 — CAMSHAFT POSITION SENSOR “A” CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0420	Catalyst System Efficiency Below Threshold (Bank 1)	<Ref. to EN(TURBO)-179, 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(TURBO)-181, 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(TURBO)-184, 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(TURBO)-186, 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(TURBO)-189, 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(TURBO)-193, DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0483	Cooling Fan Rationality Check	<Ref. to EN(TURBO)-197, DTC P0483 — COOLING FAN RATIONALITY CHECK —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0502	Vehicle Speed Sensor Circuit Low Input	<Ref. to EN(TURBO)-200, 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(TURBO)-202, DTC P0503 — VEHICLE SPEED SENSOR INTERMITTENT/ERRATIC/HIGH —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0506	Idle Control System RPM Lower Than Expected	<Ref. to EN(TURBO)-204, DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0507	Idle Control System RPM Higher Than Expected	<Ref. to EN(TURBO)-206, 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(TURBO)-208, DTC P0508 — IDLE CONTROL SYSTEM CIRCUIT LOW —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0509	Idle Control System Circuit High	<Ref. to EN(TURBO)-210, DTC P0509 — IDLE CONTROL SYSTEM CIRCUIT HIGH —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

## LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

### ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P0512	Starter switch circuit high input	<Ref. to EN(TURBO)-212, DTC P0512 — STARTER SWITCH CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0513	Incorrect Immobilizer Key	<Ref. to IM-20, DTC P0153 INCORRECT IMMOBILIZER KEY (USE OF UNREGISTERED KEY), Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P0518	Starter Switch Circuit Low Input	<Ref. to EN(TURBO)-214, DTC P0518 — STARTER SWITCH CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0519	Idle Control System Malfunction (Fail-safe)	<Ref. to EN(TURBO)-216, DTC P0519 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0545	Exhaust Gas Temperature Sensor Circuit Low-Bank1	<Ref. to EN(TURBO)-218, DTC P0545 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0546	Exhaust Gas Temperature Sensor Circuit High-Bank1	<Ref. to EN(TURBO)-220, DTC P0546 — EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0558	Generator Circuit Low Input	<Ref. to EN(TURBO)-223, DTC P0558 — GENERATOR CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0559	Generator Circuit High Input	<Ref. to EN(TURBO)-224, DTC P0559 — GENERATOR CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0604	Internal Control Module Random Access Memory (RAM) Error	<Ref. to EN(TURBO)-226, DTC P0604 — INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0691	Cooling Fan 1 Control Circuit Low	<Ref. to EN(TURBO)-229, 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(TURBO)-233, DTC P0692 — COOLING FAN 1 CONTROL CIRCUIT HIGH —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0703	Torque Converter/Brake Switch “B” Circuit	<Ref. to EN(TURBO)-236, DTC P0703 — TORQUE CONVERTER/BRAKE SWITCH “B” CIRCUIT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0705	Transmission Range Sensor Circuit (PRNDL Input)	<Ref. to AT-114, CHECK INHIBITOR SWITCH., Diagnostic Procedure for No-diagnostic Trouble Code (DTC).>
P0710	Transmission Fluid Temperature Sensor Circuit	<Ref. to AT-43, DTC 27 ATF TEMPERATURE SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0715	Input/Turbine Speed Sensor Circuit	<Ref. to AT-59, DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0720	Output Speed Sensor Circuit	<Ref. to AT-54, DTC 33 FRONT VEHICLE SPEED SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0725	Engine Speed Input Circuit	<Ref. to AT-38, DTC 11 ENGINE SPEED SIGNAL, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0731	Gear 1 incorrect ratio	<Ref. to EN(TURBO)-238, DTC P0731 — GEAR 1 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0732	Gear 2 incorrect ratio	<Ref. to EN(TURBO)-238, DTC P0732 — GEAR 2 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0733	Gear 3 incorrect ratio	<Ref. to EN(TURBO)-238, DTC P0733 — GEAR 3 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0734	Gear 4 incorrect ratio	<Ref. to EN(TURBO)-239, DTC P0734 — GEAR 4 INCORRECT RATIO —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0741	Torque Converter Clutch Circuit Performance or Stuck Off	<Ref. to EN(TURBO)-240, DTC P0741 — TORQUE CONVERTER CLUTCH CIRCUIT PERFORMANCE OR STUCK OFF —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0743	Torque Converter Clutch Circuit Electrical	<Ref. to AT-87, DTC 77 LOCK-UP DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>



# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P0748	Pressure Control Solenoid "A" Electrical	<Ref. to AT-79, DTC 75 LINE PRESSURE DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0753	Shift Solenoid "A" Electrical	<Ref. to AT-66, DTC 71 SHIFT SOLENOID 1, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0758	Shift Solenoid "B" Electrical	<Ref. to AT-69, DTC 72 SHIFT SOLENOID 2, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0778	Pressure Control Solenoid "B" Electrical	<Ref. to AT-83, DTC 76 2-4 BRAKE DUTY SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0785	Shift/Timing Solenoid	<Ref. to AT-75, DTC 74 2-4 BRAKE TIMING SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0851	Neutral Switch Input Circuit Low	<Ref. to EN(TURBO)-242, DTC P0851 — NEUTRAL SWITCH INPUT CIRCUIT LOW (AT VEHICLES) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> or <Ref. to EN(TURBO)-244, DTC P0851 — NEUTRAL SWITCH INPUT CIRCUIT LOW (MT VEHICLES) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0852	Neutral Switch Input Circuit High	<Ref. to EN(TURBO)-247, DTC P0852 — NEUTRAL SWITCH INPUT CIRCUIT HIGH (AT VEHICLES) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> or <Ref. to EN(TURBO)-250, DTC P0852 — NEUTRAL SWITCH INPUT CIRCUIT HIGH (MT VEHICLES) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0864	TCM Communication Circuit Range/Performance	<Ref. to EN(TURBO)-253, DTC P0864 — TCM COMMUNICATION CIRCUIT RANGE/PERFORMANCE —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0865	AT Diagnosis Input Signal Circuit Low Input	<Ref. to EN(TURBO)-255, DTC P0865 — AT DIAGNOSIS INPUT SIGNAL CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P0866	AT Diagnosis Input Signal Circuit High Input	<Ref. to EN(TURBO)-257, DTC P0866 — AT DIAGNOSIS INPUT SIGNAL CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1086	Tumble Generated Valve Position Sensor 2 Circuit Low	<Ref. to EN(TURBO)-259, 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(TURBO)-263, 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(TURBO)-266, DTC P1088 — TUMBLE GENERATED VALVE POSITION SENSOR 1 CIRCUIT LOW —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1089	Tumble Generated Valve Position Sensor 1 Circuit High	<Ref. to EN(TURBO)-270, 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(TURBO)-273, 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(TURBO)-273, 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(TURBO)-274, 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(TURBO)-274, 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(TURBO)-275, DTC P1094 — TUMBLE GENERATED VALVE SIGNAL 1 CIRCUIT MALFUNCTION (OPEN) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

## ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P1095	Tumble Generated Valve Signal 1 Circuit Malfunction (Short)	<Ref. to EN(TURBO)-277, 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(TURBO)-279, 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(TURBO)-281, 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(TURBO)-282, 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(TURBO)-282, DTC P1111 — ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION (HIGH INPUT) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1134	A/F sensor Micro-computer problem	<Ref. to EN(TURBO)-283, DTC P1134 — A/F SENSOR MICRO-COMPUTER PROBLEM —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1152	O <sub>2</sub> Sensor Circuit Range/Performance (Low) (Bank1 Sensor1)	<Ref. to EN(TURBO)-284, DTC P1152 — O <sub>2</sub> SENSOR CIRCUIT RANGE/PERFORMANCE (LOW) (BANK1 SENSOR1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1153	O <sub>2</sub> Sensor Circuit Range/Performance (High) (Bank1 Sensor1)	<Ref. to EN(TURBO)-286, DTC P1153 — O <sub>2</sub> SENSOR CIRCUIT RANGE/PERFORMANCE (HIGH) (BANK1 SENSOR1) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1301	Misfire Detected (High Temperature Exhaust Gas)	<Ref. to EN(TURBO)-289, DTC P1301 — MISFIRE DETECTED (HIGH TEMPERATURE EXHAUST GAS) —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1312	Exhaust Gas Temperature Sensor Malfunction	<Ref. to EN(TURBO)-291, DTC P1312 — EXHAUST GAS TEMPERATURE SENSOR MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1544	Exhaust Gas Temperature Too High	<Ref. to EN(TURBO)-293, DTC P1544 — EXHAUST GAS TEMPERATURE TOO HIGH —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1560	Back-up voltage circuit malfunction	<Ref. to EN(TURBO)-295, DTC P1560 — BACK-UP VOLTAGE CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1570	Antenna	<Ref. to IM-21, DTC P1570 ANTENNA, Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P1571	Reference code incompatibility	<Ref. to IM-15, DTC P1571 Reference Code Incompatibility, Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P1572	IMM circuit failure (except antenna circuit)	<Ref. to IM-16, DTC P1572 IMM CIRCUIT FAILURE (EXCEPT ANTENNA CIRCUIT), Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P1574	Key communication failure	<Ref. to IM-19, DTC P1574 KEY COMMUNICATION FAILURE, Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P1576	EGI control module EEPROM	<Ref. to IM-20, DTC P1576 EGI CONTROL MODULE EEPROM, Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P1577	IMM control module EEPROM	<Ref. to IM-20, DTC P1577 IMM CONTROL MODULE EEPROM, Diagnostics Chart with Diagnostic Trouble Code (DTC).>
P1698	Engine Torque Control Cut Signal Circuit Malfunction (Low Input)	<Ref. to EN(TURBO)-298, DTC P1698 — ENGINE TORQUE CONTROL CUT SIGNAL CIRCUIT LOW INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1699	Engine Torque Control Cut Signal Circuit Malfunction (High Input)	<Ref. to EN(TURBO)-300, DTC P1699 — ENGINE TORQUE CONTROL CUT SIGNAL CIRCUIT HIGH INPUT —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1700	Throttle Position Sensor Circuit Malfunction for AT	<Ref. to AT-47, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>

# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

ENGINE (DIAGNOSTICS)

DTC No.	Item	Index
P1701	Cruise Control Set Signal Circuit Malfunction for AT	<Ref. to EN(TURBO)-302, DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1703	AT Low Clutch Timing Solenoid Valve Circuit Malfunction	<Ref. to AT-72, DTC 73 LOW CLUTCH TIMING SOLENOID, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1711	Engine Torque Control Signal #1 Circuit Malfunction	<Ref. to EN(TURBO)-304, DTC P1711 — ENGINE TORQUE CONTROL SIGNAL 1 CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
P1712	Engine Torque Control Signal #2 Circuit Malfunction	<Ref. to EN(TURBO)-306, DTC P1712 — ENGINE TORQUE CONTROL SIGNAL 2 CIRCUIT MALFUNCTION —, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>