

SERVICE PRECAUTIONS

GENERAL TROUBLESHOOTING

Before troubleshooting

- First, check the MIL.
- Be sure to turn the combination switch OFF before disconnecting and connecting the connectors.
- Clear the DTCs after inspection.
 - DTC (with the Dr.H: page 5-5)
 - MIL (without the Dr.H: page 5-5)

PERMANENT FAILURE

When there is a problem in the system, the MIL will blink and go off when the engine is turned off.

When there is a permanent failure, the MIL will blink again when the engine is started again, as the problem still exists.

Most permanent failures will be indicated when the combination switch is turned on and engine is started, while others are indicated only under certain conditions. MIL will blink constantly until the problem part is fixed or replaced.

INTERMITTENT FAILURE

When there is an intermittent failure, the MIL will not blink again when the engine is restarted.

The ECM stores the problem code in its memory.

An intermittent failure is often associated with a loose connector or poor contact in the circuit.

Opens and Shorts

An open or a short are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. This usually means something will not work at all. With an ECM, an open or short may cause something to work, just not the way it is supposed to.

FUEL LINE SERVICE

⚠ WARNING

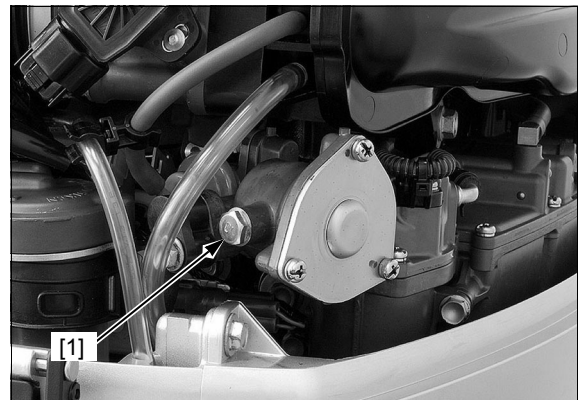
Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel.

- Keep heat, sparks, and flame away.
- Wipe up spills immediately.
- Handle fuel only outdoors.

Disconnect the battery cable from the battery negative (-) terminal.

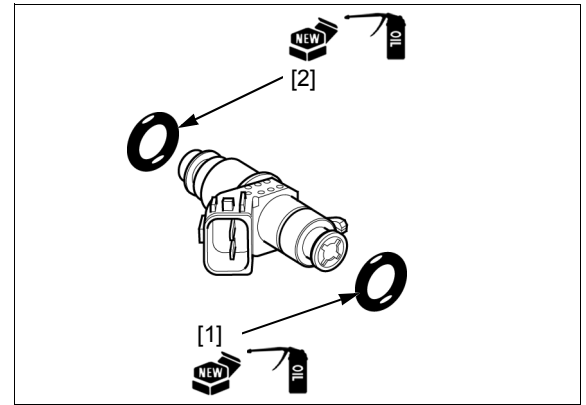
Before removing and installing the fuel line, relieve the fuel pressure by loosening the service check bolt [1] as described in "How to relieve fuel pressure" (page 5-66).

Replace the sealing washer during reassembly.



Replace the O-ring (7.47 X 3.6 mm) [1] and O-ring (7.45 X 3.61 mm) [2] with new ones when the fuel line is removed/installed or replaced.

- Install the O-rings in their proper locations.
- Apply engine oil to the O-rings before installation.
- Avoid using vegetable oil and alcohol based lubricants.



CHECK AFTER OPERATION

Check the parts for secure installation and the bolts, screws, and other fasteners for secure tightening.

Connect the battery cable to the battery negative (-) terminal.

FUEL LEAK CHECK

Turn the combination switch ON (but do not turn the starter) after connecting the fuel lines. The fuel pump (high pressure side) should operate for approximately 2 seconds and the fuel pressure in the high pressure side fuel line should rise. Repeat this operation 2 or 3 times and check for fuel leakage.

WHEN THE BOAT IS EQUIPPED WITH RADIO EQUIPMENT/D-GPS

The ECM and its wires are designed to be unaffected by radio waves. However, the ECM can malfunction when it senses an extremely powerful electric wave. Note the following to avoid malfunction of the ECM.

- Install the antenna and the body of the radio equipment at least 50 cm (20.0 in) away from the ECM, remote control cable, remote control box, NMEA interface cable, and network cable.
- Antenna wire must not be too long. Do not route the antenna wire along the main wire harness and other cables/wires.
- Do not mount high output power radio equipment on the boat. (The maximum output power of the radio equipment should be 10 W.)
- Install the D-GPS antenna and the body unit at least 3 m away from the engine.
- Connect the D-GPS antenna ground wire to ground.

SYSTEM DESCRIPTION

SELF-DIAGNOSIS SYSTEM

The ECM has a self-diagnosis function that memorizes the failure code and turns the MIL ON when it detects an abnormality with the input/output system.

FAIL-SAFE FUNCTION

The PGM-FI system is provided with a fail-safe function to provide minimum running capability even when there is trouble in the system. When any abnormality is detected by the self-diagnosis function, running capability is maintained by pre-programmed value in the simulated program map. When any abnormality is detected in the MAP sensor or CKP sensor, the fail-safe function stops the engine to protect it from damage.

DTC (Diagnostic Trouble Code)

- The DTC is composed of a main code and a sub code and it is displayed as a hyphenated number when retrieved from the ECM with the Dr.H.

The digits in front of the hyphen are the main code, they indicate the component of function failure.

The digits behind the hyphen are the sub code, they detail the specific symptom of the component or function failure.

For example, in the case of the TP sensor:

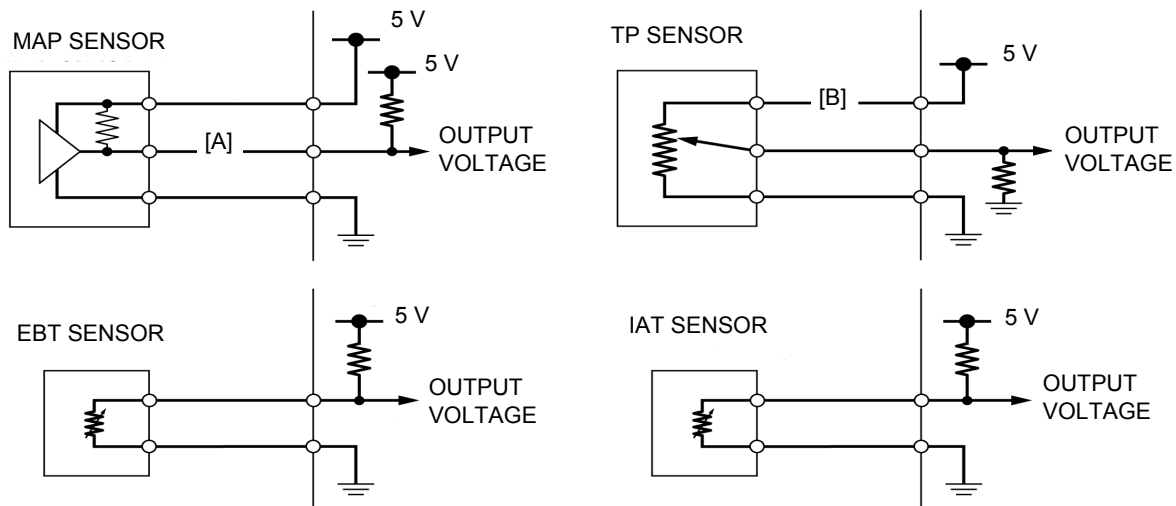
- DTC 07 - 1 = (TP sensor voltage) - (lower than the specified value)
- DTC 07 - 2 = (TP sensor voltage) - (higher than the specified value).

- The MAP, EBT, TP, and IAT sensor diagnosis will be made according to the voltage output of the affected sensor.

If a failure occurs, the ECM determines the Function Failure, compares the sensor voltage output to the standard value, and then outputs the corresponding DTC to the Dr.H.

For example:

- If the input voltage line (A) on the MAP sensor is opened, the ECM detects the output voltage is about 5 V, then the DTC 3-2 (MAP sensor circuit high voltage) will be displayed.
- If the input voltage line (B) on the TP sensor is opened, the ECM detects the output voltage is 0 V, then the DTC 7-1 (TP sensor circuit low voltage) will be displayed.



DTC READOUT

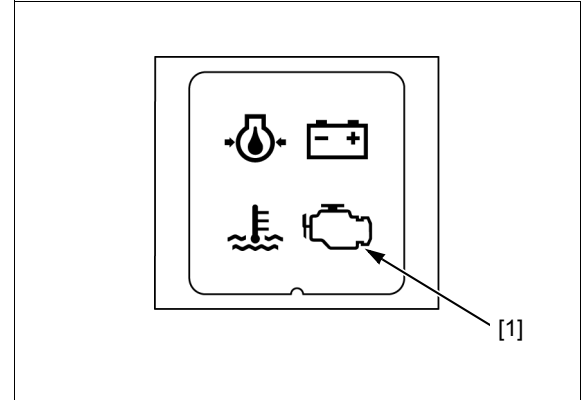
Turn the combination switch ON; the MIL [1] will stay on for a few seconds, then go off.

Start the engine and check the MIL.

- If the engine will not start, turn the starter motor for more than 10 seconds and check the MIL.

If the MIL stays on or blinks, read the following:

- DTC (with the Dr.H: page 5-6)
- MIL (without the Dr.H: page 5-6)



CLEARING DTC

How to clear the DTC with Dr.H

Connect the Dr.H to the DLC (page 5-6).

Turn the combination switch ON, and clear the DTC with the Dr.H.

- If there is any problem in the system, the ECM keeps running the self-diagnosis function and the DTC cannot be cleared.

Turn the combination switch OFF.

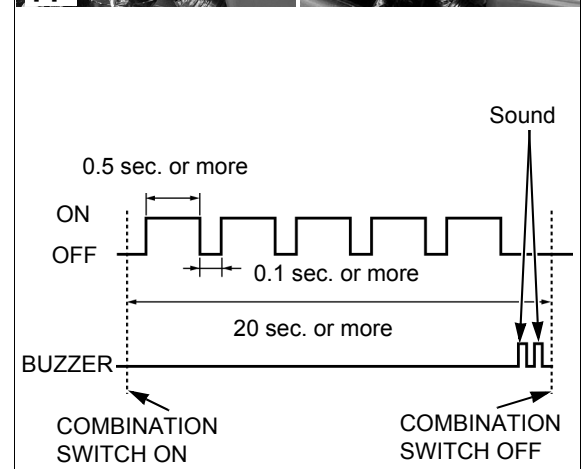
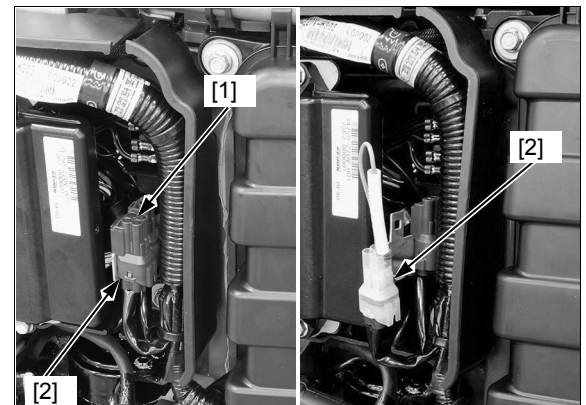
How to clear the DTC with SCS service connector

1. Turn the combination switch to OFF.
2. Remove the engine cover.
3. Disconnect the dummy connector [1] from the DLC [2] and short the DLC terminals using the special tool.

TOOL:

SCS service connector [2] 070PZ-ZY30100

4. Turn the combination switch to ON.
 - Perform steps 5 though 7 within 20 seconds.
5. Turn the emergency stop switch ON (push for 0.5 sec. or more) and OFF (release for 0.1 sec. or more). Repeat the procedure five times.
6. Check that the buzzer sounds twice. The MIL should stay ON.
7. Turn the combination switch OFF. (ECM reset procedure completes.)



READING DTC WITH THE Dr.H

- The Dr.H can readout the DTC and other engine conditions.
- Refer to the Instruction Manual for the Dr. H how to use.

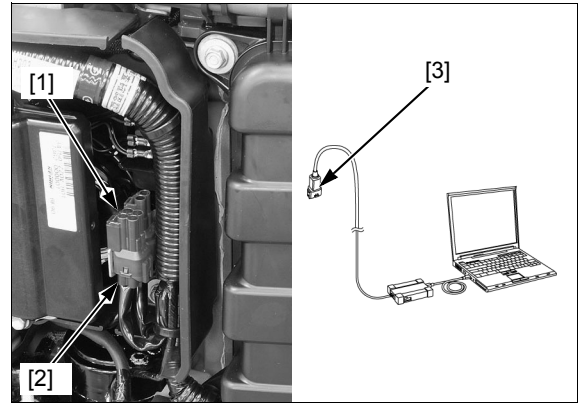
Turn the combination switch to OFF.

Remove the dummy connector [1] from the DLC [2].

Connect the Dr.H [3] to the DLC.

Turn the combination switch ON and check the DTC.

Read the DTC and follow the troubleshooting index (page 5-13).



READING DTC WITHOUT THE Dr.H

- If the ECM has any DTC in its memory, it can be read out by the number of blinks of the MIL.

Turn the combination switch to OFF.

Remove the engine cover.

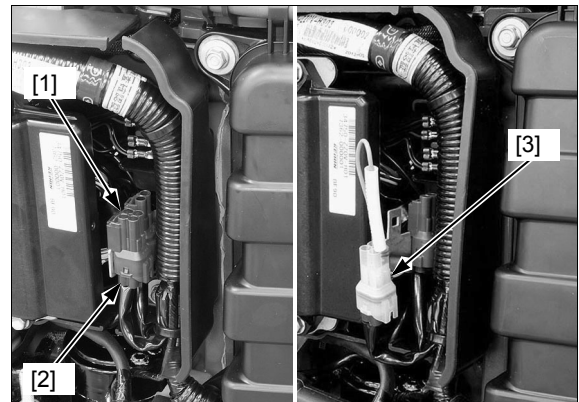
Disconnect the dummy connector [1] from the DLC [2] and short DLC terminals using the special tool.

TOOL:

SCS service connector [3] 070PZ-ZY30100

Turn the combination switch ON, note the MIL blinks, and refer to the "MIL INDEX". (page 5-43).

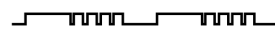
- The number of blinks of the MIL is the same as that of the DTC main code. Note that the MIL does not show any sub code.
- The MIL has two types of blinks, a long blink and short blink. One long blink is the equivalent of 10 short blinks. For example, when 1 long blink is followed by 4 short blinks, the MIL is 14 (1 long blinks = 10 blinks, plus 4 short blinks).
- When multiple problems occur simultaneously, the MIL repeatedly indicates them by blinking separate codes, one after another.



Single problem:



See DTC 3

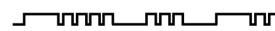


See DTC 14

Multiple problems:



See DTC 3 and 4



See DTC 1 and 14

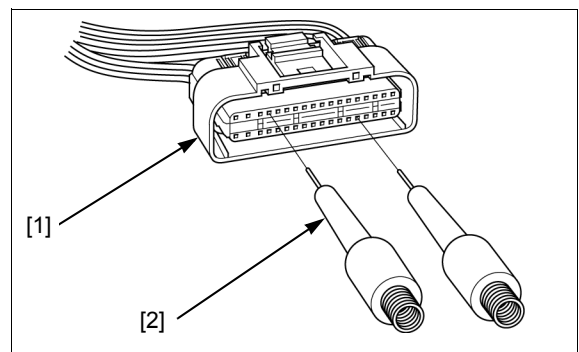
INSPECTION AT ECM CONNECTOR

- Always clean around and keep any foreign material away from the ECM [1] connector before disconnecting it.
- A faulty PGM-FI system is often related to poorly connected or corroded terminals. Check those connections before proceeding.
- In testing at the ECM connector (wire harness side) terminal, always use the test probe. Insert the test probe into the connector terminal, and then attach the digital multimeter probe to the test probe.

TOOL:

Test probe [2]

07ZAJ-RDJA110



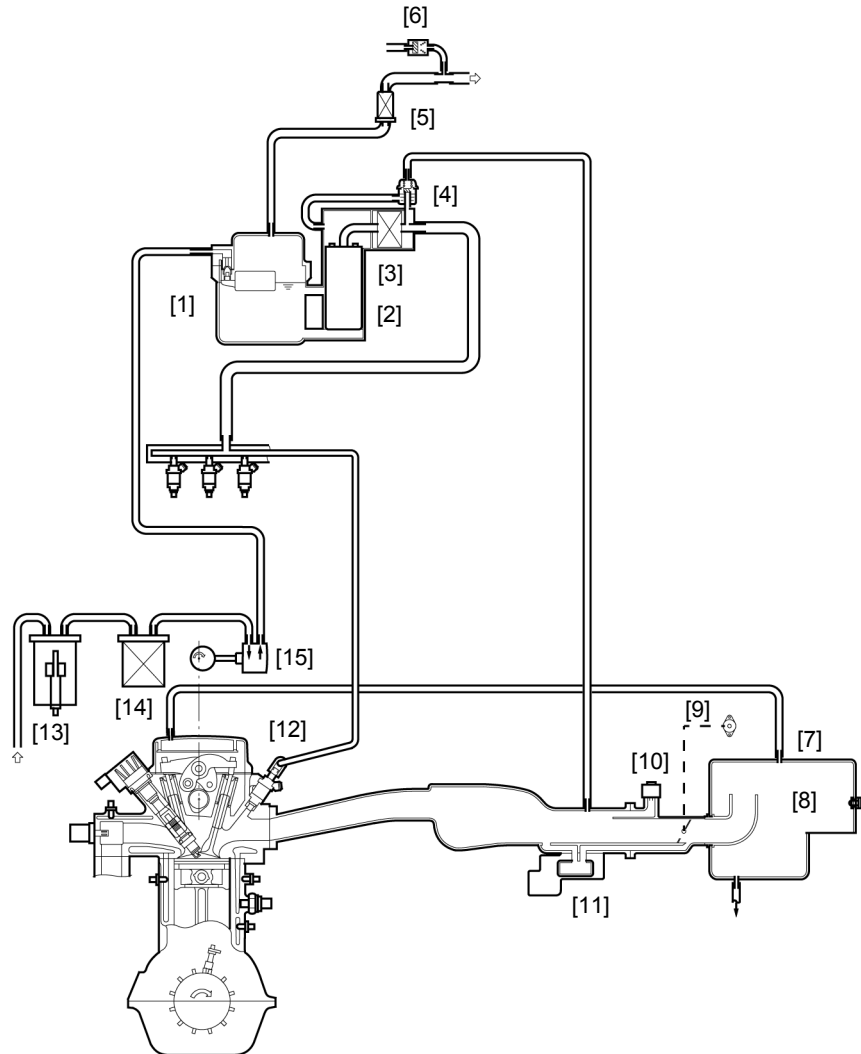
FINAL PROCEDURE (AFTER TROUBLESHOOTING)

Clear the DTCs.

- DTC (with the Dr.H: page 5-5)
- MIL (without the Dr.H: page 5-5)

Disconnect the SCS service check connector or Dr.H from the DLC and connect the dummy connector.

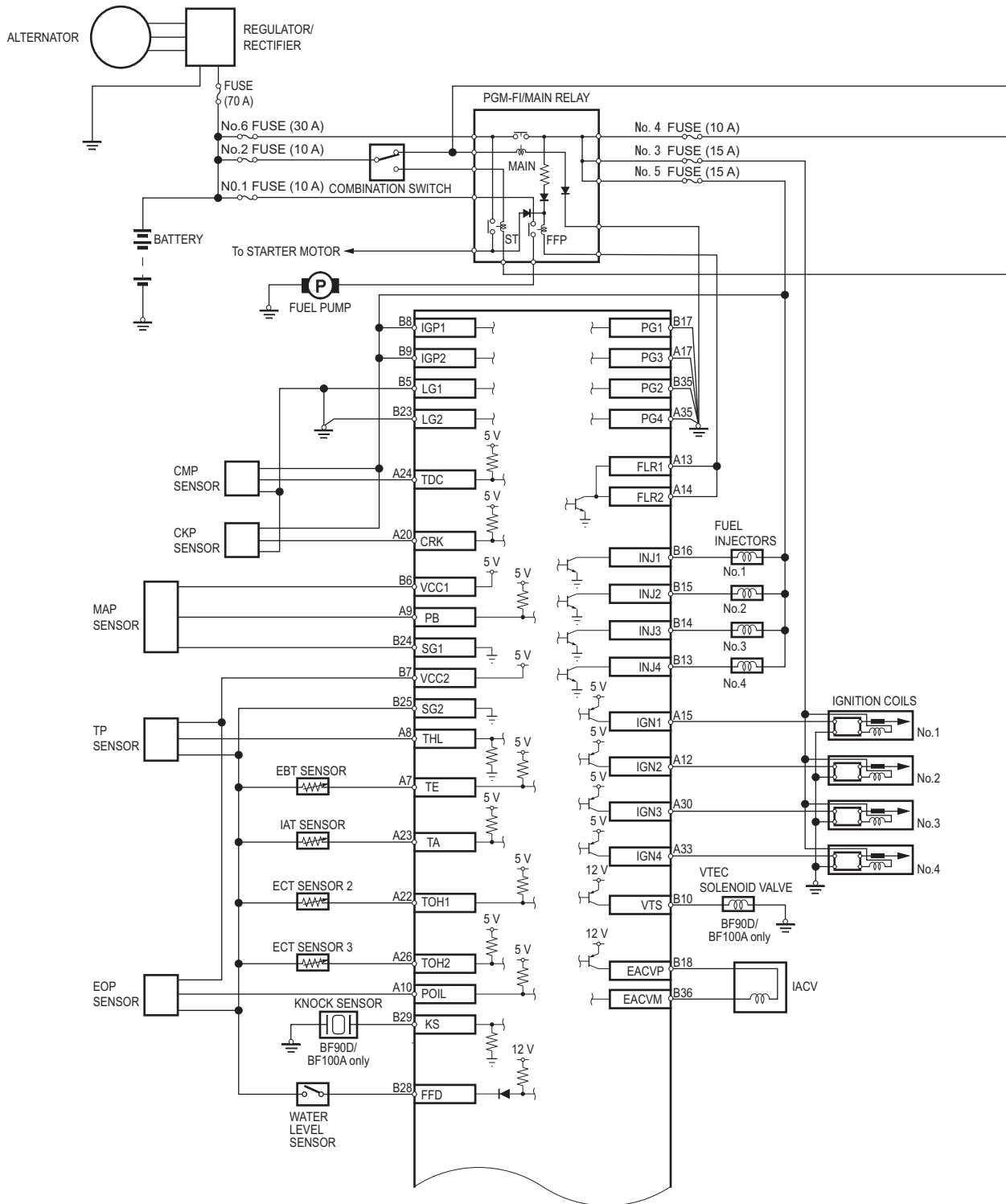
PIPING CONNECTIONS

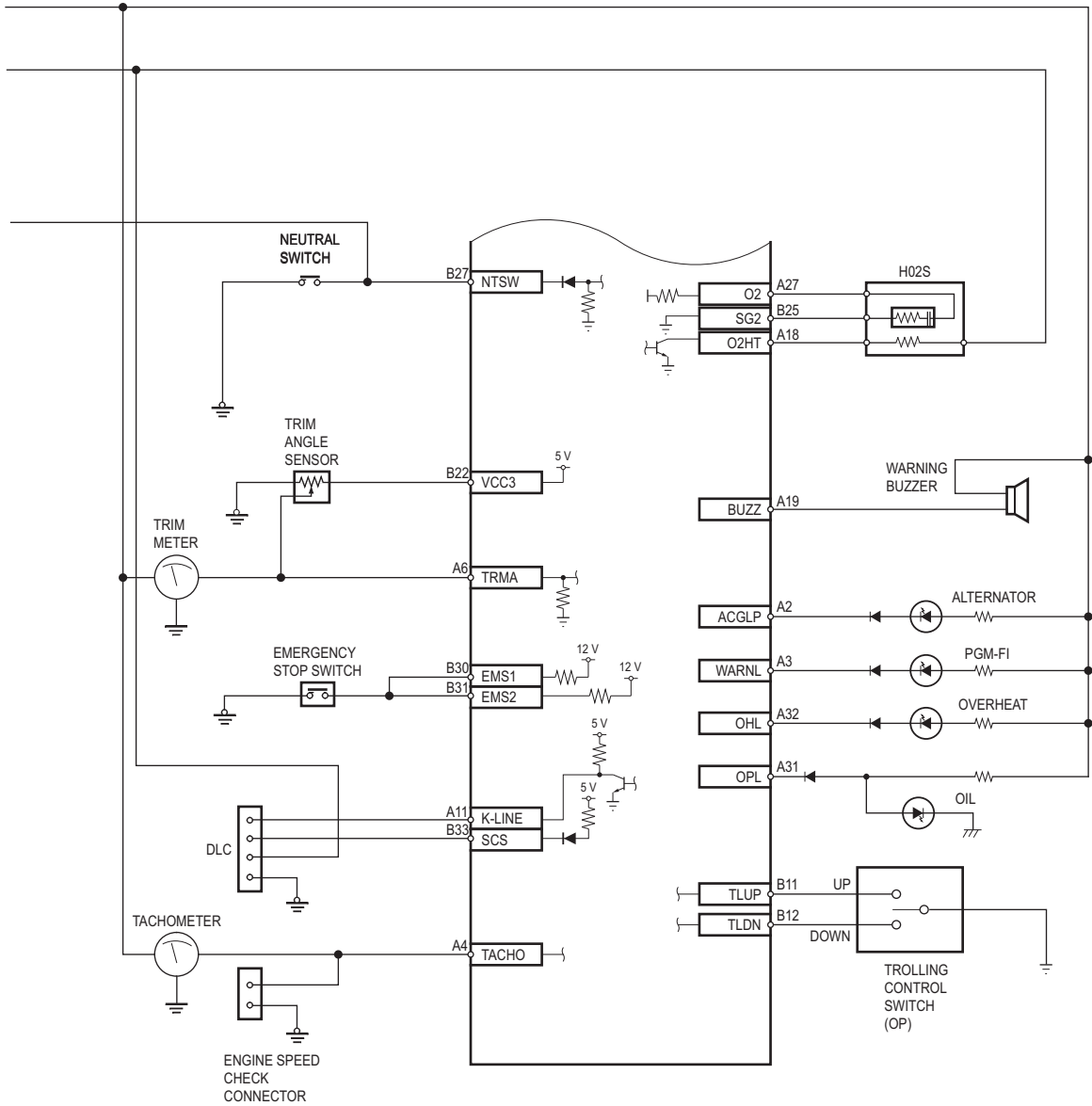


- | | | | |
|-----|------------------------------------|------|-----------------------------------|
| [1] | Vapor separator | [9] | TP sensor |
| [2] | Fuel pump (High pressure side) | [10] | MAP sensor |
| [3] | Fuel strainer (High pressure side) | [11] | IAC valve |
| [4] | Pressure regulator | [12] | Injector |
| [5] | Air vent strainer | [13] | Water separator |
| [6] | Check valve | [14] | Fuel strainer (Low pressure side) |
| [7] | Breather tube | [15] | Fuel pump (Low pressure side) |
| [8] | Silencer case | | |

FUEL SYSTEM

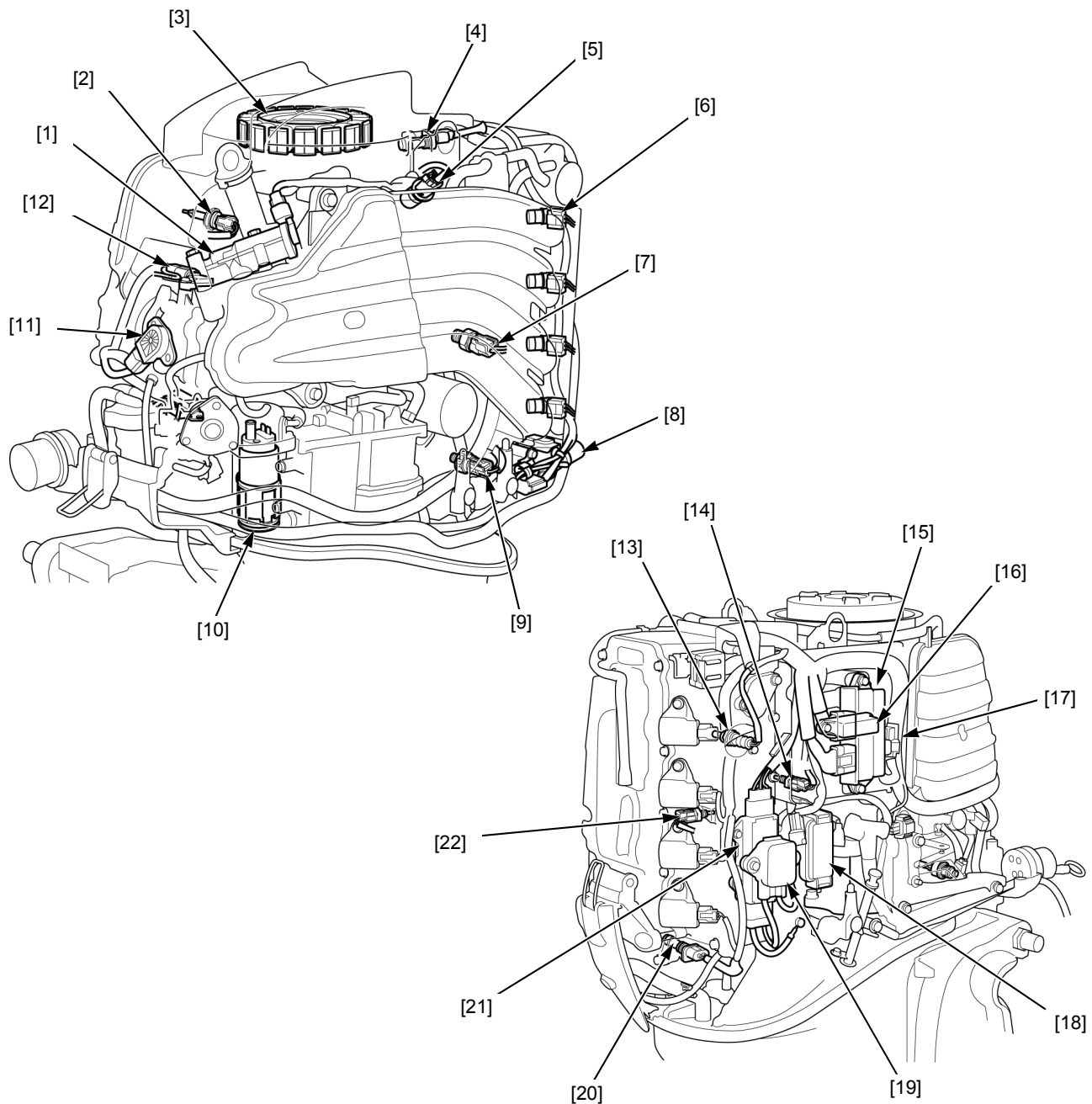
CIRCUIT DIAGRAM





FUEL SYSTEM

SYSTEM LOCATION

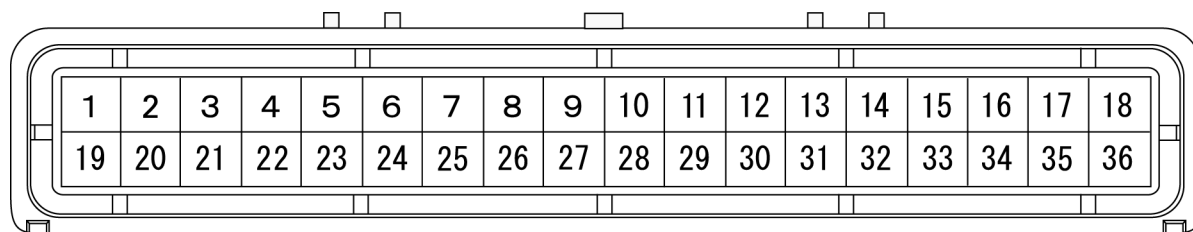


- | | | | |
|------|---|------|---------------------|
| [1] | IAC valve | [12] | MAP sensor |
| [2] | IAT sensor | [13] | HO2S |
| [3] | Alternator stator | [14] | ECT sensor 2 |
| [4] | CKP sensor | [15] | ECM |
| [5] | EOP sensor | [16] | PGM-FI/main relay |
| [6] | Injector | [17] | DLC |
| [7] | Knock sensor (BF90D/BF100A only) | [18] | Fuse box |
| [8] | VTEC solenoid valve (BF90D/BF100A only) | [19] | 70A fuse box |
| [9] | EBT sensor | [20] | CMP sensor |
| [10] | Fuel strainer pump (High pressure side) | [21] | Regulator/rectifier |
| [11] | TP sensor | [22] | ECT sensor 3 |

ECM TERMINAL ARRANGEMENT

ECM CONNECTOR A (GRAY)

29

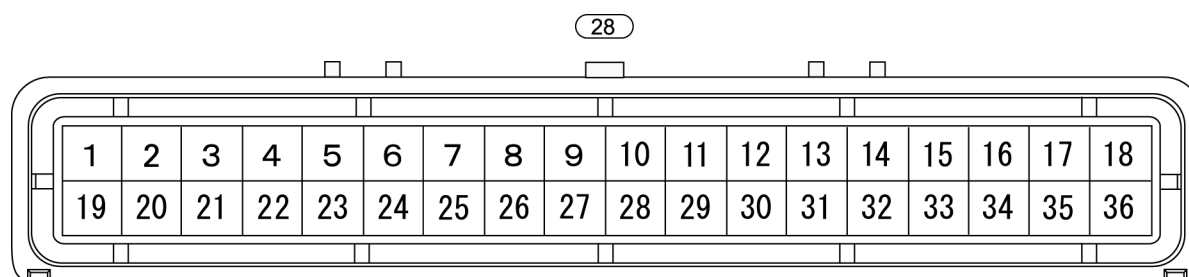


ECM side connector (viewed from the terminal side)

Terminal No.	Terminal mark	Name	Content/Signal
1	-	-	-
2	ACGLP	Alternator indicator light	Alternator indicator light output
3	WARNL	MIL	MIL output
4	TACHO	Tachometer	Tachometer pulse output
5	-	-	-
6	TRMA	Trim angle sensor	Trim angle sensor input
7	TE	EBT sensor	EBT sensor input
8	THL	TP sensor	TP sensor input
9	PB	MAP sensor	MAP sensor input
10	POIL	EOP sensor	EOP sensor input
11	K-LINE	Communication signal	Serial communication signal input/output
12	IGN2	No.2 ignition coil	No.2 ignition coil signal output
13	FLR1	Fuel pump relay 1	Fuel pump relay 1 driver
14	FLR2	Fuel pump relay 2	Fuel pump relay 2 driver
15	IGN1	No.1 ignition coil	No.1 ignition coil signal output
16	-	-	-
17	PG3	Power ground 3	Power ground 3
18	O2HT	HO2S heater	HO2S heater driver
19	BUZZ	Warning buzzer	Warning buzzer driver
20	CRK	CKP sensor (+)	CKP sensor (+) input
21	-	-	-
22	TOH1	ECT sensor 2	ECT sensor 2 input
23	TA	IAT sensor	IAT sensor input
24	TDC	CMP sensor	CMP sensor input
25	-	-	-
26	TOH2	ECT sensor 3	ECT sensor 3 input
27	O2	HO2S	HO2S input
28	-	-	-
29	-	-	-
30	IGN3	No.3 ignition coil	No.3 ignition coil signal output
31	OPL	Oil indicator light	Oil indicator light driver
32	OHL	Overheat indicator light	Overheat indicator light driver
33	IGN4	No.4 ignition coil	No.4 ignition coil signal output
34	FUP	Fuel consumption meter	Fuel consumption volume signal output
35	PG4	Power ground 4	Power ground 4
36	-	-	-

FUEL SYSTEM

ECM CONNECTOR B (BLACK)













ECM side connector (viewed from the terminal side)












Terminal No.	Terminal mark	Name	Content/Signal
1	CAN 1H	NMEA 2000 CAN HI	NMEA 2000 CAN HI output
2	CAN 12V	NMEA 2000 12V power source	NMEA 2000 12V power input
3	CAN GND	NMEA 2000 ground	NMEA 2000 ground
4	–	–	–
5	LG1	Logic ground 1	Logic ground 1
6	VCC1	Sensor power 1	Sensor power 5 V output 1
7	VCC2	Sensor power 2	Sensor power 5 V output 2
8	IGP1	ECM power source 1	ECM main power 12 V input 1
9	IGP2	ECM power source 2	ECM main power 12 V input 2
10	VTS (BF90D/BF100A only)	VTEC solenoid valve	VTEC solenoid valve driver
11	TLUP	Trolling control switch Up	Trolling control switch Up input
12	TLDN	Trolling control switch Down	Trolling control switch Down input
13	INJ4	No.4 injector	No.4 injector driver
14	INJ3	No.3 injector	No.3 injector driver
15	INJ2	No.2 injector	No.2 injector driver
16	INJ1	No.1 injector	No.1 injector driver
17	PG1	Power ground 1	Power ground 1
18	EACVP	IAC valve (+)	IAC valve (+) driver
19	CAN 1L	NMEA 2000 CAN LO	NMEA 2000 CAN LO output
20	SHILD	NMEA 2000 shield	NMEA 2000 shield
21	–	–	–
22	VCC3	Sensor power 3	Sensor power 5 V output 3
23	LG2	Logic ground 2	Logic ground 2
24	SG1	Sensor ground 1	Sensor ground 1
25	SG2	Sensor ground 2	Sensor ground 2
26	–	–	–
27	NTSW	Neutral switch	Neutral switch input
28	FFD	Water level sensor	Water level sensor input
29	KS (BF90D/BF100A only)	Knock sensor	Knock sensor input
30	EMS1	Emergency stop switch 1	Emergency stop switch input 1
31	EMS2	Emergency stop switch 2	Emergency stop switch input 2
32	–	–	–
33	SCS	Service check signal	Service check signal input
34	–	–	–
35	PG2	Power ground 2	Power ground 2
36	EACVM	EACV (–)	EACV (–) driver






DTC TROUBLESHOOTING

DTC INDEX

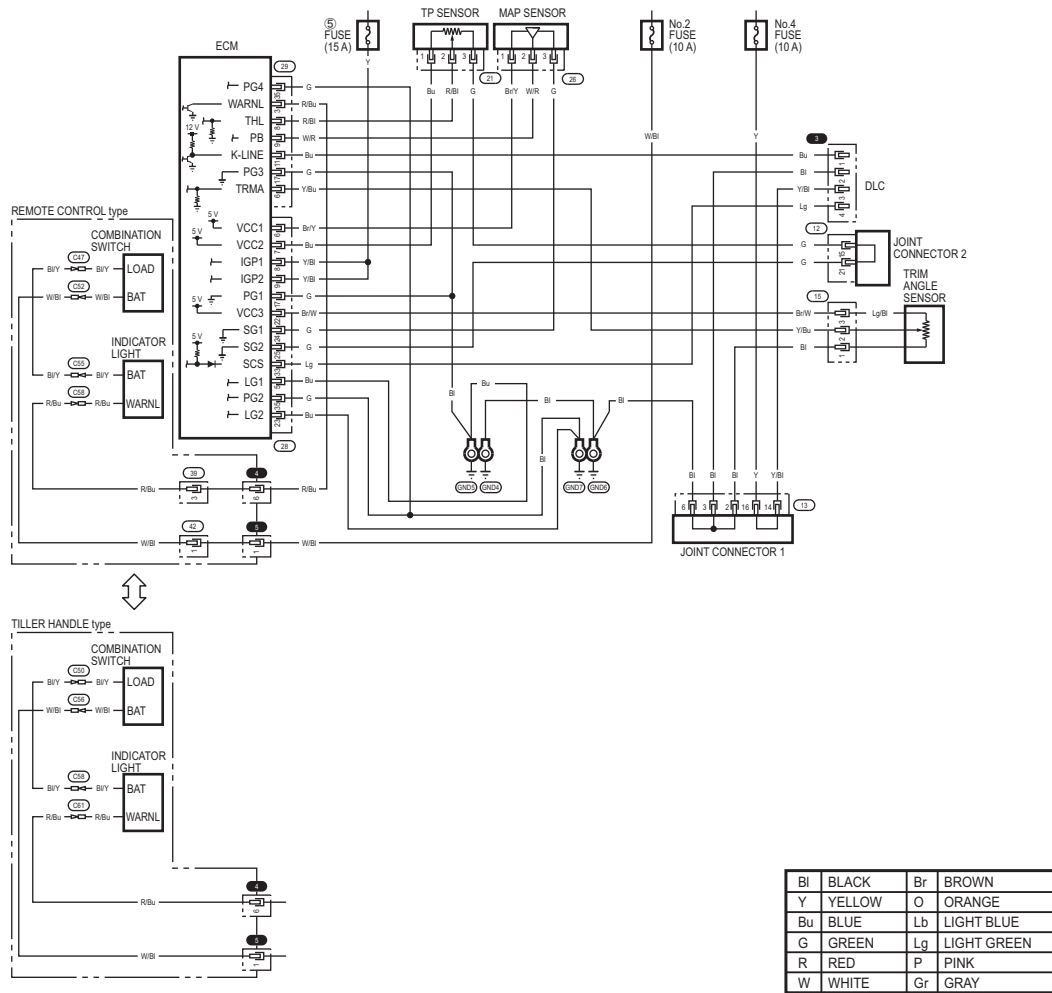
DTC	MIL	Detected component	Probable cause	Ref. page
0 or does not communicate	MIL does not come ON/ blink 	ECM	<ul style="list-style-type: none"> Loose or poor contact of the connector Faulty indicator light Open circuit in MIL wire Open circuit in ECM power/ground cable Faulty ECM 	4-17
0 or does not communicate	MIL stay ON 	ECM	<ul style="list-style-type: none"> SCS service check connector activated Short circuit in DLC wire Short circuit in MIL wire Short circuit in sensor power circuit Faulty ECM 	5-16
0-2 0-5 0-8	ON 	ECM (internal failure)	<ul style="list-style-type: none"> Faulty ECM 	5-19
1-4	ON 	HO2S (failure)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in HO2S wire Faulty fuel supply system Faulty HO2S 	5-19
3-1	ON 	MAP sensor (voltage too low)	<ul style="list-style-type: none"> Loose or poor contact of the connector Short circuit in MAP sensor wire (PB) Open circuit in MAP sensor wire (VCC1) Faulty MAP sensor 	5-20
3-2	ON 	MAP sensor (voltage too high)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open circuit in MAP sensor wire (PB) Open circuit in MAP sensor wire (VCC1) Open circuit in MAP sensor wire (SG1) Faulty MAP sensor 	5-21
4-1	ON 	CKP sensor (no pulse)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in CKP sensor wire (CRK) Open circuit in CKP sensor wire (IGP2) Open circuit in CKP sensor wire (LG1) Faulty CKP sensor 	5-23
4-2	ON 	CKP sensor (abnormal pulse)	<ul style="list-style-type: none"> Loose or poor contact of the connector Faulty CKP sensor Faulty crank purser plate 	5-24
6-1	ON 	EBT sensor (voltage too low)	<ul style="list-style-type: none"> Loose or poor contact of the connector Short circuit in EBT sensor wire (TE) Faulty EBT sensor 	5-25
6-2	ON 	EBT sensor (voltage too high)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open circuit in EBT sensor wire (TE) Open circuit in EBT sensor wire (SG2) Faulty EBT sensor 	5-26

FUEL SYSTEM

DTC	MIL	Detected component	Probable cause	Ref. page
7-1	ON 	TP sensor (voltage too low)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in TP sensor wire (THL) Open circuit in TP sensor wire (VCC2) Faulty TP sensor 	5-27
7-2	ON 	TP sensor (voltage too high)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open circuit in TP sensor wire (SG2) Faulty TP sensor 	5-28
8-1	ON 	CMP sensor (no pulse)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in CMP sensor wire (TDC) Open circuit in CMP sensor wire (IGP2) Open circuit in CMP sensor wire (LG1) Faulty CMP sensor 	5-29
8-2	ON 	CMP sensor (abnormal pulse)	<ul style="list-style-type: none"> Loose or poor contact of the connector Faulty CMP sensor Faulty cam purser plate 	5-30
10-1	ON 	IAT sensor (voltage too low)	<ul style="list-style-type: none"> Loose or poor contact of the connector Short circuit in IAT sensor wire (TA) Faulty IAT sensor 	5-31
10-2	ON 	IAT sensor (voltage too high)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open circuit in IAT sensor wire (TA) Open circuit in IAT sensor wire (SG2) Faulty IAT sensor 	5-32
14-1	ON 	IAC valve (control failure)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in IAC valve wire (EACVP) Open or short circuit in IAC valve wire (EACVM) Faulty IAC valve 	5-33
21-1 (BF90D/ BF100A only)	ON 	VTEC solenoid valve (failure)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in VTEC solenoid valve wire Faulty VTEC solenoid valve 	5-34
22-1	ON 	EOP sensor (voltage too low)	<ul style="list-style-type: none"> Loose or poor contact of the connector Short circuit in EOP sensor wire (POIL) Open circuit in EOP sensor wire (VCC2) Faulty EOP sensor 	5-35
22-2	ON 	EOP sensor (voltage too high)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open circuit in EOP sensor wire (POIL) Open circuit in EOP sensor wire (VCC2) Open circuit in EOP sensor wire (SG2) Faulty EOP sensor 	5-36
23-1 (BF90D/ BF100A only)	ON 	Knock sensor (no pulse)	<ul style="list-style-type: none"> Loose or poor contact of the connector Open or short circuit in knock sensor wire (KS) Faulty knock sensor 	5-37

DTC	MIL	Detected component	Probable cause	Ref. page
41-2	ON 	HO2S heater (failure)	<ul style="list-style-type: none"> • Loose or poor contact of the connector • Open circuit in HO2S heater wire • Faulty HO2S 	5-38
140-1	ON 	ECT sensor 2 (voltage too low)	<ul style="list-style-type: none"> • Loose or poor contact of the connector • Short circuit in ECT sensor 2 wire (TOH1) • Faulty ECT sensor 2 	5-39
140-2	ON 	ECT sensor 2 (voltage too high)	<ul style="list-style-type: none"> • Loose or poor contact of the connector • Open circuit in ECT sensor 2 wire (TOH1) • Open circuit in ECT sensor 2 wire (SG2) • Faulty ECT sensor 2 	5-40
141-1	ON 	ECT sensor 3 (voltage too low)	<ul style="list-style-type: none"> • Loose or poor contact of the connector • Short circuit in ECT sensor 3 wire (TOH2) • Faulty ECT sensor 3 	5-41
141-2	ON 	ECT sensor 3 (voltage too high)	<ul style="list-style-type: none"> • Loose or poor contact of the connector • Open circuit in ECT sensor 3 wire (TOH2) • Open circuit in ECT sensor 3 wire (SG2) • Faulty ECT sensor 3 	5-42

MIL IS ON BUT DTC IS 0 OR DOES NOT COMMUNICATE



1. DLC power/GND line open circuit inspection

Turn the combination switch OFF and disconnect the Dr.H.

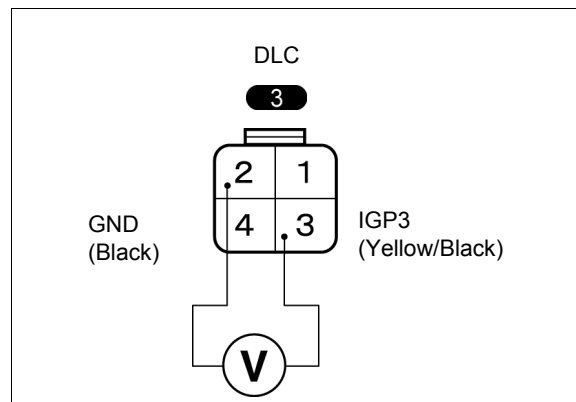
Turn the combination switch ON.

Measure the voltage at the DLC **3** No.3 (Yellow/Black) terminal and No.2 (Black) terminal.

Does battery voltage exit?

YES – GO TO STEP 2.

- NO** –
- Repair open in the Yellow/Black wire between the No.4 fuse and DLC.
 - If main wire harness is normal, inspect the No.4 fuse circuit in the fuse box (page 10-14).



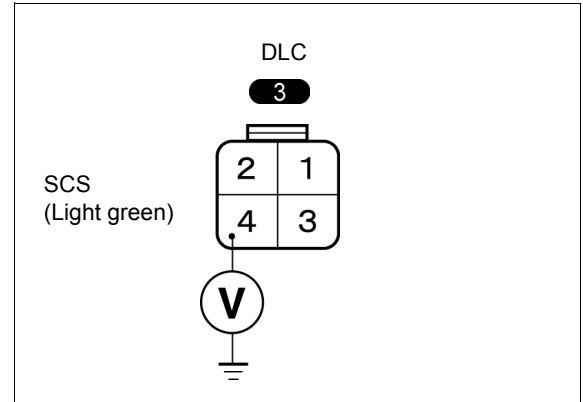
2. DLC signal line short circuit inspection

Measure the voltage between the DLC **3** No.4 (Light green) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – Repair short in the main wire harness between the ECM and the DLC.



3. MIL ON line short circuit inspection

Turn the combination switch OFF.

Disconnect ECM connector A **29**.

Turn the combination switch ON and check the MIL.

Does the MIL go OFF?

YES – GO TO STEP 4.

NO – Repair short in the main wire harness between the ECM and the MIL.

4. MAP sensor power line short circuit inspection 1

Turn the combination switch OFF.

Connect ECM connector A **29**.

Disconnect the MAP sensor 3P connector **26**.

Turn the combination switch ON and check the MIL.

Does the MIL go OFF?

YES – Replace the MAP sensor.

NO – GO TO STEP 5.

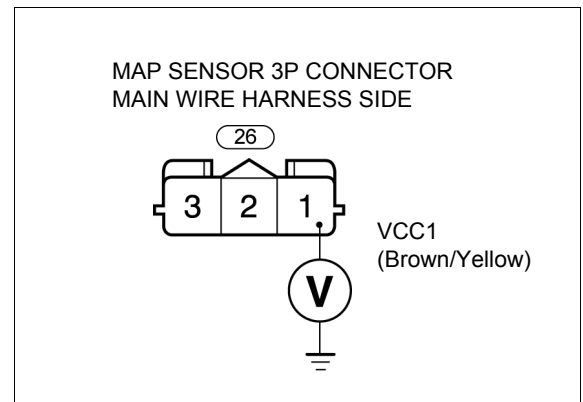
5. MAP sensor power line short circuit inspection 2

Measure the voltage between the MAP sensor 3P connector **26** main wire harness side No.1 (Brown/Yellow) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 6.

NO – Repair short in the main wire harness between the ECM and the MAP sensor.



6. TP sensor power line short circuit inspection 1

Turn the combination switch OFF.

Disconnect the TP sensor 3P connector **21**.

Turn the combination switch ON and check the MIL.

Does the MIL go OFF?

YES – Replace the TP sensor.

NO – GO TO STEP 7.

FUEL SYSTEM

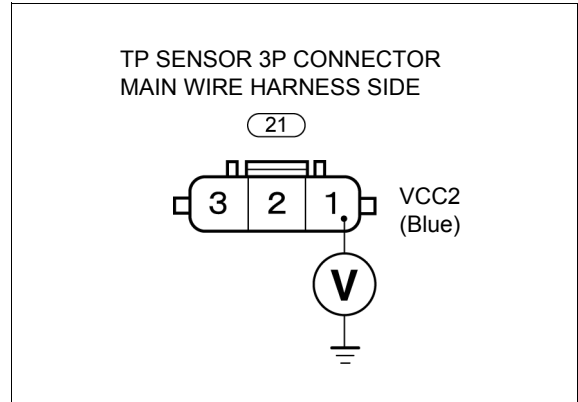
7. TP sensor power line short circuit inspection 2

Measure the voltage between the TP sensor 3P connector (21) main wire harness side No.1 (Blue) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 8.

NO – Repair short in the main wire harness between the ECM and the TP sensor.



8. Trim angle sensor power line short circuit inspection 1

Turn the combination switch OFF.

Disconnect the trim angle sensor 3P connector (15).

Turn the combination switch ON and check the MIL.

Does the MIL go OFF?

YES – Replace the trim angle sensor.

NO – GO TO STEP 9.

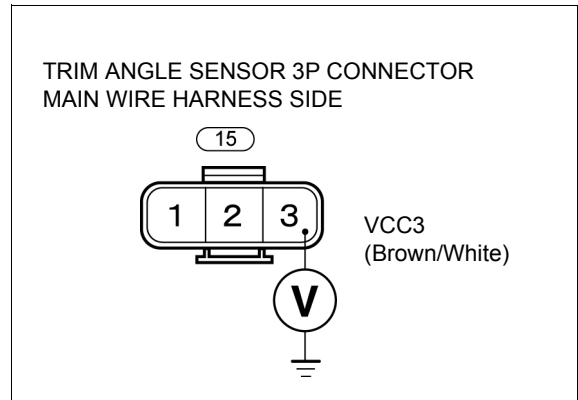
9. Trim angle sensor power line short circuit inspection 2

Measure the voltage between the trim angle sensor 3P connector (15) main wire harness side No.3 (Brown/White) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the ECM with a new one and recheck.

NO – Repair short in the main wire harness between the ECM and the trim angle sensor.



**DTC 0-2, 0-5, 0-8
(INTERNAL FAILURE OF ECM)**

1. Reproduction test

Turn the combination switch ON and wait for more than one second.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

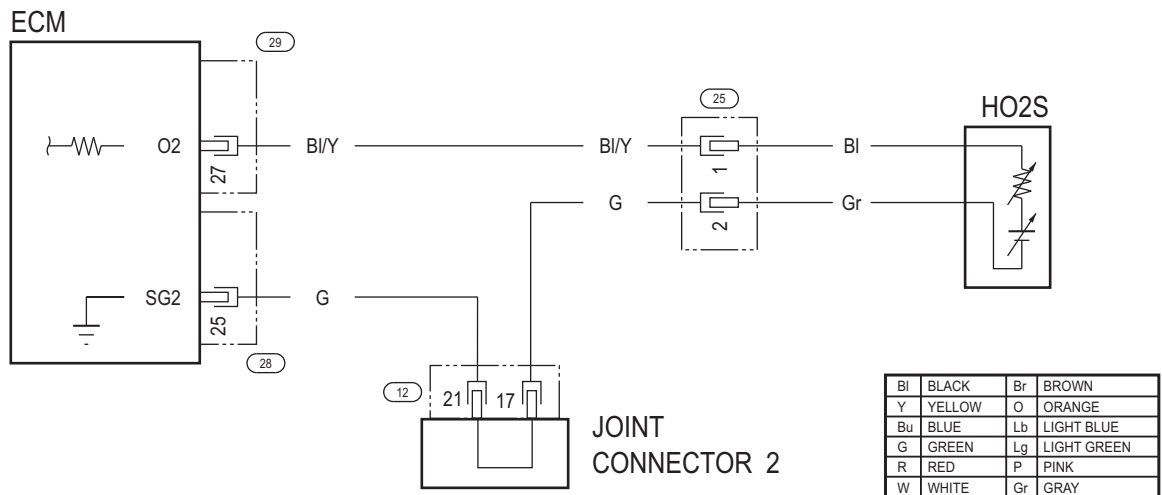
Start the engine and recheck the DTC.

Does the DTC 0-2, 0-5, 0-8 appear?

YES – Replace the ECM with a new one and recheck

NO – Temporary failure (code does not reappear)

DTC 1-4 (HO2S FAILURE)



1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the HO2S 4P connector (25), ECM connector A (29), ECM connector B (28), joint connector 2 (12) and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and let it run at 3,000 min⁻¹ (rpm) for 5 minutes or more under no load.

Let the engine idle for 1 minute or more.

Check the DTC using the Dr.H.

Does the DTC 1-4 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear).

FUEL SYSTEM

2. HO2S inspection

Turn the combination switch OFF and disconnect the HO2S 4P connector (25).

Inspect the HO2S (page 5-108).

Is the HO2S correct?

YES – GO TO STEP 3.

NO – Replace the HO2S with a new one and recheck.

3. Fuel supply system inspection

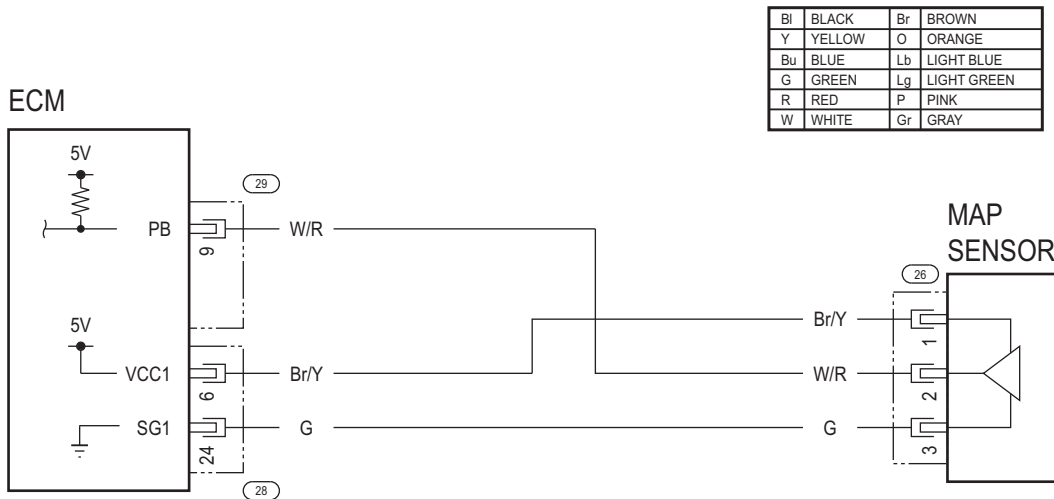
Measure the fuel pressure (page 5-97).

Is the fuel pressure normal?

YES – Repair open or short in the main wire harness between the ECM and HO2S. If the main wire harness is correct, replace the ECM with a new one, and recheck.

NO – Repair fuel supply system and recheck under normal fuel pressure.

DTC 3-1, 3-2 (MAP SENSOR VOLTAGE TOO LOW OR TOO HIGH)



DTC 3-1 (MAP SENSOR VOLTAGE IS TOO LOW)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the MAP sensor 3P connector (26), ECM connector A (29), ECM connector B (28) and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the MAP sensor voltage using the Dr.H.

Is the measurement within 0.23 – 4.49 V?

YES – Temporary failure (code does not reappear).

NO – GO TO STEP 2.

2. MAP sensor signal line short circuit inspection

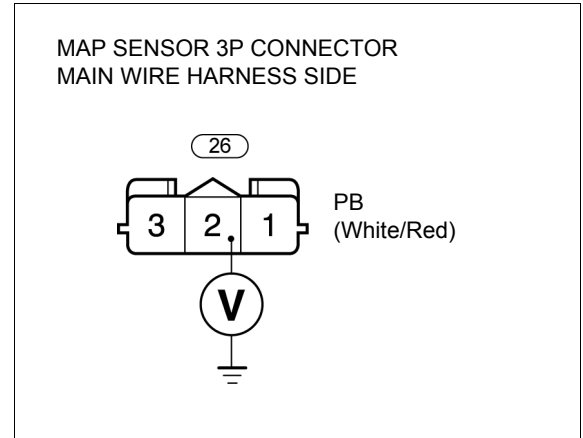
Turn the combination switch OFF and disconnect the MAP sensor 3P connector (26).

Turn the combination switch ON.
Measure the voltage between the MAP sensor 3P connector (26) main wire harness side No.2 (White/Red) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – Repair open in the White/Red wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



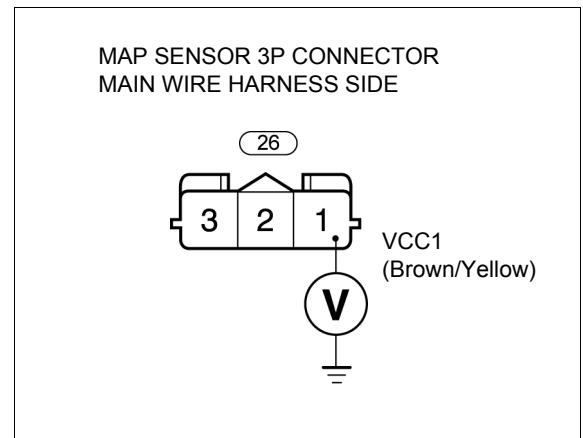
3. MAP sensor power line open circuit inspection

Measure the voltage between the MAP sensor 3P connector (26) main wire harness side No.1 (Brown/Yellow) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the MAP sensor with a new one and recheck.

NO – Repair open in the Brown/Yellow wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 3-2 (MAP SENSOR VOLTAGE IS TOO HIGH)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the MAP sensor 3P connector (26), ECM connector A (29), ECM connector B (28) and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the MAP sensor voltage using the Dr.H.

Is the measurement within 0.23 – 4.49 V?

YES – Temporary failure (code does not reappear).

NO – GO TO STEP 2.

FUEL SYSTEM

2. MAP sensor power line open circuit inspection

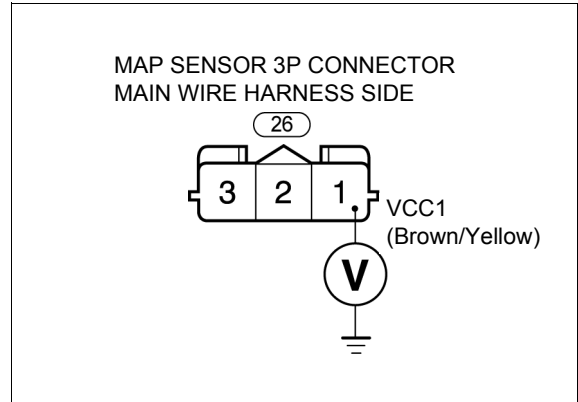
Turn the combination switch OFF and disconnect the MAP sensor 3P connector (26).

Turn the combination switch ON.
Measure the voltage between the MAP sensor 3P connector (26) main wire harness side No.1 (Brown/Yellow) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – Repair open in the Brown/Yellow wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



3. MAP sensor signal/GND line open circuit inspection

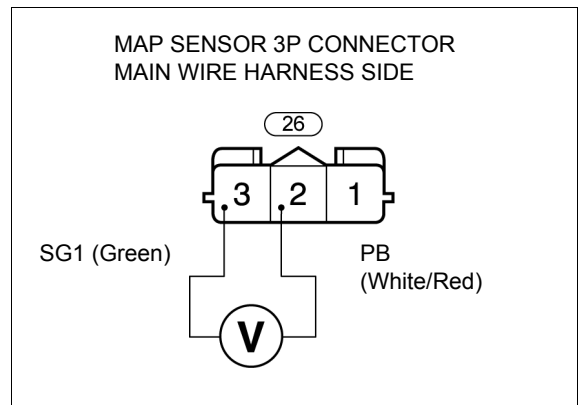
Measure the voltage between the MAP sensor 3P connector (26) main wire harness side No.2 (White/Red) terminal and No.3 (Green) terminal.

Is the measurement within 4.75 – 5.25 V?

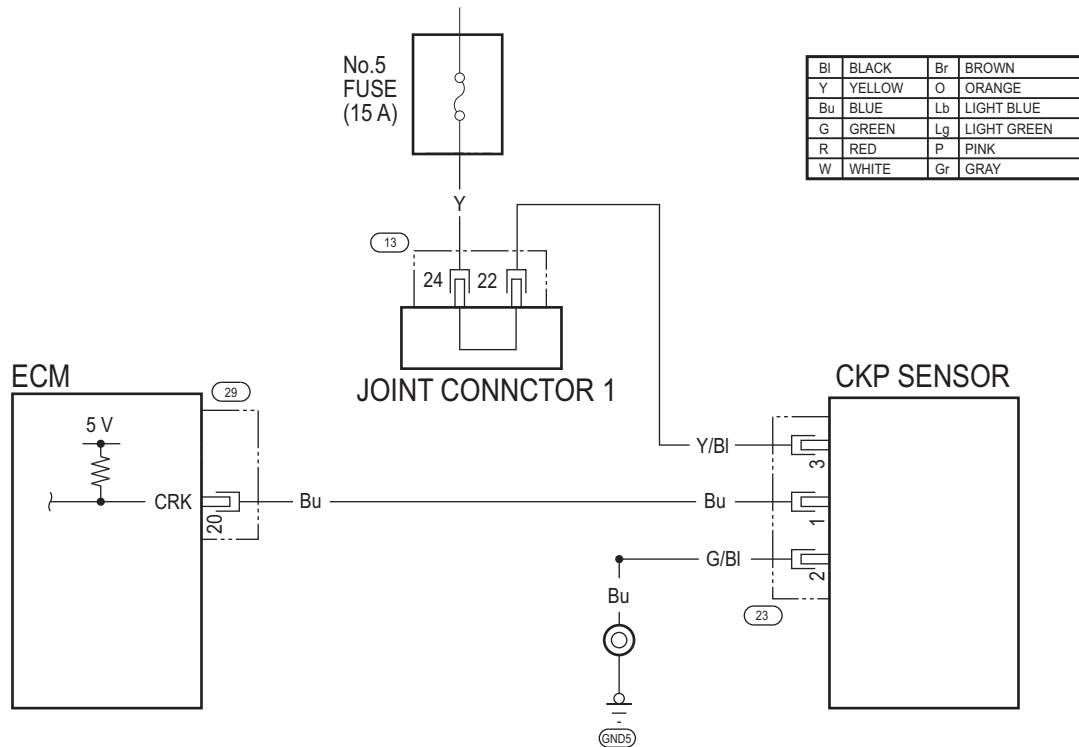
YES – Replace the MAP sensor with a new one and recheck.

NO –

- Repair open or short in the White/Red wire.
- Repair open in the Green wire.
- If the main wire harness is normal, replace the ECM with a new one, and recheck



DTC 4-1, 4-2 (NO CKP SENSOR PULSE OR ABNORMAL CKP SENSOR PULSE)



DTC 4-1 (NO CKP SENSOR PULSE)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the CKP sensor 3P connector (23), ECM connector A (29), and joint connector 1 (13), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and check the DTC using the Dr.H.

Does the DTC 4-1 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear)

FUEL SYSTEM

2. CKP sensor power line open circuit inspection

Turn the combination switch OFF and disconnect the CKP sensor 3P connector (23).

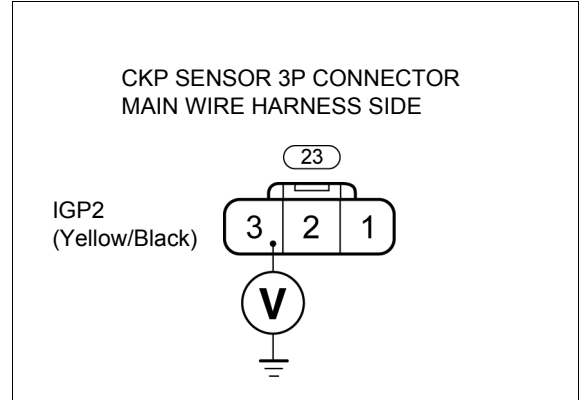
Turn the combination switch ON.

Measure the voltage between the CKP sensor 3P connector (23) main wire harness side No.3 (Yellow/Black) terminal and engine ground.

Does battery voltage exist?

YES – GO TO STEP 3.

NO – Repair open in the Yellow/Black wire. If main wire harness is normal, inspect the No.5 fuse circuit in the fuse box.



3. CKP sensor signal line open or short circuit/ GND line open circuit inspection

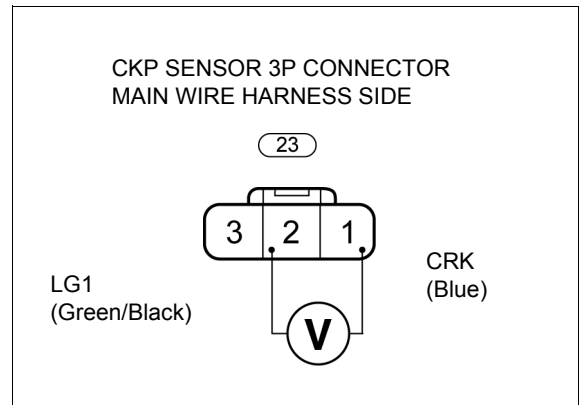
Measure the voltage between the CKP sensor 3P connector (23) main wire harness side No.1 (Blue) terminal and No.2 (Green/Black) terminal.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the CKP sensor with a new one and recheck.

NO –

- Repair open or short in the Blue wire.
- Repair open in the Green/Black wire.
- If the main wire harness is normal, replace the ECM with a new one, and recheck.



DTC 4-2 (ABNORMAL CKP SENSOR PULSE)

1. Symptom reproduction test

Disconnect the CKP sensor 3P connector (23), ECM connector A (29), and joint connector 1 (13), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and check the DTC using the Dr.H.

Does the DTC 4-2 appear?

YES – GO TO STEP 2.

NO – Temporary failure (disappears)

2. Crank pulser plate inspection

Turn the combination switch OFF.

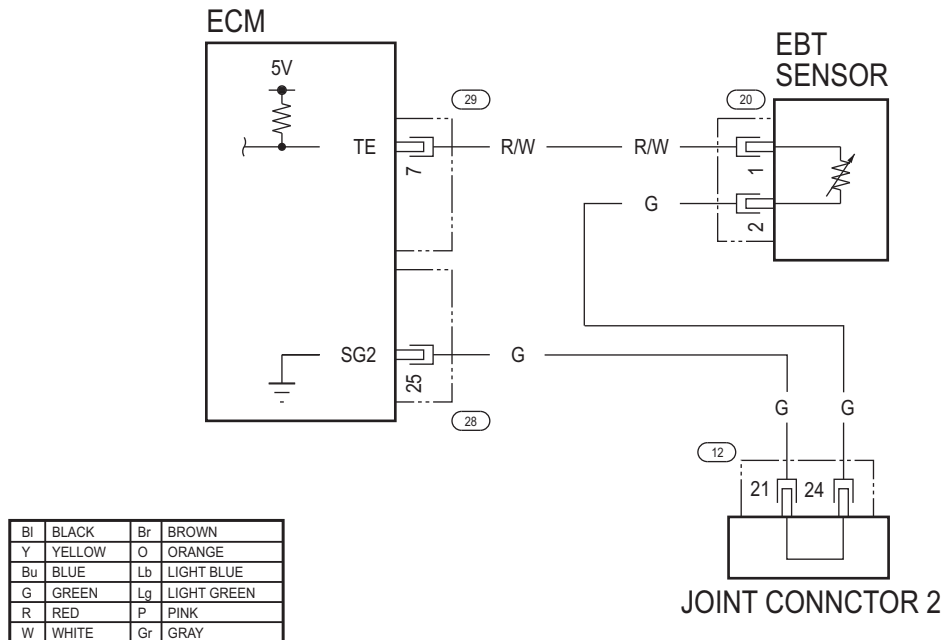
Check the crank pulser plate.
(page 7-13).

Is the crank pulser plate correct?

YES – Replace the CKP sensor with a new one and recheck. If the CKP sensor is replaced, but DTC 4-2 still appears, replace the ECM with a new one and recheck.

NO – Replace the alternator rotor and recheck.

DTC 6-1, 6-2 (EBT SENSOR VOLTAGE IS TOO LOW OR TOO HIGH)



DTC 6-1 (EBT SENSOR VOLTAGE IS TOO LOW)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the EBT sensor 2P connector (20), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the EBT sensor voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. EBT sensor signal line short circuit inspection

Turn the combination switch OFF and disconnect the EBT sensor 2P connector (20).

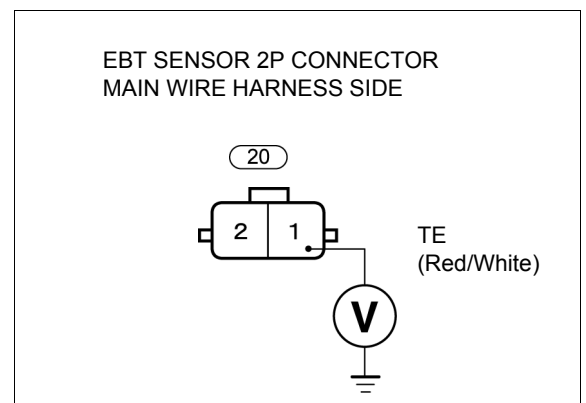
Turn the combination switch ON.

Measure the voltage between the EBT sensor 2P connector (20) main wire harness side No.1 (Red/White) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the EBT sensor with a new one and recheck.

NO – Repair short in the Red/White wire. If the main wire is normal, replace the ECM with a new one and recheck.



DTC 6-2 (EBT SENSOR VOLTAGE IS TOO HIGH)

- When the DTC code 6-2, 7-2, 10-2, 22-2, 140-2, and 141-2 are indicated at the same time, the ground line (SG2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the EBT sensor 2P connector (20), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the EBT sensor voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. EBT sensor signal/GND line open circuit inspection

Turn the combination switch OFF and disconnect the EBT sensor 2P connector (20).

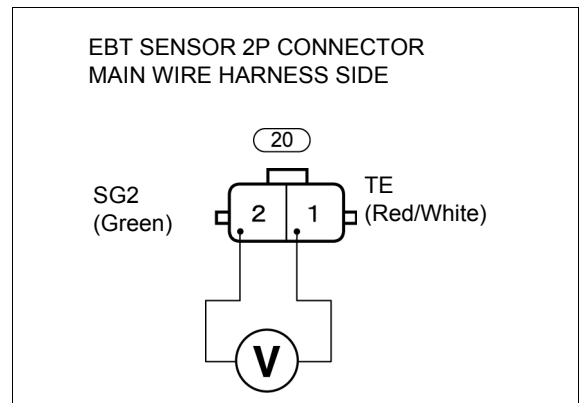
Turn the combination switch ON.

Measure the voltage between the EBT sensor 2P connector (20) main wire harness side No.1 (Red/White) terminal and No.2 (Green) terminal.

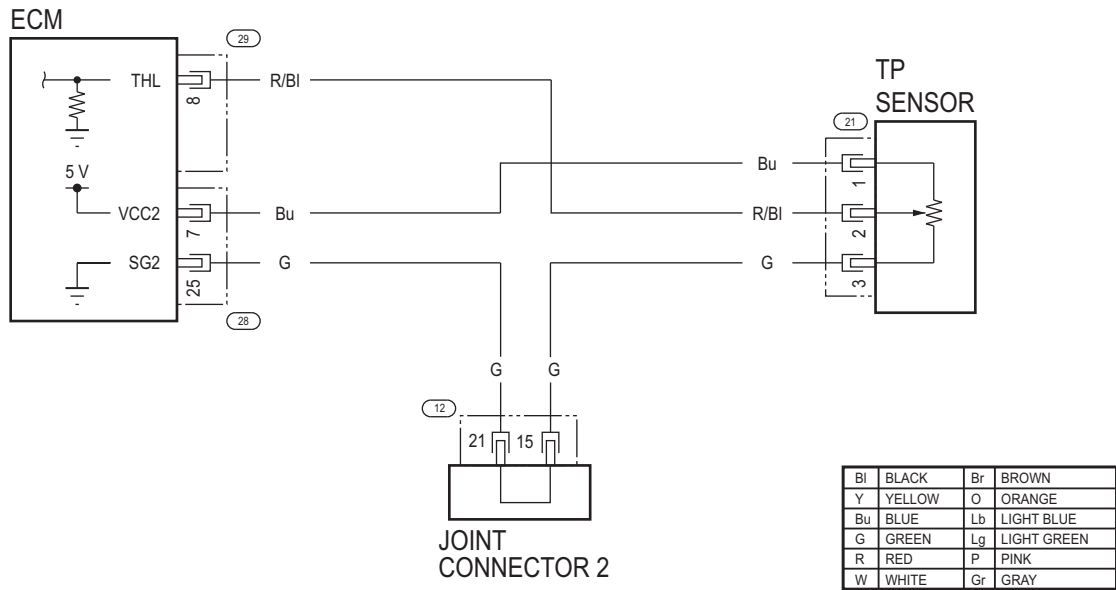
Is the measurement within 4.75 – 5.25 V?

YES – Replace the EBT sensor with a new one and recheck.

NO – Repair open in the Red/White wire or Green wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 7-1, 7-2 (TP SENSOR VOLTAGE IS TOO LOW OR TOO HIGH)



DTC 7-1 (TP SENSOR VOLTAGE IS TOO LOW)

- When the DTC code 7-1 and 22-1 or 22-2 are indicated at the same time, the power line (VCC2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the TP sensor 3P connector (21), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the TP sensor voltage using the Dr.H.

Is the measurement within 0.23 – 4.89 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. TP sensor power/signal line open circuit inspection

Turn the combination switch OFF and disconnect the TP sensor 3P connector (21).

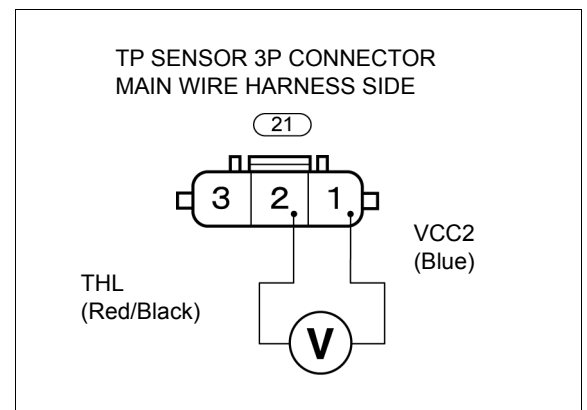
Turn the combination switch ON.

Measure the voltage between the TP sensor 3P connector (21) main wire harness side No.1 (Blue) terminal and No.2 (Red/Black) terminal.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 3.

- NO**
- Repair open in the Blue wire.
 - Repair open in the Red/Black wire.
 - If the main wire harness is normal, replace the ECM with a new one, and recheck.



3. TP sensor signal line short circuit inspection

Turn the combination switch OFF.

Disconnect ECM connector A (29).

Check for continuity between the TP sensor 3P connector (21) main wire harness side No.2 (Red/Black) terminal and engine ground.

Is there continuity?

YES – Repair short in the Red/Black wire.

NO – Replace the throttle body with a new one and recheck.

DTC 7-2 (TP SENSOR VOLTAGE IS TOO HIGH)

- When the DTC code 6-2, 7-2, 10-2, 22-2, 140-2, and 141-2 are indicated at the same time, the ground line (SG2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the TP sensor 3P connector (21), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the TP sensor voltage using the Dr.H.

Is the measurement within 0.23 – 4.89 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. TP sensor inspection

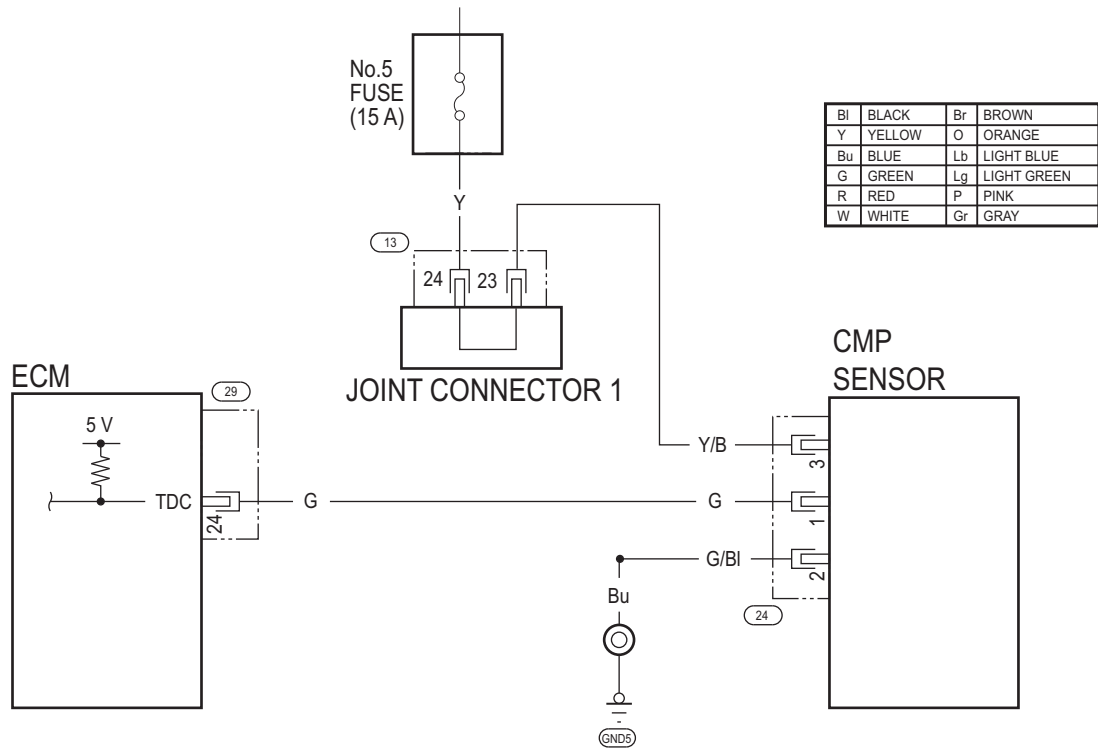
Turn the combination switch ON and measure the TP sensor voltage using the Dr.H.

Is the measurement within 4.49 – 4.85 V when the throttle is fully open and within 0.44 – 0.56 V when the throttle is fully closed?

YES – Replace the ECM with a new one and recheck.

NO – Repair the open circuit in the Green wire. If the main wire harness is normal, replace the throttle body with a new one and recheck.

DTC 8-1, 8-2 (NO CMP SENSOR PULSE OR ABNORMAL CMP SENSOR PULSE)



DTC 8-1 (NO CMP SENSOR PULSE)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the CMP sensor 3P connector (24), ECM connector A (29), and joint connector 1 (13), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and check the DTC using the Dr.H.

Does the DTC 8-1 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear)

2. CMP sensor power line open circuit inspection

Turn the combination switch OFF and disconnect the CMP sensor 3P connector (24).

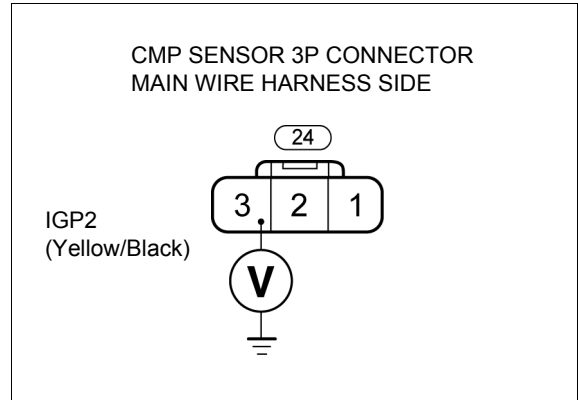
Turn the combination switch ON.

Measure the voltage between the CMP sensor 3P connector (24) main wire harness side No.3 (Yellow/Black) terminal and engine ground.

Does battery voltage exist?

YES – GO TO STEP 3.

NO – Repair open in the Yellow/Black wire. If main wire harness is normal, inspect the No.5 fuse circuit in the fuse box.



3. CMP sensor signal line open or short circuit/ GND line open circuit inspection

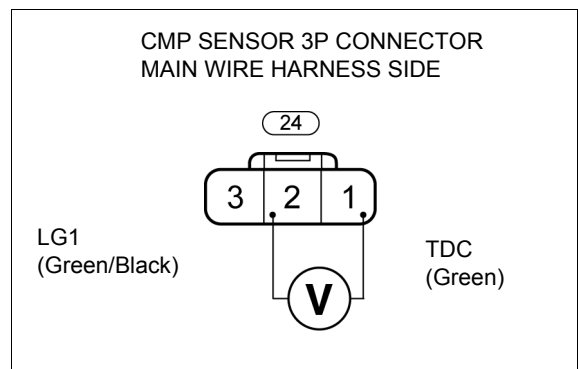
Measure the voltage between the CMP sensor 3P connector (24) main wire harness side No.1 (Green) terminal and No.2 (Green/Black) terminal.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the CMP sensor with a new one and recheck.

NO –

- Repair open or short in the Green wire.
- Repair open in the Green/Black wire.
- If the main wire harness is normal, replace the ECM with a new one, and recheck.



DTC 8-2 (ABNORMAL CMP SENSOR PULSE)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the CMP sensor 3P connector (24), ECM connector A (29), joint connector 1 (13) and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and check the DTC using the Dr.H.

Does the DTC 8-2 appear?

YES – GO TO STEP 2.

NO – Temporary failure (disappears)

2. Cam pulser plate inspection

Turn the combination switch OFF.

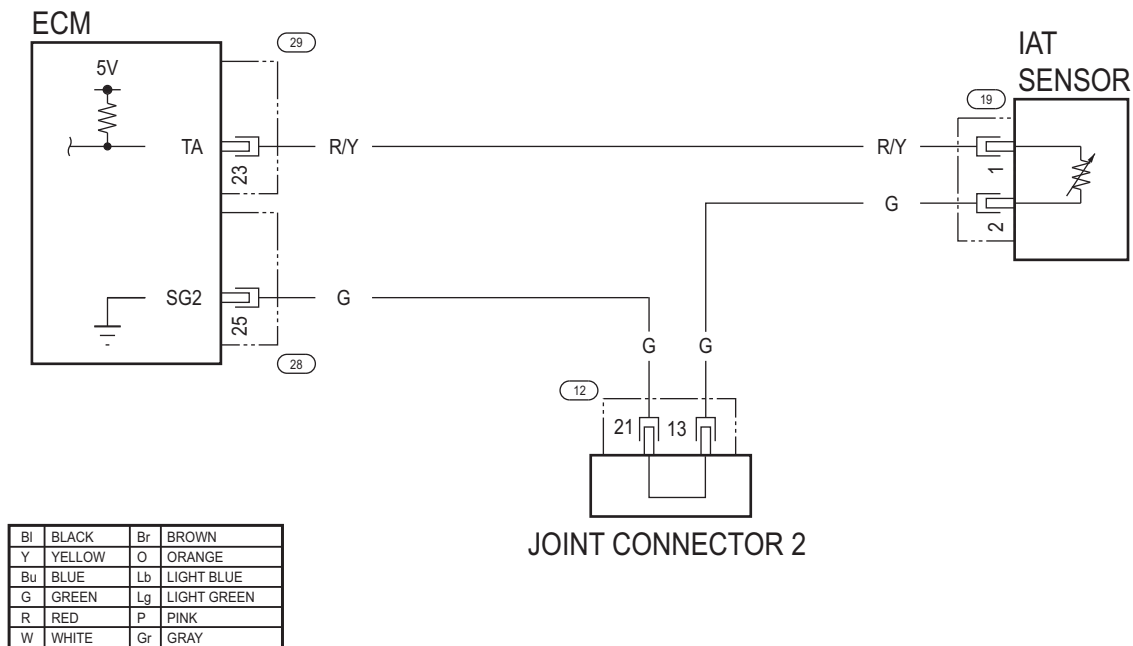
Check the cam pulser plate (page 14-22).

Is the cam pulser plate correct?

YES – Replace the CMP sensor with a new one and recheck. If the CMP sensor is replaced, but DTC 8-2 still appears, replace the ECM with a new one and recheck.

NO – Replace the cam pulser plate, and recheck.

DTC 10-1, 10-2 (IAT SENSOR VOLTAGE IS TOO LOW OR TOO HIGH)



DTC 10-1 (IAT SENSOR VOLTAGE IS TOO LOW)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the IAT sensor 2P connector (19), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the IAT sensor voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. IAT sensor signal line short circuit inspection

Turn the combination switch OFF and disconnect the IAT sensor 2P connector (19).

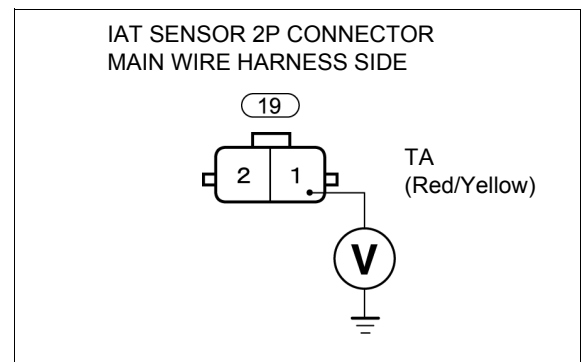
Turn the combination switch ON.

Measure the voltage between the IAT sensor 2P connector (19) main wire harness side No.1 (Red/Yellow) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the IAT sensor with a new one and recheck.

NO – Repair short in the Red/Yellow wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 10-2 (IAT SENSOR VOLTAGE IS TOO HIGH)

- When the DTC code 6-2, 7-2, 10-2, 22-2, 140-2, and 141-2 are indicated at the same time, the ground line (SG2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the IAT sensor 2P connector (19), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the IAT sensor voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. IAT sensor signal line open circuit inspection

Turn the combination switch OFF and disconnect the IAT 2P connector (19).

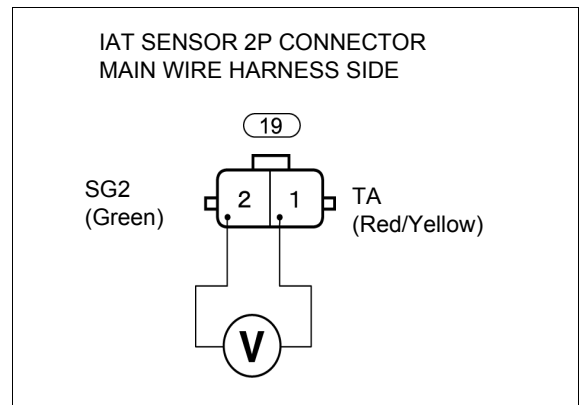
Turn the combination switch ON.

Measure the voltage between the IAT sensor 2P connector (19) main wire harness side No.1 (Red/Yellow) terminal and No.2 (Green) terminal.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the IAT sensor with a new one and recheck.

NO – Repair open in the Red/Yellow wire or Green wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 14-1 (IAC VALVE CONTROL FAILURE)



BI	BLACK	Br	BROWN
Y	YELLOW	O	ORANGE
Bu	BLUE	Lb	LIGHT BLUE
G	GREEN	Lg	LIGHT GREEN
R	RED	P	PINK
W	WHITE	Gr	GRAY

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the IAC valve 2P connector (27) and ECM connector B (28), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and check the DTC using the Dr.H.

Does the DTC 14-1 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear)

2. IAC valve inspection

Turn the combination switch OFF.

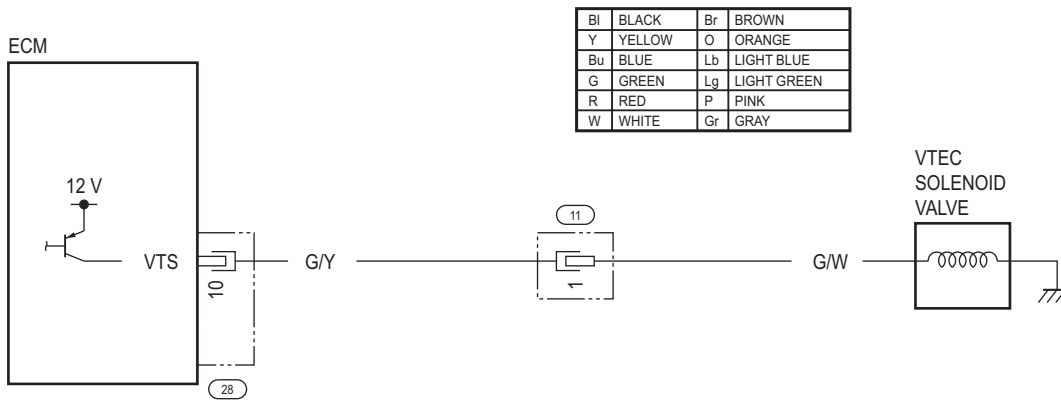
Inspect the IAC valve (page 5-107).

Is the IAC valve normal?

YES – Repair open or short in the Green wire or Black wire between the ECM and IAC valve. If main wire harness is normal, replace the ECM with a new one and recheck.

NO – Replace the IAC valve with a new one and recheck.

DTC 21-1 (VTEC SOLENOID VALVE FAILURE)



1. Symptom reproduction test

Turn the combination switch OFF.
 Disconnect the VTEC solenoid valve 1P connector (11), ECM connector B (28) and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and let it run at 3,000 min⁻¹ (rpm) for 5 minutes or more under no load.

Disconnect the neutral switch 2P connector (14).

Raise the engine speed slowly and let it run at 5,200 min⁻¹ (rpm) for a few seconds.

Recheck the DTC with the Dr.H.

Does the DTC 21-1 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear).

2. VTEC solenoid valve inspection

Turn the combination switch OFF.

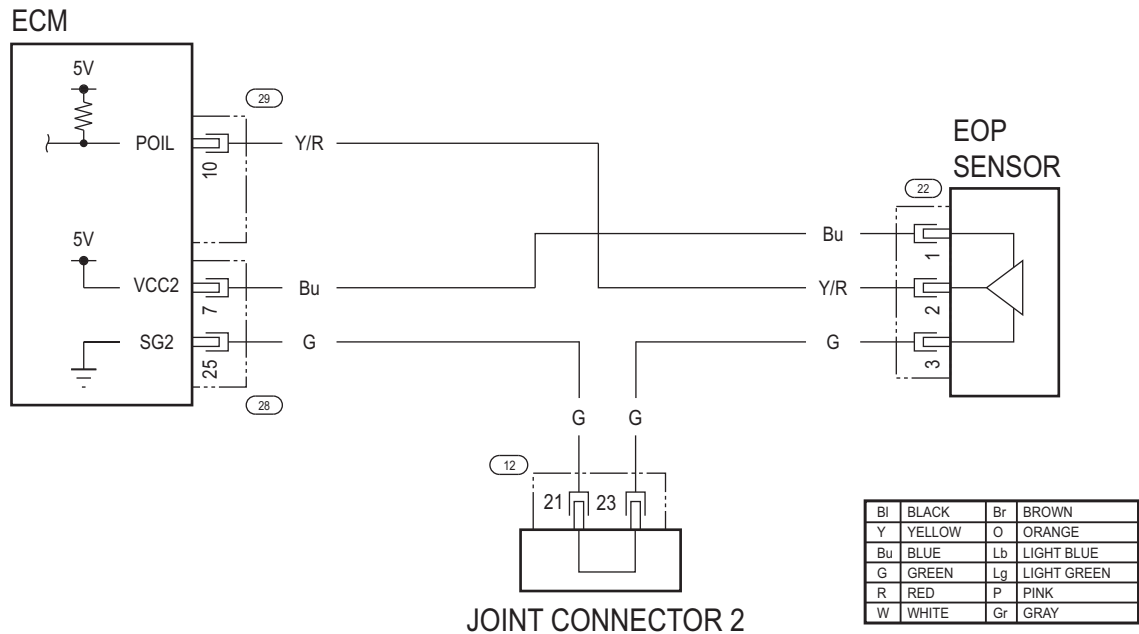
Inspect the VTEC solenoid valve (page 5-107).

Is the VTEC solenoid valve correct?

YES – Repair open or short in the main wire harness between the ECM and VTEC solenoid valve. If main wire harness is correct, replace the ECM with a new one and recheck.

NO – Replace the VTEC solenoid valve with a new one and recheck.

DTC 22-1, 22-2 (EOP SENSOR VOLTAGE TOO LOW OR TOO HIGH)



DTC 22-1 (EOP SENSOR VOLTAGE IS TOO LOW)

- When the DTC code 7-1 and 22-1 or 22-2 are indicated at the same time, the power line (VCC2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the EOP sensor 3P connector (22), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the EOP sensor voltage using the Dr.H.

Is the measurement within 0.30 – 4.70 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. EOP sensor signal line short circuit inspection

Turn the combination switch OFF and disconnect the EOP sensor 3P connector (22).

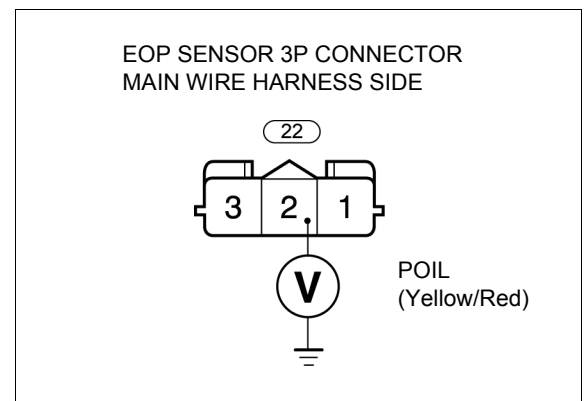
Turn the combination switch ON.

Measure the voltage between the EOP sensor 3P connector (22) main wire harness side No.2 (Yellow/Red) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – GO TO STEP 3.

NO – Repair short in the Yellow/Red wire. If the main wire harness is normal, replace the ECM with a new one and recheck.

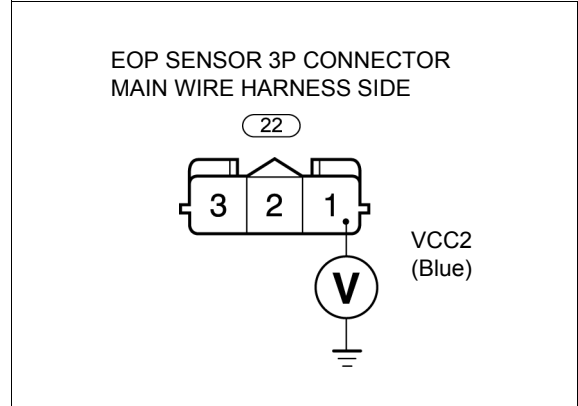


3. EOP sensor power line open circuit inspection

Measure the voltage between the EOP sensor 3P connector (22) main wire harness side No.1 (Blue) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

- YES** – Replace the EOP sensor with a new one and recheck.
- NO** – Repair open in the Blue wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 22-2 (EOP SENSOR VOLTAGE IS TOO HIGH)

- When the DTC code 6-2, 7-2, 10-2, 22-2, 140-2, and 141-2 are indicated at the same time, the ground line (SG2) is open.
- When the DTC code 7-1 and 22-1 or 22-2 are indicated at the same time, the power line (VCC2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the EOP sensor 3P connector (22), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the EOP sensor voltage using the Dr.H.

Is the measurement within 0.5 – 4.5 V?

- YES** – Temporary failure (code does not reappear)
- NO** – GO TO STEP 2.

2. EOP sensor power line open circuit inspection

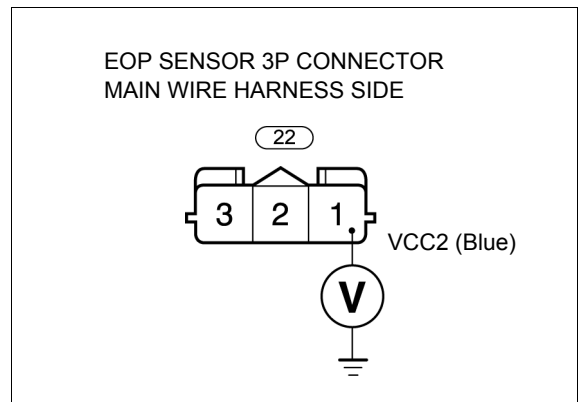
Turn the combination switch OFF and disconnect the EOP sensor 3P connector (22).

Turn the combination switch ON.

Measure the voltage between the EOP sensor 3P connector (22) main wire harness side No.1 (Blue) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

- YES** – GO TO STEP 3.
- NO** – Repair open in the Blue wire. If the main wire harness is normal, replace the ECM with a new one and recheck.

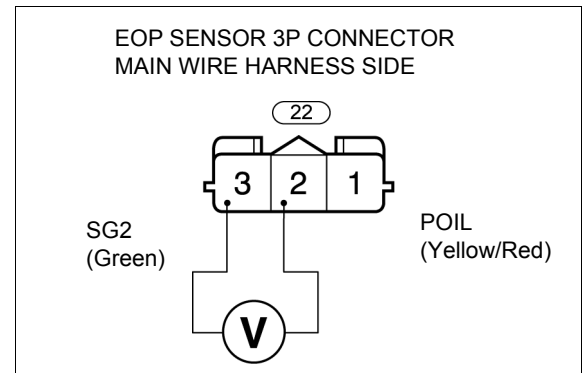


3. EOP sensor signal/GND line open circuit inspection

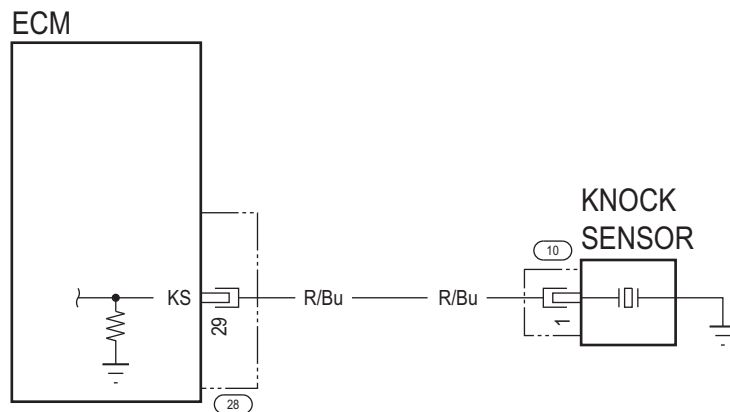
Measure the voltage between the EOP sensor 3P connector (22) main wire harness side No.2 (Yellow/Red) terminal and No.3 (Green) terminal.

Is the measurement within 4.75 – 5.25 V?

- YES** – Replace the EOP sensor with a new one and recheck.
- NO** –
- Repair open or short in the Yellow/Red wire.
 - Repair open in the Green wire.
 - If the main wire harness is normal, replace the ECM with a new one, and recheck.



DTC 23-1 (KNOCK SENSOR NO PULSE)



1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the knock sensor 1P connector (10) and ECM connector B (28), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and let it run at 5,000 min⁻¹ (rpm) for 7 minutes under no load.

Increase the engine speed gradually and run it at 3,000 min⁻¹ (rpm) for 10 seconds.

Recheck the DTC with the Dr.H.

Does the DTC 23-1 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear)

2. Knock sensor line open or short circuit inspection

Turn the combination switch OFF.

Disconnect the knock sensor 1P connector (10) and ECM connector B (28).

Check for open and short circuit between the knock sensor 1P connector (10) main wire harness side No.1 (Red/Blue) terminal and ECM connector B (28) No.29 (Red/Blue) terminal.

Is the knock sensor line normal?

YES – GO TO STEP 3.

NO – Repair open or short in the Red/Blue wire.

3. Knock sensor inspection

Replace the knock sensor with a new one (page 5-84).

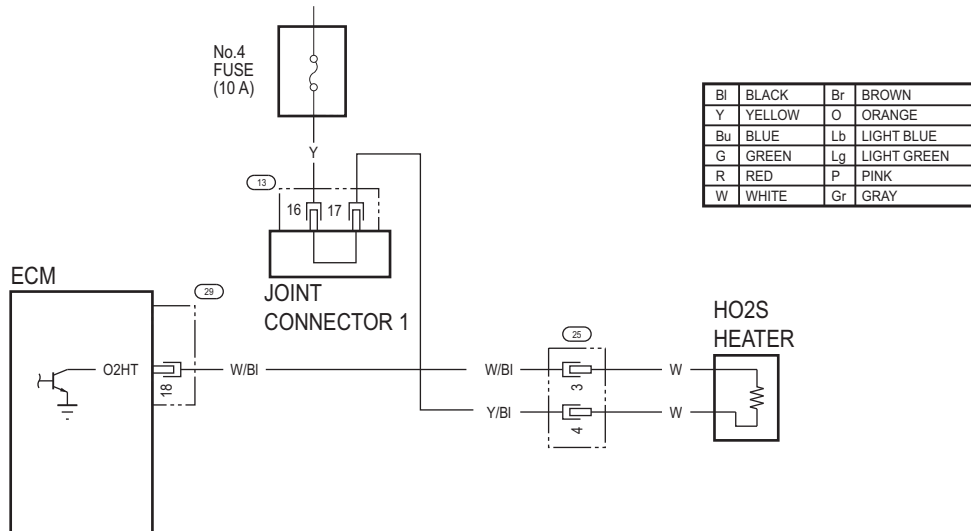
Perform the knock sensor symptom reproduction test (page 5-37).

Does the DTC 23-1 appear?

YES – Replace the ECM with a new one and recheck.

NO – Faulty original knock sensor.

DTC 41-2 (HO2S HEATER FAILURE)



1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the HO2S 4P connector (25), and ECM connector A (29), and joint connector 1 (13), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Start the engine and let it run at 3,000 min⁻¹ (rpm) for 5 minutes or more under no load.

Check the DTC using the Dr.H

Does the DTC 41-2 appear?

YES – GO TO STEP 2.

NO – Temporary failure (code does not reappear)

2. HO2S heater inspection

Turn the combination switch OFF.

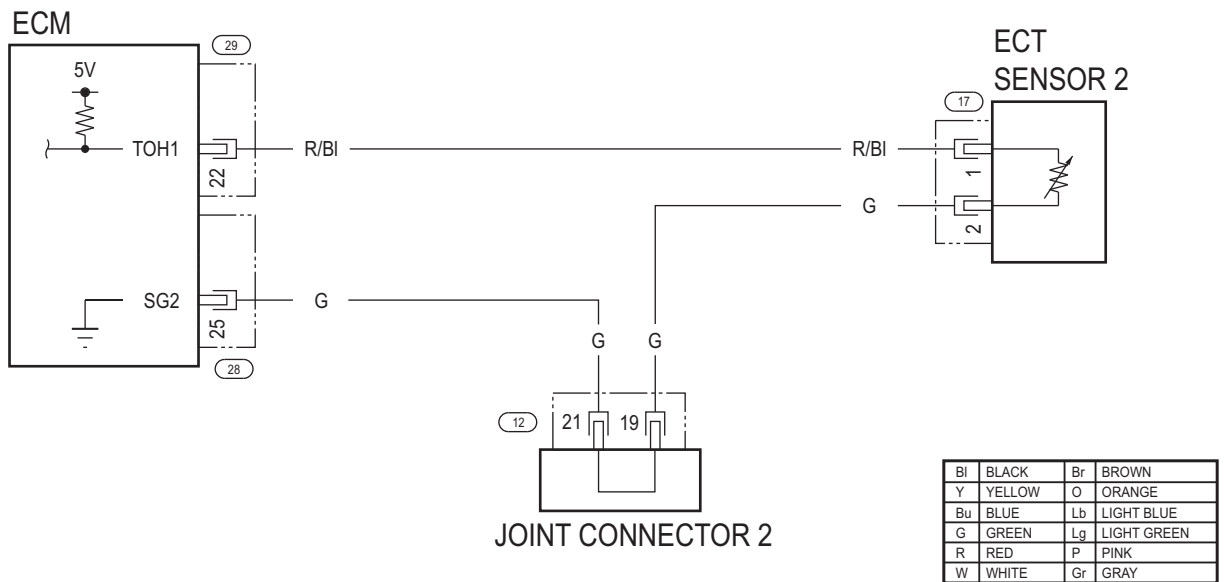
Inspect the HO2S heater (page 5-108).

Is the HO2S heater normal?

YES – Repair open in the main wire harness between the No.4 fuse and the HO2S or between the HO2S and ECM. If the main wire harness is correct, replace the ECM with a new one and recheck.

NO – Replace the HO2S with a new one and recheck.

DTC 140-1, 140-2 (ECT SENSOR 2 VOLTAGE IS TOO LOW OR TOO HIGH)



DTC 140-1 (ECT SENSOR 2 VOLTAGE IS TOO LOW)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the ECT sensor 2 (2P) connector (17), ECM connector A (29), ECM connector B (28), joint connector 2 (12) and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the ECT sensor 2 voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. ECT sensor 2 signal line short circuit inspection

Turn the combination switch OFF and disconnect the ECT sensor 2 (2P) connector (17).

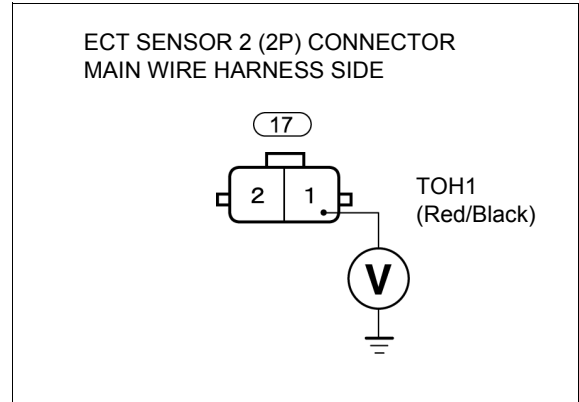
Turn the combination switch ON.

Measure the voltage between the ECT sensor 2 (2P) connector (17) main wire harness side No.1 (Red/Black) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – Replace the ECT sensor 2 with a new one and recheck.

NO – Repair short in the main wire harness between the ECT sensor 2. If the main wire is correct, replace the ECM with a new one and recheck.



DTC 140-2 (ECT SENSOR 2 VOLTAGE IS TOO HIGH)

- When the DTC code 6-2, 7-2, 10-2, 22-2, 140-2, and 141-2 are indicated at the same time, the ground line (SG2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the ECT sensor 2 (2P) connector (17), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the ECT sensor 2 voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. ECT sensor 2 signal/GND line open circuit inspection

Turn the combination switch OFF and disconnect the ECT sensor 2 (2P) connector (17).

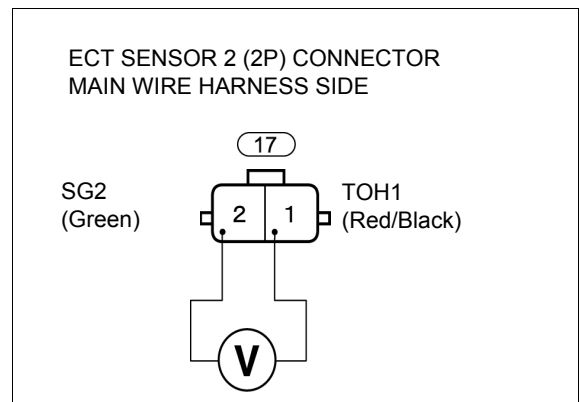
Turn the combination switch ON.

Measure the voltage between the ECT sensor 2 (2P) connector (17) main wire harness side No.1 (Red/Black) terminal and No.2 (Green) terminal.

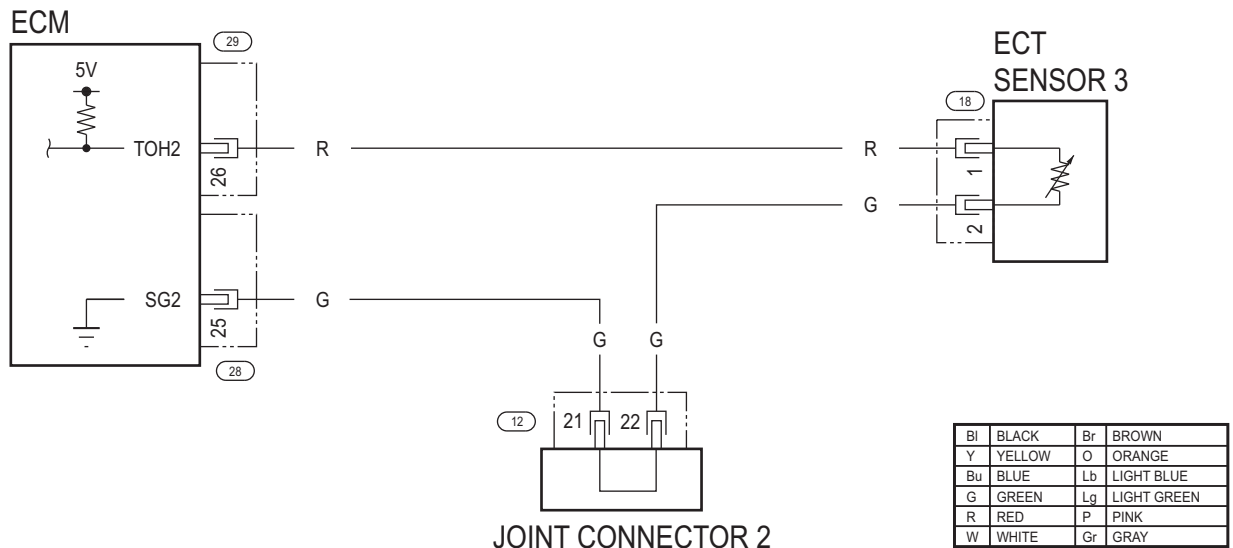
Is the measurement within 4.75 – 5.25 V?

YES – Replace the ECT sensor 2 with a new one and recheck.

NO – Repair open in the Red/Black wire or Green wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 141-1, 141-2 (ECT SENSOR 3 VOLTAGE IS TOO LOW OR TOO HIGH)



DTC 141-1 (ECT SENSOR 3 VOLTAGE IS TOO LOW)

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the ECT sensor 3 (2P) connector (18), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the ECT sensor 3 voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. ECT sensor 3 signal line short circuit inspection

Turn the combination switch OFF and disconnect the ECT sensor 3 (2P) connector (18).

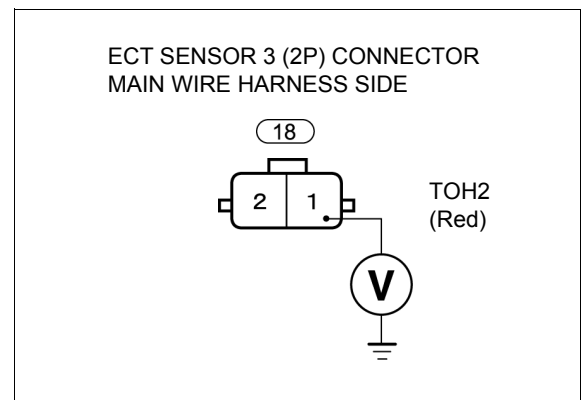
Turn the combination switch ON.

Measure the voltage between the ECT sensor 3 (2P) connector (18) main wire harness side No.1 (Red) terminal and engine ground.

Is the measurement within 4.75 – 5.25 V?

YES – Replace ECT sensor 3 with a new one and recheck.

NO – Repair short in the Red wire. If the main wire harness is normal, replace the ECM with a new one and recheck.



DTC 141-2 (ECT SENSOR 3 VOLTAGE IS TOO HIGH)

- When the DTC code 6-2, 7-2, 10-2, 22-2, 140-2, and 141-2 are indicated at the same time, the ground line (SG2) is open.

1. Symptom reproduction test

Turn the combination switch OFF.

Disconnect the ECT sensor 3 (2P) connector (18), ECM connector A (29), ECM connector B (28), and joint connector 2 (12), and then reconnect them.

Clear the DTC (page 5-5).

- Continue the procedure if the DTC does not clear.

Turn the combination switch ON.

Measure the ECT sensor 3 voltage using the Dr.H.

Is the measurement within 0.08 – 4.92 V?

YES – Temporary failure (code does not reappear)

NO – GO TO STEP 2.

2. ECT sensor 3 signal/GND line open circuit inspection

Turn the combination switch OFF and disconnect the ECT sensor 3 (2P) connector (18).

Turn the combination switch ON.

Measure the voltage between the ECT sensor 3 (2P) connector (18) main wire harness side No.1 (Red) terminal and No.2 (Green) terminal.

Is the measurement within 4.75 – 5.25 V?

YES – Replace ECT sensor 3 with a new one and recheck.

NO – Repair open in the Red wire or Green wire. If the main wire harness is normal, replace the ECM with a new one and recheck.

