

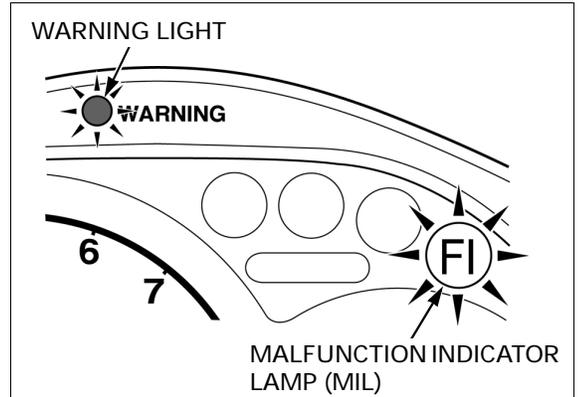
PGM-FI (Programmed Fuel Injection) SYSTEM

SELF-DIAGNOSTIC PROCEDURE

Fit the safety lanyard clip to the base of the engine stop switch.

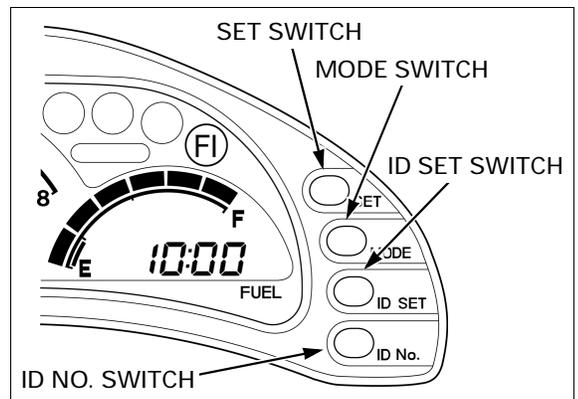
If the warning light and PGM-FI malfunction indicator lamp (MIL) do not blink, the PGM-FI system has no problem.

If the MIL and warning light blink, and the warning buzzer sounds, the PGM-FI system has a problem.



Push the SET, MODE, ID SET or ID NO. switch for more than 2 seconds to stop the warning buzzer.

Push the SET and MODE switches simultaneously for more than 5 seconds to blink the failure code. Read and record how many times the MIL and warning light blinks and determine the cause of the problem ([page 8-13](#)).



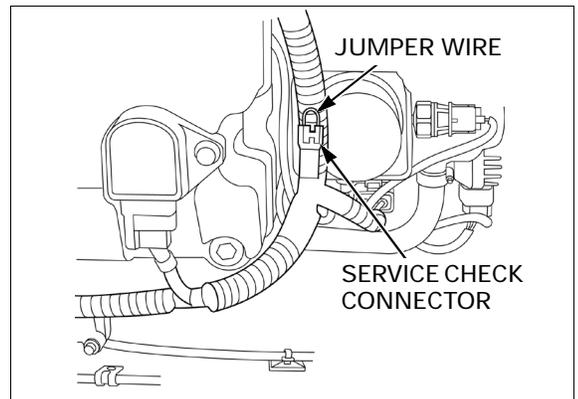
To read the ECM memory of problem data, perform the following:

Pull the safety lanyard clip off of the engine stop switch.

Remove the seats ([page 3-4](#)).

Remove the dummy connector from the service check connector.

Connect the service check connector terminals with a jumper wire.



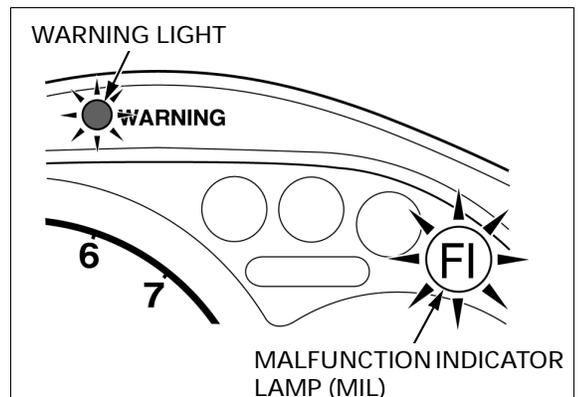
Fit the safety lanyard clip to the base of the engine stop switch.

Push the SET and MODE switches simultaneously for more than 5 seconds to blink the failure code.

If the ECM has no problem data in its memory, the MIL and warning light will come on and stay on.

If the ECM has problem data in its memory, the MIL and warning light will start blinking.

Read and record how many times the MIL and warning light blink and determine the cause of the problem ([page 8-13](#)).



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SELF-DIAGNOSTIC MEMORY RESET PROCEDURE

1. Remove the seats ([page 3-4](#)).
2. Connect the service check connector terminals using a jumper wire.
3. Fit the safety lanyard clip to the base of the engine stop switch.
4. Remove the jumper wire from the service check connector.
5. The MIL and warning light lights about 5 seconds.

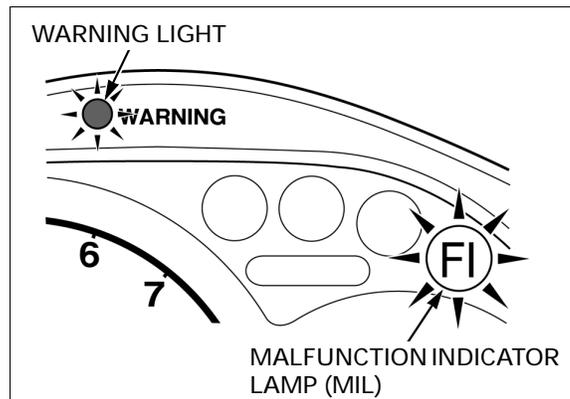
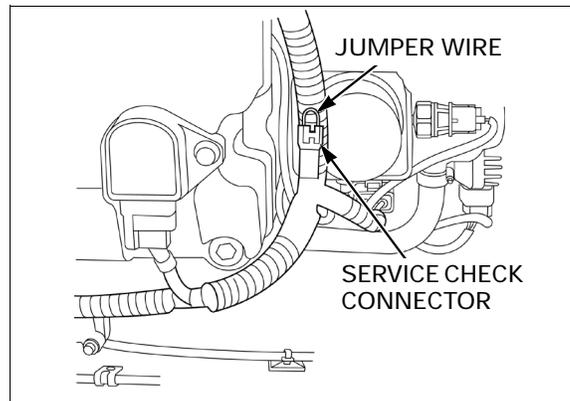
While the MIL and warning light lights, connect the service check connector terminal again with the jumper wire.

The self-diagnostic memory is erased, if the MIL and warning light goes off and starts blinking.

NOTE:

- The service check connector must be jumped while the MIL and warning light lights. If not, the MIL and warning light will not start blinking.
- Note that the self-diagnostic memory cannot be erased if you turn off the engine stop switch before the MIL and warning light starts blinking.

If the MIL and warning light blinks 33 times, the diagnostic memory has not been erased.



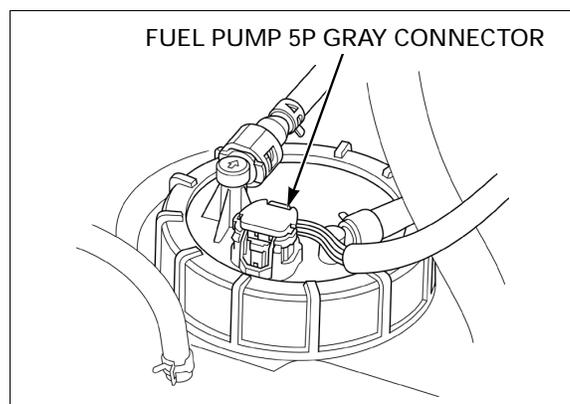
PEAK VOLTAGE INSPECTION PROCEDURE

NOTE:

- Use this procedure for the ignition pulse generator and cam pulse generator inspection.
- Check cylinder compression and check that all the spark plugs are installed correctly.
- Use a commercially available digital multimeter with an impedance of 10 M Ω /DCV minimum.
- The display value differs depending upon the internal impedance of the multimeter.

Remove the storage box ([page 3-8](#)).

Disconnect the fuel pump 5P gray connector.



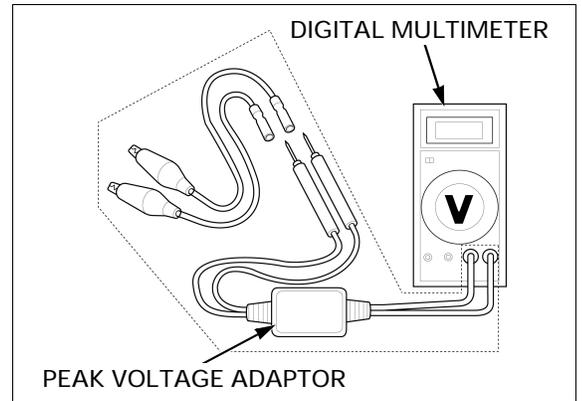
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Connect the peak voltage adaptor to the digital multimeter.

TOOLS:

IgnitionMate peak voltage tester (U.S.A. only) or Peak voltage adaptor with commercially available digital multimeter (impedance 10 M Ω /DCV minimum)

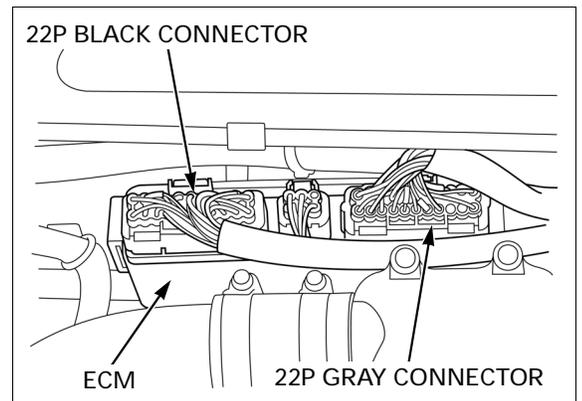
**MTP-08-0193
07HGJ-0020100
(not available in U.S.A.)**



TEST HARNESS CONNECTION

Remove the left side panel (page 3-5).

Disconnect the ECM 22P gray and 22P black connectors from the ECM.



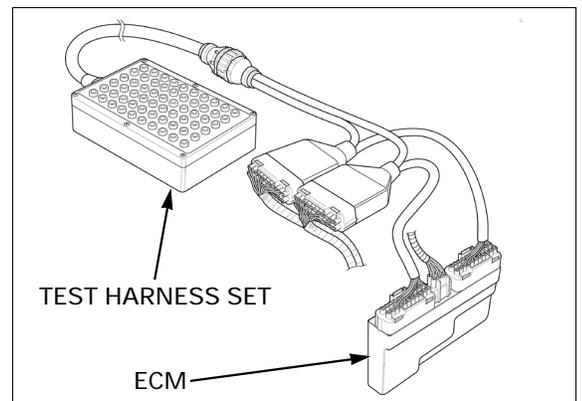
Do not disconnect the 6P black connector from the ECM.

Connect the test harnesses set to the ECM and ECM connectors.

TOOLS:

Test harness set

07WMZ-MBGA000



TEST HARNESS TERMINAL LAYOUT

The ECM connector terminals are numbered as shown.

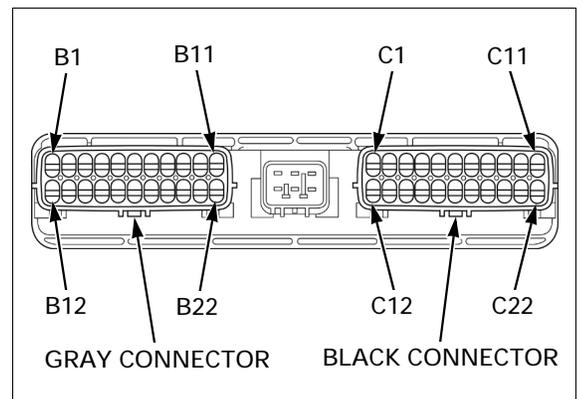
Terminals No. 1 to No. 22 of the test pin box of the test harness are for terminals C1 to C22 of the ECM black connector.

Terminals No. 31 to No. 52 of the test pin box of the test harness are for terminals B1 to B22 of the ECM gray connector.

Example:

ECM terminals: B8 (+) – C8 (-)

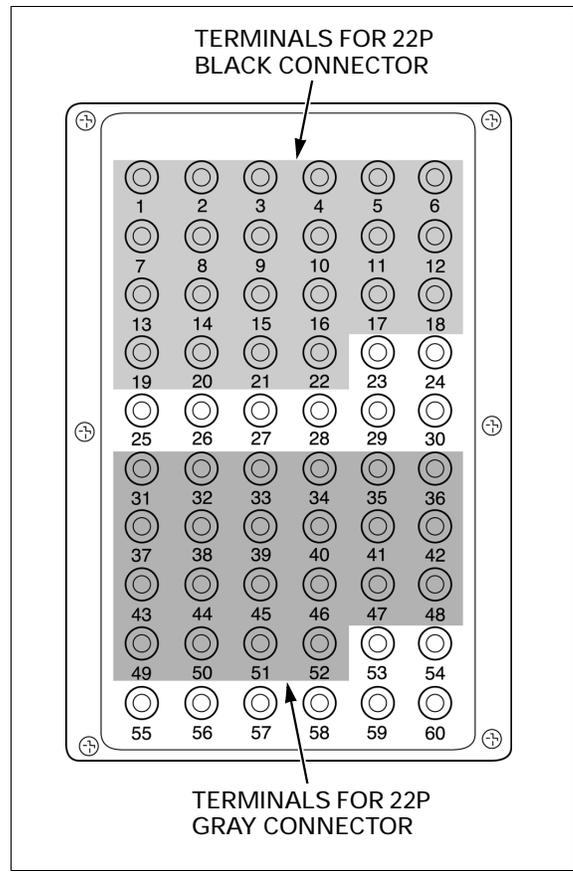
Test pin box terminals: No. 38 – No. 8



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Terminal conversion chart:

22P black connector terminal No.	Test pin box terminal No.
C1	1
C2	2
↓	↓
C21	21
C22	22
22P gray connector terminal No.	Test pin box terminal No.
B1	1
B2	2
↓	↓
B21	21
B22	22



PGM-FI SELF-DIAGNOSIS MALFUNCTION INDICATOR LAMP (MIL) FAILURE CODES

- The PGM-FI malfunction indicator lamp (MIL) denotes the failure codes (the number of blinks from 0 to 47). The MIL has two types of blinks, a long blink and short blink. The long blink lasts for 1.3 seconds, the short blink lasts for 0.5 seconds. When two long blinks occur, and five short blinks, that problem code is 25 (two long blinks = 20 blinks, five short blinks = 5 blinks). Then, go to the flow chart and see problem code 25.
- When the Engine Control Module (ECM) stores some failure codes, the MIL shows the failure codes in the order from the lowest number to highest number. For example, when the MIL blinks once, then blinks seven times, two failures have occurred. Follow the flow chart for failure codes 1 and 7.

Number of PGM-FI MIL blinks		Causes	Symptoms	Refer to page
0	 No blinks	<ul style="list-style-type: none"> • Open circuit at the power input and ground wires of the ECM • Blown sub-fuse D (7.5 A) • Faulty main relay • Open circuit in the main relay related circuits • Faulty engine stop switch • Open circuit in the engine stop switch related circuits • Faulty ECM • Blown main fuse (30 A) 	<ul style="list-style-type: none"> • Engine does not start 	-
	 No blinks	<ul style="list-style-type: none"> • Open circuit in the MIL wire • Faulty ECM 	<ul style="list-style-type: none"> • Engine operates normally 	-
	 Blinking	<ul style="list-style-type: none"> • Short circuit in the MIL wire • Faulty ECM 	<ul style="list-style-type: none"> • Engine operates normally 	-
	 Stay lit	<ul style="list-style-type: none"> • Short circuit in the service check connector wire 	<ul style="list-style-type: none"> • Engine operates normally 	-
1	 Blink	<ul style="list-style-type: none"> • Loose or poorly connected MAP sensor connector • Open or short circuit in the MAP sensor wire • Faulty MAP sensor 	<ul style="list-style-type: none"> • Engine operates normally 	8-16
2	 Blinks	<ul style="list-style-type: none"> • Loose or poor connection of the MAP sensor vacuum hose • Faulty MAP sensor 	<ul style="list-style-type: none"> • Engine operates normally 	8-19
7	 Blinks	<ul style="list-style-type: none"> • Loose or poorly connected ECT sensor connector • Open or short circuit in the ECT sensor wire • Faulty ECT sensor 	<ul style="list-style-type: none"> • Hard to start at low temperatures (ECM controls using preset value; Cooling water temperature: 90°C/194°F) • Engine operates below 3,000 rpm 	8-20
8	 Blinks	<ul style="list-style-type: none"> • Loose or poorly connected TP sensor connector • Open or short circuit in the TP sensor wire • Faulty TP sensor 	<ul style="list-style-type: none"> • Poor engine response when operating the throttle quickly (ECM controls using preset value; Throttle opening: 0°) 	8-22

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Number of PGM-FI MIL blinks		Causes	Symptoms	Refer to page
9	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected IAT sensor connector Open or short circuit in the IAT sensor wire Faulty IAT sensor 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm (ECM controls using pre-set value; Intake air temperature: 25°C/77°F) 	8-24
12	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected No. 1 injector connector Open or short circuit in the No. 1 injector wire Faulty No. 1 injector 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-27
13	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected No. 2 injector connector Open or short circuit in the No. 2 injector wire Faulty No. 2 injector 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-29
14	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected No. 3 injector connector Open or short circuit in the No. 3 injector wire Faulty No. 3 injector 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-31
15	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected No. 4 injector connector Open or short circuit in the No. 4 injector wire Faulty No. 4 injector 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-33
18	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected cam pulse generator connector Open or short circuit in the cam pulse generator wire Faulty cam pulse generator 	<ul style="list-style-type: none"> Engine does not start 	8-35
19	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected ignition pulse generator connector Open or short circuit in the ignition pulse generator wire Faulty ignition pulse generator 	<ul style="list-style-type: none"> Engine does not start 	8-36
25	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected knock sensor connector Open or short circuit in the knock sensor wire Faulty knock sensor 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-38
29	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected IAC valve connector Open or short circuit in the IAC valve wire Faulty IAC valve 	<ul style="list-style-type: none"> Engine stalls, hard to start, rough idling 	8-39
33	 Blinks	<ul style="list-style-type: none"> Faulty E²-PROM in the ECM 	<ul style="list-style-type: none"> Engine operates normally Does not hold the self-diagnostic data 	8-41
42	 Blinks	<ul style="list-style-type: none"> Loose or poorly connected TCP sensor connector Open or short circuit in the TCP sensor wire Faulty TCP sensor 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-42
43	 Blinks	<ul style="list-style-type: none"> Loose or poor connection of the TCP sensor pressure hose Faulty TCP sensor 	<ul style="list-style-type: none"> Engine operates below 3,000 rpm 	8-44

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Number of PGM-FI MIL blinks		Causes	Symptoms	Refer to page
44	 Blinks	<ul style="list-style-type: none"> • Loose or poorly connected engine oil temperature sensor connector • Open or short circuit in the engine oil temperature sensor wire • Faulty engine oil temperature sensor 	<ul style="list-style-type: none"> • Hard to start at low temperatures (ECM controls using preset value; Engine oil temperature: 90°C/194°F) • Engine operates below 3,000 rpm 	8-45
45	 Blinks	<ul style="list-style-type: none"> • Loose or poorly connected wastegate control solenoid valve connector • Open or short circuit in the wastegate control solenoid valve wire • Faulty wastegate control solenoid valve • Loose or poor connection of the wastegate control solenoid valve hose • Clogged wastegate actuator pressure hose • Faulty wastegate actuator • Faulty TCP sensor 	<ul style="list-style-type: none"> • Engine operates below 3,000 rpm 	8-46
46	 Blinks	<ul style="list-style-type: none"> • Faulty cooling system • Loose or poorly connected MST switch connector • Open or short circuit in the MST switch wire • Faulty MST switch 	<ul style="list-style-type: none"> • Engine does not start 	8-49
47	 Blinks	<ul style="list-style-type: none"> • Faulty cooling system • Loose or poorly connected ECT sensor connector • Open or short circuit in the ECT sensor wire • Faulty ECT sensor 	<ul style="list-style-type: none"> • Engine operates below 3,000 rpm when the coolant temperature is 85 – 95°C (185 – 203°F) • Engine does not start when the coolant temperature is above 95°C (203°F) 	8-50