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2009 MAZDA BT-50 OEM Service and Repair Workshop Manual

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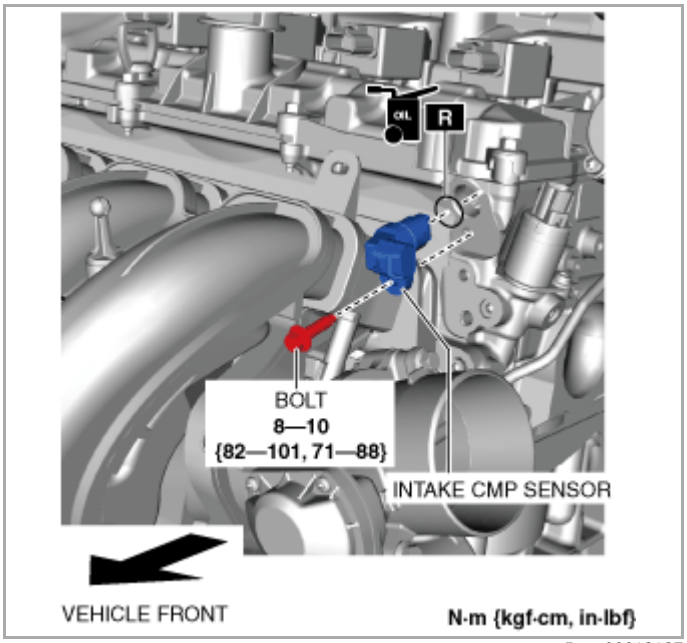

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6.Install in the reverse order of removal.

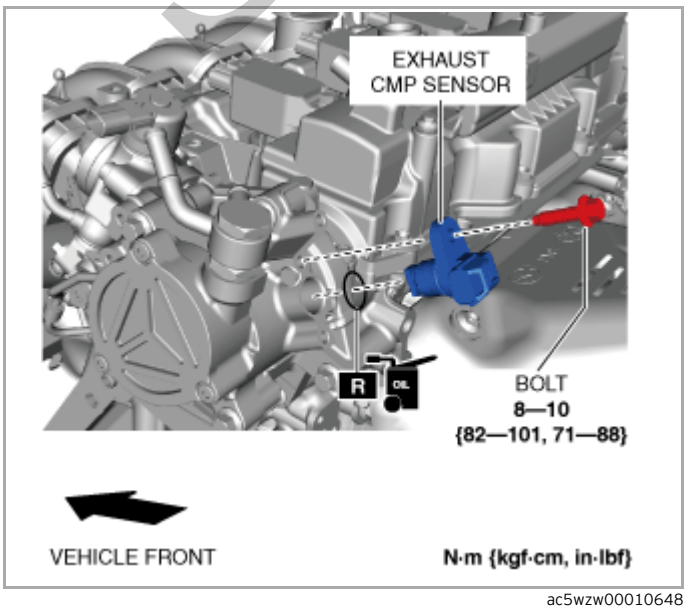
Exhaust CMP Sensor

1.Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)

2.Remove the plug hole plate. (See PLUG HOLE PLATE REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

3.Disconnect the exhaust CMP sensor connector.

4.Remove the exhaust CMP sensor.



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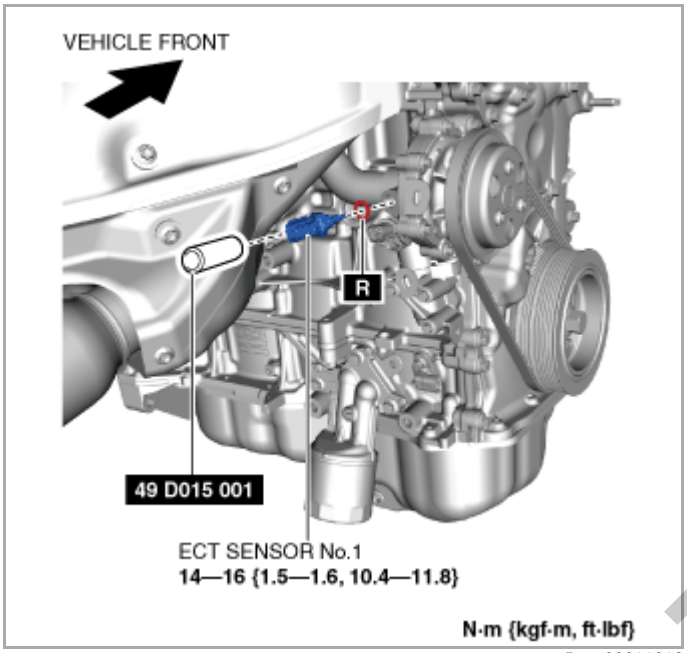
6.Remove the ECT sensor No.1 using the SST.



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7.Install in the reverse order of removal.

8.Refill the engine coolant. (See ENGINE COOLANT REPLACEMENT [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

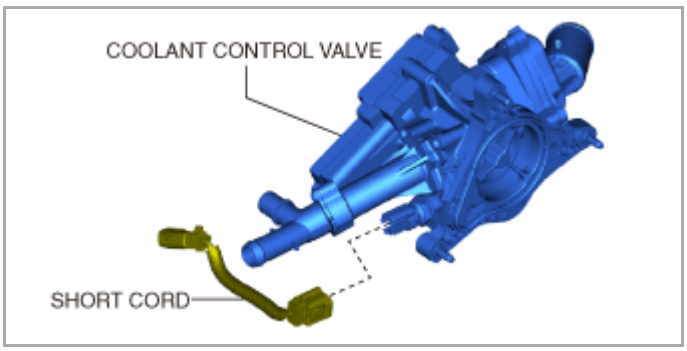
ECT sensor No.2

1.Disconnect the negative battery terminal. (See NEGATIVE BATTERY TERMINAL DISCONNECTION/CONNECTION.)

2.Drain the engine coolant. (See ENGINE COOLANT REPLACEMENT [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

3.Remove the coolant control valve. (See COOLANT CONTROL VALVE REMOVAL/INSTALLATION [SKYACTIV-G (WITHOUT EGR COOLER)].)

4.Remove the short cord.



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ENGINE COOLANT TEMPERATURE (ECT) SENSOR INSPECTION [SKYACTIV-G (WITHOUT EGR COOLER)]

SM3344941

id0140h38020m

ECT sensor No.1

Function inspection

1.Connect the M-MDS to the DLC-2.

2.Switch the ignition ON (engine off).

3.Display the PID ECT. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See PCM INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

4.Compare the voltage and temperature indications for the PID ECT with the standard in the table indicated below.

- If they do not match the standard, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)
- If they match the standard, perform the resistance inspection. (See Resistance inspection.)

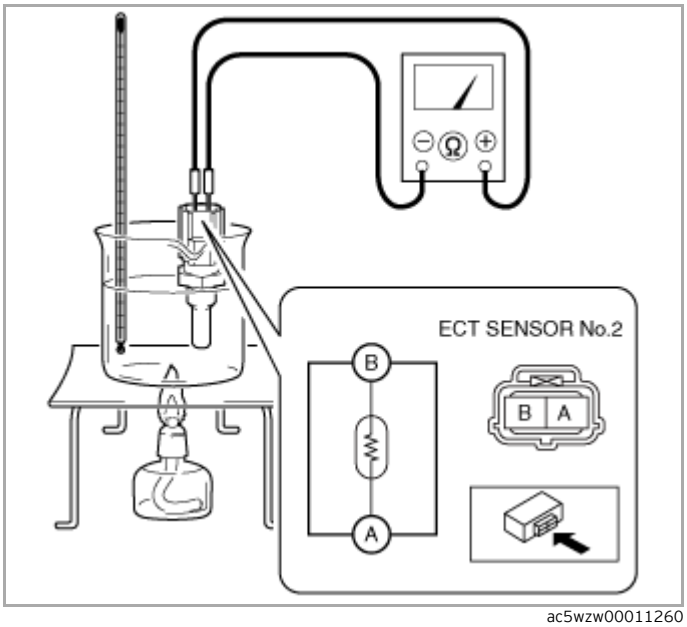
Standard

ECT	
V	°C {°F}
Approx. 3.10	20 {68}
Approx. 2.16	40 {104}
Approx. 1.40	60 {140}
Approx. 0.87	80 {176}
Approx. 0.54	100 {212}

Resistance inspection

Warning

- A hot engine can cause severe burns. Turn off the engine and wait until it is cool before removing the ECT sensor No.1.



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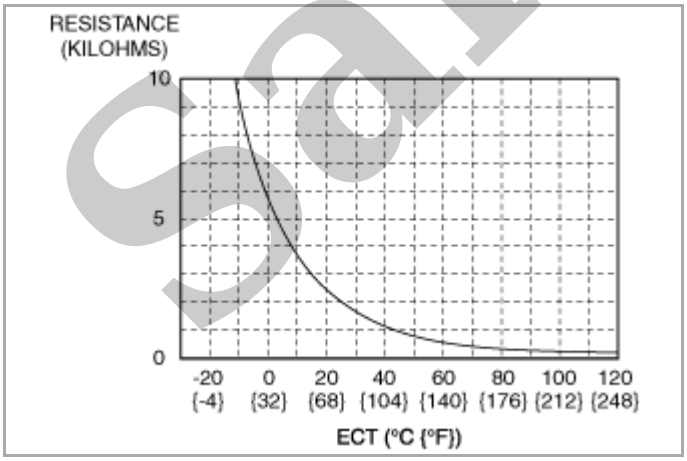
4.Measure the resistance between ECT sensor No.2 terminals A and B.

• If not as specified, replace the ECT sensor No.2. (See ENGINE COOLANT TEMPERATURE (ECT) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

Specification

ECT (°C {°F})	Resistance (Kilohms)
20 {68}	Approx. 2.45
80 {176}	Approx. 0.318



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INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)]

SM2897770

id0140h380220

IAT Sensor No.1

Note

• Because the IAT sensor No.1 is integrated in the MAF sensor, replacing the IAT sensor No.1 includes replacement of the MAF sensor/IAT sensor No.1.

Function inspection

1.Connect the M-MDS to the DLC-2.

2.Switch the ignition ON (engine off).

3.Display the PID IAT. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].) (See PCM INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

4.Compare the voltage and temperature indications for the PID IAT with the standard in the table indicated below.

• If they do not match the standard, replace the MAP sensor/IAT sensor No.2. (See MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.2 REMOVAL/INSTALLATION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)].)

Standard

IAT	
V	°C {°F}
Approx. 2.70	20 {68}
Approx. 1.80	40 {104}
Approx. 1.20	60 {140}

IAT Sensor No.2

Note

HEATED OXYGEN SENSOR (HO2S) INSPECTION [SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION)]

SM2897771

id0140h380230

HO2S Inspection

1.Connect the M-MDS to the DLC-2.

2.Switch the ignition ON (engine on).

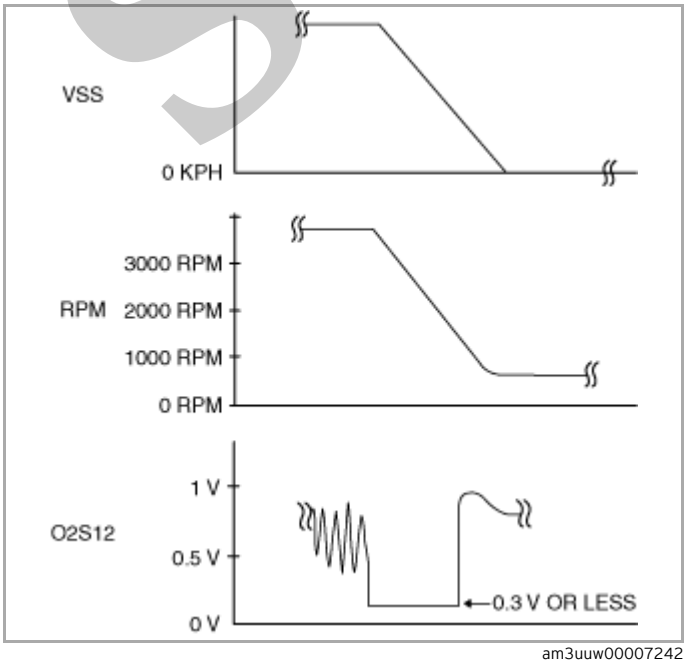
3.Warm up the engine to normal operating temperature.

4.Access the following PIDs using the M-MDS. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5 (WITH CYLINDER DEACTIVATION))].)

— VSS (Vehicle speed)
— RPM (Engine speed)
— O2S12 (HO2S output voltage)

5.Drive the vehicle and decelerate the engine speed by releasing the accelerator pedal fully when the engine speed is 3,000 rpm or more.

6.Verify that the HO2S output voltage (PID: O2S12) is 0.3 V or less while decelerating as shown in the figure.



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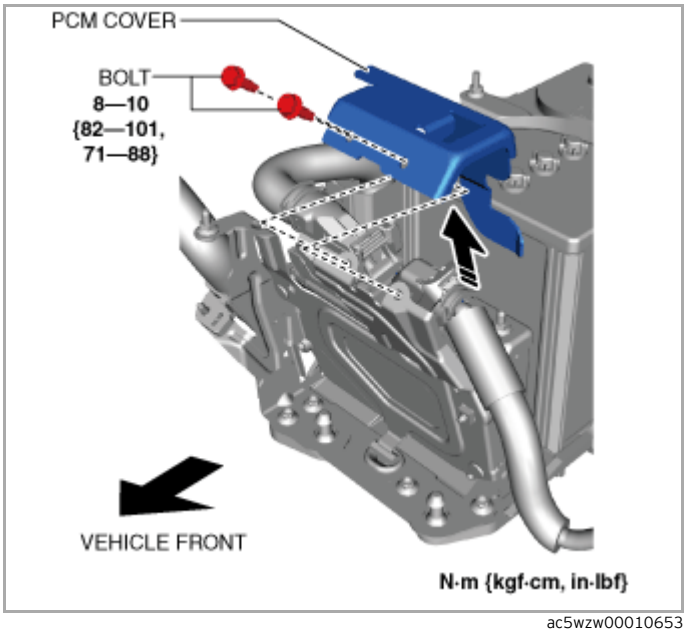

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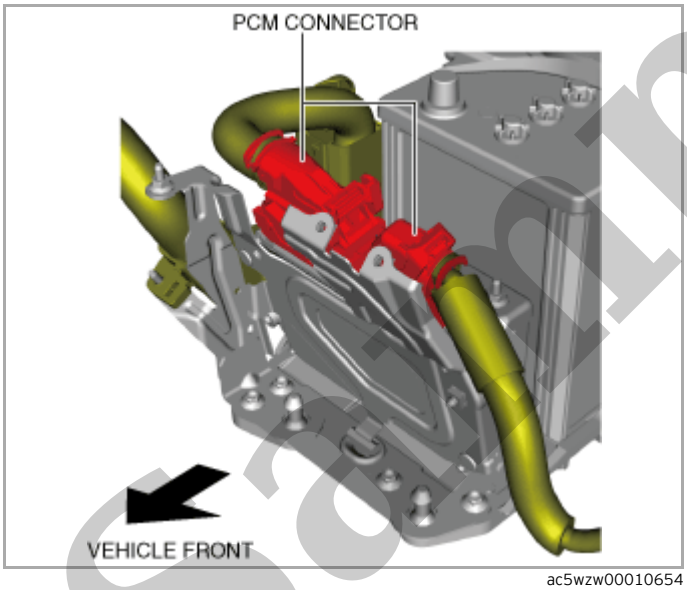
3.Disconnect the PCM connector. (See PCM Connector Connection Note.)



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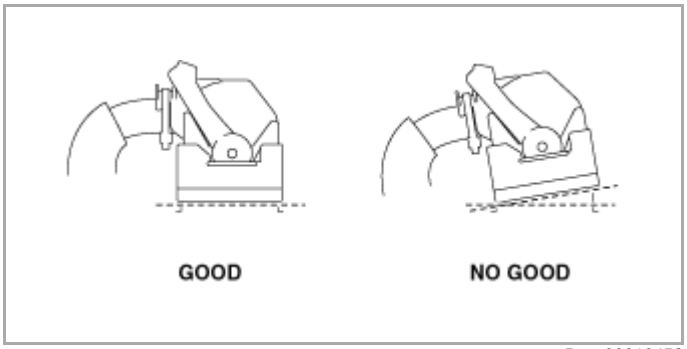
4.Remove the PCM assembly from the battery tray. (See PCM Assembly Installation Note.)

• Do not touch the PCM connector terminal. The terminal is extremely thin and can be damaged by touching it.
• If the PCM connector is inserted at an angle and the lever is moved, the connector could be damaged. Verify that the PCM connector is inserted straight.



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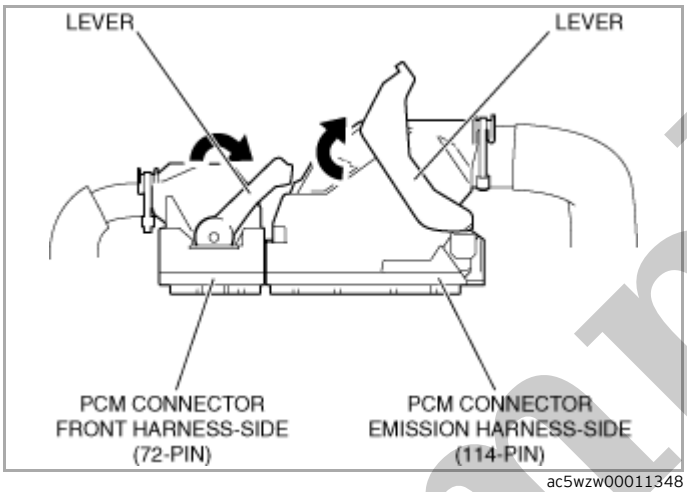
1.Set the PCM connector to the position shown in the figure.



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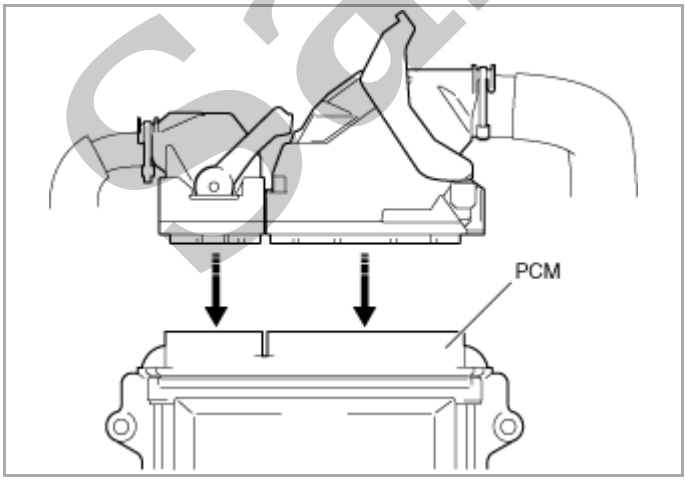
2.Align the PCM connector straight against the connection surface.



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3.Insert the PCM connector straight and press it in until the lever moves up naturally. (Front harness-side connector)

Terminal	Signal	Connected to	Test condition		Voltage (V)	inspection item
1C *1	Constant voltage (Vref)	Low fuel pressure sensor, fuel temperature sensor	Ignition switched ON (engine off)		Approx. 5.0	• Low fuel pressure sensor • Fuel temperature sensor • Related wiring harness
1D	Constant voltage (Vref)	Engine oil pressure sensor, engine oil temperature sensor, coolant control valve position sensor *2, exhaust shutter valve position sensor *2	Ignition switched ON (engine off)		Approx. 5.0	• Related wiring harness
1E	Constant voltage (Vref)	CKP sensor	Ignition switched ON (engine off)		Approx. 5.0	• Related wiring harness
1F	CKP	CKP sensor	(See CKP signal.)			• CKP sensor • Related wiring harness
1G	–	–	–		–	–
1H *1	CAN_3L	CAN system related modules	Because this terminal is for CAN, integrity determination by terminal voltage is not possible.			• Related wiring harness
1I *2	Coolant control valve position	Coolant control valve position sensor	Because this terminal is for SENT signal, integrity determination by terminal voltage is not possible.			• Coolant control valve position sensor • Related wiring harness
1J	Constant voltage (Vref)	MAP sensor, EGR valve position sensor	Ignition switched ON (engine off)		Approx. 5.0	• Related wiring harness
1K *1	Constant voltage (Vref)	High fuel pressure sensor, swirl control valve position sensor	Ignition switched ON (engine off)		Approx. 5.0	• Related wiring harness
1K *2	Constant voltage (Vref)	Fuel pressure sensor	Ignition switched ON (engine off)		Approx. 5.0	• Related wiring harness
1L *1	CAN_3H	CAN system related modules	Because this terminal is for CAN, integrity determination by terminal voltage is not possible.			• Related wiring harness
1L *2	Constant voltage (Vref)	TP sensor No.1, TP sensor No.2	Ignition switched ON (engine off)		Approx. 5.0	• Related wiring harness
1M	A/F	A/F sensor	Ignition switched ON (engine off)		Approx. 5.0	• A/F sensor • Related wiring harness
			Idle (after warm up)		3.0–4.0	
1N	GND	Sensor shield	Under any condition		Below 1.0	• Related wiring harness
1O	TP (No.1)	TP sensor No.1	Ignition switched ON (engine off)	Accelerator pedal released	Approx. 0.5	• TP sensor No.1 • Related wiring harness
				Accelerator pedal depressed	Approx. 4.59	