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2009 MAZDA 3 MPS / MAZDASPEED3 OEM Service and Repair Workshop Manual

Go to manual page

CONTROL SYSTEM DIAGRAM [SKYACTIV-G 2.5T]

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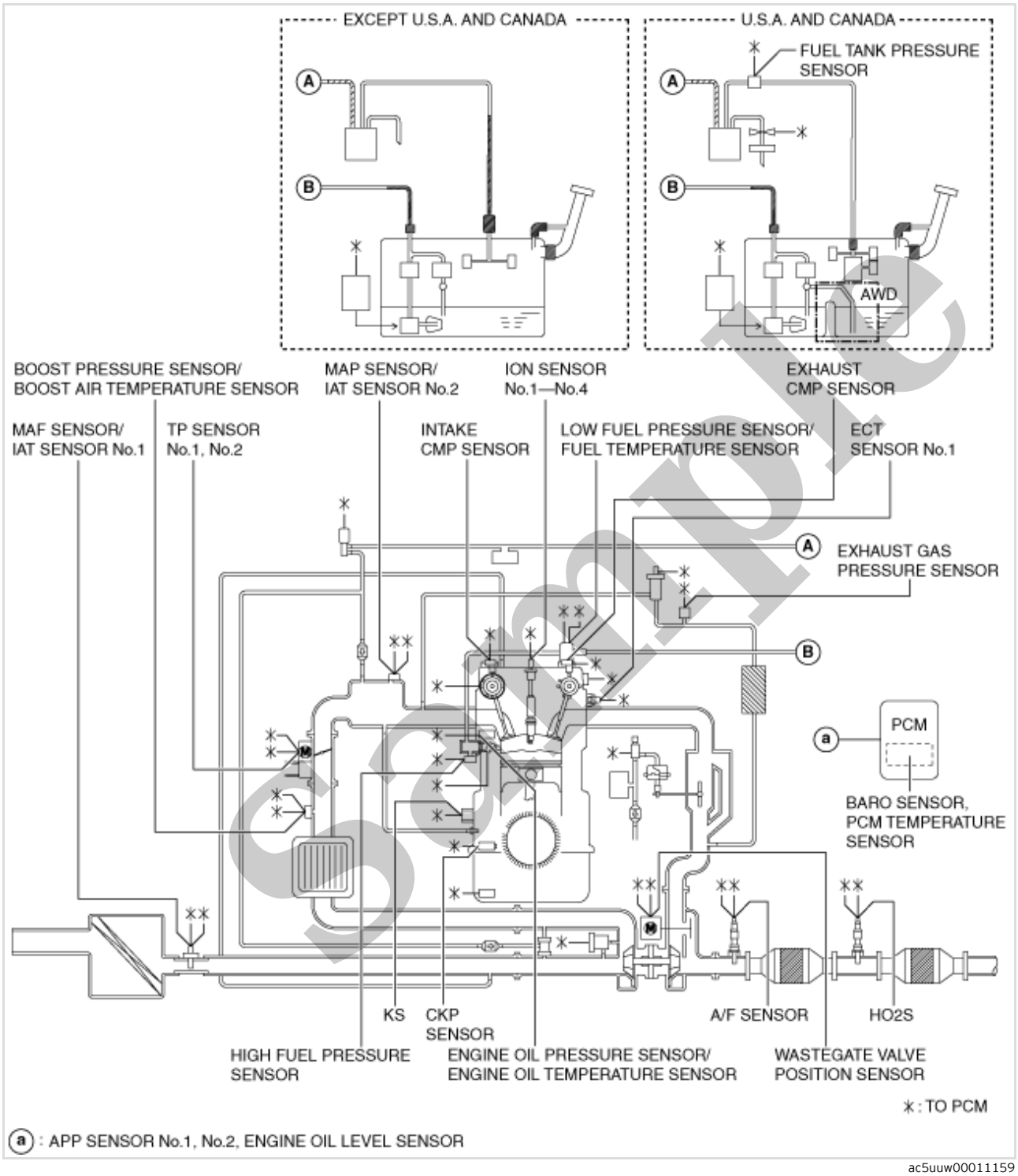

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CRANKSHAFT POSITION (CKP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T]

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Replacement Part

O-ring
Quantity: 1
Location of use: CKP sensor

Oil and Chemical Type

Engine oil
Type: Recommended oil

Caution

• When replacing the CKP sensor, make sure there is no foreign matter on it such as metal shavings. If it is installed with foreign matter, the sensor output signal will malfunction resulting from fluctuation in magnetic flux and cause a deterioration in engine control.

1.Turn the steering wheel to full right lock.

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

3.Lift up the vehicle.

4.Remove the front splash shield (RH). (See SPLASH SHIELD REMOVAL/INSTALLATION.)

5.Remove the service hole cover (installed to front under cover No.2).

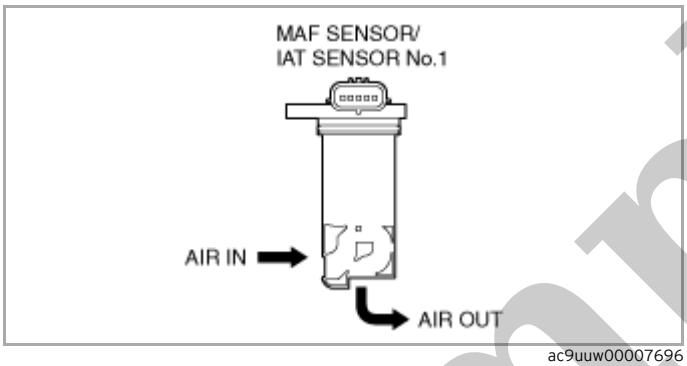
Voltage Inspection

1.Remove the MAF sensor/IAT sensor No.1 without disconnect the connector. (See MASS AIR FLOW (MAF) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.1 REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)

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

3.Switch the ignition ON (engine off).

4.As the air gradually approaches the MAF detection part of the MAF sensor/IAT sensor No.1, verify that the MAF sensor output voltage (PID: MAF) varies. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].)



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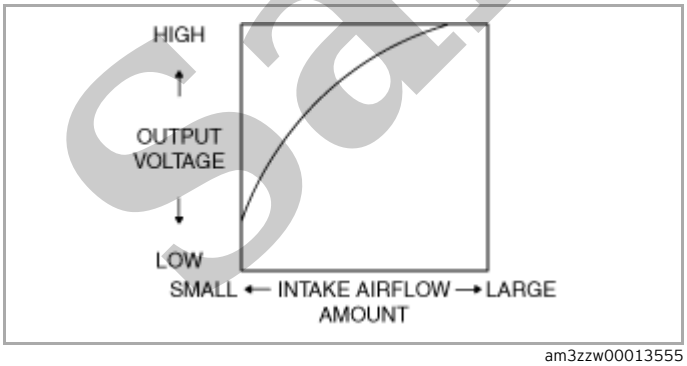
- If not as specified, replace the MAF sensor/IAT sensor No.1. (See MASS AIR FLOW (MAF) SENSOR/INTAKE AIR TEMPERATURE (IAT) SENSOR NO.1 REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)

Specification (Reference)



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BAROMETRIC PRESSURE (BARO) SENSOR INSPECTION [SKYACTIV-G 2.5T]

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Note

• Because the BARO sensor is integrated in the PCM, replacing the BARO sensor includes replacement of the PCM.

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

2.Switch the ignition ON (engine off).

3.Measure the barometric pressure using a barometer.

4.Verify that the measured barometric pressure and the actually measured barometric pressure (PID: BARO) input from the BARO sensor match. (See ON-BOARD DIAGNOSTIC TEST [PCM (SKYACTIV-G 2.5T)].) (See PCM INSPECTION [SKYACTIV-G 2.5T].)

• If the measured barometric pressure and the actually measured barometric pressure do not match, replace the PCM. (See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)

control.

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 2.5T].)

3.Disconnect the exhaust CMP sensor connector.

4.Remove the exhaust CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)

5.Verify that there are no metal shavings on the exhaust CMP sensor.

- If there is a malfunction, remove any metal shavings that are adhering.

Voltage inspection

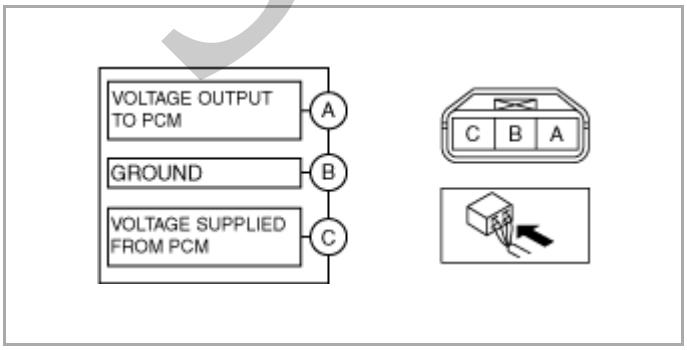
Caution

• When replacing the CMP sensor, make sure there is no foreign matter on it such as metal shavings. If it is installed with foreign matter, the sensor output signal will malfunction resulting from fluctuation in magnetic flux and cause a deterioration in engine control.
• If the wiring harnesses or waterproof connectors are damaged, water penetrating the connector will cause a sensor malfunction. To prevent this, be careful not to damage wiring harnesses or waterproof connectors.

1.Idle the engine.

2.Measure the output voltage wave pattern betweenÅ@exhaust CMP sensor terminals A and B using an oscilloscope.

- If not as specified, replace the exhaust CMP sensor. (See CAMSHAFT POSITION (CMP) SENSOR REMOVAL/INSTALLATION [SKYACTIV-G 2.5T].)



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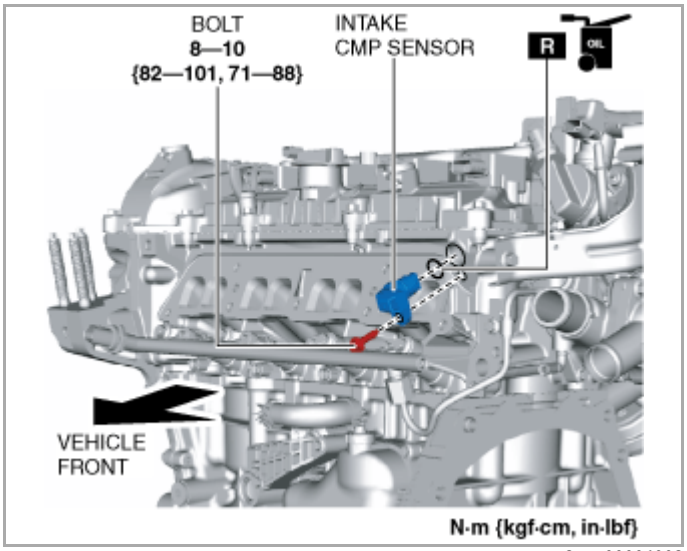
Output voltage (Reference)

Terminal	Voltage (V)	Condition
A	Above 4.8	High output *
	Below 0.8	Low output *



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6.Remove the intake CMP sensor.

7.Install in the reverse order of removal.

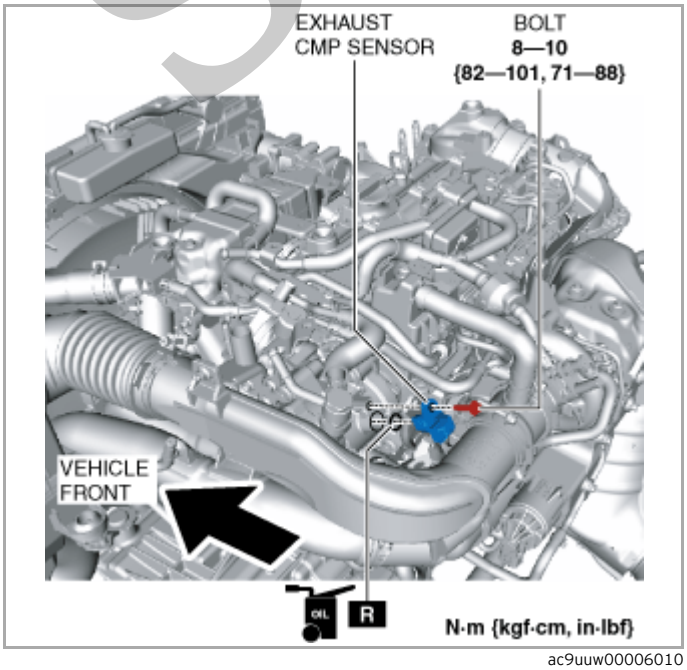
Exhaust CMP Sensor

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 2.5T].)

3.Disconnect the exhaust CMP sensor connector.

4.Remove the bolt.



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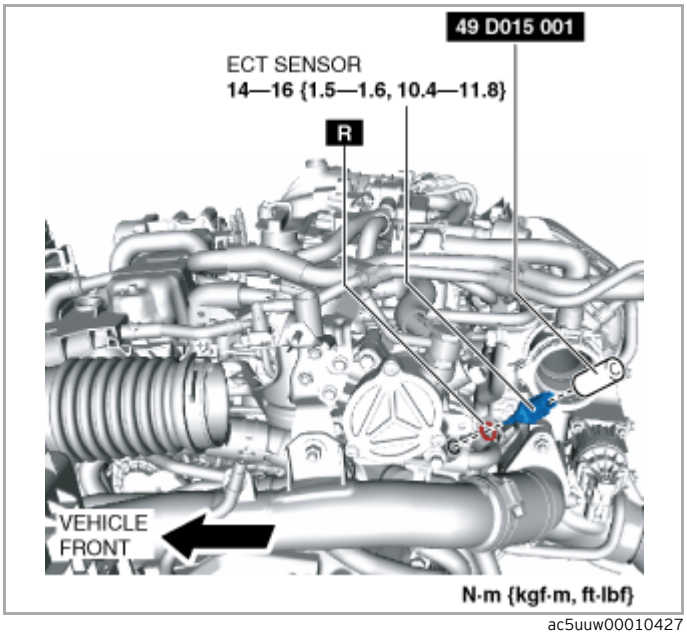

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6.Install in the reverse order of removal.

7.Refill the engine coolant. (See ENGINE COOLANT REPLACEMENT [SKYACTIV-G 2.5T].)

INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION [SKYACTIV-G 2.5T]

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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 2.5T)].) (See PCM INSPECTION [SKYACTIV-G 2.5T].)

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, perform the resistance inspection. (See Resistance inspection.)

Standard

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

Resistance inspection

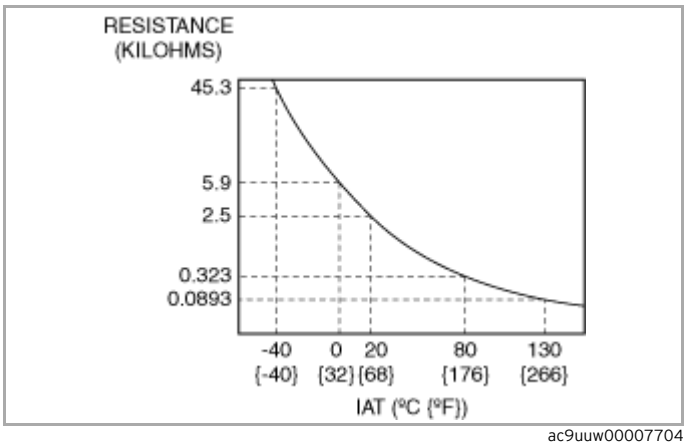
Note

- **The MAF sensor and IAT sensor No.1 cannot be removed as a single unit. When replacing the IAT sensor No.1, replace the MAF sensor/IAT sensor No.1.**

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

2.Disconnect the MAF sensor/IAT sensor No.1 connector.

IAT (°C {°F})	Resistance (Kilohms)
20 {68}	Approx. 2.5
80 {176}	Approx. 0.323
130 {266}	Approx. 0.0893



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