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## 2009 MAZDA 5 / Premacy OEM Service and Repair Workshop Manual

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# PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.5T]

SM2897726

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Caution

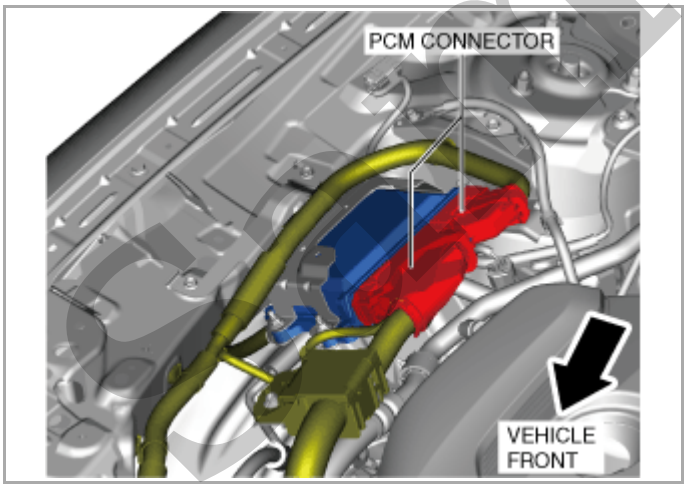
• If configuration and reprogramming is not performed when the PCM is replaced with a new one, the vehicle specification information and PCM software is not stored in the PCM and the system will not operate normally.
• When performing configuration and reprogramming, it is necessary to read the vehicle specification information from the PCM before replacing it. Connect the M-MDS to the vehicle and perform vehicle identification before removing the PCM. The vehicle specification information is temporarily stored in the M-MDS.

Note

• The PCM prior to replacement stores the vehicle specification information.
• A new PCM does not store any vehicle specification information.
• If the vehicle specification information PCM prior to replacement cannot be read, perform the configuration using As-Built data.

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

2.Disconnect the PCM connectors. (See PCM Connector Connection Note.)

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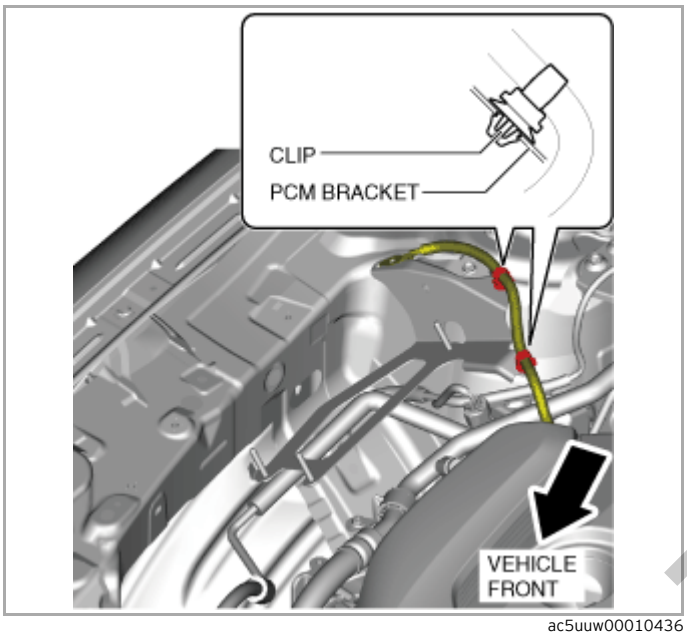
3.Remove the clips from the PCM bracket.

10.Remove the clip from the PCM bracket.



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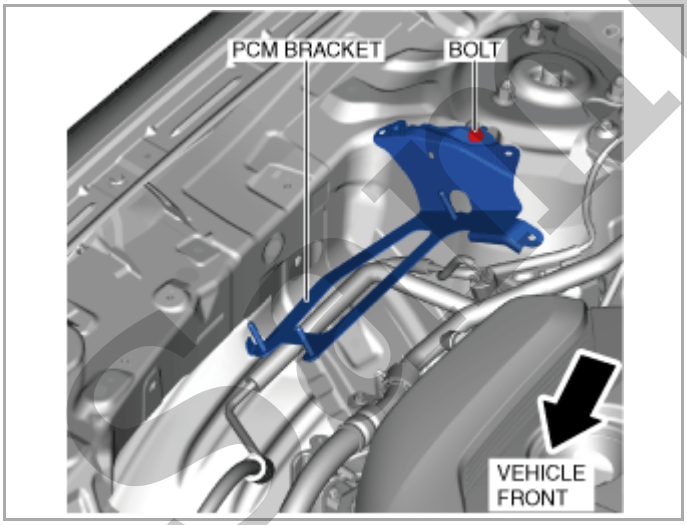
11.Remove the bolt. (See PCM Bracket Installation Note.)



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12.Remove the PCM bracket.

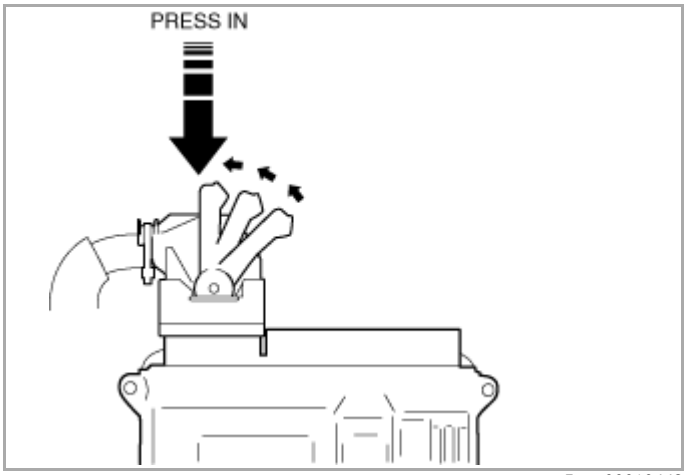
13.Install in the reverse order of removal.

14.When replacing the PCM on the vehicles, perform the following:

**Note**

**• If configuration cannot be performed by reading/writing of the vehicle specification information, perform the configuration using As-Built information after replacing the PCM. (See PCM CONFIGURATION (USING AS-BUILT DATA) [SKYACTIV-G 2.5T].)**

(1) Perform the PCM configuration. (See PCM CONFIGURATION (USING READ/WRITE FUNCTION) [SKYACTIV-G 2.5T].)



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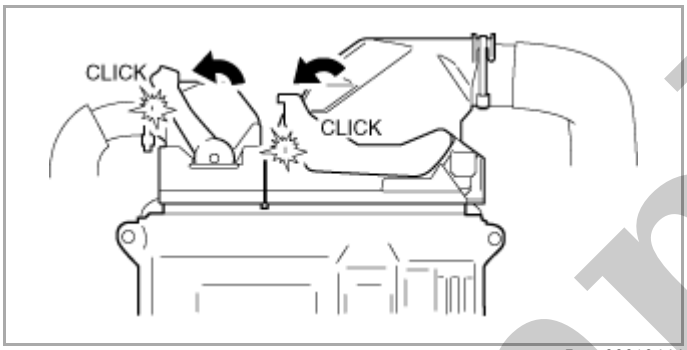
4.Press the PCM connector lever until a click sound is heard.



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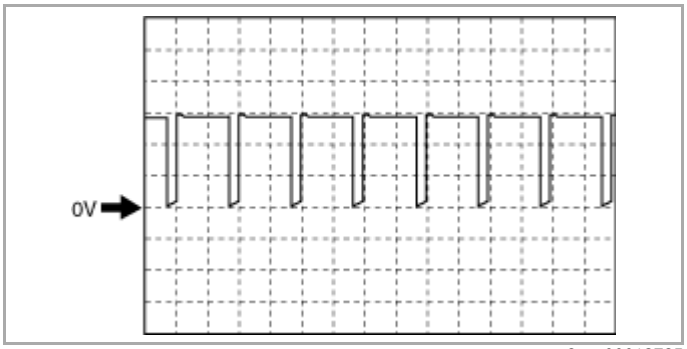
| Terminal | Signal | Connected to | Test condition | Voltage (V) | inspection item |
|---|---|---|---|---|---|
| 1Z | Electric variable valve timing control | Electric variable valve timing motor/driver | (See Electric variable valve timing control signal.) | | • Electric variable valve timing motor/driver<br>• Related wiring harness |
| 1AA | CKP | CKP sensor | (See CKP signal.) | | • CKP sensor<br>• Related wiring harness |
| 1AB | – | – | – | – | – |
| 1AC | GND | Sensor shield | Under any condition | Below 1.0 | • Related wiring harness |
| 1AD | IGT4 | Ignition coil No.4 | (See IGT1, IGT2, IGT3, IGT4 control.) | | • Ignition coil No.4<br>• Related wiring harness |
| 1AE | IGT2 | Ignition coil No.2 | (See IGT1, IGT2, IGT3, IGT4 control.) | | • Ignition coil No.2<br>• Related wiring harness |
| 1AF | IGT3 | Ignition coil No.3 | (See IGT1, IGT2, IGT3, IGT4 control.) | | • Ignition coil No.3<br>• Related wiring harness |
| 1AG | IGT1 | Ignition coil No.1 | (See IGT1, IGT2, IGT3, IGT4 control.) | | • Ignition coil No.1<br>• Related wiring harness |
| 1AH | Fuel temperature | Fuel temperature sensor | Ignition switched ON (engine off) | Approx. 2.04 | • Fuel temperature sensor<br>• Related wiring harness |
| 1AI | – | – | – | – | – |
| 1AJ | – | – | – | – | – |
| 1AK | – | – | – | – | – |
| 1AL | Ion (No.4) | Ion sensor No.4 | Idle (after warm up) | Approx. 4.55 | • Ion sensor No.4<br>• Related wiring harness |
| 1AM | GND | ECT sensor | Under any condition | Below 1.0 | • Related wiring harness |
| 1AN | – | – | – | – | – |
| 1AO | Generator field coil control | Generator | (See Generator field coil control signal.) | | • Generator<br>• Related wiring harness |
| 1AP | – | – | – | – | – |
| 1AQ | Ion (No.3) | Ion sensor No.3 | Idle (after warm up) | Approx. 4.52 | • Ion sensor No.3<br>• Related wiring harness |
| 1AR | GND | Wastegate valve position sensor | Under any condition | Below 1.0 | • Related wiring harness |
| 1AS | Hydraulic variable valve timing control | OCV | (See Hydraulic variable valve timing control signal.) | | • OCV<br>• Related wiring harness |
| 1AT | Generator output voltage | Generator | (See Generator output voltage.) | | • Generator<br>• Related wiring harness |

| Terminal | Signal | Connected to | Test condition | Voltage (V) | inspection item |
|---|---|---|---|---|---|
| 1CC | Drive-by-wire control (-) | Throttle valve actuator | Idle (after warm up)<br>Because the drive-by-wire control (-) terminal value varies depending on the vehicle, examination using only the ICC terminal is not possible. When performing the inspection, perform it together with the ICG terminal.<br>• Type A<br>— B+<br>• Type B<br>— Approx. 0 | | • Throttle valve actuator<br>• Related wiring harness |
| 1CD | Wastegate valve control (+) | Wastegate valve | Ignition switched ON (engine off) | Approx. 11.70 | • Wastegate valve<br>• Related wiring harness |
| | | | Idle (after warm up) | Approx. 13.86 | |
| 1CE | Constant voltage (Vref) | Low fuel pressure sensor, fuel temperature sensor | Ignition switched ON (engine off) | Approx. 5.07 | • Related wiring harness |
| 1CF | Constant voltage (Vref) | Wastegate valve position sensor | Ignition switched ON (engine off) | Approx. 5.07 | • Related wiring harness |
| 1CG | Drive-by-wire control (+) | Throttle valve actuator | (See Drive-by-wire control (+) signal.) | | • Throttle valve actuator<br>• Related wiring harness |
| 1CH | – | – | – | – | – |
| 1CI | Constant voltage (Vref) | High fuel pressure sensor | Ignition switched ON (engine off) | Approx. 5.06 | • Related wiring harness |
| 1CJ | GND | MAP sensor, IAT sensor No.2 | Under any condition | Below 1.0 | • Related wiring harness |
| 1CK | Battery voltage | Main relay | Ignition switched ON (engine off) | B+ | • Main relay<br>• Related wiring harness |
| 1CL | GND | GND | Under any condition | Below 1.0 | • Related wiring harness |
| 1CM | Constant voltage (Vref) | MAP sensor | Ignition switched ON (engine off) | Approx. 5.07 | • Related wiring harness |
| 1CN | GND | High fuel pressure sensor | Under any condition | Below 1.0 | • Related wiring harness |
| 1CO | Battery voltage | Fuel injector relay | Ignition switched ON (engine off) | B+ | • Fuel injector relay<br>• Related wiring harness |
| 1CP | GND | GND | Under any condition | Below 1.0 | • Related wiring harness |
| 1CQ | – | – | – | – | – |
| 1CR | GND | Low fuel pressure sensor, fuel temperature sensor | Under any condition | Below 1.0 | • Related wiring harness |
| 1CS | Battery voltage | Fuel injector relay | Ignition switched ON (engine off) | B+ | • Fuel injector relay<br>• Related wiring harness |
| 1CT | GND | GND | Under any condition | Below 1.0 | • Related wiring harness |
| 1CU | – | – | – | – | – |
| 1CV | GND | Engine oil level sensor | Under any condition | Below 1.0 | • Related wiring harness |

| Terminal | Signal | Connected to | Test condition | | Voltage (V) | inspection item |
|---|---|---|---|---|---|---|
| 2M *1 | Fuel tank pressure | Fuel tank pressure sensor | Fuel tank pressure is 2.5 kPa {0.025 kgf/cm $^2$, 0.36 psi} lower than barometric pressure. | | Approx. 1.20 | • Fuel tank pressure sensor<br>• Related wiring harness |
| | | | Fuel tank pressure is equal to barometric pressure. | | Approx. 2.62 | |
| | | | Fuel tank pressure is 1.5 kPa {0.015 kgf/cm $^2$, 0.22 psi} higher than barometric pressure. | | Approx. 3.47 | |
| 2N | – | – | – | | – | – |
| 2O | Battery voltage | Battery | Under any condition | | B+ | • Battery<br>• Related wiring harness |
| 2P | – | – | – | | – | – |
| 2Q | Ambient temperature | Ambient temperature sensor | Ignition switched ON (engine off) | AAT 20 °C {68 °F} | Approx. 2.70 | • Ambient temperature sensor<br>• Related wiring harness |
| | | | | AAT 30 °C {104 °F} | Approx. 1.80 | |
| 2R | Brake (No.2) | Brake switch (No.2 signal) | Brake pedal released | | Below 1.0 | • Brake switch (No.2 signal)<br>• Related wiring harness |
| | | | Brake pedal fully depressed | | B+ | |
| 2S | Battery voltage | Main relay | Ignition switched ON (engine off) | | B+ | • Main relay<br>• Related wiring harness |
| 2T | Battery voltage | Main relay | Ignition switched ON (engine off) | | B+ | • Main relay<br>• Related wiring harness |
| 2U | Boost air temperature | Boost air temperature sensor | Ignition switched ON (engine off) | Boost air temperature: 20 °C {68 °F} | Approx. 3.57 | • Boost air temperature sensor<br>• Related wiring harness |
| | | | | Boost air temperature: 40 °C {104 °F} | Approx. 2.70 | |
| | | | | Boost air temperature: 60 °C {140 °F} | Approx. 1.87 | |
| 2V | GND | Ambient temperature sensor, refrigerant pressure sensor, fuel tank pressure sensor *1 | Under any condition | | Below 1.0 | • Related wiring harness |
| 2W | Refrigerant pressure | Refrigerant pressure sensor | Refrigerant pressure: 1.0 MPa {10 kgf/cm $^2$, 145 psi} | | Approx. 1.49 | • Refrigerant pressure sensor<br>• Related wiring harness |
| | | | Refrigerant pressure: 1.1 MPa {11 kgf/cm $^2$, 160 psi} | | Approx. 1.72 | |
| | | | Refrigerant pressure: 1.2 MPa {12 kgf/cm $^2$, 174 psi} | | Approx. 1.87 | |
| 2X | – | – | – | | – | – |
| 2Y | Constant voltage (Vref) | Refrigerant pressure sensor, fuel tank pressure sensor *1 | Ignition switched ON (engine off) | | Approx. 5.07 | • Related wiring harness |
| 2Z | – | – | – | | – | – |
| 2AA | GND | GND | Under any condition | | Below 1.0 | • Related wiring harness |
| 2AB | GND | GND | Under any condition | | Below 1.0 | • Related wiring harness |
| 2AC | Constant voltage (Vref) | APP sensor No.2 | Ignition switched ON (engine off) | | Approx. 5.07 | • Related wiring harness |
| 2AD | GND | Sensor shield | Under any condition | | Below 1.0 | • Related wiring harness |



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PCM terminals

• 1CG(+)−1CC(-)

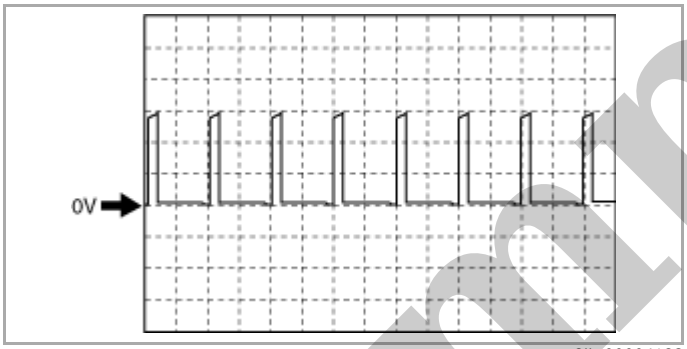
Oscilloscope setting

• 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Idle after warm up

Type B



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PCM terminals

• 1CG(+)−1CC(-)

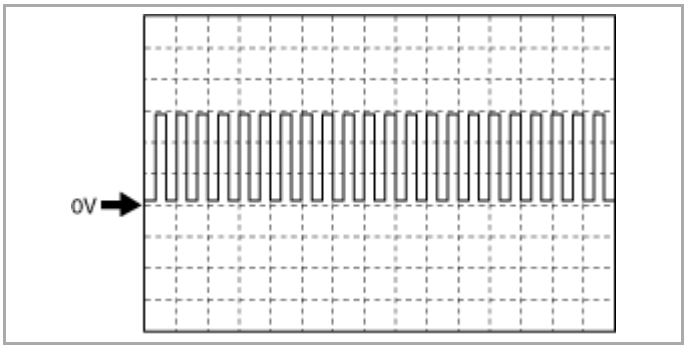
Oscilloscope setting

• 5 V/DIV (Y), 1 ms/DIV (X), DC range

Vehicle condition

• Idle after warm up

## Hydraulic variable valve timing control signal



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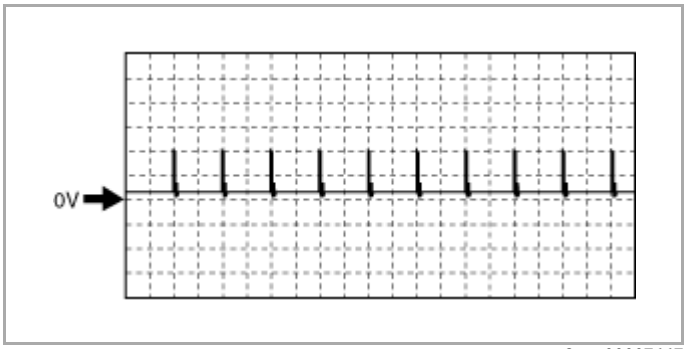
PCM terminals

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PCM terminals

- Fuel Injection No.1: 1DP(+)−body ground(-)
- Fuel Injection No.2: 1DX(+)−body ground(-)
- Fuel Injection No.3: 1EB(+)−body ground(-)
- Fuel Injection No.4: 1DT(+)−body ground(-)

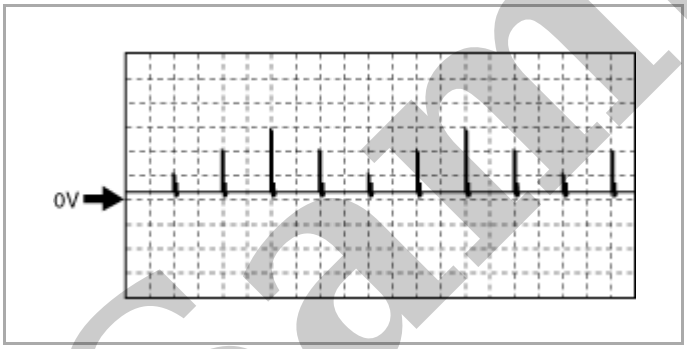
Oscilloscope setting

- 20 V/DIV (Y), 50 ms/DIV (X), DC range

Vehicle condition

- Idle after warm up

## Fuel injection control (-) signal

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PCM terminals

- Fuel Injection No.1: 1DO(+)−body ground(-)
- Fuel Injection No.2: 1DW(+)−body ground(-)
- Fuel Injection No.3: 1EA(+)−body ground(-)
- Fuel Injection No.4: 1DS(+)−body ground(-)

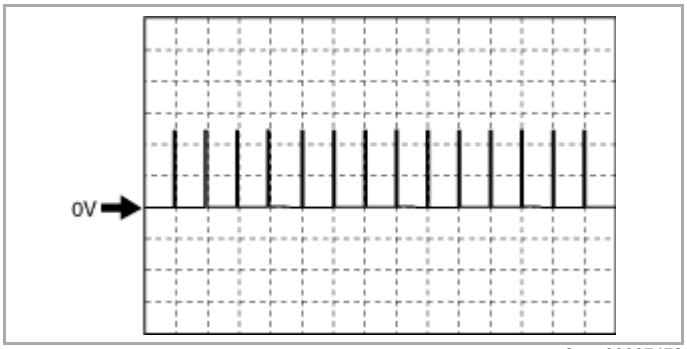
Oscilloscope setting

- 20 V/DIV (Y), 50 ms/DIV (X), DC range

Vehicle condition

- Idle after warm up

## Fuel pump control signal



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PCM terminals

• IGT1 (ignition coil No.1): 1AG(+)−body ground(−)
• IGT2 (ignition coil No.2): 1AE(+)−body ground(−)
• IGT3 (ignition coil No.3): 1AF(+)−body ground(−)
• IGT4 (ignition coil No.4): 1AD(+)−body ground(−)

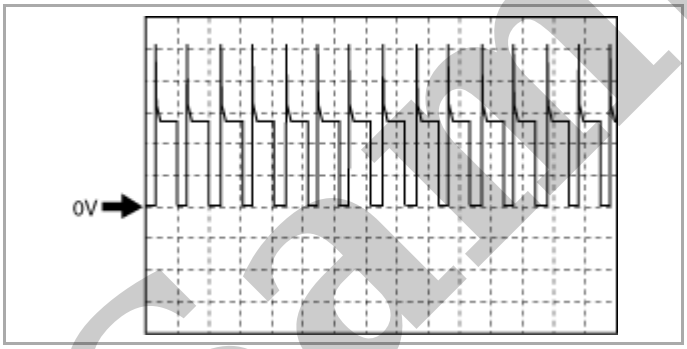
Oscilloscope setting

• 2 V/DIV (Y), 200 ms/DIV (X), DC range

Vehicle condition

• Idle after warm up

## Purge control



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PCM terminals

• 1AX(+)−body ground(−)

Oscilloscope setting

• 5 V/DIV (Y), 100 ms/DIV (X), DC range

Vehicle condition

• Purge solenoid valve control duty value: 30%

## A/F sensor heater control signal