

## DTC P0138:00 [SKYACTIV-G 2.0, SKYACTIV-G 2.5]

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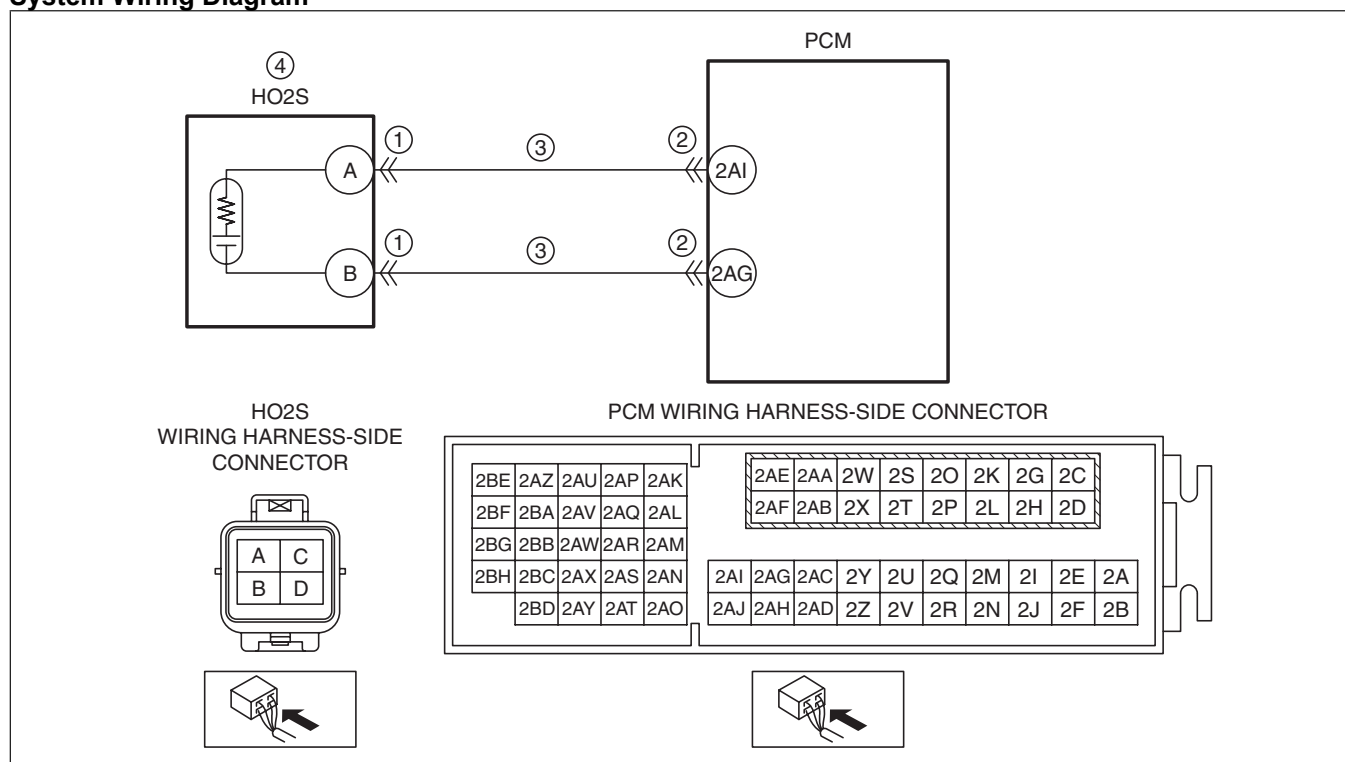
### Note

- To determine the malfunctioning part, proceed with the diagnostics from "Function Inspection Using M-MDS".

### Details On DTCs

| DESCRIPTION                         | HO2S circuit high input  |   |
|-------------------------------------|--|---|
| DETECTION CONDITION                 | Determination conditions   | • A condition in which the HO2S input voltage exceeds the specified value continues for the specified period. |
|                                     | Preconditions  | • Not applicable  |
|                                     | Malfunction determination period   | • 5 s period  |
|                                     | Drive cycle  | • 2   |
|                                     | Self test type   | • CMDTC self test, KOEO self test, KOER self test   |
|                                     | Sensor used  | • HO2S  |
| FAIL-SAFE FUNCTION                  | • Not applicable   |   |
| VEHICLE STATUS WHEN DTCs ARE OUTPUT | • Illuminates check engine light.  |   |
| POSSIBLE CAUSE                      | • HO2S connector or terminals malfunction<br>• PCM connector or terminals malfunction<br>• Short to power supply in wiring harness between the following terminals: <ul style="list-style-type: none"><li>— HO2S terminal A—PCM terminal 2AI</li><li>— HO2S terminal B—PCM terminal 2AG</li></ul><br>• HO2S malfunction<br>• PCM malfunction |   |

### System Wiring Diagram



ac5wzw00006535

### Function Explanation (DTC Detection Outline)

- The PCM detects the oxygen concentration in the exhaust gas based on the HO2S signal. The PCM determines a HO2S signal error based on the condition in which the HO2S input voltage continues to exceed the specified value, and stores a DTC.

### Repeatability Verification Procedure

1. Warm up the engine to allow the engine coolant temperature to reach **80 °C {176 °F} or more**.
2. Start the engine and leave it idling for **1 min**.

#### Note

- Match the engine coolant temperature in the recorded FREEZE FRAME DATA (Mode 2)/snapshot data, the vehicle speed, and engine speed values to the best extent possible while driving the vehicle.

3. Try to reproduce the malfunction by driving the vehicle for **5 min** based on the values in the FREEZE FRAME DATA (Mode 2)/snapshot data.

### PID Item/Simulation Item Used In Diagnosis

- Not applicable

### Function Inspection Using M-MDS

| STEP | INSPECTION  | RESULTS | ACTION  |
|------|---|---------|---|
| 1    | <b>PURPOSE: VERIFY RELATED SERVICE INFORMATION AVAILABILITY</b> <ul style="list-style-type: none"><li>• Verify related Service Information availability.</li><li>• Is any related Service Information available?</li></ul>  | Yes     | Perform repair or diagnosis according to the available Service Information. <ul style="list-style-type: none"><li>• If the vehicle is not repaired, go to the next step.</li></ul>  |
|      |   | No      | Go to the next step.  |
| 2    | <b>PURPOSE: RECORD VEHICLE STATUS AT TIME OF DTC DETECTION TO UTILIZE WITH REPEATABILITY VERIFICATION</b> <ul style="list-style-type: none"><li>• Has the FREEZE FRAME DATA (Mode 2)/snapshot data been recorded?</li></ul> | Yes     | Go to the troubleshooting procedure to perform the procedure from Step 1.   |
|      |   | No      | Record the FREEZE FRAME DATA (Mode 2)/snapshot data on the repair order.<br><br><b>Note</b> <ul style="list-style-type: none"><li>• Recording can be facilitated using the screen capture function of the PC.</li></ul> Go to the troubleshooting procedure to perform the procedure from Step 1. |

### Troubleshooting Diagnostic Procedure

#### Intention of troubleshooting procedure

- Step 1—2
  - Perform an inspection of the HO2S and PCM-related connectors.
- Step 3
  - Perform an inspection of the short to power supply in wiring harness between HO2S and PCM.
- Step 4
  - Perform a unit inspection of the HO2S.
- Step 5—6
  - Verify that the primary malfunction is resolved and there are no other malfunctions.

| STEP | INSPECTION   | RESULTS | ACTION   |
|------|--|---------|--|
| 1    | <b>PURPOSE: INSPECT HO2S CONNECTOR CONDITION</b> <ul style="list-style-type: none"><li>• Switch the ignition off.</li><li>• Disconnect the HO2S connector.</li><li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li><li>• Is there any malfunction?</li></ul> | Yes     | Repair or replace the connector and/or terminals, then go to Step 5. |
|      |  | No      | Go to the next step.   |
| 2    | <b>PURPOSE: INSPECT PCM CONNECTOR CONDITION</b> <ul style="list-style-type: none"><li>• Disconnect the PCM connector.</li><li>• Inspect for poor connection (such as damaged/pulled-out pins, corrosion).</li><li>• Is there any malfunction?</li></ul>                                      | Yes     | Repair or replace the connector and/or terminals, then go to Step 5. |
|      |  | No      | Go to the next step.   |

| STEP | INSPECTION   | RESULTS | ACTION   |
|------|--|---------|--|
| 3    | <b>PURPOSE: INSPECT HO2S CIRCUIT FOR SHORT TO POWER SUPPLY</b> <ul style="list-style-type: none"> <li>Verify that the HO2S and PCM connectors are disconnected.</li> <li>Switch the ignition ON (engine off).</li> <li>Measure the voltage at the following terminals (wiring harness-side): <ul style="list-style-type: none"> <li>HO2S terminal A</li> <li>HO2S terminal B</li> </ul> </li> <li>Is the voltage <b>0 V</b>?</li> </ul>                  | Yes     | Go to the next step.   |
|      |  | No      | Refer to the wiring diagram and verify whether or not there is a common connector between the following terminals: <ul style="list-style-type: none"> <li>HO2S terminal A—PCM terminal 2AI</li> <li>HO2S terminal B—PCM terminal 2AG</li> </ul> <b>If there is a common connector:</b> <ul style="list-style-type: none"> <li>Determine the malfunctioning part by inspecting the common connector and the terminal for corrosion, damage, or pin disconnection, and the common wiring harness for a short to power supply.</li> <li>Repair or replace the malfunctioning part.</li> </ul> <b>If there is no common connector:</b> <ul style="list-style-type: none"> <li>Repair or replace the wiring harness which has a short to power supply.</li> </ul> Go to Step 5. |
| 4    | <b>PURPOSE: DETERMINE INTEGRITY OF HO2S</b> <ul style="list-style-type: none"> <li>Reconnect all disconnected connectors.</li> <li>Inspect the HO2S.<br/>(See HEATED OXYGEN SENSOR (HO2S) INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Is there any malfunction?</li> </ul>  | Yes     | Replace the HO2S, then go to the next step.<br>(See HEATED OXYGEN SENSOR (HO2S) REMOVAL/ INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)   |
|      |  | No      | Go to the next step.   |
| 5    | <b>PURPOSE: VERIFICATION OF VEHICLE REPAIR COMPLETION</b> <ul style="list-style-type: none"> <li>Always reconnect all disconnected connectors.</li> <li>Clear the DTC from the PCM memory using the M-MDS.<br/>(See AFTER REPAIR PROCEDURE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Perform the KOEO or KOER self test.<br/>(See KOEO/KOER SELF TEST [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> <li>Is the PENDING CODE for this DTC present?</li> </ul> | Yes     | Repeat the inspection from Step 1. <ul style="list-style-type: none"> <li>If the malfunction recurs, replace the PCM.<br/>(See PCM REMOVAL/INSTALLATION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)</li> </ul> Go to the next step.   |
|      |  | No      | Go to the next step.   |
| 6    | <b>PURPOSE: VERIFY IF THERE IS ANY OTHER MALFUNCTION</b> <ul style="list-style-type: none"> <li>Is any other DTC or pending code stored?</li> </ul>  | Yes     | Go to the applicable DTC inspection.<br>(See DTC TABLE [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)  |
|      |  | No      | DTC troubleshooting completed.   |