

DTC P0031 / P0032: HO2S Heater Control Circuit Low / High (Sensor-1)

Wiring Diagram

Refer to "DTC P0030: HO2S Heater Control Circuit (Sensor-1): ".

A/F Sensor Description

Refer to "A/F Sensor Description: ".

DTC Detecting Condition and Trouble Area

DTC detecting condition	Trouble area
<p>P0031: Heater control circuit voltage of A/F sensor is lower than specification for more than specified time continuously even though control duty ratio of A/F sensor heater is less than 90% with engine running. (Heater control duty pulse is not detected in its circuit of ECM) (2 driving cycle detection logic)</p>	<ul style="list-style-type: none"> • A/F sensor heater circuit • A/F sensor heater •ECM
<p>P0032: Heater control circuit voltage of A/F sensor is higher than specification for more than specified time continuously even though control duty ratio of A/F sensor heater is more than 10% with engine running. (Heater control duty pulse is not detected in its circuit of ECM) (2 driving cycle detection logic)</p>	

DTC Confirmation Procedure

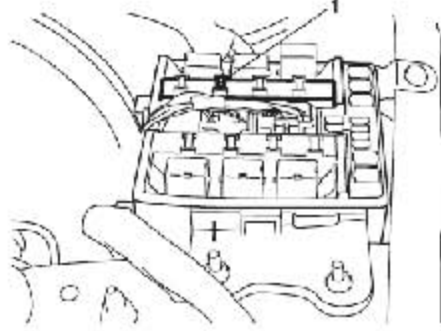
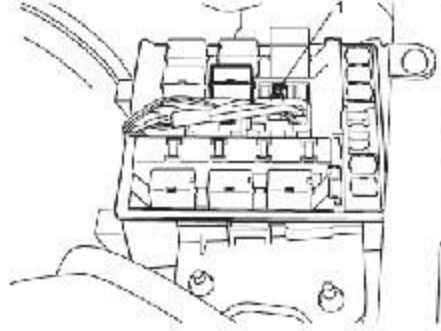
- 1) With ignition switch turned OFF, connect scan tool.
- 2) Turn ON ignition switch and clear DTC using scan tool.
- 3) Start engine and warm up to normal operating temperature.
- 4) Run engine at idle speed for 1 min. or more.
- 5) Check DTC and pending DTC.

DTC Troubleshooting

NOTE

Before this trouble shooting is performed, read the precautions for DTC troubleshooting referring to "Precautions For DTC Troubleshooting: ".

Step	Action	Yes	No
1	Was "Engine and Emission Control System Check" performed?	Go to Step 2.	Go to "Engine and Emission Control System Check: ".
2	<p>A/F sensor heater circuit check</p> <p>1) Disconnect connector from A/F sensor with ignition switch turned OFF.</p> <p>2) Check for proper connection to A/F sensor connector.</p> <p>3) If connection are OK, measure voltage between heater power terminal of A/F sensor connector and vehicle body ground with ignition switch turned ON.</p> <p>Is measured voltage 10 – 14 V?</p>	Go to Step 9.	Go to Step 3.

Step	Action	Yes	No
3	<p>HO2S heater fuse check 1) Check for "O2 HTR" fuse (1) blown. For J20 engine</p>  <p>For M16 engine</p>  <p>Is "O2 HTR" fuse in good condition?</p>	Go to Step 5.	Go to Step 4.
4	<p>A/F sensor and HO2S heater resistance check 1) Disconnect connector from HO2S-2 with ignition switch turned OFF. 2) Check heater resistance of A/F sensor and HO2S referring to "Air Fuel Ratio (A/F) Sensor On-Vehicle Inspection: in Section 1C" and "Heated Oxygen Sensor (HO2S-2) Heater On-Vehicle Inspection: in Section 1C". Are A/F sensor heater and HO2S heater in good condition?</p>	Go to Step 6.	Replace defective sensor.

Step	Action	Yes	No
5	<p>HO2S heater relay power circuit check</p> <p>1) Remove integration relay No.2 (for J20 engine) (1) or HO2S heater relay (for M16 engine) (2) with ignition switch turned OFF.</p> <p>2) Check for proper connection to relay connector.</p> <p>3) If connection are OK, measure voltage between each relay power terminal of relay connector and vehicle body ground with ignition switch tuned ON.</p> <p>For J20 engine Is each measured voltage 10 – 14 V?</p>	Go to Step 6.	Power circuit is open.
6	<p>Check HO2S heater relay</p> <p>1) Check integration relay No.2 (for J20 engine) or HO2S heater relay (for M16 engine) referring to "Control Relay Inspection: in Section 1C".</p> <p>Is it in good condition?</p>	Go to Step 7.	Replace relay.
7	<p>A/F sensor heater circuit check</p> <p>1) Measure insulation resistance between heater terminals of A/F sensor connector.</p> <p>Is measured resistance infinity?</p>	Go to Step 8.	Repair or replace short wire.
8	<p>HO2S heater relay circuit check</p> <p>1) Measure wire resistance between coil ground terminal of relay connector and vehicle body ground.</p> <p>Is measured resistance lower than 1 Ω?</p>	Output wire of relay connector is open or short to ground.	Repair or replace defective circuit.
9	<p>A/F sensor heater check</p> <p>1) Check heater resistance of A/F sensor referring to "Air Fuel Ratio (A/F) Sensor On-Vehicle Inspection: in Section 1C".</p> <p>Is A/F sensor heater in good condition?</p>	Go to Step 10.	Replace A/F sensor.

Step	Action	Yes	No
10	<p>A/F sensor heater control circuit check</p> <ol style="list-style-type: none"> 1) Disconnect connector from ECM with ignition switch turned OFF. 2) Check for proper connection of A/F sensor heater circuit terminal to ECM connector. 3) If connection are OK, measure each wire resistance of sensor heater control circuit at ECM connector between ECM to A/F sensor and ECM to vehicle body ground. <p>Is each measured wire resistance lower than 1 Ω?</p>	Go to Step 11.	Repair or replace defective wire circuit.
11	<p>A/F sensor heater circuit check</p> <ol style="list-style-type: none"> 1) Measure insulation resistance between control terminal of A/F sensor heater and ground terminal of A/F sensor heater at ECM connector. <p>Is measured resistance infinity?</p>	Substitute a known good ECM and recheck.	Repair or replace short wire.