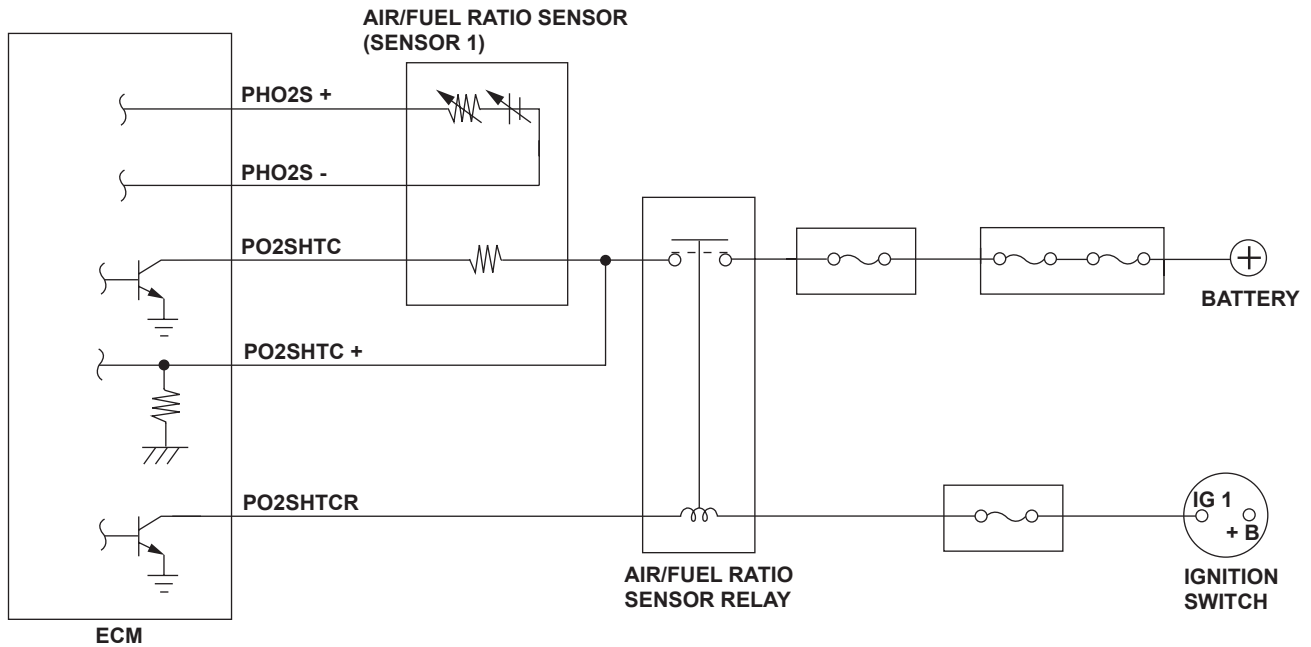


Advanced Diagnostics

DTC P1166: Air/Fuel Ratio (A/F) Sensor (Sensor 1) Heater System Electrical Problem (CVT)



P1149-0101

General Description

A heater for the sensor element is embedded in the air/fuel ratio (A/F) sensor (Sensor 1) and is controlled by the engine control module (ECM). It is activated and heats the sensor to stabilize and speed the detection of oxygen content when the exhaust gas temperature is cold.

If a combination of A/F sensor (Sensor 1) heater voltage and current is not a set value, or an overheated heater is detected, a malfunction is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Under the Enable Conditions
Sequence	None
Duration	—
DTC Type	One drive cycle, MIL ON

Enable Conditions

Condition		Minimum	Maximum
Engine coolant temperature	For 25 seconds after turning the ignition on	14°F (-10°C)	—
	Engine run	-4°F (-20°C)	
Battery voltage (IGP terminal of ECM)		9.7 V	16 V
State of the engine		Running	
No active DTCs		A/F Sensor (Sensor 1) Heater	
Other		A/F Sensor (Sensor 1) Heater is activated	

Malfunction Threshold

One of these conditions must be met.

- The heater voltage is 5 V or less and current is more than 1.5 A for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or less and current is 1.5 A or less for at least 3.9 seconds while the heater is not activated.
- The heater voltage is 5 V or less and current is 1.5 A or less for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or less and current is 1.5 A or less for at least 3.9 seconds while the heater is not activated.
- The heater voltage is 5 V or more and current is more than 1.5 A for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or more and current is 1.5 A or more for at least 3.9 seconds while the heater is not activated.
- The heater voltage is 5 V or more and current is 1.5 A or less for at least 3.9 seconds while the heater is activated, and the heater voltage is 5 V or more and current is 1.5 A or less for at least 3.9 seconds while the heater is not activated.
- The heater current is 23 A or more for at least 0.4 second.

Driving Pattern

Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM memory.

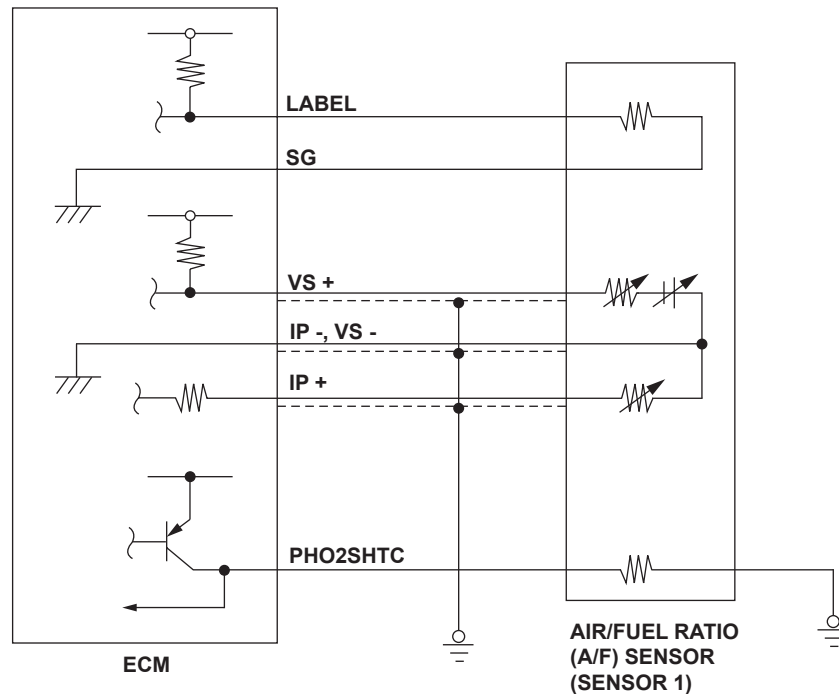
Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.

Advanced Diagnostics

DTC P1166: Air/Fuel Ratio (A/F) Sensor (Sensor 1) Heater System Electrical Problem



P1162-0001

General Description

The heater which heats the sensor element is built into the air/fuel ratio (A/F) sensor. The heater is controlled by the engine control module (ECM) and is energized when the sensor element temperature is low. It heats the sensor to stabilize the detection of oxygen content. The ECM monitors the A/F sensor heater output (return check). A malfunction is detected if the return signals do not meet the command value (for heater activation) in the ECM for a set time period or more and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Under the Enable Conditions
Sequence	None
Duration	5 seconds or more
DTC Type	One drive cycle, MIL ON

Enable Conditions

Condition	Minimum	Maximum
Engine coolant temperature	40°F (4°C)	—
Battery voltage	9 V	—
No active DTCs	A/F Sensor Heater	
Other	The heater is activated	

Malfunction Threshold

The heater return signal is 5 V or less when the command for heater activation in the ECM is ON, or the heater return signal is 5 V or more when the command for heater activation in the ECM is OFF, for at least 5 seconds.

Driving Pattern

Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected, the MIL comes on and the DTC and the freeze frame data are stored in the ECM memory.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.

The MIL, the DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.