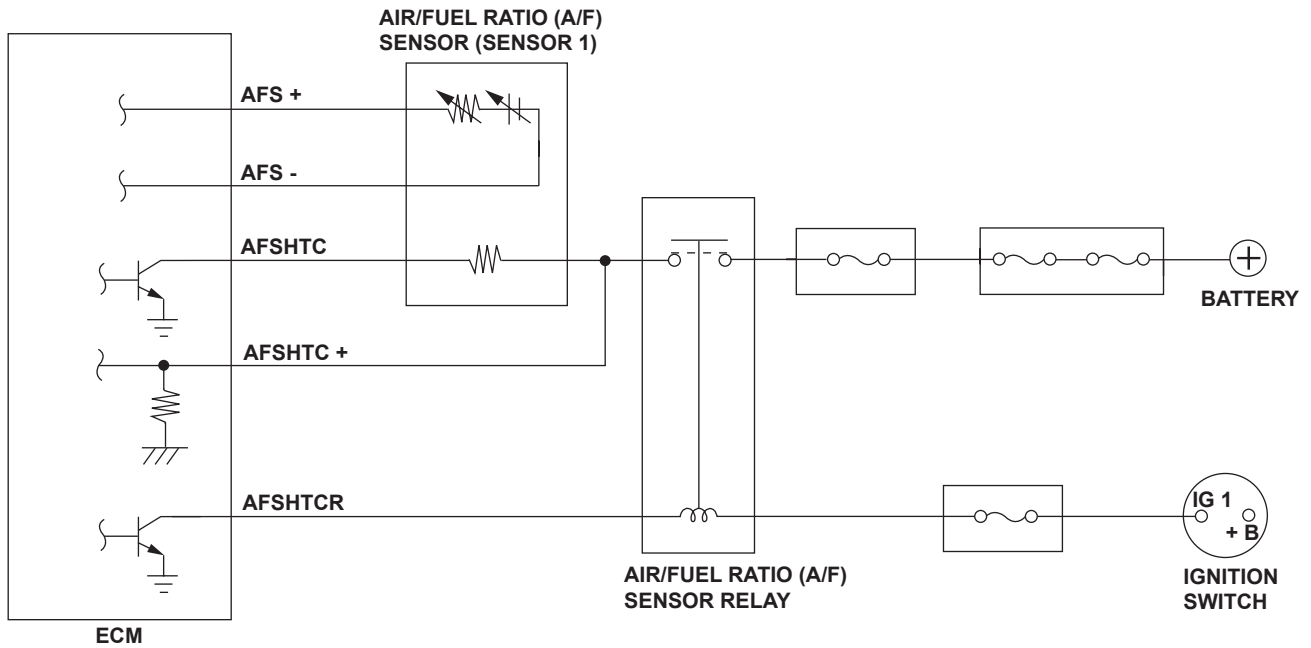


Advanced Diagnostics

DTC P0135: Air/Fuel Ratio (A/F) Sensor (Sensor 1) Heater Circuit Malfunction



P2238-0401

General Description

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

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

Monitor Execution, Sequence, Duration, DTC Type

| | |
|-----------|-------------------------|
| Execution | Continuous |
| Sequence | None |
| Duration | — |
| DTC Type | One drive cycle, MIL ON |

Enable Conditions

| Condition | Minimum | Maximum |
|--|---|---------|
| Engine coolant temperature | -4°F (-20°C) | — |
| Battery voltage (IGP terminal of ECM) | 10.5 V | 16.0 V |
| State of the engine | Running | |
| No active DTCs | A/F CPU, ECT, A/F sensor (sensor 1), 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 current is 0.8 A or less for at least 4 seconds while the heater is activated, and the heater current is 0.8 A or less for at least 4 seconds while the heater is not activated.
- The heater current is 0.8 A or more for at least 4 seconds while the heater is activated, and the heater current is 0.8 A or more for at least 4 seconds while the heater is not activated.
- The heater current is 15.2 A or more for at least 0.6 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.