

Engine Oil Temperature Sensor Diagnosis

[Diagnostic Instructions](#)

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

[Diagnostic Fault Information](#)

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Signal	1	2	2	—
Low Reference	—	2	—	—
1. Engine Oil Temperature Gauge High 2. Engine Oil Temperature Gauge Low				

[Typical Scan Tool Data](#)

Engine Oil Temperature Sensor

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Engine running at various operating conditions Parameter Normal Range: -40 to +150°C (-40 to +302°F)			
Signal	150°C (302°F)	-40°C (-40°F)	-40°C (-40°F)
Low Reference	—	-40°C (-40°F)	—

[Circuit/System Description](#)

The Engine Oil and Temperature Sensor is a variable resistor that measures the temperature of the engine oil. The Engine Control Module (ECM) supplies 5V to the Engine Oil and Temperature Sensor signal circuit and supplies a ground to the low reference circuit.

[Reference Information](#)

Schematic Reference

- [Engine Mechanical Schematics](#)
- [Instrument Cluster Schematics](#)

Connector End View Reference

[Component Connector End Views](#)

Electrical Information Reference

- [Circuit Testing](#)
 - [Connector Repairs](#)
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- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information.

Circuit/System Verification

1. Engine operating.
2. Verify the scan tool Engine Oil Temperature Sensor parameter is between -40 to $+150^{\circ}\text{C}$ (-40 to $+302^{\circ}\text{F}$) and changes with engine temperature.
 - ⇒ **If not between -38 to $+148^{\circ}\text{C}$ (-36 to $+298^{\circ}\text{F}$) or does not change**
Refer to Circuit/System Testing.
 - ↓ **If between -38 to $+148^{\circ}\text{C}$ (-36 to $+298^{\circ}\text{F}$) and changes**
3. All OK.

Circuit/System Testing

Note: You must perform the Circuit/System Verification before proceeding with Circuit/System Testing.

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the B35C Engine Oil Level and Temperature Sensor. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than $10\ \Omega$ between the low reference circuit terminal C and ground.
 - ⇒ **If $10\ \Omega$ or greater**
 - 2.1. Ignition OFF, disconnect the harness connector at the K20 Engine Control Module.
 - 2.2. Test for less than $2\ \Omega$ in the low reference circuit end to end.
 - ⇒ If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than $2\ \Omega$, replace the K20 Engine Control Module.
 - ↓ **If less than $10\ \Omega$**
3. Ignition ON.
4. Verify the scan tool Engine Oil Temperature Sensor parameter is warmer than 148°C (298°F).
 - ⇒ **If 148°C (298°F) or less**
 - 4.1. Ignition OFF, disconnect the harness connector at the K20 Engine Control Module.
 - 4.2. Test for infinite resistance between the signal circuit terminal B and ground.
 - ⇒ If less than infinite resistance, repair the short to ground on the circuit.
 - ⇒ If infinite resistance, replace the K20 Engine Control Module.
 - ↓ **If warmer than 148°C (298°F)**
5. Install a 3A fused jumper between the signal circuit terminal B and the low reference circuit terminal C.
6. Verify the scan tool Engine Oil Temperature Sensor parameter is colder than -38°C (-36°F).
 - ⇒ **If -38°C (-36°F) or colder**
 - 6.1. Ignition OFF, disconnect the harness connector at the K20 Engine Control Module, ignition ON.
 - 6.2. Test for less than 1V between the signal circuit and ground.
 - ⇒ If 1V or greater, repair the short to voltage on the circuit.
 - ↓ If less than 1V
 - 6.3. Ignition OFF.

6.4. Test for less than $2\ \Omega$ in the signal circuit end to end.

⇒ If $2\ \Omega$ or greater, repair the open/high resistance in the circuit.

⇒ If less than $2\ \Omega$, replace the K20 Engine Control Module.

↓ **If warmer than -38°C (-36°F)**

7. Test or replace the B35C Engine Oil and Temperature Sensor.

Component Testing

1. Ignition OFF, remove the B35C Engine Oil Level and Temperature Sensor.

2. Test the B35C Engine Oil Level and Temperature Sensor by varying the sensor temperature while monitoring the sensor resistance. Compare the readings with the [Temperature Versus Resistance](#) table and verify that the resistance is within 5% of the specification.

⇒ **If not within the specified range**

Replace the B35C Engine Oil Level and Temperature Sensor.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Engine Oil Level Sensor and/or Switch Replacement](#)
- [Control Module References](#) for the ECM replacement, programming, and setup