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2002 CHEVROLET Matiz / Spark (M150) OEM Service and Repair Workshop Manual

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Cooling System Description and Operation

Electrical Information Reference

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- Wiring Repairs

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool ECT Sensor parameter is warmer than –40° C (–40° F) and colder than 150° C (302° F) and changes with engine run time.
   - **If colder than –39° C (–38° F) or warmer than 149° C (300° F) or does not change**

     Refer to Circuit/System Testing.
   - **If warmer than –40° C (–40°F) and colder than 150° C (302° F) and changes**
3. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records data.
4. Verify the DTC does not set.
   - **If the DTC sets**

     Refer to Circuit/System Testing.
   - **If the DTC does not set**
5. All OK.

Circuit/System Testing

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the B34 Engine Coolant Temperature Sensor. It may take up to 2 minutes for all vehicle systems to power down.

        - If less than 1 V

    3. Ignition OFF

    4. Test for less than 2 Ω in the signal circuit end to end.

        - If 2 Ω or greater, repair the open/high resistance in the circuit.
        - If less than 2 Ω, replace the K20 Engine Control Module.

- **If warmer than 149°C (300°F)**

7. Test or replace the B34 Engine Coolant Temperature Sensor.

Component Testing

1. Ignition OFF, disconnect the harness connector at the B34 Engine Coolant Temperature Sensor.
2. Test the ECT sensor by varying the sensor temperature while monitoring the sensor resistance. Compare the readings with the Temperature Versus Resistance - Engine Coolant Temperature Sensor table. The resistance values should be in range of the table values.
    - **If not within the specified range**

      Replace the B34 Engine Coolant Temperature Sensor.
    - **If within the specified range**
3. Test for infinite resistance between each terminal and the sensor housing.
    - **If less than infinite resistance**

      Replace the B34 Engine Coolant Temperature Sensor.
    - **If infinite resistance**
4. All OK.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Engine Coolant Temperature Sensor Replacement
- Control Module References for engine control module replacement, setup, and programming.

Typical Scan Tool Data

ECT Sensor

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: Engine=Idling—At normal operating temperature. **Parameter Normal Range:** 88 to 105 °C (190 to 221 °F)			
Signal	140 °C (284 °F)	−40 °C (−40 °F)	−40 °C (−40 °F)
Low Reference	—	−40 °C (−40 °F)	—

Circuit/System Description

For an overview of the component/system, refer to: Cooling System Description and Operation

Circuit	Description
Signal	The control module input circuit has an internal resistance connected to 5 V.
Low Reference	Grounded through the control module.

Component	Description
B34 Engine Coolant Temperature Sensor	The sensor is a negative temperature coefficient thermistor. As the temperature of the air, fluid, or metal increases, the resistance of the sensor decreases, varying the voltage on the signal circuit.
K20 Engine Control Module	The control module contains a microprocessor used to process input data to control outputs. The control module controls a series of actuators to ensure optimal engine performance. The control module does this by reading values from a variety of sensors, interprets the data and adjusts the engine actuators accordingly.

Diagnostic Aids

After starting the engine, the ECT sensor parameter value should rise steadily and then stabilize after the thermostat opens.

Reference Information

Schematic Reference

Engine Controls Schematics

Connector End View Reference

Component Connector End Views

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Circuit/System Verification

1. Ignition » On / Vehicle » In Service Mode
2. Verify the scan tool parameter:ECT Sensor=−39 to 139 °C (−38 to 282 °F)
    - **If not between −39 and 139 °C (−38 and 282 °F)**

      Refer to: Circuit/System Testing
    - **If between −39 and 139 °C (−38 and 282 °F)**
3. Verify the scan tool parameter:ECT Sensor=The value should not spike or drop out.

   Perform the action while monitoring the parameter:

    - Wiggle the harness and connector(s):B34 Engine Coolant Temperature Sensor