

# Engine Coolant Temperature (ECT) Graph

**Meets NATEF Task:** (A8-B-7) Inspect and test sensors, actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action. (P-1)

Name \_\_\_\_\_ Date \_\_\_\_\_ Time on Task \_\_\_\_\_

Make/Model/Year \_\_\_\_\_ VIN \_\_\_\_\_ Evaluation: 4 3 2 1

Most engine coolant temperature sensors (ECTs) use a negative temperature coefficient (NCT) thermistor. The resistance of the sensor decreases as the temperature of the engine coolant increases. The vehicle computer applies a voltage to the sensor. The purpose of this worksheet is to plot the relationship of the ECT sensor temperature and the voltage.

- \_\_\_\_\_ 1. Carefully back probe the signal wire of the engine coolant temperature (ECT) sensor.
- \_\_\_\_\_ 2. Set the digital multimeter to read DC volts.
- \_\_\_\_\_ 3. Connect a scan tool or use a pyrometer to measure engine coolant temperature.
- \_\_\_\_\_ 4. Plot the voltage of the ECT every 10° as the engine warms up.

**NOTE:** Many engine computers connect another resistor in the ECT circuit when the temperature of the coolant reaches 120°-140°. This causes the voltage at the ECT sensor to rise, then continue to fall as the coolant temperature continues to rise.


100    110    120    130    140    150    160    170    180    190    200    210  
**TEMPERATURE (°F)**

- \_\_\_\_\_ 5. Was there a upward movement of the graph when the thermostat opened?  
                   **YES** \_\_\_\_\_ **NO** \_\_\_\_\_
- \_\_\_\_\_ 6. Was there a slight movement upward when the cooling fan came on?  
                   **YES** \_\_\_\_\_ **NO** \_\_\_\_\_
- \_\_\_\_\_ 7. Based on the test results, what is the necessary action? \_\_\_\_\_