Engine Coolant Temperature (ECT) Graph

Meets NATEF Task: (A8-B-5) 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.

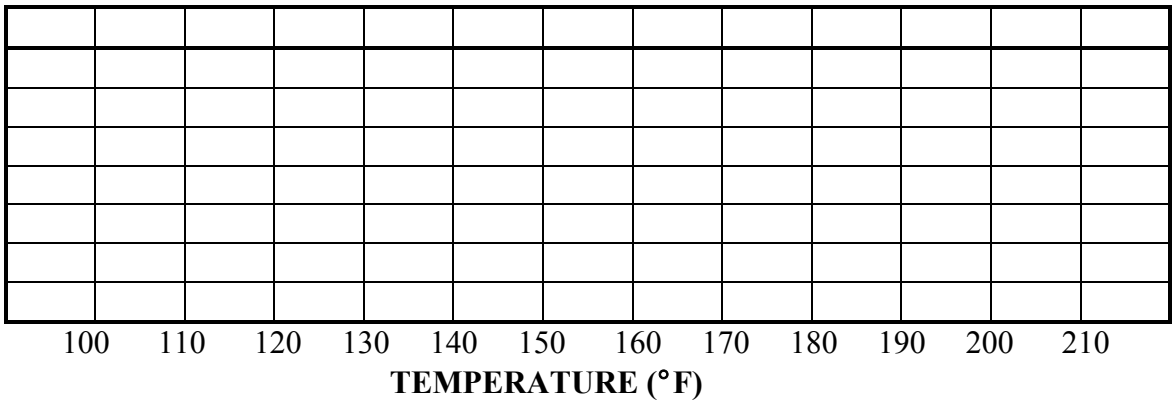
_____ **1.** Carefully back probe the signal wire of the engine coolant temperature (ECT) sensor.

_____ **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.



_____ **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? _____