Advanced Natural Gas Vehicle Training

Module 3: John Deere Computerized Engine Management System

Lesson 1: Temperature Sensors

Lecture: 15 Minutes

Lab: 15 Minutes

Classroom Instructional Objectives:

Upon completion of this unit of instruction the student will be able to:

- Define the operational characteristics of a negative temperature coefficient thermistor.
- List the relationship between resistance, voltage and current.
- Distinguish between manifold air, engine coolant, natural gas tank, and natural gas temperature sensors.
- Explain how to use the John Deere Operation and Diagnostic Manual.
- Define codes specific to manifold air, engine coolant, natural gas tank, and natural gas temperature sensors.
- Explains how to test the sensor five-volt reference using a lab scope and scan tool.
- Explains how to test the sensor signal using a lab scope and scan tool.
- Explain how to test the sensor ground using a lab scope and scan tool.

Key Classroom Points:

- Explain the operational characteristics of temperature sensors specific to John Deere natural gas engine applications.
- Explain the relationship between resistance, voltage and current as it relates to thermistors.
- Provide classroom examples of the John Deere natural gas temperature, manifold air, engine coolant, natural gas tank temperature sensors.
- Cover the John Deere wiring diagram section specific to temperature sensors.
- Explain how to use the John Deere Operation and Diagnostic Manual.
- Explain how to test sensor five-volt reference signal using a lab scope and scan tool.
- Explain how to test the sensor signal using a lab scope and scan tool.
- Explain how to test the sensor ground using a lab scope.

- Demonstrate how to use component locator information to find the specific parts on the engine.
- Explain fault codes related to the John Deere 6.8L engine.
- Explain how to perform symptom and fault code driveability checks.
- Explain how to perform symptom and no fault code driveability checks.

Lab Skill Objectives:

Upon completion of this unit of instruction the student will be able to:

- Locate the engine coolant, natural gas tank temperature, manifold air, and natural gas temperature sensors on the vehicle.
- Retrieve electronic control unit (ECU) fault codes specific to temperature sensors.
- Demonstrate how to test sensor five-volt reference using a lab scope and scan tool.
- Test the sensor signal using a lab scope and scan tool.
- Test the sensor ground.
- Perform diagnostic procedures using the John Deere operation and diagnostic manual.
- Perform symptom and no fault code driveability checks
- Perform symptom and fault code driveability checks.

Key Lab Points:

- Demonstrate the temperature/voltage relationship.
- Explain the differences between engine coolant, natural gas tank temperature, manifold air, natural gas temperature sensors.
- Demonstrate how to read John Deere wiring diagram sections specific to temperature sensors.
- Demonstrate how to use the John Deere Operation and Diagnostic Manual.
- Define fault codes specific to temperature sensors.
- Demonstrate how to test the sensor five-volt reference using a lab scope and scan tool.
- Demonstrate how to test the sensor signal using a lab scope and scan tool.
- Demonstrate how to test the sensor ground using a lab scope.
- Perform symptom and fault code driveability checks.
- Perform symptom and no fault code driveability checks

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Classroom Materials:

- Attendance sheet
- Power Point presentation CD
- Lap-top
- Projector
- Instructor's guide
- White board marking pens
- Projection screen

Handouts

- Power Point slide materials
- Lab activity sheet 25

Instructor's notes: