

# Basic Natural Gas Vehicle Training

## **Module 5: John Deere Computerized Engine Management System**

### **Lesson 3: Position Sensors**

**Lecture 15 Minutes**

**Lab 15 Minutes**

### **Classroom Instructional Objectives:**

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

- Explain the operational characteristics of position sensors.
- Recognize the difference between foot pedal position 1 (FPP1), foot pedal position 2 (FPP2) and throttle position sensors (TPS).
- Compare and contrast voltage output signals from John Deere FPP1, FPP2, and TPS sensors.
- List the relationship between throttle position and voltage output.
- Analyze John Deere wiring diagrams specific to position sensors.
- Explain how to test the five-volt reference wire using a multi-meter.
- Explain how to test the sensor signal wire using a multi-meter.
- Explain how to test the sensor ground wire using a multi-meter.

### **Key Classroom Points:**

- Explain the operational characteristics of position sensors.
- Explain the difference between John Deere FPP1, FPP2, and TPS sensors.
- Stress the importance of using wiring diagrams to diagnose position sensors.
- Demonstrate how to read John Deere wiring diagrams specific to position sensors.
- Provide specific examples of John Deere position sensors.
- Explain how to test the sensor five-volt reference signal using a multi-meter.
- Explain how to test the sensor signal using a multi-meter.
- Explain how to test the sensor ground using a multi-meter.
- Introduce electrical/electronic circuit testing using a lab scope.
- Explain fault codes related to John Deere position sensors.

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## **Lab Skill Objectives:**

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

- Create a chart of the position/voltage relationship between FPP1, FPP2, and TPS sensors.
- Recognize the difference between FPP1, FPP2, and TPS sensors.
- Locate and identify the FPP1, FPP2, and TPS sensors.
- Diagnose position sensors by using wiring diagrams.
- Perform voltage drop tests on position sensor circuits.
- Demonstrate how to test FPP1, FPP2, and TPS sensors using a digital multi-meter.
- Demonstrate how to test position sensors and evaluate their voltage signal for known good values.
- List fault codes related to John Deere pressure sensors.

## **Key Lab Points:**

- Demonstrate the position/voltage relationship of FPP1, FPP2, and TPS sensors.
- Explain the differences between FPP1, FPP2, and TPS sensors.
- Compare and contrast the voltage output from FPP1, FPP2, and TPS sensors.
- Explain how to read John Deere wiring diagrams specific to FPP1, FPP2, and TPS sensors.
- Demonstrate how to test FPP1, FPP2, and TPS sensors.
- Demonstrate how to test the five-volt reference using a multi-meter.
- Demonstrate how to test the sensor signal using a multi-meter.
- Demonstrate how to test the sensor ground using a multi-meter.
- Introduce electrical/electronic circuit testing using a lab scope.
- Explain fault codes related to John Deere pressure sensors.

## **Classroom Materials:**

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

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## Handouts:

- Power Point slide materials
- Lab activity sheet 11
- Wiring diagram

Instructor's notes:

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