

Advanced Natural Gas Vehicle Training

Module 3: John Deere Computerized Engine Management System

Lesson 10: Ignition System

Lecture: 40 Minutes

Lab: 45 Minutes

Classroom Instructional Objectives:

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

- Explain the operational characteristics of the ignition system.
- Explain the operation of the John Deere Ignition Control Unit (ICU).
- Explain the design of the John Deere combustion knock control system.
- Explain the characteristics of the John Deere ignition coils, spark plugs, and spark plug tubes.
- Compare and contrast various ignition designs found in heavy duty vehicle application.
- Explain how to use the John Deere Operation and Diagnostic Manual.
- Explain how to perform fault code diagnostic routines.
- Explain how to perform no fault code diagnostic routines.
- List the fault codes specific to the John Deere ignition system.
- Use John Deere diagnostic manual to locate specifications.
- Explain how to test the ICU, coil packs, spark plugs, and spark plug tubes.

Key Classroom Objectives:

- Explain the operational characteristics of the John Deere ignition system.
- Explain the ECU operational strategy used to control ignition timing.
- Explain the operation of the coils, spark plugs, and spark plug tubes.
- Compare and contrast the operation of the John Deere ignition system to other heavy duty ignition systems.
- Analyze John Deere wiring diagram sections specific to the ignition system.
- Explain how to use the John Deere operation and diagnostic manual.
- Explain how to perform fault code diagnostic routines.
- Explain how to perform no fault code diagnostic routines.
- List the fault codes specific to the John Deere ignition system.
- Explain how to use the John Deere diagnostic manual to locate specifications.
- Explain how to test the ignition coil using a lab scope.

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- Explain how to test the spark plug tubes using a lab scope.
- Explain how to test the spark plugs using a lab scope.
- Explain misfire codes related to the John Deere ignition system.
- Explain fault codes related to the John Deere ignition system.

Lab Skill Objectives:

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

- Locate on the vehicle the ICU, coil packs, spark plug tubes and spark plugs.
- Use the John Deere Operation and Diagnostic Manual to solve driveability complaints.
- Perform fault code diagnostic routines.
- Perform no fault code diagnostic routines.
- Extract fault codes specific to ignition misfire.
- Test the ICU using a lab scope.
- Test the Coils packs using a lab scope.
- Test the Spark plug wires using a lab scope.
- Test the spark plugs using a lab scope.
- Read and analyze John Deere wiring diagram sections specific to the ignition system and all of its related circuitry.

Key Lab Points:

- Explain how to use the John Deere Operation and Diagnostic Manual.
- Explain how to perform fault code diagnostic routines.
- Explain how to perform no fault code diagnostic routines.
- List the fault codes specific to misfire and ignition related problems.
- Demonstrate how to test the ICU using a lab scope.
- Demonstrate how to test the ignition coil packs using a lab scope.
- Demonstrate how to test the spark plugs using a lab scope.
- Demonstrate how to test the spark plug tubes using a lab scope.
- Explain how to read John Deere wiring diagram section/s specific to the ignition system.
- Explain fault codes related to the John Deere ignition system.
- Explain misfire codes related to the John Deere ignition system.

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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 32
- Wiring diagram

Instructor's notes:
