Nexteligence®
Connected-Tech Training

HEIL

3RD EYE®

Electrical Fundamentals II
Diagnosis and Testing

Two-Day Class

Scheduled Upon Request
(Factory or On-Site Availability Only)

HELP YOUR TECHNICIANS BUILD CONFIDENCE USING A DIGITAL MULTIMETER

A digital multimeter (DMM) is one of the most important diagnostic tools a technician uses, yet it is also one of the most commonly misused. Accurate electrical testing depends not only on having the right meter, but knowing how to use it correctly and safely in real service situations.

This two day course focuses specifically on proper digital multimeter operation, with an emphasis on hands on testing and real world troubleshooting. Students will learn how to confidently use a DMM to evaluate electrical circuits and components found on refuse trucks and related equipment.

In this class, students will explore:

- Identify the components and functions of a digital multimeter
- Select the correct meter settings for different types of electrical tests
- Safely test live and non-live circuits
- Measure voltage, voltage drop, resistance, and amperage
- Apply DMM testing techniques to common electrical components
- Interpret test results to identify circuit and component issues

Through guided instruction and practical exercises, participants will gain the skills needed to use a digital multimeter accurately, safely, and consistently when diagnosing electrical problems in the field.

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Electrical Fundamentals II Course Summary

Please Note: Students must bring their own multimeter for this class

Course Objectives

After completing this course, the student will be able to:

DAY 1

- Review the laws of electrical circuits, Ohm's Law, Watts Law, use of relays, electrical symbols, electrical faults, and using the proper test equipment.Understand the test tools within a digital multimeter and how each is used to diagnose electrical circuits.
- Follow the rules for safety and accurately testing electrical circuitry, including the different types of diagnostic tests.
- Understand how to maintain the digital multimeter to ensure that test results are accurate and proper. Learn how to use the meter to test functions of the meter.
- Learn how to properly set the digital multimeter to perform circuit tests such as Static Resistance, Dynamic Resistance, Open Circuit Voltage, Available Voltage, Continuity tests, and Amperage checks.
- Understand how to properly connect the meter to the circuit to perform the listed tests without damaging the circuit, a module/controller, or the meter.
- Demonstrate comprehension through knowledge checks focused on how voltage, amperage, and resistance behave at various points in a circuit under different electrical conditions and how will the digital multimeter display these readings.

DAY 2 - Hands on activities using electrical boards & power supplies

- Understand the number line and use it to convert readings to the base/zero line.
- Understand how to properly test a relay and use the test results to properly diagnose the operation of the relay.
- Understand how to properly test a diode and determine the quality of the diode.
- Use generated wiring schematics to build circuits using relays, light bulbs, and MAC valves then activate faults in each circuit and use the learned test procedures with the digital multimeter to diagnose each circuit and describe how to properly repair the circuit fault. There are four different circuits to build and diagnose.
- Review diagnosis and testing procedures and processes.

Course Outline

1. **What is a Digital Multimeter (DMM)?** Learn the components of the DMM and how each function is used to diagnose problems in an electrical circuit.
2. **Testing Resistance in Circuits.** Learn the proper procedure and understand the digital multimeter readings when testing circuits for Continuity, Static Resistance and Dynamic Resistance.
3. **Testing Voltage in Circuits.** Learn the proper procedure and understand the digital multimeter readings when testing circuits for Open Circuit Voltage, Voltage Drop, and Available Voltage.
4. **Testing Amperage in Circuits.** Learn the proper procedure and understand the digital multimeter readings when testing circuits for Amperage. Understand the difference in using the meter leads and an Amp Clamp.
5. **Testing Circuits.** Learn to test for voltage, voltage drop, resistance and amperage.
6. **Component Testing.** Apply your DMM to test various components such as relays, diodes and coils.
7. **Knowledge Check.** Test your knowledge by identifying how voltage, amperage and resistance reacts in an electrical circuit at different points under various electrical conditions.

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Have questions? We're here to help! Contact us by email: Nexteligence@Terex.com