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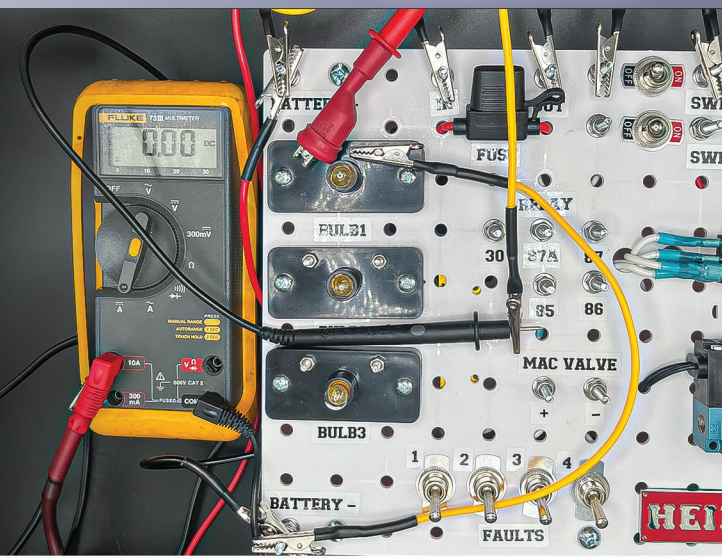
Connected-Tech Training

HEIL

3RD EYE®

Electrical Fundamentals I

Two-Day Class



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

HELP YOUR TECHNICIANS TAKE THEIR ELECTRICAL SKILLS TO THE NEXT LEVEL!

Electrical systems play a critical role in today's refuse trucks and equipment. From basic controls to sensors and diagnostics, technicians must understand how electrical systems function and how to work on them safely and correctly. This course provides a clear, straightforward introduction to electrical fundamentals used in everyday service and maintenance work.

This two-day course introduces the foundational principles of electricity, beginning with core theory and progressing into practical, real world applications used in daily service and maintenance.

In this class, students will explore:

- Electrical safety best practices and hazard awareness
- Fundamental electrical concepts, including voltage, current, and resistance
- Common electrical circuit types and how they function
- How to read and interpret electrical schematics
- Basic troubleshooting techniques for identifying and correcting electrical faults

Through a combination of classroom instruction and hands on learning, participants will gain the skills needed to confidently test, diagnose, and troubleshoot electrical systems with accuracy and consistency.

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Electrical Fundamentals I - Course Summary

Course Objectives

Day 1:

- Understand essential safety practices by reviewing best practice procedures, proper use of PPE, hazard classifications, and lockout/tagout requirements.
- Explain the fundamentals of electricity, including how electricity is formed and the difference between AC and DC power.
- Identify individual types of circuits (Series, Parallel, & Series-Parallel) and understand the laws of each type of circuit. Understand how voltage, current, and resistance interact with each type of circuit.
- Apply core electrical theory by applying Ohm's Law and the Power Formula (Watt's Law) to evaluate wiring, connectors, and components and determine equipment performance without guesswork.
- Interpret electrical schematics through recognition of standard symbols and accurate reading of circuit diagrams.
- Understand how a relay works in a circuit and what is the purpose of a relay within that circuit.
- Identifying a fault within an electrical circuit and understanding how that fault makes the circuit react allowing for quick and efficient fault identification.
- Understanding the difference in test equipment and what happens when the wrong test equipment is used on a circuit.

Day 2: (Hands-On activities using electrical boards)

- Understand how resistance reacts in a Series circuit when adding more loads to the circuit while verifying the resistance within the circuit with a digital multimeter.
- Using Watt's Law and Ohm's Law learn how to determine the resistance with a coil, such as the coil in a MAC valve.
- With power applied to the circuit, understand how voltage reacts in a Series circuit when adding more loads to the circuit while verifying the voltage with a digital multimeter.
- Understand how resistance reacts in a Parallel circuit when adding more legs/loads to the circuit while verifying the resistance within the circuit with a digital multimeter.
- With power applied to the circuit, understand how voltage reacts in a Parallel circuit when adding more legs/loads to the circuit while verifying the voltage with a digital multimeter.
- With power applied to the circuit, understand how voltage reacts in a Series-Parallel circuit by verifying the voltage with a digital multimeter.
- Understand how to use a schematic to verify wiring connections by using a schematic to wire a functioning relay circuit to operate a load.
- Understand how to properly set a digital multimeter and connect it into a Series circuit and a Parallel circuit to properly measure Amperage within the circuit.

Course Outline

1. **Safety.** Adhering to safety rules and guidelines is always a top priority for everything we do. Review best practices, personal protective equipment (PPE), hazard definitions and lock out tag out procedures.
2. **What is Electricity?** Learn how electricity is formed and the differences between alternating current (AC) and direct current (DC).
3. **Types of Electrical Circuits.** Learn the types of electrical circuits and how voltage, amperage, and resistance affect each circuit.
4. **Electrical Theory.** Overview and apply OHM's Law and the Power Formula, which are important equations for testing electrical components and knowing whether a device has failed without guesswork.
5. **How to Read Electrical Schematics.** Learn schematic symbols and how to read an electrical schematic.
6. **Faults in an Electrical Circuit.** Learn different types of faults that can occur in an electrical circuit.
7. **Knowledge Check.** Test your knowledge by troubleshooting various fault scenarios in a circuit.
8. **Resistance.** Learn how resistance is affected within a circuit when another load/resistor is added to the circuit. Learn how that resistance affects a Parallel circuit differently from a Series circuit.
9. **Voltage.** Learn how voltage is affected within a circuit when another load/resistor is added to the circuit. Learn how that voltage affects a parallel circuit differently from a Series circuit.
10. **Amperage.** Learn how amperage flows through a circuit and how amperage flow is different in a Parallel circuit compared to a Series circuit.

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