

2025 Low Voltage Seminar Course Descriptions

INTRODUCTORY

Basic Electrical Theory, Safety & Schematic Overview - Level 1A

(1.5-hour Introductory class, taught by Andy Pierce, unlimited)

Goal: Students will learn the basics of electrical theories (AC/DC, Circuits, etc.), safety (low and high voltage, protective equipment, etc.), and schematics (from reading a circuit to following a schematic for troubleshooting).

Introduction to Ski Lift Electrical - next level up from Basic Electrical - Level 1B

(2-hour Introductory class, taught by Tim Smith, Doug Tofflemeyer & Jeff Copeland, unlimited)

Goal: This hands-on program will cover turning a meter on and reviewing functions, and safety around a lift cabinet and will provide a demonstration of low-voltage componentry. Meters are required. Students should bring one if they have one (a few extras will be provided.) Students will rotate through different stations.

Intro PLC Class (Parts 1 & 2)

(Two 2-hour Introductory classes, taught by Chris Bowen, unlimited)

Goal: To provide students with an understanding of Programmable Logic Controls and a demonstration of how it works. Participants will learn the following concepts: what a PLC system is (*functional definition*) and includes (*processor, I/O, remote devices*); PLC programming (*software and communication for programming*); Communications Networks (*Ethernet, proprietary networks*); Indicators (*processor, I/O, remote devices*); and Troubleshooting basics.

Detachable Comm Line / Comm Line Boot Summer Maintenance

(2-hour Introductory class, taught by Andy Pierce, Doug Tofflemeyer, Tim Smith & Jeff Copeland, unlimited spaces, can be split into two groups)

Goal: This program is for those who want to dig into a fixed-grip, hands-on lab, and comm line setup. Students will receive RPD CPS detach training.

Detachable Systems Intro/Anti-Collision, Spacing

(2-hour Introductory class, taught by Andy Pierce & Scott Crowell, limited to 40 students. Part classroom, part trip to the gondola & Seven Brothers lift)

Goal: To provide a basic detachable lift systems overview. Students will learn about what's different system-wise on a fixed grip from what's on a detachable lift.

Electrical Components - "Things that Break"

(1.5-3 hour Beginner to Intermediate class, taught by Chris Bowen & Jeff Copeland, limited to 50 students) Level 1

Goal: To provide an interactive opportunity to review and discuss the following ski lift electrical components: switches, fans and motor blowers, encoders, PLCs (computer, power supply, input-output, and safety cards, HMI, software), RPDs and position sensors, circuit breakers and contactors, fuses, connector blocks, and wires and ferrules.

INTRO/INTERMEDIATE

Battery Maintenance, Electrical Shock Safety, Hydraulic Switches, Meter Troubleshooting & Device Intro/Testing

(2-hour Intro/Intermediate class, taught by Doug Tofflemeyer, Rob Darnell & Jeff Copeland, limited to 30 students) at Kissing Cousins lift.

Goal: to provide a conceptual overview of safety in operations and maintenance related to chair lift operations. Students will learn how to check batteries and arc flash, discuss how resorts deal with who can go in high voltage cabinets, and provide protection for those that do. Students will learn about more devices, relay contactors, setting hydraulic switches with meters, and more, plus do some hands-on troubleshooting.

Tower Safety Circuits

(2-hour Introductory/Intermediate class, taught by Sean Higgins and Shasta McMillen of Doppelmayr, limited to 30 students)

Goal: Participants in this program will gain hands-on experience working with sensors and switches specific to tower safety circuits.

INTERMEDIATE

Detachable Lifts Schematic Print Reading Part 1 & 2

(Two 2-hour Intermediate classes, taught by Chris Bowen)

Goal: To provide a basic detachable lift systems overview. *(What's the difference between what you know on a fixed grip and what is on a detachable lift?)* Students will learn about different types of electrical drawings, symbols, drawing legends and keys, numbering, and identifying wires. The first session will provide an overview of basic schematic print reading, and the second will teach students how to apply the print reading to detachable lifts. (How to use the multiple pages, charts, and books.)

Detachable Lifts Schematic Print Reading - Debugging

(2-hour Intermediate class, taught by Jeff Copeland & Steve Howell)

Goal: To provide experience debugging several problems for students following their participation in Detachable Lifts Schematic Print Reading 1 & 2.

INTERMEDIATE/ADVANCED

Troubleshooting Class & Latch Circuit (rotating groups between the two activities.

Most in any given class is 12 total, divided by two. Offer this class 2-3x.)

Hands-on troubleshooting at Seven Brothers

Build and debug a latch circuit. *(1.5 hrs. Intermediate to Advance – Jeff Copeland)*

Teams of up to five will assemble a latch circuit. The team will make up the wires with ferrules and connect them to a NO and NC switch, light, a relay, and all to a 24v power supply. A schematic is provided to those that need one.

ADVANCED

Drives / Motors Theory (Part 1 of 2)

(2-hour Advanced class, taught by Leighton Bates, Nathaniel Jakubens & Steve Howell, unlimited)

This class is intended for technical personnel in lift maintenance or snowmaking, with some experience working in electrical cabinets, and are safety conscious while performing tasks around higher voltages. The theory discussed is intended to expand the knowledge that is most useful for troubleshooting both AC and DC motors, including the drives that control the energy to operate them. Through understanding how these

components of any system are intended to function together, the technician may better realize which component is not performing as expected.

Drive & Motor Applications (Part 2 of 2)

(2 -hour Advanced class, taught by Leighton Bates, Nathaniel Jakubens & Steve Howell, limited to 20 students)

This class is intended to expand upon the foundation of D&M Theory, and will cover basic safety practices while working around Motors and Drives. With several lab stations prepared for attendees, we will assist technicians as they use the provided tools available to witness common fault scenarios, apply the theory previously discussed, and take corrective actions. This class is also intended to bridge the understanding of where Low Voltage Controls function in harmony with the Power Circuits. This class will work with 0-10VDC, 24VDC, 0-100VDC, 120VAC, and three-phase voltage up to 240VAC. Will include a presentation about transformers and connections, theory... AC & DC motor connections, 3-lead, 6-lead, 9-lead, or IEC metrics.

**** REQUIRED PPE FROM ATTENDEES: ****

SAFETY GLASSES AND CLEAN LEATHER GLOVES

Field Session Doing Summer Motor Drive Maintenance (Megger Motor, Test SCR's)

(2-hour Advanced class, taught by Leighton Bates, Nathaniel Jakubens & Steve Howell, limited to 20 students at Lincoln Express)

This class will review basic safety while working on motors and drives, and offer a live demonstration of each major inspection and testing procedure. A discussion of how data is interpreted will complement the previous two M&D sessions.