



Mechanical Service Contractors of Canada

ELECTRICAL TROUBLESHOOTING FOR HVAC LEVEL I TRAINING PROGRAM

NOW we finally have an electrical troubleshooting program that is designed specifically for HVAC-R technicians and is a full Four-Day Program. Over eighty-two percent of all service calls (heating or cooling) involve electrical troubleshooting. Unfortunately this is often a challenging area for service personnel. Two days are spent with 'Hands On Labs' which require the student to complete 199 electrical tests/questions. All students must complete a "Skills Analysis" test to which is used to determine which Level they belong in and to establish equivalent partners for the "Hands On" portion. This is confirmed by our final examination of 105 questions, which includes all practical electrical problems in the technician's language. It is completed at home so it is a learning tool rather than a stress filled experience for the student. The exam along with the 199 "Hands On Labs" and Review Questions prove to be an excellent evaluation and a meaningful source of reference for the student as it is in his/her own language.

Topics Covered:

Technicians new to the industry and those with several years of experience have found that the program consistently results in greater job satisfaction, a higher level of customer service and reduced costs. Quality results are obtained when a student is at least knowledgeable in the operation and controls of the standard furnace. Each student will progress from their current knowledge level to effective and efficient electrical troubleshooting including spark/hot surface ignition, flame rectification, capacitors, relays, multi-speed motors and testing of the micro amp signal.

Day 1

This is when the majority of the 'unlearning' is done when we take the mystery out of electricity through a host of practical experiments and demonstrations.

There is five hours of theory and three hours of 'Hands On' labs.

There are 1 1/2 hours of homework

Day 2

Practical and effective methods of using electrical meters (2 hours).

- *Voltmeter must be used two ways and it will save tens of thousands of dollars.*
- *Never/seldom use an ohmmeter. They are of little value and are often misleading.*
- *The three rules for using a clamp on style ammeter.*

'Hands On' labs to reinforce the proper use of meters (2 hours)

Examples of series circuits that are not 'supposed to' exist, but do in the thousands (1 hour). The students will be taught how to determine if there is a series circuit (7 seconds) and whether the problem is in the hot or neutral line (7 seconds).

Transformers (VA rating) and relays (two sets of single pole, double throw switches) require 1 hour to teach and 2 hours for the Hands On lab.

There are 2 hours of homework.



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Day 3

Introduction into wiring diagrams (3 hours).

Heat anticipation, operation of various types of air/pressure switches (1 hour).

Hands On labs (2 hours).

Factors affecting the amp draw of a motor and troubleshooting same (1 hour).

Self generating systems and energy cut-off devices (1 hour).

There are 2 hours of homework.

Day 4

Multi-speed motors and capacitors (1 hour)

Fireplace troubleshooting (1 hour)

Flame rectification, introduction into troubleshooting spark and hot surface ignition (2 hours)

Hands on labs (3 hours)

Examination

The student completes a 105 question examination at home, and then returns it to me for grading.



Rick Finlay - Rick has over 30 years of management experience in various industrial manufacturing companies and is the President of Hydrocarbon Training & Services Ltd. Rick has been involved with creating and delivering training programs for hourly workers, supervisors, mid-management and executive staff. He has the ability to relate to his audience and 'speak their language'. After retiring from corporate life, Rick completed his propane gas endorsements required for the recreational vehicle apprenticeship program and formed a company doing RV repairs and currently holds an Interprovincial Red Seal certificate as an RV Technician, working with propane / electronic appliances, as well as re-construction and repairs to structural components. During this period, Rick began teaching and partnered with Brent Pennington, the former managing partner of

Hydrocarbon Training & Services Ltd. The similarities between the components used in the heating refrigeration, construction heater and RV propane / natural gas appliances made the training aspect a natural fit. In fact today, Rick owns the Company.

Brent and Rick will continue to work together to ensure the original content and style are preserved for the benefit of the students.