



Advanced HVAC System Diagnostics Syllabus

Description: This 3-day course is designed to help intermediate to advanced service technicians improve the speed and accuracy of their diagnostics. There will be a mix of classroom and hands-on training so that students can practice what they are learning.

Level of Student: Intermediate to Advanced Service Technicians

Prerequisites: Minimum 3 years in the field

Tuition: Includes registration, course materials, lunch, and snacks. To qualify for the Early Bird special tuition of \$895, you must register on or before the date listed on the calendar. Normal tuition is \$1045.

Objectives:

- Improve speed & accuracy in electrical diagnostics
- Improve speed & accuracy in refrigeration diagnostics
- Improve speed & accuracy in airflow diagnostics
- Executing advanced communication skills in difficult customer situations

Class Components:

Segment 1: Residential schematics, diagrams, and troubleshooting

- Component matching and application
- Residential Electrical Schematics
 - Heat pump and air conditioning schematics
 - Air handler schematics
 - Using sequence of operation and ladder diagrams
 - Using pictorial electrical diagrams
 - Identifying electrical loads and troubleshooting methods
 - Electrical troubleshooting procedures
 - Shortcuts and best practices
- Split system refrigerant diagrams
 - Proper refrigerant flow
 - Oil return
- Refrigerant component troubleshooting
 - Compressors
 - Reciprocating, scroll, rotary, screw, centrifugal
 - Electrical failures

- Mechanical failures
- Metering devices
 - Cap tube, piston, TXV, EEV
- Evaporators
- Condensers
- Reversing valves
- Check valves
- Accumulators

Hands-on practice includes:

- Simulators
- Compressor tear down
- Accessory install and troubleshooting

Segment 2: Commercial Schematics, Diagrams, and Troubleshooting

- Commercial Electrical Schematics
 - Air Conditioning only, Gas Packs, Heat Pump
 - Accessory wiring and troubleshooting
 - Economizers
 - CO2 controls
 - Smoke detectors
 - Using sequence of operation and ladder diagrams
 - Using pictorial electrical diagrams
 - Identifying electrical loads and troubleshooting methods
 - Electrical troubleshooting procedures
 - Shortcuts and best practices
- Building management systems
- Commercial zoning controls
- Package unit refrigerant diagrams
 - Proper refrigerant flow

Hands-on practice includes:

- Wire tracker panel
- Wire VariTrac panel
- Wire TCM
- Wire CO2 controls
- Wire & troubleshoot economizers
- Wire smoke detectors

Segment 3: Duct work and Troubleshooting

- Duct work effects on air flow & refrigeration

Hands-on practice includes:

- Refrigerant system troubleshooting
 - Superheat
 - Sub-cooling
 - Understanding flooded and starved coils
 - Temperature split
 - Accessories
- System charging and capacity
- Electrical component troubleshooting
 - Defrost controls
 - Compressors
 - Motors
 - Thermostats
 - Safeties
 - Accessories

To register for this class, visit HBTI's website www.hvacinstitute.com or call the office at (253) 638-7797.