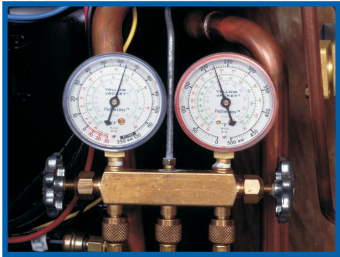


VIDEO BASED TRAINING



New training tools added...

- more **NEW** programs
- more **UPDATED** programs
- added **KEYWORD INDEX**
- videos coordinated to **ONLINE** testing
- videos to support **NATIONAL TESTING**



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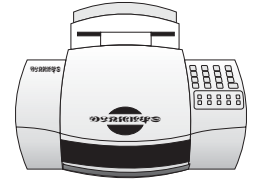


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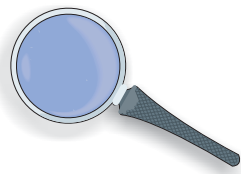


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Three Easy Ways to Find Programs to Support Technician Training...



Select programs using the *Keyword Index*.

Use this method when you want to find a video to teach a particular subject. The *Keyword Index* lists the titles rewritten to emphasize the primary subject of the program. To find a program on a particular subject merely look up the subject alphabetically in the *Keyword Index*.

The *Keyword Index* starts on page 1.



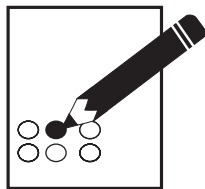
Select programs using the list of *Program Numbers and Titles*.

Use this listing for two purposes:

1. You have seen or were told about a video and wish to order a copy.
2. You have found a title in the *Keyword Index* and you wish to read the details about the program.

You can find all videos presently in the *Program Numbers and Titles index*.

The *Program Numbers and Titles Index* starts on page 3.

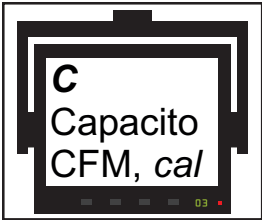


Select programs based on *Online Testing*.

The testing of HVAC Technicians is gaining broader acceptance. Much of the content in this catalog has been selected to quickly isolate the educational needs of the technician and improve the chances of passing many of these tests. This is particularly true of the NATE certification exam.

You can pre-qualify your personnel using the online test from VGI (the NATE test administrator). Using this test, the candidate is immediately given a detailed analysis of their test results with training recommendations. The test also provides a review of missed questions with specific training for each question.

To access the on-line test go to www.vgitraining.com/training and follow the instructions given.



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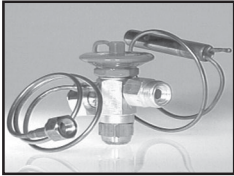
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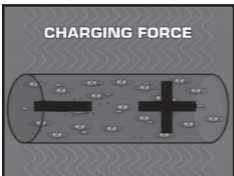
L4007-00B-V

TROUBLESHOOTING EXPANSION VALVES

Provides an in-depth look at TEV mechanics and operations, with emphasis on possible failures, causes, and solutions.

- Superheat Measurements
- TEV Evaluation
- Contamination
- TEV Malfunctions
- Valve Sizing
- Multi-circuit Coils

27 min.



L4008-00B-V

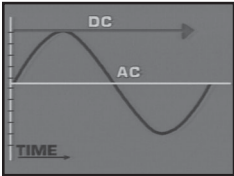
ELECTRON WORLD

Gives the viewer a "feel" for electricity that is vital to build and diagnose HVAC circuits. Animation is used extensively to aid in the understanding of the science of electron action and resulting effects on circuit components.

- Electron Movement
- AC and DC Current
- Voltage
- Basic Circuits
- Resistance
- Conductivity

21 min.

1st in Electricity Series (LBES-V)



L4009-00B-V

WORKING WIRES

Describes the circuit types and loads used in HVAC. It graphically portrays the power sources and how they are generated. The program closes with a look at magnetism and its application to HVAC circuits.

- HVAC Voltages
- AC vs. DC
- Transformers
- Electrical Waveforms
- Electromagnetism
- Relays

19 min.

2nd in Electricity Series (LBES-V)



L4010-00B-V

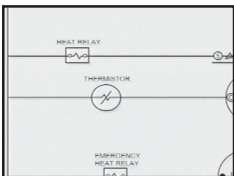
METERS AND MEASUREMENTS

Stresses the value of accurate interpretation of electrical meter readings. The viewer is taken through a step-by-step set of readings using both digital and analog type meters.

- Voltage Checks
- Continuity
- Current Checks
- Analog Meters
- Resistance Checks
- Digital Meters

19 min.

3rd in Electricity Series (LBES-V)



L4011-00B-V

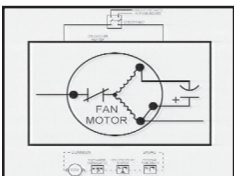
INSIDE CIRCUITS

Circuit analysis is covered using illustrations that are easy to grasp with comprehension that can be quickly put to use. The effects of various circuit combinations adds to the basic understanding that is vital for good electrical work.

- Ohm's Law
- Voltage Drops
- Control Strings
- Series Circuits
- Watts
- Parallel Circuits

19 min.

4th in Electricity Series (LBES-V)



L4012-00B-V

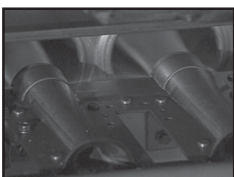
ELECTRICITY AT WORK

Looks at electricity as the technician sees it in the field. An overview of system wiring is covered together with the different types of commonly used wiring diagrams. Symbols are covered using a unique musical presentation. The need for safety, and how it can be assured, closes the program.

- 3 C's of Troubleshooting
- Accessory Wiring
- Symbols
- Safety
- Schematics
- Wiring Diagrams

25 min.

5th in Electricity Series (LBES-V)



L4013-00A-V

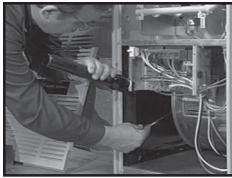
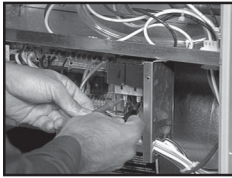
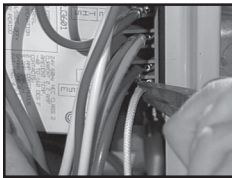
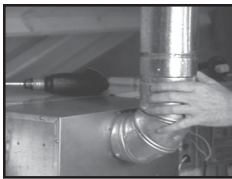
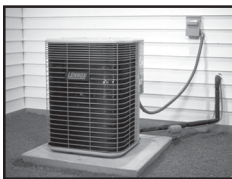
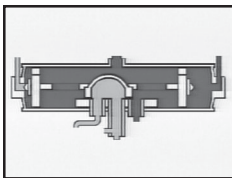
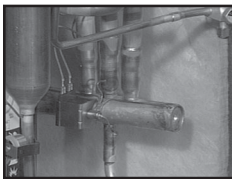
GAS COMBUSTION FURNACES (NATURAL DRAFT)

The first step in learning how to properly service any gas furnace is an understanding of the combustion process that takes place within the furnace. Also covers the fundamental components of a natural gas furnace, their operation and function.

- Heat Exchanger
- Controls
- Gas Valve
- Flame Types
- Burner Types
- Ignition Types

14 min.

1st in Gas Heating Series (LGAS-V)

**L4014-00A-V****L4015-00A-V****L4016-00A-V****L4017-00A-V****L4018-00B-V****L4019-00B-V****L4020-00B-V****L4021-00C-V**

TROUBLESHOOTING GAS FURNACES: MECHANICAL (NATURAL DRAFT)

The systematic mechanical checks needed to correctly diagnose problems in residential gas furnaces are shown in this video. Approved methods of checking and adjusting supply and manifold pressures are demonstrated in detail.

- Supply Pressure
- Gas Valve
- Manifold Pressure
- Limit Control
- Burner Pilot
- Ignition Failures

15 min.

2nd in Gas Heating Series (LGAS-V)

TROUBLESHOOTING GAS FURNACES: ELECTRICAL (NATURAL DRAFT)

Covers the procedures used in diagnosing electrical problems in basic gas heating systems. Procedures shown include checks of electrical controls, transformers, and safety switches.

- Safety Switches
- Gas Valves
- Control Switches
- Thermostats
- Limit Controls
- Transformers

15 min.

3rd in Gas Heating Series (LGAS-V)

SPARK IGNITION OPERATION AND TROUBLESHOOTING (NATURAL DRAFT)

Examines the operation and components of a spark ignition system. Troubleshooting procedures are shown that will speed diagnostics of each of the major components.

- Thermal Flame Pilot Sensing
- Electronic Ignition
- Vent Damper Systems
- Gas Valve Interface
- Flame Rectification
- Troubleshooting

14 min.

4th in Gas Heating Series (LGAS-V)

FUNDAMENTALS OF GAS VENTING (NATURAL DRAFT)

Gas furnaces produce waste in the form of combustion by-products or gases. Proper outdoor venting of these gasses is an important part of a heating system. A definitive look at the function of gas venting, installation and design, plus troubleshooting guidelines.

- Vent Designs
- Vent Sizing
- Flues
- Chimneys
- Vent Installation
- Induced Draft

15 min.

5th in Gas Heating Series (LGAS-V)

SCROLL COMPRESSOR OPERATION AND SERVICE

A look at one of the industry's most important technical advances. Explains scroll compressor construction, operating characteristics and troubleshooting, as well as system design and application.

- Scroll Mechanics
- Efficiency
- Advantages
- Durability
- Capacity

14 min.

INTRODUCTION TO HEAT PUMPS

Covers the operating principles of the air-to-air heat pump. Main components of the system are studied and the complete heat pump cycle is explained.

- Operation
- Compressors
- Reversing Valves
- Safety Controls
- Metering Devices
- Accessories

15 min.

1st in Heat Pump Series (LHP-V)

REVERSING VALVE OPERATION

Gives a detailed look at the operating characteristics of reversing valves, their role in the heat pump cycle, and valuable installation tips.

- Valve Mechanics
- Coil Operation
- Slide Operations
- Valve Cycling
- Precautions

15 min.

2nd in Heat Pump Series (LHP-V)

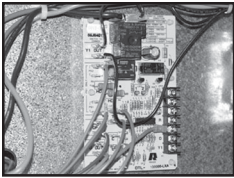
REVERSING VALVE TROUBLESHOOTING

Teaches systematic diagnostic procedures and aids in the understanding of major causes of reversing valve failure. It also presents important replacement guidelines.

- Mechanical Problems
- Valve Function
- Cooling Mode
- Heating Mode
- Electrical Problems
- Valve Replacement

15 min.

3rd in Heat Pump Series (LHP-V)

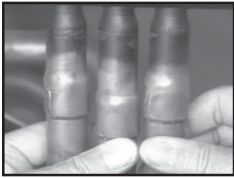
**L4022-00B-V**

HEAT PUMP DEFROST CONTROLS

Low outdoor temperature combined with high humidity levels can reduce the efficiency of a heat pump by causing frost and ice to develop on the heat pumps outdoor coil. Explains how a defrost control senses and eliminates these accumulations.

- Defrost Function
- Mechanical Defrost
- Control Types
- Defrost Relays
- Solid State Defrost
- Termination

16 min.

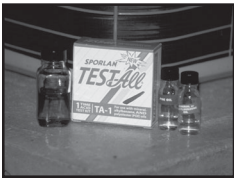
4th in Heat Pump Series (LHP-V)**L4023-00C-V**

HEAT PUMP DIAGNOSTICS

Designed to help the technician efficiently diagnose and correct malfunctions in a heat pump system. Methodical procedures for isolating the source of a problem are represented, along with suggested techniques for correcting typical problems in the shortest time.

- Reversing Valve Checks
- Failure Types
- Defrost Control Checks
- Noise Problems
- Heating Checks
- Cooling Checks

15 min.

5th in Heat Pump Series (LHP-V)**L4024-00C-V**

HEAT PUMP CLEANUP

Covers the cleanup procedures used when a compressor fails in a heat pump. Both mechanical failures with and without a burn are discussed. Also shows how to trace, clean up, and perform important tests on related components in a heat pump system following a compressor failure.

- Compressor Failures
- Burnouts
- Unit Start-Up
- Charging
- Compressor Removal
- Compressor Replacement

14 min.

6th in Heat Pump Series (LHP-V)**L4028-00A-V**

PULSE FURNACE INSTALLATION

The pulse furnace sets a new standard for heating efficiency. Provides an overview of the Pulse design and the importance of a good installation. While this information covers the G14 in all its configurations, its information is valuable for a basic understanding of any Pulse furnace installation.

- Condensate Lines & Traps
- Gas Supply
- Low Ambient Control
- PVC Piping
- Sound Isolation
- Unit Mounting

15 min.

**L4029-00A-V**

PULSE FURNACE OPERATION AND TROUBLESHOOTING

Provides a detailed discussion of Pulse operation. Also covers electrical and mechanical troubleshooting. Loaded with information that is critical to a complete understanding for the Pulse furnace.

- Combustion Cycle
- Pressure Switches
- Venting
- System Wiring
- Purge Cycle
- Orifice Checks

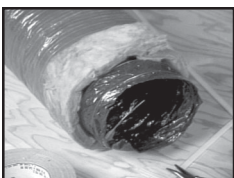
65 min.

**L4030-01A-V**

DUCT FABRICATION - SHEET METAL

Demonstrates approved methods of constructing, connecting, and supporting sheet metal ductwork. Sheet metal duct repair is also covered.

- Support
- Fabrication
- Joining Sections
- Insulating Ducts
- Sealing Joints
- Routing Ducts

**L4030-02A-V**

DUCT FABRICATION - FLEXIBLE DUCT

The use of flexible duct has increased a great deal in a few short years. Teaches how to properly install, support, and repair flexible duct.

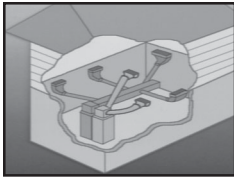
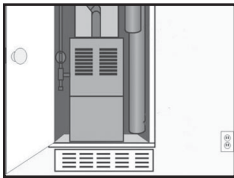
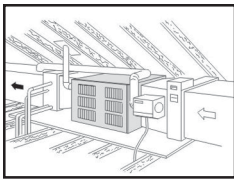
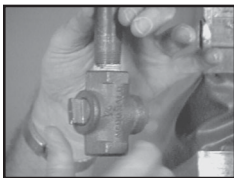
- Support
- Fabrication
- Joining Sections
- Insulating Ducts
- Sealing Joints
- Routing Ducts

**L4030-03A-V**

DUCT FABRICATION - DUCTBOARD

Ductboard provides rigid construction without the problems associated with sheet metal ductwork. Shows how to properly assemble, support, and repair this type of duct system.

- Support
- Fabrication
- Joining Sections
- Insulating Ducts
- Sealing Joints
- Routing Ducts

**L4031-00C-V****L4032-00B-V****L4033-00C-V****L4034-00C-V****L4035-01A-V****L4035-02A-V****L4035-03A-V****L4035-04A-V**

RESIDENTIAL DUCT SYSTEMS

Describes the types, applications, and advantages of six basic supply duct configurations. Also explains the different furnace supply and return configurations, and discusses duct system combinations typically used in the northern and southern regions.

- Perimeter Radials
- Radial Duct Systems
- Perimeter Loops
- Return Duct Systems
- Extended Plenum
- Overhead Reducing Radial

16 min.

BASEMENT INSTALLATIONS

Takes the viewer step-by-step through the process of a basement installation, from the best location of the furnace, the placement of the evaporator coil, to running duct work.

- Furnace Location
- Mounting
- Gas Supply
- Duct Designs
- Combustion Air
- Refrigerant Lines

13 min.

CLOSET INSTALLATIONS

Demonstrates the proper method of positioning a furnace in a closet, and positioning the cooling coil to promote condensate drainage. Also covers the installations of refrigerant lines, gas lines, flue vents, and condensate lines.

- Furnace Location
- Mounting
- Gas Supply
- Duct Designs
- Combustion Air
- Refrigerant Lines

15 min.

ATTIC AND CRAWLSPACE INSTALLATIONS

A furnace installed in an attic or crawlspace is popular in warm climates. Explains how to locate and mount the furnace for best air distribution and quietness. Explains the proper methods of suspending the furnace, the installation of the cooling coil, duct system, refrigerant lines, thermostat wires, gas piping, and flue vent.

- Furnace Location
- Mounting
- Gas Supply
- Duct Designs
- Combustion Air
- Refrigerant Lines

15 min.

INSTALLING GAS SUPPLIES

Demonstrates iron pipe cutting techniques, and the proper methods for installing gas lines.

- Leak Checks
- Code Requirements
- Gas Pipe Fittings
- Joint Compounds
- Gas Supply Layout

INSTALLING NATURAL DRAFT FURNACE VENTS

Demonstrates how to properly install vent systems for natural draft furnaces. Code requirements, joining techniques, and weatherproofing techniques are also covered.

- Flue Types
- Clearances
- Leak Checks
- Assembly Techniques
- Assorted Components

INSTALLING INDUCED DRAFT FURNACE VENTS

Demonstrates approved methods used to attach, route, and terminate vent piping for induced draft furnaces. Routing, and vent materials are also covered.

- Flue Types
- Draft Checks
- Vent Pipe Fittings
- Code Requirements
- Clearances

INSTALLING CONDENSING FURNACE VENTS

Condensing furnaces typically use exhaust vents fabricated from PVC. Covers the techniques used to correctly join, fabricate, and assemble this type of material.

- Adhesives
- Installation Precautions
- Layout
- Joining Techniques
- Code Requirements



L4036-00B-V

INSTALLING CONDENSING UNITS AND REFRIGERANT LINES

Helps to determine proper location for the installation of the outdoor condensing unit and shows the appropriate methods for attaching the refrigerant lines.

- Unit Location
- Slabs
- Clearances
- Tube Bending
- Brazing
- Insulation

13 min.



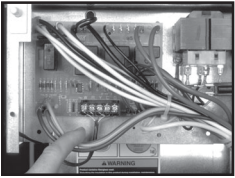
L4037-00B-V

INSTALLING RESIDENTIAL ACCESSORIES

Gives an overview of function, operation and typical installation procedures on several types of mechanical filters, electronic air cleaners, humidifiers, and programmable thermostats.

- Mechanical Filters
- Humidifiers
- Electronic Air Cleaners
- Programmable Thermostats

16 min.



L4038-00B-V

FIELD WIRING OF RESIDENTIAL FURNACES

The technician must know how to properly use test equipment to test electrical components and wiring. Covers high voltage residential power distribution, low voltage wiring practices, testing components, wire sizing, code requirements, and safety precautions.

- Wiring Gas Furnaces
- Wiring Accessories
- Wiring Heat Pumps
- Wiring Electrical Furnaces
- Wiring Condensing Units

14 min.

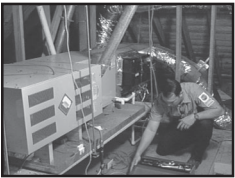


L4039-01A-V

RESIDENTIAL START-UP OF NATURAL DRAFT FURNACES

Explains the initial steps for starting a natural draft furnace. Flame checks, ignition checks, and draft tests are included.

- Pilot Checks
- Visual Checks
- Start Sequence
- Shut Down Sequence
- Fuel Pressure Adjustments
- Fan Limit Adjustments



L4039-02A-V

RESIDENTIAL START-UP OF INDUCED DRAFT FURNACES

Demonstrates the procedures used in starting induced draft furnaces. Operating sequences, function checks, and possible system adjustments are also covered.

- Inducer Blower Checks
- Blower Motor Adjustments
- Igniter checks
- Sequence checks
- Safety checks

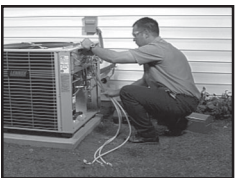


L4039-03A-V

RESIDENTIAL START-UP OF CONDENSING FURNACES

To realize the full efficiency of a condensing gas furnace it must be set-up and adjusted correctly. Details the checks on a typical condensing furnace. Combustion air and condensate lines are also covered.

- Heat Rise Checks
- Ignition Checks
- Fuel Pressure Checks
- Burner and Blower Start-Up
- Burner and Blower Shutdown



L4039-04A-V

RESIDENTIAL START-UP OF A/C

Demonstrates correct procedures used in starting a new A/C unit. Component checks, refrigerant pressures, and system readings are also covered.

- Wiring Checks
- Pressure Checks
- Thermostats
- Leak Checks
- Electrical Checks
- Charging Techniques

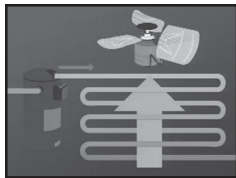


L4039-05A-V

RESIDENTIAL START-UP OF HEAT PUMPS

Shows the correct methods used in the initial start-up of a residential heat pump. Operational checks are demonstrated on a heat pump in both the heating and cooling modes.

- Wiring Checks
- Reversing Valve Checks
- Low Voltage Checks
- Component Checks
- Operational Sequences



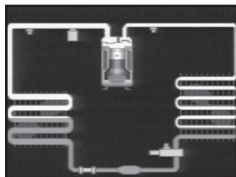
L4042-00B-V

HEAT TRANSFER AND COOLING

The movement of heat is the foundation of understanding air conditioning. How heat moves both inside and outside a boiling liquid shows us the true "heart" of a cooling circuit. The definitions of heat, both in quality and quantity, are the important start of an education in good air conditioning practices.

- Convection
- Radiation
- Heat Energy
- Specific Heat
- Sensible Heat
- Heat Loads

25 min.

1st in Air Conditioning Series (LBAC-V)

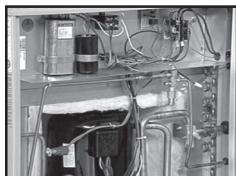
L4043-00B-V

AIR CONDITIONING CIRCUITS

Refrigerant pressures and temperatures required to extract and remove heat from a conditioned space are examined in this program. The air conditioning sequence and the operation of each component is explained in detail.

- Circuit Elements
- Evaporator
- Superheat and Subcooling
- Compressor
- Refrigerant
- Condenser

18 min.

2nd in Air Conditioning Series (LBAC-V)

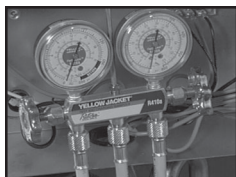
L4044-00B-V

AIR CONDITIONING COMPONENTS

Examines new components used in air conditioning equipment. New component design and the designs overall effect on system performance and reliability is also covered.

- Condensate Drains
- Condensing Units
- Filter-Driers
- Controls
- Evaporators
- Refrigerants

27 min.

3rd in Air Conditioning Series (LBAC-V)

L4045-00B-V

AIR CONDITIONING TOOLS AND MEASUREMENTS

New procedures and service tools are required as HVAC equipment changes. Explains the purpose and use of these tools and explains how they can save time and improve the quality of HVAC work.

- Tubing tools
- Leak detectors
- Brazing tools
- Evacuation tools
- Charging tools
- Electrical tools

36 min.

4th in Air Conditioning Series (LBAC-V)

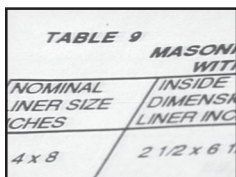
L4046-00B-V

EVACUATION, CHARGING, AND CHECKOUT

Evacuation and charging are critical steps in the installation of every HVAC system. Covers the information needed in selecting the correct procedures that will decrease installation time and maximize system performance.

- Leak Checks
- Determining Charge
- Checking Charge
- Checking System
- Moisture Checks
- Evacuation Options

27 min.

5th in Air Conditioning Series (LBAC-V)

L4057-00A-V

USING THE AGA/GAMA VENT TABLES

Using the AGA-GAMA vent tables is a must for any technician. The often misinterpreted tables are explained in full detail. The use of graphics and video helps the technician to understand and use the tables correctly.

- Configuration Selection
- Tables Format
- Vent Capacities
- Vent Requirements
- Vent Diameter Selection
- Draft Methods

25 min.



L4064-00A-V

COMPRESSOR CHECKOUT PROCEDURES: ELECTRICAL

HVAC service people must be able to identify cooling equipment problems, and repair them accurately and quickly. Focuses on electrical checks made on the condensing unit, including line voltage and low voltage components such as switches, thermostats, and contactors.

- Troubleshooting Sequence
- Condenser Fan Checks
- Contactor Checks
- Pressure Control Checks
- Capacitor Checks
- Compressor Checks

26 min.



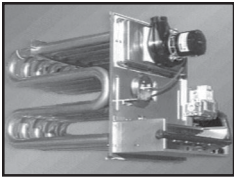
L4065-00A-V

COMPRESSOR CHECKOUT PROCEDURES: MECHANICAL

Over 50% of all compressors returned to the factory have nothing wrong with them. This video helps the service technician develop a systematic troubleshooting method to help solve cooling problems, not just their symptoms.

- Pressure Tests
- Low Head Problems
- Low Suction Problems
- IPR Checks
- High Head Problems
- High Suction Problems

30 min.

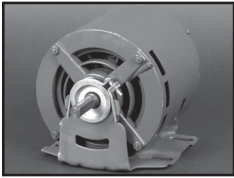
**L4066-00A-V**

HEAT EXCHANGER CHECKOUT

Details the steps used in diagnostic tests to the heat exchanger of a gas furnace. The effect of leaks on system performance, visual leak indications, and mechanical methods of leak detection are also shown.

- Heat Exchanger Failures
- Carbon Monoxide Prevention
- Heat Exchanger Test
- Combustion and Supply Air
- Common Misconceptions
- Visual Checks

30 min.

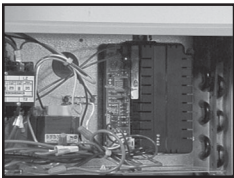
**L4068-00A-V**

BASIC AC MOTORS

Induction motors powered by alternating current are an integral part of the HVAC industry. Simplifies diagnostics and reduces needless motor replacements by explaining the operation and construction of these motors.

- Induction Motor Theory
- Motor Enclosures
- Motor Types
- Bearing Types
- Motor Spec & Ratings
- Motor Mounts

26 min.

**L4069-00A-V**

ELECTRONIC TWO-SPEED COMPRESSOR CONTROLS

Provides technicians with an insight to electronic two speed compressor controls. Covers many functions and controlling sequences of the TSC's from both early to current control units.

- Operating Sequence
- Speed Sequencing
- Safety Input Options
- Mode Selection Options
- Field Diagnostics
- Troubleshooting

23 min.

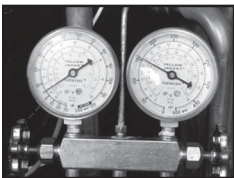
**L4070-00A-V**

COMBUSTION EFFICIENCY TESTING IN GAS FURNACES

Describes the combustion process and the importance of combustion efficiency testing as it relates to overall system performance in a gas or oil furnace.

- Combustion principles
- Combustion variables
- Gas Combustion testing
- Gas flow
- Oil Combustion testing
- CO₂ testing

18 min.

**L4072-00A-V**

REFRIGERANT CHARGING METHODS

For an air conditioning refrigeration circuit to work properly with efficiency and reliability, a complex balance of pressures and temperatures must be maintained. Presents the charging steps required of the technician that affect system performance and the tools and methods used to carry out these steps.

- Basic Refrigeration Cycle
- Charging Tools
- Refrigerant Charging Meters
- Charging Methods
- Safety Considerations
- Checking Methods

22 min.

**L4073-00A-V**

SPARK IGNITION

For years, the standing pilot was considered the standard method of igniting burners in forced air gas furnaces. In today's systems, the trend has moved towards the more energy efficient spark ignition. Spark ignition principles and operating methods are explained as well as specific manufacturer's controls.

- Robertshaw Ignition
- Spark ignition
- Heatcraft Ignition
- Pilot sensing
- Johnson Controls Ignition

25 min.

**L4074-00A-V**

INSTALLATION AND START-UP OF HIGH EFFICIENCY FURNACES

Today's high efficiency gas furnaces require an increased level of expertise all the way from the initial sales call to the final installation. Describes the installation process for typical high efficiency gas furnace systems.

- Duct systems
- Vent piping
- Condensate piping
- Gas piping
- Electrical wiring
- System start-up

26 min.

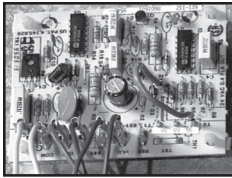
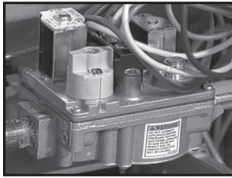
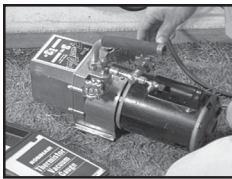
**L4075-00A-V**

METERING DEVICES

For efficient performance, a precise amount of refrigerant at the correct pressure must be fed to the evaporator. This flow is controlled with a variety of refrigerant metering devices. Explores the construction and use of these metering device types.

- Basic refrigeration cycle
- Troubleshooting
- Restriction metering devices
- Superheat
- Thermal Expansion Valves
- Subcooling

23 min.

**L4077-00A-V****L4079-00A-V****L4089-00A-V****L4091-00A-V****L4092-00A-V****L4093-00A-V****L4095-00A-V****L4097-00A-V**

DEFROST CONTROLS

Proper defrost control is an important ingredient in maintaining good heat transfer and preventing a reduction in heating capacity. An introduction to the function, operation and troubleshooting of various defrost controls.

- Clock timer defrost controls
- Solid state defrost controls
- Time defrost controls
- Temperature defrost control
- Air pressure controls

20 min.

GAS VALVES

The gas valve is a fundamental component of the gas combustion system. Today's technician needs to understand the ever-growing complexity of the many different gas valves available. Provides an in-depth look at the construction and use of the gas valve.

- Types of gas valves
- Installation
- Setup
- Troubleshooting
- Thermocouples
- Flame rectification

19 min.

BASIC THERMOSTATS

A primary component of comfort in a structure is the temperature of the air within the structure. Desired temperature is maintained by an HVAC system which is controlled by a thermostat located in the structure. Covers the various types and operations of thermostats as well as their installation and troubleshooting.

- Electromechanical thermostats
- Electronic thermostats
- Installation
- Troubleshooting

23 min.

EVACUATION AND DEHYDRATION

Removal of all moisture, air, and other non-condensables from a refrigerant circuit is a MUST before a refrigerant charge is introduced into the piping. These contaminants are removed using an evacuation and dehydration process. Explores the procedures used to ensure that an evacuation is done properly.

- Dehydration
- Vacuum pump
- Vacuum gauge
- Single evacuation
- Deep evacuation
- Triple evacuation

18 min.

SERVICE PROFESSIONALISM

Today's HVAC customer is looking for a highly professional technician. Discusses the technician's need for professionalism in appearance, behavior and communication with the customer. Covers the steps necessary to maintain professionalism throughout the workday.

- Meeting the customer
- Resolving issues
- Disgruntled customers
- Dress
- Selling yourself
- Grooming

16 min.

HOT SURFACE IGNITION

Hot surface ignition has proven to be an energy efficient, reliable alternative to standing pilots and spark ignition. Details the operation of the hot surface ignition system and its variations from alternative systems.

- Thermocouple sensing
- Flame conduction
- Ignition system control
- Flame rectification
- Sequence of operation
- Hot surface ignitions

21 min.

AIRFLOW MEASUREMENTS

The key to complete performance is a properly designed and installed central system AND air distribution system. Teaches the technician the elements of a properly operating duct system and the techniques to be used in the field to bring the system into proper balance.

- Seasonal considerations
- Measuring techniques
- Computing air distribution
- Setting blower speeds
- Airflow measurements
- Use of balancing dampers

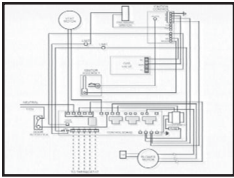
21 min.

INDOOR AIR QUALITY

Indoor Air Quality (IAQ) is a factor becoming ever more important for the HVAC technician. Covers the fundamentals of IAQ and the appropriate role for the technician when discussing these issues with customers. The steps the technician can take with an HVAC system to improve IAQ are also covered.

- IAQ issues
- Sources of Indoor pollutants
- HVAC equipments role
- Steps to reduce emissions
- HVAC technicians role
- Removing pollutants

21 min.



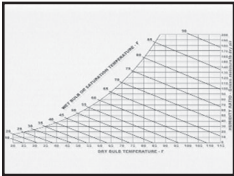
L4099-00A-V

SCHEMATICS

Starts with the fundamentals of schematics and builds upon them to make schematics an easy to use tool. Designed to eliminate a fear most technicians have when handed a schematic.

- How voltages are displayed
- Ladder diagrams
- How loads are displayed
- Connection diagrams
- Most often used symbols
- Schematic types

25 min.



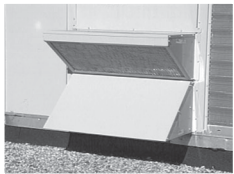
L4100-00A-V

UNDERSTANDING PSYCHROMETRICS

Cuts through the first-glance complexity of the "psych" chart and brings its power to the surface. After finishing this program, the technician will be able to quickly solve temperature and humidity related problems.

- Sensible heat ratios
- Dry bulb readings
- Sling psychrometers
- Wet bulb readings
- Relative humidity
- Converting readings

23 min.



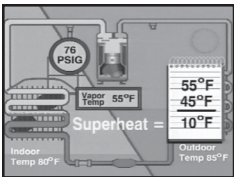
L4101-00A-V

ECONOMIZERS

An economizer allows outdoor air - which is at an acceptable temperature and humidity - to be used for cooling instead of more costly mechanical refrigeration. Explores the economizer from design requirements to proper use in the field.

- Applications
- Control configuration
- Setpoint requirements
- Enthalpy controls
- Setup procedures
- Troubleshooting

24 min.



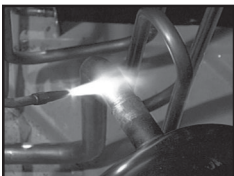
L4102-00A-V

SUPERHEAT AND SUBCOOLING

A proper charge contributes to high capacity, efficiency, and reliability in an air conditioner or heat pump. Checking superheat and subcooling are two very important checks that are critical for a good installation and quick service diagnosis. Simplifies these checks and demonstrates their importance.

- What is superheat?
- Role of superheat in A/C
- What is subcooling?
- How to measure superheat
- Role of subcooling in A/C
- How to measure subcooling

20 min.



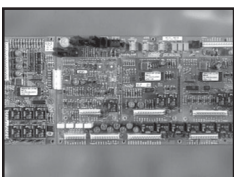
L4103-00A-V

BRAZING REFRIGERANT LINES

Discusses the fundamentals that make brazing much less a mystery and more a reliable technician procedure. With a little practice and the information in this program, even a novice can quietly make reliable brazed joints.

- Where and how to use flux
- How to use the filler rod
- How to adjust a flame
- How to apply heat
- The oxy-acetylene rig
- What is brazing?

23 min.



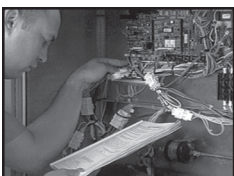
L4104-00A-V

INTEGRATED MODULAR CONTROL - DESIGN AND OPERATION

The Integrated Modular Control (IMC) is unique. Breaks through the product mystery to simplify and explain. Using easily understood graphics, product features are described and sequences are easily seen. If you install the L-series, this program is a must!

- Basic design
- Board functions
- Configuration
- Sequencing
- Basic field checks
- Error codes

23 min.



L4105-00A-V

INTEGRATED MODULAR CONTROL - STARTUP AND CHECKOUT

Integrated Modular Controls are used in "L" Series units from 3 through 30 tons. Introduces the functions of the main control board and the six add-on boards used to build various control configurations.

- Main control operation
- Board layouts
- Check-out procedures
- Enthalpy controls
- Computer diagnostics
- Dip-switch settings

22 min.



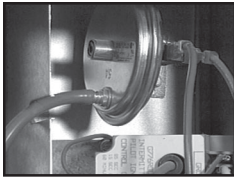
L4106-00A-V

SIZING AND LAYOUT OF REFRIGERANT LINES

The sizing and layout of refrigerant lines is often mistakenly overshadowed by other HVAC installation concerns. Explains how line size and layout can affect customer comfort, system performance, and equipment life.

- Sizing refrigerant lines
- Installing vertical lines
- Effect of copper fittings
- Minimizing vibration
- Insulating refrigerant lines

23 min.



L4107-00A-V

DIFFERENTIAL PRESSURE CONTROLS IN GAS FURNACES

Examines the construction and operation of differential pressure controls in modern gas furnaces. Troubleshooting, installation, and replacement techniques are demonstrated.

- Construction
- Troubleshooting
- Replacement
- Switching action
- Installation

23 min.



L4108-00A-V

PREVENTIVE MAINTENANCE ON 80% EFFICIENCY GAS FURNACES

A thorough set of preventative maintenance steps can result in reduced equipment repairs, and an increase in customer satisfaction. Shows the steps necessary to maximize equipment service life and maintain optimal performance.

- Induced draft motor checks
- Motor maintenance
- Electrical checks
- Blower checks
- Checking gas pressures
- Visual checks

24 min.



L4109-00A-V

COMPRESSOR CHANGEOUT

Covers the steps involved in removing a failed compressor, and in installing its replacement. Cleaning the system after a compressor burnout is demonstrated along with handling and warranty procedures.

- Compressor removal
- Brazing
- Wiring
- Cleanup procedures
- Sealing compressors
- Warranty paperwork

26 min.



L4110-00A-V

HVAC ESSENTIALS: AN INTRO TO AC EQUIPMENT (NON-TECH. PERSONNEL)

Describes the major components in a HVAC system and explains how their combined functions relate to year-round indoor comfort. Explanations are given for the industry terms used in describing the size and efficiency of HVAC components.

- System Component Names
- Heat Pump Operation
- Types of Metering Devices
- Basic HVAC Terminology
- Reversing Valve Operation

18 min.



L4111-00A-V

PREVENTIVE MAINTENANCE ON 90% EFFICIENCY GAS FURNACES

Explains how 90% efficiency gas furnaces should be inspected to maintain maximum efficiency and service life.

- Condensate piping
- Combustion air piping
- Ignition controls
- Electrical checks
- Induced draft checks
- Visual checks

25 min.



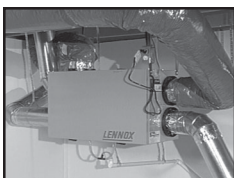
L4112-00A-V

SERVICING R-410A A/C UNITS

R-410a was developed in response to the growing need in the HVAC market for ozone friendly refrigerant. Explains operating characteristics and charging techniques that a technician must understand in order to service R-410a equipment. Service procedures and tools related to R-410a are also covered.

- Charging with R-410a
- New tools
- Compatibility
- Equipment identification
- Operating pressures

21 min.



L4113-00A-V

ADDING FRESH AIR TO RESIDENTIAL SYSTEMS

The addition of fresh air is one of the best ways to purify and improve indoor air quality. Explains the operation of recovery ventilators and how we can use them to lower utility bills while maintaining fresh, clean, indoor air.

- Indoor air quality
- Installation
- Heat Recovery Ventilator
- Sizing ventilators
- Controls
- Energy Recovery Ventilator

21 min.



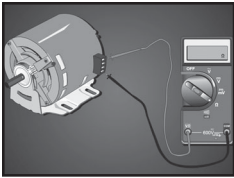
L4114-00A-V

COMPONENTS OF TOTAL COMFORT

Indoor comfort is a combination of many different factors; temperature, humidity, noise, etc. Explains the six basic components of total comfort and how they can be adjusted to achieve total indoor comfort.

- Temperature control
- Air circulation
- Ventilation air
- Humidity control
- Air filtration
- Quietness

22 min.



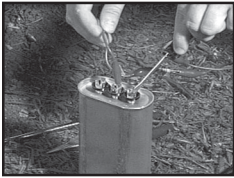
L4115-00A-V

CHECKING ELECTRIC MOTORS

Demonstrates the basic steps used in electric motor diagnostics. The technician will learn preventative motor maintenance, wiring checks, bearing checks, and typical causes of electric motor failures.

- Determining motor speed taps
- Checks for internal motor wiring
- Tool requirements
- Safety requirements

22 min.



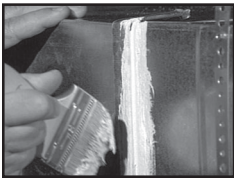
L4116-00A-V

CHECKING CAPACITORS

Improper capacitor checks can lead to misdiagnosed equipment problems. Covers field tests that will correctly identify a failing, or failed capacitor. How to correctly wire a capacitor to avoid potential damage to other system components is also covered.

- Effect on motors
- Visual indications
- Choosing replacements
- Testing
- Required tools
- Safety

22 min.



L4117-00A-V

CHECKING AND SEALING DUCTWORK

Properly sealed ductwork will minimize the amount of unconditioned air and contaminants that are drawn into a conditioned space. Shows indoor air problems associated with leaks, and how to properly install and seal ductwork. Duct leak detection and repair are also covered.

- Types of sealants
- Sealing sheet metal
- Sealing flexible duct
- Sealing ductboard
- Sealing duct chases
- Leak detection

22 min.



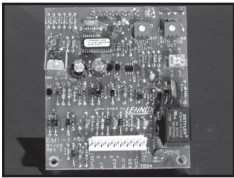
L4118-00A-V

HOW TO SELL AND INSTALL A PROGRAMMABLE!

Shows the benefits customers will receive from a programmable thermostat. Different thermostat features are explained and demonstrated to instruct the technician on the latest temperature controls. Installation of various programmable thermostats is also covered.

- Automatic temperature adjustments
- Adaptive programming
- Basic thermostat wiring
- Basic programming steps

20 min.



L4119-00A-V

USING ENTHALPY CONTROLS FOR EFFICIENCY

Explains the steps required in setting enthalpy controls to efficiently regulate the amount and quality of outdoor air used for cooling.

- Selecting enthalpy setpoints
- Estimated savings
- Effect on cooling equipment
- Types of economizers
- Effect of outdoor air on indoor comfort

19 min.



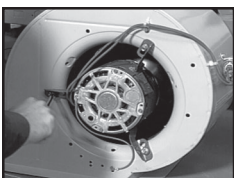
L4120-00A-V

CALCULATING CFM

Improperly sized ductwork can deliver too much, or too little, conditioned air causing uneven, and uncomfortable indoor conditions. Teaches how to properly proportion airflow into a conditioned space.

- Required system information
- Automatic duct reduction
- Calculating fitting loss
- Calculating friction
- Calculating velocity
- Calculating static pressure

20 min.



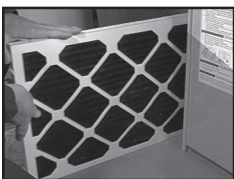
L4121-00A-V

WHAT THE FAN LAWS CAN DO FOR YOU

Gives the technician a clear interpretation of exactly what the fan laws say and how they can be used in the field to solve a long list of problems. Find out why the motor does not appear to be matching the installation. Learn the quick steps to find airflow problems and how to solve them.

- CFM and RPM
- Static pressure vs. CFM
- Horsepower and CFM
- Efficiency effects
- Using laws in diagnostics
- Motor sizing

20 min.



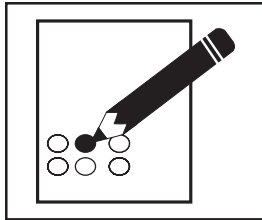
L4122-00A-V

FILTERS - FACTS AND FABLES

Air filtration is an important part of every HVAC system. Explains what can, and cannot be expected of a filtration system. Examines the major types of filters, their construction, and specific purpose.

- Pleated filters
- Throw-away filters
- Washable filters
- Odor removal
- Filter efficiency
- Rating systems

19 min.



ONLINE BASED VIDEOS



COORDINATED
TO TESTING

FUNDAMENTALS FOR HVAC TECHS

L4008-00B-V *Electron World*
L4009-00B-V *Working Wires*
L4010-00B-V *Meters and Measurements*
L4011-00B-V *Inside Circuits*
L4012-00B-V *Electricity at Work*

L4089-00A-V *Basic Thermostats*
L4092-00A-V *Service Professionalsim*
L4099-00A-V *Schematics*
L4110-00A-V *HVAC Essentials: An Intro to AC Equipment*
L4122-00A-V *Filters - Facts and Fables*

AIR CONDITIONING

Tools and Methods

1. Refrigerant System Tools and Measurements

L4045-00B-V *Tools and Measurements*
L4072-00A-V *Refrigerant Charging Methods*
L4091-00A-V *Evacuation and Dehydration*
L4102-00A-V *Superheat and Subcooling*
L4103-00A-V *Brazing Refrigerant Lines*

2. Electrical Measurements

Systems and Components

1. Introduction to AC Equipment

L4042-00B-V *Heat Transfer and Cooling*

2. AC Systems Construction and Components

L4043-00B-V *The Basic Cooling Circuit*
L4044-00B-V *A/C Components and Equipment*

3. Air Duct Systems for Air Conditioning

L4031-00C-V *Duct Systems for Residential*
L4068-00A-V *Basic AC Motors*

4. Field Wiring and Electrical for AC Systems

L4038-00B-V *Field Wiring Residential Furnaces*

5. Controls For Air Conditioners

L4068-00A-V *Basic AC Motors*
L4069-00A-V *Two Speed Compressor Controls*
L4104-00A-V *IMC Design and Operation*
L4118-00A-V *How to Sell and Install a Programmable!*

6. Accessories for Air Conditioning

L4101-00A-V *Economizers*
L4113-00A-V *Adding Fresh Air to Residential Systems*

7. Air Conditioning Components

L4018-00B-V *Scroll Compressor Operation and Service*
L4044-00B-V *A/C Components and Equipment*
L4068-00A-V *Basic AC Motors*
L4075-00A-V *Metering Devices*

Installation Procedures

1. Installing Units-General Requirements

L4036-00B-V *Installing Condensing Units & Refrigerant Lines*
L4046-00B-V *Evacuation, Charging, and Checkout*
L4072-00A-V *Refrigerant Charging Methods*
L4091-00A-V *Evacuation and Dehydration*
L4103-00A-V *Brazing Refrigerant Lines*
L4106-00A-V *Sizing and Layout of Refrigerant Lines*

2. Installing Units in Basements

L4032-00B-V *Basement Installations*

3. Installing Units in Closets

L4033-00C-V *Closet Installations*

4. Installing Units in Crawlspace

L4034-00C-V *Installations - Attics and Crawlspace*

5. Air Ducts For Air Conditioning

L4030-01A-V *Duct Fabrication - Sheet Metal*
L4030-02A-V *Duct Fabrication - Flexible Duct*
L4030-03A-V *Duct Fabrication - Ductboard*
L4031-00C-V *Duct Systems for Residential*
L4117-00A-V *Checking and Sealing Ductwork*

6. Installing Accessories

L4037-00B-V *Installing Residential Accessories*
L4101-00A-V *Economizers*
L4113-00A-V *Adding Fresh Air to Residential Systems*
L4118-00A-V *How to Sell and Install a Programmable!*

Service and Diagnostics

1. General Checks for Air Conditioners

L4007-00B-V *Troubleshooting Expansion Valves*
L4018-00B-V *Scroll Compressor Operation and Service*
L4091-00A-V *Evacuation and Dehydration*
L4105-00A-V *IMC - Startup and Checkout*
L4109-00A-V *Compressor Changeout*
L4112-00A-V *Servicing R-410a A/C Units*
L4115-00A-V *Checking Electric Motors*
L4116-00A-V *Checking Capacitors*

2. Startup and Checkout of Air Conditioners

L4039-04A-V *Residential Start-up of A/C*
L4046-00B-V *Evacuation, Charging, and Checkout*
L4064-00A-V *Compressors - Electrical Checkout*
L4065-00A-V *Compressors - Mechanical Checkout*

3. Scheduled Service for Air Conditioning

4. Troubleshooting Air Conditioners

5. Diagnostics - Low Comfort

L4095-00A-V *Airflow Measurements*
L4097-00A-V *Indoor Air Quality*
L4114-00A-V *Components of Total Comfort*
L4117-00A-V *Checking and Sealing Ductwork*

Applications and Design

1. Designing for Total Comfort

L4095-00A-V *Airflow Measurements*
L4097-00A-V *Indoor Air Quality*
L4114-00A-V *Components of Total Comfort*

2. Sizing Equipment

L4097-00A-V *Indoor Air Quality*
L4100-00A-V *Understanding Psychrometrics*
L4106-00A-V *Sizing and Layout of Refrigerant Lines*
L4119-00A-V *Using Enthalpy Controls for Efficiency*
L4120-00A-V *Calculating CFM*
L4121-00A-V *What the Fan Laws Can Do For You*

GAS HEATING

Tools and Methods

- 1. Combustion Path Tools and Measurements**
L4070-00A-V *Combustion Efficiency Testing in Gas Furnaces*
- 2. Electrical Measurements**

Systems And Components

- 1. Introduction to Gas Furnaces**
L4013-00A-V *Gas Combustion Furnaces (Natural Draft)*
L4017-00A-V *Gas Furnace Venting (Natural Draft)*
- 2. Gas Furnace Construction and Components**
L4013-00A-V *Gas Combustion Furnaces (Natural Draft)*
- 3. Air Duct Systems for Gas Heating**
L4031-00C-V *Duct Systems for Residential*
L4068-00A-V *Basic AC Motors*
- 4. Field Wiring and Electrical**
L4038-00B-V *Field Wiring Residential Furnaces*
- 5. Controls For Gas Furnaces**
L4013-00A-V *Gas Combustion Furnaces (Natural Draft)*
L4016-00A-V *Spark Igniters - Op/Trblshtng. (Natural Draft)*
L4073-00A-V *Spark Ignition*
L4093-00A-V *HSI Gas Furnace Control*
L4107-00A-V *Differential Pressure Controls in Gas Furnaces*
L4118-00A-V *How to Sell and Install a Programmable!*
- 6. Accessories**
L4113-00A-V *Adding Fresh Air to Residential Systems*
- 7. Gas Furnace Components**
L4013-00A-V *Gas Combustion Furnaces (Natural Draft)*
L4079-00A-V *Gas Valves*

Installation Procedures

- 1. Installing Units - General Requirements**
L4017-00A-V *Gas Furnace Venting (Natural Draft)*
L4035-01A-V *Installing Gas Supplies*
L4035-02A-V *Installing Natural Draft Furnace Vents*
L4035-03A-V *Installing Induced Draft Furnace Vents*
L4035-04A-V *Installing Condensing Furnace Vents*
L4038-00B-V *Field Wiring Residential Furnaces*
L4074-00A-V *Installation and Startup: High Efficiency Furnaces*
- 2. Installing Units in Basements**
L4032-00B-V *Basement Installations*
L4074-00A-V *Installation and Startup: High Efficiency Furnaces*
- 3. Installing Units in Closets**
L4033-00C-V *Closet Installations*
L4074-00A-V *Installation and Startup: High Efficiency Furnaces*
- 4. Installing Units in Crawlspace**
L4034-00C-V *Installations - Attics and Crawlspace*
L4074-00A-V *Installation and Startup: High Efficiency Furnaces*
- 5. Installing Air Ducts For Heating Applications**
L4030-01A-V *Duct Fabrication - Sheet Metal*
L4030-02A-V *Duct Fabrication - Flexible Duct*
L4030-03A-V *Duct Fabrication - Ductboard*
L4031-00C-V *Duct Systems for Residential*
L4117-00A-V *Checking and Sealing Ductwork*
- 6. Installing Heating Accessories**
L4037-00B-V *Installing Residential Accessories*
L4113-00A-V *Adding Fresh Air to Residential Systems*
L4118-00A-V *How to Sell and Install a Programmable!*

Service and Diagnostics

- 1. General Checks for All Furnaces**
L4014-00A-V *Troubleshooting - Mechanical (Natural Draft)*
L4015-00A-V *Troubleshooting - Electrical (Natural Draft)*
L4095-00A-V *Airflow Measurements*
L4115-00A-V *Checking Electric Motors*
L4116-00A-V *Checking Capacitors*
L4121-00A-V *What the Fan Laws Can Do For You*
- 2. Startup and Checkout - Condensing Furnaces**
L4039-03A-V *Residential Start-up of Condensing Furnaces*
L4074-00A-V *Installation and Startup: High Efficiency Furnaces*
- 3. Startup and Checkout - Induced Draft Furnaces**
L4039-02A-V *Residential Start-up of Induced Draft Furnaces*
L4074-00A-V *Installation and Startup: High Efficiency Furnaces*
- 4. Startup and Checkout - Natural Draft Furnaces**
L4039-01A-V *Residential Start-up of Natural Draft Furnaces*
- 5. Scheduled Service**
L4066-00A-V *Heat Exchanger Checkout*
L4108-00A-V *80% Efficiency Gas Furnaces*
L4111-00A-V *90% Efficiency Gas Furnaces*
L4117-00A-V *Checking and Sealing Ductwork*
- 6. Diagnostics - Condensing Furnaces**
L4070-00A-V *Combustion Efficiency Testing in Gas Furnaces*
L4095-00A-V *Airflow Measurements*
L4107-00A-V *Differential Pressure Controls in Gas Furnaces*
- 7. Diagnostics - Induced Draft Furnaces**
L4107-00A-V *Differential Pressure Controls in Gas Furnaces*
- 8. Diagnostics - Natural Draft Furnaces**
L4014-00A-V *Troubleshooting - Mechanical (Natural Draft)*
L4015-00A-V *Troubleshooting - Electrical (Natural Draft)*
L4016-00A-V *Spark Igniters - Op/Trblshtng. (Natural Draft)*
L4017-00A-V *Gas Furnace Venting (Natural Draft)*
L4066-00A-V *Heat Exchanger Checkout*
L4070-00A-V *Combustion Efficiency Testing in Gas Furnaces*
- 9. Diagnostics - Low Comfort**
L4095-00A-V *Airflow Measurements*
L4097-00A-V *Indoor Air Quality*
L4113-00A-V *Adding Fresh Air to Residential Systems*
L4117-00A-V *Checking and Sealing Ductwork*

Applications and Design

- 1. Designing for Total Comfort**
L4095-00A-V *Airflow Measurements*
L4097-00A-V *Indoor Air Quality*
L4100-00A-V *Understanding Psychrometrics*
L4114-00A-V *Components of Total Comfort*
- 2. Sizing Equipment**
L4057-00A-V *Using AGA/GAMA Tables*
L4095-00A-V *Airflow Measurements*
L4120-00A-V *Calculating CFM*
- 3. Sizing Accessories**
- 4. Codes and Regulations**
L4057-00A-V *Using AGA/GAMA Tables*
- 5. Safety**

HEAT PUMPS

Tools and Methods

1. Refrigerant System Tools and Measurements

- L4045-00B-V *Tools and Measurements*
- L4072-00A-V *Refrigerant Charging Methods*
- L4091-00A-V *Evacuation and Dehydration*
- L4095-00A-V *Airflow Measurements*
- L4102-00A-V *Superheat and Subcooling*
- L4103-00A-V *Brazing Refrigerant Lines*

2. Electrical Measurements

Systems And Components

1. Introduction to Heat Pumps

- L4018-00B-V *Scroll Compressor Operation and Service*
- L4019-00B-V *Introduction to Heat Pumps*
- L4020-00B-V *Reversing Valve-Introduction*
- L4022-00B-V *Heat Pump Defrost Controls*
- L4042-00B-V *Heat Transfer and Cooling*
- L4043-00B-V *The Basic Cooling Circuit*
- L4044-00B-V *A/C Components and Equipment*
- L4068-00A-V *Basic AC Motors*
- L4077-00A-V *Defrost Controls*

2. Heat Pump Systems Construction and Components

3. Air Duct Systems for Heat Pumps

- L4031-00C-V *Duct Systems for Residential*
- L4068-00A-V *Basic AC Motors*

4. Field Wiring and Electrical of Heat Pumps

- L4038-00B-V *Field Wiring Residential Furnaces*

5. Controls For Heat Pumps

- L4068-00A-V *Basic AC Motors*
- L4118-00A-V *How to Sell and Install a Programmable!*

6. Accessories for Heat Pumps

- L4113-00A-V *Adding Fresh Air to Residential Systems*

7. Heat Pump Components

Installation Procedures

1. Installing Units - General Requirements

- L4030-01A-V *Duct Fabrication - Sheet Metal*
- L4030-02A-V *Duct Fabrication - Flexible Duct*
- L4030-03A-V *Duct Fabrication - Ductboard*
- L4031-00C-V *Duct Systems for Residential*
- L4036-00B-V *Installing Condensing Units & Refrigerant Lines*
- L4046-00B-V *Evacuation, Charging, and Checkout*
- L4091-00A-V *Evacuation and Dehydration*
- L4103-00A-V *Brazing Refrigerant Lines*
- L4106-00A-V *Sizing and Layout of Refrigerant Lines*

2. Installing Units in Basements

- L4032-00B-V *Basement Installations*

3. Installing Units in Closets

- L4033-00C-V *Closet Installations*

4. Installing Units in Crawlspace

- L4034-00C-V *Installations - Attics and Crawlspaces*

5. Air Ducts For Heat Pumps

- L4095-00A-V *Airflow Measurements*

6. Installing Accessories

- L4037-00B-V *Installing Residential Accessories*
- L4113-00A-V *Adding Fresh Air to Residential Systems*
- L4118-00A-V *How to Sell and Install a Programmable!*

Service and Diagnostics

1. General Checks for Heat Pumps

- L4018-00B-V *Scroll Compressor Operation and Service*
- L4024-00C-V *Heat Pump Cleanup*
- L4072-00A-V *Refrigerant Charging Methods*
- L4091-00A-V *Evacuation and Dehydration*
- L4102-00A-V *Superheat and Subcooling*
- L4109-00A-V *Compressor Changeout*
- L4115-00A-V *Checking Electric Motors*
- L4116-00A-V *Checking Capacitors*
- L4121-00A-V *What the Fan Laws Can Do For You*

2. Startup and Checkout of Heat Pumps

- L4039-05A-V *Residential Start-up of Heat Pumps*
- L4046-00B-V *Evacuation, Charging, and Checkout*
- L4064-00A-V *Compressors - Electrical Checkout*
- L4065-00A-V *Compressors - Mechanical Checkout*

3. Scheduled Service

4. Troubleshooting Heat Pumps

- L4021-00C-V *Reversing Valves Diagnostics*
- L4023-00C-V *Heat Pump Diagnostics*

5. Diagnostics - Low Comfort

- L4095-00A-V *Airflow Measurements*
- L4097-00A-V *Indoor Air Quality*
- L4117-00A-V *Checking and Sealing Ductwork*

Applications and Design

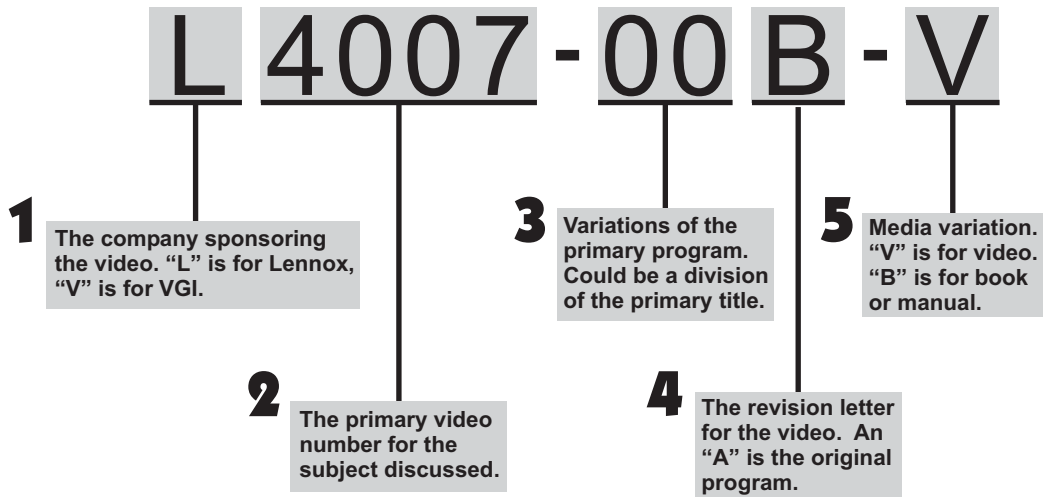
1. Designing for Total Comfort

- L4097-00A-V *Indoor Air Quality*
- L4100-00A-V *Understanding Psychrometrics*
- L4114-00A-V *Components of Total Comfort*
- L4119-00A-V *Using Enthalpy Controls for Efficiency*

2. Sizing Equipment

- L4100-00A-V *Understanding Psychrometrics*
- L4119-00A-V *Using Enthalpy Controls for Efficiency*
- L4120-00A-V *Calculating CFM*
- L4121-00A-V *What the Fan Laws Can Do For You*

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