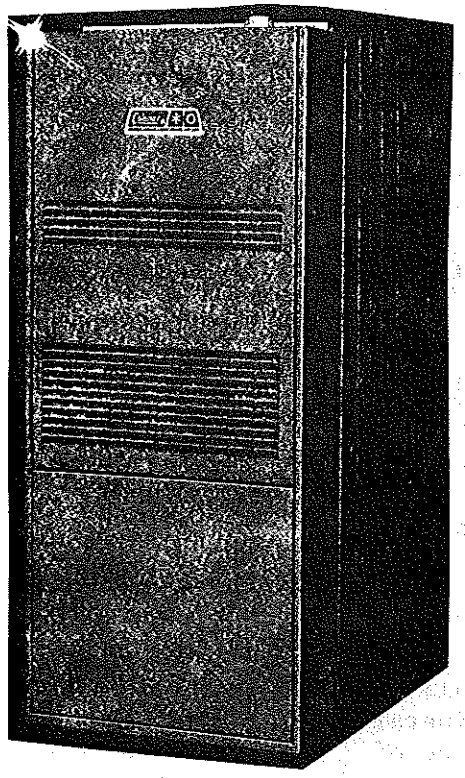
COLEMAN

T. H. E.™

CONDENSING GAS FURNACE



SPECIFICATIONS

MODEL	NAT.	2940-666	2960-666	2970-766	2985-766	2960-766
UNIT RATING Btu/Hr.	Input: 0-2,000 Ft. Elevation	45,000	65,000	80,000	95,000	65,000
	High Altitude	FOR ELEVATIONS ABOVE 2,000 FT. REDUCE INPUT 4% FOR EACH 1,000 FT. OF ELEV. ABOVE SEA LEVEL				
AIR TEMPERATURE RISE RANGE °F.		20-50	25-55	30-60	35-65	25-55
DESIGNED MAX. OUTLET AIR TEMP. °F.		145	150	155	160	150
MAX. EXTERNAL STATIC PRESSURE IN. W.C.		.5				
VENT PIPE		2 in. DIAMETER * SCHEDULE 40 CPVC				
VENT PIPE FITTINGS		2 in. DIAMETER SCHEDULE 40 or 80 CPVC				
CONDENSATE PIPE AND FITTINGS		1/2 in. CPVC				
GAS CONNECTION		1/2 in. FPT				
ELECTRICAL SERVICE		115 VAC 60 HZ 1 PH				
MINIMUM DISTANCE TO COMBUSTIBLE MATERIALS — inches						
FRONT		6				
BACK		0				
PLENUM-TOP		1				
FLOOR		COMBUSTIBLE				
SIDES		0				
VENT		0				
FILTER (Furnished)		16 x 25 x 1/2		20 x 25 x 1/2		

*3 in. diameter must be used for all horizontal runs with model 2985.

APPLICATION

FURNACE CERTIFICATION AND USAGE

The furnace models described in these instructions are design certified by the American Gas Association to be in compliance with American National Gas Association to be in compliance with American National Standard Z21.47-1983.

These furnaces are forced air type and may be utilized for indoor installation in buildings constructed on-site, or manufactured buildings (modular only). These furnaces are not certified for installation in mobile homes.

MUNICIPAL, STATE AND FEDERAL CODES

The installer must conform to all state and local building codes when installing these appliances. In the absence of state and local codes, these furnaces and related equipment must be installed in accordance with the latest issue of the following:

NATIONAL ELECTRICAL CODE - ANSI/NFPA 70-1981.

NATIONAL FUEL GAS CODE ANSI Z223.1-1980.

INSTALLATION PROCEDURE

Installation on Combustible Flooring

This furnace shall not be installed directly on carpeting, or tile or other combustible material, other than wood flooring.

When installing unit on combustible floor - A casing bottom Block-off panel is supplied with the furnace. This panel must be in place when a side inlet return duct connection is employed. When bottom inlet return connection is employed or furnace is on non-combustible surface the Block-off panel needs to be removed.

Installation in Residential Garages

When furnace is installed in a residential garage it must be located and installed in such that it will be protected against vehicular damage. The furnace must be installed such that the burners, and any source of ignition is a minimum of 18" above the floor.

PROVIDE VENTILATION AND COMBUSTION AIR

WARNING

ADEQUATE VENTILATION AND COMBUSTION AIR MUST BE PROVIDED TO INSURE SATISFACTORY AND SAFE OPERATION OF THE FURNACE. AIR OPENINGS IN CASING FRONT PANEL AND VESTIBULE TOP PANEL MUST NOT BE OBSTRUCTED. FAILURE TO OBSERVE THIS RECOMMENDATION COULD RESULT IN ASPHYXIATION.

DO NOT STORE HALOGEN EMITTING SUBSTANCES SUCH AS LAUNDRY BLEACH AND DETERGENT, CLEANING FLUIDS, SPRAY CAN PROPELLENTS AND SOLVENTS IN THE VICINITY OF THIS APPLIANCE. THE AIR USED BY THE BURNER FOR COMBUSTION MUST BE FREE OF HALOGENS TO AVOID POSSIBLE CORROSION TO THE HEATING SURFACES WHICH COULD RESULT IN ASPHYXIATION.

Installations in a Confined Space

If the unit is to be installed in a confined space such as a small closet or room, provisions must be made for supplying combustion and ventilation air to the space surrounding the furnace. (see Fig. 1)

Two openings of equal area must be provided; one commencing with 12 inches of the ceiling and one commencing within 12 inches of the floor of the confined space. The upper opening shall always be above the top of the furnace casing. The lower opening in the floor, side wall or door shall be located below the level of the burner in the furnace.

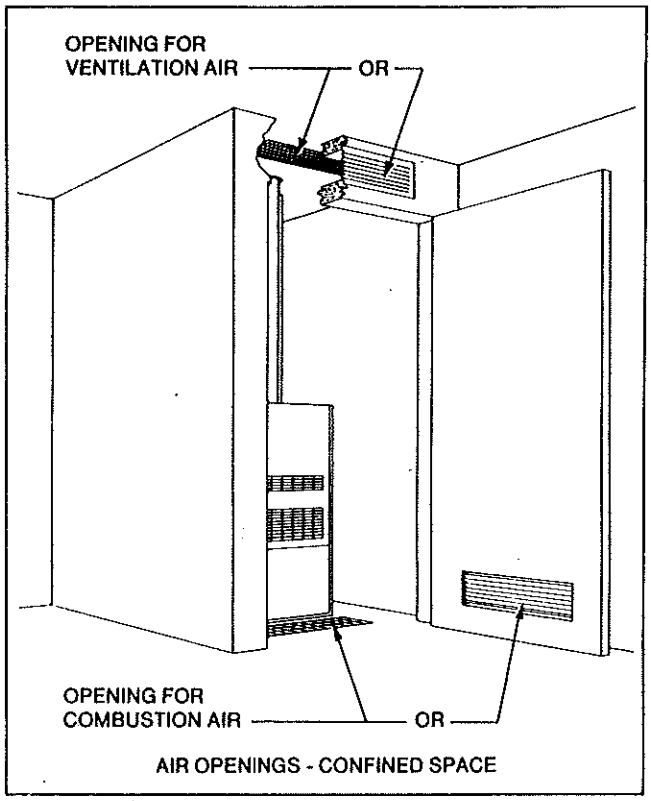


Figure 1

All air from inside building:

The total free area of each opening must be at least 1 square inch for each 1,000 BTUH of furnace input, but not less than 100 square inches.

All air from outdoors:

When communicating directly with the outdoors or through vertical ducts, the total free area of each opening must be at least 1 square inch for each 2,000 BTUH of furnace input.

When ducts are used, they must be of the same cross-sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts must not be less than 3 inches.

Installation in an Unconfined Space.

In unconfined spaces in a building, infiltration normally is adequate to provide air for combustion and

ventilation.

CAUTION:

WHEN THE FURNACE IS INSTALLED IN A CLOSET OR OTHER CONFINED SPACE, AND A SIDE INLET DUCT EMPLOYED, THE DUCT MUST BE SEALED TO THE FURNACE AND EXTEND TO THE CONDITIONED SPACE TO PREVENT ANY COMMUNICATION BETWEEN THE SPACE OR ROOM IN WHICH THE FURNACE IS INSTALLED WHICH COULD RESULT IN ASPHYXIATION.

GAS PIPING AND SUPPLY PRESSURES

In the absence of local codes follow the recommendations contained in NATIONAL FUEL GAS CODE ANSI Z223.1-1980 for gas piping materials, pipe sizing and the requirements for installation.

If test pressure is greater than 1/2 psig, the furnace and its individual shutoff valve must be disconnected for the gas supply piping system.

CAUTION

THOROUGHLY CHECK THE PIPING SYSTEM FOR LEAKS. NEVER USE AN OPEN FLAME, FIRE OR EXPLOSION COULD OCCUR SINCE SOME LEAKS SOLUTIONS INCLUDING SOAP AND WATER MAY CAUSE CORROSION, THE PIPING SHALL BE CLEANED OFF AFTER TESTING.

The maximum and minimum gas supply pressure required at the inlet of the gas control valve is shown on the unit rating plate. When furnace is in operation the inlet pressure must be within the limits shown.

VENTING

VENTING COMBUSTION GASSES

These furnaces are induced draft type and vented by an electrically powered vent blower. The vent piping operates under a slight positive pressure; therefore, IT IS IMPORTANT THAT THE VENT PIPING BE PROPERLY INSTALLED TO INSURE THERE WILL BE NO LEAKAGE OF PRODUCTS OF COMBUSTION. TO INSURE THERE WILL BE NO LEAKAGE OF PRODUCTS OF COMBUSTION, SEAL ALL VENT PIPE JOINTS WITH A PVC/CPVC CEMENT.

In some venting applications and certain geographical areas where mud daubers, birds, rodents, etc. can create blockage or restrictions in the vent pipe, it is advisable to install access in the CPVC pipe at strategic locations allowing the vent pipe to be easily cleared. The screw in plug must fasten tight enough to prevent any condensate, that might form in the vent pipe, from leaking through the threads. Coleman recommends using tees with cleanout fittings and threaded plugs. See figure 5 for recommended arrangements.

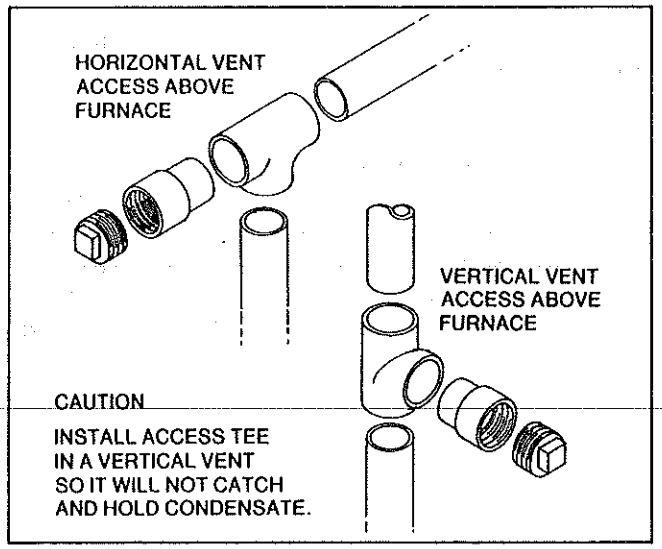


Figure 5

Selecting The Best Vent Arrangement

The vent system may be one of two basic types:

1.A horizontal vent that terminates at the outer surface of an outside wall which is above grade. This type of venting must terminate with a 2 inch diameter schedule 40 or 80 plastic CPVC "tee" for the vent terminal.

2. A vent arrangement which consists of a vertical riser or horizontal lateral connected to a vertical riser which passes through the interior of the structure and terminates above

the roof with 2 inch diameter schedule 40 or 80 plastic CPVC return bend (two 90° elbows).

Special Requirements

1. These furnaces must be vented with 2 inch diameter (except for 3 inch diameter horizontal runs required on furnace model 2985) schedule 40 plastic CPVC pipe as listed in the specification table. DO NOT USE ANY TYPE OF METAL PIPE FOR VENTING.

2. These furnaces must be vented separately from any other appliance, with the vent running continuously from the furnace to the outside atmosphere. DO NOT VENT THESE FURNACES INTO A COMMON FLUE OR VENT WITH ANY OTHER APPLIANCE SUCH AS WATER HEATER, SPACE HEATER, WOOD BURNING STOVE OR FIREPLACE, OR CLOTHES DRYER.

3. DO NOT VENT THESE FURNACES INTO A MASONRY CHIMNEY OR ANY OTHER ALL-FUEL TYPE CHIMNEY.

Observe The Following Rules:

A. General

   1. Any horizontal run of the vent must be pitched (min. 1/4 inch per foot) upward, never downward.

   2. Joints in the vent pipe must be securely made and any horizontal run the vent pipe supported no less than one support every 3 feet to prevent sagging or displacement of the pipe and stressing of the joints.

   3. The vent piping has to be planned to minimize the number of elbows. Short offsets made by joining 2 elbows together should be avoided if possible. (Two 45° elbows are equal to one 90° elbow in flow resistance.) Approximately, each 5 foot reduction in a maximum vent piping length will allow an additional 90° elbow to be used, if needed.

B. Horizontal Vents

   1. The total run of the vent must not exceed 30 feet with a maximum of two 90 degree elbows. Keep the vent as short and direct as practical.

   2. When the vent pipe exits the building structure, its exit must be at least 3 feet above any forced air inlet located with 10 feet. Also, the exit must be at least 4 feet below, or 4 feet horizontally from or 1 foot above any door, window or gravity air inlet.

   3. The vent pipe must extend at least 1 foot, but no more than 1-1/2 feet past the outside wall and must terminate with a 2 inch diameter schedule 40 or 80 plastic CPVC "tee". See Figure 7.

WARNING

USE OF NON-APPROVED TERMINAL COULD CAUSE FIRE OR ASPHYXIATION.

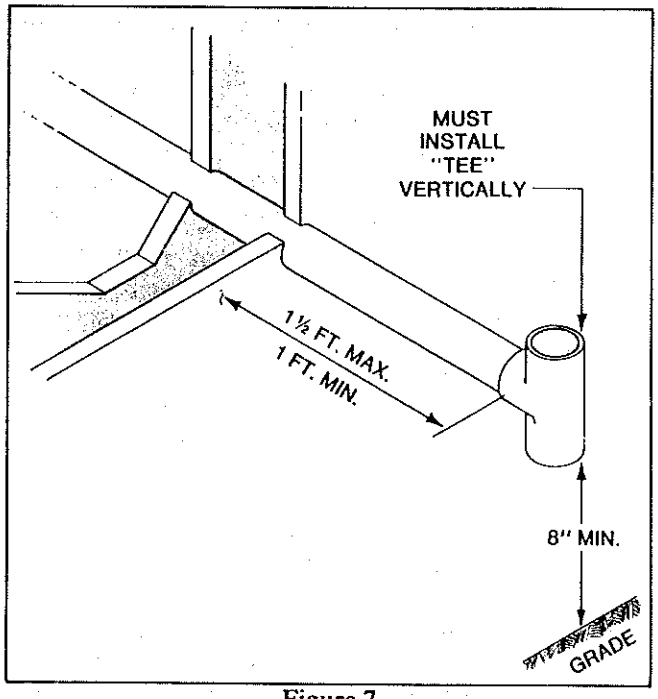


Figure 7

4. All horizontally running vent pipe used on model 2985 furnaces must be 3 inch diameter schedule 40 plastic CPVC (PVC) pipe. The pipe extending through and past the outside wall must be 2 inch diameter schedule 40 plastic CPVC (PVC) pipe. A suitable 3 to 2 inch reducer must be used when going from 2 inch to 3 inch diameter pipe. See Figure 8.

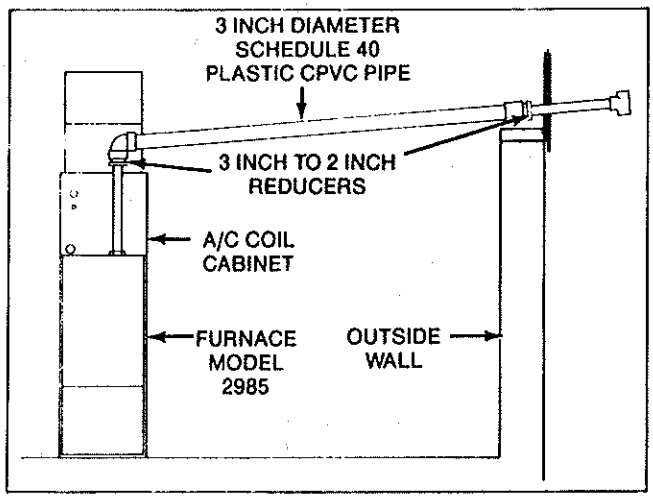


Figure 8

C. Vertical Vents

1. The total run of the vent must not exceed 30 feet with a maximum of two 90 degree elbows. Keep the vent as short and direct as practical. The furnace may be vented vertically by running the vent pipe directly above the vent connection or with a horizontal lateral connected to a vertical riser.

2. Vertical vent risers must not be installed where they will be exposed to the outdoors.

3. The opening where the vent pipe penetrates the roof must be sealed with a plastic flashing.

4. The vent pipe must terminate with a 2" diameter schedule 40 or 80 plastic "return bend" (two 90° (PVC) elbows) CPVC pipe and the opening of the return bend must be at least 1 foot, but no more then 1-1/2 feet above the roof. See Figure 9.

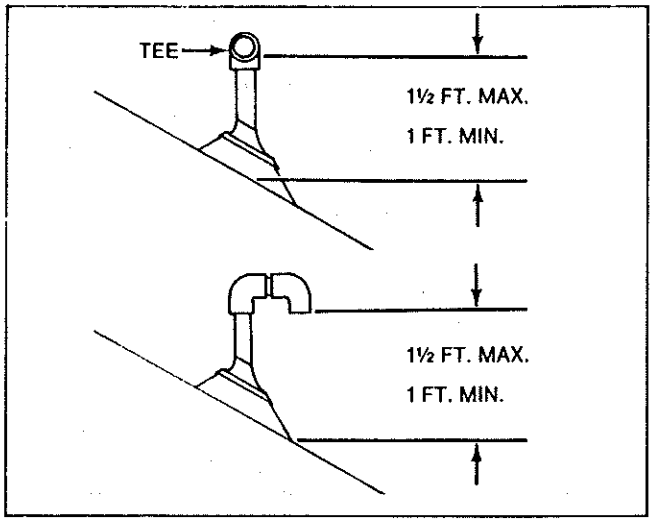


Figure 9

CONDENSATE REMOVAL

These furnaces are condensing type appliances and are equipped with a condensate fitting that must be piped to a drain.

Special Requirements

1. The condensate must be removed from the furnace with no less than 1/2 inch CPVC pipe. See Figure 4. DO NOT USE METAL PIPE FOR REMOVAL OF CONDENSATE FROM THE FURNACE.

2. The condensate from the furnace may be drained with the condensate from the air conditioning system using a common PVC or CPVC pipe. See Figure 10. In this application, the condensate drain pipe must be no less than 3/4 inch I.D.

CAUTION

The draining of other components not tested in combination with these furnaces may make the equipment in violation of local codes, may create a hazard and may ruin the equipment and void the warranty.

3. The condensate pipe, from the furnace condensate exit to the drain, must always be lower than the condensate exit point of the furnace.

4. A 1/2 inch PVC fitting will fit snugly over the condensate exit fitting on the furnace and can be glued directly to it. A section of 1/2 inch CPVC pipe will fit into the condensate exit fitting on the furnace and can be glued directly into it.

5. Seal all condensate pipe joints with a PVC/CPVC cement to insure there will be no leakage of condensate.

Control Wiring

Thermostat should be installed in accordance with the manufacturer's instructions, furnished with the thermostat, and make connections to the unit as shown on the unit wiring diagram. It is recommended 18 AWG wire be used.

If the thermostat has an adjustable heat anticipator, set it to .13 ampere.

Blower Motor Speed Selection

These furnaces are equipped with blowers which have multi-speed direct drive motors.

The furnace must be adjusted to operate within the air temperature rise range as shown on the unit rating plate.

Furnace models 29XX-6XX are equipped with 3-speed blower motors.

Furnace models 29XX-7XX are equipped with 4-speed blower motors.

These furnaces are equipped with a blower relay which will change blower speeds automatically when the furnace is properly connected to a heating and cooling type wall thermostat. The blower motors are factory connected to operate on high speed for heating operation and medium (or medium high) speed for cooling operation. Dependent upon the conditions in a particular installation, the blower speeds may be changed. HOWEVER, ONLY THE HIGH OR MEDIUM (OR MEDIUM HIGH) SPEEDS ARE TO BE USED FOR HEATING OPERATION.

SEQUENCE OF OPERATION

These furnaces are equipped with an electric spark, direct burner ignition system; therefore, in response to a call for heat by the room thermostat, the burner is lighted by an electric arc at the beginning of each operation cycle. The burner will continue to operate until the thermostat is satisfied at which time all burner flame is extinguished. During the off cycle, no gas energy is consumed. With the room thermostat set below room temperature and with the electrical power and gas supply to the furnace on, the normal sequence of operation is as follows:

1. When the room temperature falls below the setting of the room thermostat, the thermostat energizes the heating relay.

2. When the heating relay closes, a circuit is made starting the vent blower. A circuit is also made through the normally closed limit switch contacts and the heating relay to the normally open vent air pressure switch contacts.

3. As the vent blower increases in speed, a negative pressure is developed in the vent blower. When sufficient negative pressure has been developed, the contacts of the vent air pressure switch will close and complete the electrical circuit to the electronic ignition module.

4. After 15 to 20 seconds the electronic ignition module simultaneously energizes: (1) the electric ignition electrode, (2) the gas control valve, (3) the blower sequencer and (4) a safety lock out circuit.

5. When the burner lights, a flame

sensor, which is part of the ignition electrode assembly, senses the presence of burner flame and causes the safety lock out circuit in the ignition module to be de-energized. This allows the gas valve to remain open and the burner to operate.

6. If the burner fails to light within 6-8 seconds from the time the ignition control is first energized by the vent pressure switch, the ignition module will de-energize; (1) the gas valve, (2) the ignition electrode, and (3) the blower sequencer. The ignition control will again energize: (1) the gas valve, (2) the ignition electrode, and (3) the blower sequencer after 15-20 second delay. If after three trials for ignition the burner still fails to light, the safety lock out circuit in the ignition module will de-energize and lock off: (1) the gas valve, (2) the ignition electrode, and (3) the blower sequencer. The system will remain in a lockout mode until the room thermostat is set below room temperature causing the thermostat contacts to open and release the safety lock out circuit. Then setting the room thermostat above room temperature and causing the thermostat contacts to close will start the system to try for ignition again.

7. The lapsed time from the moment the wall thermostat closes to when the burner lights may be from 20 to 40 seconds. This delay in the ignition sequence is caused by: (1) the time required for the vent blower to develop sufficient negative pressure to activate the vent air pressure switch (2) the somewhat slow reaction of the vent air pressure switch, and (3) the 15 to 20 second delay designed into the ignition module. The lapsed time will also be effected by the temperature within the furnace and in the vent piping.

   The 15 to 20 second delay designed into the ignition module is a purge cycle. This allows the vent blower time to replenish the heat exchanger with fresh air so ignition can occur safely.

8. 30 to 50 seconds after the burner has lighted, the normally open contacts of the blower sequencer close and the furnace air circulation blower runs. The fan switch, which is in a parallel circuit with the blower sequencer, will also turn on but at a later time.

   NOTE

   If a heating/cooling thermostat is being used and the fan switch is set in the "ON" (continuous blower) position, the furnace air circulation blower will run at the air conditioning speed. If the wall thermostat calls for heat, the furnace air circulation blower will shut off for 20 to 40 seconds then the burner will light. 30 to 50 seconds after the burner has lighted, the furnace air circulation blower will begin running again but at heating speed. There is no pause in the furnace air circulation blower operation when the wall thermostat is satisfied; the furnace air circulation blower just changes over to cooling (continuous blower) speed.

9. When the room thermostat is satisfied the circuit to the heating relay is broken and the heating relay contacts return to the normally open position. The circuit to the vent blower, the ignition module and the blower sequencer is broken and the burner is extinguished. The contacts of the blower sequencer return to the normally open position within 30 seconds after the burner extinguishes. The fan switch remains on until it senses a fall in the heat exchanger temperature to a safe limit then opens the circuits to the furnace air circulation blower.

GAS CONTROL VALVE

The gas valve is multi-function, with two operating valves in line, pressure regulator and manual gas cock.

The pressure regulator is factory set to provide an operating manifold pressure of 3.5" W.C.

The pressure regulator is a limited adjustment type.

The input may be adjusted slightly by adjusting the pressure regulator in the gas control valve in order to change manifold pressure.

To adjust pressure regulator, remove cover screw on top of valve. Turn adjusting screw counter-clockwise to decrease pressure, turn clockwise to increase pressure. IN NO CASE SHOULD THE FINAL MANIFOLD PRESSURE VARY MORE THAN + .3" W.C. FROM THE SPECIFIED REGULATOR PRESSURE SETTINGS -- 3.5" W.C. FOR NATURAL GAS AND 10" W.C. FOR L.P. GAS.

LIGHTING INSTRUCTIONS

This furnace is equipped with an automatic electric spark, direct burner ignition system which lights main burner each time the thermostat calls for heat.

This furnace cannot be lighted with a match.

If after 3 trials for ignition, and burner fails to light, go to complete shutdown and determine cause for failure to light.

BURNER ADJUSTMENT

After lighting the furnace, allow the furnace to operate for approximately 15 minutes and then adjust burner primary air as follows:

1. Loosen air adjustment rod locking screw.

2. Close primary air shutter by pulling on adjustment rod until yellow tips appear in the flame at the end of the burner.

3. Slowly open the primary air shutter by pushing adjustment rod in until yellow flame tips at the end of the burner disappear; then push adjustment rod in another 1/8 inch.

4. Secure primary air adjustment rod by tightening locking screw against it.

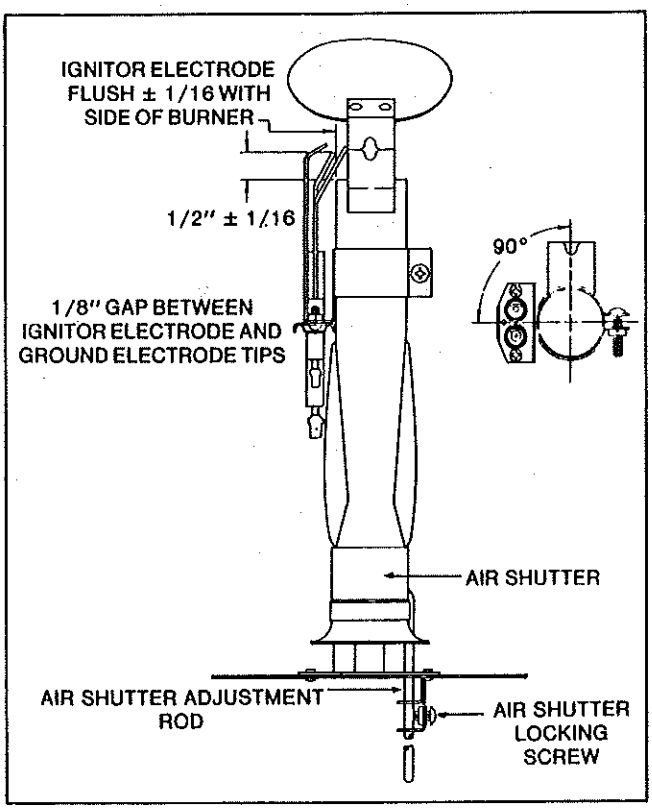


Figure 11

FURNACE INPUT CAPACITY

The maximum BTUH input capacity for each model is shown on the unit rating plate and in the specification tables. This input must not be exceeded.

The input shown may be used in geographic areas where the elevation is from 0 to 2000 feet. In areas above 2000 feet, high altitude, the furnace BTU input must be reduced 4% for each 1000 feet of elevation above sea level. The BTU input depends on the BTU content of the gas

(BTU/Cu Ft), orifice size and manifold pressure. Coleman orifice sizes are based on BTU content of 1050 BTU/Cu Ft for natural gas and 2500 BTU/Cu Ft for L.P. gas (Propane). The orifice size supplied with the furnace should provide satisfactory input capacity for installations in most areas, except at high altitude.

GAS CONVERSION

Furnaces can be converted to L.P. gas by using a conversion kit available from The Coleman Company, Inc. The conversion essentially consists of:

1. Instructions, burner orifice, two stickers and a spring for converting a White Rodgers gas valve.

2. Instructions, two screws, gasket, burner orifice, and pressure regulator, for converting a Honeywell gas valve.

Conversion parts for either valve are contained in one conversion kit. See the installation instructions packed with each kit for complete instructions.

FURNACE COMPONENTS

Gas Valve — The gas valve is a redundant type valve. There are two operators which must open to allow gas to flow to the burner. Since furnace cannot be match lighted, there is no pilot position on the control knob. Operating voltage is 24 volts.

CAUTION

Never short the terminals on the gas valve. To do so may damage the valve or burn out the heat anticipator on the thermostat.

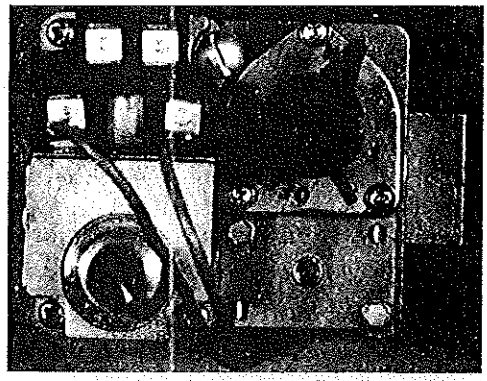


Figure 1
Gas Valve

Vent Motor — The vent motor is a 115 volt motor which supplies combustion air to the burner. Air for combustion is pulled in thru the louvers in the front panel, over the burner thru the heat exchanger, and discharged out thru the vent pipe.

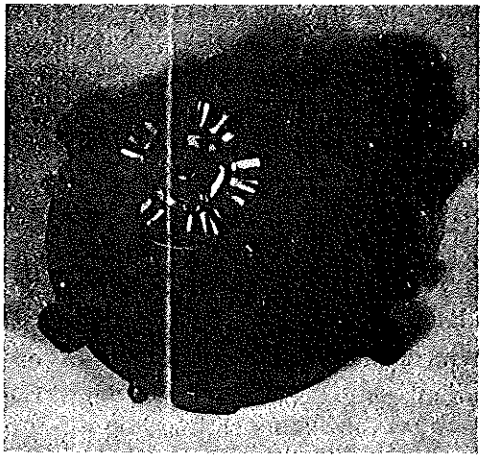


Figure 2
Vent Motor

Pressure Switch — The pressure switch is an air actuated switch with normally open contacts. These contacts are connected to the tube which runs from the switch up to the vent blower housing. When the vent motor starts the negative pressure on the tube closes the contacts on the pressure switch. If the flue should become obstructed the contacts on this switch will not close and furnace will not operate.

A low pressure reading indicates a severly restricted flue or combustion air inlet. A properly operating vent motor assembly should produce well over .5 inches water column negative pressure.

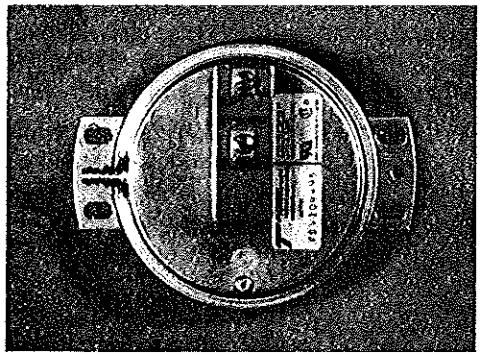


Figure 3
Pressure Switch

Ignition Module — The ignition module contains the timing circuits which produces the high voltage spark to ignite the burner. At the same instant the spark starts, the gas valve and blower sequencer are energized. After the third try for ignition, if the burner is not ignited, the module locks out the system and will stay locked out until the system is reset.

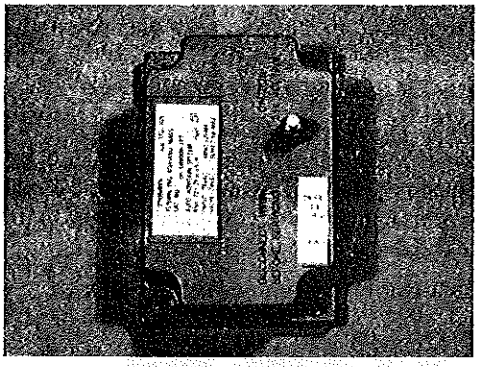


Figure 4
Ignition Module

Heating Relay — The heating relay has 3 sets of contacts — 2 normally open sets and 1 normally closed set. One set of normally open contacts control the power to the vent motor. The other set of normally open contacts control the power thru the normally closed limit switch and normally open air pressure switch to the ignition module. The set of normally closed contacts provides the power to the blower relay for continuous blower in cooling operation.

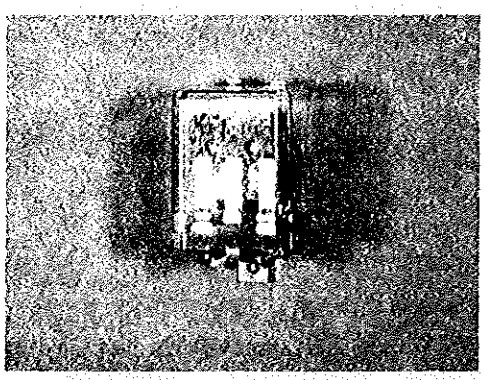


Figure 5
Heating Relay

Blower Relay — Double pole double throw. One set of contacts, normally open, wired to cooling speed of blower motor. Normally closed contacts wired to heating speed of the blower motor.

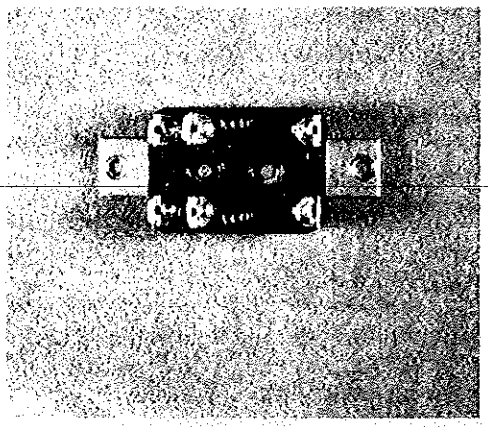


Figure 6
Blower Relay

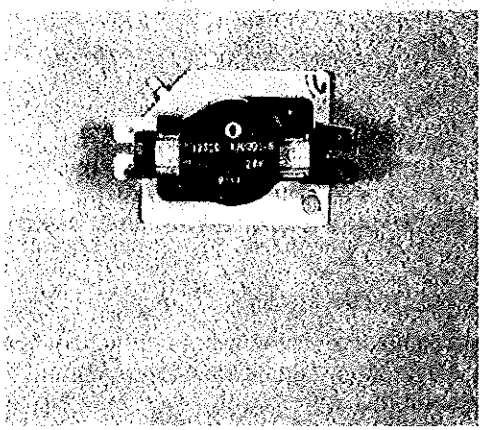


Figure 7
Blower Sequencer

Blower Sequencer — This sequencer is energized by the ignition module at the same instant the gas valve is energized. Approximately 30 seconds after the sequencer is energized the normally open contacts close starting the blower motor. These contacts by-pass the thermal fan switch. The purpose of this switch is to start the blower with a minimum of delay after burner has ignited.

Blower Motor — 115 volt, multi-speed permanent split capacitor type. Factory wired for high speed in heating operation. Speed for cooling is optional and should be selected to match cooling load. Heating speed can be adjusted down one tap to medium high.

Transformer — The purpose of the transformer is to reduce the 115 volt primary voltage to 24 volts which the serviceman can work with easily and safely. The transformer is rated at 40 VA with sufficient capacity for add on air conditioning.

Fan Switch — Thermally actuated normally open switch — closes when heat exchanger temperature reaches switch temperature. Opens after burner is out and heat exchanger cools off.

Limit Control — Thermally actuated normally closed switch. Opens to de-energize the ignition module and close the gas valve when the heat exchanger temperature becomes excessive.

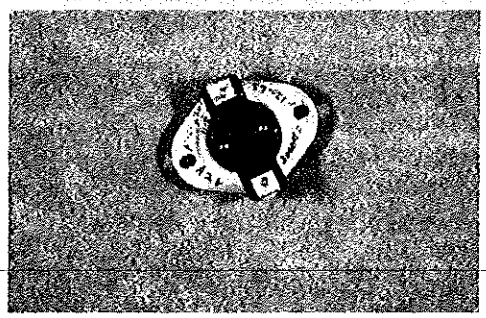


Figure 8
Fan Switch

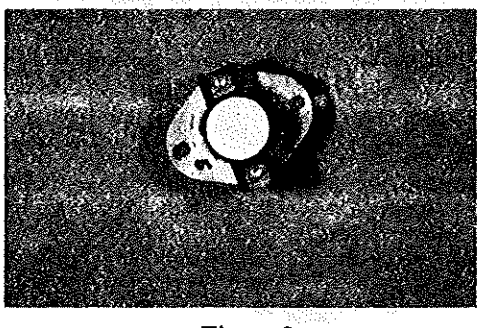
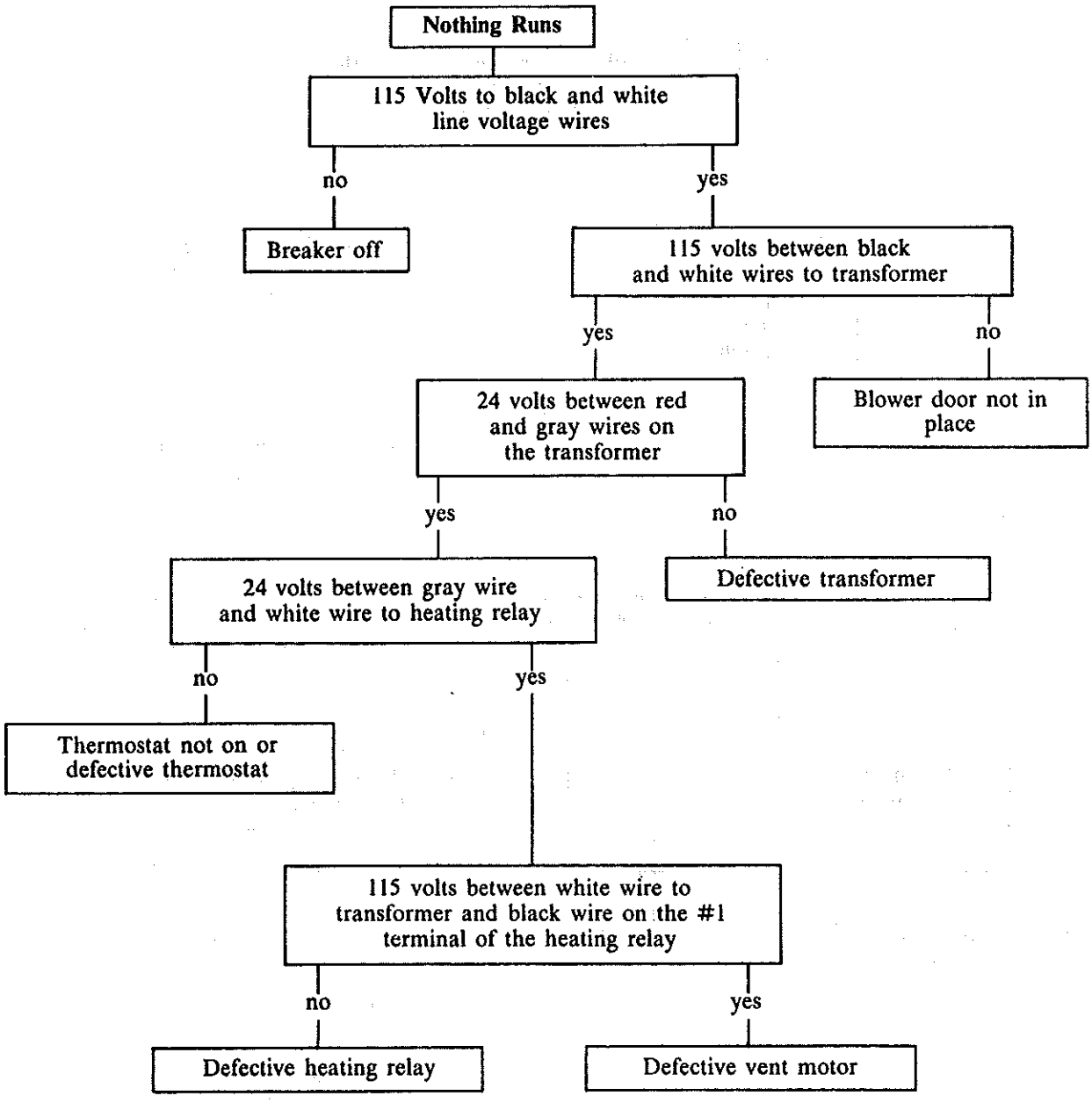
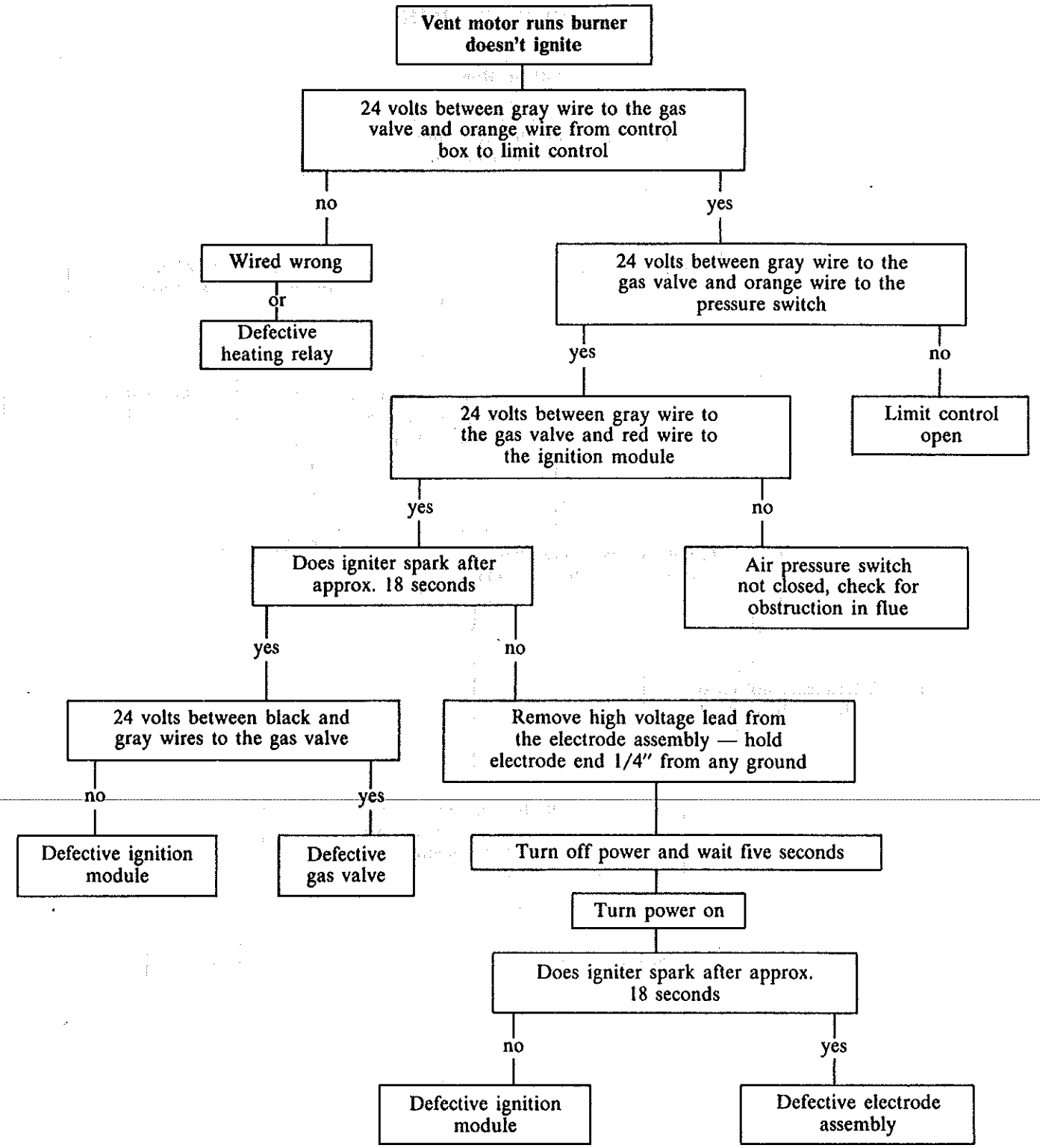


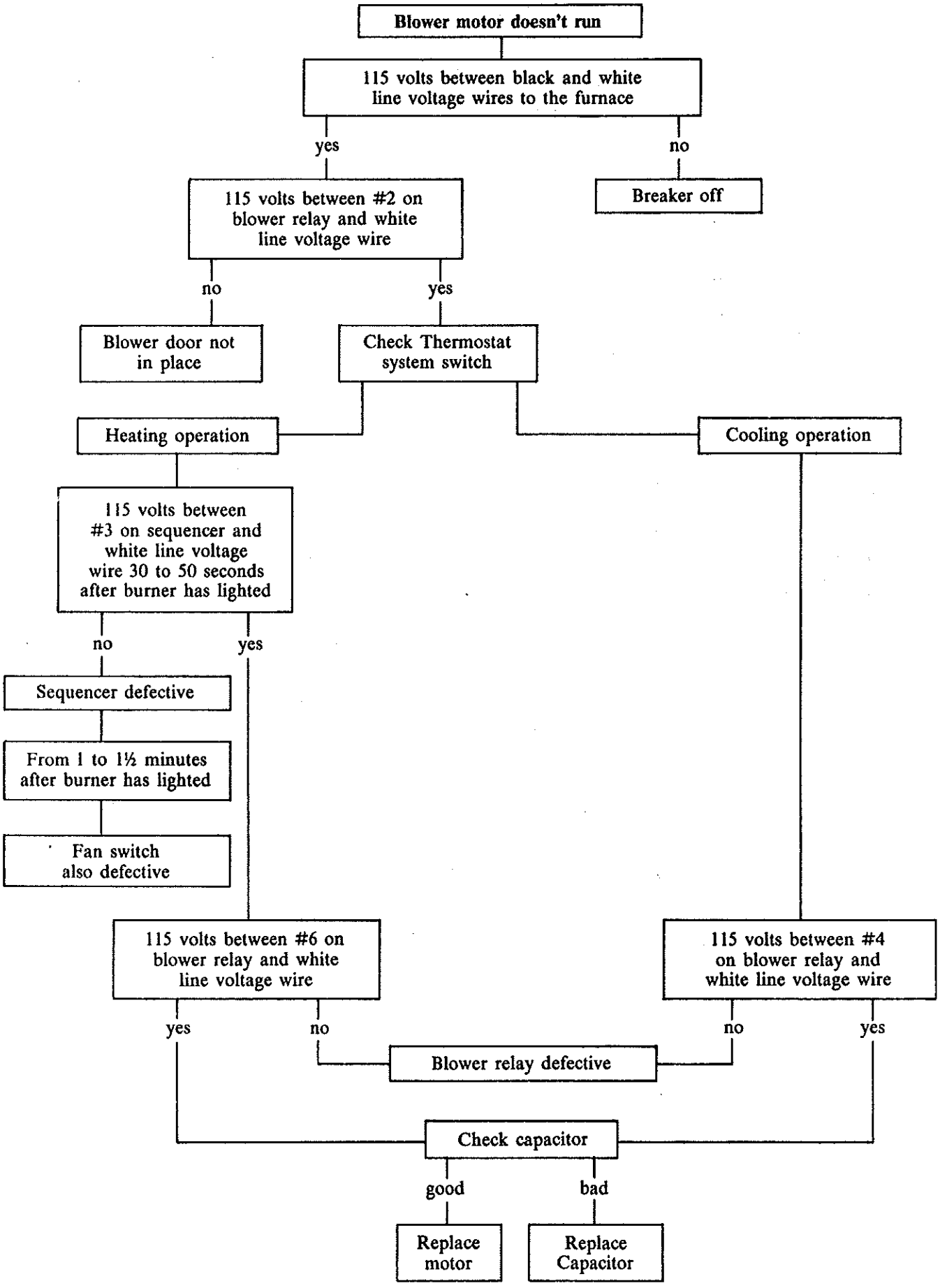
Figure 9
Limit Control

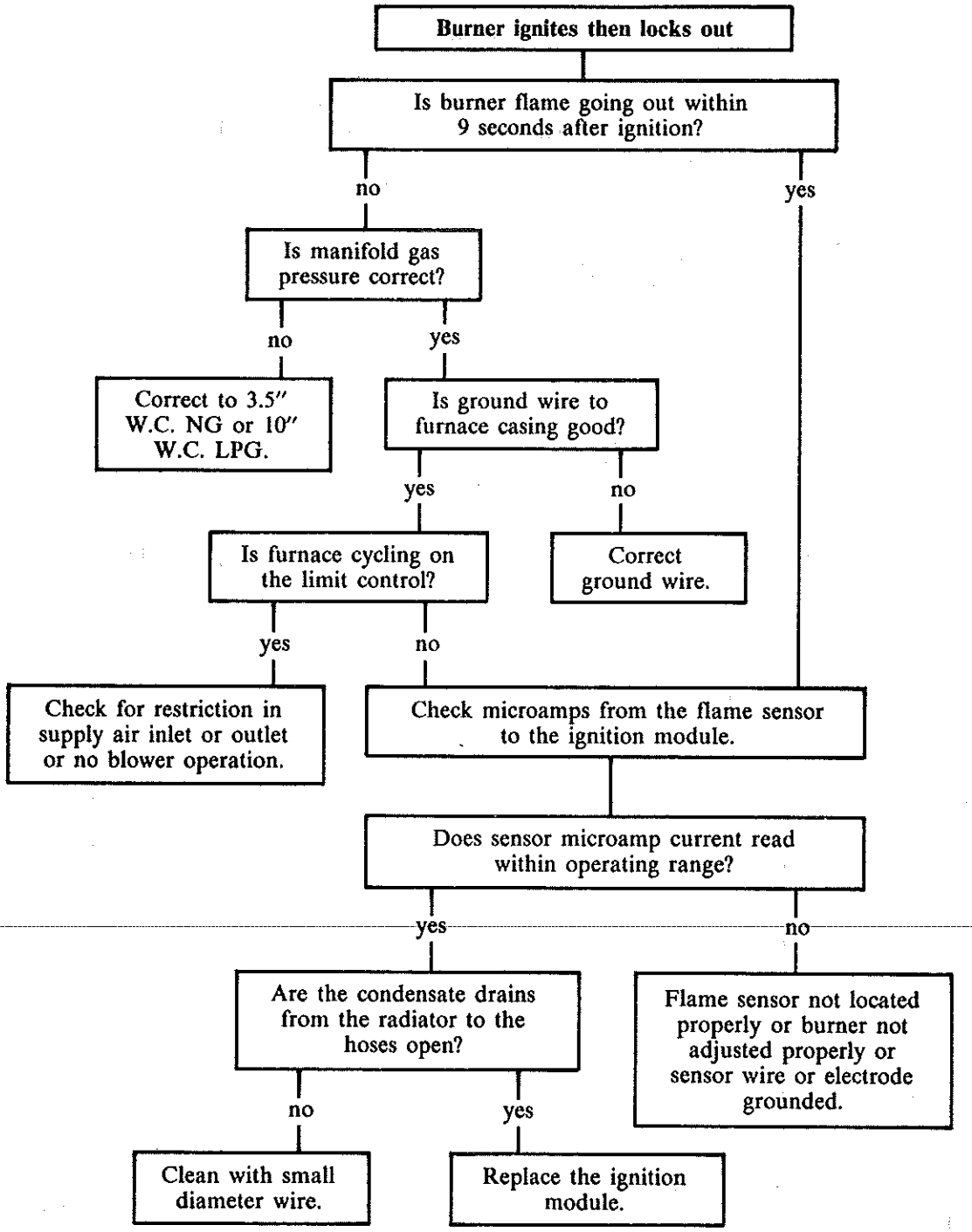
Safety Switch — This switch is located inside the blower compartment and controls the electrical supply to the furnace electrical circuits. When the blower door is put in place, the switch is activated allowing the furnace to operate. The switch is designed to prevent furnace operation if the blower door is removed and inadvertantly not re-installed, thus preventing the possibility of the blower creating a negative pressure in the furnace enclosure.

Burner — Mono-Port with a stainless steel flame spreader and adjustable primary air.

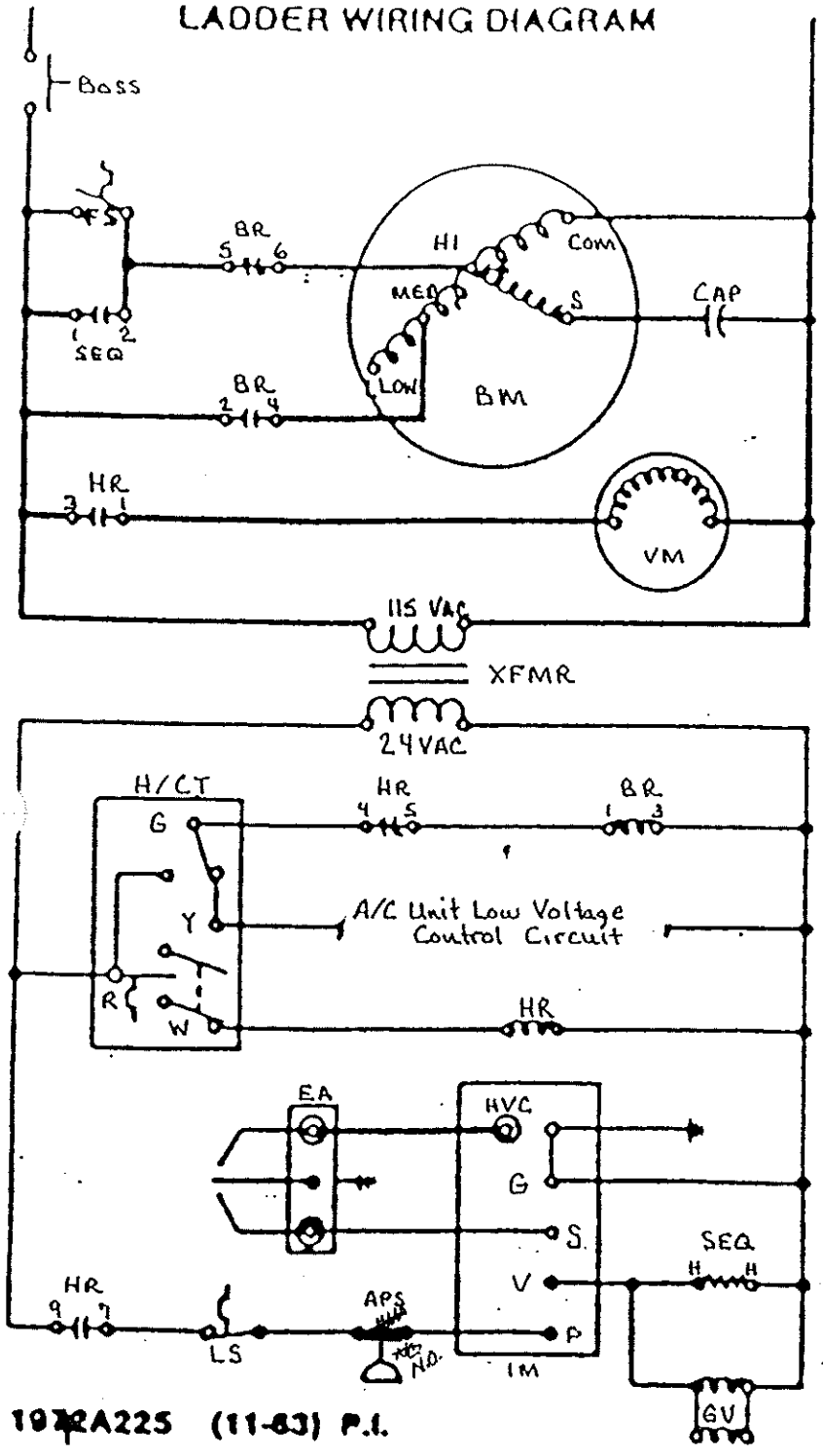

Nothing Runs
115 Volts to black and white line voltage wires
no
yes
Breaker off
115 volts between black and white wires to transformer
yes
no
24 volts between red and gray wires on the transformer
Blower door not in place
yes
no
24 volts between gray wire and white wire to heating relay
Defective transformer
no
yes
Thermostat not on or defective thermostat
115 volts between white wire to transformer and black wire on the #1 terminal of the heating relay
no
yes
Defective heating relay
Defective vent motor


Vent motor runs burner doesn't ignite
24 volts between gray wire to the gas valve and orange wire from control box to limit control
no
yes
Wired wrong
or
Defective heating relay
24 volts between gray wire to the gas valve and orange wire to the pressure switch
yes
no
Limit control open
24 volts between gray wire to the gas valve and red wire to the ignition module
yes
no
Does igniter spark after approx. 18 seconds
Air pressure switch not closed, check for obstruction in flue
yes
no
24 volts between black and gray wires to the gas valve
Remove high voltage lead from the electrode assembly — hold electrode end 1/4" from any ground
no
yes
Defective ignition module
Defective gas valve
Turn off power and wait five seconds
Turn power on
Does igniter spark after approx. 18 seconds
no
yes
Defective ignition module
Defective electrode assembly


Blower motor doesn't run
115 volts between black and white line voltage wires to the furnace
yes
no
Breaker off
115 volts between #2 on blower relay and white line voltage wire
no
yes
Blower door not in place
Check Thermostat system switch
Heating operation
Cooling operation
115 volts between #3 on sequencer and white line voltage wire 30 to 50 seconds after burner has lighted
no
yes
Sequencer defective
From 1 to 1½ minutes after burner has lighted
Fan switch also defective
115 volts between #6 on blower relay and white line voltage wire
115 volts between #4 on blower relay and white line voltage wire
yes
no
no
yes
Blower relay defective
Check capacitor
good
bad
Replace motor
Replace Capacitor


Burner ignites then locks out
Is burner flame going out within 9 seconds after ignition?
no
yes
Is manifold gas pressure correct?
no
yes
Correct to 3.5" W.C. NG or 10" W.C. LPG.
Is ground wire to furnace casing good?
yes
no
Is furnace cycling on the limit control?
Correct ground wire.
yes
no
Check for restriction in supply air inlet or outlet or no blower operation.
Check microamps from the flame sensor to the ignition module.
Does sensor microamp current read within operating range?
yes
no
Are the condensate drains from the radiator to the hoses open?
Flame sensor not located properly or burner not adjusted properly or sensor wire or electrode grounded.
no
yes
Clean with small diameter wire.
Replace the ignition module.

LADDER WIRING DIAGRAM



ABBREVIATIONS

APS	– Air Pressure Switch
BOSS	– Blower Door Safety Switch
BM	– Blower Motor
BR	– Blower Relay
CAP	– Capacitor
EA	– Electrode Assembly
FS	– Fan Switch
GV	– Gas Valve
H/C T	– Heat/Cool Thermostat
HR	– Heating Relay
HVC	– High Voltage Coil
IM	– Ignition Module
LS	– Limit Switch
SEQ	– Sequencer
VM	– Vent Motor
XFMR	– Transformer

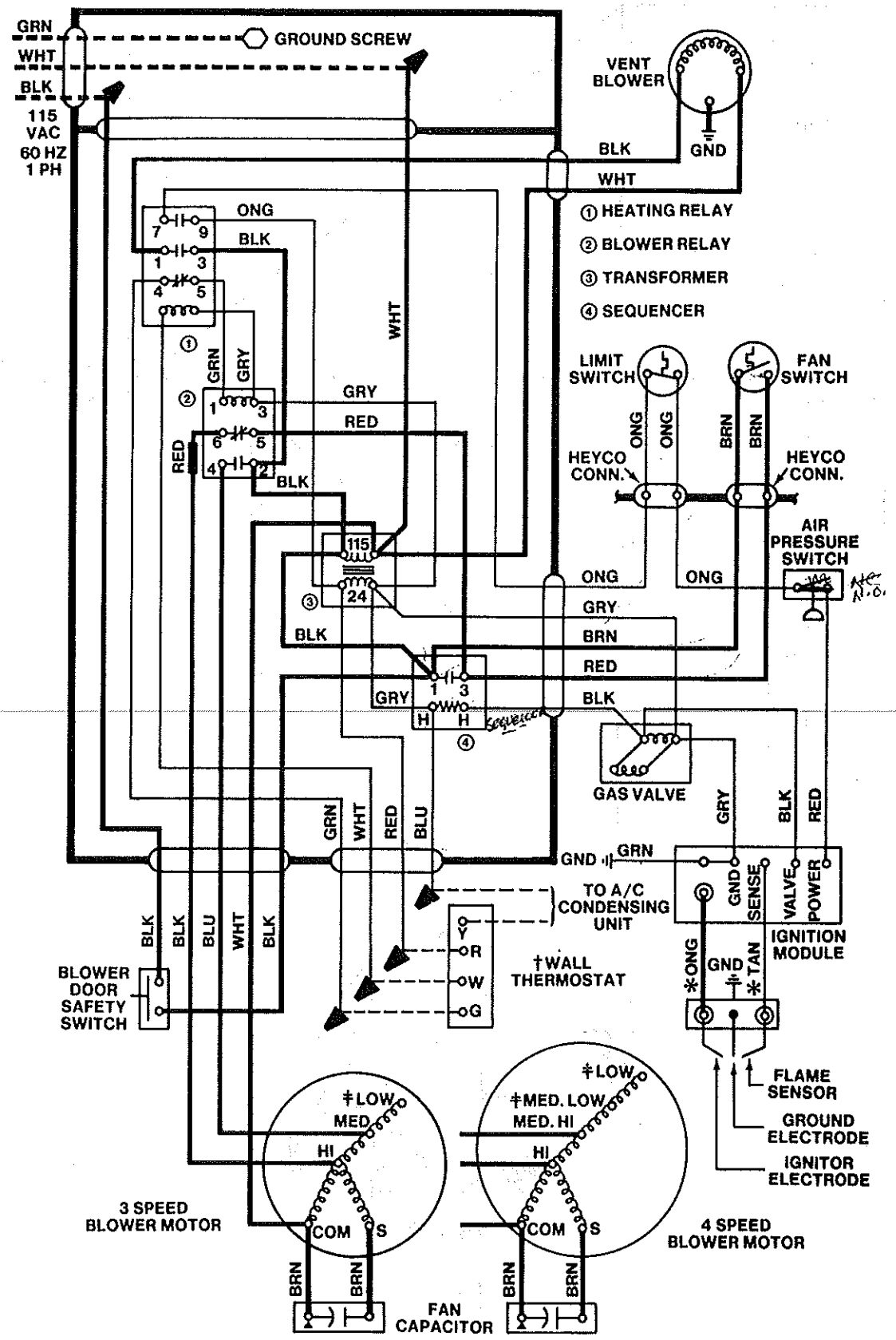
MODELS
2940, 2960, 2970, AND 2985

THE COLEMAN COMPANY, INC.
Wichita, Kansas 67201

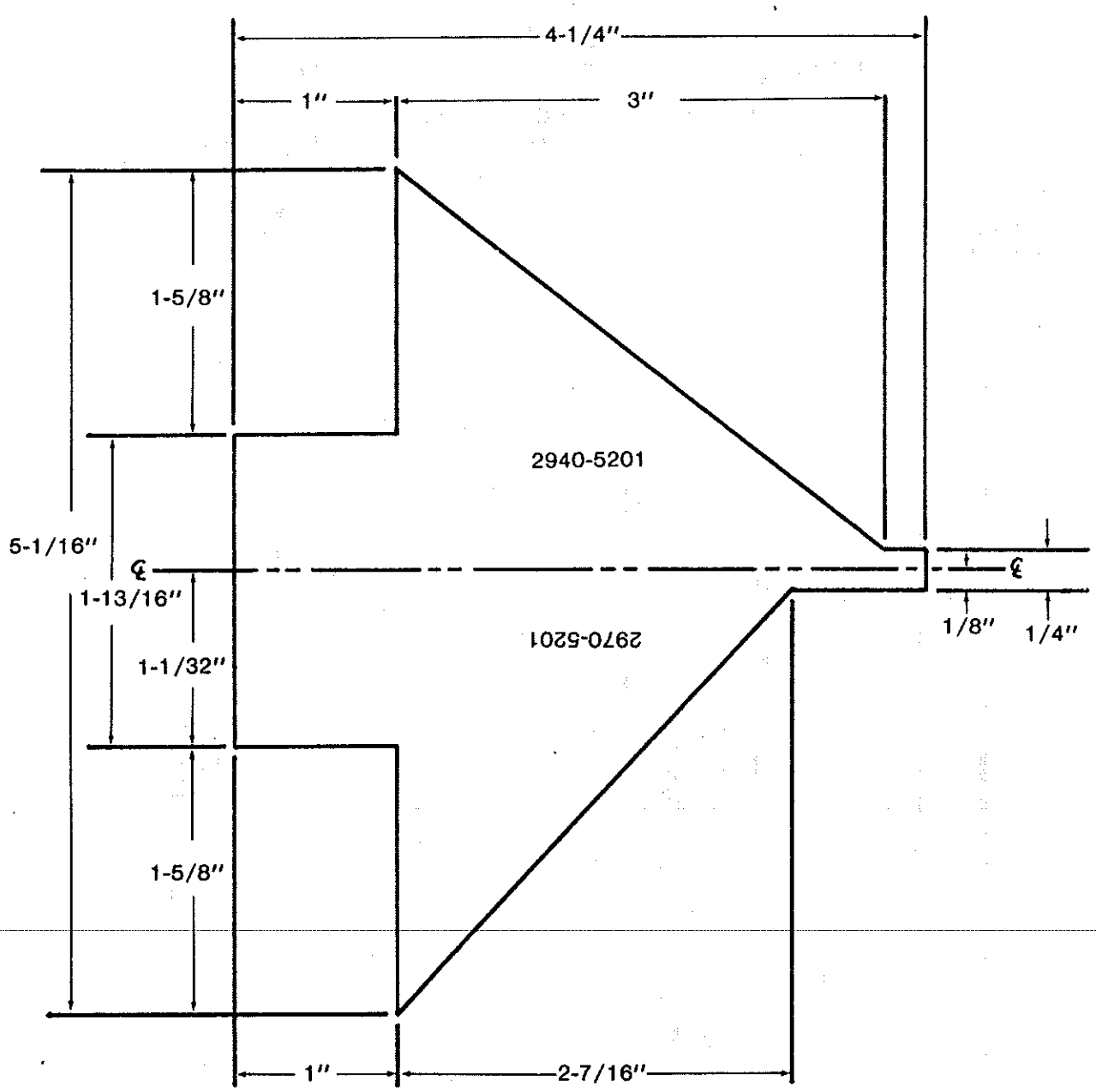
19[illegible]A225 (11-83) P.I.

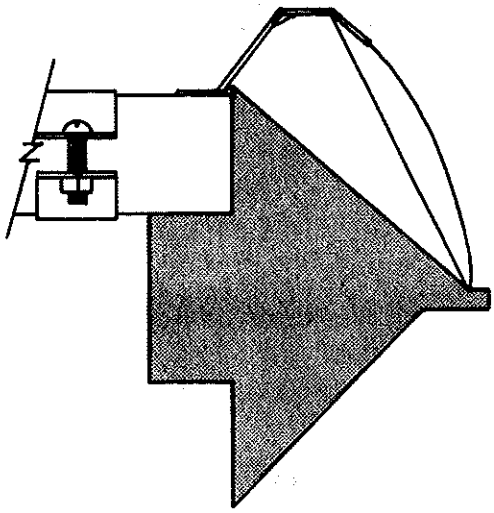
90 SERIES
COLEMAN GAS FORCED AIR FURNACE

USE ONLY 115 VAC 60 HZ 1 PH
LESS THAN 12 AMPS MAX. OVERCURRENT PROTECTION 15 AMPS



FACTORY INTERNAL WIRING SHOWN SOLID


4-1/4"
1"
3"
1-5/8"
2940-5201
5-1/16"
1-13/16"
1-1/32"
2970-5201
1/8"
1/4"
1-5/8"
1"
2-7/16"



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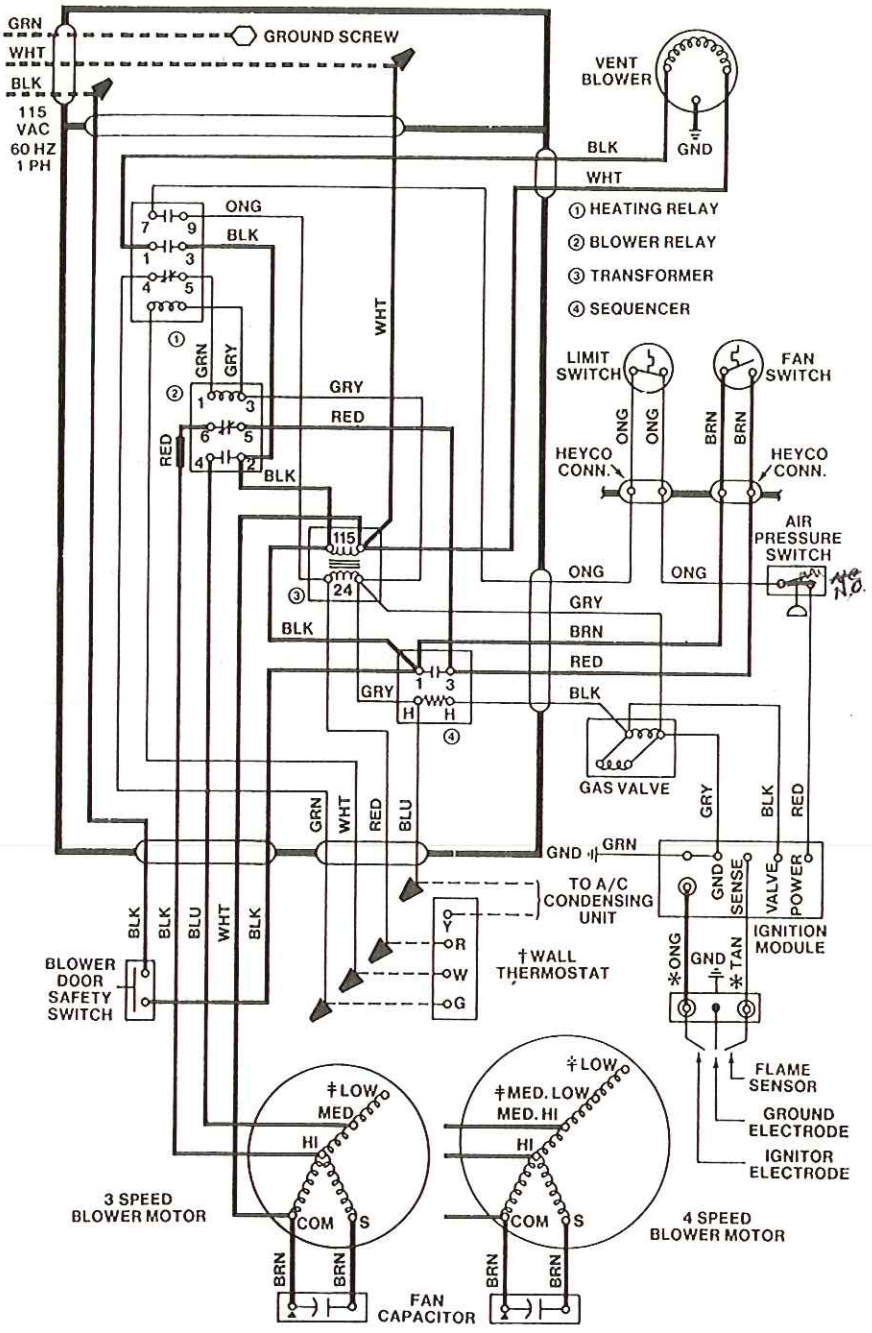

FACTORY INTERNAL WIRING SHOWN SOLID.
IF ANY OF THE ORIGINAL WIRE SUPPLIED WITH THIS UNIT MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 105°C* THERMOPLASTIC OR ITS EQUIVALENT.
*ORANGE AND TAN WIRES INDICATED: 200°C
†WHITE RODGERS HEAT THERMOSTAT: COLEMAN MODEL 7670-3751
COOLING SUB BASE: COLEMAN MODEL 7670-3701
WHEN OTHER MODEL THERMOSTAT IS USED, REFER TO MFG. DIAGRAM WITH THERMOSTAT AND SUB BASE FOR CONNECTION.
WHEN USING 2-WIRE HEATING ONLY THERMOSTAT, CONNECT TO RED AND WHITE WIRES.
‡DO NOT USE THESE BLOWER TAPS FOR HEATING SPEEDS. TSWD 29