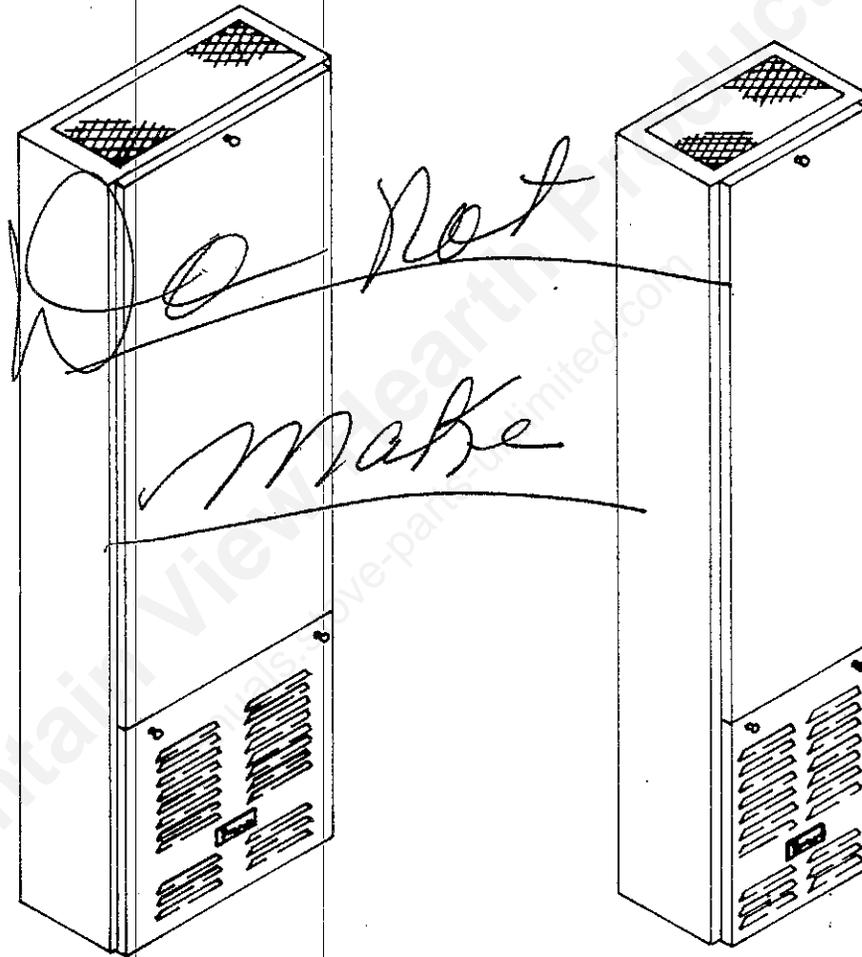


owner's manual

INSTRUCTIONS FOR INSTALLING AND  
OPERATING — WITH REPAIR PARTS LIST

# GAS FIRED, COUNTER FLOW, SEALED CUMBUSTION SYSTEM WALL FURNACE



VCF-45(A,AI)W(N.L.)

VCF-35(A,AI)W(N.L.)

**FOR USE WITH NATURAL AND L.P. GASES**

THIS MANUAL WILL HELP YOU TO OBTAIN EFFICIENT, DEPENDABLE SERVICE FROM THE HEATER, AND  
ENABLE YOU TO ORDER REPAIR PARTS CORRECTLY. KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

*Lawson Division*

UNITED STATES STOVE COMPANY, SOUTH PITTSBURG, TENNESSEE

FORM 9393-2

# INTRODUCTION

## When Your Furnace Arrives

Your complete heating unit is in two packages. The large carton is the main heating unit, and the small carton is the outside vent which is necessary to complete the installation.

First, inspect each item received for visible damage. If any parts are damaged, report this to the freight company immediately and request them to call and make an inspection before you make any installation. Have the inspector prepare a signed report. Send us a copy of the report and we will send replacements for the damaged parts, but we must have the signed inspection report of the freight company to prove their liability. Second, examine all packing material carefully for loose parts before discarding it. Also, store all parts received where they cannot be accidentally damaged.

## Unpacking Your Furnace

After removing your furnace from its carton, stand it upright close to the area chosen for installation as explained on Page 3 of this booklet.

1. Remove the front panel by pulling forward at the top and lifting up to free the hinge tab.
2. Follow the instructions for removing the packing from around the blower carefully to prevent possible damage to the blower or filters.
3. To remove protective packing from blower:
  - a. Pull scored pad in front of blower forward and out of furnace . . . discard.
  - b. If filter is still in place above blower, remove it. Place in a safe place where you can find it later.
  - c. Reach over and behind blower and pull the scored pad up through the opening in furnace top . . . discard.
4. Be sure blower discharge opening is in opening of shield and that blower assembly floats free on suspension springs.
5. Replace filter.

# INSTALLATION . . .

**MODEL NO.** VCF-35 (A,AI)WN  
VCF-45 (A,AI)WN

This model is for use with natural gas only. It is intended for automatic operation and is equipped with a 3/8" x 1/2" Minneapolis Honeywell Gas Control Valve with built-in pressure regulator and safety pilot. A wall thermostat completes the automatic controls set. In the event of a pilot failure, the gas to the main burner and pilot burner will be automatically shut off.

**MODEL NO.** VCF-35 (A,AI)WL  
VCF-45 (A,AI)WL

This model is for use with liquified petroleum gas only. It is intended for automatic operation and is equipped with a 3/8" x 1/2" Minneapolis Honeywell Gas Control Valve. A wall thermostat completes the automatic controls set. In the event of a pilot failure, the gas to the main burner will be automatically shut off.

## Location of Furnace

Never install this furnace on an inside wall. Your furnace may be installed on **any outside wall with an overall thickness of 6" to 12"**. On walls greater than 12" thick, the vent tubes will not overlap properly and improper combustion will result.

1. Observe minimum space requirements shown in Fig. 1.
2. Your furnace should be located where it will afford the best circulation. Generally the best location is along the center of the outside wall of the room or area to be heated. Never install furnace beside a door where the door might be opened in front of the furnace or drapes might come in contact with the furnace body or block the air discharge louvers.
3. Determine locations of wall studs to insure that one will not interfere with the hole which must be cut through the wall for the vent tubes.
4. After the location has been selected, the wall and floor areas should be carefully inspected to make sure there are no wires, ducts, pipes, etc., which may interfere with installation. Examine the wall outside the house to make sure there are no obstructions which would interfere with the outside vent.

MODEL	VCF-35	VCF-50
A	7 1/8	10"
B	6 3/8	9 1/4
C	8 1/4	9 1/2

Minimum Distance from center line of Air Intake to nearest outside corner construction is 30".

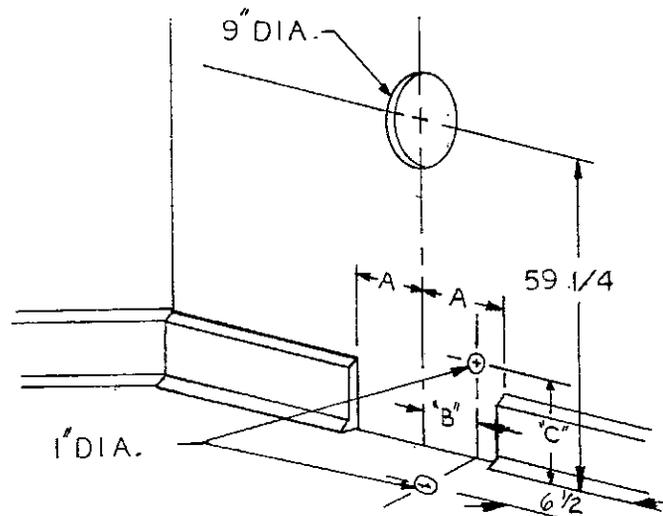


FIG. 1

# INSTALLATION . . .

## Installing Your Furnace

1. After the location for your wall furnace has been selected, a 9" dia. hole must be cut through the inside wall and outside wall. Use dimensions shown in Fig. 1 for this hole location.
2. It is advisable to mark center lines on the wall to use after the hole has been cut through the wall. Proceed now to cut the 9" dia. vent hole through the wall (Fig. 1).
3. In order to mount your furnace flush against the wall, it will be necessary to remove a section of baseboard and quarter-round trim the width of your furnace.
4. Using a plumbbob, determine a vertical line from the 9" dia. hole center line to the floor.
5. Remove a section of baseboard equal to dimension "A" from each side of the centerline determined in Step 4 above (Fig. 1).
6. Now cut the 1" dia. hole in **either** the inside wall **or** floor for the gas line, depending on whether the gas line is to be brought through the wall or floor (Fig. 1).
7. Remove front panel (1) and access door (18), (Fig. 2).
8. Place furnace against wall and enter vent centering ring (on back of the furnace) into vent hole you have cut in wall.
9. Secure furnace to wall with four wood screws (47), (Fig. 2).

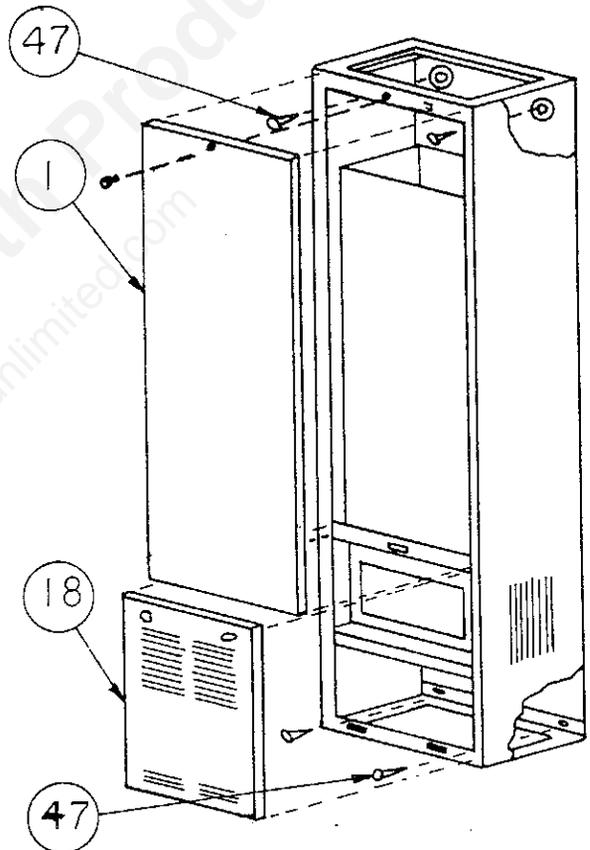


FIG. 2

### INSTALLATION CLEARANCES:

Minimum to ceiling above - 10"

Minimum to floor below - 0"

Minimum to side walls - 19"

# INSTALLATION . . .

## Connecting the Gas Supply Line

1. The gas supply line **must** have a trap or drip leg at the inlet gas connection to the controls assembly (Fig. 3).
2. This can be accomplished with a pipe tee fitting and plug (Fig. 3).
3. **Shut off all gas appliances in the house and turn off gas supply at the meter.**
4. Pre-install a manual valve shut-off ahead of furnace controls (Fig. 3). This is for easy shut-off of the gas if servicing is required on burner controls, etc.
5. During installation, apply a joint sealing compound resistant to the action of liquified petroleum gases to all male pipe threads.
6. Connect gas line to control assembly. Be certain when making connection you do not cause misalignment of controls and manifold; such as creating a torque which will put the controls and burner in a strain.  
**REMEMBER:** A good burner flame depends upon proper alignment of the controls, manifold, and burner.
7. After the pipe installation is finished, open the gas line.

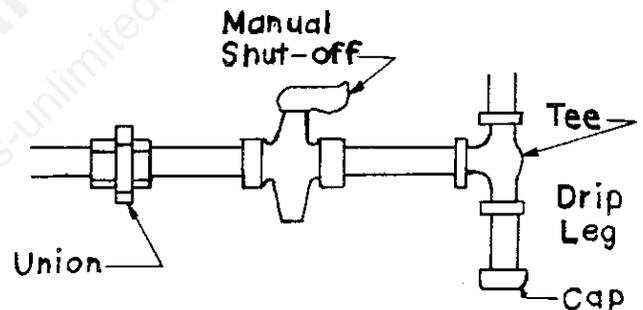


FIG. 3

## Testing For Leaks

1. Open the valve at the meter and light pilots on all other appliances.
2. Open manual shut-off valve you have installed and test for leaks.
3. **NEVER use an open flame to test for leaks.**
4. Use a soapy water solution. Apply to each joint in turn. If there is a leak, bubbles will form and burst.
5. Correct even the smallest leak immediately. **DO NOT LIGHT FURNACE PILOT NOW.**

# INSTALLATION . . .

## Connecting the Wiring

1. Your wall furnace was completely wired at the factory and it will be necessary for you to connect only the 110V A.C. power supply and install the wall thermostat.
2. **TURN OFF POWER AT MAIN FUSEBOX BEFORE STARTING WIRING CONNECTIONS.**
3. Remove transformer from junction box at furnace base.
4. Connect 110V A.C. power supply to furnace circuit as shown in wiring diagrams of this manual. **Make this connection inside junction box.**
5. Replace transformer.
6. **DO NOT RECONNECT POWER AT MAIN FUSEBOX AT THIS TIME.**

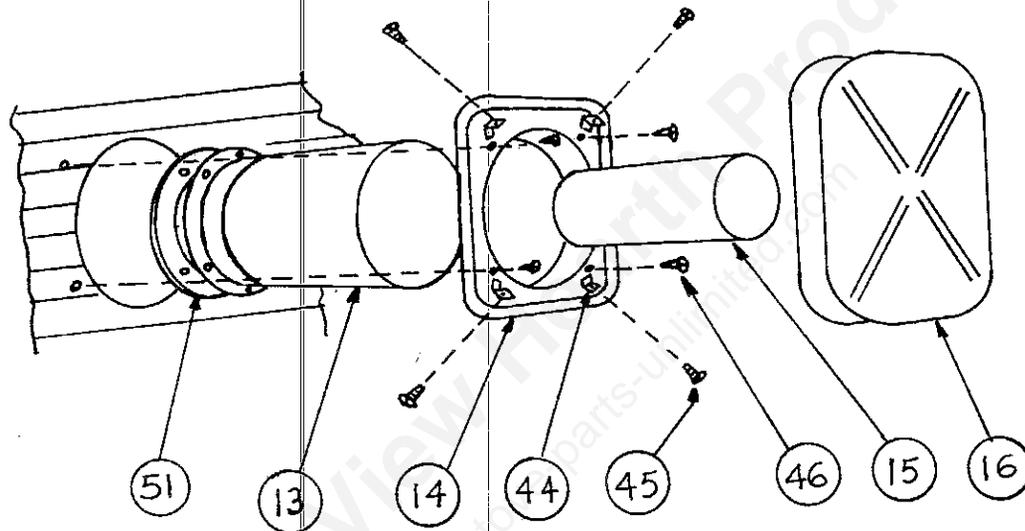


FIG. 4

## Installing Vent Assembly

1. The vent assembly was designed for a wall with overall thickness of 12". If your wall is less than 12" thick, it will be necessary to remove part of the length of the vent extension tubes (13 and 15), (Fig. 4).
2. From outside of building, insert a rule into vent hole you have cut in wall until rule touches furnace back (Fig. 5).
3. Determine length "E" (distance from furnace back to outside finish wall), (Fig. 5).
4. **Subtract length "E" from 13".** The remainder is the amount to be removed from both extension tubes.
5. Attach air inlet extension tube, with gasket, to back of heat exchanger, metal screws provided in parts bag.

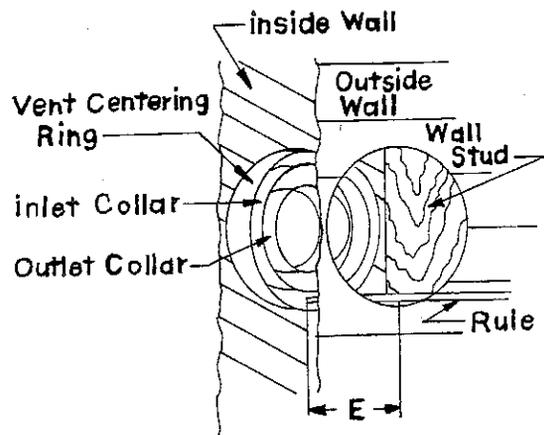


FIG. 5

# INSTALLATION . . .

**BE CAREFUL NOT TO BEND OR DISTORT THE EXTENSION TUBES.**

6. Place a bead of common caulking compound in caulk well on back side of wall plate (14) completely around wall plate (Fig. 6).
7. Press wall plate collar (14) into air inlet extension and secure wall plate to wall with four wood screws (46) from parts bag (Fig. 7).
8. Press flue outlet extension (15) over flue outlet collar (Fig.7).
9. Press vent plate collar (16) into flue outlet extension (15) and secure wall plate (14) to vent plate assembly (16) with self-tapping screws (45) through plate brackets (44), (Fig. 7).

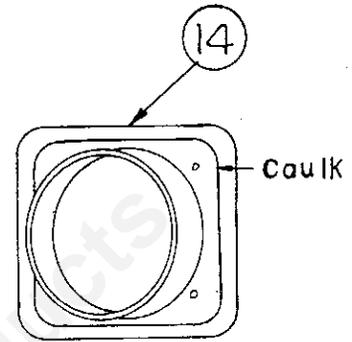


FIG. 6

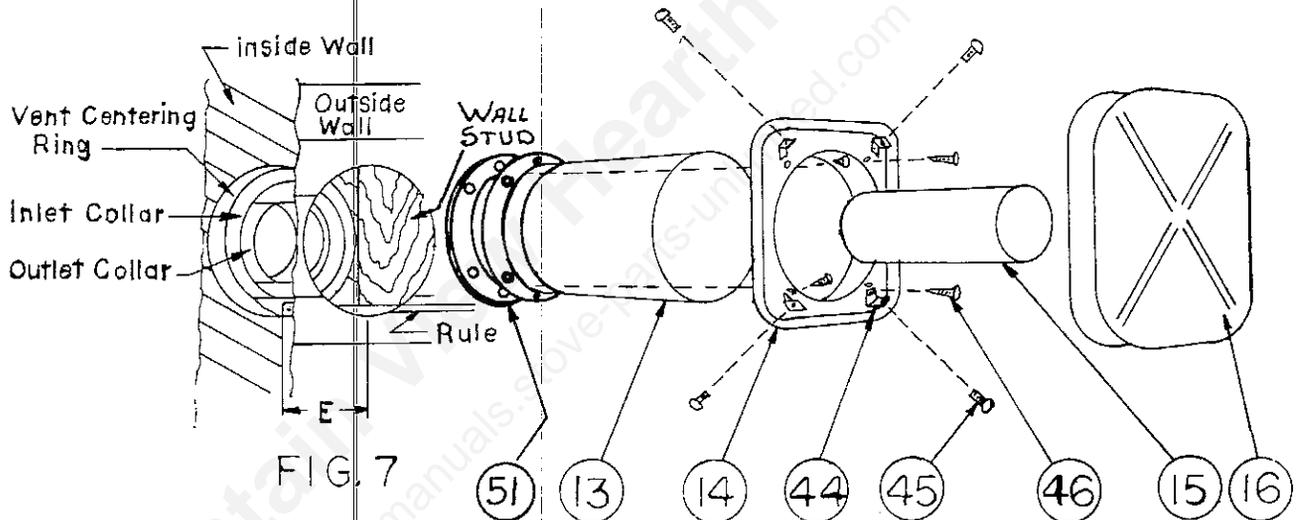


FIG. 7

## Installing Wall Thermostat

1. Locate thermostat approximately five feet above floor level on an inside wall near the center of area to be heated.
2. Do not place thermostat near other sources of heat such as television, light bulbs, etc.
3. Plan to conceal the wiring if possible.
4. Connect thermostat to your furnace according to the wiring diagrams of this manual. Refer to instructions packed with thermostat.

# ADJUSTMENTS AND OPERATION . . .

## OPERATING YOUR HEATER

Be certain all packing material is removed from inside your furnace. The blower (7) must be freely suspended from the suspension springs (6) and the filter (11) in position above it, (Fig. 9) or (Fig. 10). Reconnect 110V A.C. power at fusebox. The blower is operated by the thermostatic fan switch (3), (Fig. 9), or (Fig. 10), and will start shortly after the burner ignites and will shut off after the burner shuts off.

## STARTING YOUR FURNACE

1. To light pilot, turn wall thermostat to its lowest position.
2. Open pilot lighter door (20) to expose pilot burner (32) and thermocouple (30) (Fig. 9).
3. Depress gas valve knob and turn clockwise to "OFF" position. Wait five minutes for unburned gas to vent.

**CAUTION:** LP Gas is heavier than air and will not vent upward naturally.

4. With knob in "OFF" position, depress knob, HOLD IT DEPRESSED, AND:

- a. Turn knob counterclockwise to "PILOT" position.
- b. Insert lighted match next to pilot and hold knob depressed about one minute so that pilot will stay lit when knob is released.

NOTE: If pilot does not stay lit, repeat Steps 3 and 4.

5. When pilot remains lit, close lighter door and secure tightly with wingnuts.
6. Turn gas valve knob counterclockwise to "ON" position.
7. Turn wall thermostat to highest position. Burner will ignite.

## TO ADJUST AIR INPUT

1. Loosen wingnut holding air adjustment door (22), (Fig. 9), or (Fig. 10), in place and open air adjustment to expose air adjustment bolt (24), (Fig. 8).
2. Observe the burner flame through the air adjustment door. The burner flame should be a series of sharp blue flames, (Fig. 8).
3. To adjust flame, insert screwdriver into air adjustment hole and turn air adjustment bolt clockwise or counterwise. **NOTE:** Do not screw air adjustment bolt out of burner.
4. If the flame has yellow tips, blows off, is noisy, or pops when turned off, there is too much primary air. Turn the air adjustment bolt clockwise until you obtain a good flame.

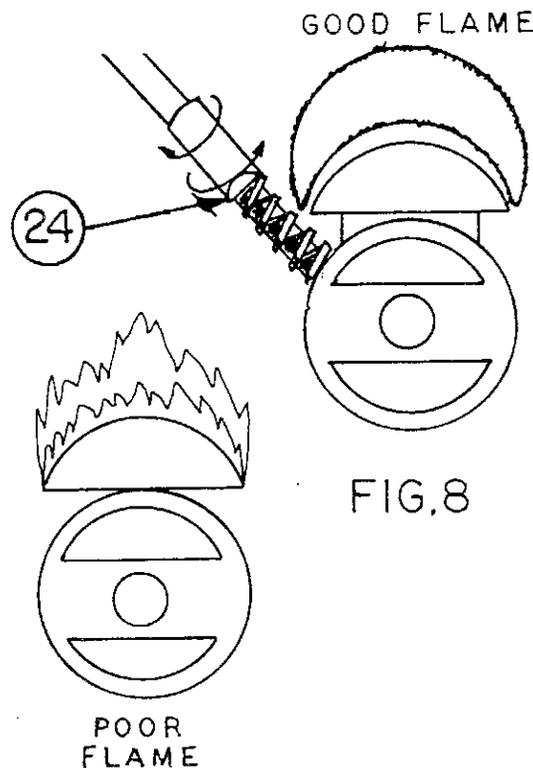
5. If the flame is yellow-orange and extends high into combustion chamber, there is insufficient primary air. Turn the air adjustment bolt counterclockwise.
6. After adjusting flame, close lighter door and secure tightly with wingnuts.
7. Replace controls access door (18), (Fig. 9) or (Fig. 10).
8. Replace front panel (1), (Fig. 9) or (Fig. 10).

Set wall thermostat for the desired room temperature.

## CHECKING GAS INPUT RATING

1. Set the wall thermostat to its highest setting and allow your furnace to burn for five minutes.
2. Turn off gas to other appliances.
3. Using a stopwatch or watch with a sweep-second hand, observe your gas meter and determine the amount of time your furnace takes to burn one cubic foot of gas.
4. Your furnace is burning correctly when it consumes one cubic foot of gas in following approximate times:

MODEL NO.	INPUT RATING	TYPE GAS	TIME
VCF-35 (A,AI)WN	35,000	Nat.	1 Min/51 Sec.
VCF-35 (A,AI)WL	32,500	Propane	4 Min/44 Sec.
VCF-35 (A,AI)WL	32,500	Butane	5 Min/58 Sec.
VCF-45 (A,AI)WN	45,000	Nat.	1 Min/24 Sec.
VCF-45 (A,AI)WL	40,000	Propane	4 Min/15 Sec.
VCF-45 (A,AI)WL	40,000	Butane	5 Min/15 Sec.



## SERVICE HINTS --- FOR BETTER PERFORMANCE

### Insufficient Heat:

1. Incorrect gas input.
  - a. Recheck input as described in section "Checking Gas Input Rating". Have gas company correct input if necessary.
  - b. Check orifice to be sure it is the correct size and is not clogged. Do not ream orifice or distort in any way.
2. Wall thermostat malfunctioning.
  - a. Recheck the location to be sure air freely circulates around thermostat and that thermostat is not affected by an outside source of heat.
3. Heater undersized.
  - a. This can happen when a building or room is enlarged. Have a heating contractor check your "heat load" against your furnace capacity. He will make proper recommendations for solving this problem.
4. Incorrect gas mixture.
  - a. Recheck adjustment of primary air to burner as in section "To Adjust Air input".
  - b. Check for dust and other foreign matter at air mixer opening and burner ports . . . clean if necessary.

### Noisy Flames:

1. Excessive gas input.
  - a. Due to gas pressure being too high. Have gas company check and correct.
2. Excessive primary air.
  - a. Check primary air to burner as in section, "To Adjust Air input".
3. Damaged orifice (if it whistles).
  - a. Replace orifice.

### Soot or Carbon in Burner or Combustion Chamber:

1. Vent tubes blocked or improperly installed. Check and correct if necessary.
2. Insufficient primary air. Check burner flame and readjust.
3. **NOTE:** If soot has formed, it must be cleaned thoroughly before unit will function properly again.

### Pilot Outage :

1. Unit over-gassed.
  - a. Recheck input as in section, "Checking Gas Input Rating". Have heating contractor adjust input if necessary.
2. Insufficient primary air.
  - a. Recheck and adjust.
3. Pilot lighter door not sealed.
  - a. This door and air adjustment door **MUST BE CLOSED SECURELY.**
4. Defective thermocouple or valve.
  - a. Call your heating contractor.
5. Vent tubes leaking.
  - a. Recheck installation.
6. Thermocouple not properly heated.
  - a. The pilot flame must envelope one-half of thermocouple tip.
  - b. If it does not adjust pilot flame by removing cover screw and turning set screw on valve.

## MAINTAINING YOUR HEATER AT TOP EFFICIENCY

### Filter:

To clean filter, soak in warm soapy water, then shake filter to remove excess water. Replace on top of heater in original position.

### Air Discharge Louvers :

The louvers should be cleaned of any lint which will accumulate on them.

### Casing:

Any dirt which accumulates on casing should be removed soon after it happens but always when casing is cool. Use only soap on a damp cloth.

**WE RECOMMEND THAT YOUR HEATER BE CHECKED EACH YEAR BY AN EXPERIENCED SERVICEMAN.**

The control compartment must be kept clean.

# PARTS ILLUSTRATION

## Model No. VCF-35(A,A1)W(N,L)

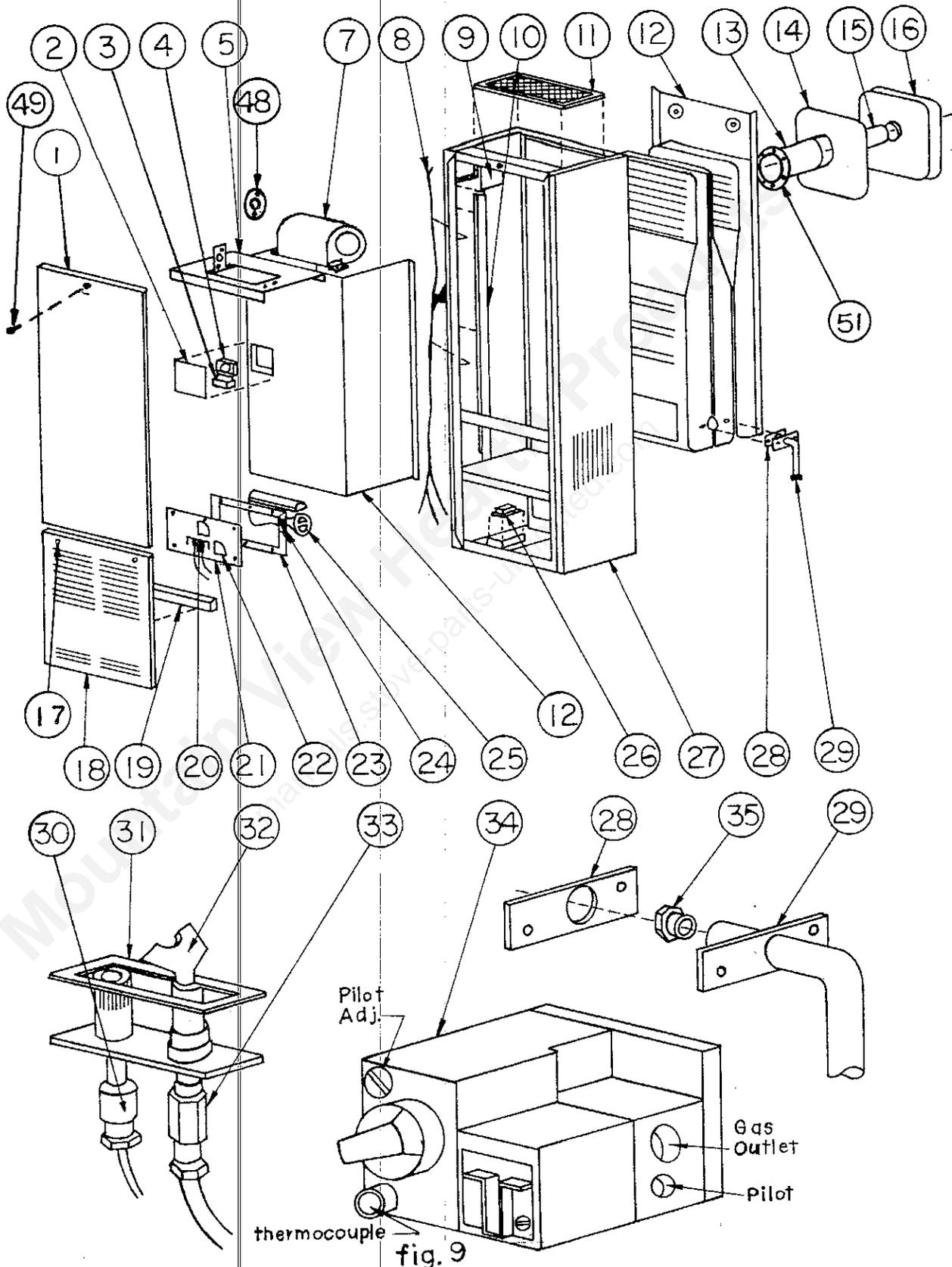
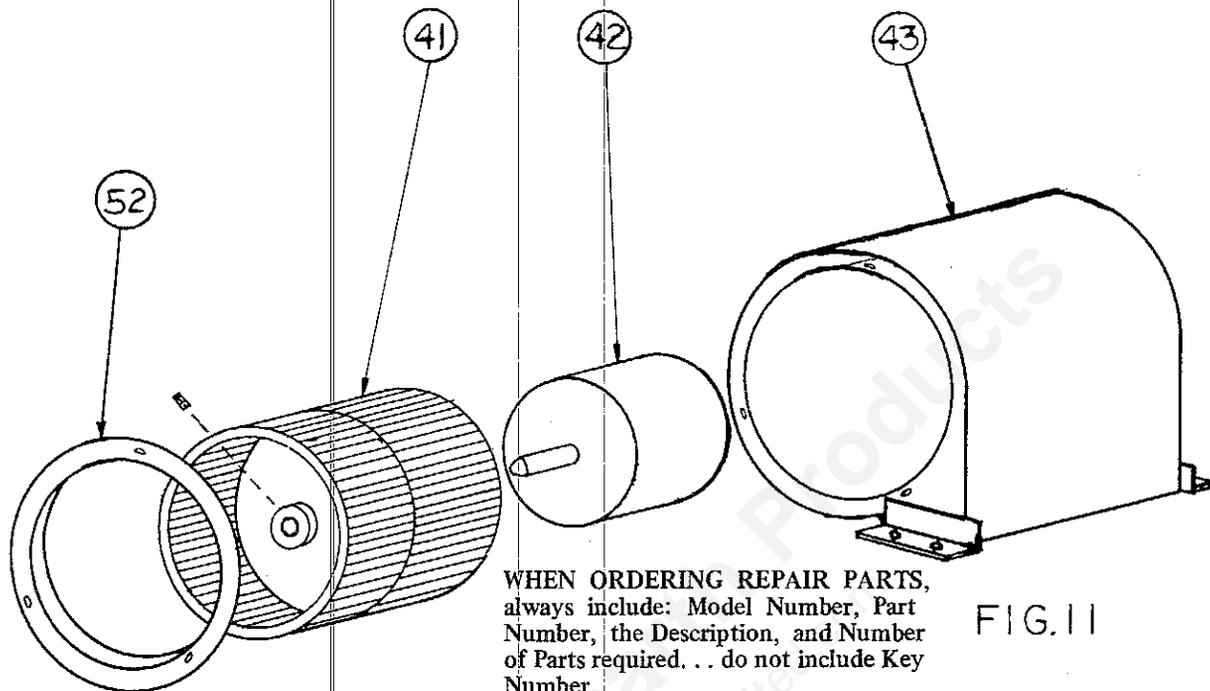


fig. 9

# REPAIR PARTS LIST

## Model No. VCF-35(A,A1)W(N,L)



WHEN ORDERING REPAIR PARTS, always include: Model Number, Part Number, the Description, and Number of Parts required. . . do not include Key Number.

FIG. 11

\* Parts not shown in illustrations.

KEY NO.	PART NO.	DESCRIPTION
1	1462	Front Panel
2	1458	Switch Bracket Cover
3	9316	Fan Switch
4	9314	Limit Switch
5	1871	Blower Shield
7	6672	Blower Assembly (Motor & Housing)
8	9328	Wiring Harness
9	1459	Blower Junction Box Cover
10	1457	Raceway Cover
11	9309	Filter
12	6502	Inner Unit Assembly
13	1483	Air Inlet Extension Tube
14	6527	Wall Plate
15	1482	Flue Outlet Extension Tube
16	6526	Vent Plate Assembly
17	9594	Knob with screw (2 req.)
18	6519	Controls Access Panel
19	9307	Controls Access Panel Gasket
20	1476	Pilot Lighter Door
21	6521	Burner Access Panel
22	1475	Air Adjustment Door
23	9294	Burner Access Panel Gasket
24	9318	Air Adjustment Bolt
	9317	Air Adjustment Spring

KEY NO.	PART NO.	DESCRIPTION
25	4325	Burner
26	9330	Transformer
27	6496	Cabinet Assembly
28	9321	Manifold Gasket
29	9320	Manifold
30	9302	Thermocouple
31	9303	Pilot Gasket
32	9306	Pilot Burner
33	9305	Pilot Orifice, Nat.
	9304	Pilot Orifice, LPG
34	9290	Valve, Nat.
	9289	Valve, LPG
35	9597-N	Burner Orifice No. 32 Drill, Nat.
	9597-L	Burner Orifice No. 52 Drill, LPG
41	9312	Blower Wheel
42	9311	Blower Motor
43	6514	Blower Housing
45		Self-tapping Screw (4 req.)
46	9258	Wood Screw (4 req.)
47	9257	Wood Screw (4 req.)
*	9517	Pilot Tubing
*	9392	Wall Thermostat
*	9391	Thermostat Wire
48	9182	Auxiliary Limit Switch
49	9014	Knurled Head Screw
*	1437	Vent Centering Ring
51	9988	Vent Tube Gasket
52	1680	Fan Inlet Ring

# PARTS ILLUSTRATION

## Model No. VCF-45(A,A1)W(N,L)

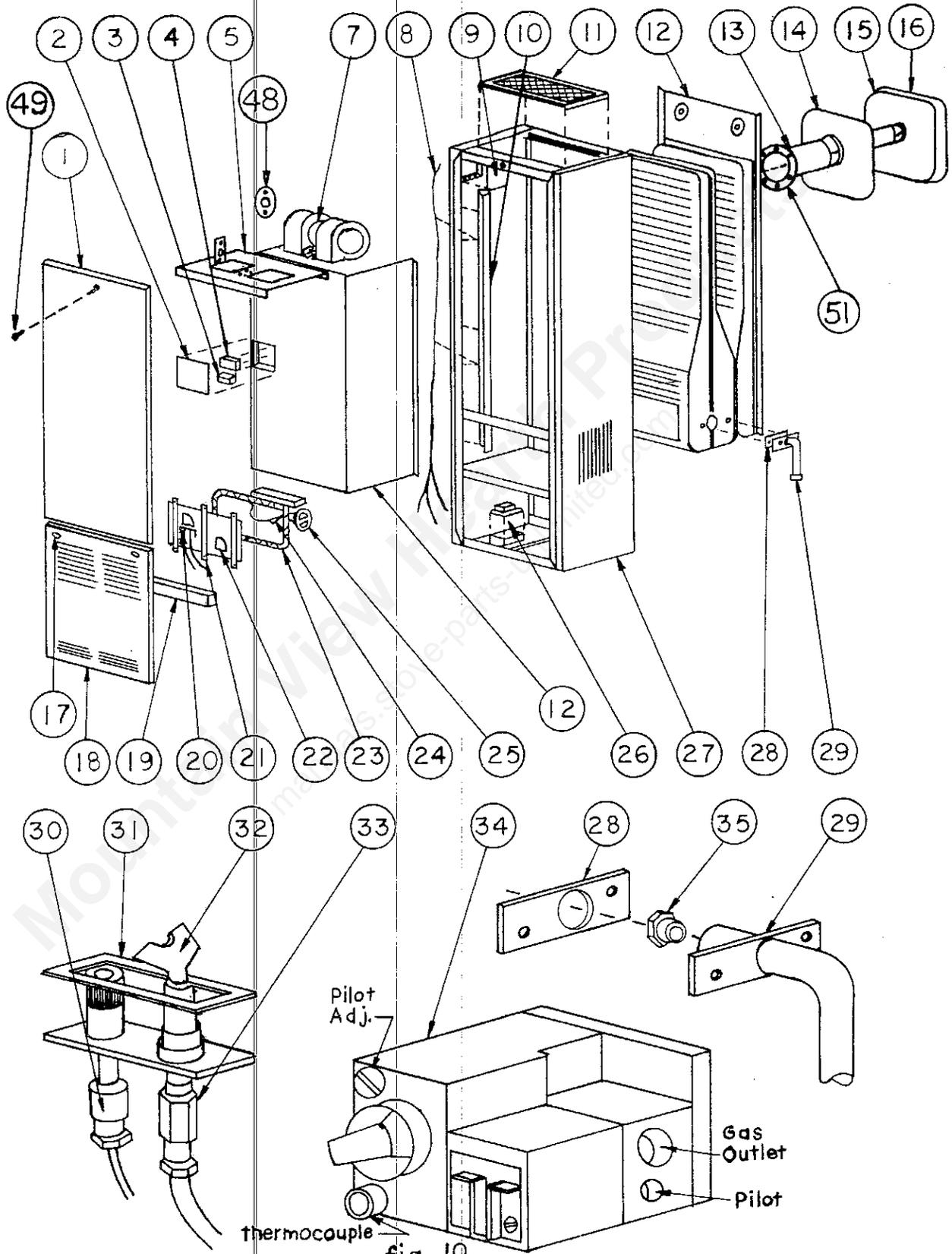


fig. 10  
12

# REPAIR PARTS LIST

## Model No. VCF-45 (A,A1)W(N,L)

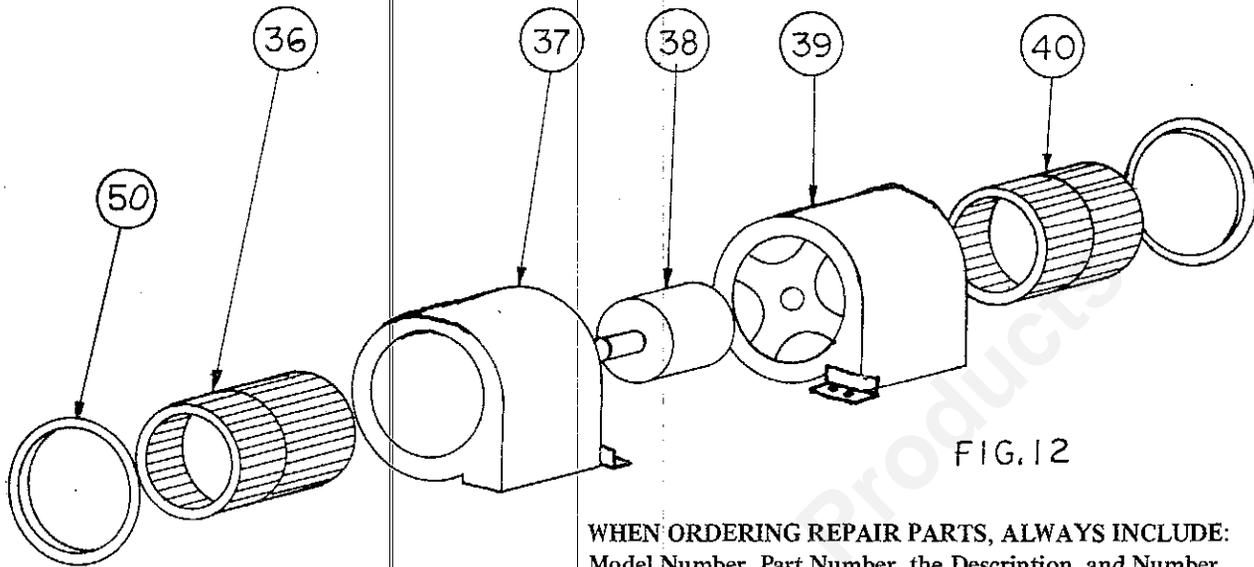


FIG. 12

WHEN ORDERING REPAIR PARTS, ALWAYS INCLUDE:  
Model Number, Part Number, the Description, and Number  
of Parts required. . . do not include key number.

\* Parts not shown in illustrations.

KEY NO.	PART NO.	DESCRIPTION
1	1463	Front Panel
2	1458	Switch Bracket Cover
3	9316	Fan Switch
4	9314	Limit Switch
5	1873	Blower Shield
7	6673	Blower Assembly (Motor & Housing)
8	9328	Wiring Harness
9	1459	Blower Junction Box Cover
10	1457	Raceway Cover
11	9281	Filter
12	6503	Inner Unit Assembly
13	1483	Air Inlet Extension Tube
14	6527	Wall Plate
15	1482	Flue Outlet Extension
16	6526	Vent Plate Assembly
17	9594	Knob w/6-32 x 1/4 machine screw
18	6520	Controls Access Panel
19	9226	Controls Access Panel Gasket
20	1476	Pilot Lighter Door
21	6522	Burner Access Panel
22	1475	Air Adjustment Door
23	9279	Burner Access Panel Gasket
24	9318	Air Adjustment Bolt
24	9317	Air Adjustment Spring
25	4326	Burner

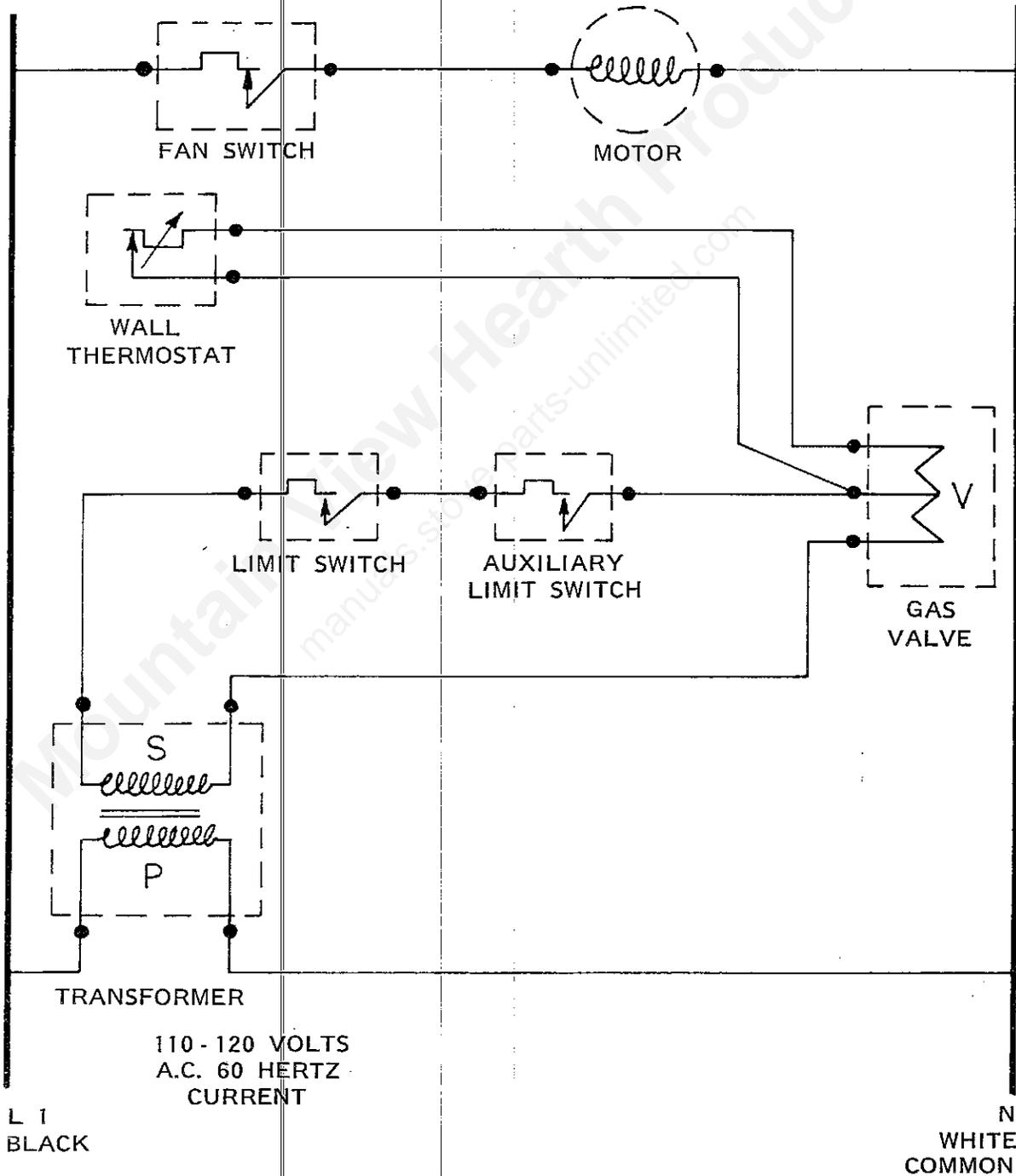
KEY NO.	PART NO.	DESCRIPTION
26	9330	Transformer
27	6497	Cabinet Assembly
28	9321	Manifold Gasket
29	9251	Manifold
30	9280	Thermocouple
31	9303	Pilot Gasket
32	9306	Pilot Burner
33	9305	Pilot Orifice, Nat.
33	9304	Pilot Orifice, LPG
34	9290	Valve, Nat.
34	9289	Valve, LPG
35	9597-N	Burner Orifice No. 29 drill, Nat.
	9597-L	Burner Orifice No. 49 drill, LPG
36	9283	Left Blower Wheel
37	6529	Left Blower Housing
38	9285	Blower Motor
39	6528	Right Blower Housing
40	9284	Right Blower Wheel
45		Self-Tapping Screw, (4 req.)
46	9258	Wood Screw, (4 req.)
47	9257	Wood Screw, (4 req.)
*	9517	Pilot Tubing
*	9392	Wall Thermostat
*	9391	Thermostat Wire
48	9159	Auxiliary Limit Switch
49	9014	Knurled Head Screw
50	1681	Fan Inlet Ring
*	1437	Vent Centering Ring
51	9988	Vent Tube Gasket

# WIRING DIAGRAM

## Ladder Form

IF ANY OF THIS ORIGINAL WIRE MUST BE REPLACED, IT SHOULD BE REPLACED BY WIRE HAVING 4/64 INSULATION TYPE 105 DEGREES C OR EQUIVALENT.

MODEL NO.	TEMPERATURE PRIMARY	LIMIT CONTROLS AUXILIARY
VCF-35-A-W	WA-11 (155F)	WA-11 (135F)
VCF-35AI-W	60T-11 (155F)	60T-11 (135F)
VCF-45A-W	WA-11 (155F)	WA-11 (125F)
VCF-45AI-W	60T-11 (155F)	60T-11 (135F)

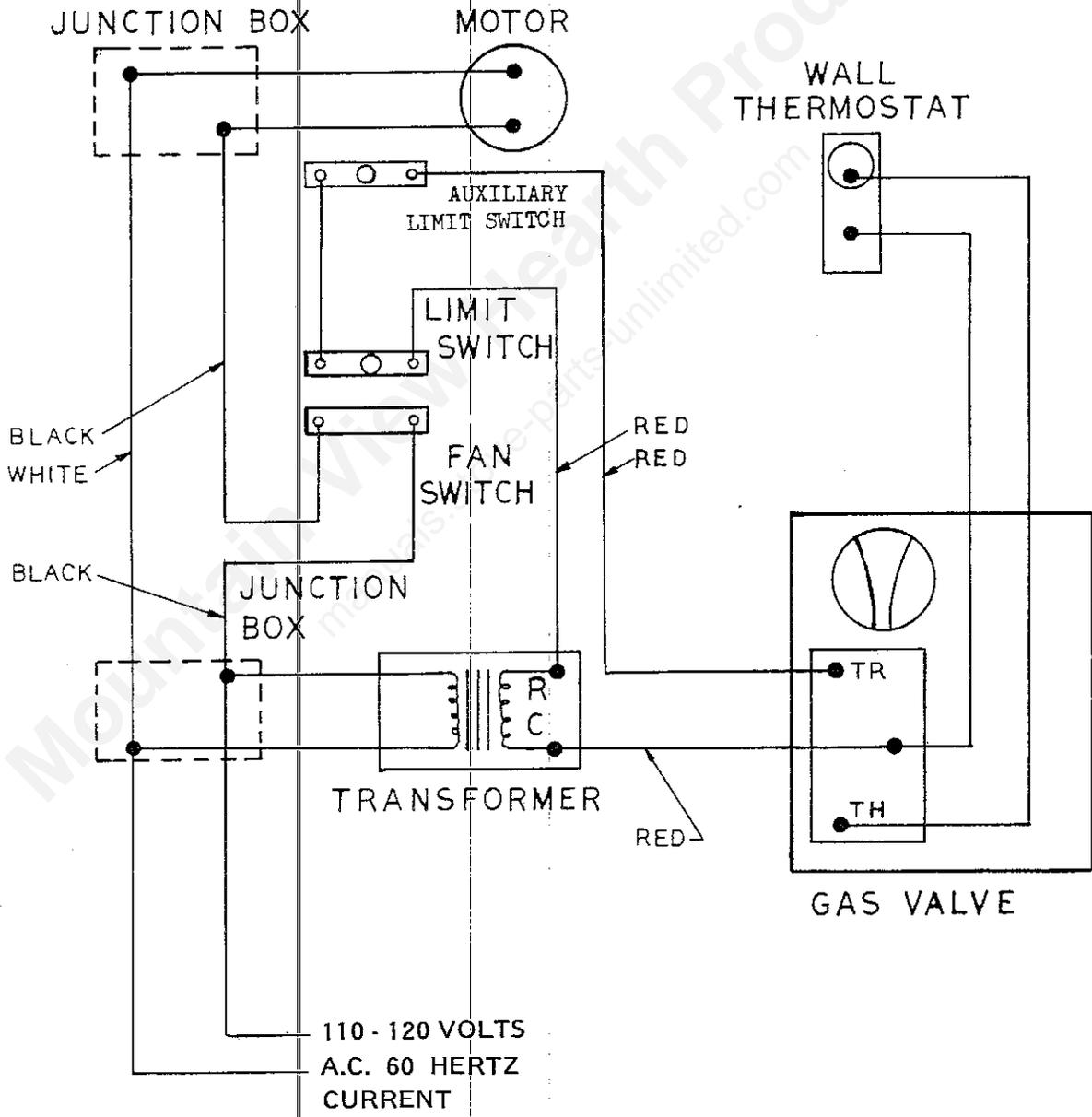


# WIRING DIAGRAM

## Schematic Form

IF ANY OF THIS ORIGINAL WIRE MUST BE REPLACED, IT SHOULD BE REPLACED BY WIRE HAVING 4/64 INSULATION TYPE 105 DEGREES C OR EQUIVALENT.

<u>MODEL NO.</u>	<u>TEMPERATURE PRIMARY</u>	<u>LIMIT CONTROLS AUXILIARY</u>
VCF-35-A-W	WA-11 (155F)	WA-11 (135F)
VCF-35AI-W	60T-11 (155F)	60T-11 (135F)
VCF-45A-W	WA-11 (155F)	WA-11 (125F)
VCF-45AI-W	60T-11 (155F)	60T-11 (135F)



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## HOW TO ORDER REPAIR PARTS

THIS MANUAL WILL HELP YOU TO OBTAIN EFFICIENT, DEPENDABLE SERVICE FROM THE HEATER, AND ENABLE YOU TO ORDER REPAIR PARTS CORRECTLY.

KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

WHEN WRITING, ALWAYS GIVE THE FULL MODEL NUMBER WHICH IS ON THE NAMEPLATE ATTACHED TO THE HEATER.

11CRL

WHEN ORDERING REPAIR PARTS, ALWAYS GIVE THE FOLLOWING INFORMATION AS SHOWN IN THIS LIST:

1. The PART NUMBER
2. The PART DESCRIPTION
3. The MODEL NUMBER
4. The NAME of ITEM

*Lawson Division*

UNITED STATES STOVE COMPANY • SOUTH PITTSBURG, TENNESSEE