



# SOLID FUEL INDEPENDENT WARM AIR FURNACE MODEL KF3010A

**INSTALLATION, OPERATION AND MAINTENANCE MANUAL**  
ALL INSTALLATIONS MUST BE MADE IN ACCORDANCE WITH LOCAL AND STATE CODES.

## TABLE OF CONTENTS

	Section	PAGE
IMPORTANT INFORMATION	1	1
HOW THIS FURNACE OPERATES	2	2
BUILDING CODES AND SAFETY STANDARDS	3	2
FLOOR PROTECTION	4	2
CHIMNEY CONNECTOR AND CHIMNEY REQUIREMENTS	5	3
Chimney Connector		3
Chimney		3
SELECTING A LOCATION FOR THE FURNACE	6	3
Air For Combustion and Ventilation		5
"Warm Air Furnace" Located In An Unconfined Space		5
"Warm Air Furnace" Located In Confined Spaces		5
Louvers and Grilles		5
DUCT REQUIREMENTS	7	5
TOOLS AND EQUIPMENT NEEDED FOR INSTALLATION	8	6
UNPACKING AND ASSEMBLING THE FURNACE	9	6
SELECTING A LOCATION FOR THE BAROMETRIC DRAFT REGULATOR	10	6
INSTALLATION OF THE FURNACE SYSTEM	11	7
Furnace, Chimney Connector and Air Duct Installation		7
Limit/Fan Control Installation		8
Adjustment and Operation of the Control		8
CONNECTION OF THE ELECTRICAL WIRING AND INSTALLATION OF THE WALL THERMOSTAT	12	8
ADJUSTMENT OF THE BAROMETRIC REGULATOR	13	9
USING THE FURNACE	14	9
To Build A Fire		10
Fire Tending		10
Ash Removal and Disposal		10
Wood and Coal Storage		10
Electrical Power Failure		10
FURNACE, CHIMNEY CONNECTOR AND CHIMNEY MAINTENANCE	15	10
Chimney Connector and Chimney		10
Furnace and Chimney		11
Filters		11
Blower and Blower Motor		11
TROUBLESHOOTING CHART	16	12
CHECKLIST OF DO'S AND DON'TS	17	12
REPAIR PARTS		13, 14, and 15

### Section 1

### IMPORTANT INFORMATION

To assure that satisfactory and safe service is received from this furnace:

1. Have this furnace installed by a qualified installer competent in the installation of central furnaces.
2. The installer should read these instructions completely before beginning the installation and use these instructions as a guide when performing each phase of the pre-installation planning, pre-installation checks, installation and first operational checks and adjustments.
3. Be sure these instructions become the property of the owners and future users of this furnace to use as a guide for operating and maintaining the furnace.
4. Be sure the furnace is attached to either a U.L. listed factory-built chimney for residential type heating appliances or a masonry chimney built to N.F.P.A. standards. A copy of the N.F.P.A. standard can be obtained from N.F.P.A., Battery-march Park, Quincy, MA 02269.

These instructions should be reviewed even if the furnace appears to be identical to a furnace recently installed. Undetectable design changes may have been made that have required changes in the installation procedure.

Improper installation or use of this furnace can cause:

1. Damage to the furnace from overheating.
2. Hazardous temperatures to develop on combustible materials near the furnace, chimney connector or chimney that could cause a fire.



- 3. Unsatisfactory heat output and airflow from the furnace.
- 4. Emission of smoke or hazardous gases into the dwelling.

The air ducts should be sized to accommodate the airflow of this furnace. For the purpose of making the duct sizing calculations, a value of 1,050 CFM airflow at .2 inch water column static pressure should be used.

Prior to beginning the installation, careful consideration must be given the requirements for spacing from combustibles and combustion air supply requirements contained in the section of this manual titled "Selecting a Location for the Furnace."

**Section 2 HOW THIS FURNACE OPERATES**

This furnace uses a wall thermostat to sense the temperature of the air in the dwelling to signal a combustion air blower on the furnace that supplies the combustion air to the fire. This airflow and the burning rate of the wood or coal determines the heat output from the furnace and the rate at which the wood or coal is consumed.

The hot air and gases developed by the wood or coal burning within the firebox are drawn up the chimney. Because of the welded seams in the firebox and the gasketed ash and feed doors, air must enter the firebox through the combustion air blower. It is very important that this unit be attached to a proper chimney to develop the draft necessary to help pull air through the combustion air blower and minimum air inlet and vent smoke up the chimney.

There is also an automatic switch sensing temperature of the air flowing over the firebox that turns the furnace blower on after the furnace is lit and reaches the burning rate that will supply sufficient heat to the furnace duct system. This switch also turns the blower off if the fire in the firebox diminishes to the point that the amount of heat supplied to the duct system is insufficient to maintain an acceptable temperature at the air registers in each room.

Gas and oil furnaces are usually sized so that they can raise the temperature of a house rapidly to bring a cold, unheated house up to a comfortable temperature in a relatively short time. For this reason, once the house has been warmed, the normal gas or oil furnace turns on and off frequently to maintain the desired inside temperature.

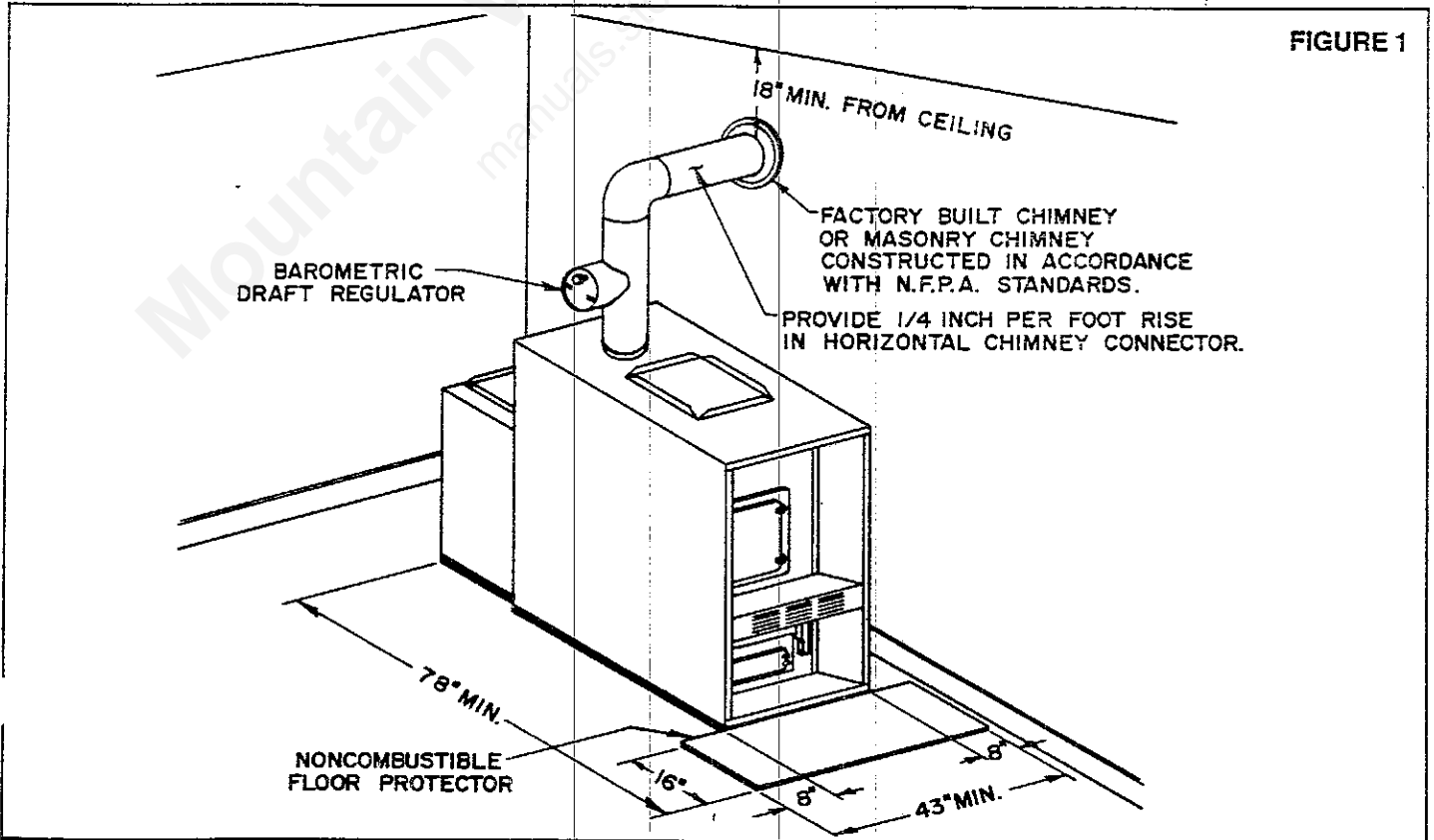
A wood or coal burning furnace has a lower heat output than most gas and oil furnaces but tends to run continuously to maintain a desired inside temperature. Unlike gas and oil furnaces where the amount of fuel being burned is metered by automatic controls, this furnace is dependent on the operator to keep the wood or coal supplied to the fire in balance with the airflow to the fire.

**Section 3 BUILDING CODES AND SAFETY STANDARDS**

These instructions comply with the applicable safety standards for the installation and operation of this type furnace. Before beginning the installation, you should check with the local building officials to assure compliance with local regulations and codes.

**Section 4 FLOOR PROTECTION**

This furnace can be set directly on combustible flooring materials without causing damage to the materials. It is important, however, that a non-combustible floor covering be applied to the floor area beneath the furnace and chimney connector pipe and extend 16 inches in front of and 8 inches to either side of the feed door and ash removal openings and 2 inches beyond the chimney connector pipe. (See figure 1.) This floor covering is required to protect the floor from sparks that may fall from the feed or ash doors during fire tending or from the joints in the chimney connector.



**FIGURE 1**

## Section 5

## CHIMNEY CONNECTOR AND CHIMNEY REQUIREMENTS

### Chimney Connector

To assure safe and satisfactory operation, the furnace must be properly connected to a correctly constructed and maintained chimney. The chimney connector is the sections of pipe used to connect the furnace to the chimney. The chimney is the vertical passageway that carries the smoke to the outside of the building.

The chimney connector must be 8 inches in diameter and made from 24-gauge or heavier steel.

The length of the chimney connector should be as short as possible and maintain the required minimum spacing between the furnace, chimney connector, and combustible materials. Avoid elbows in the chimney connector, if possible, but never use more than two elbows. Horizontal runs of the chimney connector must slope upward toward the chimney at least 1/4 inch per foot of chimney connector length. (See figure 1.) The length of a horizontal run of chimney connector should not exceed 8 feet or be longer than one-half the height of the chimney serving the furnace. (Example: A chimney with a height of 14 feet above the point where the chimney connector attaches to the chimney cannot serve a furnace with a chimney connector having a horizontal run exceeding 7 feet.)

All joints of the chimney connector must be arranged with the male end of the pipes toward the furnace to prevent leakage of condensate from within the chimney to the outside. All joints must also be secured with at least three sheet metal screws to prevent accidental disassembly of the chimney connector and sealed with furnace cement. The chimney connector must be spaced at least 18 inches from all combustible materials.

When inserting the chimney connector into a masonry chimney, it should extend to the inside face of the chimney liner, but should not protrude into the interior of the liner. One common cause of improper draft on an appliance is restriction caused by improper positioning of the chimney connector as shown by figure 2.

A barometric draft regulator must be installed in the chimney connector to prevent the creation of an excessive draft on the furnace by the chimney. Proper location and installation of the barometric draft regulator is explained in Section 10 of this manual. The Model DR8 barometric draft regulator is furnished with this furnace.

### Chimney

The chimney used for this furnace must provide a minimum of .06 inch water column of draft.

A masonry chimney used for this furnace must be built to N.F.P.A. standards. A factory-built chimney must be a listed residential type heating appliance chimney installed in strict compliance with the chimney manufacturer's instructions.

The flue lining of the chimney must be a minimum of 6-1/2" x 10" or 8 inches in diameter. It is possible that a chimney flue liner can be too large for this furnace. If the cross-sectional area of the flue liner exceeds 107 square inches, it should be used for venting of the furnace only if an alternate chimney of the proper size can be provided in the event the larger chimney proves unsatisfactory. To determine the cross-sectional area of the flue liner, use the appropriate formula below:

#### Square or Rectangular Flue Liner:

Width in inches (x) length in inches = Cross- Sectional Area

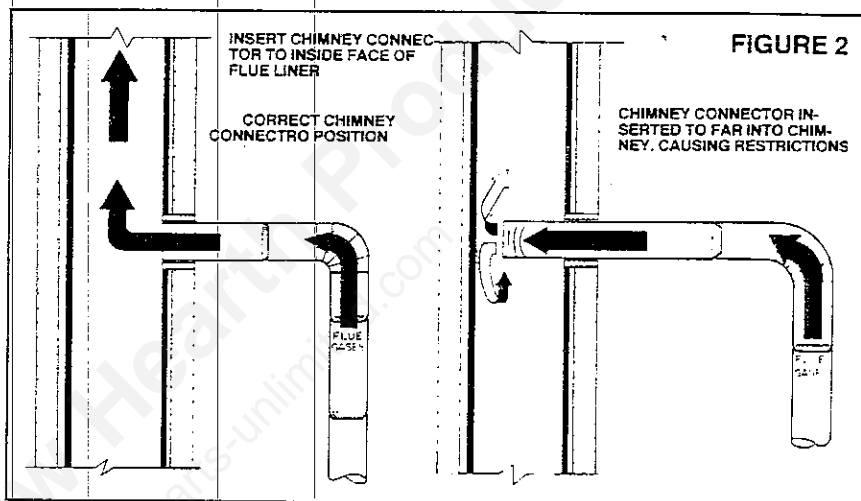
#### Cylindrical (Round) Flue Liner:

$\frac{\text{Diameter (distance across)}}{2} (X) \frac{\text{Diameter (distance across)}}{2} (X) 3.1416 = \text{Cross- Sectional Area}$

**DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**

If you have an existing chimney of the proper size constructed of brick or stone and lined with tile and not serving any other appliance, it may be used, but be sure to have the chimney inspected to determine that it is safe and complies with local codes or the National Fire Protection Association Standards (N.F.P.A. No. 211). Have the inspection performed by the authority having jurisdiction over the installation. (A MASONRY CHIMNEY WITHOUT A LINER IS NOT ACCEPTABLE.)

Make sure the chimney is at least two feet higher than any portion of the roof or other structures within ten feet and three feet higher than the point where it penetrates the roof. Install a chimney cap above the chimney top to serve as a rain shield.



## Section 6

## SELECTING A LOCATION FOR THE FURNACE

When selecting a location for the furnace, the following considerations must be given proper attention:

- The location must provide access to a chimney with a properly routed chimney connector as described in the preceding section of this manual.
- The location must provide the minimum clearances to combustibles and obstructions as shown by figures 3 and 4.
- The location must provide a level floor of sufficient structural strength to support the furnace.
- The furnace must not be installed in an area where combustible gases or liquids may be present. This includes areas such as workshops, garages, etc.
- The location must have provisions for supplying adequate ventilation and combustion air. To assure safe and satisfactory performance of the furnace and other heating appliances in the same area, a supply of combustion air is absolutely necessary. Without adequate combustion air, solid-fuel, gas and oil burning appliances can emit harmful gases into the dwelling. The following information is taken from the national fuel gas code.

FIGURE 3

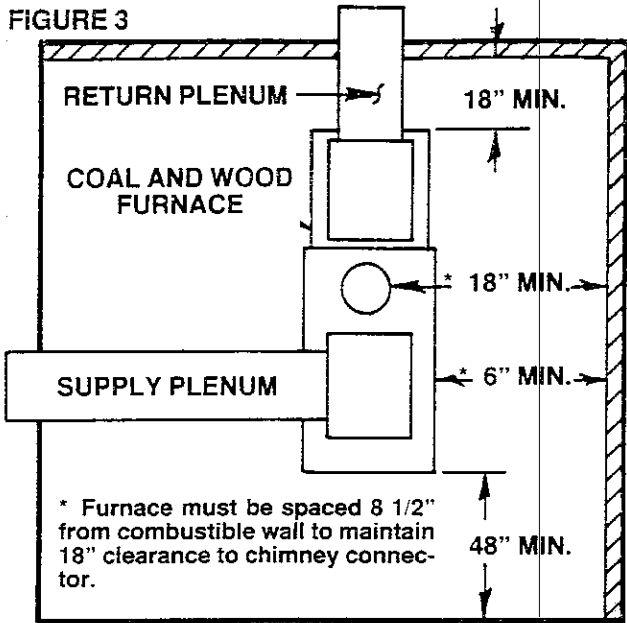


FIGURE 4

U.L. LISTED FACTORY-BUILT CHIMNEY FOR RESIDENTIAL TYPE HEATING APPLIANCES.

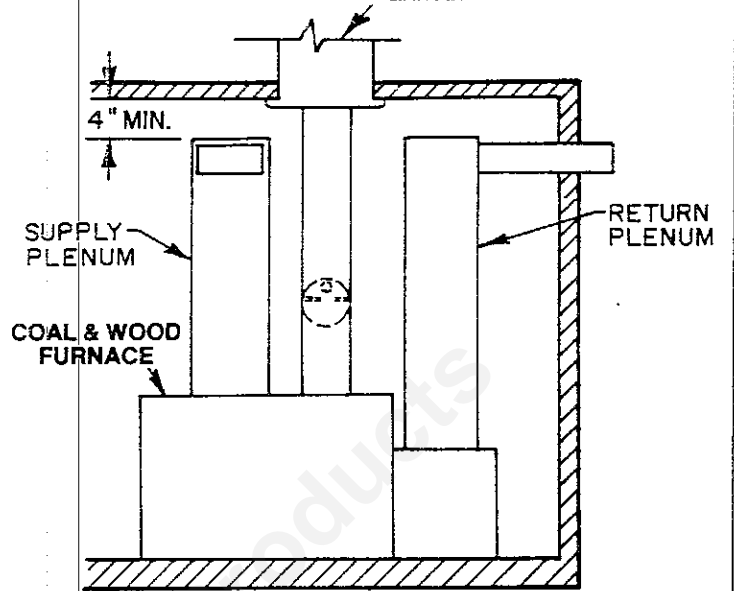


FIGURE 5

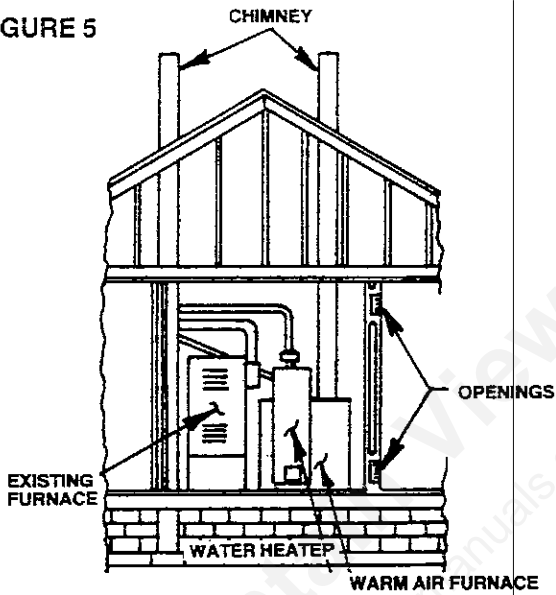


FIGURE 6

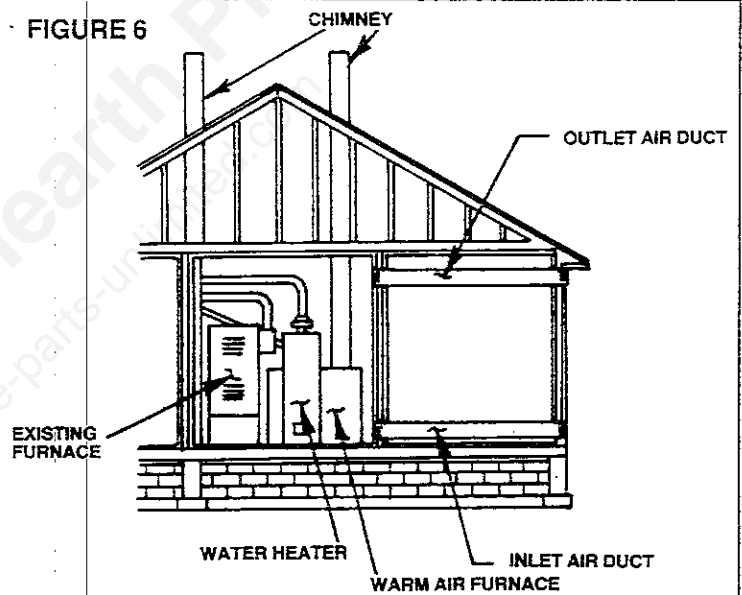


FIGURE 7

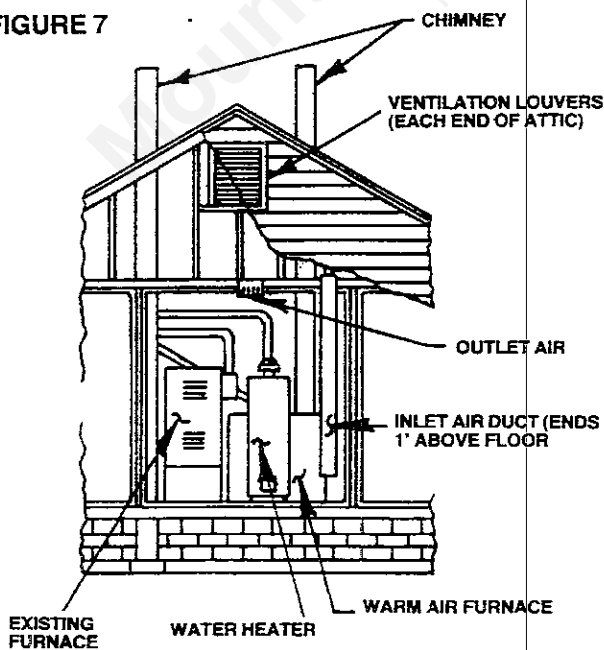
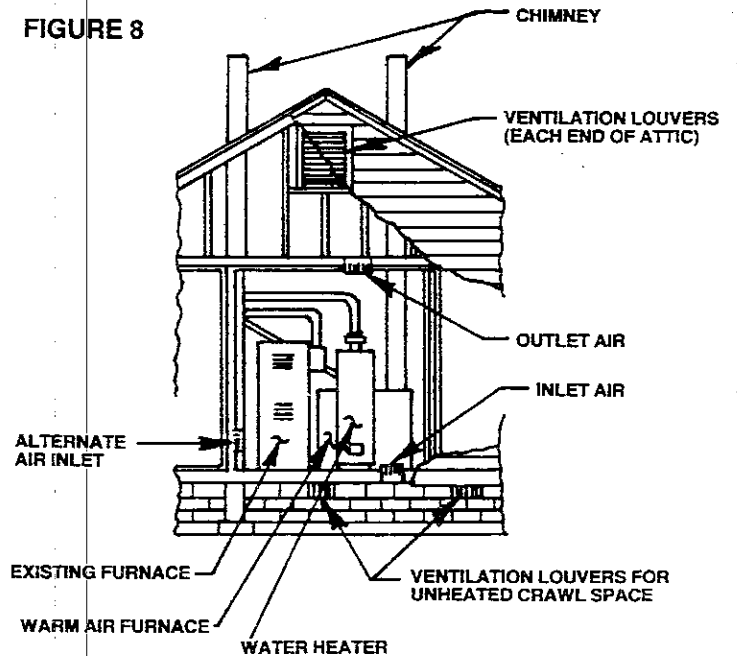


FIGURE 8



### Air For Combustion and Ventilation

Be certain that adequate ventilation and combustion air are available. Outside air must be introduced into a building that has been determined not to adequately support proper combustion. The combustion air openings must not be restricted in any manner. The homeowner should be told that the furnace area must not be used as a broom closet or for any other storage purposes.

#### "WARM AIR FURNACE" Located In An Unconfined Space

1. In unconfined spaces in buildings of conventional frame, brick or stone construction, infiltration normally is adequate to provide air for combustion and ventilation.
2. If the unconfined space is within a building of unusually tight construction, air for combustion and ventilation shall be obtained from outdoors or from spaces freely communicating with the outdoors. Under those conditions, a permanent opening or openings have a total free area of not less than one square inch per 5,000 BTU per hour of total input rating of all appliances shall be provided. Ducts used to carry combustion air from the outdoors shall be of the same cross-sectional area as the free area of the openings to which they connect. The minimum dimensions of rectangular air ducts shall not be less than three inches.
3. For the purposes of calculation, 165,000 BTU input should be used for the Warm Air Furnace.

#### "WARM AIR FURNACE" Located In Confined Spaces

1. If all air for combustion is taken from inside the building, the confined space shall be provided with two permanent openings, one near the top of the enclosure and one near the bottom. Each opening shall have a free area of not less than one square inch per 1,000 BTU per hour of the total input rating of all appliances in the enclosure, freely communicating with interior areas having in turn adequate infiltration from the outside. (See figure 5.)
2. If all air for combustion is taken from outdoors, the confined space shall be provided with two permanent openings, one in or near the top of the enclosure and one in or near the bottom. The openings shall communicate directly, or by means of ducts, with the outdoors or to such spaces that freely communicate with the outdoors. (See figures 6, 7 and 8.)

When directly communicating with outdoors or by means of vertical ducts, each opening shall have a free area of not less than one square inch per 4,000 BTU per hour of total input rating of all appliances in the enclosure. If horizontal ducts are used, each opening shall have a free area of not less than one square inch per 2,000 BTU per hour of total input of all appliances in the enclosure.

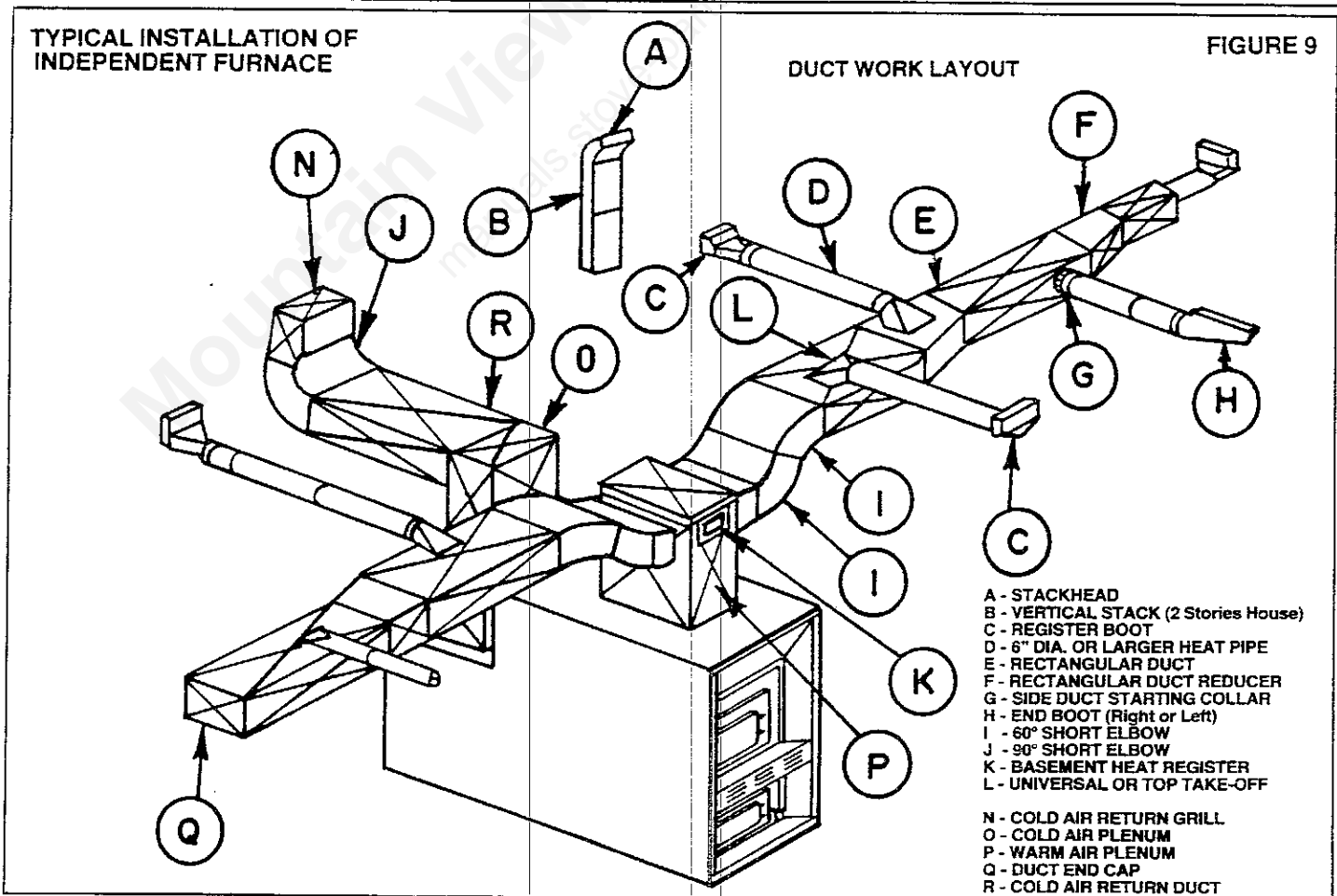
Ducts shall be of the same cross-sectional area as the free area of the opening to which they connect. The minimum dimension of rectangular air ducts shall not be less than three inches.

#### Louvers and Grilles

In calculating free area, consideration shall be given to the blocking effect of louvers, grilles or screens protecting openings. Screens used shall not be smaller than 1/4 inch mesh. If the free area through a design of louver or grille is known, it should be used in calculating the size opening required to provide the free area specified. If the design and free area are known, it may be assumed that wood louvers will have 20-25% free area and metal louvers and grilles will have 60-75% free area.

### Section 7

### DUCT REQUIREMENTS



The air distribution system should be designed, built from metal and installed in conformance with Manual 7, 7A or 10, published by the National Environmental Systems Contractors, Association and Standard No. 90B of the National Fire Protection Association. Due to the high temperatures that may be experienced on extended power failure operation, all-metal ducts must be used and must be installed with proper clearance to combustibles.

Before beginning work, study the plan and consider how best to perform the various steps. Often, the return air duct work will cross under or closely parallel the warm air pipes or duct, so it is best to install them simultaneously.

The total external static pressure on the duct system should not exceed .2 inch water column at 1,050 CFM airflow.

Oversizing duct work is unnecessarily expensive, while undersizing can be even more expensive in terms of customer dissatisfaction and service problems. When the duct work is undersized imposing excessive static pressure on the furnace, either poor air distribution or noise problems are likely. The duct sizing and design should be generous enough for good gravity airflow during extended power failure operation. The supply and return air duct openings in the furnace are 14" x 15 1/2". To ensure maximum performance of the unit, the main trunks should be of equal size and the branch feeders not less than six-inch diameter rounds.

Avoid 90° bends whenever possible. They increase the system static pressure. If a 90° bend is required in the main trunk, be sure to install turning vanes in the bend to provide smooth direction of the airflow. If a 90° bend is required in a branch feeder, use a long radius elbow.

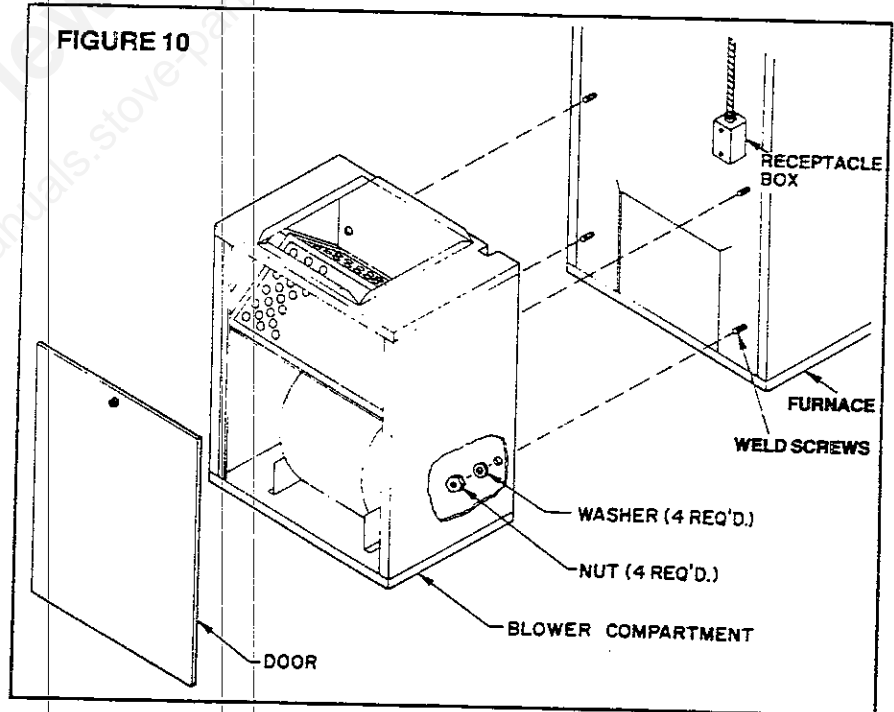
Connect the ducts to the furnace in a manner that will be easily removed in the unlikely event the furnace must be disconnected for repair. Figure 9 illustrates a typical duct system.

### Section 8 TOOLS AND EQUIPMENT NEEDED FOR INSTALLATION

Amprobe type volt, ohm, ammeter  
Electric drill 1/4"  
Drill bit 1/4" and 1/8"  
Static pressure gauge 0" to 1.0" W.C.  
Chimney draft gauge 0" to .08" W.C.  
Screwdriver  
Tin snips and sheet metal tools to attach ducts  
Furnace cement  
Chimney connector pipes and elbows as required to attach furnace to chimney

### Section 9 UNPACKING AND ASSEMBLING THE FURNACE

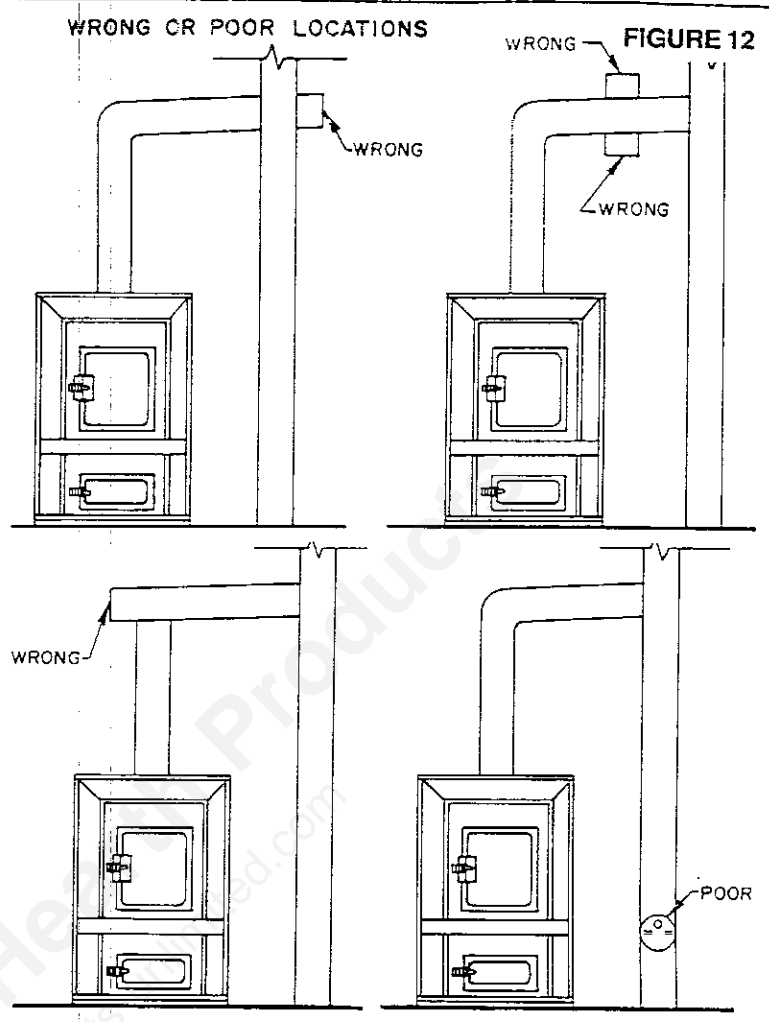
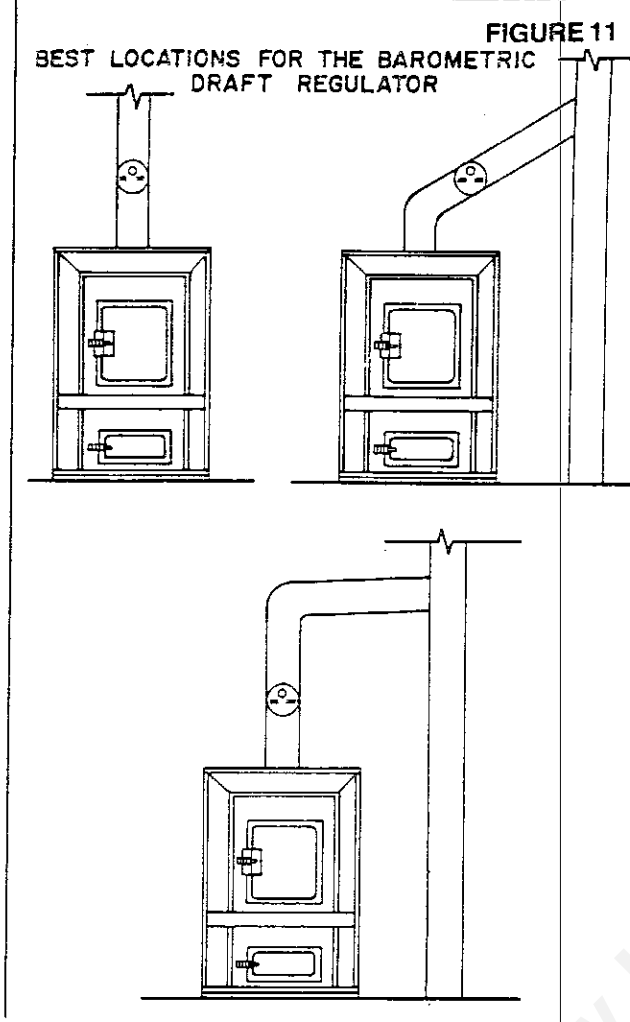
This furnace is shipped in two packages. One package contains the furnace and another the blower compartment. Unpack and check each for concealed freight damage. If they are undamaged assemble them as shown by figure 10.



### Section 10 SELECTING A LOCATION FOR THE BAROMETRIC DRAFT REGULATOR

The barometric draft regulator is required to assure the draft placed on the furnace by the chimney does not exceed .060 inch water column. The barometric draft regulator must be properly located to operate correctly. Refer to figures 11 and 12 as a guide for selecting a proper location for the regulator.

Some barometric draft regulators require specific installation procedures when the assembly is installed on either a vertical or horizontal chimney connector. Be sure to comply with any instructions printed on or accompanying the draft regulator assembly.



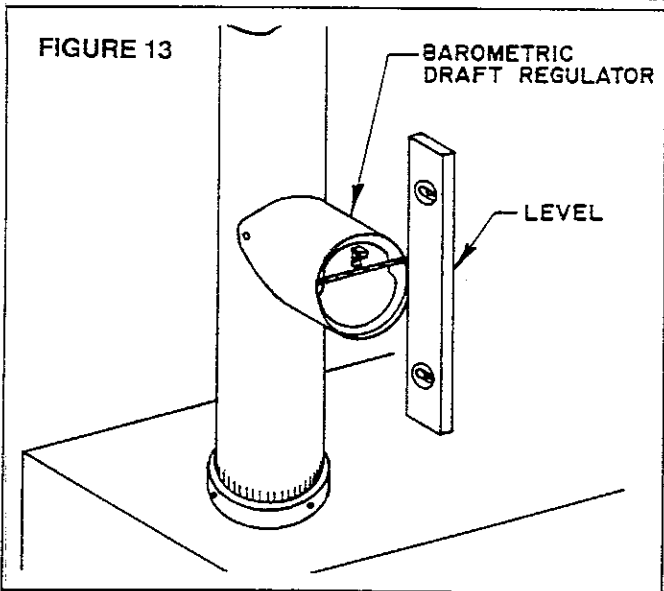
**Section 11** **INSTALLATION OF THE FURNACE SYSTEM**

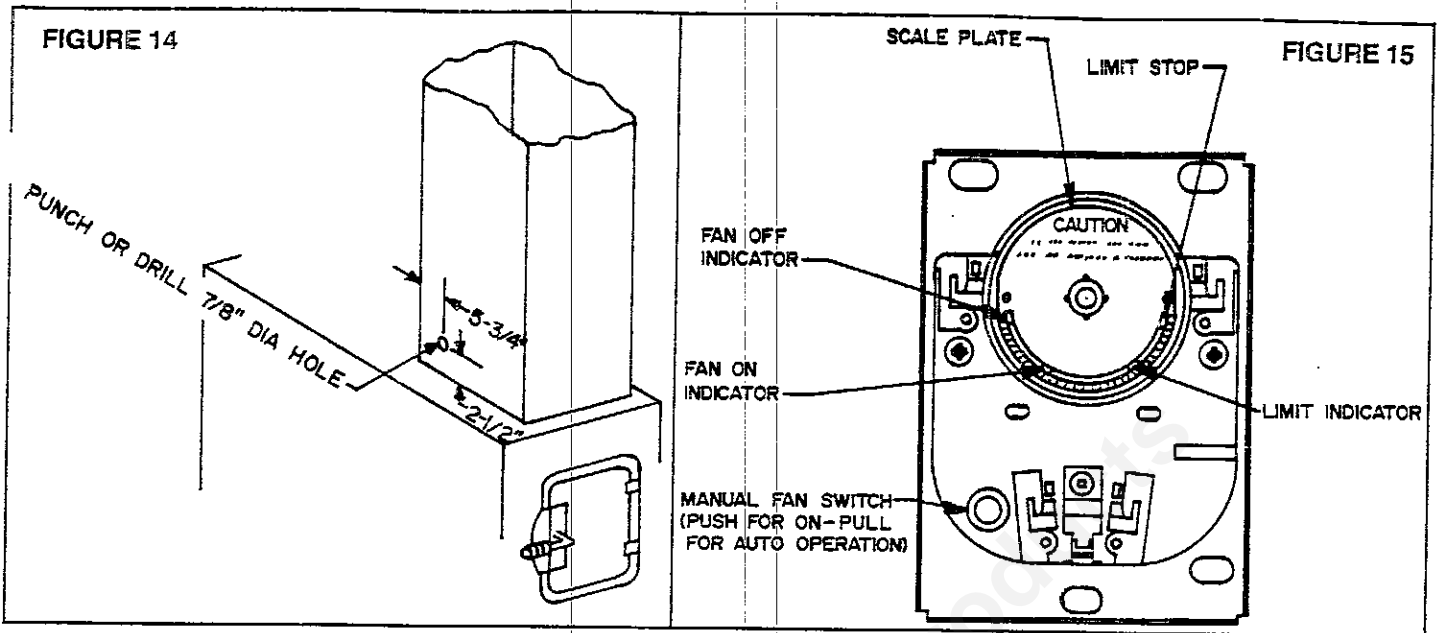
**Furnace, Chimney Connector and Air Duct Installation**

NOTE: Be sure section 5 of this manual is read and understood before installing the chimney connector.

1. Locate the furnace and noncombustible floor protection in accordance with the specification and minimum safe installation clearances to combustible materials as shown by figures 1, 3 and 4. The marked clearances are based on testing related to UL listing of the furnace and are minimum allowable dimensions. The clearances may be greater but never less than specified.
 

1. Front (Loading End)	48" minimum
2. Rear (Blower End)	18" minimum
3. Side	6" minimum
4. Chimney Connector	18" minimum
5. Plenum & Duct Within 6 ft. of Plenum	4" minimum
2. Place the crimped end of the first chimney connector pipe or draft regulator into the furnace flue collar and mark it through each of the holes in the furnace flue collar.
3. Remove the pipe or elbow from the furnace flue collar and drill 1/8" holes at the points marked by Step 2.
4. Apply furnace cement to the inside surface of the furnace flue collar, reinstall the first pipe or elbow and fasten it in place with three of the No. 8 sheet metal screws provided. Apply additional furnace cement to the outside of the chimney connector-flue collar joint if an airtight seal was not achieved when the pipe or elbow was installed.
5. Assemble the remaining chimney connector pipes, drill 1/8" holes for and attach each joint with three No. 8 sheet metal screws, and seal the joints with furnace cement.
6. Remove all excess furnace cement from the outside surface of the chimney connector with a cloth and allow the cement to dry for at least 12 hours before building the first fire in the furnace.
7. Check the face of the barometric regulator with a level as shown by figure 13 and adjust the chimney connector as necessary to assure the regulator is plumb.





**LIMIT/FAN CONTROL INSTALLATION**

Punch or drill 7/8" dia. hole in the warm air plenum (see figure-14). Insert the shaft of the limit/blower control into the 7/8" hole in the plenum and fasten the base of the control to the plenum by placing sheet metal screws through the mounting holes provided in the control base.

**ADJUSTMENT AND OPERATION OF THE CONTROL**

There are three small indicators that protrude through the scale plate (see figure 15.) The "limit indicator" should be pushed around the slot and positioned against the limit stop. **CAUTION:** Hold the scale plate with one hand when moving the indicators to prevent rotating and straining the sensing element.

Move the "fan on indicator" so that its center point aligns with the 115 mark on the scale plate. Move the "fan off" indicator so that its center point aligns with the 100 mark on the scale plate. At this setting the furnace blower will be turned on when the air in the plenum reaches approximately 115 degrees F. and be turned off when the air reaches approximately 100 degrees. After the furnace is in use, these settings may be changed if desired to alter the blower performance. If the blower tends to cycle on and off even when there is a reasonable size fire in the firebox, the space between the indicators should be increased.

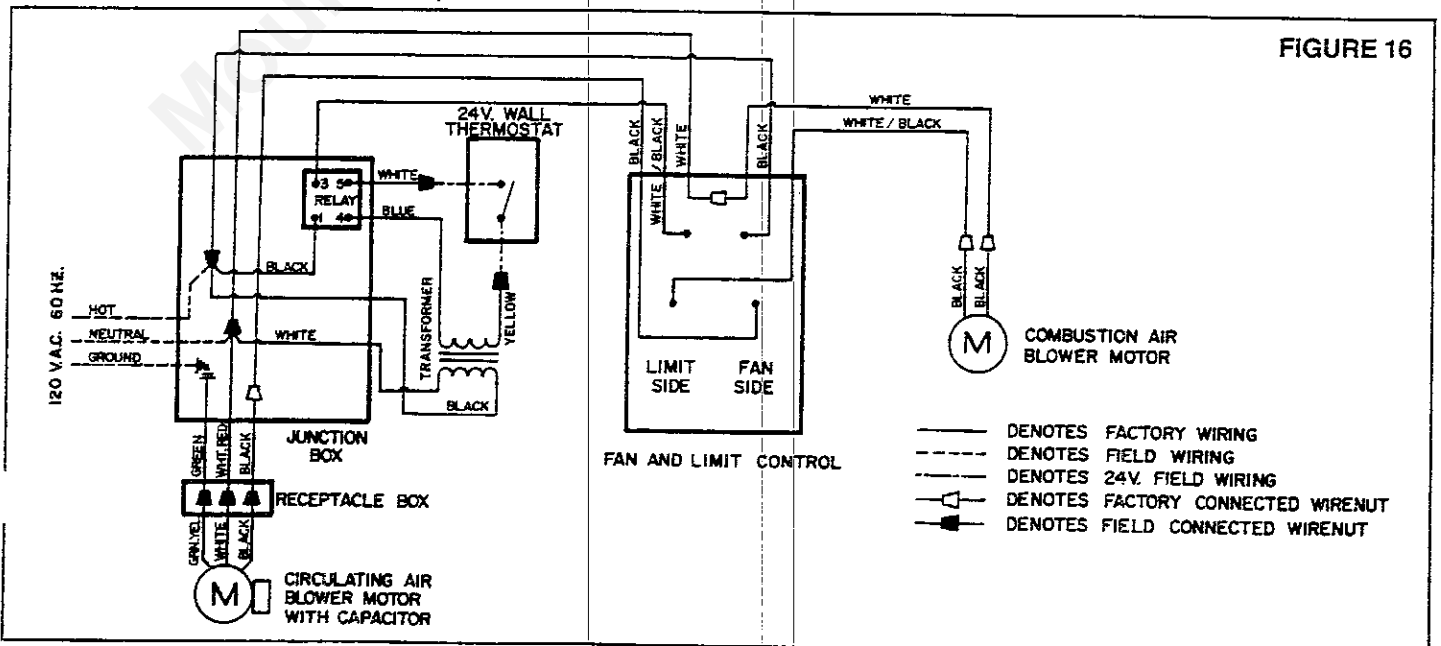
The manual blower switch can be pushed in if it is ever desired for the blower to run continuously. It must be in the pulled out position for the blower control to operate automatically.

Replace the blower control cover after each adjustment is made to prevent unauthorized persons from tampering with or damaging the controls.

**Section 12 CONNECTION OF THE ELECTRICAL WIRING AND INSTALLATION OF THE WALL THERMOSTAT**

All electrical wiring should be performed by a qualified electrician and must comply with the National Electrical Code and applicable local codes. The furnace must be connected with a No. 14 A.W.G. minimum, grounded copper cable to a properly protected 120-volt, 15-amp circuit. The furnace should be the only load served by this circuit.

A 24-volt thermostat should be located on a partition wall near the return air inlet to the furnace at approximately five feet above the floor. Do not locate the thermostat where it will be near other heat-producing devices or frequently opened doors. Poor locations can cause erratic thermostat performance.



To complete the wiring, refer to the wiring diagram (figure 16) and:

1. Complete the thermostat circuit by inserting one of the thermostat leads into the transformer and connecting the remaining lead to the loose wire extending out the side of the furnace junction box.
2. Remove the furnace junction box cover and install a cable clamp in the end of the junction box.
3. Pass the electrical supply cable through the cable clamp, attach the black and white leads in the junction box to the corresponding conductors of the supply cable with wire nuts, and tighten the cable clamp.
4. Attach the ground wire of the supply cable to the ground lug inside the junction box and replace the junction box cover.
5. Remove the cover plate from the receptacle box inside the blower compartment, remove a knockout from the bottom of the receptacle box and install a cable clamp in the knockout hole.
6. Pass the blower leads through the cable clamp, attach the green conductor to the ground lug inside the junction box, and fasten the remaining blower leads of corresponding color with wire nuts, tighten the cable clamp and replace the wiring box cover.

### Section 13

### ADJUSTMENT OF THE BAROMETRIC REGULATOR

1. Build and tend a fire according to section 14 of this manual until the furnace has reached its normal operating temperature and the firebed is well established.
2. Drill a 1/4 inch diameter hole into the chimney connector between the flue collar of the furnace and the barometric draft regulator as close to the flue collar as possible.
3. Set up the draft gauge and insert the draft gauge sensing tube into the 1/4 inch hole.
4. Adjust the balance weight on the barometric draft regulator to maintain a reading of .060 inch water column on the draft gauge.
5. Remove the draft gauge sensing tube and plug the hole in the chimney connector with furnace cement.

### Section 14

### USING THE FURNACE

This furnace is designed to burn wood or coal. Diverter baffles inside the combustion air manifold above the ash door are adjustable to vary the amount of combustion air supplied above or below the grate. The position of these baffles should be set by properly locating the diverter baffle locking tabs as shown by figure 17. Be sure the baffles are locked in the proper position before using the furnace.

Two factors largely determine the amount of heat energy per cord of wood. The first is moisture content. When wood is moist, its moisture content is high so wood burns poorly and encourages the formation of creosote. Wood stored for drying from six months to two years is considered to be seasoned wood and is preferred.

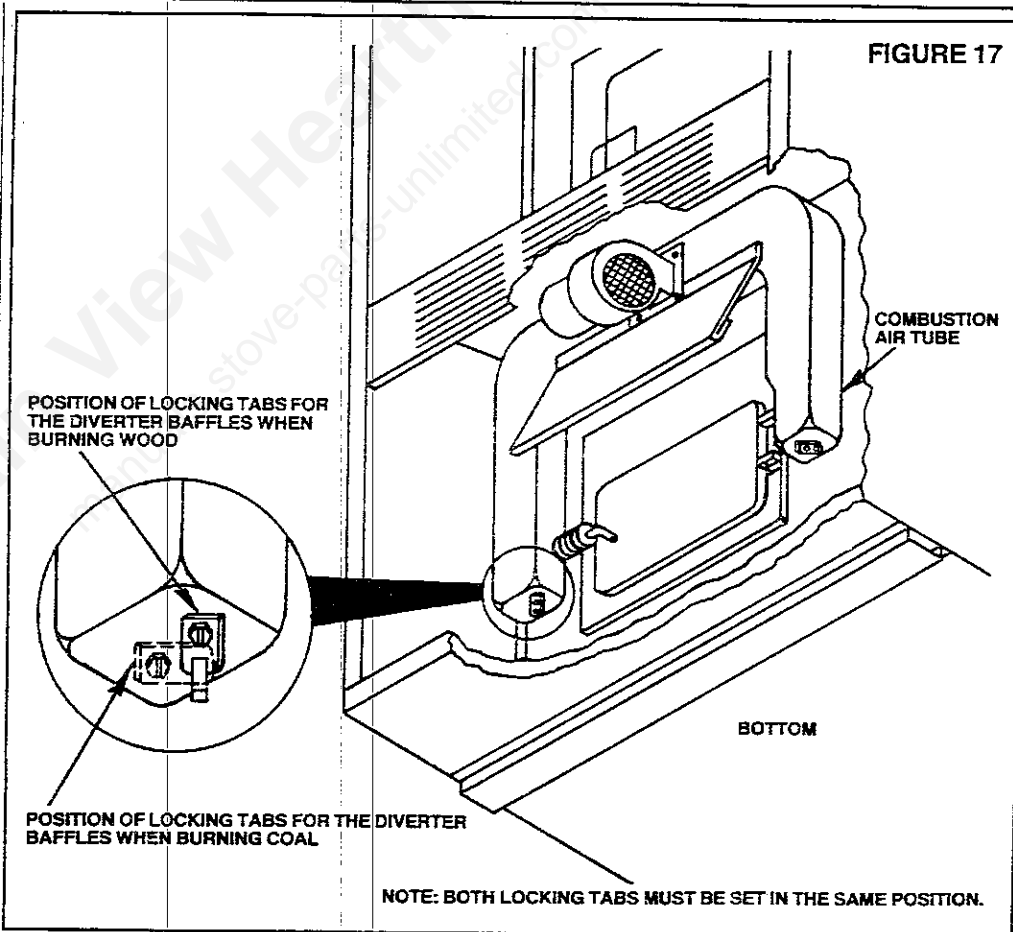
The second factor determining heat output of wood is its density or weight per cord. In general, assuming equal seasoning or dryness, heavier, denser woods have more heating value per cord. For example, hickory is denser wood than pine, so a cord of hickory will give more heat than a cord of pine. For longer and safer furnace life, never use manufactured composition logs or salt water-soaked wood (driftwood).

The piece size of wood has some influence over the furnace performance. Small pieces of split wood will burn rapidly and develop large amounts of heat for a short time. Large pieces of wood tend to burn and maintain a fire longer between required refueling. Select the piece size of the wood you use to give the performance characteristic you desire.

For more specific information on how to select and obtain good firewood, see The U.S. Department of Agriculture - Forest Service Leaflet No. 559. The leaflet is available by writing to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

#### DANGER

- RISK OF FIRE/EXPLOSION.
- DO NOT USE GASOLINE, OIL, GARBAGE OR OTHER VOLATILE MATERIAL TO START OR INTENSIFY FIRE.



## WARNING

- RISK OF FIRE.
- DO NOT OPERATE WITH FLUE DRAFT EXCEEDING .06 MAX W.C.
- DO NOT OPERATE WITH FEED AND ASH PIT DOORS OPEN.
- DO NOT STORE PAINTS, THINNERS, OR OTHER FLAMMABLE MATERIALS IN FURNACE ROOM.
- DO NOT STORE FUEL CLOSER THAN MARKED CLEARANCES.
- INSPECT AND CLEAN FIREBOX, SMOKE PIPE AND CHIMNEY REGULARLY.

## CAUTION

- HOT SURFACES.
- KEEP CHILDREN AWAY.
- DO NOT TOUCH DURING OPERATION.

## TO BUILD A FIRE

1. Lay crumpled paper on the grate and cover it with small wood kindling.
2. Turn the thermostat to the highest setting.
3. Check the ash door and be sure it is closed and properly latched.
4. Light the paper with a match. (Do not use a butane lighter, kerosene, charcoal lighter, lighter fluid, etc. Use of these could cause an explosion.)
5. Close the feed door.
6. Open the feed door occasionally and add small pieces of wood gradually.
7. Set the thermostat to the setting that will maintain the desired temperature.
8. Maintain the fire in the furnace by proper fire tending.

## Fire Tending

Fire tending is the occasional poking, stirring, or shaking of the burning wood or coal to ensure airflow through the firebed and adding new wood or coal as needed. With experience, you should determine how often fire tending is required to maintain the desired heat output of the furnace.

Tend the fire within the furnace by occasionally poking or stirring the fire to ensure air movement through the firebed. As experience in fire tending is gained, a routine of stirring the firebed, adding wood or coal and removing ashes can be established to meet the needs of the particular heating situation.

Prepare the furnace to hold fire all night by loading it with well dried wood or coal at least an hour before bedtime. Burn the furnace at the normal rate for this hour, before setting the thermostat to a lower temperature for the night. This procedure will help to drive out excess moisture and minimize creosote or soot buildup during the night.

## Ash Removal and Disposal

Ashes should not be allowed to accumulate until they obstruct the airflow up through the fuel bed. If this occurs, poor burning will occur. If ashes are allowed to accumulate near the grates, overheating and rapid burn-out of the grates will occur.

Wear non-combustible gloves to protect your hands when removing ashes from the appliance.

Always place ashes in a metal container with a tight fitting lid and place the container on a non-combustible floor or on the ground well away from all combustible materials. Dispose of the ashes only after they have completely cooled.

Wood ashes and coal cinders can be shaken into the grate by placing the shaker handle over the end of one of the shaker shanks and cranking it back and forth. Take care and do not shake excessive amounts of burning or unburned wood or coal into the ash pan. Only moderate shaking should be necessary for wood ashes but vigorous shaking may be required to crush coal cinders.

## Wood and Coal Storage

Wood can be dried sufficiently for burning within a few weeks if protected from rain in a low humidity area. It is far better to cut wood and allow it to dry for a year. In all cases, the wood should be stacked so that it is protected from rain and is exposed to the air. The dryer the wood, the more usable the heat that is produced by the fire and the less likely rapid accumulation of soot and creosote within the chimney will occur. See the section of this manual concerning chimney maintenance for information concerning the hazards of soot and creosote accumulation.

Store coal in a dry, ventilated space. Coal that is improperly stored can catch fire from heat generated by chemical changes occurring within the coal bed (spontaneous combustion). To avoid the development of these conditions, coal quantities that will be stored more than three days should be kept clean of all combustible materials, such as leaves, hay, wood, rags, etc., and stored where the temperature of the air and object the coal contacts are 75 degrees F. or less. Alternate wetting and drying of coal should be avoided. Wet and dry coal should never be stored where each will be in contact with the other.

If the emission of heat or unusual odors from a coal storage area is observed, the process leading up to spontaneous combustion may be occurring and the fire department should be called immediately.

Small quantities of wood or coal required for fire tending must be kept at least 36 inches from the furnace.

## Electrical Power Failure

A limited amount of heat may be obtained under power failure. The amount of heat obtained will depend on how restrictive the duct system is. To obtain maximum airflow through the furnace, the filters should be removed. **BE SURE TO REPLACE THE FILTERS WHEN ELECTRICAL POWER IS RESTORED.**

---

## **Section 15 FURNACE, CHIMNEY CONNECTOR AND CHIMNEY MAINTENANCE**

---

### Chimney Connector and Chimney

#### Creosote and Soot - Formation and Need For Removal

When wood is burned slowly it produces tar and other organic vapors which combine with expelled moisture to form creosote. The creosote vapors condense and the soot residue forms in the relatively cool chimney flue of a slow-burning fire and accumulates on the flue lining. When ignited, the creosote or soot makes an extremely hot fire, commonly called a chimney fire.

Coal burning will cause soot formation in the chimney and may cause a soot fire in the chimney.

The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote or soot buildup has occurred. If creosote or soot has accumulated, it should be removed to reduce the risk of a chimney fire.

If a chimney fire occurs, turn the furnace thermostat to the lowest setting, call the fire department and protect the roof by wetting with a garden hose or buckets of water. After the chimney fire is over, immediately inspect the chimney, chimney connector and surrounding materials for damage or fires that might have been ignited. Repair any damage caused by the chimney fire before resuming use of the furnace.

Although a properly constructed chimney should not be damaged by a chimney fire, it is best to prevent chimney fires by properly cleaning the chimney. There are special chimney cleaning brushes available for this. Many areas have professional chimney cleaning services. Most fire departments make free chimney inspections and can provide assistance in locating chimney services.

Although a properly constructed chimney should not be damaged by a chimney fire, it is best to prevent chimney fires by:

1. Burning well seasoned wood. Green or wet wood increases the chance of creosote forming.
2. Not burning small smoldering fires for long periods of time. Small smoldering fires tend to allow the chimney to stay relatively cool, increasing the chances of creosote forming.
3. Cleaning and inspecting the chimney regularly.

#### Furnace and Chimney

At the end of each heating season, the furnace and chimney should be thoroughly cleaned of all ashes, soot or creosote. Ashes remaining in the furnace and chimney in combination with moisture in the air can cause severe corrosion of the furnace and chimney. All rust spots on the furnace should be wire brushed and covered with a coat of high-temperature paint. Check the ash and feed door gaskets frequently and replace them if deterioration or wear is observed.

#### Filters

The "Warm Air Furnace" is equipped with two 10" x 20" x 1" disposable air filters that must be periodically replaced to assure proper operation of the furnace. The replacement filter must be the same type included with the furnace when it is purchased.

#### Blower and Blower Motor

At least once a year disconnect the power to the furnace and clean the blower of all lint and dust and oil the blower motor bearings with a few drops of S.A.E. 20 oil.

**DO NOT CONTINUE TO USE THE FURNACE IF IT IS DAMAGED OR NEEDS REPAIR. KEEP THE FURNACE IN GOOD REPAIR FOR CONTINUED SAFE PERFORMANCE.**

**Section 16**

**TROUBLESHOOTING CHART**

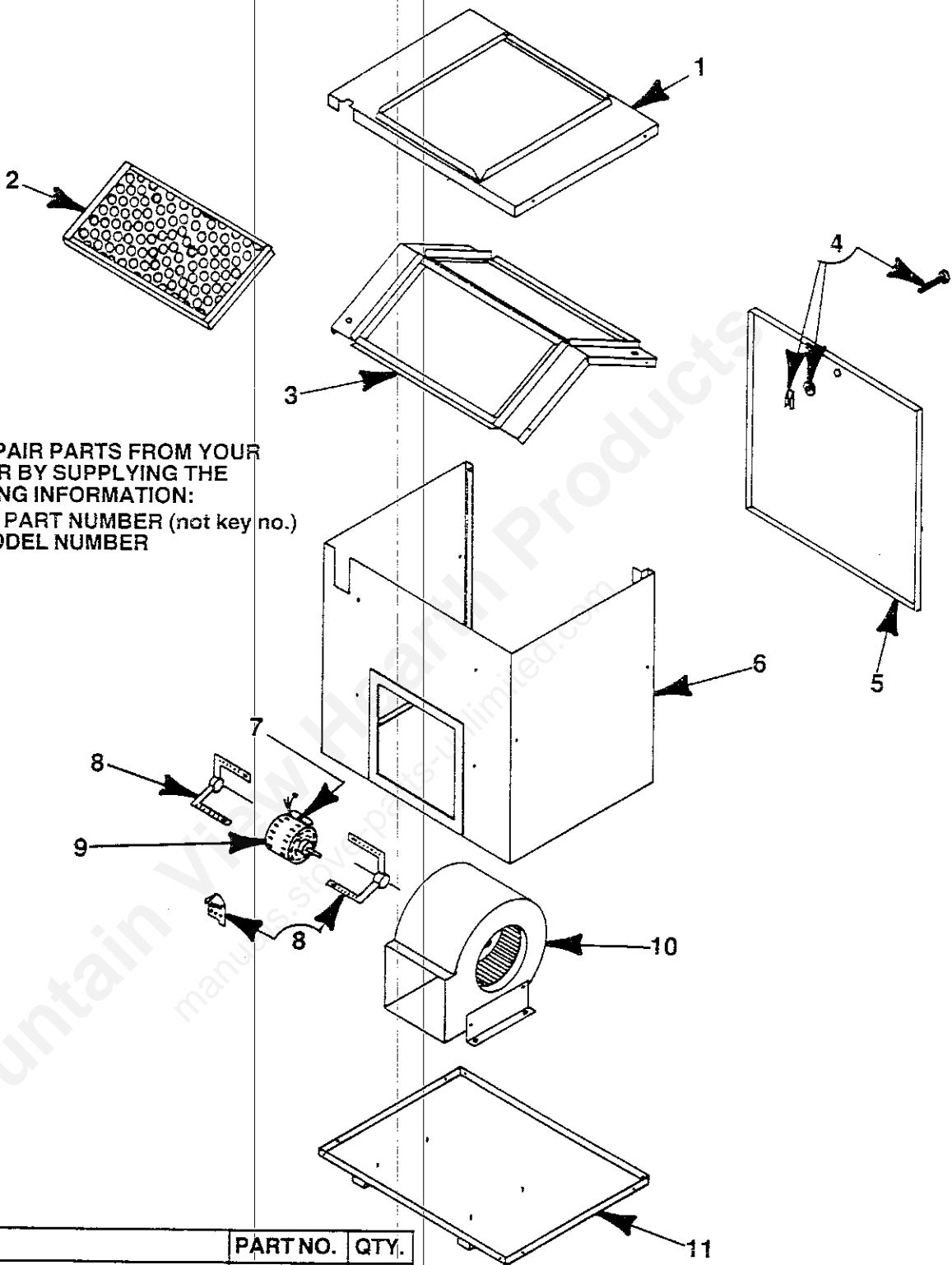
NOTE: Disconnect electrical power before performing service work on blower or other electrical components.

SYMPTOM	POSSIBLE CAUSES	CORRECTIVE ACTION
A. Excessive noise.	<ol style="list-style-type: none"> <li>Blower wheel contacting housing.</li> <li>Foreign material inside housing.</li> <li>Loose duct work.</li> </ol>	<ol style="list-style-type: none"> <li>Realign blower wheel.</li> <li>Clean.</li> <li>Tighten or repair.</li> </ol>
B. Blower will not run.	<ol style="list-style-type: none"> <li>Blown fuse or open circuit breaker.</li> <li>Defective motor.</li> <li>Automatic-Reset Thermal Protector "tripped".</li> <li>Motor improperly wired.</li> <li>Defective fan switch.</li> </ol>	<ol style="list-style-type: none"> <li>Replace fuse or reset circuit breaker.</li> <li>Replace.</li> <li>Check for high (or low) voltage input or ambient temperatures.</li> <li>Re-wire.</li> <li>Check and replace if found to be defective.</li> </ol>
C. Fire rate does not increase with thermostat circuit closed and combustion air blower is running or smoke spills from feed door during firetending.	<ol style="list-style-type: none"> <li>Chimney connector pushed too far into a masonry chimney thimble restricting draft.</li> <li>Chimney or chimney connector restricted with creosote or soot.</li> <li>Chimney draft reduced by air entering through:                             <ul style="list-style-type: none"> <li>Unsealed chimney clean-out access.</li> <li>Loose mortar or cracked chimney wall.</li> <li>Holes in rusted chimney connector.</li> <li>Incompletely sealed chimney connector joint or thimble.</li> </ul> </li> <li>Downdraft in too large chimney or chimney with no top cover.</li> </ol>	<ol style="list-style-type: none"> <li>Shorten chimney connector.</li> <li>Clean.</li> <li>Seal any leaks found in chimney or chimney connector.</li> <li>Install chimney top cover or sleeve to prevent downdraft.</li> </ol>
D. Fire rate too high when thermostat circuit is open and combustion air blower is not running.	<ol style="list-style-type: none"> <li>Feed door or ash door not securely closed.</li> <li>Feed door or ash door gasket worn excessively.</li> <li>Combustion air damper not closing.</li> </ol>	<ol style="list-style-type: none"> <li>Close feed door and ash door securely.</li> <li>Adjust doors or install new gaskets.</li> <li>Check through combustion blower or remove blower and align.</li> </ol>
E. Smoke smell in living space.	<ol style="list-style-type: none"> <li>Items 1, 2, 3 and 4 in No. C above.</li> <li>Leaking creosote at pipe joints or flue collar.</li> </ol>	<ol style="list-style-type: none"> <li>Items 1, 2, 3 and 4 in No. C above.</li> <li>Seal with a good grade of furnace cement. Wait until the cement is dry before starting a fire.</li> </ol>

**Section 17**

**CHECKLIST OF DO'S AND DON'TS**

- Do's**
- Do have this furnace install by a qualified installer.
  - Do be sure the furnace is attached to a listed factory-built all-fuel chimney or a masonry chimney built to N.F.P.A. standards.
  - Do provide the required floor protection when installing on combustible floors as illustrated by figure 1.
  - Do maintain the required minimum clearances between the furnace and chimney connector and combustible materials.
  - Do be sure provisions are made to supply adequate combustion air to the furnace and other fuel-burning appliances that are located in the same area with the furnace.
  - Do install and properly adjust a barometric draft regulator in the chimney connector serving the furnace.
  - Do seal all chimney connector joints with furnace cement and fasten them securely with three sheet metal screws per joint.
  - Do be sure all electrical wiring complies with the National Electric Code.
  - Do be sure that the combustion air blower is off when the thermostat is off (no voltage at the combustion blower relay).
- Don't**
- Don't use a chimney flue for this furnace that is serving any other appliance.
  - Don't use volatile liquids such as kerosene, gasoline or lighter fluids to start or freshen up a fire in this furnace.
  - Don't burn liquid fuels, or trash in this furnace.
  - Don't install this furnace in an area where combustible gases or liquids may be present.
  - Don't install this furnace in a residential garage.
  - Don't operate the furnace with the ash or feed door open. Close the doors promptly after tending the fire or removing ashes.



ORDER ALL REPAIR PARTS FROM YOUR KING DEALER BY SUPPLYING THE FOLLOWING INFORMATION:  
 1. PART NAME 2. PART NUMBER (not key no.)  
 3. MODEL NUMBER

KEY NO.	PART NAME	PART NO.	QTY.
1	Top, Blower Compartment	036708	1
2	Filter, Air 10 x 20 x 1	*	2
3	Rack, Filter	017952	1
4	Handle, Latch	008506	1
5	Door Blower Compartment	036709	1
6	Wrap, Blower Compartment	036710	1
7	Capacitor W/Rubber Boot	018895	1
8	Hangers & Supports	018917	1
9	Motor	018563	1
10	Housing & Blower Assy.	018918	1
11	Bottom, Blower Compartment Ptd	035973	1
	*Purchase Locally		



KEY NO.	PART NAME	PART NO.	QTY.
1	Damper, Air Distributor	018919	1
2	Cog Retainer	007715	2
3	Cog Grate	007714	4
4	Rod Smoke Curtain	018725	1
5	Curtain Smoke	007924	1
6	Liner, Upper Rear	018436	1
7	Liner, Front & Rear	018437	2
8	Grate No. 2	018448	2
9	Grate No. 1	018447	2
10	Tubing	018572	2
11	Frame Grate	018466	2
12	Handle Shaker	005256	1
13	Pan Ash Assy.	018462	1
14	Bottom Cabinet Ptd	035976	1
15	Control Blower	023232	1
16	Regulator DR8 Draft	021850	1
17	Rope Gasket for Feed Door	009535-03	1
18	Side Cabinet Left Assy.	036706	1
19	Unit Inner Weld Assy.	017733	1
20	Box Receptacle	*	1
21	Plate Cover	*	1
22	Transformer Assy.	023199	1
23	Cover Junction Box	036667	1
24	Box Junction	036649	1
25	Relay	018562	1
26	Back Cabinet Assy.	036700	1
27	Connector Conduit	008611	3
28	Conduit Flexible	022835	4
29	Connector Conduit	008610	5
30	Top Cabinet Assy.	036707	1
31	Side Cabinet Right Assy.	036699	1
32	Thermostat	008133	1
33	Baffle Flue	018434	1
34	Support Brick	018452	2
35	Liner Side	018435	4
36	Retainer Brick	018677	4
37	Brace Side Liner	018683	2
38	Shield Blower Radiation	018658	1
39	Brick	004911	14
40	Support Grate	018455	2
41	Shield Front Top	036701	1
42	Gasket Blower	018660	1
43	Blower	018564	1
44	Shield Front Blower	036703	1
45	Shield Front Left	036704	1
46	Shield Front Right	036705	1
47	Guard Ash	036702	1
48	Handle Assy.	015905	1
49	Latch Assy. for Ash Door	018920	1
50	Door Ash & Rope Assy.	018921	1
51	Frame Ash Door	016095	1
52	Gasket Ash Door Frame	012959	2
53	Latch Assy. for Feed Door	018922	1
54	Manifold & Relief Assy.	018925	1
55	Door, Feed & Rope Assy.	016074	1
56	Frame & Rope Assy.	016081	1
57	Rivit, 1/4 x 1-1/4	P626	4
58	Gasket Rope	026592	1
59	Rope Fiberglass	009535-02	1
60	Shield Hdl Radiation Ptd	008804	1
**	Wire for Furnace (complete)	022956	1
**	Wire 24V, 25 ft. & Staples	018923	1
61	Handle Assy.	023819	1
	* Purchase Locally		
	** These parts not shown on illustration		

# LIMITED WARRANTY

## KING WOOD OR COAL BURNING HEATERS, ACCESSORY BLOWERS, OR FURNACES

Manufactured by: Martin Industries, Inc., Post Office Box 128, Florence, Alabama 35631

### WHAT IS COVERED AND FOR HOW LONG

For two years from the date this heater, accessory blower, or furnace is first purchased for use, Martin Industries, Inc. will make available to you at our factory a free replacement for any defective part of this heater, accessory blower, or furnace.

### WHAT IS NOT COVERED

- Removal and re-installation costs.
- Labor costs for replacement or repairs.
- Transportation or shipping cost.
- The cost of a service call to diagnose trouble.
- Painted surfaces.
- Damage or defect caused by improper installation, accident, misuse, abuse, or alteration.

### LIMITATIONS AND EXCLUSIONS

1. No one has authority to add to or vary this limited warranty, or to create for Martin Industries, Inc. any other obligation or liability in connection with this heater, accessory blower, or furnace.
2. ANY IMPLIED WARRANTY APPLICABLE TO THIS HEATER, ACCESSORY BLOWER OR FURNACE IS LIMITED IN DURATION TO THE SAME PERIOD OF TIME AS THIS WRITTEN WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.
3. MARTIN INDUSTRIES, INC. SHALL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL, OR CONTINGENT DAMAGES YOU MIGHT SUFFER AS A RESULT OF ITS BREACH OF THIS WRITTEN WARRANTY OR ANY IMPLIED WARRANTY. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
4. This warranty applies only to the original purchaser and may not be transferred.
5. This warranty applies only to a heater sold and used in the United States.

### YOUR DUTIES

- This heater, accessory blower, or furnace must be installed and operated in accordance with local codes and the instructions furnished with it.
- You should keep an invoice, cancelled check, or payment record to verify the purchase date.

### IF YOU HAVE A PROBLEM WITH YOUR HEATER, ACCESSORY BLOWER, OR FURNACE

1. Contact or take it to the nearest King dealer. If you cannot locate your King dealer, call or write Martin Industries Customer Service Department as indicated below.
2. If you do not receive satisfactory service from the dealer within a reasonable time, write Martin Industries, Inc. Customer Service Department and include the date you purchased your heater, accessory blower, or furnace its serial number, and details of the problem you are having.

Customer Service Department  
Martin Industries, Inc.  
Post Office Box 128  
Florence, Alabama 35631  
Telephone: 205-767-0330

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

