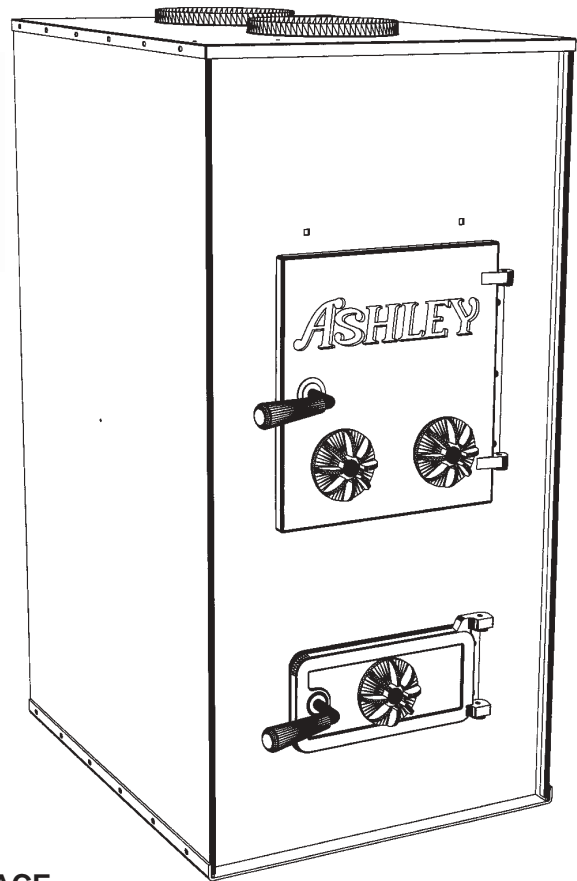




## **Model 22AF**

**OWNER'S MANUAL**

# **SOLID FUEL WARM AIR FURNACE**



\*FOR INSTALLATION AS A CENTRAL FURNACE

\*CERTIFIED UNDER ANSI/UL 391 & CAN/CSA-B366.1-M91

## **Keeping North America Warm Since 1869**

**CAUTION:**  
READ ALL INSTRUCTIONS CARE-  
FULLY BEFORE STARTING THE  
INSTALLATION OR OPERATING  
THE FURNACE

**IMPROPER INSTALLATION MAY VOID  
YOUR WARRANTY**

**DO NOT USE THIS FURNACE  
IN A MOBILE HOME OR TRAILER**



**UNITED STATES STOVE COMPANY**  
227 Industrial Park Road  
P.O. Box 151  
South Pittsburg, TN 37380  
(423) 837-2100



# CONGRATULATIONS!

You've purchased one of America's Finest Wood and Coal Burning Furnaces. By heating with wood and coal you're helping to CONSERVE AMERICA'S ENERGY! Wood is our Renewable Energy Resource. Please do your part to preserve our wood supply. Plant at least one tree each year. Future generations will thank you.

NOTE: YOUR UNIT MUST BE INSTALLED BY A QUALIFIED FURNACE INSTALLER. IMPROPER INSTALLATION COULD VOID YOUR WARRANTY!

## TOOLS AND MATERIALS NEEDED

### TOOLS

Pencil  
6 Foot Folding Rule or Tape  
Tin Snips  
Drill, Hand or Electric  
Drill Bit (For Sheet Metal Screws) 1/8" Dia.  
Screw Driver (Blade-Type)  
Gloves  
Sabre Saw  
5/16" Nut Driver or  
5/16" Socket with Ratchet

### MATERIALS

6" Pipe, 6" Elbow, Collar and Thimble; as required  
(24 gauge min.)  
1/2" Sheet Metal Screws  
6" Inside Diameter Listed Residential Type or  
Building Heating Appliance Chimney or Existing  
Masonry Chimney (SEE Page 8).  
Electrical Wiring  
6" Draft Regulator  
1/2" Conduit  
(Conduit Connectors)  
Furnace Cement (Manufacturer Recommends:  
Rutland Black - Code 78 or Equivalent)  
Plenum and Duct Work as Required

## CAUTION

Your Furnace has the following labels. Read and obey all labels.

### **DANGER: RISK OF FIRE OR EXPLOSION.**

**DO NOT** burn garbage, gasoline, drain oil, or other flammable liquids.

### **WARNING: FIRE HAZARD.**

**DO NOT** operate with fire draft exceeding .06 inches W.C.

**DO NOT** operate with fuel loading or ash removal doors open.

**DO NOT** store fuel or other combustible material within the marked installation clearances.

**DO NOT** store fuels, paints, thinners, flammable liquids, or other highly volatile substances in the furnace room.

### **CAUTION: HOT SURFACES**

Keep children away.

Do not touch during operation.

**WARM-AIR SUPPLY-DUCT SYSTEM MUST BE CONSTRUCTED ONLY OF METAL**

### **CAUTION!**

**INSPECT FLUE PIPES, FLUE PIPE JOINTS AND FLUE PIPE SEALS REGULARLY TO ENSURE THAT SMOKE AND FLUE GASES ARE NOT DRAWN INTO, AND CIRCULATED BY, THE AIR CIRCULATION SYSTEM.**

### **CAUTION!**

**CLEANOUT OF THE HEAT EXCHANGER, FLUE PIPE, CHIMNEY, AND DRAFT INDUCER IF USED, IS ESPECIALLY IMPORTANT AT THE END OF THE HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS, CAUSED BY ACCUMULATED ASH.**

#### **SAFETY NOTICE:**

If this heater is not properly installed, a house fire may result. For your safety, follow the installation directions. Contact local building or fire officials about restrictions and installation inspection requirements in your area.

**REFER TO MARKINGS ON THE APPLIANCE FOR ADDITIONAL INFORMATION.**

# RULES FOR SAFE INSTALLATION AND OPERATION

Read these rules and the instructions carefully. Failure to follow them will cause a hazard that could result in death, serious bodily injury, and/or property damage.

1. Check your local codes. This installation must comply with their rulings.
2. Do not install this furnace in a mobile home or trailer.
3. Always connect this furnace to a chimney and vent to the outside. Never vent to another room or inside a building.
4. Do not connect this furnace to an aluminum Type B gas vent. This is not safe and is prohibited by the National Fire Protection Association Code. This furnace requires a masonry or listed factory built chimney for residential type or building heating appliance chimney. Use a 6" diameter chimney or larger, that is high enough to give a good draft. (See Page 8)
5. Be sure that if a masonry chimney is used, it is safely constructed and in good repair. Have the chimney inspected by the Fire Department or an inspector.
6. Inspect chimney connector and chimney before and frequently during the heating season for any deposit of creosote or soot which must be removed (see Chimney Maintenance, page 18.)
7. Provide air for combustion into the room where the furnace is located. If the intake is not in the same room, air must have free access to the room.
8. CAST IRON PARTS MUST BE "SEASONED" TO AVOID CRACKING. BUILD ONLY SMALL FIRES ON FIRST USE.
9. To prevent injury, do not allow anyone to use this furnace who is unfamiliar with the correct operation of the furnace.
10. For further information on using your furnace safely, obtain a copy of the National Fire Protection Association (NFPA) publication "Chimney's, Fireplaces and Solid Fuel Burning Appliances" NFPA 211. The address of the NFPA is Batterymarch Park, Quincy, MA 02269. For more information on Canadian installation, obtain a copy of CAN/CSA-B366-M91 Installation Code for Solid Fuel Burning Appliances and Equipment.
11. Keep the ashpit section free of excess ashes. Do not allow ashes to stack higher than the sides of the ash pan.
12. DISPOSAL OF ASHES - Place ashes in a metal container with a tight fitting lid. Keep the closed container on a noncombustible floor or on the ground, well away from all combustible materials. Keep the ashes in the closed container until all cinders have thoroughly cooled. The ashes may be buried in the ground or picked up by a refuse collector.
13. CAUTION - The special paints used on your furnace may give off some smoke while they are curing during the first few fires. Build small fires at first. The metal used in construction of the furnace and duct work has a light coating of oil. This could give off smoke and/or odors from registers when furnace is used for the first time. This should disappear after a short period of time. Once this burn-off has occurred, it should not reoccur.

# RULES FOR SAFE INSTALLATION AND OPERATION

14. **CARING FOR PAINTED PARTS** - This furnace has a painted outside jacket, which is durable but it will not stand rough handling or abuse. When installing you furnace, use care in handling. Clean with soap and warm water when furnace is not hot. **DO NOT** use any acids or scouring soap, as these wear and dull the finish. **DISCOLORATION WILL OCCUR IF THE FURNACE IS OVERFIRED. FOLLOW OPERATING INSTRUCTIONS CAREFULLY.**
15. Keep the feed and ash doors closed at all times except while tending the furnace.

Your Furnace is designed to be installed in a parallel air flow arrangement with a gas or oil-fired forced air upflow-type central furnace, or it may be installed as a central furnace.

## HOW THE FURNACE FUNCTIONS

Your Ashley Furnace is designed to be a supplemental or central heating source for your home. This solid fuel furnace may be installed in conjunction with a properly operating central furnace that is listed or certified in accordance with nationally recognized safety standards and equipped with the required controls and other safety features and which has been installed with appropriate standards of National Fire Protection Association with installation clearances specified in the furnace nameplate marking. The installation must be accomplished by a qualified agency (one who is engaged in, and is responsible for, or is thoroughly familiar with the installation and operation of the gas, oil, and solid fuel burning heating appliances, who is experienced in such work, familiar with all precautions required, and has complied with all the requirements of the authority having jurisdiction.) The installation shall be in strict accordance with the manufacturer's installation instructions furnished with the solid fuel furnace.

The chimney connector of the furnace is to be installed to provide clearances to combustible material not less than specified in the individual classifications and marked on the furnace. The chimney connector must be connected to a chimney suitable for use with residential type or building heating appliances which burn solid fuel.

The furnace is designed to operate in either parallel or series air flow arrangement with the central furnace or as a central furnace.

**CENTRAL FURNACE INSTALLATION:** As a central furnace, the unit functions independently of any other system. The blower will come on when the plenum temperature reaches the setting on the blower control.

**PARALLEL INSTALLATION:** The design is such that when the blower comes on, the blower on the central system also comes on.

The blower will only come on when the temperature in the plenum has reached the setting on the blower control. This is to insure that there is sufficient warm air in the system to make it efficient for the unit to operate. When the central system thermostat calls for heat, the central system will operate by the burner igniting and the blower coming on. It is possible that both systems will operate simultaneously. It is recommended that for the most efficient use of your Ashley Furnace, that it be fired as much as possible in order to reduce the demand on your existing central heating system. This unit has an Optional forced draft kit that operates from a wall thermostat. When the temperature falls below the setting on the wall thermostat, the forced draft will come on. (U.S. Stove Option 11 DIK)

The warm air supply outlet of the Ashley furnace shall not be connected to the cold air return inlet of the central furnace because the possibility exists of components of the central furnace overheating and causing the central furnace to operate other than is intended.

### **SERIES INSTALLATION: (U.S. & CANADA)**

This type of installation uses only the blowers of the existing central furnace. The solid fuel fan/limit control must also control the functions of the existing furnace. All electrical power must come from a single branch circuit.

# MODEL 22AF DIMENSIONS

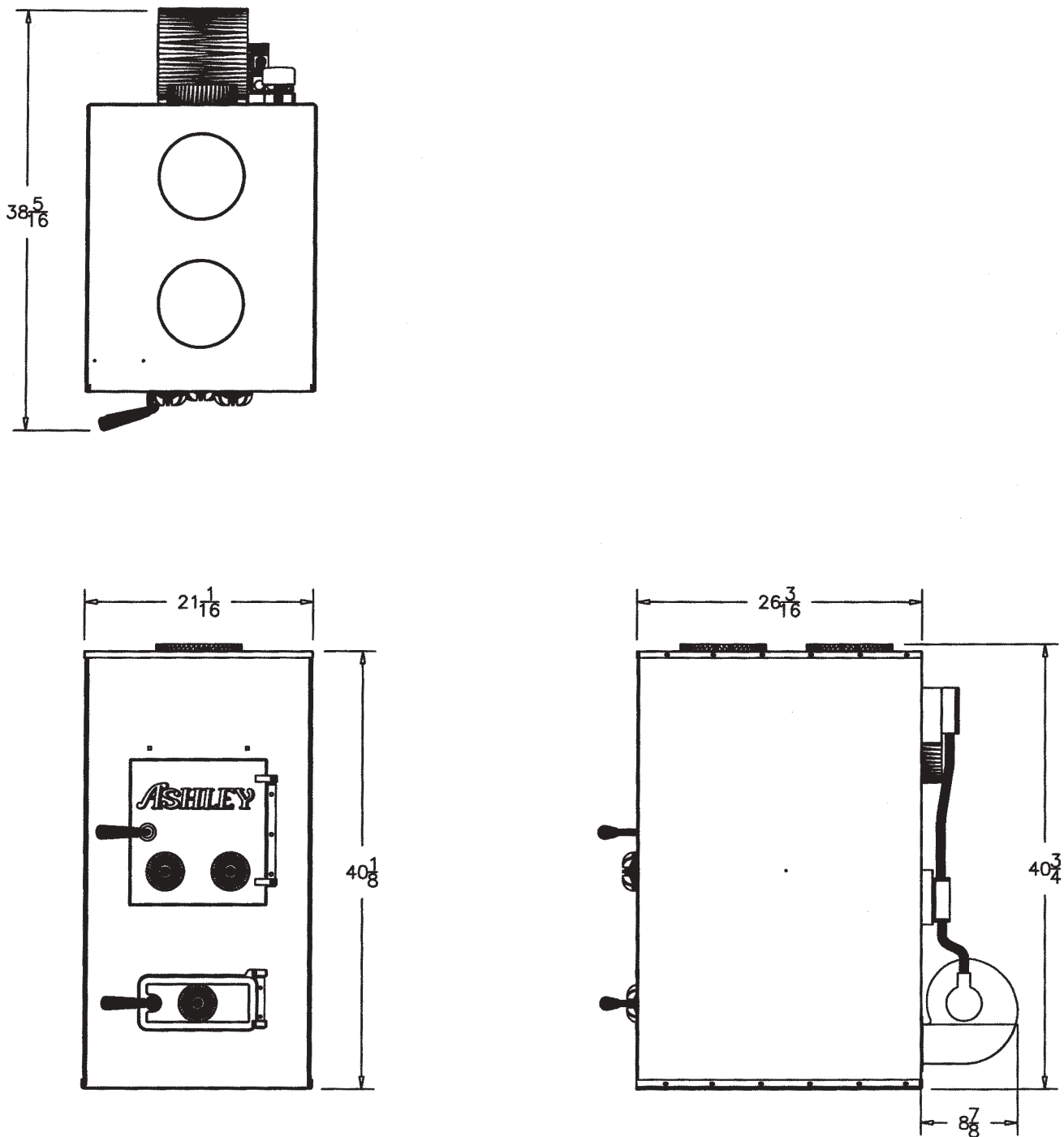


FIG. 1

## LOCATING THE FURNACE

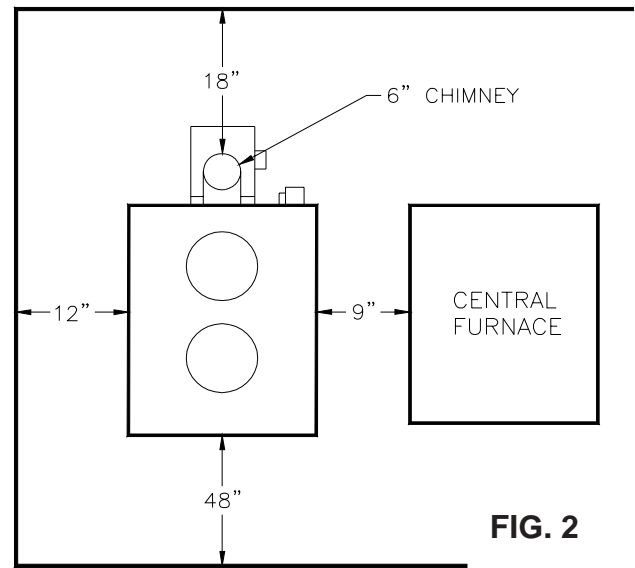
1. The furnace should be located in the same room as the central system and as close as possible, but no closer than 9". There should be no wall between the furnace and the warm air outlet duct that is connected directly to the warm air outlet plenum of the central furnace. See Fig. 2.

The unit will require installation with the following clearances:

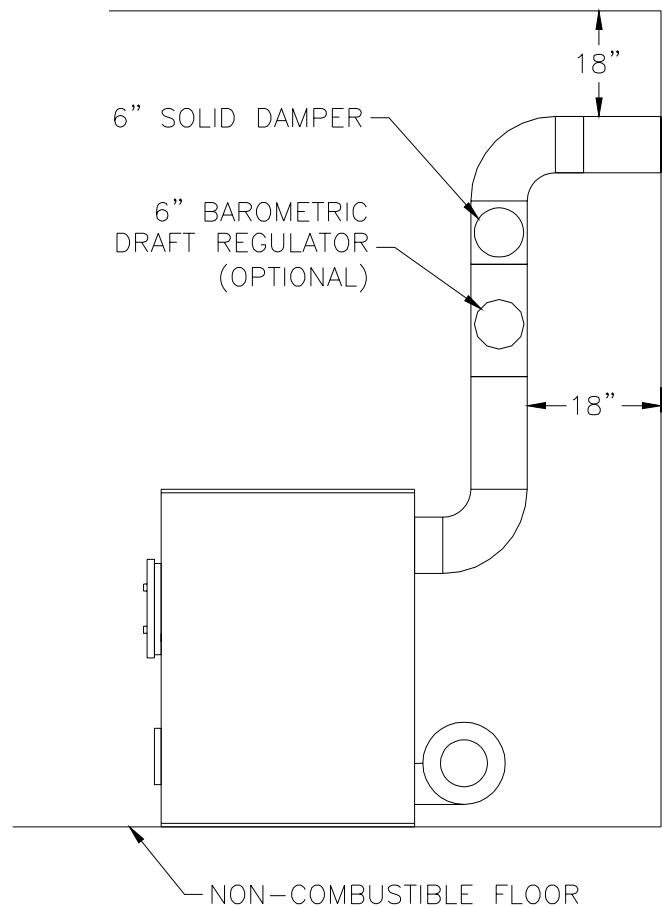
2.
  - Unit to sidewall ..... 12" (305 mm)
  - Unit to backwall ..... 30" (760 mm)
  - Chimney connector pipe to sidewall ..... 18" (530 mm)
  - Chimney connector pipe to backwall ..... 18" (460 mm)
  - Hot air ducts to combustibles ..... 2" (50 mm)

**NOTE: Install only on a noncombustible floor.** (REFER TO FIG. 2 & 3)

3. Place the furnace on a noncombustible floor.
4. Check figures 2 and 3. Be sure you have the clearances shown from the furnace and the connector pipe to combustible surfaces. If you have a solid brick or stone wall behind your heater, you can place the furnace as close as you wish to the wall. If the wall is only faced with brick or stone, treat it as a combustible wall.



**FIG. 2**



**FIG. 3**

# CHIMNEY CONNECTION

**FIG. 4**

## MASONRY CHIMNEY

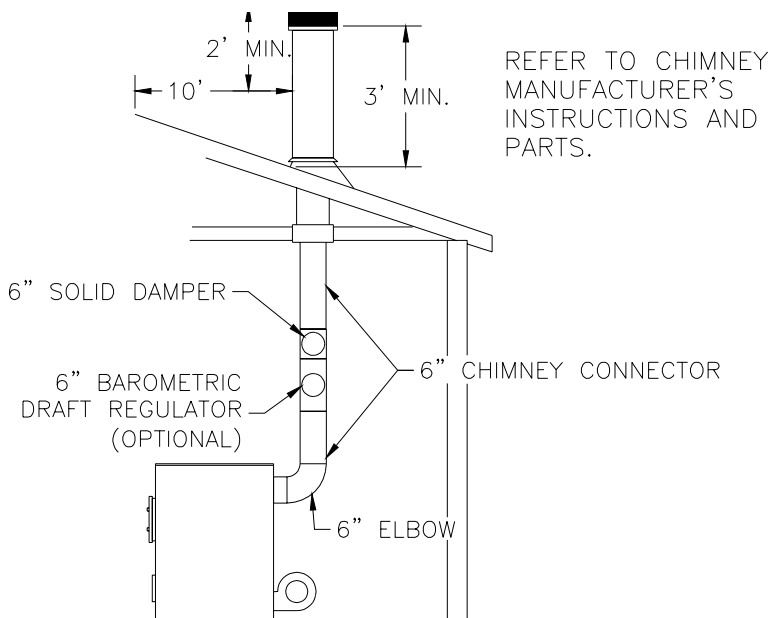
Before using an existing masonry chimney, clean the chimney and inspect the flue liner to be sure it is safe to use. Make repairs before attaching the furnace. See Page 4, item 5. Look at Fig. 4. The connector pipe and fittings you will need to connect directly to a masonry chimney are shown.

The chimney connection should be as short as possible. If the connector pipe must go through a combustible wall before entering the masonry chimney, consult a qualified mason or chimney dealer. The installation must conform to local fire codes, and N.F.P.A. 211.

## DO NOT CONNECT THIS FURNACE TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

The chimney used for a furnace must not be used to ventilate the cellar or basement. If there is a cleanout opening at the base of the chimney, close it tightly.

**FIG. 5**



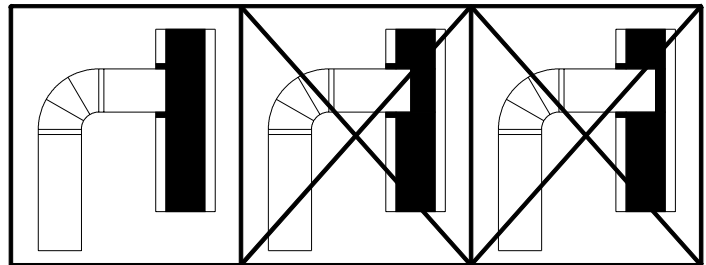
## LISTED FACTORY BUILT CHIMNEY

Carefully follow chimney manufacturer's instructions. Use only a Listed Residential Type or Building Heating Appliance Chimney. If your chimney starts at the ceiling (Fig. 5), you will need enough 6" pipe to reach the ceiling. The top of the chimney must be at least 3 feet above the roof and be at least 2 feet higher than any point of the roof within 10 feet (Fig. 5).



# RULES FOR CONNECTOR PIPE INSTALLATION

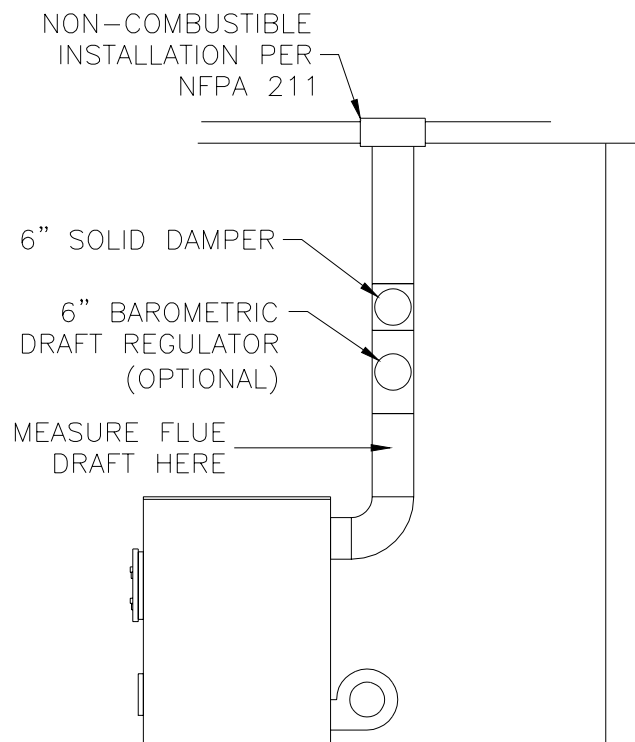
1. The crimped end of the chimney connector fits inside the furnace flue collar. Install additional chimney connector and elbow with the CRIMPED END TOWARD THE FURNACE. This will allow any condensation in the flue to run back into the furnace. Use 6" dia. (minimum 24 gauge) black chimney connector.
2. Slope any horizontal pipe upward toward the chimney at least 1/4 inch for each foot of horizontal run.
3. You must have at least 18 inches of clearance between any horizontal piping and the ceiling. (See Fig. 3)
4. The chimney connector must not extend into the chimney flue (See Fig. 6).
5. Seal each chimney connector pipe joint with furnace cement. Also seal the pipe at the chimney.
6. Use 3 sheet metal screws at each chimney pipe joint to make the piping rigid.
7. The chimney connector may include a section for a barometric draft regulator between the furnace and the chimney (Fig. 4, 5, 6, & 7). The barometric draft regulator must be installed in the same room (same pressure zone) as the furnace.
8. Install the barometric draft regulator strictly in accordance with the instructions that are provided with the barometric draft regulator. A solid damper can be placed between the barometric draft regulator and the chimney.
9. (Fig. 4, 5, 6, & 7)



**FIG. 6**

## Adjusting the Barometric Draft Regulator

1. Drill a hole in the chimney connector within 18" of the flue collar below the barometric draft regulator just large enough for the tube of the manometer.
2. Build a fire after all chimney connections have been made.
3. Use a manometer to measure the draft in the flue. (U.S. Stove Model DG-26)
4. Adjust the barometric draft regulator to obtain a draft of 0.05" - 0.06" W.C. under stable conditions.



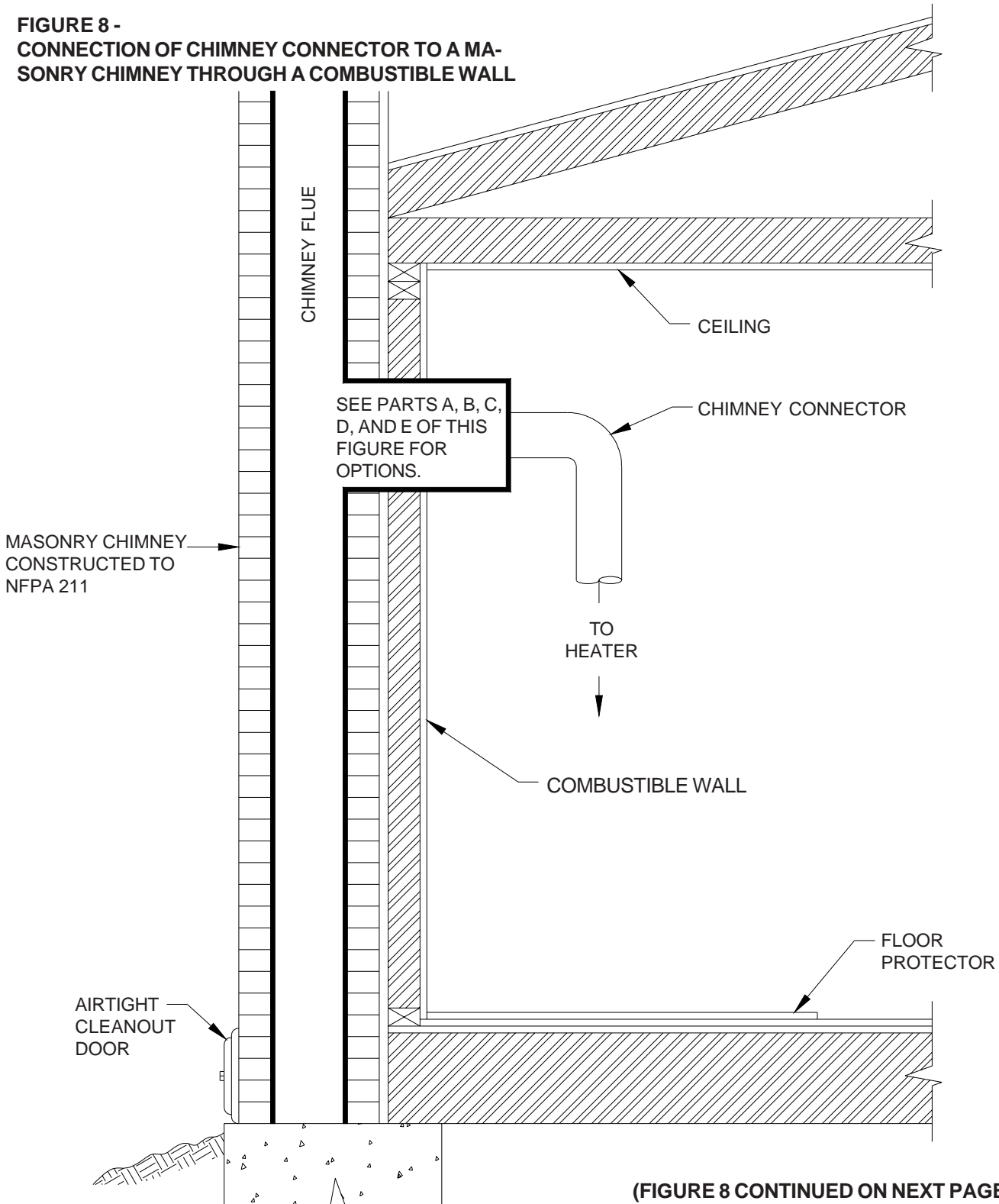
**FIG. 7**

## CONNECTION OF CHIMNEY CONNECTOR TO A MASONRY CHIMNEY THROUGH A COMBUSTIBLE WALL

Figure 8 shows how to connect the chimney connector of a heater to a masonry chimney through a combustible wall.

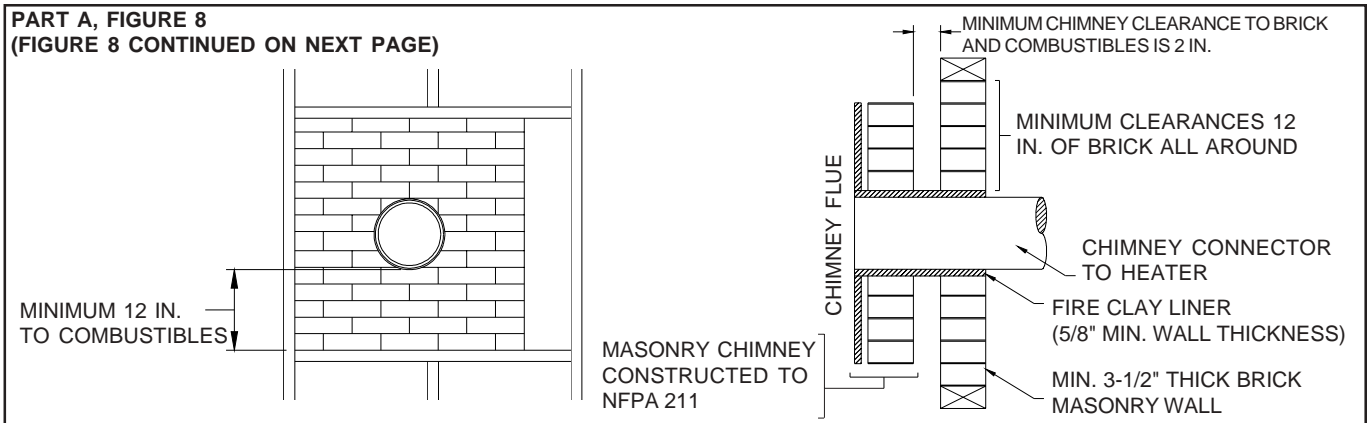
There are five allowable ways that a chimney connector can be connected to a masonry chimney by passing through a combustible wall. NFPA Standard 211 allows the following wall pass-through systems.

**FIGURE 8 -  
CONNECTION OF CHIMNEY CONNECTOR TO A MA-  
SONRY CHIMNEY THROUGH A COMBUSTIBLE WALL**



(FIGURE 8 CONTINUED ON NEXT PAGE)

**PART A, FIGURE 8**  
(FIGURE 8 CONTINUED ON NEXT PAGE)

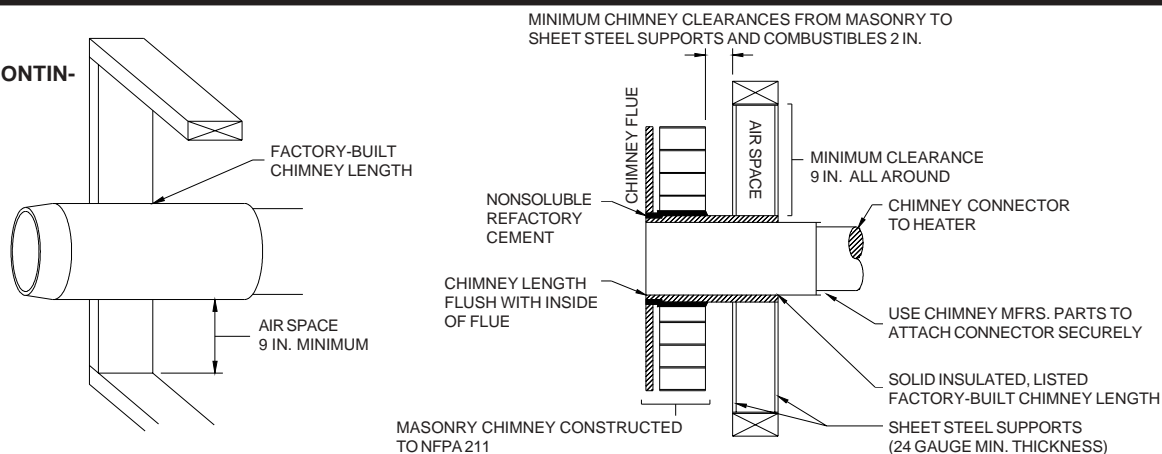


1. Use a minimum 3-1/2" thick brick masonry wall framed into the combustible wall. A fireclay liner (ASTM C315 or equivalent) having a 5/8" minimum wall thickness must be used and it must be at least 12" away from any material that could catch fire. The inside diameter of the fireclay liner shall be sized for the proper snug fit of a 6" diameter chimney connector pipe. The fireclay liner shall run from the outer surface of the brick wall to, but not beyond, the inner surface of the chimney flue and shall be firmly cemented in place. See Part A of Figure 8.
2. Use a solid insulated listed factory-built chimney length having an inside diameter of 6" and having 1" or more of solid insulation. There must be at least a 9" air space between the outer wall of the chimney length and any combustible materials. The inner end of the chimney length shall be flush with the inside of the masonry chimney flue shall be sealed to the flue and to the brick masonry penetration with nonwater-soluble refractory cement. Sheet steel supports which are at least 24 gauge (0.024") in thickness shall be securely fastened to wall surfaces on all sides. Fasteners between supports and the chimney length shall not penetrate the chimney liner. See Part B of Figure 8.
3. Use a 10" diameter ventilated thimble made of at least 24 gauge (0.024") steel having two 1" air channels. The ventilated thimble must be separated from combustible materials by a minimum of 6" glass fiber insulation. The opening in the combustible wall shall be covered and the thimble supported with sheet steel supports which are at least 24 gauge (0.024") in thickness. The sheet steel supports shall be securely fastened to wall surfaces on all sides and shall be sized to fit and hold the chimney section. Fasteners used to secure chimney sections shall not penetrate chimney flue liner. See Part C of Figure 8.
4. Use an 8" inside diameter solid insulated listed factory-built chimney length which has 1" or more of solid insulation. The minimum length of this chimney section shall be 12" and will serve as a pass-through for the 6" diameter chimney connector. There must be at least a 12" air space between the outer wall of the chimney section and any combustible materials. The chimney section shall be concentric with and spaced 1" away from the chimney connector by means of sheet steel support plates on both ends of the chimney section. The opening in the combustible wall shall be covered and the chimney section supported on both sides with sheet steel supports which are at least 24 gauge (0.024") in thickness. The sheet steel supports shall be securely fastened to wall surfaces on all sides and shall be sized to fit and hold the chimney section. Fasteners used to secure chimney sections shall not penetrate chimney flue liner. See Part C of Figure 8.
5. A listed factory-built wall pass-through system may be purchased and installed according to the instructions packaged with it to provide a safe method of passing the chimney connector through a combustible wall for connection to a masonry chimney.

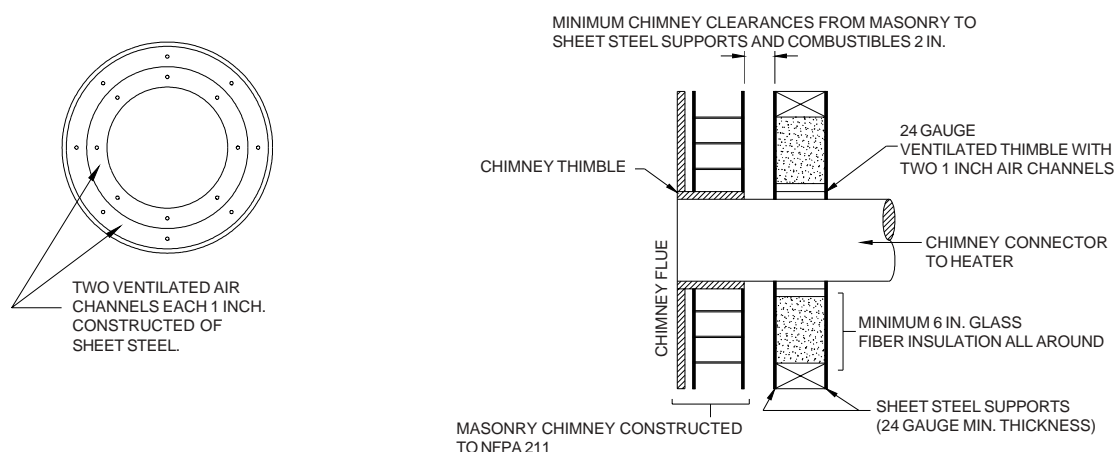
**Additional requirements pertaining to Figure 8 and the above wall pass-through systems:**

1. Insulation material used as part of wall pass-through system shall be of noncombustible material and shall have a thermal conductivity of 1.0 Btu • in./ft.<sup>2</sup> • °F (4.88 kg • cal/hr • m<sup>2</sup> • °C) or less.
2. All clearances and thicknesses are minimums: larger clearances and thickness are acceptable.
3. A chimney thimble, as shown for 3" and 4" above (Parts C and D respectively of Figure 8) shall be for types "3" and 4" connections to facilitate removal of the chimney connector for cleaning. The chimney thimble shall be of ASTM C315 fireclay with 5/8" minimum wall thickness, or material of equivalent durability. The inside diameter of the thimble shall be sized for the proper snug fit of a 6" diameter chimney connector pipe. The thimble shall be installed without damage to the chimney flue. The thimble shall extend through the chimney wall to, but not beyond, the inner surface of the chimney flue and shall be permanently cemented in place with high temperature cement.
4. A chimney connector to a masonry chimney, except for 2" above (Part B of Figure 8), shall extend through the wall pass through system to the inner face of the chimney flue, but not beyond. It does not have to be fastened in place so long as it cannot accidentally be pulled out of the chimney or shoved into the chimney flue. If fasteners are used to secure the chimney connector to a masonry chimney, the fasteners shall not penetrate the chimney flue liner.
5. Any material used to close up any opening for the connector shall be noncombustible.

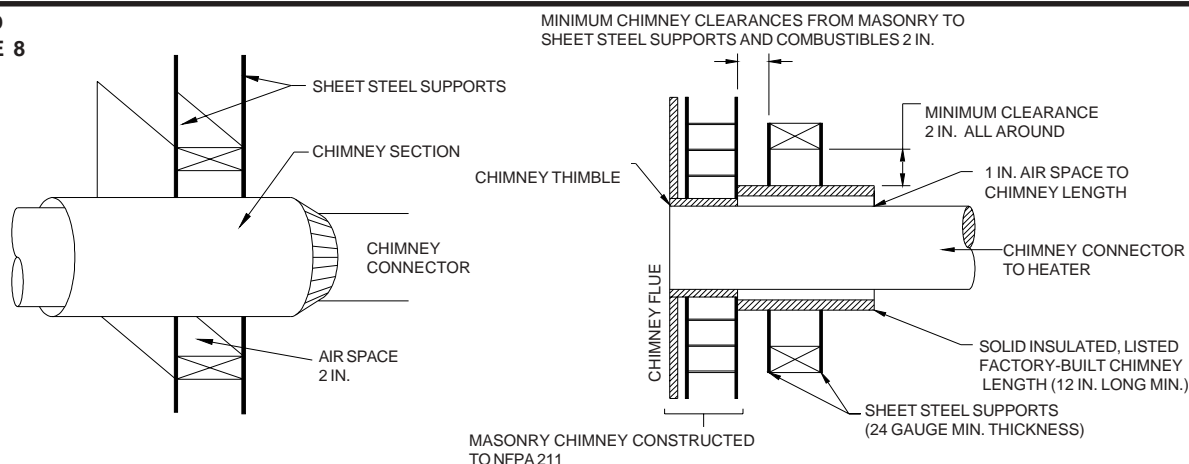
**PART B  
FIGURE 8 -  
(FIGURE 8 CONTINUED)**



**PART C  
FIGURE 8**



**PART D  
FIGURE 8**



**PART E - (Figure 8)**

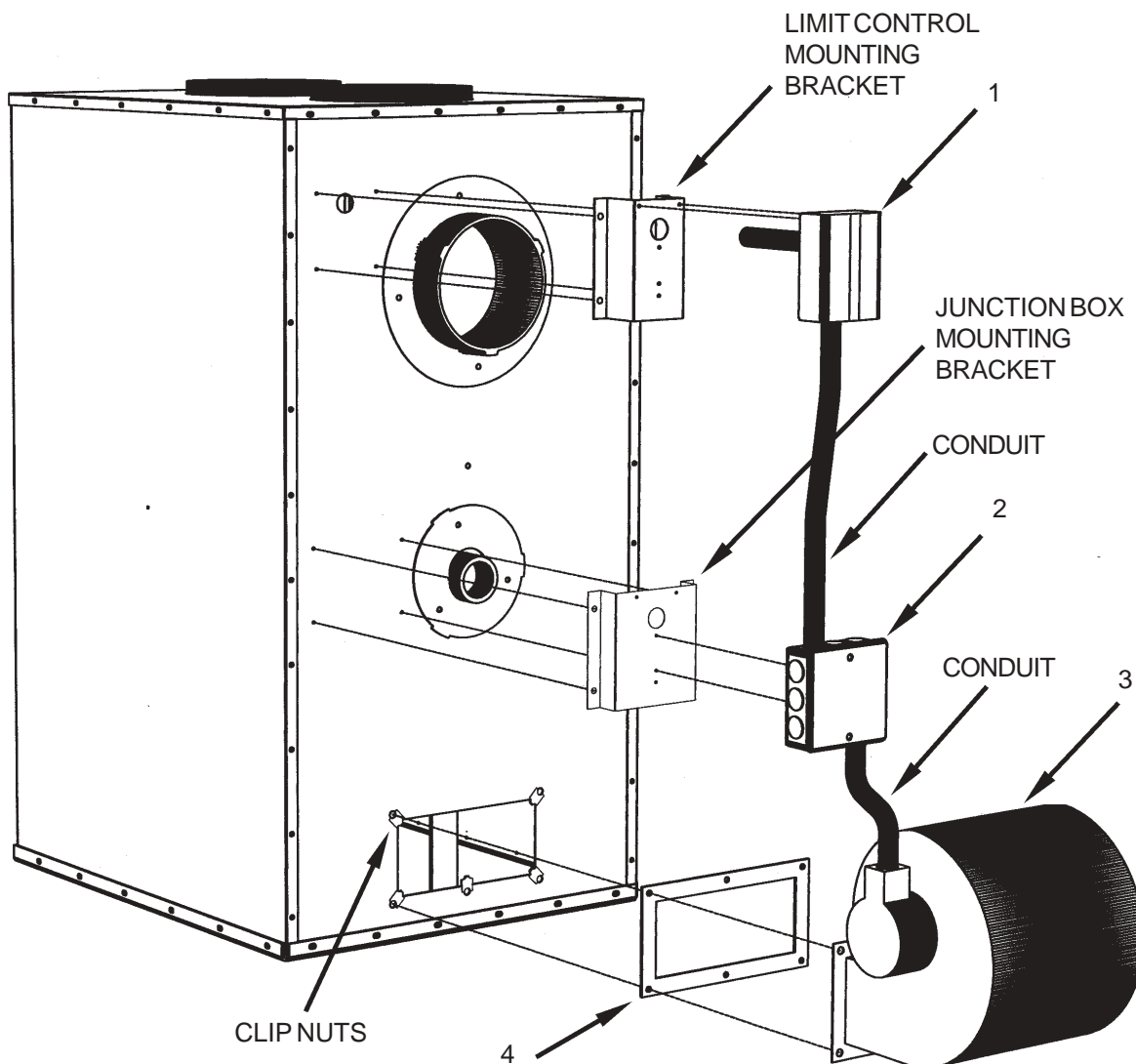
In addition to the methods shown by A, B, C, and D of Figure 8, a listed factory-built wall pass-through system may be purchased and installed according to the instructions packaged with it to provide a safe method of passing chimney connector through a combustable wall for a connection to a masonry chimney.

**CONNECTION OF CHIMNEY CONNECTOR TO A MASONRY CHIMNEY WHEN CHIMNEY CONNECTOR DOES NOT PASS THROUGH A COMBUSTABLE WALL**

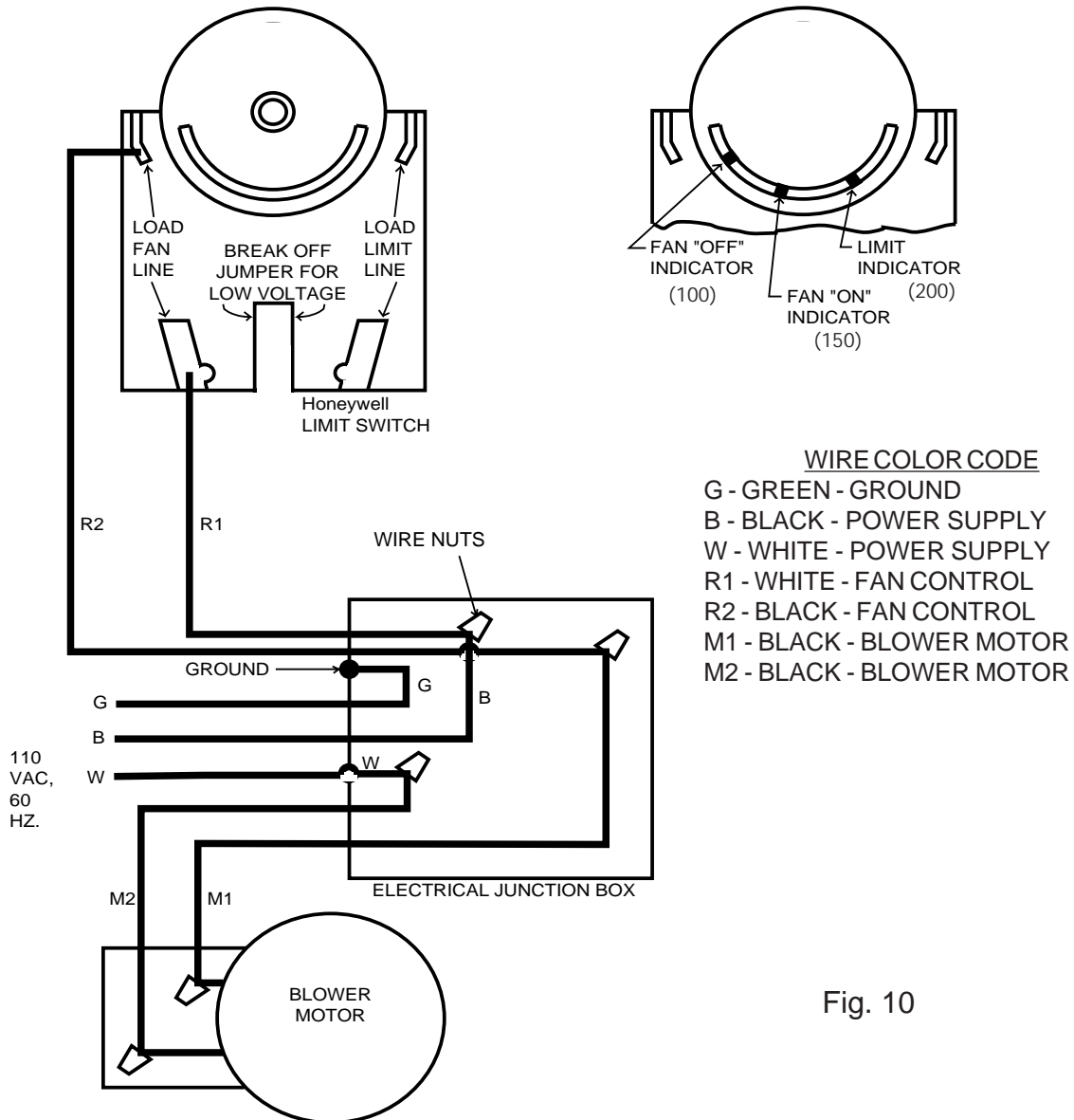
If the chimney connector does not have to pass through a combustable wall to get to a masonry chimney, simply connect the chimney connector directly to the masonry chimney's chimney thimble as described and shown by parts C and D of Figure 8. Remember, the chimney connector should extend into the chimney thimble to the innerface of the chimney flue but not beyond; if the chimney connector is extended through the chimney thimble into the chimney flue, resistance to the flow of smoke and gases up the chimney will occur; that flow resistance will have an adverse affect on the operation and performance of the heater and venting system.

## BLOWER & COMPONENT ASSEMBLY - FIG. 9

1. Attach the **Fan Limit Control Bracket** to the rear of the furnace with four(4) of the #10 x 1/2 Tek screws provided in the parts bag.
2. Install the Honeywell Limit Control (1) to the bracket with two(2) of the #10 x 1/2 Tek screws provided in the parts bag.
3. Attach the Junction Box(2) to the **Junction Box Bracket** using two(2) #10 x 1/2 Tek screws. Then Mount the bracket to the rear of the furnace with four(4) #10 x 1/2 Tek screws. Also Attach the **Conduit** from the Limit Control to the Junction Box.
4. Install the five(5) **Clip Nuts** to the back of the furnace. Install the Blower(3) and Blower Gasket(4) to the furnace using the 1/4-20 x 3/4 bolts provided in the parts bag. Attach the remaining piece of **Conduit** from the junction box to the Blower. Use the Wiring Diagram on the following page to wire the assembly.
5. Reattach the junction box cover.



# MODEL 22AF WIRING DIAGRAM - FIG. 11



# INSTALLATION

**Please see all methods of Installation in Appendix at the rear of this booklet.**

This is a furnace, not a free standing stove. You must direct heated air from 12" outlet away from the furnace, or it will not function properly.

1. This installation must be done by a qualified heating equipment installer.

2. The installation is to be done in compliance with National Fire Protection Association installation standards: No. 89M, 90B, 211, 70 (National Electric Code) and Uniform Mechanical Code 913, 6-4, in the states where applicable. (Their code offers connecting smoke pipe connectors into chimney with other fuel burning appliances.)

3. Rooms large in comparison with size of the appliances:

a) A Wood Burning Furnace needs air for combustion and circulation to house.

b) Provision must be made to make up this air and not starve gas or oil furnace of combustion air.

c) Have "Authority Having Jurisdiction" determine that air is of adequate makeup. (Reference N.F.P.A. Nos. 30 & 54, Code for Installation of Gas & Oil Equipment)

4. Have "Authority Having Jurisdiction" to inspect all chimneys and installations for adequate venting and for compliance with standard and local codes and regulations regarding installation of wood burning appliances.

5. Installation of Supplemental Heat Application to Existing Central System. (See Fig. 12 for typical installation.)

a) Place Wood Burning Furnace so that the chimney connector will be as short as possible and avoiding unnecessary sharp turns in the smoke pipe connector and the installation of devices that would create excessive resistance to the flow of flue gases.

b) Locate the Wood Burning Furnace as close as practical to the existing central hot air heating system, maintaining clearances as stated on the label located on the side of the furnace.

c) Clearances from combustible materials must be complied with as stated on the label below the fuel door:

Unit to Combustible:

Front: 48"

Back: 30"

Sides: 12"

Plenum to Ceiling: 2"

Pipe to Combustible:

Sides: 18"

Back: 18"

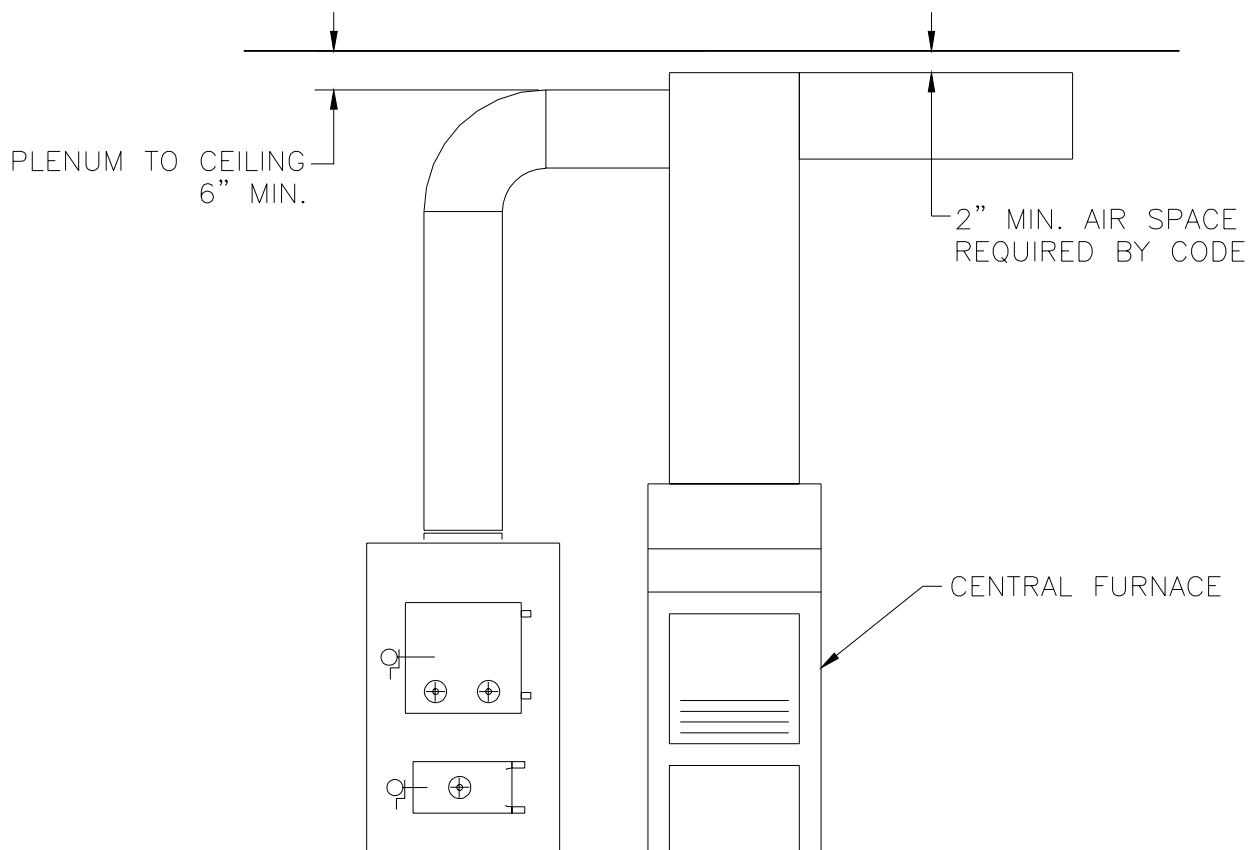
The installation must be made only on a noncombustible floor.

d) Install the smoke pipe connector to the chimney with 26-gauge pipe and elbows (to be purchased separately), maintaining the proper clearances for the specific model. Make sure that the proper clearances as stated on the label and earlier in this manual are maintained. Seal the smoke pipe in the chimney with furnace cement. (The chimney connector shall be securely supported, and joints fastened with sheet metal screws or rivets.)

e) Install 8" diameter heat pipe to plenum of the central hot air furnace. Use 26-gauge pipe and connectors (to be purchased separately). If central air conditioning is installed in the plenum, install heat pipe above the air conditioning unit. Secure heat pipe connection with supports and sheet metal screws.

f) Connect electrical supply in the electrical junction box that is mounted on the back of the Wood Burning Furnace. See Wiring Diagram (Fig. 10). Remove the cover from electrical junction box. Connect power supply wires to wires designated, using wire nuts. The power cord supplied may be used for installation, if permitted by local codes and regulations. If the power cord supplied cannot be used, the power supply wiring must be 90 degrees Centigrade in a metal cable and should be completed by a qualified installer complying with NFPA Standard No. 70 and local codes.

**NOTE: THE MAXIMUM STATIC PRESSURE AT THE CENTRAL OR COMBINED PLENUM MUST NOT EXCEED 0.12 INCHES WATER COLUMN.**



(U.S. ONLY)  
FIG. 11

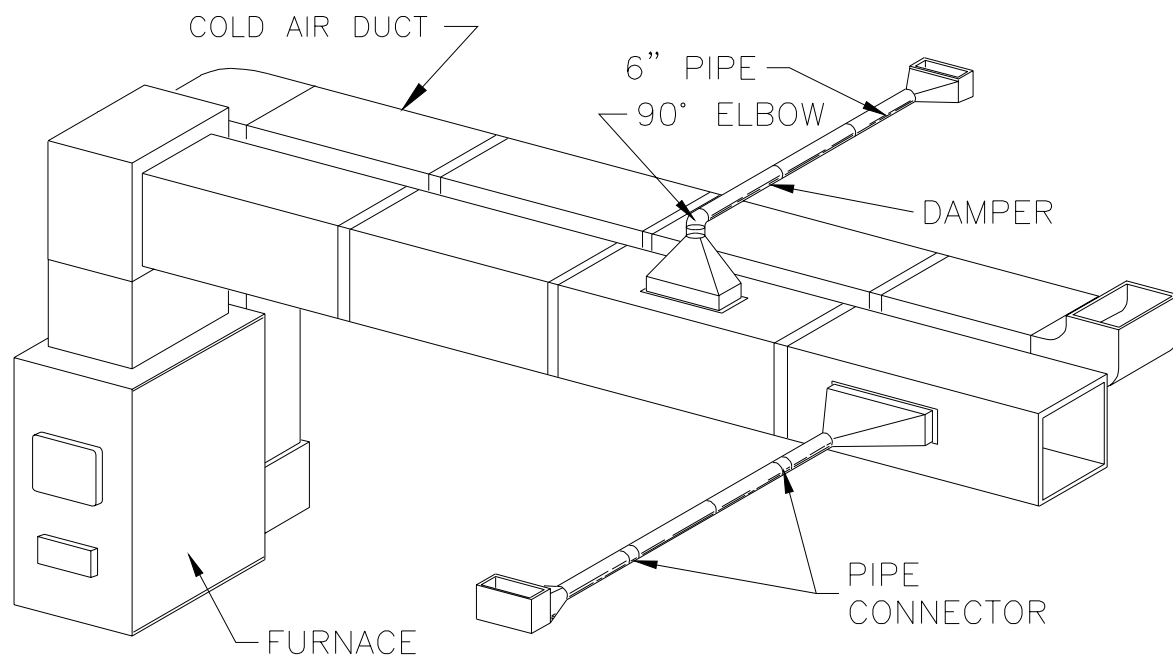
## POWER FAILURE INSTRUCTIONS:

Operation after loss of power —

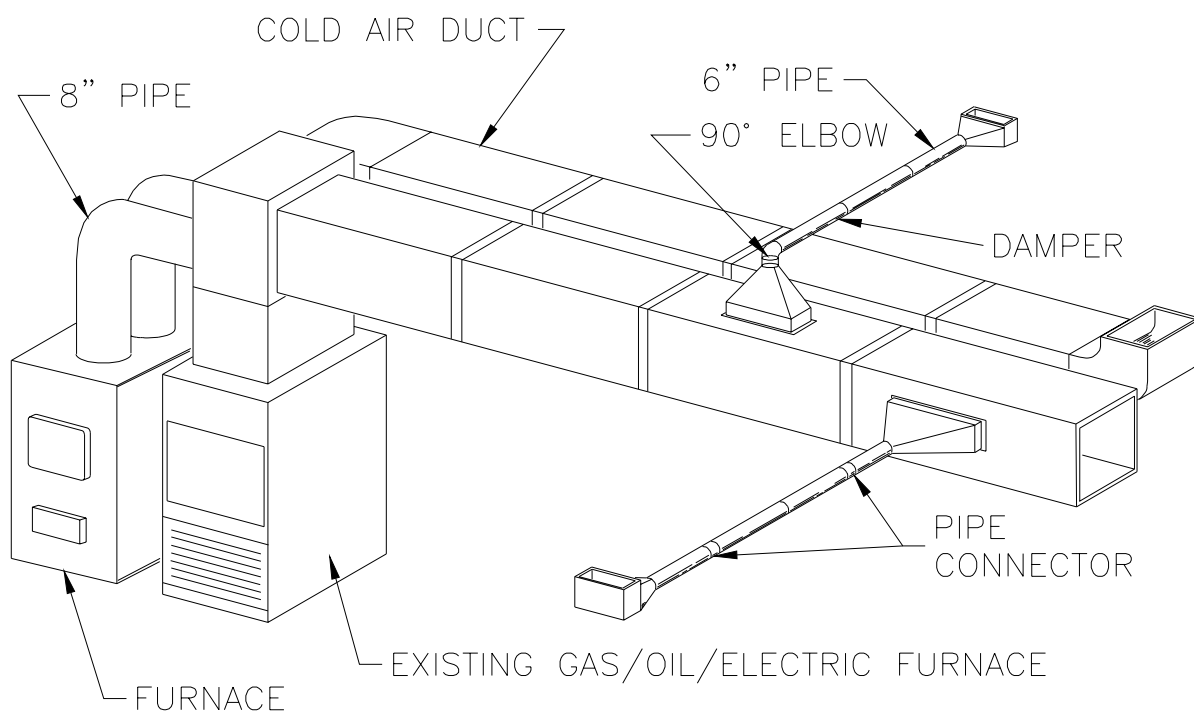
- 1 Remove filter if provided.
- 2 Do not expect to keep home at normal temperatures.
- 3 Do not load fuel above bottom of feed door.
- 4 Set Fuel door and Ash door spin draft maximum closed per the factory installed stops.



## CENTRAL INSTALLATION (U.S. & CANADA) (FIGURE 12)

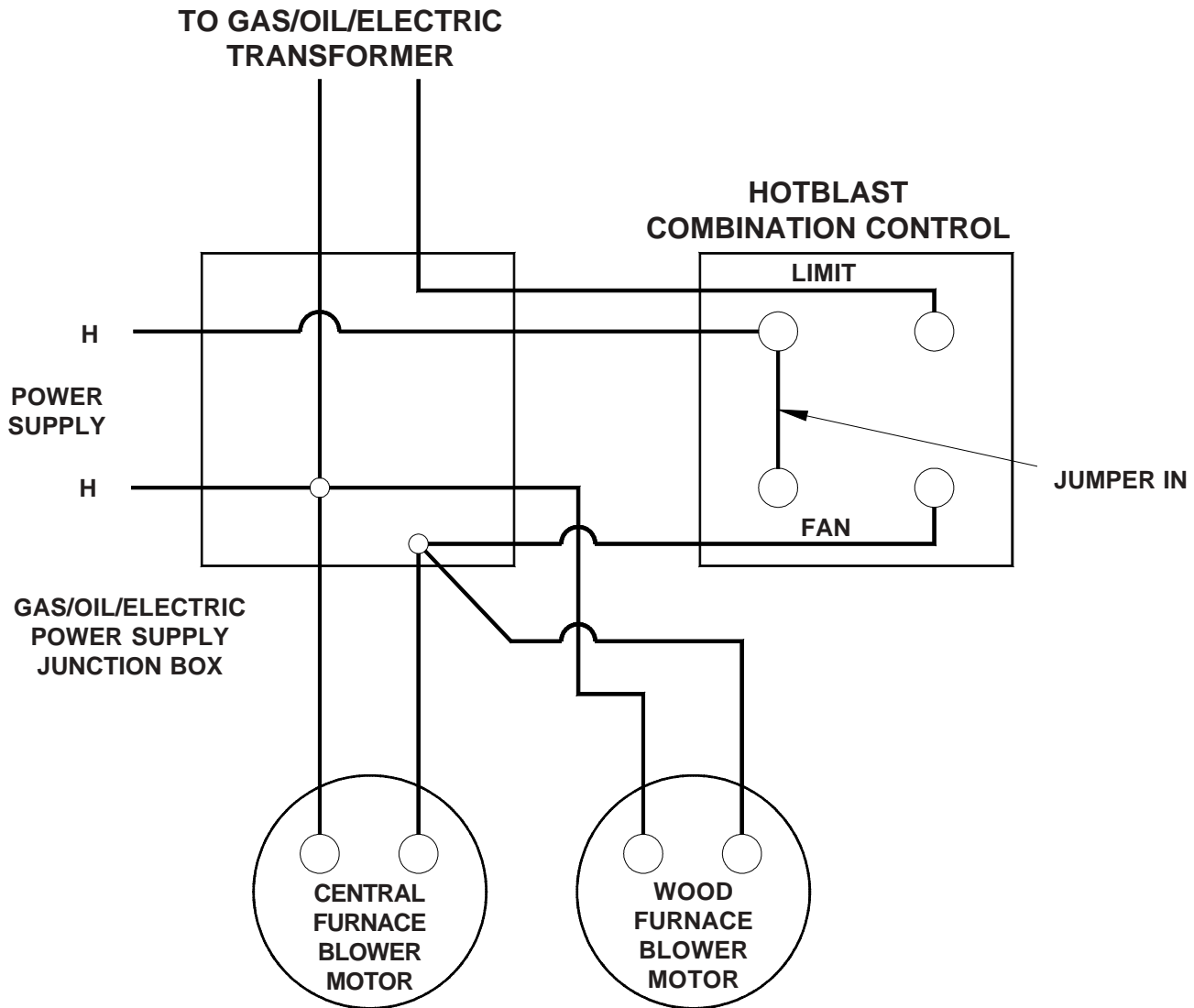


## ADD-ON INSTALLATION (U.S. ONLY) (FIGURE 13)



## ALTERNATIVE PARALLEL INSTALLATION WIRING DIAGRAM - FIG. 14

This unit is certified for parallel installation with existing forced air-gas or oil fired furnace (U.S. Only)



**CAUTION!**  
DO NOT CONNECT  
PLENUM FAN CONTROL  
SWITCH ACROSS FURNACE  
LIMIT CONTROL.

# OPERATING INSTRUCTIONS

## COAL FUEL

Egg size (1-3/16" or larger) bituminous coal for residential furnaces, or any of the specially packed fireplace coals can be used. Coal with a low ash content (2% to 6%) is recommended.

## WOOD FUEL

Hardwood, 18" to 26" should be split and air dried (seasoned) for 6 months.

## LIGHTING

1. Open the draft controls to "HIGH" for maximum draft.
  2. Open the feed door and place paper and kindling on the grate for starting the fire.
  3. Light the fire and close the feed door.
  4. Add wood or about 15 lbs. of coal (depending on which model) after fire is burning briskly.
- Set draft control for desired temperature.

## ADDING FUEL

When starting a fire, add small amounts of fuel instead of adding large quantities of fuel. This will give more complete combustion and less build-up of tars or soot in the chimney.

1. Set draft control to HIGH before opening feed door.
2. **Wood fire**  
Add wood to a convenient level.
3. **Coal Fire**
  - a. Never smother the fire when adding coal (See Caution). Gas accumulation and a mild smoky explosion will occur. Add fresh kindling if the bed of coals has cooled.
  - b. Add up to 20 lbs. of coal per loading. Never add coal above the bottom of feed door opening.
  - c. Stir the coal and watch the fire. Be sure the new coal is burning briskly before you close the doors and turn the lower the draft control setting down.

- d. Shake grates vigorously 1/2" left to right to spill ashes into the ash pan. Do this at least once every 12 hours of operation. Empty ash pan regularly. Do not allow ashes to build-up to grate as grate will warp and burnout, and you might spill the ashes when removing the pan. Dispose of hot ashes properly (See note 12 on page 4).
- e. Rotation of the handle (5 o'clock to 7 o'clock) position will agitate coals and spill ashes into ash pan.
- f. It is advisable for you to get familiar with the shaker grate operation before firing.

## CAUTION

**GASES THAT ARE DRIVEN BY FRESH COAL MUST BE BURNED OR THEY WILL ACCUMULATE AND EXPLODE. NEVER SMOOTHER A FIRE WHEN ADDING FRESH COAL.**

## CAUTION

**DO NOT OPERATE WITH THE FEED AND/OR ASH DOOR OPEN. THIS FURNACE IS DESIGNED FOR THERMOSTATIC OPERATION. OPERATION WITH ANY OF THESE DOORS OPEN WILL OVERHEAT AND DAMAGE THE FURNACE.**

## CAUTION

**NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR FLAMMABLE LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THE FURNACE.**

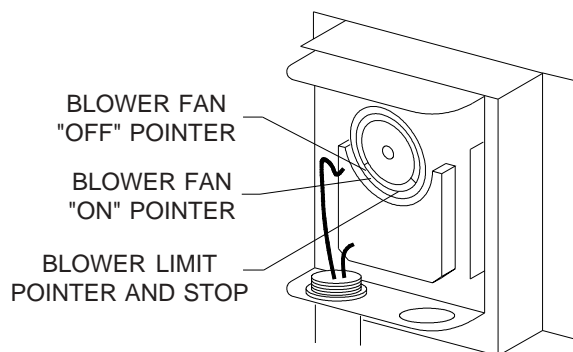
## CAUTION

**NEVER STORE FLAMMABLE LIQUIDS, ESPECIALLY GASOLINE, IN THE VICINITY OF THE FURNACE.**

# ADJUSTING BLOWER LIMIT CONTROL SETTINGS

The temperature in the plenum of the warm air furnace at which the blower turns on or turns off is controlled by the setting of the pointers in the blower limit control. These pointers may be adjusted through their entire range of settings to achieve the desired warm air output from the furnace. (See Fig. 15)

1. Move both pointers towards the right (counter clockwise) - this increases the temperature setting at which the blower will turn on and off.
2. Move both pointers towards the left (clockwise) - this decreases the temperature setting at which the blower will turn on and off.
3. Move pointers away or apart from each other- this increases the time that the blower will run on each warm cycle.



**FIG. 15**

## SERVICE HINTS

Do not expect a furnace to draw. It is the chimney that creates the draft. Smoke spillage into the house or excessive build-up of water or creosote in the chimney would keep it from functioning properly. Correct the problem before using this furnace. Possible causes are:

1. The connector pipe may be pushed into the chimney too far, stopping the draft (Fig. 6).
2. Do not connect two furnaces or a stove and a furnace into the same chimney flue.
3. The chimney used for a furnace must not be used to ventilate the cellar or basement. If there is a cleanout opening at the base of the chimney, it must be closed tightly.
4. If the chimney is operating too cool, water will condense in the chimney and run back into the furnace. Creosote formation will be rapid and may block the chimney. Operate the furnace at a high enough fire to keep the chimney warm preventing this condensation.
5. If the fire burns well but sometimes smokes or burns slowly, it may be caused by the chimney top being lower than another part of the house or a nearby tree. The wind blowing over a house or a tree, falls on top of the chimney like water over a dam, beating down the smoke. The top of the chimney should be at least 3 feet above the roof and be at least 2 feet higher than any point of the roof within 10 feet (Fig. 5).
6. See page 28 for list of trouble shooting tips.

**A DRAFT READING OF .05 TO .06 W.C. IS SUGGESTED FOR PROPER BURNING OF THIS UNIT WHEN USING WOOD.**

## CHIMNEY MAINTENANCE

### 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 in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire.

The chimney should be inspected at least twice monthly during the heating season to determine if a creosote or soot build-up has occurred.

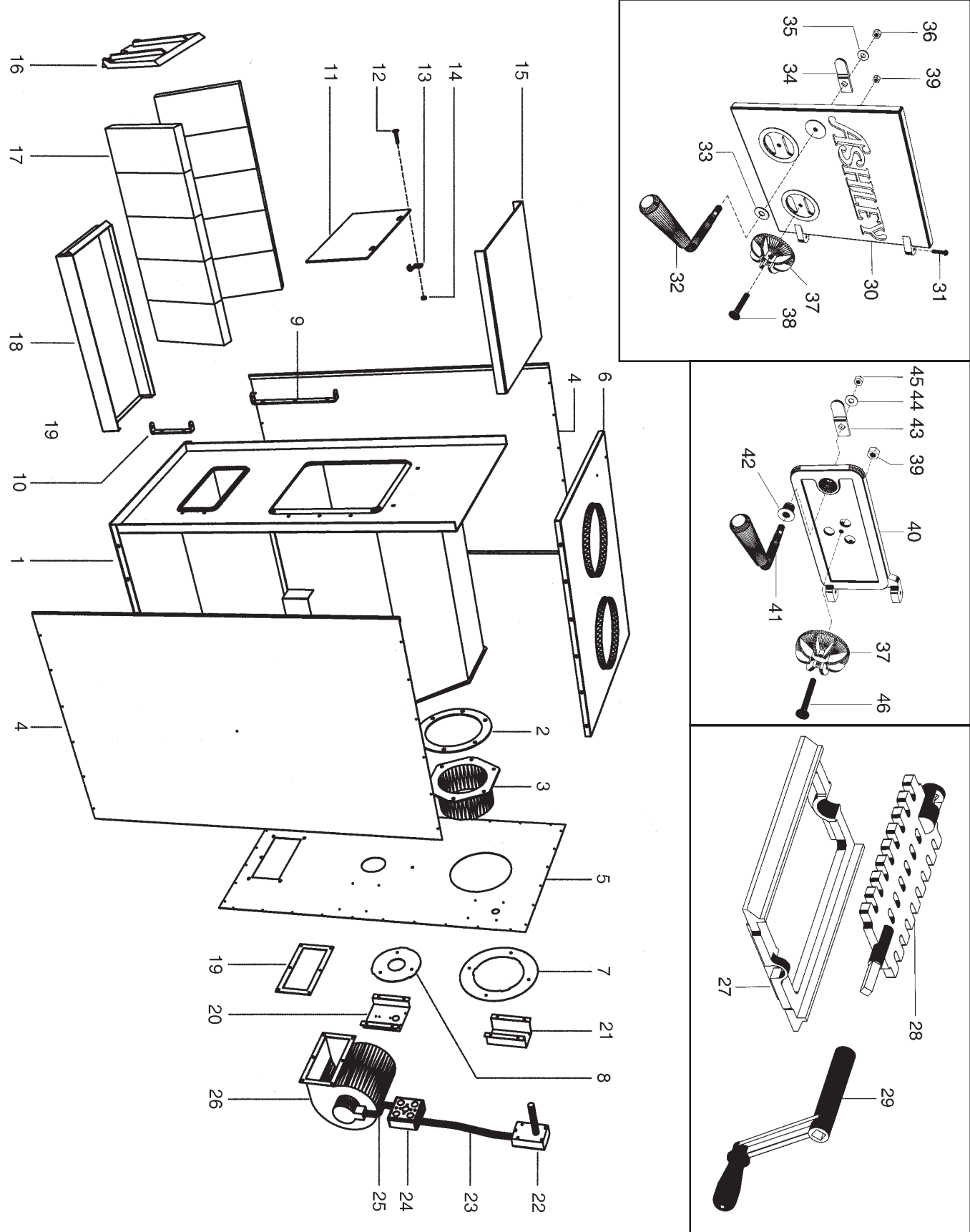
If soot or creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Chimney fires burn very hot. If the chimney catches fire, immediately call the fire department, then reduce the fire by closing the inlet air control. Pour a large quantity of coarse salt, baking soda or cool ashes on top of the fire in the firebox.

### CAUTION

**A Chimney fire may cause ignition of wall studs or rafters which you thought were a safe distance from the chimney. If you have a chimney fire, have your chimney inspected by a qualified person before using again.**

# MODEL 22AF - PARTS

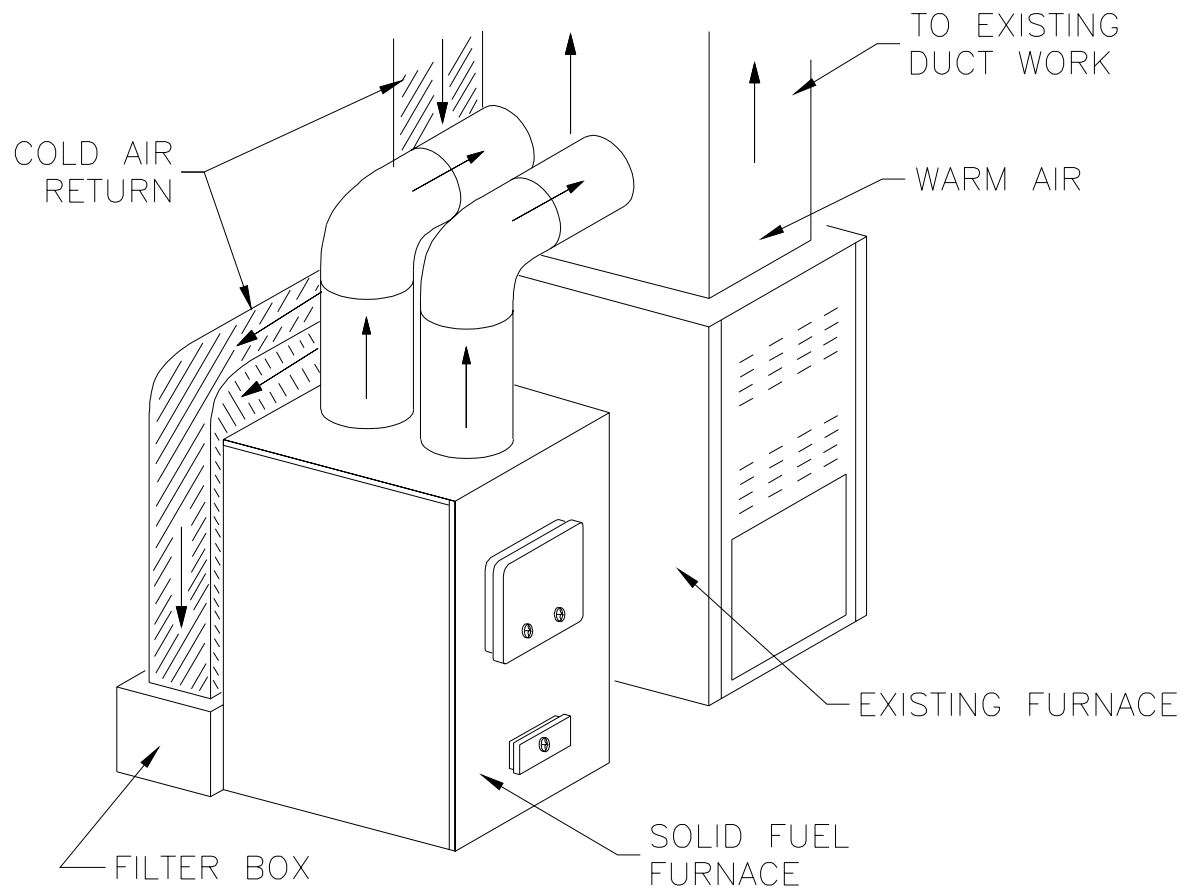


•DRAWINGS FOR ILLUSTRATION PURPOSES ONLY•

## MODEL 22AF - PARTS LIST

KEY	PARTNO.	DESCRIPTION	QTY.
1	69356	Firebox Weldment	1
2	88032	Flue Collar Gasket	1
3	40246	Flue Collar	1
4	25102R	Cabinet Side	2
5	22682	Cabinet Back	1
6	25106R	Cabinet Top	1
7	22761	Flue Collar Ring	1
8	22762	Forced Draft Ring	1
9	24959B	Feed Door Hinge	1
10	25202B	Ash Door Hinge	1
11	23800	Smoke Curtain	1
12	83445	1/4-20 x 1-1/4 Carriage Bolt	2
13	23787	Smoke Curtain Clip	2
14	83250	1/4-20 Kep Nut	2
15	23397	Baffle	1
16	40264	Front & Rear Liner	2
17	89066	Brick (4-1/2 x 9 x 1-1/4 THK.)	10
18	68238	Ash Pan Weldment	1
19	89319	Blower Gasket	1
20	22140	Junction Box Bracket	1
21	68234	Fan Limit Bracket Assembly	1
22	80145	Fan Limit Control	1
23	68231	Fan Limit Conduit Assembly	1
24	80131	4 x 4 Junction Box	1
N/S	80231	Junction Box Cover	1
25	68232	Blower Connection Conduit Assembly	1
26	80230	Blower Motor - 1/20 hp	1
27	40256	Grate Frame	1
28	40257	Shaker Grate	1
29	40260	Shaker Handle	1
* *	<b>69355</b>	<b>Feed Door Assembly</b> (Order ONLY if the entire Assembly is needed)	<b>1</b>
30	25105B	Feed Door (Painted)	1
N/S	88066	5/8 Rope Gasket	4.58 ft
31	83872	Door Pin	2
32	89354	Feed Door Handle	1
33	83461	Handle Washer	1
34	24935	Ash Door Latch	1
35	83045A	3/8" SAE Flat Washer	1
36	83274	3/8-16 Lock Nut	1
37	23859B	Spin Damper (Painted)	3
38	83345	3/8-16 x 1-3/4 Carriage Bolt	2
39	83178	3/8-16 Jam Nut	4
*	<b>69388</b>	<b>Ash Door Assembly</b> (Order ONLY if the entire Assembly is needed)	<b>1</b>
40	25190B	Ash Door	1
N/S	88033	3/8 Rope Gasket	2.42 ft
41	89354	Ash Door Handle	1
42	-----	Handle Bushings (Comes with Handle - 89354)	1
43	24935	Ash Door Latch	1
44	83045A	3/8" SAE Flat Washer	1
45	83274	3/8-16 Lock Nut	1
46	83503	3/8-16 x 2-1/2 Carriage Bolt	1
N/S = Not Shown			

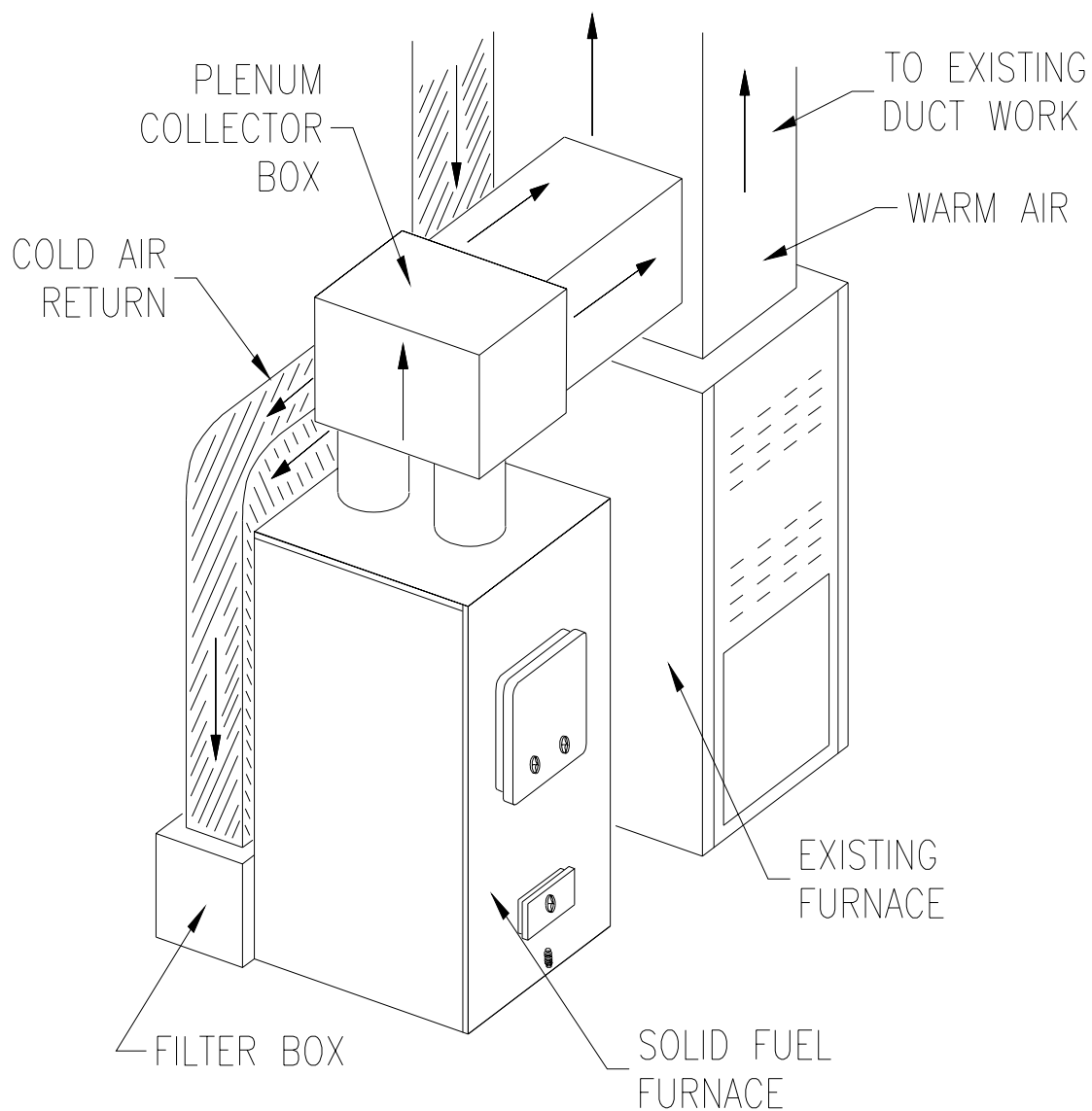
## APPENDIX



### INSTALLATION A

**NOTE: ANTI-BACKDRAFT FLAPPERS OR BAFFLE ARE REQUIRED FOR THIS INSTALLATION.**

## APPENDIX

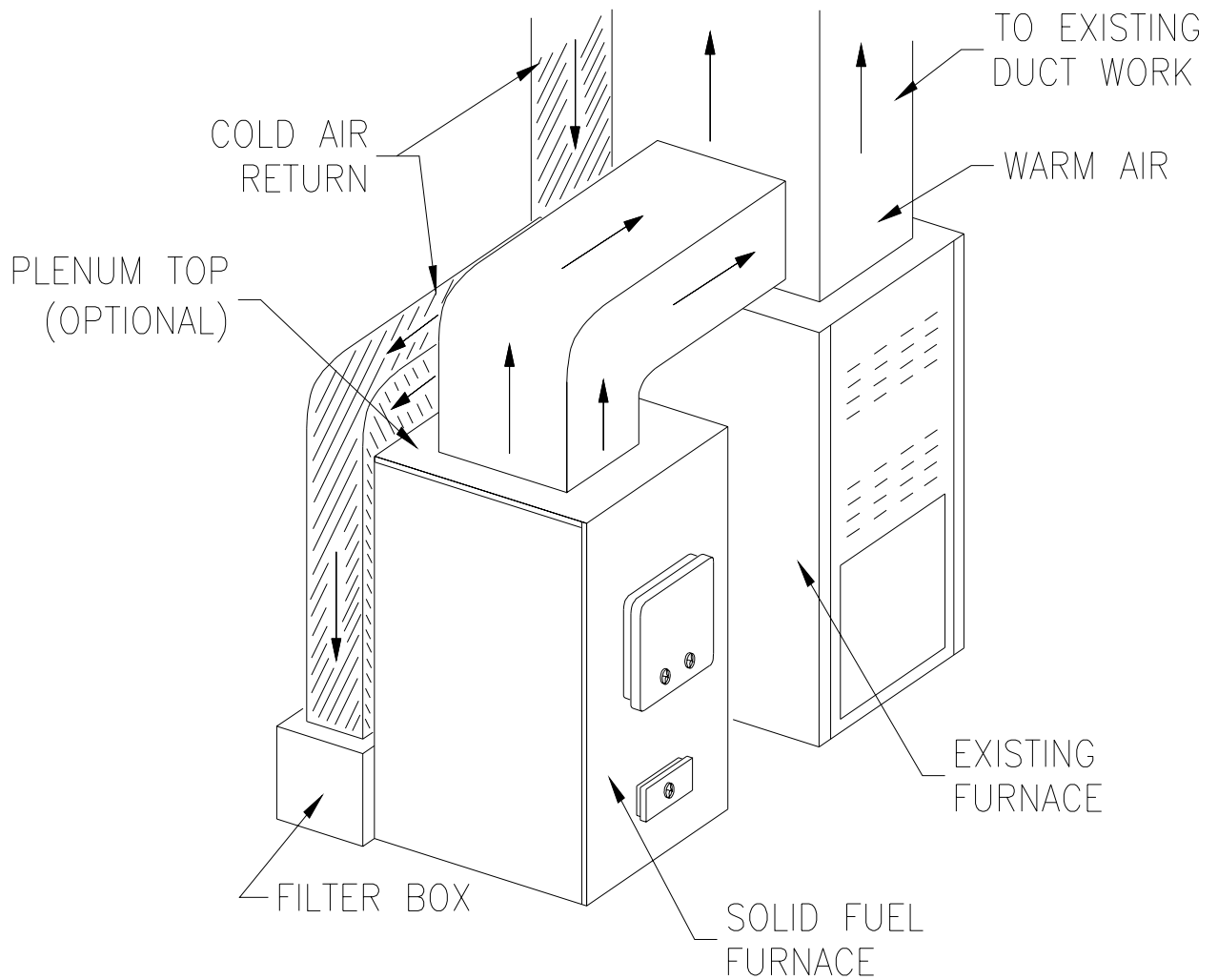


### INSTALLATION B

**NOTE: ANTI-BACKDRAFT FLAPPERS OR BAFFLE ARE REQUIRED FOR THIS INSTALLATION.**



## APPENDIX

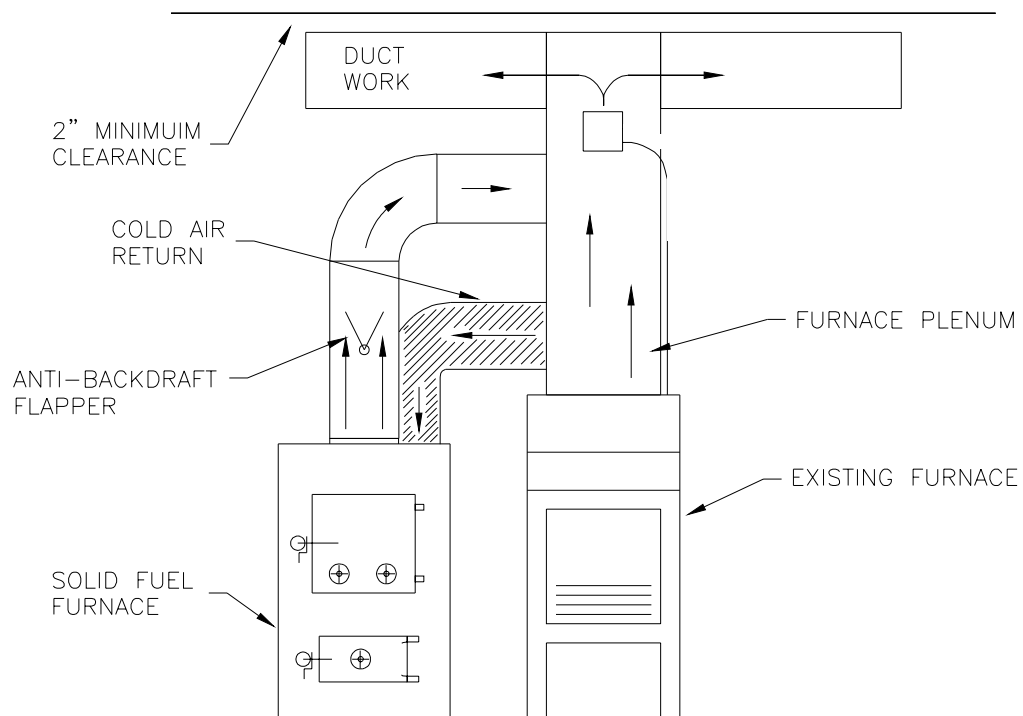


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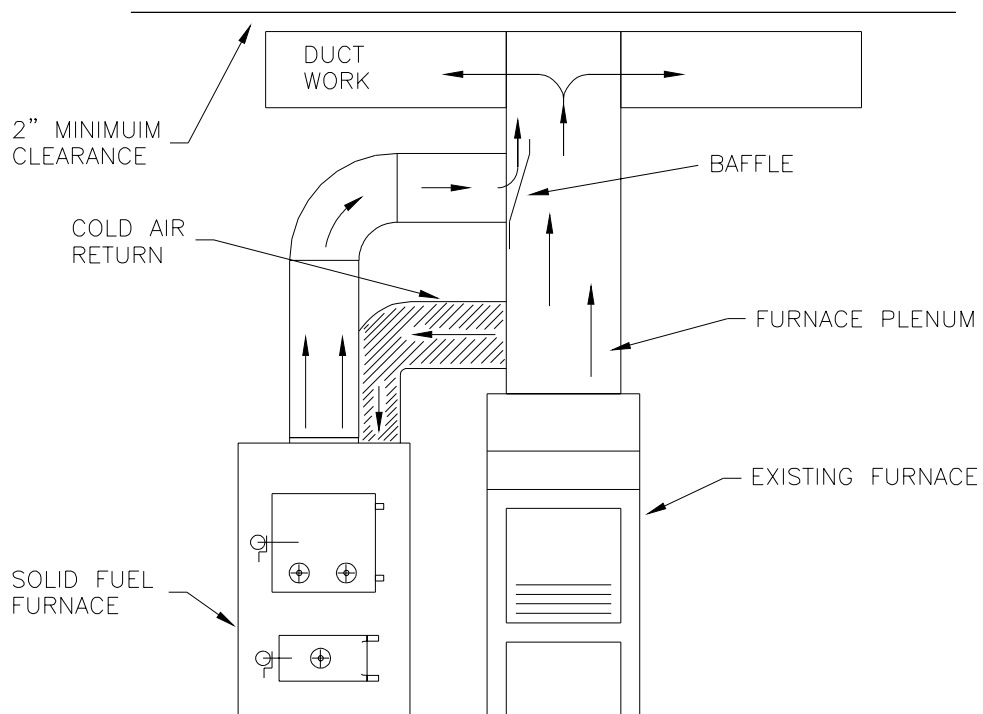
**NOTE: ANTI-BACKDRAFT FLAPPERS OR BAFFLE ARE REQUIRED FOR THIS INSTALLATION.**

# APPENDIX

## INSTALLATION D (U.S. ONLY)

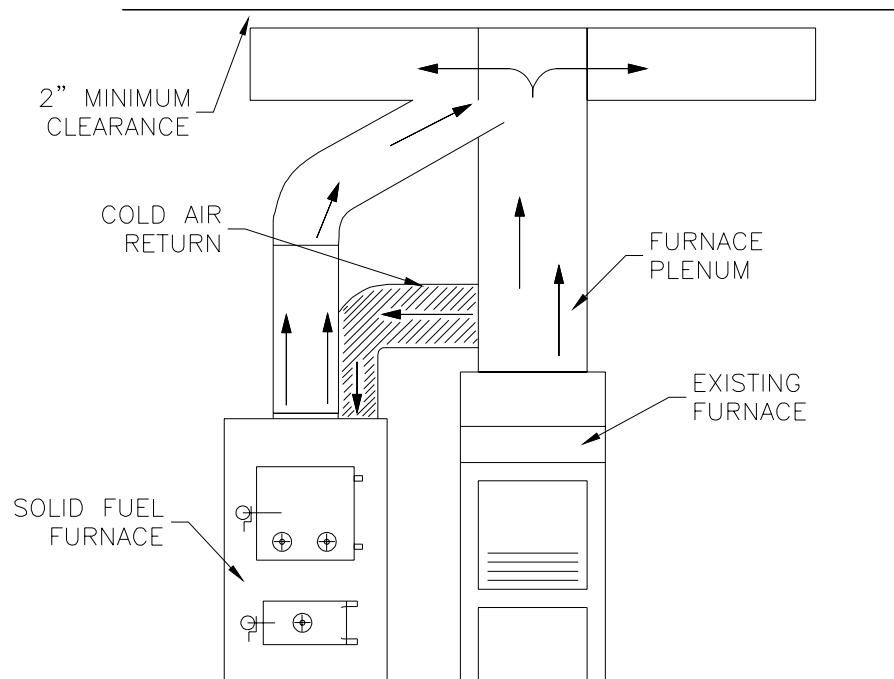


## INSTALLATION E (U. S. ONLY)

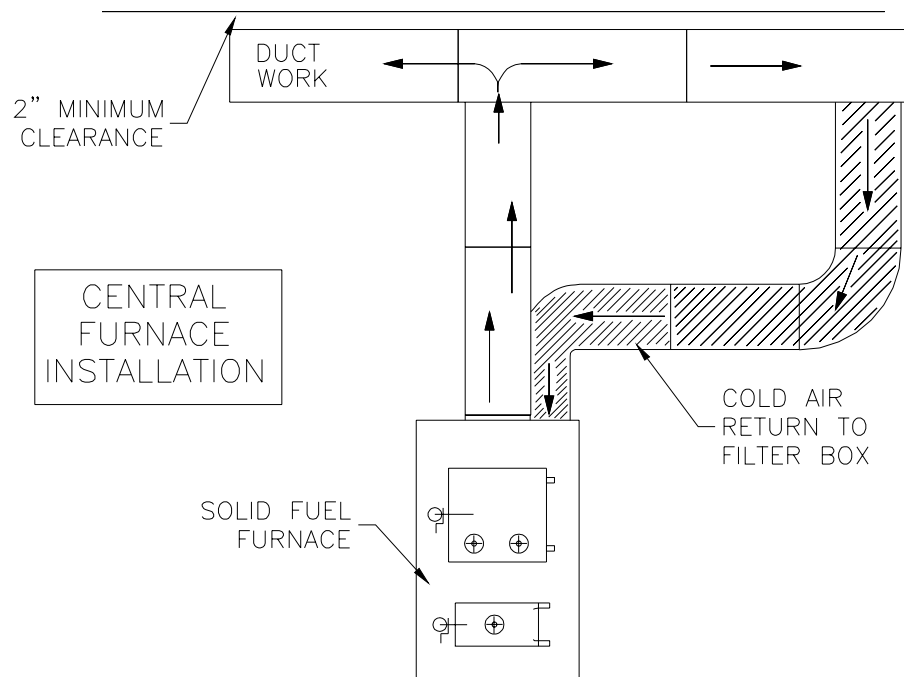


# APPENDIX

## INSTALLATION F



## INSTALLATION G



# TROUBLE SHOOTING TIPS FOR WARM AIR FURNACE

List of Problems	Possible Cause	Solutions
1. Smoking when feed door is open.	a) Insufficient draft. b) Clogged chimney or chimney connector. c) Down draft in chimney.	a) Open spin dampers. b) Clean chimney. c) Add raincap to chimney.
2. Furnace does not heat.	a) Wood not seasoned and dry. b) Blower control set too low. c) Insufficient flue draft.	a) Allow wood to season in a dry, well ventilated area for six months. b) Set blower control to higher temperature (See Page 19). c) Set flue draft (See Page 9).
3. Blower does not run.	a) Improperly wired. b) Bad blower control. c) Bad relay. d) Bad blower motor.	a) Wire unit properly. b) Replace blower control. c) Replace relay. d) Replace blower.
4. No air from registers - fan running.	a) Registers are closed. b) Duct work improperly installed. c) Improper wiring between central furnace and Model 22AF.	a) Open registers. b) Correct duct work installations. c) Wire unit properly.
5. Air from registers is not hot.	a) Blower control set too low. b) Bad blower control.	a) Adjust blower control to higher setting (See Page 19). b) Replace blower control.
6. Blower runs too long.	Blower control cut off set too low.	Set blower control cut off to higher setting (See Page 19)
7. Blower does not run long enough.	a) Blower control cut off set too high. b) Bad blower motor.	a) Set blower control cut off to lower setting (See Page 19). b) Replace blower.
8. Smoke and/or odor from registers when furnace is used for first time.	Oil from furnace and duct work.	The metal used in construction of the furnace and duct work has a light coating of oil. This should disappear after a short period of time. Once this burn-off has occurred, it should not reoccur.
9. Creosote build-up.	a) Burning green wood (not seasoned or dry). b) Thermostat setting too low for type fuel.	a) Burn only seasoned wood. b) Set thermostat higher to attain higher flue temperatures. This will aid in preventing build-up of creosote.
10. Flame spillage when feed door is open.	a) Insufficient draft. b) Smothering fire when adding fresh fuel.	a) Open stack damper. b) Add fuel so as not to smother fire.

## NOTES

## NOTES

## HEATING WITH WOOD

TYPE	WEIGHT (LBS. CU. FT., DRY)	PER CORD	EFFICIENCY RANKING	SPLITS	MILLIONS BTU's/CORD
Hickory	63	4500	1.0	Well	31.5
White Oak	48	4100	.9	Fair	28.6
Red Oak	46	3900	.8	Fair	27.4
Beech	45	3800	.7	Hard	26.8
Sugar Maple	44	3700	.6	Fair	26.2
Black Oak	43	3700	.6	Fair	25.6
Ash	42	3600	.5	Well	25.0
Yellow Birch	40	3400	.4	Hard	23.8
Red Maple	38	3200	.3	Fair	22.6
Paper Birch	37	3100	.3	Easy	22.1
Elm/Sycamore	34	2900	.2	Very Difficult	20.1
Red Spruce	29	1800	.1	Easy	16.1

## HOW TO ORDER REPAIR PARTS

THIS MANUAL WILL HELP YOU OBTAIN EFFICIENT, DEPENDABLE SERVICE FROM YOUR HOTBLAST FURNACE, AND ENABLE YOU TO ORDER REPAIR PARTS CORRECTLY.

KEEP THIS MANUAL IN A SAFE PLACE FOR FUTURE REFERENCE.

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

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: 22AF
4. THE SERIAL NUMBER: \_\_\_\_\_



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