



# DOVRE®

Aladdin Hearth Products  
401 N. Wynne  
Colville, WA99114  
ADivision of Hearth Technologies Inc.

## THE MODEL 400 WOODSTOVE INSTALLATION & OPERATING INSTRUCTIONS



**Model 400 Woodstove**

### **SAFETY NOTICE:**

**IF THIS STOVE 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.**

## PLEASE RETAIN THIS MANUAL FOR FUTURE REFERENCE.

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#### Safety Precautions:

1. Please read these installation instructions completely before beginning installation procedures. Failure to follow them could cause a woodstove malfunction resulting in serious injury and/or property damage.
2. Always check your local building Codes prior to installation. The installation must comply with all local, regional, state and national Codes and Regulations.
3. An adequate supply of replacement combustion air from outside the house must be available to the fire for the woodstove to operate properly.  
  
Aladdin is not responsible for any smoking or related problems that may result from the lack of adequate combustion air. It is the responsibility of the builder/contractor to ensure that adequate combustion air has been provided for the woodstove.
4. **NEVER** leave children unattended when there is a fire burning in the woodstove.
5. This woodstove is built for solid fuel only. **DO NOT** use chimney cleaners or flame colorants in your fireplace.
6. **NEVER** use gasoline, gasoline type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids in this woodstove. Keep any flammable liquids a safe distance from the unit.
7. To ensure a safe woodstove system and to prevent the buildup of soot and creosote, inspect and clean the woodstove and chimney prior to use and periodically during the burning season.

## A. LISTINGS AND CODE APPROVALS

These installation instructions describe the installation and operation of the DOVRE® Model 400 woodstove. This stove meets the U.S. Environmental Protection Agency's 1990 particulate emission standards. Under specific test conditions this stove has been shown to deliver heat at rates ranging from 8,700 to 22,500 BTU/HR.

The DOVRE® Model 400 is listed by Underwriters Laboratories Inc. to UL Safety Standard 1482 and ULC Safety Standard S627.

Check with your local Building Code Agency before you begin your installation to ensure compliance with

local Codes, including the need for Permits and follow-up inspections. Be sure local building Codes do not supersede UL specifications and always obtain a Building Permit so that insurance protection benefits cannot be unexpectedly canceled. If any assistance is required during installation, please contact your local dealer or the Dovre Customer Relations Department, 401 N. Wynne, Colville, WA99114.

DOVRE® is a registered trademark of Aladdin Hearth Products. Aladdin Hearth Products is a Division of Hearth Technologies Inc.

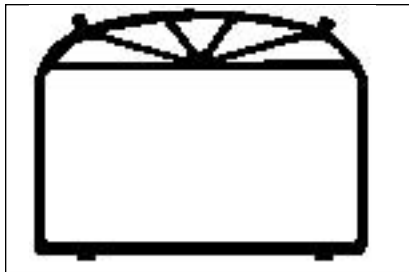
## B. WOODSTOVE SYSTEM COMPONENTS

The DOVRE® Model 400 has several options available for installation and appearance. These options are packaged separately and are listed below and pictured on page 4.

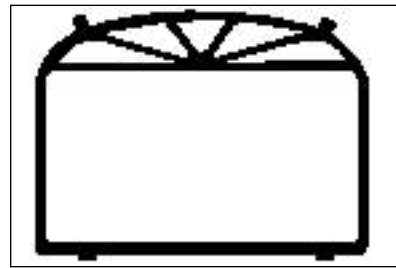
Catalog Number	Description:
400	Non-catalytic - painted black with ash pan
400PBK	Non-catalytic - black porcelain enamel with ash pan
400PCR	Non-catalytic - creme porcelain enamel with ash pan
400PGR	Non-catalytic - green porcelain enamel with ash pan
400PBL	Non-catalytic - blue porcelain enamel with ash pan
400HSB	Back shield to reduce clearances & allows use of fan kit
DFK1	Fan kit (requires use of 400HSB for completion)
DT6BK	Door trim kit, black
DT6G	Door trim kit, gold

It's a good idea to plan your installation on paper, using exact measurements for clearances and floor protection, before actually beginning the installation. If you're not using an existing chimney, place the stove where there will be a clear passage for a factory-built listed chimney through the ceiling and roof.

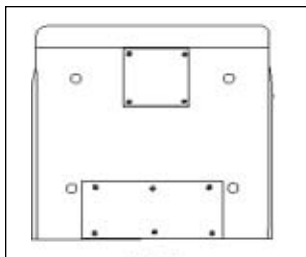
We also recommend that you have a qualified building inspector and your insurance company representative review your plans before installation.

**DOOR TRIM**

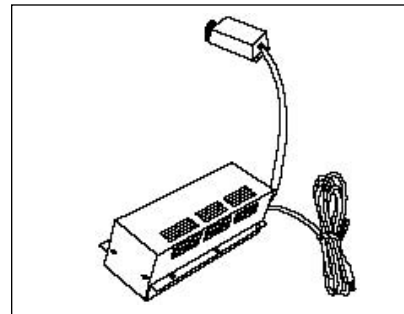
DT6BK



DT6G

**HEAT SHIELD**

400HSB

**FAN KIT**

DFK1

**C. PRE-INSTALLATION PREPARATION****1. MINIMUM CLEARANCES TO COMBUSTIBLES.**

The clearances listed in Table I are the minimum distances that must be maintained, as demonstrated in Figures 1 and 2. It is important to note that simply covering a combustible material with a non-combustible material does not offer sufficient heat protection. For example, drywall conducts the radiant heat directly to the wood, and the effect is the same as if the wood was unprotected.

Clearances to a combustible backwall may be reduced to 8" by using Dovre Backshield, part #400HSB, and listed double wall connector pipe.

The following table and diagrams show the minimum clearance requirements between your Dovre, chimney connectors and unprotected combustible walls and materials. If further reduced clearances are needed, obtain requirements for construction of a protected wall from your local building code authorities and their allowable reductions of the listed clearances.

CLEARANCES FROM UNIT TO COMBUSTIBLES			
	BACKWALL	SIDEWALL	CEILING
FLUE TOP	15"	15"	18"
FLUE REAR	24"	15"	--
FLUE TOP (WITH REAR HEAT SHIELD)	8"	15"	18"

Table I  
Minimum Clearances to Combustibles

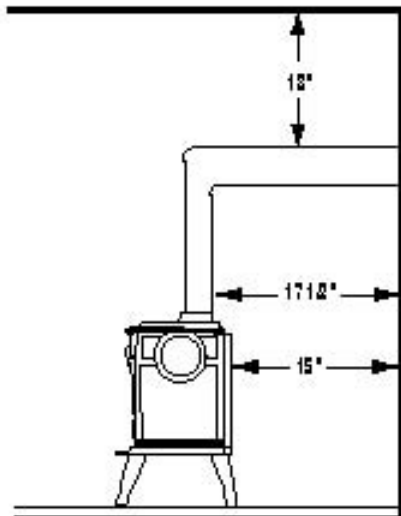


Figure 1  
Flue Top Clearances

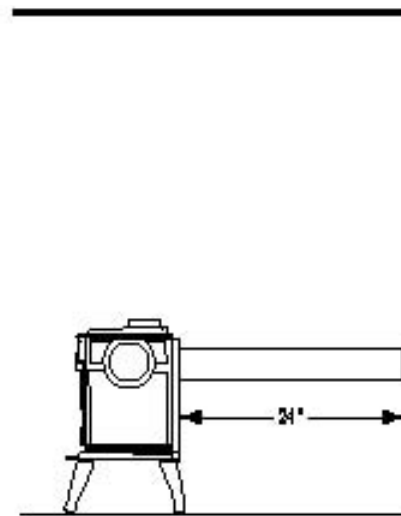


Figure 2  
Flue Rear Clearances

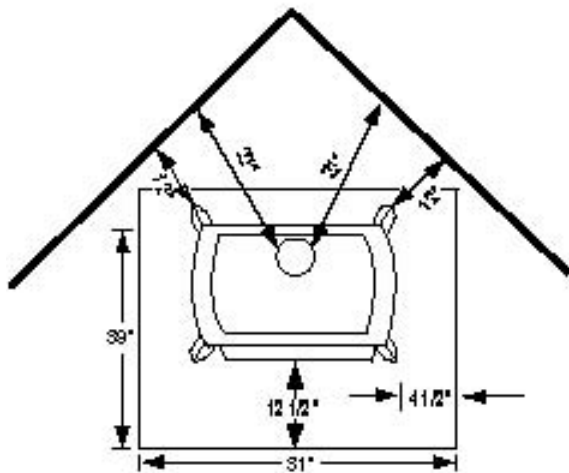


Figure 3a

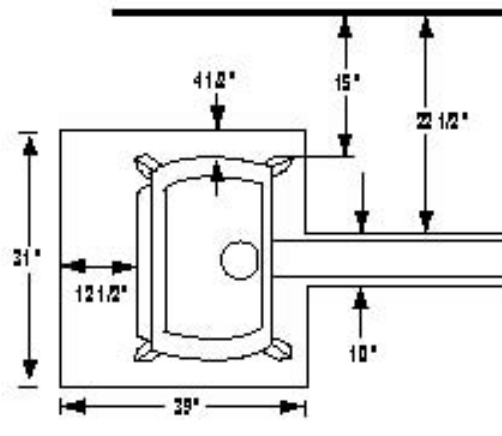


Figure 3b

**WARNING!**

**COMPLIANCE WITH ALL MINIMUM CLEARANCES SHOWN IN THIS MANUAL IS NECESSARY FOR YOUR SAFETY.**

**2. FLOOR PROTECTION.**

A combustible floor must be protected from the radiant heat given off by the unit and from the inevitable spark or falling ember. This includes almost any floor surface. Only a solid masonry or concrete floor adequately covering the distance around the unit is acceptable. A layer of thin brick or ceramic tile over a combustible floor is insufficient. To protect your floor, it is necessary to install a floor protector of one layer of 3/8" non-combustible millboard having a thermal conductivity of  $K = 0.84 \text{ BTU IN/FT}^2\text{HR F}$ , or an equally thick UL listed floor protector. The required dimensions of floor protector vary according to the length of chimney connector as shown. If you construct your own floor protector with the one layer of millboard, we suggest that it be covered by one sheet of 24-gauge, or heavier, galvanized sheet metal. It can then be covered with ceramic tile, or thin brick, and framed to protect the millboard and give it a finished look.

Any horizontal length of chimney connector pipe must also have the floor protector beneath it and extending 2" on each side of the pipe. The required floor protector size for Model 400 is 31" x 39". Refer to Figures 3a and 3b.

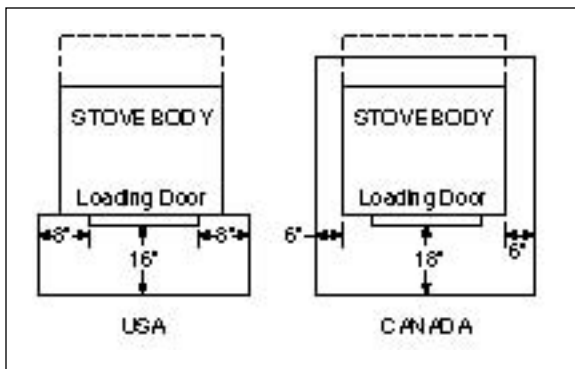
**NOTE: In calculating equivalent thickness of alternate materials, the following formula should be used:**

One layer of 3/8" (0.375 inch) thick millboard has a K factor of

$(\text{BTU}) / (\text{INCH})$

$0.31 \text{ (HR)} / (\text{FT}^2) \text{ (F)} \text{ at } 75 \text{ F}$

**NOTE: The minimum Floor Protector Size for the Model 400 Woodstove is 31" wide x 39" deep.**



**Figure 4**  
**Floor Protection**

**NOTE: Dotted line indicates additional floor protection required on through-the-wall chimney installation. Floor protection must extend behind the stove to the rear wall.**

EXAMPLES OF INSULATION

	Required Thickness	"K" Value
MICORE 300	1"	.45

(Thermal Conductivity) "K" = BTU in./hr. ft<sup>2</sup> F (based on 1" thickness)

To substitute alternate insulation material, you need to know the "K" factor for that material. To calculate the required thickness for the alternate material use the following formula:

"K" Alt. x 1 = Thickness of alternate mat. (inches)

.45

"K" of brick = 5

$\frac{5}{.45} \times .50 = 5.5$  In. of brick.

Figure 5

### 3. CHIMNEY HEIGHT REQUIREMENTS.

**WARNING!**

**ALWAYS FOLLOW CHIMNEY CONNECTOR MANUFACTURER'S INSTRUCTIONS FOR PROPER INSTALLATION.**

**CHIMNEY CONNECTOR IS TO BE USED ONLY WITHIN THE ROOM, BETWEEN THE STOVE AND CEILING WALL, NEVER PASSING THROUGH A COMBUSTIBLE CEILING OR WALL. ALWAYS KEEP MINIMUM CLEARANCES TO COMBUSTIBLES AS SHOWN IN TABLE 1.**

**WARNING!**

**IF INSTALLING THIS MODEL TO A MASONRY CHIMNEY, ALWAYS BE SURE THE CHIMNEY IS IN GOOD CONDITION AND THAT IT MEETS THE MINIMUM STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARD 211.**

**THIS APPLIANCE IS MADE WITH A 6 INCH/152 MM. DIAMETER CHIMNEY CONNECTOR (IF YOU ARE USING A FACTORY-BUILT CHIMNEY SYSTEM, AS RECOMMENDED) AS THE FLUE COLLAR ON THE UNIT.**

**CHANGING THE DIAMETER OF THE CHIMNEY CAN AFFECT DRAFT AND CAUSE POOR PERFORMANCE. IT IS NOT RECOMMENDED TO USE OFFSETS OR ELBOWS AT ALTITUDES ABOVE 4000 FEET ABOVE SEA LEVEL OR WHEN THERE ARE OTHER FACTORS THAT AFFECT FLUE DRAFT.**

Masonry chimney or a factory-built chimney must be the required height above the roof and any other nearby obstructions. The chimney must be at least 3 feet higher than the highest point where it passes through the roof and at least 2 feet higher than the highest part of the roof or structure that is within 10 feet of the chimney, measured horizontally. See Figure 6.

These are safety requirements and are not meant to assure proper flue draft.

We recommend using a minimum total system height of 12 feet/3657 mm when using single wall connector, not including the chimney cap, measured from the stove flue collar to the top of the chimney. For a listed connector pipe, use a minimum total system height of 9 feet/2743 mm.

#### 4. FLUE SYSTEMS.

There are two separate and different parts to a flue system: the chimney connector and the chimney itself.

##### Chimney Connector.

The chimney connector connects the stove to the chimney. The connector must be the same size as the flue outlet of the stove. There are two types of chimney connectors.

- A. Single wall connector or stovepipe. This must be at least 24 gauge mild steel or 26 gauge blue steel. The sections must be attached to the stove and to each other with the crimped (male) end pointing toward the stove. See Figure 7. All joints, including the connection at the stove collar, should be secured with three sheet metal screws. Make sure to follow the minimum clearances in Table 1, page 5.
- B. Factory-built listed chimney connector (vented). The listed connectors must be the same brand at the listed chimney.

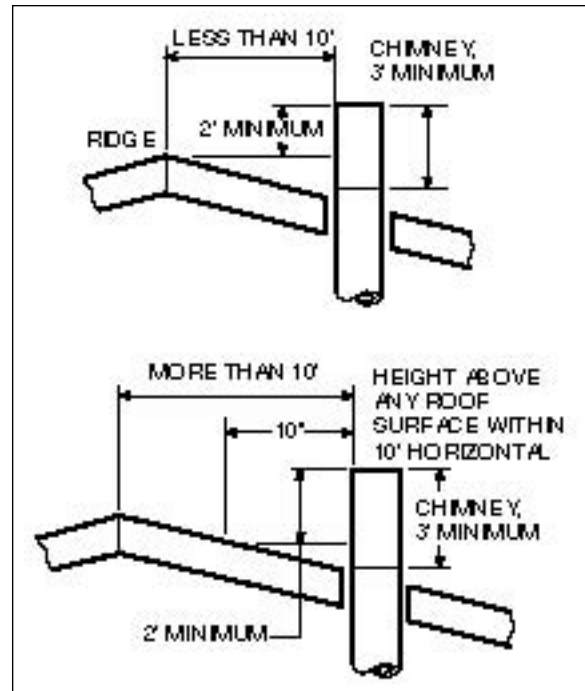


Figure 6  
Chimney Height

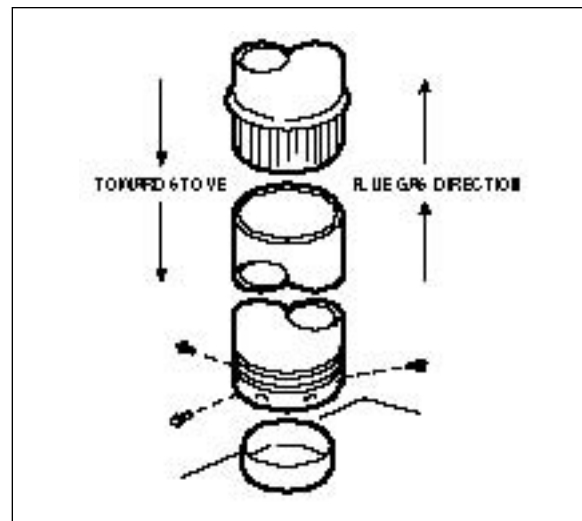


Figure 7  
Chimney Connector

**NOTE:** The chimney connector must be attached to either an approved masonry chimney or any safety listed factory-built chimney.



**5. MASONRY CHIMNEY.**

Be sure a masonry chimney meets the minimum standards of the National Fire Protection Association (NFPA) Standard 211. It must have at least a 5/8 inch/16 mm fire clay liner or a listed chimney liner system. Make sure there are no cracks, loose mortar or other signs of deterioration and blockage. It is best to have the chimney inspected by a professional and be sure to have the chimney cleaned before the stove is installed and operated.

The flue should be checked to determine that it is not too large for the stove. NFPA211 allows the cross-sectional area of the flue to be no more than 3 times the cross-sectional area of the flue collar of the stove ( $28 \times 3 = 84$ ). It is recommended that a chimney with a larger diameter be relined, since the oversized flue can cause poor performance and contribute to the accumulation of creosote. (See page 16 for more information about draft.)

**NOTE: Never install more than one appliance to any Chimney.**

When connecting the stove through a combustible wall to a masonry chimney, special methods are needed. There are several ways to make this connection, including the construction of a masonry thimble. Check with your local building authorities or consult the National Fire Protection Association (NFPA211). Refer to Figure 8.

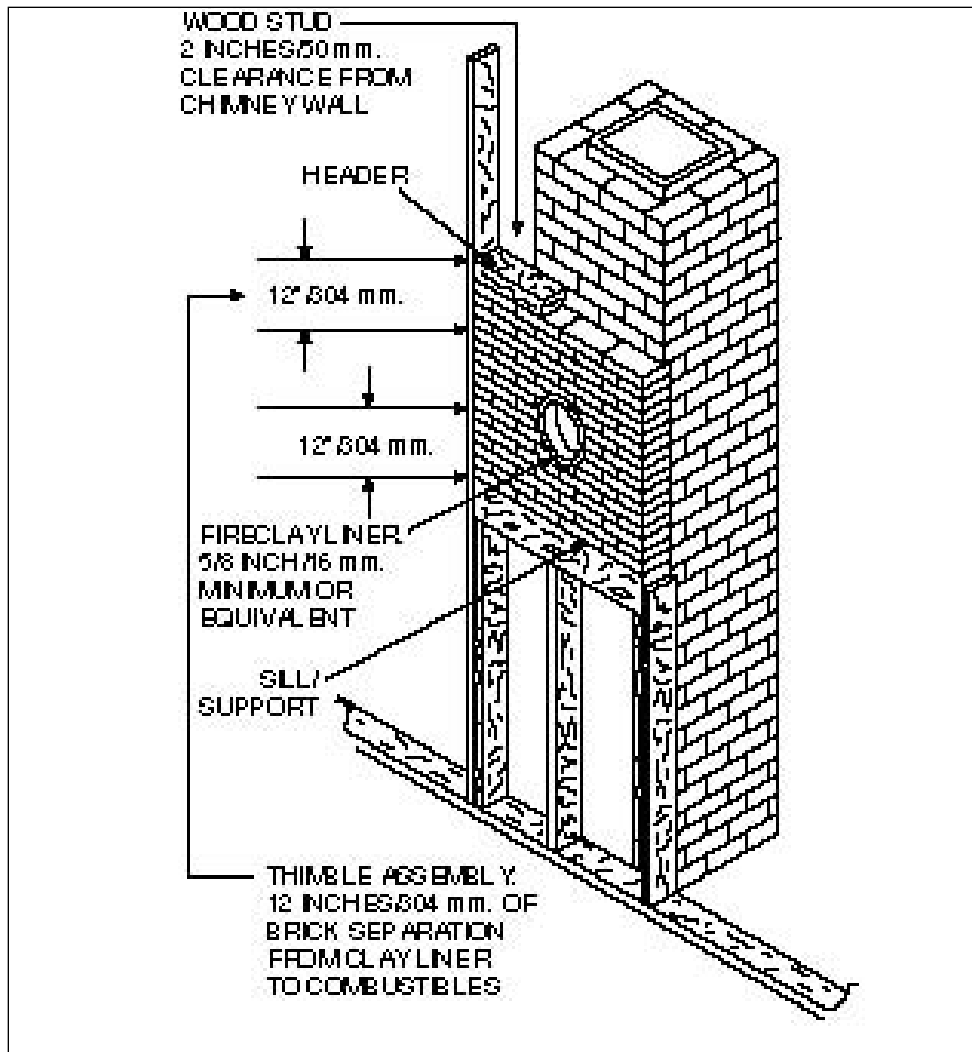
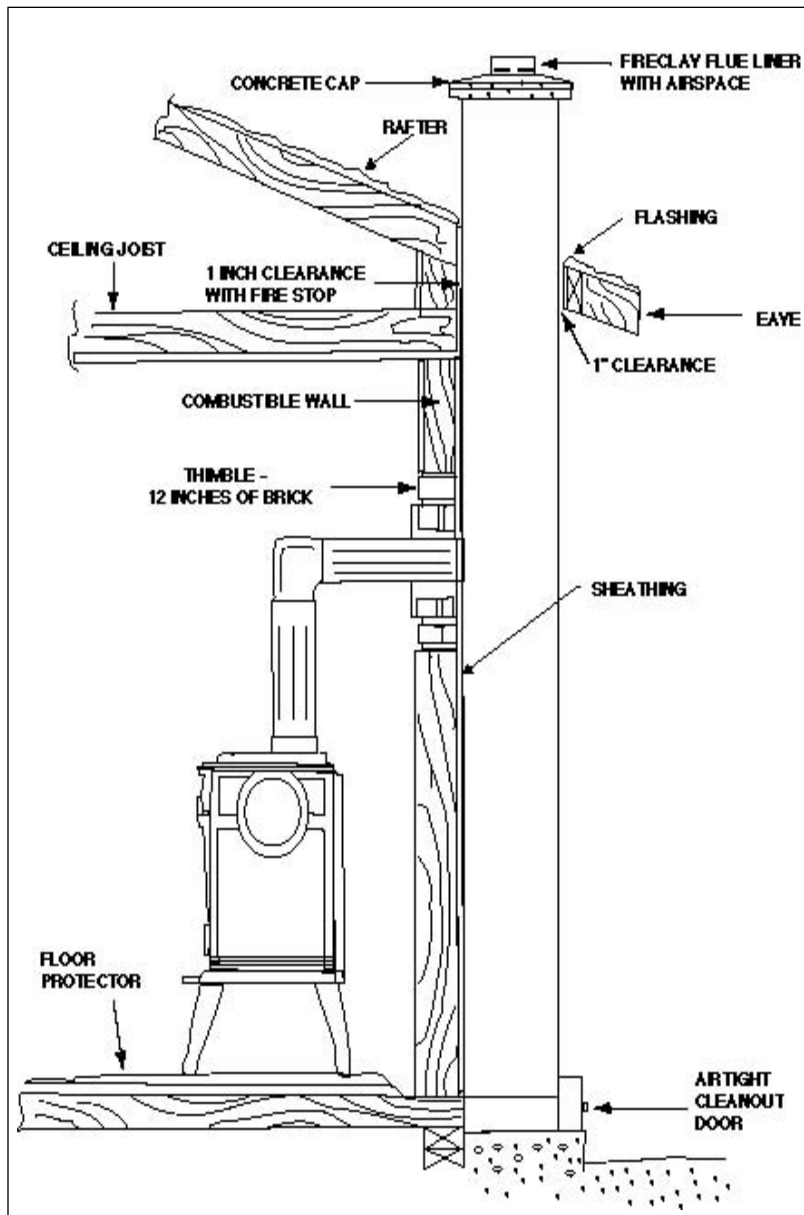


Figure 8  
Masonry Thimble



## EIGHT INCH SOLID PACK CHIMNEY WITH METAL SUPPORTS AS A THIMBLE.

For the method of installation to a masonry chimney shown in Figures 10 & 11, it will be necessary to purchase a 8 inch inside diameter 12 inch long section of prefabricated listed solid pack chimney to use as a thimble. Purchase a wall spacer, trim collar and a ware manufactured to fit the chimney section you purchase.

The safety features of this system are: 2 inch air space between the chimney section and combustible wall, and the 1 inch air space around the chimney connector as it passes through the chimney section to the chimney.

The location of the opening through the wall to the chimney must leave a minimum 18 inch vertical clearance between the connector pipe and the ceiling to prevent the ceiling from catching fire.

Cut out an opening in the wall large enough to accommodate the outside dimension of the chimney section plus the minimum air space specified by its manufacturer. It may be necessary to cut the wall studs and install a header and a sill frame to maintain the wall support. The hole in the chimney must have at least an 8 inch diameter fire clay liner or equivalent secured with refractory mortar. If it is necessary to cut a hole in the chimney liner, use extreme care to keep it from shattering.

First, make the frame for the thimble, being sure it is no smaller than 14 inches square, to maintain a 2 inch air space around the chimney section. Attach the wall spacer to the chimney side of the frame. Then insert the frame into the opening, toe nailing it to the wall studs. Install the wall band in the framing to secure the chimney section in place. Insert a single section of chimney connector into the chimney through the wall band, being sure it does not protrude into the chimney beyond the edge of the chimney flue lining. Apply high temperature furnace cement to the end of the chimney section and install it over the connector, through the wall spacer. Tighten the wall band to hold the chimney section firmly in place and against the chimney. Install the trim collar on the outside of the opening. Check to assure there is a 1 inch air space between the connector and the chimney section. Also, during installation, always check to assure that a 2 inch air space is being maintained to the wood framing. Do not fill this space with insulation. Insulation in this air space will cause a heat buildup which may ignite the wood framing.

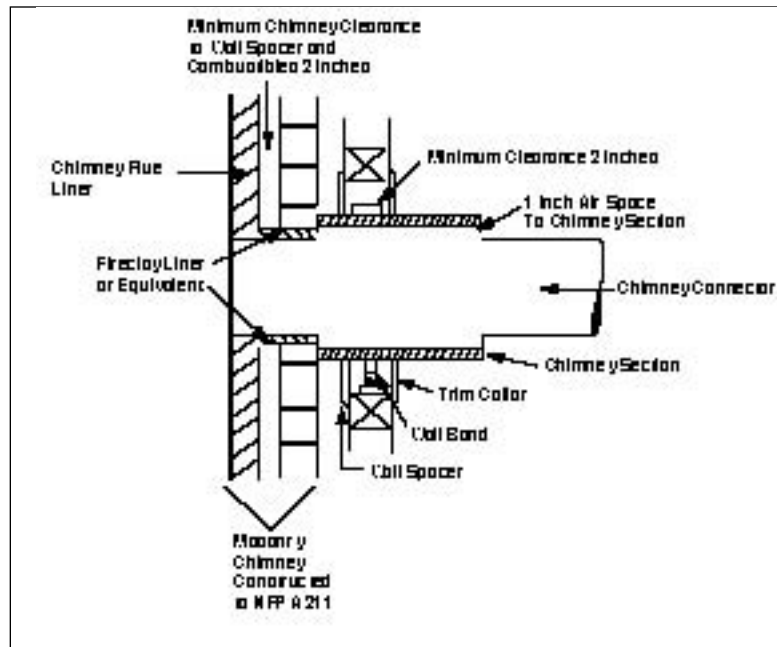


Figure 10  
Installation to a Masonry Chimney

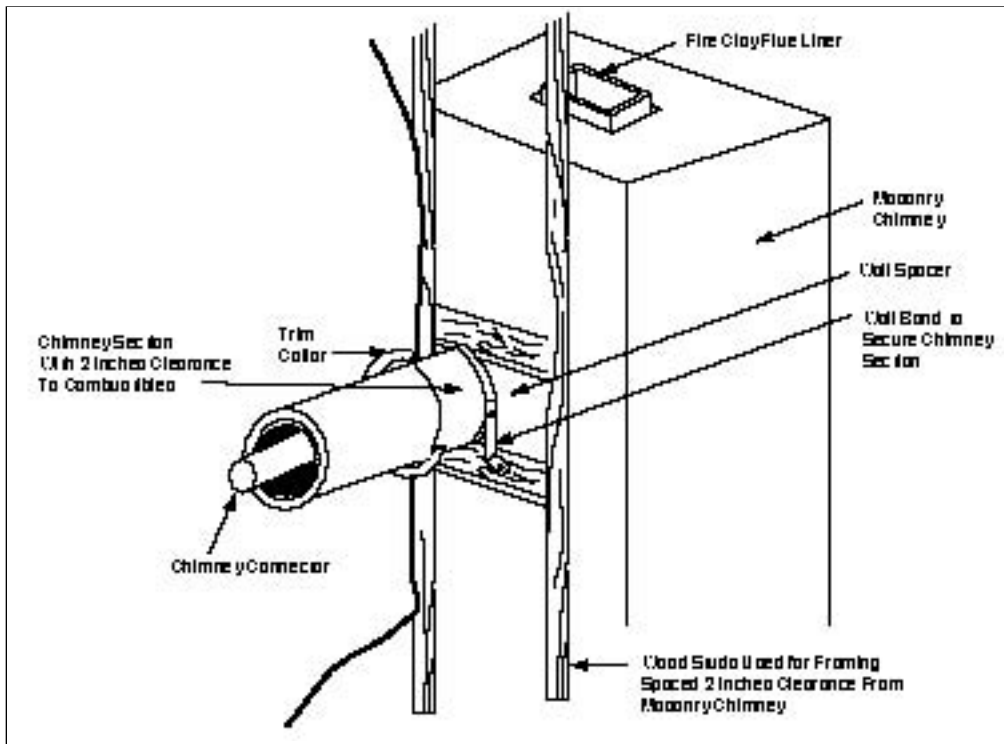


Figure 11  
Installation to a Masonry Chimney

### CONNECTION TO A MASONRY FIREPLACE.

There are several kits available to connect the stove to a masonry fireplace. Look for a listed kit. The kit is an adapter which is installed at the location of the fireplace damper. The existing damper may have to be removed to allow installation of the kit. The key points of this type of stove connection are that the connector pipe must extend up the chimney above where the fire clay liner starts, and the areas of the kit installation and penetration should fit tightly and be sealed with high temperature furnace cement unless the kit's instructions state otherwise. See Figure 12. The tight fitting installation aids the proper draw of the chimney.

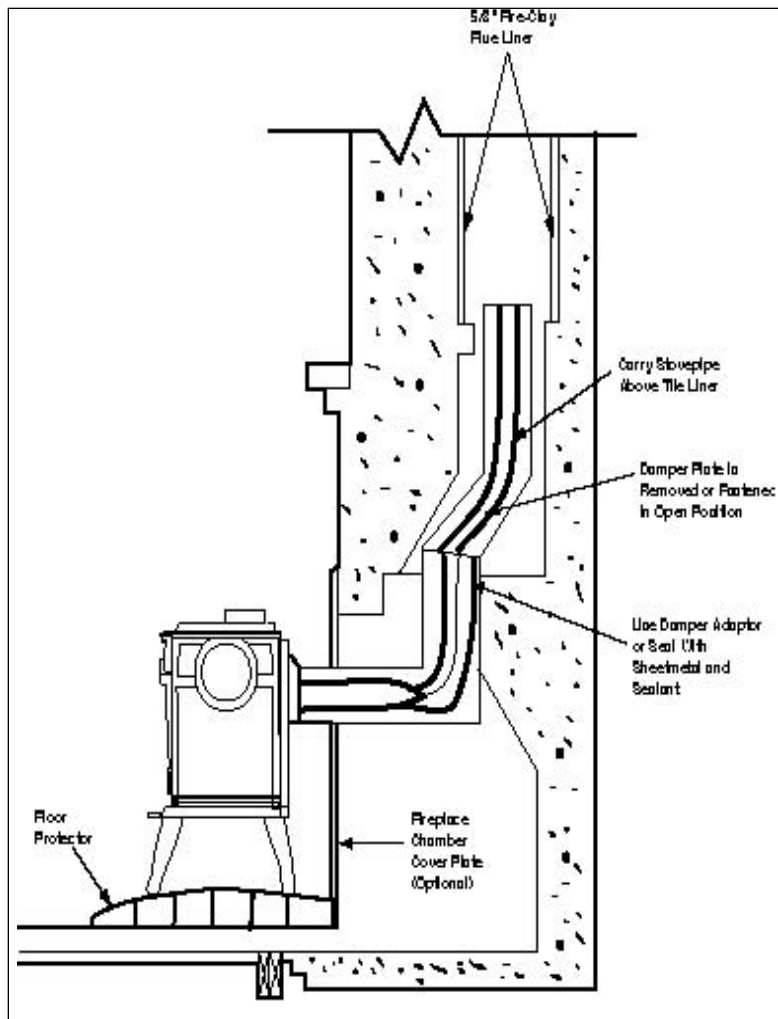


Figure 12  
Connection to a Masonry Fireplace

### 6. CONNECTION TO A METAL PREFABRICATED CHIMNEY.

When a metal prefabricated chimney is used, the manufacturer's installation instructions must be followed precisely. You must also purchase (from the same manufacturer) and install the ceiling support package or wall pass through and "T" section package, firestops (when needed), insulation shield, roof flashing, chimney cap, etc. Maintain the proper clearance to the structure as recommended by the manufacturer. This clearance is usually a minimum of 2 inches, although it may vary by manufacturer or for certain components.

There are basically two methods of metal chimney installation. One method is to install the chimney inside the residence through the ceiling and the roof. See Figures 13 and 14.

The other method is to install an exterior chimney that runs up the outside of the residence. See Figures 15 and 16. The components illustrated may not look exactly like the system you purchase, but they demonstrate the basic components you will need for a proper and safe installation.

The chimney must be the required height above the roof or other obstruction for safety and for proper draft operation. The requirement is that the chimney must be at least 3 feet higher than the highest point where it passes through the roof and at least 2 feet higher than the highest part of the roof or structure that is within 10 feet of the chimney, measured horizontally. Install an attic insulation shield to maintain the specified clearance to insulation. Insulation in this air space will cause a heat buildup which may ignite the ceiling joists.

This method of installation requires, at minimum, a ceiling support package, an insulation shield and roof flashing.

### LISTED FACTORY-BUILT CHIMNEY.

Your Dovre unit requires a 6" diameter pipe. Follow the installation instructions provided by the chimney manufacturer and maintain the specified clearances to combustibles.

When using a factory-built chimney, make sure it is safety listed, Type HT or conforming to CAN/ULC-S692M, STANDARD FOR 650°C FACTORY-BUILT CHIMNEYS.

**IMPORTANT**  
FOLLOW THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND MAINTAIN THE MANUFACTURER'S CLEARANCE DISTANCES.

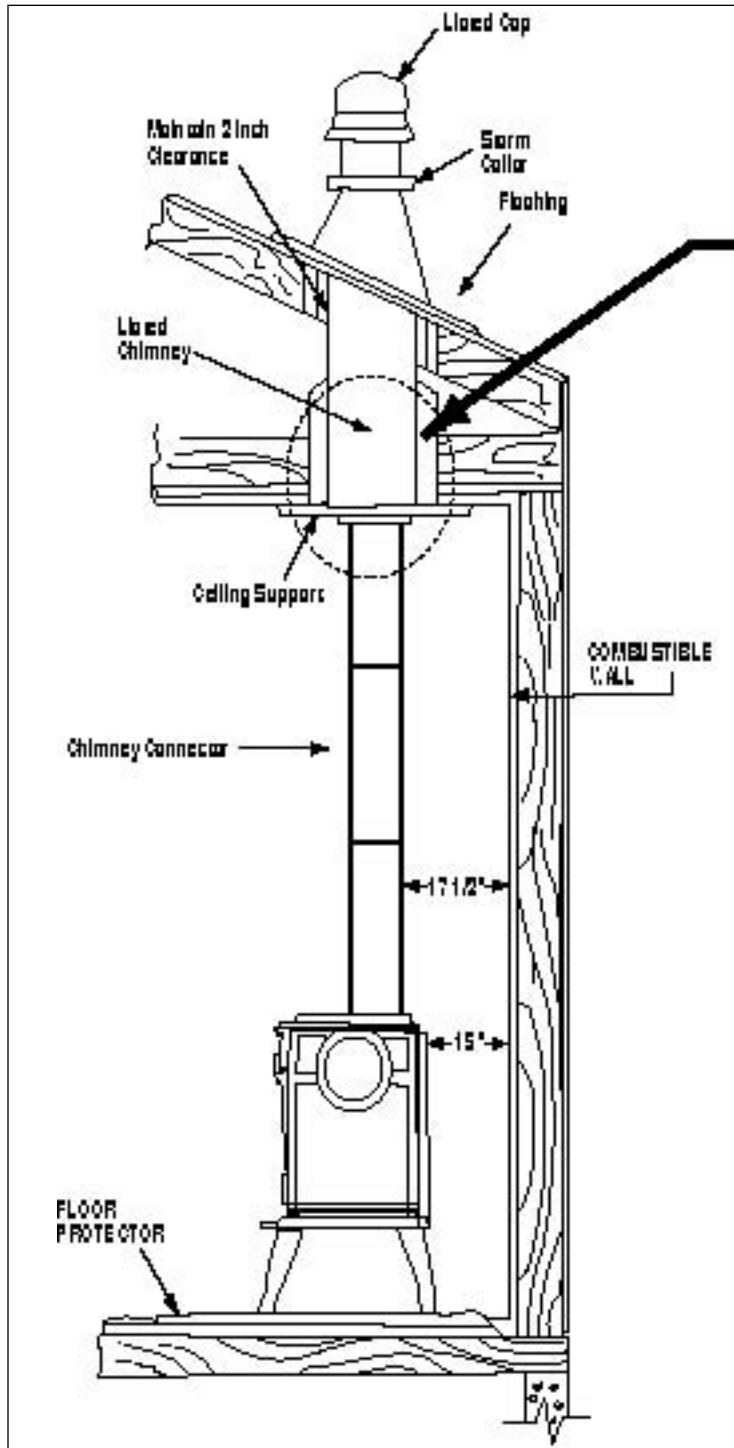


Figure 13  
Installation of an Interior  
Chimney

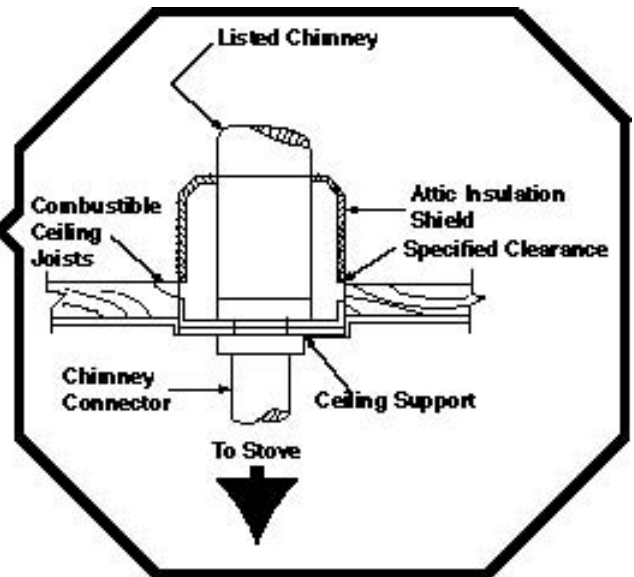


Figure 14

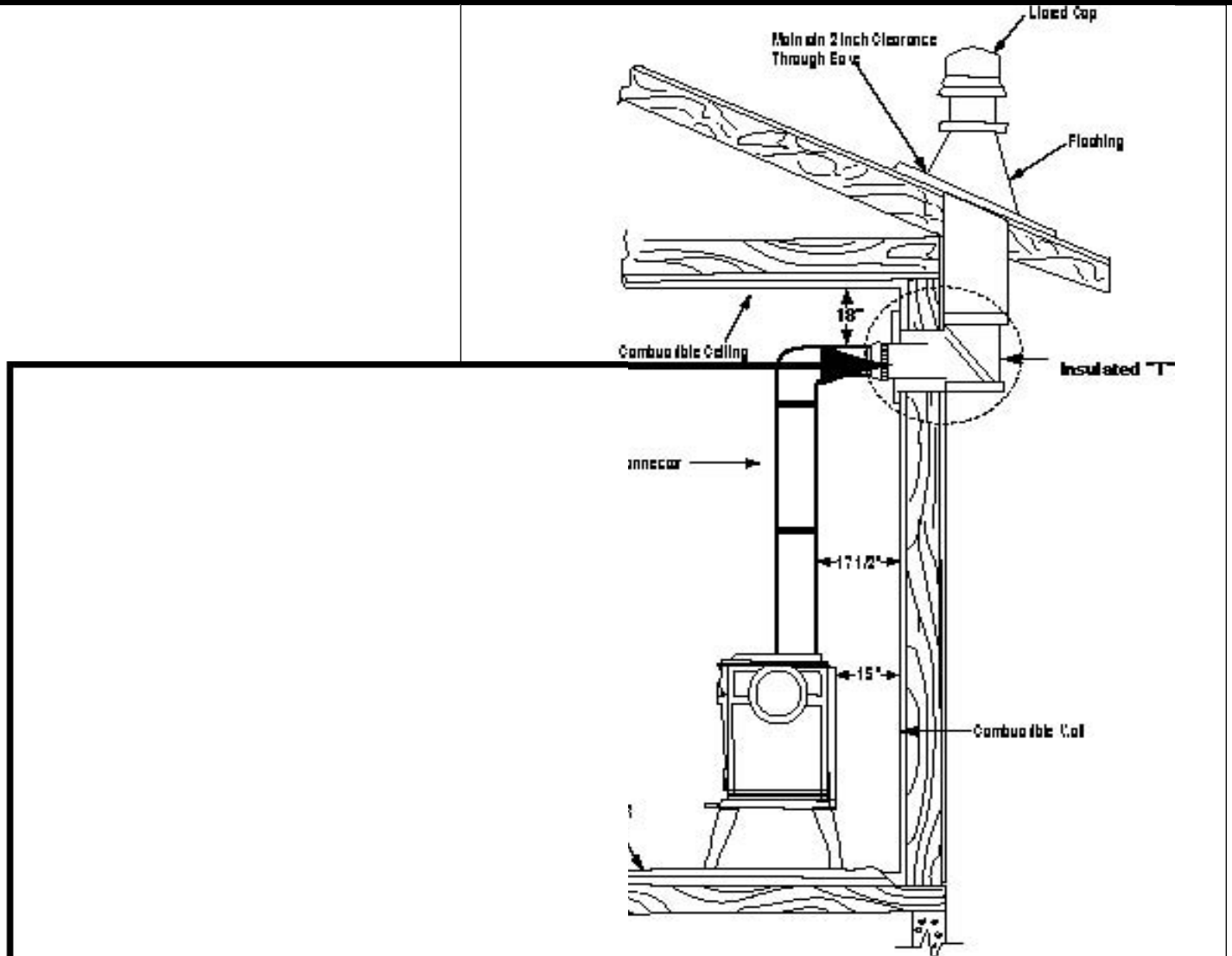


Figure 15  
Installation of an Exterior Chimney

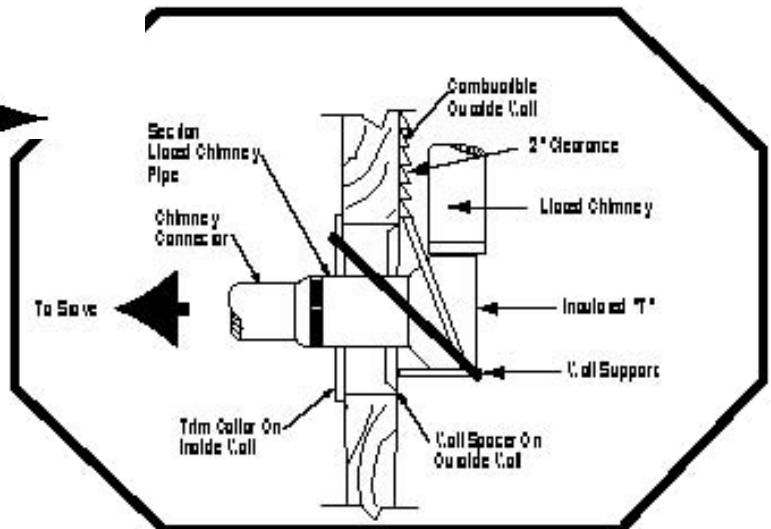


Figure 16

## D. STEP BY STEP INSTALLATION OF THE WOODSTOVE

### 1. ASSEMBLY.

Before assembly, place the unit near the final position, then follow the procedures below.

- a. Open the stove and remove all the parts and articles packed inside. Inspect all the parts and the cast iron body for shipping damage. Contact your dealer if any irregularities are noticed.
- b. Install floor protection if the heater is being placed on a combustible floor. Refer to the section on floor protectors for required materials and sizes on page 6.
- c. Lift the unit upright and place it into position on the floor protector. **DO NOT TILT THE UNIT ON THE ON THE CAST IRON LEGS.**
- d. The Flue Collar is located inside the Model 400. For a top flue exit, attach the Collar to the top of

the heater with the bolts and nuts provided. Furnace cement may be used to seal under the Collar. See Figure 17.

Should a rear flue exit be necessary, you will need to remove the center section from the back shield to allow for rear exit. The Flue Collar is then fastened to the back of the unit with the bolts and nuts provided, as shown in Figure 17. Install the cast iron Cover Plate on the top of the heater in the unused Flue Opening by placing a bead of furnace cement around the edge and place the Cover in position so it sits firmly against the cast iron. Attaching the Cover Plate to the rear of the stove, you will also need to attach the Fixing Bar to the Cover Plate with the washers provided. See Figure 17 for Top and Rear Cover Plate installation.

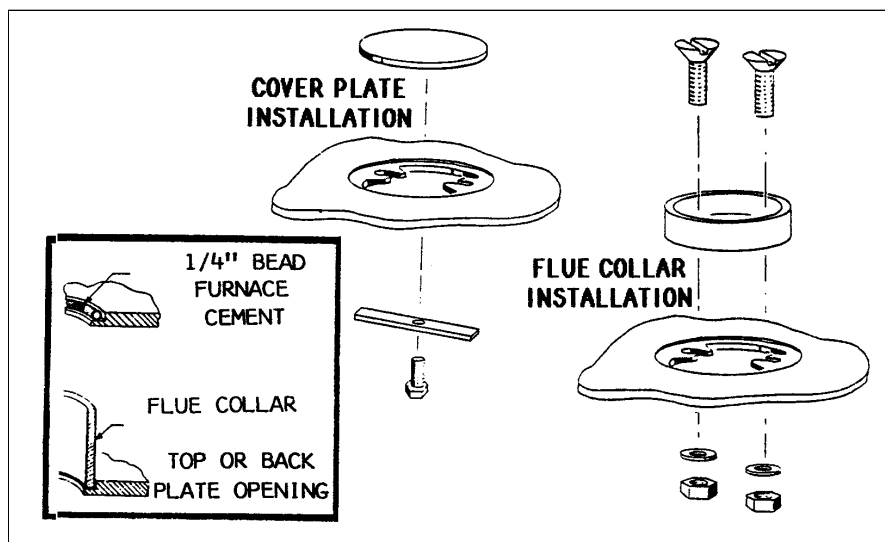


Figure 17  
Top and Rear Cover Plate Installation

**WARNING!**

**NEVER DRAW COMBUSTION AIR FROM A WALL, FLOOR OR CEILING CAVITY OR FROM ANY ENCLOSED SPACE SUCH AS AN ATTIC OR GARAGE.**

**CAUTION:**

**IF THE OPTIONAL BLOWER KIT IS USED, THE CORD SHOULD BE ROUTED AWAY FROM THE UNIT.**

**2. FIREBRICK PLACEMENT.**

Make sure the firebricks are in position and not broken before operating the unit. Also make sure the baffle insulation is positioned all the way against the rear of the unit.

**✓ PRE-USE CHECK LIST**

Use the following checklist as a guide to be sure your installation is correct and complete.

- All of the safety warnings have been read and followed.
- Floor protection requirements have been followed.
- Chimney connector is properly installed.
- The proper clearances from the stove and chimney to combustible material have been met.
- The masonry chimney is inspected and clean or the factory built metal chimney is installed according to the manufacturer's instructions and clearances.
- The chimney meets the required minimum height.



## E. OPERATING INSTRUCTIONS

### WARNING!

**DO NOT ATTEMPT TO OPERATE THIS WOODSTOVE WITHOUT READING AND UNDERSTANDING THESE OPERATING INSTRUCTIONS THOROUGHLY. FAILURE TO OPERATE THIS APPLIANCE PROPERLY MAY CAUSE A SERIOUS HOUSE FIRE.**

#### GENERAL INFORMATION.

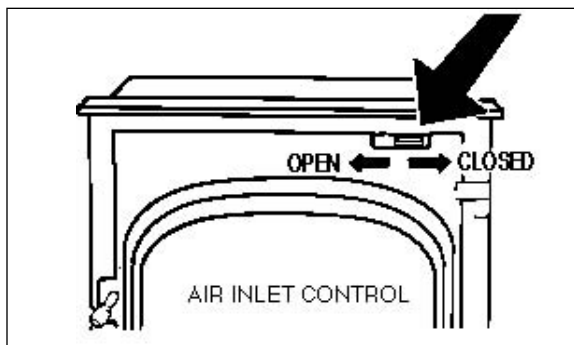
The DOVRE® Model 400 woodstove is an efficient woodstove designed to burn natural, seasoned wood. Do not burn artificial logs or driftwood.

The Air Inlet Control is located at the upper right corner of the stove. Move the lever to the left to open and to the right to close. See Figure 18a. In addition, when starting a fire in the Model 400 also open the Spin Draft Control located in the center of the Lower Door. To open this Control, turn counter clockwise and clockwise to close. See Figure 18b.

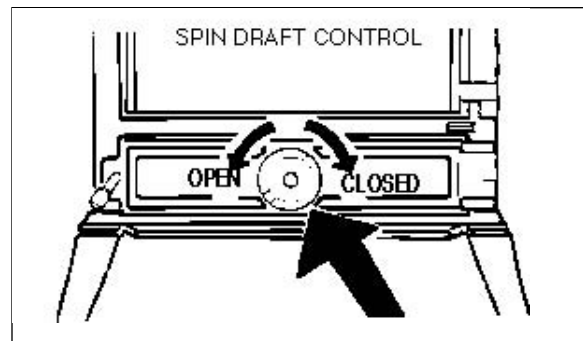
The more combustion air allowed into the Firebox, the hotter and faster the fire will burn. Closing the Air Intake slows the rate of combustion resulting in a slower burning fire. Experience with your stove, the quality of your firewood, and local conditions will determine the proper setting for maintaining the heat output that best suits your needs.

#### BREAK-IN PERIOD.

Build your first few fires small to allow the high temperature paint on your stove to cure. During this period excessive temperatures may damage the paint. Allow adequate ventilation to dissipate smoke and odor that may come from the paint during curing.



**Figure 18a**  
Air Inlet Control



**Figure 18b**  
Spin Draft Control

**STARTING THE FIRE.**

1. Place several crumpled newspaper pages on the firebox floor.
2. Cover the paper with several pieces of kindling. The kindling should be less than 1" in diameter, well seasoned, dry, split firewood.

**WARNING!**

**FAILURE TO FOLLOW INSTRUCTIONS LISTED MAY AFFECT THE PERFORMANCE OF THE APPLIANCE. DURING START-UP AND RE-FUELING IT IS NECESSARY THAT THE APPLIANCE REACH OPERATING TEMPERATURE FOR PROPER PERFORMANCE.**

**WARNING!**

**NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN-UP' A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER.**

3. Move the Air Intake control lever all the way to the left (High) to open the air intake. Also, open the Spin Draft by rotating it counter clockwise
4. Light the newspaper in several places, starting at the back of the firebox and working towards the front.

**NOTE:** If the chimney flue is cold due to low outside temperatures, several pieces of crumpled paper on top of the fuel may help establish a draft in the flue.

**WARNING!**

**BUILD THE FIRE DIRECTLY ON THE FIREBRICK FLOOR. DO NOT USE A GRATE OR OTHERWISE ELEVATE THE FIRE WHEN BURNING WOOD.**

**WARNING!**

**DO NOT USE ARTIFICIAL LOGS THAT CONTAIN WAX, PARAFFIN, OR OTHER INGREDIENTS THAT CAN RELEASE VOLATILE GASES WHICH MAY CONDENSE ON THE INSIDE OF THE FIREBOX AND CHIMNEY. SOME ARTIFICIAL LOGS CONTAIN FLAMMABLE LIQUIDS THAT MAY CAUSE AN UNCONTROLLABLE FIRE.**

5. Close the door to prevent smoke spillage but do not latch. This allows extra air into the firebox for start-up while preheating the glass to help keep it cleaner.
6. Once the kindling is burning, place three or four small pieces of firewood, two or three inches in diameter on the fire, close the door and latch.

**WARNING!**

**ALWAYS OPERATE THIS APPLIANCE WITH THE DOOR CLOSED AND LATCHED EXCEPT DURING START-UP AND RE-FUELING.**

7. Maintain the fire by adding small pieces of firewood periodically until a uniform fire bed has been established.
8. After establishing the fire bed, and the small firewood is burning briskly, add a minimum of three average sized pieces of split firewood, place the wood in such a manner to allow combustion air and flames between them.

**WARNING!**

**DO NOT LEAVE THE FIRE UNATTENDED WHEN THE DOOR IS UNLATCHED. CARELESSLY PLACED FIREWOOD COULD FALL OUT OF THE FIREBOX CREATING A FIRE HAZARD.**

9. After about 45 minutes to 1 hour the stove will have reached operating temperature. You may slow down the burn rate by pulling the air intake control lever out to the desired setting.
10. If equipped with optional blower, turn it on at this time.

**WARNING!**

**ALWAYS OPEN THE DOOR SLOWLY WHILE THE FIRE IS BURNING TO AVOID SMOKE AND FLAME SPILLAGE. IT IS BEST TO UNLATCH THE DOOR, WAIT A FEW SECONDS, THEN OPEN THE DOOR SLOWLY. TO INSURE GOOD, RAPID RE-IGNITION, CREATE A VALLEY IN THE COAL BED FROM THE FRONT TO ABOUT ITS CENTER, WHICH WILL ALLOW COMBUSTION AIR UNDERNEATH THE FRONT PIECE OF FUEL.**

**WARNING!**

**DO NOT OVER FIRE THIS HEATER. ATTEMPTS TO ACHIEVE HEAT OUTPUT RATES THAT EXCEED HEATER DESIGN SPECIFICATIONS CAN RESULT IN PERMANENT DAMAGE TO THE HEATER. IF ANY PART OF THE UNIT OR FLUE SYSTEM IS GLOWING, THE STOVE IS BEING OVER FIRED.**

**RE-FUELING.**

When adding fresh wood to an existing fire:

1. Open the air intake by moving the control lever all the way to the left.
2. Wait a few seconds, then open the door slowly.

If the fire has been allowed to die down between re-fueling, it may be necessary to use smaller pieces of wood to re-kindle it. Leave the control lever on HI after re-fueling for 10 to 20 minutes to re-establish a moderately high firing rate and bring the stove back up to operating temperature.

**OPERATING EFFICIENCY.**

Rather than burning the stove hot and not running the blower, it is more efficient to adjust the damper down and operate the blower on low to move air across firebox surfaces. This method of operation will conserve fuel and gain a maximum amount of heat from the stove. Model 400 woodburning stove is designed to be an exceptional value in heating efficiency when installed, operated and maintained in accordance with the information in this manual. However, factors unique to your location, installation, or firewood can affect or alter the performance of this appliance. If you experience difficulty lighting the fire or sporadic burning refer to Flue Draft section on page 23 of this manual.

**WARNING!**

**DO NOT STORE FUEL WITHIN THE CLEARANCES TO COMBUSTIBLES MENTIONED ON PAGE 5, OR IN THE SPACE REQUIRED FOR REFUELING AND ASH REMOVAL.**

**WARNING!**

**BURNING WET UNSEASONED WOOD CAN CAUSE EXCESSIVE CREOSOTE ACCUMULATION. WHEN IGNITED IT CAN CAUSE A CHIMNEY FIRE THAT MAY RESULT IN A SERIOUS HOUSE FIRE.**

## WOOD FUEL.

### Hardwood vs. Softwood

Your woodstove's performance depends a great deal on the quality of the firewood you use. Contrary to popular belief, one species of wood varies very little to the other in terms of energy content. All seasoned wood, regardless of species, contains about 8,000 BTU's per pound. The important factor is that hardwoods have a greater density than softwoods. Therefore, a piece of hardwood will contain about 60% more BTU's than an equal size piece of softwood. Since firewood is commonly sold by the cord (128 cu. ft.), a volume measurement, a cord of seasoned oak (hardwood) would contain about 60% more potential energy than a cord of seasoned pine (softwood).

There are many definitions of hardwood and softwood. Although not true in every case, one of the most reliable is to classify them as coniferous or deciduous.

Softwoods are considered coniferous. These are trees with needle-like leaves that stay green all year and carry their seeds exposed in a cone. Examples of softwood trees are Douglas fir, pine, spruce and cedar.

Softwoods, being more porous, require less time to dry, burn faster and are easier to ignite than hardwoods.

Deciduous trees are broadleaf trees that lose their leaves in the fall. Their seeds are usually found within a protective pod or enclosure. Hardwoods fall into this category. Some examples of deciduous trees are oak, maple, apple, and birch. However it should be noted that there are some deciduous trees that are definitely not considered hardwoods such as poplar, aspen and alder. Hardwoods require more time to season, burn slower and are usually harder to ignite than softwoods.

Obviously, you will use the type of wood that is most readily available in your area. However, if at all possible the best arrangement is to have a mix of softwood and hardwood. This way you can use the softwood for starting the fire giving off quick heat to bring the appliance up to operating temperature. Then add the hardwood for slow, even heat and longer burn time.

## MOISTURE CONTENT.

Regardless of which species of wood you burn, the single most important factor that effects the way your stove operates is the amount of moisture in the wood. The majority of the problems woodstove and fireplace insert owners experience are caused by trying to burn wet, unseasoned wood.

Freshly cut wood can be as much water as it is wood, having a moisture content of around 50%. Imagine a wooden bucket that weighs about 8 pounds. Fill it with a gallon of water, put it in the firebox and try to burn it. This sounds ridiculous but that is exactly what you are doing if you burn unseasoned wood.

## SEASONING.

Seasoned firewood is nothing more than wood that is cut to size, split and air dried to a moisture content of around 20%. The time it takes to season wood varies from around nine months for softwoods to as long as eighteen months for hardwoods. The key to seasoning wood is to be sure it has been split, exposing the wet interior and increasing the surface area of each piece. A tree that was cut down a year ago and not split, is likely to have almost as high a moisture content now as it did when it was cut.

The following guideline will ensure properly seasoned wood:

1. Stack the wood to allow air to circulate freely around and through the woodpile.
2. Elevate the woodpile off the ground to allow air circulation underneath.
3. The smaller the pieces, the faster the drying process. Any piece over six inches in diameter should be split.
4. Cover the top of the woodpile for protection from rain and snow. Avoid covering the sides and ends completely. Doing so may trap moisture from the ground and impede air circulation.

The problems with burning wet, unseasoned wood are twofold. First, you will receive less heat output from wet wood because it requires energy in the form of heat to evaporate the water trapped inside. This is wasted energy that should be used for heating your home. Secondly, this moisture evaporates in the form of steam which has a cooling effect in your firebox and chimney system. When combined with tar and other organic vapors from burning wood it will form creosote which condenses in the relatively cool firebox and chimney. See the maintenance section of this manual for more information regarding creosote formation and need for removal.

## F. MAINTENANCE INSTRUCTIONS

### ASH HANDLING.

Open the ash grate by sliding the upper grate to the left. See Figure 19. Use a fireplace tool to work the desired amount of ash through the grate into the ash pan. Some ash on the grate is desirable to help keep an active bed of coals for refueling. We recommend emptying the ash pan at least once a day when the stove is in constant operation. The amount of ash is dependent on the type of wood being burned. **DO NOT LET ASHES BUILD UP IN THE ASH PAN UNTIL THEY REACH THE GRATE AS THIS WILL LEAD TO PREMATURE DETERIORATION OF THE GRATE AND MAKE IT DIFFICULT TO EMPTY THE ASH PAN.** See Figure 20 for ash pan diagram.

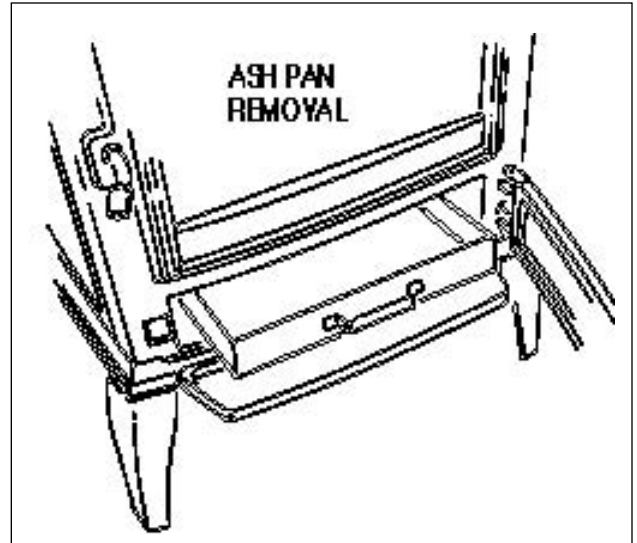


Figure 20  
Ash Pan

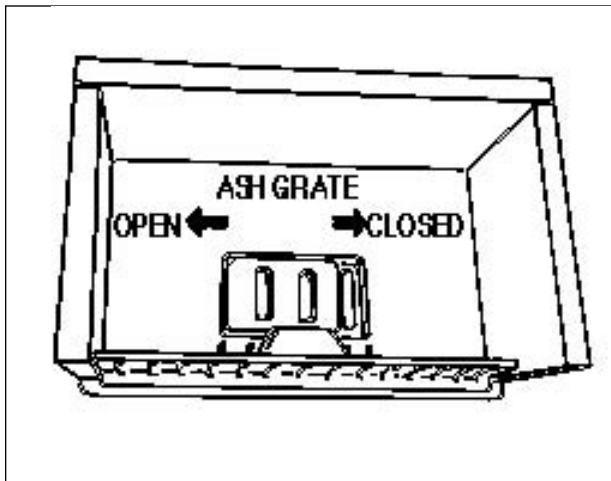


Figure 19  
Ash Grate

### ASH DISPOSAL.

Ashes must be disposed of carefully. The National Fire Protection Association (NFPA) suggests that all ashes be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally disbursed, they should be retained in the closed container until all cinders have thoroughly cooled.

It is critical to remember that while you may not see any red coals in the ashes being removed, it is most likely there still is some residual burning occurring unless the fire has been cold for at least 48 hours.

**WARNING!**

**ASHES SHOULD NEVER BE PLACED IN WOODEN OR PLASTIC CONTAINERS, OR IN PAPER OR PLASTIC BAGS, REGARDLESS OF HOW LONG THE FIRE HAS BEEN OUT. COALS HAVE BEEN FOUND TO STAY HOT FOR SEVERAL DAYS WHEN EMBEDDED IN ASHES.**

**WARNING!**

**FAILURE TO INSPECT AND CLEAN YOUR CHIMNEY REGULARLY CAN RESULT IN A SERIOUS FIRE WHICH MAY DAMAGE THE CHIMNEY OR CAUSE A HOUSE FIRE.**

**CREOSOTE & 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 newly started fire or from a slowly burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire which may damage the chimney or even destroy the house.

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 so, it should be removed to reduce the risk of a chimney fire.

**WARNING!**

**NEVER ATTEMPT TO CLEAN THE GLASS WHILE IT IS HOT.**

To help prevent creosote build-up, always burn dry, well seasoned firewood. When re-fueling after an extended low burn rate, allow the appliance to burn with the combustion air intake fully open (temperature setting on HI) for ten to twenty minutes to burn off creosote deposits that accumulate during the low burn.

Inspect the system at the insert connection and at the chimney top. Cooler surfaces tend to build creosote deposits quicker, so it is important to check the chimney from the top as well as the bottom.

The creosote and soot should be removed with a brush specifically designed for the type of chimney in use. A chimney sweep can perform this service. It is also recommended that before each heating season the entire system be professionally inspected, and cleaned and repaired if necessary. This insert should be removed for periodic inspection and cleaning of chimney.

**DOOR GASKET.**

Check the door gasket periodically for proper seal. As the door gasket compresses or "seats" during use it will be necessary to adjust or tighten the door latch. Wear or damage to the gasket material can cause air leakage into the firebox resulting in overfiring and loss of efficiency.

Replace the gasket when necessary with 3/4" diameter woodstove gasket material available from your local woodstove retailer or order Part #18589 Fire door Gasket Kit from your nearest DOVRE® dealer. The Fire door Gasket Kit comes complete with gasket material, high temperature adhesive and instructions.

**WARNING!**

**DO NOT OPERATE THIS INSERT IF THE DOOR GASKET IS MISSING OR DAMAGED. DANGEROUS OVERFIRING MAY OCCUR WHICH CAN DAMAGE THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY, POSSIBLY CAUSING A HOUSE FIRE.**

**DOOR GLASS.**

Do not strike or slam the door shut.

Inspect the glass regularly for cracks or breaks. If you detect a crack or break, extinguish the fire immediately and contact your DOVRE® dealer for replacement.

A portion of the combustion air entering the firebox is deflected down over the inside of the door glass. This air flow "washes" the glass helping to keep smoke from adhering to its surface.

When operated at a low burn rate less air will be flowing over the glass and the smoky, relatively cool condition of a low fire will cause the glass to become coated. If the deposits on the glass are not very heavy, normal glass cleaners work well. Heavier deposits may be removed by using a damp cloth dipped in wood ashes or by using

a commercially available oven cleaner. After using an oven cleaner, it is advisable to remove any residue with a glass cleaner, or soap and water. Oven cleaner left on during the next firing can permanently stain the glass and damage the finish on plated metal surfaces.

Do not clean the glass with materials that may scratch or otherwise damage the glass. Scratches on the glass can develop into cracks or breaks. Never attempt to clean the glass while a fire is in the unit.

The best way to keep the glass clean is to operate the stove efficiently by using dry well seasoned wood and burning moderate to hot fires.

**GOLD PLATED DOOR TRIM.**

**NOTE:** All prints and smudges must be wiped clean from the gold door trim prior to initial burn. If this is not done, these prints will be cured into the gold finish and set for the life of the stove.

To keep the finish looking its best, gently wipe with a soft cloth. If desired, use a non-abrasive cleaner such as soap and water, window cleaner, or vinegar and water. Never use any solvent, thinner, or abrasive cleaner since these will damage the finish.

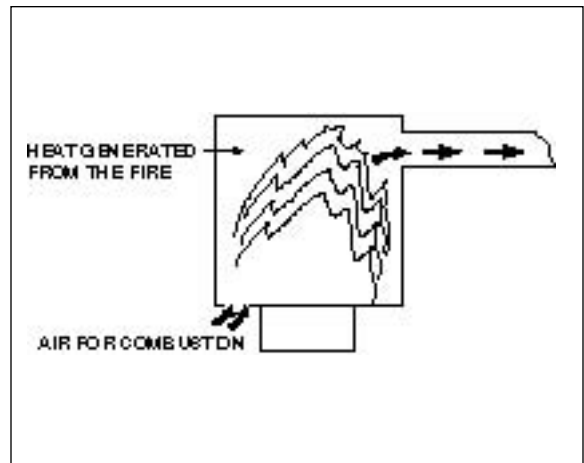
**G. FLUE DRAFT**

Like all modern woodburning appliances, The Model 400 woodstove requires the proper amount of flue draft to assure safe and efficient operation. Flue draft is measured as negative pressure in the chimney. The amount of negative pressure determines how strong the draft is. The draft is important because it draws the combustion air into the firebox and pulls the smoke out of the chimney.

There are three basic criteria essential in establishing and maintaining flue draft:

1. Availability of combustion air
2. Heat generated from the fire
3. Diameter and height of the flue system

These three factors work together as a system to create the flue draft. Increasing or decreasing any one of them will effect the other two and thus change the amount of draft in the entire system. See Figure 21.



**Figure 21**

1. **Availability of combustion air.** A source of air (oxygen) is required in order for combustion to take place. The air enters the firebox through an opening in the insert body. The amount of air allowed in is regulated by the draft slide control. The important thing is to realize that whatever air is consumed by the fire must be replaced. If you are using room air, the air is replaced through cracks around windows, under doors, etc. However, most newly constructed houses or existing homes fitted with tightly sealed doors and windows are relatively air tight. In this case, an outside air source must be made available to feed combustion air from outside the home into the stove.
2. **Heat generated from the fire.** Most of the heat produced from the fire is transferred into the heat exchanger of the insert, then into the room. However, part of this heat escapes up the chimney taking smoke and other combustion gases with it. Most modern woodburning appliances, including the Model 400, extract heat so efficiently that the amount that goes up the flue can be minimal. This is one reason why it is important to burn well seasoned wood. The heat generated from the fire should be warming your home and establishing the flue draft. It should not be wasted by evaporating moisture out of wet, unseasoned wood.
3. **Diameter and height of flue system.** A specific volume of air, determined by the diameter and height of the chimney connector and chimney, is contained within the flue system. As heat from the fire enters the flue, it warms this air causing it to rise. The air moving up the flue draws smoke and more heated air from the fire with it, thus establishing draft. The amount of draft depends on the temperature of the heated air and the volume of air that is contained in the flue system.

## DRAFT PROBLEMS.

For the Model 400 woodstove, the minimum flue draft requirement is 0.06 inches of water column as measured with a draft meter. Most woodstove dealers have draft meters available to measure your flue draft if you suspect a problem.

If the fire is hard to start and smoke spills out of the door, or you find it difficult to establish and maintain a moderately high burn rate, then the flue draft is too low and corrective measures must be taken.

Be sure you have air available for combustion and that your firewood is dry and well seasoned. Build your fires properly and according to the instructions given on page 18. Be sure your flue system is installed correctly and that it is the proper diameter and height. In addition, check for the following:

- All chimney connector sections are properly installed and the joints are sealed tightly.
- The chimney and chimney connectors are clean; free of creosote build-up.
- If utilizing an existing chimney that has been left unused over a period of time, be sure it is not obstructed with debris from animals or nesting birds.
- Make sure overhanging trees and branches are cut back within 10 feet of the top of the chimney.
- If the chimney cap is equipped with a spark arrestor screen, be sure it is clean and free of any build-up of soot or creosote.

If you still suspect you have a low draft problem it may be necessary to increase the volume of air in your flue system. Since the diameter of your flue system is matched with the size of the flue collar and should not be changed, then the height of the system will need to be increased. Add chimney a little at a time until the draft improves.

In some cases, regardless of what you do, it can still be difficult to establish the proper flue draft. This is especially evident when using an exterior factory-built chimney or exterior masonry chimney which is likely to have too large of a flue. Try placing several sheets of crumpled paper on top of your kindling as close to the flue outlet of the stove as possible. Light this paper first then the paper under the kindling. The heat generated from the rapidly burning paper on top of the kindling should help get the draft established.

Still other factors can effect how well your flue system performs. Neighboring structures, high winds, tall trees, even hillsides can effect air currents around the chimney. Well designed chimney caps, wind directional caps, even draft inducing caps are available that can help. Your woodstove dealer is the local expert in your area. He can usually make suggestions or discover problems that can be easily corrected allowing your woodstove and flue systems to operate correctly as it has been designed, providing safe and economical heat for your home.



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## H. INSTALLATION OF REPLACEMENT GLASS

**WARNING!**

**DO NOT OPERATE THE WOODSTOVE IF THE DOOR GLASS IS BROKEN OR MISSING. DANGEROUS OVERFIRING CAN OCCUR WHICH CAN DAMAGE THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY, POSSIBLY CAUSING A HOUSE FIRE.**

1. Make certain the fire is out and the appliance is cool to the touch.
2. Remove door from the appliance.
3. Lay door face down on a table or counter with the door handle hanging off the edge of the table so the door lays flat. Protect the table so neither the table nor door will be scratched.
4. Remove the screws from each glass retainer.
5. Remove the glass.
6. Use only 5mm Ceramic Glass, Part No. 20912.
7. Position the glass with its edges evenly overlapping the opening in the front door.
8. Replace the glass retainers. Be careful not to cross thread the screws.
9. Tighten each retainer just a few turns until each is secured. Then continue to tighten alternately each retainer a few turns at a time until the glass panel is tightened snugly.
10. Replace the door on the appliance.

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# WARRANTY

Aladdin Hearth Products warrants their wood heating appliances to the original purchaser for the lifetime of the appliance, to be free from defects in material and workmanship. This warranty gives you specific legal rights; you may have other rights which may vary from state to state.

This limited Lifetime Warranty covers items such as but not limited to steel and cast iron components, combustion chambers, doors, gold plating and glass damaged by thermal breakage.

All parts to be replaced must be returned to an authorized Aladdin Hearth Products dealer at purchaser's expense for inspection and approval by Aladdin Hearth Products prior to repair or replacement. No repair or replacement costs will be honored without approval of Aladdin Hearth Products.

This new Dovre product must be installed by a competent, authorized, service contractor. It must be installed and operated at all times in accordance with the Installation and Operating Instructions furnished with this product, as well as any applicable local and national codes. Any alteration, willful abuse accident, or misuse of the product shall void this warranty.

Any installation, construction, transportation or other related costs or expenses arising from defective part(s), repair, replacement, etc., will not be covered by this warranty, nor will Aladdin Hearth Products assume responsibility for them. Further, Aladdin Hearth Products will not be responsible for any incidental, indirect, or consequential damages, except as provided by law.

All electrical components such as but not limited to the blower assembly and speed control switch are covered by Aladdin's one-year warranty program.

Aladdin Hearth Products will not be responsible for any alteration to the unit which causes sooting that results in damage to the interior or exterior of the building in which this appliance is installed.

This warranty is void if the stove has been operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals, the stove is subjected to prolonged periods of dampness or condensation, or there is any damage to the stove or other components due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

This limited Lifetime Warranty does not extend to or include surface finish of the stove, door seal or firebrick. It does not cover installation or operational-related problems such as overfiring, use of corrosive driftwood, downdrafts or spillage caused by environmental conditions, nearby trees, buildings, hilltops, mountains, inadequate venting or ventilation, excessive offsets, or negative air pressures caused by mechanical systems such as furnaces, fans, clothes dryers, etc.

This limited Lifetime Warranty does not apply to venting components, hearth components or other accessories used in conjunction with the installation of this product not manufactured by Aladdin Hearth Products.

This limited Lifetime Warranty is effective on all wood stoves sold at point of retail after July 1, 1998, and supersedes any and all warranties currently in existence.

# **Attention**

## **WOODSTOVE INSTALLER**

***Please return these  
Operating & Installation  
Instructions to the  
Firebox  
for Consumer Use***



Aladdin Hearth Products  
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Colville, WA99114  
ADivision of Hearth Technologies Inc.