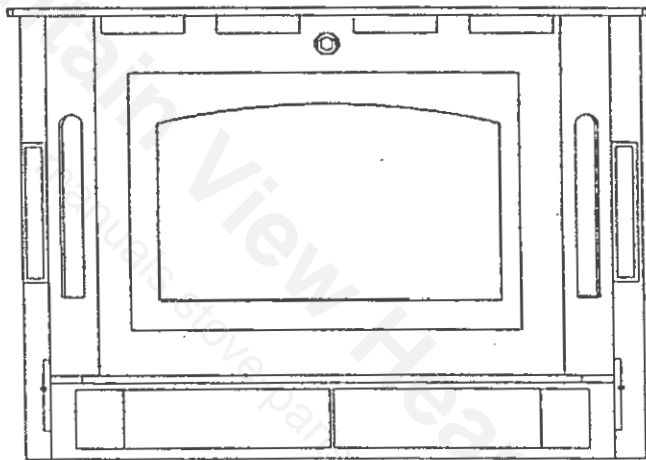


BUCK STOVE



MODEL 70 MODEL 71

- FEATURES**
PREPARATION INSTALLATION
OPERATION MAINTENANCE SAFETY

Contact your Insurance company for coverage and Installation Inspection

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.



This symbol on the nameplate means the product is Listed by Underwriters Laboratories, Inc.
File No. MH15931, MH15933, UL Standard No. 1482

Manufactured by New Buck Corp. - Spruce Pine, NC 28777 - EFFECTIVE 10/1/89

PN-PI 700660

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SECTION I

The New Buck Corporation room heater Models 70 and 71 are safe and efficient heating systems when installed and operated as specified in these instructions and as stipulated on the operation and installation labels affixed to the unit. The unit is designed to burn wood fuel only.

The installation and operating instructions found in this manual have been developed through extensive laboratory testing and in the field experience. The procedures outlined **MUST** be followed exactly to ensure a safe and operational installation as well as to validate your warranty.

Throughout the manual, you will see this symbol . This indicates areas of importance regarding safety. Please make a special note of these areas. Read these instructions carefully before installing your heater and keep them with your important papers for future reference.

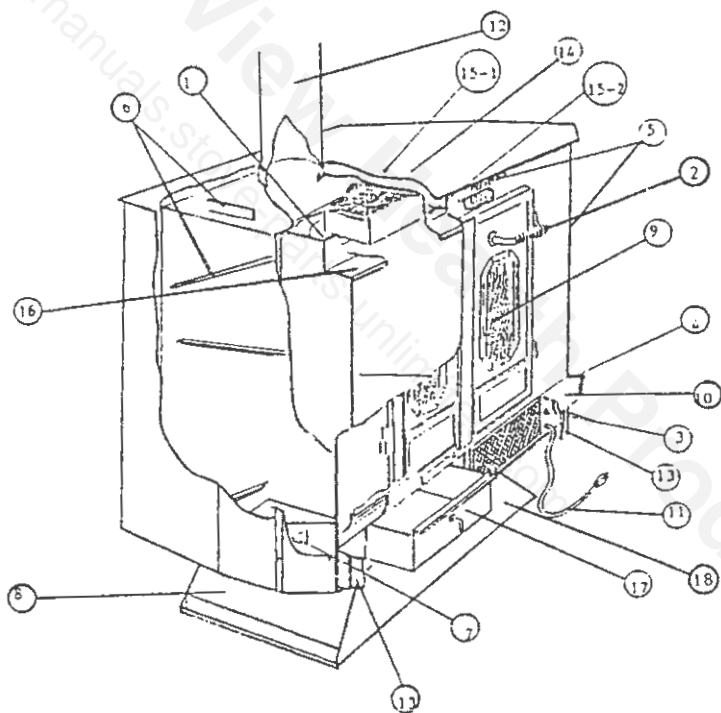


FIGURE 1

PHYSICAL FEATURES

Install and use only in accordance with the manufacturer's installation and operating instructions. Do not connect this unit to a chimney flue serving another appliance.

ROOM HEATER FEATURES

Before attempting to install or operate your heater, it is a good idea to familiarize yourself with the features and operating controls of the unit.

OPERATING CONTROLS (See Figure 1)

- 1. Bypass Damper:** The bypass damper control is located in the top center of the heater front, just under the top. It is operated by pushing or pulling the rod with the removable handle. The damper is fully open when the handle is pushed in and fully closed when it is pulled out. The damper must be opened before the door(s) are opened.
- 2. Removable Door Handle:** The removable door handle is located on the inside of the ash pan/motor cover door. The handle is held in place with a magnet or clip. To use, simply open the cover door and obtain the handle and use it to adjust the bypass damper or to open and close the door(s).
- 3. Blower Control:** Two blower control switches are located under the hearth and behind the cover door. The left switch is used to engage or disengage the automatic thermostat operation. Place in "Auto" for thermostat operation or place in "Manual" to operate the blower continuously. In the "Auto" position, the thermostat in the unit reacts to the temperature of the heater and switches on or off automatically depending on heater temperature.
- 4. Primary Air Controls:** The primary air intake draft controls are located on the lower portion of the unit next to the hearth extension. They are operated by moving up to open and down to close the amount of primary air entering the firebox.
- 5. Warm Air Outlets:** Provides heat extraction from the top and sides of the firebox.
- 6. Baffles:** Directs air flow around the unit for maximum heat transfer.
- 7. Air Inlet:** Allows cool air near the floor to be circulated through the blower and back into the warm air chamber of the heater.
- 8. Stand:** Elevates heater above the floor for safety and a neat appearance.
- 9. Door(s):** Provides an "airtight" feature. The door(s) allow a much higher burning efficiency than can be obtained with an open firebox.
- 10. Hearth Extension:** Offers protection from spilled ashes and cinders.
- 11. Power Cord:** Provides electrical power to operate the blower.
- 12. Chimney Connector:** Used to connect unit to chimney or direct connect kit.
- 13. Cover Door:** Conceals blower, blower controls and ash pan and provides for removable handle mounting.
- 14. Catalysts:** Enables the unit to burn cleanly and efficiently.
- 15. Temperature Monitor locations:** Two locations are provided. One is located in the top of the stove and can be used when the heater is installed as a freestanding heater. The other location can be used for either a fireplace insert or freestanding installation but the use of the New Buck Corp. Electronic Digital Temperature Monitor must be used.
- 16. Airwash:** Primary air is preheated in internal chambers and is directed in such a way as to provide a "sweeping" airwash over the glass to keep it clean. This design also allows higher burning efficiencies in the firebox.
- 17. Ashpan:** Provides for easy ash removal.
- 18. Outside Air Control:** Allows for adjustment of the amount of outside air entering the unit (installations using outside air kit # P5B.)

EPA COMPLIANCE STATUS

This manual describes the installation and operation of the New Buck Corporation, Model 70 and Model 71. The Model 70 Heater meets the U.S. Environmental Protection Agency's Emission limits for catalyst equipped wood heaters sold between July 1, 1990, and July 1, 1992. Under specific test conditions, the Model 70 heaters have been shown to deliver heat at rates ranging from 9800 to 31,100 BTU/Hr. The Model 71 Heater meets the U.S. Environmental Protection Agency's Emission limits for catalyst equipped wood heaters sold after July 1, 1992. Under specific test conditions, the Model 71 heaters have been shown to deliver heat at rates ranging from 13,100 to 40,200 BTU/Hr.

CATALYST EQUIPPED

This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against the law to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed.

CATALYST WARRANTY

The combustor supplied with the Model 70 is a set (2) of corning 2" x 2" x 7" x 25 cell long life combustors. The combustor supplied with the Model 71 is a set (3) of corning 2" x 2" x 7" x 25 cell long life combustors. Consult the catalytic combustor warranty also supplied with this wood heater. Warranty claims should be addressed to:

Corning Glass Works/Warranty Claim Department
Electronic Materials Plant - A Dock
Addison Road
Painted Post, NY 14870

See enclosed catalyst warranty for instruction on proper packaging for return shipment.

PROPER FUEL SELECTION

This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

DO NOT BURN:

- | | | | |
|---------------|------------|----------------|--------|
| *Treated Wood | *Garbage | *Solvents | *Trash |
| *Coal | *Cardboard | *Colored Paper | |

Burning treated wood, garbage, solvents, colored paper or trash may result in release of toxic fumes and may poison or render ineffective the catalytic combustor.

Burning coal, cardboard, or loose paper can produce soot, or large flakes of char or fly ash that can coat the combustor, causing smoke spillage into the room and rendering the combustor ineffective.

ACHIEVING CATALYTIC LIGHTOFF

The temperature in the stove and the gases entering the combustor must be raised to between 500 deg. F to 700 deg. F for catalytic activity to be initiated. During the start up of a cold stove a high firing rate must be maintained for about 20 minutes. This ensures that the stove, catalyst, and fuel are all stabilized at proper operating temperatures. Even though it is possible to have gas temperatures reach 600 deg. F within two to three minutes after a fire is started, if the fire is allowed to die down immediately it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning the smoke will keep it working.

ACHIEVING CATALYTIC LIGHTOFF- WHEN REFUELING

During the refueling and rekindling of a cool fire, or a fire that has burned down to the charcoal phase, operate the stove at a medium to high firing rate for about 10 minutes to ensure that the catalyst reaches approximately 600 deg. F.

CATALYST MONITORING

It is important to periodically monitor the operation of the catalytic combustor to ensure that it is functioning properly and to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions. Following is a list of items that should be checked on a periodic basis.

*Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decrease in performance. If any of these conditions exist, refer to Catalyst Troubleshooting section of the owner's manual.

*This catalytic heater is equipped with the means to install a temperature probe to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of 1000 deg. F. If catalyst temperatures are not in excess of 500 deg. F, refer to Catalyst Troubleshooting section of this owner's manual. You can get an indication of whether the catalyst is working by comparing the amount of smoke leaving the chimney when the smoke is going through the combustor and catalyst light-off has been achieved to the amount of smoke leaving the chimney when the smoke is not routed through the combustor (bypass mode).

Step 1 - Light stove in accordance with instructions.

Step 2 - With smoke routed through the catalyst, go outside and observe the emissions leaving the chimney.

Step 3 - Engage the bypass mechanism and again observe the emissions leaving the chimney.

Significantly more smoke should be seen when the exhaust is not routed through the combustor (bypass mode). Be careful not to confuse smoke with steam from wet wood.



CAUTION AGAINST OVERFIRING

Do Not Overfire This Heater.

Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater and to the catalytic combustor.

MAINTAIN PROPER DRAFT

Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions, and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause backpuffing into the room and "plugging" of the chimney or the catalyst.

Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints.

An uncontrollable burn or a glowing red stove part or chimney connector indicates excessive draft.

ASH REMOVAL

Whenever ashes build up in the firebox and when the fire has burned down and cool, remove excess ashes. Leave an ash bed approximately 1 inch deep on the firebox bottom to help maintain a hot charcoal bed.

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, away from all combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled.

SECTION II

MASONRY INSERT INSTALLATION

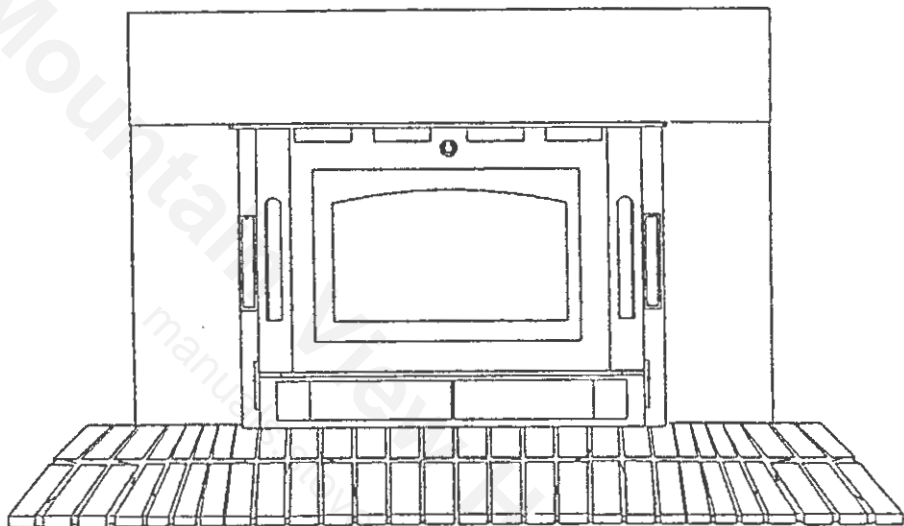


FIGURE 1



INSTALLATION PRECAUTIONS

Extensive field and laboratory testing has shown that catalytic stoves perform best as fireplace inserts when:

1. A positive sealing direct connect kit is used to connect the stove exhaust outlet directly to the masonry flue of the fireplace when flue liner size is approximately the same size as the heater flue gas exit. A rain cap is also recommended to keep flue dry thus allowing a hotter draft.

NFPA 211 Code: The National Fire Protection Association code requires all fireplace insert heaters to be positively connected from the heater to the flue liner.

2. An equivalent sized oval flue liner is installed when the flue liner size is larger than the heater flue gas exit. Connection must be from stove exhaust outlet extending the full height of the chimney and must include a rain cap.
3. Height of the chimney is at least 15 feet tall.
4. Location of chimney is interior (not on an outside wall).

Satisfactory results have been reported with installations other than as listed above. However, as all chimneys draw differently, problems with performance may be encountered if steps are not taken to keep the chimney hot. A draft between .03 and .06 inches of water is recommended for proper catalytic operation.

Use the following to complete the installation of the unit as an insert:

Model 70: #FP70

Model 71: #FP70

SECTION II:

INSTALLATION (Fireplace Insert)

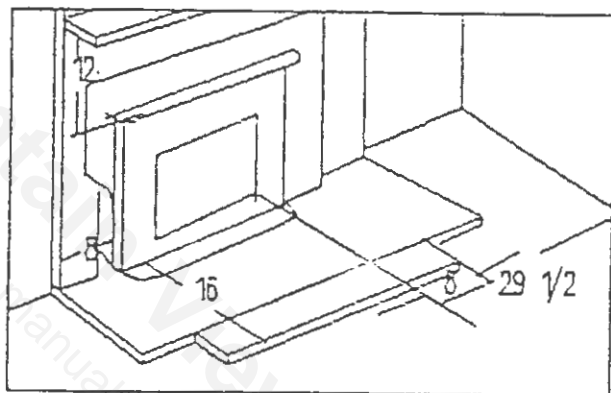


Figure 2

FIREPLACE INSERT

Minimum Clearances:

The Model 70 and 71 Fireplace Inserts are intended for installation in accordance with the standard for chimneys, fireplaces, vents, and solid-fuel burning appliances, NFPA-211 Code. This model is not intended for installation into factory-built metal fireplaces or for use with a metal chimney.

1. The hearth must be of masonry construction and must extend a minimum of 16" in front of the firebox opening and a minimum of 8" to either side of the firebox opening.
2. If there is not 16" from the front of the firebox opening and the front of the masonry hearth, a floor protector must be used in front of the hearth to protect combustible materials. 2" of brick, a listed "floor protector" or a floor protector made of non-combustible, inorganic material with a "K" factor may be used as follows:

$$K = 2.5 \text{ BTU}/(\text{ft}^2) (\text{Ft}^2) (\text{°F}/\text{IN})$$

ALTERNATE FLOOR PROTECTORS MATERIALS

With the floor protector or hearth extension material specified as one layer of 2" thick brick with a K * factor of 5.0, you may use alternate materials as long as the K factor(s) is calculated as follows:

Formula: Required thickness = (K of alternate material/K of millboard) X (thickness of millboard)

Example: An alternate inorganic non-combustible millboard with a K of .9375 would require a thickness as follows:

$$\begin{aligned} \text{Required thickness} &= (.9375/5.0) \times 2 \text{ in.} \\ &= 3/8 \text{ inch} \end{aligned}$$

K Factors of Alternate Materials:

Material	K	Required Thickness
Ceraform 126	.21	1/8"
Limestone	8.0	3.2"
Concrete	8.0	3.2"
Sandstone	13.0	5.2"
Marble	18.0	7.2"

Hearth extension or floor protector thicknesses above four (4) inches are generally not acceptable due to cost, floor load capacity, and look. The alternate we recommend is using ceraform No. 126 millboard 1/8" thick minimum and putting any type decorative brick or stone (any thickness) on top of it.

* The "K" factor represents the thermal conductivity of a material and is the time rate of heat flow through a homogeneous material under steady-state conditions, through unit area, per unit temperature gradient in the direction perpendicular to a surface.

3. If your fireplace has wood trim above it, the wood trim must be at least 8" above the top of the unit and may be a maximum of 1/2" thick.

4. If your fireplace has a wood mantel, the mantel or mantel supports must be located at a height greater than 12" above the top of the unit.

REQUIRED FIREPLACE DIMENSIONS

Minimum and/or maximum fireplace dimensions:

	Height		Width		Depth
	Min.	Max.	Min.	Max.	Min.
Model 70	24-1/8	31	36	46	20 (17")
Model 71	24-1/8	31	36	46	20 (17")

* Depths from 17" to 19 1/2" also accommodate the heater if the top panel is cut down in size.

POSSIBLE TOOLS NEEDED FOR INSTALLATION

If you decide to install your own stove, there are several hand tools you may need to do the job. If you do not already have them, they are readily available at most hardware stores.

Caulking gun

Large adjustable wrench (may not be needed)

Drop cloths

Vacuum cleaner or whisk broom

Flashlight

1 tube of RTV silicone, Code 103 or 106, or high temperature rubber cement rated between 450 deg. - 600 deg. F.

7/32" drill bit and drill

Socket/Ratchet Set

INSTALLATION PREPARATION

Fireplace

1. Locate furniture and other materials away from the front of the fireplace to allow free access to the fireplace.
2. Cover the hearth and adjacent floor areas with the drop cloths to protect from soiling or marring the surface.
3. Remove the existing fireplace damper plate.
4. Thoroughly clean the fireplace of ashes and soot.

5. Check the chimney and smoke chamber for excessive buildups of creosote or soot. Also, check for obstructions, such as birds' nest. If the chimney is excessively dirty, clean it, or have someone clean it professionally BEFORE installing or using the room heater.
6. If the fireplace has an ash dump or outside air provision, these must be sealed off with metal or tightly packed non-combustible insulation to prevent this cold air from entering the fireplace chamber.

Heater Preparation

1. Remove the protective plastic wrapping from the stove.
2. Inspect the unit for any obvious physical damage.
3. Plug the power cord into a 115 VAC outlet to test the motor and fan. Place the blower control in the "MANUAL" position to test.
4. Check the primary air draft controls to ensure that they slide freely.
5. Check the operations of the damper control to ensure that it will open and close properly.

INSTALLATION Procedure (Use a Listed Direct or Positive Connect)

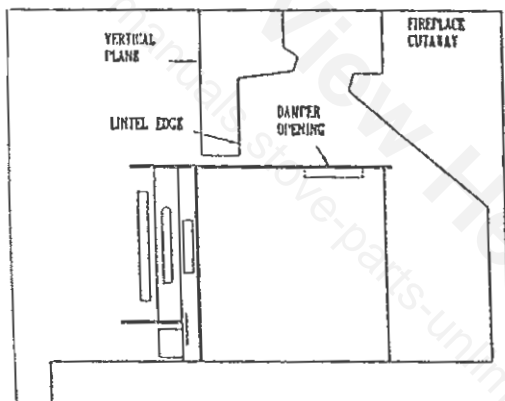


FIGURE 3

POSITIONING

POSITIONING THE HEATER

When positioning the heater, the following conditions MUST be met! (See Figure 3)

1. The front of the damper opening must be positioned BEHIND the rear edge of the lintel to ensure proper draft. (See Figure 3)
2. The vertical plane of the fireplace front must fall BEHIND the side cold air vent on top of the unit. (In other words, it is possible to have the heater too far in as well as not far enough.)
3. Center the heater in the fireplace opening.

MOUNTING THE TRIM PANELS

After the unit is positioned, as shown in Figure 3, mark the mounting position of the trim panels as follows:

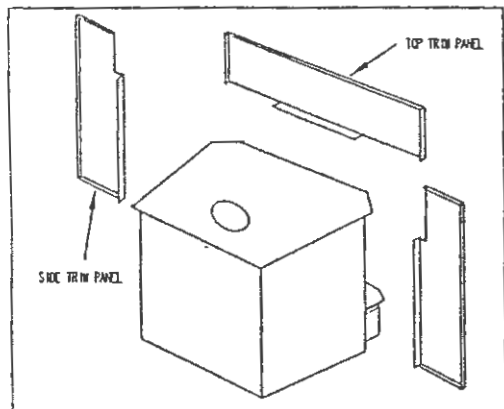


FIGURE 4

MOUNTING TRIM PANELS

1. Set the top (long) trim panel in place on top of the unit. The panel should be flat against the outside face of the fireplace, and standing vertically. Mark along the lower edge of the trim panel with a pencil to make a reference line for mounting.
2. Set the side trim panels in place, again flat against the face of the fireplace. Mark down the inside edge of the trim panel to make a vertical reference line.

NOTE: For short depth (17" to 19 $\frac{1}{2}$ ") see Figure 7.

3. Slide the unit out of the fireplace far enough to work behind the trim panel reference lines.
 4. **CAUTION:** If optional fireplace trim kit brass will be used on the trim panels, set the trim panels out $5/16''$ to allow for brass overhang.
 5. Mount the side trim panels. (See Figure 4)
 - a. Position the trim panel on the reference line.
 - b. Drill Mounting Holes in center of trim panel mounting brackets to allow for adjustment in and out if necessary.
 - c. Mount the trim panel using the self-tapping screws provided.
 6. Mount top trim panel to side panels with screws provided as indicated in Figure 4.
 7. If desired obtain optional brass trim from box and assemble using an "ell" bracket in each corner where the top and side trim joins. Tighten set screws joining trim together.
 8. Next slip the brass trim over the top edge of the trim panels and slide all the way down until sides and tops interlock. Obtain screws provided and lock brass trim in place. (See Figure 5).
 9. Slide the unit back into the fireplace. Check to be sure that the trim panels (and brass) are properly positioned and lie flat against the front of the fireplace. If one or more of the panels is out of position, slide the unit out and reset by loosening the mounting screws and repositioning in the slot. (See Figure 6).
- NOTE:** If side and top panels gap due to unevenness of fireplace (normally on rock faced fireplaces), you will need to drill a $5/32''$ hole through both side and top panels near where the panels intersect and install a #10 self threading screw to eliminate the gap (paint screws to match).

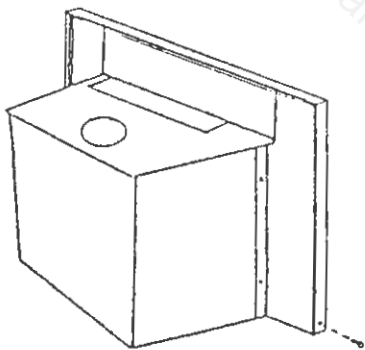


FIGURE 5 **Securing Panels and Brass Trim**

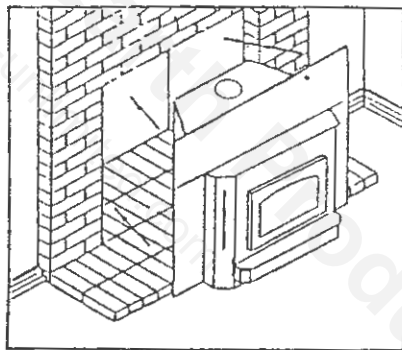


FIGURE 6

10. Pull the unit back out of the fireplace and remove the brass and top trim panel to facilitate the installation of the direct connect or positive connect.
11. Now, follow the installation procedures in the listed direct or positive connect kit you are using and install the heater and connector kit in the fireplace.
12. Reinstall the top trim panel.
12. Obtain the brass trim and slip over the top and sides. You will have to spread out the side brass pieces and raise the brass approximately 8-10 inches above the top of the trim panel before the brass will go on.
14. Using the two brass screws provided, secure the brass to the trim panel at each side.

Short depth installation: follow the basic trim kit installation instructions except you will have to:

- 1) Cut off both ends of the top panel to the same dimension as the side panels (outside edge)
- 2) Drill two (2) 5/32" holes through each side of the top and side panels as shown in Figure 7 below.
- 3) Install 2 each #10 self threading screws per side to join panels (paint screws to match).

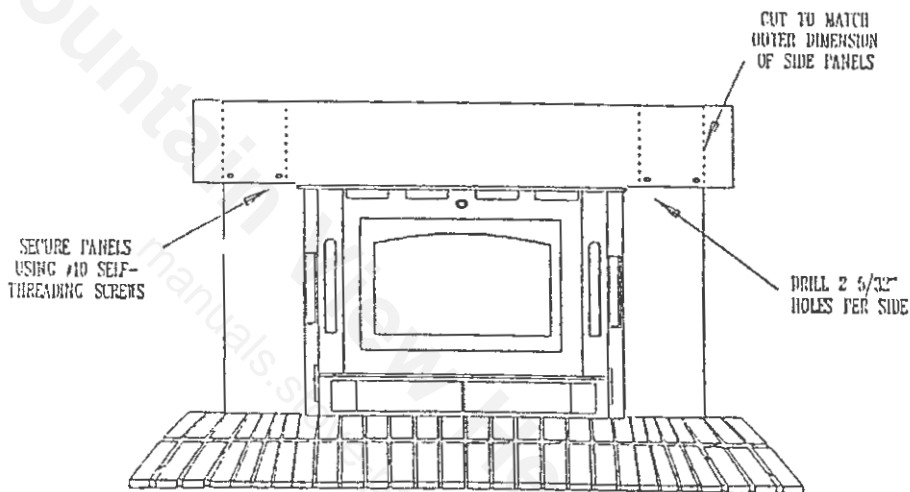


FIGURE 7

Short Depth Installation

FINAL CHECK

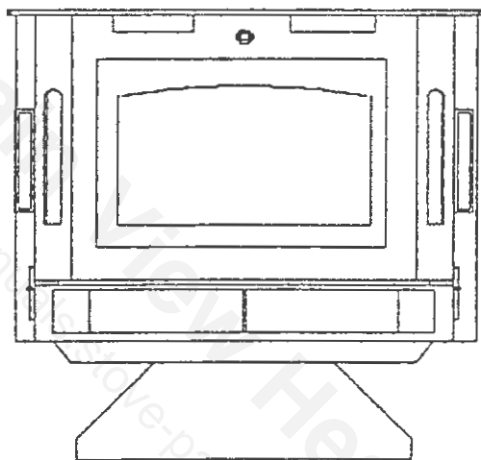
1. Recheck the specified clearances.
2. Remove all foreign material from the firebox area.
3. Open the primary air drafts and damper bypass.
4. Plug the power cord into a 115 VAC outlet.
5. Place crumpled pieces of newspaper in the stove. Light it and close the doors. Ensure that the stove draws properly through the primary drafts.
6. Check for smoke leaks around the doors.
7. Open the doors and check for smoke escaping from the front of the stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be preheated by lighting newspaper and holding it near the open damper with a poker or fire tong. Once the chimney heats up, a proper draft can usually be obtained.

If a thorough review of the Troubleshooting Guide in the rear of the manual does not reveal the problem, contact your dealer for assistance.

NOTE: The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. You may notice a slight smoking effect and an odor of burning paint when you build the first fires. This is normal and is not a cause for alarm. In some cases, these fumes will activate a smoke alarm. Cracking a window near the unit will allow these fumes to escape. DO NOT build a large, roaring fire until this curing is complete or the heater finish may be damaged.

SECTION III

RESIDENTIAL FREESTANDING ROOM HEATER INSTALLATION



INSTALLATION PRECAUTION

Extensive field and laboratory testing has shown that catalytic stoves perform best as freestanding stoves when vented into a masonry chimney when:

1. A rain cap is installed on the chimney.
2. Height of chimney is at least 15 feet tall.
3. Location of chimney is interior (not on an outside wall).
4. In a high pitch or chalet ceiling, use a minimum amount of single wall pipe but never run more than five (5) feet. Long lengths of single wall pipe will result in rapid cooling of the flue gas and heater draft and performance will be affected.

NOTE: Certain types of double wall pipe (close clearance) also cause a substantial drop in flue gas temperature. If a double wall pipe connector is being contemplated, check with the pipe manufacturer to ascertain that the use of their product will not affect the flue gas temperature. Do not use double wall pipes which reduce flue gas temperatures.

Satisfactory results have been reported with installations other than listed above. However, draft problems are possible if a hot chimney is not maintained.

*Use pedestal kits as follows:

Model 70 Kit #P4B or Kit #P7B (Outside Air Kit)

Model 71 Kit #P4B or Kit #P7B (Outside Air Kit)



CAUTION: Do not connect this unit to a chimney flue serving another appliance.

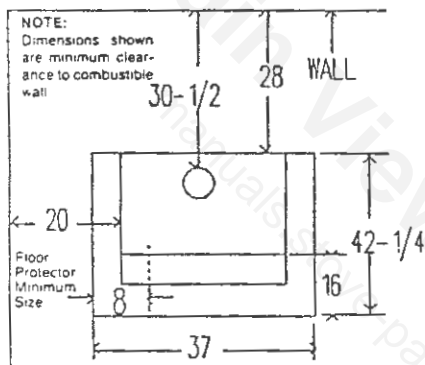
MODEL 70 and 71

Minimum Clearances

The New Buck Corporation Models 70 and 71 must be installed in compliance with the instructions contained in this manual.

Clearance from combustible walls and ceilings.

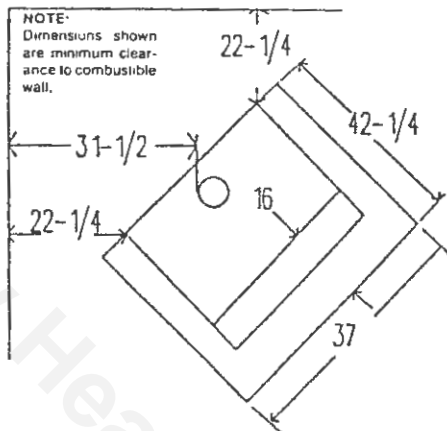
The minimum lateral distance between any part of the room heater and combustible walls is shown in Figures 1 and 2.



MODEL 70/71

FIGURE 1

Wall Installation



MODEL 70/71

FIGURE 2

Corner Installation

FLOOR PROTECTION

If a freestanding model is to be installed on a combustible floor, a noncombustible pad must be placed below it to protect the floor from burning material from the stove. The pad must be 37 inches wide by 42 1/4 inches deep. U.L. tests were conducted without a floor protector. Therefore, the protector can be of any thickness and any "k" factor.

The unit must be positioned on the pad so that there is a minimum of 16" from the front of the door to the front of the pad, and a minimum of 8" measured horizontally from the sides of the fuel loading and ash removal openings to the sides of the pad.

NOTE: For clearance reductions using wall protectors refer to the NFPA-211 Code.

TOOLS FOR INSTALLATION

Drop Cloth

Electric Drill with 7/32" drill bit

1/2" - 9/16" combination wrench

3/8" magnetic socket chuck adapter, 3/8" wrench (box or socket) or adjustable wrench

Socket Set

Tape Measure

Pencil

Level

Screw Driver

Preparing The Stove for Installation

1. Remove the protective plastic wrapping from the unit.
2. Inspect the unit for any obvious physical damage.
3. Plug the power cord into a 115 VAC outlet to test the motor and fan. Place the blower control in the "MANUAL" position to test.
4. Check the primary air draft controls to ensure that they slide freely.
5. Check the operation of the damper bypass control to ensure that it will open and close properly.
6. Remove any items from within the firebox. Spread the drop cloth on the floor behind the heater. Next, tilt the heater so that the back is on the drop cloth. (If the unit is installed using the outside air pedestal kit, remove the 3/4" hole plug from the bottom of the heater.)
7. Using a tape measure, make a line down 7/16" from the front of the heater.
8. Open the corresponding freestanding kit and obtain the stand. Place the stand against the bottom of the heater (angle side to heater) at the marked line. Center the stand left and right and mark screw locations on bottom through outer holes of stand mounting angles. Set stand aside and drill four 7/32" holes in heater bottom. (See figure 3)
9. Obtain four 1/4" self tapping screws and secure the stand to the heater.
10. Reposition the heater to the upright position.

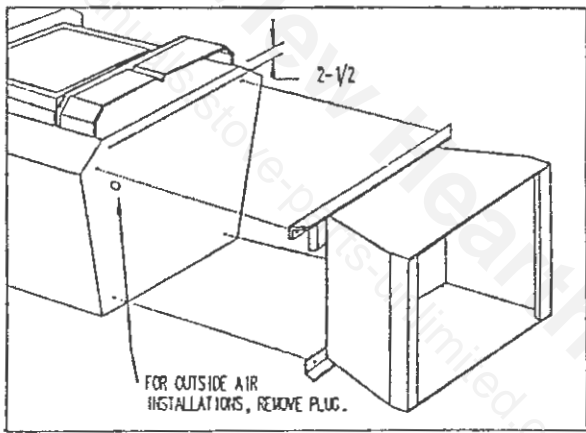


FIGURE 3 MOUNTING PEDESTAL

Preparing The Room Heater Location

1. Select an installation location that will give the best airflow from the front of the heater to the remainder of the home.
2. Place the protective floor pad in position.
3. Place the unit on the pad making sure the minimum clearance specifications are met.
4. In connecting to an existing masonry flue, first ensure that the flue conforms to the NFPA-211 Code and/or consult your local code for proper procedures.

CHIMNEY

Ceiling Exits:

The Models 70 and 71 are designed for connection to either 8" inside diameter Underwriters Laboratories, Inc. listed Metal Fab type "TG" or Simpson Dura-Vent type "SDP" all fuel residential type and building heating appliance chimney, "Type HT" 2100 Deg. F rated.

90° Wall Exits:

The Models 70 and 71 are designed for connection to either 8" inside diameter Underwriters Laboratories, Inc. listed all fuel residential type and building heating appliance chimney, "Type HT" 2100 deg. F rated, or to a masonry chimney which meets the specifications of the National Fire Protection Association's 211 Code.

DETERMINING THE CHIMNEY LOCATION

A. Ceiling Exit (Using Single Wall Chimney Connector and Metal Fab type "TG" or Simpson Dura-Vent type "SDP" chimney)

1. Suspend a plumb bob from the ceiling above the unit so that the weight is hanging in the center of the flue exit. (A small weight on a string will serve as a plumb bob). Mark the ceiling where the string is suspended to locate the center of the chimney hole.
2. After locating the center of the hole, install the ceiling support box, chimney, flashing, storm collar and rain cap per the chimney manufacturer's instructions.

CAUTION: Use only Metal Fab type "TG" or Simpson Dura-Vent type "SDP" chimney.

3. Now, connect the stove and ceiling support box using #24 ga. minimum blued or black steel connector pipe (do not use galvanized pipe). Connect each section so the crimped end faces downward, and secure each section to each other using at least three (3) sheet metal screws or rivets. Also, use the screws and pipe mounting clips provided in the freestanding kit and secure the pipe to the heater.

(See Figure 4)

NOTE: If the optional New Buck Corp. chimney connector is used, disregard the pipe mounting clip instructions and follow the instructions contained in the chimney connector kit (PN MA8CHIMCNB).

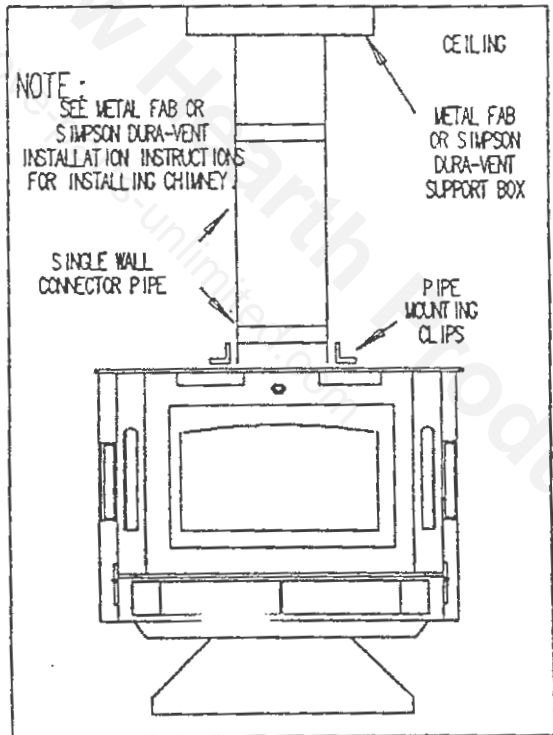


FIGURE 4

B. Wall Exit into metal tee-box.

1. Mark the plumb line on the wall directly behind the center of the heater. (See figure 5).
2. Place the vertical portion of the heater pipe and the elbow in position and project a point onto the plumb line level with the center of the elbow.
3. Measure up so there will be at least 1/4" rise per. foot of horizontal connector pipe, maintaining clearances as noted in Figure 5. This will give you the center of the hole for the chimney penetration.
4. After locating the center of the penetration, install the tee box and chimney as per the chimney manufacturer's specifications.
5. Connect the chimney collar to the tee-box using #24 ga.-minimum blued or black steel connector pipe. **DO NOT** use galvanized pipe. Connect each section so the crimped end faces downward, and secure each section to each other using at least three steel sheet metal screws or rivets.
6. Using the screws and pipe mounting clips provided in the free-standing kit, secure the pipe to the heater. (See Figure 5)

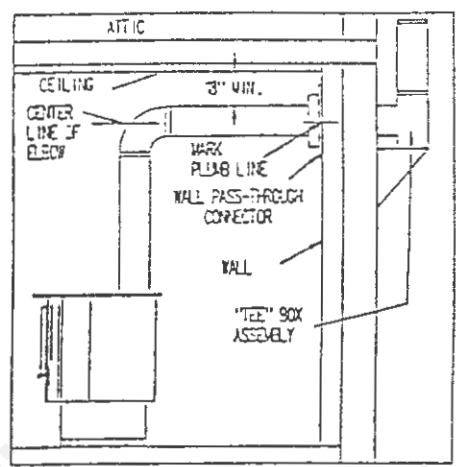


FIGURE 5 Flue Exit into "Tee" box assembly

C. Wall Exit into Masonry

1. Before connecting the Models 70 and 71 to a masonry chimney, determine that the masonry fireplace wall pass-through connector thimble meets the NFPA-211 Code and local building codes and is a minimum of 18" from the ceiling. If the connector thimble does not meet these codes, the pass-through connector must be modified. Connectors may pass through walls or partitions constructed of combustible material if the connector is:
 - (a) Either listed for wall pass-through or is routed through a device listed for wall pass-through and is installed in accordance with the conditions of the listing.
 - (b) Selected or fabricated in accordance with the conditions and clearances as stated in table 5-7 of the 1988 NFPA 211 Code. Any unexposed metal that is used as part of a wall pass-through system and is exposed to flue gases shall be constructed of stainless steel or other equivalent material that will resist corrosion, softening, or cracking from flue gases at temperatures up to 1800 deg. F.

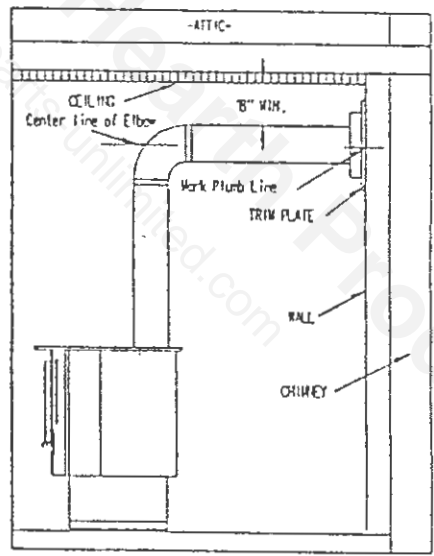


FIGURE 6 Flue Gas Exit into Masonry Chimney

In addition, a connector to a masonry chimney shall extend through the wall to the inner face or liner but not beyond, and shall be firmly cemented to masonry.

Exception: A thimble may be used to facilitate removal of the chimney connector for cleaning, in which case the thimble shall be permanently cemented in place with high-temperature cement.

2. Once the through-the-wall thimble codes are met, simply connect the chimney collar to the wall pass-through connector using #24 ga. minimum, blued or black steel connector pipe as follows:
 - (a) Maintain 1/4" rise per foot (horizontal length) from the appliance to the chimney.
 - (b) Connect each section so the crimped end faces downward.
 - (c) Secure each section to each other using at least three (3) sheet metal screws or rivets.
 - (d) Use the screws and pipe mounting clips provided (or optional chimney connector PN MA8CHIMCNB) and secure the chimney connector to the heater. (See Figure 6)



CAUTION: Because of the high efficiency and low flue gas temperatures, free-standing catalytic heaters connected to masonry chimneys with oversized flue liners may encounter drafting problems.

FINAL CHECK

1. Recheck the specified clearances.
2. Remove all foreign material from the firebox area.
3. Open the primary air drafts and damper bypass.
4. Plug the power cord into a 115 VAC outlet.
5. Place crumpled pieces of newspaper in the stove. Light it and close the doors. Ensure that the stove draws properly through the primary drafts.
6. Check for smoke leaks around the doors.
7. Open the doors and check for smoke escaping from the front of the stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be preheated by lighting newspaper and holding it near the open damper with a poker or fire tong. Once the chimney heats up, a proper draft can usually be obtained.

If a thorough review of the Troubleshooting Guide in the rear of the manual does not reveal the problem, contact your dealer for assistance,

NOTE: The unit is painted with a specially formulated high temperature paint that cures during the first two or three firings. You may notice a slight smoking effect and an odor of burning paint when you build the first fires. This is normal and is not a cause for alarm. In some cases, these fumes will activate a smoke alarm. Cracking a window near the unit will allow these fumes to escape. DO NOT build a large, roaring fire until this curing is complete or the heater finish may be damaged.

SECTION V

WOOD HEATER SAFETY

Certain safety hazards are inherent in any wood heater installation. You should be aware of these so that a safe and proper installation can be made.

1. **FAULTY CHIMNEY:** An older masonry chimney should be thoroughly checked to be sure there are no holes or weak spots which could allow sparks or hot gasses to escape.
2. **HEAT CONDUCTION:** Placing combustible materials too close to a heater or chimney can be a fire hazard.

By keeping these particular hazards in mind as you install and use your room heater you can ensure a safe, reliable installation.

SAFETY PRECAUTIONS


For your protection, read and follow these safety precautions closely:

1. Use a spark arresting shield (3/8" mesh) on top of the chimney. Check monthly as this is a code requirement in some areas.
2. Use smoke detectors around the heater as well as in sleeping areas.
3. Keep a fire extinguisher rated for Class "A" fires near the heater.
4. Check with your insurance company to be sure your policy covers the installation and use of a wood fired room heater.
5. **Creosote-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 connector and/or chimney should be inspected at least once a month during the heating season to determine if a creosote buildup has occurred.

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

6. Locate furniture and any other combustible away from the heater.
7. Store firewood at a safe distance from the heater.
8. **Disposal of Ashes:** Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible 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 dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Ashes can ignite up to 72 hours after removal.
9. Always exercise caution when using your heater. Be particularly careful when there are children around an operating heater.

CAUTION!!  NEVER use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or "freshen up" a fire in the heater. Keep all such liquids well away from the stove when it is in use. All fluids of this type give off volatile fumes and can **WILL EXPLODE!!** Don't take a chance with the safety of your home and family.

SECTION VI

HEATER OPERATION

This section of the manual is to help you get the maximum efficiency and maximum smoke (particulate) reduction from your Model 70 or 71 heater. If you should experience any difficulty or have any questions concerning your heater, contact your dealer for assistance.

Building a fire for maximum efficiency: Because this heater burns wood and extracts heat so efficiently, a large fire is not necessary. A large fire not only wastes energy, it usually results in the home being too warm for comfort.

The following steps will serve as a guide for operating your heater.

Building a Fire:

1. Place the blower control switch in the "Automatic" controlled position.
2. Open the door(s).
3. While looking inside the firebox, operate the damper bypass door in and out observing the movement. If the door does not operate freely and seal to the door opening, then the door has jumped out of its track during shipping and/or installation.
4. Open the primary air controls on each side of the stove. Also, open outside air control if so equipped.
5. Twist two pieces of non-colored newspaper into a roll and place them on the floor of the firebox.
6. Lay several pieces of dry kindling on top of the newspaper.
7. Place three or four small pieces of firewood, 2-3" in diameter, on top of the kindling.
8. Light the newspaper in the front, close and latch the door(s). Don't leave the fire unattended at this point. The draft system of the heater should start quickly. It may be necessary to preheat the chimney to get the draft started. To do this, open the door(s) and add newspaper to the top rear of the wood. Light or let this paper ignite and allow to burn while holding the door(s) slightly cracked. Once the draft has started, close and lock the door(s).
9. After embers and a coal bed have been established, load the heater with wood.

A. Low Burn Rate - Set primary air controls (one on each side) to the low setting.

Wood Loading - During refueling, open (push-in) the by-pass damper to allow smoke in the firebox to escape, open the door(s), and add wood. Immediately close door(s) and by-pass damper. Open primary air controls wide open for five minutes to charge wood. Reset primary air controls to the low setting.

After most of the wood is burned and if you are not planning on reloading immediately, it may be necessary to open the by-pass and door(s) and rake the wood and coals into a pile near the front center of the firebox (be certain wood chunks are pulled out of the rear corners). Close door(s) and by-pass. This step will assure continued combustion and thorough burning of the wood.

Medium - Low Burn Rate - Set the primary air controls to the medium-low setting.

Wood Loading - During refueling, open the by-pass damper, open the door(s), and add wood. Immediately close door(s) and by-pass damper. Open primary air controls wide open for five minutes to charge wood. Reset primary air controls to the med-low setting.

During Burn - After most of the wood is burned and if you are not planning on reloading immediately, it may be necessary to open the by-pass and door(s) and rake the wood coals into a pile near the front center of the firebox (be certain wood chunks are pulled out of the rear corners). Close door(s) and by-pass. This step will assure continued combustion and thorough burning of wood.

Medium - High Burn Rate - Set the primary air controls to the medium - high setting. **Wood Loading** - During refueling, open the by-pass damper, open the door(s), and add wood. Immediately close door(s) and by-pass damper. Open primary air controls wide open for five minutes to charge wood. Reset primary air controls to the med-high setting.

During Burn - After most of the wood is burned and if you are not planning on reloading immediately, it may be necessary to open the by-pass and door(s) and rake the wood and coals into a pile near the front center of the firebox (be certain wood chunks are pulled out of the rear corners). Close door(s) and by-pass. This step will assure continued combustion and thorough burning of the wood.

High Burn Rate - Set primary air controls wide open.

Wood Loading - During refueling, open the by-pass damper, open the door(s), and add wood. Immediately close door(s) and by-pass damper.

You will have to experiment with the fire rate until you find the particular setting for heating your home. Chimney drafts, tightness of the house doors and windows, and atmospheric conditions all influence which setting you must have so it may take you several firings to learn the setting necessary for your installation.

MODEL 70 and 71 OPERATION

Alternate Operation: in case of thermostat failure, follow these instructions.

- A. Low Burn Rate** - Set primary air controls (one on each side) to the low setting. Set the fan speed to low (low to med-low position on motor label).

Wood Loading - During refueling, open (push-in) the by-pass damper to allow smoke in the firebox to escape, open the door(s), and add wood. Immediately close door(s) and by-pass damper. Open primary air controls wide open for five minutes to charge wood. Reset primary air controls to the low setting.

After most of the wood is burned and if you are not planning on reloading immediately, it may be necessary to open the by-pass and door(s) and rake the wood and coals into a pile near the front center of the firebox (be certain wood chunks are pulled out of the rear corners). Close door(s) and by-pass. This step will assure continued combustion and thorough burning of the wood.

- B. Medium-Low Burn Rate** - Set the primary air controls to the medium-low setting. Set the blower fan speed to low (low to med-low position on motor label).

Wood Loading - During refueling, open the by-pass damper, open the door(s), and add wood. Immediately close door(s) and by-pass damper. Open primary air controls wide open for five minutes to charge wood. Reset primary air controls to the med-low setting.

During Burn - After most of the wood is burned and if you are not planning on reloading immediately, it may be necessary to open the by-pass and door(s) and rake the wood and coals into a pile near the front center of the firebox (be certain wood chunks are pulled out of the rear corners). Close door(s) and by-pass. This step will assure continued combustion and thorough burning of the wood.

- C. Medium - High Burn Rate** - Set the primary air controls to the medium-high setting. Set the blower fan speed to medium (med-high to high position on motor label).

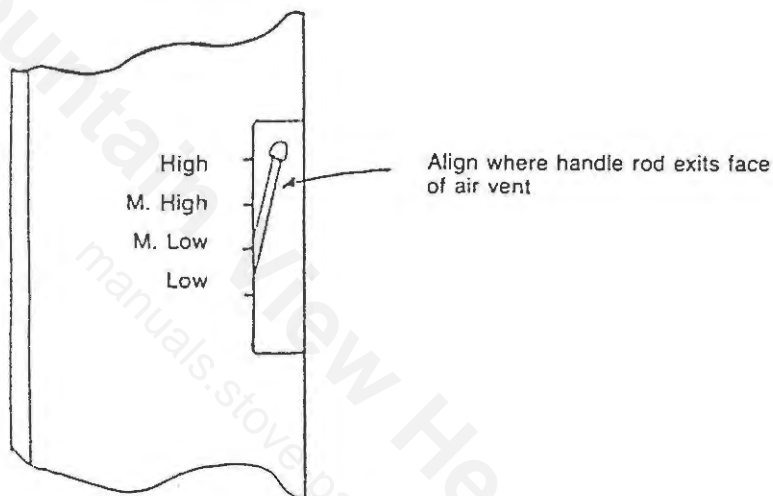
Wood Loading - During refueling, open the by-pass damper, open the door(s), and add wood. Immediately close door(s) and by-pass damper. Open primary air controls wide open for five minutes to charge wood. Reset primary air controls to the med-high setting.

During Burn - After most of the wood is burned and if you are not planning on reloading immediately, it may be necessary to open the by-pass and door(s) and rake the wood and coals into a pile near the front center of the firebox (be certain wood chunks are pulled out of the rear corners). Close door(s) and by-pass. This step will assure continued combustion and thorough burning of the wood.

D. High-Burn Rate - Set primary air controls wide open. Set the blower fan speed to medium (med-high to high position on motor label).

Wood Loading - During refueling, open the by-pass damper, open the door(s), and add wood. Immediately close door(s) and by-pass damper.

NOTE: To select primary air setting, center rod where it exits the air vent opening and align to the marked settings on the heater.



You will have to experiment with the fire rate until you find the particular setting for heating your home. Chimney drafts, tightness of the house doors and window, and atmospheric conditions all influence which setting you must have so it may take you several firings to learn the setting necessary for your installation.

NOTE: The high speed blower setting should not be used during normal operation. High is designed to cool a stove which has been overheated.

Although the catalytic heaters cut down on ash residue, routine removal of excess ash is still necessary.

OPERATING AND SAFETY HINTS:

When preparing to refuel the heater, open the bypass damper (taking the heater out of catalytic mode) and wait for the smoke to clear out of the firebox before opening the doors.

Burn only natural wood in your catalytic heater. You should not burn trash or garbage, artificial or paper logs, gift wrappings, treated or painted wood, nor should you start a fire with lighter fluids or chemical starter. These and other compositions may contain lead, zinc, or other elements that can coat the catalyst and reduce its activity.

Catalytic ignition (lightoff) begins when the smoke gases reach approximately 500 deg. F. Temperature monitors are available if you wish to use this during stove operation. If you would like to add an optional catalytic temperature monitor ask your dealer about details of the Model TM-2 designed specifically for your heater.

Generally, a fire large enough to keep the blower at least on low speed continuously will be sufficient enough to keep the catalyst ignited.

GUIDE TO THE DIFFERENT BURNING QUALITIES OF WOOD

Type of Wood	Ease of Starting	Coaling Qualities	Amount of Sparks
Apple	Poor	Excellent	Few
Ash	Fair	Good	Few
Beech	Poor	Good	Few
Birch	Good	Excellent	Moderate
Cherry	Poor	Excellent	Few
Cedar	Excellent	Poor	Many
Elm	Fair	Good	Very Few
Hemlock	Good	Low	Many
Hickory	Fair	Excellent	Moderate
Locust	Poor	Excellent	Very Few
Maple	Poor	Excellent	Few
Oak	Poor	Excellent	Few
Pine	Excellent	Poor	Moderate

The Main Audubon Society recently charted the heat produced by a wood fire. They noted that the heat produced by a wood fire varies greatly with the kind of wood burned. Beech is considered the best wood for a fire. A cord of well-seasoned Beech will produce as much heat as 169 gallons of fuel oil, Sugar Maple and Red Oak produce as much heat as 166 gallons of fuel oil, followed by White Ash, 154; American Elm 130; White Birch 124; and White Pine, 94.

HELPFUL HINTS

CURING THE PAINT ON YOUR HEATER: During the first several firings, burn small fires to cure the paint and to prevent damage to the finish. It is a good idea to flip the toggle switch to "Manual" position during these first firings so the blower will run continuously. This will allow the paint to cure at a slower rate and creates a better overall finish.

Thermostat: After the thermostat sits dormant through an off-heating season, it may need to be operated in the manual setting a few times at the start of a new heating season to break it in.



CAUTION: Never remove ashes from your heater with the blower running.

TIPS ON FIRE BURNING

GREEN WOOD vs. SEASONED WOOD - Green wood has a high moisture content, and should not be used. Seasoned wood - cut at least one year before use - allows for a quicker, prolonged burn and more complete combustion.

SPLIT WOOD vs. ROUND WOOD - Split wood burns easier and more rapidly. If used after starting a fire, it should be packed tightly to achieve a longer burn.

Round wood burns longer, but requires more effort to start. Inserting a round piece over a bed of red coals with the damper and drafts open will help it catch fire. Round wood should be used to accomplish an all-night burn.

SECTION VII

PREVENTIVE MAINTENANCE/ PARTS REPLACEMENT

Check Chimney

- A. The chimney should be cleaned as necessary to remove creosote, soot, leaves, birds' nests, etc. (Refer to Page 19, Creosote)
- B. A neglected chimney can eventually cause a draw restriction or can ignite and burn hot enough to cause damage to the chimney.
- C. For proper inspection the chimney should be cleaned.
- D. A chimney cap should be installed to prevent moisture from entering chimney, to prevent sparks and burning materials from escaping chimney, and to keep birds and foreign materials from entering.

NOTE: Some areas may require an approved spark arrestor.

CLEANING THE HEATER

- A. The heater should not be cleaned with any type of detergent as most all detergents have an oil base and cannot be painted over.
- B. The heater should be lightly sanded with fine sandpaper or steel wool, then repainted or touch up with high temperature paint.
- C. If the heater is located in a moist or damp location, check thoroughly for signs of condensation during times when the heater is not in use.
- D. When the heating season is over, the heater should be cleaned out completely with a wire brush or cloth to help eliminate ash and burned wood smell.

CARE OF GLASS DOORS: The glass doors on your heater permit you to enjoy the beauty of the fire while retaining the efficiency of your heater. Although the brand of glass used in the heater doors has well established and recognized heat resistant and strength characteristics, it can be broken through improper care. To achieve the maximum utility and safety of your glass doors, we advise that you observe the following use and safety tips:

1. Inspect the glass regularly for cracks or breaks. If you detect a crack or break extinguish the fire immediately and return the door to your dealer for glass replacement before further use.
2. Do not slam heater doors or otherwise impact the glass. When closing door, make sure that no logs or other objects protrude to impact against the glass.
3. Do not clean the glass with materials which may scratch it (such as steel wool) or otherwise damage the glass. Scratches on the glass can develop into cracks or breaks.

The glass can be cleaned with a commercial oven cleaner, providing it does not contain abrasives. A build-up on the glass that has been there for a considerable length of time can be burned off with a propane torch.

CATALYTIC INSPECTION (Cold Heater Only)

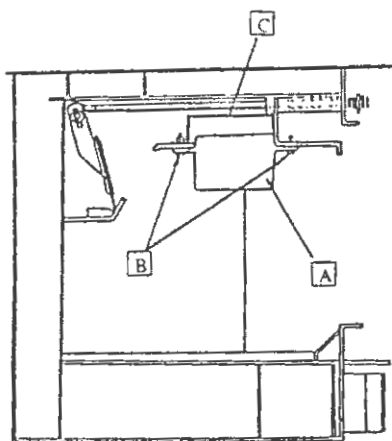
Catalytic combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred.

Preferred Inspection Method: The easiest method to determine the condition of the catalyts is to observe the glow of the catalyst after ignition (med-low firing or hotter). You can observe the catalyts by leaning down and looking up through the door glass.

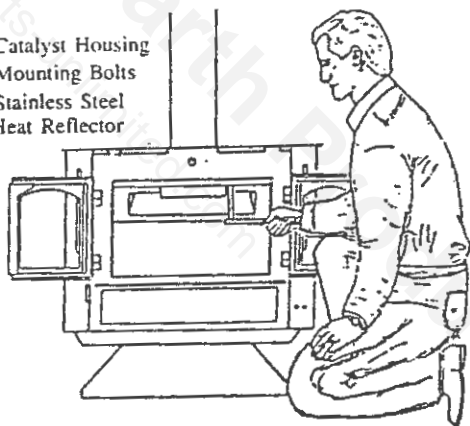
- a. Properly functioning catalyts will be exhibiting a uniform glow from one end to the other (indicating ignition).
- b. Physically degraded catalyts will have cold places (areas not igniting) where plugging, crumbling, or other degradation has occurred. For further inspection it will be necessary to go by the disassembly method as follows:

Disassembly Inspection Method: For thorough catalyts inspection, removal of the catalyst housing is necessary (cold heater only).

- a. Spread a drop cloth in front of the heater.
- b. Open doors and clean out any ash.
- c. Open the by-pass door to give access to the two rear mounting bolts.
- d. Using 9/16" wrench and 9/16" socket, loosen the four bolts and remove the catalyst housing (drop down) and place to a suitable inspection area (it may be necessary to use penetrating oil if nuts and bolts have seized).

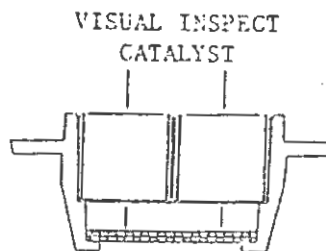
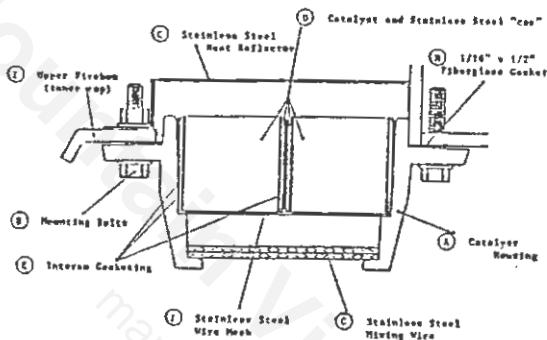


- A Catalyst Housing
- B Mounting Bolts
- C Stainless Steel Heat Reflector



e. Inspect top and bottom side of catalyts for plugging, crumbling, and other physical degradation.

1. If a problem exists, refer to the trouble shooting section of the manual for possible cause of the problem and solution (including replacement if necessary).
2. Reassemble if the catalyts are okay being sure the stainless steel heat reflector is positioned back in its original position and bolt housing and heat reflector securely back in place.



CATALYTIC REPLACEMENT

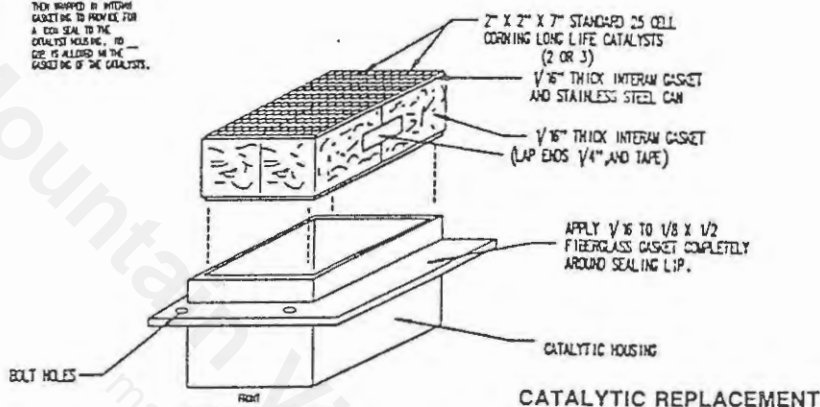
The catalysts in your stove are designed for many years of use. If after several years of use, the efficiency of the stove decreases or if a notable increase in the amount of smoke is observed, the catalysts may need to be replaced. See the Catalyst Warranty prior to replacement.

CATALYST REPLACEMENT (Off-Season Replacement Recommended)

1. Spread a drop cloth in front of the stove.
2. Open the doors and clean out any ash.
3. Open the by-pass door to give access to the two rear mounting bolts.
4. Using penetrating oil, generously lubricate the four (4) bolt threads and nuts holding the catalyst housing in place. Allow oil to penetrate.
5. Using a 9/16" wrench and 9/16" socket, loosen the four (4) bolts and remove the catalyst housing (drop down) and place to a suitable work area.
6. Using needle nose pliers, grasp the front edge of the stainless steel "can" which house the catalytic element and pull upward. Reposition pliers to another position and pull upward. Repeat procedure until the catalyst can be removed from the housing.
7. Using a small putty knife or scraper, remove any gasket that may have adhered to the catalyst housing. Also, brush off any ash from the mixing screens.
8. Now, obtain the new catalysts and wrap the stainless steel can with interam gasket and tape ends together using "scotch" or masking tape. Note: The Model 70 has two (2) catalysts inside one "can" and the Model 71 has three (3) catalysts inside one "can".
9. Insert the new catalysts into the catalytic housing and push down until they are seated on top of the stainless steel wire mesh supports.
10. Reinstall the catalyst housing into the stove and secure in place with the bolts and washers.
11. The stove is now ready for use.

NOTE:

CATALYSTS ARE WRAPPED IN INTERAM GASKETING AND ARE CANNED. THE CAN IS THEN WRAPPED IN INTERAM GASKETING TO PROVIDE FOR A DOOR SEAL TO THE CATALYST HOUSING. NO GREASE IS ALLOWED IN THE GASKETING OF THE CATALYSTS.



DOOR SEAL

Gasket Inspection/Replacement (Cold Heater)

GASKET INSPECTION

For proper function of the heater it is imperative that the doors seal against the heater. The following steps will assist you in determining if the gaskets need replacement.

1. Open the door and visually check the gasket in the door frame for deterioration. If the gasket is frayed, obviously worn, or in apparent need of replacement, go to step 1 of Gasket Replacement Instructions and determine how to replace the gaskets.
2. The gasket that seals the glass or cast insert in the door does not need replacing unless the glass or cast is removed. However, on a new unit, the gaskets will compact after several firings. To assure that there is no air being drawn around the glass, tighten the glass mounting screws to a snug (but not too tight) fit. **CAUTION** - Do not overtighten these screws or you may run the risk of glass breakage.
3. Grasp the door handle and push in and out alternately checking that the door is adjusted properly and does not move in and out. If the door is not tight, you can correct this by taking a hammer and hitting the door catch, bending it back toward the heater. Continue adjusting the catch until door is tight.
4. To verify that the door seals properly, use a dollar bill and insert between the door and the unit as indicated in illustration #1. Close and latch the door. Try pulling the dollar bill out of the sealing area. If the dollar bill comes out without very much resistance, the gasket needs to be replaced or reinstalled, or the latch needs to be adjusted. Check all gasket seal contact areas for proper fit.

NOTE: Some door designs with piano hinge can be adjusted on the hinge side as well as the latch side. Use penetrating lubricant on the nuts and bolts, then loosen, adjust doors and retighten nuts and bolts.

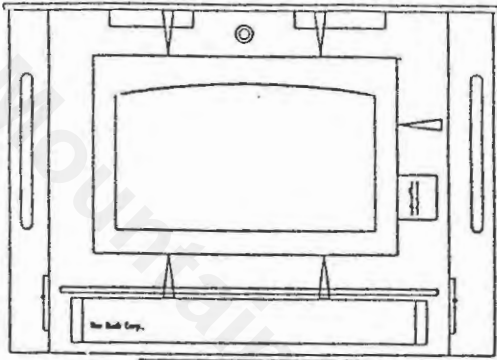


Illustration 1
Checking Door Gasket Seal

Gasket Replacement (Cold Heater)

To replace deteriorated gaskets, the following steps must be taken to insure proper installation of gaskets.

1. Obtain the proper gaskets and silicone glue from your local dealer.
2. Using pliers, remove any worn and deteriorated gaskets.
3. Using a scraper, wire brush, and sand paper or steel wool, clean glue and gasket residue from the door frame area.
4. Measure and cut gaskets to length.. Care should be taken not to stretch the gaskets. What you want is a full and loose gasket weave after attached to the framing.
5. Obtain the gasket(s) and place in the gasket channel areas. Use a technique which assures that the gasket is applied in a loose like manner. **DO NOT STRETCH GASKETS** See illustration 2.
6. After gasket(s) are applied to the glue, use your finger and go over all the gasket gently pressing the gasket to the channel. Use the same pressure against the gasket so that the final result is an evenly applied gasket.
7. Leave door open and allow one hour for the glue to dry.
8. Refer back to the gasket inspection instructions at the beginning of this section to adjust door and check for proper installation. Once gaskets are checked, the heater is ready for use.

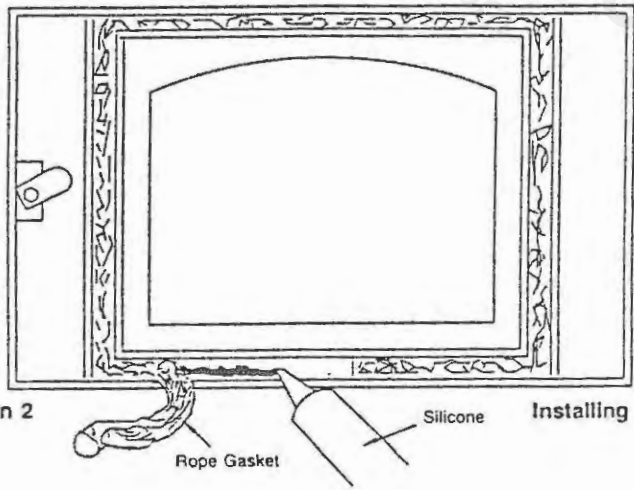
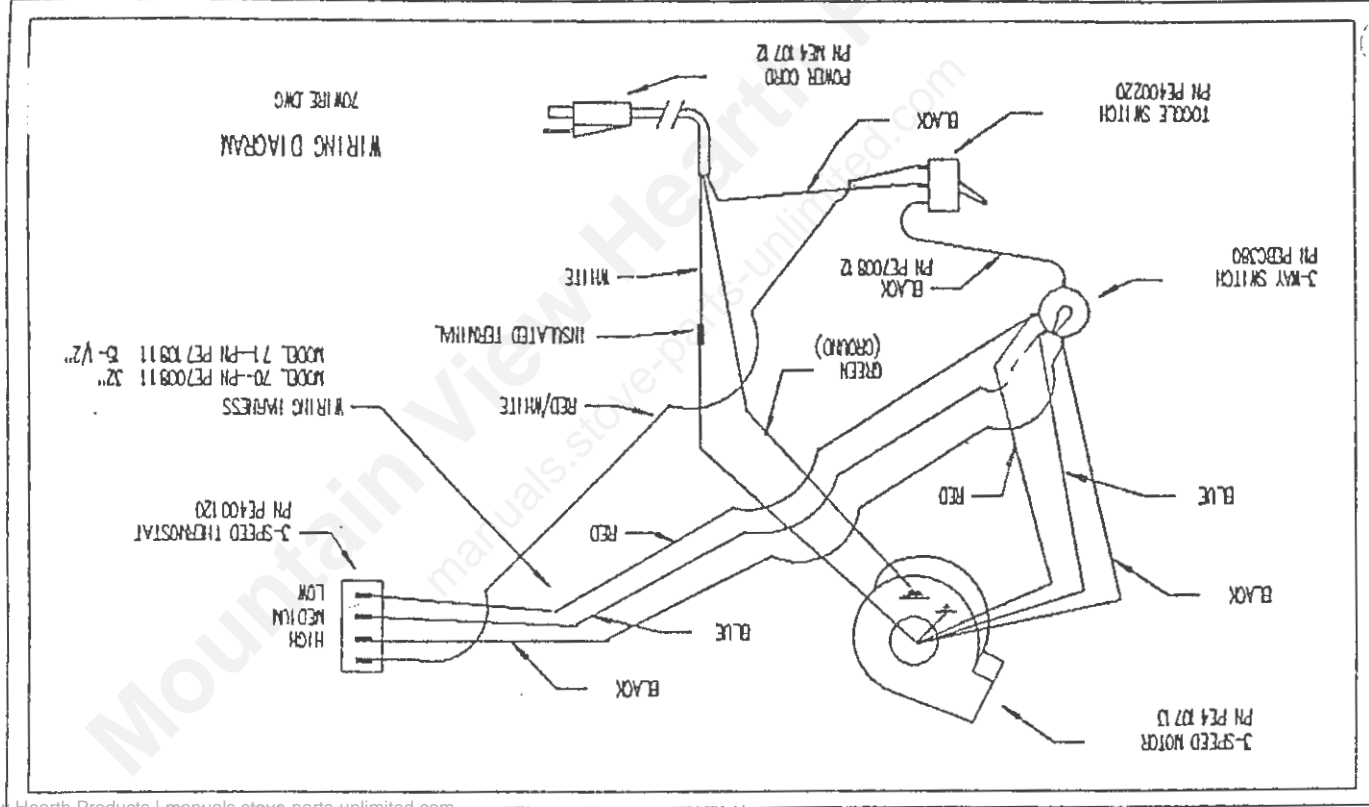


Illustration 2

Installing Gasket



SECTION VIII

CATALYTIC TROUBLE SHOOTING

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I. DEFINITIONS

AIRTIGHT HEATER - In an airtight heater, all air enters in through the inlets. Generally, non-airtight stoves are not as efficient and their level of heat output is less controllable than that of an airtight.

BAROMETRIC DAMPER - Damper in a stove pipe that is controlled by changes in air pressure.

BAROMETRIC DRAFT GAUGE - Gauge that measures the amount of draft in a chimney in inches of water.

BURN CYCLE - Time span between refuelings in which the wood is reduced to a bed of hot coals.

BYPASS - Movable door inside a woodstove that is opened when the stove door is opened to give a path of least resistance to smoke to prevent roll-out.

By-pass also refers to the positioning of the combustor in a retrofit which allows smoke to flow around it during high-fire modes or refueling.

CREOSOTE - Condensed wood-gas vapor.

DAMPER - A movable plate or valve in the flue, for controlling the draft.

DOWNSTREAM TEMPERATURE - Outlet temperature of the combustor or temperature of the gas leaving the combustor from the chimney side or face.

DRAFT - Amount of vacuum created by buoyant hot air in the chimney. Draft pulls in oxygen for the combustion process and pulls out exhaust gases.

FIREBRICK - Brick capable of withstanding high temperatures. Used in furnaces, kilns and stoves. Used to mean only "hard" or "dense" firebrick as distinguished from "soft" or "insulating" firebrick.

FIRING RATE - Rate at which fuel is burned in a heater.

FLAME IMPINGEMENT - Flames directly contacting the combustor face.

FLUE COLLAR - The part of a stove to which the chimney connector or chimney attaches.

GASIFIED - Changed to gas.

GLOW-PLUG EFFECT - When a combustor is at temperatures above 1400°F. (760°C) and periodically causes pockets of wood gas in the firebox to ignite spontaneously.

GREEN WOOD - Undried, freshly cut wood from a live tree.

IGNITION TEMPERATURE - The minimum temperature of a flammable mixture of gases at which it can spontaneously ignite.

INSULATING FIREBRICK - Low-density (high porosity), low-thermal conductivity firebrick intended for use in kilns, furnaces or stoves to reduce heat losses. Has a 20-33% more insulation (low conductivity) and heat-storage capacity than that of a hard firebrick.

LIGHT-OFF - Activation temperature of the combustor catalyst.

MASKING - Concealing or covering catalyst with a substance which prevents catalytic activity.

NOBLE-METAL CATALYST - A catalyst is a substance that can accelerate a chemical process without being consumed by it. A noble-metal catalyst is one made of a precious metal or metals. (In the combustor, platinum and palladium are used because they are stable under high-heat conditions.)

OXIDATION - Uniting of a substance with oxygen, as in burning.

PITCHY WOOD - Wood that is full of pitch.

PITHY WOOD - Soft, spongy, air-filled wood.

REFRACTORY MATERIALS - Heat-resistant materials used to line stoves and furnaces.

SUBSTRATE - Ceramic base material of the combustor, which is coated with washcoat and catalyst.

THERMAL SINK - Large mass or conductive surfaces that readily removes heat from an appliance or gas stream.

THERMOCOUPLE - Heat-measuring device which operates on thermoelectric current when heated.

UPSTREAM TEMPERATURE - Inlet temperature of the combustor or temperature of the air that is entering the combustor from the stove side or face.

VOLATILES - Substances that vaporize or evaporate quickly.

WASHCOAT - An inert substance, such as alumina, that is deposited on the surface of the substrate to increase the overall surface area and maintain the dispersion of the catalyst evenly across the combustor surface.

II. INTRODUCTION

Heating with wood - it's the self-sufficient answer to continuously rising fuel prices. And with the New Buck Corp. catalytics, heating with wood is easier and more efficient than ever before and the smell and smoke are nearly eliminated, too.

Developed during years of research at Corning Glass Works, Catalytic Combustors are a unique ceramic honeycomb coated with a "noble" metal catalyst, such as platinum or palladium.

III. HOW THE CATALYTIC COMBUSTOR WORKS

From 5 to 30 percent of the chemical energy contained in every log escapes up the chimney when wood is burned in a conventional airtight stove. The Catalytic Combustor is designed to make use of this energy, converting it into useful heat as it lessens chimney creosote build-up and air pollution.

The catalytic combustor consists of a durable, temperature-resistant ceramic composition which is extruded into a cellular, or honeycomb, configuration. After extrusion, this ceramic monolith is fired and then covered with a noble-metal catalyst.

When wood smoke contacts this catalyst, chemical changes occur that cause the smoke to ignite at temperatures around 500°F - temperatures easily found in a wood-stove firebox. Normally, smoke will ignite and burn only at temperatures around 1000°F. (540°C).

Properly designed and operated, a wood-burning appliance incorporating a Catalytic Combustor can produce up to:

- * 50 percent more heat;
- * 90 percent less creosote;
- * 90 percent less air pollution.

IV. OPERATING A CATALYTIC HEATER

On a showroom floor, a combustor-equipped heater may look like any other wood heater. But once a combustor-equipped stove is installed and ready for use, there are certain slight differences an operator must keep in mind. These differences involve obtaining conditions favorable to combustor performance, such as:

- reaching proper catalytic operational temperatures, commonly known as light-off;
- maintaining the conditions that support catalytic burning;
- proper bypass positioning.

Achieving Catalytic Light-Off - At least once during each burning cycle, the temperature within the stove should be raised high enough to cause the catalyst to become active. The most convenient time to do this is during fuel loading. Gas inlet temperatures to the combustor of between 350 and 500°F. (260-370°C) will initiate catalytic burning.

Placed between fire and flue, the catalytic combustor literally causes smoke to burn as fuel, creating more heat from less wood. That means a wood stove can be burned slowly, transferring almost all of the energy stored in a log to the room as heat instead of to the outside air as pollution.

And creosote, the smelly, black substance that may clog a chimney, is drastically reduced, thereby substantially lessening the chance of a damaging chimney fire.

Operating a stove equipped with a Catalytic Combustor is not much different than operating a traditional wood stove -- in fact, it's even easier in many cases

NOTE: The use of temperature monitors is a reliable means of determining if the combustor is functioning.

Maintaining Catalytic Burning Conditions - During the start-up of a cold heater, a medium to high firing rate must be maintained for about 20 minutes. This insures that the catalyst and fuel are all stabilized at proper operating temperatures. Even though it's possible to have gas temperatures reach 600°F (320°C) within two or three minutes after a fire is started, if the fire is turned down immediately to low-fire conditions, it will result in either the fire or the combustor going out.

At the end of a burn cycle, it's possible that the amount of burning charcoal might not provide sufficient temperatures or fuel for the catalyst. During the refueling of a hot heater that has an internal firebox temperature below 500°F (260°C), we recommend that the heater be fired for about 10 minutes to ensure that the catalyst reaches 600°F (320°C). Doing this will ensure sufficient temperatures and proper amounts of volatiles for catalyst operation.

When refueling a hot heater that has an internal firebox temperature above 500°F (260°C), no refiring step is necessary. Just load the fuel and continue to operate. Temperatures within the firebox will be hot enough to support catalytic burning and wood pyrolysis.

Methods for determining these temperatures are included in the Temperature Monitors section.

Bypass - Whenever the heater is being loaded the bypass should be in the open position. This keeps smoke from entering the room when the door is opened.

RECOMMENDED FUELS

Catalytic heaters are designed to burn natural wood only - Burning materials other than natural wood will appreciably shorten the life of the catalyst. Use quality fuel wood that is available in your area. Do not burn trash or garbage, artificial or paper logs, gift wrappings, coal, lighter fluids, chemical starters, treated or painted wood, driftwood or chemical cleaners. These contain chemicals that may cause the catalyst to become deactivated.

DRAFT CONTROLS

The proper amount of draft is important in both the catalytic appliance as well as a non-catalytic unit. Without enough draft the burning process cannot take place. Installations with a draft of .02" of water or less are considered marginal and may not burn reliably. In the combustor-equipped appliance it is not recommended that the draft exceed .06" of water or overfiring can occur. The recommended operating range is .03-.06" of water.

Bypass - The bypass is used in combustor-equipped devices - when the heater door is opened for loading or inspection and when the stove is operated in the high-fire mode.

Draft Gauge - Draft conditions vary due to altitude, atmospheric changes, chimney and wind conditions. Changes in draft can affect the combustor's performance and life. A draft gauge will permit an operator to adjust the stove for more consistent burning. There are a variety of gauges on the market.

TEMPERATURE MONITORS

The most effective way of operating a catalytic appliance is by utilizing temperature monitors. Sensing temperatures will give all the information needed to tell when to engage the combustor, how well the combustor is operating, when it's time to refuel and when the combustor is no longer operational.

The temperature gauge should extend down into the combustor approximately 1". Thermocouples and thermometers of various designs are available for this purpose including New Buck Corporation Model TM-2.

V. POSSIBLE PROBLEMS

Problems encountered with the operation of catalytic-combustor equipped wood heaters are usually the same as those experienced in the operation of traditional wood heaters.

Our experience has shown that adoption of good operating practices will eliminate most of these problems.

In addition, it should be noted that problems with catalytic combustors are rare - fewer than 1 percent of combustors are returned for any reason.

Nonetheless, installers and retailers should make themselves aware of the nature, cause and solution to possible problems so as to serve their customers better.

Plugging - Plugging can occur if the combustor is operated improperly. It may occur if the wrong materials are burned. Evidence of these types of plugging is a coating of black soot, creosote or fly ash on the combustor. Burning materials that produce large flakes or char, such as Christmas wrapping paper or cardboard, can plug enough cells to cause smoke spillage.

Extreme Temperatures - A combustor becomes extremely hot during operation. Temperatures between 1400 and 1600°F (760-870°C) are common, but operating temperatures between 1200 and 1400°F (650-760°C) are recommended. Most of this heat is transmitted to surrounding heater parts via thermal radiation.

Flow Restrictions - Because the combustor is mounted in the gas flow stream, it does offer resistance to draft. This restriction or resistance presents two problems:

If the bypass is not open when the fuel-loading door is opened, smoke rollout will occur.

Chimneys that produce marginal draft may prevent operation of a combustor-equipped device. A chimney that provides, on average, .02" of water draft in low-fire operation would probably not operate with a catalytic-combustor appliance in the low-fire mode. In such a case, the combustor resistance would offset the remaining draft, resulting in a system that will not draft.

Creosote Build-up - Even though reduction of creosote is one of the primary advantages of a combustor-equipped device, some creosote-forming gases will escape unburned during normal operation. In the event the combustor ceases to function, creosote can be expected to accumulate. Consequently, flues and chimneys should be inspected regularly (every 2-3 months of operation) and any creosote build-up removed. Failure to do this could result in a chimney fire.

Chemical Deactivation - Deactivation can occur when the catalyst is attacked by materials such as compounds of sulphur, phosphorus, or lead and other heavy metals. Burning large quantities of trash, pressure-treated lumber or painted wood can deactivate the catalyst. The operator takes a chance when burning anything other than natural wood. The catalysts are durable and are not likely to be greatly affected by an occasional mistake, but burning large quantities of chemical-laden materials will appreciably shorten the life of the combustor. The catalyst can also be deactivated when it is coated with excessive creosote, carbon or fly ash. This build-up greatly reduces the amount of catalyst available to react with the smoke.

Excessive Handling - An older combustor, especially one that is uncanned, is susceptible to handling damage. Stress-relief cracks may develop in service but will not affect the performance of the combustor if it is not moved or handled. Handling a unit with these cracks, however, could result in it breaking apart. Excessive handling could also potentially remove some of the catalyst coating.

Condensation in Chimney - The burning that takes place in a combustor converts harmful hydrocarbons and carbon monoxide to heat, carbon dioxide and water. The additional water produced by this complete burning can lead to associated problems in the chimney.

Backpuffing - A hot combustor (above 1400°F) can sometimes act like a glow plug (spontaneous combustion ignitor). Usually the wood gas-to-air mixture is either too lean or too rich to form a highly flammable mixture. There are times when this mixture is just right within the firebox during the normal burning process. If the combustor is running at or above the ignition temperature of the mixture, spontaneous combustion will result, causing the stove to vent puffs of smoke.

Non-Uniform Flow - Non-uniform flow causes the combustor to heat and cool unevenly and is a result of fuel-loading configuration. This occurs when the flow pattern of the fire is concentrated on one side of the combustor. This condition causes thermal stress within the ceramic, resulting in cracking.

TROUBLESHOOTING

Operation of any wood heater can create problems. While the use of a catalytic-combustor equipped stove will substantially lessen some of these problems---such as creosote formation---other traditional wood-heater problems may remain.

The following guidelines apply to operation of all wood heaters, with problems related to catalytic heaters addressed where appropriate.

HEATER RELATED PROBLEMS

Problem	Possible Cause	Solution
1. Sluggish heater Performance	1. Obstruction in chimney	1. Check for and remove obstruction.
	2. Improperly sealed trim kit or direct connect kit	2. (a) Check trim kit gasketing seal to fireplace and gasket as necessary to seal unit. Gasket under stove if needed. (b) Check seal of direct connect and correct.
	3. Manual damper in chimney is closed	3. Open manual damper and wire shut with stainless steel wire or remove damper.
	4. Closing bypass or exhaust damper too soon.	4. Follow New Buck instructions for proper firing procedures.
	5. Wet or unseasoned wood being burned	5. Burn dry, seasoned wood
	6. Too much wood added to too few coals	6. Add small amounts of wood to small coal beds. Once a good bed of coals has been established more wood can be added.
	7. Dislodged stove parts	7. Check all movable heater parts. Replace if necessary.
	8. Poor chimney draft	8. See section in "Chimney-Related Problems"
	9. Combustor is plugged	9. See section in "Combustor-Related Problems"

Problem	Possible cause	Solution
2. Drop in Overall Efficiency	<ol style="list-style-type: none"> 1. Cold, windy weather 2. Burning wet, pithy, or spongy wood 3. Combustor not in operating mode 4. Combustor not functioning 	<ol style="list-style-type: none"> 1. Weather stripping, caulking, insulation, storm windows 2. Burn quality wood available in your area 3. Close bypass or engage combustor when temperatures are high enough and stabilized 4. See "Combustor-Related Problems"
3. High Fuel Consumption	<ol style="list-style-type: none"> 1. Inexperience in catalytic operation 2. Improper regulation of draft or inlet air 3. Burning wet, unseasoned wood or pithy, spongy wood 4. Cold, windy weather 5. Smoke bypassing combustor 6. Bypass stuck out 7. Combustor not engaged 8. Combustor not functioning 	<ol style="list-style-type: none"> 1. Operate stove with desired heat output in mind. Do not be overly concerned with maintaining light-off temperatures 2. (a) Close inlet air control as much as possible to maintain desired heat output. (b) Check gaskets, reinstall fiberglass gasketing around doors and glass as necessary. 3. Burn seasoned wood that is dry and of good quality 4. Weather stripping, caulking, insulation, storm windows 5. Replace warped stove parts 6. If warped or broken, replace 7. Put combustor in operating position in retrofit or close bypass in stove 8. See "Combustor-Related Problems"
4. Backpuffing	<ol style="list-style-type: none"> 1. Gusts of wind 2. Hot combustor. (Above 1400°F) 3. Opening doors in a tightly constructed house 	<ol style="list-style-type: none"> 1. Install chimney cap 2. Avoid burning soft, pitchy wood or large amounts of small diameter wood 3. Slowly open and close outside doors.
5. Smoke Rollout When Heater Door is Opened	<ol style="list-style-type: none"> 1. Bypass is closed, or combustor is in operating position 2. Wind gusts blowing down chimney 3. Opening heater door too fast 	<ol style="list-style-type: none"> 1. Open bypass. In retrofit place combustor in bypass position before opening stove door 2. Install wind-resistant chimney cap 3. Wait a few seconds after opening bypass before opening heater door to give smoke a chance to exit heater

Problem	Possible Cause	Solution
6. Low Catalytic Temperature	1. Bypass is open	1. Once light-off temperatures have been reached and unit is stabilized, close bypass
	2. Light-off not obtained	2. Follow manufacturer's operating instructions
	3. Fuel charge is spent	3. Refuel as necessary for combustor operation
	4. Gases bypassing combustor	4. Check parts, particularly bypass. Replace if warped
	5. Combustor coated with fly ash or soot	5. See section on "Combustor-Related Problems-Catalyst Masking"
	6. Heater dampered down too much	6. Ensure that proper air mixture and draft are available for wood pyrolysis to continue
	7. Combustor not functioning	7. See section on "Combustor-Related Problems"

7. Creosote Fluing From Draft Inlet Openings	1. Burning wet, pitchy woods	1. Burn dry, seasoned wood
	2. Burning too much wood in one load	2. Burn reasonably sized loads so the combustor has a chance to burn the wood gases that are produced.
	3. Cool heater walls	3. Keep a good bed of coals in the heater

CHIMNEY-RELATED PROBLEMS

1. Creosote Accumulation	1. Leading bypass baffle plate	1. Replace any damaged parts
	2. Types and amounts of wood burned	2. (a) Try not to burn pitchy wood (b) Don't overstuff the firebox (c) Burn pieces of wood with an approximate diameter of 6 inches or larger
	3. Poorly insulated chimney	3. (a) Replace single-walled metal chimneys with double-walled insulated chimney sections (Meet local codes) (b) Install a chimney liner in a masonry chimney. (Meet local codes) (c) In new installations utilize an interior chimney rather than an exterior one
	4. Combustor not functioning	4. See section on "Combustor-Related Problems"

Problem	Possible Cause	Solution
2. Tar and Liquid Creosote Leaking From Metal Flue Joints	1. No chimney cap on chimney 2. Metal flue assembled improperly 3. Normal increase in moisture due to catalytic burning (Condenses on cool chimney walls)	1. Install a chimney cap 2. Top flue sections should be inserted into lower flue sections 3. (a) Replace single-walled chimneys with doubled-walled insulated sections (Meet local codes) (b) Install chimney liner in masonry chimney (Meet local codes) (c) In new installations try to utilize an interior chimney rather than an exterior one.
3. Heavy Concentration of Smoke Leaving Chimney	1. Water vapor. (On cold, still days water vapor may be mistaken for smoke. The difference is that water vapor appears white and will tend to rise vertically and dissipate rapidly while smoke is usually dark or bluish brown and will drift down and settle in low areas near the ground before slowly dissipating) 2. Wet, pitchy woods being burned 3. Combustor not functioning 4. Bypass warped or in open position	1. Water vapor is normal and should be of little concern 2. Burn dry, seasoned wood 3. See section of "Combustor-Related Problems" 4. (a) Replace warped bypass (b) Close bypass
4. Rusted or Corroded Flue Parts	1. Added moisture from efficient burning 2. Overheated flue parts due to a chimney fire 3. Age. Failure due to normal use	1. Replace wornout parts with corrosion-resistant parts or materials 2. (a) Same as #1 above (b) Have chimney inspected every 2-3 months of operation for creosote buildup 3. Replace worn-out parts with corrosion-resistant replacements
5. Odor - Both Inside and Outside The Home	1. Bypass is open 2. Smoke is leaking around combustor	1. Close bypass 2. Check for warped or damaged parts. Replace if necessary

Problem

Possible Cause

Solution

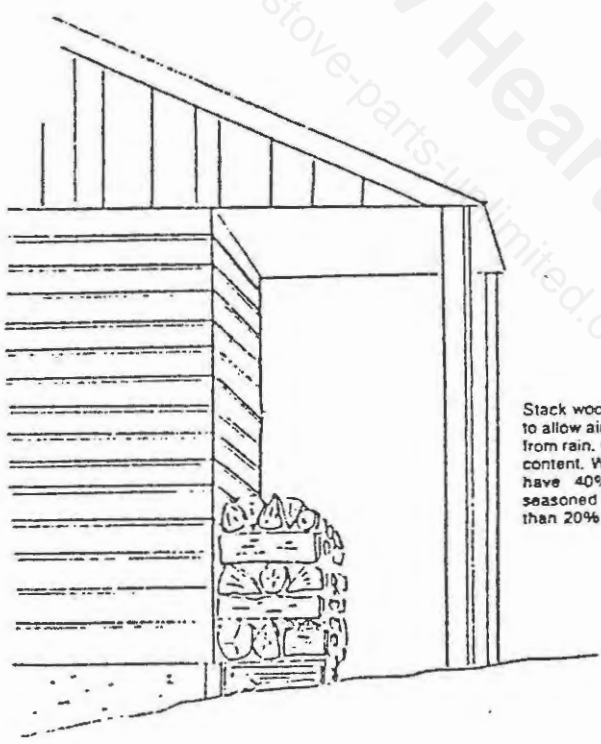
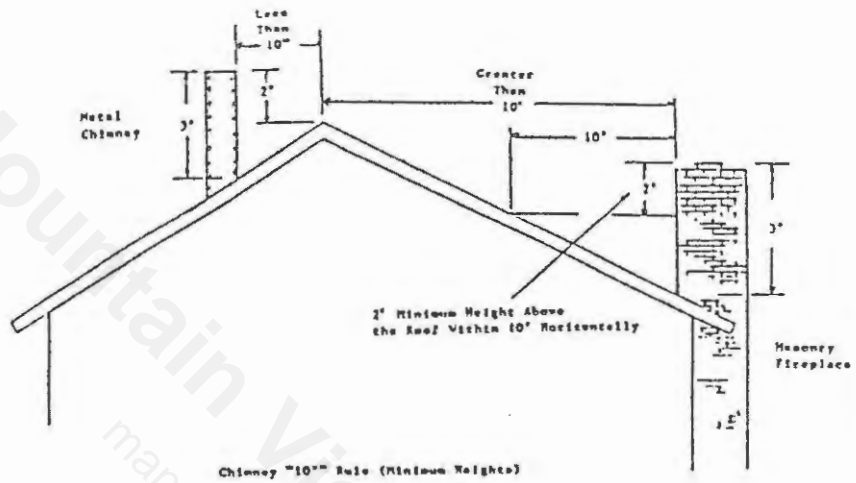
3. Backpuffs due to wind or hot combustor
4. Combustor not functioning
5. Insert trim panels or direct connect kit not sealed

3. See "Stove-or Retrofit Related Problems-Back-puffing"
4. See "Combustor-Related Problems"
5. Check seal and regasket as necessary

6. Poor-Drafting Chimney

1. Improper chimney height
2. Wrong flue size being used. Ex.-using a 10" flue on an 8" flue collar
3. Cooler temperatures caused by external chimney
4. Massive stone or masonry chimney

1. Extend height of chimney (Meet codes)
2. (a) Use properly sized flue
(b) Install topper with 8" chimney cap to hold heat in
3. Insulate chimney or build chimney taller. In new installations, try to utilize internal chimney
4. (a) Install chimney liner (Meet codes)
(b) Extend height



Stack wood in criss-cross pattern under a shelter to allow air flow to dry the wood and to keep wood from rain. Green wood may have 50-60% moisture content. Wood seasoned outside uncovered may have 40% moisture content. Wood properly seasoned in a covered environment will have less than 20% moisture content.

COMBUSTOR-RELATED PROBLEMS

Problem	Possible Cause	Solution
1. Plugging	<ol style="list-style-type: none"> 1. Burning materials that produce a lot of char and fly ash 2. Burning wet, pitchy wood or burning large loads of small-diameter wood with the combustor in the operating position without light-off taking place 3. Combustor not functioning. If proper burning procedures have been followed to no avail, the combustor is not functioning 	<ol style="list-style-type: none"> 1. Do not burn materials such as garbage, gift wrap or cardboard 2. (a) Burn dry, seasoned wood (b) Don't place the combustor in the operating position until temperatures are high enough to initiate light-off (c) It may be possible to burn the accumulated soot or creosote off by putting the combustor in a partially open-partially closed position after a "hot" fire has been started 3. Replace combustor
2. Catalyst Peeling	<ol style="list-style-type: none"> 1. Extreme temperatures (above 1800°F or 1000°C) at combustor surface can cause the catalyst to peel. Over-firing and flame impingement are primary causes 	<ol style="list-style-type: none"> 1. (a) If peeling is severe, remove and replace combustor (b) Avoid extreme temperatures
3. Catalyst deactivation.	<ol style="list-style-type: none"> 1. Burning large quantities of trash, pressure treated lumber or painted wood. 	<ol style="list-style-type: none"> 1. (a) Burn quality wood available in your area. (b) If you decide the catalyst has been deactivated, replace combustor.
4. Catalyst Masking - the catalyst with a layer of fly ash or soot which prevents catalytic activity.	<ol style="list-style-type: none"> 1. Not maintaining light-off temperatures. 2. Burning coal causes a sulfur based compound to coat the catalyst. 	<ol style="list-style-type: none"> 1. Place combustor in a partially closed position after a "hot" fire has been started to burn soot off. 2. Revert to burning wood and fire the combustor at elevated temperatures for a period of 1 hour. (Five 20 minute high-fire startups would do it)
5. Substrate cracking-thermal.	<ol style="list-style-type: none"> 1. Normal operation, as long as combustor remains intact. 	<ol style="list-style-type: none"> 1. If cracking causes blockage of exhaust gases, replace combustor.

Problem	Possible Cause	Solution
6. Substrate Cracking-Mechanical	1. Mishandling or abuse	1. Handle with care
7. Substrate Crumbling	1. Extreme thermal shock 2. High draft	1. Combustor being continually overfired. Reduce burn rate. 2. Do not exceed .06" of water draft. Install a manual damper and draft gauge, or a barometric damper with free-standing units.
8. Color Variations	1. Variation in color from combustor to combustor or within a combustor can occur. (New combustors)	1. These color variations are normal and do not affect combustor performance