

MODEL 81 NON-CATALYTIC UNIT



FIREPLACE INSERT & FREESTANDING

FEATURES
PREPARATIONS INSTALLATION
OPERATION MAINTENANCE SAFETY

SAFETY NOTICE

IF THIS HEATER IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT THE AUTHORITY HAVING JURISDICTION (SUCH AS MUNICIPAL BUILDING DEPARTMENT, FIRE DEPARTMENT, FIRE PREVENTION BUREAU, etc.) CONSULT BEFORE INSTALLATION TO DETERMINE THE NEED TO OBTAIN A PERMIT. KEEP THESE INSTRUCTIONS FOR FUTURE USE.

TESTED AND LISTED BY:



PFS/TECO, COTTAGE GROVE, WI

MANUFACTURED BY NEW BUCK CORPORATION

200 ETHAN ALLEN DRIVE

P.O. BOX 69

SPRUCE PINE, N.C. 28777

www.buckstove.com

Revised May 2020

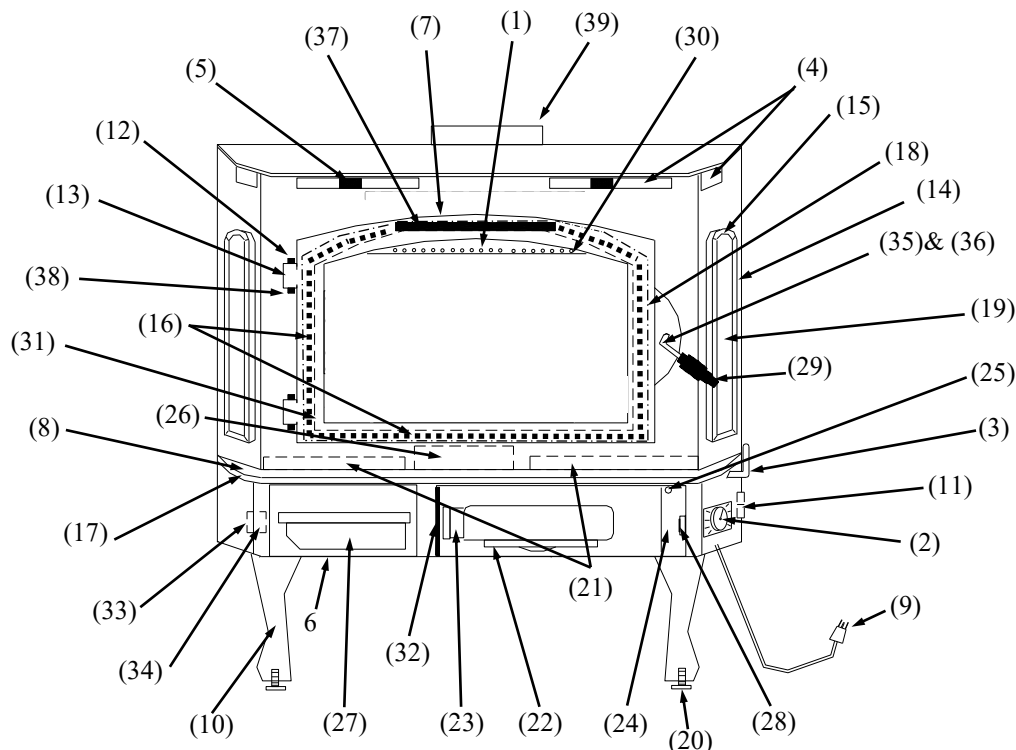
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EPA COMPLIANCE STATUS

This manual describes installation and operation of the **New Buck Corporation Model 81** wood heater. This heater meets the U.S. Environmental Protection Agency's Emission limits for wood heaters sold after May, 15 2020. Under specific test conditions, this heater has been shown to deliver heat at rates ranging from approximately 13,800 to 59,500 BTU/hr. A weighted average was used to calculate the overall efficiency across all of the burn rate categories using the higher heating value (HHV 69.8%).

MODEL 81 WOOD STOVE



- | | | |
|--------------------------------|-----------------------------------|---------------------------------------|
| 1. Secondary air tubes | 15. Brass overlay mounting screws | 28. Disc thermostat |
| 2. Blower control (rheostat) | 16. Glass clips | 29. Door handle & brass spring handle |
| 3. Primary air control | 17. Hearth Brass | 30. Air wash screen |
| 4. Warm air outlets | 18. Door Gasket | 31. Glass gasket |
| 5. Baffles (interior of stove) | 19. Side glass | 32. Cover door hinge |
| 6. Air inlet | 20. Leveling screws | 33. Magnet holder |
| 7. Door | 21. Firebrick | 34. Cover door Magnet |
| 8. Hearth extension | 22. Motor | 35. Door latch |
| 9. Power cord | 23. Motor mount bracket | 36. Door latch screw |
| 10. Legs | 24. Cover Door | 37. Top Baffle Board |
| 11. Automatic/off/man. switch | 25. Cover door screws | 38. Hinge pins |
| 12. Brass cap | 26. Shot gun air box | 39. 6" Flue exit |
| 13. Hinge Block | 27. Ash pan | |
| 14. Brass overlays | | |

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS MODEL 81

BEFORE INSTALLING YOUR NEW BUCK STOVE,
READ THE ENTIRE INSTRUCTION MANUAL

IMPORTANT INSTRUCTIONS

WARNING

THIS UNIT GENERATES HIGH HEAT, SO TREAT IT WITH CARE. **HOT WHILE IN OPERATION.** KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE. DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS. DO NOT CONNECT TO ANY DISTRIBUTION DUCT OR SYSTEM. READ ALL INSTRUCTIONS BEFORE INSTALLING AND USING THE APPLIANCE. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH. SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCES.

- The New Buck Corp. non-catalytic Model 81 has been tested to UL 1482 Standards and listed by PFS/TECO. Standard for Room Heaters, Solid Fuel Type.
- Install and operate your unit according to instructions provided in this manual. Local building codes may apply; therefore, contact your local building inspector for necessary installation requirements and permits which may go beyond these instructions. Contact your insurance company for coverage and installation inspection.
- **DO NOT INSTALL IN SLEEPING ROOMS.**
- **NOTE: When burning any unit or appliance that combusts fuel for heat, such as coal, oil, wood or natural and (L.P.) liquid petroleum gas. Correctly place monitors in those areas that are expected to produce Carbon Monoxide (CO). Consult with your local fire safety officials to learn more**
- Examine the masonry fireplace and chimney prior to installation of fireplace accessory to determine that construction meets the minimum fireplace construction requirements illustrated in the instructions. Make sure that it is free from cracks, loose mortar, creosote deposits and other blockage, or other signs of deterioration.

CAUTION

DO NOT USE MORE THAN ONE STOVE TO A CHIMNEY. DO NOT USE A FLUE INTENDED FOR A GAS APPLIANCE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

- A factory-built pre-fabricated chimney may be used for your units when installed in compliance with manufacturer's specification and uniform building code.

CAUTION

YOUR CHIMNEY MUST BE CORRECTLY SIZED. A CHIMNEY THAT IS TOO SMALL OR LARGE IN DIAMETER, OR TOO SHORT, CAN CAUSE YOUR STOVE TO SPILL SMOKE WHEN THE DOOR IS OPENED.

SECTION I

INTRODUCTION

Your new MODEL 81 is a non-catalytic unit designed to meet the most stringent emissions standards without the use of a catalytic combustor. This effect is achieved through the use of a secondary air which is mixed with primary air in unit's firebox.

For peak performance, we suggest the use of natural seasoned hard wood, loading wood from front to rear.

NOTE: Soft woods such as pine, create more creosote, clogging of chimney and produce a less efficient burn performance.

You should not burn trash or garbage, artificial or paper logs, gift wrapping, treated or painted wood or any type of coal or flammable fluids.

**DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.
DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS.”**

The primary air, which is controlled by the user, burns the wood. Secondary air is admitted into firebox through secondary air tubes at top of firebox. This secondary air burns impurities in smoke released from the initial wood burning. The temperature necessary for this combustion is maintained through the firebrick refractory. If any more technical information is necessary, contact your local dealer.

This heater is equipped with a standard room air blower. For operation and use of these electrical assemblies, see instructions provided in this manual starting on page 37.

*Model 81: Motor Assembly—MA 910714

SECTION II

MASONRY INSERT INSTALLATION

The Model 81 may be installed using an all masonry fireplace built in accordance with the Uniform Building Code and National Fire Protection Association (NFPA). The first step in this type of installation is to determine acceptability of fireplace and chimney for use with a woodstove. Both construction and condition of fireplace are important considerations when installing a woodstove. The chimney should extend at least 3' above roof and at least 2' above any point of roof within 10'. (See Page 6 Figure 4).

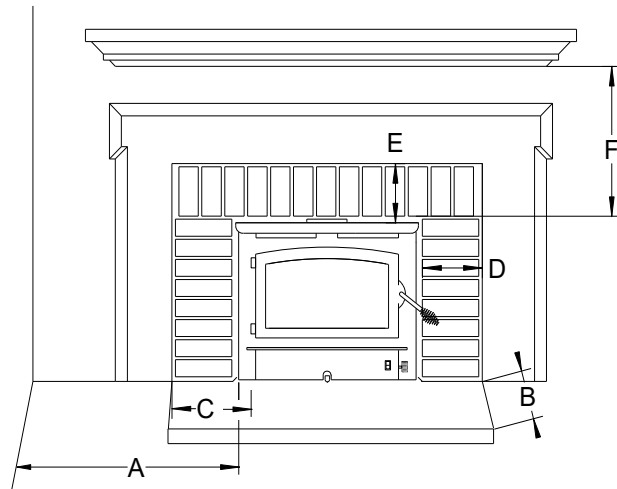
CAUTION

REMEMBER TO HAVE YOUR CHIMNEY INSPECTED FOR LEAKS AND BLOCKAGE BEFORE YOU INSTALL YOUR STOVE. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

MINIMUM CLEARANCE MASONRY INSERT

MODEL 81

A. Side Wall Combustible	12"
B. Front Floor Protector	16"
C. Side Floor Protector	8"
D. Side Wood Trim	7"
E. Top Wood Trim	10"
F. Mantel or Brackets	21"



1. The hearth must be of masonry construction and must extend a minimum of 16" in front of firebox opening and a minimum of 8" to either side of firebox opening.
2. If there is not minimum hearth protection from front of firebox opening and front of masonry hearth, a floor protector must be used in front of hearth to protect combustible materials. The floor protector must have a minimum R-Value of 1.1 non-combustible material.(See Page 7).

CHIMNEY HEIGHTS

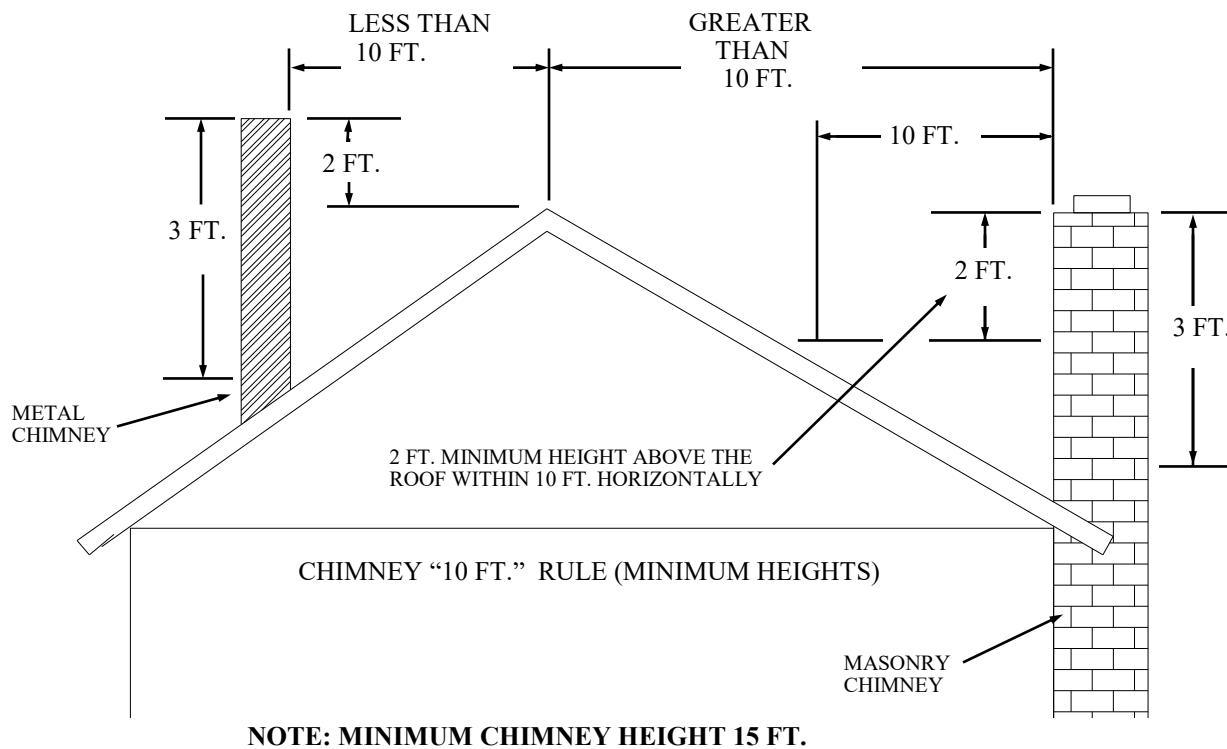
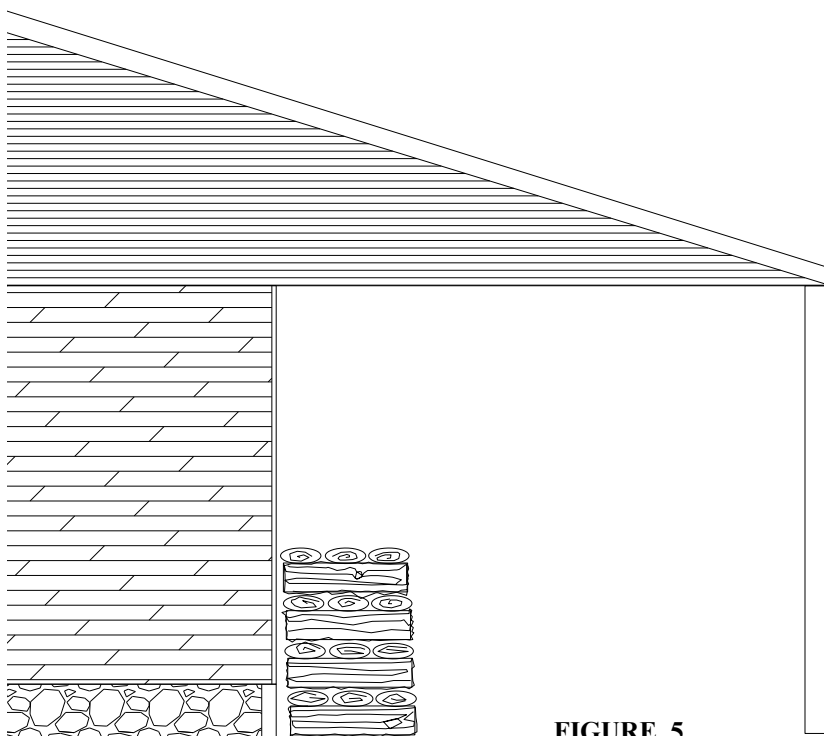


FIGURE 4

HOW TO STACK WOOD



Stack wood in crisscross pattern under a shelter to allow air flow to dry 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.

FIGURE 5

MINIMUM CLEARANCES

Floor Protection:

When installing a heater, a floor protector must be used. Floor protector must have a minimum of 1.1 R-Value non-combustible material.

How to use alternate materials and how to calculate equivalent thickness

Most people have heard of R-Values, which are used for rating common building materials such as fiberglass insulation and glass. However, many texts which cover stoves and fireplaces use K-Values instead of R-Values. Although the two are somewhat related, there are differences.

R-Value: The higher the R-Value, the better the insulating properties of the subject materials. R-Values are most often used to express the thermal resistance (ability to stop heat flow) of a building wall, ceiling or floor. Because of this, most R-Values are calculated at normal temperatures of approx. 75 F. R-Values are easy to add together so calculating the total R-Value of a wall is simply done by adding the values for the sheetrock, insulation, sheathing and siding.

K-value is a measure of heat conductivity of a particular material. Specifically, it is the measure of the amount of heat, in BTUs per hour, that will be transmitted through one square foot of material that is one inch thick to cause a temperature change of one degree Fahrenheit from one side of the material to the other. The lower the K-value for a material, the better it insulates. If the K-value of the material is known, the R-value per inch can be determined by dividing 1 by the K-value ($R\text{-value per inch} = 1/K\text{ value}$). The LOWER a K-Value, the better its performance as an insulator.

R or K values have nothing to do with whether a material is flame proof, flame resistant or combustible. Styrofoam, cork, wood and polyester are just some examples of materials which are good insulators but will burn or smoke dangerously when exposed to excess heat.

Technical - For those who desire to calculate their own K or R values, please use the following formulas:

1. R value can be calculated by dividing the thickness by the K value.

For US calculations, we use inches as the unit of measurement.

“In the inch-pound units, thermal resistance is measured in degrees F times square feet of area times hours of time per Btus of heat flow.”

$R\text{-value} = \text{thickness} / K\text{-value}$

2. K value is the inverse of the R-Value. If one is known, the other can be calculated.

“units of Btu-inch/hour per square foot per degree F”

$\text{Thickness}/k\text{ value} = R\text{ value}$

or:

Divide the inches of thickness by R.

$k = \text{inches of thickness} / R$

Common K and R Values Chart				
Material	K value	R Value	inches-K value .84	inches-R value of 1
per inch				
Micore 300*	0.43	2.33	0.5	0.43
Wonderboard (ce	1.92	0.52	2.3	1.92
Common Brick	5	0.2	6	5
Cement Mortar	5	0.2	6	5
Ceramic Tile	12.5	0.08	14.9	12.5
Marble	11	0.09	13.1	11
Air Space (ventila	0.7	1.43	0.8	0.7
sand and gravel	1.7	0.59	2	1.7
Drywall (gypsum)	1	1	1.2	1
Rockwool or Fiber	0.3	3.33	0.4	0.3
Units	K per unit	R per unit		
per unit				
8" Concrete Block	1	1		
Glass Block - 4"	2	0.5		
* These materials or equiv are some of the best to use for relatively thin hearth protection				

K-Value Example: A wood stove may call for a floor which has a K factor of 1 or less. A product such as Micore 300 Board from USG has a K-Value of approx .43 per inch. Therefore a 1/2" thickness of this board would have a K-Value of .86, which meets the requirement of our example stove.

R-Value Example: A stove or fireplace may call for an floor with an R-Value of 1.5. The same board above is rated as having an R-Value of 2.33 for a one inch thickness. Therefore, 3/4" of the Micore 300 Board would meet the specifications for this stove.

Summary: R and K values are related, but K is the value commonly used for specifying materials for use with stoves and fireplaces. Be sure that your choice of insulating material for high temperature applications is noncombustible.

With K values, the lower value is a better insulator. With R Values, the highest number is better.

For low profile hearths, it is best to use manufactured materials such as Micore and Cement Board (Durock, Wonderboard, etc.) as these will allow hearth thicknesses of from 1/4" to 2" with most stoves and fireplaces. Most other common building materials will require at least 3" of thickness and usually much more.

Example of Hearth Calculations - this is for a Hearth requirement of approx $R=1.15$ (figures taken from Ceramic Tile manufacturers trade association)

The assembly that we will evaluate is a $3/8''$ layer of Micore 230 and a layer of $1/2''$ Util-A-Crete. The first step is to convert the k values of the materials in question into R so that we may add them up and determine if they will provide the necessary insulation value required by the manufacturer.

Micore 230 has a k value of .43 so –

$1 \text{ divided by } k = 2.32 \text{ times the thickness } .375 (3/8'') = 0.87$

Util-A-Crete (cement tile backer board) has a k value of 1.6 so – $1 \text{ divided by } k = .625 \text{ times the thickness } .5 (1/2'') = 0.3125$

Add the values together $0.87 \text{ plus } 0.3125 = 1.1825$ This R- value is an acceptable assembly.

What if we decide to use only one material? In this example, only Util-A-Crete cement board?

We could use the published R-Value of Util-A-Crete which is .31 in the $1/2''$ material and add them up to the value of the minimum required which is $R=1.16$

$1.16 \text{ divided by } .31 = 3.74$ This assembly would require 3.74 layers of $1/2''$ Util-A-Crete to reach the necessary R-value required. Obviously, you would have to round up to the next layer, which would mean that you would have two inches of Util-A-Crete.

NEW BUCK CORPORATION HIGHLY RECOMMENDS A PROFESSIONAL INSTALLER TO INSTALL YOUR UNIT. PLEASE CONTACT YOUR DEALER

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 or newspapers
Vacuum cleaner or whisk broom
Flashlight
1 tube of RTV silicone, Code 103 or 106, or high temperature rubber cement rated between 450° F- 600° F
7/32" drill bit and drill
Socket/Ratchet Set

INSTALLATION PREPARATION

Fireplace:

1. Relocate furniture and other materials away from front of fireplace to allow free access to fireplace.
2. Cover hearth and adjacent floor areas with a drop cloths to protect from soiling or marring surface.
3. Remove existing fireplace damper plate.
4. Thoroughly clean fireplace of ashes and soot.
5. Check chimney and smoke chamber for excessive buildup of creosote or soot. Also, check for obstructions, such as birds nests. If chimney is excessively dirty, clean it or have someone clean it professionally BEFORE installing or using room heater.
6. If fireplace has an ash dump or outside air provision, these must be sealed off with metal or tightly packed non-combustible insulation to prevent cold air from entering fireplace chamber.

MASONRY INSERT INSTALLATION OPTIONS

This unit (appliance) may be installed into an all masonry fireplace, built in accordance with Uniform Building Code and National Fire Protection Association (*NFPA 211*).

NOTE: Check with local building officials for any permits required for installation of this unit and notify your insurance company before proceeding with installation.

In cases, such as improperly drawing fireplaces, oversize flue liners are needed to meet codes in certain areas it is recommended that one of the following procedures be followed:

- A. A **Chimney Connector** can be installed from appliance flue exit through damper, plus a air-tight face seal. (See Page 11, Figure 5, Option (A).
- B. A listed **Direct Connect** can be installed from appliance flue exit through damper, into first section of flue liner with air-tight seal. (See Page 11, Figure 6, Option (B).
- C. A **Positive Connect** can be installed from appliance flue exit continuing up through entire chimney and exiting at top of chimney. (See Page 11, Figure 7, Option (C).



SAFETY NOTICE

If this appliance 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

FIGURE 5, OPTION (A)

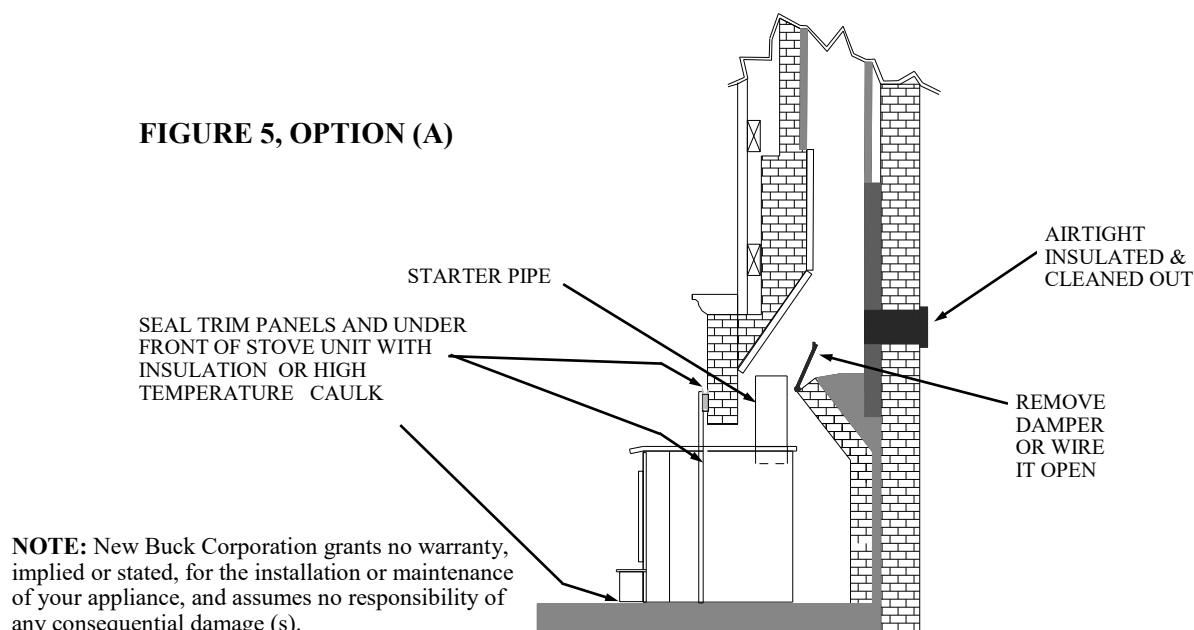


FIGURE 6, OPTION (B)

NOTE: Follow installation instruction with Direct Connection Kit. (Kit sold separately)

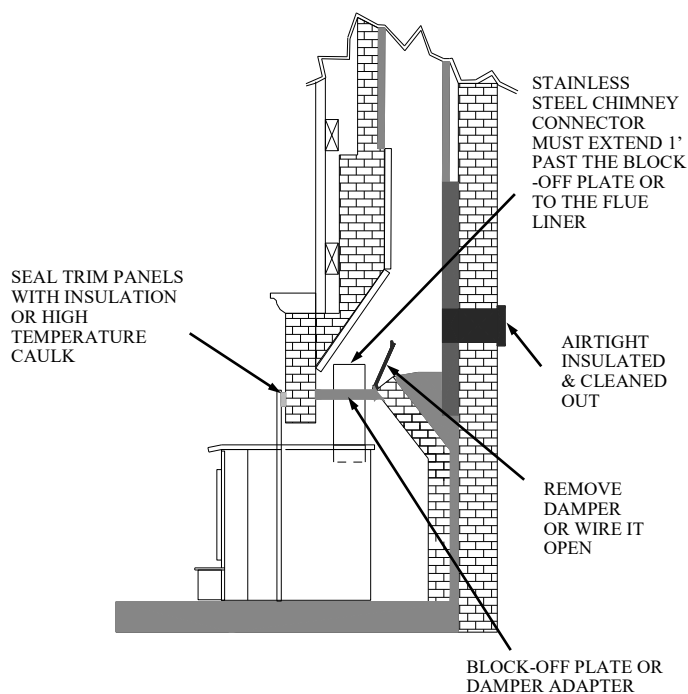
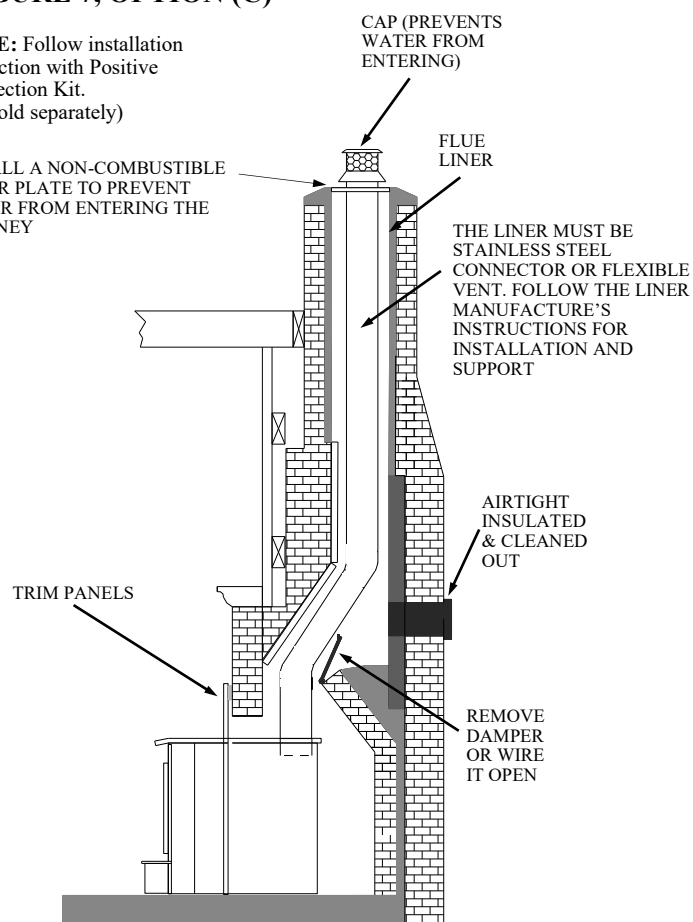


FIGURE 7, OPTION (C)

NOTE: Follow installation instruction with Positive Connection Kit. (Kit sold separately)

INSTALL A NON-COMBUSTIBLE COVER PLATE TO PREVENT WATER FROM ENTERING THE CHIMNEY



INSTALLATION PROCEDURE

Follow installation procedures on direct connect or positive connect kit you are using and install heater connect kit in fireplace.

MOUNTING TRIM PANELS

Mark mounting position of trim panels as follows:

1. Center stove in fireplace opening.
2. Place side trim panels flat against face of fireplace. Mark front edge of trim panel with a pencil to make a vertical reference line. (See Figure 9).
3. Place top (long) trim panel on top of unit. The panel should be flat against the outside face of fireplace and standing vertically. Mark along lower edge of trim panel with a pencil to make a reference line for mounting.
4. Slide unit out of fireplace far enough to work behind trim panel reference lines.
5. Mount side trim panels. (See Figure 9).
 - a. Position side trim panel on reference line.
 - b. Drill mounting holes in center of side trim panel mounting brackets to allow for adjustment in and out if necessary.
 - c. Mount trim panel using self-tapping screws provided.
6. Place top trim panel on reference mark, be sure the panel sits in front of the side trim panels. Place the top trim panel mounting bracket (supplied) behind the top trim (See Figure 9). Position so the rear lip of top trim panel overlaps the mounting bracket. Drill mounting holes in top of stove using holes in bracket as guide. Tighten with self-tapping screws provided.
7. Slide unit back into fireplace. Check to be sure that trim panels are properly positioned and lie flat against front of fireplace. If one or more of panels is out of position, slide unit out and reset by loosening mounting screws and reposition in slot.
8. After you get the panels in the correct position. Slide unit back into fireplace and set top trim panel aside and finish hooking up the pipe to the top of the unit.
9. Reinstall top trim panel by sliding rear lip of top trim panel underneath front lip of mounting bracket already secured to top of unit.

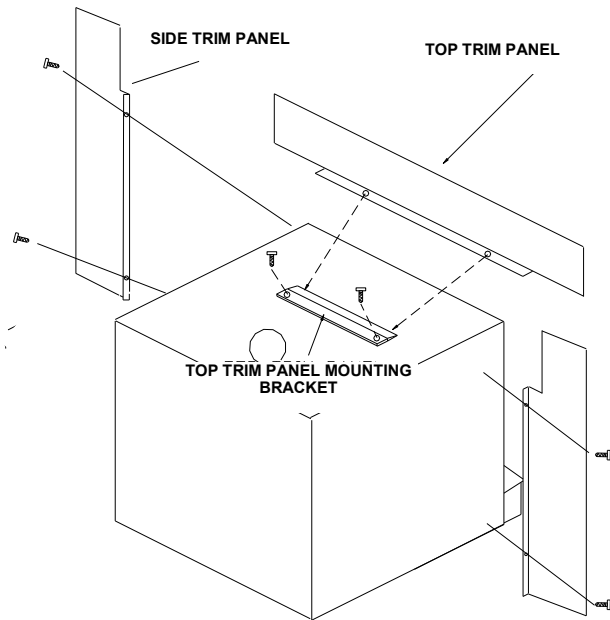
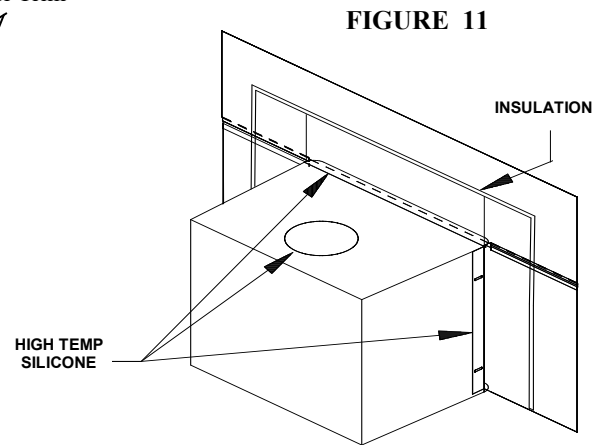
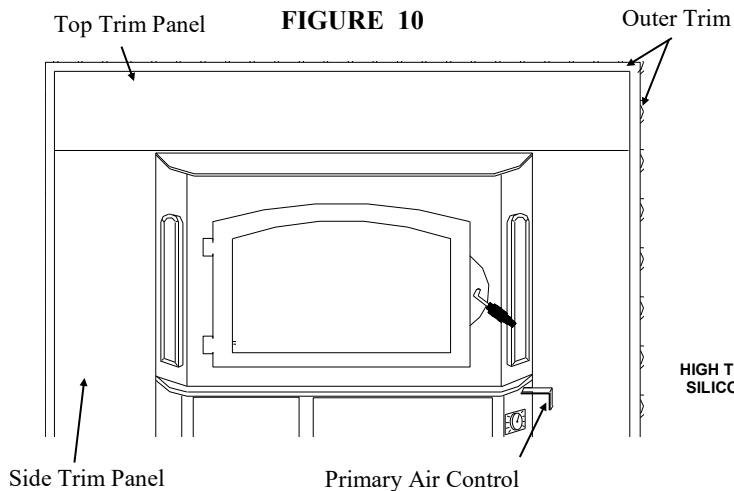


FIGURE 9

10. Obtain outer black trim kit provided with insert kit and slip over top and sides of trim panels. (See Figure 10).
11. Using insulation provided, peel and stick to back of panels overlapping fireplace dimensions by 1" on each side and top. (See Figure 11).
12. Next using high heat silicone or furnace cement run heavy bead of caulking around where panels meet the stove. (See Figure 11).
13. Using the bar, lift stove up in front. Place insulation across front and surface of hearth or bottom of fireplace to make complete seal.
14. To check seal of panels, use candle flame and go around entire area sealed by silicone and insulation. If flame leans toward inside of fireplace, add additional insulation. This ensures an airtight seal.



FINAL CHECK

1. Recheck specified clearances.
2. Remove all foreign material from firebox area.
3. Primary Air Control: The primary air intake draft control is located at right bottom side of hearth. It is operated by moving handle **OUT** to open (to allow air into the firebox) or **IN** to control or close off air into firebox. (See Figure 10).
4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.
5. Place crumpled pieces of newspaper in stove. Light it and close door. Ensure that stove draws properly through primary draft.
6. Check for smoke leaks around door.
7. Open door and check for smoke escaping from front of stove. Smoking usually indicates a defective or poorly positioned chimney. Some chimneys with a marginal draft can be pre-heated by lighting newspaper and holding it near open damper with a poker or fire tong. Once chimney heats up, a proper draft can usually be obtained.

CAUTION

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. OPENING A WINDOW NEAR THE UNIT WILL ALLOW THESE FUMES TO ESCAPE. DO NOT BUILD A LARGE, ROARING FIRE UNTIL THIS CURING IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.

The connector and/or chimney should be inspected at least once a month during heating season to determine if a creosote buildup has occurred.

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 AND WILL EXPLODE! DON'T TAKE A CHANCE WITH THE SAFETY OF YOUR HOME AND FAMILY.

SECTION III PRE-FAB INSERT INSTALLATION

The Model 81 may be installed into any UL listed pre-fabricated fireplace that is large enough to accept it.

NOTE: When installing Model 81 into a Pre-Fab Zero-Clearance fireplace, a UL-1777 LINER must be installed the Full Length of chimney and attached to flue exit of insert.

NOTE: The ash lip, smoke baffle and smoke shelf of pre-fab fireplace may be removed if necessary to provide room for these models. Any other alteration to unit will void ALL New Buck Corporation responsibility and liability. The warning label below must be attached to back of fireplace.

NOTE: Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

NOTE: DO NOT BLOCK ANY EXISTING LOUVERS OR VENTS ON EXISTING PRE-FAB WITH ANY TRIM PANELS FOR MODEL 81.

Except for “notes” above, please follow instruction of masonry installation, Section II.

WARNING: This fireplace must be restored to it's original condition for safe use if the fireplace insert is removed.

SECTION IV

RESIDENTIAL FREESTANDING INSTALLATION

Select an installation location that will give best airflow from front of heater to remainder of home.

PREPARING STOVE FOR INSTALLATION

1. Inspect unit for any obvious physical damage.
2. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.
3. Check primary air draft control to ensure that it slides freely. Primary air control located on right side of stove under hearth (See Figure 12).
4. Remove the manual bag and items from within firebox. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
5. **(Leg Kit):** If legs are to be used, obtain four legs, attach legs to holes in bottom of unit with bolts and washers supplied with leg kit. (See Figure 12).
6. **(Pedestal Kit):** If pedestal kit is being used an outside air is required for residential freestanding installation (page 25 Out Side Air Installation). Open freestanding kit and obtain stand. Place stand against bottom of heater (angle side to heater). Center stand front to rear and also center stand left and right. Mark screw locations with pen or pencil on bottom of stove through outer holes of stand mounting angles. Set stand aside and drill four 7/32" holes in heater bottom. Then mount stand to bottom of heater with screws provided. (See Figure 13).
7. Obtain four (4) 3/16" self-tapping screws and secure stand to heater.
8. Reposition heater to upright position.

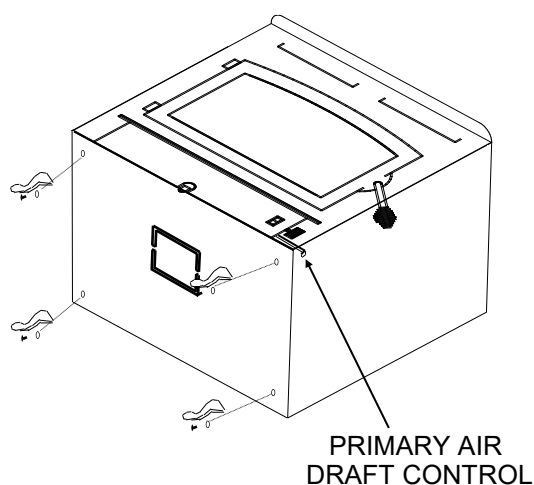


FIGURE 12

HOLES FOR MOUNTING PEDESTAL

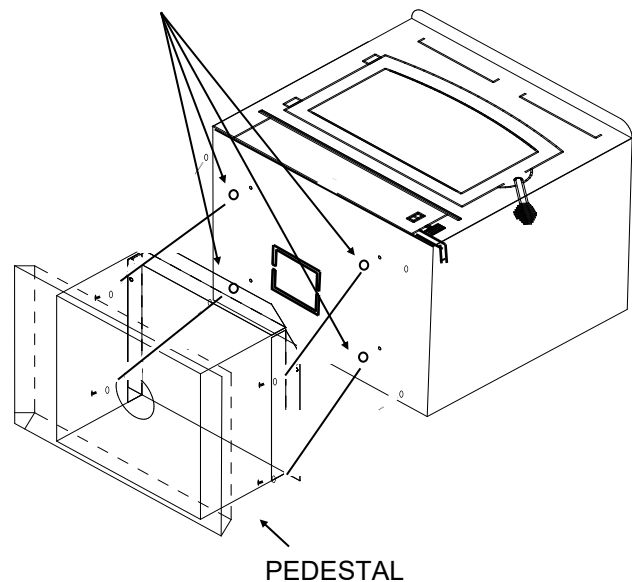


FIGURE 13

MINIMUM CLEARANCES

Floor Protection:

When installing a heater, a floor protector must be used. Floor protector must have a minimum of 1.1 R-Value non-combustible material.

How to use alternate materials and how to calculate equivalent thickness

Most people have heard of R-Values, which are used for rating common building materials such as fiberglass insulation and glass. However, many texts which cover stoves and fireplaces use K-Values instead of R-Values. Although the two are somewhat related, there are differences.

R-Value: The higher the R-Value, the better the insulating properties of the subject materials. R-Values are most often used to express the thermal resistance (ability to stop heat flow) of a building wall, ceiling or floor. Because of this, most R-Values are calculated at normal temperatures of approx. 75 F. R-Values are easy to add together so calculating the total R-Value of a wall is simply done by adding the values for the sheetrock, insulation, sheathing and siding.

K-value is a measure of heat conductivity of a particular material. Specifically, it is the measure of the amount of heat, in BTUs per hour, that will be transmitted through one square foot of material that is one inch thick to cause a temperature change of one degree Fahrenheit from one side of the material to the other. The lower the K-value for a material, the better it insulates. If the K-value of the material is known, the R-value per inch can be determined by dividing 1 by the K-value ($R\text{-value per inch} = 1/K \text{ value}$). The LOWER a K-Value, the better its performance as an insulator.

R or K values have nothing to do with whether a material is flame proof, flame resistant or combustible. Styrofoam, cork, wood and polyester are just some examples of materials which are good insulators but will burn or smoke dangerously when exposed to excess heat.

Technical - For those who desire to calculate their own K or R values, please use the following formulas:

1. R value can be calculated by dividing the thickness by the K value.

For US calculations, we use inches as the unit of measurement.

“In the inch-pound units, thermal resistance is measured in degrees F times square feet of area times hours of time per Btus of heat flow.”

$R\text{-value} = \text{thickness} / K\text{-value}$

2. K value is the inverse of the R-Value. If one is known, the other can be calculated.

“units of Btu-inch/hour per square foot per degree F”

$\text{Thickness}/k \text{ value} = R \text{ value}$

or:

Divide the inches of thickness by R.

$k = \text{inches of thickness} / R$

Common K and R Values Chart				
Material	K value	R Value	inches-K value .84	inches-R value of 1
per inch				
Micore 300*	0.43	2.33	0.5	0.43
Wonderboard (ce	1.92	0.52	2.3	1.92
Common Brick	5	0.2	6	5
Cement Mortar	5	0.2	6	5
Ceramic Tile	12.5	0.08	14.9	12.5
Marble	11	0.09	13.1	11
Air Space (ventila	0.7	1.43	0.8	0.7
sand and gravel	1.7	0.59	2	1.7
Drywall (gypsum)	1	1	1.2	1
Rockwool or Fiber	0.3	3.33	0.4	0.3
Units	K per unit	R per unit		
per unit				
8" Concrete Block	1	1		
Glass Block - 4"	2	0.5		
* These materials or equiv are some of the best to use for relatively thin hearth protection				

K-Value Example: A wood stove may call for a floor which has a K factor of 1 or less. A product such as Micore 300 Board from USG has a K-Value of approx .43 per inch. Therefore a 1/2" thickness of this board would have a K-Value of .86, which meets the requirement of our example stove.

R-Value Example: A stove or fireplace may call for an floor with an R-Value of 1.5. The same board above is rated as having an R-Value of 2.33 for a one inch thickness. Therefore, 3/4" of the Micore 300 Board would meet the specifications for this stove.

Summary: R and K values are related, but K is the value commonly used for specifying materials for use with stoves and fireplaces. Be sure that your choice of insulating material for high temperature applications is noncombustible.

With K values, the lower value is a better insulator. With R Values, the highest number is better.

For low profile hearths, it is best to use manufactured materials such as Micore and Cement Board (Durock, Wonderboard, etc.) as these will allow hearth thicknesses of from 1/4" to 2" with most stoves and fireplaces. Most other common building materials will require at least 3" of thickness and usually much more.

Example of Hearth Calculations - this is for a Hearth requirement of approx $R=1.15$ (figures taken from Ceramic Tile manufacturers trade association)

The assembly that we will evaluate is a $3/8$ " layer of Micore 230 and a layer of $1/2$ " Util-A-Crete. The first step is to convert the k values of the materials in question into R so that we may add them up and determine if they will provide the necessary insulation value required by the manufacturer.

Micore 230 has a k value of .43 so –

$1 \text{ divided by } k = 2.32 \text{ times the thickness } .375 (3/8") = 0.87$

Util-A-Crete (cement tile backer board) has a k value of 1.6 so – $1 \text{ divided by } k = .625 \text{ times the thickness } .5 (1/2") = 0.3125$

Add the values together $0.87 \text{ plus } 0.3125 = 1.1825$ This R- value is an acceptable assembly.

What if we decide to use only one material? In this example, only Util-A-Crete cement board?

We could use the published R-Value of Util-A-Crete which is .31 in the $1/2$ " material and add them up to the value of the minimum required which is $R=1.16$

$1.16 \text{ divided by } .31 = 3.74$ This assembly would require 3.74 layers of $1/2$ " Util-A-Crete to reach the necessary R-value required. Obviously, you would have to round up to the next layer, which would mean that you would have two inches of Util-A-Crete.

Chimney

This model is designed for connection to any listed 2100° UL103 HT chimneys and parts. Follow chimneys manufacturer's instructions carefully.

NOTE: This Room Heater must be connected to either two options:

1. A chimney complying with requirements for Type HT chimneys in Standard for Safety Factory-Built Chimneys For Residential Type and Building Heating Appliances, UL 103.
2. A code approved masonry chimney with a flue liner.

CAUTION

SPECIAL METHODS ARE REQUIRED WHEN PASSING THROUGH A WALL OR CEILING. SEE INSTRUCTIONS AND BUILDING CODES. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

DETERMINING CHIMNEY LOCATION

A. Ceiling Exits: (Using 6" Single Wall Pipe and UL 103 HT type chimney system listed with manufacturer in this section of manual).

1. Suspend a plumb bob from ceiling above unit so weight is hanging in center of flue exit. (A small weight on a string will serve as a plumb bob). Mark ceiling where string is suspended to locate center of chimney. (See Figure 14).
2. After locating center of hole, install ceiling support box, chimney, flashing and rain cap, per chimney manufacturer's instructions.
3. Now connect stove and ceiling support box using #24 ga. minimum blue or black steel connector pipe. (**DO NOT USE GALVANIZED PIPE**). Connect each section so crimped end faces downward and secure each section to each other using at least three (3) sheet metal screws or rivets. Next, install an optional New Buck Corporation chimney connector to flue exit of heater. (See Figure 14).

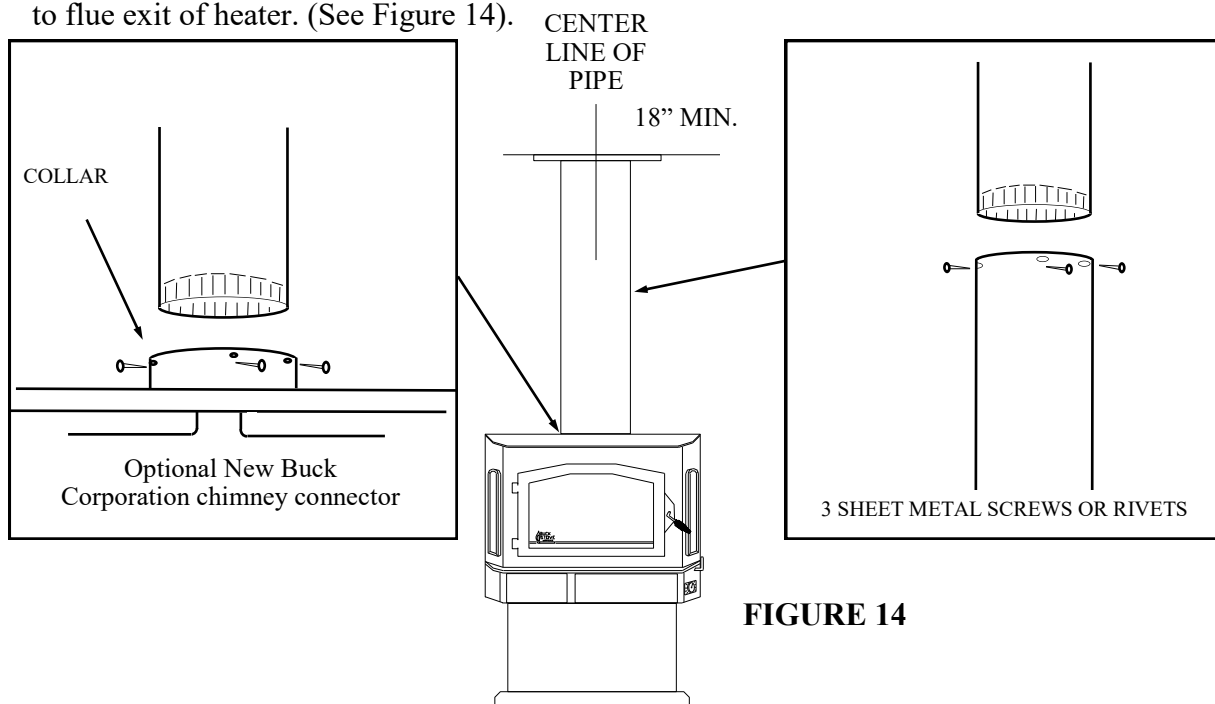
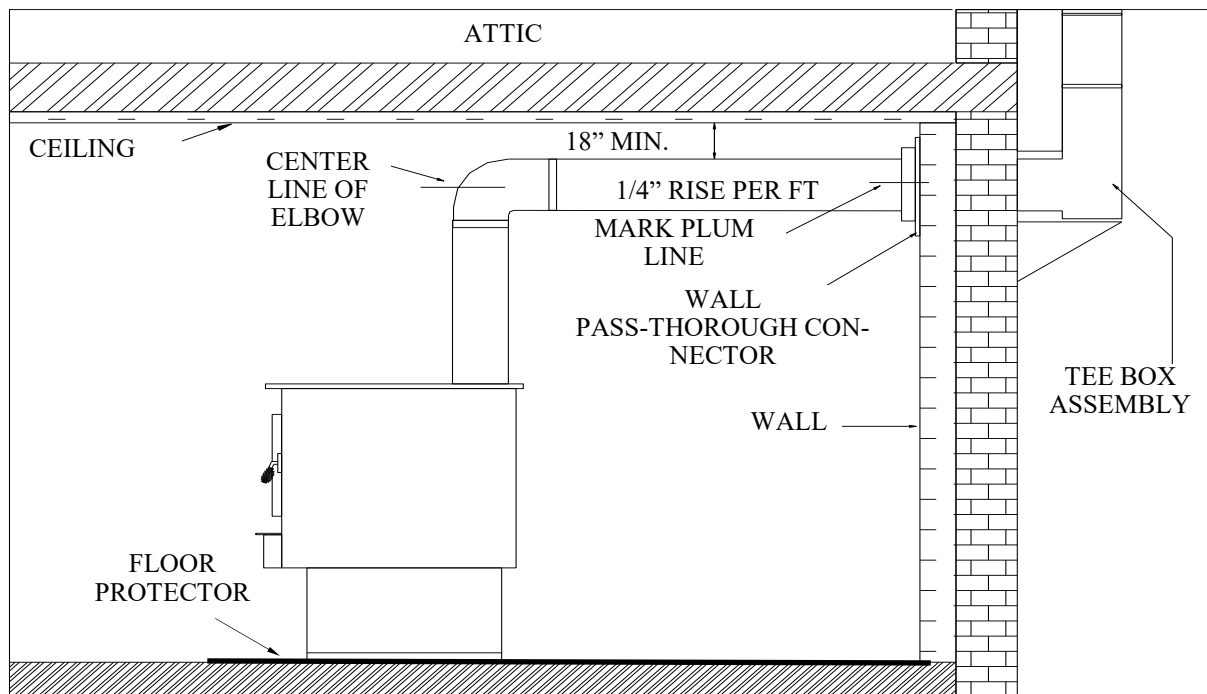


FIGURE 14

B. Wall Exit Into Metal Tee-Box

1. Mark the plumb line on wall directly behind center of heater. (See Figure 15). Floor protector must be under horizontal pipe exit.
2. Place vertical portion of heater pipe and elbow in position and project a point onto plumb line level with center of the elbow. (See Figure 15).
3. Measure up so there will be at least 1/4" rise per foot of horizontal connector pipe. When using #24 ga. minimum blue or black steel pipe maintain 18" between pipe and ceiling (See Figure 15). This will give you center of hole for chimney penetration.
4. After locating center of penetration, install tee box and chimney, per chimney manufacturer's specifications.
5. Connect chimney collar to tee-box using #24 ga. minimum blued or black steel connector pipe. **(DO NOT USE GALVANIZED PIPE)**. Connect each section so crimped end faces downward and secure each section to each other using three (3) sheet metal screws or rivets. (See Figure 14, Page 20).
6. For closer clearances to the ceiling use double wall or triple wall type A or 2100 HT pipe and follow those manufactures clearance instructions.



Wall Exit Into Metal Tee-Box

FIGURE 15

C. Wall Exit Into Masonry (Using Single Wall Pipe)

1. Before connecting this unit to a masonry chimney, determine that masonry fireplace wall pass through connector thimble meets **NFPA-211** Code and local building codes and is a minimum of 18" from ceiling. If connector thimble does not meet these codes, the pass through connector must be modified. (See Figure 16).

Connectors may pass through walls or partitions constructed of combustible material if 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 conditions of listing.
- (a) Selected or fabricated in accordance with conditions and clearances as stated in **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° F.

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

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

2. Once through-the-wall thimble codes are met, simply connect chimney collar to 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 appliance to chimney.
 - (b) Connect each section so crimped end faces downward or back toward unit.
 - (c) Secure each section to each other using at least three (3) sheet metal screws or rivets. (See Page 20, Figure 14).
 - (d) Use three (3) sheet metal screws to fasten pipe to connector collar on heater. (See Page 20, Figure 14).
 - (e) For closer clearances to the ceiling use double wall or triple wall type A or 2100 HT pipe and follow those manufactures clearance instructions.

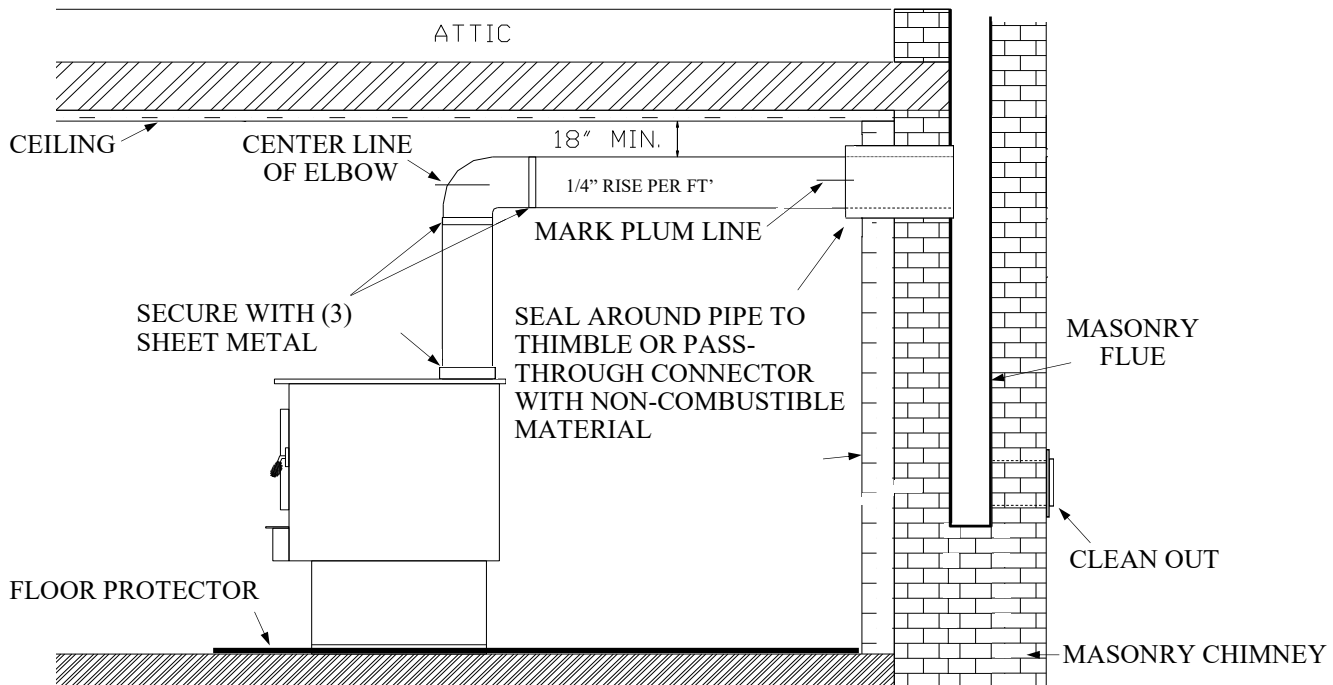


Figure 16

FINAL CHECK

1. Recheck specified clearances. (See Page 24)
2. Remove all foreign material from firebox area.
3. Open primary air draft. Primary air control located on right side of stove under hearth.
4. Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.
4. Place crumpled pieces of newspaper in stove. Light it and close door. Ensure that stove draws properly through primary draft.
5. Check for smoke leaks around door.

CAUTION

Open door and check for smoke escaping from front of 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 open damper with a poker or fire tong. Once the chimney heats up, a proper draft can usually be obtained.

CAUTION

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 first fires. This is normal and is not a cause for alarm. In some cases, these fumes will activate a smoke alarm. Opening a window near unit will allow these fumes to escape. DO NOT build a large, roaring fire until this curing is complete or heater finish may be damaged.

CLEARANCES FOR MODEL 81

MINIMUM CLEARANCES TO COMBUSTIBLES

FREESTANDING

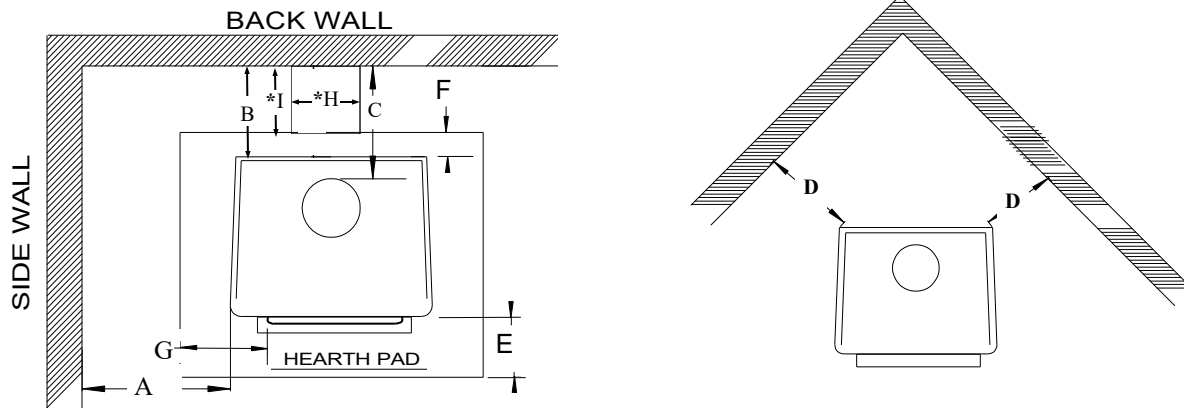


FIGURE 18

	A	B	C	D	E	F	G	*H	*I
MODEL 81	23"	23"	25"	16"	16"	8"	8"	10"	FULL LENGTH PIPE TO WALL

NOTE: All clearances are to combustibles without low clearance shields and using single wall pipe and minimum floor protector. Clearances above may be reduced by using close clearance shields. Follow **NFPA-211** codes if available or follow instructions on next page.

* For wall exit, floor protector must be under horizontal pipe full length of pipe. There must be 2" on each side of pipe. Maintain 18" between pipe and ceiling.
(See Figure 20, measurements H & *I).

CLEARANCES FOR MODEL 81

MINIMUM CLEARANCES TO COMBUSTIBLES USING SINGLE WALL CHIMNEY CONNECTOR AND OPTIONAL SHIELDS, PERMANENTLY LOCATED MANUFACTURED HOME AND ALCOVE INSTALLATIONS

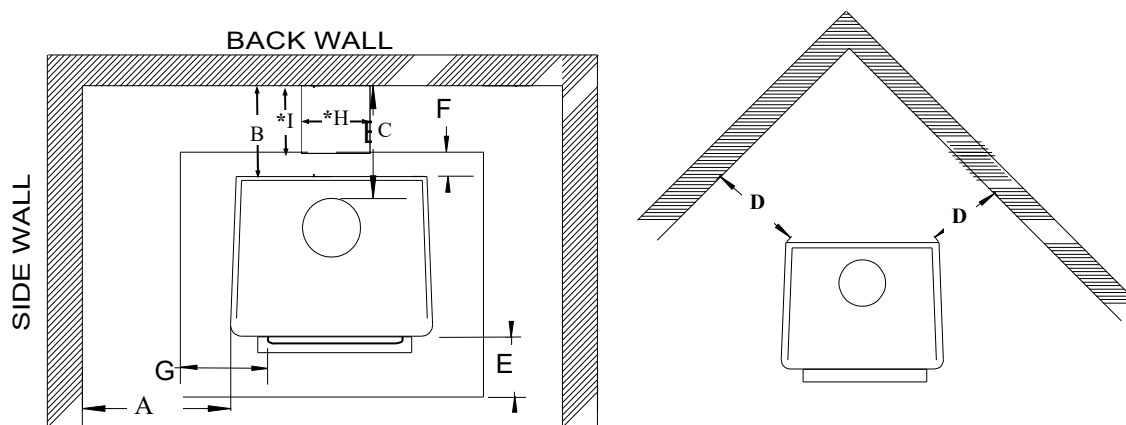


FIGURE 19

	A	B	C	D	E	F	G	*H	*I
MODEL 81	12"	16"	16.5"	12"	16'	8"	8"	10"	FULL LENGTH PIPE TO WALL

NOTE: All clearances are to combustibles using single wall pipe and all low clearance shields and minimum floor protector.

* For wall exit, floor protector must be under horizontal pipe full length of pipe. There must be 2" on each side of pipe. Maintain 18" between pipe and ceiling.
(See Figure 20, measurements H & *I).

INSTALLATION OF (OPTIONAL) CLOSE CLEARANCE SHIELDS

1. Center rear close clearance shield with back of stove. Mark back of stove, using holes in rear shield as reference. Drill pilot holes using a 1/8 drill bit. Using self-tapping screws, secure back shield to back of stove (See figure 20).
2. Insert front end of side shield behind side angle on front side of stove. Align top of side shield with top of back shield. Mark holes on back shield through holes in back of side shield. Using four self tapping screws, drill four holes in the locations marked. Tighten bottom screws and leave top screws loose for step 3. Use same step to install side shield on opposite side of stove. (See figure 21).
3. Insert pipe shield where back shield and top back side shield meets. Tighten screws. (See figure 22).

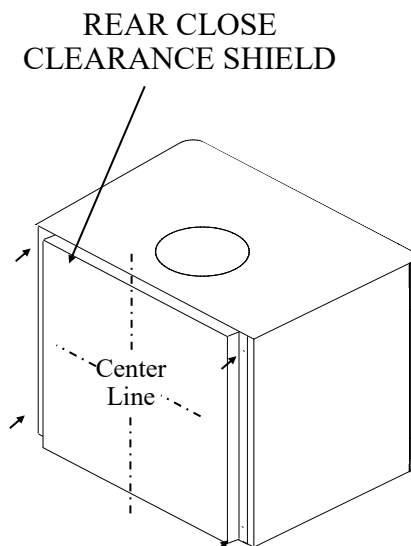


FIGURE 20

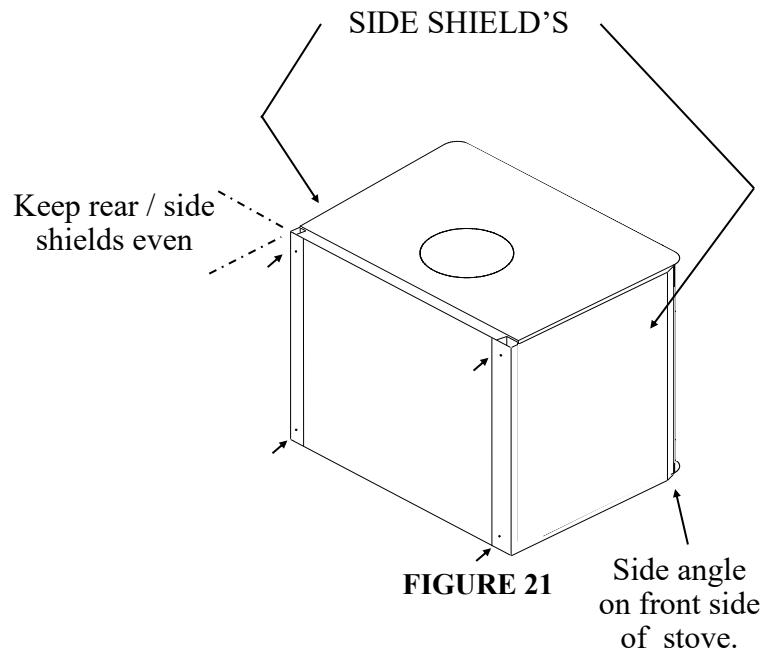


FIGURE 21

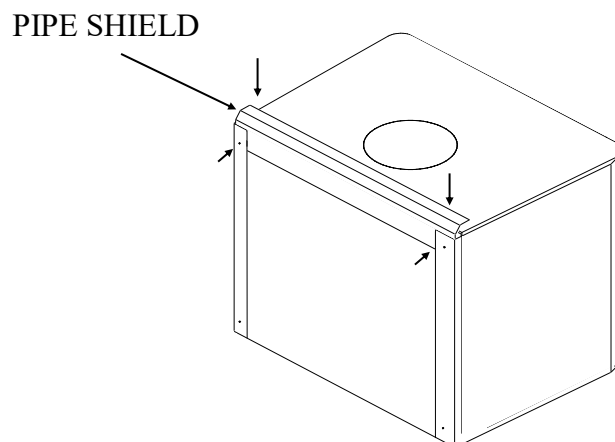


FIGURE 22

SECTION V

FREESTANDING PERMANENTLY LOCATED MANUFACTURED HOME INSTALLATION

FOR MINIMUM CLEARANCES SEE PAGE 25.

Floor Protection:

When installing a heater, a floor protector must be used. Floor protector must have a minimum of 1.1 R-Value non-combustible material.

How to use alternate materials and how to calculate equivalent thickness

Most people have heard of R-Values, which are used for rating common building materials such as fiberglass insulation and glass. However, many texts which cover stoves and fireplaces use K-Values instead of R-Values. Although the two are somewhat related, there are differences.

R-Value: The higher the R-Value, the better the insulating properties of the subject materials. R-Values are most often used to express the thermal resistance (ability to stop heat flow) of a building wall, ceiling or floor. Because of this, most R-Values are calculated at normal temperatures of approx. 75 F. R-Values are easy to add together so calculating the total R-Value of a wall is simply done by adding the values for the sheetrock, insulation, sheathing and siding.

K-value is a measure of heat conductivity of a particular material. Specifically, it is the measure of the amount of heat, in BTUs per hour, that will be transmitted through one square foot of material that is one inch thick to cause a temperature change of one degree Fahrenheit from one side of the material to the other. The lower the K-value for a material, the better it insulates. If the K-value of the material is known, the R-value per inch can be determined by dividing 1 by the K-value ($R\text{-value per inch} = 1/K \text{ value}$). The LOWER a K-Value, the better its performance as an insulator.

R or K values have nothing to do with whether a material is flame proof, flame resistant or combustible. Styrofoam, cork, wood and polyester are just some examples of materials which are good insulators but will burn or smoke dangerously when exposed to excess heat.

Technical - For those who desire to calculate their own K or R values, please use the following formulas:

1. R value can be calculated by dividing the thickness by the K value.

For US calculations, we use inches as the unit of measurement.

“In the inch-pound units, thermal resistance is measured in degrees F times square feet of area times hours of time per Btus of heat flow.”

$R\text{-value} = \text{thickness} / K\text{-value}$

2. K value is the inverse of the R-Value. If one is known, the other can be calculated.

“units of Btu-inch/hour per square foot per degree F”

$\text{Thickness}/k \text{ value} = R \text{ value}$

or:

Divide the inches of thickness by R.

$k = \text{inches of thickness} / R$

Common K and R Values Chart				
Material	K value	R Value	inches-K value .84	inches-R value of 1
per inch				
Micore 300*	0.43	2.33	0.5	0.43
Wonderboard (ce	1.92	0.52	2.3	1.92
Common Brick	5	0.2	6	5
Cement Mortar	5	0.2	6	5
Ceramic Tile	12.5	0.08	14.9	12.5
Marble	11	0.09	13.1	11
Air Space (ventila	0.7	1.43	0.8	0.7
sand and gravel	1.7	0.59	2	1.7
Drywall (gypsum)	1	1	1.2	1
Rockwool or Fiber	0.3	3.33	0.4	0.3
Units	K per unit	R per unit		
per unit				
8" Concrete Block	1	1		
Glass Block - 4"	2	0.5		
* These materials or equiv are some of the best to use for relatively thin hearth protection				

K-Value Example: A wood stove may call for a floor which has a K factor of 1 or less. A product such as Micore 300 Board from USG has a K-Value of approx .43 per inch. Therefore a 1/2" thickness of this board would have a K-Value of .86, which meets the requirement of our example stove.

R-Value Example: A stove or fireplace may call for an floor with an R-Value of 1.5. The same board above is rated as having an R-Value of 2.33 for a one inch thickness. Therefore, 3/4" of the Micore 300 Board would meet the specifications for this stove.

Summary: R and K values are related, but K is the value commonly used for specifying materials for use with stoves and fireplaces. Be sure that your choice of insulating material for high temperature applications is noncombustible.

With K values, the lower value is a better insulator. With R Values, the highest number is better.

For low profile hearths, it is best to use manufactured materials such as Micore and Cement Board (Durock, Wonderboard, etc.) as these will allow hearth thicknesses of from 1/4" to 2" with most stoves and fireplaces. Most other common building materials will require at least 3" of thickness and usually much more.

Example of Hearth Calculations - this is for a Hearth requirement of approx $R=1.15$ (figures taken from Ceramic Tile manufacturers trade association)

The assembly that we will evaluate is a $3/8$ " layer of Micore 230 and a layer of $1/2$ " Util-A-Crete. The first step is to convert the k values of the materials in question into R so that we may add them up and determine if they will provide the necessary insulation value required by the manufacturer.

Micore 230 has a k value of .43 so –

$1 \text{ divided by } k = 2.32 \text{ times the thickness } .375 (3/8") = 0.87$

Util-A-Crete (cement tile backer board) has a k value of 1.6 so – $1 \text{ divided by } k = .625 \text{ times the thickness } .5 (1/2") = 0.3125$

Add the values together $0.87 \text{ plus } 0.3125 = 1.1825$ This R- value is an acceptable assembly.

What if we decide to use only one material? In this example, only Util-A-Crete cement board?

We could use the published R-Value of Util-A-Crete which is .31 in the $1/2$ " material and add them up to the value of the minimum required which is $R=1.16$

$1.16 \text{ divided by } .31 = 3.74$ This assembly would require 3.74 layers of $1/2$ " Util-A-Crete to reach the necessary R-value required. Obviously, you would have to round up to the next layer, which would mean that you would have two inches of Util-A-Crete.

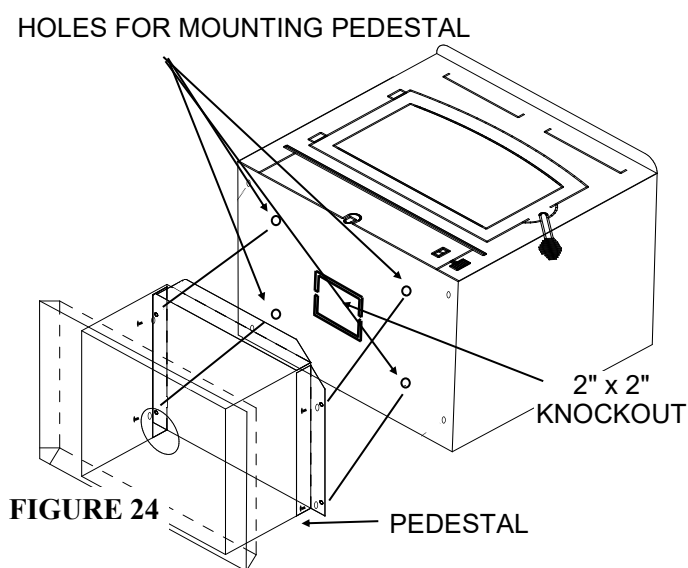
TOOLS FOR INSTALLATION

Drop cloth, 3/32" Metal drill bit, 5/16" magnetic socket chuck adapter, 5/16" wrench (box or socket) or adjustable wrench, Jigsaw with masonry, metal and wood blades

WARNING: DO NOT INSTALL IN A SLEEPING ROOM

PREPARING STOVE FOR INSTALLATION

1. Remove protective plastic wrapping from unit, inspect unit for any obvious physical damage.
2. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.
3. Check primary air draft control to ensure that it slides freely.
4. Remove any items from within firebox. Spread a dropcloth on floor behind heater. Next, tilt heater so that back is on drop cloth.
5. **Pedestal Kit: For Permanently Located Manufactured Home installation a pedestal kit is required and outside air is required, see *Out Side Air Installation* below.**
 - Before attaching heater to stand, take a large flat screwdriver or pliers and remove the 2" x 2" knockout on bottom of unit. (See Figure 24).
 - Open freestanding kit and obtain stand. Place stand against bottom of heater (angle side to heater). Center stand front to rear and also center stand left and right. Mark screw locations on bottom of stove through outer holes of stand mounting angles. Set stand aside and drill four 3/16" holes in heater bottom. Then mount stand to bottom of heater with screws provided 1/4"-14 x 1". (See Figure 24).
6. Remove the screws and remove the pedestal. Reposition heater to upright position.



Out Side Air Installation

CAUTION

THE STRUCTURAL INTEGRITY OF PERMANENTLY LOCATED MANUFACTURED HOME FLOOR MUST BE MAINTAINED. (MOVE OPENING AND/OR REPOSITION HEATER LOCATION IF NECESSARY).

1. Select an installation location that will give best airflow from front of heater to remainder of home making sure minimum clearance specifications are met. See minimum clearance to combustibles (See Page 25).
2. Place protective floor pad in position. For minimum floor protection (See Page 27).
3. Place pedestal on pad.
4. Mark on pad the outside air opening in bottom of pedestal stand.
5. Mark center line of outside air opening. Set pedestal aside for now.
8. **CAUTION! The structural integrity of home floor must be maintained.**
Cut a 4 1/4" diameter hole in pad and continue through floor.
(Move opening and/or reposition heater location if necessary).
9. Now, reposition pedestal stand and set on pad being sure to line stand up with outside air opening.
12. Obtain outside air duct from box in pedestal kit marked FA P81BOA.
13. Slip duct down through 4-1/4" hole until face of outside air duct with screen wire, contacts bottom of pedestal.
15. Set heater back onto stand and resecure using screws.
16. NOTE: If home is underpinned, you must duct through underpin as shown. (See Figure 26).

FIGURE 26

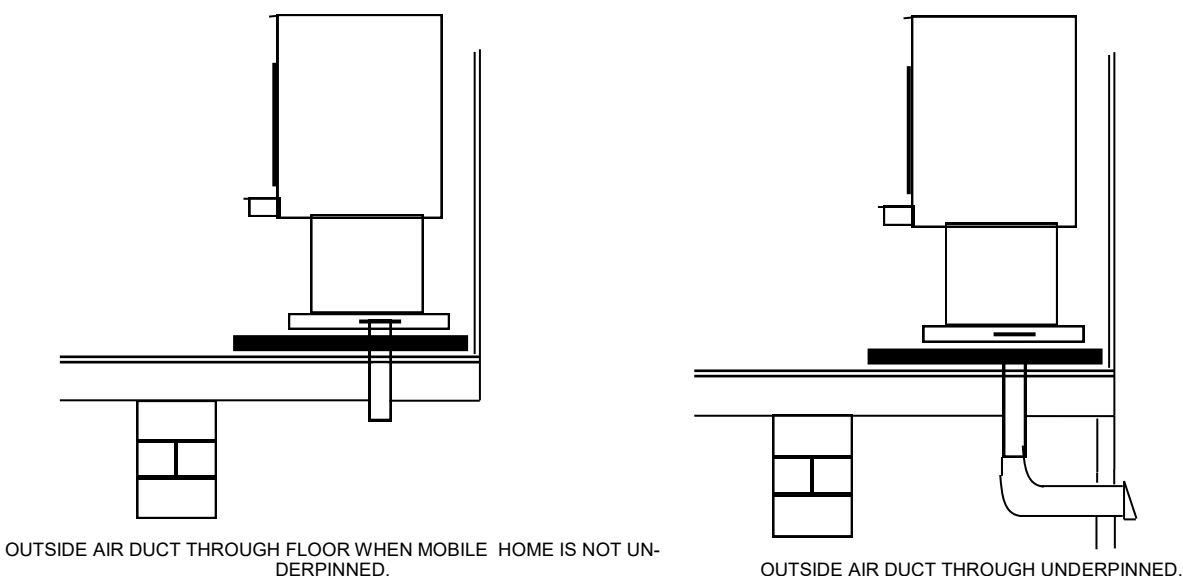
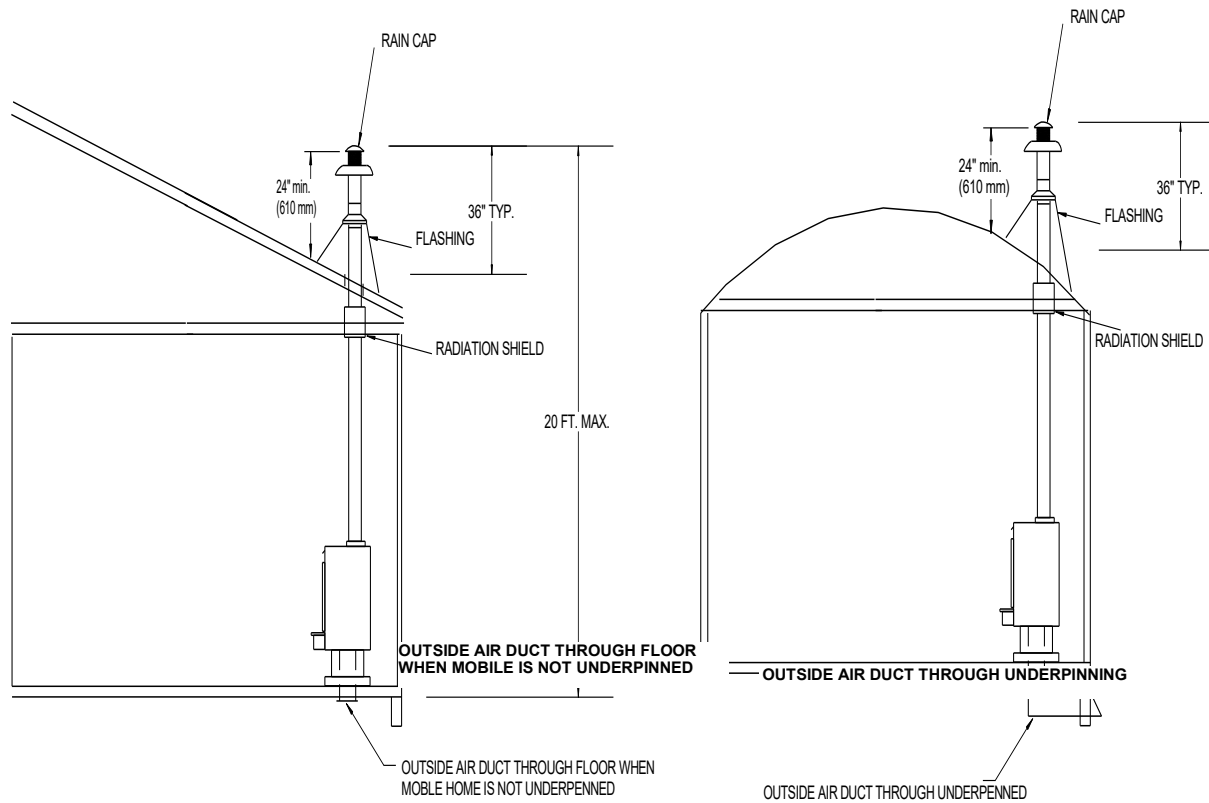


FIGURE 27



Ceiling Exit (Using Close Clearance Listed Chimney)

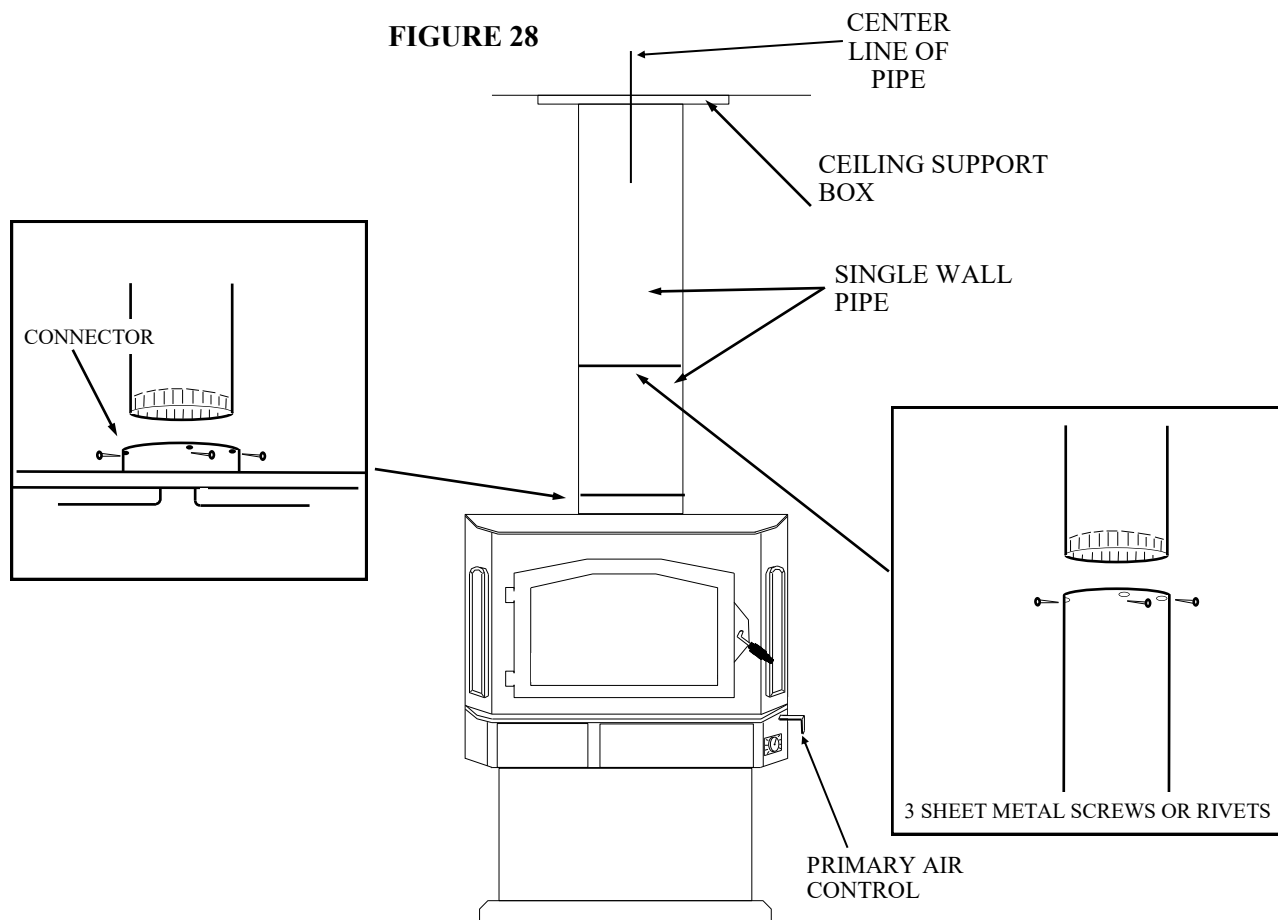
1. Suspend a plumb bob from ceiling above unit so that weight is hanging in center of flue exit. (A small weight on a string will serve as a plumb bob). Mark ceiling where string is suspended to locate center of chimney hole.(See Page 33, Figure28).
2. After locating center of hole, install ceiling support box, chimney or chimney connector, flashing and rain cap using listed 2100° HT chimney only.

CAUTION

REFER TO CHIMNEY MANUFACTURERS INSTRUCTIONS FOR ASSEMBLY AND DISASSEMBLY OF CHIMNEY PARTS. BE SURE TO FOLLOW CHIMNEY INSTRUCTIONS FOR PROPER CLEARANCES TO COMBUSTIBLE AND PROPER AIR SPACING REQUIRED.

3. Add additional pipe until both of the following are met:
 - (a) Chimney pipe is 3' higher than roof at point where it penetrates roof.
 - (b) Chimney pipe height is at least 2' higher than any part of roof within 10' of chimney. (See Figure 27).

4. Next, install a New Buck Corporation chimney connector to flue of heater or use 3 L brackets and secure to top of heater and pipe.
5. Using single wall chimney connector, connect heater to chimney by following manufacturer's installation instructions exactly.



FINAL CHECK

1. Recheck specified clearances.
2. Remove all foreign material from firebox area.
3. Open primary air control located on right side of stove under hearth. (See Figure 28). To OPEN, pull all the way out, to CLOSE, push all the way in. Adjustments to airflow may be made by positioning handle anywhere in between.
4. Plug power cord into a 115V AC outlet. Set switch to "Manual" and rheostat to "High" position to ensure motor operates properly. Route power cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

4. Place crumpled pieces of newspaper in stove. Light it and close door. Ensure that stove draws properly through primary draft.
5. Check for smoke leaks around door.
6. Open door and check for smoke escaping from front of 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 open damper with a poker or fire tong. Once chimney heats up, a proper draft can usually be obtained.

CAUTION

THE UNIT IS PAINTED WITH A SPECIALLY FORMULATED HIGH TEMPERATURE PAINT THAT CURES DURING 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. OPENING A WINDOW NEAR THE UNIT WILL ALLOW THESE FUMES TO ESCAPE. DO NOT BUILD A LARGE ROARING FIRE UNTIL THIS CURING PROCESS IS COMPLETE OR HEATER FINISH MAY BE DAMAGED.

SECTION VI 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 gases 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.

The chimney and chimney connector should be inspected once every two months. Any build-up of creosote should be removed to prevent risk of a chimney fire. To remove chimney or chimney connector, remove screws or fasteners, remove pipe and clean with steel brush. Replace chimney or chimney connector and replace screws and/or fasteners.

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



CAUTION

NEVER USE GASOLINE, GASOLINE TYPE LANTERN FUEL, KEROSENE, HARCOAL 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 AND WILL EXPLODE! DON'T TAKE A CHANCE WITH SAFETY OF YOUR HOME AND FAMILY.

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

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 ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in closed container until all cinders have thoroughly cooled.

SECTION VII OPERATION/EFFICIENCY

1. To maximize the efficiency of your wood stove make sure it is sized properly for the space you plan to heat.
2. Use dry, seasoned wood only. Recommended fire wood length 18" front to back. Using wet wood will greatly reduce your efficiency.
3. Consult with your installer/dealer to correctly place the stove in your home. An incorrectly placed stove can greatly reduce efficiency. Maximizing the efficiency of your stove will heat your house quickly, burn cleaner and use less wood. **Use dried split wood (6-12 months) and placed from front to back position in heater.**

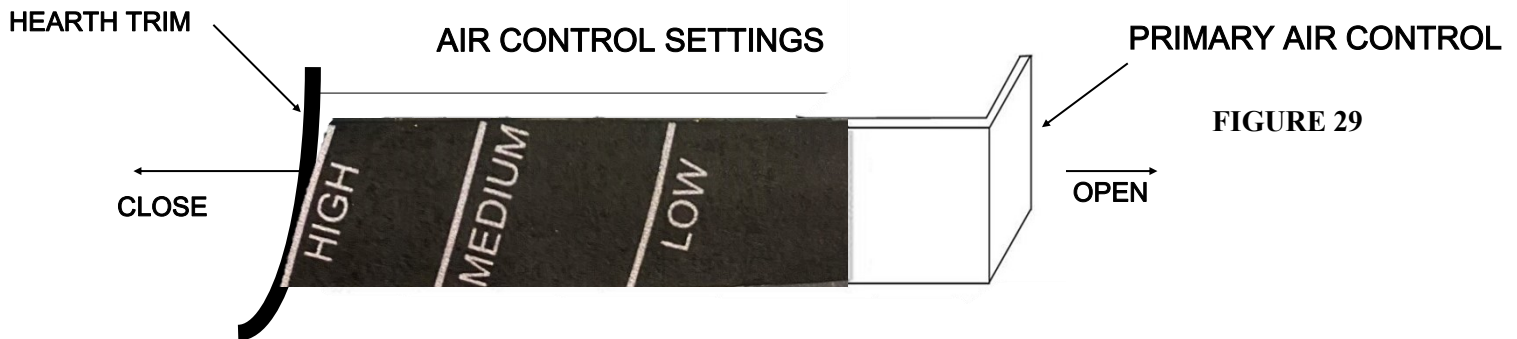
"This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instruction in this manual."

NOTE: "Following all suggested operating and maintenance procedures will help minimize visual emissions.

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

BUILDING A FIRE

1. Open door.
2. Open primary air control. Primary air intake draft control is located at center bottom side of hearth. It is operated by moving handle **OUT** to open (to allow air into firebox) or **IN** to control or close off the firebox.



1. Place crumbled pieces of paper and place them on floor of firebox.
NOTE: Do not use grate or elevate fire. Build wood fire directly on inner bottom of fire box.
2. Lay several pieces of dry kindling on top of newspaper.
3. Place three or four small pieces of firewood, 2"-3" in diameter, on top of kindling.
4. Light paper in front. Close and latch door. Don't leave fire unattended at this point. The draft system of heater should start quickly. It may be necessary to preheat chimney to get draft started. To do this, open door and add newspaper to top rear of wood. Light or let this paper ignite and allow to burn while holding the door slightly cracked. Once draft has started, close and lock door. You are over-heating the unit if the chimney and or connector glows red.
5. **NOTE: After embers and a coal bed have been established, load heater with seasoned natural hard wood, placing it front to rear.**

NOTE: THE FUELING DOOR MUST REMAIN CLOSED DURING OPERATION.

Your stove is equipped with an automatic thermostat. When stove gets hot enough, thermostat will activate room air blower. Set fan speed on low, when burning on low, med-low or med-high. Set fan speed on high when burning on high.

NOTE: When refueling or removing ashes turn "OFF" room air blower. Be sure to turn room air blower back on when finished.

NOTE: Do not run power cord underneath heater or in walk way or heavy traffic areas.

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

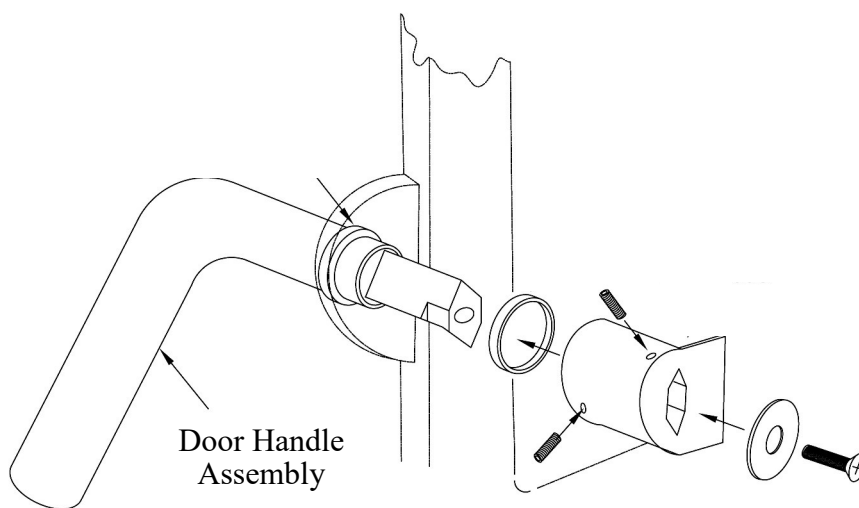
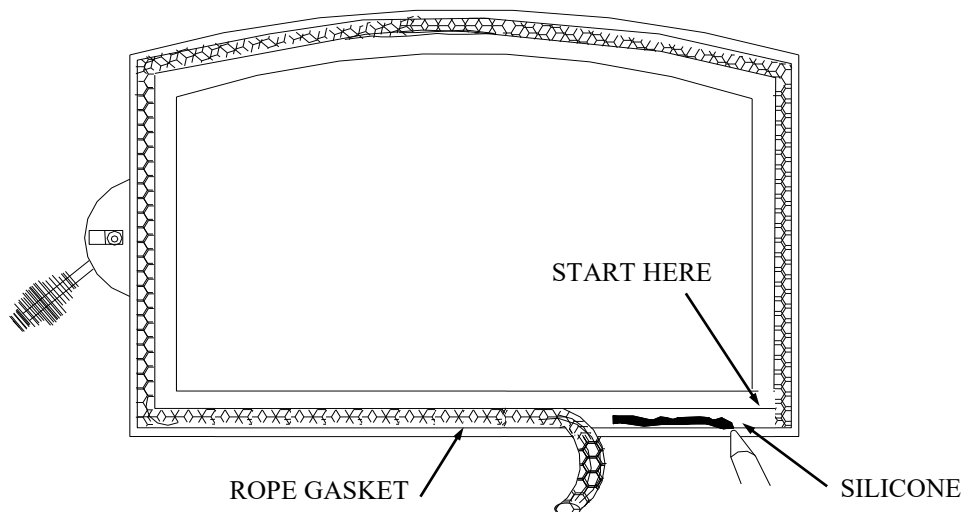
The Main Audubon Society recently charted the heat produced by a wood fire. They noted that heat produced by a wood fire varies greatly with kind of wood burned. Beech is considered best wood for a fire. A cord of well-seasoned Beech will produce as much heat as 169 gallons of fuel oil; Sugar Maple and 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.

MAINTENANCE

DOOR GASKET REPLACEMENT (COLD HEATER)

To replace deteriorated gaskets, follow these steps to ensure proper installation of gaskets.

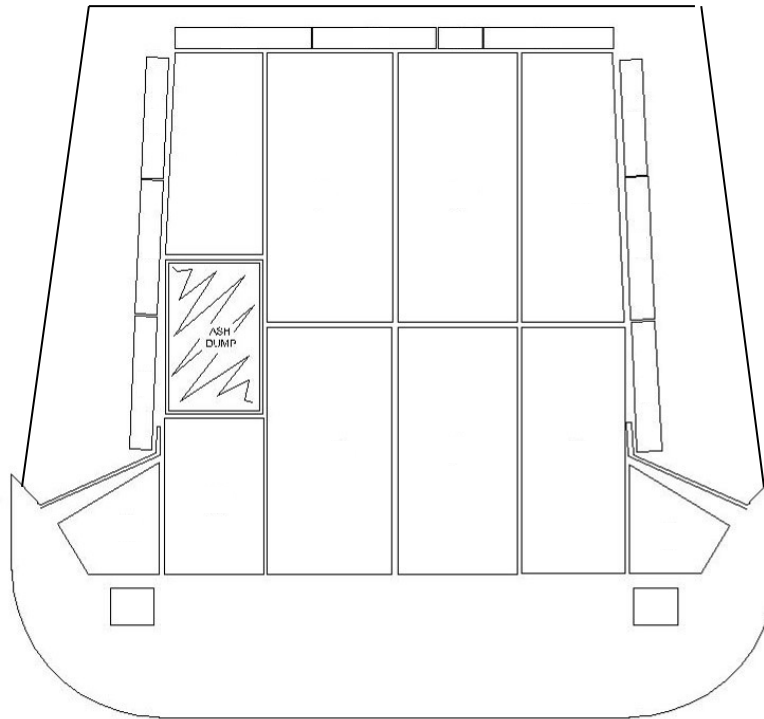
1. Obtain proper gaskets and silicone glue from your local dealer.
2. Using pliers, remove any worn and deteriorated gaskets.
3. Using a scraper, wire brush and sandpaper or steel wool, clean glue and gasket residue from door frame.
4. Measure and cut gaskets to length. Care should be taken not to stretch gaskets. What you want is a full and loose gasket weave after attachment to framing.
5. Obtain silicone glue and run a 3/16" bead inside door frame.
6. Obtain gasket and place in gasket channel areas starting at lower right corner, see below. Use a technique which assures that gasket is applied in a loose like manner. **DO NOT STRETCH GASKETS.**
7. After gasket is applied to glue, use your finger and go over all gasket gently pressing gasket to the channel. Use same pressure against gasket so that final result is an evenly applied gasket.
8. Leave door open and allow at least two (2) hours for glue to dry.
9. Once gaskets are checked, heater is ready for use.
10. This should be done annually. Allowing gaskets to deteriorate can cause over firing and shorten burn time.



PA 910096

MAINTENANCE BRICK LAYOUT

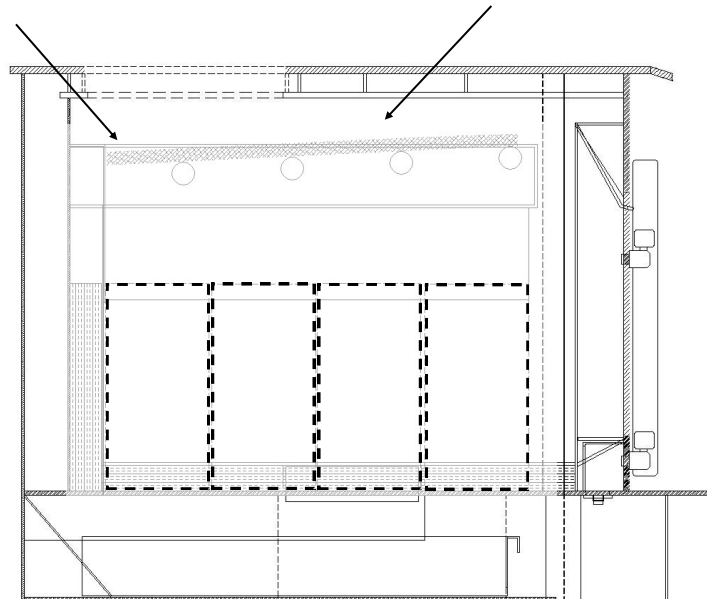
TOP VIEW



SIDE VIEW

BAFFLE BOARD

FIRE BLANKET



NOTE: “This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.”

MAINTENANCE

SECONDARY AIR TUBES REPLACEMENT

(Replacing secondary air tubes)
COLD STOVE

1. Unplug heater from 115V AC outlet.
2. Put drop cloth down.
3. Empty ashes.
4. Remove air tubes. The (4) secondary air tubes are located in top of burn chamber. On right side of tubes you will find a cotter pin. To remove air tube remove cotter pin and slide tube to left, it will drop down, slide tube to right it should come out. (See Figure 32).
5. Replace air tube. On one end of tube you will find a hole drilled on both sides through the tube. This end goes to right side. Place tube in left tube holder and slide other end of tube into right side tube holder. Line up through hole in air tube with tube holder bracket and replace cotter pin and bend slightly so it won't fall out.

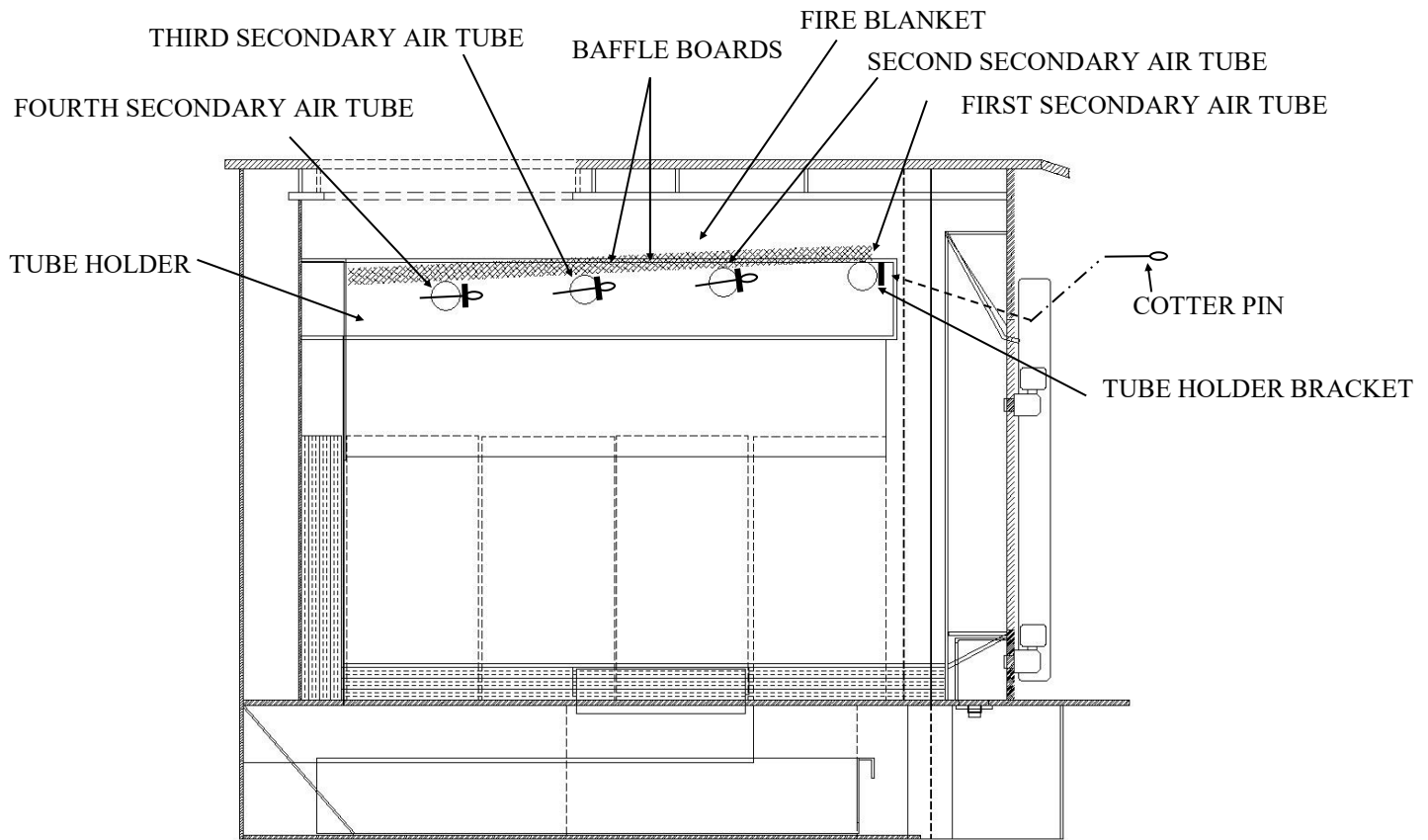


Figure 32

BAFFLE BOARDS AND/OR FIRE BLANKET REPLACEMENT

(Replacing baffle board)
COLD STOVE

1. Repeat steps 1-4 from above removing 1st tube only.
2. The baffle boards run long ways front to rear. Lift and slide baffle board toward the front. You should be able to just lift the fire blanket that is laying on top of the baffle boards and tube holders and slide baffle boards out. If replacing fire blanket go ahead and pull this out as well.
3. Replace baffle boards making sure the board is seated on top of air tubes and behind front baffle board holder and below the fire blanket. If replacing fire blanket, now place on top of the baffle boards and tube holders. It will go up the sides of the stove some it's ok. After replacing both baffle boards and/or fire blanket. Replace front air tube following step 5 from secondary air tube replacement.

MAINTENANCE ELCTRICAL REPLACMENT MOTOR, THERMOSTAT, RHEOSTAT

1. **TO REPLACE MOTOR:** Unplug heater from 115V AC outlet.
 2. Remove bottom cover door removing (2) screws holding it in place. See Figure 33.
 3. To the right of ash pan you will find a wire cover screen protecting you from electrical components of this unit. See Figure 34. There are (3) screws holding wire cover screen . Remove (2) screws on left side of screen inward holding wire screen. Remove (1) right bottom screw holding right side of wire screen set aside. See Figure 34.
 4. Mark and unhook wire servicing motor. NOTE: You may remove thermostat to make it easier to work in area. Unscrew motor bracket with motor from unit. See Figures 34, 35. Gently slide motor bracket and motor out and while pulling it out move the back of the motor facing you from right to left in a clockwise motion.
 5. Place new motor over old motor and locate motor bracket in the same location as was on the old motor and mark holes on new motor. Remove motor bracket from old motor, line up with marks on new motor and secure bracket to new motor with screws form original motor assembly.
 6. To replace motor, turn motor so that 4"x4" air discharge opening is pointing toward back of stove. The flat part of motor housing turned up. With the air discharge opening pointing in the 2 o'clock position, start in toward unit. Rotating the back of motor counterclockwise. The air discharge opening of motor housing fits in a cavity in back of unit, that will direct air flow to proper location. Make sure air discharge opening is located firmly in opening. Reinstall motor bracket screws. If thermostat was removed, replace thermostat in bracket.
 7. Hook up wiring to all components, if you have replaced or unhooked them to rewire motor, rheostat or switch. If you need to see wiring diagram See Page 42, Figure 36. If rheostat was removed, replace rheostat with the nut and replace control knob, reconnect wires to switch.
 8. Replace wire cage. Replace bottom cover door. Plug heater back into a 115V AC outlet.
1. **TO RPLACE THERMOSTAT:** Unplug heater from 115V AC outlet. Follow steps 2 through 3.
 2. Mark and unhook wires. Gently push thermostat up and out of thermostat bracket and replace with new thermostat. Reinstall wiring and cover screen. See Figure 35. If you need to see wiring diagram See Page 37, Figure 36. Plug heater back into a 115V AC outlet.
1. **TO REPLACE RHEOSTAT:** Unplug heater from 115V AC outlet. Follow steps 2 through 3.
 2. Mark and unhook wires. Bottom under hearth is rheostat. Remove control knob and nut and replace with new rheostat installing with nut, then control knob. Reinstall wiring and cover screen. See Figure 35. If you need to see wiring diagram See Page 37, Figure 36. Plug heater back into a 115V AC outlet.

Figure 33

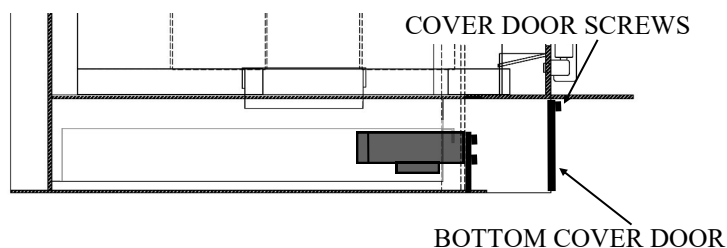


Figure 35

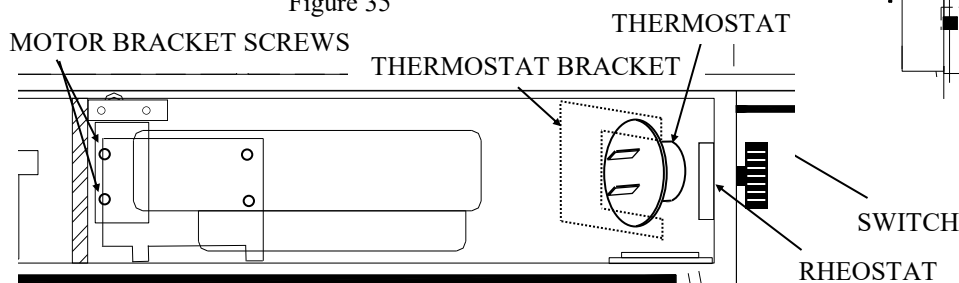
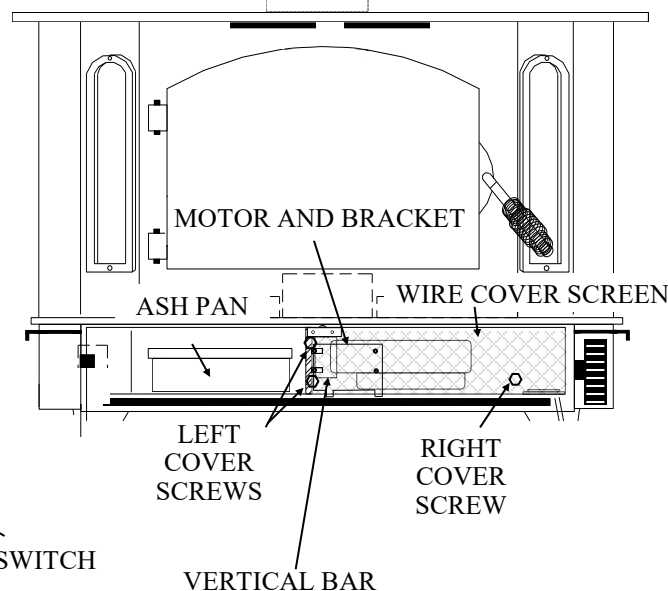


Figure 34



ROOM AIR BLOWER OPERATION

Your heater is equipped with a room air blower. For operation and wiring see figure below.

For your convenience, your heater is equipped with a rheostat with which you are able to select the air flow. The auto and manual switch will allow you to select the position at which thermostat will function.

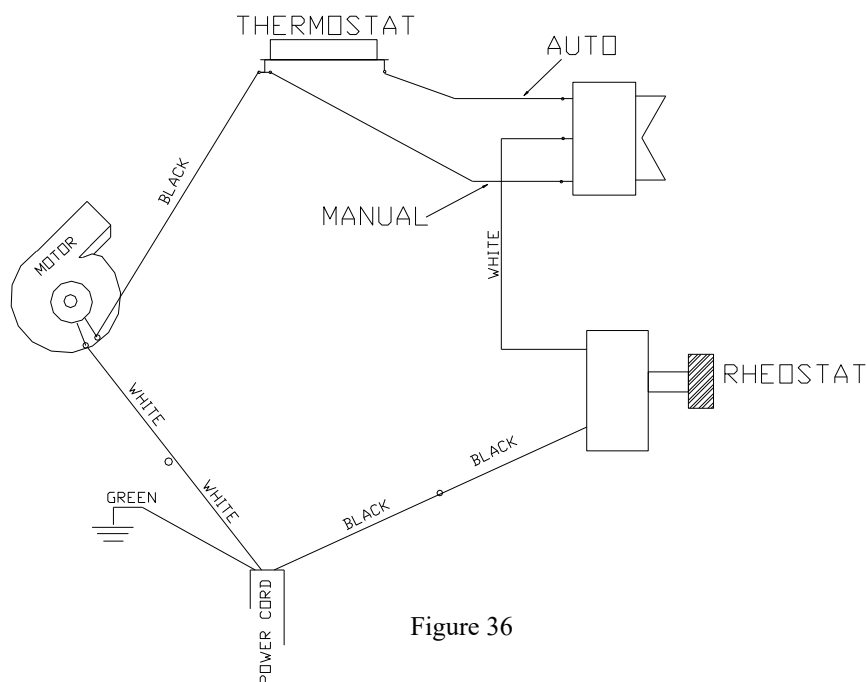


Figure 36

Auto- position:
After heater has warmed up and Auto-Manual switch is placed in “Auto” position and rheostat is in desired position, fan will automatically come on. When stove cools off, fan will automatically shut-off.

Manual position: You must turn room air blower on and off.

NOTE: Plug power cord into a 115V AC outlet. Set switch to “Manual” and rheostat to “High” position to ensure motor operates properly. Route cord to prevent damage to cord insulation from heat and sharp objects. Keep cord out of way of traffic to prevent damage caused by tripping, etc.

NOTE: When refueling or removing ashes turn “OFF” room air blower. Be sure to turn room air blower back on when finished.

MAINTENANCE CHECK CHIMNEY

- A. Chimney should be inspected twice a year.
- B. The chimney should be cleaned as necessary to remove creosote, soot, leaves, birds' nests, etc.

Before sweeping the chimney a few steps must be done. Put drop cloth down.

1. Open door. The (4) secondary air tubes are located in top of burn chamber. On right side of tubes you will find a cotter pin. To remove air tube remove cotter pin and slide tube to left, it will drop down, slide tube to right it should come out, remove (2) front air tubes then gently remove the baffle boards and fire blanket, set them aside. Remove the (2) rear air tubes.
2. Close door for cleaning chimney so debris don't fall out door while cleaning chimney.
3. Creosote and debris will fall into the bottom of the stove unit from the cleaning.
4. Clean out all the creosote and debris from inside stove unit left from clean sweeping chimney.
5. Replace 2 rear air tubes. On one end of tube you will find a hole drilled on both sides through the tube. This end goes to right side. Place tube in left tube holder and slide other end of tube into right side tube holder. Line up through hole in air tube with tube holder bracket and replace cotter pin and bend slightly so it won't fall out. Replace baffle boards making sure the board is seated on top of air tubes and behind front baffle board holder. Baffle boards run long ways front to rear. After replacing both baffle boards replace the fire blanket making sure it is laying flat on the baffle boards and covering the tube holders and replace front air tube.

 **NOTE:** 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 touched 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 heater is not in use.
- D. When heating season is over, heater should be cleaned out completely with a wire brush or cloth to help eliminate ash and burned wood smell.

CARE OF GLASS DOOR

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

1. Inspect glass regularly for cracks or breaks. If you detect a crack or break extinguish fire immediately and return door to your dealer for glass replacement before further use.
2. Do not slam heater door or otherwise impact glass. When closing door, make sure that no logs or other objects protrude to impact against glass.
3. Do not clean glass with materials which may scratch it (such as steel wool) or otherwise damage 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 glass that has been there for a considerable length of time can be burned off with a propane torch or straight razor blade. Use protective gloves when using razor.

SECTION VIII TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
1. Sluggish heater	1. Obstruction in chimney 2. Improperly sealed trim kit or direct connect kit 3. Wet or unseasoned wood being burned. 3. Poor chimney draft	1. Check for and remove obstruction 2. (a) Check trim kit gasketing seal to fireplace and gasket as necessary to seal unit. Gasket under front bottom of stove if needed. (b) Check seal if direct connect and correct 3. Burn dried natural seasoned hard wood 4. Improper chimney height or wrong size flue is being used. Cooler temperatures caused by external chimney
2. High Fuel Consumption	1. Improper regulation of draft or inlet air 2. Improper door fitting	1. Close inlet air control as much as possible to maintain desired heat output. Check gaskets, reinstall fiberglass gasket around doors and glass as necessary 2. Check door gasket, check adjustment of door latch, check door hinges
3. Back puffing	1. Gusts of Wind	1. Smoke shelf in chimney is filled with creosote & ash. Chimney may need wind diverter. Raise chimney for better draft
4. Smoke rollout when heater door is opened	1. Wind gusts blowing down the chimney 2. Opening heater door too fast	1. Smoke shelf in chimney is filled with creosote & ash. Chimney may need wind diverter. Raise chimney for better draft 2. Open air control. Crack door for 15 seconds before fully opening door

REPLACEMENT PARTS FOR THE MODEL 81

1. Air Control Bar	MF 810084
2. Door Handle Assembly	PA 910096
3. Door Gold	PC 212400G
4. Door Black	PC 212400
5. Door Pewter	PC 212400P
6. Off/Auto/Man Fan Switch	PE RC211RB
7. Thermostat 110 disc	PE 400132
8. Power Cord	PE 400240
9. Strain Relief	PE 400320
10. Motor	PE 910714
11. Rheostat	PE BC204
12. Rheostat knob	PE BC204A
13. Glass	PG 2124GL
14. Glass, Bay side	PG 810100
15. Spring Handle	PO 100150
16. Top Baffle Board	PO BPFB81B
17. Fire blanket	PO 81CBLANKET
18. Front Secondary Air Tube	PS 810050
20. Second Secondary Air Tube	PS 810052
21. Third Secondary Air Tube	PS 810054
22. Rear Secondary Air Tube	PS 810055
23. Primary Air Block	MF 810081
24. 1" x 1" x 1/8" thick magnet	PO DM841
25. Firebrick	PR 900050

NEW BUCK CORPORATION (NBC)
"LIMITED WARRANTY" FOR THE BUCK STOVE
PLEASE READ THIS WARRANTY CAREFULLY

PRODUCTS COVERED

This warranty covers the new Buck Stove heating unit, so long as it is owned by the original purchaser, including optional and standard accessories purchased at the same time, subject to terms, limitations, and conditions herein set out.

PRODUCTS NOT COVERED

This warranty does not cover the following:
Glass, Refractory Material, Firebrick or Gaskets.

This Warranty will not cover any damage and/or failure caused by abuse or improper installation of the products covered.

WARRANTY TIME PERIODS

(A) Period I

For one year from the date of purchase, NBC will replace or repair, at its option, any part defective in materials or workmanship. The costs of parts only are included. The customer pays any labor or transportation charges required.

Thereafter,

(B) Period II

For the period after the first year from the date of purchase and extending for five years as long as the Buck Stove is owned by the original purchaser, NBC will repair or replace, at its option, any part defective in materials or workmanship, with the exception of, electrical motors, wiring, switches, components, optional and standard accessories, and all parts not permanently attached to the heating unit. Parts not permanently attached to the heating unit are defined as those items designed to be removed from the stove, including those removable with common hand tools. The costs of parts only are included. The customer pays any labor or transportation charges required.

PROCEDURE

Should you feel that your BUCK STOVE is defective, you should contact any Buck Stove dealer for the name of your nearest authorized Buck Stove service representative, who will instruct you on the proper procedure, depending on which Warranty Time Period (Period I or Period II) applies.

If for any reason you are dissatisfied with the suggested procedures, you may contact us in writing at:
New Buck Corporation
Customer Service Department
P. O. Box 69
Spruce Pine, NC 28777
Email: info@buckstove.com

CONDITIONS AND EXCLUSIONS

- (A) Replacement of parts may be in the form of new or fully reconditioned parts, at NBC's option.
- (B) There is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of the Express Warranty.
- (C) New Buck Corporation is not liable for indirect, incidental, or consequential damages in connection with the use of the product including any cost or expense of providing substitute equipment or service during periods of malfunction or non-use.
Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.
- (D) All warranty repairs under this warranty must be performed by an authorized Buck Stove service representative. Repairs or attempted repairs by anyone other than an authorized service representative are not covered under this warranty. In addition, these unauthorized repairs may result in additional malfunctions, the correction of which is not covered by warranty.

OTHER RIGHTS

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

OWNER REGISTRATION CARD

The attached Owner Registration Card must be completed in its entirety and mailed within 30 days from the date of purchase or from the date of installation, if installed by a factory certified installer, to New Buck Corporation in order for warranty coverage to begin.

PLEASE NOTE: The Owner Registration Card must contain the Authorized Buck Stove Dealer Code Number and the Certified Installer's number (if applicable) for warranty coverage to begin.

To be completed by selling distributor/ dealer/ customer:

Name _____
(Last) (First)

Address _____

City _____ State _____ Zip _____

CUSTOMER EMAIL:: _____

MODEL 81 - Serial Number _____

Date of Installation: Day _____ Month _____ Year _____

Installer's Name _____

Installer's Certification Number _____

Dealer's Name _____

City _____ State _____ Zip _____