



**MODEL
8804**

OWNER'S MANUAL

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

**CATALYTIC CIRCULATOR HEATER
FOR USE WITH SOLID WOOD FUEL ONLY**

**SAFETY TESTED TO UL1482 AND LISTED
BY
WARNOCK HERSEY INTERNATIONAL, INC.**

IMPORTANT GENERAL INFORMATION

- READ ALL INSTRUCTIONS BEFORE STARTING THE INSTALLATION.
- FAILURE TO FOLLOW SAFETY INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY, OR EVEN DEATH.
- SAVE MANUAL FOR FUTURE REFERENCE.

TAMPER WARNING

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

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 heater must be connected to a Listed High Temperature Type HT Factory-Built Residential Type and Building Heating Appliance Chimney or an approved masonry chimney with a flue liner.

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INTRODUCTION

Many home fires result from not following installation, operation and maintenance instructions supplied by manufacturers of heating appliances. For your safety please read and follow our instructions before installation and use of the heater.

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SECTION 1

SUMMARY OF RULES FOR SAFE INSTALLATION, USE AND CARE

PLEASE READ THIS ENTIRE MANUAL BEFORE YOU INSTALL AND USE YOUR NEW HEATER, FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

SAFE INSTALLATION

- 1. Qualified Installer/Codes.** Your heater should be installed only by an experienced wood burning heater installer in strict accordance with this manual. Even though the work is done by a qualified installer, you should be familiar with your installation and be sure the work is done in accordance with this manual. Contact local building or fire officials about restrictions and installation inspection in your area. Make sure the installation meets all local codes and that all needed permits are obtained. Many home fires are caused by too little clearance or improper installation of the venting system. This manual gives necessary information to safely install your heater.
- 2. Dangerous Uses/Locations.** Due to fire risk, do not install this heater in a mobile home, modular home or trailer. Do not install it in a garage or area where any flammable liquids are stored. An explosion or fire could result. Due to risk of persons being injured by contacting the hot surfaces of the heater, locate the heater away from traffic areas such as halls.
- 3. Chimney and Chimney Connector.** This heater must be connected to a separate chimney connector and chimney system vented to the outside. The chimney may be either an approved Class "A" Masonry Chimney or a Listed High Temperature Type HT Factory-Built Residential Type and Building Heating Appliance Chimney. These two chimney types will be described in detail in this manual. The heater must be connected to the chimney using 6" diameter chimney connector pipe that is at least 24 gauge black or blued steel. Do not use a Class "B" aluminum gas vent pipe for either the chimney connector pipe or the chimney. This is unsafe, is a fire risk, and is prohibited by the National Fire Protection Association. To avoid the risk of fire, masonry chimneys must be at least 4" thick (12" if built of rubble stone) and must have a 5/8" fireclay or stainless steel lining.

Review the methods of venting shown by Figures 5 through 9. Follow the method that best suits your home. Failure to vent the heater in accordance with the instructions can result in fire or smoke damage and bodily injury including death.

DANGER: THE CHIMNEY CONNECTOR GETS SO HOT IT CAN CATCH YOUR WALL OR CEILING ON FIRE IF NOT PROPERLY INSTALLED. THEREFORE, YOU MUST USE AN APPROPRIATE METHOD TO PASS THROUGH A COMBUSTIBLE WALL TO A CHIMNEY (SEE FIGURES 5, 7, AND 8) OR A CHIMNEY SUPPORT OR FINISH SUPPORT PACKAGE TO PASS THROUGH A CEILING, (SEE FIGURES 6 AND 9). OTHERWISE, THE WALL OR CEILING WILL CATCH FIRE FROM THE HOT CHIMNEY CONNECTOR.

DANGER: DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. THERE IS A SERIOUS SAFETY RISK IF TWO APPLIANCES OR HEATERS ARE CONNECTED TO THE SAME FLUE.

- 4. Floor Protector.** The heater must be placed on a listed floor protector if the floor is wood or other combustible flooring. If carpet is present, it must be removed. Place the heater on a listed floor protector or a floor protector made of a noncombustible, inorganic material equal to 3/8 inch thick millboard having a thermal conductivity of $K = 0.43 \text{ BTU/In.}/\text{Ft.}^2/\text{Hr.}/^\circ\text{F}$ to prevent the floor from catching fire from sparks or glowing embers that might escape the heater or drop from the joints of the chimney connector pipe. The floor protector must protect the floor beneath and around the heater and chimney connector (also known as flue pipe) as shown by figure 10.
- 5. Safe Clearances.** Minimum clearances to unprotected combustible walls and ceilings as noted by figures 5 through 9 must be maintained. Drapes, curtains, furniture and other combustible materials should be kept much further away from the heater to avoid a fire. If you choose to, you may install the heater and chimney connector closer to combustible surfaces than indicated by figures 5 through 9 if a clearance reduction system is also installed to protect combustible ceiling and walls near the heater. See "Minimum Clearances To Combustible Walls and Ceilings" later in this manual for details.
- 6. Hot Surfaces.** Keep children away from the heater. Do not touch the heater until it is cool to avoid burns.
- 7. Smoke Detector.** Install a smoke detector on each floor of your home. In case of accidental fire it can provide time to escape.
- 8. Inspection After Installation, But Before Use.** Have the entire installation inspected by the local fire department, building code inspector or fire marshal to be sure your installation is safe. Have this manual on hand for a reference if needed. Keep the manual in a safe place where it can be found when needed.

SAFE USE

- 1. Dangerous Fuels.** This heater is designed to burn only natural wood. (See the "Wood Facts" section of this manual for additional information about wood.) This heater is not designed to burn artificial logs, processed fuels, coal, charcoal, plywood, trash, garbage, wrapping paper, preformed wood, or treated wood. These prohibited fuels may cause the heater and chimney to dangerously overheat or release poisonous gases into the dwelling. These prohibited fuels also contain elements such as lead, zinc and sulfur that will "poison" or deactivate the catalytic combustors. A poisoned catalytic combustor will not operate effectively and must be replaced.

Never use gasoline, gasoline type lantern fuels, kerosene, charcoal lighter fluid, or any similar liquids to start or freshen up a fire in this heater. The use or presence of these type fuels in or around the heater can cause an explosion and house fire resulting in personal injuries and property damage.

2. **Dangerous Overfiring. DO NOT OVERFIRE THIS HEATER.** Overfiring can damage the catalytic combustors or cause a chimney fire or a house fire. A catalytic combustor that has been damaged by excessive temperatures caused by overfiring will not operate effectively and must be replaced. Overfiring can also greatly shorten the life of the heater. The following conditions will cause your heater to overfire:

- Leaving the heater's fuel feed door open during heater operation.
- Leaving the heater's ash removal door open during heater operation.
- Burning improper fuel. (See Dangerous Fuels above).

If any part of the chimney connector or heater (other than the combustors) glows red hot, the heater is overfired. Immediately turn the heater's thermostat to "LO" and keep the heater's doors closed until the heater cools.

3. **AVOID CHIMNEY FIRES.** A chimney fire is usually indicated by a roaring noise within the chimney and/or a pinging noise within the chimney connector and the emission of sparks and ash from the top of the chimney. Chimney fires can be dangerous.

TO REDUCE THE RISK OF A CHIMNEY FIRE:

- BURN ONLY WELL SEASONED WOOD.**
- DO NOT OVERFIRE THE HEATER.**

-KEEP THE CHIMNEY'S FLUE LINING CLEAN OF AS NOTED BY THE FOLLOWING SAFE CARE SECTION OF THIS MANUAL..

For what to do in case of a chimney fire, see "VENTING SYSTEM CARE" in Section 4 of this manual.

For additional information on safe use of this heater. See Section 3 of this manual.

SAFE CARE

1. **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 in the chimney called a chimney fire. Even though reduction of creosote is one of the primary advantages of a heater employing catalytic combustors, some creosote residue will still accumulate on the flue lining. Also, in the event the catalytic combustor ceases to function, creosote can be expected to accumulate on the flue lining at an increased rate. So, the chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.
2. **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.
3. **Annual Inspection.** Have a qualified person inspect your complete system before cold weather each year. Make sure creosote is removed. Replace all damaged or worn parts before using.

For additional information on safe care of this heater, see SECTION 4 of this manual.

SECTION 2

LOCATING AND INSTALLING THE HEATER

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.

SELECTING A LOCATION FOR THE HEATER

1. When locating your heater, consider safety, convenience, traffic flow, and the fact that the heater will need a chimney and chimney connector.
2. Your heater should be located away from doors and hallways or other areas where drafts could blow smoke, fire or ashes out of the heater during fire tending.
3. The heater should be located in an open area to allow for necessary clearances as specified within this manual.
4. Keep furniture, drapes, curtains, wood, paper, and other combustibles far away from the heater.
5. Never install the heater in locations where gasoline, kerosene, charcoal lighter, or any other flammable liquids are used or stored.
6. **DO NOT INSTALL THIS HEATER IN A MOBILE HOME, MODULAR HOME OR TRAILER.**

TOOLS AND SUPPLIES NEEDED FOR INSTALLATION

Pencil	Electric drill	Rag or several paper towels
Ruler or tape	Drill bits	No. 8 sheet metal screws
	Screwdriver	(3 each for each joint of
	Furnace cement	connector pipe)

INSTALLATION EQUIPMENT NEEDED FOR YOUR SAFETY

1. **Chimney Connector (Also known as flue pipe):** The chimney connector joins the heater to the chimney. The chimney connector should be 6-inch diameter black or blued steel, 24 gauge minimum.
2. **Wall Thimble:** A manufactured or site-constructed device installed in combustible walls through which the chimney connector passes to the chimney. It is intended to keep walls from igniting. A wall thimble is needed only if chimney connector must pass through a combustible wall between the heater and the chimney.
3. **Chimney:** A Masonry Chimney (constructed to the National Fire Protection Association and local code standards) with at least 5/8" fireclay lining joined with refractory cement or other listed lining system suitable for use with wood burning heaters. See the "MASONRY CHIMNEY REQUIREMENTS" section of this manual for masonry chimney specifications.

OR

A Listed High Temperature Type HT Factory-Built Residential and Building Heating Appliance Chimney. Associated components required for installation such as the chimney support base, firestop (as appropriate), attic insulation shield, insulated tee, etc., are necessary to assure a safe chimney installation. Use only components manufactured for the chimney. See the "METAL PREFABRICATED CHIMNEY REQUIREMENTS" portion of this manual for Listed High Temperature Type HT Factory-Built Residential and Building Heating Appliance Chimney requirements.

AVOID FIRE: Maintain the designated clearance distance to combustibles. Insulation must NOT touch the chimney. There must be the designated air space clearance around the chimney. This air space around a chimney is necessary to allow natural heat removal from the area. Insulation in this space will cause a heat buildup which may ignite wood framing.

4. **Floor Protector:** To prevent floor from catching fire, a listed floor protector or a floor protector made of a noncombustible inorganic material equal to 3/8-inch thick millboard having a thermal conductivity of $K = 0.43 \text{ BTU/In/Ft}^2/\text{Hr}/^\circ\text{F}$ must be used. Depending on the type of heater installation you use, the floor protector must protect the floor beneath and beyond the heater and chimney connector pipe (also known as flue pipe) as shown by figure 10.

IMPORTANT INFORMATION ABOUT THE VENTING SYSTEM

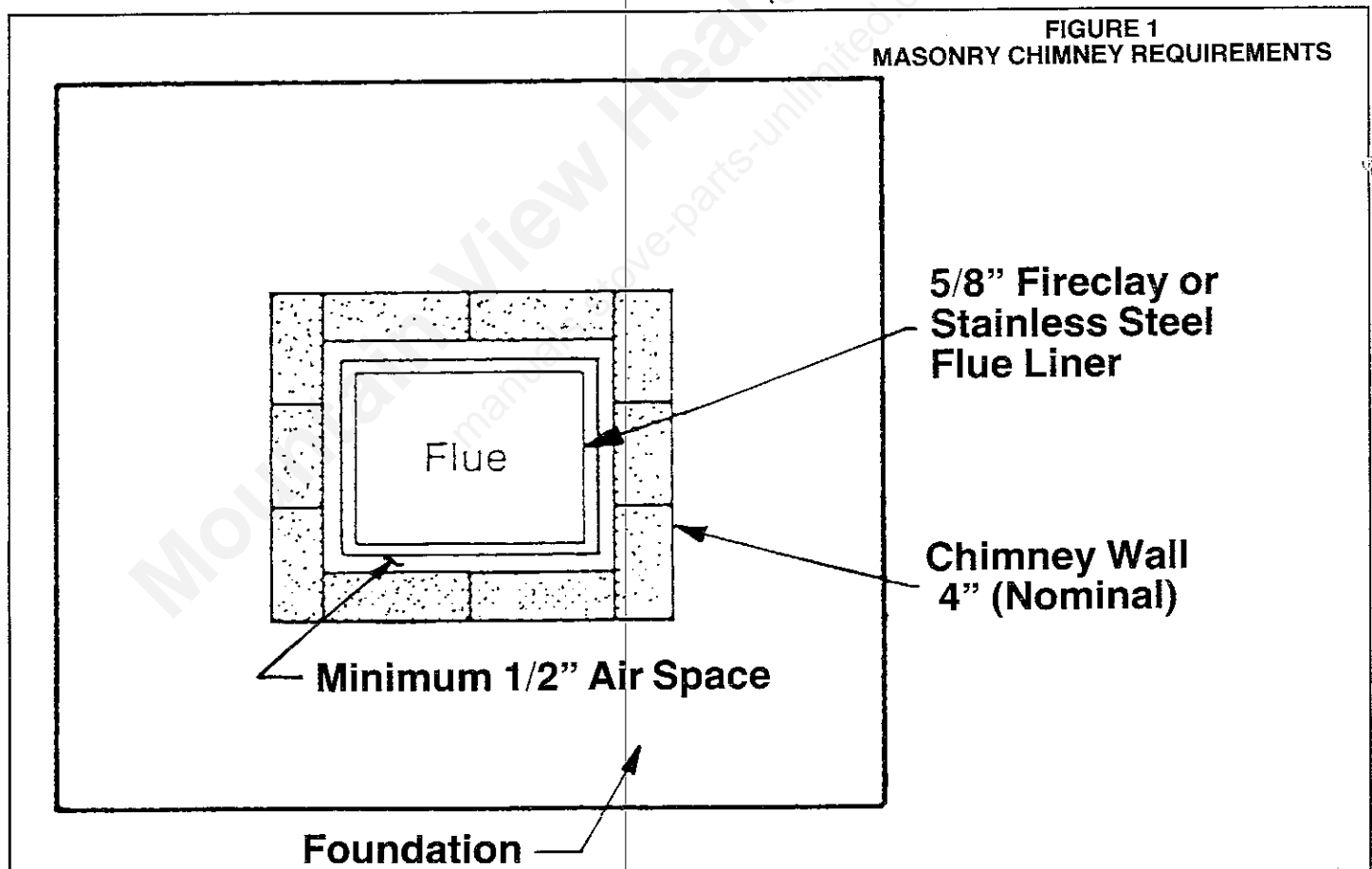
1. The venting system consists of the chimney connector (also known as flue pipe) and a chimney. The entire venting system gets extremely hot during use. Temperatures inside the chimney may exceed 2000 degrees in the event of a creosote fire. To protect against the possibility of a home fire, the chimney connector and the chimney must be properly installed and maintained. A thimble must be used when a connection is made through a combustible wall to a chimney. A chimney support package must be used when a connection is made through the ceiling to a prefabricated chimney. These accessories are absolutely necessary to provide safe clearances to combustible wall and ceiling material.
2. The chimney connector must be 6-inch diameter, 24 gauge minimum blued or black steel. **DO NOT** use aluminum or galvanized steel. They cannot properly withstand the extreme temperatures of a wood fire. **DO NOT** use chimney connector pipe as a chimney. You **MUST** connect this heater to a chimney comparable to those illustrated in this manual.

3. The joints of the chimney connector must be assembled so the crimped end is toward the heater and each joint must be sealed with furnace cement and fastened with a minimum of three sheet metal screws.
4. The heater must be connected to a prefabricated Listed High Temperature Type HT Factory-Build Residential Type and Building Heating Appliance chimney or an approved Class "A" masonry chimney with a flue liner. These two chimney types will be described in detail later in this manual.
5. NEVER connect this heater to an aluminum type "B" gas vent. It is not safe, is a fire hazard and is prohibited by National Fire Protection Association code (N.F.P.A. 211).
6. Do not connect this heater to a chimney flue serving another appliance. There is a serious safety risk if two appliances or heaters are connected to the same flue.
7. A copy of the N.F.P.A. 211 codes (Chimney, Fireplace, Vents and Solid Fuel Burning Appliances) may be obtained from N.F.P.A., Inc. Batterymarch Park, Quincy, MA 02269.

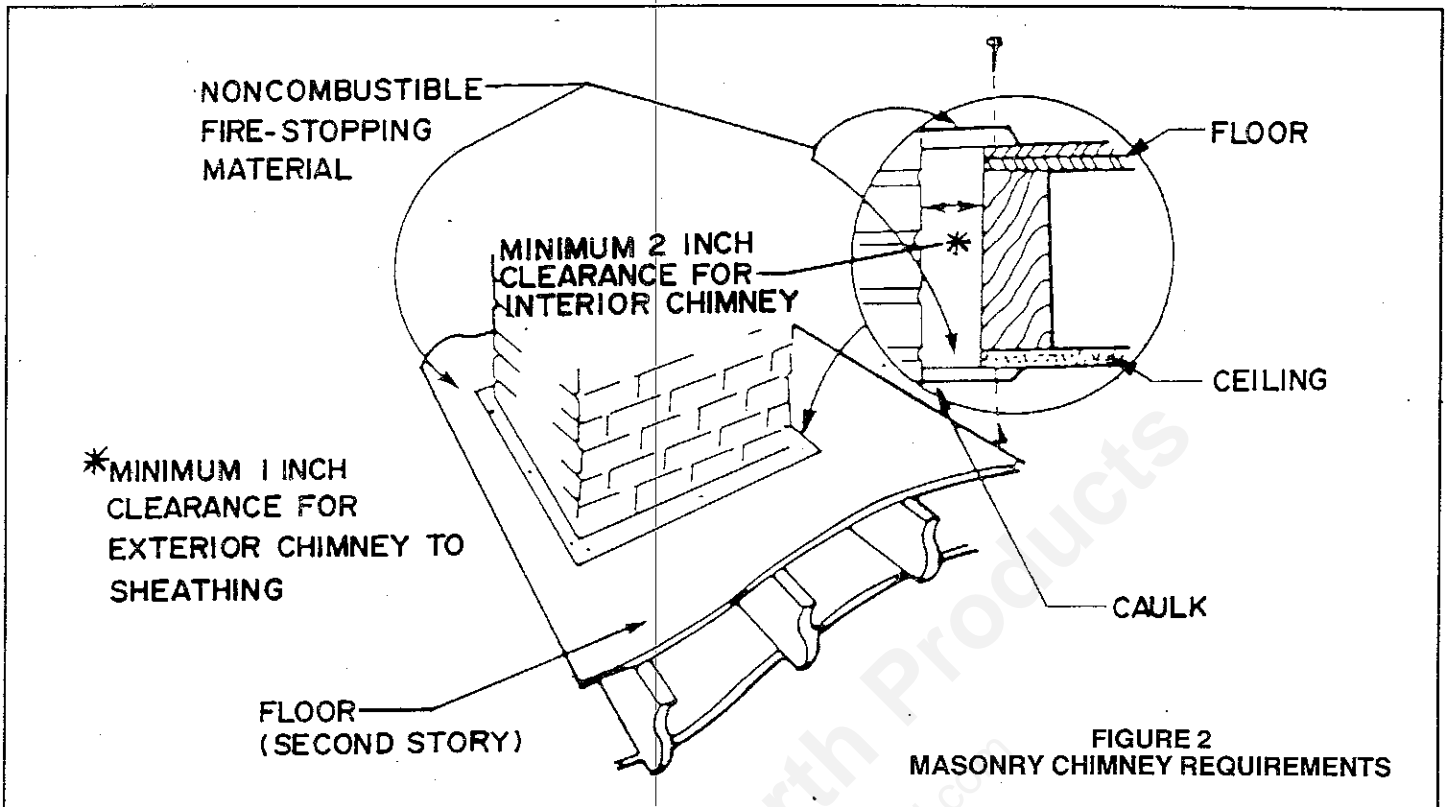
MASONRY CHIMNEY REQUIREMENTS

If the heater is to be attached to a masonry chimney, the heater should not be installed until it is determined that the chimney is safe for use. Before installing the heater, have the chimney inspected by a building inspector, fire department, or qualified heating engineer. To prevent risk of walls, roof, or other combustibles catching fire from the extremely hot fire, smoke, and flue gases, and to obtain a proper draw, a chimney must meet the minimum standards for masonry chimneys established by the National Fire Protection Association (NFPA). Make certain the inspection agency is familiar with NFPA No. 211 and all local codes. Some of those minimum standards are listed here for your convenience.

1. The top of the chimney must not be obstructed so as to interfere with the venting of the smoke and flue gases. If a chimney cap, protector or spark arrestor is installed, have it checked by your local building official before using. An unapproved chimney cap, protector or spark arrestor can become clogged with creosote, leaves or other matter. This blocks the chimney and causes smoke and the dangerous carbon monoxide in smoke to spill back into your home where it can kill you.
2. Your masonry chimney must be supported on an adequate foundation and must have either a 5/8" thick fireclay or stainless steel lining. There must be at least 1/2-inch air space between the flue liner and the chimney wall. (See figure 1).



3. A chimney inside the house must have at least 2 inches of clearance to the combustible structure. A chimney outside the house must have at least 1 inch clearance to the combustible structure. Fire stops must be installed at the spaces where the chimney passes thru floors and/or ceiling (see figure 2). Insulation should be at least 2 inches from the chimney to leave an air space around the chimney. (See figure 3).
4. The flue lining of the masonry chimney must be smooth and have no leaks. The inside of the chimney flue liner should be no smaller than 8 inches square or 6 inches round; a smaller chimney flue liner will be too restrictive to the flow of smoke and gases. A 6" diameter round liner is preferred because round flues draw better than square flues.



**FIGURE 2
MASONRY CHIMNEY REQUIREMENTS**

5. Since an oversized chimney flue contributes to the accumulation of creosote, the size of the chimney flue liner must be checked to determine that it is not too large for the heater. For this heater, the inside cross-sectional area of the chimney flue liner should be no more than 65 square inches to assure proper venting.
6. The top of the chimney must be at least 3 feet above the point where it comes through the roof, and at least two feet higher than any obstruction within a 10 foot radius. (See figure 4).
7. If the chimney has insufficient draft, the draft may be improved by extending the height of the chimney or reducing the number of elbows in the venting system. See section 5 of this manual for important draft information.
8. Make certain the chimney is kept clean and is not blocked. Check for overhanging limbs over the top of the chimney periodically.

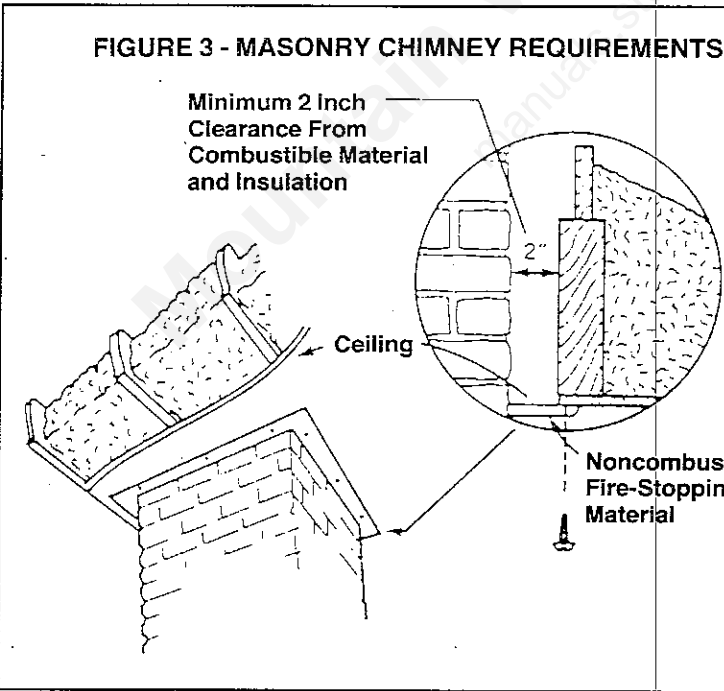


FIGURE 3 - MASONRY CHIMNEY REQUIREMENTS

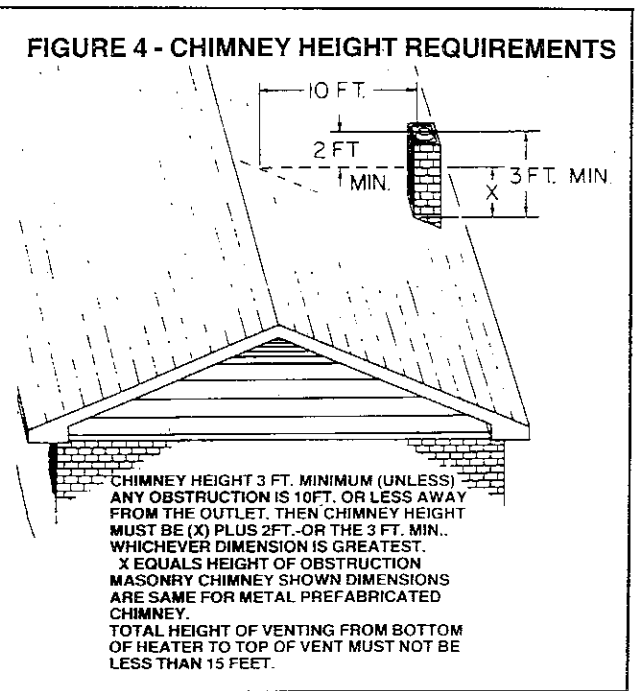


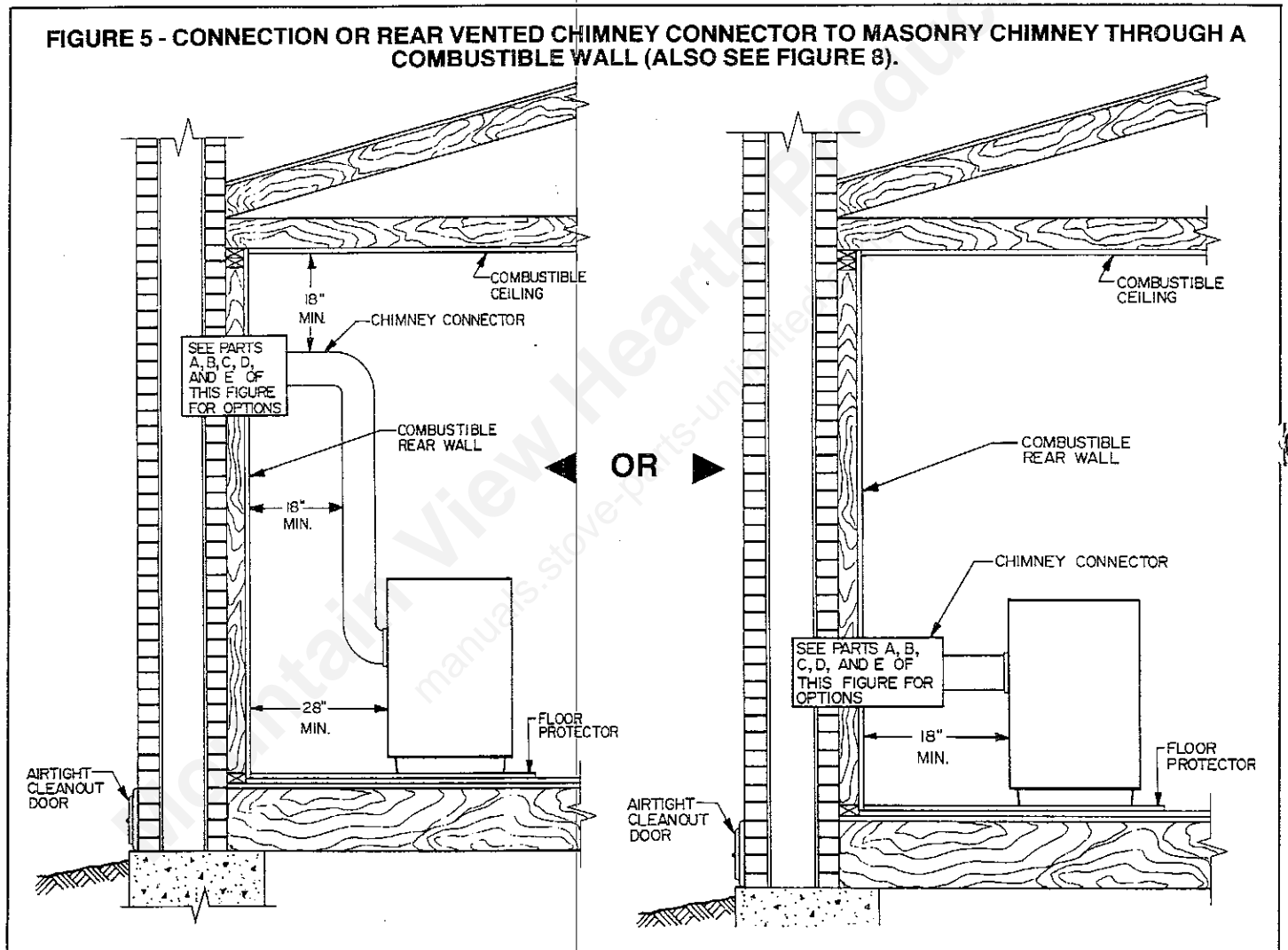
FIGURE 4 - CHIMNEY HEIGHT REQUIREMENTS

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

Figure 5 shows how to connect the chimney connector of a rear vented heater to a masonry chimney through a combustible wall.

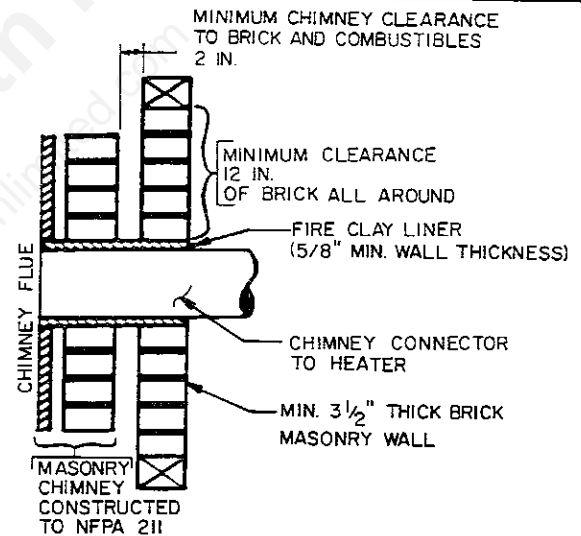
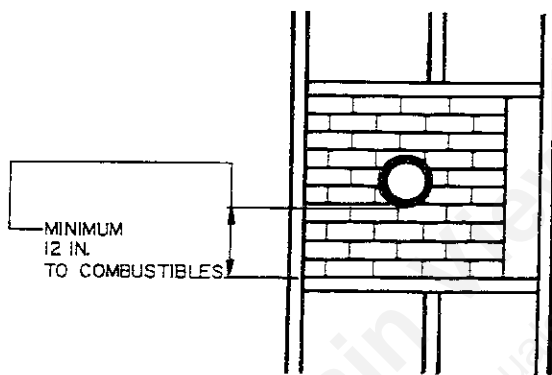
There are five allowable ways that a chimney connector can be connected to a masonry chimney by passing through a combustible wall. NFPA Standard 211 allows the following wall pass-through systems:

1. Use a minimum 3-1/2" thick brick masonry wall framed into the combustible wall. A fireclay liner (ASTM C315 or equivalent) having a 5/8" minimum wall thickness must be used and it must be at least 12" away from any material that could catch fire. The inside diameter of the fireclay liner shall be sized for the proper snug fit of a 6" diameter chimney connector pipe. The fireclay liner shall run from the outer surface of the brick wall to, but not beyond, the inner surface of the chimney flue and shall be firmly cemented in place. See Part A of Figure 5.

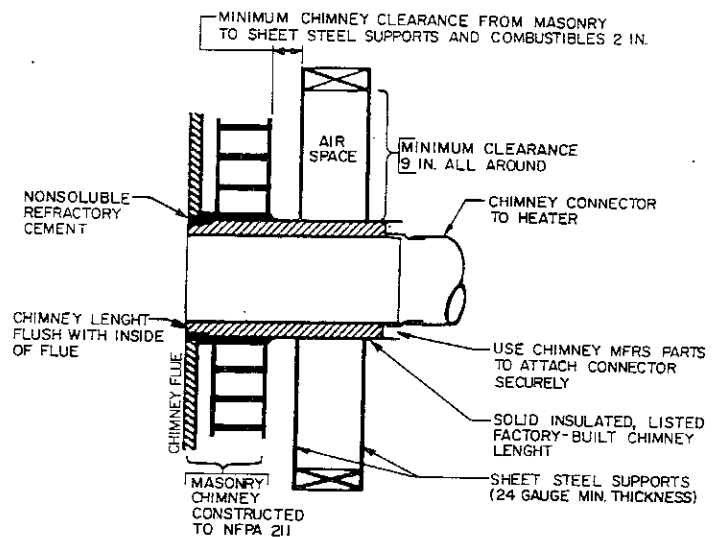
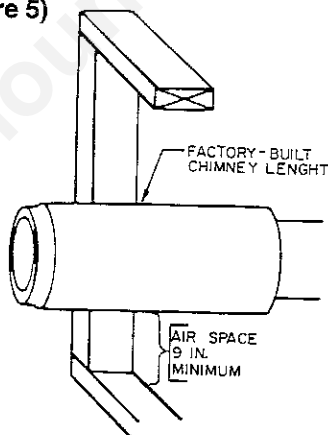


2. Use a solid insulated listed factory-built chimney length having an inside diameter of 6" and having 1" or more of solid insulation. There must be at least a 9" air space between the outer wall of the chimney length and any combustible materials. The inner end of the chimney length shall be flush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

PART A (FIGURE 5 CONTINUED)



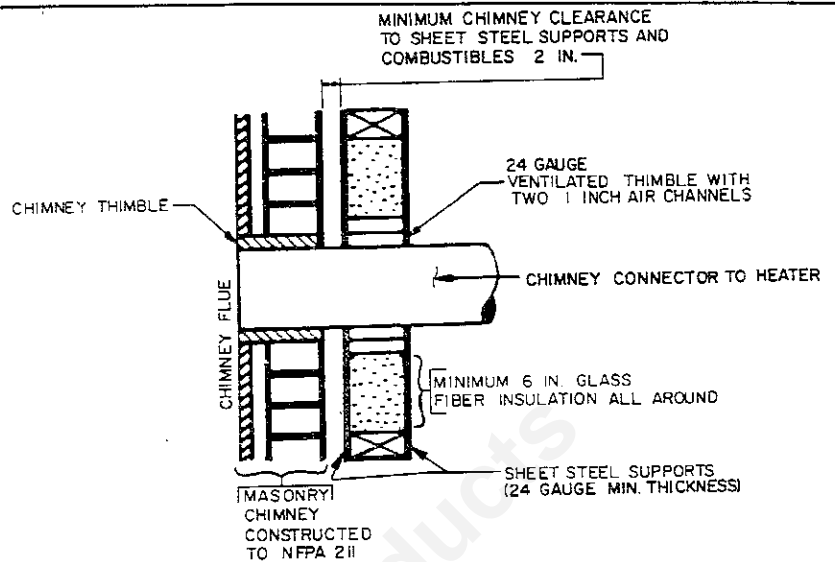
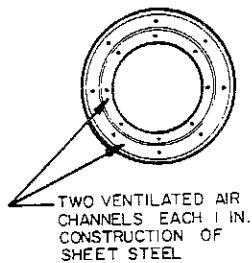
PART B (Figure 5)



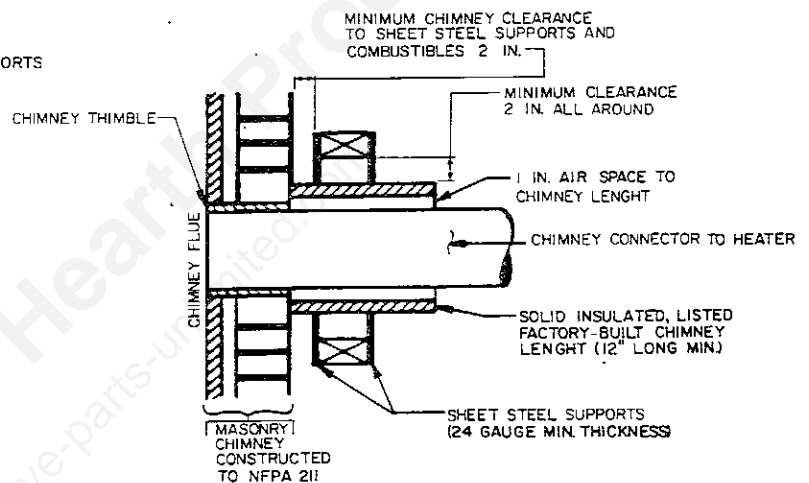
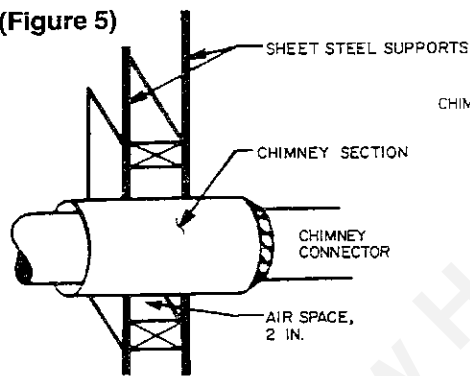
Additional requirements pertaining to Figure 5 and its wall pass-through systems:

1. Insulation material used as part of wall pass-through system shall be of noncombustible material and shall have a thermal conductivity of 1.0 Btu•in./ft²•°F (4.88 kcal/h•m²•°C) or less.
2. All clearances and thicknesses are minimums: larger clearances and thicknesses are acceptable.

PART C (Figure 5)



PART D (Figure 5)



PART E (Figure 5) In addition to the methods shown by A, B, C and D of Figure 5, a listed factory-built wall pass-through system may be purchased and installed according to the instructions packaged with it to provide a safe method of passing the chimney connector through a combustible wall for connection to a masonry chimney.

3. A chimney thimble, as shown for "3" and "4" above (Parts C and D respectively of Figure 5) shall be used for types "3" and "4" connections to facilitate removal of the chimney connector for cleaning. The chimney thimble shall be of ASTM C315 fireclay with 5/8" minimum wall thickness, or material of equivalent durability. The inside diameter of the thimble shall be sized for the proper snug fit of a 6" diameter chimney connector pipe. The thimble shall be installed without damage to the chimney flue. The thimble shall extend through the chimney wall to, but not beyond, the inner surface of the chimney flue and shall be permanently cemented in place with high-temperature cement.
4. A chimney connector to a masonry chimney, except for "2" above (Part B of Figure 5), shall extend through the wall pass-through system to the inner face of the chimney flue, but not beyond. It does not have to be fastened in place so long as it cannot accidentally be pulled out of the chimney or shoved into the chimney flue. If fasteners are used to secure the chimney connector to a masonry chimney, the fasteners shall not penetrate the chimney flue liner.
5. Any material used to close up an opening for the connector shall be of noncombustible material.

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

If the chimney connector does not have to pass through a combustible wall to get to a masonry chimney, simply connect the chimney connector directly to the masonry chimney's chimney thimble as described and shown by parts C and D of figure 5. Remember, the chimney connector should extend into the chimney thimble to the innerface of the chimney flue, but not beyond; if the chimney connector is extended through the chimney thimble into the chimney flue, resistance to the flow of smoke and gases up the chimney will occur; that flow resistance will have an adverse affect on the operation and performance of the heater and venting system.

METAL PREFABRICATED CHIMNEY REQUIREMENTS

Any metal prefabricated chimney that this heater is connected to must be a Listed High Temperature Type HT Factory-Built Residential Type and Building Heating Appliance Chimney. It's interior size should be no smaller than 6 inches in diameter or no larger than 9 inches in diameter. An undersized chimney (less than 6 inches interior diameter) will result in poor draft and inefficient operation whereas an oversized chimney (larger than 9 inches interior diameter) will result in poor draft and more creosote accumulation.

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

A Listed chimney cap should be installed to prevent entrance of rain and help eliminate down drafts. An unapproved chimney cap, protector or spark arrestor can become clogged with creosote, leaves or other matter. This blocks the chimney and causes smoke, and the dangerous carbon monoxide in smoke, to spill back into your home where it can kill you.

If the chimney has insufficient draft, the draft may be improved by extending the height of the chimney, making certain the chimney is clean and not blocked, checking for overhanging limbs, and reducing the number of elbows in the chimney connector connecting the heater to the chimney. See Section 5 of this manual for important draft information.

The top of the chimney should be at least three feet above the point it comes through the roof and at least two feet higher than any part of the roof or house within a ten foot radius. See Figure 4.

A straight up chimney is best because it will draw better. A 15 degree offset, if necessary, is better than a 30 degree offset.

METAL PREFABRICATED CHIMNEY INSTALLATION

There are basically two methods of metal prefabricated chimney installation. One method is to install the chimney inside the residence through the ceiling and the roof. The other method is to install an exterior chimney that runs up the outside of the residence.

Figure 6 shows how to connect the chimney connector of a rear vented heater to a metal prefabricated chimney installed inside the residence through the ceiling and the roof.

Figure 7 shows how to connect the chimney connector of a rear vented heater to an exteriorly installed metal prefabricated chimney that runs up the outside of the residence.

The components illustrated by figures 6 and 7 may not look exactly like the system you purchase, but they demonstrate the basic components you will need for a proper and safe installation.

REMEMBER: Follow the chimney manufacturer's installation instructions and maintain the manufacturer's specified clearance distances.

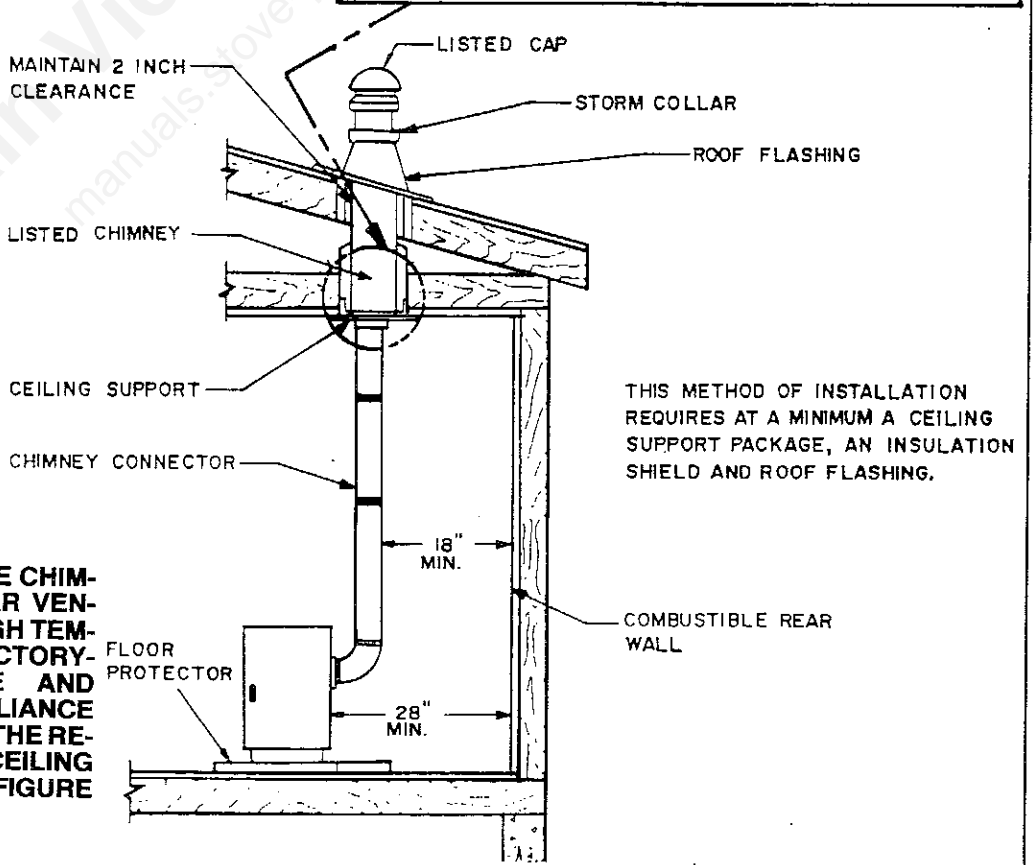
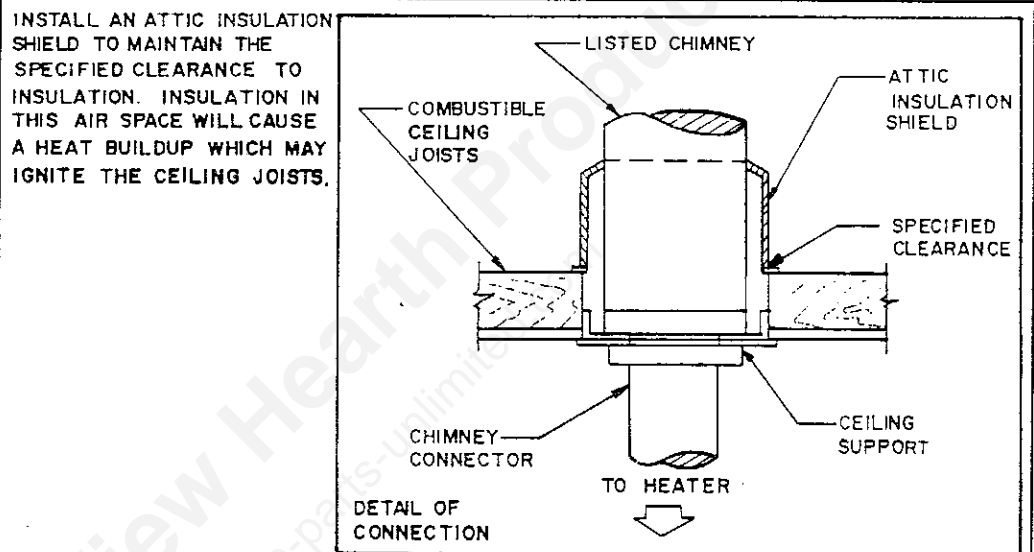
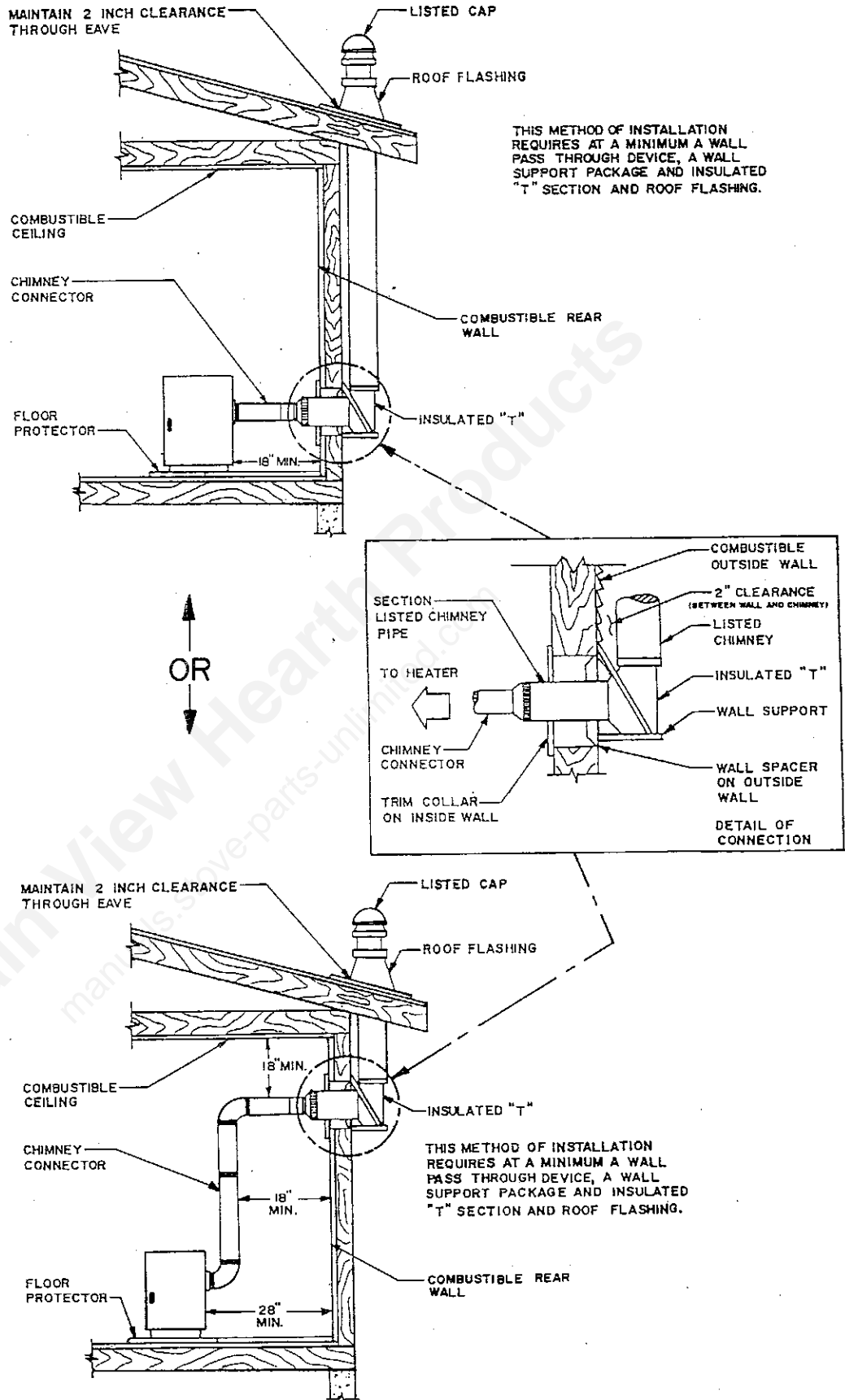


FIGURE 6 -- CONNECTING THE CHIMNEY CONNECTOR OF A REAR VENTED HEATER TO A LISTED HIGH TEMPERATURE TYPE HT FACTORY-BUILT RESIDENTIAL TYPE AND BUILDING HEATING APPLIANCE CHIMNEY INSTALLED INSIDE THE RESIDENCE THROUGH THE CEILING AND THE ROOF. (ALSO SEE FIGURE 9).

**FIGURE 7 --
CONNECTING THE
CHIMNEY CONNECTOR
OF A REAR VENTED
HEATER TO AN EX-
TERIORLY INSTALLED
LISTED HIGH TEMPERA-
TURE TYPE HT
FACTORY-BUILT RESI-
DENTIAL TYPE AND
BUILDING HEATING
APPLIANCE CHIMNEY
THAT RUNS UP THE
OUTSIDE OF THE
RESIDENCE. (ALSO
SEE FIGURE 8).**



HEATER INSPECTION

Before installing the heater, inspect the heater for external damage or missing parts. Check the gaskets around the doors to assure that they are still in place. Check the inside of the heater. If any parts are found to be damaged or missing, report these to your dealer and make sure all problems are resolved before installing the heater. See figure 15 for illustrations of heater parts.

HEATER INSTALLATION

CAUTION: 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.

CAUTION: DO NOT CONNECT THIS HEATER TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. THERE IS A SERIOUS SAFETY RISK IF TWO APPLIANCES OR HEATERS ARE CONNECTED TO THE SAME FLUE.

CAUTION: THE HEATER MUST BE PLACED ON A LISTED FLOOR PROTECTOR AS NOTED IN THIS MANUAL IF THE FLOOR IS WOOD OR OTHER COMBUSTIBLE FLOORING. IF CARPET IS PRESENT, IT MUST BE REMOVED. THE FLOOR PROTECTOR MUST NOT BE PLACED ON CARPET. SEE FIGURE 10.

CAUTION: MOST WALLS AND CEILINGS CONTAIN WOOD EVEN THOUGH THEY ARE MADE OF SHEETROCK OR PLASTER ON THE OUTSIDE. THESE WALLS AND CEILINGS CAN CATCH FIRE FROM THE HOT CHIMNEY CONNECTOR IF THE HEATER AND CHIMNEY CONNECTOR ARE NOT PROPERLY INSTALLED.

MINIMUM CLEARANCE TO COMBUSTIBLE WALLS AND CEILINGS

Minimum clearances to unprotected combustible walls and ceilings as noted by Figures 5 through 9 must be maintained. Drapes, curtains, furniture and other combustible materials should be kept much further away from the heater to avoid a fire. If you choose to, you may install the heater and chimney connector closer to combustible surfaces than indicated by Figures 5 through 9 if a clearance reduction system is also installed to protect combustible ceiling and walls near the heater. However, there are limits as to how close the heater can be installed to combustible surfaces protected by a clearance reductions system.

A correctly installed clearance reduction system protects the combustible surfaces well beyond the sides and above the top of the heater and beyond the sides and top of the chimney connector pipe.

Two common types of clearance reduction systems use sheet metal with a minimum thickness of 28 gauge (galvanized steel, aluminum, copper) or a 3-1/2 inch (4 inch nominal) thick masonry wall. Either of these materials must be spaced out 1 inch from the combustible surfaces. With sheet metal, non-combustible spacers are used to maintain the 1 inch air space. With a masonry wall, metal wall ties and furring strips, if needed, are used to anchor the brick to the wall. To avoid excessive heat transmission, the spacers or wall ties should not be placed directly behind the heater or chimney connector. The 1 inch air space provides free air circulation. It is essential that there be openings at the top and bottom of these clearance reducers so cool air can enter at the bottom and warm air exit at the top. It is the "chimney effect" whereby when the air in the space is heated, it rises exiting from the top and being replaced by cooler air at the bottom, that makes these shields effective.

FIGURE 8 -- MINIMUM CLEARANCES TO COMBUSTIBLE SIDE WALL. (PLAN VIEW SHOWN, SEE FIGURES 5 AND 7 FOR SIDE VIEW.)

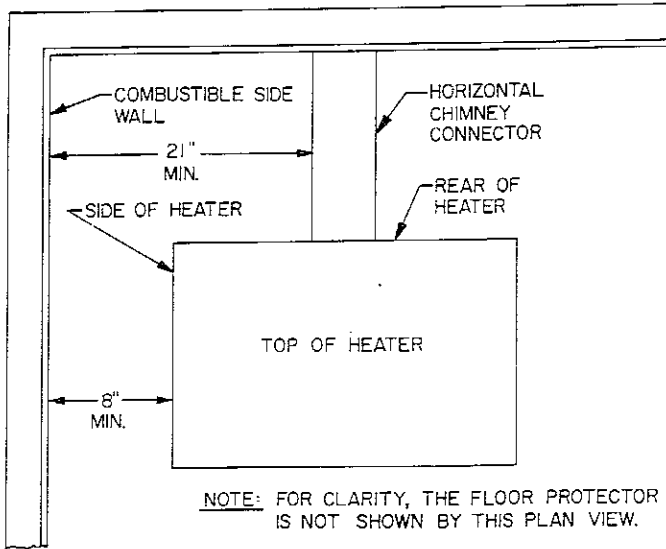


FIGURE 9 -- MINIMUM CLEARANCES TO COMBUSTIBLE SIDE WALL. (PLAN VIEW SHOWN, SEE FIGURE 6 FOR SIDE VIEW.)

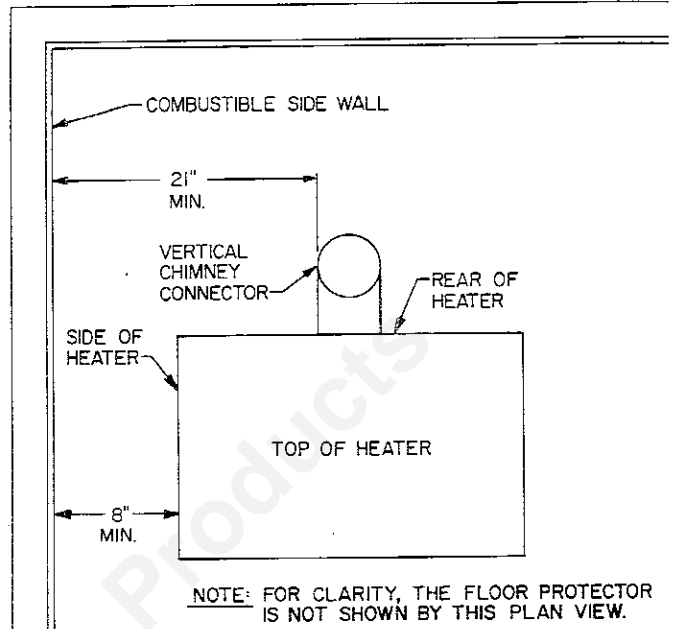
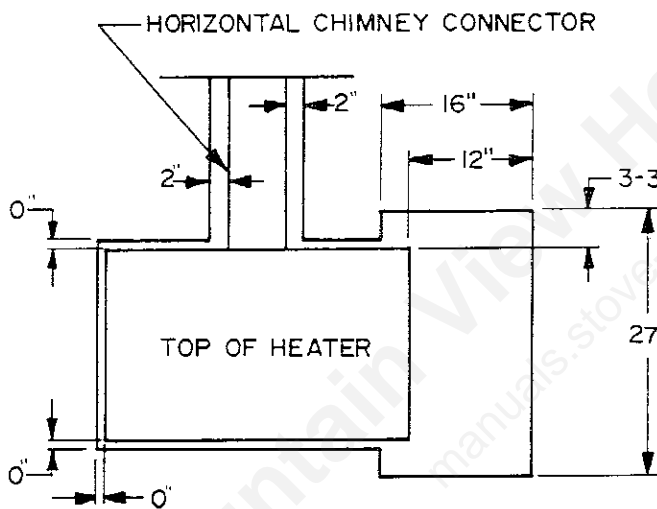
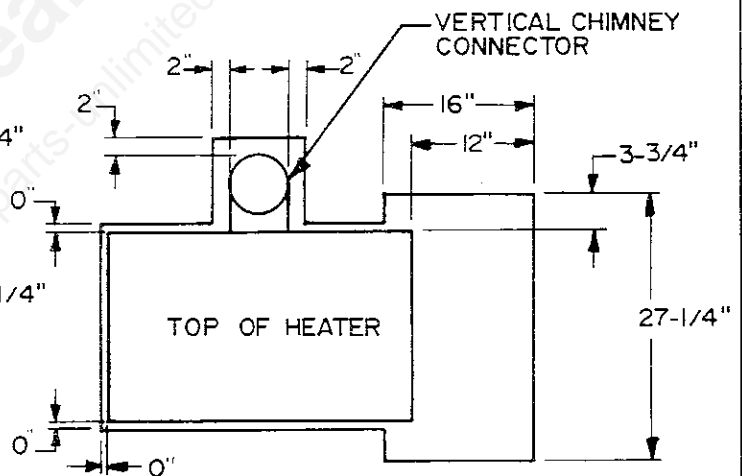


FIGURE 10 -- FLOOR PROTECTION



PLAN VIEW OF INSTALLATION WITH HORIZONTAL CHIMNEY CONNECTOR SHOWING OUTLINE OF MINIMUM SIZE FOR NON-COMBUSTIBLE FLOOR COVERING OR A LISTED FLOOR PROTECTOR.



PLAN VIEW OF INSTALLATION WITH VERTICAL CHIMNEY CONNECTOR SHOWING OUTLINE OF MINIMUM SIZE FOR NON-COMBUSTIBLE FLOOR COVERING OR A LISTED FLOOR PROTECTOR.

Masonry, or other non-combustible products, attached directly to a combustibleside surface without an air space offer very little protection and cannot be considered a clearance reduction system unless specific materials have been tested and listed for direct attachment to a combustibleside surface. The same applies to thin veneer brick and stone coverings. These materials provide adequate protection only when mounted on sheet metal with a 1 inch minimum spacing to the wall.

A variety of prefabricated clearance reduction systems which have been safety tested and listed are available through heater dealers. Always look for a safety listing label on the product when selecting a clearance reduction system through a heater dealer and make sure it is designed for use with solid fuel appliances. The manufacturers of these tested and listed systems provide specific installation instructions that must be followed exactly for a safe installation.

Should you choose to make your own clearance reduction system, contact your local fire department, fire marshal or building code inspector for specific requirements regarding home-constructed clearance reduction systems and safe installation clearance to protected combustibleside surfaces.

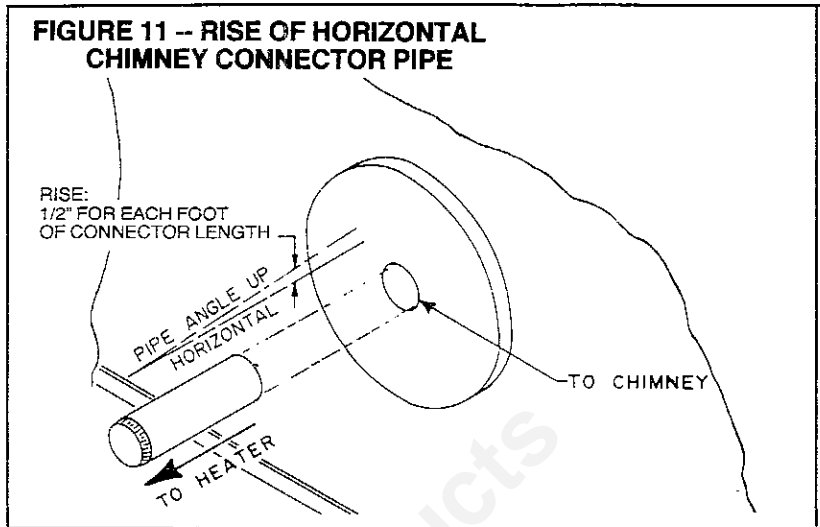
TO SAFELY AND PROPERLY INSTALL THIS HEATER:

1. Install a Listed High Temperature Type HT Factory-Built Residential Type and Building Heating Appliance Chimney, build an approved masonry chimney with flue liner, or adapt an existing masonry chimney with flue liner to vent this heater. (See Figures 1 through 7.)

2. Purchase the 6-inch diameter chimney connector pipes that are required. The pipe should be black or blued steel, 24 gauge minimum. If elbows are needed, use only seamless elbows because seamed elbows can leak smoke. Do not use more than two elbows or the chimney draft will be restricted. Number 8 sheet metal screws and furnace cement will also be needed to assemble the chimney connector pipes.

3. If the heater is to be installed on a combustible floor, purchase a listed noncombustible floor protector as described in this manual and install it in the proper location. The floor protector **MUST** protect the floor beneath and around the heater and chimney connector as shown by Figure 10.

4. Assemble the chimney connector pipe sections to determine if the chimney connector pipe will correctly extend from the heater flue collar to the chimney. Any horizontal section of chimney connector pipe must slope upward at least 1/2" rise to the horizontal foot to maintain adequate draft, (see Figure 11). Always install the chimney connector pipe with the crimped end toward the heater to prevent creosote from leaking out of the joints, (see Figure 11). Always use the least number of chimney connector pipe sections possible. Minimum clearance to combustible walls and ceilings as noted throughout this manual **MUST** always be maintained if a clearance reduction system is not installed.



5. After it is determined that the assembled chimney connector will properly connect the heater to the chimney, disassemble all sections of the chimney connector in preparation for the final assembly procedures.

6. Place the crimped end of the first chimney connector pipe or elbow into the heater's flue collar and mark it through each of the holes in the heater's flue collar.

7. Remove the pipe or elbow from the flue collar and drill 1/8-inch diameter holes at the points marked by step 6.

8. Apply furnace cement to the inside surface of the heater's flue collar, reinstall the first pipe or elbow and fasten in place with No. 8 sheet metal screws. Apply additional furnace cement to the outside of the chimney connector flue collar joint if an airtight seal was not achieved when the pipe or elbow was installed.

9. Assemble the remaining chimney connector pipes by applying furnace cement to the joints, drilling 1/8-inch diameter holes for and attaching each joint with three No. 8 sheet metal screws.

10. Connect the chimney connector to the chimney as shown by Figure 5, 6, or 7.

11. Remove all excess cement with a rag or paper towels. Allow the applied cement to dry before building the first fire in the heater.

12. Install the factory-furnished thermometer probe as shown by figure 12. The heater's cabinet top is not fastened to the heater so the cabinet top can easily be removed. The cabinet top has tabs on its front and rear flanges for positioning purposes:

First - Remove cabinet top.

Second - Insert the stainless steel ferrule into the factory-drilled hole located in the heater's firebox top.

Third - Insert the thermometer probe through the stainless steel ferrule. The head of the thermometer probe should rest freely on the heater's firebox top.

Fourth - Place the heater's cabinet top back on the heater, use the tabs on the cabinet top to position the cabinet top correctly.

DANGER: IF ANY CLEARANCE TO UNPROTECTED COMBUSTIBLE WALL OR CEILING IS LESS THAN THOSE SPECIFIED BY FIGURES 5 THROUGH 9 AFTER HEATER INSTALLATION IS COMPLETED, A CLEARANCE REDUCTION SYSTEM MUST BE INSTALLED BEFORE THE FIRST FIRE IS BUILT IN THE HEATER; OTHERWISE, THE UNPROTECTED WALL OR CEILING COULD CATCH FIRE. REMEMBER, THERE ARE ALSO LIMITS AS TO HOW CLOSE THE HEATER CAN BE INSTALLED TO A COMBUSTIBLE SURFACE PROTECTED BY A CLEARANCE REDUCTION SYSTEM. REREAD "MINIMUM CLEARANCES TO COMBUSTIBLE WALLS AND CEILINGS" PRESENTED EARLIER IN THIS MANUAL.

CAUTION: FOR YOUR SAFETY, CONTACT YOUR LOCAL FIRE DEPARTMENT, FIRE MARSHAL, OR BUILDING CODE INSPECTOR FOR INSPECTION PRIOR TO AND FOLLOWING CLEARANCE REDUCTION SYSTEM AND/OR HEATER INSTALLATION.

SECTION 3

HOW TO USE THE HEATER, SAFE OPERATION

IMPORTANT: DO NOT USE THE HEATER UNTIL A PROFESSIONAL INSPECTION HAS BEEN MADE OF THE ENTIRE INSTALLATION BY YOUR LOCAL FIRE DEPARTMENT, FIRE MARSHAL OR BUILDING CODE INSPECTOR. INSTALL A SMOKE DETECTOR ON EACH FLOOR OF YOUR HOME, IN CASE OF ACCIDENTAL FIRE FROM ANY CAUSE IT CAN PROVIDE TIME FOR ESCAPE.

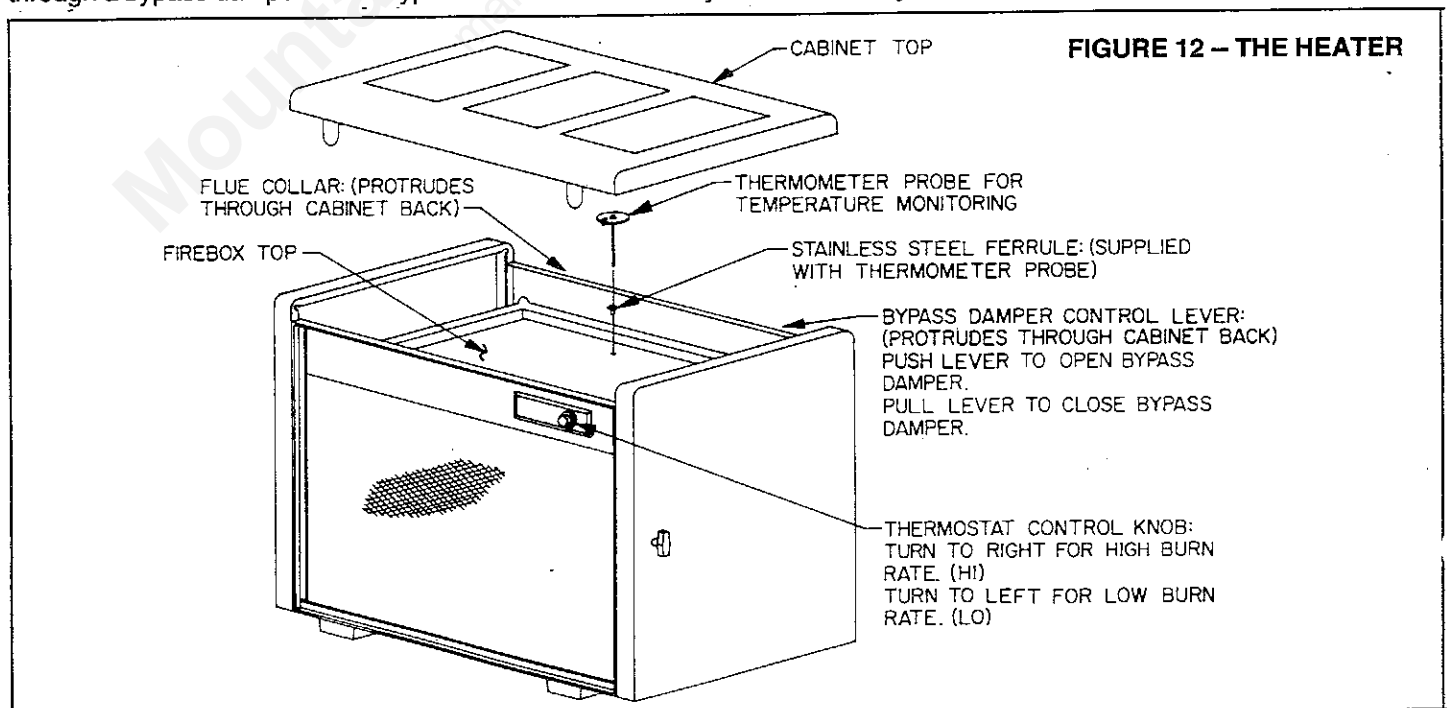
SAFETY REMINDERS

- A correctly installed heater can still pose a fire hazard if it is not used properly.
- Only after the heater is installed properly, attached to an approved chimney in good condition and has been inspected by a qualified person, it is ready for operation.
- Remember not to place any combustibles near the heater. In addition to furniture, rugs and clothing, this includes paper which you might use to start the fire. A hot coal could fall from the heater and cause a fire.
- Never use flammable liquids to start or freshen a fire. Gasoline, kerosene, lantern fuel and other such liquids can explode.
- Don't touch a heater to see if it's hot. Use insulated and fireproof gloves when tending the heater.
- When the heater is operating, children must be closely supervised. Unaware of the potential danger of a hot heater, children may accidentally bump into or touch the heater and be burned.
- Make sure you do not wear loose or flowing garments when tending the heater. Clothing like this could ignite. Be careful that hot coals don't fall on your clothing.
- Open a window to allow fresh air into the room when you use the heater for long periods of time to prevent asphyxiation.
- Do not use this heater as a trash disposal. This can cause dangerous overheating.
- Do not overfire this heater. Overfiring can cause a chimney fire or house fire. Overfiring can also shorten the life of the heater.
- Burn natural wood only in this heater. See the "WOOD FACTS" section of this manual for detailed information. Burning anything other than natural wood in this heater may damage the catalytic combustors.
- The small amounts of wood used for daily fire tending should be kept in a non-combustible container at least 36 inches away from the heater.
- Use only metal containers with tight fitting lids to remove ashes.

HEATER OPERATION

HOW THIS HEATER OPERATES (See Figure 12)

The chimney draft draws combustion air (oxygen) into the heater's firebox through a thermostatically controlled inlet air damper located on the front of the heater's firebox. The combustion air flows through and across the bed of fuel (natural wood), causing the fire to progress through the fuel bed. The gases (smoke) produced by the burning wood are either (1) consumed by the fire and burned if there is sufficient heat and combustion air present, or (2) drawn through the heater's catalytic combustion system and burned there on its way to the heater's venting system, or (3) drawn out of the heater into the venting system through a bypass damper which bypasses the heater's catalytic combustor system.



As the air between the firebox and the cabinet of the heater is heated by the fire inside the heater, it rises and exits through the cabinet top or perforated front of the heater's cabinet. This air is replaced by air drawn from underneath the heater. If this air flow is blocked, the heater may overheat. An optional blower (model KB902) may be purchased from your heater dealer and mounted to the back of the heater to enhance the circulation of the heated air as it leaves the heater. Any other attempt to alter this flow of air by connecting the heater to a duct system or other air movement blower can lead to improper and possibly hazardous operation of the heater.

The heater is equipped with a removable cabinet top which may be removed to expose an emergency cooking surface and a thermometer probe for temperature monitoring.

THERMOSTATICALLY CONTROLLED INLET AIR DAMPER EXPLAINED

The thermostatically controlled inlet air damper on this heater is intended to ensure automatically a steady room temperature when the heater is in operation; that is, when the heater and air around the heater reach a temperature predetermined by the setting of the thermostat control knob located on the front of the heater, the thermostat's bimetallic coil expands and causes the heater's inlet air damper to close to a point that will maintain the predetermined temperature as long as there is a sufficient fire inside the heater. As the heater and air around the heater cools, the bimetallic coil slowly contracts causing the heater's inlet air damper to open, allowing combustion air (oxygen) into the heater's firebox to increase the intensity of the fire until the heater and air around the heater reach the predetermined temperature once again. This process will continue as long as there is sufficient wood to be burned in the firebox or until the thermostat setting is changed by turning the thermostat control knob to a new setting.

Leaking of air into the heater's firebox through degenerated feed door or ash door seals, or improperly closed feed or ash doors will make the thermostat ineffective and can cause the heater, chimney connector and chimney to overheat.

CATALYTIC COMBUSTORS EXPLAINED

Under normal conditions, hydrocarbons and other potentially flammable products in wood smoke have a wide range of ignition temperatures. Many won't burn below about 1200°F or even higher. In most woodburning heaters, the average temperature in the firebox is only 700°F to 800°F during a burn cycle. Thus, much of the wood smoke passes through the heater unburned, wasting a good bit of the potential heat in the wood. Worst, some of the unburned smoke products condense and accumulate as dangerous creosote in the heater's venting system while other smoke products are expelled out the chimney to pollute our environmental air. However, when wood is correctly burned in a heater properly equipped with a catalytic combustor system, the majority of the smoke generated by the burning wood is disposed of (burned) so well that the heater's combustion efficiency is improved, there is less dangerous creosote to accumulate in the heater's venting system, and there is less harmful air pollutants to pollute our environmental air.

A catalytic combustor is a ceramic honeycomb-type structure (the combustor) which is chemically coated with a compound known as noble metal (the catalyst). The catalyst, metals like platinum and palladium, have chemical properties that, when heated to as little as 500°F (260°C), enable the combustor to "light-off" (ignite) and burn (oxidize) the majority of the hydrocarbons and other flammable products present in the unburned smoke of a wood fire as the smoke passes through the combustor on its way to the heater's venting system. In other words, a catalyst is an element which will cause something to happen under conditions by which they would not normally happen, without being consumed or used up by that reaction. In a wood heater equipped with catalytic combustors, this simply means that the catalyst is allowing the hydrocarbons and other flammable products in wood smoke to be burned at temperatures as low as 500°F (260°C) rather than at the 1100°F to 1500°F temperatures normally required to burn the same smoke products.

Once the catalytic combustor begins burning the smoke entering the combustor, the temperature in the combustor will continue to rise as long as there is smoke and sufficient oxygen present, often to temperatures exceeding 1800°F, although the heater's firebox temperature will be much less. As the temperature in the combustor exceeds 1000°F, the combustor may glow cherry red - this will generally happen very soon after the combustor starts burning the smoke and will last approximately one hour, depending upon the amount and type of wood being burned in the heater.

The combustor will not - and should not - glow cherry red for the entire burning of the wood load because combustors will glow only when operating above 1000°F whereas most catalytic burning does and should occur below that temperature. Therefore, the catalytic combustor need not glow to be working. In the majority of catalytic combustor equipped heaters, including this heater, the combustors cannot be seen during heater operation anyway, so glowing catalytic combustors are not very important; however, maintaining adequate temperatures is important - that's why the heater is provided with a thermometer probe for monitoring the heater's internal temperatures. (See Figure 12).

BYPASS DAMPER EXPLAINED

The smoke generated by the fire in the heater's firebox must bypass the heater's catalytic combustor system during certain phases of heater operation. To accomplish this, the heater is equipped with a bypass damper.

As a general rule, the bypass damper must be either in the closed position or the open position during the heater's operation. In the closed position, the smoke generated by the fire in the heater's firebox is drawn through the catalytic combustor system as it flows its way to the venting system; when the bypass damper is in the open position, the smoke bypasses the catalytic combustor system and goes directly into the venting system.

The bypass damper should be in the open position any time the heater's fuel feed door is opened for loading, firetending or inspection of fire. Because the catalytic combustor system offers some resistance to the flow of smoke, opening the fuel feed door of an operating heater with its bypass damper in the closed position would allow smoke and possibly flames to spill from the heater; the open bypass damper offers a path of least resistance to the smoke. **ALWAYS OPEN THE BYPASS DAMPER BEFORE OPENING THE HEATER'S FUEL FEED DOOR AND KEEP IT OPEN WHILE LOADING, FIRETENDING OR INSPECTING THE FIRE.**

The bypass damper should be in the open position anytime the heater's thermometer probe indicates the heater's internal temperature is less than 500°F (260°C).

WOOD FACTS

As previously mentioned, only natural wood should be burned in this heater. Of course, enough newspaper to start the wood fire is acceptable.

The small amount of wood used in daily fire tending should be kept in a noncombustible container at least 36 inches away from the heater.

The amount of heat you receive from the heater, the degree of control you have over its heat output, how safely you operate the heater, and how often you have to clean its catalytic combustor system and venting system are all somewhat dependent on how much you know about wood and burning wood.

The two factors that determine the amount of heat you get from a quantity of wood is its density and moisture content. All species of wood when oven dried and burned will produce approximately 8,600 Btu's per pound of wood, but because hardwoods are more dense than softwoods, a piece of hardwood will produce more heat than a piece of softwood of equal size and moisture content.

Before wood can burn, the water trapped in the wood must be boiled away. As anyone who has ever boiled water knows, it takes a considerable amount of heat to boil even a cup of water until it is all boiled away. Because freshly cut green wood or wet wood may be 50% water by weight, a considerable amount of the heat produced by burning green or wet wood is consumed by boiling the water out of the wood before it will burn. For this reason, green or wet wood is likely to produce a smoldering smoky fire and chimney temperatures that are cool enough to cause rapid accumulation of creosote. Burning green or wet wood can also waste up to 50% of the heat you should be getting in your home and maintaining catalytic combustion will be much more difficult due to the water vapor coming off the wood and cooling the combustor temperature too much.

To prepare wood for the most economical and trouble free burning, it should be cut, split, and stacked out of the rain with its ends exposed for at least 6 months before it is burned. Wood that has been "seasoned" in this fashion will normally dry naturally until it is approximately 20% water by weight.

Choosing the proper kind of firewood to burn in this heater depends on what is available to you.

Softwoods like pine, spruce, and fir are easy to ignite because they are resinous. They burn rapidly with a hot flame, but, since a fire built entirely of softwoods burn out quickly, it required frequent attention and replenishment.

This characteristic of softwoods can be a boon, if you want a quick-warming or short burning fire that will burn out before you go to bed.

If you do have a choice, for a long-lasting fire, it is best to use the heavier, denser hardwoods such as ash, beech, birch, maple, and oak. These hardwoods species burn less vigorously than softwoods and with a shorter flame. Oak gives the most uniform flame and produces steady, glowing coals.

By mixing softwoods with hardwoods, you can achieve an easily ignited and long-lasting fire.

To get an idea of how firewood is described and sold, you should first know that the most common measure is the cord. A cord is a tightly stacked pile of logs 8 feet long, 4 feet high, and 4 feet deep. The logs are usually cut 2 feet long, but you can have them cut into shorter lengths. A partial cord, called a face cord or a rick, is the same length and height as a cord, but its depth can be anywhere from 1 to 3 feet.

Wood is also sold by the ton. A ton of air-dry, dense hardwood (oak, hickory, maple, etc.) is equal to approximately one-half cord.

If you buy wood by weight, look for the driest wood. Don't pay for extra water!

Small twigs and branches found in your yard and wood wastes found around sawmills are also good.

When you buy wood, request a mixture of wood species and diameter sizes.

The wood should be generally sound, but don't worry about small pockets of rotten wood that you may find in logs.

For more specific information on how to select and obtain good firewood, write the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402, and request a copy of Forest Service Leaflet No. 559.

TO BUILD A FIRE

WARNING: THE PAINT ON THE EXTERIOR OF THE HEATER'S FIREBOX WILL GO THROUGH A CURING PROCESS DURING THE FIRST FIRING OF THE HEATER AND WILL EMIT SOME SMOKE AND ODOR. BE PREPARED FOR THIS BY RAISING A WINDOW OR OPENING A HOUSE DOOR TO PROVIDE VENTILATION.

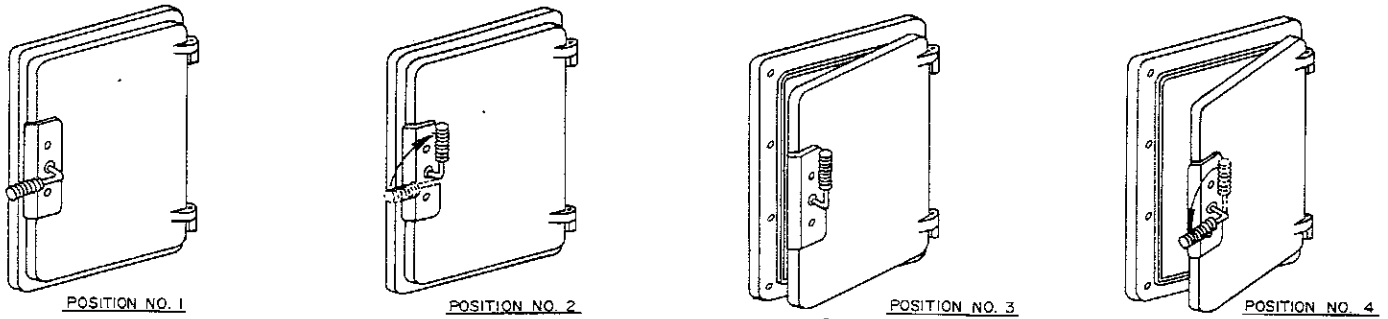
The first three times the heater is fired, the fire should be regulated so as to increase in intensity gradually to allow the painted components to cure slowly and to allow the other heater components to adjust to their expanded size.

1. Set the heater's thermostat to the "HI" position. (See figure 12).
2. Fully open the heater's bypass damper. The bypass damper is opened by pushing the bypass damper control lever to its innermost position.

NOTE: The bypass damper lever protrudes through the heater's cabinet back. (See Figure 12).

3. Open the heater's cabinet door.
4. Open the heater's fuel feed door (see figure 13) and place several wadded grapefruit size newspaper balls on the heater's grate beneath the bypass damper. Be sure the heater's ash removal door is securely closed.
5. Cover the newspaper balls with dry kindling sticks. Place the kindling sticks close enough to one another so the flames can move easily from one stick to the other. If the kindling is packed too tightly, the fire will suffocate, smoke and then die out.

FIGURE 13 -- OPENING AND CLOSING THE FUEL FEED DOOR.



TO OPEN
WHEN CLOSED AND LATCHED, THE DOOR AND HANDLE WILL BE AS SHOWN IN POSITION NO. 1. ROTATE THE HANDLE UNTIL IT IS AS SHOWN IN POSITION NO. 2. PULL THE DOOR OPEN UNTIL IT STOPS, APPROXIMATELY 1 INCH AS SHOWN IN POSITION NO. 3. CONTINUE TO HOLD THE DOOR OPEN AS THE HANDLE IS RETURNED TO ITS ORIGINAL POSITION. THE DOOR WILL THEN OPEN COMPLETELY AS SHOWN IN POSITION NO. 4.

TO CLOSE
WITH THE HANDLE AS SHOWN IN POSITION NO. 4, CLOSE THE DOOR AS FAR AS POSSIBLE. NOW ROTATE THE HANDLE TO POSITION NO. 3 AND COMPLETELY CLOSE THE DOOR AS SHOWN IN POSITION NO. 2. ROTATE THE HANDLE AS SHOWN IN POSITION NO. 1 AND APPLY SUFFICIENT PRESSURE TO INSURE THAT THE DOOR IS SEALED.

NOTE: Softwoods make better kindling than hardwoods because the softwoods burn faster than the hardwoods.

NOTE: If the heater tends to smoke when first lit, a draft may be induced by holding a torch of rolled-up newspaper at the opening of the bypass damper. Occasionally, this must be done two or three times to establish an updraft. It may also help to open a house door or window slightly.

6. Light the wadded balls of paper in the heater. Leave the fuel feed door slightly ajar (approximately 1 to 2 inches) to allow plenty of oxygen to reach the fire, but **DO NOT LEAVE THE HEATER UNATTENDED.**

WARNING: NEVER LIGHT OR REKINDLE A FIRE WITH KEROSENE, GASOLINE, OR CHARCOAL LIGHTER FLUID. RESULT CAN BE FATAL.

7. Once the original kindling is well lit, add more kindling and 2 or 3 logs about three inches in diameter. Be careful not to smother the fire. Stack the new wood pieces carefully near enough to keep each other hot, but far enough away to allow adequate air flow between them. **NEVER LEAVE THE HEATER UNATTENDED WHILE ANY OF ITS DOORS ARE NOT SECURELY CLOSED.**
8. Once the logs begin to burn, securely close the heater's fuel feed door.

CAUTION: OPERATING THE HEATER WITH THE FUEL FEED DOOR OR THE ASH REMOVAL DOOR OPEN CREATES AN ABNORMAL FIRING CONDITION WHICH CAN OVERHEAT THE HEATER, CHIMNEY AND ADJACENT COMBUSTIBLE MATERIALS. THIS CAN DRASTICALLY SHORTEN THE HEATER'S LIFE, THE CATALYTIC COMBUSTOR'S LIFE, AND VOID THE FACTORY WARRANTIES OF THE HEATER AND ITS COMPONENTS.

9. When all the wood in the firebox is burning well, finish loading the heater in the following sequence:

First - Open the fuel feed door.

Second - Load the heater's firebox with the desired amount of wood.

NOTE: Probably the least understood requirement in maintaining a good fire is that of establishing a good base of coals. Many new heater users hesitate to load enough wood to sustain a fire. A good bed of hot coals will maintain a more even temperature as well as get a new load of wood started burning easily.

Third - Securely close the heater's fuel feed door and then securely close the heater's cabinet door.

10. During the start-up of a cold heater, a medium to high firing rate must be maintained with the bypass damper and the inlet air damper open for about 20 minutes or until the heater, catalyst, and wood are all stabilized at a proper internal operating temperature of between 500° to 700°F (260°C to 370°C) as indicated by the gauge on the heater's thermometer probe. Even though it is possible to have the heater's internal temperature reach 600°F within two to three minutes after a fire is started-if the bypass damper is closed and the inlet air damper adjusted too soon, the heater's fire may go out or the catalytic combustors may not maintain "light-off". Therefore, wait until the heater, catalyst, and wood are stabilized at a proper internal operating temperature before closing the bypass damper and adjusting the inlet air damper in the following sequence:

First - Close the bypass damper. The bypass damper is closed by pulling the bypass damper control lever to its outermost position. (See Figure 12).

Second - Immediately after closing the bypass damper, adjust the heater's inlet air damper for the desired heat and burn rate. The inlet air damper is adjusted by setting the heater's thermostat control knob to a point midway between "HI" and "LO". If the house or heating situation requires a higher or lower setting to obtain the desired amount of heat, adjust the heater's thermostat setting appropriately.

NOTE: The gauge on the thermometer probe should indicate a rapid temperature rise shortly after the heater's bypass damper is closed. This rapid rise in temperature indicates that catalytic burning is taking place. If there is no rapid temperature rise, catalytic burning is not taking place and it will be necessary to repeat step 10 so that catalytic burning is maintained at the end of step 10 before proceeding to the following step 11.

11. Let each load of wood burn down to a good coal bed.

How long a load of wood burns will vary considerably with variables such as type of wood, how well the wood is seasoned, the heater's thermostat setting, the position of the heater in the house and how well the house is insulated.

FIRETENDING

Firetending is the occasional poking or stirring of the burning fuel bed to ensure airflow through the fire and adding new wood as needed. With experience, you should determine how often firetending is required to maintain the desired heat output of the heater. To ensure safe and satisfactory performance of the heater, the following rules should be observed:

1. **KEEP THE FUEL FEED DOOR, ASH DOOR, AND CABINET DOOR CLOSED EXCEPT WHEN TENDING THE FIRE OR REMOVING ASHES.** Operating the heater with its doors open can cause the heater to overheat and will increase the possibility of smoke, ash or sparks escaping the heater and damaging the dwelling or its contents.
2. The following sequence should always be followed when opening the heater's fuel feed door to prevent smoke and possibly fire from spilling out of the heater:
 - a. Fully open the heater's inlet air damper by setting the heater's thermostat to the "HI" position.
 - b. Fully open the bypass damper.
 - c. Wait about one minute, then open the fuel feed door.
3. Never load the heater in any manner which might block or hinder the bypass damper in any way. A blocked or hindered bypass damper could have a detrimental affect on the heater's performance and operation.
4. **ADD ONLY SMALL AMOUNTS OF FRESH WOOD TO THE HEATER AT EACH REFUELING.** Adding large amounts of fresh wood can cause an accumulation of gases above the fire that can cause backpuffing. Backpuffing can occur whenever concentrated gases accumulate over the firebed and then catch fire quickly. This may cause smoke and flame to be expelled from the heater during firetending, but under rare conditions, backpuffing can be severe enough to break apart poorly connected chimney connector pipes. If backpuffing is experienced, see section 5 of this manual for possible cause and solution to stop the backpuffing. This is an abnormal condition and a potential hazard. Determine and correct the cause.

Adding large amounts of wood to the fire causes a rapid cooling of the chimney and the release of excessive amounts of water vapor up the chimney. This can cause excessive creosote accumulation in the chimney.
5. **DO NOT TAMPER WITH THE INTERNAL THERMOSTAT MECHANISM.** The thermostat has been designed and calibrated to provide continuous control of the fire for safety and efficiency. Thermostat adjustments are made with the thermostat control knob only.
6. **DO NOT OVERFIRE THE HEATER.** If any part of the chimney connector or heater (other than the combustors) glows red hot, turn the heater's thermostat to "LO" and keep the heater's doors closed until the heater cools.
7. **NEVER LEAVE THE HEATER UNATTENDED FOR LONG PERIODS OF TIME AFTER ADDING FRESH WOOD.** Before the heater is left unattended, the fire should be well established and the thermostat set at medium or less.
8. Immediately after refueling a hot heater that has an internal firebox temperature below 500°F (260°C), the heater should be operated at a medium to high firing rate with the bypass damper open for about 10 minutes, or until the gauge on the heater's thermometer probe indicates a stabilized internal firebox temperature of between 500°F to 700°F (260°C to 370°C). This helps to ensure that the heater's catalytic combustor reach the proper operating temperature to maintain "light-off". When the internal firebox temperature is stabilized at between 500°F and 700°F (260°C to 370°C), close the bypass damper and set the heater's thermostat to the desired setting.
9. Immediately after refueling a hot heater that has an internal firebox temperature above 500°F (260°C), the heater's bypass damper may be closed and the heater's inlet air control lever set to the desired setting because firebox temperatures above 500°F will be hot enough to support catalytic burning and wood pyrolysis (smoke generation).
10. **IF YOU DO NOT WISH TO BURN THE HEATER CATALYTICALLY, LEAVE THE HEATER'S THERMOSTAT ON "HI" FOR 15 MINUTES AFTER ADDING FRESH WOOD TO A FIRE.** This allows the gases to be driven off and shortens the length of time the dense smoke is likely to deposit creosote in the heater's chimney connector and chimney. (NOTE: As previously noted, the bypass damper should remain in the open position during non-catalytic burning.)

A REVIEW OF CATALYTIC COMBUSTION OPERATING TEMPERATURES

Achieving Catalytic Light-Off: At least once during each burning cycle, the temperature within the heater should be raised high enough to cause the catalyst to become active. The most convenient time to do this is during fuel loading. With new catalytic combustors, internal firebox temperatures of 500° to 600°F (260° to 320°C) will initiate catalytic burning. But as a combustor ages, its catalytic activity decreases, so older combustors need more heat during startup to sustain catalytic action. During the catalytic combustors' normal range of life, internal firebox temperatures between 500°F and 700°F (260°C to 370°C) will be sufficient for light-off.

NOTE: As previously noted, a thermometer probe is provided for monitoring the internal firebox temperatures (see Figure 12).

Maintaining Catalytic Burning Conditions: During the start-up of a cold heater, a medium to high firing rate must be maintained with the bypass damper and the inlet air damper open for about 20 minutes or until the heater, catalytic combustors, and wood are all stabilized at a proper internal operating temperature of between 500°F to 700°F (260°C to 370°C). Even though it is possible to have internal firebox temperatures reach 600°F (320°C) within two to three minutes after a fire is started - if the bypass damper is closed and the heater's thermostat adjusted too soon, the heater's fire may go out or the catalytic combustors may not maintain "light-off".

After the refueling of a hot heater that has an internal firebox temperature below 500°F (260°C), the heater should be operated at a medium to high firing rate with its bypass damper open for about 10 minutes (or until the gauge on the heater's thermometer probe indicates a stabilized internal firebox temperature of between 500°F to 700°F) to help ensure the heater's catalytic combustors reach the proper operating temperature to maintain "light-off". At the end of a burn cycle, it's possible that the amount of burning charcoal might not provide sufficient temperature or fuel for the catalyst system; therefore, firing a new load

of wood with the heater's bypass damper and the heater's thermostat set for a medium to high firing rate until the heater, catalytic combustors, and wood are all stabilized at a proper operating temperature helps to ensure proper catalytic burning during a burn cycle.

When refueling a hot heater that has an internal firebox temperature above 500°F (260°C), temperatures within the firebox will be hot enough to maintain catalytic burning and wood pyrolysis (smoke generation) so that immediately after loading the wood, the bypass damper may be closed and the heater's thermostat set to the desired setting which will provide the desired heat output.

If difficulty is encountered in achieving catalytic light-off or maintaining catalytic burning conditions, refer to Section 5 of this manual for appropriate remedies.

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SECTION 4

HOW TO TAKE CARE OF THE HEATER AND VENTING SYSTEM (ROUTINE MAINTENANCE)

VENTING SYSTEM CARE

As previously noted, the venting system consists of the heater's chimney connector (the pipe which connects the heater to the chimney) and the chimney itself.

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 chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occurred.

NOTE: EVEN THOUGH REDUCTION OF CREOSOTE IS ONE OF THE PRIMARY ADVANTAGES OF A CATALYST-EQUIPPED HEATER, CREOSOTE WILL STILL ACCUMULATE IN THE HEATER'S VENTING SYSTEM. CATALYTIC COMBUSTORS DO NOT ELIMINATE THE NEED FOR CREOSOTE INSPECTION AT LEAST TWICE MONTHLY DURING THE HEATING SEASON.

If creosote has accumulated, it should be removed to reduce the risk of a chimney fire. **NOTE:** When removing creosote from the chimney connector and chimney, the heater should be disconnected from the chimney connector to prevent the dislodged creosote from entering the heater where it could jam the heater's bypass mechanism or plug the catalytic combustors.

A chimney fire is usually indicated by a roaring noise within the chimney and/or a pinging noise within the chimney connector, and the emission of sparks and ash from the top of the chimney.

If a chimney fire should occur, do the following:

1. Immediately close any heater door that might be open.
2. Turn the heater's thermostat control knob to "LO".
3. Alert all people in the house. Either have them leave, or be ready to leave.
4. Call the fire department.
5. Protect the roof by wetting it with a garden hose or buckets of water.

A chimney fire may cause structural damage to the chimney. After the chimney fire is over, thoroughly inspect the chimney, chimney connector and surrounding materials for damage and make any necessary repairs before using the heater again. Most fire departments make free chimney inspections and can provide assistance in locating chimney cleaning or repair services.

THE VENTING SYSTEM SHOULD ALWAYS BE CLEANED AND INSPECTED BEFORE EACH HEATING SEASON.

CHIMNEY CONNECTOR PIPE - CORROSION INSPECTION

Chimney connector pipes do not last forever. Corrosion is particularly a problem if the inside of the pipe tends to get damp from condensation of flue gases or from rain or snow getting into the chimney. Just being on an ocean coast can also accelerate chimney connector pipe corrosion.

Chimney connector pipe replacement may be necessary more than once a season, but once every few years is more typical. Every time the chimney and chimney connector are checked for creosote buildup, the strength and integrity of the chimney connector pipes should also be checked. Tap each chimney connector pipe with a small hammer or poke with a screwdriver to reveal where the metal is getting thin due to corrosion on the inside. Elbows usually give out first. Replace as necessary.

ICE - FORMATION AND PREVENTION

Most of what you see coming from the chimney of a properly operating catalyst-equipped heater is water vapor. In extremely cold weather, and with some exterior chimneys, this vapor may freeze in the chimney to the point of actually blocking the chimney and extinguishing the fire in the heater. In such weather, occasionally burn the heater with the bypass damper open and the heater's thermostat knob turn to the "HI" position to melt any possible ice buildup.

CAUTION - CARE SHOULD BE TAKEN NOT TO OVERHEAT THE HEATER OR VENTING SYSTEM.

HEATER CARE

ASHES - REMOVAL AND DISPOSAL

Ashes should not be allowed to accumulate until they obstruct the airflow through the burning wood. If ashes are allowed to accumulate to within two inches of the bottom of the grates, poor burning of the fuel is likely, and the grates will be damaged from overheating.

When removing the ash pan from the heater, wear gloves to protect your hands from glowing embers and hot surfaces. **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 should never be placed in wooden or plastic containers, or in paper or plastic bags, no matter how long the fire has been out. Coals have been known to stay hot for several days when embedded in ashes.

HEATER MAINTENANCE

The heater's cabinet surfaces may be wiped free of dust with a soft cloth. The use of any other cleaning method may damage the cabinet's finish.

At the end of each heating season, the heater should be thoroughly cleaned of all ashes. Ashes remaining in the heater, in combination with moisture in the air, can cause severe corrosion of the heater. All rust spots on the heater should be wire brushed and covered with a coat of high temperature paint. If the heater is to be stored until the next heating season, be sure the storage area is dry.

The heater should never be used with damaged or missing parts.

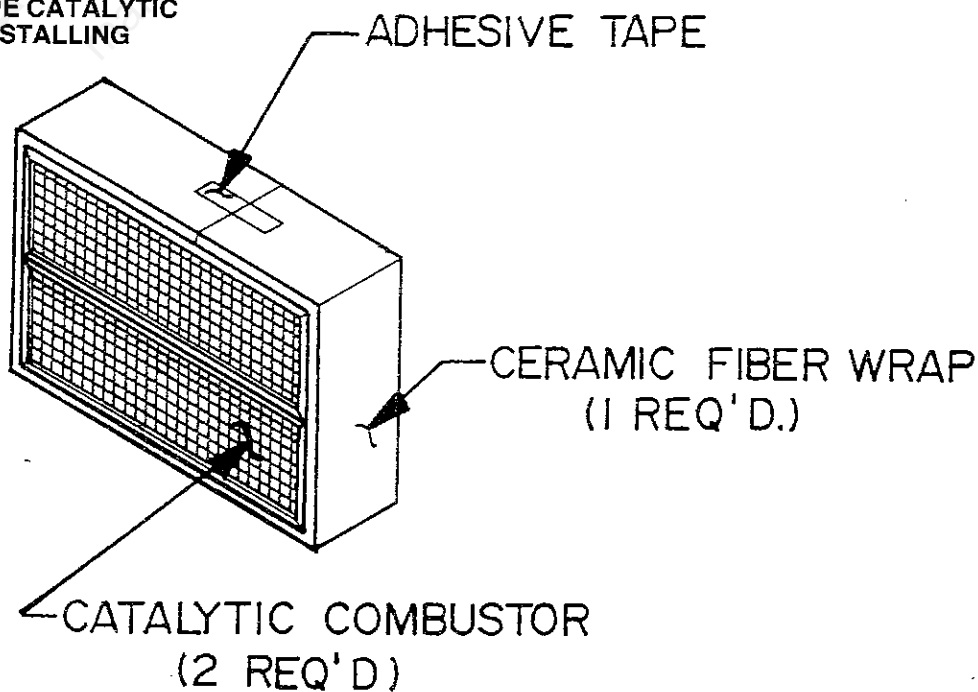
Have a qualified heater installer inspect the complete system before each heating season. Replace all damaged or missing parts.

Check the following items regularly during the heating season to ensure proper heater operation:

1. Condition and operation of fuel feed door and ash door gaskets: repair or replace if air leakage is observed and replace if excessive wear is observed. These door gaskets are attached to the doors by standard furnace cement which may be purchased from your heater dealer. See figure 15 for gasket replacement illustrations and part numbers.
2. Condition and operation of fuel feed door, ash door and cabinet door latching pawls and handles - ensure that operation will securely close the door(s). Adjust as necessary and replace if necessary. See figure 15 for replacement illustrations and part numbers.
3. Condition and operation of bypass damper - As necessary, brush or vacuum the bypass damper free of ashes to eliminate bypass damper jamming or misalignment caused by a buildup of ashes in the bypass damper mechanism.
4. Condition and operation of catalytic combustors - It is important to periodically monitor the operation of the catalytic combustors to ensure that they are functioning properly and to determine when they need to be replaced. Non-functioning combustors will result in a loss of heating efficiency, and an increase in creosote and emissions. There are two simple ways to determine if the heater's catalytic combustor system is functioning properly. They are:
 - a. Take note of the smoke exiting the chimney with a well established fire burning in the heater and the bypass damper open. Then close the bypass damper to achieve catalytic light-off. Wait a few minutes, then observe the smoke exiting the chimney. If the catalytic combustor system is functioning properly, there should be a significant decrease in the amount of smoke exiting the chimney after the bypass damper is closed. Be careful not to confuse smoke with steam from wet wood.
 - b. With a well established fire burning in the heater and the bypass damper open, take note of the temperature registered by the thermometer probe's gauge. Then close the bypass damper to achieve catalytic light-off. The thermometer probe's gauge should indicate a rapid temperature rise within the heater if the catalytic combustor system is functioning properly.

The catalytic combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustors is not recommended unless more detailed inspection or cleaning is warranted because of decreased performance which cannot be remedied by one of the following procedures, or as outlined by section 5 of this manual.

FIGURE 14 -- WRAPPING THE CATALYTIC COMBUSTORS PRIOR TO INSTALLING THEM IN THE HEATER.



- If fly ash accumulation is evident on the combustors, brush the fly ash off the front faces of the combustors when the heater does not have a fire in it and is not hot. Use a soft bristle brush - a clean, dry paint brush will do fine.
- If creosote is evident on the combustors, operate the heater at a high fire rate with the bypass damper partly open. Reinspect the combustors after the fire in the heater has burned out and the heater is not hot. If some creosote still remains, repeat the firing procedure.

CAUTION: CARE SHOULD BE TAKEN NOT TO OVERHEAT THE HEATER OR VENTING SYSTEM.

- At least once per heating season, remove the catalytic combustors from the heater and clean the rear faces of the combustors as well as their front faces by brushing them with a soft bristled brush or by vacuuming them lightly. Cleaning the combustors with plain water is also good - after soaking the combustors in warm or hot (NOT BOILING) water for about 20 minutes, allow the combustors to cool at room temperature and then rinse them under medium water faucet pressure, then allow the combustor to dry thoroughly. For information on how to remove and reinstall the combustors, see the "WHEN AND HOW TO REPLACE THE CATALYTIC COMBUSTOR(S)" portion of this manual.

CAUTIONS:

- Never try to clean the cells of catalytic combustor by inserting an instrument of any type. This may dislodge the catalyst coating from the combustor, rendering the combustor useless.
- The use of compressed air to clean combustor cells is not recommended. Experience has shown that the catalyst coating can be blasted off the combustor if high-pressure compressed air is used to clean the combustor cells.
- It is normal for small amounts of the ceramic to break off the combustor face during the life of the combustor. This loss of material has little effect on the performance of the catalytic combustor. Only when large pieces - golf ball size or larger - are missing should replacement be considered because of ceramic material loss.

WHEN AND HOW TO REPLACE THE CATALYTIC COMBUSTOR(S)

Tests conducted by a leading catalytic combustor manufacturer indicate that the average expected operational life of a catalytic combustor should be about 6,000 operating hours. Remember, this is an average test figure; actual operational life of your heater's combustors may be more or less, depending on operation procedures and normal care.

Whenever a catalytic combustor is no longer functional, it should be replaced as soon as possible. Section 5 of this manual outlines possible problems which might cause this heater's catalytic combustors to stop functioning. Follow the solutions offered by section 5 for the most trouble-free and efficient operation of this heater.

When you do have to replace one or both of the heater's catalytic combustors or just remove them for cleaning, here's how it's done:

1. Allow any fire in the heater to burn out and the heater to cool.
2. Open the heater's cabinet door and fuel feed door.
3. Locate the heater's catalytic combustors. The combustors are located in the combustor housing which is located in the upper portion of the heater's firebox just in front of the heater's flue collar. A flame impingement shield, which protects the combustors from direct fire contact, is mounted over the face of the combustor housing.
4. Remove the flame impingement shield from the face of the combustor housing. This is accomplished by reaching through the fuel feed door opening and removing the screw(s) which fasten the flame impingement shield to the combustor housing. Once the screw(s) are removed, simply lift the flame impingement shield off the combustor housing retaining-studs located on the far side of the combustor housing.
5. Remove the thermometer probe from the heater's firebox top. (See figure 12).
6. Remove the combustors from the combustor housing; this is best accomplished if you disconnect the heater's chimney connector from the heater's flue collar and reach into the combustor housing through the heater's flue collar and push the combustors toward the front of the combustor housing to partially dislodge the combustors from the combustor housing. The combustors may then be removed from the heater by reaching through the heater's fuel feed door and pulling the combustors free of the combustor housing. Care should be taken not to drop the combustors from the combustor housing because that could damage or break the combustors.
7. Once the combustors are out of the heater, inspect for residue where the combustors were sitting inside the combustor housing. Wipe this area clean with a dry cloth. **DO NOT USE DETERGENTS, STEEL OR METALLIC BRUSHES OR SOLVENTS.**
8. Clean the front and rear faces of the combustors by brushing them with a soft bristled brush or by vacuuming them lightly, or by soaking them in plain water as described earlier; or, if necessary, obtain new replacement combustors.
NOTE: The catalytic combustor warranty furnished with each new heater gives specific details regarding the purchase of new catalytic combustors.
9. Prepare the combustor for installation by tightly wrapping them with **NEW** insulating material as shown by Figure 14. Do not handle the combustors any more than necessary because the combustors are made of ceramic material which can break.
NOTE: Combustors **MUST** be rewrapped with **NEW** insulating material **ANY TIME** combustors are removed from the combustor housing. The new insulating material may be obtained from your heater dealer; refer to Section 6 of this manual for ordering information.
10. Install the newly wrapped catalytic combustors into the clean combustor housing as they were originally installed before removal by Step 6 above.
NOTE: The new insulating material will expand and form a tight seal between the catalytic combustors and the combustor housing when heated by the next fire built in the heater.

11. Reinstall the flame impingement shield onto the front of the combustor housing as it was originally installed before removal by step 4 above.
12. Reinstall the thermometer probe in the top of the heater's firebox.
13. Reconnect the chimney connector to the heater's flue collar as it was originally connected before being disconnected by step 6 above.
14. If heater or floor protector was moved, be sure to reposition correctly.

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TROUBLESHOOTING

Problems can arise during the operation of any wood heater. While the use of a catalytic combustor equipped heater will substantially lessen some of these problems, other traditional wood heater problems may remain. These problems can usually be traced to such things as the venting system, draft, aged or failed heater parts, fuel, and operator error.

The troubleshooting suggestions contained in this section of the manual apply to the operation of all wood heaters, with problems related to catalytic heaters addressed where appropriate.

Experience has shown that correct installation and good operating practices-including routine heater and venting system maintenance, along with a good sound chimney, will eliminate most of the problems mention by this section of the manual.

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

Nonetheless, wood heater operators should make themselves aware of the nature, cause and solution to possible problems so as to help themselves obtain the best possible service from this heater.

TROUBLESHOOTING GUIDELINES

THE VENTING SYSTEM - KEY TO GOOD HEATER PERFORMANCE

A majority of performance problems with good burning heaters can be traced to some factor in the venting system that is adversely affecting the heater. Air will flow into the heater and smoke will flow up the chimney only if there is sufficient difference between the air pressure in the room where the heater is located and the air pressure inside the chimney. As hot gases and smoke flow up a chimney, the pressure in the chimney is lowered, creating a difference in pressure inside and outside the chimney. When this pressure difference, often referred to as "draft pressure" or simply as "draft", is sufficient, air will be forced into the inlet air damper of the heater. This air supplies the oxygen necessary for the wood to burn. If the draft is not sufficient, insufficient oxygen will reach the burning wood and it will burn poorly. This condition can also cause smoke and dangerous gases to spill or backpuff from the heater into the room. Backpuffing occurs when the air flow through the heater is insufficient to burn all the gases being released by the wood causing them to build up until they ignite as a minor explosion. This causes smoke to puff out of every opening in the heater and venting system. Too much draft may cause excessive temperatures in the heater and may damage the catalytic combustors. An uncontrollable burn or a glowing red heater part or chimney connector is an indication of excessive draft. The amount of draft in the chimney depends on the length of the chimney, local geography, nearby obstructions (even a tree that has grown tall can affect the draft of a chimney that was previously trouble-free), and other factors described below.

The common unit used to measure draft is "INCHES OF WATER". To determine the draft of your chimney, a draft pressure reading should be taken with a DRAFT METER or a WATER MANOMETER. This requires someone with the proper equipment and the knowledge of how to use it. Your heater dealer should be able to perform this task for you or recommend someone who can.

For this heater, installations with a draft of .03 inches of water or less are considered marginal and will not burn reliably as noted above. In this catalytic combustor-equipped heater, it is not recommended that the draft exceed .08 inches of water or overfiring can occur as noted above. The recommended operating range for this heater is .04 to .07 inches of water.

REMEMBER- THE HEATER CANNOT CREATE DRAFT. ONLY A PROPER LEAK FREE CHIMNEY CAN CREATE THE NECESSARY DRAFT.

WHAT TO DO IF THE HEATER SMOKES OR BURNS POORLY OR EXCESSIVE CREOSOTE ACCUMULATES IN THE CHIMNEY

1. Open a window slightly to see if the conditions improve. If opening a window improved the performance of the heater or stops the spillage of smoke into the room, the problem is caused by a slight vacuum in the room. The vacuum can be the result of the room being so tightly constructed that the air removed from the room by the heater is not replaced by normal infiltration of air from outside the room.
The vacuum can also be caused by the loss of air from the room through kitchen or bathroom ventilating fans, other chimneys or vents, etc. The only solution to this type problem is to reduce the air lost from the room or provide a source for air to enter the room.
2. Check the pipes connecting the heater to the chimney for loose or unsealed joints that may allow air to leak into the chimney system.
3. Examine your method of building and tending the fire in the heater. If you close the by-pass damper too soon when building a fire, fail to open it before opening the fuel feed door, add too much fresh wood at each refueling, or attempt to operate the heater at too low a combustion rate for the amount of wood present in the firebox, your failure to follow proper practices may be causing the problem. Also check for ash buildup in the ash pan. Ashes can restrict air flow thru the burning wood.
4. Check the catalytic combustors for damage or functional failure.

5. Check the height of the chimney. A chimney that is too short will not develop sufficient draft or will allow wind to interfere with the draft. (Refer to figure 4 for correct chimney height).
6. Check the chimney for cracks or holes that may allow air to leak into chimney. If the chimney is equipped with an ash clean out, be sure the door is closed and fits tightly. The door may have to be temporarily sealed with tape or furnace cement to be as air tight as required. An excellent way to check an exterior chimney for leaks is to perform a smoke test by building a small wood fire in the heater, adding a small amount of wood to the fire to make it smoke heavily, momentarily blocking the top of the chimney, and watching for smoke to leak out of any opening or cracks.
7. Check the entire venting system for obstructions that could be causing resistance to the flow of smoke and gases up the chimney.
8. Check the inside diameter of the chimney. If the inside diameter is too small, it will be too restrictive to the flow of smoke and gases. If the inside diameter is too large, it will result in excess capacity, which means less draft and more creosote. If a chimney's inside diameter is too large, it may be improved by restricting the top opening of the chimney to a 6-inch round opening. In more extreme cases, if a masonry chimney's inside diameter is too small or too large, it may be possible to re-line the chimney with a smaller or larger lining as the situation dictates if the diameter of a metal prefabricated chimney is too small or too large, the chimney can be replaced with a larger or smaller diameter metal prefabricated chimney as the situation dictates. Refer to the "MASONRY CHIMNEY REQUIREMENTS" and the "METAL PREFABRICATED CHIMNEY REQUIREMENTS" sections of this manual for chimney diameter requirements.

WHAT TO DO IF THE HEATER BURNS TOO RAPIDLY OR OVERHEATS

1. If the room in which the heater is located becomes uncomfortably warm on moderately cool days, it may be because you are placing too much wood in the heater for the amount of heat required to heat your home. Although the thermostat control on the heater is intended to control the burning rate of wood, a certain amount of air must enter the heater at all times to assure the fire does not go out and the wood burns as cleanly as possible. Thus you should adjust the amount of wood you put into the heater to the outdoor temperature. Placing excessive wood in the heater will cause excessive creosote formation in the chimney, waste wood, can plug up the catalytic combustors can cause the heater to smoke or backpuff into the room, as well as make the room uncomfortably warm.
2. If the heater burns too rapidly or overheats, it may be because air is leaking around a loose door gasket or a fuel feed door or ash door latching pawl and handle may need adjusting. Check thoroughly for leaks where air may be entering the heater's firebox.
3. If the heater burns too rapidly or overheats due to excessive draft as described earlier, a barometric damper may be purchased and installed in the heater's chimney connector. The barometric damper should be set to regulate a .07 draft through the heater. Check with your heater dealer for details.

QUICK REFERENCE TROUBLESHOOTING

HEATER-RELATED PROBLEMS

PROBLEM

POSSIBLE CAUSE/SOLUTION

- | | |
|--------------------------------|--|
| 1. Sluggish Heater Performance | <ol style="list-style-type: none"> (1) Obstruction in chimney/check for and remove obstruction. (2) Closing bypass damper and adjusting inlet air damper too soon/follow proper firing procedures described in owner's manual. (3) Wet or unseasoned wood being burned/burn dry seasoned wood. (4) Too much wood added to too few wood coals/add small amounts of wood to small wood coal beds. Once a good bed of coals has been established, more wood can be added. (5) Dislodged heater parts/check all movable heater parts. Replace if necessary. (6) Poor chimney draft/see "CHIMNEY-RELATED PROBLEMS" below. (7) Combustor is plugged/see "CATALYTIC COMBUSTOR-RELATED PROBLEMS" below. |
| 2. Drop In Overall Efficiency | <ol style="list-style-type: none"> (1) Cold, windy weather/house may need weather stripping, caulking, insulation or storm windows. (2) Burning wet, pithy, or spongy wood/burn quality wood available in your area. (3) Catalytic combustors not operating/Close heater's bypass damper when temperature is high enough and stabilized to maintain catalytic burning. Also see "CATALYTIC COMBUSTOR-RELATED PROBLEMS" below. |
| 3. High Fuel Consumption | <ol style="list-style-type: none"> (1) Inexperience in catalytic operation/operate heater with desired heat output in mind. Do not be overly concerned with maintaining light-off temperature. Also reread owner's manual. |

4. Backpuffing

- (2) Improper regulation of draft or inlet air/Have chimney checked; it should be .04 to .07 inches of water. Also may need to set heater's thermostat to a lower setting after establishing fire in heater.
 - (3) Burning wet, unseasoned wood or pithy, spongy wood/Burn seasoned wood that is dry and of good quality.
 - (4) Cold, windy weather/House may need weather stripping, caulking, insulation, or storm windows.
 - (5) Catalytic combustors not engaged/Close heater's bypass damper to engage catalytic combustors when temperature is high enough to maintain catalytic burning.
 - (6) Catalytic combustors not functioning/See "CATALYTIC COMBUSTOR-RELATED PROBLEMS" below.
 - (1) Gusts of wind/Install chimney cap.
 - (2) Hot catalytic combustors above 1400°F/Avoid burning soft, pithy woods or large amounts of small diameter wood.
 - (3) Improper regulation of draft/Have the chimney draft checked; it should be .04 to .07 inches of water.
 - (4) Opening doors in a tightly constructed house/Slowly open and close outside doors.
- (1) Heater being burned too hot/Follow operating instructions described by owner's manual.

5. Glowing Heater Parts and/or Heater Discoloration

PROBLEM

CHIMNEY-RELATED PROBLEMS

POSSIBLE CAUSE/SOLUTION

1. Very Rapid Creosote Accumulation

- (1) Types and amounts of wood burned/Try not to burn pithy woods. Don't overstuff the heater's firebox.
- (2) Poorly insulated chimney/Replace single-walled metal chimneys with double-walled insulated chimney sections. Be sure to meet local codes, OR install a chimney liner in a masonry chimney, be sure to meet local codes, OR in new installations, utilize an interior chimney rather than an exterior one, OR consider installing a barometric damper set to .07 inches of water.
- (3) Catalytic combustor not functioning/See "CATALYTIC COMBUSTOR-RELATED PROBLEMS" below.

2. 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)/Water vapor is normal and should be of little concern as long as it doesn't freeze in the chimney.
- (2) Wet, pithy wood being burned/Burn dry, seasoned wood.
- (3) Bypass damper not closed/Close heater's bypass damper when temperature is high enough and stabilized to maintain catalytic burning.
- (4) Catalytic combustors not functioning/See "CATALYTIC COMBUSTOR-RELATED PROBLEMS" below.

3. Poor Drafting Chimney

- (1) Improper chimney height/Extend height of chimney, be sure to meet local codes.
- (2) Cooler temperatures caused by external chimney/Insulate chimney or build chimney taller. In new installations, try to utilize internal chimney.
- (3) Massive stone or masonry chimney/Install chimney liner. Be sure to meet local codes.

CATALYTIC COMBUSTOR-RELATED PROBLEMS

PROBLEM

POSSIBLE CAUSE/SOLUTION

1. Combustor Plugging (Also see Catalyst Masking)
 - (1) Burning materials that produce a lot of char and fly ash can plug combustor cells and cause a smoke spillage problem and prevent catalytic burning/Do not burn materials such as garbage, gift wrap or cardboard. Burn dry, seasoned wood.
 - (2) Burning wet, pithy woods or burning large loads of small-diameter wood with the bypass damper closed without light-off taking place can plug combustor cells with creosote and cause smoke spillage problems and prevent catalytic burning/Don't close the heater's bypass damper until temperature is high enough and stabilized to maintain catalytic burning. Follow proper firing procedure described by owner's manual. It may be possible to burn the accumulated creosote off combustor by putting the bypass damper in a partially open-partially closed position after a "hot" fire has been started.
 - (3) Not maintaining light-off/Same solution as (2) above.
 - (4) Combustor not functioning. If proper burning procedures have been followed to no avail, the combustor is not functioning/Replace combustor or combustors.

2. Catalyst Masking (Also see Combustor Plugging)
 - (1) Closing the heater's bypass damper before temperature is high enough or stabilized enough to maintain catalytic burning can cause the catalyst to become masked or coated with a layer of fly ash which will prevent catalytic burning/Brush cooled combustors with a soft bristled brush or vacuum lightly. At least once per heating season, carefully remove the combustors from the heater and clean each combustor thoroughly. This will help prevent masking from taking place.
NOTE: The difference between masking and plugging is that plugging actually plugs up the combustor cells whereas masking does not. Masking is more likely than plugging, but both are easily preventable by proper heater operation and maintenance.

3. Catalyst Deactivation
 - (1) Burning trash, pressure-treated lumber or painted wood will deactivate the catalyst to the point that combustors are no longer functional/Burn quality woods available in your area. If the catalyst has been deactivated, replace the combustors.
 - (2) The catalyst can also be deactivated when it is coated with excessive creosote or fly ash. This buildup reduces the amount of catalyst available to react with the smoke./See "COMBUSTOR PLUGGING" and "CATALYST MASKING" above for solutions.

4. Catalytic Peeling
 - (1) Extreme temperatures (above 1800°F or 1000°C) at combustor surface may cause the catalyst to peel. Over firing and flame impingement are primary causes. Minor peeling is normal and will not affect function of catalyst. Severe peeling will close all openings and cause a plugging problem./If peeling is severe, remove and replace combustor or combustors. Avoid extreme temperatures and flame impingement. (NOTE: Flame contact with combustors is known as flame impingement.)

5. Thermal Cracking of Combustor
 - (1) The cyclical heating and cooling of the combustors and the varying conditions of wood burning create temperature differentials within a combustor's ceramic material. These temperature differences cause the material to expand and contract at differing rates, resulting in internal stresses that can crack the ceramic material. /This is normal. As long as the combustor remains intact, no burning problems should result. If cracking causes large pieces of the ceramic material to fall out, replace the combustor.

6. Mechanical Cracking of Combustor
 - (1) An older combustor 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 mishandled or abused. However, mishandling or abusing a combustor which has stress-relief cracks could result in the combustor completely breaking apart or loss of some of the catalyst coating./Do not mishandle or abuse. Replace combustor if breakage affects catalytic operation.

- 7. Combustor Crumbling
 - (1) Extreme thermal shock due to flame impingement caused by high-fire mode may cause the face of a combustor to crumble./Bypass combustors when heater is operated in high-fire mode. If combustor crumbling occurs, replace combustor if the crumbling affects catalytic operation.
- 8. Catalyst Abrasion
 - (1) High draft can cause fly ash to grit-blast the surface of a combustor./If more than 1/2" of catalyst (as measured along length of cell) is abraded, replace the combustor. To control catalyst abrasion, keep chimney draft at .04 to .07 inches of water.
- 9. Combustor Color Variation
 - (1) Variation in color from combustor to combustor or within a combustor can occur./These color variations are normal and do not affect combustor performance.

CHECKLIST OF DO'S AND DON'TS

DO'S:

1. Do read and follow the installations, operation and maintenance manual instructions carefully.
2. Do install a smoke detector in an area that will give warning in an unlikely event that a fire develops in the area of the heater or the heater malfunctions.
3. Do be sure that there is a fire extinguisher of the proper type and in good working order accessible in the unlikely event that a fire develops near the heater or the heater malfunctions.
4. Do check with local building officials to be sure the installation of the heater complies with all building codes and requirements and obtain required building permits.
5. Do plan your installations with safety as your primary consideration.
6. Do keep all flammable liquids, gases and pressurized containers away from the heater.
7. Do complete the installation before attempting to use the heater.
8. Do use only the prescribed materials and parts for the installation of the heater.
9. Do install the heater in an area that will minimize the hazards of persons coming in contact with the hot surfaces of the heater.
10. Do instruct all responsible persons in the proper and safe operation of the heater.
11. Do instruct all persons, especially children and elderly persons, of the hazards involved with the heater and improper and unauthorized tampering of the heater.
12. Do check the heater for proper adjustment and operation before leaving it unattended for long periods of time.
13. Do start fire only with paper and kindling. The use of liquid fire starters can cause an explosion within the heater.
14. Do use only a Listed High Temperature Type HT Factory-Built Residential Type and Building Heating appliance chimney or a properly constructed and maintained masonry chimney to vent this heater.
15. Do use 6-inch diameter chimney connector pipes made from a minimum of 24 gauge cold rolled or blued steel.
16. Do place all ashes in a metal container with a tight fitting lid and place them on a non-combustible surface well away from other combustible materials until they have completely cooled.
17. Do check the door latching mechanisms and gaskets regularly and replace parts or make adjustments as needed to maintain the intended tightness of the fire chamber.
18. Do use a non-combustible floor protector beneath the heater as required.
19. Do observe all instructions regarding clearance between the appliance, chimney connector and combustibles.
20. Do store your fuel supply at least 36 inches from the heater.
21. Do burn only seasoned wood in this heater.
22. Do be sure the heater is located in an area where combustible vapors are not present.
23. Do use a chimney for this heater that is not used by another appliance.
24. Do assemble the chimney connector so that moisture that accumulates within the chimney will flow back toward the heater.
25. Do remove ashes from heater regularly.
26. Do store wood in such a manner as to keep it dry.
27. Do protect your hands with non-combustible gloves when loading the heater, removing ashes, etc.
28. Do keep the heater doors closed except when tending the fire or removing ashes.
29. Do build fires of moderate intensity in the heater for the first three fires to allow the materials to adjust and cure before being subjected to the intense heat of a large fire.
30. Do keep the catalytic combustors clean.

31. Do keep the bypass damper mechanism free of ash buildup to prevent bypass damper jamming or misalignment.
32. Do inspect chimney connector pipes for corrosion.

DON'TS:

1. Don't dry clothing or other articles on or near the heater.
2. Don't store or place flammable liquids, gases or pressurized containers near the heater.
3. Don't use gasoline, kerosene, engine oil, charcoal lighter or other flammable liquids to start or intensify a fire. Using these and other similar materials can cause an explosion within the heater.
4. Don't use an unlisted, type B, or poorly constructed or maintained chimney to vent this heater.
5. Don't use galvanized pipe, nor steel pipe less than 24 gauge, nor pipe of improper diameter, as a chimney connector.
6. Don't store ashes in combustible containers, nor store them near combustible materials, nor dispose of them until they have completely cooled.
7. Don't neglect to inspect regularly and maintain door gaskets and latching mechanisms to assure the intended tightness of the fire chamber.
8. Don't install the heater or chimney connector at clearances to combustibles less than those recommended in this manual.
9. Don't install the heater where flammable or explosive liquids or vapors are likely to be present.
10. Don't connect this heater to a chimney flue that is used by another appliance.
11. Don't neglect to clean and inspect your venting system regularly.
12. Don't operate the heater with its doors open.
13. Don't tamper with the heater's thermostat mechanism. Internal thermostat adjustments should only be made by qualified persons.
14. Don't neglect to keep the catalytic combustors clean.
15. Don't neglect to keep bypass damper mechanism free of ash buildup.
16. Don't neglect to inspect chimney connector pipes for corrosion.
17. Don't operate the heater with its grate(s) removed.

SECTION 6

WARRANTY INFORMATION AND REPAIR PARTS

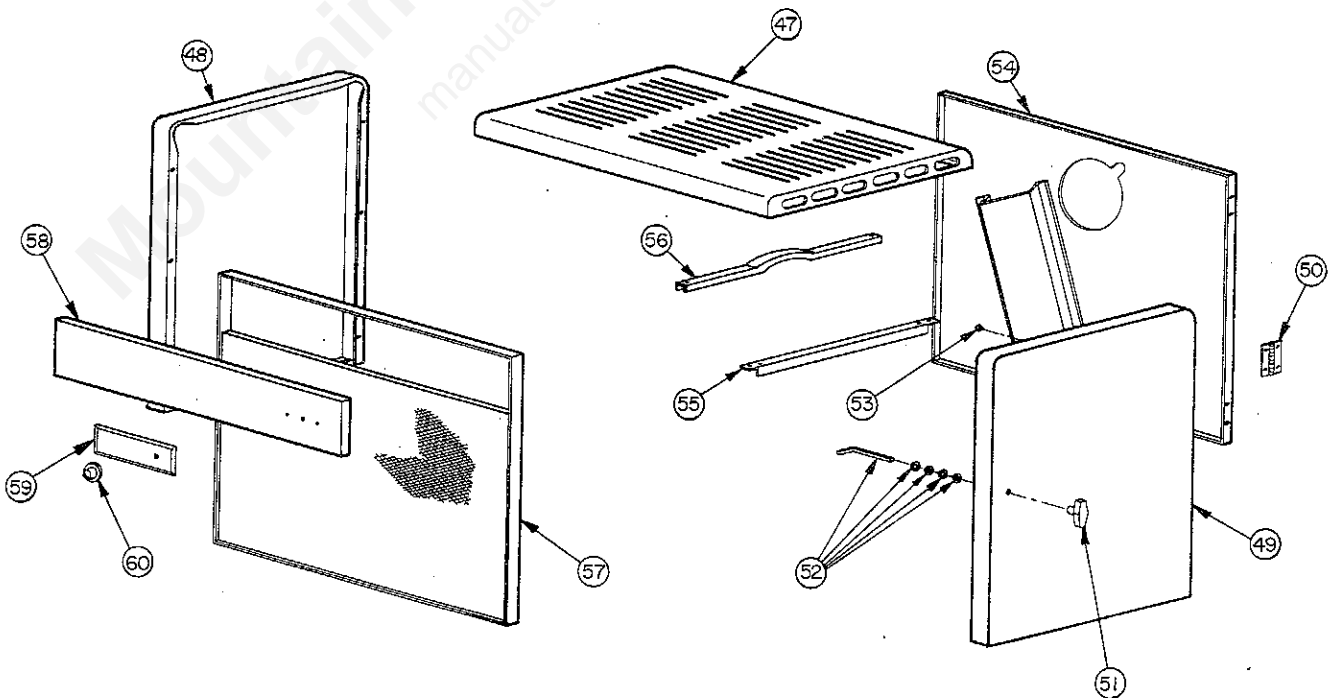
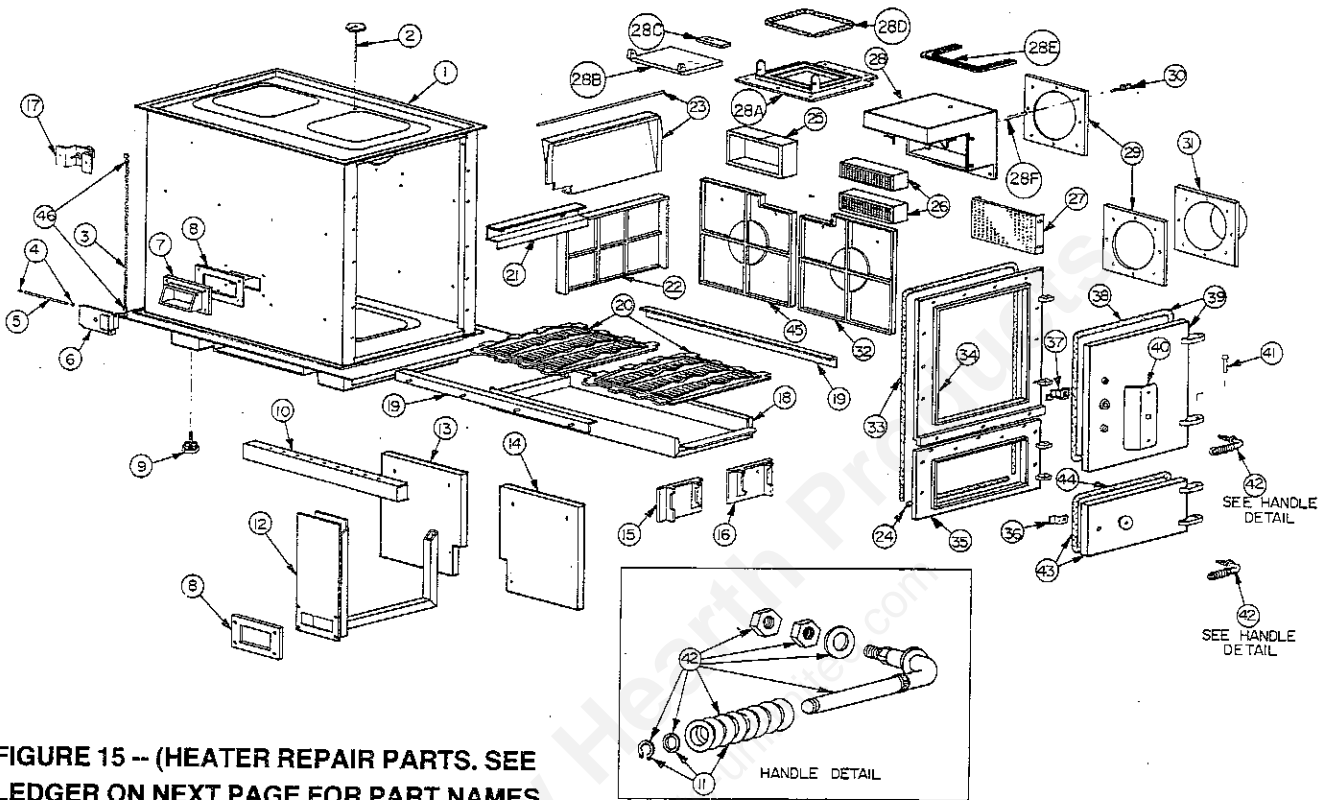
WARRANTY CLAIM INFORMATION

A catalytic combustor warranty and a heater warranty are packed with this owner's manual. For warranty claims, follow the instructions provided by each warranty.

REPAIR PARTS

Order all repair parts from your King dealer by supplying the following information:

1. Part Name
2. Part Number (not key number)
3. Model Number



SEE FIGURE 15 FOR ILLUSTRATION OF PARTS.

KEY NO.	PART NAME	QTY. Per Heater	8804 PART NO.
1	Inner Unit Assy. Ptd. ✓	1	35 039348 ✓
2	Probe Thermostat	1	037212
3	Chain	2.5 Ft.	P5072
4	Nut Acorn	2	009028
5	Pin Inlet Cover	1	009027
6	Plate Draft Assy. Ptd.	1	039351
7	Manifold Ptd. Assy.	1	006401
8	Gasket Manifold	2	006145
9	Leveler	4	009041
10	Tube Horizontal Ptd.	1	039577
11	Handle Knob Kit	2	024822
12	Tube Vert. Inlet Air Ptd.	1	039578
13	Liner Left Side Rear Kit	1	039579
14	Liner Left Side Front Kit	1	039580
15	Liner Left Front Kit	1	039581
16	Liner Right Front Kit	1	039582
17	Thermostat Assy.	1	009006
18	Pan Ash Assy.	1	006562
19	Angle Grate Support Kit.	2	039583
20	Grate	2	006054
21	Rear Retainer Kit	1	039584
22	Liner Rear	1	009669
23	Curtain Smoke & Rod Kit	1	045383
24	Rope Gasket	1	009535-06
25	Wrap Combustor	1	039352
26	Combustor Catalytic	2	035199
27	Shield Flame Impingement	1	039243
28	Combustor Housing	1	045958
28A	Frame & Rope Assy.	1	045384
28B	Damper Bypass Drilled	1	045378
28C	Prop Plate	1	043179
28D	Rope Fiberglass Kit	1	046846
28E	Gasket w/Adhesive	1	045376
28F	Actuator Bypass Damper	1	045342
29	Gasket	2	035177
30	Handle Spring	1	025516
31	Collar Flue Ream & Drill	1	035175
32	Liner Rt. Side Front Kit	1	039587
33	Rope Fiberglass	1	009448-01
34	Frame Feed Door	1	016097
35	Frame Ash Door	1	016093
36	Latch Ash Door Kit	1	024821
37	Latch Feed Door	1	014713
38	Rope Gasket	1	009535-01
39	Door Feed & Rope Assy.	1	016101
40	Shield Radiation Kit	1	024819
41	Pin Door	4	P626
42	Handle Kit	2	024823
43	Door Ash & Rope Assy.	1	016082
44	Rope Gasket	1	009535-02
45	Liner Right Side Rear Kit	1	039588
46	"S" Hook	2	011641
47	Cabinet Top Assy. ✓	1	51 048700 ✓
48	Cabinet End Assy. ✓	1	38 048706 ✓
49	Door Casing Assy. ✓	1	20 048712 ✓
50	Hinge Painted	2	009054
51	Handle Cab. Door & Screw	1	011335
52	Catch Cabinet Door Assy.	1	009917
53	Bumper Rubber	2	P6108
54	Back Cabinet Assy. Ptd. ✓	1	16 039355 ✓
55	Bar Right Casing Tie Ptd.	2	004090
56	Brace Top	2	C15301
57	Screen Frame Assy. Ptd. ✓	1	13 039358 ✓
58	Panel Trim ✓	1	43 008338 ✓
59	Plate Logo	1	006474
60	Knob	1	004798