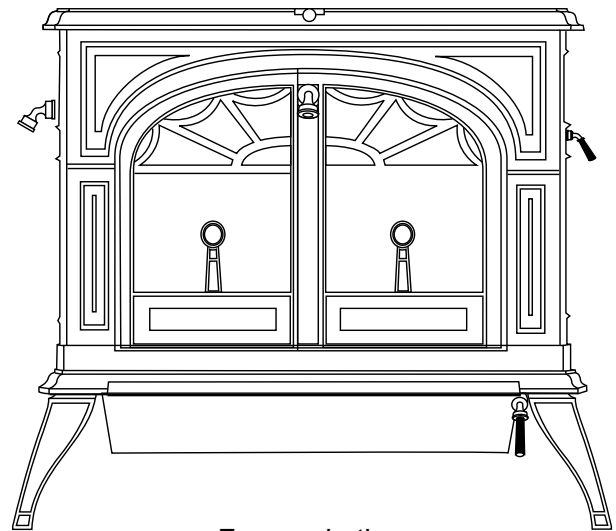




Defiant® FlexBurn® Non-Catalytic/Catalytic Wood Burning Stove Installation and Operating Manual Model 1975



For use in the
United States and Canada

SAFETY NOTICE: IF THIS APPLIANCE IS NOT PROPERLY INSTALLED, OPERATED AND MAINTAINED, A HOUSE FIRE MAY RESULT. TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH. CONTACT LOCAL BUILDING OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.



The French language version of this manual is available online: www.vermontcastings.com
La version française de ce manuel est disponible en ligne : www.vermontcastings.com

DO NOT DISCARD THIS MANUAL. RETAIN FOR FUTURE USE.

Welcome

Congratulations on your choice of a Vermont Castings Defiant® stove. With this purchase you have made a commitment to make the hearth a place of warmth, beauty and comfort in your home. At Vermont Castings Group, we share that joy and appreciation for the hearth. We assure you that your cast-iron Vermont Castings stove has been made with the utmost care and will provide you with many years of service.

As you become acquainted with your new stove, you will find that its appearance is matched by its functionality, due to cast iron's unique ability to absorb and radiate heat.

Also, Vermont Castings Group products are among the cleanest-burning wood stoves and fireplaces available today. As an owner of a Vermont Castings stove, you make a strong statement for pollution-free energy. However, clean burning depends on both the manufacturer and the operator. Please read this manual carefully to understand how to properly operate and maintain your stove.

At Vermont Castings Group, we are equally committed to your satisfaction as a customer. That is why we maintain an exclusive network of the finest dealers in the industry. Our dealers are chosen for their expertise and dedication to customer service. They are factory-trained and knowledgeable about every Vermont Castings Group product. Feel free to contact your Authorized Vermont Castings Dealer anytime you have a particular question about your stove or its performance.

This manual contains valuable instructions on the installation and operation of your Vermont Castings Defiant®. It also contains useful information on maintenance. Please read the manual thoroughly and keep it as a reference.

Sincerely,

Vermont Castings Group

This manual describes the installation, operation, and maintenance of the Vermont Castings Defiant Model 1975 Non-Catalytic / Catalytic wood burning heater. This heater meets the U.S. Environmental Protection Agency's emission limits for wood heaters sold on or after May 15, 2015. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 8,200 to 33,000 Btu/hr.

The Defiant® Model #1975 has been tested and is listed by OMNI-Test Laboratories of Portland, Oregon. The test standards are ANSI/UL-1482-2011 and ANSI/UL-737 for the United States, and ULC S627-00 for Canada. The Defiant® is listed for burning wood only. Do not burn other fuels. The Defiant® is not approved for use in manufactured (mobile) homes.

We recommend that you hire a professional installer certified by the Wood Heat Education and Research Foundation (WHERF) or the Wood Energy Technical Training (WETT) to install your stove, or to advise you on the installation should you attempt to install it yourself.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death.

Save These Instructions for Future Reference

The Story of the Defiant®

No wood-burning appliance, save for Ben Franklin's Pennsylvania Fireplace, has a stronger heritage than the Vermont Castings Defiant®. Named for a 19th-century steamship, the original Vermont Castings Defiant® Wood Burning Stove came to epitomize America's resolve and independence during the Energy Crisis of the 1970s.

The year was 1975. With energy prices going through the roof, without an attractive or efficient wood stove to be found anywhere, two entrepreneurs set out to create a stove that was both beautiful and highly functional. Finely crafted from cast iron, the Defiant® was the first wood stove to combine an artistically designed exterior with a methodically engineered interior, using new technologies for efficient combustion.

Americans purchased over a quarter-million Defiant® stoves, as they rediscovered the common sense of heating with wood, a home-grown fuel with none of the political and economic entanglements of foreign oil.

Thirteen years later, in 1988, Vermont Castings 'retired' the Defiant®, replacing it with modern wood-burners such as the Encore®. A decade later the Defiant® was resurrected and updated with aesthetics and features that again led the industry.

In 2010, the third generation of the Defiant® maintains the product's rich tradition by introducing the most advanced wood-burning stove on the market. The quality and classic look that consumers have come to expect from Vermont Castings is combined with the latest combustion technology, an innovative design that allows the stove to quickly be converted to burn in either a catalytic or noncatalytic mode. In a sense, the Defiant® Model 1975 has been 35 years in the making.

Due to its significant role in American history, the original Defiant® model is in the permanent collection of the Smithsonian Institution in our nation's capitol. Each new purchase of the Defiant® continues that proud history.

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Proposition 65 Warning: Fuels used in gas, woodburning or oil fired appliances, and the products of combustion of such fuels, contain chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

California Health & Safety Code Sec. 25249.6

Installation Accessories

Warming Shelf

- #0210 Classic Black
- #0211 Biscuit
- #0213 Ebony
- #0218 Bordeaux
- #0217 Brown Majolica
- #0219 Twilight

- #3265* Outside Air Kit
- #3180 Outside Air Adapter
- #1907 Firescreen
- #1860 6" x 12" Oval Starter Pipe
- FK26 Fan Kit
- #3190 Connector Pipe Heat Shield
- #0180 Rectangular Ceiling Kit
- #0181 Round Ceiling Kit

A line of porcelain enamel stove pipe is available in Biscuit, Bordeaux, Ebony, Brown Majolica colors.

*If you order #3265, you will also need #3180.

What Kind of Chimney to Use

You must connect the Defiant® to a code-approved masonry chimney with a flue liner, to a relined masonry chimney that meets local codes, or to a prefabricated metal chimney that complies with the requirements for Type HT chimneys in the Standard for Chimneys, Factory-Built, Residential Type and Building Heating Appliance, UL 103. Figure 3 illustrates the two types. The chimney and chimney connector must be in good condition and kept clean.

If you use an existing masonry chimney, it must be inspected to ensure it is in a safe condition before the stove is installed. Your local professional chimney sweep, building inspector, or fire department official will be able to inspect the chimney or provide a referral to someone who can. See "Chimney and Fireplace hazards", in the appendix, for particulars.

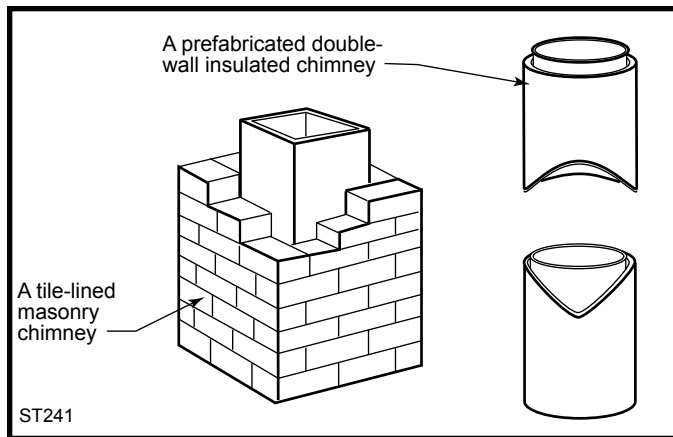


Fig. 3 Approved chimney types.

The chimney must extend at least 3' (914 mm) above the highest point where it passes through or near a roof, and at least 2' (610 mm) higher than any part of a building within 10' (3 m) horizontally. (Fig. 4)

For proper draft and good performance, any chimney used with a Defiant® should extend at least 16' (5 m) above the flue collar of the stove.

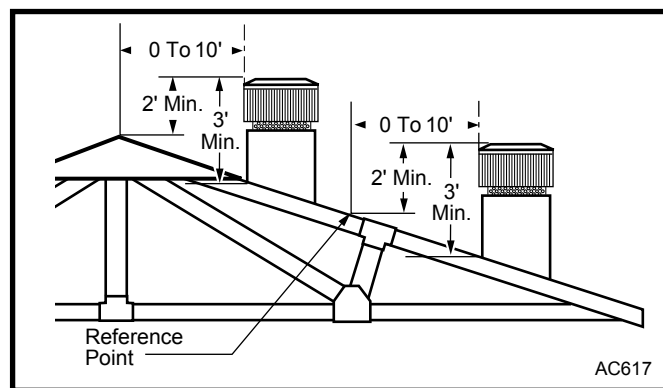


Fig. 4 The 2'-3'-10' Chimney Rule.

Masonry Chimneys

An inspection of the chimney must confirm that it has a lining. Do not use an unlined chimney. The chimney should have no cracks, loose mortar, other signs of deterioration, and blockage. Repair any defects before the chimney is used with your stove.

Unused openings in an existing masonry chimney must be sealed with masonry to the thickness of the chimney wall, and the chimney liner should be repaired. Openings sealed with pie plates or wallpaper are a hazard and should be sealed with mortar or refractory cement. In the event of a chimney fire, flames and smoke may be forced out of these unused thimbles.

The chimney should be thoroughly cleaned before use.

A newly-built masonry chimney must conform to the standards of your local building code or, in the absence of a local code, to a recognized national code. Masonry chimneys must be lined, either with code-approved masonry or pre-cast refractory tiles, stainless steel pipe, or a code-approved, "poured-in-place" liner. The chimney's clean-out door must seal tightly. A loose or leaky clean-out door can weaken chimney draft, causing performance problems.

Prefabricated Chimneys

A prefabricated metal chimney must be one tested and listed for use with solid-fuel burning appliances to the High-Temperature (H.T.) Chimney Standard UL-103-1985 (2100°F) for the United States, and High Temperature (650°C) Standard ULC S-629 for Canada.

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

Chimney Size

A Defiant® with an 8" (203 mm) flue collar is approved for venting into a masonry chimney with a nominal flue size of 8" x 8" (203 x 203 mm) or 8" x 12" (203 x 305 mm), and into a round flue with nominal flue size of 8" (203 mm). A Defiant® with a 6" (152 mm) flue connector is approved for venting into a masonry chimney with a nominal flue size of 8" x 8" (203 x 203 mm), and into a round flue with nominal flue of 6" (152 mm).

NOTE: When installed with a 6" flue collar, the Defiant® may not be operated with the front doors open.

Whatever the flue collar size, a Defiant® may be vented into larger chimneys as well. However, chimneys with liners larger than 8" x 12" (203 x 305 mm) may experience rapid cooling of smoke and reduction in draft, especially if the chimneys are located outside the home. These large chimneys may need to be insulated or have their flues relined for proper stove performance.

How to Determine if Alternate Floor Protection Materials are Acceptable

All floor protection must be noncombustible (i.e. metals, brick, stone, mineral fiber boards, etc.). Any organic materials (i.e. plastics, wood paper products, etc.) are combustible and must not be used. The floor protection specified includes some form of thermal designation such as R-value (thermal resistance) or k-factor (thermal conductivity).

Procedure:

- Convert specifications to R-value:
 - R-value given - no conversion needed.
 - k-factor is given with a required thickness (T) in inches: $R = \frac{1}{k} \times T$
 - K-factor is given with a required thickness (T) in inches: $R = \frac{1}{K \times 12} \times T$
 - r-factor is given with a required thickness (T) in inches: $R = r \times T$
- Determine the R-value of the proposed alternate floor protector:
 - Use the formula in Step 1 to convert values not expressed as R.
 - For multiple layers, add R-values of each layer to determine overall R-value.
- If the overall R-value of the system is greater than the R-value of the specified floor protector, the alternate is acceptable.

EXAMPLE: The specified floor protector should be 1/2-inch thick material with k-factor of 0.84. The proposed alternate is 4" brick with an r-factor of 0.2 over 1/8" mineral board with a k-factor of 0.29

Step a: Use formula above to convert specification to R-value: $R = \frac{1}{k} \times T = \frac{1}{0.84} \times 0.5 = 0.59$

Step b: Calculate R of proposed system.

4" brick of r = 0.2, therefore:

$$R_{\text{brick}} = 0.2 \times 4 = 0.8$$

1/8" mineral board of k = 0.29, therefore

$$R_{\text{mineralboard}} = \frac{1}{0.29} \times 0.125 = 0.431$$

$$R_{\text{total}} = R_{\text{brick}} + R_{\text{mineralboard}} = 0.8 + 0.431 = 1.231$$

Step c: Compare proposed system R_{total} of 1.231 to specified R of 0.59. Since proposed system R_{total} is greater than required, the system is acceptable.

Definitions

$$R = \frac{(\text{ft}^2)(\text{hr})(^\circ\text{F})}{\text{Btu}} \quad k = \frac{(\text{Btu})(\text{in})}{(\text{ft}^2)(\text{hr})(^\circ\text{F})} = K \times 12$$

$$K = \frac{(\text{Btu})(\text{ft})}{(\text{ft}^2)(\text{hr})(^\circ\text{F})} \quad r = \frac{(\text{ft}^2)(\text{hr})(^\circ\text{F})}{(\text{Btu})(\text{in})} = \frac{1}{k}$$

Floor Protection for Fireplace Installation

Do not assume that your fireplace hearth is completely noncombustible. Many fireplace hearths do not satisfy the "completely noncombustible" requirement because the brick or concrete in front of the fireplace opening is supported by heavy wood framing. Because heat passes readily through brick or concrete, it can easily pass through to the wood. As a result, such fireplace hearths can be a fire hazard and are considered a combustible floor.

For all fireplace installations, follow the floor protection guidelines described above, including the need for a bottom shield. Keep in mind that many raised hearths will extend less than the required clearance from the front of the heater. In such cases, sufficient floor protection as described above must be added in front of the hearth to satisfy the minimum floor protector requirement from the front of the stove: 16" (410 mm) in the United States and 18" (460 mm) in Canada. Hearth rugs do not satisfy the requirement for floor protection as they are not fire proof.

Fireplace installations also have special clearance requirements to the side walls, side decorative trim and fireplace mantel. Refer to the information on fireplace and mantel trim shields in this section.

Keep the Stove a Safe Distance From Surrounding Materials

Both a stove and its chimney connector radiate heat in all directions when operating, and nearby combustible materials can overheat dangerously if they are too close to the heat source. A safe installation requires that adequate clearance be maintained between the hot stove and its connector and nearby combustibles.

Clearance is the distance between either your stove or chimney connector, and nearby walls, floors, the ceiling, and any other fixed combustible surface. The Defiant® has specific clearance requirements that have been established after careful research and testing. These clearance requirements must be strictly observed.

In addition, keep furnishings and other combustible materials away from the stove. In general, a distance of 48" (1219 mm) must be maintained between the stove and moveable combustible items such as drying clothes, furniture, newspapers, firewood, etc. Keeping those clearance areas empty assures that nearby surfaces and objects will not overheat.

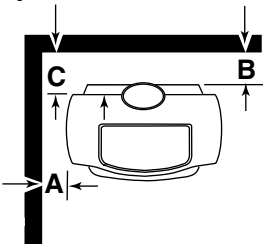
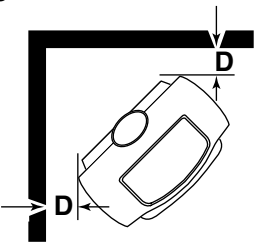
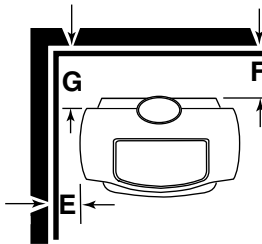
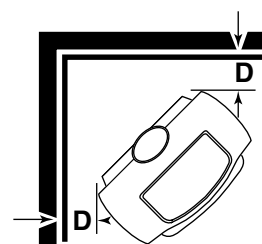
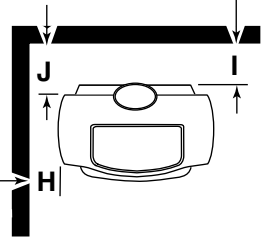
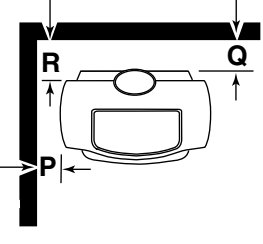
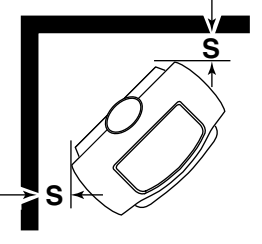
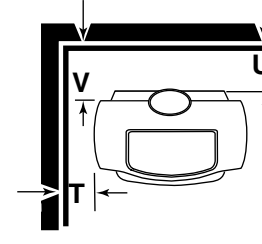
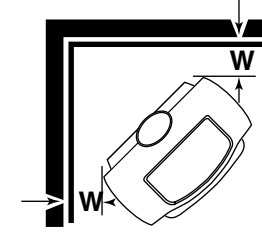
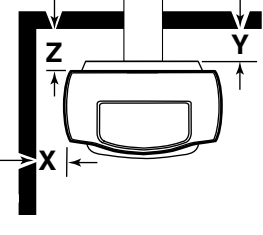
Safe Ways to Reduce Clearances

Clearance requirements are established to meet every installation possibility, and they involve the combination of these variables:

- When the stove pipe has no listed heat shield mounted on it.
- When the wall has no heat shield mounted on it.

Defiant® Clearance Diagrams

for use with either a 6" or 8" chimney connection

Unprotected Surfaces No Connector Heat Shield		Protected Surfaces with Connector Heat Shield	
Stove Installed Parallel to Wall	Stove in Corner	Stove Installed Parallel to Wall	Stove in Corner
Top Exit Installations, single-wall connector			
			
Door open with fire screen, damper open, 8" chimney only, 1" floor protection			
	N/A	N/A	N/A
Top Exit Installations, double-wall chimney connector, flue collar shield installed			
			
Rear Exit Installations			
	N/A	N/A	N/A

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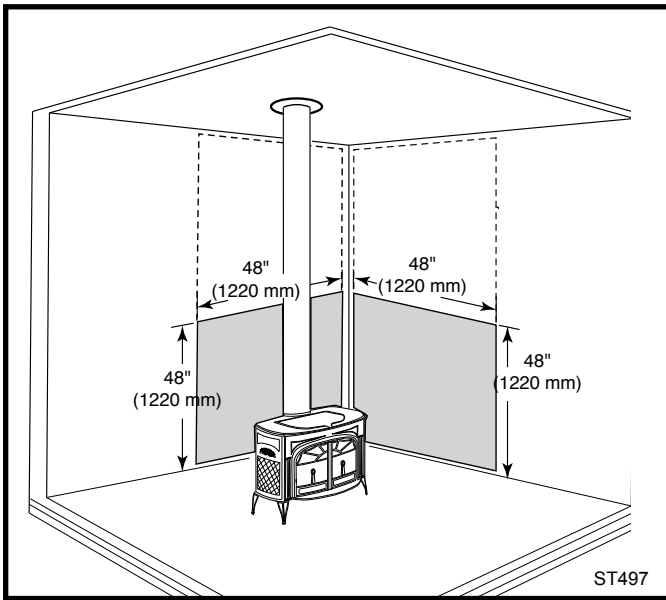


Fig. 16 Parallel installation, vertical chimney connector, two wall shields. Reduced clearances for both rear and side walls. Wall shields may meet at corner if desired. Shielding for connector is centered behind connector.

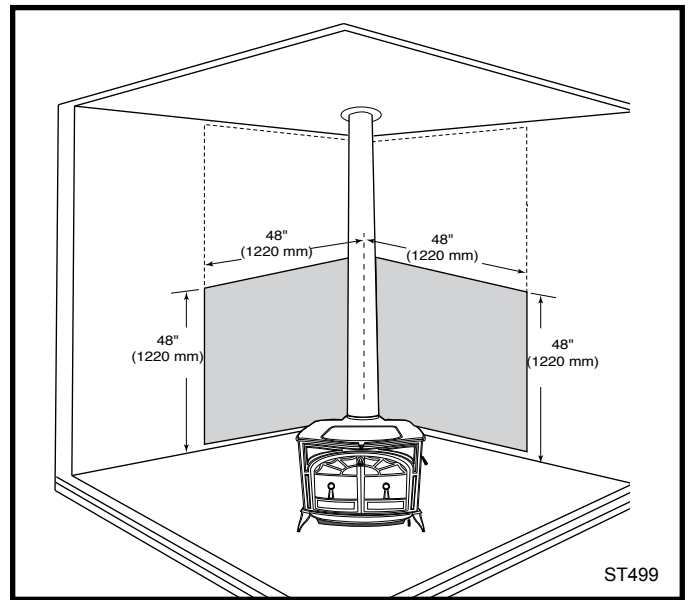


Fig. 18 Corner installation, vertical chimney connector, two wall shields. Reduced side clearances. Wall shield **MUST** meet at corner.

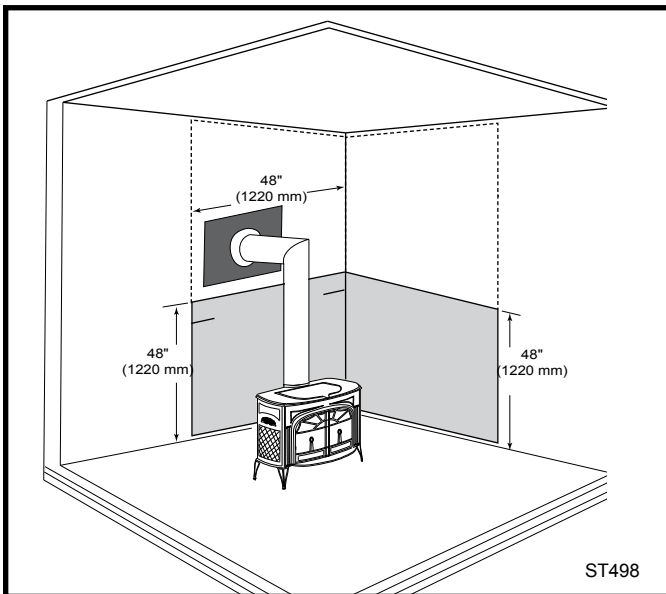


Fig. 17 Parallel installation with rear wall pass-through, two wall shields. Reduced clearances to both rear and side walls. Wall shields may meet at corner if desired. Wall pass-through must comply with codes. Refer to "Special Installations."

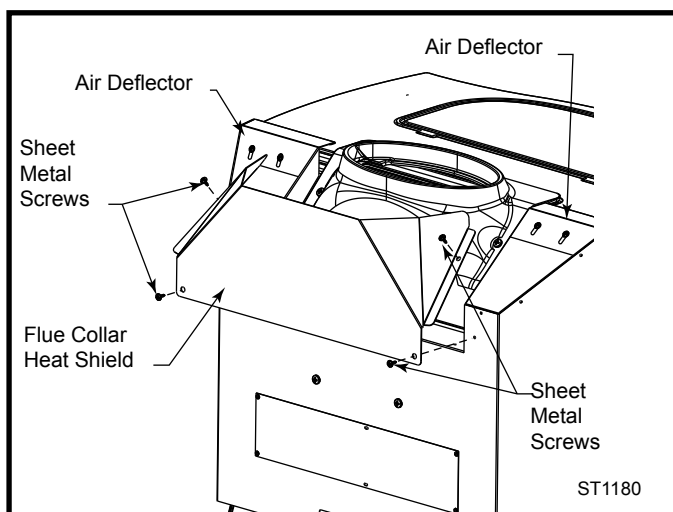


Fig. 23 Install flue collar heat shield.
WARNING: Flue collar heat shield must be installed.

Adjust Air Deflector

If you have the optional fan kit, you may decide to adjust the air deflector to blow heat across the top of your stove. (Fig. 23) Loosen the two (2) screws on each side and raise or lower the deflector. After adjustment, tighten the screws.

Attach Flue Collar Heat Shield

WARNING: The flue collar heat shield must be attached to the Defiant® stove. Use four #10 sheet metal screws supplied to secure the flue collar heat shield to the rear of the stove. (Fig. 23)

Attach the Catalyst Temperature Probe

To install the catalyst temperature probe, remove the hole plug from the cast iron wall behind the rear shield as shown (Fig. 24) use two #10 sheetmetal screws and bracket supplied, secure the bracket and probe to the back of your stove. (Fig. 24)

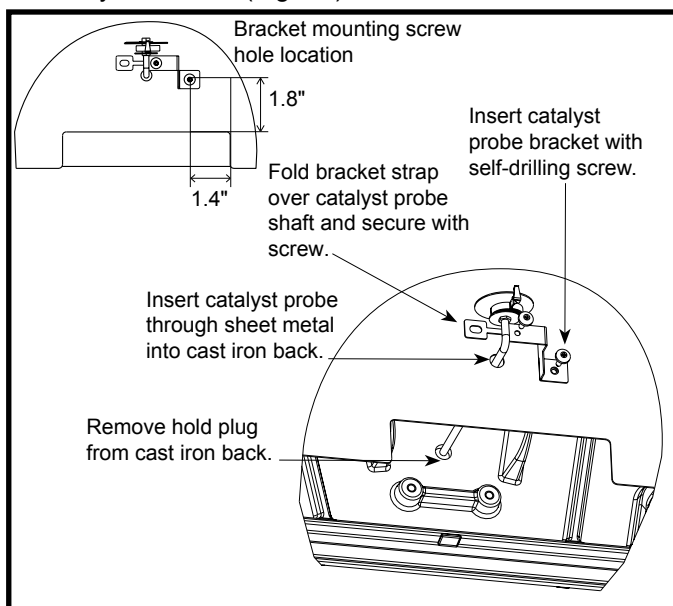


Fig. 24 Install the Catalyst Temperature Probe

Attach the Damper Handle

Use the 1/4" -20 x 3" screw to attach the damper handle to the damper stub on the left side.

Attach the Primary Air Thermostat Handle

The primary air thermostat handle is the smaller of the two black handles. Secure the handle to the stub on the right side of the stove with an 8-32 x 2" slot head machine screw. (Fig. 25)

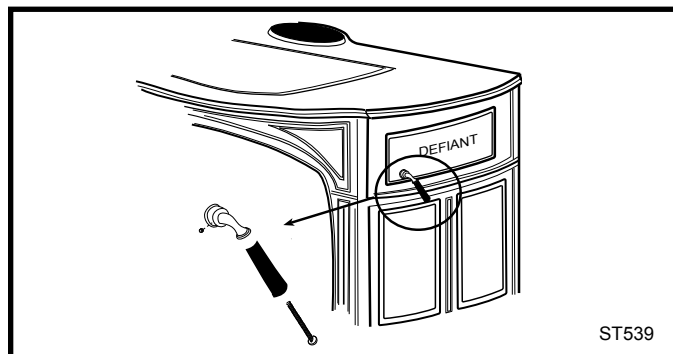


Fig. 25 Attach the thermostat handle.

Assemble the Removable Insert Handle

The ceramic removable insert handle opens and closes the front doors. Remove after each use, and store it in the handle holder behind the right front leg. Assemble the handle by passing the 3/8" screw through the ceramic shaft and into the bright metal nub. (Fig. 26) Tighten carefully until snug.

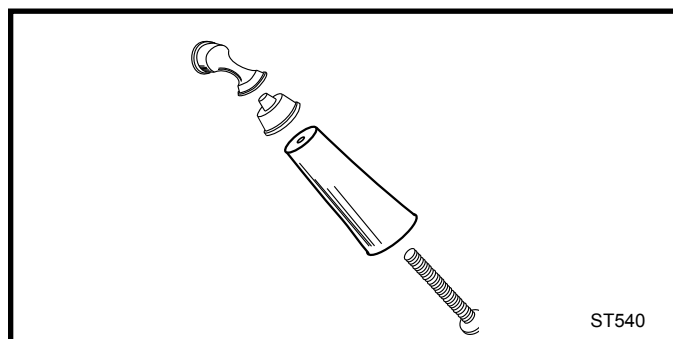


Fig. 26 Assemble the front door handle.

Operation

The Defiant® Controls

Two controls regulate the performance of the Defiant®: a **primary air control** supplies oxygen for the fire, and a **damper** directs air flow within the stove to activate and deactivate the combustion system. (Fig. 31)

Symbols cast into the stove are reminders of the correct directions for using the controls. The words 'Left' and 'right' in these directions are *facing the stove*.

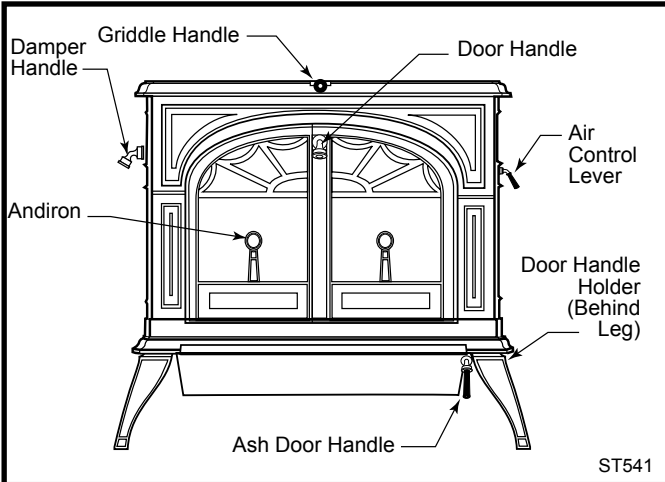


Fig. 31 The Defiant®'s controls are conveniently located and easy to operate.

A Single Air Control Regulates Heat Output and Burn Time

The **primary air control lever**, on the right side of the stove, controls the amount of incoming air for starting, maintaining, and reviving a fire.

More air entering the stove makes the fire burn hotter and faster, while less air prolongs the burn at a lower heat output level. (Fig. 32)

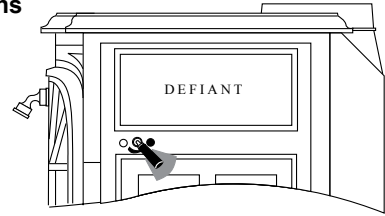
For the greatest air supply and maximum heat output (but the shortest burn time), move the lever toward the front of the stove. For a fire that will last longer with less heat, move the lever toward the rear of the stove.

WARNING

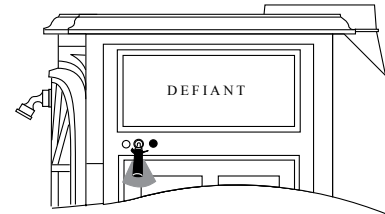
This wood heater has a manufactured-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

Air Control Positions

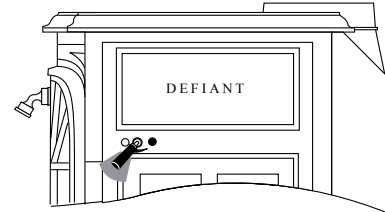
Low Heat Range



Medium Heat Range



High Heat Range



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Fig. 32 The handle also may be positioned anywhere between the two extremes for different heat levels.

A Damper Directs Air Flow Within the Stove

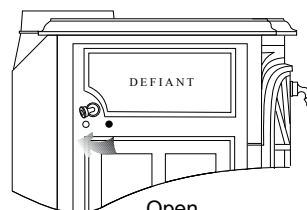
The **damper handle** on the left side of the stove operates the damper to direct air flow within the stove.

The damper is **open** when the handle points to the **rear**, enabling smoke to pass directly into the chimney. The damper must be open when starting or reviving a fire, and whenever the griddle or doors are opened.

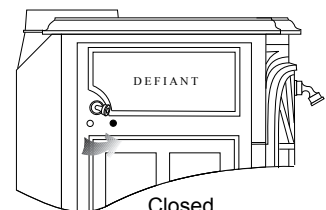
The damper is **closed** when the handle points **forward**. Smoke travels through the non-catalytic combustion system where it can be further burned, before passing up the chimney. (Fig. 33)

The damper should always be either fully open or fully closed. There are no intermediate positions. When closing the damper, be sure to pull firmly enough to snap the handle into the locked position.

Damper Positions



Open
(Updraft Mode)



Closed
(Efficient Mode)

ST543

Fig. 33 The Defiant®'s damper operating positions.

To reduce the risk of breaking the glass, avoid striking the glass or slamming the doors.

When you are not using the door handle, store it in the holder behind the right front leg of the stove. Be careful to not drop the handle, since it is breakable.

WARNING: Fireplace stoves equipped with doors should be operated only with doors fully open or doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.

WARNING: For safety and greatest efficiency, operate your stove only with all doors/griddles fully closed. The test standard for your stove when it is operated in this mode is UL 1482.

The Defiant® may be used as a fireplace with the front doors open or removed, BUT only when it is equipped with 8" (203 mm) stove pipe and only when the optional spark screen is secured correctly in the opening to protect against the possibility of sparks and embers leaving the stove. The test standard for your stove when it is operated in this mode is UL 737. 1" floor protection is also required. Refer to "Floor Protection" section on Pages 10 - 11.

Use only the Defiant® spark screen, Item #1907, with your Defiant®.

Defiant® spark screens are available from your Vermont Castings Dealer.

Andirons Help Protect the Glass

Your stove has andirons to keep logs away from the glass panels. The andirons are essential to maintain clear fire viewing, and should be left permanently in place. Since the andirons may slightly hinder refueling through the front doors, most stove owners will prefer the convenience of top loading through the griddle. Do not place fuel between the andirons and the doors.

Burn Only High-Quality Wood

The Defiant® is designed to burn natural wood only; do not burn fuels other than that for which it was designed.

IMPORTANT: Do not burn any type of artificial or synthetic materials such as fire starter logs (containing wax) in this appliance. Never burn liquid-based fuels such as kerosene, gasoline or alcohol.

Burning any materials not allowed in these instructions, or over-firing the stove, may void the warranty.

You'll enjoy the best results when burning wood that has been adequately air-dried. The wood should be 22-24" (559-610 mm) in length. Avoid burning "green" wood that has not been properly seasoned. **Do not burn construction materials;** they often contain chemicals and metals

that can damage the inside surfaces of the stove and pollute the air. Do not burn ocean driftwood; when it burns, the salt it contains will attack the cast iron.

The best hardwood fuels include oak, maple, beech, ash, and hickory that has been split, stacked, and air-dried outside under cover for at least one year.

If hardwood is not available, you can burn softwoods that include tamarack, yellow pine, white pine, Eastern red cedar, fir, and redwood. These should also be properly dried.

Store wood under cover to keep it dry. The longer it is stored, the better heating and fire-viewing performance you will enjoy. Even for short-term storage, be sure to keep wood a safe distance from the heater and keep it out of the areas around the heater used for refueling and ash removal.

A Surface Thermometer is a Valuable Guide to Operation

An optional surface thermometer tells you when to adjust the air control, and when to refuel. (Fig. 36)

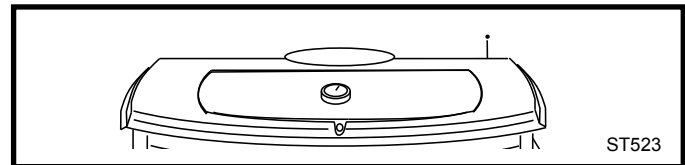


Fig. 36 Take temperature readings with a thermometer located in the middle of the griddle.

For example, when the thermometer registers at least 450°F. (230°C) after start-up you know the stove is hot enough and it may be time to close the damper. Note that the stove will warm up much sooner than the chimney, though; a warm chimney is the key to easy, effective stove operation. Please review the draft management information on Page 27 to see how the size, type, and location of your chimney will affect your stove operation. When thermometer readings drop below 350°F. (175°C) it's time to adjust the air control for a higher burn rate or to reload the stove. A temperature reading over 650°F. (340°C) is a sign to reduce the air supply to slow the burn rate.

Use the following temperature ranges as a guide:

- Readings in the 350°-500°F. (175°-260°C) range indicate low to medium heat output.
- 500°-600°F. (260°-315°C) readings indicate medium heat output.
- Readings of 600°-650°F. (315-340°C) indicate high heat output. Operating your Defiant® continuously at griddle temperatures higher than 650° F. (340°C) may damage the cast iron or enamel finish.

Refuel While the Embers Are Still Hot

When reloading, best results will be achieved if you first de-ash the stove by stirring the fuel bed to allow ash to fall through the grate into the ash pan.

Do not break the charcoal into very small pieces or pound or compress the charcoal bed.

It is important that air can circulate through the charcoal bed during the burn. Larger pieces of charcoal allow more air to circulate under the wood, resulting in the fire reviving more quickly. (Fig. 39)

For best results when refueling, wear long-cuffed stove gloves to protect your hands and forearms, add fuel while the stove still has plenty of glowing embers to re-kindle the fire, and include some smaller pieces of wood in the new fuel load to help the stove regain its operating temperature quickly. Use this sequence as a guide to successful refueling:

1. Open the damper.
2. De-ash the stove as described above. Open the ash-door and check the level of ash in the ash pan. Empty the pan if necessary and replace it in the stove. Close the ash door.
3. Open the griddle, load the wood (smaller pieces first), and close the griddle.
4. Close the damper.
5. When the surface temperature reaches 450°F. (230°C), adjust the air control for the amount of heat you desire.

NOTE: If the remaining charcoal bed is relatively thick (2-3"/51-75 mm) and if your fuel is well seasoned, it is possible to add fresh fuel (smaller pieces first), close the door and damper, and reset the primary air control for the desired heat output within five minutes.

WARNING: FIREPLACE STOVES EQUIPPED WITH DOORS SHOULD BE OPERATED ONLY WITH DOORS FULLY OPEN OR DOORS FULLY CLOSED. IF DOORS ARE LEFT PARTLY OPEN, GAS AND FLAME MAY BE DRAWN OUT OF THE FIREPLACE STOVE OPENING CREATING RISKS FROM BOTH FIRE AND SMOKE.

CAUTION: The Defiant® will be hot while in operation. Keep children, clothing and furniture away. Contact may cause skin burns.

DO NOT OVERFIRE THIS HEATER. Overfiring may cause a house fire, or can result in permanent damage to the stove. If any part of the Defiant® glows, you are overfiring.

Draft Management

A stove is part of a system, which includes the chimney, the operator, the fuel, and the home. The other parts of the system will affect how well the stove works. When there is a good match between all the parts, the system works well.

Wood stove or insert operation depends on natural (unforced) draft. Natural draft occurs when the exhaust is hotter (and therefore lighter) than the outdoor air at the top of the chimney. The bigger the temperature difference, the stronger the draft. As the hot gases rise through the chimney they provide suction or 'draw' that pulls air into the stove for combustion. A slow, lazy fire with the stove's air inlets fully open indicates a weak draft. A brisk fire, supported only by air entering the stove through the normal inlets, indicates a good draft. The stove's air inlets are passive; they regulate how much air can enter the stove, but they don't move air into it.

Depending on the features of your installation - steel or masonry chimney, inside or outside the house, matched to the stove's outlet or oversized - your system may warm up quickly, or it may take a while to warm up and operate well. With an 'airtight' stove, one which restricts the amount of air getting into the firebox, the chimney must keep the stove's exhaust warm all the way to the outdoors in order for the stove to work well. Some chimneys do this better than others. Here's a list of features and their effects.

Masonry Chimney

Masonry is a traditional material for chimneys, but it can perform poorly when it serves an 'airtight' stove. Masonry is a very effective 'heat sink' - it absorbs a lot of heat. It can cool the chimney gases enough to diminish draft. The bigger the chimney, the longer it takes to warm up. It's often very difficult to warm up an outdoor masonry chimney, especially an oversized one, and keep it warm enough to maintain an adequate draft.

Steel Chimney

Most factory-made steel chimneys have a layer of insulation around the inner flue. This insulation keeps the chimney warm. The insulation is less dense than masonry, so a steel chimney warms up more quickly than a masonry chimney. Steel doesn't have the good looks of masonry, but it performs much better.

Indoor/Outdoor Location

Because the chimney must keep the smoke warm, it's best to locate it inside the house. This uses the house as insulation for the flue and allows some heat release into the home. An indoor chimney won't lose its heat to the outdoors, so it takes less heat from the stove to heat it up and keep it warm.

Chimney Height

The common wisdom tells us that a taller flue draws better than a short one. This isn't necessarily so. If a chimney is tall enough to meet the safety requirements of the 2/3/10 foot rule, then adding more height isn't the right answer to a draft problem. In fact it could make the problem worse by adding more mass to the chimney system, which must be warmed up, a distance from the heat source (the stove). Don't make a chimney taller unless you must in order to meet the safety rules, or unless there's some nearby feature causing a downdraft. Even then, there are downdraft-preventing chimney caps available, which are probably the smarter choice.

Flue Sizing

The inside size of a chimney for an 'airtight' stove should match the size of the stove's flue outlet. When a chimney serves an airtight stove, more is not better; in fact, it can be a disadvantage. Hot gases lose heat faster as they travel slower through a chimney; if we vent a stove with a six-inch flue collar (28 square inch area) into a 10 x 10" flue, the gases slow to one third their original speed. This allows the gases to cool more rapidly, which weakens draft strength. If an oversized flue is also outside the house, the heat it absorbs gets transferred to the outdoor air and the flue usually stays cool.

It is common for a masonry flue, especially one serving a fireplace, to be oversized for the stove. It can take quite a while to warm up such a flue, and the results can be disappointing. The best solution to an oversized flue is an insulated steel chimney liner, the same diameter as the stove or insert's flue outlet; the liner keeps the exhaust warm, and the result is a stronger draft. A non-insulated liner is a second choice - the liner keeps the exhaust restricted to its original size, but the hot gases still must warm up the air around the liner. This makes the warm-up process take longer.

Pipe & Chimney Layout

Every turn the exhaust must take as it travels to the chimney top will slow it down. The ideal pipe and chimney layout is to vent vertically into a completely straight and vertical chimney. If you are starting from scratch, use this layout if possible. If the stovepipe must elbow to enter a chimney, locate the thimble about midway between the stove top and the ceiling. This achieves several goals: it allows the gases to speed up before they must turn, it leaves some pipe in the room for heat transfer, and it gives you long-term flexibility for installing a different stove without relocating the thimble.

There should be no more than eight feet of single-wall stove pipe between the stove and a chimney; longer runs

Maintenance

Keep Your Stove Looking New and Working Its Best

Let the fire in the stove go out and allow the stove to cool completely before beginning any maintenance procedure.

Care of the Cast Iron Surface

An occasional dusting with a dry rag will keep the painted cast iron of your Defiant® looking new.

The stove's paint can be touched up as needed. First, mask the areas, such as enamelled parts, glass, or handles, around the spot to be painted. Clean the spot with a wire brush. Remove the griddle and set it aside. It is normal for the griddle to darken after use. You can clean it with a fine-bristle wire brush, or steel wool.

Then, touch up the stove with Vermont Castings' high temperature stove paint. Apply the paint sparingly; two light coats of paint are better than a single heavy one.

Care of the Porcelain Enamel Surface

Use a dry or slightly damp rag or soft brush to remove spills or stains. For difficult jobs that require a cleaning agent, use only a kitchen appliance cleaner or polish recommended for use on enamel surfaces.

If porcelain enamel becomes chipped or scratched during use, apply "enamel epoxy" to the damaged area and allow to dry. Once the epoxy has dried, sand the area to blend with surrounding area and apply appropriate color touch-up paint. Allow to dry completely before operating stove.

Cleaning the Glass

Most of the carbon deposits on the glass will burn off during hot fires.

However, the ash residue that accumulates on the glass surface should be removed regularly to prevent etching. To clean the glass, follow this procedure:

- Be sure the glass is completely cool.
- Clean the glass with water or a cleaner made especially for this purpose. Do not use abrasive cleaners. Use cleaning agents sparingly and be sure to keep them off the outer surfaces of the stove.
- Rinse the glass thoroughly.
- Dry the glass completely.

Replace Broken Glass Immediately

Do not operate your stove if the glass in the doors is damaged.

If you need to replace the glass, use only the high temperature ceramic glass supplied by Vermont Castings. Do not use substitutes.

Removing the Glass

1. Remove the right and left door assemblies by raising the door until the lower hinge pin clears its hole; then, angle the door bottom slightly outward and pull down to release the upper hinge pin. Place the doors face down on a padded work surface. Be especially careful with enamelled doors.
2. Remove the screws that hold the glass retainer clips in place, and remove the clips.
3. Carefully lift the broken glass panel from the door.

Installing the Glass

Check the gasket around the window; it should be soft and resilient so that the glass will seal properly against the door. Replace the gasket if it has hardened or if it is compressed.

1. Center the glass on the gasket.
2. Secure the glass on both doors with the retainer clips. Tighten all screws. (Fig. 42)
3. Replace the doors on the stove.
4. Open and close the doors to check that they fit and work properly. Adjust as necessary.

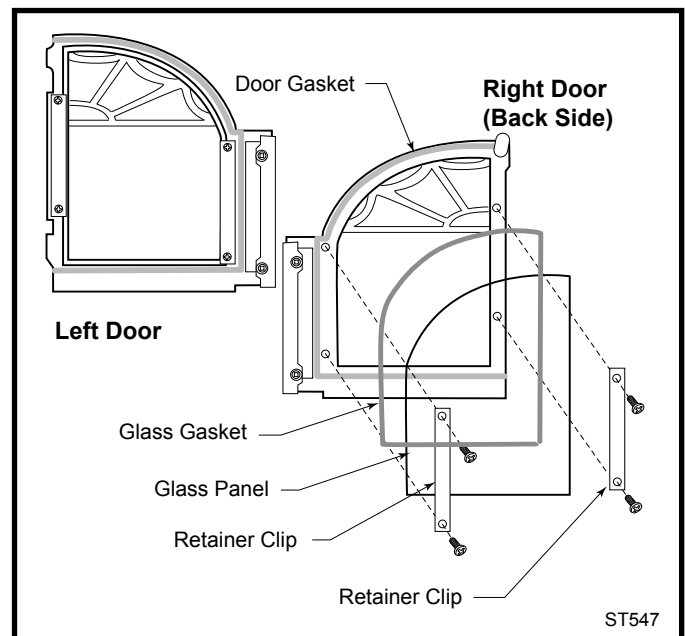


Fig. 42 An exploded view of the glass assembly.

Clean the chimney connector by disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.

If you cannot inspect or clean the chimney yourself, contact your local Vermont Castings dealer or a professional chimney sweep.

Maintenance Schedule

The Stove

DAILY:

- Clear any ash build-up from around the air holes and combustion flow path in the lower fireback.
- Ashes should be removed before they reach the top of the ash pan. Check accumulation at least once a day.
- Keep the area around the stove clear of any combustible materials such as wood, furniture or clothing.

TWO MONTHS:

- Check door handle to be sure it is working properly. Gasketing becomes compressed after a period of time. Adjust handle tightness if necessary.
- Check leg bolts and heat shield screws; tighten if necessary.

ANNUAL SPRING CLEANING:

- Check gasketing for wear, and replace if necessary.
- Remove ashes from the ash pan and replace with a moisture absorbing material (such as kitty litter) to keep the interior of the stove dry.
- Clean the dust from the inner sides of bottom, rear or pipe heat shields if your stove is equipped with them. Clean surfaces are better heat reflectors than dirty surfaces.
- Touch up the black paint.
- Inspect for and remove ash build-up behind the combustion package. This should be done in conjunction with annual cleaning of the chimney connector. Inspect the passage behind the combustion package (a mirror will be helpful) and vacuum away ash using a flexible vacuum hose inserted in the passage. (Fig. 47)

The Chimney Connector

TWO WEEKS:

- Inspect the chimney connector and chimney. Clean if necessary.

TWO MONTHS:

- Inspect the chimney and chimney connector. Pay particular attention to the horizontal runs of chimney connector, and the elbows. Clean the system if necessary.

ANNUAL SPRING CLEANING:

- Disassemble the chimney connector and take it outdoors for inspection and cleaning. Replace weak sections of connector.
- Inspect the chimney for signs of deterioration. Repairs to a masonry chimney should be made by a professional mason. Replace damaged sections of prefabricated chimney. Your local Vermont Castings dealer or a chimney sweep can help determine when replacement is necessary.
- Thoroughly clean the chimney.

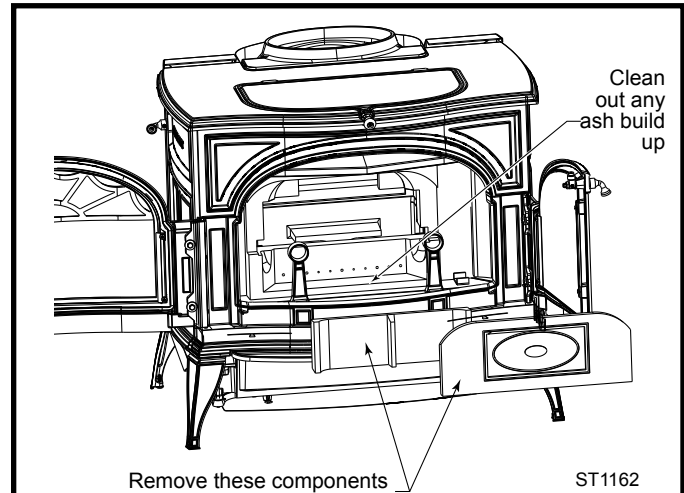


Fig. 47 Inspect and clean out ash accumulation behind the combustion system.

The Catalytic Element

This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. In the United States it is against the law to operate this wood heater in a manner inconsistent with the operating instructions in this manual.

Under normal operating conditions, the catalytic combustor should remain active for two to six years (depending on the amount of wood burned). However, it is important to monitor the combustor periodically to ensure that it is functioning properly, as well as to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions.

Inspection and Cleaning

Inspect the combustor for fly ash accumulation and physical damage three times per year. Clean the combustor as needed.

The refractory package that houses the catalytic combustor should be inspected for a buildup of fly ash and cleaned if necessary. This may be done when you examine the combustor.

Defiant® Wood Burning Stove Model 1975 (continued)

Item Description	Part Number
1. Brick Support Bracket	30005279
2. Griddle Gasket	1203668
3. Back	30005242
4. Refractory Rt End	30005206
5. Refractory Lt End	30005207
6. Refractory Support	30005233
7. Gasket, Fiber, Refractory Support	30005237
8. Back Insulation Board	30005269
9. Outer Back	30005249
10. Left Griddle Quadrant	30002399
11. Right Griddle Quadrant	30002401
12. Griddle	30005257
13. Complete Griddle Handle Assy	30002775
13a. Griddle Handle Wood	1600661
13b. Griddle Handle CRS-BN1	30002715
13c. Nut Hex 1/4-20	1203210
14. Griddle Handle Bushing	1201900
15. Griddle Handle Bolt	1201308
16. Damper Gasket	1203588
17. Damper Ramp	1300643
18. Damper Housing	30002821
19. Damper ¹	30002816
20. Damper Tab ¹	1601488
21. Damper Rod ¹	1600065
23. Gasket, Fiber Back Refractory	30005270
24. Rheostat Bracket	30002863
25. Refractory, Engine - E/D	30005202
26. Damper Handle Screw	1201310
27. Damper Handle	1600644
28. Damper Handle w/Screw Assy	30002720
29. Left Side	See Chart Pg. 37
30. Left Air Manifold	30002818
31. Right Air Manifold	30005243
32. Right Side	See Chart Pg. 37
33. Thermostat Handle Base	30002716
34. Washer Damper Rod	1202560
35. Fireback Plate, S/S	30005217
36. Inner Bottom	30005241
37. Top Ashdoor Hinge	30002836
38. Door Handle Bracket	30002844
39. Bottom	30005240
40. Ashlip	See Chart Pg. 37
41. Gasket, Fireback	30005209
42. Refractory, Fireback	30005203
43. Retainer, Fireback Refractory	30005248
44. Refractory, Inner Cover	30005205
45. Andiron	30002827
46. Refractory, Access Cover	30007252
47. Leg Leveller	1201745
48. Ashdoor Handle Shaft	30005301
49. Pawl Assy 3/4 short adj	30005157
49a. Spring Washer	63D0069

Item Description	Part Number
50. Ashdoor	30002810
50a. Ashdoor Gasket	1203589
51. Ashdoor Handle (Wood)	1600663
52. Ashdoor Hinge Rod	30002826
53. Cotter Pin, Ashdoor	30001749
54. Ashdoor Bottom Hinge Support	1300642
55. Ashpan Bracket	30001908
56. Rear Side Bracket	30002845
57. Thermostat Handle	1600660
58. Airwash Manifold, Frt	30005244
59. Front	See Chart Pg. 37
60. Flue Collar Gasket	30002422
61a. Left Door	See Chart Pg. 37
61b. Left Door	See Chart Pg. 37
62. Door Hinge Strip	1300645
63. Top	See Chart Pg. 37
64. Glass Clip	30001715
65. Glass Clip (Right Door Only)	30001716
66. Front Door Handle & Shaft	30002717
67a. Right Door	See Chart Pg. 37
67b. Right Door	See Chart Pg. 37
68. Door Gasket	7000910
69. Glass Gasket	1203556
70. Left Door Glass	30005247
71. Right Door Glass	30005247
72. Lower Door Hinge Pin	30002727
73. Spacer (for Damper rod)	1201779
74. Upper Door Hinge Pin	30002727
75. Complete Handle Assy	30004175
75a. Handle Base Stub	30002714
76. Wood Handle	1600664
77. Handle Bolt	1201310
78. Thermostat Handle Bolt	1201243
79. Ash Pan Assy	30001690
80. Flue Collar	See Chart Pg. 37
81. Leg	See Chart Pg. 37
82. Hex Head Jam Nut	1203290
83. Bottom Heat Shield	30005037
83a. Bottom Heat Shield Rt Wing	30005038
83b. Bottom Heat Shield Lt Wing	30005039
84. Grate Bottom	30005234
85. Thermostat Assy.	5005470
86. Thermostat Cable	5005471
87. Thermostat Friction Spring	1201846
88. Primary Air Valve Assy.	30005275
89. Heat Plate Vertical Flue	30005265
90. Catalyst, Ceramic	30005353
91. Thermostat Handle Assembly	30007067
92. Primary Air Cover	30007069
93. Primary Air Base	30007071
94. Temperature Probe	30007274
95. Bracket, Temperature Probe	30007278

Defiant® Wood Burning Stove Model 1975 (continued)

SHELL ENAMEL PARTS: DEFIANT® MODEL 1975						
Part Name	Classic Black	Biscuit	Bordeaux	Ebony	Majolica Brown	Twilight
Top	30002834	30002874	30006700	30002894	30004837	30007129
Left Side	30002832	30002872	30006697	30002892	30004834	30007126
Right Side	30002831	30002871	30006698	30002891	30004835	30007127
Flue Collar	30001576	30002947	30006701	30002910	30004815	30007130
Front	30002830	30002873	30006699	30002893	30004836	30007128
Ashlip	30002811	30002870	30006696	30002890	30004833	30007125
Left Door (61a)	30002813	30002876	30006703	30002896	30004842	30007132
Left Door Assembly*	30002854	30002879	30006773	30002899	30004840	30007133
Right Door (67a)	30002812	30002875	30006702	30002895	30004841	30007131
Right Door Assembly*	30002853	30002878	30006772	30002898	30004839	30007134
Leg	30002835	30002877	30006695	30002897	30004843	30007124

TRANSITION DOOR ENAMEL PARTS: DEFIANT® MODEL 1975					
Part Name	Classic Black	Biscuit	Bordeaux	Majolica Brown	Twilight
Left Door Assembly	30007175	30007177	30007179	30007181	30007183
Left Door (61b)	30007091	30007093	30007097	30007095	30007109
Right Door Assembly	30007176	30007178	30007180	30007182	30007184
Right Door (67b)	30007090	30007092	30007096	30007094	30007108

*NOTE: Does not contain glass or glass gasket.

NOTES:

In the diagram and throughout this manual, 'left' and 'right' mean as you face the front of the stove.

When ordering parts, be sure to mention the stove's model number. When ordering external parts, be sure to specify color.

The hardware in the Defiant® is in standard sizes; most bolts are 1/4" diameter by 20 threads per inch. Most hardware stores can supply replacement hardware if you specify bolt diameter, number of threads per inch and length. Fasteners inside the firebox should be replaced with stainless steel for ease of future disassembly.

LIMITED LIFETIME WARRANTY

Limited Lifetime Warranty

Vermont Castings Group warrants that all refractory brick and material used in this product will be warranted against deterioration not resulting from physical damage or overloading of the woodstove for the lifetime of this product. This coverage includes the components of the FlexBurn® System: "engine, inner cover, access cover and fireback." In addition all cast iron parts are warranted against breakage, cracking or burn-through and glass door panels against thermal breakage. Coverage is provided only to the original purchaser. Vermont Castings Group will also pay labor associated with repairing or replacing the component described above for up to five years.

Limited 5 Year Warranty

The porcelain finish is warranted to be free of defects in material and workmanship for a period of five years from the date you purchase the stove. Warranty excludes chipping, scratching or other surface damage to the porcelain that might result from normal wear and tear and also excludes failure of porcelain coating due to misuse or overfiring.

Limited 1 Year Warranty

The following parts of the woodburning stove are warranted to be free of defects in material and workmanship for a period of one year from the date you purchase the stove: handles, gasketing and thermostat assembly

As designated in the descriptions above, Vermont Castings Group will repair or replace, at its option, any part found to be defective upon inspection by a Vermont Castings, Authorized Dealer. The customer must return the defective part or the stove, with shipping prepaid, to the Authorized Dealer or pay for any Authorized Dealer in-home travel fees or service charges for in-home repair work. It is the dealer's option whether the repair work will be done in the customer's home or in the dealer's shop. If, upon inspection, the damage is found to be the fault of the manufacturer, repairs will be authorized at no charge to the customer for parts and/or labor. Labor rates will be determined by Vermont Castings Group's published labor rates in effect at the time labor is performed.

Any parts repaired or replaced during the limited warranty period will be warranted under the terms of the limited warranty for a period not to exceed the remaining term of the original limited warranty or six (6) months, whichever is longer.

Limited Catalyst Warranty

The catalyst will be warranted for a six year period as follows: If the original catalyst or a replacement catalyst proves defective or ceases to maintain 70% of its particulate emission reduction activity (as measured by an approved testing procedure) within 24 months from the date the stove is received, the catalyst itself will be replaced free.

From 25 - 72 months a pro-rated credit will be allowed against a replacement catalyst and the cost of labor necessary for its installation at the time of replacement.

A third year (25 - 36 months) of no charge replacement will be made when combustor failure is due to thermal degradation of the substrate (crumbling of ceramic material). The customer must pay for any in-home travel fees, service charges, or transportation costs for returning the stove to the Authorized Dealer.

Amount of Time Since Purchase	Credit Towards Replacement Cost
0 - 24 months	100%
25 - 36 months	50%
37 - 48 months	30%
49 - 60 months	20%
61 - 72 months	10%

Any replacement catalyst will be warranted under the terms of the catalyst warranty for the remaining term of the original warranty. The purchaser must provide the following information in order to receive a replacement catalyst under the terms of this limited warranty:

1. Name, address and telephone number.
2. Proof of original purchase date.
3. Date of failure of catalyst.
4. Any relevant information or circumstances regarding determination of failure.

5. In addition, the owner must return the failed catalyst.

Exclusions & Limitations

1. This product must be installed or serviced by a qualified installer, preferably NFI or WETT (Canada) certified, as prescribed by the local jurisdiction. It must be installed and operated at all times in accordance with the Installation and Operating instructions furnished with the product any alteration, willful abuse, accident or misuse of this product shall nullify this warranty.
2. This warranty does not cover misuse of the stove. Misuse includes overfiring which will result if the stove is used in such a manner as to cause one or more of the plates to glow red. Overfiring can be identified later by warped plates and areas where the paint pigment has burned off. Overfiring in enamel fireplaces is identified by bubbling, cracking, chipping and discoloration of the porcelain enamel finish. Vermont Castings Group offers no warranty on chipping of enamel surfaces. Inspect your woodburning stove prior to accepting it for any damage to the enamel.
3. This warranty does not cover misuse of the stove as described in the Owner's Guide, nor does it cover an stove which has been modified unless authorized by a Vermont Castings Group representative in writing. This warranty does not cover damage to the stove caused by burning salt saturated wood, chemically treated wood, or any fuel not recommended in the Owner's Guide.
4. This warranty does not cover a stove repaired by someone other than a Vermont Castings Authorized Dealer.
5. Damage to the unit while in transit is not covered by this warranty but is subject to a claim against the common carrier. Contact Vermont Castings Authorized Dealer from whom you purchased your stove or Vermont Castings Group if the purchase was direct. (Do not operate the stove as this may negate the ability to process the claim with the carrier.)
6. Claims are not valid where the installation does not conform to local building and fire codes or, in their absence, to the recommendations in our Owner's Guide.
7. The salt air environment of coastal areas, or a high-humidity environment, can be corrosive to the porcelain enamel finish. These conditions can cause rusting of the cast iron beneath the porcelain enamel finish, which will cause the porcelain enamel finish to flake off. This warranty does not cover damage caused by a salt air or high-humidity environment.
8. Vermont Castings Group shall have no obligation to enhance or update any unit once manufactured.

IN NO EVENT SHALL Vermont Castings Group BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES. ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, ARE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. THIS WARRANTY SUPERCEDES ALL OTHER ORAL OR WRITTEN WARRANTIES.

Some states do not allow the exclusion or limitations of incidental and consequential damages or limitations on how long an implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific rights and you may have other rights which vary from state to state.

How to Obtain Service

If a defect is noted within the warranty period, the customer should contact a Vermont Castings Authorized Dealer or Vermont Castings Group if the purchase was direct with the following information:

1. Name, address, and telephone number of the purchaser.
2. Date of purchase.
3. Serial number from the label on the back.
4. Nature of the defect or damage.
5. Any relevant information or circumstances, e.g., installation, mode of operation when defect was noted.

A warranty claim will then start in process. Vermont Castings Group reserves the right to withhold final approval of a warranty claim pending a visual inspection of the defect by authorized representatives.



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