

# ABSOLUTE STEEL HYBRID MODEL 211



GEAR HEAD STOVES  
BY WOODSTOCK SOAPSTONE COMPANY

## OWNER'S MANUAL



Tested To UL 1482-2011 7th Edition  
Listed By PFS Corporation

Tested and Listed by



Woodstock Soapstone Company, Inc.  
66 Airpark Road, West Lebanon, NH 03784  
Toll Free 1-800-866-4344 • [www.woodstove.com](http://www.woodstove.com)

Rev 0621

## OUR PROMISE

We are sure you will enjoy your new stove. During the first six months that you own it, test its performance and experience the comfortable warmth of soapstone. If you are not thoroughly delighted with the beauty, quality, and energy efficiency of your stove, you may return it for a full refund, including the cost of return freight. This is the best consumer protection plan in the industry.

## EPA APPROVAL

This Manual describes the installation and operation of: the **Model 211 Absolute Steel Hybrid Catalytic Wood Stove**

The Model 211 Absolute Steel Hybrid Catalytic Wood Stove meets the 2020 Standard U.S. Environmental Protection Agency's crib wood emission limits for wood heaters sold after May 15, 2020. Under specific test conditions, this stove has been shown to deliver heat at rates ranging from 10,000 to 48,000 BTU/hr., and average emissions of 0.5 grams/hr.

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

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



Tested and Listed by



## LISTING TO UL #1482-2011

The **Model 211 Absolute Steel Hybrid Catalytic Wood Stove** has been tested to UL Standard #1482 7th edition 2011 for safety, and is listed by PFS Corporation. UL Standard #1482 is the standard for testing solid fuel heating appliances which is universally recognized by all national building regulatory agencies (SBCC, BOCA, ICBO) and individual states.

**Please Note:** Tested and Listed for US installations only

## LIMITED WARRANTY

Your Woodstock Soapstone Stove will be carefully inspected before shipment. We will replace any part which is defective in material or workmanship, free of cost, for a period of one year from the date of purchase. If a defect is discovered, please contact Woodstock Soapstone Company, Inc. for instructions regarding return or replacement of the defective part.

## CATALYTIC COMBUSTOR WARRANTY

The catalytic combustor supplied with your Absolute Steel Hybrid Catalytic Wood Stove is a Clariant Corporation, stainless, durafoil catalyst. The catalyst is fully warranted for three years from the date of purchase against any defect in workmanship or materials that prevent the combustor from functioning when installed and operated properly. The catalytic combustor is additionally warranted for three years from the date of purchase for any deterioration in the stainless steel substrate material. Operating the Absolute Steel Hybrid in a manner inconsistent with the owner's manual will void the catalytic combustor warranty.

For instructions regarding return or replacement of the catalytic combustor, please contact:

Woodstock Soapstone Company, Inc.  
66 Airpark Road  
West Lebanon, NH 03768  
Phone: 1-800-866-4344 • Web: [www.woodstove.com](http://www.woodstove.com)

## GEAR HEAD STOVES

Gear Head Stoves is a division of Woodstock Soapstone Co., which is specifically 'geared' to designing and building high efficiency, low emission, and more affordable wood stoves. The first Gear Head Stove, The Ideal Steel Hybrid, was the grand prize winner of the 2013 Wood Stove Design Challenge competition, which judged on efficiency, emissions, affordability, innovation, and user friendliness. The Absolute Steel Hybrid is our R2Z (Race to Zero) stove, our internal challenge to design and build a stove that reaches zero wood stove emissions.

# MODEL 211

## ABSOLUTE STEEL HYBRID CATALYTIC

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# INTRODUCTION

## The Absolute Steel Hybrid Combustion System Explained

The Woodstock Soapstone Company's tradition of building high quality, dependable wood stoves continues in the Absolute Steel Hybrid Wood Stove. This new design combines modern technology to achieve clean and efficient heating performance with rugged reliability and affordable steel construction.

While the Absolute Steel Hybrid shares some time tested features with other members of the Woodstock Soapstone family, it also includes some features that are unique. The Absolute Steel Hybrid has a large glass front that benefits from our proven air-wash design. The firebox is lined with thick soapstone panels, and the exterior is plate steel in order to make the Absolute Steel Hybrid more affordable.

The Absolute Steel Hybrid has a hybrid combustion system similar to the one that we designed in our Ideal Hybrid wood stove. The combination of the catalytic combustor and the secondary combustion system gives the operator a wide range of heat output while maintaining a clean and efficient burn. In addition to the Hybrid combustion design, the Absolute Steel Hybrid incorporates two automatic catalyst air ports to optimize the catalytic combustor's effectiveness.

Hybrid burn technology improves efficiency, lowers emissions, and allows for a wider range of output to meet the heating needs of the operator. Hybrid stoves from Woodstock combine the best attributes of both catalytic combustors and secondary combustion systems. A brief description of each is below, followed by a more detailed explanation.

### ***Catalytic Combustion:***

- Burns woodstove exhaust gases starting at 500° F
- Operates best at low to moderate burn rates
- Typically yields long duration burns that are clean & efficient
- Improves stove efficiency by generating heat from burning wood smoke

### ***Secondary Combustion:***

- Burns woodstove exhaust gases starting at approximately 1000° F
- Operates best at moderate to high burn rates
- Creates hot firebox for maximum heat output
- Provides a very active fire that is great for viewing

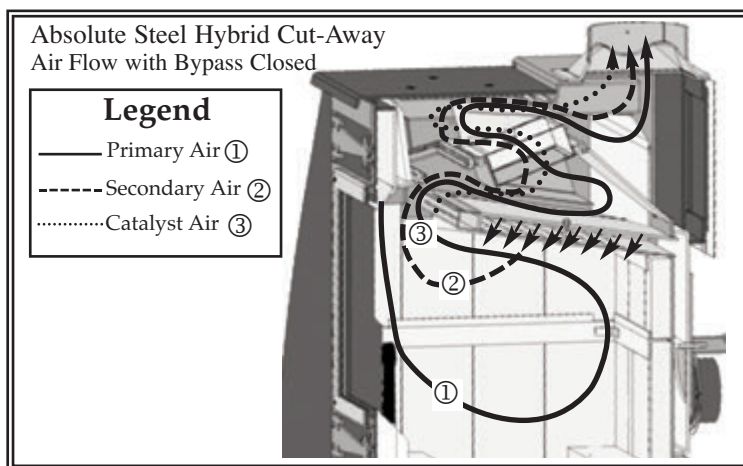
Catalytic combustors are well suited for very long burn cycles. Catalytic combustors have the ability to reduce or eliminate woodstove pollution at low stack temperatures. This means much cleaner, more efficient burns at low firing rates than is possible without a catalyst. The catalytic reaction eliminates harmful combustion byproducts and converts exhaust to water vapor and carbon dioxide. The catalytic combustor burns exhaust gasses and converts them to heat, which is captured inside the stove. This extra heat increases the overall efficiency and output of a catalytic wood stove. The combustor takes full advantage of the energy in wood smoke that would otherwise be lost up the chimney as pollution and wasted energy at low burn rates.

Secondary combustion systems are designed to maximize efficiency and reduce emissions as well, but they operate differently. The secondary combustion system introduces secondary air in the firebox to ignite the volatile gases produced by the burning wood. This reaction requires temperatures over 1000 degrees F to start breaking down the organic compounds in the wood smoke. Secondary combustion systems work best when the stove has high firebox temperatures and secondary combustion air introduced into the high temperature area at the top of the firebox. With secondary combustion the exhaust gases burn at very high temperatures before leaving the firebox, providing an unusual display of secondary flames in the top of the firebox.

In addition to primary and secondary air, the Absolute Steel Hybrid incorporates a system to introduce air directly to the catalytic combustor as it heats up. When the catalyst is fully engaged two self adjusting, bimetallic strips open small dampers to allow heated air into the exhaust path just upstream from the combustor. This dedicated "catalyst air" keeps the combustor active and helps control primary and secondary burn rates. As the stove and chimney heat up and draft is increased, more catalyst air is added automatically. This has the effect of stabilizing primary and secondary air and at higher temperatures will actually reduce primary and secondary air. The catalyst air design acts similar to a barometric damper. The catalyst air improves emissions and efficiency at high burn rates, provides overfire protection, and stabilizes the burn rate automatically.

These systems are not mutually exclusive and have been designed to work together. The Absolute Steel Hybrid is designed to utilize each system depending on the conditions present in the firebox. This makes operating the Absolute Steel Hybrid as simple as possible while providing a clean and efficient burn over a wider range of heat output.

The Absolute Steel Hybrid wood stove. The perfect combination of affordability, innovative combustion technology, and rugged construction.





# EFFICIENCY & EMISSIONS

## Inside Testing of the Absolute Steel Hybrid

### EPA TEST DATA

The following data is direct from our 2016 EPA tests for the Absolute Steel Hybrid. The Absolute Steel Hybrid meets/exceeds the 2020 EPA Standard of 2.0 g/hr maximum emissions set by the EPA in 2015. The current test protocol specifies “crib wood” using dimensional Douglas Fir. The efficiency is determined using High Heat Value (HHV). The weighted emissions average is 0.50 grams per hour, and the weighted efficiency is 77%.

#### Model 211 Absolute Steel Hybrid

Test No.	Burn Rate kg/hr	Test Mi <sub>n</sub>	Ave. Emissions Rate g/hr	HHV (OHE)	Heat Output (BTU/hr)	Weighting Factor
1	0.956	399	0.140	80.30	14,426	24.18%
2	1.042	354	0.200	79.50	15,213	22.42%
3	1.415	269	0.500	74.80	19,895	19.29%
4	1.451	279	0.420	76.20	20,797	17.38%
5	3.411	105	1.520	70.70	45,317	16.74%
	Weighted average emissions rate:				0.50 g/hr	
	Weighted average heating efficiency (OHE):				77%	

### FACTORS EFFECTING EFFICIENCY & EMISSIONS

**1. Burn Rate:** As shown in the table above the lowest emissions and greatest efficiency was achieved by running the Absolute Steel Hybrid at a low-medium burn rate (indicated in Tests 1-4). A lower burn rate gives the combustor more time to effectively burn the volatile gases as they enter into the catalytic combustor (see discussion in the Catalytic Combustor Section of the Manual). When operating your stove at a lower burn rate you will achieve a cleaner burn over a longer period of time. Low burn rates are also how you achieve desirable long burn times of 10+ hours.

**2. Wood Quality:** Cord wood with a moisture content between 15-22% is ideal for burning. The Absolute Steel Hybrid will still burn wood with a higher moisture content with great effectiveness, however, the energy loss at start up and reloading is significant. During the first stage of wood burning the moisture content within the wood is expelled creating steam. The higher the moisture content the lesser the available heat value.

**Kiln Dried Wood:** Approximately 8600 BTU Available/per pound  
**20% Moisture Content:** Approximately 6,200 BTU Available/per pound  
**50% Moisture Content:** Approximately 4,000 BTU Available/per pound

**3. Effective Fire Starting:** The most effective method for an emissions free start is a top down fire. A top down fire is built with the larger splits on the bottom of the firebox, the second layer should be medium sized splits, and if possible running perpendicular to the large splits on the bottom, and the third layer should be small splits. On top of the small splits a generous amount of small very dry kindling and newspaper will be placed at the top. The newspaper and kindling will produce enough heat very quickly allow in the secondary air and catalytic combustor to ignite within minutes. You may need to leave the loading door cracked open to allow enough oxygen in for a quick start. Within a few minutes you should be able to engage the combustor and start the clean burn cycle.

# INSTALLATION

For over two centuries, New Englanders have heated their homes with soapstone stoves. A properly installed and operated soapstone stove will warm your home and delight your eye for a lifetime.

**Read this entire manual carefully.** It explains how to install your Woodstock Soapstone Absolute Steel Hybrid Wood Stove safely and how to operate it correctly and efficiently. The clearances and procedures recommended in this guide are in compliance with the recommendations of the National Fire Protection Association (NFPA), the Underwriters Laboratories (UL), and the U. S. Environmental Protection Agency (EPA). You may feel some of them are very stringent, but they should be followed. They were designed to protect you, your home, and the environment. **Improper installations are a major cause of serious fires. Failure to follow instructions may result in property damage, bodily injury, or death.**

Before installing a woodstove, check your local building codes and any requirements established by your insurance company.

You may need a local building permit to install your stove. Any changes in your home must comply with building codes. If the codes have not been fully updated, you may want to check with the Building Inspection Department or your local Fire Department. A qualified stove installer should be aware of any changes and updates to local and

state codes and may be best suited to handle your installation work.

Many chimney sweeps are qualified installers. If you are unfamiliar with sweeps or need to locate a certified sweep in your area, you can check listings at [www.csia.org](http://www.csia.org) (Chimney Safety Institute of America). Builders and contractors are another option. In some cases, homeowners install their own stoves. Before installing your stove, please review carefully the stove installation, clearance, and safety information in this manual. Woodstock Soapstone has NFI (National Fireplace Institute) certified woodburning specialists on staff and available to answer any questions you may have about your installation. If you have questions, please call us toll free at 1-800-866-4344.

You should notify your insurance company that you are using a woodstove. Before you light your first fire, have a local building inspector and your insurance representative inspect, and approve in writing, your installation.

When this room heater is not properly installed, a house fire may result. To reduce the risk of fire, follow the installation instructions. Contact local building or fire officials about restrictions and installation inspection requirements in your area.



## LOCATION

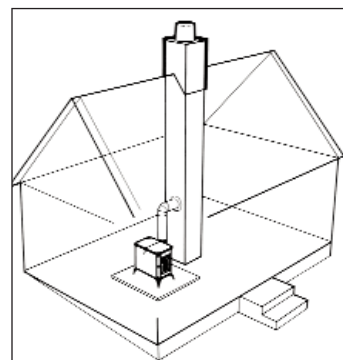
A stove which is centrally located will heat the greatest area of your home. Heat should be able to circulate easily into nearby rooms. Placing your stove near an open stairway or register in the floor will help transfer heat to other rooms.

Other installation considerations are:

- Clearance to Combustibles
- Adequate Space for Wood Loading and Ash Removal
- Room Traffic Patterns

Most people install their stove in a room they use frequently where they can enjoy the beauty and comfort of the stove. This also helps in the monitoring and reloading the stove as needed.

A well-planned placement will enhance your enjoyment of your stove and may save installation costs.



*The best location for a chimney and woodstove is in the center of the house. The chimney will be warmer, draft will be better, and radiant heat will be distributed more evenly.*

### ALCOVE INSTALLATIONS

**THE MODEL 211 ABSOLUTE STEEL HYBRID WOODSTOVE IS NOT APPROVED FOR AN ALCOVE INSTALLATION. AN ALCOVE IS DESCRIBED AS AN AREA LESS THAN 512 CUBIC FEET, WHICH IS EQUIVALENT TO AN 8'X8'X8' SPACE.**

# CHIMNEYS

Your chimney is a critical component of your wood heating system. A properly designed and constructed chimney will help to provide safe and efficient woodstove operation. Hot exhaust rising up through the chimney also pulls combustion air into the stove through the air damper. If a chimney is too short, or the flue too large, the hot exhaust will cool and slow down. This can lead to poor stove performance, smoke spillage, back puffing, and even creosote build up in the chimney itself. An excessively tall chimney could lead to a strong draft, which may make the fire difficult to control with the stove damper. A draft that is too strong could result in over firing the stove and lead to damage to the steel components as well as the catalytic combustor. An uncontrollable burn or excessive stove or pipe temperatures can indicate excessive draft. Whether you are installing a new chimney, or adapting an existing chimney to your woodstove, close attention to chimney height, flue size, and location should be considered.

## Chimney Flue Sizing:

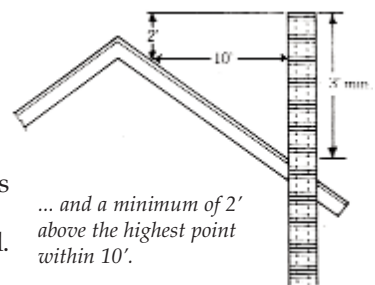
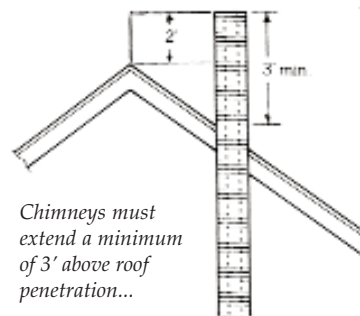
The ideal flue size for the Absolute Steel Hybrid is 6" (28 sq.in.), which is the same diameter as the stove's flue collar.

If upsizing needs to occur due to an existing chimney the following general rules apply:

1. **Interior Chimney** (no walls of the chimney exposed to the outside below the roofline): the inside cross-sectional area of your chimney should be no more than 3x (85 in<sup>2</sup>) the cross-sectional area of the woodstove flue collar.
2. **Exterior Chimney** (if there are one or more walls exposed to the outside below the roofline) - The flue should be no more than 2x (57 in<sup>2</sup>) the cross-sectional area of the flue collar.

**Recommendation:** The Absolute Steel Hybrid has a 6 inch flue collar, thus an 8 inch x 10 inch rectangular or 10 inch round flue tile for an **inside** chimney are the maximum flue sizes we recommend for this stove. For an **outside** chimney, an 8 inch x 8 inch square or 8 inch round would be the largest acceptable. The smallest size we recommend is 6 inches round, as the flue should not be less than the flue collar size.

Note: For flues that exceed the recommended area, a stainless steel chimney liner is recommended.



## Height Requirements:

The chimney must extend 3 ft. above the point where it passes through the roof and must also be 2 ft. higher than any roof surface or obstruction within 10 feet (measured horizontally) of the chimney. You should check your local building codes for any other requirements.

The recommended minimum chimney height is 15 feet from the flue collar of the stove to the top of the chimney. This includes connector pipe and chimney pipe. There may be other factors to conform to code for clearances on the roof, high wind, high altitude, etc., that may make the *minimum* height undesirable or a violation of building codes.

## CHIMNEY TYPES

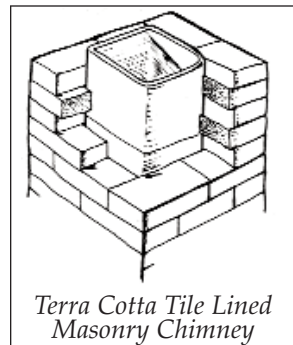


**DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**

There are two acceptable types of chimneys: (1) A chimney complying with the requirements for Type HT chimneys in the Standard for Chimneys, Factory-Built, Residential Type and Building Heating Appliance UL 103 **OR** A code-approved masonry chimney with a flue liner.

## Lined Masonry Chimneys:

Always have the chimney inspected prior to your stove installation. If your chimney is not lined with appropriately sized clay flue tiles, or the clay tiles are old, cracked, damaged or otherwise compromised, a stainless steel chimney liner or poured liner will be required. Depending on the condition of your flue or clay tiles, the stainless steel liner may need to be wrapped in a high temperature insulation blanket. A liner may also be recommended if your flue is too large for the draft to flow properly (please refer to the section on chimney sizing). Our customer service department can answer any questions regarding the use of a liner and/or insulating blanket. Call 1-800-866-4344.

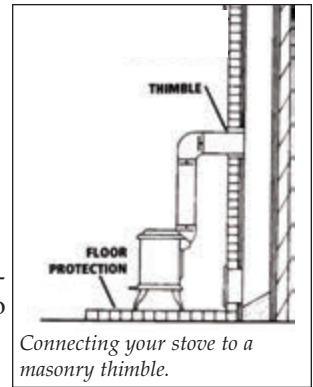


Existing chimneys should be checked twice a year for obstructions, creosote deposits, surface cracks, chemical deterioration and poor construction. Any damage should be repaired immediately. Two other chimney

related areas that should be checked are chimney penetrations at the floor or ceiling joists, and at the roofline. There should be at least 2 inches of clearance between the chimney and floor joists or other combustible materials. Poor flashing between the chimney and the roofline can cause leaks and deterioration of chimney mortar.

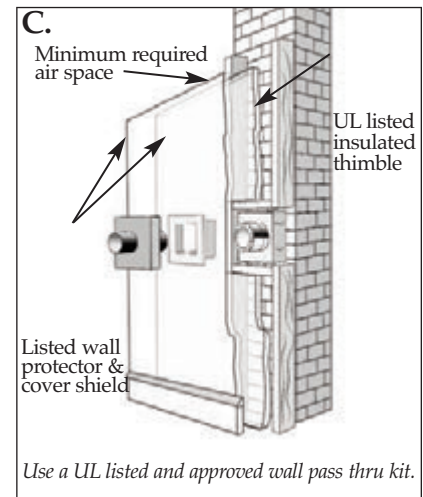
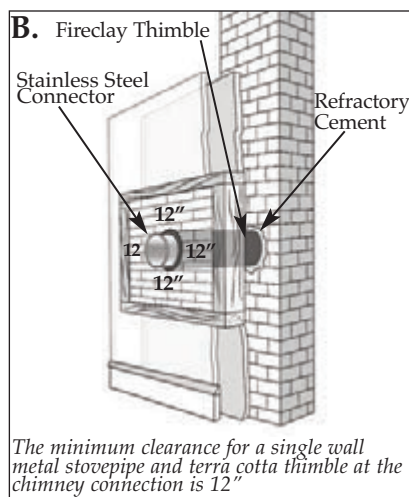
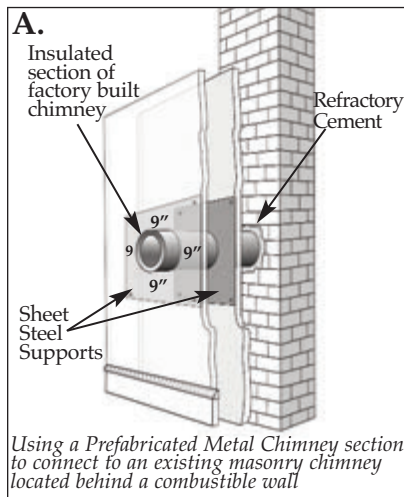
You should make preliminary checks, but if you have any doubts, or are unfamiliar with chimney construction, cleaning, or maintenance, have a local fire official or certified chimney professional inspect your chimney. If repairs are required, be sure to use someone who is knowledgeable in chimney work and familiar with local code requirements.

In addition: All brick or cinder block chimneys should have clean out access with a tightly fitting door. Masonry chimneys should have a wash at the top. All chimneys should have a cap to keep out rain and snow and to minimize downdrafts caused by wind.



## Passing Through A Combustible Wall:

With an exterior chimney, in most cases the chimney connector (or stove pipe) will need to pass through a combustible wall. The following are acceptable methods:



**A. Use a section of Solid Insulated Prefabricated Metal Chimney to connect to the chimney** - Use a section of insulated prefabricated 2100° Class A chimney pipe listed to UL 103 HT (at least 1" of insulation or greater) the same inside diameter as the stove pipe and maintain a 9" air space between the wall of the prefabricated chimney and the combustible wall. This section of chimney pipe can be supported by a sheet metal plate securely fastened to the combustible wall, with a hole cut in the middle of it. This will close the gap around the chimney pipe and the framed opening. (See Diagram A Above)

**B. Build a solid brick surround around a tile liner** - Frame a 3.5" thick brick surround into the combustible wall you need to pass through. Maintain a minimum 12" brick separation from the clay liner to combustibles. The minimum 5/8" thick clay liner should be cemented in place and run from the outer surface of the brick to the inner surface of the chimney. (See Diagram B Above)

**C. There are also UL Listed kits available** that are specifically designed for passing through a combustible wall. For more information on these kits, please contact Woodstock Soapstone Company. Please note: there are several UL listed wall pass through kits available, always follow the specific manufacturers installation instructions. (See Diagram C Above)

**For other methods, please refer to NFPA 211.**

**REMEMBER, UNPROTECTED SINGLE OR DOUBLE WALL STOVE PIPE SHOULD NOT PASS THROUGH A COMBUSTIBLE WALL OR CEILING TO CONNECT TO THE CHIMNEY. YOU MUST USE AN APPROVED METHOD WHICH PROVIDES GREATER PROTECTION THAN SINGLE OR DOUBLE WALL PIPE.**

## Prefabricated Metal Chimneys:

For high efficiency, freestanding woodstoves, like your Woodstock Soapstone stove, a Prefabricated Metal Chimney must be listed as Class A and carry a UL Listing of 103 HT (high temperature). The "UL 103 Type HT Class A" prefabricated chimney will have a temperature rating of 2,100° F.

There are prefabricated chimney systems that are approved only to 1,700° F and are suitable only for fireplace inserts or factory built fireplaces. **DO NOT** use these with your Woodstock Soapstone stove.

At the point of the first penetration of a combustible surface (i.e., wall or ceiling) all subsequent venting components need to be prefabricated "UL Type HT Class A". If your prefabricated chimney goes through a living





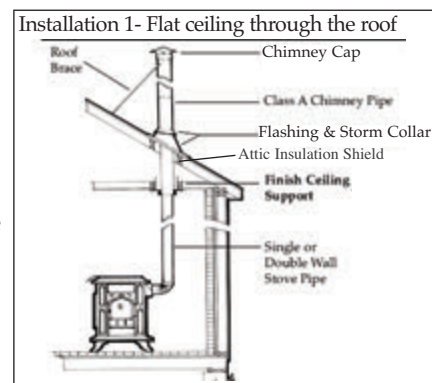
space it must be enclosed, and that enclosure must conform to clearance standards for the prefabricated chimney. Your chimney must pass through your roof and extend above the roof line in accordance with code standards. Please refer to height requirements on Page 2.

## Prefabricated Chimney Configurations

The diagrams below represent the most common and acceptable installations using prefabricated chimney pipe. The necessary components are listed and shown in their appropriate locations. These components are Class A listed to U.L. 103HT (tested to 2100 degrees F.) Only components listed to UL 103HT can be used to install your wood stove. Installation instructions are described below **as examples only**. More detailed instructions are available through Woodstock Soapstone or the pipe manufacturer. **ALWAYS FOLLOW THE SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.**

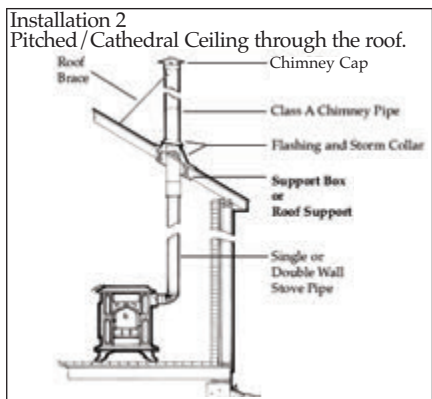
### Installation 1- Flat ceiling through the roof

First, determine where the stove will be placed. Pay close attention to all required clearances for the stove **and** connector pipe. Next, use a plumb line to locate the finish ceiling support in the ceiling above. Cut the appropriate sized hole in the ceiling and frame in the necessary supports to secure the ceiling support. Install the pipe adapter onto the first section of chimney pipe, and lower them into the ceiling support. Use an insulation shield in the attic to keep any insulation away from the pipe. If the attic is a living space the chimney pipe must be fully enclosed. As the pipe extends through the roof, install the appropriate flashing and storm collar to keep the weather out. As the height of the chimney increases to meet code, it may be necessary to install a roof brace (typically recommended at 5' intervals). All chimneys should have the appropriate cap installed at the top to reduce wind and weather related downdrafts as well as deter any animals from building nests. The connector pipe should extend from the flue collar of the stove to the pipe adapter at the ceiling support. The male (crimped) end should always point down toward the stove. Be sure that each joint has enough overlap for a secure connection. All connections should be fastened with screws, including at the flue collar and pipe adapter. (Please refer to the manufacturers full set of installation instructions).



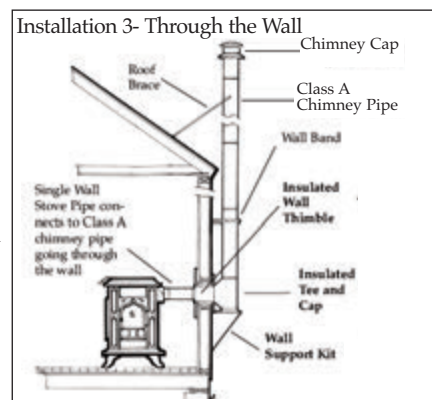
### Installation 2- Pitched/Cathedral Ceiling through the roof

Determine where the stove will be placed. Be sure all clearance requirements are satisfied. Choose the appropriate support for your installation (support box or roof support). Use a plumb line to locate the support in the ceiling above. Cut the appropriate sized hole in the ceiling and install the necessary framing to secure the support. Install the support according to its specific instructions. Be sure that the support hangs down below the ceiling far enough to maintain proper clearance for the connector pipe (steeper slopes require more chimney pipe below the ceiling). Install the pipe adapter to the first section of chimney pipe and lower it into the support box (or connect it to the bottom of the roof support). As the pipe extends through the roof, install the appropriate roof flashing and storm collar. Install the proper chimney pipe lengths to meet code and recommended chimney height. It may be necessary to install a roof brace for stability. Always install the appropriate cap to the top of the chimney. Double wall connector pipe is recommended for installations that have 8' or more from the stove to the chimney. Be sure that all joints in the connector pipe are secure and fastened with screws, including at the flue collar and chimney pipe adapter. (Please refer to the manufacturers full set of installation instructions).



### Installation 3- Through the wall

This installation requires the use of an insulated wall thimble to penetrate a combustible wall. Typically a 9"-12" chimney pipe and pipe adapter will pass through the thimble and make the connection between the interior connector pipe and an insulated tee with a clean out on the outside of the building. The tee and chimney rising up from it rest on a wall support designed to bear the weight of the chimney. Install lateral supports as specified as the chimney rises along the exterior wall. The appropriate flashing and storm collar should be installed if the chimney penetrates an eave or overhang. An offset of 15 or 30 degrees may also be used to go around an overhang. As the chimney extends above the roof to meet code recommended heights it may be necessary to install a roof brace. (Please refer to the manufacturers full set of installation instructions).



## Stove Pipe (Connector Pipe):

Connector pipe is either single wall (sheet metal) or double wall (sheet metal outer pipe with a stainless steel inner pipe). We strongly recommend 22 gauge pipe (26 or 28 gauge is too thin for use with a woodstove). The connector pipe should be 6 inch diameter to match the flue collar of the stove. If your connection to either a masonry chimney or prefabricated chimney system is more than 8 feet tall, we recommend the use of double wall connector pipe. If you need to reduce clearances for your connector pipe installation, double wall connector pipe would be recommended. All pipe connections, including at the flue collar, must be secured with screws. **DO NOT USE GALVANIZED SINGLE WALL PIPE.**

Connector pipe is designed to connect your stove to your masonry lined or approved prefabricated chimney system. **CONNECTOR PIPE SHOULD NEVER BE USED AS A CHIMNEY AND SHOULD NEVER PASS THROUGH A COMBUSTIBLE WALL, CEILING, WINDOW, CLOSET, OR ROOF.** At the point where your stovepipe meets the chimney, you must either vent into a masonry chimney with approved non-combustible transition, or a prefabricated chimney system with a specially designed transition piece.

## FIREPLACE INSTALLATION

Your Model 211 Absolute Steel Hybrid Woodstove has an option of rear venting. The centerline height of the rear flue is 28", in order for the exiting pipe to clear the fireplace lintel, the opening height will need to be 31" or greater. Installing the Absolute Steel Hybrid stove in a fireplace setting is a great way to enjoy the view of the fire, while greatly increasing the efficiency and reducing heat loss to the fireplace chimney.

We do not recommend placing the stove inside the fireplace, as it would make routine maintenance such as cleaning the combustor more difficult, and much of the heat radiating off the stove would not circulate into the room.

The preferred method for installing a stove in front of a fireplace is by running a stainless steel 'flex' liner down the chimney, connecting it to the stove at the fireplace. Chimneys with large flues should be relined to achieve proper draft. If the chimney does not have flue tiles or if the tiles are cracked or compromised, an additional insulating material must be used.

It is important that there be a secure connection between the stove and the flue liner. It is **NOT** acceptable to simply install a plate in front of the fireplace and run a stovepipe through it. The stove pipe must connect with the liner for a continuous outlet to the top of your chimney.

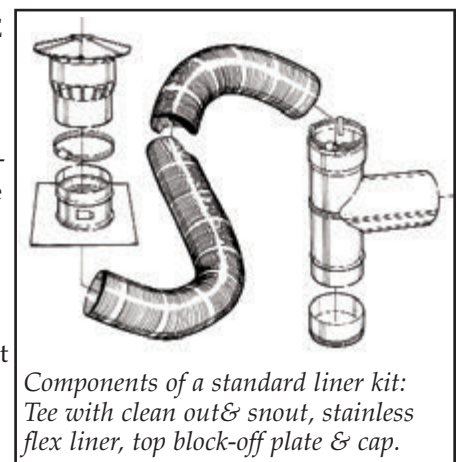
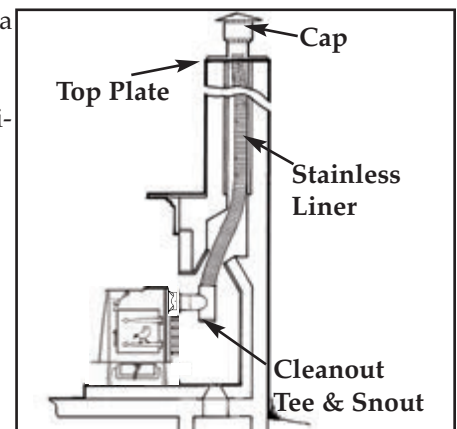
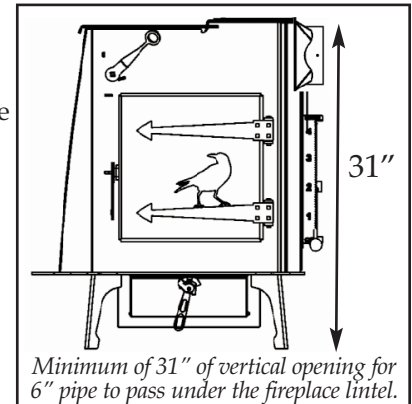
Stainless steel flex liner kits come in a variety of lengths and are readily available. These kits include a flexible stainless steel pipe, tee with snout & clean out, a block-off plate for the top of the chimney, and a cap. Please contact Woodstock Soapstone Company for more information on these kits. **ALWAYS FOLLOW THE SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.**

If the fireplace surround is clad in wood trim, the proper clearance to a combustible will need to be maintained. Please refer to the clearance charts on pages 8-10. An unprotected wood mantel needs to be a minimum of 30" from the top of the stove. If a mantel shield is installed that clearance can be reduced to 12".

**DO NOT VENT YOUR WOOD STOVE THROUGH A FACTORY BUILT FIREPLACE UNLESS IT IS SPECIFICALLY LISTED FOR SUCH AN INSTALLATION** Most factory-built fireplace chimney systems are only rated to 1,700° F, which is not sufficient for a freestanding wood burning stove.

## FLOOR PROTECTION REQUIREMENTS

Your Woodstock Soapstone stove must be set on an approved hearth or floor protection. The hearth protects your floor from two hazards:



- Heat Transfer: Heat radiation from the bottom, front, and sides of the woodstove
- Ember Protection: Sparks and hot coals that may fall out during ash removal and reloading of firewood

**DO NOT INSTALL YOUR WOODSTOCK SOAPSTONE STOVE ON A COMBUSTIBLE SURFACE (WOOD, CARPET, LAMINATE, OR VINYL, FOR EXAMPLE).**



Even if you have a stone or tile overlay on wood, it is still considered combustible since the surface materials will not provide adequate heat transfer protection.

Your stove **MUST** sit on one of the following:

- A hearth pad of solid masonry (brick or tile on concrete and mortared in place)
- A prefabricated hearth pad listed to UL1618 approved standards. These pads are made to be placed on an existing floor.
- A custom designed pad constructed of approved non-combustible materials which will protect the floor from sparks, hot coals, and ashes; and prevents heat from being transferred onto the floor beneath.

### IF YOU CHOOSE TO BUILD YOUR OWN HEARTH PAD

1) Start with a plywood base or subfloor.

*Over this apply:*

2) a layer of insulating board with an R-Value of at least 0.39 (equivalent to 1/2" of cementboard). Depending on the material you choose, the insulating board can be as little as 1/2" thick. For additional help with material specifications, contact Woodstock Soapstone Company at 1-800-866-4344 or info@woodstove.com.

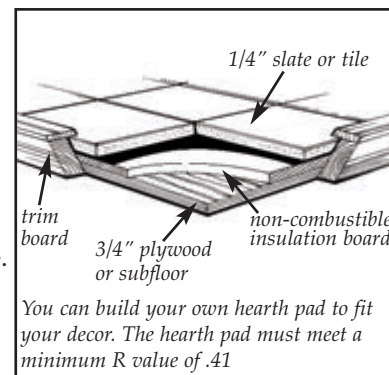
*Over this apply:*

3) Cover with a non-combustible material such as steel, tile, slate, stone, or brick. Use mortar or grout to set the material in place, then grout the seams.

Specifications for floor protectors may be listed in terms of R-value, K-value, or C-value. To convert K or C value to R-value use the following formulas.

K to R:  $R=1/K \times T$  (Thickness of the alternate material)

C to R:  $R=1/C$



Once alternate materials have been converted to R-values, the values of multiple layers can be added to determine the combined protection. If the overall R-value meets or exceeds the specified .39 then the materials are acceptable.

**DO NOT USE:** Old-fashioned stove boards that were commonly sold in hardware stores as they **DO NOT** have adequate protection and **ARE NOT** approved for primary floor protection under your stove.

Hearth Rugs also **ARE NOT** meant to be used as primary hearth protection. These are made to be used in addition to an approved hearth, and are an auxiliary decorative protection. They are not a substitute for an approved hearth pad.

### **R-values of common hearth materials:**

Ceramic Tile	1/4"	0.020
Granite	1/4"	0.020
Slate	1/4"	0.025
Cement Mortar	1/2"	0.025
Cementboard	1/4"-1/2"	0.20-0.39
Common Brick	2.25"	0.450
Common Brick	4.00"	0.800
Mineral/Ceramic Fiber Board	1/2"	1.10-1.470

**Please Note:** Always check with the manufacturer of the hearth material used to verify the R or K value.

K Values cannot be added. Convert to R value before adding multiple layers.

### **Hearth Sizing:**

Clearances for your Absolute Steel Hybrid stove on the front, back and sides must be taken into consideration when determining the placement and size of your floor protection. The floor protection must extend under any horizontal connector pipe and 2 inches beyond each side of that connector. \* Please note: floor clearances (hearth) and stove clearances to surrounding walls, etc. are tested separately and typically have varying clearance requirements. Both sets of clearance requirements need to be met.

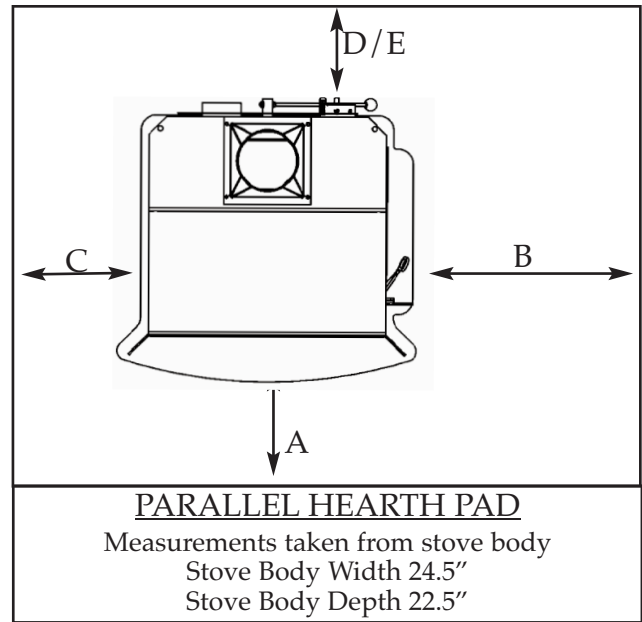
## PARALLEL HEARTH PAD

### MINIMUM DIMENSIONS

- A. Floor protection in front stove = 6"
- B. Protection on loading door side = 16"
- C. Floor protection non-loading door sides = 6"
- D. Floor protection behind stove (top vent or rear vent) = 6"
- E. Floor protection under pipe when rear vented must extend under any horizontal connector pipe and 2 inches beyond each side of that connector.

Minimum hearth size in a top vent/parallel install is 34.5"D x 46.5"W  
Recommended size is 40" D x 57"W or larger.

A 38.5" x 57" rectangular hearth pad will allow for 8" behind the stove, 16" on either side, and 8" in front of the stove. The hearth pad must have a minimum R value of 0.39 (1/2" of "cementboard" covered with non-combustible material such as sheet metal, tile or stone).



## CORNER HEARTH PAD

Minimum hearth size in a corner installation must be 54"x54" (with the front corner cut off).

**NOTE:** On a hearth of minimum size, the stove will not be centered left to right, but will meet the minimum required clearances.

Calculating a Corner Hearth Pad (per NFPA 211):

**A = C x 1.414 + W/2 + D + Front Hearth Requirement**

A = distance from corner to the front of the hearth pad

C = clearance from rear corner of appliance to wall (13 non-door side & 18" on door side")

1.414 = a constant

W/2 = one half the appliance width (12.25")

D = appliance depth (22.5")

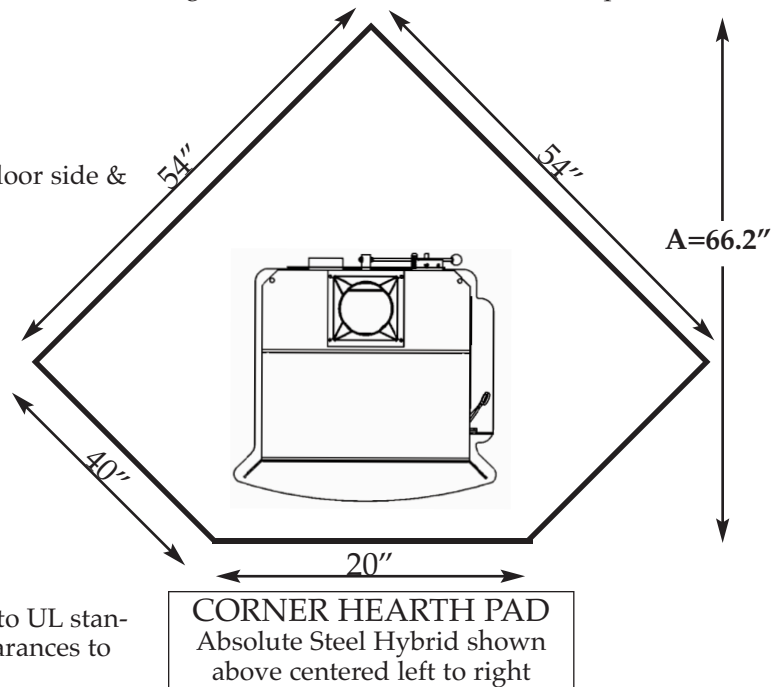
**Front Hearth Clearance = 6"**

Example:

Absolute Steel with the Rear Heat Shield & Pipe Shield

**A = 18" x 1.414 + 12.25 + 22.5" + 6"**

**A = 66.2"**



## **WALL PROTECTION**

The Model 211 Absolute Steel Hybrid stove has been tested to UL standards for clearances to combustible walls. The minimum clearances to unprotected walls are as follows:

Minimum clearances with no heat shields to unprotected combustible walls:

From the back----- 14"

From the sides----- 26"

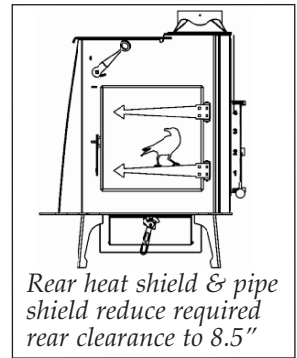
**DO NOT ASSUME THAT A WALL IS NOT COMBUSTIBLE BECAUSE IT HAS A NONFLAMMABLE SURFACE.** A wall with any combustible materials in it must be considered combustible. For example, a brick wall attached to wood studs is considered a combustible wall. Over time, heat will pass through bricks and heat the wood, lowering the ignition temperature of the studs, possibly resulting in a fire. As waves of radiant heat energy meet a combustible object, heat is absorbed and the temperature of the object is raised, which can result in spontaneous combustion. Similarly, wood-framed walls which are covered with tile, stone or fire-rated sheetrock must be considered combustible. Fire-rated sheetrock is also considered combustible due to the paper covering.

If you wish to install your stove closer to a combustible wall than standard clearances will permit, you can either attach an approved stove & pipe shield, or mount a ventilated, non-combustible shield on the wall.



## Stove and Pipe Shields:

Clearances can be reduced by attaching an approved heat shield, Part #R-997 and pipe shield, part #W-413. Woodstock Soapstone Company carries heat shields specifically designed for this stove. When using one or both of these shields, **clearance is measured from the back of the shield to the combustible wall**. The clearance behind the stove (in a parallel installation) can be reduced to 8.5 inches. The clearance behind the pipe can be reduced to 6 inches.



### Clearance Table:

The Absolute Steel Hybrid can be installed at a 14" clearance with no additional protection, if the stove pipe is top vented, and the provided shield is installed on the inside of the rear flue cover plate. To further reduce the rear clearance to 8.5", you must attach an approved rear heat shield and a 24" pipe shield.

Clearance Table For Model 211 Absolute Steel						
Type of Installation►	Clearance from stove back, top vent, with stove pipe which goes straight up	Clearance from stove back and pipe, which goes straight back	Clearance from stove back and vertical single wall connector pipe with elbow at stove back *Controlling clearance		Stove Sides	
Type of protection▼			Stove Back	Stovepipe		
No Protection	14"	14"	23.5"*	15.5"	26"	
With 24" Pipe Shield			18"	10"	26"	
With Approved Rear Heat Shield, 24" Pipe Shield & Side Shield	8.5"		18"	10"*	16"	
3 1/2" thick Masonry Against Combustible Wall*	12"	12"	20"	12"	13"	See note below regarding NFPA 211 clearance reduction methods and implementation.
3 1/2" thick Masonry with 1" ventilated airspace*	12"	12"	14"	6"	12"	See note below regarding NFPA 211 clearance reduction methods and implementation.
24 ga. sheet metal with 1" ventilated airspace*	12"	12"	14"	6"	12"	See note below regarding NFPA 211 clearance reduction methods and implementation.
1/2" thick non-combustible insulation board with 1" airspace*	12"	12"	14"	6"	12"	See note below regarding NFPA 211 clearance reduction methods and implementation.

\*These clearance reductions meet or exceed requirements of NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances. Approved NFPA 211 clearance reduction methods **DO NOT** allow stove clearances to be reduced below 12". **NFPA WALL SHIELDS MUST BE SIZED TO NFPA 211 SPECIFICATIONS. CONSULT NFPA 211 AND A QUALIFIED EXPERT BEFORE IMPLEMENTING THESE REDUCTIONS.**

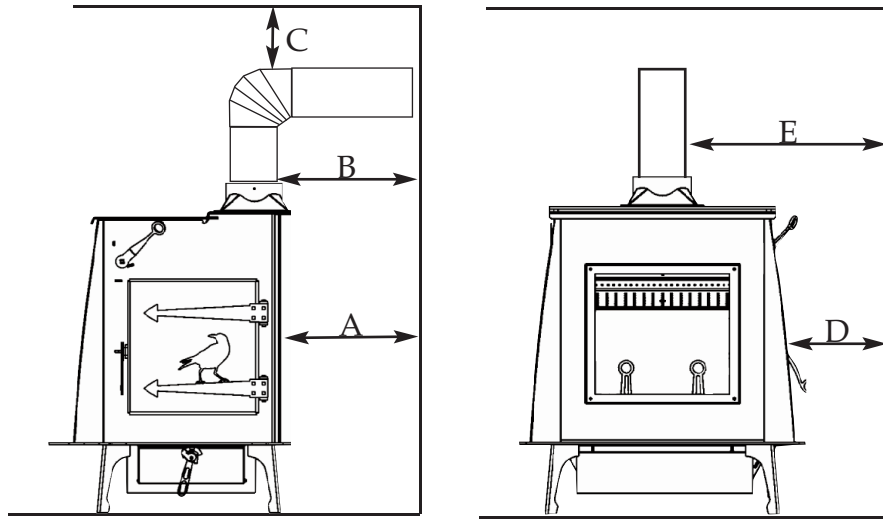
The only approved method allowing for a rear stove clearance less than 12" is the Approved Rear Heat Shield (#R-997) provided by Woodstock Soapstone Co. If your installation requires the use of the Approved Rear Heat Shield call 1-800-866-4344.

- These clearances apply to walls, ceilings, furniture and other combustibles.
- The 24" Vertical Stack Shield attaches to the back of the stove pipe and prevents excess heat from being radiated from the pipe. Heat shield protection is only required for the first 24" of vertical connector pipe.
- At least 30" is required from the front of the stove to combustibles (such as curtains, wall hangings, and furniture).

The same clearances from your stove and stove pipe apply to both fireplace and freestanding installations. Be particularly careful to check clearances to a wood mantel or a wood fireplace facade. You must maintain a 30" clearance to an unprotected wood mantel. See Fireplace Installations on Page 5.

## CLEARANCE INSTALLATION DIAGRAMS

### 1) Parallel Installation, Single Wall Pipe, Top Vent



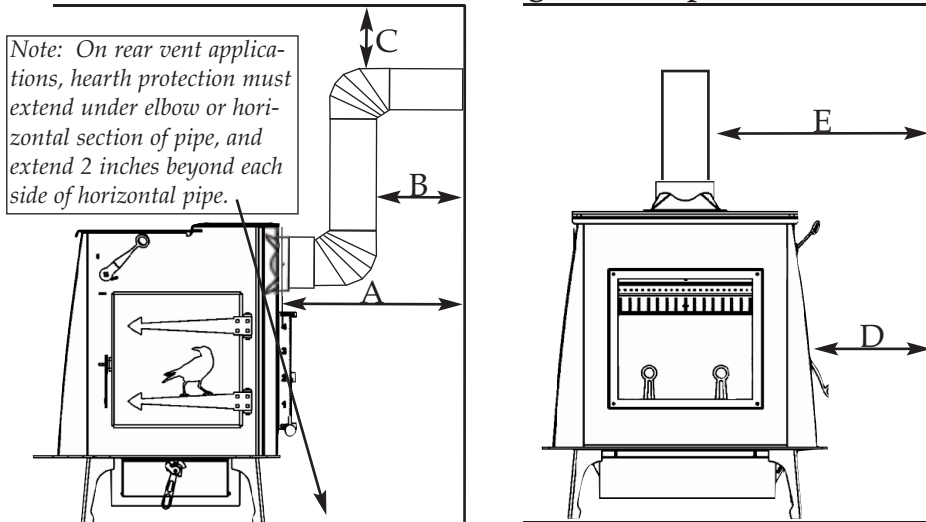
#### **NO HEAT SHIELD**

- |                          |         |                          |         |
|--------------------------|---------|--------------------------|---------|
| A. Back of stove to wall | = 14"   | D. Side of stove to wall | = 26"   |
| B. Back of pipe to wall  | = 15.5" | E. Side of pipe to wall  | = 35.5" |
| C. Above pipe to ceiling | = 18"   |                          |         |

#### **WITH REAR HEAT SHIELD & PIPE SHIELD ATTACHED**

- |                                 |        |                          |         |
|---------------------------------|--------|--------------------------|---------|
| A. Back of stove shield to wall | = 8.5" | D. Side of stove to wall | = 26"   |
| B. Back of pipe shield to wall  | = 8.5" | E. Side of pipe to wall  | = 35.5" |
| C. Above pipe to ceiling        | = 18"  |                          |         |

### 2) Parallel Installation, Single Wall Pipe, Back Vent



#### **NO HEAT SHIELD**

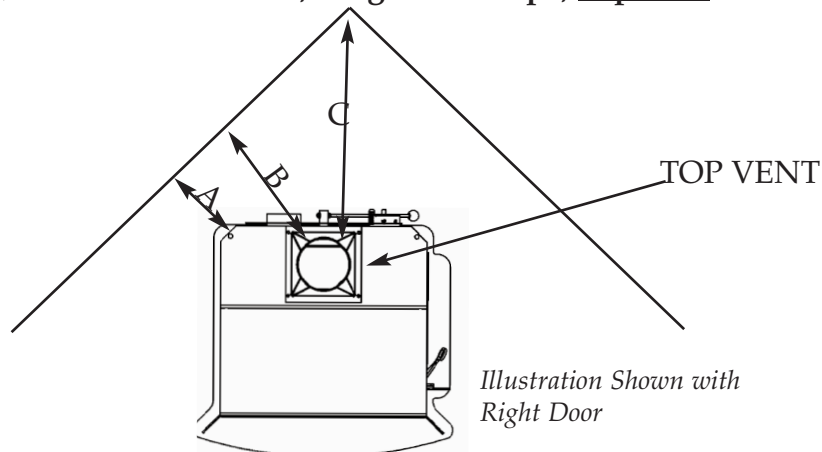
- |                          |         |                          |         |
|--------------------------|---------|--------------------------|---------|
| A. Back of stove to wall | = 23.5" | D. Side of stove to wall | = 26"   |
| B. Back of pipe to wall  | = 15.5" | E. Side of pipe to wall  | = 35.5" |
| C. Above pipe to ceiling | = 18"   |                          |         |

#### **WITH REAR SHIELD & PIPE SHIELD ATTACHED**

- |                                 |       |                          |         |
|---------------------------------|-------|--------------------------|---------|
| A. Back of stove shield to wall | = 18" | D. Side of stove to wall | = 26"   |
| B. Back of pipe shield to wall  | = 10" | E. Side of pipe to wall  | = 35.5" |
| C. Above pipe to ceiling        | = 18" |                          |         |

## CLEARANCE INSTALLATION DIAGRAMS

### **3) Corner Installation, Single Wall Pipe, Top Vent**

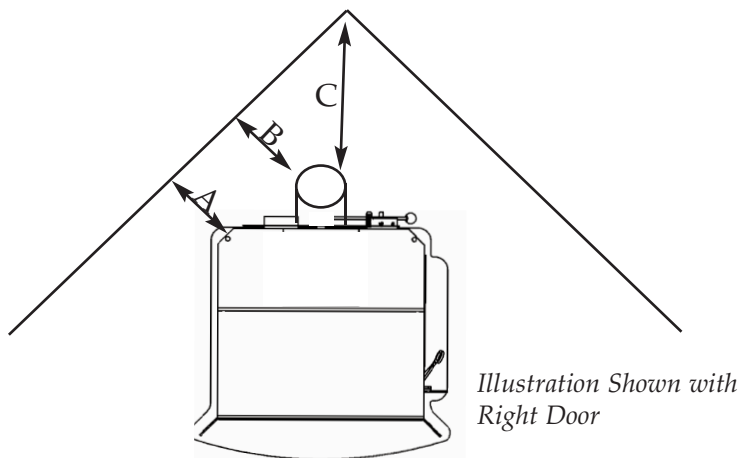


The tested clearance with or without a rear heat is shown below.

#### **WITH OR WITHOUT REAR HEAT SHIELD**

- |                                |                                                           |
|--------------------------------|-----------------------------------------------------------|
| A. Stove corners to side walls | = 13" non door side; 18" door side (determines placement) |
| B. Pipe to side walls          | = 20" minimum                                             |
| C. Pipe to corner              | = 26" minimum                                             |

### **4) Corner Installation, Double Wall Pipe, Back Vent**



If you vent your stove through the rear, rather than the top, and then go up with an elbow, the stovepipe will be closer to the wall than if you top vent (see illustration top of page 10). For this venting configuration, we recommend using double wall pipe. You must adhere to the clearances listed below.

#### **WITH OR WITHOUT REAR SHIELD & DOUBLE WALL CONNECTOR PIPE**

- |                                      |                                                           |
|--------------------------------------|-----------------------------------------------------------|
| A. Stove corners to side walls       | = 13" non door side; 18" door side (determines placement) |
| B. Back of pipe shield to side walls | = 13" min (Approved Double Wall Connector Pipe)           |
| C. Pipe to corner                    | = 17" min (Approved Double Wall Connector Pipe)           |

# MOBILE HOME INSTALLATION

**CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.**

Because mobile homes are also referred to by HUD as “manufactured” homes, regulations present a gray area. Many “mobile” homes are set on a permanent foundation and connected to public utilities. If you are installing a stove in a mobile or manufactured home, check out the requirements below and check with your local code officials. More questions? Give us a call Monday through Saturday from 9 to 5 Eastern time at 1-800-866-4344.

While all stove installations have to meet National Fire Safety codes, mobile homes are given special consideration when it comes to installing a wood burning stove. These additional regulations were established by the Department of Housing and Urban Development (HUD), and result in the following additional requirements:

1. Double Wall Connector Pipe
2. Outside Air for Combustion
3. Tie Downs for the Stove
4. Spark Arrestor on the Chimney Cap
5. Stove Grounded to Chassis
6. Stoves May Not Be Installed in Mobile Home Bedrooms



Mobile Home Prohibition:  
**WARNING:**  
**DO NOT INSTALL IN SLEEPING ROOM**

**Double wall pipe** must be used to connect the stove to the chimney. This is stove pipe that is constructed with two walls, usually with the inner wall made of stainless steel. It reduces the required clearance to combustible building materials and furnishings.

**Outside Air** must be used for combustion. Because of the tight construction of mobile homes, wood stoves need a way to get adequate air from outside the home for complete combustion in order to avoid the risk of depleting oxygen in the living space. Having outside air for combustion is a requirement for all woodburning stoves in the state of Washington and is recommended for woodstoves in “super tight” new construction.

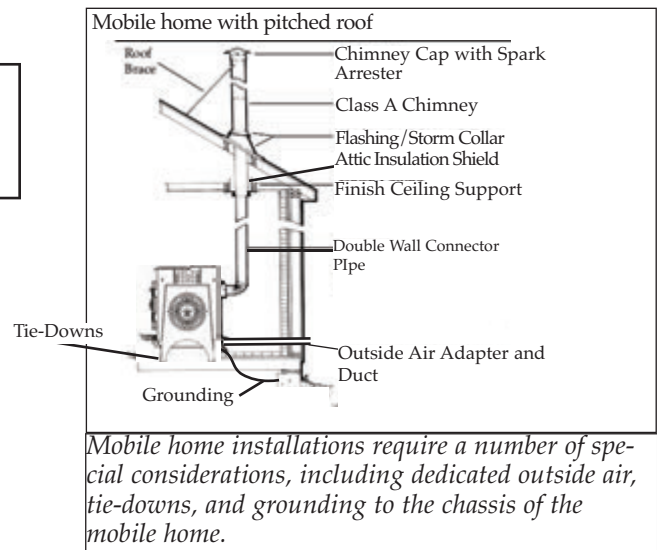
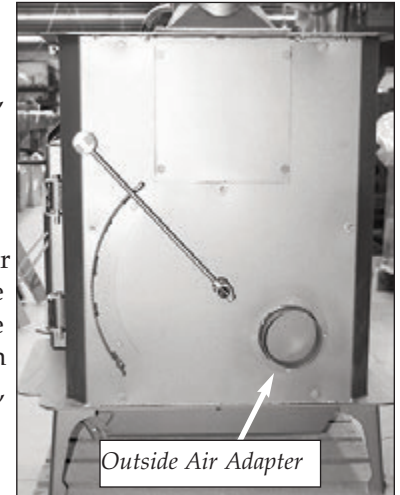
**Tie Downs:** The stove must be attached to the floor. This is to prevent tipping in the event the home is moved. (We can provide tie downs for our stoves at no extra charge).

**Spark Arrestor:** The chimney cap must have a spark arrestor screen. These are available with most prefabricated chimney systems.

**Grounding:** The stove should be grounded to the home chassis.

**Not allowed in mobile home bedrooms:** wood stoves are not permitted for installation in bedrooms in mobile homes.

The Outside Air Adapter is built into the design of the Absolute Steel Hybrid, and is located at the back of the stove. It has a four-inch collar which allows you to attach a four inch pipe, usually flexible dryer duct, from the stove to the outside. For long runs, the flexible pipe can transition to PVC or aluminum pipe, if you wish.



Woodstock Soapstone Company  
66 Airpark Road, West Lebanon, NH 03784  
800-866-4344 • www.woodstove.com



# SETTING UP YOUR STOVE

**Attention:** Remove the ash pan lid from the removable ash pan prior to lighting the stove.

Your Model 211 Absolute Steel Hybrid woodstove has been shipped assembled except for two parts:

1) The flue collar and cover plate, including the internal cover plate shield. 2) Required bottom heat shield.

All necessary hardware and instructions are also packed in the firebox. Any optional items such as heat shields will be packed separately.

## 1) How to attach the Absolute Steel Hybrid flue collar & cover plate, and the cover plate shield:

The Absolute Steel Hybrid is designed to be vented out the top or out the rear with an easily convertible flue collar and cover plate. Each part is secure to the stove body with 4 bolts. You will need a 7/16" wrench or socket and ratchet to install these parts. The stove is shipped with the cover plate installed over the rear flue exit with an internally mounted heat shield. The flue collar is packed inside the firebox.



*Image above shows a top mounted flue collar and rear cover plate*

1. Decide which way you would like to vent your stove. This may be dependent on the location of an existing chimney or the design of an existing hearth. Always pay close attention to required clearances when considering stove placement

### TOP VENTING:

1. If you are **top venting**, use the (4) bolts supplied making sure that the gasket on it is secure and stays in place while installing. Use four of the bolts to attach the flue collar to the stove body. The holes in the stove body are threaded to accept the bolts. Alternate between the bolts while tightening to ensure even pressure. The bolts should be tight enough to firmly compress the gasket. Do not over tighten.

### REAR VENTING:

1. If you are **rear venting**, the cover plate has an internally mounted stainless steel heat shield. Two of the four mounting bolts are longer to accommodate this shield and are diagonally opposite each other. Remove the (2) hex nuts from these longer bolts using a 7/16" wrench or socket. Remove the shield and set aside. **When rear venting the shield does not get reinstalled.**
2. Remove the (4) mounting bolts from the cover plate and transfer the cover plate to the top of the stove. Install the (2) longer bolts diagonally opposite from each other (doesn't matter which 2 holes). Install the remaining shorter (2) bolts.
3. You can now install the flue collar on the rear of the stove using the (4) 1/4-20 hex bolts supplied.

## 2) Installation of the required bottom heat shield: (FACTORY INSTALLED)

The Absolute Steel Hybrid was tested and listed with the use of the bottom heat shield. The bottom heat shield **MUST** be installed prior to lighting the first fire. The attachment instructions can be used for both the ash pan and non-ash pan versions of the Absolute Steel Hybrid. If your stove **DOES NOT** have an ash pan, the shield will be flat sheet metal instead of formed sheet metal.

1. Locate the (4) 1/4-20 studs welded to the bottom of the stove. The studs can be found in each corner, just behind each leg. With the attachment flanges facing up, slide the heat shield under the stove centered on the ash pan housing. The shield is symmetrical so there is no front or back.
2. Each attachment flange has (2) holes, one on each end. Align these holes with the studs and push the shield up over the studs. It may be easier to have a helper during this step.
3. Thread (1) 1/4-20 nut on each stud. 2-3 threads is all that's necessary as you want the shield to drop down and rest on the nuts, this will leave a small air gap. **DO NOT** affix the shield firmly to the bottom of the stove.



# OPERATION

## Seasoning Your Stove

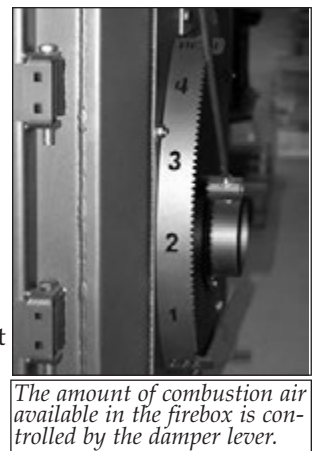
Both soapstone and steel need to be seasoned. The seasoning can be accomplished through a series of small to moderate fires. Your Woodstock Soapstone Stove is an easy stove to season, because even a small fire will provide hours of radiant heat once the stove is warm. **There are two things you will notice during the first fire:**

**First, there will be a hot, acrid smell as the stove heats up.** This smell is a result of the paint on the stove and pipe curing. You will want to have your first fire on a day when you can open the windows in the house to provide adequate ventilation. The odor is non-toxic and will only be present for the first few fires.

**Second, there will be some condensation on the glass.** This condensation is a result of any moisture being driven out of the stove and condensing on the inner surface of the glass. It takes a couple of small fires to season the stove and remove this excess moisture.

## Starting a Fire And Establishing Proper Draft

1. Open the catalytic bypass. The bypass lever is located above loading door either on the right or left side of the stove. Lift the bypass lever up until it stops to bypass the catalytic combustor. The bypass must be opened before opening the load door.
2. Open the combustion air damper by lifting the knobbed handle up to the 4 position. The air damper is located at the rear of the stove (same side as the loading door). Push the handle slightly away from the stove and move the lever up, this allows maximum air is into the firebox.
3. **Always confirm there is adequate draft before lighting the fire.** Hold a lit match or light a small piece of newspaper in the top/front of the firebox, where smoke exits. If the flame is drawn out of the firebox, toward the flue, proceed with lighting the fire. If the flame stands still or is pushed away from the flue exit, you must establish a good draft before lighting a fire. A hair dryer or heat gun pointed at the flue exit is a good way to establish draft without creating a lot of smoke. After you think you have draft, re-test with a match.
4. Once good draft has been established, build a fire on the floor of the firebox.  
**DO NOT USE ADDITIONAL GRATES, ANDIRONS OR ANY OTHER METHODS TO SUPPORT THE FUEL IN THE FIREBOX.** Start with crumpled newspaper and dry kindling.
5. Add small splits of firewood once the kindling has ignited. This will establish a bed of hot coals.
6. Add small to medium splits onto the hot coals. Assuming the wood is dry, the fire should spread through the wood. After about 10 minutes, close the air damper down between around the 3 mark.
7. After the single wall pipe temperature reaches 250°-300°F, close the bypass by lowering the handle down to the closed position. All of the smoke from the firebox will now pass through the catalytic combustor. The combustor will generate a substantial amount of heat as it "burns" the smoke passing through it.
8. Adjust the air control damper to a lower setting, the best burn setting is between 1 and 2. Push the air damper handle gently away from the stove and and push it down to a lower air setting. The closer the lever is to the bottom of the stove, the lower the burn rate, as less air is entering the firebox. The final damper setting will be determined by the desired heat output from the stove, the condition of the wood being burned, and the draft through the chimney system.



# Engaging the Catalytic Combustor

The catalytic combustor will start to burn the gases and particles in the smoke when the temperature of the smoke reaches approximately 500°F (internally), or after about 5-15 minutes of establishing a strong fire. Each stove comes with a magnetic thermometer. Use the thermometer to monitor your stove/pipe temperatures. The temperature of the single wall pipe is approximately 1/2 the temperature of the exhausting smoke, so when the thermometer on the stove pipe reads 250°F, it is approximately 500°F inside. You will find that after the combustor is engaged, temperatures will often stabilize or lower on the pipe - evidence that the heat isn't getting lost up the chimney!

Engage the combustor by lowering the bypass handle (above the loading door) down until it closes completely. Then reduce the air damper setting to achieve the desired burn rate. Make fine adjustments to your air control damper by moving it slightly up or down. You may find that you can achieve the longest burn when the damper is only slightly open. In the Absolute Steel Hybrid, allowance is made for a small amount of primary and secondary air to enter the stove even when the damper is fully closed, and the stainless steel catalyst will work efficiently at low to moderate firing rates, thus preventing creosote formation or excessive smoke from your chimney.



## CAUTION

NEVER USE GASOLINE, GASOLINE TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS STOVE. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE STOVE WHILE IT IS IN USE.

## Low & Overnight Burning

These instructions are intended as a guide to operating your wood stove. Your timing and final damper settings will vary depending on chimney draft, type of wood, moisture content of the wood and size of the splits. The Absolute Steel Hybrid is simply designed and intended to be user friendly, but it will take some practice to understand how the stove works best for you.

1. Before you open the loading door, you must fully open the catalytic bypass and the air damper. Wait a minute or so, before opening the loading door slowly, for a strong draft to be established to prevent smoke from spilling back into the room.
2. Wearing stove gloves, open the loading door and stir up the hot coals. If necessary, excess ash should be removed before reloading the firebox. If your stove has the optional ash pan, simply rake the hot coals back and forth in the firebox to allow the loose ash to fall through the center grate into the ash pan. If your stove does not have an ash pan, push the hot coals to one side and shovel the loose ash into a non-combustible ash container with a tight fitting lid. Dispose of the ash properly.  
**NEVER PUT AN ASH CONTAINER ON A COMBUSTIBLE SURFACE, LIKE A WOOD FLOOR.**
3. Place several small splits on top of the hot coals and allow them to ignite.
4. Load the firebox to capacity leaving roughly 2" of space for secondary combustion, with a mix of larger and smaller splits. Close the loading door.
5. Allow the temperature on the exterior of single wall pipe to come back up to 250°, this may only take 5-15 minutes depending on the dryness of the wood and draft conditions.
6. Adjust the air damper to a low setting, around the 1.5 position, by lowering the air damper handle down.
7. Close the catalytic bypass by lowering the lever until it stops.
8. Initially the fire may appear to die out. This may cause a small amount of soot to collect on the glass. Any buildup on the glass should go away with higher temperature burns.



*Bypass lever should be up when starting or reloading the Absolute Steel. Allowing the smoke to heat up to 500° F*



*The bypass lever interlocks with the door when the combustor is engaged (bypass closed). This safety feature makes it impossible to open the loading door without opening the bypass.*

**NEVER BURN THE STOVE WITH THE AIR DAMPER FULLY OPEN EXCEPT WHEN KINDLING A FIRE OR RELOADING THE FIREBOX. NEVER BUILD A ROARING FIRE IN A COLD STOVE. IT TAKES AT LEAST 30 MINUTES TO HEAT THE INNER SOAPSTONE PANELS OF THE ABSOLUTE STEEL HYBRID. ATTEMPTS TO REACH HIGH TEMPERATURES VERY QUICKLY COULD RESULT IN DAMAGE TO THE STEEL OR SOAPSTONE PARTS.**

# Burning for Higher Heat Output

These instructions are intended as a guide to operating your wood stove. Your timing and final damper settings will vary depending on chimney draft, type of wood, moisture content of the wood and size of the splits. The Absolute Steel Hybrid is simply designed and intended to be user friendly, but it will take some practice to understand how the stove works best for you.

1. Before you open the loading door, you must fully open the catalytic bypass and the air damper. Wait a minute or so to establish a strong draft. This will help to keep smoke from spilling into the room.
2. Open the load door and stir up the coals and remove excess ash as needed.
3. Place several small splits on top of the hot coals and allow them to ignite.
4. Load the firebox to capacity leaving about a 2" space for secondary combustion at the top, with a mix of larger and smaller splits. Close the loading door.
5. Allow the fresh wood to become involved in the fire. With dry wood this may take 5-15 minutes, or until the exterior of single wall pipe reaches 250°. Lower air damper handle down to the 3 position.
6. Close the catalytic bypass by lowering the lever until it stops.
7. You should see the flames from secondary combustion at the top of the firebox becoming more active. Adjust the air damper to approximately the 1.5 position.

## Ash Removal

### NEVER BURN THE STOVE WITH THE ASH DOOR OPEN!

#### Without an ash pan:

If your Absolute Steel Hybrid does not have an ash pan you will have to remove ash through the side loading door, approximately every 5-7 days if the stove is in continuous operation. You do not have to let the fire die out completely to remove the ashes, but the fire must be reduced to hot coals. First make sure that both the catalytic bypass damper and the air control damper are open. This will increase the draft and prevent smoke from entering the room.

Open the side loading door and move the hot coals to one side or the back of the firebox. Scoop out the ashes that were underneath the coals, place them into a metal container with a tight fitting lid and then reverse the procedure. Leave some ash and hot coals in the bottom of the stove to help rekindle a fire.



*The ash Pan door is located at the front of the stove, below the ash lip.*

#### With an ash pan:

If your Absolute Steel Hybrid is in continuous operation, you will probably need to empty the ash pan every 7-10 days. You do not have to let the fire die out completely, but make sure that it is reduced to hot coals. Open the catalytic bypass damper, and open the air control damper. Remember to wear stove gloves - the ash pan will be hot! Open the ash pan door located on the same side as, and below the loading door. Carefully slide the lid into place on the top of the ash pan and remove the ash pan from the base of the stove. The lid slides over the long top edges of the ash pan. Close the ash pan door before emptying the ashes into an appropriate container.



*The ash pan door drops down and the ash pan slides out from under the stove for easy ash removal.*

Do not open the ash removal door while the stove is in the middle of a long burn, because the additional draft created under the fire could cause the stove to burn excessively hot and the ash pan itself will be very hot, and full of live coals. If you are burning your stove 24 hours/day, it is often easiest to empty the ashes first thing in the morning, after an overnight burn.

**ASHES SHOULD BE EMPTIED INTO 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. LIVE CINDERS CAN TAKE 36 HOURS OR LONGER TO COOL.**

**NEVER SHOVEL ASHES INTO A COMBUSTIBLE CONTAINER LIKE A CARDBOARD BOX OR A PLASTIC BUCKET. DO NOT USE A VACUUM CLEANER TO REMOVE ASHES UNLESS IT IS SPECIFICALLY DESIGNED FOR WOODSTOVE ASH REMOVAL. NEVER LEAVE A CONTAINER OF HOT ASHES ON A WOOD FLOOR, PORCH, OR ANY COMBUSTIBLE SURFACE.**



# The Pipe Thermometer

We recommend placing the thermometer 8"-10" above the flue collar on **single wall** stove pipe if the stove is vented out the top. If the stove is rear vented, the surface thermometer should be placed on the steel plate toward the back of the stove.

If you are reading the single wall stove pipe temperature, the interior flue exhaust temperature is about twice as hot. Since the 22 gauge sheet metal pipe is more reactive (faster heat transfer) than the stove top, you will find you can engage the combustor sooner. We recommend engaging your catalytic combustor once the pipe thermometer reaches 250° F.

Once the combustor is engaged, you should see the stove surface temperature rise and the pipe temperature stabilize, then drop, indicating catalytic combustor activity. From a cold start it may take about 30 minutes to get the stove up to temperature. If you are reloading a hot stove, wait approximately 5-15 minutes before engaging the combustor. The thermometer is not a precise instrument – it will not tell you the exact temperature inside the firebox or in the flue.



## Overfiring

Burning a stove frequently at excessive temperatures is known as overfiring. When the surface temperature is consistently over 700° F, the stove has reached 1400° F inside. Operation with temperatures in this range can lead to metal warping, becoming brittle, and eventually deteriorating completely. It can shorten the useful life of the catalytic combustor.



### DO NOT OVERFIRE THIS WOOD STOVE!

ATTEMPTS TO ACHIEVE HEAT OUTPUT RATES THAT EXCEED STOVE DESIGN SPECIFICATIONS CAN RESULT IN PERMANENT DAMAGE TO THE STOVE AND TO THE CATALYTIC COMBUSTOR.

Avoid overfiring by letting the combustor and secondaries do most of the work in the stove. Your stove is operating at peak efficiency when the combustor is "engaged" and the secondaries are ignited, with the damper lever set to a low to moderate setting, and the logs are glowing with secondary flames apparent. You will get the greatest amount of heat per pound of wood when the stove is operated in this manner.

## Daily Use

Your Absolute Steel Hybrid stove is well suited for continuous firing on a 24 hour a day basis. It will burn for hours on one load of wood, and will provide steady, even, heat for hours after the fire dies down. You need only disengage the catalytic combustor when you kindle a fire, or reload the stove. Once the catalyst is ignited, it will continue to function as long as there is smoke to burn.

Your connector pipe and chimney, or chimney pipe, should be inspected at regular intervals (not less than once every two months). Examine the connector pipe for creosote, corrosion, loose seams, or excessive soot. Clean and replace as necessary. The chimney or chimney pipe should be cleaned and checked by a certified specialist once a year. A small mirror held at the cleanout door of a masonry chimney will be helpful. For a Class A prefabricated metal pipe, some disassembly is usually required.



## The Cook Top

The top lid of the Absolute Steel Hybrid wood stove consists of a decorative metal plate. The lid has been designed to enhance the beauty and versatility of your stove. The steel cook top is not designed as a cooking surface and food should always be placed in a heavy duty Dutch oven or skillet, not directly onto the steel surface.

## The Fall-Away Tool

The "fall-away tool", which comes with your stove, can be used to operate the door latch and the bypass lever. Simply insert the tool into the door handle circle to use to safely open/close the loading door. The loading door and the door handle are very hot, so use the tool provided. The "fall-away tool" conforms to UL requirements and is made so that if you let go of it, it will "fall-away" from the stove and not become too hot to handle.



# Firewood

Your Woodstock Soapstone Absolute Steel Hybrid Wood Stove is designed to burn dry, natural cordwood. Higher efficiency and lower emissions generally result when burning air dried hardwoods, as compared to green, freshly cut hard woods. It is perfectly fine to burn soft woods in your stove as long as they are properly dried. Hardwoods are preferable because they are typically denser than soft woods which gives them a higher fuel value per volume.

The moisture content of some trees may range as high as 50% – i.e., there is as much moisture in the tree as there is wood. After wood has been cut to length, split and stacked for a year, the moisture content will usually range from 15-25%. Splitting wood before it is stored will reduce drying time. Properly dried wood will produce more heat, reduce the likelihood of water vapor condensing in the chimney, forming creosote, and result in less pollution entering the air. It is safer and more efficient to burn dry hardwood than green or wet wood that smolders.

The advantages of burning dry wood are many. Dry wood is lighter, easier to split, and easier to carry. It is easier to light, produces more heat, and generates less pollution. If you burn wet wood much of the energy generated by the fire is used to drive moisture out of the wood, rather than producing heat for you. Dry wood will maintain the highest combustor temperatures and burn the most efficiently. Creosote is much less likely to form if you burn dry wood.

There are several ways to determine if wood is properly dried. Visual “checking” on the end of the wood splits, dry wood will feel lighter, if you bang two pieces of dry wood together it will sound hollow (wet wood will sound solid & dull) no bubbling or sizzling from the wood as it burns. Moisture meters are a great way to determine the percentage of moisture content in wood. Moisture meters utilize two pin probes that insert into the wood and read the percentage of moisture. Moisture meters can be purchased online.



Dry Firewood will show “checking” or cracks at the end of the split

Common symptoms of burning wet wood include: Difficulty getting the fire started, smokey fire, dirty glass, creosote buildup within the stove pipe and/or chimney, low heat output, short burn times, and excessive wood use.

**DO NOT BURN pressure treated or painted wood, unseasoned wood, coal, garbage, solvents, lawn clippings or yard waste, materials containing rubber; including tires, plastics, petroleum products, paints, paint thinners, asphalt products, materials containing asbestos, construction debris, railroad ties, manure or animal remains, salt water driftwood or other salt treated saturated materials, or paper products, cardboard, plywood, or particle board in your Woodstock Soapstone Absolute Steel Hybrid Wood Stove.** The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in the Absolute Steel Hybrid.

Coal and artificial logs burn much hotter than wood and could cause damage through overheating the the steel or the soapstone panels. Burning treated wood, garbage, solvents, colored paper or trash may result in the release of toxic fumes and may poison or otherwise render the catalytic combustor ineffective and cause smoke.

Burning cardboard, loose paper, and trash will add significantly to ash and soot buildup, and it will not produce much heat. Fly ash from improper fuel can also coat or plug the combustor, causing smoke spillage into the room. Under normal operating conditions, the Woodstock Soapstone Stove is designed to last for generations. It is not, however, designed for continuous over-firing, or firing with coal, artificial logs or trash.



## DO NOT BURN!

- UNSEASONED WOOD
- TREATED/PAINTED WOOD
- COAL
- GARBAGE
- CARDBOARD
- SOLVENTS
- COLORED PAPER
- TRASH
- LAWN CLIPPING
- RUBBER PRODUCTS
- PLASTICS
- PETROLEUM PRODUCTS
- PAINT/PAINT THINNER
- MATERIALS CONTAINING ASBESTOS
- DRIFTWOOD
- ASPHALT PRODUCTS
- RAILROAD TIES
- MANURE/ANIMAL REMAINS
- PLYWOOD/PARTICLE BOARD

# THE CATALYTIC COMBUSTOR

Here is how your catalytic combustor works.

The catalytic combustor is a stainless steel honeycomb with hundreds of cells. If you looked at the inside of each cell with a microscope, you would see that the walls are uneven and filled with minute nooks and crannies. Precious metals, such as platinum, are sprayed on the inside of these cells to coat all of the nooks and crannies. This creates the largest possible surface area to interact with the wood smoke. The catalytic combustor in your stove is very similar to the one in the exhaust system of your automobile and works to achieve the same results - high efficiency and clean air!

When you first start a fire, you should bypass your catalytic combustor and let the smoke go directly up the chimney. Once wood smoke reaches 500° F (about 10-15 minutes after reestablishing a strong fire), it is hot enough to ignite the catalytic combustor. As the wood smoke passes through the cells in the combustor, the smoke reacts with the precious metals which line the inside of the honeycomb and both combustible gases and particles in the smoke ignite and burn. This “catalytic burn” reduces emissions and also increases heat output from the stove.

Without a catalytic combustor, between 5% - 40% of the chemical energy contained in wood simply escapes up the chimney when wood is burned. Energy laden gases are exhausted up the chimney where they pollute the air or may condense on the inside of the chimney flue as creosote. The slower the burn, without a catalytic combustor, the greater the amount of energy that is lost. A long smoldering fire is the least efficient use of energy in wood, yet it produces lots of smoke, which is the fuel supply for the catalytic combustor.

Most of the chemical compounds in wood smoke are combustible. The catalyst produces high temperatures, which loosen the bonds of these chemical compounds and “burns” wood smoke. A stove that “burns” these compounds and uses smoke as additional fuel will burn more efficiently and produce more heat, while reducing creosote and air pollution at the same time. However, most stoves cannot consistently produce temperatures high enough to burn cleanly, particularly during long burning times - hence the need for a catalytic combustor.

Your catalytic combustor can get the most efficiency out of every piece of wood if it has three things: temperature, turbulence, and time.

- 1. Temperature.** The catalytic combustor can only start burning the gases in the wood smoke after the smoke has reached at least 500 degrees F (internal temperature). Before the smoke reaches that temperature, it simply is not hot enough to start the reaction at the combustor. This will result in an inefficient smoldering fire.
- 2. Turbulence.** The wood smoke can interact best with the precious metals inside the honeycomb cells if there is some variation in the air flow. Increased turbulence enables more of the wood smoke to come into contact with more of the nooks and crannies in the honeycomb cells. The exhaust path as well as the irregular surface of the combustor cells adds needed turbulence.
- 3. Time.** Once the temperature and turbulence are achieved, the catalytic combustor just needs to have enough time to burn all the gases in the wood smoke. For this reason, it is best to minimize the amount of air you allow into the firebox once the combustor is ignited. Allowing too much air into the firebox speeds up the rate at which the fire burns and allows more wood smoke to be consumed by the secondary combustion system. The ideal air setting for a long catalytic burn allows enough air to keep the wood burning and producing smoke.

With proper care, a new catalytic combustor will give years of fuel savings and lowered emissions. By following some simple guidelines you can ensure maximum combustor performance and longevity. Your catalytic combustor is designed to last for 12,000 -14,000 hours of use. You can ensure yourself of getting the maximum life from your combustor by following these simple guidelines:

- 1) Burn only natural, dry wood.
- 2) Wait until the exhaust gases reach about 500 degrees F when monitoring temperatures with an internal catalytic probe thermometer or flue probe thermometer, **or** 250° on single wall stove pipe, after reestablishing a strong fire.
- 3) Bypass the combustor before reloading, and leave the bypass open for a few minutes after reloading, to raise the temperature in the stove.
- 4) Don't overfire the stove.



*Bypass lever should be up when starting or reloading the Absolute Steel. Allowing the smoke to heat up to 500° F*



*The bypass lever interlocks with the door when the combustor is engaged (bypass closed). This safety feature makes it impossible to open the loading door without opening the bypass.*



5) Clean the combustor regularly. See instructions below.

You can also obtain a lot of useful information by visiting our website ([www.woodstove.com](http://www.woodstove.com)). Other very useful web sites on all aspects of wood burning are ([www.woodheat.org](http://www.woodheat.org)) and ([www.csia.org](http://www.csia.org)). CSIA is the Chimney Safety Institute of America.

## Inspection & Cleaning

Your stove comes with a new stainless steel combustor already installed. The stainless combustor is a honeycomb foil block located under the top lid of the Absolute Steel . Typical lifespan for a well maintained catalytic combustor is 4-6 years. There are a few ways to determine if your combustor needs to be cleaned. If you notice the smoke exiting your chimney is thicker and darker in color, the combustor may need cleaning. Additionally, if you notice reduced draft or backpuffing, or performance and heat output has diminished, then the combustor may not be working as efficiently as designed.

Plan to clean and visually inspect your catalytic combustor about every 4-6 weeks, or at least 3 times during the heating season. Any fly ash deposits on the combustor will need to be brushed or vacuumed off. An accumulation of fly ash can reduce the draft, causing backpuffing, sluggish burning and inefficient heating performance. You should clean and check your combustor before the heating season begins, as well as on a regular 4-6 week basis.

### COMBUSTOR STANDARD CLEANING HOW TO:

**Materials needed:** (1) work gloves and safety glasses; (2) soft bristled paint brush or vacuum cleaner (preferably one designed for ash removal).

1. Be sure the fire is out and the stove is cold. If you are using a regular home vacuum, it is extremely important that no hot ashes or embers be sucked into it as this could result in damage to the vacuum or cause a serious fire. Open the top lid. The combustor is located under a heat deflector. To remove the heat deflector, tilt up the back of the shield and pull it forward.

2. Lift the combustor out of the stove. Brush or vacuum the combustor sure to remove all fly ash from the combustor. Inspect the gasket that the combustor housing rests against.

3. Return the combustor to the stove. Be sure that it is seated properly. Place the heat deflector over the combustor.

4. Close the top lid.

### COMBUSTOR VINEGAR & WATER CLEANING HOW TO:

The vinegar & distilled water cleaning is recommended 1-2 times during the heating season. The vinegar is just acid enough to remove any ash within the cells of that may be masking the catalytic coating.

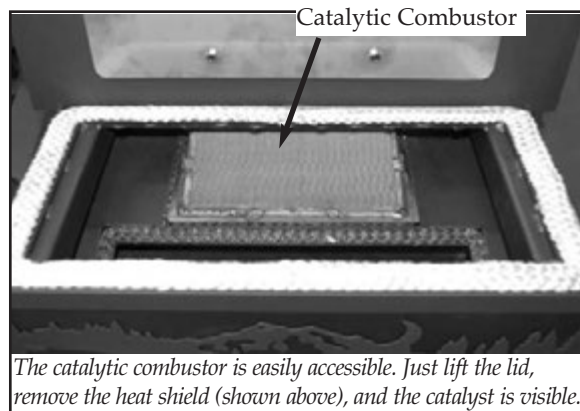
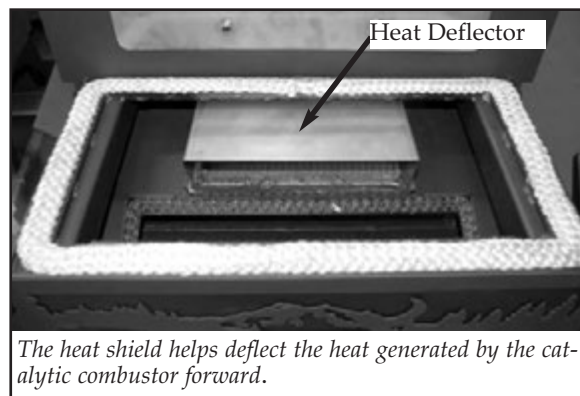
**Materials needed:** (1) work gloves and safety glasses; (2) spray bottle; (3) white vinegar; (4) distilled water.

1. Be sure the fire is out and the stove is cold. Open the top lid. The combustor is located under a heat deflector. To remove the heat deflector, tilt up the back of the shield and pull it forward.

2. Lift the combustor out of the stove. Place the combustor onto newspaper or an old towel. In the spray bottle prepare a 50/50 white vinegar & distilled water mixture.

3. Spray the 50/50 mixture through one side of the combustor and allow it to drain onto the newspaper. Flip the combustor over and spray through the other side and allow it to drain.

4. Rinse the combustor with 100% distilled water to remove any remaining vinegar, allow the combustor to dry before returning the combustor to the stove.





5. Return the combustor to the stove. Be sure that it is seated properly. Place the heat deflector over the combustor.
6. Close the top lid.

## Catalytic Combustor Replacement

If you feel that your catalytic combustor is not working properly, please contact Woodstock Soapstone Company at 1-800-866-4344 for instructions regarding return and replacement. Accessing the catalyst in your new Absolute Steel Hybrid Woodstove is simple. **1)** Lift the top stove lid, **2)** Remove the heat deflector (pictured on previous page), **3)** Lift the catalyst from the stove, **4)** Install the new combustor, **5)** Set the heat deflector over the combustor, and **6)** Close the top lid.

## Frequently Asked Questions

### Q. How does the catalytic combustor work?

- A. The catalytic combustor breaks the bonds that hold the chemicals contained in wood smoke together. The result is that these chemicals begin to burn at temperatures of about 500 degrees F (the normal range of exhaust gas temperatures). Without the catalytic combustor, wood smoke would have to be brought up to a temperature of 1000 to 1200 degrees F in order to start to burn. A stove with a catalytic combustor will generate up to 25% more heat from each piece of wood, thus reducing the amount of fuel used during the year.

There are three advantages to burning the smoke created by burning wood. *First*, the smoke becomes another source of fuel, giving you more heat from the same amount of wood. *Second*, creosote causing materials will be burned up instead of being deposited in your chimney, reducing the risk of a chimney fire. *Third*, air pollution will be drastically reduced.

### Q. How can I tell if the catalytic combustor is working or “worn out”?

- A. *First* - The best way to tell if the catalytic combustor is working is by observing the smoke coming out of your chimney. If there is only a small amount of smoke, and/or it's white in color, the catalytic combustor is working. You will see significantly more smoke when the combustor is being bypassed than when the smoke is being burned by the combustor.

*Second* - One very noticeable effect of a well functioning combustor is the high efficiency of your stove. Catalytic combustors produce lots of heat, which the stove radiates into your home. If you notice that the stove is producing less heat, or that a load of wood doesn't provide as much warmth, under similar circumstances, as it did before, it's time to check the combustor. If and when the catalyst ceases to function properly, the stove will produce noticeably less heat.

*Third* - Regular inspection of the connector pipe and chimney flue should show very little accumulation of soot and creosote. Soot is typically brown and powdery when the combustor is working properly. Heavy buildup of black sticky creosote may indicate the combustor is not functioning or needs cleaning.

If you suspect that your catalyst is not working, let the stove cool down and clean the combustor and try it again.

### Q. How do I maintain my catalytic combustor?

- A. Combustors should be inspected and cleaned if necessary **every 4-6 weeks, or a minimum of 3 times** during the heating season. When the stove is cool, the combustor can be cleaned by thoroughly vacuuming or brushing both sides.

If the stove does not draft well when the catalytic combustor is engaged then the combustor cells themselves might be partially plugged with fly ash. If this is the case, follow the cleaning procedure described in detail on page 19 of this manual.

### Q. Is it all right to burn my stove hot daily to clean any build up in my chimney system?

- A. It is not necessary to burn your stove hot daily to burn off any creosote build up in the chimney. This function is performed by the catalytic combustor. It is there to reduce the emissions from the stove that contribute to deposits in the connector pipe and chimney flue.

View more frequently asked questions and articles at our web site **[www.woodstove.com](http://www.woodstove.com)**. Other very useful websites

on all aspects of wood burning are [www.woodheat.org](http://www.woodheat.org), and [www.csia.org](http://www.csia.org). CSIA is the Chimney Safety Institute of America.

## **TWO OTHER IMPORTANT POINTS REGARDING CATALYTIC COMBUSTORS:**

- 1) The combustor uses wood smoke as fuel. Most smoke is created in the early stages of the burn cycle. When a bed of coals is all that remains of your wood, there is little smoke left to fuel the combustor, and it will no longer create substantial amounts of heat. Hence, the temperatures on the surface thermometer tend to fall toward the end of the burn, even though the firebox is full of hot coals. This does not mean that you have to reload the stove or open the bypass. Let the hot coals burn down to ashes.
- 2) Since the combustor blocks the path of exiting smoke, it can reduce the draft in your stove. When draft is reduced by warm or rainy weather, open the bypass damper longer when starting the stove to create more draft.

## **CATALYTIC COMBUSTOR WARRANTY**

The catalytic combustor in your Absolute Steel Hybrid Woodstove is fully warranted for three years from the date of purchase against any defect in workmanship or materials that prevent the combustor from functioning when installed and operated properly. The catalytic combustor is additionally warranted for three years from the date of purchase for any deterioration in the stainless steel substrate material. For instructions regarding return or replacement of the catalytic combustor, please contact:

Woodstock Soapstone Company, Inc.

66 Airpark Road

West Lebanon, NH 03784

Phone: 1-800-866-4344 • Web: [www.woodstove.com](http://www.woodstove.com)

# MAINTENANCE

## Stove Cleaning

The steel body of your Absolute Steel Hybrid stove is painted with high temperature stove paint. Under normal operating conditions, this paint will not peel or blister. We suggest cleaning by dusting with a soft brush or cloth, or vacuuming with a brush attachment when the stove is cold. If the steel is exposed to moisture for a long period of time it may develop surface rust. If this happens, brush the affected area until clean with either a short wire brush or medium steel wool and then touch-up with high temperature stove paint, which is available from Woodstock Soapstone Company.

The soapstone or firebrick that lines the firebox interior is rugged and well suited to the harsh environment of the firebox. It should last for years under normal use. Should you need a replacement soapstone or firebrick part, contact Woodstock Soapstone Company directly.

## Glass Cleaning

We use ceramic glass in our stoves because it is resistant to both impact and thermal shock. The panes of ceramic glass installed in the stove fronts have full gaskets around the perimeter so there is no contact between the glass and the steel frame.

There are two panes of glass at the front of the Absolute Steel Hybrid, with an air-space between the two panes. This “thermalpane” arrangement helps to maintain a higher temperature on the inside glass, which helps prevent condensation and soot from accumulating. The Absolute Steel Hybrid has a large glass area with an “airwash” design in which the primary air supply washes over the front glass to assist in keeping the glass free of ash and soot.

The glass may soot up the *first* time you use the stove (from condensation already inside the stove). *Don't be alarmed!* Usually, as soon as you build up adequate temperature with a hot fire, the glass will clean itself. The residue will burn off, and it will stay clean. Soot accumulation on the inside of the glass is more likely in the spring and fall, when temperatures are very mild and you are less likely to maintain a hot fire.

To clean the inside of the glass or wipe off fly ash, we recommend that you use a brush with soft bristles (like a paintbrush). A white vinegar and water solution works well to remove most ash or soot accumulation. You may clean heavy soot from the glass with very fine steel wool (0000 grade), but first, be sure the fire is out; and second, be sure that the glass has cooled to room temperature before you clean it. Once the glass is cool, you can lift out the two andirons to give you easier access to the glass. Once the glass is clean simply reinstall the andirons. **DO NOT ATTEMPT TO CLEAN HOT GLASS.**



*For easy access to the glass for cleaning, simply remove the two andirons by lifting up.*



*Insert the andirons back into the stove after cleaning the glass. The andirons help keep wood away from the glass and the air wash system unobstructed.*

## Gasket Replacement

There are 5 places on your stove where you should check the gasket routinely: (1) on the loading door, (2) under the steel lid/cooktop, (3) under the catalytic bypass damper, (4) under the catalytic combustor, and (5) the ashpan door (models purchased with the ashpan). These gaskets are most important for maintaining high efficiency and clean burning. Close a slip of paper in these gasketed areas. There should be resistance as you pull the paper out. If there is any evidence of deterioration and/or leaking in any of these areas or if any of the gasket material in the stove becomes worn or frayed, it should be replaced. Please contact Woodstock Soapstone Company for replacement gasket and instructions. The sizes of all the gaskets on your Absolute Steel Hybrid woodstove are included in the parts list on page 29 of this manual.

## Routine Checks And End of Season Maintenance

Every few weeks of operation we recommend checking the chimney connector (stovepipe) and combustor (see combustor section) and cleaning, if necessary. The connector pipe and chimney should be inspected every two months at a minimum and cleaned if necessary.

When the weather warms up and the burning season is over, it is a good idea to do a thorough spring cleaning and inspection of your stove and chimney system. We recommend an annual inspection and cleaning by a certified chimney sweep who has the tools and knowledge to inspect the whole system, from top to bottom. Chimney safety is an important part of responsible wood burning. The best way to gain confidence in the safety of your Absolute Steel Hybrid woodstove is to have it serviced and inspected once a year by a professional chimney sweep. The Chimney Safety Institute of America maintains a database of certified sweeps nationwide, visit their website [www.csia.org](http://www.csia.org) to find a professional in your area.

If you live in a climate with warm, humid summer weather, your stove may collect moisture from warm, moist, chimney downdrafts during the summer. If this happens, you may get smoky smells in your home. One way to reduce the likelihood of this happening is to block the flue exit in the stove with fiberglass insulation at the end of the heating season. This will help prevent downdrafts and humidity from entering the stove. (You'll have to be careful to remember to remove the insulation before you light the stove again in the fall!). Some prefer to place a tray of kitty litter or baking soda in the firebox to reduce moisture and odors.

## Creosote Formation and Need for Removal

When wood is burned too 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 and dangerous fire.

The chimney connector and chimney should be inspected at least once every two months 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. Cleaning the combustor regularly will also greatly reduce creosote buildup. Under certain conditions, creosote can form rapidly.

The most likely conditions for creosote to occur are: (1) when filling the firebox with a hot bed of coals and the damper is then completely closed; (2) extremely long, smoldering fires, and; (3) burning wet or green wood.

Lack of combustion air and smoldering fires usually result in dense smoke and low stack temperatures in the chimney connector and the chimney. Wet or green wood can also produce dense smoke and excessive water vapor, which can quickly lead to creosote buildup.

Creosote will accumulate faster in exterior chimneys than interior chimneys because of colder outside temperatures.

There are three stages of creosote build-up. The first is a flaky, crystal like accumulation which can be removed with a brush. The second is a tar like coating. The third is a hard, glossy enamel like coating that is difficult to penetrate. If your chimney is heavily coated with tar or enamel like creosote, we recommend that you consult with an experienced chimney sweep about removal and prevention.

**CREOSOTE PREVENTION:** Without question, the best way to treat creosote is to prevent its accumulation. In order to reduce the danger of accumulation, we recommend the following:

1. Only burn properly dried firewood. Dry wood burns hotter, cleaner, and expels less moisture to condense.
2. Use the catalytic combustor properly. It can reduce possible creosote accumulation by as much as 90% and improve stove efficiency at the same time. Be sure to read the section on catalytic combustors on pages 19-21.
3. Never operate your stove for extended periods of time with the draft control completely closed. Both the wood fire and the catalytic combustor need oxygen to burn efficiently.
4. Reestablish a hot fire, and reignite the combustor after every reloading by opening the primary air control for about 10 minutes.
5. Check the catalytic combustor output. Use the thermometer provided with the stove to be sure that the catalytic combustor is igniting properly when you kindle a fire or reload the stove. The temperatures on the stove top should rise noticeably when the catalytic combustor is engaged.
6. Avoid long, smoldering fires. Again, the catalytic combustor is critical here. Hot firebox temperatures (with the stove top thermometer in the 400-600°F range) will produce more complete combustion and maintain proper catalytic activity.



# TROUBLESHOOTING GUIDE

<u>Problem</u>	<u>Possible Cause</u>	<u>Solutions</u>
Stove smokes	Operating technique	Open bypass and air damper prior to reloading stove
	Cold start	Check and establish a chimney draft prior to lighting the stove. If you have neutral or a down draft, preheat the chimney with a hairdryer, heat gun, or twists of lit newspaper.
	Blocked Chimney	Examine chimney and stovepipe for blockage and creosote accumulations. Check spark arrestor screen on your cap, if you have one.
	Blocked outside airduct	Check the outside inlet for blockage caused by snow, debris, or insects.
	Oversized chimney	Reline chimney to appropriate size.
	Chimney too short	Add height (industry standard is 15ft or more).
Back Puffing or sudden internal ignitions	More than one appliance vented into flue	Disconnect other appliances, seal openings appropriately.
	Operating technique	Open bypass and air dampers before opening to reload and keep it open a few minutes after reloading.
	Burn rate too low	Open air damper to allow for hotter burn.
	Chimney down draft	In high wind areas, a specially designed wind cap may be necessary.
	Combustor is plugged	Clean combustor of accumulated fly ash.
	Tight house	Dedicated air supply with outside air adapter attachment to stove.
Combustor not glowing	Late stage of burn	Combustor does not need to be glowing to be working. Check smoke exiting chimney to help determine if combustor is working properly.
Stove burning too hot or fast	Ashpan Door is Open	Close ash door securely, check ash door gasket for tight seal.
	Excessive draft	Adjust air damper to lower setting;a pipe damper may be necessary.
	Extra tall chimney	Consider installing pipe damper

Stove burning too hot or fast (cont.)	High wind or hilltop location	Install wind cap on top of chimney
Insufficient Heat	Poor quality or green wood	Use only dry wood (dried at least one year depending on wood species) Test with kiln dried wood.
	Blocked outside air duct	Check outside air duct for blockage
	Heat going up chimney	Test with thermometer on 1st section of stovepipe– temps should drop below 300 degrees F when combustor is engaged.
Acrid odor during initial burn	Paint and/or window gasket curing	Open windows until paint or gasket is cured.
Window Dirty	First start up fire	This is sometimes the result of condensation in a new stove, and should disappear after several hot fires.
	Airflow too restricted	Open the air damper in small increments until some slow flames appear. Run a hot fire to burn smoke off the glass, or remove build up with glass cleaner when stove is cold.
	Smoldering fire	Green or wet wood. Burn dry wood, or open air damper slightly for a hotter burn. (see above)

#### Is my Combustor still working?

Your catalytic combustor is viable for 12,000 to 14,000 burn hours. This translates, roughly, into a life span of 4 -6 years. If the catalytic coating is not working as it should, it is not burning the gas vapors in the smoke and therefore, the smoke exiting your chimney will be darker in color. If your draft is sluggish and you have ruled out any draft related issues in the venting or in the wood supply, your combustor may not be burning the smoke vapors and too much volume is trying to pass through the honeycomb at one time. If heat output is diminished, and any other factors are ruled out, that may also be a sign that the catalytic combustor is not burning the smoke vapors, therefore not extracting maximum heat from available BTUs in the wood you are burning.

# SAFETY

## Overview

To gain maximum enjoyment and benefit from your stove, you must have a safe installation. Adhere to all guidelines found in this manual. All local and national building codes need to be followed. Having a certified installer perform all connections to an inspected chimney system is strongly advised. If you choose to perform any or all of this work yourself, it must be inspected by either a Certified Wood Stove Specialist or a Certified Chimney Specialist.

You will often find the local Fire Department to be very knowledgeable. They may inspect your house for proper warning devices, fire extinguishers, and evacuation routes. Keep their phone number handy. Although many communities utilize Fire Department personnel for woodstove installation inspections, they are not usually trained as combustion venting specialists. Generally, you are best advised to use a certified specialist. The sense of security that comes with a properly installed and maintained system is worth far more than its cost.

## Installation

Your Woodstock Soapstone Co. Stove has been thoroughly tested and listed to UL #1482 by an independent testing laboratory. UL #1482 is the standard for testing solid fuel appliances and is universally recognized by all national building regulatory agencies, (SBCC, BOCA, ICBO) and individual states. Your woodstove is a safe product, but it must be installed in accordance with the instructions in this manual. Woodstoves themselves rarely cause fires, but improper installation or careless operation are often to blame.

Follow the guidelines in the Installation chapter of this manual with regard to:

- Proper chimney and connector pipe
- Clearances to combustible surfaces and objects
- Floor protection

## Smoke and the Chimney

According to [www.woodheat.org](http://www.woodheat.org), "The chimney is the engine that drives a wood heat system". To have a safe system you must have:

- The correct type of chimney
- The correct size of chimney
- Correct location inside the house
- A properly installed system

Smoke spilling into the living space when starting a fire is an inconvenience. Smoke spilling into the house when you are away or asleep can be a major problem. In order to have all the smoke go up the chimney all the time, the chimney must have positive draft. Ideally, this draft is between 10-18 pascals, or .04-.07 inches water column, a pressure measurement, when there is no fire in the stove. A certified installer can perform a simple draft test for this.

## Hot Surfaces

Your stove is HOT to the touch! Utilizing the fall-away tool and use of heat resistant or insulated stove gloves can prevent serious burns when opening or closing the door, ash pan, or lid of your stove.

## Ash removal

Convenient and safe ash removal is a necessity for trouble free wood burning. An ash removal container should have:

- A comfortably large capacity
- Good stability
- A top that closes securely and will not fall off
- Legs or other means of preventing downward heat flow
- A design that prevents spilling when loading

Ashes should never be dumped into a combustible container, such as a cardboard box, and an ash container should never be set on a combustible surface. Hot embers in the ashes can often stay viable for 36 hours or longer after removal from your stove.

## Precautions

- **Smoke detectors:** A smoke detector is inexpensive insurance and is required by most localities. They can either work on batteries, or can be hard-wired into your electrical system. If you have battery operated detectors, it is a good idea to replace batteries on an annual basis (i.e.: every New Year's day, or 4th of July, etc). They will sound an audible alarm in the event of the presence of smoke. Smoke will almost always precede a wood fueled fire.
- **Fire Extinguisher:** If you burn wood, you should have at least one ABC dry chemical extinguisher. The chemical extinguisher is preferable to water because the application of cold water to hot metal stove pipes can cause metal parts to buckle or crack, thereby releasing more fuel to the fire.
- **Carbon Monoxide Detector:** These operate in a manner similar to smoke detectors but are usually user calibrated and record minute quantities on a digital readout before sounding an audible alarm. The chances of carbon monoxide being created and escaping from your properly installed and operated stove are miniscule. You may have other vented appliances in your home that could be potential problems. The investment in a high quality carbon monoxide detector is well worth its cost in the peace of mind it affords.
- **Chimney inspection:** Your connector pipe and chimney, or chimney pipe, should be inspected at regular intervals. Examine the connector pipe for creosote, corrosion, loose seams, or excessive soot. Clean and replace as necessary. The chimney, or chimney pipe, should be cleaned and checked by a certified specialist once a year. A small mirror held at the cleanout door of a masonry chimney will be helpful. For a Class A prefabricated metal pipe, some disassembly is usually required.

## Emergency Procedures In The Event of a Chimney Fire:

If you have a chimney fire or runaway fire, follow these safety precautions:

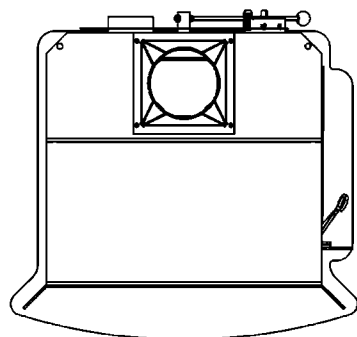
1. Close the draft damper immediately, with a slow and even motion. This cuts off the supply of oxygen to the stove.
2. Call the fire department immediately.
3. Get everyone out of the house. One adult should stay in the house to check for sparks and signs of fire. Those outside should watch the roof for signs of fire.
4. If there is a danger of a fire, discharge the fire extinguisher into the stove. Do not pour or spray water directly into the chimney as rapid contraction caused by the application of cold water could cause the tile liner in the chimney to crack.
5. After the fire is out, check the stove, chimney connector and chimney carefully for signs of damage. The entire system should be thoroughly inspected by a certified chimney professional.

**Note:** Chimney fires must be put out from the bottom. The entire system must be air tight to suffocate a fire; hence the importance of having a tight cover on the chimney cleanout and not venting two appliances into a single flue.

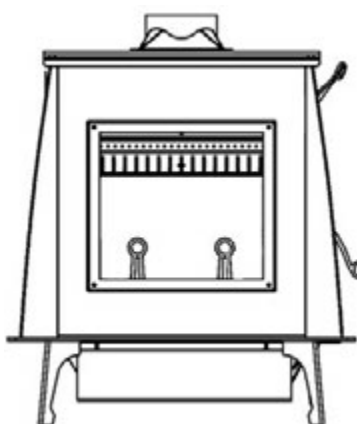
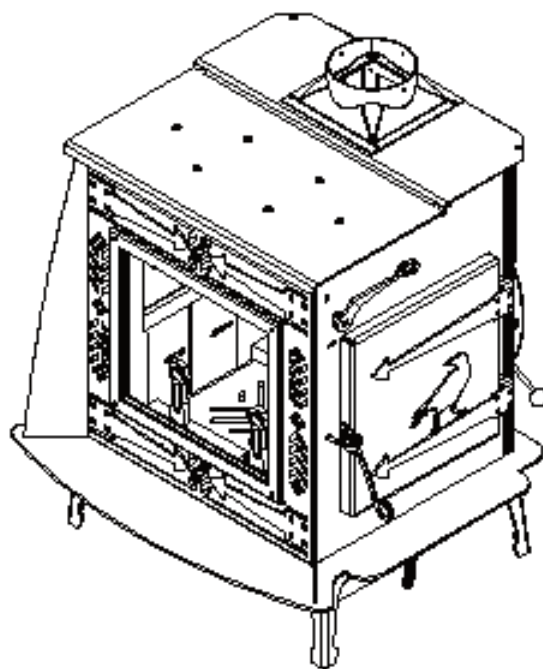
The length of time it takes to bring a chimney fire under control depends on the amount of fuel in the stove, the rate at which it is burning and the amount of oxygen available to it. The faster it is brought under control the less severe any damage is likely to be.



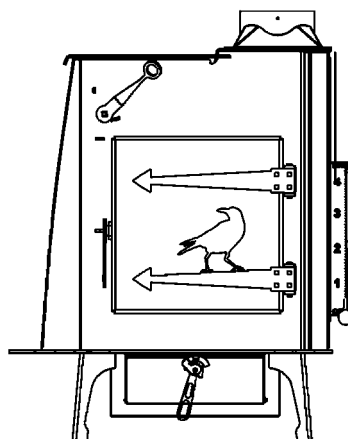
## REPLACEMENT PARTS



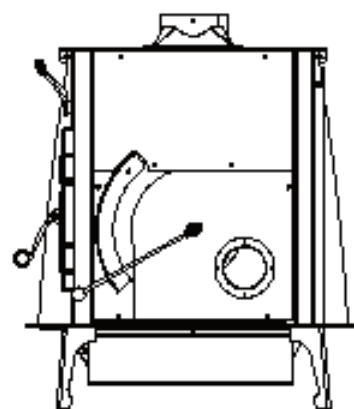
TOP VIEW



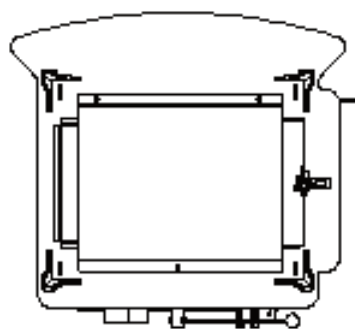
FRONT VIEW



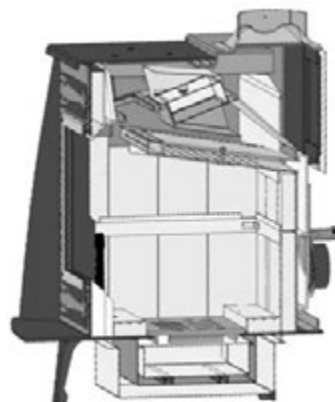
SIDE VIEW



BACK VIEW



BOTTOM VIEW



CUT-AWAY VIEW

## REPLACEMENT PARTS

### COMPLETE ASSEMBLIES AVAILABLE AS REPLACEMENT PARTS

PART NO.	DESCRIPTION	QTY/PER	
R-10	DOOR ASSEMBLY	1	
R-18	FLUE COLLAR ASSEMBLY	1	
R-22	AIR INTAKE WHEEL ASSEMBLY	1	
R-26	TOP LID ASSEMBLY	1	
R-30	BRICK RETAINER ASSEMBLY	1	
R-32	ANDIRON HOLDER ASSEMBLY	2	
R-34	PRIMARY JET INLET ASSEMBLY	2	
R-46	RACHET, AIR INTAKE ASSEMBLY	1	
R-48	OUTSIDE AIR ADAPTOR ASSEMBLY	1	
R-50	GRATE ASSEMBLY	1	
R-52	SOAPSTONE LINER ASSEMBLY	1	
R-54	TERTIARY AIR INLET ASSEMBLY	2	

### INDIVIDUAL PARTS AVAILABLE FOR REPLACEMENT

PART NO.	DESCRIPTION	QTY/PER	MATERIAL
R-907	HINGE PIN, DOOR	2	STEEL
R-193	HANDLE, DOOR	1	STEEL
R-925	BYPASS COVER	1	STEEL
R-513	HEAT SHIELD, BYPASS COVER	1	SS
R-935	HANDLE, BYPASS	1	STEEL
R-165	TOP LID	1	STEEL
R-515	HEAT SHIELD, TOP LID	1	SS
R-163	FLUE COVER	1	STEEL
R-145	GLASS RETAINER	1	STEEL
R-904	GLASS, HIGH TEMP: 5 MM CERAMIC	2	GLASS
R-981	ASH PAN (PG-934)	1	STEEL
R-983	ASH PAN COVER (PG-989)	1	STEEL
R-917	HINGE PIN, ASH DOOR	1	STEEL
R-121	HANDLE, ASH DOOR	1	STEEL
R-913	ASH DOOR, OUTER	1	STEEL
R-941	HANDLE, AIR INTAKE	1	STEEL
R-943	KNOB, AIR INTAKE	1	PHENOLIC
R-997	HEAT SHIELD, REAR	1	STEEL
R-995	HEAT SHILD, BOTTOM	1	STEEL
R-523	HOOD, COMBUSTOR	1	SS

### GASKET SPECIFICATIONS

PART	SPECIFICATION		
TOP LID	0.875" MD DENSITY ROPE	64"	
BYPASS	0.625" LD2 BASALT ROPE	42"	
COMBUSTOR	0.625" LD2 BASALT ROPE	38"	
DOOR	0.875" MD DENSITY ROPE	52"	
ASH PAN DOOR	0.500 MD ROPE	32"	
OUTER GLASS	BH .125 X .750 GRAPHITE TAPE /.187 X .750 TAPE	58"	
INNER GLASS	BH .1875 X .750 GRAPHITE TAPE /.187 X .750 TAPE	58"	
FLUE COLLAR	BH .125X.750 GRAPHITE TAPE CUT IN HALF	34"	
FLUE COVER	BH .125X.750 GRAPHITE TAPE CUT IN HALF	34"	
OAA	BH .125X.750 GRAPHITE TAPE CUT IN HALF	121"	

### CATALYTIC COMBUSTOR SPECIFICATIONS

R-56: 5.25" X 10"X 2.125" CANNED DIM. DURAFOIL OR EQUIVALENT. 49 CELLS PER SQ INCH

INSIDE LINER REPLACEMENT PARTS

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REVISIONS SHEET

DESCRIPTION\*

DATE\*

APPROVED\*

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	Material	Dim. 1	Dim. 2
1	R-411-151007	BRICK (WHOLE)	7	PURCHASED	4.5	9.0
2	R-413-160802	SOAPSTONE 1-1/4	4	PURCHASED	4-1/2	5
3	R-431-151007	BRICK (2 CUT)	1	PURCHASED	2.13	5
4	R-439-160802	SOAPSTONE 1-1/4	1	PURCHASED	4-3/4	5-1/8
5	R-415-151007	BRICK (1 CUT)	1	PURCHASED	4.5	5.87
6	R-417-151007	BRICK (1 CUT)	1	PURCHASED	4.5	6.63
7	R-437-160802	SOAPSTONE 1-1/4	2	PURCHASED	4	9-1/4
8	R-429-160802	SOAPSTONE 1-1/4	2	PURCHASED	3	8-1/4
9	R-433-160802	SOAPSTONE 1-1/4	2	PURCHASED	2-1/4	5
10	R-421-151007	BRICK (1 CUT)	2	PURCHASED	1.63	9
11	R-425-151007	BRICK (1 CUT)	2	PURCHASED	3.65	9
12	R-427-160802	SOAPSTONE 1-1/4	2	PURCHASED	2-1/4	8-1/4
13	R-426-160802	SOAPSTONE 1-1/4	2	PURCHASED	3-3/4	5
14	R-449-151230	SOAPSTONE (2 CUT)	1	PURCHASED	5-1/8 (-45°)	7.4
15	R-451-160802	SOAPSTONE 1-1/4	2	PURCHASED	3-3/8	5-1/8 (-45°)
16	R-455-160802	SOAPSTONE 3/4	2	PURCHASED	3-1/4	4 (-45°)
17	R-453-151230	SOAPSTONE (2 CUT)	1	PURCHASED	4 (-45°)	6.9
18	R-419-151007	BRICK (1 CUT)	4	PURCHASED	3	9
19	R-447-151229	BRICK (2 CUT)	2	PURCHASED	3	3

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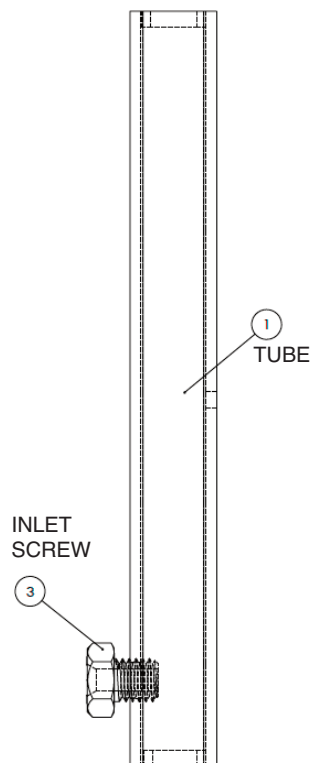
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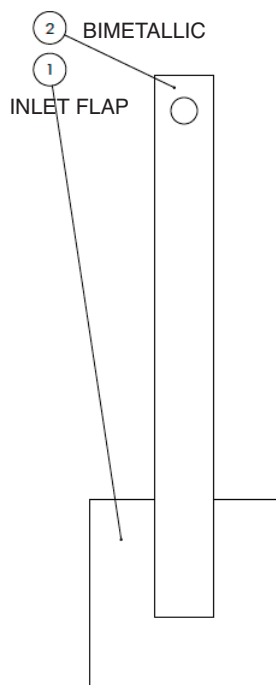
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## REPLACEMENT PARTS

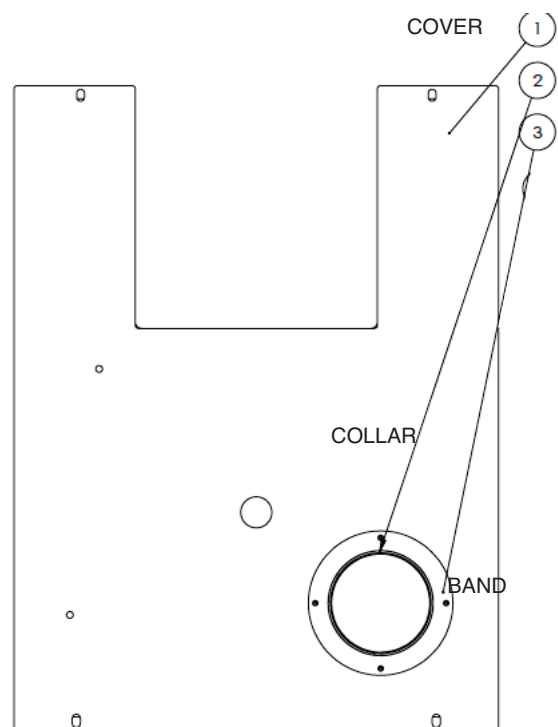
**R-34 PRIMARY JET  
INLET ASSEMBLY**



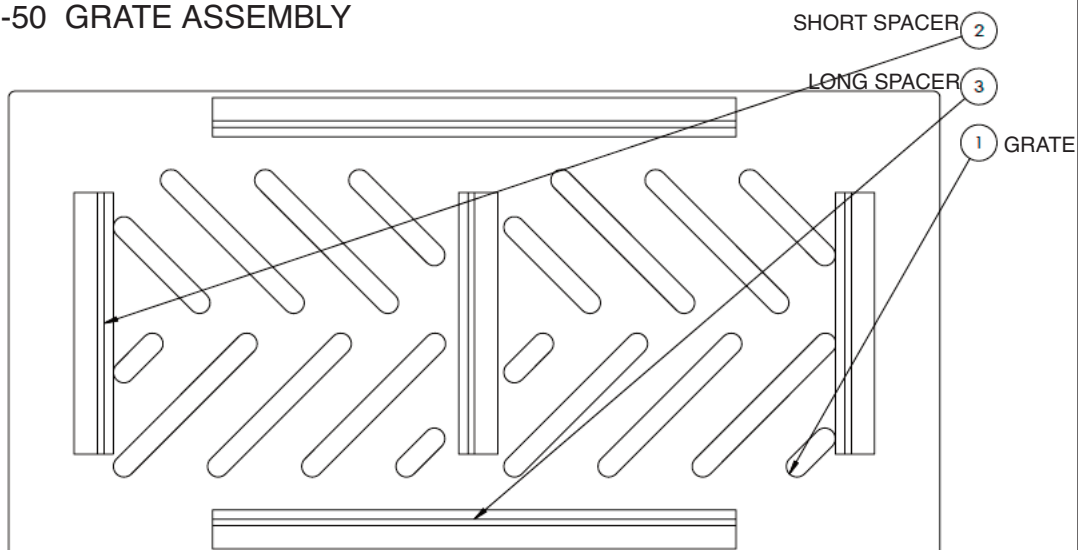
**R-54 TERTIARY AIR  
INLET ASSEMBLY**



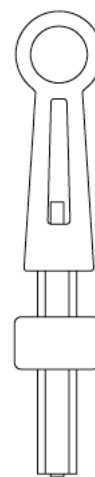
**R-48 OUTSIDE AIR  
ADAPTOR ASSEMBLY**



**R-50 GRATE ASSEMBLY**



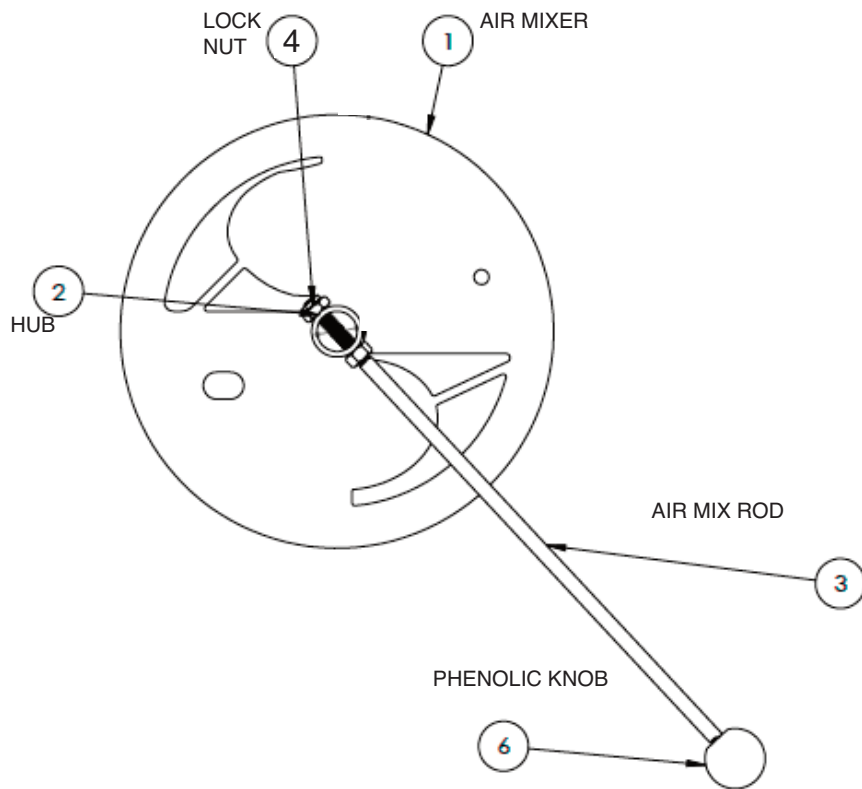
**R-32a ANDIRON**



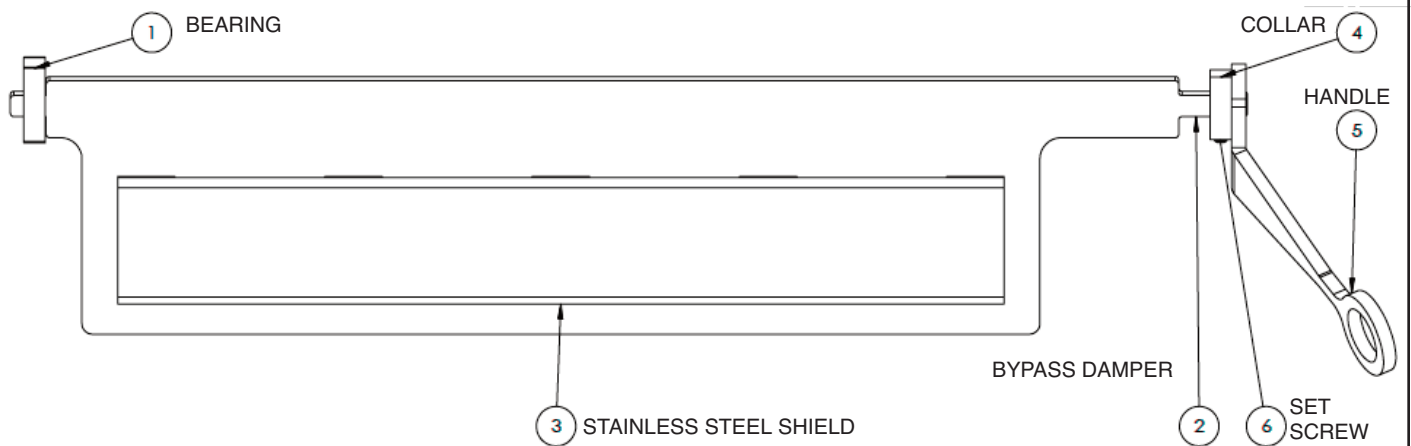


## REPLACEMENT PARTS

### R-22 AIR INTAKE WHEEL ASSEMBLY



### R-22 BYPASS DAMPER ASSEMBLY



[illegible]

# DIMENSIONS & SPECIFICATIONS

## Dimensions of Standard Height Stoves:

*Curved Wing & Triangle Wing Styles:*

H x W x D (includes ash lip & skirting) . . . . . 33.25" x 30" x 27.25"

*Wingless Styles:*

H x W x D (includes ash lip & skirting) . . . . . 33.25" x 25.5" x 24"

Footprint . . . . . 25" W x 20" D

Flue Height to Center (Rear Vent) . . . . . 28"

Weight . . . . . 490 lbs.

## Dimensions of High Style Stove:

H x W x D (includes ash lip & skirting) . . . . . 45.5" x 27" x 25.125"

Footprint . . . . . 25.5" W x 21.125" D

Flue Height to Center (Rear vent) . . . . . 40.625"

Weight . . . . . 530 lbs.

## Specifications for All Absolute Styles:

EPA 2020 Certified . . . . . Yes

Listed to UL 1482 . . . . . Yes

EPA Emissions Rating . . . . . 0.5 grams/hr

EPA Efficiency . . . . . 77%

Catalytic Combustor & Secondary Air . . . . Standard

Bottom Heat Shield . . . . . Standard

Area Heated . . . . . up to 1,800 sq. ft.

Flue Exit . . . . . Top or Back

Flue Size . . . . . 6"

Ash Pan . . . . . Optional

Loading Door . . . . . Right or Left Side

Loading Door Opening (W x H) . . . . . 12" x 10"

Draft Control . . . . . Manual

Back Clearance (no protection) . . . . . 14"

Back Clearance (w/Heat Shield Kit) . . . . . 8.5"

Side Clearance . . . . . 26"

Wood Length (Maximum) . . . . . 16-18"

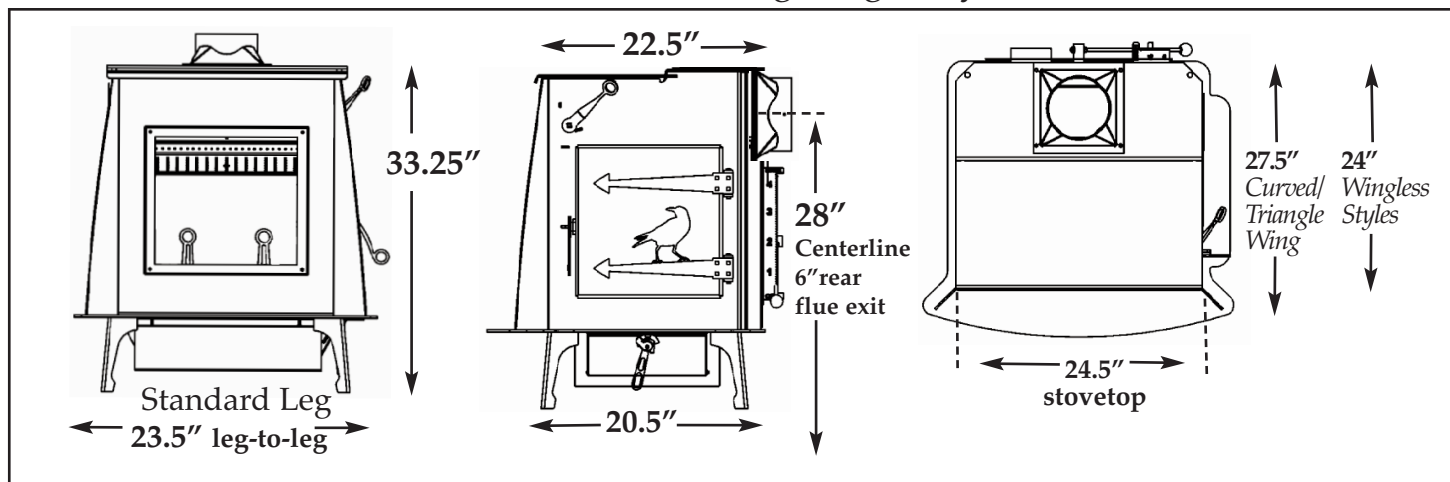
Window Size (viewable) . . . . . 14.5" W x 13" H

Firebox Size . . . . . 2.45 Cubic ft.

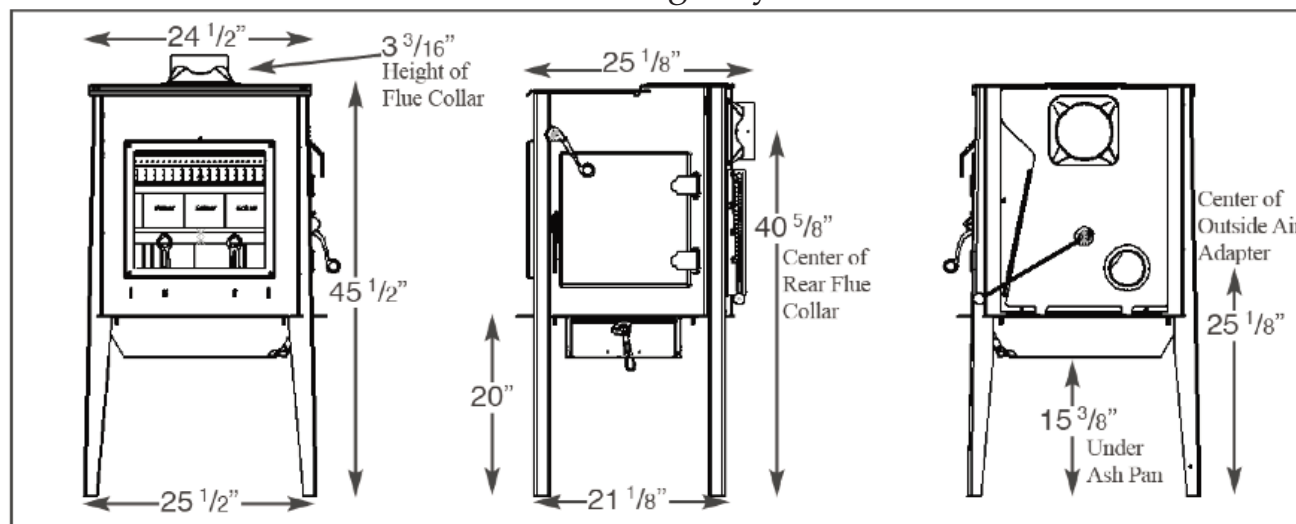
Burn Time . . . . . 10-14 hrs.

Heat Output Range . . . . . 10,000-48,000 BTU/hr.

## Absolute Standard Leg Height Styles:



## Absolute "High Style" Model:





GEAR HEAD STOVES  
BY WOODSTOCK SOAPSTONE COMPANY