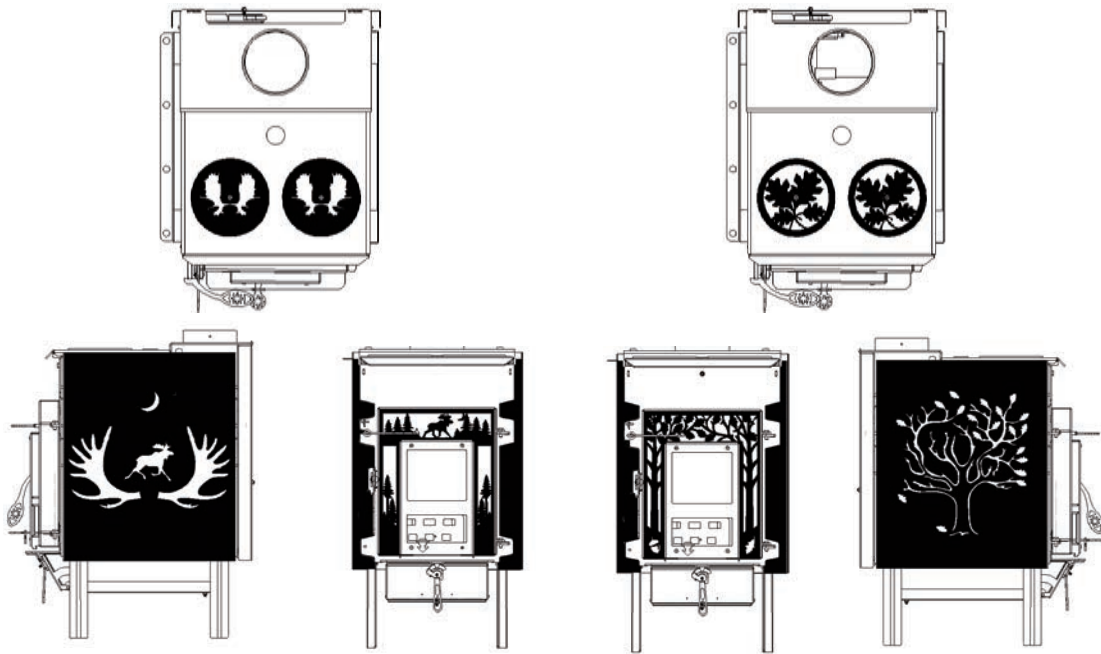


# SURVIVAL HYBRID WOOD STOVE MODEL 212S



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GEAR HEAD STOVES  
BY WOODSTOCK SOAPSTONE COMPANY

## OWNER'S MANUAL



Tested To UL 1482-2011(R2015)  
Tested & Listed By PFS Corporation  
Report #NAV171012v1

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

Tested and Listed by



Report #NAV171012v1

Rev 2105

# OUR GUARANTEE

We are confident that you will enjoy your new stove. During your first six months of ownership, test its performance and experience the comfortable warmth of soapstone. If you are not completely satisfied 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 212 Survival Hybrid Wood Stove**

The Model 212 Survival Hybrid 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 wood heat at rates ranging from 15,332 to 27,294 BTU/hr., and average emissions of 1.048 grams/hr. The Survival 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 Survival 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



Report #NAV171012v1

# LISTING TO UL #1482-2011

**Model 212 Survival Hybrid Wood Stove** has been tested to UL Standard #1482-2011 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 Survival Hybrid Wood Stove is a Clariant Corporation high performance 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 Survival 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 03784  
Phone: 1-800-866-4344 • Web: [www.woodstove.com](http://www.woodstove.com) • Email: [info@woodstove.com](mailto:info@woodstove.com)

# GEAR HEAD STOVES

Gear Head Stoves is a division of Woodstock Soapstone Co., which is specifically 'geared' to designing and building affordable stoves with high efficiency and low emissions. The first Gear Head Stove, The Ideal Steel Hybrid, was the grand prize winner of the 2013 Wood Stove Design Challenge competition, which judged 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. The Survival Hybrid Wood Stove is designed to be the cleanest, most efficient small wood stove available today.

# MODEL 212S

## SURVIVAL HYBRID WOODSTOVE

### TABLE OF CONTENTS

WARRANTY INFORMATION / CERTIFICATIONS.....	Inside Cover
EPA Certification, UL Listing, Warranty, Catalytic Combustor Warranty	
INTRODUCTION & EFFICIENCY / EMISSIONS.....	ii-iii
Survival Hybrid Wood Stove Explained	
INSTALLATION.....	1-7
Installation, Location, Chimneys, Clearance Table, Wall Protection, Floor Protection, Mobile Home Installation, Install Shields First	
OPERATION.....	8-15
Seasoning Your Stove, Getting to Know the Controls, Wood Burning Operation, Reloading & Overnight Burning, Ash Removal, Probe Thermometer, Overfiring, Daily Use, the Fall-Away Tool, Firewood	
CATALYTIC COMBUSTOR.....	16-18
How Your Combustor Works, Inspection & Cleaning, Replacement, Catalytic Probe Thermometer, Frequently Asked Questions, Catalytic Combustor Warranty Information	
MAINTENANCE.....	19-20
Stove & Glass Cleaning, Gasket Replacement, Routine Checks, End-of-Season Maintenance, Creosote	
TROUBLESHOOTING.....	21-22
SAFETY.....	23-24
Overview, Installation, Smoke & the Chimney, Heat, Ash Removal, Precautions, Emergency Procedures	
PARTS LIST & DIAGRAMS.....	25-28
MAINTENANCE LOG & NOTE SHEET.....	29
DIMENSION & SPECIFICATIONS.....	Back Cover

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# INTRODUCTION

Thank you for choosing one of our Survival Stoves! Our Survival Hybrid Wood Stove is designed to heat a small house. Here are some important things to know before using your stove for the first time.

## THERE SHOULD BE NO SMOKE INSIDE

With a good stove and chimney system, there should be no smoke or odor inside your home, and very little smoke outside the house. If you have smoke or odors inside the house, please let us know right away so we can help you!

## THE STOVE IS ONE PART OF A SYSTEM

The stove is part of a system. All parts of that system need to work together to ensure your wood stove is a safe and efficient heat source that you and your family will enjoy for years to come.

The system includes the 1) chimney, 2) stove, 3) hearth, 4) tools and ash bucket, 5) a safe installation, and 6) a trained operator (you!)

**1) The Chimney:** The chimney serves a critical function. It is the “engine” that drives the stove. As hot air rises in the chimney, “draft” is created which pulls combustion air into the firebox. It is essential to have a good draft in your chimney system for optimum stove performance.

A good draft in your chimney provides the oxygen needed for the fire to burn. A stove with a strong draft creates more heat. A sluggish or weak chimney draft will cause your stove to smolder, produce less heat, and potentially spill smoke and/or odors inside the home. These are all indications of a stove that isn't burning as it should.

Common reasons for poor draft include: a chimney that is too short or too tall, flue of the wrong size, and high winds.

High efficiency stoves, like your Survival Hybrid, maximize the heating potential of your wood and send cleaner exhaust into the air by burning the gas vapors in the smoke. The additional heat generated inside your stove is then radiated in your home. The smoke going up your chimney is cooler and cleaner. This makes a highly efficient stove more draft sensitive. A chimney that meets all requirements for your stove will ensure peak performance for heating..

**2) The Stove:** The Survival Hybrid is designed to burn wood efficiently and cleanly. It will produce more heat with less wood, resulting in clean air both inside and outside of the home. With basic maintenance and proper operation, this stove will keep you and your family warm for years to come. Plus, the Survival Stove has an added bonus of a cook surface on top for skillets, saucepans or kettles.

**3) The Hearth:** The stove is the heart of the home, and the hearth that the stove sits on creates a focal point that serves an important safety function. The stove must be placed on a non-combustible surface so that the floor is protected from

falling embers or ashes. The dimensions required for the hearth area are based on providing this protection, particularly from the loading door and ash pan.

Not having enough thermal protection to any combustible flooring under the stove (wood, carpet, vinyl, laminate, etc) can cause hidden scorching and can be a fire hazard. If the thermal protection is adequate but the size of the pad is not, there is danger of heat, ashes, or embers starting a fire on the combustible floor surface.

The manual has specific minimum dimensions for a hearth pad for your stove (pg. 3-4). If possible, we prefer larger hearth areas to allow plenty of room, if possible, for storing wood, hearth tools, or drying boots. A larger hearth also provides a visual cue so children, elders, and other members of the household give it a wide berth when passing by.

**4) Tools:** Having the right tool for the right job is a key to success. Your stove and your safety will benefit from the proper use of tools such as – an ash rake, an ash shovel, poker, a stove top thermometer, and an ash bucket. Woodstock Soapstone makes tools and ash buckets and has them available for purchase.

**Ash Rake** - Use the rake to help move ash down to the ash pan below.

**Ash Shovel** - Handy to remove coal “klinkers” and ash from the firebox. Be sure to use an appropriate ash bucket.

**Poker** - Use this to reposition wood inside the stove. You will also find the poker handy to adjust the air damper - just “poke” it to adjust the heat output. A very small adjustment can make a big difference.

**Magnetic Thermometer** - One is provided with your stove to help you monitor the firebox and stove top temperatures and catalyst operation.

**Ash Bucket** - The safe removal and disposal of ashes is of utmost importance. An ash removal container should be metal, have legs that lift it off the floor, and have a top that closes securely and will not fall or blow off.

**Ashes should NEVER be dumped into a combustible container, such as a cardboard box. An ash container should never be set on a combustible floor. Hot embers in the ashes can often stay viable for 36 hours or longer after removal from your stove. A galvanized ash can, set away from the home, on a non-combustible surface or up on bricks or cinder blocks is advisable.**

**5) Stove Installation:** A wood stove by itself is not a hazard, but an unsafe installation is. Following the specific guidelines for clearances and venting materials is critical. Your stove installation needs to conform to certain clearances for safety, not just around it, but under and over it as well.

Clearance is the open space between your stove, or stovepipe, and any combustible surface. A combustible surface is a surface that burns (like wood, sheetrock, fabric, etc.). Framed or sheet rock walls simply covered by brick or stone are still considered combustible because heat will transfer through those materials and dry out the combustible wall behind.

Both your stove and your chimney pipe need to conform to the required distances to combustible materials for the safety of your home and your family. Clearance specifications and information is in your manual (pg. 3-7). Read it carefully and make sure your installation meets all requirements.

Please note that installation of any wood stove in a mobile home has additional requirements that must be met. Because mobile homes can be airtight, an outside air adapter connection from the stove down and out to an outside air source is necessary for good air supply to your stove. This manual has additional information on connecting an outside air adapter. A pipe shield is necessary for the connection from the stove to the stainless chimney and there must be a spark guard screen on the chimney cap. Wood stoves cannot be installed in bedroom areas of a mobile home.

**6) Stove Operator** - The last part of a happy relationship with your stove is in the day-to-day use. Learning to use a catalytic stove means a little more participation on the owner's end, but the result is rewarding. Like learning to drive a car, or ride a bicycle, it becomes second nature.

The catalyst will work when the firebox temperature is 500 degrees, roughly when your magnetic thermometer reads 200-250 degrees on the top of the stove or single wall connector pipe. For proper use, start your stove with dry kindling and burn it for about 10 minutes with the bypass cover open. Watch your magnetic thermometer. When it reaches 200-250 degrees, close the bypass cover to force the smoke through the catalytic combustor. Smoke will then filter through the honeycomb of the stainless catalytic combustor. The catalytic combustor will activate and cause the gas vapors in the smoke to burn, creating more heat inside your stove and eliminating smoke.

## EFFICIENCY & EMISSIONS

### EPA TEST DATA

Your Survival Hybrid Wood Stove is a small wood stove, but is also:

- One of the cleanest woodburning stoves approved by EPA;

- One of the most efficient wood stoves approved by EPA;

AVERAGE WOOD EMISSIONS:	1.13 g/hr
AVERAGE WOOD EFFICIENCY:	79.5%
HEAT OUTPUT WOOD (BTU/hr):	15,332-27,294

## FACTORS EFFECTING EFFICIENCY & EMISSIONS

**1) Burn Rate:** The Survival Hybrid is able to attain its highest efficiency and lowest emissions burning wood at a low-medium burn rate. A lower burn rate gives the combustor more time to effectively burn the volatile gases as they enter into the catalytic combustor (pg. 16-18). 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 6-8+ hours.

**2) Wood Quality:** Cord wood with a moisture content between 15-22% is ideal for burning. The Survival 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 8,600 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 Wood 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 can produce enough heat quickly draw in secondary air and ignite the catalytic combustor within minutes. You may need to leave the loading door cracked open to allow enough oxygen in for a quick start. Soon you should be able to engage the combustor and start the clean burn cycle.



# INSTALLATION

Woodstock Soapstone Co. has been designing, building, and innovating wood and gas stoves since 1978. A properly installed and operated Woodstock 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 Survival 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 wood stove, 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 who are available to answer any questions you may have about your installation. 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 your installation in writing.

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.



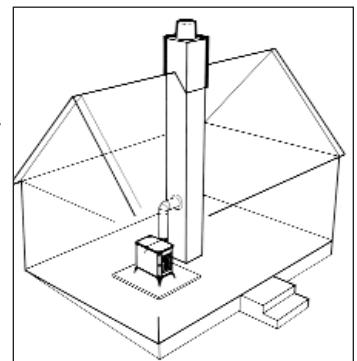
## LOCATION

A centrally located stove 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 so they can enjoy the beauty and comfort of the stove. A prominent location also helps with monitoring and reloading the stove as needed. A well planned placement will enhance your enjoyment of your stove and can also 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 212S SURVIVAL 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' X 8' X 8' SPACE.**

# STOVEPIPE AND CHIMNEYS

## Stovepipe (Connector Pipe)

Connector pipe is either single wall (sheet metal) or double wall (sheet metal outer pipe with a stainless steel inner pipe). Connector pipe is designed to connect your stove to your approved prefabricated chimney system. The connector pipe should be 6-inch diameter to match the flue collar of the stove. If you use single wall pipe, we strongly recommend 22 gauge pipe (26 or 28 gauge is too thin for use with a woodstove). Attach a 3-foot pipe shield to the first three feet of stovepipe. Use three sheet metal screws to secure each pipe joint, including the pipe to stove connection.



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

Single wall or double wall connector pipe CANNOT be used to pass through a combustible surface like a ceiling, wall, or window. Only use insulated chimney pipe to pass through a wall, ceiling, or roof. Single wall pipe can be used **inside the home**, but must connect to insulated chimney pipe to pass through a combustible surface.



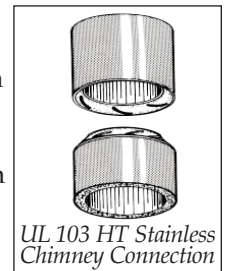
**DO NOT USE GALVANIZED SINGLE WALL PIPE AS CONNECTOR PIPE.**

## Stovepipe Shields

The Survival Hybrid includes a three foot pipe shield that must be attached to the back of the pipe, and a round ceiling shield/trim collar that must be attached where the connector pipe attaches to the chimney pipe. These shields are considered part of the stove and must be attached to the pipe and ceiling.

## Approved Chimney Type: "UL 103 Type HT Class A":

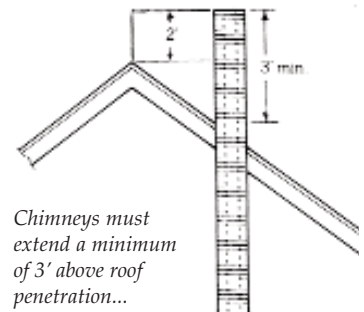
The Survival Hybrid Wood Stove requires a prefabricated metal chimney listed as Class A and carrying a UL Listing of 103 HT (high temperature). The "UL 103 Type HT Class A" prefabricated chimney will have a temperature rating of 2,100° F. There are prefabricated chimney systems that are approved only to 1,700° F and are suitable only for fireplace inserts or factory built fireplaces. **DO NOT** use these with your Survival Hybrid 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 103 Type HT Class A". If your prefabricated chimney goes through a living space like an attic or second story, the chimney pipe 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 the height requirements detailed below.

## Chimney Flue Sizing: 6" Round ID

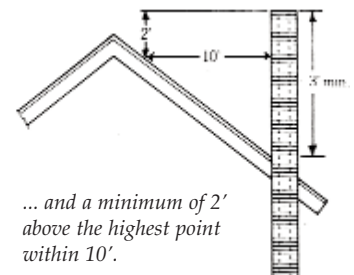
The Survival Hybrid has been designed for use with a 6" (28 sq.in.) chimney system, which is the same diameter as the stove's flue collar.



*Chimneys must extend a minimum of 3' above roof penetration...*

## Chimney Height Requirements

The chimney must extend 3-feet above the point where it passes through the roof **and** must also be 2-feet 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.



*... and a minimum of 2' above the highest point within 10'.*

The recommended minimum chimney height for the Survival Hybrid is 10 feet from the flue collar of the stove to the top of the chimney. At the top of the system, the chimney must extend 3 feet above the roof **and** 2 feet above any obstruction in a 10-foot radius. There may be other factors, like local building codes, high wind, high altitude, etc., that may make the minimum height undesirable or a violation of building codes.

If a chimney is too short, or if the flue too large, your stove's hot exhaust can cool and reduce the "engines draft". A slow draft can lead to poor stove performance, smoke spillage, or back puffing. Generally, if the Survival Hybrid is installed with a 10-12 foot chimney and there is smoke spillage or backpuffing, the height of the chimney may have to be increased by adding another section of pipe on the outside of the home to create better flow through the stove and up the chimney.



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

## Approved 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 UL 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- Through ceiling, attic or second floor, and roof

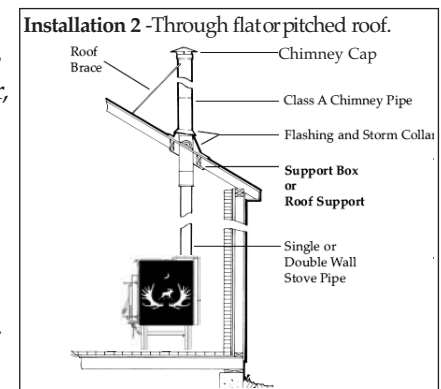
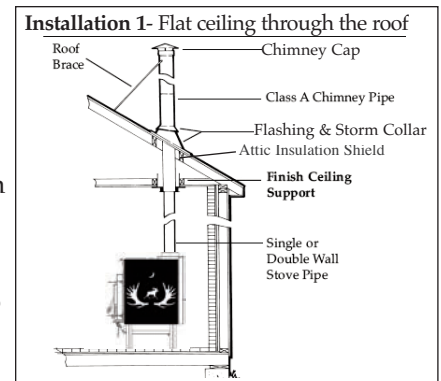
### Installation 2- Through flat or pitched roof

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 support in the ceiling/roof above. Cut the appropriate sized hole in the ceiling and frame in the necessary supports to secure the chimney support.

Install the pipe adapter onto the first section of chimney pipe, and lower the pipe into the appropriate support. *If the chimney passes through an attic, use an insulation shield in the attic to keep any insulation away from the pipe. If it passes through a second story living space, the chimney will need to be enclosed.*

As the pipe extends through the roof, install the appropriate flashing and storm collar to keep the weather out. If the height of the chimney above the roof is 5 feet or greater, a roof brace will be used. 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 chimney 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.



## FLOOR PROTECTION REQUIREMENTS

Your Survival Hybrid stove requires the use of an approved hearth pad. The hearth protects your floor from two hazards:

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

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: (1) a floor of solid non-combustible material (masonry, brick or tile on concrete and mortared in place), (2) a prefabricated hearth pad listed to UL 1618 approved standards (these pads are made to be placed on an existing floor), or (3) 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.





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

## The Survival Hearth Pad

The minimum size of the Survival Hearth pad is 30" x 48", and provides the following:

- A) 16" where wood is loaded and ashes are removed
- B) 6" of protection to the sides of the stove
- C) 4" in the back of the stove

## To Build Your Own Hearth Pad

- 1) Start with a plywood base or subfloor.

*Over this apply:*

- 2) A layer of cement board (1/2" or greater).

*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.

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.

## REQUIRED STOVE CLEARANCES

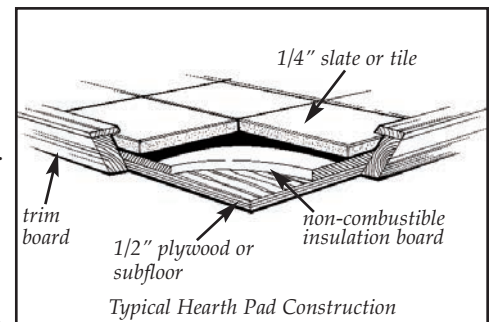
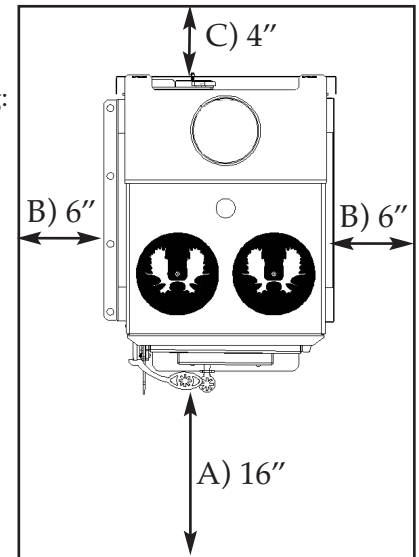
The Model 212 Survival Hybrid stove has been tested to UL standards for clearances to combustible walls. The stove comes with two side shields, a back shield, and a shield for under the ash pan. The Survival Hybrid also comes with a pipe shield and a ceiling shield. All of these shields are considered part of the stove and must be installed before the stove is operated.

These shields enable the stove to be installed in areas where space is limited and the stove must be placed near a combustible wall. The two side shields are decorative as well as protective.

## Stove Shields and Pipe Shields

Clearances for the Survival Hybrid were determined by testing with heat shields designed specifically for this stove. When using these shields, **clearance is measured from the back of the stove to the combustible wall**. The shield is not included in the clearance calculation. In addition, there is a 3-foot pipe shield that must be attached to the back of the pipe, and a round ceiling shield/trim collar that must be attached where the connector pipe attaches to the chimney pipe.

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.



## Clearance Table

The Survival Hybrid can be installed at a 9" clearance with no additional protection, provided that all of the stove and pipe shields are installed.

Clearance Table For Model 212 Survival Hybrid			
Type of Installation▶	<i>Back clearances, installed parallel to walls, top vent, &amp; stove pipe which goes <u>straight up</u></i>	<i>Side clearances, installed parallel to walls, top vent, &amp; stove pipe which goes <u>straight up</u></i>	<i>Corner installation clearances, when stove is installed in corner at 45 degrees to 2 walls</i>
Type of protection▼			
Top Vent, Straight Up, With all Shields (sides, back, 36" pipe shield, and ceiling shield)	9" stove back 11.5" stove pipe	9" stove sides 15" stove pipe	9" stove corners 16" stove pipe
No Protection	36"	36"	36"* stove corners
3 1/2" thick Masonry Against Combustible Wall*	24"	24" stove sides 30" stove pipe	24" stove sides 28" stove pipe
3 1/2" thick Masonry with 1" ventilated airspace*	12"	12" stove sides 18" stove pipe	12" stove sides 18" stove pipe
24 ga. sheet metal with 1" ventilated airspace*	12"	12" stove sides 18" stove pipe	12" stove sides 18" stove pipe
1/2" thick non-combustible insulation board with 1" airspace*	12"	12" stove sides 18" stove pipe	12" stove sides 18" stove pipe

\*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.**

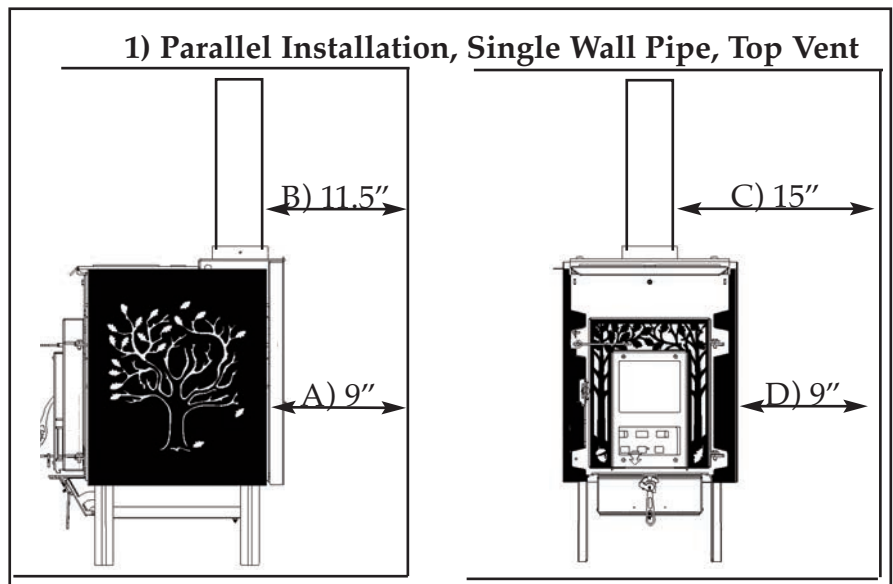
- These clearances apply to walls, ceilings, furniture and other combustibles.
- The 36" Vertical Pipe Shield attaches to the back of the stove pipe and prevents excess heat from being radiated from the pipe. Heat shield protection is only required for the first 24" of vertical connector pipe.
- At least 30" is required from the front of the stove to combustibles (such as curtains, wall hangings, and furniture).

*Note: The only approved method allowing for a rear stove clearance less than 12" is the Approved Rear Heat Shield (#N-997) provided by Woodstock Soapstone Co.*

## CLEARANCE INSTALLATION DIAGRAMS

The Survival Hybrid stove is a top vent stove designed to be installed along a side or back wall, or at a 45 degree angle to a corner wall. Straight up venting will provide the best draft and easiest operation.

<b>PARALLEL INSTALLATION WITH STOVE SHIELDS, PIPE/CEILING SHIELDS</b>	
A) Back of stove to wall	= 9"
B) Back of pipe shield to wall	= 9"
C) Side of stove to wall	= 9"
D) Side of pipe to wall	= 15"

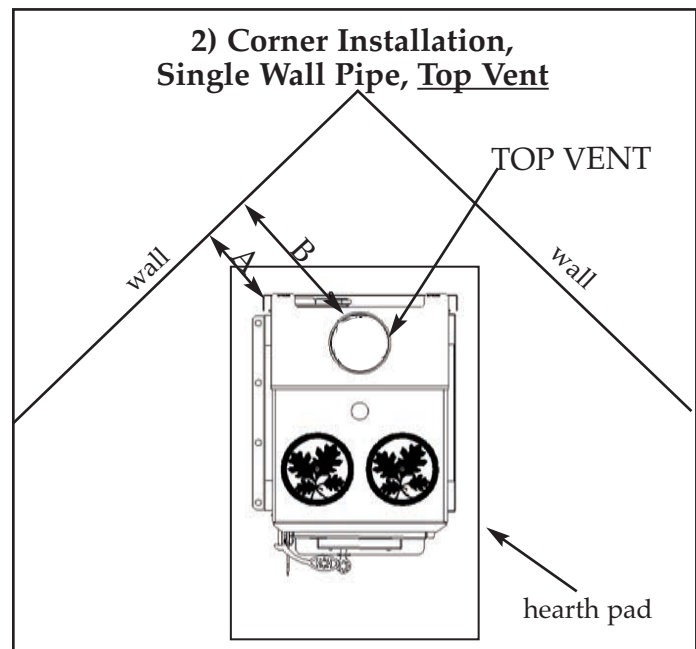


## CLEARANCE INSTALLATION DIAGRAMS, Continued

In a corner installation, the distance from the stove corners to the side walls dictates where the stove can, and cannot, be placed. The minimum distance from the back corners to the side walls is 9"

### CORNER INSTALLATION WITH STOVE SHIELDS, PIPE/CEILING SHIELDS

- A. Stove corners to side walls = 9"  
(determines placement)
- B. Pipe to side walls = 16"



## 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, read the requirements below and check with your local code officials. More questions? Give us a call Monday through Friday, 9:00-5:00 ET or Saturday 9:00-12:00 ET 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. Outside Air for Combustion (factory installed when ordered)
2. Tie Downs for the Stove
3. Spark Arrestor on the Chimney Cap
4. Stove Grounded to Chassis
5. Stoves May Not Be Installed in Mobile Home Bedrooms



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

**1) Outside Air** must be used for combustion. Many mobile homes have very tight construction, so wood stoves need to get adequate combustion air from *outside the home* to avoid the risk of depleting oxygen in the living space and to reduce the likelihood of smoldering and spilling smoke. Having outside air for combustion is a requirement for all wood burning stoves in the state of Washington and is recommended for wood stoves in "super tight" new construction.

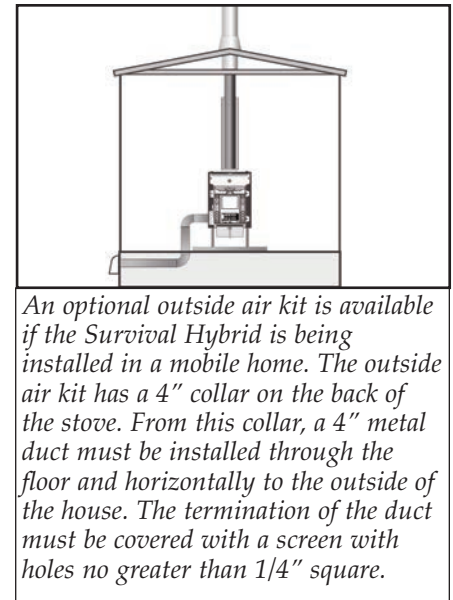
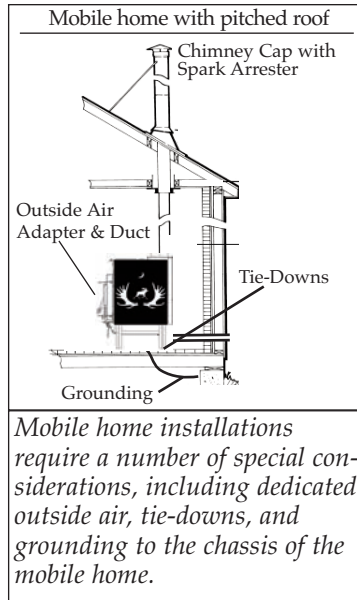
The outside air adapter has a 4-inch collar on the back of the stove. Use 26 gage pipe to make a duct from this collar, through the floor, and then horizontally to the outside of the foundation or skirting. The termination of the outside air adapter should be covered with wire mesh with openings no larger than 1/4 inch by 1/4 inch.

**2) Tie Downs:** HUD requires that the stove must be attached to the floor. This is to prevent tipping in the event the home is moved. It also provides some protection if the mobile home is installed in an earthquake zone. Two legs of the Survival Stove have a plate at the bottom to bolt opposite corners to the floor.

**3) Spark Arrestor:** The chimney cap must have a spark arrestor screen for fire-protection. These are available with most prefabricated chimney systems.

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

**5) Not allowed in mobile home bedrooms:** Wood stoves are not permitted for installation in sleeping rooms.

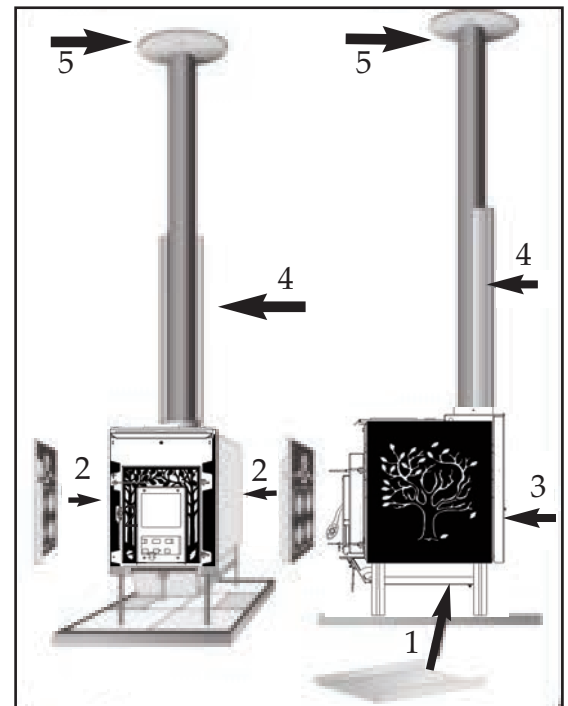


*Note: A heat shield is provided for the stovepipe to prevent excessive heat from being radiated to nearby walls. The heat shield should be attached to the back of the stovepipe with screws provided. Double wall pipe is often used in mobile homes to connect the stove to the chimney, but when the Survival Hybrid was tested to UL Standards the heat shield provided better protection than double wall pipe.*

## INSTALL SHIELDS BEFORE YOU LIGHT YOUR STOVE

Your Model 212 Survival Hybrid Stove has been shipped with the side, rear, and bottom shields attached to the stove. The pipe and ceiling shields must be installed before lighting your stove. The pipe and ceiling shield hardware is packed in the manual kit. These shields are considered parts of the stove, and must be installed before lighting the first fire.

- 1) Bottom Heat Shield: Protects the floor (already installed)
- 2) Side Heat Shields: Protects walls (already installed)
- 3) Back Heat Shield: Protects walls (already installed)
- 4) Pipe Shield: Protects walls from heat from pipe (install onsite)
- 5) Ceiling Shield: Protects from heat from pipe (install onsite)





# OPERATION

The Survival Hybrid Wood Stove is designed to burn clean at all times. The directions below detail how to maintain peak efficiency and clean-burning.

## Seasoning Your Stove

Seasoning is accomplished through a series of small to moderate wood fires. *Don't place anything on the top surface of the stove until the paint has finished curing. 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.

## Getting to Know the Survival Stove Controls

### Bypass Damper

When the bypass damper is open, smoke travels directly from the firebox to the chimney. When the bypass damper is closed, smoke travels through the catalytic combustor. The catalytic combustor burns the smoke to produce more heat and cleaner exhaust.

Bypass Damper Handle  
Open Position



Bypass Damper Handle  
Closed Position



*The Bypass Damper Handle must be opened to kindle a fire and to reload the stove. Close the Bypass Damper Handle when the stove is in operation. The stove will produce more heat and less smoke with the handle closed.*

### Air Control

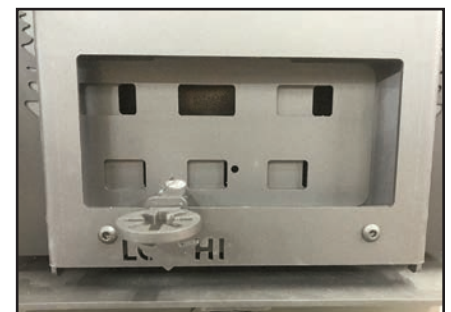
The air control damper on the load door controls the rate the fuel is burned and the amount of heat that the stove produces.

Move the air damper all the way to the right to kindle a fire or maximum heat.

Slide the damper slowly to the left to decrease the burn rate or heat output. The damper is very sensitive; moving the damper just a fraction of an inch will affect the burn rate and heat output.



Push RIGHT To Kindle a Fire, or  
High Heat



Push LEFT For Low Fire, or  
Long Burn Time

### Door Latch Detent

There is a small notch in the door handle. If you close the door just to this notch, it will let air in at the edge of the door. This will provide a small boost when kindling a fire. Use the detent to add a little air when starting a wood fire, or just after reloading.

# Wood Burning Operation



## 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.

- 1) Open the Air Control Damper all the way (Figure 1)
- 2) Open the Bypass Damper (Figure 2). The Bypass Damper must be open to open the loading door. Keep the Bypass Damper open to prevent smoke from spilling into the room when kindling the fire.
- 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/back 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, retest 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 (Figure 3).
- 5) Add small splits of firewood once the kindling has ignited to establish a bed of hot coals.
- 6) Add small to medium splits onto the hot coals (Figure 4).



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5

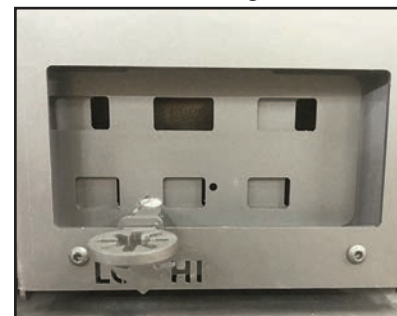


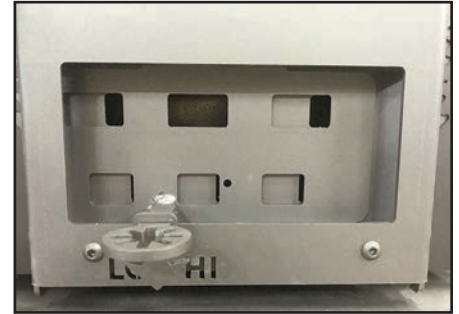
Figure 6

- 7) After the single wall pipe temperature reaches 200-250°F, close the Bypass Damper by lowering the handle down to the closed position (Figure 5). 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, by sliding the Air Control to the left. The closer the air damper is to being closed, the longer the wood will burn (Figure 6).

# 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 Survival Hybrid Wood Stove 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 opening the loading door, open the bypass damper and the air control damper. Wait a minute or so, before slowly opening the loading door, allowing a strong draft and prevent smoke from spilling into the room.
- 2) Wearing stove gloves, open the loading door and stir up the hot coals with a poker or rake. If necessary, excess ash should be removed before reloading the firebox. 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. 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 (stainless steel, perforated ceiling), with a mix of larger and smaller split pieces of wood. Close the loading door.
- 5) Allow the temperature on the surface of single wall pipe or stove top to come back up to 200°-250°, this may only take 5-15 minutes depending on the dryness of the wood and draft conditions.
- 6) Adjust the Air Control Damper to a low setting, moving it to the left.
- 7) Close the Bypass Damper.



*Low combustion air setting*

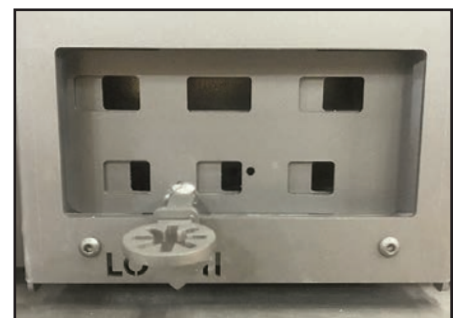
**DO NOT BURN THE STOVE WITH THE AIR DAMPER FULLY OPEN FOR EXTENDED PERIODS. USE THE FULL OPEN POSITION TO KINDLE A FIRE, TO RELOAD THE FIREBOX, OR WHEN HIGH HEAT IS NEEDED.**

**NEVER BUILD A ROARING FIRE IN A COLD STOVE. IT TAKES AT LEAST 30 MINUTES TO HEAT THE INNER FIREBRICK WALLS OF THE SURVIVAL HYBRID. ATTEMPTS TO REACH HIGH TEMPERATURES VERY QUICKLY COULD RESULT IN DAMAGE TO THE STEEL 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 Survival Hybrid Wood Stove 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 opening the loading door, open the bypass damper and the air control damper. Wait a minute or so, before slowly opening the loading door, allowing a strong draft and prevent smoke from spilling into the room.
- 2) Open the load door and 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 (stainless steel, perforated ceiling), with a mix of larger and smaller splits. Close the loading door.
- 5) Allow the temperature on the surface of single wall pipe or stove top to come back up to 200°-250°. Lower the Combustion Air Control down to 1/2 open.
- 6) Adjust the Air Control Damper to roughly 1/2 open.
- 7) Close the Bypass Damper by lowering the lever until it stops.
- 8) You should see the flames from secondary combustion at the top of the firebox becoming more active.



*Air combustion set to 1/2 open*

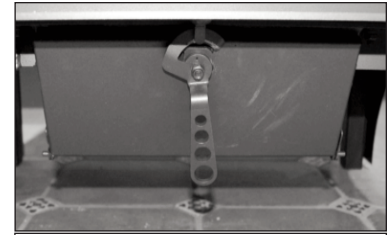


# Ash Removal

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

If your Survival Hybrid Wood Stove is in continuous operation we recommend that you check the ash pan every few days, and empty it at least once a week. Before emptying out the ash pan, make sure that the fire is reduced to hot coals. Open 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 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.

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.



*The ash pan door is located below the front loading door.*



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

**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.**

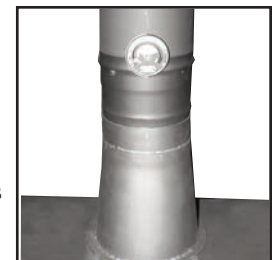
**NEVER SHOVEL ASHES INTO A COMBUSTIBLE CONTAINER LIKE A CARDBOARD BOX OR A PLASTIC BUCKET. DO NOT USE A VACUUM CLEANER TO REMOVE ASHES UNLESS IT IS SPECIFICALLY DESIGNED FOR WOODSTOVE ASH REMOVAL. NEVER LEAVE A CONTAINER OF HOT ASHES ON A WOOD FLOOR, PORCH, OR ANY COMBUSTIBLE SURFACE.**

# Magnetic Thermometer

We recommend placing the magnetic thermometer 8"-10" above the flue collar on single wall stove pipe.

If you are reading the single wall stove pipe temperature, the interior flue exhaust temperature is about twice as hot as the reading on the magnetic thermometer. We recommend engaging your catalytic combustor once the pipe thermometer reaches 200°-250°F.

Once the temperature on the pipe has reached 200°-250°F and you have engaged the catalytic combustor, move the magnetic thermometer to the stovetop, right over the catalytic combustor. Since the exhaust has not been passing through this area, initially the temperature will be low (less than 200°-250°F). As the catalytic combustor engages, this temperature will rise to the 300-500°F range, or somewhat higher. This temperature can be high either when there are a lot of small pieces of wood in the firebox (more surface area), or when there is a smoldering fire and lots of smoke is passing through the catalyst. You will quickly learn what burning conditions produce different temperatures. **When you see reduced temperatures on this top thermometer, it is almost always a sign that the catalyst needs to be removed and cleaned.**



*Place the surface thermometer 8" above the stove top for top vent, or on the cover plate for rear vent.*

# 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.



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.



### **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.**

## **Daily Use**

Your Survival Hybrid stove is well suited for continuous firing on a 24 hour a day basis. It can burn for 6-8 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, even when the surface temperature drops below 200°-250°.

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 Stove Top**

The top lid of the Survival Hybrid makes for a perfect cook surface. The cook surface can be used to make soups, stews, sauces, and even meals that require higher temperature cooking. The steel cooktop is not designed as a cooking surface. Food should always be placed in a heavy duty Dutch oven or skillet.

## **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 lift the door handle with the “fall-away tool” 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 Survival 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 hardwoods. 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, giving 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), and 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.

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, 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 Survival 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 Survival Hybrid.



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

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 the burning of trash.

## DO NOT BURN!

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

# Wood Burning Basics

If you did not grow up in a house with a wood burning stove, you are probably wondering what is involved in burning wood for heat and enjoyment. Here are some of the most frequently asked questions about wood.

## Q: What is the best wood for a wood burning stove ?

A: On a pound-for-pound basis all wood contains just about the same amount of energy. However, on a volume basis there is a great difference in the heat given off by different woods. As a general rule, so-called "hardwoods" are more dense than "softwoods". They burn longer and give off more heat than softwoods. The following table should help you in choosing which woods to burn.

### Species Having High Heat Value

(1 cord = 21,000,000 - 24,000,000 BTU = 200-250 gal. of fuel oil or 250-300 cu. ft. of natural gas)

American Beech	Red Oak
Apple	Sugar Maple
Hickory	White Oak
Ironwood	Yellow Birch

### Species Having Medium Heat Value

(1 cord = 17,000,000 - 20,000,000 BTU = 150-200 gal. of fuel oil or 200-250 cu. ft. of natural gas)

Big Leaf Maple	Red Maple
Eastern Larch	White Ash
Elm	White Birch

### Species Having Low Heat Value

(1 cord = 12,000,000-17,000,000 BTU = 100-150 gal. of fuel oil or 200-250 cu. ft. of natural gas)

Aspen	Red Alder
Cottonwood	Redwood
Hemlock	Sitka Spruce

## Q: Where do I get firewood?

A: For many people the most satisfying way is to cut your own. Even if you do not own a woodlot, you may find that someone who does would be happy to have you improve his woodland by culling out poor quality hardwoods. In many states you are allowed to cut in state forests. You can find out by contacting your county forester or your state's department in charge of parks and forests. As pointed out elsewhere in this presentation, even if you have to buy firewood, you can invariably save money over buying other kinds of fuel. You can usually find firewood vendors listed in local classified pages, online, and on local list serves. Look for someone who is honest about the types of wood they offer and how well seasoned it is. There is nothing wrong with buying green, unseasoned wood as long as the price reflects the fact that you cannot use it until you have taken the time to stack it and dry it. (More about that, below). It is important to understand the unit of measure most commonly used for wood: the cord.



## Q: How much wood is in a cord?

A: Depending on the size of the pieces of wood and the care with which it is stacked, the actual amount of wood in a cord will vary considerably. It is legitimate for a cord to be as much as 1/3 air. However, no matter what length of firewood you buy, it must stack up to 8' x 4' x 4' to be a cord. Note: If you buy a cord of 4 foot lengths of wood and cut it up yourself, the resulting pile will take up less than a cord because of all the sawdust you create. A cord put into 16-inch or 24-inch lengths will shrink by 14 percent, or 18 cubic feet, in volume. Another measure by which wood is sold is the run. A run is 1/3 of a cord and measures 8 feet by 4 feet by 16 inches.

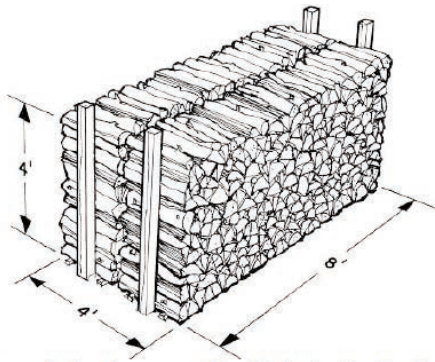
## Q: So, what is a "face cord"?

A: Wood is often advertised as so much per "face cord", you should be very careful about buying wood on this basis. A "face cord" is a non-standard measurement that should never be confused with a cord. It measures 8 feet long by 4 feet high, but is only as deep as one length of wood. Obviously, it is possible for a face cord to contain considerably less than one cord of wood. Before buying a face cord of wood, you ought to use your calculator to figure how much you are paying on a cord basis; you may be unpleasantly surprised.

## Q: Everyone says you should let your wood dry for a year before using it. Is it really necessary to burn seasoned wood?

A: The simple answer is yes. Seasoned wood will burn better, provide more heat, and cause fewer problems than green wood. When first cut, wood is often more than 50% water by weight. It takes a lot of energy to drive off this water -- which is what has to happen before the wood can burn. So green wood is hard to light, doesn't produce much heat, and smokes a lot. The water in green wood can also cool the catalytic combustor to the point that it will no longer function and/or cause smoke to condense on the inside of your chimney's walls as creosote. What is important is the dryness of the wood (optimally 15-25% water content), not the period of time it has been drying. At one extreme, some professional firewood suppliers use wood kilns to dry wood in only a few days. At the other extreme, unsplit, improperly stacked wood will rot long before it is ever dry enough to use.





*A standard cord measures 128 cubic feet (or 4'x 4'x 8').*

**Q: So, how do I tell if my wood is dry enough to use?**

A: Partly, being able to tell if wood is dry is a matter of experience. However, some of the signs you can use to tell if your wood is dry are:

- 1) The wood is lighter than green wood. However, be aware that the density and weight of wood also depends on the species. White oak is denser and heavier than white pine. Still, dry white oak is lighter than wet white oak.
- 2) The bark is loose. As wood dries it tends to lose its bark. This is not an absolute rule, but when your wood is dry you should notice a good bit of barkless wood and free pieces of bark.
- 3) The color of the wood fades. Different types of wood are more or less colorful, but for all species, dry wood is more subdued and faded looking than green wood.
- 4) The wood shows radial cracks. As wood dries it shrinks. As a result, it usually develops cracks, visible at the ends, which radiate out from the heartwood to the bark. Since the wood will often start to crack before it is completely dry, the presence of radial cracks is not a fool-proof sign that the wood is ready to burn. But, the total absence of such cracks is a good sign that it is not ready yet.
- 5) The wood loses its sappy smell. Dry wood is much less aromatic than green wood.
- 6) Dry wood makes a "crack" when hit. If you hit two pieces of seasoned wood together, they will make a resonant sound, like a bat hitting a baseball. Green wood makes more of a "thud".

**Q: I have green wood, what do I do now?**

A: If you have the time, carefully stack your wood and let it dry. If you have no other options, try splitting the wood into smaller pieces, mixing dry wood or kindling with it, and letting more air into the stove, so it burns a little hotter.

**Q: What is the best way to dry my wood?**

A: The best way to dry your wood is to split it and then stack it so that it is well-ventilated, covered and off the ground. Storing wood this way for 4-6 months can make a big difference in the efficiency of your stove. Split wood has much more surface area than unsplit wood. It also has surfaces that are not covered with bark. Therefore, it will dry faster than unsplit wood. The ultimate example of this is birch wood. Because birch bark is waterproof, unsplit birch wood will often rot from the inside without ever drying. Wood not only takes up less space when stacked, but it

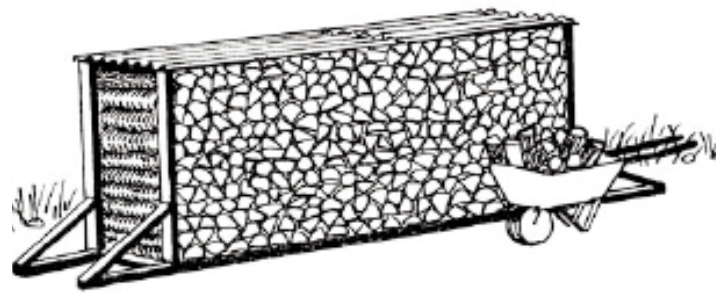
allows air to circulate around the wood. Good ventilation is the most important factor in having dry wood. It helps to dry the wood by speeding up evaporation. If you have the space, you might want to employ a trick used by old timers. They stacked their wood in long thin rows spaced apart, and at right angles to the prevailing winds to ensure good ventilation. Covering the wood and keeping it off the ground are important because these practices keep the wood away from moisture. Wood acts very much like a sponge. If it is exposed to rain, snow or moisture in the ground, it will soak this water right up, putting to naught all your efforts to dry it out.



*Don't cover your woodpile with a tarp or plastic sheet that goes all the way to the ground. Moisture will get trapped under the tarp, and the wood will not dry.*

With these basics in mind, there are a few simple rules you will want to follow:

- 1) Do cover the wood, but do not drape a plastic sheet or tarp over your wood pile so that it covers the sides of the pile. This will trap the moisture in the pile and the wood will not dry. If you can, make a simple wood frame to raise the plastic cover a few feet above the wood. The ultimate drying place is an open sided shed.
- 2) Use 2 x 4's, poles, or pallets or some other method to keep your wood off the ground.
- 3) If you dry your wood inside, allow for adequate ventilation. Wood stored in a heated space does dry faster. However, drying wood gives off a lot of water. If you do not allow for that water to exit to the outside you will probably raise a bumper-crop of mold and/or mushrooms. Another reason to be careful about storing wood inside is the fact that ants, beetles or other unwanted guests sometimes ride along on unseasoned wood.



*Store your firewood off the ground on 2 x 4's or 2 x 6's. Cover it with plastic or metal roofing. Leave the sides open*



# THE CATALYTIC COMBUSTOR



The catalytic combustor is ONLY used while burning wood. DO NOT burn treated wood or use chimney cleaning chemicals without removing the catalyst.

## Here is how your catalytic combustor works.

The catalytic combustor in your stove is very similar to the one in the exhaust system of your car and works to achieve the same results - high efficiency and clean air! The catalytic combustor is a round stainless steel honeycomb with hundreds of cells. The inside of the cells has a coating that ignites exhaust gases - helping the stove create more heat and reduce smoke and emissions. The dense cell structure is used to create a large surface area so all of the exhaust is exposed to hot surfaces inside the catalyst.

When you first start a fire, have your bypass damper open to let the smoke go directly up the chimney. Once wood smoke reaches 500° F internally and 200-250° externally (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 catalytic coating and both gases and particles in the smoke ignite and burn. This “catalytic - burn” reduces emissions and increases the heat output.

Without a catalytic combustor, between 5% - 40% of the chemical energy contained in wood escapes up the chimney. The catalyst takes smoke in a slow-burning fire and turns it into heat, and eliminates pollution at the same time.

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.

With proper care, a new catalytic combustor will give years of fuel savings, increased heat and lowered emissions. By following some simple guidelines you can ensure maximum combustor performance and longevity. Your catalytic combustor is designed to last for 10,000 - 12,000 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 internal exhaust gases reach about 500 degrees F (250° F on the pipe or stovetop) before closing the Bypass Damper and engaging the catalytic combustor.
- 3) Open the Bypass Damper before reloading, and leave the bypass open for a few minutes after reloading, to raise the exhaust temperature to 500 degrees F (250° F on the pipe or stovetop).
- 4) Don't overfire the stove.
- 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



*Bypass lever should be up when starting or reloading the Survival Hybrid, allowing the smoke to heat up to 500° internally, or 200°-250° on the surface.*



*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.*

# Inspection & Cleaning

Your stove comes with a new stainless steel combustor already installed. The combustor is a round stainless steel honeycomb located under the top lid of the Survival Hybrid. 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 that 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 or may need to be cleaned.

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 or 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.

## CLEANING A COMBUSTOR WITH BRUSH OR VACUUM:

**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 can be removed as illustrated at the right.
2. Lift the combustor out of the stove. Brush or vacuum the combustor sure to remove all fly ash from the combustor.
3. Return the combustor to the stove. Be sure that it is seated flat on the catalyst base. Close the top lid.

## CLEANING A COMBUSTOR WITH WHITE VINEGAR & WARM WATER:

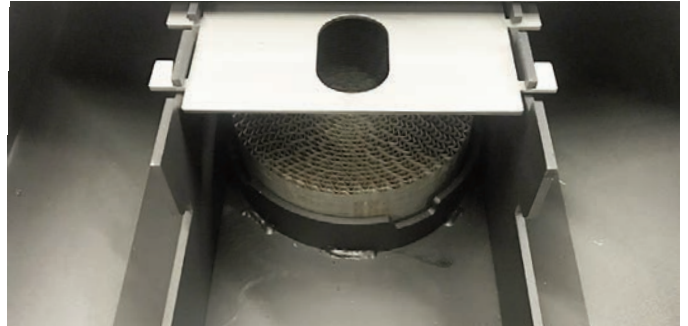
A cleaning with a 50/50 mixture of white vinegar & distilled water is recommended at least once each year. The acidity of common white vinegar (diluted 50%) is just enough to remove any fly ash within the catalytic cells that may be masking the catalytic coating.

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

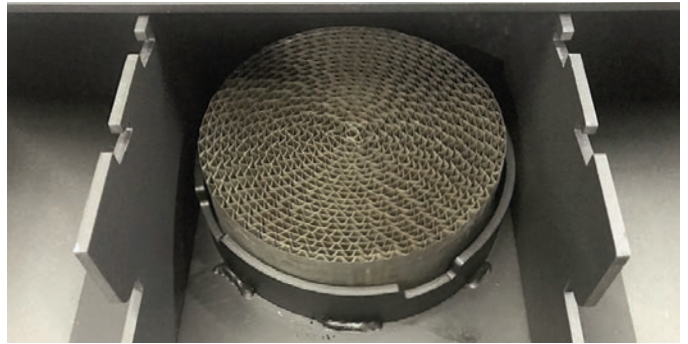
1. Be sure the fire is out and the stove is cold. Open the top lid.
2. Lift the combustor out of the stove. Place the combustor on a newspaper or an old towel. In a spray bottle prepare a 50/50 white vinegar & distilled water mixture.
3. Spray the 50/50 mixture through one side of the combustor and allow 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. Close the top lid.



*With the top lid lifted you will see the catalytic combustor below a stainless steel shield.*



*Remove the shield to access the catalytic combustor for removal.*



*Lift the catalytic combustor out and clean both side (see instructions to the left).*

## 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 Survival Hybrid Woodstove is simple. **1)** Lift the top stove lid, **2)** Remove the shield installed over the catalyst, **3)** Lift the catalyst from the stove, **4)** Install the new combustor, **5)** Reinstall the shield, **6)** Close the top lid.

# Frequently Asked Questions

## Q. Why use a catalytic combustor for burning wood?

A. 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. 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.

## 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 Bypass Damper is open and smoke is going straight up the flue, as opposed to then the Bypass Damper is closed and 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.

## 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 using white vinegar and warm water described on the previous page

## 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 Survival 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 Survival 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 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 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 ceramic glass installed in the loading door is fully gasketed around the perimeter so there is no contact between the glass and the steel frame.

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. **DO NOT ATTEMPT TO CLEAN HOT GLASS.**

## Gasket Replacement

There are 3 places on your stove where you should check the gasket routinely: (1) on the loading door, (2) under the steel lid/cooktop, (3) the ashpan door. 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 Survival Hybrid woodstove are included in the parts list at the end 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 Survival 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 16-18.
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. Re-establish 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 damper and air control damper prior to reloading stove
	Blocked Chimney	Examine chimney and stovepipe for blockage and creosote accumulations. Check spark arrestor screen on your chimney 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).
	More than one appliance vented into flue	Disconnect other appliances, seal openings appropriately.
Back-puffing or sudden internal ignitions	Operating technique	Open bypass damper and air control damper before opening to reload and keep it open a few minutes after reloading.
	Burn rate too low	Open air control damper to allow for hotter burn.
	Chimney down draft	In high wind areas, a specially designed wind cap may be necessary.
	Combustor plugged	Clean combustor of accumulated fly ash.
	Tight house	Dedicated air supply with outside air adaptor attachment to stove.
	Combustor not glowing	Late stage of burn
Ashpan Door is Open		Close ash pan door securely, check ash pan door gasket, check cleanout door or cap secure.
Stove burning too hot or fast	Excessive draft	Adjust air damper to lower setting.
	Extra tall chimney	Adjust air damper to lower setting.
	High wind or hilltop location	Consider installing pipe damper.
		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° F when combustor is engaged. Inspect bypass damper cover for warpage or damage
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 short fires.
	Airflow too restricted	Open air damper in small increments until some slow flames appear. Run hot fire to burn smoke off the glass, or remove build up with glass cleaner, or a 50/50 mix of water and vinegar, when stove is cold.
	Smoldering fire	Green or wet wood. Burn dry wood, or open air damper slightly for a hotter burn.

### 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.

- 1) If the catalytic coating is not working as it should the smoke exiting your chimney will be darker in color.
- 2) If your draft is sluggish and the catalytic combustor had recently been cleaned, 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.
- 3) 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 btu's 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. Visit the Chimney Safety Institute of America website at [www.csia.org](http://www.csia.org), to find a certified chimney sweep.

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 wood stove is a safe product, but it must be installed in accordance with the instructions in this manual. Wood stoves 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:

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

Ashes should never be dumped into a combustible container, such as a cardboard box. Ash containers should never be set on a combustible surface such as a wood floor or porch. Hot embers in the ashes can 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 hardwired 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:

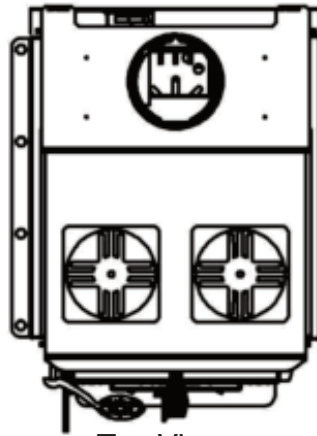
- 1) Close the air control damper immediately, with a slow and even motion. This cuts off the supply of oxygen to the stove.
- 2) Call the fire department immediately.
- 3) Get everyone out of the house. One adult should stay in the house to check for sparks and signs of fire. Those outside should watch 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.

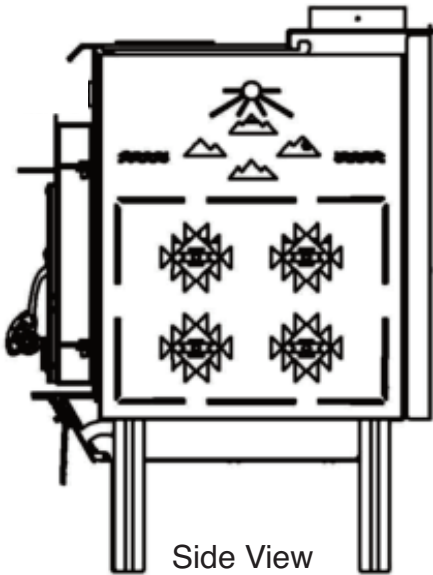
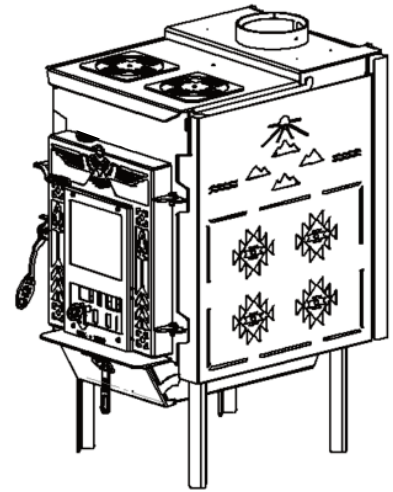
The length of time it takes to bring a chimney fire under control depends on the amount of fuel in the stove, the rate at which it is burning and the amount of oxygen available to it. The faster it is brought under control the less severe any damage is likely to be.



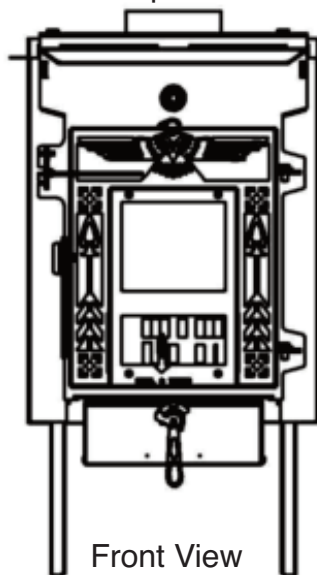
MODEL 212S: SURVIVAL HYBRID STOVE  
MODEL 212 VIEWS



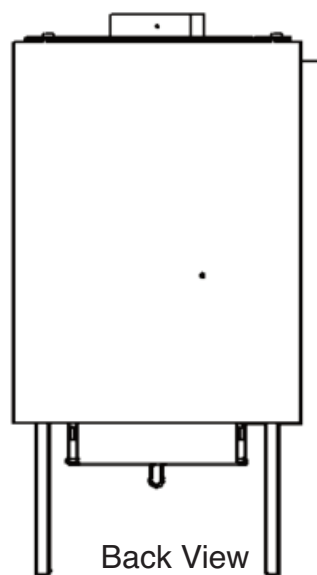
Top View



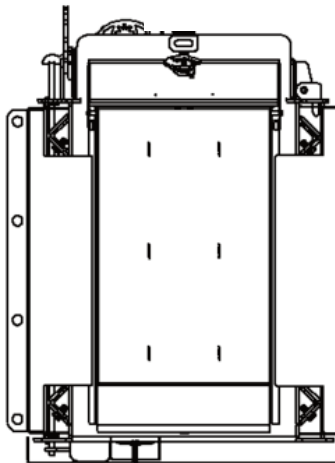
Side View



Front View



Back View

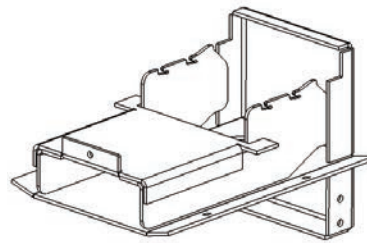
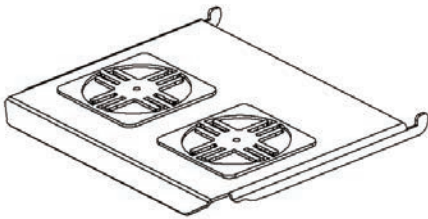


Bottom View

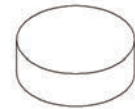
## MODEL 212S: SURVIVAL HYBRID STOVE ASSEMBLIES

NS-2 Ash Grate	NS-12 Ash Pan Assembly
NS-3 Lift Top Assembly	NS-13 Load Door Assembly
NS-4 Bypass Rod Assembly	NS-19 Firebrick Assembly
NS-5 Tertiary Inlet/Bimetallic Assembly	NS-21 Fireback Assembly
NS-7 Heat Exchange Assembly	NS-22 Leg (4)
NS-8 Body Box	NS-25 Fixed Top Assembly
NS-10 Bypass Damper	NS-31 Catalyst: Clariant 5.83" x 2" x 49 cpsi Stainless

NS-3 Lift Top Assembly

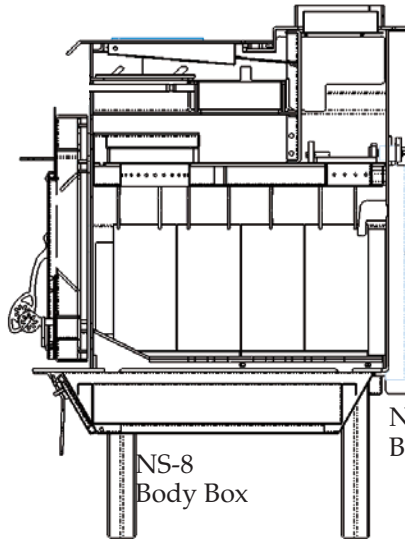
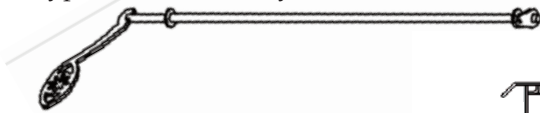


NS-7 Heat Exchange Assembly



NS-31 Catalyst

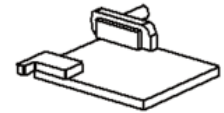
NS-4 Bypass Rod Assembly



NS-8 Body Box

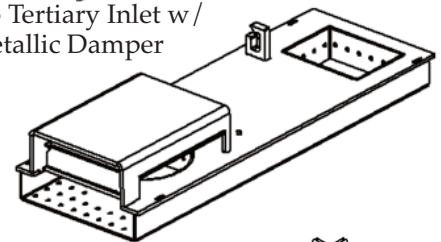
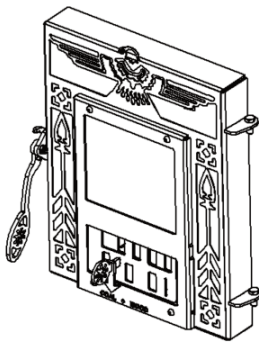


NS-5 Tertiary Inlet w/  
Bimetallic Damper



NS-10 Bypass Damper

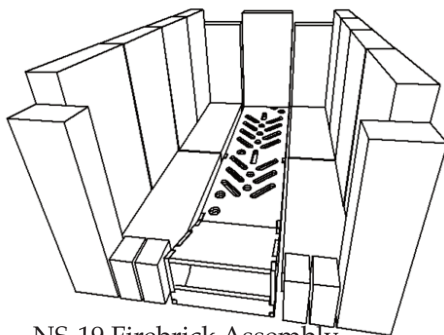
NS-13 Load Door Assembly



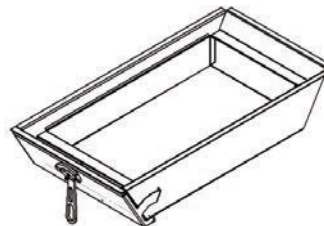
NS-21 Fireback Assembly



NS-22 Leg (4)



NS-19 Firebrick Assembly  
NS-2 Ash Grate

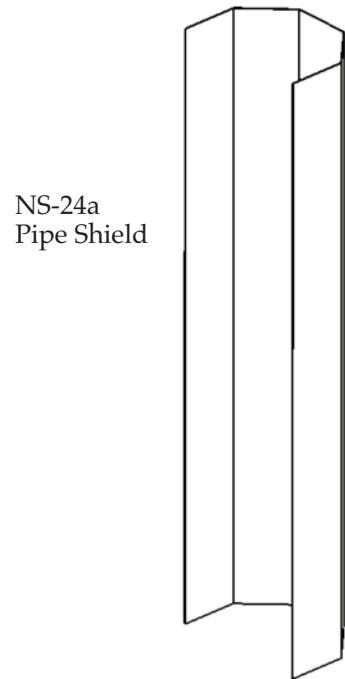
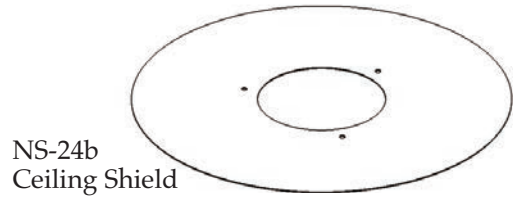
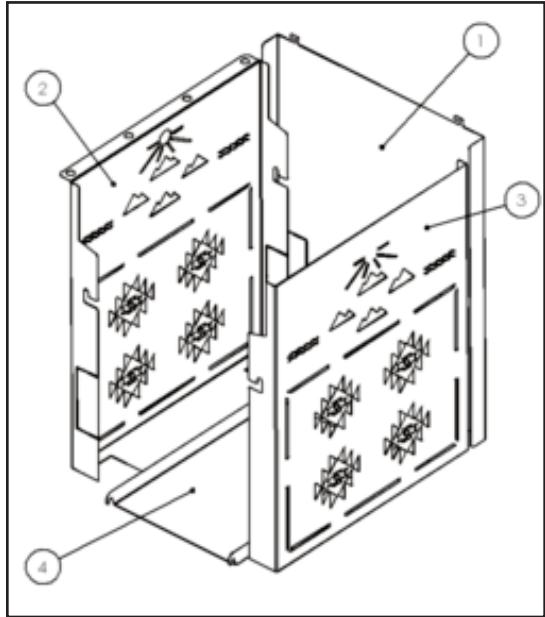
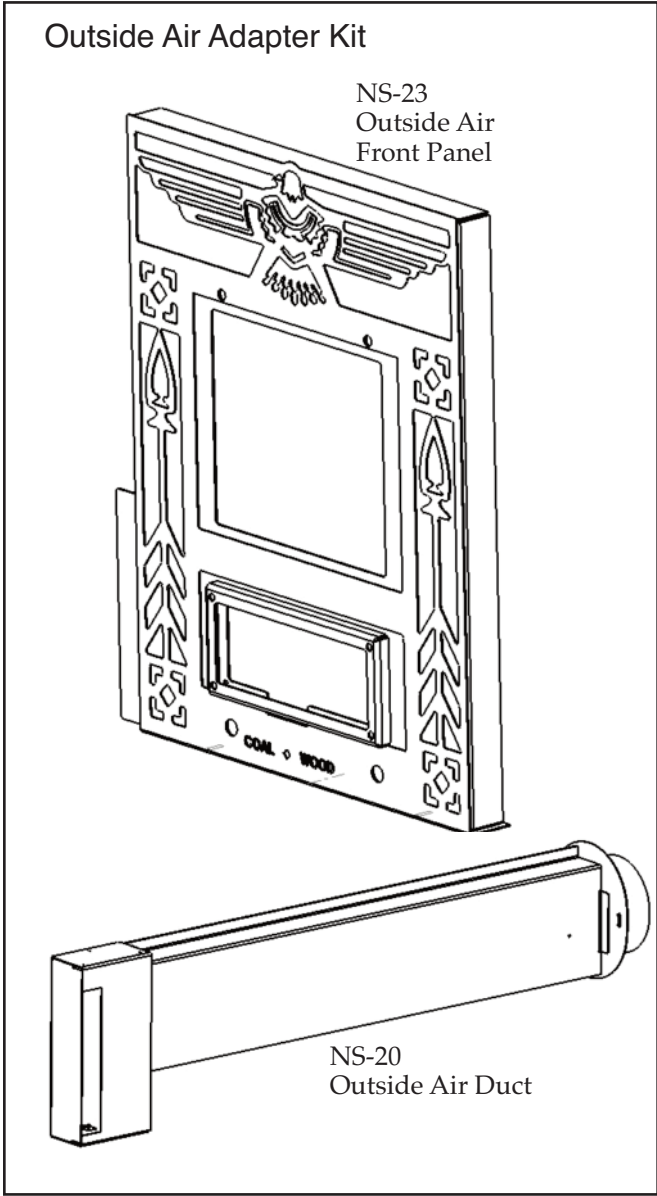


NS-12 Ash Box and Ash Pan Assembly  
Welded to Body Box

- NS-18 Heat Shield Assembly
- 1. Back Shield
- 2. Left Shield/Tool Holder
- 3. Right Shield
- 4. Bottom Shield

MODEL 212S: SURVIVAL HYBRID STOVE SHIELDS AND OUTSIDE AIR ADAPTER

NS-18 Heat Shield Assembly	NS-20 Outside Air Duct
1) Back Shield	NS-23 Outside Air Front Panel
2) Left Shield	NS-24a Pipe Shield
3) Right Shield	NS-24b Ceiling Shield
4) Bottom Shield	



MODEL 212S: SURVIVAL HYBRID STOVES  
PARTS LIST

<b>MODEL 212</b>	<b>Parts List</b>	<b>Manufacturer</b>
NS-2	Ash Grate	Woodstock Soapstone Co.
NS-3	Lift Top	Woodstock Soapstone Co.
NS-4	Bypass Rod Assembly	Woodstock Soapstone Co.
NS-5	Tertiary Air Inlet/Bimetallic	Woodstock Soapstone Co.
NS-7	Heat Exchange Assembly	Woodstock Soapstone Co.
NS-8	Body Box	Woodstock Soapstone Co.
NS-10	Bypass Damper	Woodstock Soapstone Co.
NS-13	Load Door	Woodstock Soapstone Co.
NS-18	Heat Shield Assembly	Woodstock Soapstone Co.
	<i>Left, right, bottom back shields</i>	
NS-19	Firebrick Assembly	Purchased Parts
		<i>4.5" x 9" x 1.25 medium duty split brick</i>
NS-20	Outside Air Duct	Woodstock Soapstone Co.
NS-21	Fireback Assembly	Woodstock Soapstone Co.
NS-22	Leg (4)	Woodstock Soapstone Co.
NS-23	OAA Front Panel	Woodstock Soapstone Co.
NS-24	Flue Shield/Ceiling Shield	Woodstock Soapstone Co.
NS-25	Fixed Top Assembly	Woodstock Soapstone Co.
NS -12	Ash Pan Assembly	Woodstock Soapstone Co.
R-54	Tertiary Damper	Woodstock Soapstone Co.
NS-31	Catalyst	Woodstock Soapstone Co. & Applied Catalyts
		<i>5.86" Dia x 2" x 49 cpsi frameless ss foil catalyst</i>
NS-906	Glass for Load Door	Purchased Part - Schott
		<i>5mm x 8" x 7" Robax</i>
	<b>Gasket</b>	
	Top Lid	0.875" LD x 59" Fiberglass Rope
	Side Door	0.875" LD x 70" Fiberglass Rope
	Ash Pan Door	0.500" MD BHM x 30" Fiberglass Tape
	Fireback Assembly	0.187" x 0.75" x 70" Fiberglass Tape
	Heat Exchange Assembly	0.187" x 0.75" x 42" Fiberglass Tape
	Front Window	0.187" x 0.75" x 30" Fiberglass Tape







# DIMENSIONS & SPECIFICATIONS

H x W x D (standard height) ..... 36.5"x19.5"x26"  
 Cooktop Height ..... 34"  
 Footprint ..... 16.5" W x 18.5" D  
 EPA 2020 Certified ..... Yes  
 Listed to UL 1482 ..... Yes  
 EPA Emissions Rating ..... 1.13 grams/hr  
 EPA Efficiency ..... 79.4%  
 Flue Height to Center ..... 28"  
 Catalytic Combustor & Secondary Air .... Standard  
 Bottom Heat Shield ..... Standard  
 Area Heated ..... up to 1,000 sq. ft.  
 Weight ..... 310 lbs.  
 Flue Exit ..... Top Only  
 Flue Size ..... 6"

Ash Pan ..... Standard  
 Loading Door ..... Front  
 Loading Door Opening (W x H) ..... 8" x 9"  
 Draft Control ..... Manual  
 Back Clearance (w/Heat Shield Kit) ..... 9.0"  
 Side Clearance (w/Heat Shield Kit) ..... 9.0"  
 Corner Clearance (w/Heat Shield Kit) ..... 9.0"  
 Wood Length (Recommended Maximum) ..... 16"  
 Window Size (viewable) ..... 7" W x 6"H  
 Firebox Size ..... 1.2 Cubic ft.  
 Burn Time ..... 6-8 hrs.  
 Heat Output Range ..... 15,332-27,294 BTU/hr

