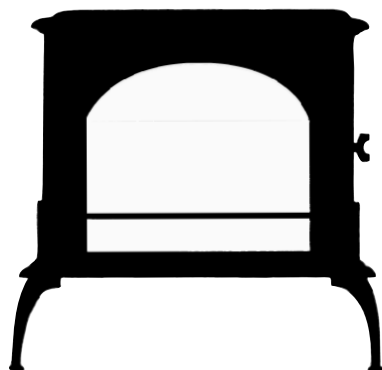
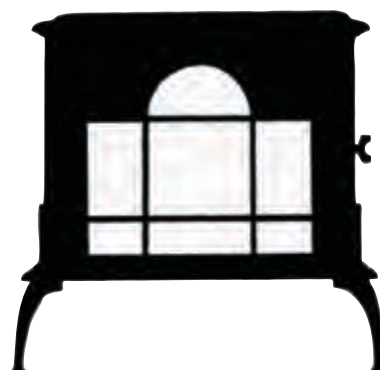


KEYSTONE MODEL 204 PALLADIAN MODEL 202

Model 204 Keystone



Model 202 Palladian



WOODSTOCK SOAPSTONE STOVES

OWNER'S MANUAL

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

Tested and Listed by



Woodstock Soapstone Company, Inc.
66 Airpark Road, West Lebanon, NH 03784
Toll Free 1-800-866-4344 • www.woodstove.com

Rev 0320

OUR PROMISE

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

EPA APPROVAL

This Manual describes the installation and operation of: **202 Palladian Catalytic Soapstone Stove & 204 Keystone Catalytic Soapstone Stove** .

Model 202 Palladian Catalytic Soapstone Stove & 204 Keystone Catalytic Soapstone Stove meet the U.S. Environmental Protection Agency's cordwood emission standard for wood heaters sold after May 15, 2020. Under specific test conditions, this stove has been shown to deliver heat at rates ranging from 9,989 to 46,437 BTU/hr., and average emissions of 0.85 grams/hr.

The Keystone/Palladian model contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against the law to operate this woodstove in a manner inconsistent with the operating instructions in this manual, or if the catalytic element is deactivated or removed.

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

Tested and Listed by



LISTING TO UL #1482

Model 202 Palladian Catalytic Soapstone Stove & 204 Keystone Catalytic Soapstone Stove has been tested to UL Standard #1482 7th edition 2011 for safety, and is listed by PFS Corporation. UL Standard #1482 is the standard for testing solid fuel heating appliances which is universally recognized by all national building regulatory agencies (SBCC, BOCA, ICBO) and individual states.

Please Note: Tested and Listed for US installations only

LIMITED WARRANTY

Your Woodstock Soapstone Stove will be carefully inspected before shipment. We will replace any part which is defective in material or workmanship, free of cost, for a period 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 in your Keystone/Palladian 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 03768
Phone: 1-800-866-4344 • Web: www.woodstove.com

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INSTALLATION

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

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

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

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

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

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

LOCATION

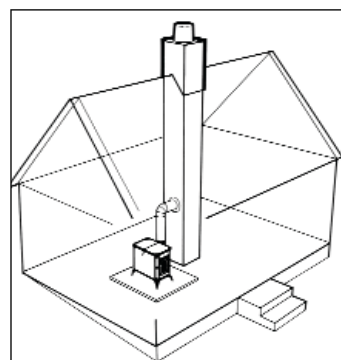
A stove which is centrally located will heat the greatest area of your home. Heat should be able to circulate easily into nearby rooms. Placing your stove near an open stairway or register in the floor will help transfer heat to other rooms.

Other installation considerations are:

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

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

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



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

ALCOVE INSTALLATIONS

The Model 202 & 204 Palladian & Keystone Wood Stoves are **not** approved for an alcove installation. An alcove is described as an area less than 512 cubic feet, which is equivalent to an 8'x8'x8' space.

CHIMNEYS

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

Chimney Flue Sizing:

Keystone and Palladian stoves have 7" flue collars and are approved for the use of 7" or 6" vent pipe. If upsizing needs to occur due to an existing chimney the following general rules apply:

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

Recommendation: Woodstock Soapstone recommends the Keystone and Palladian wood stoves, with either the 6" or 7" flue collar, a maximum of 8 inch x 10 inch rectangular or 10 inch round flue tile for an **inside** chimney . For an **outside** chimney, an 8 inch x 8 inch square or 8 inch round would be the largest recommended. The smallest size we recommend is 6 inches round. **DO NOT VENT THE PALLADIAN OR KEYSTONE INTO A CHIMNEY OF LESS THAN 6 INCHES IN DIAMETER.**

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

Height Requirements:

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

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

CHIMNEY TYPES

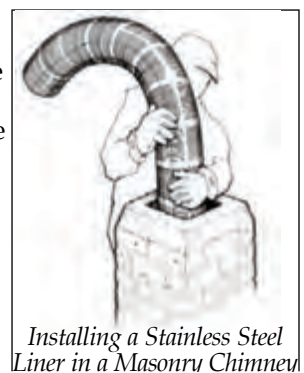
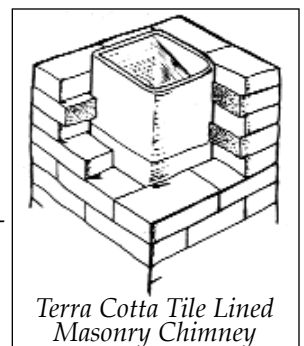
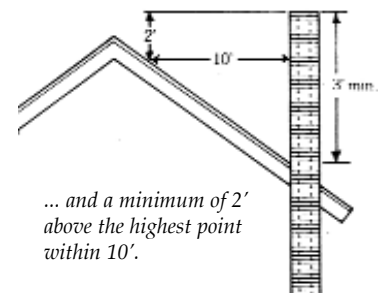
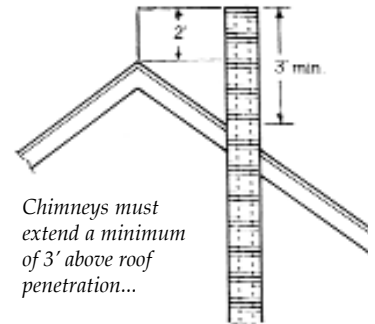
DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

There are two acceptable types of chimneys: Lined Masonry Chimneys and Class A, Pre-fabricated Metal Chimneys rated to 2100° F. Masonry chimneys must meet all applicable codes for a safe installation.

Lined Masonry Chimneys:

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

Existing chimneys should be checked twice a year for obstructions, creosote deposits, surface cracks, chemical deterioration and poor construction. Any damage should be repaired immediately. Two other chimney related areas that should be checked are chimney penetrations at the floor or ceiling joists, and at the roofline. There should be at least 2 inches of clearance between



the chimney and floor joists or other combustible materials. Poor flashing between the chimney and the roof line can cause leaks and deterioration of chimney mortar.

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

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

Passing Through A Combustible Wall:

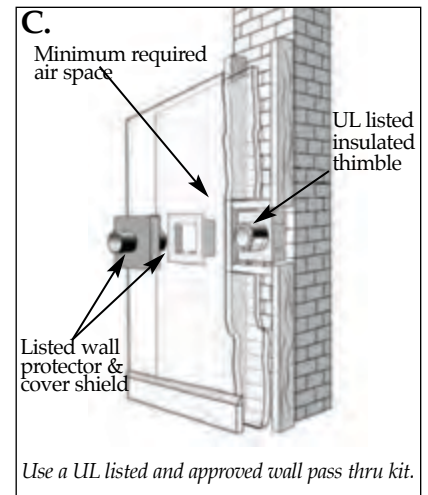
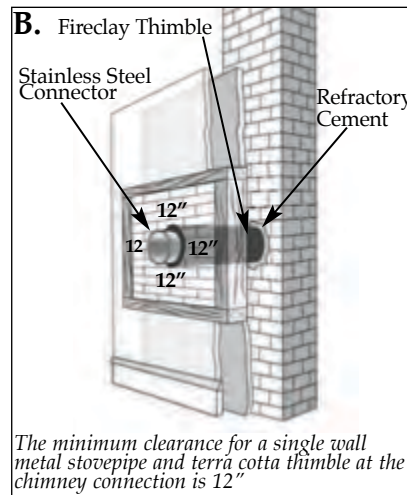
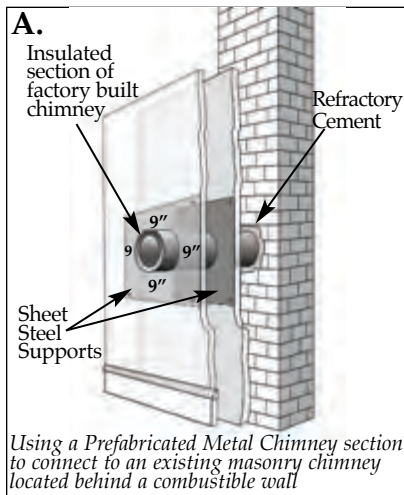
With an exterior chimney, in most cases the chimney connector (or stove pipe) will need to pass through a combustible wall. The following are acceptable methods:

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

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

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

For other methods, please refer to NFPA 211.

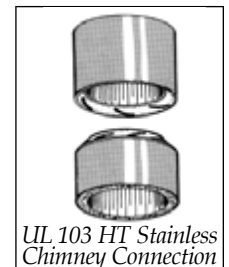


REMEMBER, UNPROTECTED SINGLE OR DOUBLE WALL STOVE PIPE SHOULD NOT PASS THROUGH A COMBUSTIBLE WALL OR CEILING TO CONNECT TO THE CHIMNEY. YOU MUST USE AN APPROVED METHOD WHICH PROVIDES GREATER PROTECTION THAN SINGLE OR DOUBLE WALL PIPE.

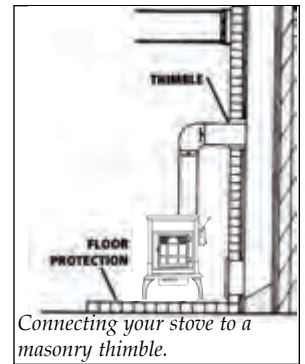
Prefabricated Metal Chimneys:

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

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



At the point of the first penetration of a combustible surface (i.e., wall or ceiling) all subsequent venting components need to be prefabricated "UL Type HT Class A". If your prefabricated chimney goes through a living space it must be enclosed, and that enclosure must conform to clearance standards for the prefabricated chimney. Your chimney must pass through your roof and extend above the roof line in accordance with code standards. Please refer to height require-

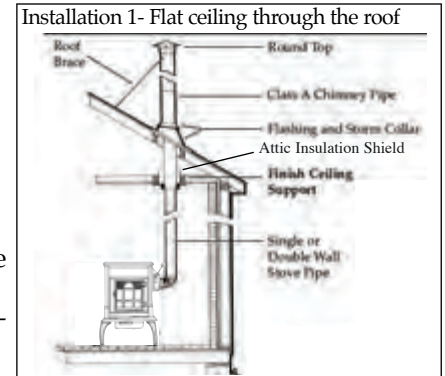


PREFABRICATED CHIMNEY CONFIGURATIONS

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

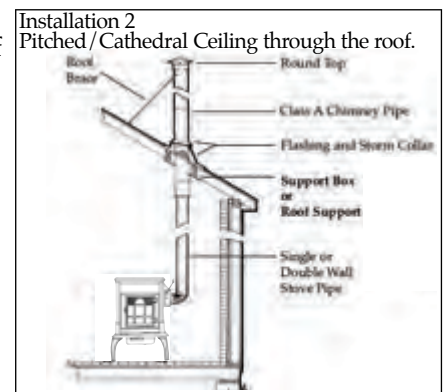
Installation 1- Flat ceiling through the roof

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



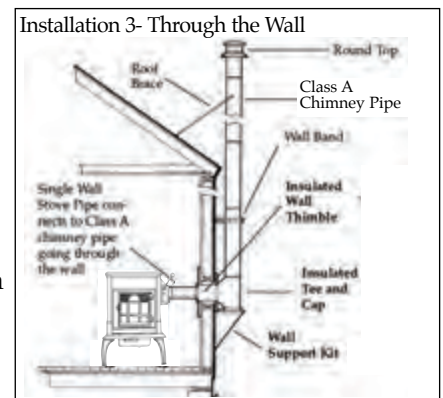
Installation 2- Pitched/Cathedral Ceiling through the roof

Determine where the stove will be placed. Be sure all clearance requirements are satisfied. Choose the appropriate support for your installation (Support box or Roof support package). Use a plumb line to locate the support in the ceiling above. Cut the appropriate sized hole in the ceiling and install the necessary framing to secure the support. Install the support according to its specific instructions.. Be sure that the support hangs down below the ceiling far enough to maintain proper clearance to the connector pipe (steeper slopes require more pipe below the ceiling). Install the pipe adapter to the first section of chimney pipe and lower it into the support box (or connect it to the bottom of the roof support). As the pipe extends through the roof install the appropriate roof flashing and storm collar. Install the proper chimney pipe lengths to meet code and recommended chimney height. It may be necessary to install a roof brace for stability. Always install the appropriate cap to the top of the chimney. Double wall connector pipe is recommended for installations that have 10' or more from the stove to the chimney. Be sure that all joints in the connector pipe are secure and fastened with screws, including at the flue collar and chimney pipe adapter. (Please refer to the manufacturers full set of installation instructions)



Installation 3- Through the wall

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



Stovepipe (Connector Pipe):

Connector pipe is either single wall (sheet metal) or double wall (sheet metal outer pipe with a stainless steel inner pipe). We strongly recommend 22 gauge pipe (26 or 28 gauge is too thin for use with a wood stove). The connector pipe should be 6 inch diameter to match the flue collar of the stove. If your connection to either a masonry chimney or prefab-

reduce clearances for your connector pipe installation, double wall connector pipe would be recommended. All pipe connections, including at the flue collar, must be secured with screws. **DO NOT USE GALVANIZED SINGLE WALL PIPE.**

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

FIREPLACE INSTALLATION

Your Model 202 Palladian or 204 Keystone wood stove can be installed in front of an existing fireplace with a lintel opening of 26.5" high or taller. Installing the Palladian or Keystone soapstone stove in a fireplace setting is a great way to enjoy the view of the fire, while greatly increasing the efficiency and reducing heat loss to the fireplace chimney.

We do not recommend placing the stove inside the fireplace, as it would be difficult to access the control levers, load the stove, and much of the heat radiating off the stove would not circulate into the room.

The preferred method is to install a stove in front of a fireplace and run a stainless steel 'flex' liner down the chimney, connecting it to the stove at the fireplace. Chimneys with large flues should be re-lined to achieve proper draft. If the chimney does not have a tile lined flue or if the tile is cracked or compromised, an additional insulating material must be used.

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

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

If the fireplace surround is clad in wood trim, the proper clearance to a combustible will need to be maintained. See illustrations to the left. An unprotected wood mantel needs to be a minimum of 30" from the top of the stove. If a mantel shield is installed that clearance can be reduced to 12".

DO NOT VENT YOUR WOOD STOVE THROUGH A FACTORY BUILT FIREPLACE UNLESS IT IS SPECIFICALLY LISTED FOR SUCH AN INSTALLATION .

Most factory-built fireplace chimney systems are only rated to 1,700° F, which is not sufficient for a freestanding wood burning stove.

FLOOR PROTECTION REQUIREMENTS

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

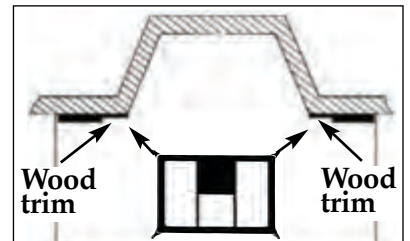
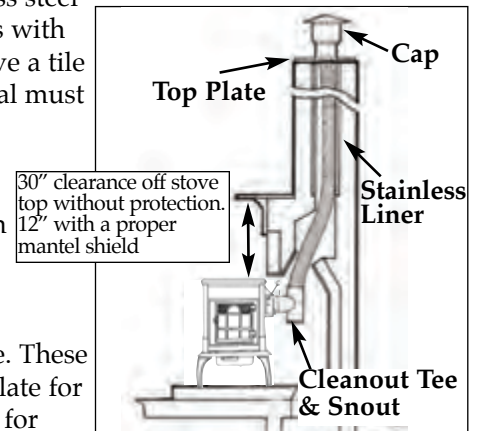
- Heat Transfer: Heat radiation from the bottom, front, and sides of the woodstove
- Ember Protection: Sparks and hot coals that may fall out during ash removal and reloading of firewood

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

Even if you have a stone or tile overlay on wood, it is still considered combustible since the surface materials will not



Keystone Stove in front of an existing fireplace



18" min. to combustible trim or 12" with rear heat shield

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

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

IF YOU CHOOSE TO BUILD YOUR OWN HEARTH PAD

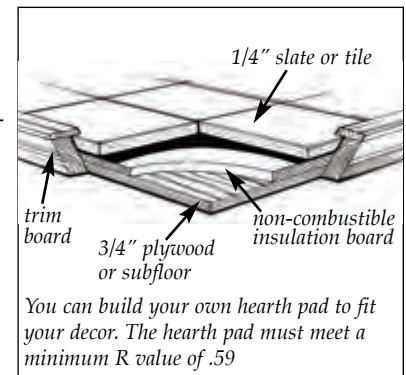
1) Start with a plywood base or sub-floor.

Over this apply:

2) a layer of insulating board with an R-Value of at least **0.59**. Depending on the material you choose, the insulating board can be as little as 1/2" thick. For additional help with material specifications, contact Woodstock Soapstone Company at 1-800-866-4344 or at info@woodstove.com.

Over this apply:

3) 1/4" or greater of a decorative, non-combustible material such as tile, slate, stone, or brick. Use mortar or grout to set the material in place, then grout the seams.



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

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

C to R: $R=1/C$

Once alternate materials have been converted to R-values, the values of multiple layers can be added to determine the combined protection. If the overall R-value meets or exceeds the specified 0.59 then the materials are acceptable.

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

Please Note: Always check with the manufacturer of the hearth material used to verify the R or K value.
K Values cannot be added, convert to R value before adding multiple layers.

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

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

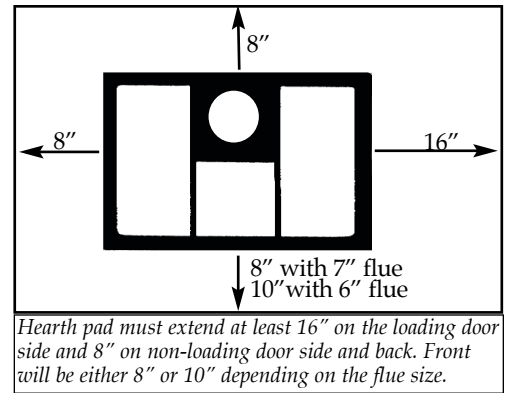
Hearth Sizing:

Clearances for your Palladian/Keystone stove on the front, back and sides must be taken into consideration when determining the placement and size of your floor protection. Vertical dimensions can be added to horizontal dimensions on all but the loading door side to equal the clearances needed to a combustible floor surface. For example, if you are required to have 10 inches in front of the stove for clearance and you have a raised hearth that measures 5 inches high, the stove can sit 5 inches from the edge to equal the 10 inches required. The floor protection must extend under any horizontal connector pipe and 2 inches beyond each side.

PARALLEL INSTALLATION HEARTH PAD

- A. Floor protection in front of stove using 7" flue collar = 8"
Floor protection in front of stove using 6" reducer= 10"
- B. Floor protection at loading door side = 16"
- C. Floor protection non-loading door side = 8"
- D. Floor protection behind stove = 8"

Minimum hearth size in a parallel installation is: 36"D x 49"W
Recommended size is: 48" D x 60"W



CORNER HEARTH PAD

Minimum hearth size in a corner installation must be 54"x54" (with the front corner cut off). **NOTE:** On a hearth of minimum size, the stove will not be centered left to right, but will meet the minimum required clearances.

Calculating a Corner Hearth Pad (per NFPA 211):

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

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

C = clearance from rear corner of appliance to wall (12" w/ rear heat shield)

1.414 = a constant

W/2 = one half the appliance width (12.5")

D = appliance depth (20")

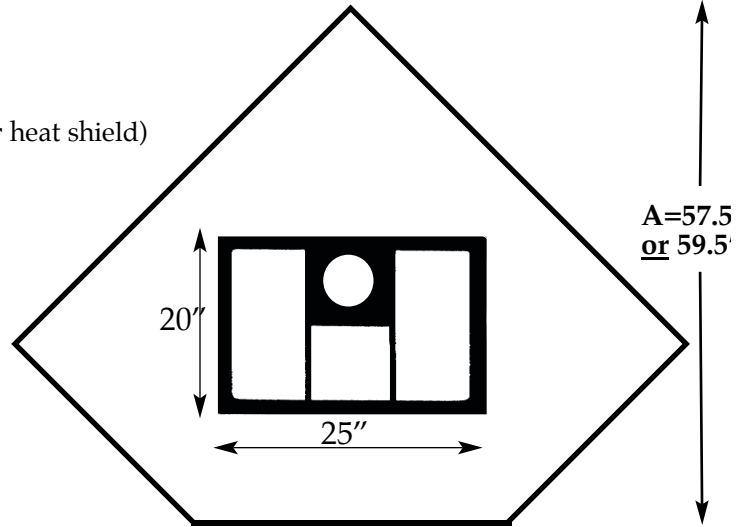
Front Hearth Clearance= 10"

Example:

Palladian/Keystone with the Rear Heat Shield & Pipe Shield & 6" Flue

A= 12" x 1.414 + 12.5" + 20" + 10" A= 59.50"

Note: If using the 7" Flue A= 57.50"



CORNER HEARTH PAD
Palladian/Keystone shown above
centered left to right

WALL PROTECTION

The Keystone & Palladian models have been tested to UL standards for clearances to combustible walls. The minimum clearances to unprotected walls are as follows:

Minimum clearances with no heat shields to unprotected combustible walls:

From the back-----30"

From the sides-----18"

Do not assume that a wall is not combustible because it has a nonflammable surface. A wall with any combustible materials in it must be considered combustible. For example, a brick wall attached to wood studs is considered a combustible wall. Over time, heat will pass through bricks and heat the wood, lowering the ignition temperature of the studs, possibly resulting in a fire. As waves of radiant heat energy meet a combustible object, heat is absorbed and the temperature of the object is raised, which can result in spontaneous combustion. Similarly, wood-framed walls which are covered with tile, stone or fire-rated sheetrock must be considered combustible. Fire-rated sheetrock is also considered combustible due to the paper covering.

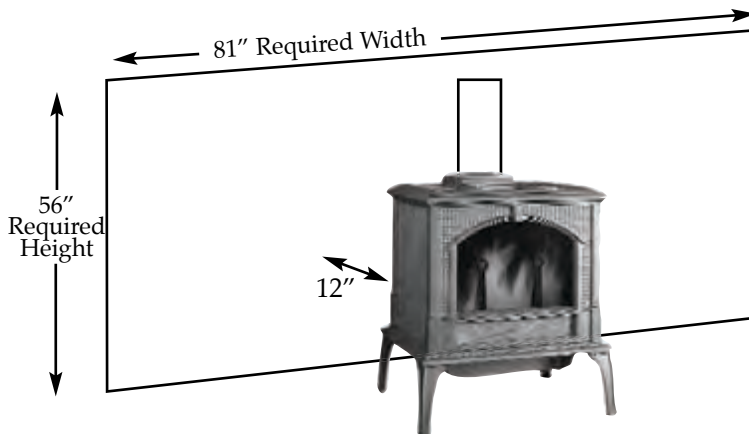
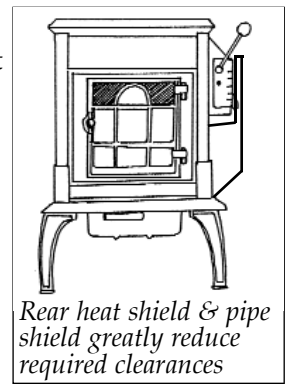
If you wish to install your stove closer to a combustible wall than standard clearances will permit, you can either attach a UL approved stove & pipe shield, or mount a protective non-combustible shield on the wall.

Stove and Pipe Shields:

Clearances can be reduced by attaching a UL approved heat shield and pipe shield. Woodstock Soapstone Company carries heat shields specifically designed for this stove. When using one or both of these shields, the clearance behind the stove can be reduced to 14.5 inches when top venting. The clearance behind the pipe can be reduced to 10 inches.

Wall shields:

Clearances can also be reduced by mounting a ventilated shield on the wall that extends 36" out beyond the stove (see diagram below). If you are installing wall protection, it should be spaced out from the wall one inch. This air space allows air to flow freely behind the shield, cooling the combustible wall and preventing a pocket of hot air from being trapped behind the shield. The wall protection can be attached to the studs using long screws and ceramic wall spacers. The spacers should not be installed directly behind the stove. The top and either a.) both sides, or b.) the bottom must be left open for adequate ventilation.



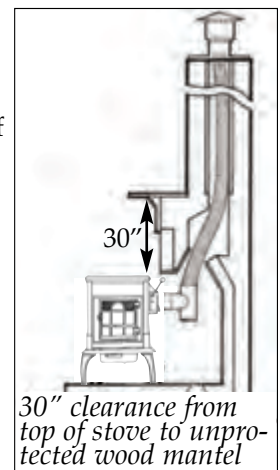
Clearance Table For Model 202 / 204 Palladian & Keystone

Type of Installation ▶	Top Vent Clearance from stove back and pipe, which goes straight up	Rear Vent Clearance from stove back and pipe, which goes straight back	Rear Vent with elbow Clearance from stove back and vertical single wall connector pipe. Using reducer & 6" stove pipe.		Stove Sides
Type of protection ▼			Stove Back	Stovepipe	
No Protection	30"	30"	30"	20"	18"
3 1/2" thick Masonry Against Combustible Wall*	20"	20"	26"	14"	14"
3 1/2" thick Masonry with 1" ventilated airspace*	12"	12"	19"	7"	12"
24 ga. sheet metal with 1" ventilated airspace*	12"	12"	19"	7"	12"
1/2" thick non-combustible insulation board with 1" airspace*	12"	12"	19"	7"	12"
UL Listed Rear Heat Shield and 36" Vertical Stack Shield	14.5"	14.5" stove	22"	10"	18"

*These clearances meet or exceed requirements of NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances.

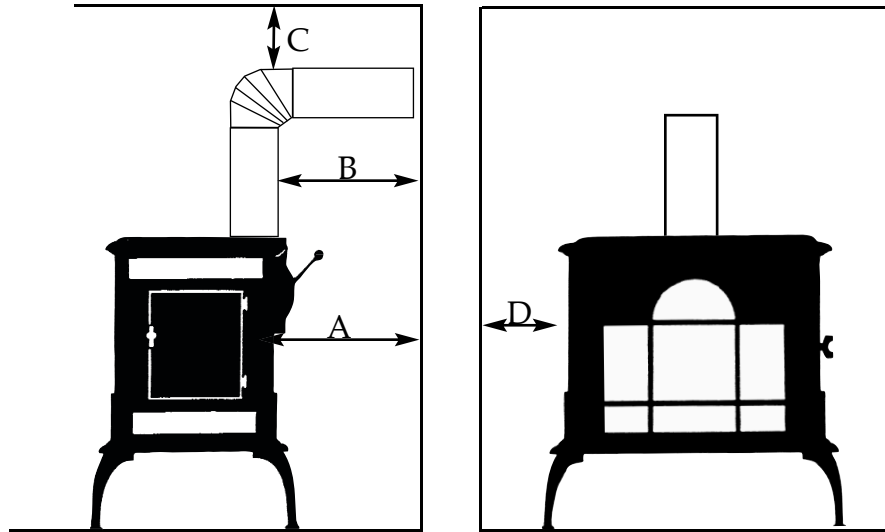
- These clearances apply to walls, ceilings, furniture and other combustibles.
- The 36" Vertical Stack Shield attaches to the back of the stove pipe and prevents excess heat from being radiated from the pipe. Heat shield protection is only required for the first 36" of vertical connector pipe.
- At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

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



CLEARANCE INSTALLATION DIAGRAMS

1) Parallel Installation, Single Wall Pipe, Top Vent



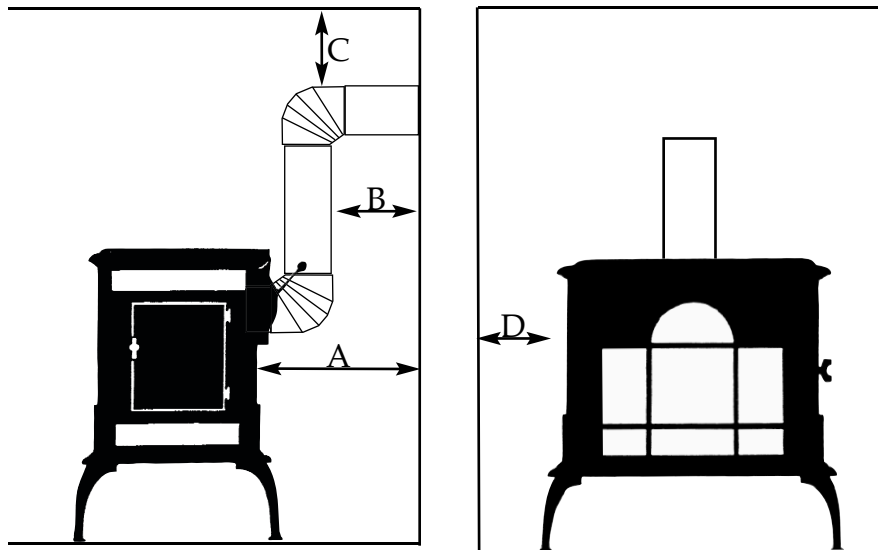
NO HEAT SHIELD

- | | |
|--------------------------------|--------------------------------|
| A. Back of stove to wall = 30" | C. Above pipe to ceiling = 20" |
| B. Back of pipe to wall = 20" | D. Side of stove to wall = 18" |

WITH REAR HEAT SHIELD & PIPE SHIELD ATTACHED

- | | |
|---|--------------------------------|
| A. Back of stove shield to wall = 14.5" | C. Above pipe to ceiling = 20" |
| B. Back of pipe shield to wall = 10" | D. Side of stove to wall = 18" |

2) Parallel Installation, Single Wall Pipe, Back Vent



NO HEAT SHIELD

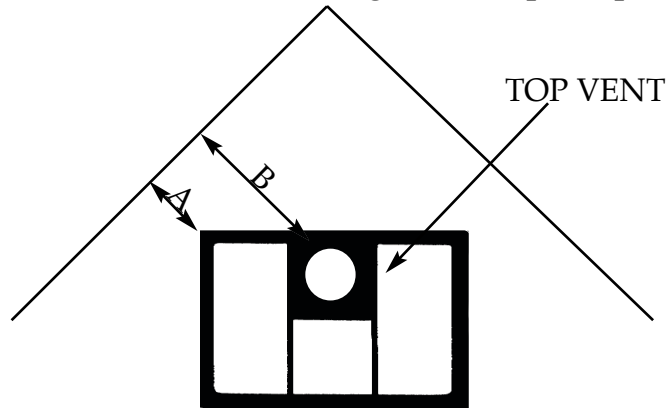
- | | |
|--------------------------------|--------------------------------|
| A. Back of stove to wall = 30" | C. Above pipe to ceiling = 20" |
| B. Back of pipe to wall = 20" | D. Side of stove to wall = 18" |

WITH REAR SHIELD & PIPE SHIELD ATTACHED

- | | |
|---------------------------------------|--------------------------------|
| A. Back of stove shield to wall = 22" | C. Above pipe to ceiling = 20" |
| B. Back of pipe shield to wall = 10" | D. Side of stove to wall = 18" |

CLEARANCE INSTALLATION DIAGRAMS

3) Corner Installation, Single Wall Pipe, Top Vent



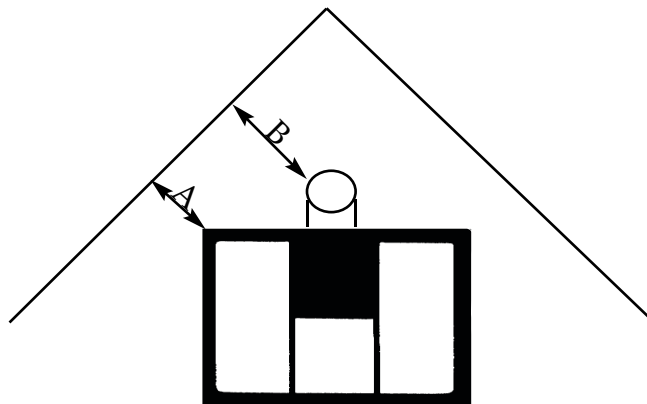
NO HEAT SHIELD

- A. Stove corners to side walls = 18" (determines placement)
- B. Pipe to side walls = 25"

WITH REAR HEAT SHIELD & PIPE SHIELD ATTACHED

- A. Stove corners to side walls = 12" (determines placement)
- B. Pipe to side walls = 10" minimum

4) Corner Installation, Single Wall Pipe, Back Vent



NO HEAT SHIELD

- A. Stove corners to side walls = 18" (determines placement)
- B. Pipe to side walls = 20"

WITH REAR SHIELD & PIPE SHIELD ATTACHED

- A. Stove corners to side walls = 12" (determines placement)
- B. Back of pipe shield to side walls = 10" minimum

MOBILE HOME INSTALLATION

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

Both the Keystone and Palladian stoves are approved for installation in a mobile home. Along with the general installation requirements for your stove, there are further regulations that must be followed for installing a stove in a mobile home. These regulations assume that the structure is very tightly constructed, made of metal, and that the home can be moved. Mobile home regulations vary from one locality to another, and may include some, or all, of the following:

- The stove must be attached to the floor of the home.
- The stove must be grounded to the mobile home's chassis.
- You must maintain the structural integrity of the home.
- You must bring outside air to the stove for combustion.
- You must use close clearance (double wall) connector pipe between stove and chimney.
- You must install a rain cap with spark arrestor.
- You may **NOT** install the appliance in a bedroom.

Since mobile homes are tightly constructed, **YOU MUST SUPPLY OUTSIDE COMBUSTION AIR DIRECTLY TO THE STOVE.** Woodstock Soapstone Company makes an outside air adapter that attaches to the back of the stove. The flange on this adapter will accept a 4" duct. We recommend flexible aluminum duct for ease of installation. Run the duct through the floor to a ventilated crawl space below, and have it terminate in the crawl space underneath the stove. You may want to install a piece of screen at the termination of the duct to keep out unwanted insects.

In a mobile home, the interior connector pipe must be close clearance (double wall) pipe. **SINGLE WALL CONNECTOR PIPE IS NOT ALLOWED IN A MOBILE HOME INSTALLATION.**

Finally, metal straps must be used to bolt the stove to the floor of the mobile home. These straps are available from Woodstock Soapstone Company at no charge.

Additional information about the installation of wood burning appliances in mobile homes is available from the Department of Housing and Urban Development (HUD).

SETTING UP YOUR STOVE

Before you light your stove for the first time, please follow these instructions.

1) Remove the combustor shipping bolts 2) Install the bottom heat shield, 3) Install the flue collar/cover plate, 4) Attach the knob for the bypass handle, and 5) Remove the ash pan cover.

(1.) Remove the combustor shipping bolts:

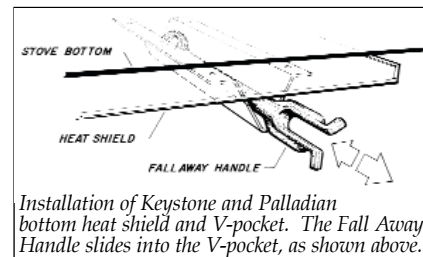
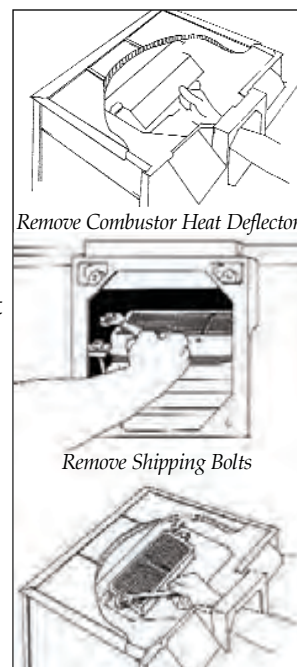
Before attaching your flue collar and cover plate, you will want to remove the shipping bolts that were installed for transportation purposes. (1) First make sure the lever in the back is in the upright position, closing the bypass cover. (2) Using either the top or back opening, reach into the upper section of the stove and remove the heat deflector using a 7/16" wrench. The deflector is installed with one bolt and star washer. (3) Lift the deflector and turn it 90° to remove it temporarily from the stove. You'll now have view of the combustor. (4) Using a 1/2" wrench, remove the two long bolts and washers on the right and left side of the combustor and discard. (5) Reinstall the heat deflector.

(2.) How to attach the Palladian/Keystone bottom heat shield:

The bottom heat shield prevents excess heat from being radiated from the ash pan housing onto the hearth. The bottom heat shield also contains a pocket to hold the Fall-Away Handle.

1. Attach the "V-Shaped" pocket to the bottom of the heat shield. Hardware is included with the manual and the 4 holes are pre-drilled. This pocket serves as storage for the Fall-Away Handle.
2. There are 4 threaded holes in the bottom of the stove that line up with the 4 holes in the shield. Slide the shield under the stove and attach it to the bottom of the stove with the 4 bolts provided in the manual package. The shield hangs down below the bottom of the stove, and rests on the bolt heads, leaving air space for cooling.

3. The "V-Shaped" pocket will be on the bottom of the heat shield, right under the ash door. Slide the Fall-Away Handle



(3) How to attach the Palladian/Keystone Flue Collar and Cover Plate:

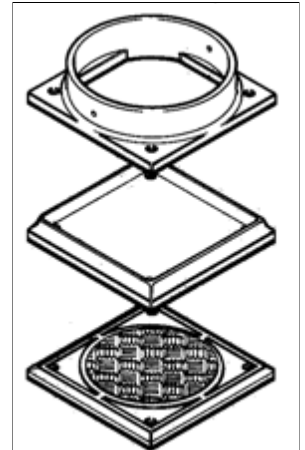
The flue collar and cover plate are interchangeable, so first you must decide whether you will vent your stove from the top or the back. If you are venting from the top, you will put the flue collar on the top vent and the cover plate on the back vent. If you are venting from the back, you will do the opposite.

TOP VENTING: First, attach the flue collar to the top of the stove using 4 of the 6 flat headed machine screws included in the manual package. (An allen wrench is provided to tighten them.)

Second, attach the remaining cover plate to the back of the stove. When you attach this part, the top two screws are slightly longer than the bottom two screws, and they are already in the screw holes to help eliminate confusion. Remove these two screws from the back, and reuse them to attach the cover plate. The two screws for the bottom are included in the manual package.

Do not overtighten these screws: simply tighten until the gasket has seated and the screws are snug. When you top vent a Keystone and install the cover plate on the back of the stove, you can put the soapstone insert on the top of the stove, right in front of the flue collar. It will provide a convenient raised cooking surface for kettles and pots.

REAR VENTING: Attach the flue collar to the back of the stove using the 2 screws that are already in the top holes plus 2 of the flat headed machine screws included in the manual package. (An allen wrench is provided to tighten them.) The Keystone cover plate has a soapstone insert when it is installed on top of the stove.



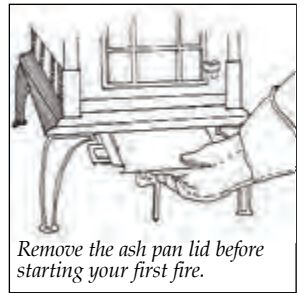
From top to bottom: interchangeable flue collar; Keystone cover plate; and Palladian cover plate.

(4) How to Attach the Palladian/Keystone Bypass Damper Knob:

Attach the “press-on” black plastic knob on the end of the damper rod at the back of the stove using a pushing, twisting motion; or gently hammer the knob onto the rod with a soft mallet.

(5.) Remove your Ash Pan Cover:

Open your ash pan door, located on the right side of the stove, below the loading door, slide the ash pan out and remove the cover and set it aside. The cover can be used when removing the ash pan from the stove for safe disposal of the accumulated ash.



Remove the ash pan lid before starting your first fire.

OPERATION

Prior to operating your new Keystone/Palladian woodstove, please refer to "Setting up your stove" on page 11, located in the Installation portion of the manual.

Seasoning Your Stove

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

First, there will be a hot, acrid smell as the stove heats up. This smell is a result of the paint on the cast iron 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. Fortunately, 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 moisture being driven out of the furnace cement in 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.

After the first few fires, the texture and grain of the stone may become slightly more pronounced, and the color may deepen slightly.

Starting a Fire

THIS IS IMPORTANT: Check the Draft Before You Light The Stove:

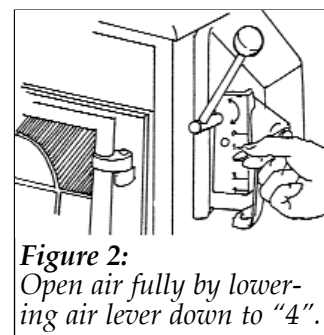
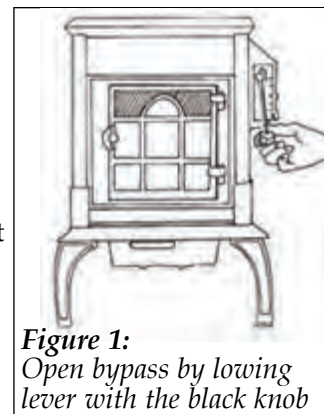
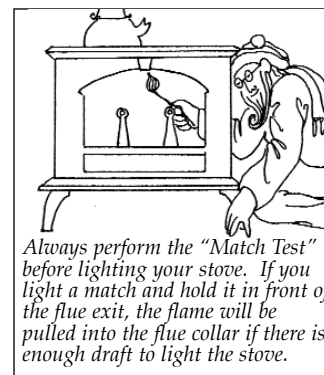
Before you light your stove, it is a good idea to check the draft. If you experience a down draft (cool air moving down the chimney), you will need to correct this before you light the stove. Otherwise, you may get smoke in the house.

1. Open the catalytic bypass damper by pushing the lever with the black knob all the way down. This will open the bypass door. (Fig. 1)
2. Push the air lever next to the side door all the way down to "4" to completely open the air damper. With the lever in the down position, maximum air is allowed into the firebox. (Fig. 2)
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 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. There are several ways of establishing a draft, below are a few suggestions:
 - A) You may be able to correct inadequate draft by opening a door or window in the room where the stove is installed. Wait a minute or two, then light a match again in front of the flue outlet. The flame should be pulled into the flue opening.
 - B) A hair dryer or heat gun pointed at the flue exit is a good way to establish draft without creating a lot of smoke. After you think you have draft, re-test with a match.
 - C) Light rolled up newspaper and hold it under the bypass door at the back of the stove. This should warm the chimney enough to establish proper draft.

Lighting the Fire

DO NOT USE ANDIRONS OR A GRATE TO SUPPORT WOOD. BUILD A FIRE DIRECTLY ON THE BOTTOM OF THE FIREBOX.

- 1) 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.
- 2) Now light the newspaper. Once it catches, you may leave the door open 1/4 to 1/2 inch for a few minutes to promote air flow, but **DO NOT** forget to close it. **DO NOT OPEN ASH PAN DOOR TO START THE FIRE.**
- 3) Add small splits of firewood once the kindling has ignited. This will establish a bed of hot coals.

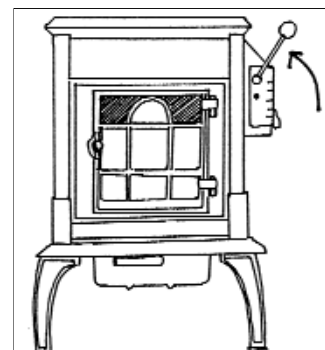


- 4) Add small to medium splits onto the hot coals. Assuming the wood is dry, the fire should spread through the wood. After about 10 minutes, close the air damper down about half way between the "2" and "3" mark.
- 5) After the stove top temperature reaches 250°F or your single wall pipe temperature reaches 300-350°F, close the bypass by lifting the lever with the black knob all the way up into the closed position. It will stop when the bypass is fully closed. 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.
- 6) Adjust the air control damper to a lower setting, our recommendation is near the "1" mark. The closer the lever is to the "0", the lower the burn rate, as less air is entering the firebox. The final damper setting will be determined by the desired heat output from the stove, the condition of the wood being burned, and the draft through the chimney system.

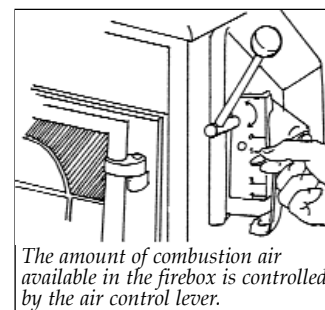
Engaging the Catalytic Combustor

The catalytic combustor will start to burn the gases and particles in the smoke when the temperature of the smoke reaches approximately 500°F, or after about 10-15 minutes of establishing a strong fire. Each stove comes with a surface thermometer. Use the surface thermometer to monitor your stove temperatures. The temperature on top of the stove is approximately 1/2 the temperature inside the stove, so when the thermometer on the stove top reads 250°F, it is 500°F inside. You will find that after the combustor is engaged, surface temperatures will often rise considerably- evidence that the combustor is producing lots of heat, and the pipe temperature will go down, indicating less heat loss to your chimney!

Engage the combustor by lifting the bypass handle (with the black knob) up until it clicks into its upright position and then reduce the air damper to 1. You should see the bright yellow flames slow down and become more orange in color. Make fine adjustments to your damper (by moving it closer to 0 in 1/8 to 1/4 inch increments) until you achieve this slower moving, darker flame. Closing the air damper to 0 will cause smoldering which can smoke up your stove's window and produce creosote.



The combustor bypass lever; shown here in the "engaged" position. When the handle is down, the combustor is "bypassed".



The amount of combustion air available in the firebox is controlled by the air control lever.

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 Keystone/Palladian model is simply designed and intended to be user friendly, but it will take some practice to get used to it.

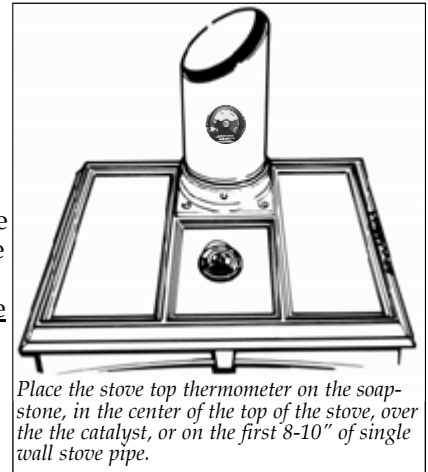
- 1) Before you open the loading door, you must fully open the catalytic bypass and the air damper. Wait a minute or so for a strong draft to be established to prevent smoke from spilling back into the room.
- 2) Stir up the hot coals. If necessary, excess ash should be removed before reloading the firebox. Simply rake the hot coals back and forth in the firebox to allow the loose ash to fall through the 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 space for secondary combustion, with a mix of larger and smaller splits. Close the loading door and allow the pipe temperature to come back up to 300°-350°.
- 5) Adjust the air damper to a low setting by lifting the lever up toward #1.
- 6) Close the catalytic bypass, by lifting the lever with the black knob all the way up into the closed position. It will stop when the bypass is fully closed.
- 7) Initially the fire may appear to die out. This may cause a small amount of soot to collect on the glass. Any buildup on the glass should go away with higher temperature burns

THE STOVE SHOULD NEVER BE OPERATED WITH THE DRAFT DAMPER COMPLETELY OPEN EXCEPT WHEN KINDLING A FIRE OR RELOADING THE STOVE. It should be "damped down" or partially closed as soon as the fire has been kindled or, if the stove is being reloaded, as soon as the fire has been re-established.

NEVER BUILD A ROARING FIRE IN A COLD STOVE! It takes approximately 30-45 minutes to heat the soapstone mass of the Keystone or Palladian stove thoroughly. Any attempt to hurry this process and generate extremely high heat quickly could result in damage to the cast-iron or to the soapstone. Your patience will be rewarded with hours of "stored" warmth.

The Surface and Probe Thermometers

We recommend placing the surface thermometer 8"-10" above the flue collar on **single wall** stove pipe if the stove is vented out the top. If you are reading the single wall stove pipe temperature, the interior flue exhaust temperature is about twice as hot. Since the 22 gauge sheet metal pipe is more reactive (faster heat transfer) than the stove top, it gives a better idea of exhaust temperatures. We recommend engaging the catalytic combustor once the pipe thermometer reaches 250°-300° F. Once the combustor is engaged, you should see the stove surface temperature rise and the pipe temperature drop, indicating catalytic combustor activity. From a cold start it may take 30-45 minutes to get the stove up to temperature. If you are reloading a hot stove, wait approximately 10-15 minutes before engaging the combustor.



The surface thermometer is not a precise instrument – it will not tell you the exact temperature inside the firebox or in the flue. If reading the surface temperature, the thermometer will not register changes in temperature quickly due to the thickness and heat retention of soapstone. We supply the thermometer to give you some idea of what is going on inside the stove, and to provide a guide for operation.

<u>STOVE TOP READING</u>	<u>OPERATION</u>
over 250°.....	OK to engage the combustor
400-600°.....	Normal operating temperature
600-700°.....	High burn range
over 700°.....	DO NOT burn in this range

The probe thermometer can be inserted into the port beside the flue collar in the rear of the stove. The probe thermometer will measure the temperature immediately downstream of the catalytic combustor. The sensing end of the probe extends to within 1 inch of the face of the catalyst. The probe is calibrated from room temperature to 1700 degrees F. The catalyst can be engaged as soon as the temperature on this probe exceeds 500 degrees F, or as soon as the temperature on the pipe thermometer exceeds 250 degrees (see above). The best operating range for the catalyst is from 500 - 1400 degrees F. When the temperature on the probe thermometer exceeds 1400°F, we recommend closing the damper to prevent excessive heat from occurring

Overfiring

The cast iron parts in your Woodstock Soapstone Stove are of the finest quality. Our cast iron parts have been made in the same foundry since the mid 1980's, and the foundry itself has been in business for over one hundred years. Each cast iron part is inspected by our stove builders before it becomes part of a stove. However, cast iron is not indestructible. Experts have shown that cast iron begins to oxidize (reddish or whitish discoloration) at 1400° F. Burning a stove frequently at excessive temperatures is known as overfiring. When the surface temperature is consistently near or over 700° F, the stove has reached 1400° F inside. Operation with temperatures in this range can lead to cast iron warping, becoming brittle, and eventually deteriorating completely. Overfiring can also shorten the useful life of the catalytic combustor.

DO NOT OVERFIRE!
ATTEMPTS TO ACHIEVE HEAT OUTPUT RATES THAT EXCEED STOVE DESIGN SPECIFICATIONS CAN RESULT IN PERMANENT DAMAGE TO THE STOVE AND TO THE CATALYTIC COMBUSTOR.

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

Daily Use

Your Keystone or Palladian is well-suited for continuous firing on a 24 hour-a-day basis. It will burn for hours on one load of wood, and will provide steady heat for hours after the fire dies down. When the temperature on top of the stove drops below 250° during an all-night burn, it is not necessary to disengage the combustor. 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. This is true even if the surface temperature on top of the stove drops below 250° at the end of a long burn.

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

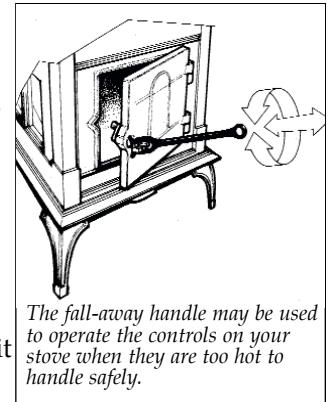
The Fall-Away Handle

The metal “fall-away” handle, which comes with your stove, can be used to operate any of the three controls on the stove: 1) The side door latch, 2) The draft damper control, and 3) The catalytic bypass handle.

The FORK of the handle should be used to turn the latch, to push the door closed, or open and close the damper.

The LEG of the handle should be used to pull the door open or to move the combustor bypass into position.

The “fall-away” handle 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.



Cooking

The soapstone top of your stove provides a good cooking surface for soups and stews or meals cooked in a Dutch oven. The soapstone distributes heat evenly for long simmering, and the polished surface is a natural no-stick surface. We do not recommend cooking directly on the stove top, as the surface will discolor. If the soapstone does discolor, it can easily be restored by sanding lightly with 000 or 0000 steel wool. Soapstone griddles have been popular in New England for years. They are available in a variety of shapes and sizes and can be purchased directly from Woodstock Soapstone Company.

Firewood

Your Woodstock Soapstone Stove is designed to burn seasoned, natural cordwood only. Higher efficiency and lower emissions generally result when burning air-dried hardwoods, as compared to soft woods or green, freshly cut hardwoods.

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 stored for a year, the moisture content will usually range from 15-25%. Splitting wood before it is stored will reduce drying time, result in more even burning, and lessen the danger of water vapor condensing in the chimney, creosote formation, and damage to the catalyst. It is safer and more efficient to burn dry or seasoned cordwood 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 smoke. If you burn wet wood some 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.

DO NOT BURN treated or painted wood, coal, garbage, cardboard, solvents, colored paper, or trash in your Woodstock Soapstone Stove. Coal and artificial logs burn much hotter than wood and could cause damage, through overheating, to the cast iron or the soapstone panels. Burning treated wood, garbage, solvents, colored paper or trash may result in the release of toxic fumes and may poison or otherwise render the catalytic combustor ineffective.

Burning cardboard, loose paper, and trash will add significantly to ash and soot build-up, and it will not produce much heat. Fly ash from improper fuel can also coat or plug the combustor, causing smoke spillage into the room.

Under normal operating conditions, the Woodstock Soapstone Stove is designed to last for generations. It is not, however, designed for continuous over-firing, or firing with coal, artificial logs or trash.

DO NOT BURN

- Treated Wood
- Coal
- Garbage
- Cardboard
- Solvents
- Colored Paper
- Trash

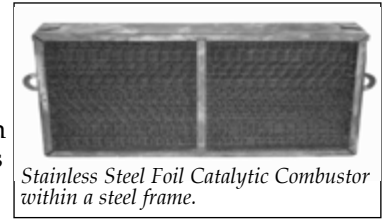
CAUTION

NEVER USE GASOLINE, 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.

CATALYTIC COMBUSTORS

Here is how your catalytic combustor works.

The catalytic combustor is a stainless steel foil with hundreds of cells. Precious metals, such as platinum, are sprayed on the inside of these cells to coat the steel foil. This creates the surface area which interacts with the wood smoke. The catalytic combustor in your stove is very similar to the one in the exhaust system of your automobile and works to achieve the same results - high efficiency and clean air!



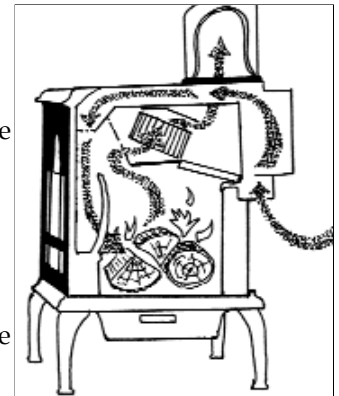
When you first start a fire, you should bypass your catalytic combustor and let the smoke go directly up the chimney. Once wood smoke reaches 500° F internally (about 10-15 minutes after re-establishing a strong fire), it is hot enough to ignite the catalytic combustor. As the wood smoke passes through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

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

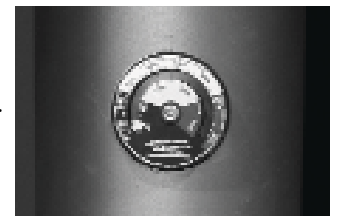
Most of the chemical compounds in wood smoke are combustible. The catalyst produces high temperatures, which loosen the bonds of these chemical compounds and "burns" wood smoke. A stove that "burns" these compounds and uses smoke as additional fuel will burn more efficiently and produce more heat, while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

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

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



Cut-away drawing of the airflow pattern in a Palladian & Keystone. Air enters the firebox by washing down over the window and exits after going through the combustor.



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

- 1) Burn only natural, well-seasoned wood.
- 2) Wait until the exhaust gases reach about 500 degrees F (internally) before engaging the catalytic combustor (about 10-15 minutes after re-establishing a strong fire).
- 3) Bypass the combustor before reloading and leave the bypass open for a few minutes after reloading to raise the temperature in the stove.
- 4) Don't overfire the stove.
- 5) Clean the combustor regularly. See instructions below.

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

Inspection & Cleaning

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

The catalytic combustor is protected from ash build up by a high temperature alloy screen. The screen should be cleaned at every combustor cleaning. Plan to clean and inspect your catalytic combustor and screen about every 4-6 weeks. Any fly ash deposits on the screen or combustor will need to be brushed or vacuumed off. An accumulation of fly ash can reduce the draft, causing backpuffing, sluggish burning and inefficient heating performance. You should clean and check your combustor & screen before the heating season begins, as well as on a regular 4-6 week basis.

Tools needed: (1) work gloves and safety glasses; (2) 7/16" and 1/2" socket or box wrench, or adjustable wrench; (3) soft bristled paint brush or vacuum cleaner (preferably one designed for ash removal).

There are two ways to clean your combustor.

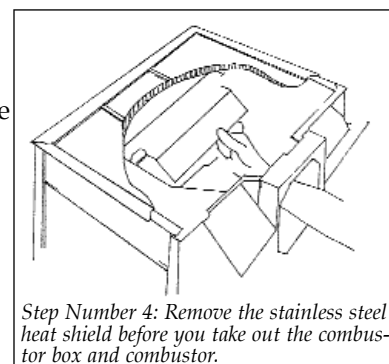
METHOD I: REMOVE YOUR COMBUSTOR FROM THE STOVE:

This is the most thorough method of cleaning your combustor.

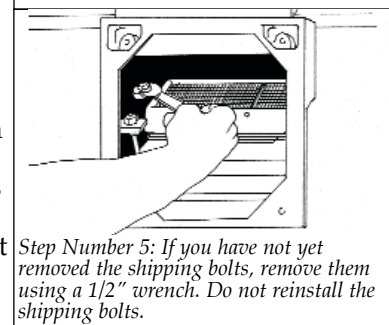
1. Be sure the fire is out and the stove is cold. Even though the stove may be cold, there may be some lingering embers in the ashes.
2. Your Palladian/Keystone has an interchangeable cover plate and flue collar that enable you to vent the stove from the top or back. Leave the flue collar and pipe in place and remove the cover plate.
3. Using the Allen wrench provided with the stove, remove the four screws.
4. Reach in through the opening, remove the single hex head bolt that holds the stainless steel heat shield in place, using an adjustable wrench or 7/16" open-end wrench, and remove the heat shield (*see illustration*).
5. If you haven't already done so, remove the two bolts that hold the combustor box in place using the 1/2" open-end wrench. These bolts are located at either side of the combustor box and have flat washers under the bolt heads. These are shipping bolts so the combustor doesn't move while your stove is in transit. You can either discard them now or hold onto them if you ever plan to move your stove again. They do not have to be reinstalled (*see illustration at right*).
6. Tip the front of the combustor box up, turn it 90 degrees, and remove it through the rear opening. If you're removing it through the top of the stove, you will have to slide one end of the combustor into the flue opening, and tip it up so that it will come out through the top opening.
7. Once out, you can use a paint brush (or other soft bristled brush) or a vacuum cleaner to remove any fly ash from both sides of the combustor. **Never use anything abrasive** to clean the combustor. A vacuum cleaner may be used, but **never use high pressured (or compressed) air** to blow the cells free of build-up. It could strip the precious metal coating from the inside of the cells. Any cell blockage can be removed with a pipe cleaner or a cotton swab. Vacuum the area where the combustor is installed inside the stove.
8. Once cleaned, put the combustor back into place inside the stove.



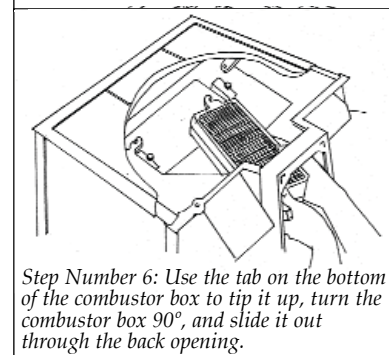
To clean the catalyst you will need a 7/16" and a 1/2" wrench (or an adjustable wrench) You should wear gloves and safety glasses. You can clean the actual catalyst with a vacuum cleaner.



Step Number 4: Remove the stainless steel heat shield before you take out the combustor box and combustor.



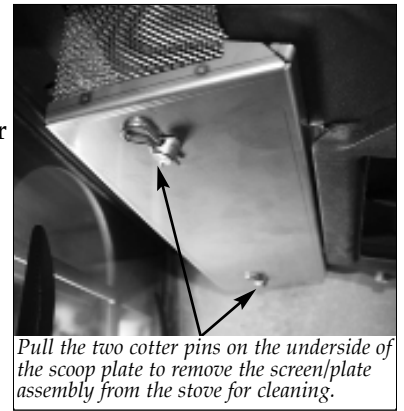
Step Number 5: If you have not yet removed the shipping bolts, remove them using a 1/2" wrench. Do not reinstall the shipping bolts.



Step Number 6: Use the tab on the bottom of the combustor box to tip it up, turn the combustor box 90°, and slide it out through the back opening.

You should now clean the metal screen located inside of the firebox, under the catalytic combustor.

9. Open the side door. The top of the firebox (inside the stove) consists of a flat stainless steel plate (K-805 Scoop Kit) with an attached metal screen. This screen prevents direct flame from hitting the combustor and creates turbulence in the exhaust stream. The scoop plate is held in place with two metal hair pin cotters that feed through stainless steel posts. The scoop plate is also supported in the slot under the bypass damper toward the back of the stove.
10. Remove the two hair pin cotters. This will allow you to remove the scoop plate from the ceiling of the firebox.
11. You can now use a brush, vacuum, or rinse the screen to remove any ash that may have accumulated.
12. To reassemble, put the scoop/screen assembly back in place, taking care that the back edge of the scoop is wedged in the slot under the bypass damper and push the scoop plate up to reveal the holes in the stainless posts. Push the hair pin cotter through the posts so the pins are below the scoop plate/screen assembly. You are finished.



METHOD II: CLEAN YOUR COMBUSTOR FROM INSIDE THE FIREBOX:

This is a quicker way to give your combustor and screen a quick cleaning when you don't have the time to do the more thorough method described above.

1. Follow the steps above to remove the scoop plate and screen (#9-#10, above).
2. Brush them off with a paint brush or vacuum.
3. While the scoop is removed, reach into the firebox with the brush or vacuum and remove the ash from the "upstream" face of the combustor while it sits in place. Fly ash will accumulate on this side more than the backside. This will keep the cells open for the smoke to flow through.
4. Follow the instructions for re-installing the scoop back into place. (#12, above).

REPLACING A CATALYTIC COMBUSTOR

You will need the following tools: (1) 5/32" allen wrench that came with stove, (2) 1/2" open end wrench, (3) 2- 7/16" wrenches, (4) vacuum — preferably one designed for ash removal, (5) work gloves, and (6) safety glasses.

1. Your Palladian/Keystone has an interchangeable cover plate and flue collar which enables you to vent the stove from either the top or back. Leave the flue collar in place and the pipe connected to it. Remove the cover plate, using the enclosed 5/32" allen wrench to loosen the 4 socket set screws in the corners.
2. Reach in through the hexagonal opening, and remove the single hex-head bolt that holds the stainless steel combustor shield in place using an adjustable wrench or 7/16" open-end wrench to loosen the bolt. Remove the stainless steel shield.
3. If you haven't already, remove the two bolts that hold the combustor box in place using the 1/2" open-end wrench. These two bolts are located at either side of the combustor box and have flat washers under the bolt heads. These are shipping bolts so the combustor doesn't move while the stove is being shipped. To make future maintenance easier, do not reinstall them.
4. Tip the front of the combustor box up, turn the box 90 degrees, and remove it through the rear opening. If you are removing the combustor box through the top of the stove, you will have to slide one end of the combustor into the flue collar opening, and tip it up so that it will come out through the top opening.
5. Separate the top and bottom of the combustor box by removing the 2 bolts with two 7/16" wrenches. Remove the old combustor and clean off any old gasket residue. Put the new combustor with its new gasket into the combustor box. It may fit loosely at first but when the stove is fired, the gasket will expand to fill the space. Reassemble the combustor box. Place the box back into the stove so it is seated on the gasket. Bolt the stainless shield back in place.
6. Attach the cover plate again, tightening the 4 socket set screws with the Allen wrench.

Frequently Asked Questions

Q. How does the catalytic combustor work?

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

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

Q. How can I tell if the catalytic combustor is working?

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

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

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

Q. How do I maintain my catalytic combustor?

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

There is a metal screen in the top of the firebox, just in front of the bypass damper. This screen is made of an alloy called inconel, and can withstand very high temperatures. Since the screen is in a very hot part of the exhaust path, it incinerates most airborne fly ash, and prevents fly ash from reaching the catalytic combustor. If fly ash in its pure mineral form (calcium carbonate or magnesium oxide, for example) is left on the screen, you can remove these mineral deposits by gently tapping on the front of the screen until the deposits become dislodged, brushing the screen with a soft wire brush to dislodge the mineral deposits, or by soaking the screen in a vinegar/water bath for roughly 10 minutes, rinse in fresh water, then reinstall. It is very important to keep the screen clean.

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

Q. How will I know if the combustor is "worn out"?

- A. There are three symptoms that will indicate that the catalyst in your stove may not be working: First, your stove will generate noticeably less heat than it will when the catalyst is working. Second, you will notice a dramatic increase in the amount of soot and/or creosote in your stovepipe or chimney. Third, the color of the smoke produced by the stove will change. Smoke will appear black or brownish, instead of clear, white smoke (almost steam) from a catalytic stove.

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

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. Other very useful websites on all aspects of wood burning are www.hearth.com, www.woodheat.org, and 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

Model #202 Palladian and Model #204 Keystone have a 3-5/8" x 9-1/2" rectangular catalytic combustor, which is made of corrugated stainless steel. These combustors are manufactured by Clariant.

The Keystone & Palladian catalytic combustors in Woodstock Soapstone Stoves have a three year unconditional warranty, with an additional three years of pro-rated warranty. Warranty claims should be addressed to:

Woodstock Soapstone Company, Inc.
66 Airpark Road
West Lebanon, NH 03784
Phone: 1-800-866-4344 • Web: www.woodstove.com
Email: info@woodstove.com

MAINTENANCE

Ash Removal

If your Palladian or Keystone is in continuous operation, ashes will have to be removed every 3-4 days. You do not have to let the fire die out completely to remove the ashes, but do let it burn down to coals. First make sure the combustor is in bypass position. Remember to wear stove gloves - the ash pan will be hot! Open the ash removal door under the side door. Carefully remove the ash pan from the base of the stove and attach the lid to the top of the ash pan. The lid slides into two channels in the sides of the ash pan. Use both hands, and pick up the pan by both ends. Close the ash pan door.

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

Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible material, 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 up to 36 hours 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 wood stove ash removal. Do not ever leave a container of hot ashes on a wood floor or porch.

Stove Cleaning

The ornamental cast iron frame of the Woodstock Soapstone Stove is painted with two coats of 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 vacuuming with a brush attachment when the stove is cold. If the iron castings are exposed to moisture for a long period of time they may 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.

Soapstone is a very soft mineral and the polished exterior surfaces can be scratched. Scratches may be easily removed by sanding lightly with medium steel wool or 120 grit sandpaper. The surface may then be buffed with 400 grit sandpaper or fine steel wool. Remove dust created by sanding with a vacuum cleaner; a damp cloth will simply spread it around. Be sure the stove is cold before you clean it.

Glass Cleaning

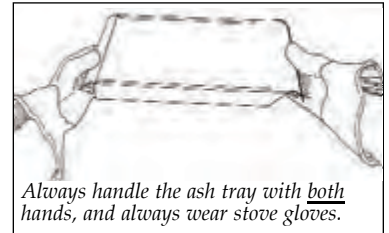
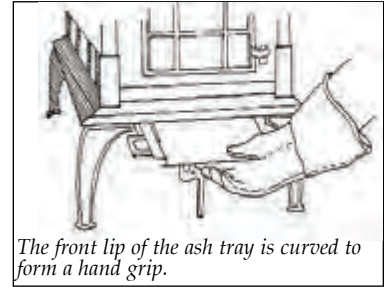
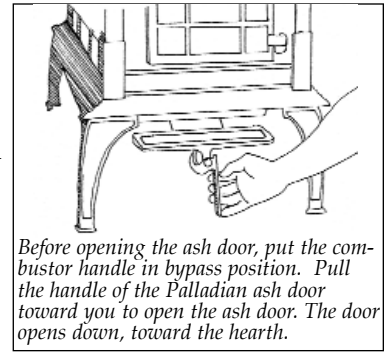
We use ceramic glass in our stoves because it is resistant to both impact and thermal shock. The panes of ceramic glass installed in the stove fronts have full gaskets around the perimeter so there is no contact between the glass and the cast iron frame.

There are two panes of glass in each fireplace front, with an air-space between the two panes. This "thermal-pane" arrangement helps keep the temperature on the inside of the glass higher and prevents condensation and soot from accumulating. The Keystone and Palladian have large glass areas and also have an "air-wash" design in which the primary air supply washes over the front glass to assist in keeping the glass free of ash and soot.

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

To clean the inside of the glass or wipe off fly ash, we recommend that you use a brush with soft bristles (like a paintbrush). 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.

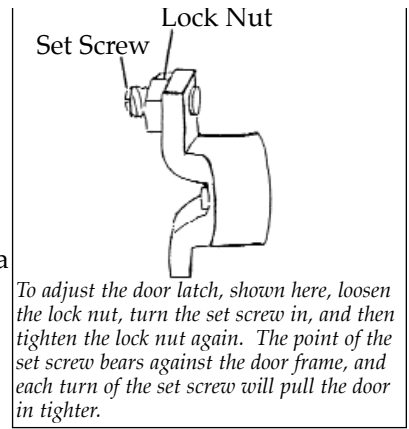
DO NOT ATTEMPT TO CLEAN HOT GLASS.



Door Latch Adjustment

The Keystone and Palladian stoves have latches that can be easily adjusted as required. If the gasketing on the side door becomes compressed, the latch has a set screw that can be adjusted to take up the slack, maintaining a tight seal around the door.

To adjust the latch, loosen the lock nut on the back of the latch. Tighten the set screw a turn or two, until the door closes more tightly. Then tighten the lock nut so the set screw will not move.



To adjust the door latch, shown here, loosen the lock nut, turn the set screw in, and then tighten the lock nut again. The point of the set screw bears against the door frame, and each turn of the set screw will pull the door in tighter.

Gasket Replacement

There are five areas on your stove where you should check the gasket routinely: (1) on the side door, (2) the ash pan door, (3) under the catalytic bypass damper, (4) under the catalytic combustor, (5) and the flue collar & cover plate. These five gaskets are the 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 replacement instructions.

The sizes of all the gaskets on your Keystone/Palladian woodstove are included in the parts list on page 30 of this manual.

Routine Checks And End of Season Maintenance

Every two months of operation we recommend checking the chimney connector (stovepipe), chimney, and combustor (see combustor section) and cleaning, if necessary. If any of the gasket material in the stove becomes worn or frayed, it should be replaced. Also inspect the cast iron interior parts to make sure that over-firing hasn't occurred.

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 combustor. We recommend a yearly service visit from a certified chimney sweep who will look at the whole system, from top to bottom. Chimney safety is important for you and your family so you can fully enjoy your stove without worrying. The best way to gain confidence in the safety of your Keystone/Palladian is to have it serviced and inspected once a year by a professional chimney sweep.

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, the moisture may wick through the gasket between the cast iron and the soapstone panels, and appear as discoloration around the edge of the soapstone, on the outside of the stove. If this happens, you can remove any discoloration with fine steel wool. You can prevent future occurrences by blocking the flue exit in the stove with fiberglass insulation at the end of the heating season. This will prevent downdrafts 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!)

Creosote - Formation and Need for Removal

WHEN WOOD IS BURNED SLOWLY, IT PRODUCES TAR AND OTHER ORGANIC VAPORS, WHICH COMBINE WITH EXPELLED MOISTURE TO FORM CREOSOTE. THE CREOSOTE VAPORS CONDENSE IN THE RELATIVELY COOL CHIMNEY FLUE OF A SLOW-BURNING FIRE. AS A RESULT, CREOSOTE RESIDUE ACCUMULATES ON THE FLUE LINING. WHEN IGNITED THIS CREOSOTE MAKES AN EXTREMELY HOT FIRE. THE CHIMNEY CONNECTOR AND THE CHIMNEY SHOULD BE INSPECTED AT LEAST ONCE EVERY TWO MONTHS DURING THE HEATING SEASON TO DETERMINE IF A CREOSOTE BUILDUP HAS OCCURED. IF CREOSOTE HAS ACCUMULATED IT SHOULD BE REMOVED TO REDUCE THE RISK OF A CHIMNEY FIRE.

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

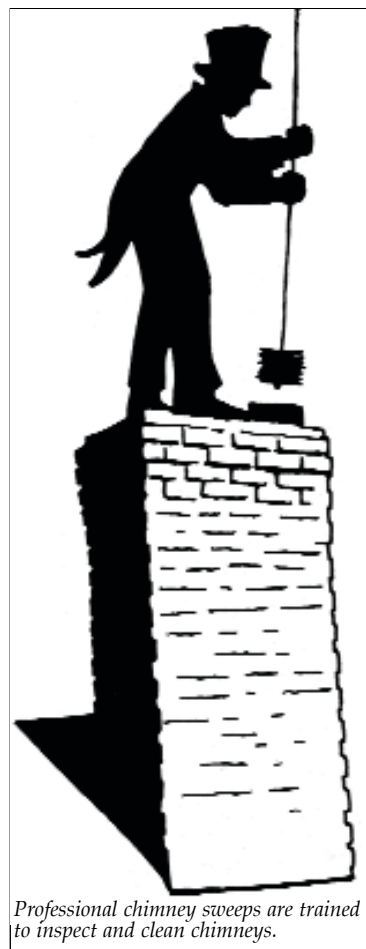
Lack of combustion air and smoldering fires usually result in dense smoke and low stack temperatures in the chimney connector and the chimney. Wet or green wood can also produce dense smoke and excessive water vapor, which can quickly lead to creosote buildup.

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.

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. Burn only dry cordwood. Dry wood burns hotter 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.
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. Try to re-establish a hot fire, and re-ignite 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, and pipe temperatures should drop, when the catalytic combustor becomes 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° range) will produce more complete combustion and maintain proper catalytic activity.



Professional chimney sweeps are trained to inspect and clean chimneys.

TROUBLESHOOTING

Woodstock Soapstone Company's Customer Service Representatives are available by phone Monday through Saturday from 9 a.m. to 5 p.m Eastern. You can reach us by calling toll-free **1-800-866-4344** or e-mailing **info@woodstove.com**. This troubleshooting guide is intended to help you understand more about the operation of your stove and to be a helpful, accessible resource for you.

The Quick Draft Test

Many stove performance problems are caused by poor draft. One of the first things to do when diagnosing operational problems is to be sure that you have adequate draft. If you perform the simple draft test that follows, it will often tell you where to look for a solution to your operational problems. (If the draft is not good, you would look for problems (1) with basic chimney specifications, (2) with obstructions inside the chimney, (3) with a tight seal between the stovepipe and the chimney - especially in fireplace installations, (4) with wind, (5) with negative house pressure, and so on. If the draft is good, you would generally look for problems within the stove or with the operation of the stove - (1) a plugged combustor, (2) plugged air passages, (3) wet or unseasoned wood, for example.) Here's the test:



Always perform the "Match Test" before lighting your stove. If you light a match and hold it in front of the flue exit, the flame will be pulled into the flue collar if there is enough draft to light the stove.

1. Perform The Match Test: Light a match in front of the flue outlet inside your stove. If the flame is drawn toward the outlet and chimney, then you have adequate draft to light your stove. If the flame doesn't move or is leaning toward you, you do not have enough draft and need to correct this situation before starting a fire.

2. How To Improve Draft Before Re-Testing: Open a door or window in the room where the stove is installed. Wait a minute or two, then light a match again in front of the flue outlet. The flame should be pulled into the flue opening. If this doesn't work, light a small piece of rolled up newspaper and hold it in front of the flue outlet. This should warm the chimney enough to establish proper draft. If this does not work, you have a draft problem. **DO NOT** light the stove, because you will simply get smoke back into the room. Read carefully the grid below, and try to determine the source of the draft problem. Feel free to call us for help at 800-866-4344. Our toll free customer service help line is open from 9 to 5, (E.T.) Monday through Saturday.

Troubleshooting Grid:

Use this grid to help identify the cause and solution for common woodstove problems.

Problem	Cause	Solution
Stove Smokes At Start Up	Bypass door or air damper is closed.	Check that air control and bypass damper are both open (both handles all the way down).
	Chimney is blocked.	Clear chimney and cap of obstructions.
	Flue is cold.	Warm the flue with burning newspaper or a hair dryer and re-check draft with match.
	Negative pressure in room.	Turn off exhaust fans, open window in the room, then do the match test.
	Small difference between outdoor and indoor temperatures.	Prime the chimney by burning newspaper in the flue.
	Flue is too large.	Install a liner that matches the stove's flue outlet. A 6" or 7" liner is recommended for the Keystone/Palladian.
Stove Puffs Smoke When Combustor Is Engaged	Combustor is plugged.	Let the stove cool down and clean the combustor.
	Not enough air for the fire.	Increase the amount of air coming into the stove by opening air damper.

Problem	Cause	Solution
Stove Smokes Occasionally/ Erratically	Wind forcing smoke down chimney.	Increase height of chimney or install a wind cap.
	Negative pressure in the home.	Turn off exhaust fans, open a window in the room, consider solving pressure problems with an HVAC professional.
	Inadequate draft.	Increase the amount of air coming into the stove by opening air damper.
	Wet wood.	Use smaller pieces of dry split wood.
	Flue is too large.	Install a liner that matches the stove's flue outlet. A 6" or 7" liner is recommended for the Keystone/Palladian.
	Multiple inlets to chimney.	Connect stove to a chimney that only has one appliance per flue. Block other inlets properly.
Warping Or Breaking Of Cast Iron Parts	Overfiring as a result of compensating for wet wood.	Burn dry cordwood.
	Overfiring - too much primary air.	After kindling a fire and getting the <u>internal</u> firebox temperature to 500° (250° on stovetop or about 300° on stovepipe), engage the combustor by bringing the bypass handle up and reduce the air damper to 1. You should see the bright yellow flames slow down and become more orange in color. Make fine adjustments to your damper (moving it closer to 0 in 1/8 to 1/4 inch increments) until you achieve this slower moving, darker flame.
	Overfiring after reloading firebox.	After reloading the firebox, let the <u>internal</u> firebox temperature come up to the 500° mark (250° on stovetop or about 300° on stovepipe) before re-engaging the combustor and re-adjusting your air control as above.
<i>Note: The cast iron parts in your stove are high quality class 30 grey iron. They will withstand normal operating temperatures of up to 1400 degrees, internally, (or roughly up to 700° surface temperature). When iron parts become warped or heavily oxidized (reddish-brown in color, with a rough surface), it is evidence that they have been repeatedly exposed to temperatures above 1400 degrees.</i>		
Combustor Not Glowing	Late stage in burning cycle.	The combustor does not need to glow to be working. Check smoke exiting from chimney to ensure combustor is working properly.
Window Dirty	Air flow restricted.	Check air gap at top of stove window inside stove. There should be 1/4" gap between glass and edge of cast iron. A smaller gap may cause window to soot.
	Smoldering fire.	Open air control in 1/4 inch increments until some slow flames appear. Run hot fire to burn smoke off the glass. Or, remove build-up with glass cleaner when stove is cold.

Problem	Cause	Solution
Stove Burning Too Hot Or Too Fast	Excessive air fueling fire.	Adjust air control on stove. Check gaskets with dollar bill test (close the door on a dollar bill. If you can pull the bill out between the door and gasket, the seal is too loose) on loading door, bypass door, ashpan door. Replace gaskets if necessary. Consider installing pipe damper in chimneys with excessive draft. Check the air damper plate under the rear flue exit. Make sure the damper plate is not lifted off its track. If it is, with a gloved hand, gently push the plate up and rest it back into the slide track.
	Combustor not firing.	Follow instructions for starting fire and make sure firebox is up to 500° before engaging combustor. Once combustor is engaged, set air control at 1 and leave alone.
	Wet wood.	Test stove by making a fire with wood that is kiln dried (available at supermarkets or Woodstock Soapstone).
Stove Not Burning Hot Enough	Heat going up chimney.	Test by attaching thermometer to stovepipe. Temperature on stovepipe should register 200° - 300° while combustor is engaged. Consider installing pipe damper.
	Paint curing/window gasket curing.	Open windows and try to leave house during first several burns until paint/gasket is cured.
Acrid Odor During First Burn	Rain coming down chimney without a cap.	Install a cap on chimney.
	Stovepipe installed incorrectly.	Install stovepipe crimped end down to allow condensation to run back inside the stovepipe and stove instead of running down outside of pipe.
	New masonry chimney curing.	Burn several fires without using combustor in order to heat inside of new chimney and cure masonry completely.
	Failure of seal on storm collar.	If water is leaking along outside of pipe, most likely rain is getting through between storm collar and chimney pipe. Re-caulk.
Water Leaking From Chimney		

Is my Combustor still working?

Your catalytic combustor is viable for 12,000 to 14,000 burn hours. This translates, roughly, into a life span of 4 -6 years. If the catalytic coating is not working as it should, it is not burning the gas vapors in the smoke and therefore, the smoke exiting your chimney will be darker in color. If your draft is sluggish and you have ruled out any draft related issues in the venting or in the wood supply, your combustor may not be burning the smoke vapors and too much volume is trying to pass through the honeycomb at one time. If heat output is diminished, and any other factors are ruled out, that may also be a sign that the catalytic combustor is not burning the smoke vapors, therefore not extracting maximum heat from available 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. All guidelines found in this manual should be adhered to. All local and national building codes need to be followed. Having a certified installer perform all connections to an inspected chimney system is strongly advised. If you choose to perform any or all of this work yourself, it must be inspected by either a Certified Wood Stove Specialist or a Certified Chimney Specialist.

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

Installation

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

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

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

Smoke and the Chimney

According to www.woodheat.org, "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.

Heat

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

Ash removal

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

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

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

Precautions

• **Smoke detectors:** A smoke detector is inexpensive insurance and is required by most localities. They can either work on batteries, or can be hard-wired into your electrical system. If you have battery operated detectors, it is a good idea to replace batteries on an annual basis (i.e.: every New Year's day, or 4th of July, etc). They will sound an audible alarm in the event of the presence of smoke. Smoke will almost always precede a wood-fueled fire.

• **Fire Extinguisher:** If you burn wood, you should have at least one ABC dry chemical extinguisher. The chemical extinguisher is preferable to water because the application of cold water to hot metal stove pipes can cause metal parts to buckle or crack, adding more air to the fire.

• **Carbon Monoxide Detector:** These operate in a manner similar to smoke detectors but are usually user calibrated and record minute quantities on a digital readout before sounding an audible alarm. The chances of carbon monoxide being created and escaping from your properly installed and operated stove are miniscule. You may have other vented appliances in your home that could be potential problems. The investment in a high quality carbon monoxide detector is well worth its cost in the peace of mind it affords.

• **Chimney inspection:** Your connector pipe and chimney, or chimney pipe, should be inspected at regular intervals. Examine the connector pipe for creosote, corrosion, loose seams, or excessive soot. Clean and replace as necessary. The chimney, or chimney pipe, should be cleaned and checked by a certified specialist once a year. A small mirror held at the cleanout door of a masonry chimney will be helpful. For a class A prefabricated metal pipe, some disassembly is usually required.

Emergency Procedures In The Event of a Chimney Fire:

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

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

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

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

PARTS LIST

Cast Iron Parts

W-174 Fallaway Handle
 W-203 Leg
 W-207 Door Frame
 W-234 Base
 W-239 Flue Collar
 W-240 Palladian Front Wall
 W-271 Keystone Front Wall
 W-241 Rear Wall
 W-242 Top
 W-206 Palladian Flue Cover
 W-274 Keystone Flue Cover
 K-267 Palladian Door Assembly
 K-272 Keystone Door Assembly
 K-232/233 Key/Pall Door Knob & Latch Kit
 W-231 Grate
 W-235 Ash Door
 W-236 Ash Door Lock
 W-237 Ash Door Handle
 W-238 Palladian Glass Retainer
 W-243 Combustor Box Bottom
 W-244 Combustor Box Top
 W-245 Combustor Pan
 W-246 Clamp Frame
 W-250 Bypass Frame
 W-251 Left Top Bracket
 W-252 Right Top Bracket
 W-253 Bypass Cover
 W-254 Bypass Lift Guide
 W-255 Damper
 W-256 Damper Guide
 W-257 Damper Handle
 W-258 Instruction Plate
 W-259 Rear Stone Retainer
 W-260 Air Guide
 W-264 Bypass Retainer (pair)
 W-269 Keystone Glass Retainer
 W-270 Keystone Andiron
 W-273 Keystone Door Stone Retainer

Steel/Sheet Metal Parts

K-531 Stainless Steel Catalytic Combustor with Frame
 K-805 Stainless Steel Scoop Assembly
 W-805 Scoop plate & screen
 W-2601 Scoop Post w/ thru holes
 W-2593 Cotter Pins
 W-2591 Bypass Actuator Handle
 W-261 Combustor Heat Shield
 W-262 Stainless Steel Bypass Shaft
 W-263 U-Bolt
 W-265 Damper Link
 W-291 Ash Pan w/ Lid
 W-293 V-Pocket
 W-294 Bottom Heat Shield
 W-312 Window Clips
 W-2513 Hinge Pins
All steel parts manufactured by Woodstock Soapstone Company

Soapstone Parts

	#pcs
W-276 Exterior Back Stone	2
W-277 Exterior Small Top Stone	1
W-278a Exterior Large Top Stone	2
W-279 Interior Side Stone	1
W-280 Interior Under Front Stone	1
W-281 Interior Back Stone	1
W-282 Keystone Exterior Key Stone	1
W-283 Keystone Door Stone	1
W-284a Exterior Over Door Stone	1
W-284b Exterior Under Door Stone	1
W-284c Exterior Under Front Stone	1
W-285 Exterior Left Side Stone	1

All soapstone parts cut and fabricated by Woodstock Soapstone Company

Other Parts

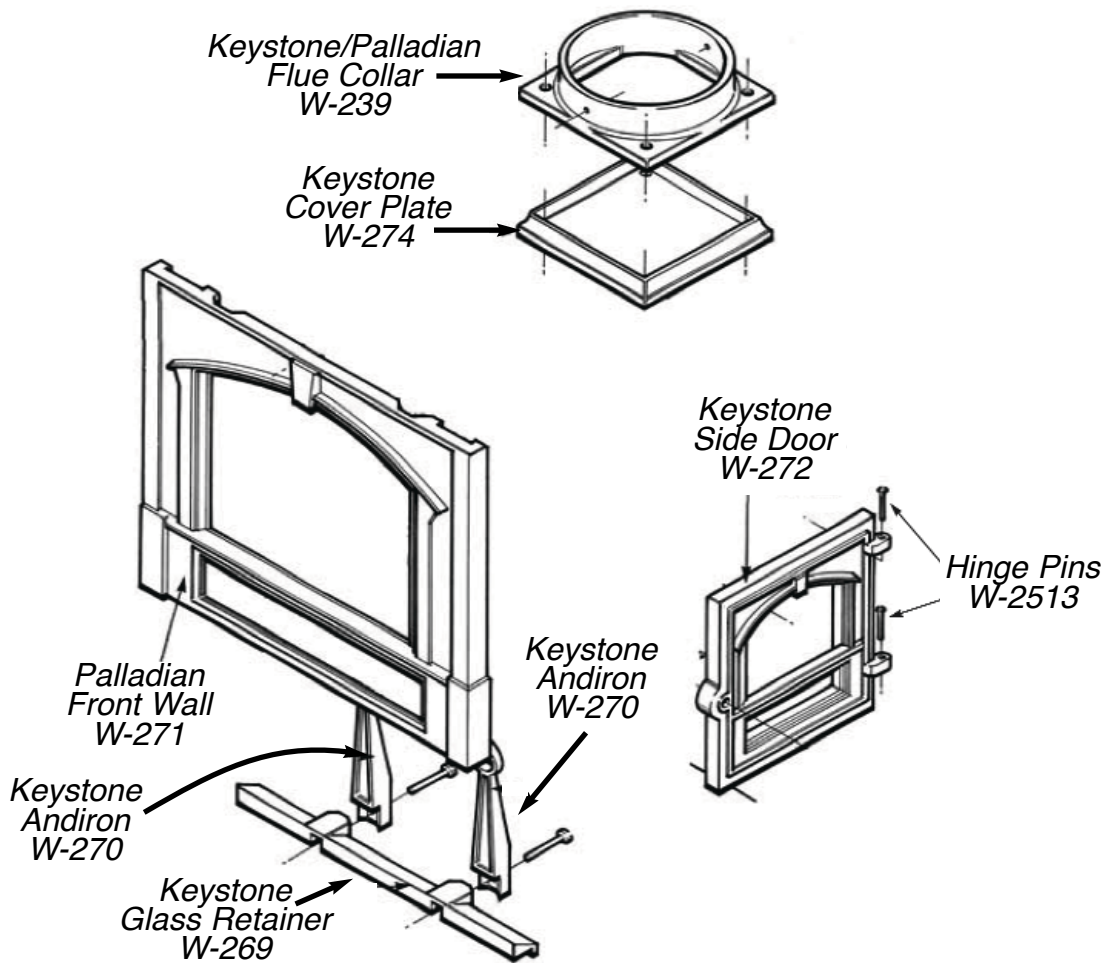
W-204 Glass 11.125"x16"x 5mm- Pyroceram III
 W-2404 Black Phenolic Knob
 8" Probe Thermometer
 Surface Thermomometer

Gasket List

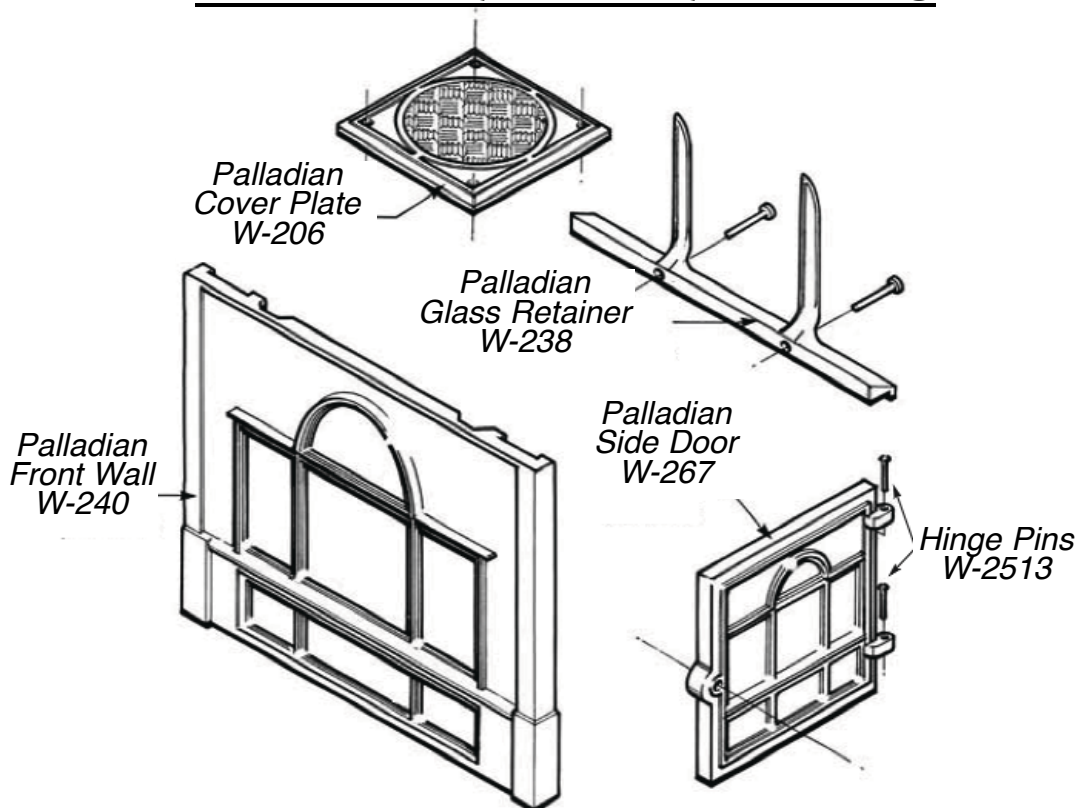
<u>Part #</u>	<u>Desc.</u>	<u>Location</u>	<u>Density</u>	<u>Amount</u>
21063	.375" gasket	Keystone Loading Door	LD1	3 Feet
21092	.312" gasket	Palladian Loading Door		3 Feet
21066	.500" gasket	Bypass Frame	LD1	3 Feet
21066	.500" gasket	Ash Door	LD1	3 Feet
21085	.250" gasket	Under Combustor	LD2	3 Feet
21209	.75" flat adhesive	Window Gasket		11 Feet
21085	.250" gasket	Flue collar & cover plate	LD2	6 Feet
W-1601	2" Interam Gasket	Around the catalytic combustor <i>(built prior to 06/2013)</i>		4 Feet
W-1800	Furnace Cement			1 Tube
W-1605a	Gasket Glue			.5 oz bottle

A Full Gasket Maintenance Kit (202/204-MK) is available and includes the above listed gaskets (except interam gasket), furnace cement, gasket glue, and steel wool.

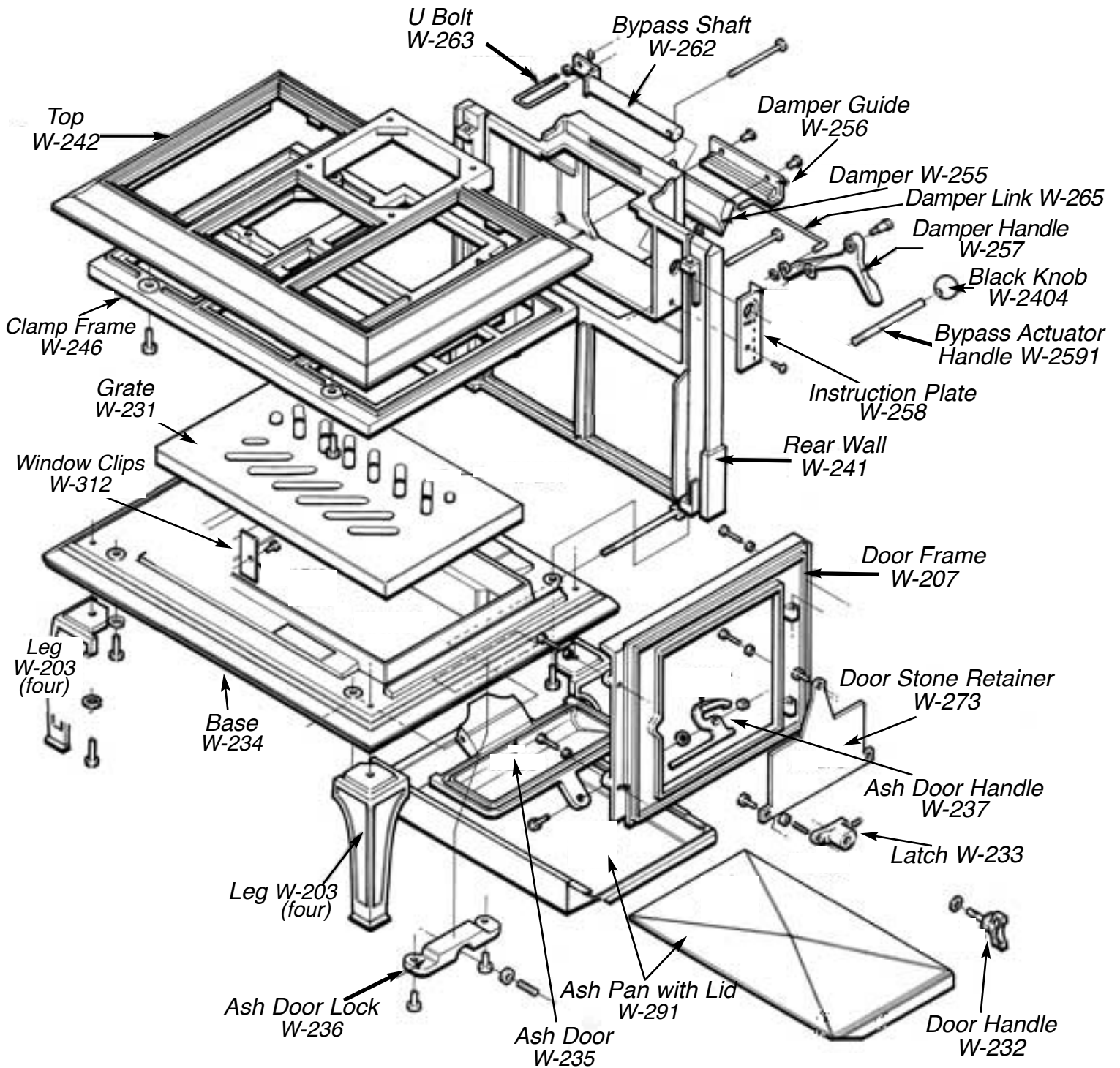
KEYSTONE EXTERNAL PARTS



PALLADIAN EXTERNAL PARTS

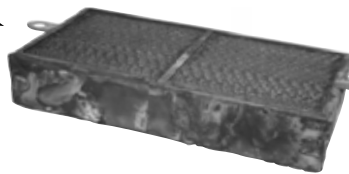
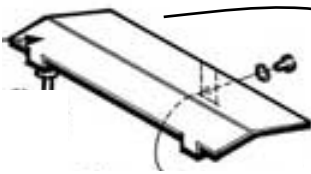


KEYSTONE -PALLADIAN FRAME

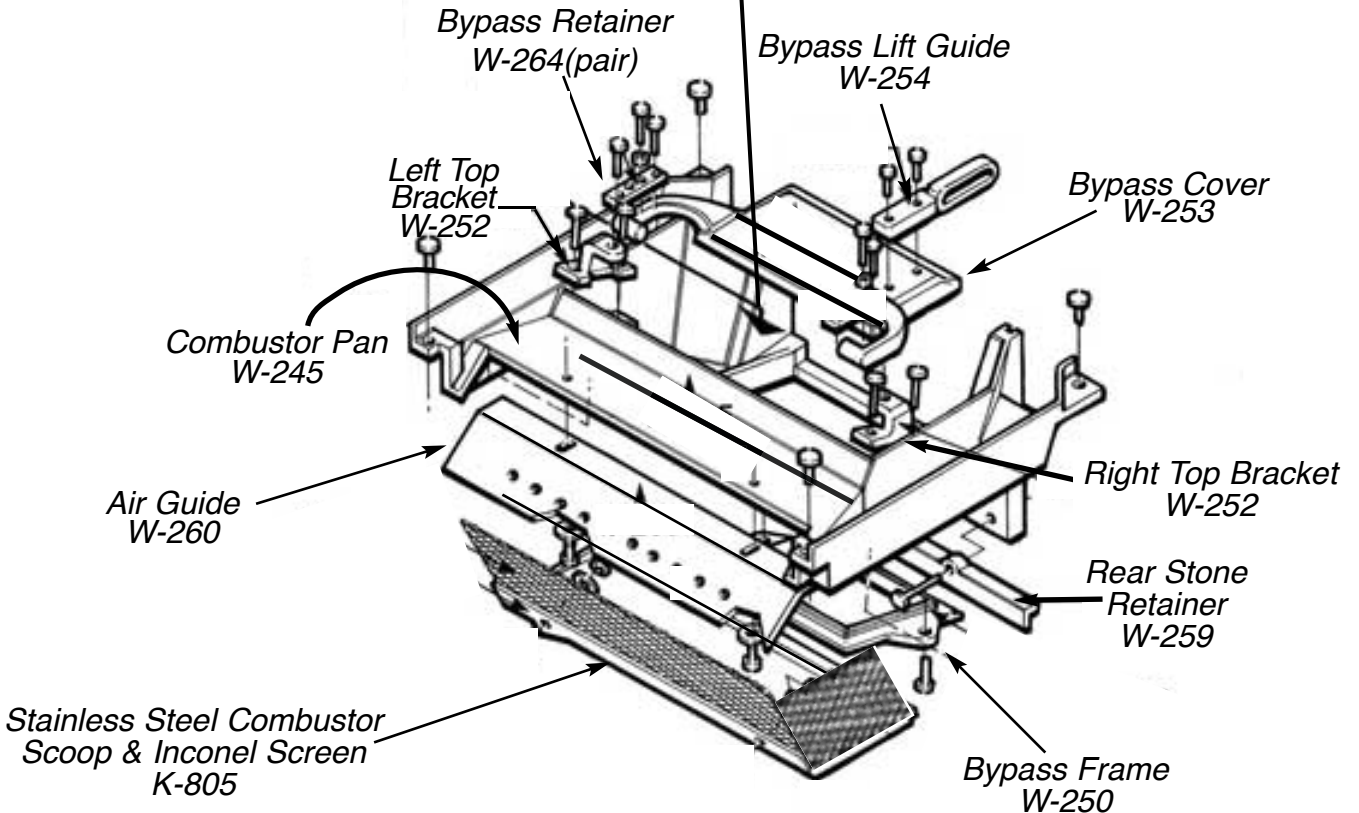


KEYSTONE -PALLADIAN UPPER INTERIOR

Combustor
Heat Shield
W-261

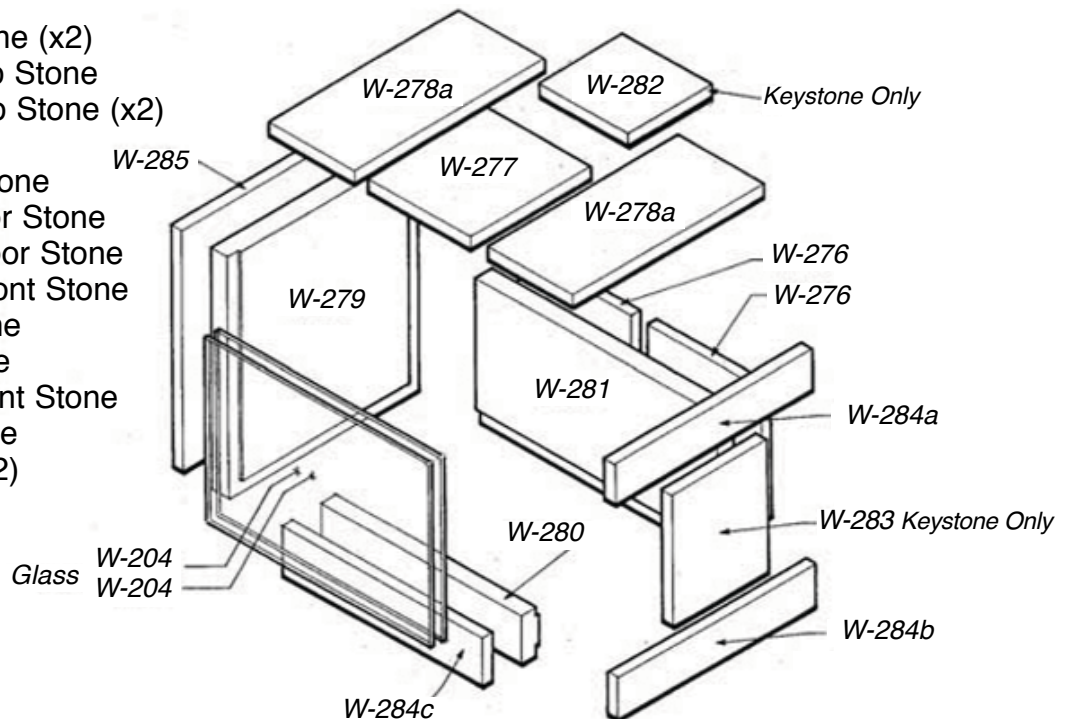


Catalytic Combustor & Frame
K-531



KEYSTONE -PALLADIAN STONE

- W-276 Exterior Back Stone (x2)
- W-277 Exterior Small Top Stone
- W-278a Exterior Large Top Stone (x2)
- W-282 Exterior Keystone
- W-283 Keystone Door Stone
- W-284a Exterior Over Door Stone
- W-284b Exterior Under Door Stone
- W-284c Exterior Under Front Stone
- W-285 Exterior Side Stone
- W-279 Interior Side Stone
- W-280 Interior Under Front Stone
- W-281 Interior Back Stone
- W-204 Ceramic Glass (x2)

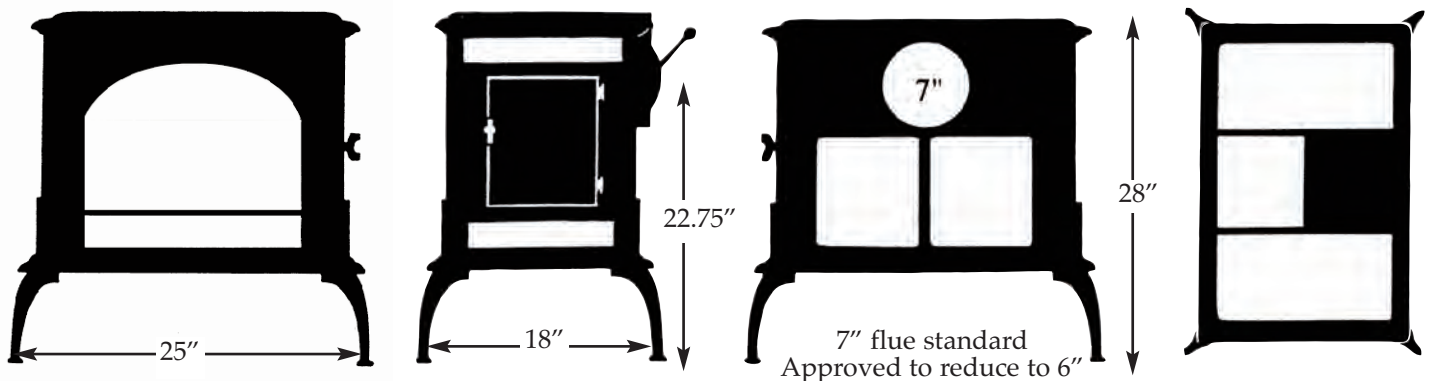


DIMENSIONS & SPECIFICATIONS

H x W x D28" x 25" x 20"
 Flue Exit.....Top or Back
 Flue Size.....7" or 6"
 Flue Height to Center (Back Vent).....22.75"
 Keystone Weight.....440lbs.
 Palladian Weight.....430 lbs.
 Loading Door.....Right Side Only
 Loading Door Size (HxW).....9.5"x8.5"
 Wood Length (Maximum).....16"
 Firebox Size.....1.4 Cubic ft.
 BurnTime.....8-10 hrs.
 Heat Output Range.....9,989-46,437 BTU/hr
 Area Heated800-1,300 sq. ft.

EPA 2020 Certified Yes
 Listed to UL 1482..... Yes
 EPA Emissions Rating.....0.85 grams/hr
 EPA Efficiency (HHV).....80%
 EPA Efficiency (LHV)86%
 Catalytic Combustor Standard
 Ash Pan..... Standard
 Back Clearance (no protection).....30"
 Back Clearance (w/Heat Shield Kit) ... 14.5" (top vent)
 Side Clearance.....18"
 Mobile Home Approved Yes

KEYSTONE MODEL 204



PALLADIAN MODEL 202

