

# THE CATALYTIC COMBUSTOR



The catalytic combustor is **ONLY** used while burning wood. **DO NOT** activate the catalytic combustor while coal is burning in the Navajo Stove. Coal exhaust will reduce the efficiency of the catalyst.

## Here is how your catalytic combustor works.

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

When you first start a fire, 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 reestablishing a strong fire), it is hot enough to ignite the catalytic combustor. As the wood smoke passes through the cells in the combustor, the smoke reacts with coating which lines the inside of the catalyst and both gases and particles in the smoke ignite and burn. This “catalytic burn” reduces emissions and increases the stove’s heat output.

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

Most of the chemical compounds in wood smoke are combustible. The catalyst produces high temperatures, which loosen the bonds of these chemical compounds and “burns” wood smoke. A stove that “burns” these compounds and uses smoke as additional fuel will burn more efficiently and produce more heat, while reducing creosote and air pollution at the same time.

With proper care, a new catalytic combustor will give years of fuel savings, increased heat and lowered emissions. By following some simple

guidelines you can ensure maximum combustor performance and longevity. Your catalytic combustor is designed to last for 10,000 -12,000 hours of use. You can ensure yourself of getting the maximum life from your combustor by following these simple guidelines:

- 1) Burn only natural, dry wood.
- 2) Wait until the internal exhaust gases reach about 500 degrees F (250° F on the pipe or stovetop) before closing the Bypass Damper and engaging the catalytic combustor.
- 3) Open the Bypass Damper before reloading, and leave the bypass open for a few minutes after reloading, to raise the exhaust temperature to 500 degrees F (250° F on the pipe or stovetop).
- 4) Don’t overfire the stove.
- 5) Clean the combustor regularly. See instructions below.



*Bypass lever should be up when starting or reloading the Navajo Steel, allowing the smoke to heat up to 500° internally.*



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

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

## Inspection & Cleaning

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

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

### CLEANING A COMBUSTOR WITH BRUSH OR VACUUM:

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

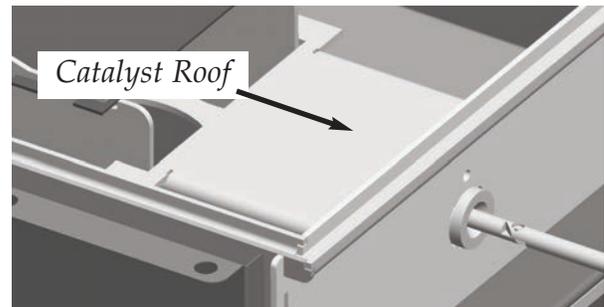
1. Be sure the fire is out and the stove is cold. If you are using a regular home vacuum, it is extremely important that no hot ashes or embers be sucked into it as this could result in damage to the vacuum or cause a serious fire. Open the top lid. The combustor can be removed as illustrated at the right.
2. Lift the combustor out of the stove. Brush or vacuum the combustor sure to remove all fly ash from the combustor.
3. Return the combustor to the stove. Be sure that it is seated flat on the catalytic sled. Close the top lid.

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

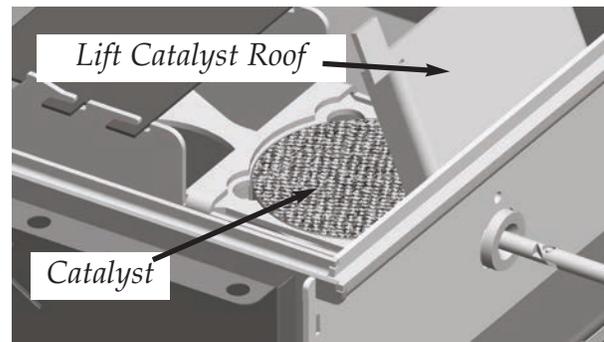
A cleaning with a 50/50 mixture of white vinegar & distilled water is recommended at least once each year. The acidity of common white vinegar (diluted 50%) is just enough to remove any fly ash within the catalytic cells that may be masking the catalytic coating.

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

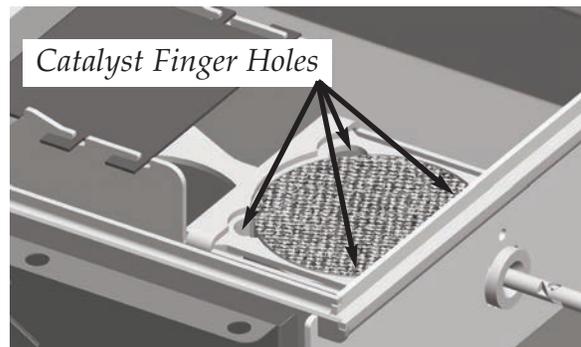
1. Be sure the fire is out and the stove is cold. Open the top lid.
2. Lift the combustor out of the stove. Place the combustor on a newspaper or an old towel. In a spray bottle prepare a 50/50 white vinegar & distilled water mixture.
3. Spray the 50/50 mixture through one side of the combustor and allow it to drain onto the newspaper. Flip the combustor over and spray through the other side and allow it to drain.
4. Rinse the combustor with 100% distilled water to remove any remaining vinegar, allow the combustor to dry before returning the combustor to the stove.
5. Return the combustor to the stove. Be sure that it is seated properly. Close the top lid.



To remove the catalytic combustor, first lift the top lid



Next, lift the catalyst roof.



There are finger holes around the combustor. The catalyst will lift right out for cleaning.

# Catalytic Combustor Replacement

If you feel that your catalytic combustor is not working properly, please contact Woodstock Soapstone Company at 1-800-866-4344 for instructions regarding return and replacement.

Accessing the catalyst in your new Navajo Steel Hybrid Woodstove is simple. **1)** Lift the top stove lid, **2)** Remove the roof installed over the catalyst, **3)** Lift the catalyst from the stove, **4)** Install the new combustor, **5)** Reinstall the roof, **6)** Close the top lid.

## Frequently Asked Questions

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

**A.** There are three advantages to burning the smoke created by burning wood. *First*, the smoke becomes another source of fuel, giving you more heat from the same amount of wood. *Second*, creosote causing materials will be burned up instead of being deposited in your chimney, reducing the risk of a chimney fire. *Third*, air pollution will be drastically reduced. A stove with a catalytic combustor will generate up to 25% more heat from each piece of wood, thus reducing the amount of fuel used during the year.

**Q. How can I tell if the catalytic combustor is working or "worn out"?**

**A.** *First* - The best way to tell if the catalytic combustor is working is by observing the smoke coming out of your chimney. If there is only a small amount of smoke, and/or it's white in color, the catalytic combustor is working. You will see significantly more smoke when the Bypass Damper is open and smoke is going straight up the flue, as opposed to then the Bypass Damper is closed and the smoke is being burned by the combustor.

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

*Third* - Regular inspection of the connector pipe and chimney flue should show very little accumulation of soot and creosote. Soot is

typically brown and powdery when the combustor is working properly. Heavy buildup of black sticky creosote may indicate the combustor is not functioning or needs cleaning.

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

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

If the stove does not draft well when the catalytic combustor is engaged then the combustor cells themselves might be partially plugged with fly ash. If this is the case, follow the cleaning procedure using white vinegar and warm water described on the previous page

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

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

View more frequently asked questions and articles at our web site [www.woodstove.com](http://www.woodstove.com). Other very useful websites on all aspects of wood burning are [www.woodheat.org](http://www.woodheat.org), and [www.csia.org](http://www.csia.org). CSIA is the Chimney Safety Institute of America.

### TWO OTHER IMPORTANT POINTS REGARDING CATALYTIC COMBUSTORS:

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

## CATALYTIC COMBUSTOR WARRANTY

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

Woodstock Soapstone Company, Inc.

66 Airpark Road

West Lebanon, NH 03784

Phone: 1-800-866-4344 • Web:

[www.woodstove.com](http://www.woodstove.com)