# Econoburn™

GASIFICATION BOILERS


## EBW 200-170 SERIES
## HIGH-EFFICIENCY
## WOOD-FIRED BOILERS

# OPERATOR'S MANUAL

Econoburn™
GASIFICATION BOILERS

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Econoburn™

GASIFICATION BOILERS

# INTRODUCTION

Congratulations on the purchase of your new ECONOBURN™ Wood-Fired Boiler. Developed in the northeastern United States, the ECONOBURN™ Wood-Fired Boiler has been designed to allow you to heat and supply hot water for your home or business, by burning wood, one of North America's most plentiful, affordable and environmentally friendly fuels.

Your ECONOBURN™ Wood-Fired Boiler has been engineered and manufactured to our highest standards for dependability, ease of operation, and operator safety. When properly maintained and cared-for, the ECONOBURN™ Wood-Fired Boiler will give you years of energy-efficient, rugged and trouble-free performance.

The ECONOBURN™ Wood-Fired Boiler utilizes gasification burning technology to get an astonishing *efficiency* out of traditional wood fuel sources, and will provide you with many, many years of safe and cost effective space and water heating.

To ensure that you have a clear understanding of the operating procedures of your ECONOBURN™ Wood-Fired Boiler, please take the time to read this manual carefully and completely, and follow all instructions. If you have any questions regarding the operation of your Boiler, please contact us by email, through the ECONOBURN™ website at *www.econoburn.com* or call our technical support team at 1-716-792-2095. We will be happy to assist you.

**IMPORTANT:** The ECONOBURN™ Wood-Fired Boiler must be installed by a certified and properly trained and qualified Heating, Ventilation and Air Conditioning (HVAC) professional. Do not attempt to install this unit yourself unless you are a certified and properly qualified HVAC professional. Improper installation could result in fire, personal injury and/or property damage.

**KEEP THIS MANUAL IN A SAFE PLACE FOR FUTURE REFERENCE**

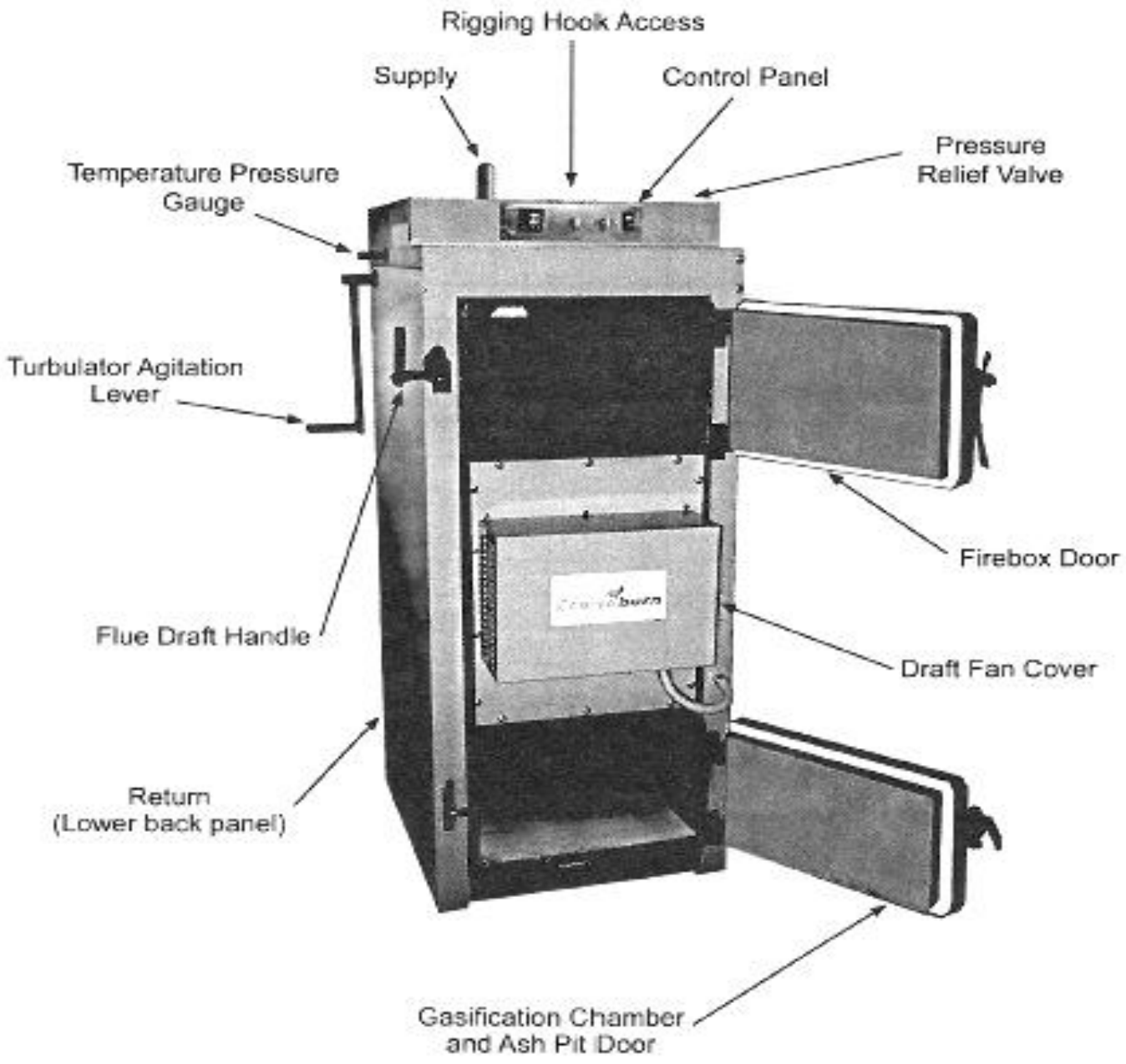
# WARNING

**THIS UNIT MUST BE INSTALLED BY A CERTIFIED AND PROPERLY QUALIFIED HEATING, VENTILATION AND AIR CONDITIONING (HVAC) PROFESSIONAL.**

**DO NOT ATTEMPT TO INSTALL THIS UNIT YOURSELF UNLESS YOU ARE A CERTIFIED AND PROPERLY QUALIFIED HVAC PROFESSIONAL.**

**IMPROPER INSTALLATION COULD RESULT IN FIRE, PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

# BOILER DIAGRAM



# OPERATING INSTRUCTIONS

## WOOD-BURNING

The ECONOBURN™ Wood-Fired Boiler will burn most solid wood fuels; however, it is recommended that hardwoods be used for their superior energy content. Burning dry, seasoned wood is also recommended because a residual moisture content of between 15 and 25% is required for optimal gasification combustion. The use of dry, seasoned wood will also significantly reduce the accumulation of creosote in the combustion chamber and heat exchanger.

Use firewood that is that is the appropriate length for your firebox, as referenced in the technical data sheet. Longer firewood will cause “bridging” which will prevent the wood from falling to the bottom of the burn chamber and could cause gasification to cease. Do not use excessive amounts of wood that is cut into tiny pieces. This can generate an intense coal bed that could overheat your Boiler. If you have small scraps to burn, mix them with regular chunk wood. Do not burn driftwood, wood chips, manufactured logs, sawdust or pellets.

Do not use chemicals or fluids to start the fire or during operation.

The ECONOBURN™ Wood-Fired Boiler is designed to burn wood, as detailed herein. Do not burn garbage, gasoline, naphtha, engine oil, plastic or any item with glue or chemicals.

**WARNING**

**DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE OR DURING OPERATION.**

**DO NOT BURN DRIFTWOOD, WOOD CHIPS, MANUFACTURED LOGS, SAWDUST OR PELLETS. DO NOT BURN GARBAGE, GASOLINE, NAPHTHA OR ENGINE OIL.**

If you are having problems with heat outputs, check the moisture content of your wood. Firewood moisture meters are available on the Internet for minimal cost (typically less than $30) and can save you a lot of time and energy spent trouble-shooting an easy-to-remedy problem. We cannot overstate the effect that wood moisture content has on the overall performance of your Boiler.

For maximum efficiency when operating without thermal storage, keep an adequate coal bed established in the upper chamber while adding only a few pieces of wood at a time to maintain the desired Boiler temperature. This works well when you're at home and can reduce the overall amount of wood that is used.

If you wait until the fire has burned to coals before refilling the upper firebox, you will have less chance of smoke rollback into the Boiler room than if a partial load of wood is still burning inside.

Keep the firebox door tightly closed and check the door seal condition regularly. The 10.3-ounce tube of high-temperature silicone provided with the Boiler should be used to maintain the integrity the seals of the pressurized chambers. When applying silicon, use a caulking gun. Squeeze the silicone into the track (i.e., the indentation on the door seal). A 3/16-inch diameter bead will work best, or approximately half the diameter of a pencil.

## STORAGE OF WOOD

Do not store wood within installation clearances or within the space required for charging or ash removal.

## INSPECTION & CLEANING

During daily wood fuel loading, stoking of the wood in the upper chamber (also referred to as the "firebox chamber") should cause most ash to fall through the nozzle to the bottom chamber (also referred to as the "lower combustion chamber"). Any dead ash that has not fallen through the nozzle should be removed from the upper chamber. Ash acts as an insulator and will retard performance. Check the bottom chamber weekly for ash buildup until experience shows how often cleaning is necessary. Be aware that hotter fires yield greater boiler performance, higher efficiency, and reduced maintenance. It is recommended that horizontal flue runs be inspected mid-season for any accumulated ash that may have been entrained in the combustion stream and settled-out in the flue runs.

## THE FLUE DRAFT CONTROL SYSTEM

The ECONOBURN™ Wood-Fired Boiler has been designed so that the firebox door latch remains locked, preventing the firebox door from opening unless the flue draft handle (see Figure 1) is first pushed inward as far as it will go toward the rear of the unit. This opens the bypass damper. Opening this bypass damper depressurizes the upper burn chamber and forces the smoke and flue gasses directly up the chimney, thereby preventing a surge of smoke and/or flames toward the operator when the firebox door is opened.

The forced draft fan must be stopped (via the toggle switch on the blower box; see Figure 10) and the rear damper fully opened for at least one minute before opening the firebox door to refuel.

## DO NOT RUN THE BOILER WITH THE FLUE DAMPER IN THE OPEN POSITION.

Running with the damper in the open position will damage the water jacket.

## WARNING

**NEVER OPEN EITHER DOOR ON THE UNIT (EITHER THE UPPER FIREBOX DOOR OR THE LOWER COMBUSTION CHAMBER DOOR) WHEN THE BOILER IS IN OPERATION WITHOUT (1) OPENING THE REAR DAMPER BY PUSHING THE FLUE DRAFT HANDLE ALL THE WAY TOWARD THE BACK OF THE UNIT, (2) TURNING THE FORCED DRAFT FAN OFF, AND (3) WAITING A MINIMUM OF ONE MINUTE.**

## FUEL LOADING

To load your ECONOBURN™ Wood-Fired Boiler with fuel (wood), ALWAYS use the following procedure:

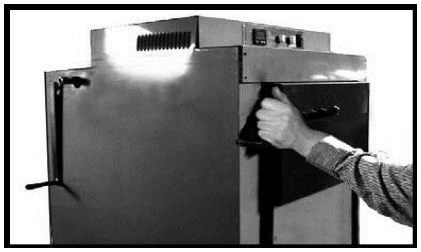


**Figure A**

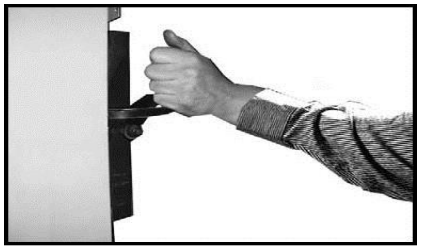


**Figure B**

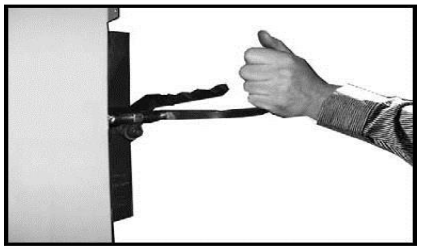


**Figure C**

1. Open the Boiler's bypass damper by pushing the flue draft handle as far to the rear of the unit as it will go. (See Figure A.)
2. Turn off the forced draft fan at the blower cover. (Toggle switch.)
3. Wait a minimum of one minute.
4. SLOWLY open the firebox door. (See Figure B)
5. Load fuel into the firebox. Although your ECONOBURN™ Wood-Fired Boiler is very ruggedly built, do not throw wood into the firebox haphazardly as you may chip the gasification nozzle.
6. Close the firebox door.
7. Close the bypass damper by pulling the flue draft handle all the way forward. This will engage the mechanical safety lock. (See Figure C.)
8. Turn the forced draft fan on once again at the blower cover. (Toggle switch.)

## WARNING

**THE FORCED DRAFT FAN MUST BE STOPPED AND THE FLUE BYPASS DAMPER FULLY OPENED FOR AT LEAST ONE MINUTE BEFORE OPENING THE FIREBOX DOOR TO REFUEL. THIS IS NECESSARY TO ENSURE THAT SMOKE AND FLAMES FROM THE FIRE WILL NOT EXIT THE FIREBOX DOOR AND HARM THE OPERATOR.**

**NEVER OPEN EITHER DOOR ON THE UNIT (THE UPPER FIREBOX DOOR OR THE LOWER COMBUSTION CHAMBER DOOR) WHEN THE BOILER IS IN OPERATION WITHOUT FIRST OPENING THE FLUE DAMPER HANDLE AND WAITING A MINIMUM OF ONE MINUTE.**

## WARNING

**DO NOT ADD MORE FUEL UNTIL YOU ARE CERTAIN THAT ALL CONTROLS ARE FUNCTIONING PROPERLY AND NO DAMAGE HAS BEEN DONE TO THE BOILER.**

## FIRING YOUR BOILER

When first firing the Boiler, use dry kindling and leave the bypass damper open for approximately 15 to 20 minutes. This will allow time to establish the coal bed above the refractory nozzle, which will in turn yield the most efficient gasification. You will likely find your own routine for firing your Boiler, but this method works well.

We do not recommend leaving the Boiler off and the bottom door open to get your fire going faster. In the event that you leave the Boiler and forget to close the door, the fire will grow to the point that the Boiler overheats and produces steam.

As a starting point, set the temperature controller approximately 10 to 15 degrees below the temperature you would like your system to operate. Unlike gas or oil fired boilers, when the ECONOBURN$^{TM}$ Wood-Fired Boiler goes into stand-by mode, its temperature will continue to rise until the lack of combustion air slows the fire enough to stabilize the water temperature. This setting will vary from system to system and will be dependent upon the size of your Boiler, the amount of water in the system, the time of year, and the heat load on the Boiler.

## COMBUSTION AIR SUPPLY & NEGATIVE AIR PRESSURE

An adequate flow of air to the Boiler must exist at the location where the Boiler is to be installed in order to ensure proper combustion and to maintain safe ambient room temperatures. For Boilers located in a confined space, or in an unconfined space in a building or structure of unusually airtight construction, outdoor air must be provided.

Prior to installation of your Boiler, the installer MUST test for negative air pressure at the location where the ECONOBURN$^{TM}$ Wood-Fired Boiler is to be installed. If needed, outdoor air may be provided by the creation of two (2) permanent openings which communicate directly or by duct with the outdoors. Any air openings, if needed, must be constructed at the time of installation by the installation professional.

**WARNING:** If the ECONOBURN$^{TM}$ Wood-Fired Boiler does not draw air steadily, the Boiler may experience smoke roll-out, burn poorly, or back-drafts might occur, whether or not there is combustion occurring.

**NOTE:** Outside combustion air supply may be necessary if fans are installed in the same room where the Boiler is to be installed, or if the house is equipped with a well-sealed vapor barrier and tight-fitting windows, and/or has any powered devices that exhaust house air. Excessive condensation on windows in the winter is also an indication that negative air pressure may exist in the structure. Negative air pressure is also likely to exist where a ventilation system has been installed in the structure.

## CLEANING CREOSOTE BUILD-UP

Creosote is a flammable and corrosive substance that can build up on the walls of your fireplace and chimney. Creosote is formed when unburned wood particles, fly ash and other volatile gases combine as they exit the chimney. If there's a poor draft, these unburned particles and gases can condense and build up on the walls of your chimney. Over time, these creosote or soot buildups can become a danger as they can potentially result in a chimney fire.

The failure to clean and remove any existing creosote build-up could result in chimney fire, property damage and/or personal injury. Your installation contractor should inspect the chimney for creosote build-up before beginning installation of your Boiler. If creosote exists in the chimney, it MUST be cleaned by a professional (e.g., chimney sweep) prior to installation of the ECONOBURN™ Wood-Fired Boiler.

**WARNING**

**THE CHIMNEY MUST BE CLEANED AND FREE OF ALL CREOSOTE PRIOR TO INSTALLATION AND OPERATION OF THE ECONOBURN™ WOOF-FIRED BOILER. THE FAILURE TO CLEAN AND REMOVE ANY EXISTING CREOSOTE BUILD-UP COULD RESULT IN CHIMNEY FIRE, PROPERTY DAMAGE AND/OR PERSONAL INJURY.**

## BUILDING A NONCOMBUSTIBLE BASE AND/OR AN ELEVATED BASE

If the Boiler installation site has a combustible floor, a noncombustible floor MUST be constructed by a professional contractor, as described in detail in the Installation Manual enclosed herewith.

For basement installation, if the existing floor is not level or if water might accumulate on the floor around the Boiler, an *elevated* noncombustible base (such as a concrete pad) must be constructed for your Boiler.

## GENERAL SAFETY TIPS FOR BOILER OPERATION

Never refuel the boiler during a power failure. If a prolonged power failure occurs do not fire the unit until the power supply resumes and stabilizes.

Never attempt to operate the boiler with natural draft by opening the flue gate.

During a power failure, do not refuel the Boiler, if refueled during a power failure it is possible for the boiler to overheat causing damage to piping, and to the Boiler. Do not open the doors or damper. This will stop the amount of oxygen to enter the burn chambers. It is recommended to let the gravity loop handle the excess Btu's or install a battery back-up to allow the pumps to circulate and dissipate the excess heat.

## TIPS FOR MAXIMIZING BOILER EFFICIENCY

Proper sizing and installation of your boiler by a qualified heating professional.

Burn clean hardwoods with a moisture content in the 15-25% range.

Ashes should be removed twice per week from the upper and lower chambers.

Add the proper amount of wood for the heat output required from the boiler. Short, hot, burns yield the highest efficiency.

The integration of thermal storage will yield the highest efficiency and gain the most energy from the wood.

It is advisable to install an auxiliary power supply to power the boiler during a power failure.

A gravity flow piping circuit should be installed.

## BOILER OPERATING CHECKLIST

Keep area around your ECONOBURN$^{TM}$ Wood-Fired Boiler clean and clear of combustibles.

Use only wood. DO NOT burn any other combustible material, or liquid.

Remove ashes as directed.

Watch for soot in flue pipe - clean regularly.

Be aware of danger due to over firing unit.

This unit is NOT suitable for automatic stoking.

Load the firebox chamber carefully.

Always observe the following minimum clearances to combustible materials:

Front 48”
Right side 18”
Left side and rear 24”
Flue pipe 18”
Floor must be non-combustible.

Maintain seals on firing door in good condition.

Establish a routine for storage of fuel, care of the appliance, and firing techniques.

DO NOT OPERATE WITH FUEL LOADING OR ASH REMOVAL DOORS OPEN. DO NOT STORE FUEL OR OTHER COMBUSTIBLE MATERIAL WITHIN MARKED INSTALLATION CLEARANCES. INSPECT AND CLEAN FLUES AND CHIMNEYS REGULARLY.
CAUTION - HOT SURFACES - KEEP CHILDREN AWAY! DO NOT TOUCH DURING OPERATION!

KEEP THE DOORS CLOSED AND MAINTAIN SEALS IN GOOD CONDITION.

OFF-SEASON MAINTENANCE BY A QUALIFIED PROFESIONAL..
CLEANING OF THE HEAT EXCHANGER, FLUE PIPE, CHIMNEY AND DRAFT INDUCER, IF USED, IS ESPECIALLY IMPORTANT AT THE END OF THE HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS CAUSED BY ACCUMULATED ASH.

INSTALLER INSTRUCTIONS TO THE BOILER OWNER

1. Keep area around unit clean.

2. Use SOLID wood only. Hardwood is preferred.

3. Load carefully. Plan wood load based on BTU requirement. Maintain intense burns for maximum efficiency.

4. Remove ash regularly as directed.

5. Watch for soot build up in Flue pipe, and Heat Exchanger.

6. Realize the danger of extreme overheating due to over firing.

7. Danger of flue fire if poor maintenance produces creosote buildup.

8. Operation of unit during power failure, (i.e. manual operation of zone valves and flow check valves).

9. When shutting down for extended periods, clean unit thoroughly.

10. BEFORE RELOADING THE BOILER WITH WOOD, DRAFT CONTROL FAN MUST BE STOPPED, AND FLUE DAMPER FULLY OPENED FOR AT LEAST ONE MINUTE BEFORE OPENING THE LOADING DOOR TO REFUEL.

This is necessary to ensure that smoke and flames from the fire will not exit the loading door and harm the operator.

# MAINTENANCE AND CLEANING

The ECONOBURN™ Wood-Fired Boiler must be cleaned regularly to maintain top efficiency. A good practice is to establish a routine for the storage of fuel, care of the appliance, and firing techniques.

## BOILER MAINTENANCE

Turbulator assembly should be exercised every day of boiler usage when the unit is hot.

Ashes should be removed as needed. Recommend weekly.

Clean heat exchangers annually with a 2 inch bore brush or similar device.

Inspect refractory and nozzles every month to check condition.

Grease door hinges annually.

## CLEANING THE HEAT EXCHANGER

Every day of boiler use, the turbulator assembly should be exercised. To perform this maintenance, grasp the turbulator agitation lever on the upper left side of the Boiler (see Figures 11 & 12) and firmly raise and lower it several times. The turbulator arm will only move a short distance (from the 6 o'clock to the 3 o'clock position) back and forth, and should be left as shown in Figure 12, below.

When the turbulator agitation lever is moved back and forth, it clears the heat exchanger tubes of any buildup of soot and ash that might have collected from the normal functioning of the Boiler combustion.

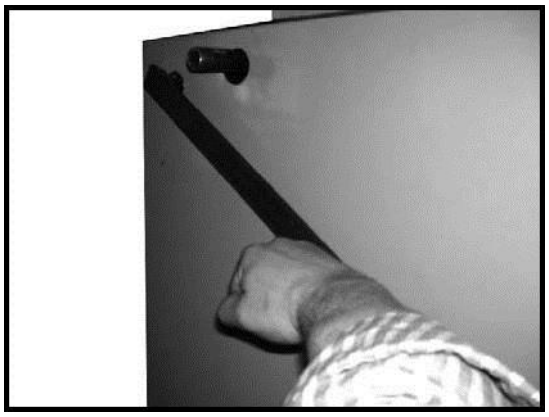


**Figure 11**

**Figure 12**

## ASH DISPOSAL

Before removing ashes, cease refueling and allow the fire to die down. Before opening the lower combustion chamber door, ensure the fire in the boiler is completely extinguished.

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

**WARNING**

**ASHES USUALLY CONTAIN LIVE DORMANT COALS, WHICH MAY BURN FOR MANY HOURS AFTER A RECOGNIZABLE FLAME HAS DISAPPEARED. USE EXTREME CAUTION WHEN HANDLING AND DISPOSING ASHES.**

## HEAT EXCHANGER MAINTENANCE

The boiler Heat Exchanger must be thoroughly cleaned at least once a year. This consists of cleaning the Heat Exchanger tubes of accumulated soot and ash with a wire brush (Figs. 13 & 14)

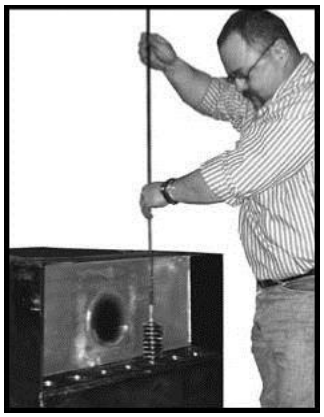


**Figure 13**

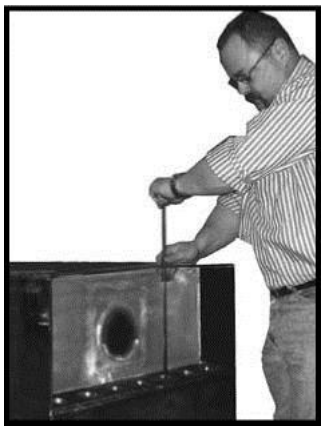


**Figure 14**

**ALWAYS FOLLOW THIS PROCEDURE TO CLEAN THE HEAT EXCHANGER.**

1. Remove back and top jacket panels of the Boiler.
2. Cut insulation to expose top clean out.
3. Remove 1/4” steel top cover plate and rear flue plate.
4. Disconnect the turbulator rod by removing the nut and bolt which affixes it to the turbulator shaft.
5. Remove the turbulator arms by grasping the turbulator connecting rod and lifting them out of the heat exchanger.
6. Using a steel brush, remove any soot and ash buildup from the heat exchanger tubes and vacuum any ash accumulated on the top of the heat exchanger.
7. Remove ash from the lower combustion chamber.
8. Replace 1/4” steel top cover plate and rear flue plate making sure all connections are tight, sealed with a high temperature silicone.

## MAINTENANCE TIPS

Make sure your chimney stays clean. Your ECONOBURN™ Wood-Fired Boiler will not produce the creosote levels that other conventional woodstoves and boilers create, but if you're not using thermal storage it's likely that some creosote will form. It's always better to be safe and inspect your chimney once a year.

Keep an eye on your pressure gauge. If you see a drop in pressure over time, it could mean that there is a leak in your system somewhere. Low water levels can prevent circulation and damage your equipment.

Be sure to cycle your turbulator arm once every day, and only when the boiler is hot. This will keep your boiler operating at peak efficiency. If the handle is stuck or difficult to move, DO NOT FORCE IT. This could sheer the bolts off of the mechanism inside. Wait until the boiler has been in the gasification mode for a while before attempting to move the lever, and gently work the turbulators free. If you are consistently experiencing sticky turbulators, you are probably burning wood with a higher moisture content than is recommended, or you need to work the turbulator arm more often.

Burning potatoes in the lower chamber can help free up sticky turbulators. Just place 2 or 3 decent sized potatoes on the refractory below the gasification nozzle in the bottom chamber and operate the boiler normally. In a few hours, depending how much your boiler gasifies, your sticky turbulators should free up. Your best bet is to burn them over night.

Keep the ashes cleaned out of the combustion chamber, especially from in front of the heat exchanger port at the rear of the chamber. We recommend that ashes be removed from this area around twice per week in order to keep the efficiency of your Econoburn at maximum.

If ashes accumulate in the upper firebox, rake them through the gasification nozzle and into the lower combustion chamber. A thick pile of ashes on top of the refractory in the base of the firebox will insulate the coal bed from the refractory and reduce the gasification efficiency, or prevent gasification altogether. We recommend letting your boiler burn down to just hot coals at least a few times per month to facilitate this type of upper chamber cleaning.

For indoor installations, maintenance of the upper chamber door seal is imperative. Even a slight leak in this gasket will be immediately noticeable by a creosote smell which some find objectionable in their home. The best way we have found to prevent this is to brush the door gasket with mineral oil once per week. The mineral oil keeps the gasket swollen and pliable so that it seals completely each time the door is closed. Caution: mineral oil is flammable use discretion when applying.

## CHIMNEY MAINTENANCE

Inspect monthly during heating season. For extra safety, have your chimney inspected by an accredited professional yearly, prior to the heating season.

# TROUBLESHOOTING GUIDE

| PROBLEM | CAUSE | SUGGESTED REMEDY |
|---|---|---|
| Boiler doesn't reach desired temperature. | Wood too moist. | Use properly seasoned wood. |
| | Nozzle plugged. | Clean firebox. |
| | Chimney plugged. | Clean chimney. |
| Smoke escaping while loading wood. | Intense wind or down draft. | Consider installing a chimney cap. |
| | Inadequate chimney length. | Add proper chimney length. |
| | Negative building pressure. | Ensure adequate air for combustion. |
| | Improper draft. | Install barometric damper. |
| Smoke escaping from closed boiler doors. | Leak in door gasket. | Adjust door hinges per instructions. |
| | Rope seal worn. | Replace rope or service call. |
| Fan not functioning. | Thermal protection engages. | Investigate reason for boiler overheating. |
| | No power to unit. | Check fuse, breaker and wiring. |
| | Fan damaged. | Call service department. |
| | Fan blocked. | Inspect and clean unit. |
| Fan making excessive noise. | Bearings damaged. | Call service department. |
| | Fan blades dirty. | Inspect and clean unit. |
| | Debris in fan cover. | Inspect and clean unit |
| Control settings and indicators off. | Not determined. | Call dealer or service department. |

# SPECIFICATIONS

ECONOBURN™ Specifications (subject to change without notice):

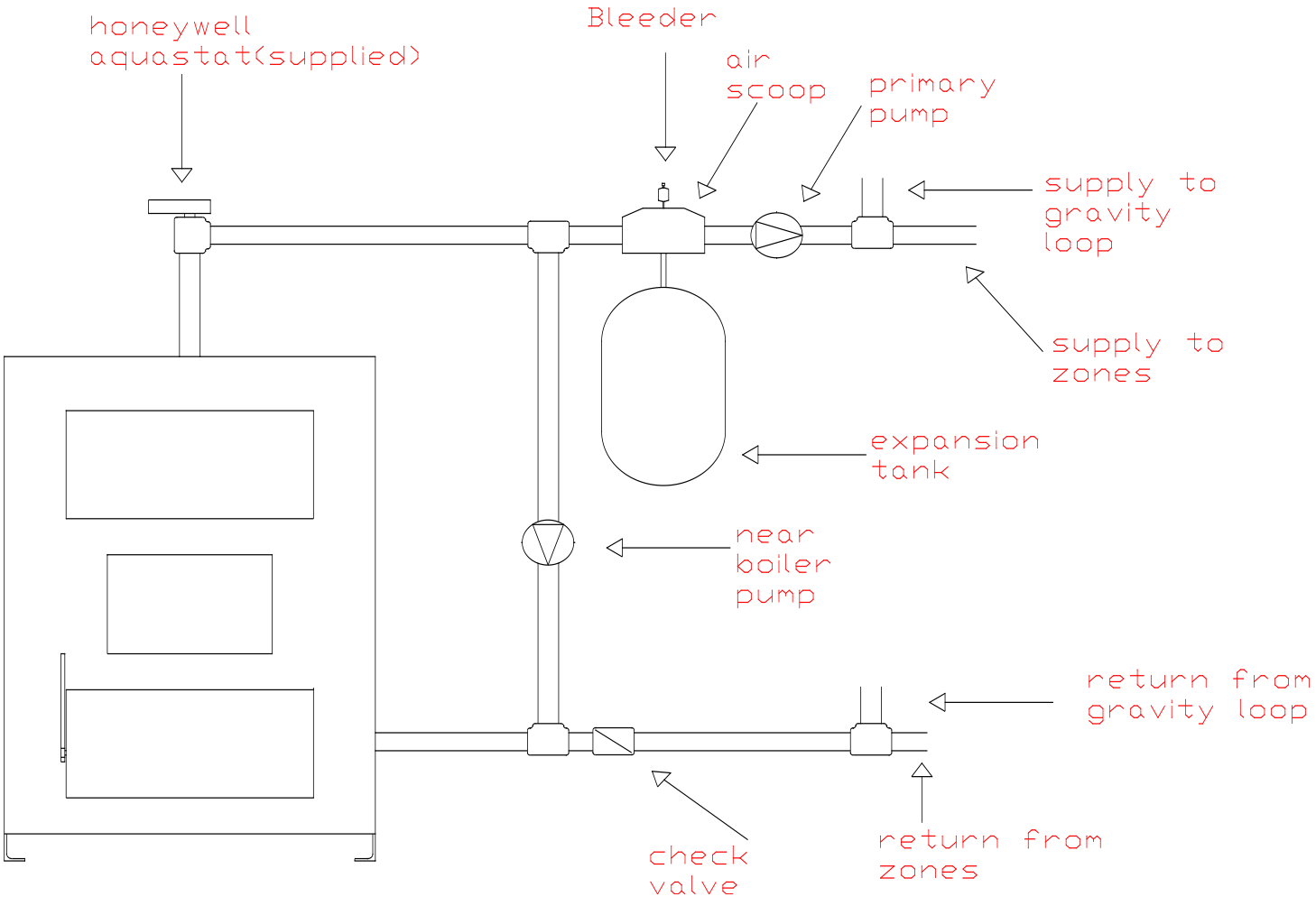
| Boiler Model | EBW-200-170 | EBW-300 | EBW-500 |
|---|---|---|---|
| Design Application | Indoor | Indoor | Indoor |
| BTU Output | 170,000 | 300,000 | 500,000 |
| **Boiler Dimensions** | | | |
| Depth | 46.6875" / 118.6 cm | 50" / 127cm | 63" / 160 cm |
| Width | 30.5"/ 77.47 cm | 36" / 91.4 cm | 41" / 104.1 cm |
| Height | 64.25" / 163.2 cm | 70" / 177.8 cm | 76" / 193 cm |
| **Firebox Dimensions** | | | |
| Depth | 22.875" / 58.1 cm | 26" / 66 cm | 32" / 81.3 cm |
| Width | 20.375" / 51.7 cm | 24" / 61 cm | 27" / 68.6 cm |
| Height | 28.5" / 72.4 cm | 32" / 83.3 cm | 39" / 99.1 cm |
| Weight Empty | 1,980 Lbs /898 kg | 2,515 lbs / 1,141 kg | 3,405 lbs / 1,544 kg |
| **Piping Data** | | | |
| Water Volume | 42 us gal / 159 L | 79 us gal / 299 L | 95 us gal / 360 L |
| Supply Pipe (female) | 2" | 2.5" | 4" |
| Return Pipe (female) | 2" | 2.5" | 4" |
| Min Boiler Loup Size | 1 1/4" | 2" | 3" |
| Fill/Drain valve size | 1 1/4" | 1.5" | 1.5" |
| **Flue Dimensions** | | | |
| Flue outlet Diameter | 7.9375" | 7.9375" | 12" |
| Height to center of Flue | 51" | 57" | 61.5" |
| **Operating Data** | | | |
| Maximun Operating Temperature | 210 deg F / 99 deg C | 210 deg F / 99 deg C | 210 deg F / 99 deg C |
| Maximun operating Pressure | 30 PSI / 207 kPa | 30 PSI / 207 kPa | 30 PSI / 207 kPa |
| Output Temperature (range) | 170 Deg F / 77 Deg C | 170 Deg F / 77 Deg C | 170 Deg F / 77 Deg C |
| Specified Fuel | cord wood or bio blocks | cord wood or bio blocks | cord wood or bio blocks |
| Recommended moisture content | 15% to 22% | 15% to 22% | 15% to 22% |

| | | | |
|---|---|---|---|
| Minimum Draft required | (-.02 to -.05 inches of WC) | (-.02 to -.05 inches of WC) | (-.02 to -.05 inches of WC) |
| Flue gas temperature | 280 deg F-450 deg F | 280 deg F-450 deg F | 280 deg F-450 deg F |
| **Electrical Data** | | | |
| Boiler Power Requirment | 110volt /15 Amp | 110 volt, 15 amp | 110 volt, 15 amp |
| Electrical Consumption (watts | 175 watts | 175 watts | 175 watts |
| Aquastat setting | 220 Deg F / 138 Deg C | 220 Deg F / 138 Deg C | 220 Deg F / 138 Deg C |
| Electrical Consumption (amps) | < 8 amps | < 8 amps | < 8 amps |

Home owner Check list, Questions to ask the installer.

Are there any leaks?
Is the pressure staying the same when hot?
Was an over temp zone installed?
Is there enough clearance in rear to do annual maintenance?
Is all air eliminated from the system?
Is the boiler on a dedicated electrical circuit?
Is the flue sized correctly? 8”
Is a barometric damper installed?
Is a cleanout tee installed?
Is the flue Class A pipe?
Is the flue secured by screws?
Is the draft set to? -002 to -.005 inches of water Colum?
Is the Flue pipe 18” from combustible material or surface?

Diagram (C)


honeywell
aquastat(supplied)
Bleeder
air
scoop
primary
pump
supply to
gravity
loop
supply to
zones
expansion
tank
near
boiler
pump
return from
gravity loop
check
valve
return from
zones

## Econoburn Boiler initial Light off Instruction. REV 1.2 Addendum IOM 3/24/2014

1. Open Bypass Damper and Loading Door
2. Twist 8 Pcs of newspaper and insert in to top chamber. (24" X 24")
3. Place Dry kindling over newspaper in a criss-crossed manner. Kindling should be <8% MC
   a. (twigs. Kiln dried scrap lumber, etc.)
   b. Load smallest pieces first on top of newspaper.
4. Place 10% of fuel charge on top of kindling (2-3 inch pieces) as long as newspaper can be easily reached for lighting. If not, load immediately after newspaper has been lit.
5. Power on the electronic boiler control, Scroll to "boiler setup"
6. Depress enter button and ensure that the fan has engaged.
   a. Temporarily interrupt the fan with the toggle switch located on the side of the blower cover.
7. Use up and down arrows to 550 F
8. Depress enter until main screen reappears.
9. Scroll to screen that reads "boiler stopped, hit enter to start.
10. Depress enter button and ensure that the fan has engaged.
11. Light the newspaper in various locations.
12. Turn on the fan with the toggle switch, close the loading door and leave bypass damper open.
13. On Electronic control, scroll to the screen that displays stack temperature. (left or right arrow)
14. Over the course of 5 minutes, the stack temperature should continue to climb indicating that a good light off has been attained.
15. Once the stack temperature has reached 550 deg F, (or 5 to 7 minutes has elapsed) turn of fan toggle switch, open the top loading door and visually inspect and ensure that the kindling charge is fully involved in flame and volatizing.
16. If so, insert remainder of fuel charge in the chamber (smallest pieces first) and close the door.
17. Turn the fan toggle switch back on and close the damper.
18. Return to Stack temperature setting screen in the Boiler setup menu.
19. Change stack temperature setting to 360 deg F.