



DS Boilers High Efficiency Boilers

Models #1100 #3200 #4200 #9158C

OWNER'S MANUAL



MADE IN USA
By
D.S. MACHINE SHOP

**Before you install or operate a DS Boiler,
you must:**

- Read all instructions carefully
- Install smoke and carbon monoxide detectors.

All Boilers Must Be Installed By A NFI Specialist And Plumbed By A Qualified Licensed Plumber Or D.S. Is Not Responsible For Warranty.

Safety Instructions

- 1 - Read all instructions carefully before installing or operating any D.S. boiler.
- 2 - **NEVER fire boiler without water in the system. Doing so will ruin the boiler.**
- 3 - You must install smoke and carbon monoxide detectors before you install or operate any boiler.
Check your local codes, this installation must comply with their rulings.
- 4 - Never leave boiler doors open when unattended
- 5 - Install barometric damper or manual damper when burning coal.
- 6 - Do not hook up a coal boiler to an aluminum type B gas vent. Use a code approved Class A chimney that is equal or greater than the exhaust on the boiler, and a minimum of 20' high.
- 7 - On all new installs connecting to an existing chimney, a level 2 chimney inspection must be done by a certified Chimney Sweep.
- 8 - Clean chimney before installing boiler. If there is creosote attached to the liner you could create a serious chimney fire.
- 9 - Never leave children unsupervised when they are in same room as boiler. Provide a sturdy barrier to keep children and pets a safe distance from the boiler, or they could get severely burned.
- 10 - Keep boiler area clear from all combustible materials, gasoline, and other flammable vapors and liquids.
- 11 - Use the required floor protection as shown on (page 6).
- 12 - Check the clearance to combustible walls and floors. (see page 6)
- 13 - Do Not allow anyone who is unfamiliar with the boiler to operate it.
- 14 - Spend some time with your boiler to become well acquainted with the different settings and how each will affect its burning patterns. It is impossible to state just how each setting will affect your boiler because of variations in each installation, and chimney drafts.
- 15 - Be extremely careful when removing the boiler ash pan. It can get very hot!
- 16 - Make sure your single wall chimney connectors have at least 3 screws per joint.
- 17 - You must install a 30# safety valve.
- 18 - If you have a circulator pump you must install a high limit Aquastat set at 190 degrees F.
- 19 - When starting a fire circulator pump must be running continuously.
- 20 - Always use a mixing valve when hooking up a domestic coil.

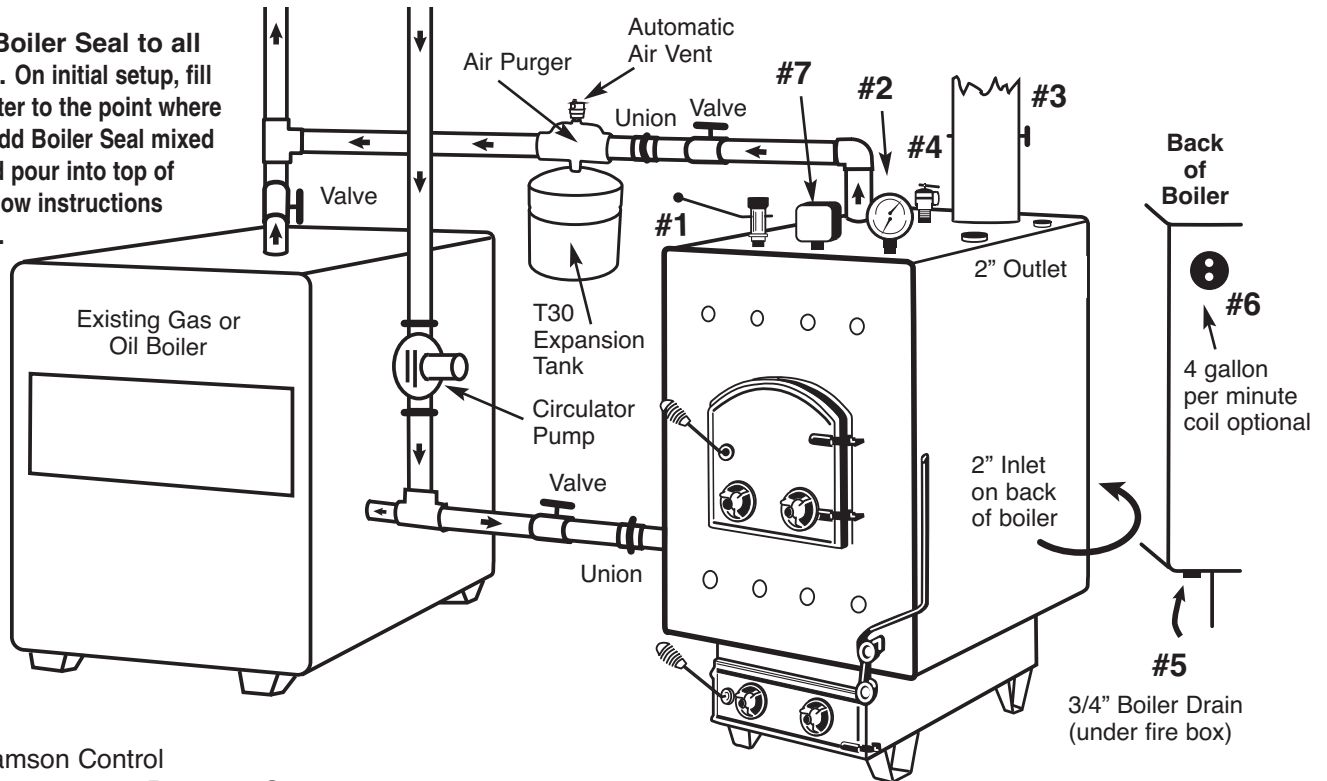
Operation Instructions

Starting a Fire

- 1 - Set samson draft regulator at boiler to HIGH.
- 2 - **DO NOT leave boiler unattended with the fire or ash door open!**
- 3 - Open fire door and place wads of crushed paper in the firebox.
- 4 - Put kindling on top of paper. NOTE: You can also buy Fire Starter Gel or Bricks
- 5 - Or use charcoal briquettes when starting a coal fire.
- 6 - Ignite paper or fire starter product.
- 7 - Once kindling is ignited add larger pieces of wood.
- 8 - If you want to burn coal, add a 2" layer of coal.
- 9 - Keep adding coal as necessary, but don't add too much at a time or you could smolder the fire.
- 10 - You do not have an established coal fire until you have 8 inches of red coals on top of the grates.
- 11 - Once you have an established coal fire you can add 30 lbs. or more coal per feeding.
- 12 - Set your regulator to meet your needs.
- 13 - NOTE: When burning coal, shake ashes every 12 hours if possible. You must keep your ashes cleaned out from under the grates. This may require emptying your ash pit daily. If there is no air space under the grates, the grates will warp and become inoperable.
- 14 - Reload coal every 12 hours or as needed.
- 15 - If you have a manual damper installed, adjust according to your draft. Before loading coal, open damper and let open until gases have escaped.
- 16 - When burning coal, open spinners on fire door approx. 1/8", on all models. When burning wood for coal ignition purposes, close the fire door spinners.
- 17 - In the event of a chimney fire, shut all draft controls off and call your fire department immediately. Alert everyone in the house. If flue is still burning vigorously, throw baking soda into firebox or discharge a fire extinguisher into fire box. After the chimney fire is over, have a certified Chimney Sweep complete a level 2 chimney inspection, before farther use of your chimney.

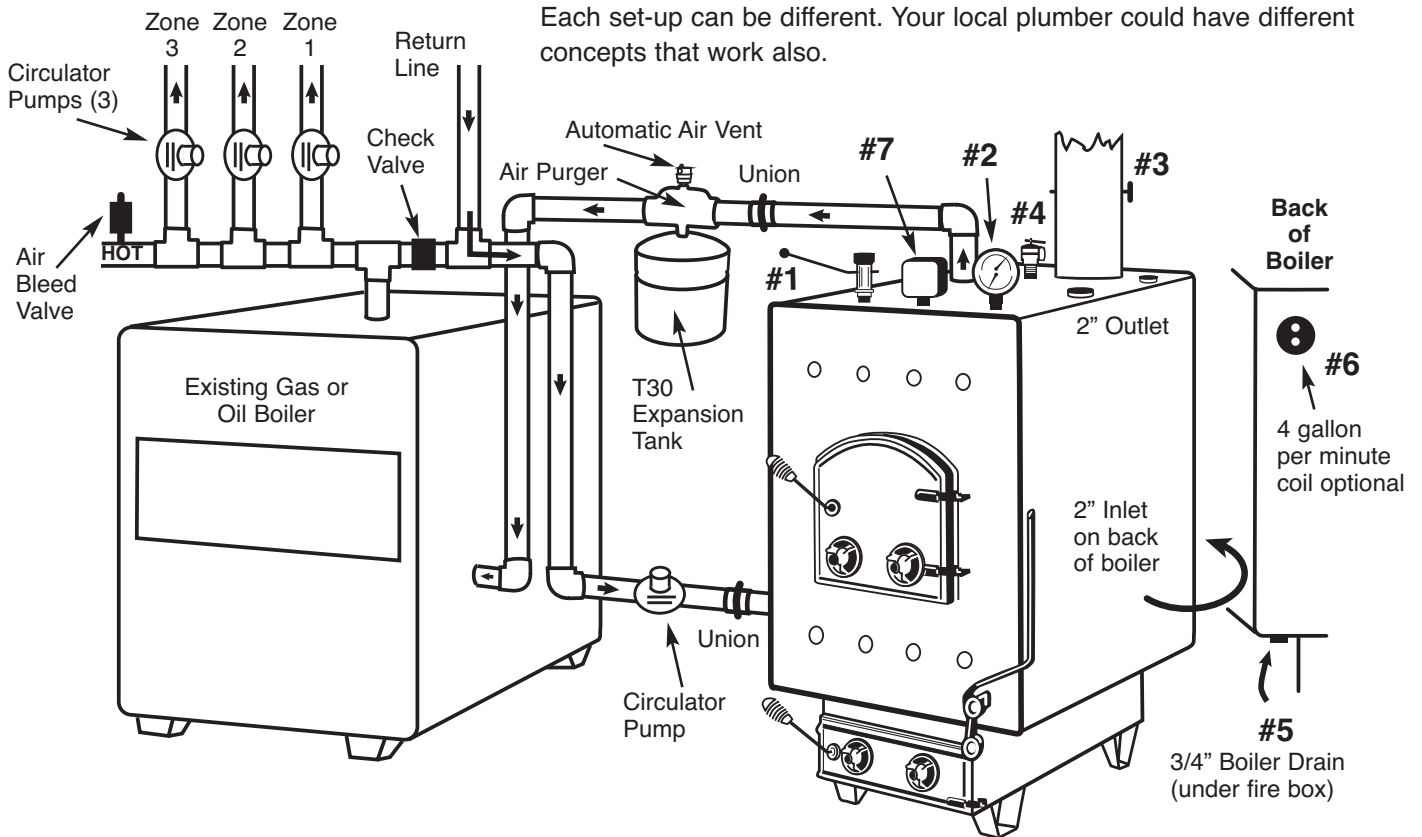
Boiler Installation

NOTE: Add Boiler Seal to all new boilers. On initial setup, fill boiler with water to the point where you can still add Boiler Seal mixed with water and pour into top of boiler. OR, follow instructions on Boiler Seal.



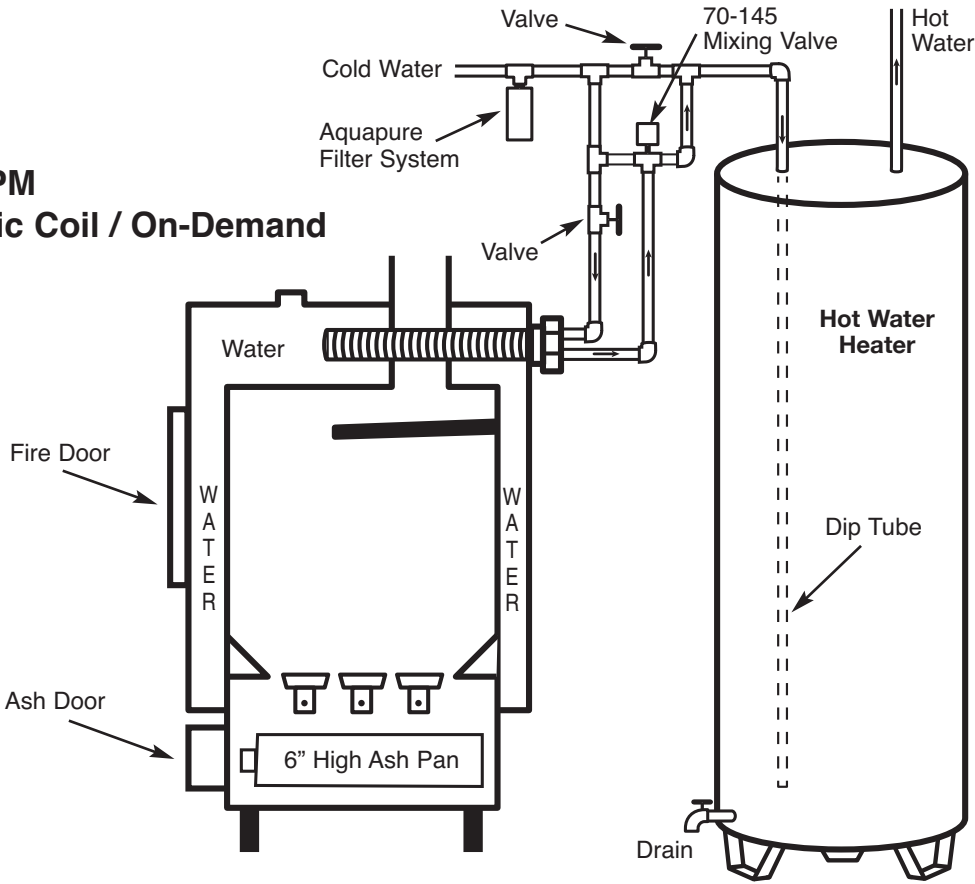
- #1 Samson Control
- #2 Temperature - Pressure Gauge
- #3 Damper
- #4 30# Safety Valve
- #5 3/4" Boiler Coil
- #6 4 Gallon Coil
- #7 Aquastat

- All D.S. Boilers must be plumbed up by a Qualified Licensed Plumber or D.S. is not responsible for warranty.
- Failure to follow installation and basic operation will void the warranty
- All Boilers are tested to 100psi.
- Recommended working pressure - 12psi.
- **NOTE:** This Boiler set-up is only a D.S. Machine Design. Each set-up can be different. Your local plumber could have different concepts that work also.



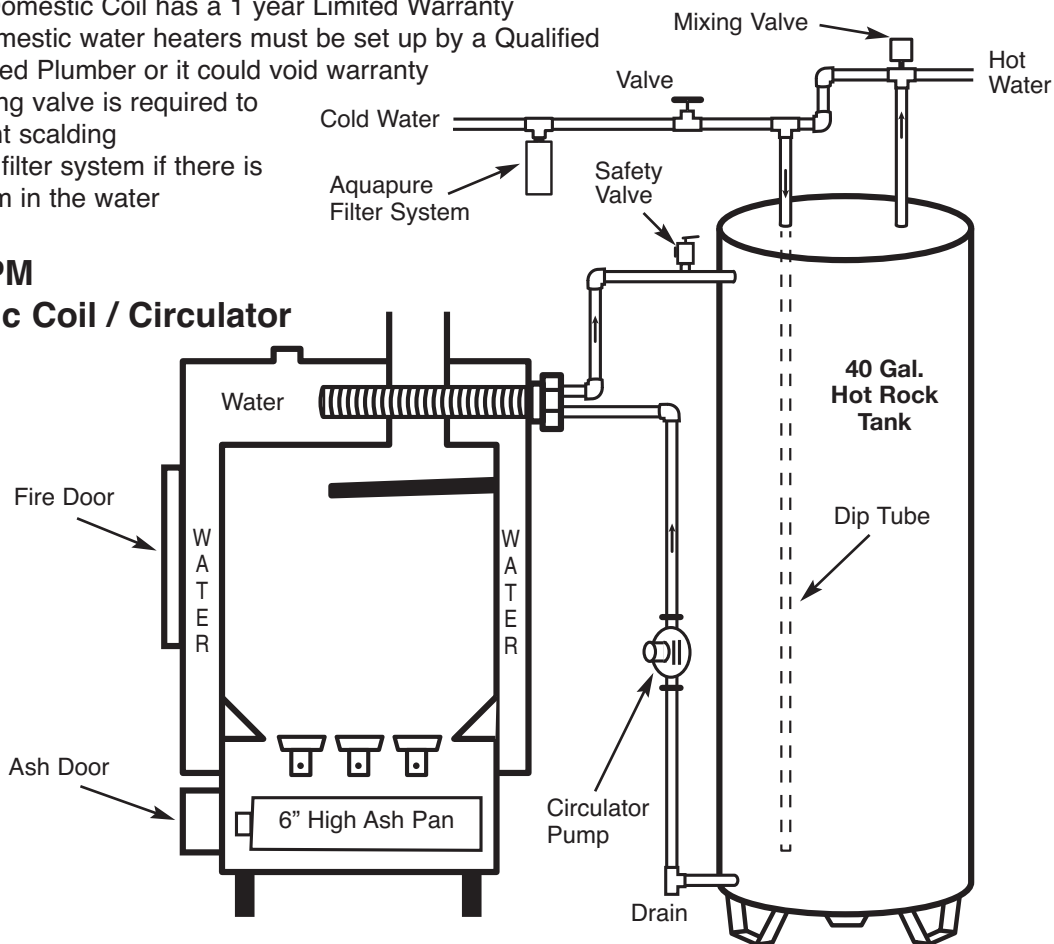
Boiler Installation

DS 4-GPM Domestic Coil / On-Demand



- This Domestic Coil has a 1 year Limited Warranty
- All Domestic water heaters must be set up by a Qualified Licensed Plumber or it could void warranty
- A mixing valve is required to prevent scalding
- Install filter system if there is calcium in the water

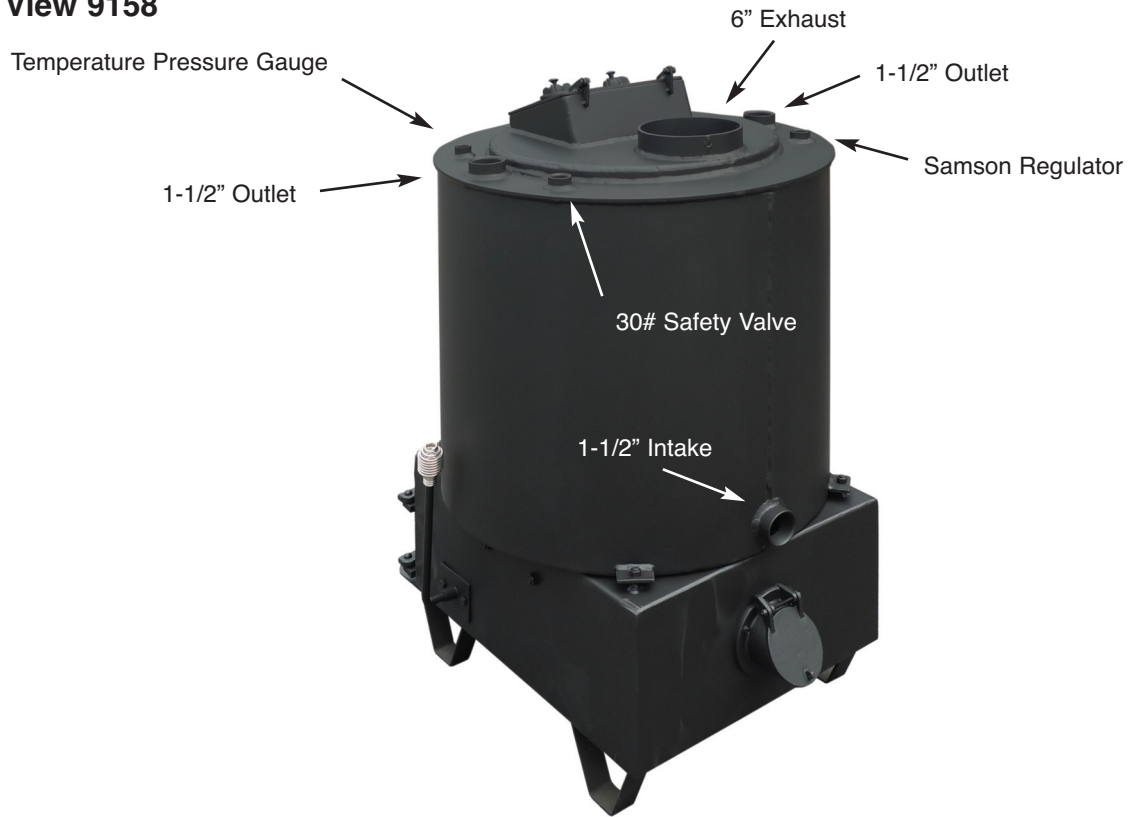
DS 4-GPM Domestic Coil / Circulator Pump





Boiler Installation

Back View 9158



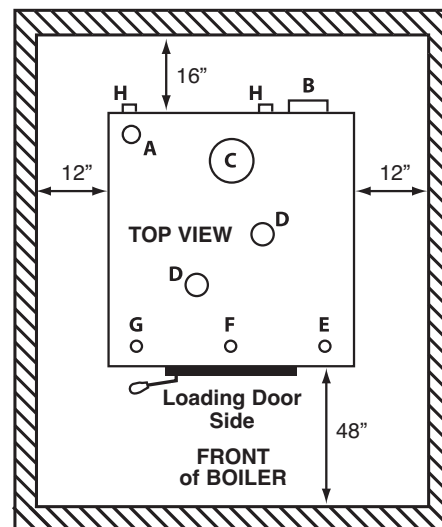
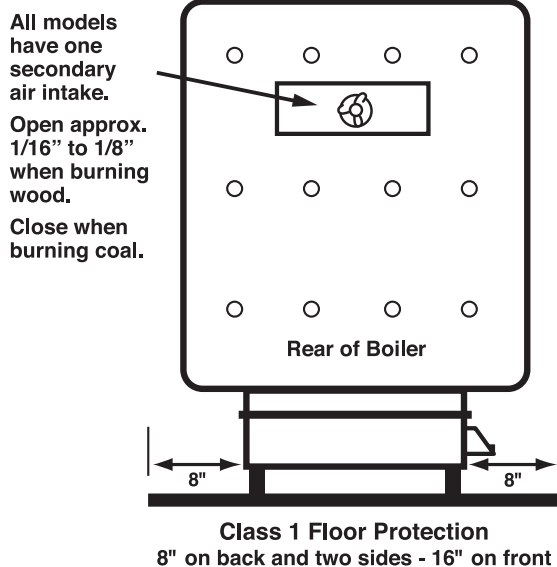
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Locating Boiler

- 1 - The boiler must be placed on a solid none combustibile floor. If you have a combustibile floor it is required to use a code approved none combustibile floor board (Type 1 Board)
- 2 - It is recommended that the boiler be centrally located.
- 3 - The most important consideration in installing your boiler is adequate clearance between the boiler and any combustibile surface. A boiler that is placed too close to a wall or to furniture can cause a fire. See UL plate on boiler for clearances.
- 4 - The base must extend at least 16" beyond the front and 8" of the back, and sides of fuel opening, and must extend under and 2" beyond either side of the single wall chimney connector if it's elbowed towards a wall.
- 5 - The boiler or furnace must have its own flue. Do not connect this unit to a chimney flue serving other appliances.
- 6 - Connection of the boiler to the chimney should be made as directly as possible (6 feet maximum horizontal) and not more than two bends. No reduction in flue pipe below the exhaust diameter should be used. The pipe connecting the boiler to the chimney should be at least 24 gauge. Thicker gauges are available and will resist corrosion longer and need fewer replacements. Slope

CAUTION:
Keep furnishings and other combustibile materials away from the boiler.

the flue pipe back towards the heater, 1/4" per foot of horizontal run. That way if any condensation forms in the pipe it will be carried back into the heater. The connector pipe should be installed so that the upper pipe section fits inside the lower section. This way any condensation building up inside the pipe will stay inside the pipe as it flows down the inside surface. Horizontal pipe runs should have the pipe seams turned up. Particular attention should be paid to the point where the flue passes through a wall or ceiling. This penetration should always be made with a thimble, insulated pipe, and then proper accessories following manufacturers instructions.



Clearance to Combustibles

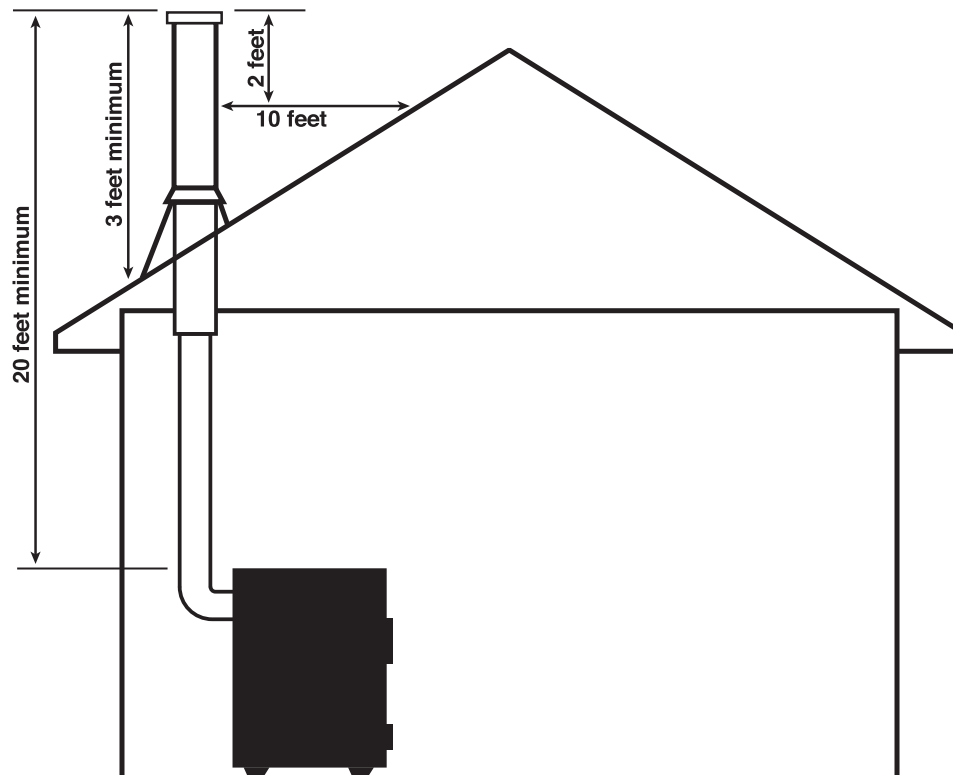
- A - 30# Safety Valve
- B - Domestic Coil
- C - Exhaust
- D - 2" Hot Water Out
- E - Temp. Pressure Gauge
- F - High Limit Aquastat
- G - Samson Regulator
- H - 2" Water Return on back

Chimney connectors must not pass through the ceiling, concealed spaces, or enter the chimney in the attic, unless proper clearance or insulated pipe is used following manufacturers instructions. REMEMBER that all single wall chimney connector sections should be connected with at least 3 sheet metal screws per joint. A fire in the stack may cause vibration and poorly fastened piping may come apart causing an extreme fire and smoke hazard. Do not extend single wall chimney connector past the inside edge of the flue liner. If you have a manufactured Stainless Steel chimney, attach single wall chimney connector to single wall chimney connector adapter. Where the pipe connects to a masonry chimney. The flu to the chimney should be larger than the single wall chimney connector so you can insert the pipe out to the inside edge of the chimney, but not past. Then seal as tight as possible and cover with a trim collar.



Chimney Requirements

The minimum height of a chimney system for the D.S. Boiler is 20 feet. The chimney must exceed the roof of a house at a minimum of 3 feet at any point of exit. In a pitched roof installation the chimney must be 2 feet higher than anything within a 10 foot radius of the chimney. It is important to have a chimney draft of 0.06 water column. It is required to abide by the manufacturer's instructions on Class A chimneys as well as local building codes. It is not recommended to build a chimney on an addition that is lower than the main part of your house. **Do not extend the single wall chimney connector past the inside of a masonry chimney liner. Never connect this unit to a chimney serving another appliance.**



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Boiler Controls

1 Samson Regulator

The Samson Reg. is designed to regulate the draft going into the draft intake. There is no electricity needed to operate the Samson reg.

Set Up - thread Samson Reg. into 3/4" fitting at top left (see page 6) when installing chain from Samson Reg. to draft intake. Turn knob clockwise and connect chain so lid is shut and chain is tight. Then turn knob counterclockwise to increase draft.

2 Temperature Pressure Gauge

The Temperature Pressure Gauge has two features:

- A - Needle shows temperature of water
- B - Needle shows water pressure

Note: Normal pressure for closed systems are 12-15 lbs.

Warning: Do not exceed 200^o water temperature.

Thread temperature pressure gauge into 1/2 inch fitting at top right corner (see page 6)

3 30# Safety Valve

This is a pop-off valve. At 30 PSI hot water will dump out of the 30# safety valve.

Installation Instruction: You must run some sort of high temperature pipe down to the floor from the safety valve. Install a drain in the floor if possible.

Thread 30# safety valve into 3/4 fitting at top left back (see page 6)

4 Automatic Fill Valve / Pressure Reducing Valve

The Automatic Fill Valve need to be hooked up to the water supply line connected to your system.

The Automatic Fill Valve will reduce pressure to 12 lbs. and keep water supplied.

A water line with an automatic fill valve can be hooked up anywhere in your system.

5 Expansion Tank

An Expansion Tank is designed to maintain the boiler pressure at 12-15 lbs.

Every degree the temperature rises the boiler will gain 1 lb. of pressure. The expansion tank will absorb the pressure and keep it at 12-15 lbs. in normal temperature ranges. This normally gets hooked up to the hot water horizontal line close to the boiler.

6 Circulator Pump

A Circulator Pump is designed to circulate water through your heating system. This normally runs off 110 volts, 12 volts, or air. The thermostat controls the circulator.

The circulator pump must be set up in the return line close to the boiler, pushing water into the boiler.

7 Aquastat (High Limit)

The Aquastat is a safety feature. It will override the thermostat. If the thermostat is not calling for heat the circulator will not run. If water is not circulating through your system the water temperature will rise slowly.

The Aquastat wires get hooked up to the thermostat wires.

Set the High Limit Aquastat to 190 degrees.

If the water temperature rises to 190 degrees, the circulator will run.

8 Domestic Water Coil

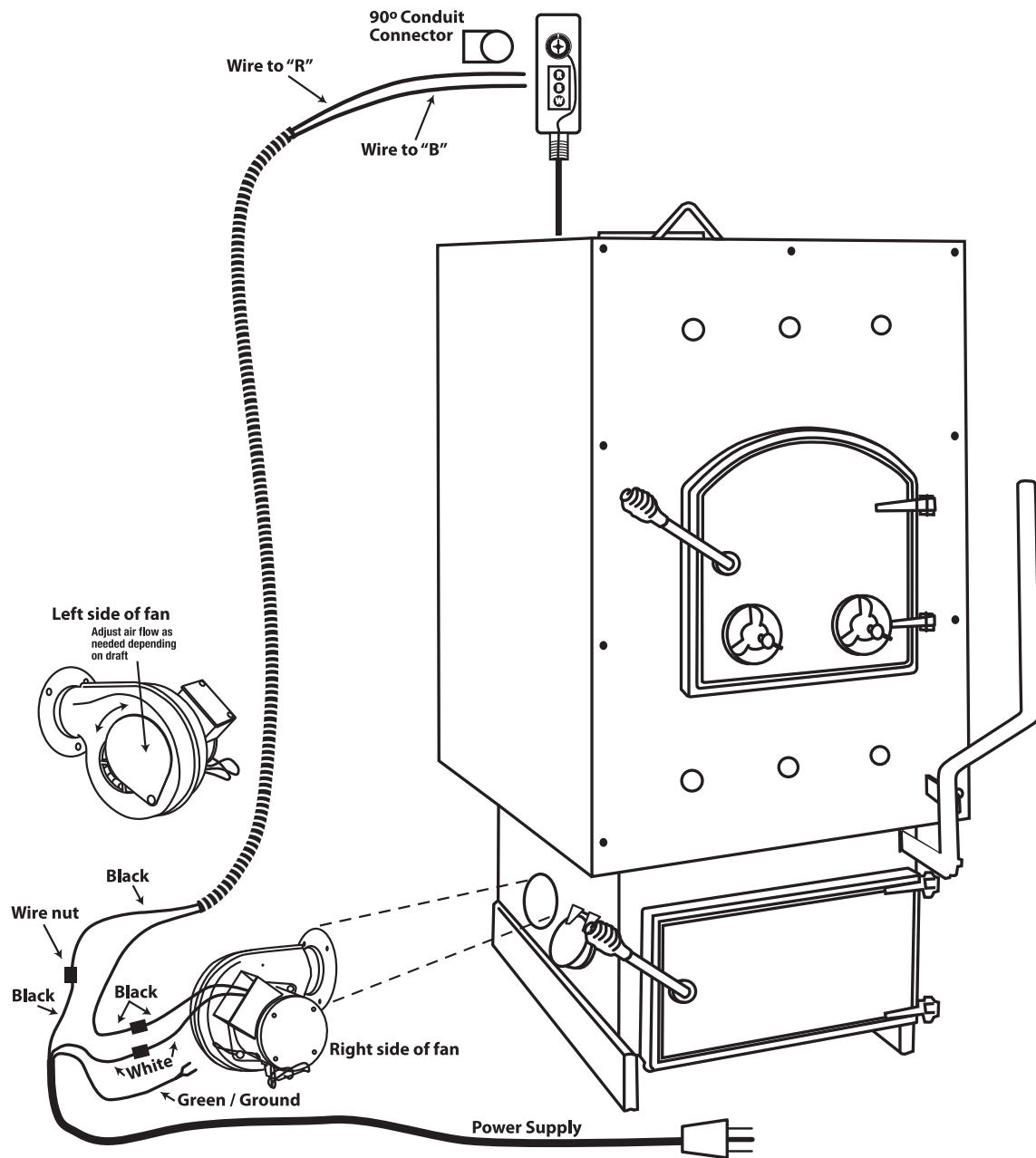
The Domestic Water Coil will heat 4 gallons per minute when the water temperature is set at 160 - 180 degrees. The coil has a 4" NPT that threads into the back of the boiler. Use thread sealant to prevent leaking. **NOTE:** Always hook up a mixing valve when using a domestic water coil, or someone could get burnt.

9 Air Purger

The Air Purger can also be called an Air Scoup. It is designed to do three things:

- Capture air pockets, which is then released by the air vent.
- Mounts the automatic airvent
- Mounts an expansion tank

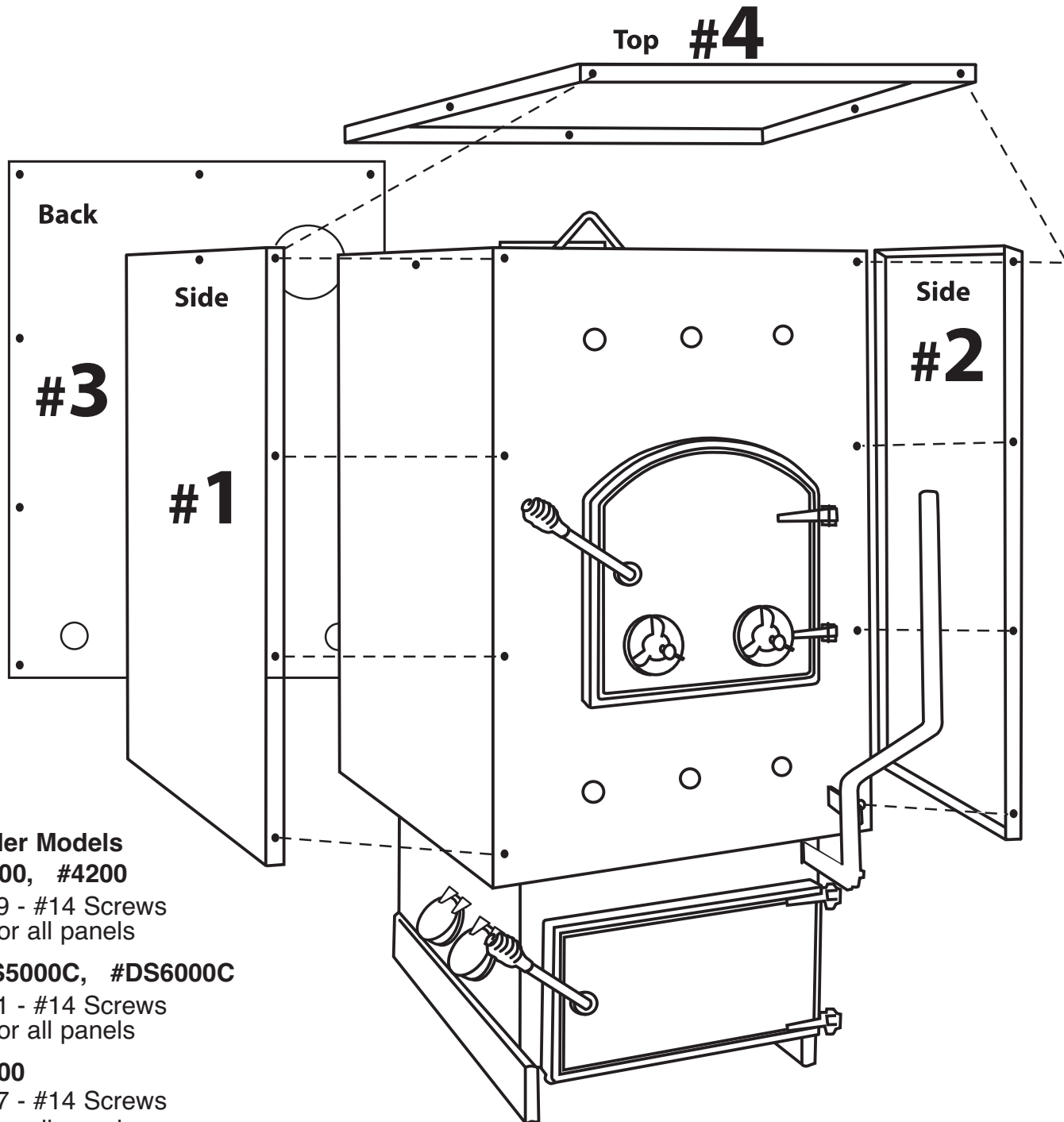
Forced Draft Kit Setup



- Remove the rear draft intake
- Replace with draft fan
- Use bolts to cover holes

Boiler Sheet Metal Installation

Install in order as numbered - 1,2,3,4



Boiler Models #3200, #4200

19 - #14 Screws
For all panels

#DS5000C, #DS6000C

21 - #14 Screws
For all panels

#1100

17 - #14 Screws
For all panels

- Install side and back panels first.
- Back panel goes inside of side panels.
- Top panel goes outside of all panels.



Trouble Shooting

Problem 1 - Inadequate heat being delivered to your home,

Solution:

- Is boiler the recommended BTU size for your home?
- Check home insulation – is it adequate?
- Is water temperature at boiler hot enough? It should not exceed 180 degree.
- Is water circulating properly through your system? If not your system could be air locked. If your system is air locked install an air auto bleed valve at the highest point of that zone.
- Do you have a circulator pump? If not install one if needed.
- Do you have a good draft of 0.06 water column? If not, check and clean chimney and single wall chimney connector
- Do you have the appropriate amount of floor heat or radiators?
- When burning coal your coal bed needs to be at least 8" high throughout firebox.

Problem 2 - Boiler burns too hot

- Is boiler the recommended BTU size for your home?
- Turn Samson Regulator to low.
- Check gasket on all Ash Doors (replace if needed). All doors must be sealed.

If you have a manuel draft damper:

- A windy day will create more draft. If you do not have a barometric damper or manuel damper when burning coal, you must install one now. Read instructions on barometric damper before installing. At least a 0.06 water column on all D.S. Coal Boilers.
- Manuel dampers work good but you need to be cautious because a manuel damper can restrict draft so much that it can create carbon monoxide.

Problem 3 - Poor Draft

- Check and clean chimney and single wall chimney connectors
- Check chimney draft – there should be at least a 0.06 inch of water column. This service is provided by a certified chimney sweep or a professional installer.
- Open manuel damper if you have one
- If you have barometric damper? Is it installed properly? Read the instructions.
- Check ash pit. If it is too full - empty it.
- There might be a cracked flue liner. If so you need to reline chimney before further use of the boiler.
- Make sure no other fuel burning devices are connected to the chimney impairing the draft.
- Make sure all of chimney mortar connections are airtight.
- Check chimney for possible down draft caused by taller surrounding trees or objects.
- Make sure clean-out door in the chimney is closed tight if you have one.
- When start up, the chimney is cold so you will have less draft.

Problem 4 - Odor from first fire

- Uncured paints and oils will create an odor that can last a few hours. Odors can continue to develop if you make hot fires until the paint cures.



Limited Warranty



LIMITED WARRANTY DS Boilers

Please read this warranty carefully!

D.S. Stoves warrants this DS Boiler against premature failure of any component due to workmanship quality or materials. So long as it is owned by the original purchaser, subject to terms, limitations and conditions herein set out. **Soft coal is prohibited in any DS Furnace or Boiler.**

	Time Period
1 - Firebox	Five Years
2 - All doors - (fire and ash door)	Five Years
3 - Cast Iron Components (grates, grate rails, bypass baffle and firebox retainer)	Five Years
4 - All Electrical Components	One Year

D.S. Stoves will replace, at no charge to the owner, any defective part which D.S. Stoves determines affects the operation of the boiler.

The owner is responsible for labor and costs to complete the repair. The owner may at his option and with D.S. Stoves approval, have the boiler shipped to the factory for repair. All labor and material costs for repair at the factory will be borne by D.S. Stoves.

The owner is responsible for all shipping costs.

D.S. Stoves door glass, gaskets, paint or enameled parts, firebrick, and furnace cement are not covered by this Limited Warranty.

Failure to follow installation and basic operation recommendations written in this negligence abuse modifications to the boiler or over firing 200 degrees water temperature, as determined by D.S. Stoves or its authorized dealers.

This Limited Warranty is in lieu of all other warranties either expressed or implied.

(US Environmental Protection Agency. The boiler is only for burning Coal. Use of any other solid fuel except for Coal ignition purposes is a violation of federal law.)

D.S. Stoves is not responsible for accidents due to improper installation or failure to follow instructions.

– D.S. Stoves
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