



# EnergyMAX

Models #110 and #160

## OWNER'S MANUAL



Model #110



Model #160

This stove meets U.S. Test  
Standard UL 391,ETLM78-1  
CAN/CSA-366-1



MADE IN USA  
By  
D.S. MACHINE SHOP

Before you install or operate a DS  
furnace, you must:

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

## **Safety Instructions**

1. Read all Instructions before installing or operating any D.S. Furnace
2. You must install smoke and carbon monoxide detectors before you install or operate any furnace.  
**Check your local code, this installation must meet their rulings.**
3. Do not open bottom ash door to increase draft. It is designed only to empty ashes.
4. Never leave furnace doors open when unattended.
5. Do not hook up a coal furnace to an aluminum Type B gas vent. Use a code approved Class A chimney that is equal or greater than the exhaust on your furnace, and a maximum of 20' high.
6. On all new installs connecting to an existing chimney, a level 2 chimney inspection must be done by a Certified Chimney Sweep.
7. Clean chimney before installing furnace. If there is creosote attached to the liner you could create a serious chimney fire.
8. Never leave children unsupervised when they are in same room as furnace. Provide a sturdy barrier to keep children and pets a safe distance from the furnace, or they could get burned.
9. Keep Furnace area clear from all combustible materials, gasoline, and other flammable vapors and liquids.
10. Use the required floor protection as shown on the Safety Label on back of furnace.
11. Check the clearance to combustible walls and floors.
12. Do not allow anyone who is unfamiliar with the furnace to operate it.
13. Spend some time with your furnace to become well acquainted with the different settings and how each setting will affect its burning patterns. It is impossible to state how each setting will affect your furnace.
14. Be extremely careful when removing the furnace ash pan. It may be very hot!
15. Make sure your single wall chimney connectors have at least 3 screws per joint.
16. Do not install this furnace in a mobile home or trailer.
17. Do not use a manual, barometric or automatic damper when burning anything other than anthracite hard coal.

## **Operational / Work Practice Standards**

1. When starting a fire, set hot air regulator on furnace to HIGH.
2. Completely open bypass damper on front top center of furnace. See page 6 for location.
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 made by Rutland Products. [www.rutlandproduct.com](http://www.rutlandproduct.com) OR use charcoal briquettes.
5. Ignite paper or fire starter product.
6. Leave fire door open slightly until the smoke clears out. DO NOT leave stove unattended with the fire door open!
7. Once kindling is ignited add larger pieces of wood. After wood is burning add a 2" layer of coal.
8. Keep adding coal as necessary, but don't add too much at a time or you could smolder the fire.
9. You do not have an established coal fire until you have 8" of red coals on top of the grates.
10. Once you have an established fire, close your bypass damper, set your regulator to meet your needs and reload coal as needed. You can add 30 lbs. or more coal per feeding.
11. When tending the firebox always pull the bypass damper slide out prior to opening load door. Open load door slowly to avoid a "flash back". After closing load door, close the bypass damper.
12. The furnace is designed to burn coal at a predetermined firing rate. Over firing occurs when the ash door is left open during operation or a highly volatile fuel, i.e. large amounts of small kindling is used. Do not exceed 600 degrees Fahrenheit on top of furnace.
13. Shake ashes every 12 hours if possible. You must keep your ashes cleared 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. Install a manual or barometric damper if your draft exceeds 0.08 inches water column.

15. If you have a manual damper installed, before loading coal, open damper and let open until coal gases have escaped.
16. When installing a barometric damper, adjust barometric damper to 0.06 - 0.08 inches water column draft reading at furnace. This service is provided by a certified chimney sweep.
17. Regularly check the fit on the load and ash doors. They must fit tightly. If it does not, check for deterioration or wear of the ceramic rope seal and door hardware. Replace defective seals and hardware.
18. Inspect and clean your chimney and single wall chimney connectors regularly.
19. In the event of a chimney fire, shut all draft controls and blower off. Call your fire department immediately. Alert everyone in the house. If flue is still burning vigorously, throw baking soda into fire box 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 the chimney.
20. With new steel there is a small amount of oil or dirt on the metal. You may smell the odor. This is normal during the first operation. You may want to assemble the furnace out of doors and build a small fire in it to "BURN OFF" this dirt and oil before installing unit.
21. Equip your home with fire extinguishers, carbon monoxide and smoke detectors.
22. Do not burn garbage, gasoline or any other flammable liquids in this furnace.
23. Do not burn furnace over 600 degrees Fahrenheit or warranty will be void!

### **Energy Max Annual Maintenance - After each heating season**

1. Clean out firebox and ash pan area.
2. Remove firebrick on right side and clean heat exchanger area.
3. Replace any cracked or broken firebrick - very important! If this is not followed your stove is at risk for warping and may void your warranty.
4. Clean out above cast iron baffle in the top of fire box.
5. Check grates and shaker handle for wear or warping. Replace if necessary. Check for any loose hardware on doors, door latches and shaker handle. Tighten or replace as needed. Check all gaskets on fire and ash doors for deterioration or tears, replace where necessary. Also check seal of doors by closing doors on a piece of paper. If you can move the piece of paper between door frame and gasket, replace door gasket. Clean inside of single wall chimney connectors and chimney at least once annually (in Spring). For longer life of your single wall chimney connectors, disconnect from stove, oil inside with vegetable oil and store in attic during the summer months.

# Locating Furnace

- 1 - The furnace must be placed on a solid none combustible floor. If you have a combustible floor it is required to use a code approved none combustible floor board (Type 1 Board)
- 2 - It is recommended that the furnace be centrally located.

**Two Options for good circulation from basement to first floor:**

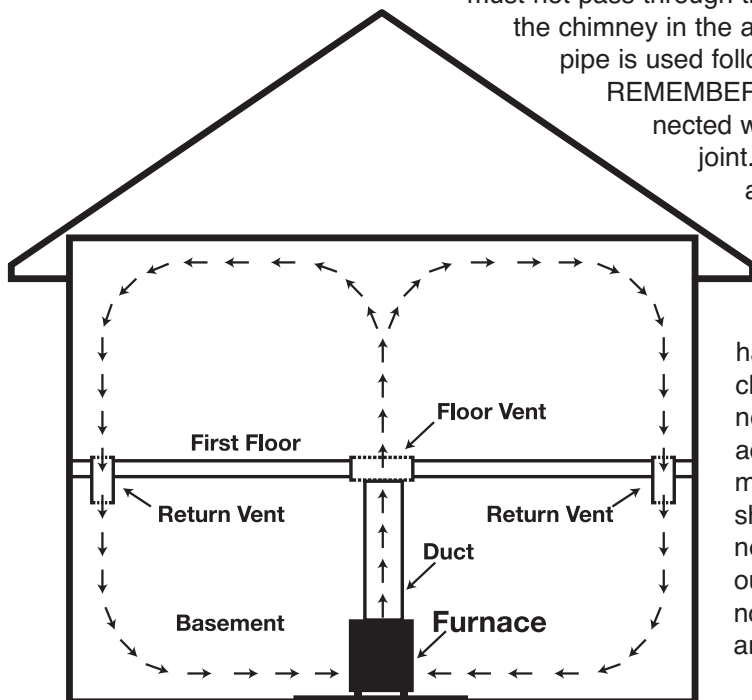
**A** - Run a plenum from furnace to 1st floor – recommended 14" x 20" or larger with return vents that equal at least 12% more in sq. inches.

**B** - Install floor vents where needed without plenum. Extend the return vents at least 12" down from the ceiling (see drawing).

- 3 - Locate and read label on furnace before installation. The most important consideration in installing your furnace is adequate clearance between the furnace and any combustible surface. A furnace that is placed too close to a wall or to furniture can cause a fire.
- 4 - The base must extend at least 16" beyond the front and back of the furnace, 8" to the 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 (see page 4).
- 5 - The furnace must have its own flue. Do not connect this unit to a chimney flue serving other appliances.

- 6 - Connection of the furnace to the chimney should be made as directly as possible (6 feet maximum horizontal) and not more than two bends, when needed, should be used. No reduction in flue pipe below 6 inches in diameter should be used. The pipe connecting the furnace to the chimney should be at least 24 gauge. Thicker gauges are available and will resist corrosion longer and need fewer replacements. Slope 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. 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.

**CAUTION:**  
Keep furnishings and other combustible materials away from the stove.



REMEMBER that all pipe 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.

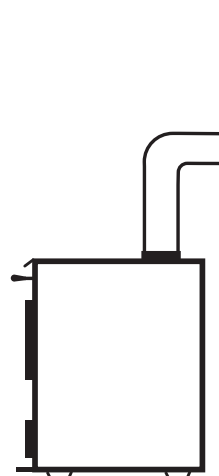
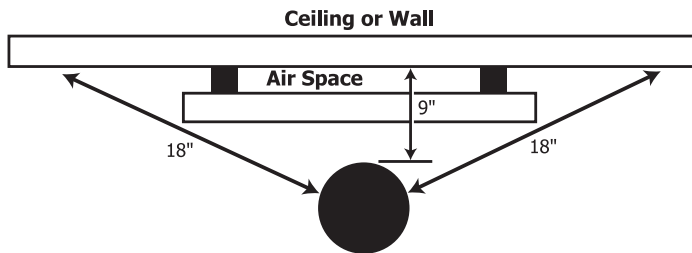
## Locating Furnace

This furnace is to be installed maintaining clearances as shown in illustration.

1. Set the furnace on a solid noncombustible floor.
2. Use a U.L. approved fire retardant material for the floor mat.
3. The material must extend at least 16" in front of and 8" on either side and back, and underneath the chimney connector and extending at least 2" on either side of the chimney connector.

**Caution: Do not store combustible or flammable material near furnace.**

Specifications	#110	#160
Sides	24"	24"
Back	24"	24"
Front	48"	48"
Clearance from flue to combustible with single wall chimney connector	18"	18"
Clearance from flue to combustible with double wall chimney connector	6"	6"
Corner Clearance from furnace to combustible	9"	9"

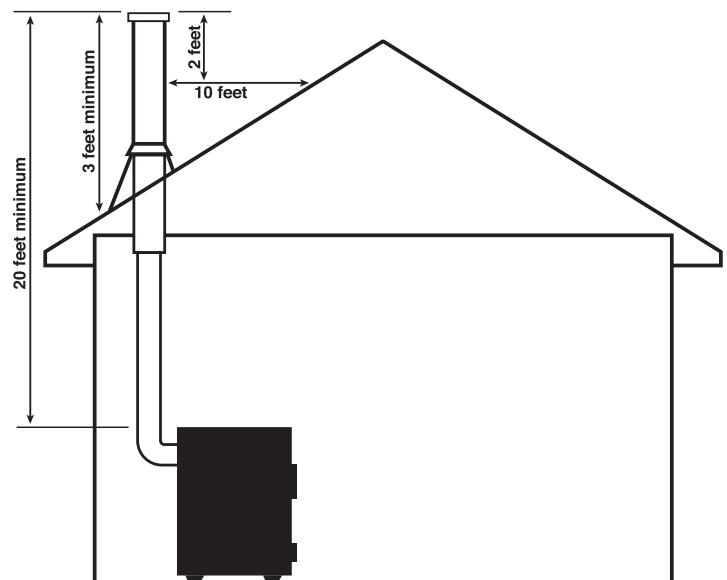
According to NFPA Standards single wall chimney connector can be within 9" of combustible provided an approved fire retardant material covered with 28 gauge sheet metal, spaced out 1" on non-combustible spacers is utilized.

1. The furnace should be the only heating appliance using a chimney. One furnace per flue.
2. A masonry chimney should be a chimtek or stainless steel liner.
3. The masonry chimney should not have any missing mortar or loose bricks.
4. There should be no mortar or parts of the chimney blocking the chimney flue.
5. There should be a two inch clearance between any chimney except chimtek has zero clearance.
6. The chimney should extend at least 2' above the highest point of the house, or 2' above the point at which the chimney is 10' from the roof.

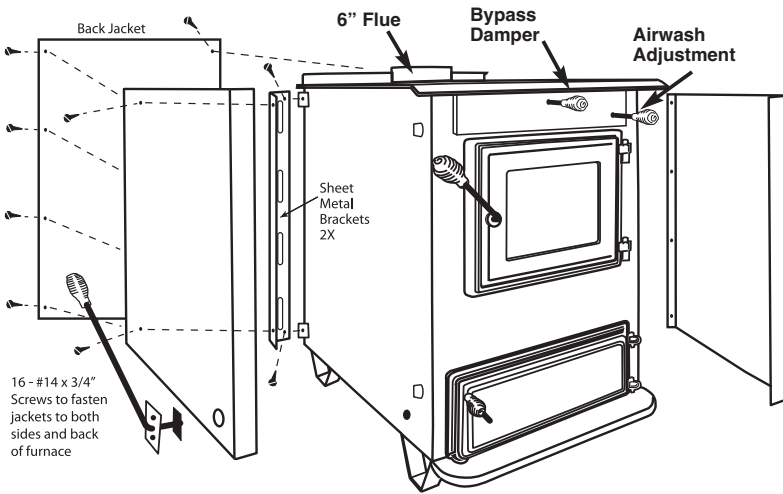
## Chimney Requirements

The minimum height of a chimney system for the D.S. Furnace 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 inches 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.**

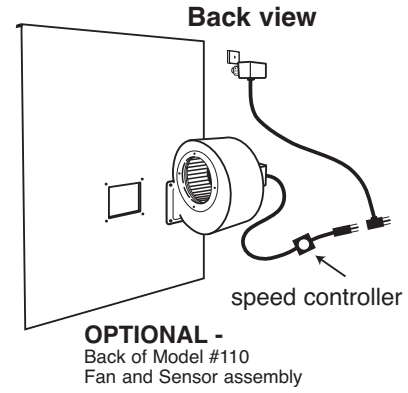
Should you have a problem with inadequate draft you should see page 11.



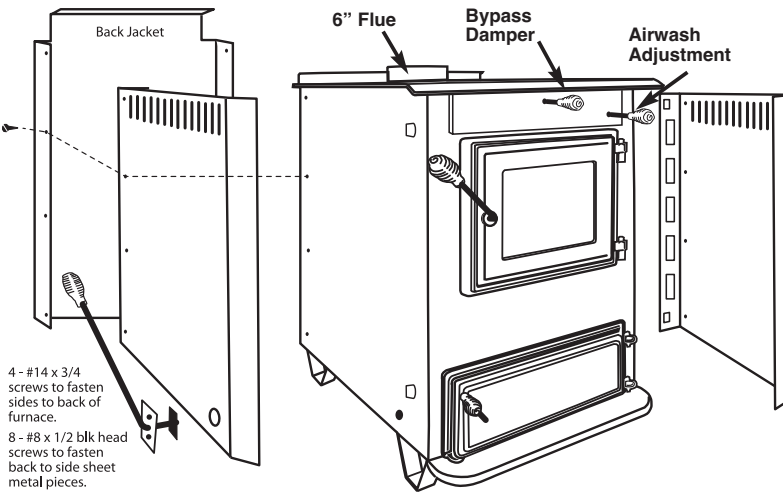
## Model #110 Basement



16 - #14 x 3/4\"/>

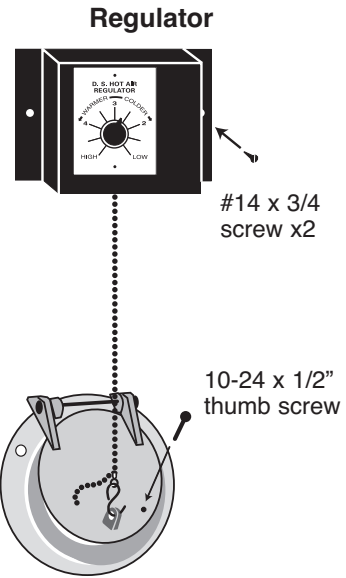


## Model #110 Living Room



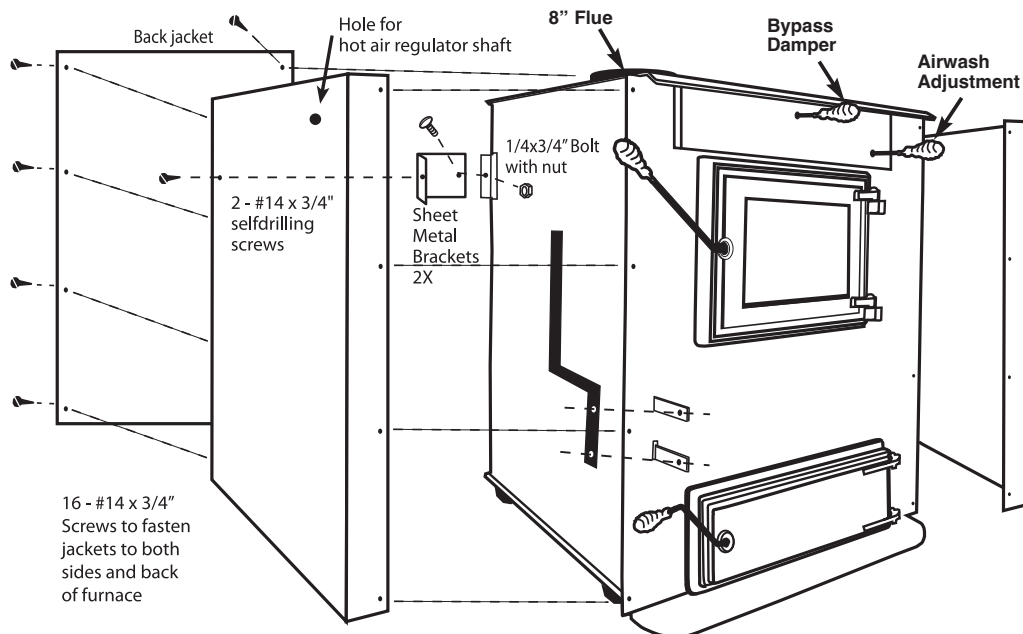
4 - #14 x 3/4\"/>

8 - #8 x 1/2\"/>



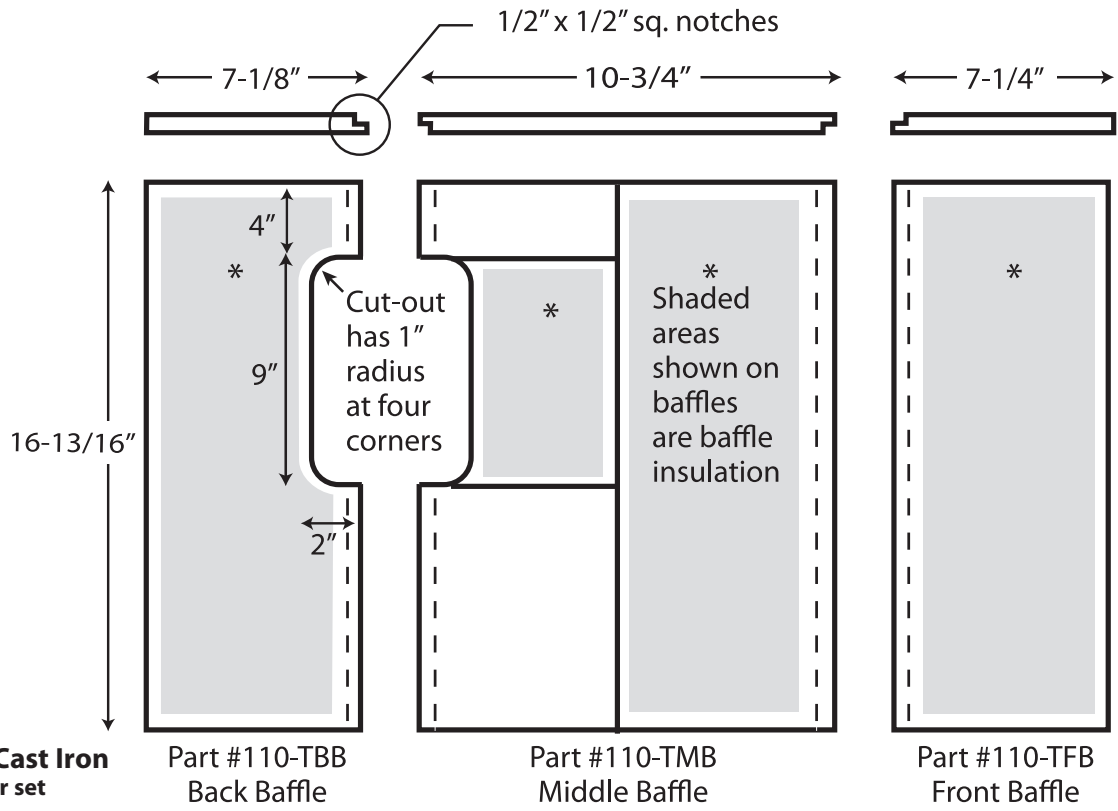
Thumb screw is for manual draft control, to prevent unit from completely shutting down on a low burn. Do not burn hotter than 600 degrees Fahrenheit on furnace top.

## Model #160



16 - #14 x 3/4\"/>

# Parts List - Energy Max 110



**Material: Cast Iron**  
- 3 pieces per set

**Baffle Insulation**  
**Material: 1/2"**  
- 4 pieces per set

Part #110-TBBI  
Back Baffle Insulation

Part #110-TBMI-1  
Part #110-TBMI-2  
Middle Baffle Insulation

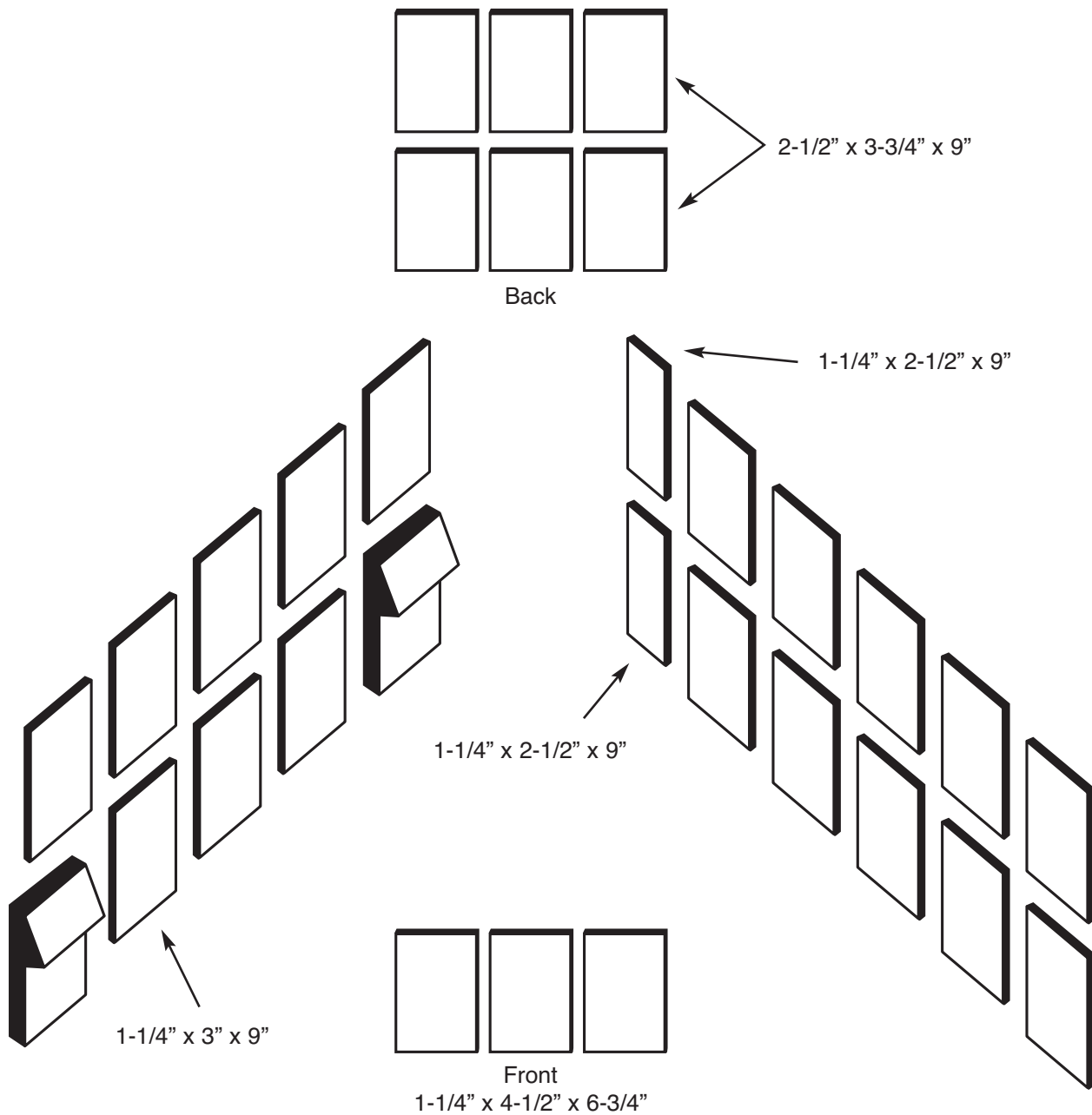
Part #110-TBFI  
Front Baffle Insulation

**Qty per furnace**

Qty per furnace	Description	Model	Parts#
1	Left side sheet metal jacket	110	110-5L
1	Right side sheet metal jacket	110	110-5R
1	Back sheet metal	110	110-5B
2	Cast Iron 4 - Grate Rail for 4 - 4" Grates	110	44-GR
4	Cast Iron 4" x 13" Grate	110	4x13-C1G
1	Cast Iron Energy Max Door	110	EM-D
1	Cast Iron Ash Door	110	ASH-D
2	Spinners on Ash Door (stationary)	110	110-09
3	Removable After Burner Pipes (stainless steel)	110	110-RT
1	1/2" Spring Handle on Fire Door	110	12-CSH
3	3/8" Spring Handle on Bypass, Ashdoor and Airwash	110	38-CSH
1	Ash Pan 15-1/2"w x 21"d x 3"h	110	ASH-PAN
1	Ash Shaker Bar Assembly	110	110-ASBA
1	Steel Bypass Plate (slide)	110	110-SBV
2	Cast Iron Louvers	110	CI-FL
1	Stainless Steel H-Channel Firebrick Holder	110	110-HBR
1	Stainless Steel U-Channel Firebrick Holder	110	110-TBR
1	Stainless Steel Firebrick / Baffle Bracelet	110	110-FBH
1	2 piece cast iron downdraft baffle	110	CI-110
1	Top Door Gasket 3/4" Round x 4'	110	3448-kit
1	Bottom Door Gasket 5/8" Round x 4'	110	5848-kit



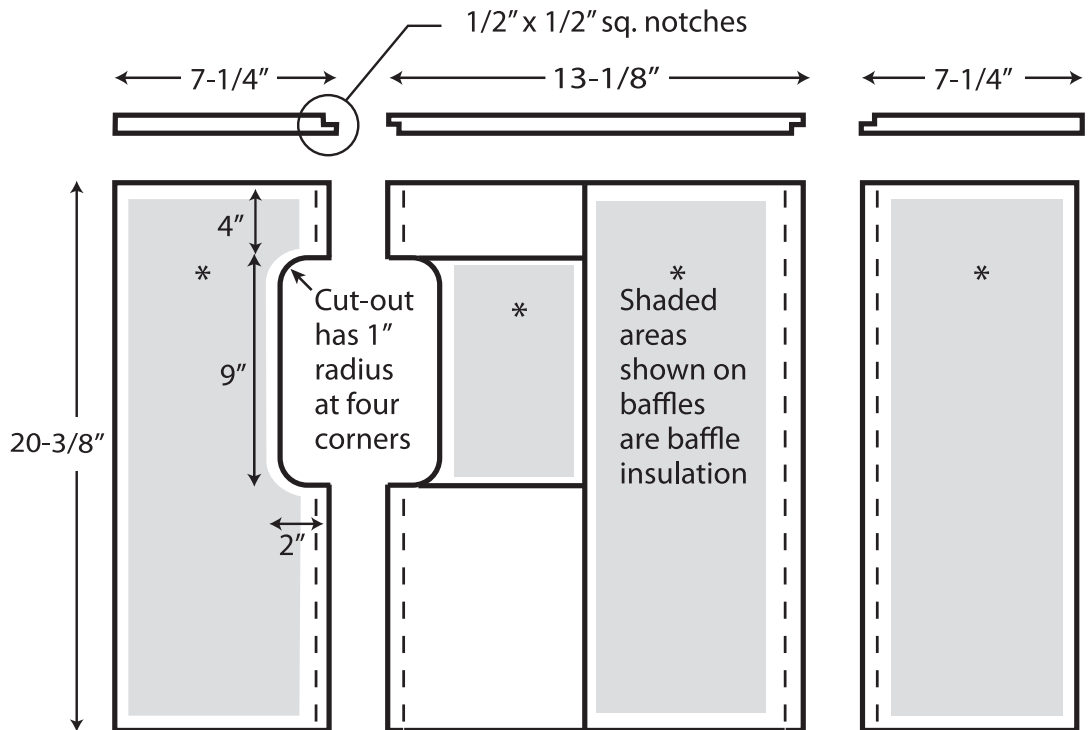
# Firebrick Panels for Energy Max 110



Left Side TOP	5	1-1/4" x 4-1/2" x 9"	Front	2	1-1/4" x 4-1/2" x 6-3/4"
Left Side BOTTOM	2	1-1/4" x 4-1/2" x 9"	Back TOP	2	2-1/2" x 4-1/2" x 9"
	1	1-1/4" x 3" x 9"		1	2-1/2" x 3-3/4" x 9"
Right Side TOP	5	1-1/4" x 4-1/2" x 9"	Back BOTTOM	2	2-1/2" x 4-1/2" x 9"
	1	1-1/4" x 2" x 9"		1	2-1/2" x 3-3/4" x 9"
Right Side BOTTOM	5	1-1/4" x 4-1/2" x 9"			
	1	1-1/4" x 2" x 9"			



# Parts List - Energy Max 160



**Material: Cast Iron**  
- 3 pieces per set

Part #160-TBB  
Back Baffle

Part #160-TMB  
Middle Baffle

Part #160-TFB  
Front Baffle

**Baffle Insulation**  
**Material: 1/2"**  
- 4 pieces per set

Part #160-TBBI  
Back Baffle Insulation

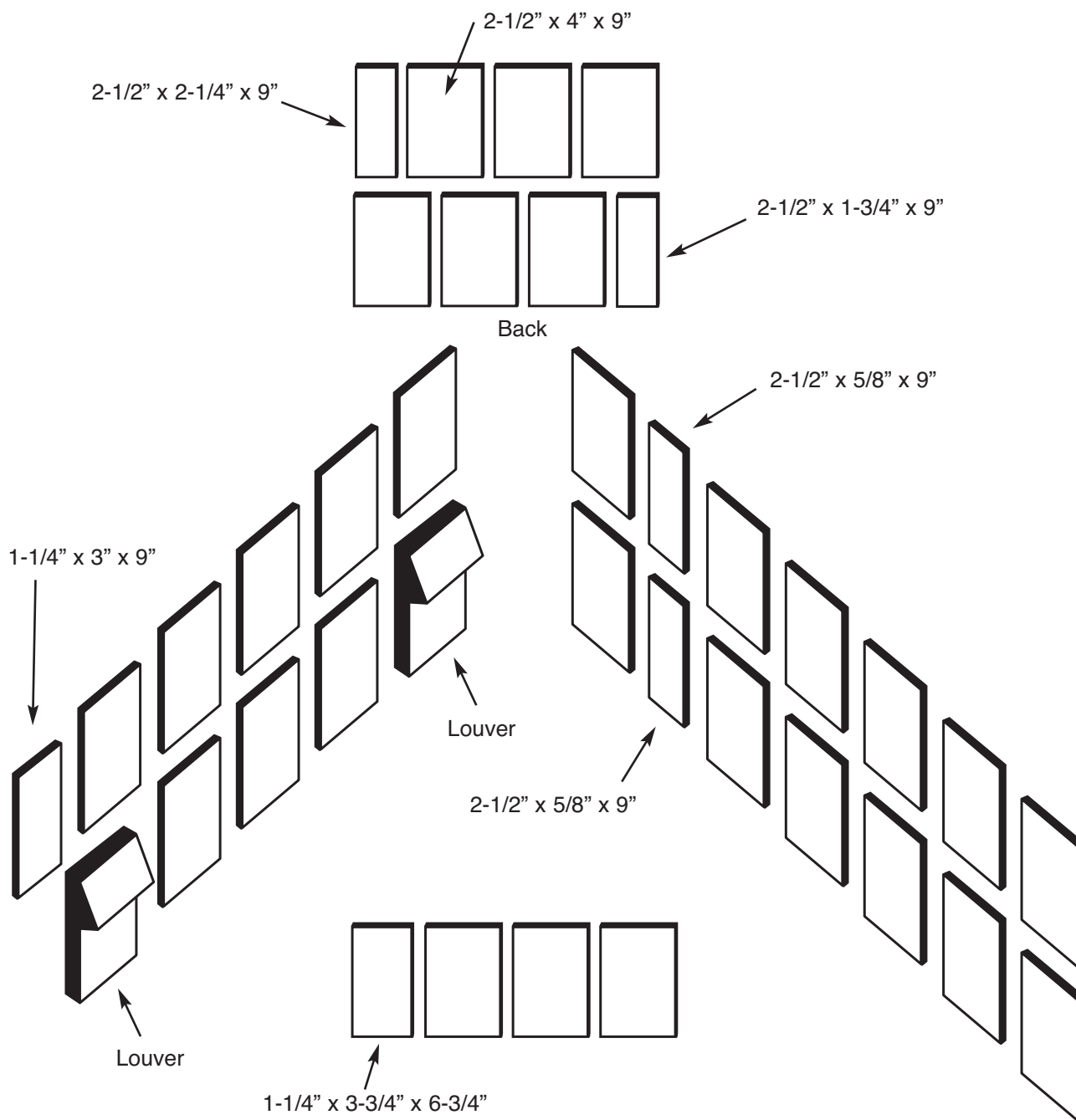
Part #160-TBMI-1  
Part #160-TBMI-2  
Middle Baffle Insulation

Part #160-TBFI  
Front Baffle Insulation

## Qty per furnace

	Description	Model	Parts#
1	Left side sheet metal jacket	160	160-5L
1	Right side sheet metal jacket	160	160-5R
1	Back sheet metal	160	160-5B
2	Cast Iron 3-Grate Rail for 6" Grate	160	63-GR
3	Cast Iron 6 x 16 Grates	160	6x16-C1G
1	Cast Iron Fire Door	160	EM-D
1	Cast Iron Ash Door	160	ASH-D
2	Spinners on Ash Door (stationary)	160	160-09
3	Removable After Burner Pipes (stainless steel)	160	160-RT
1	1/2" Spring Handle on Fire Door	160	12-CSH
3	3/8" Spring Handle on Bypass, Ash Door and Airwash	160	38-CSH
1	Ash Pan 15-1/2"w x 23"d x 3-1/2"h	160	ASH-PAN
1	Ash Shaker Bar Assembly	160	160-ASBA
1	Steel Bypass Plate (slide)	160	160-SBV
2	Cast Iron Louvers	116	CI-FL
1	Stainless Steel H-Channel Firebrick Holder	160	160-HBR
1	Stainless Steel U-Channel Firebrick Holder	160	160-TBR
1	Stainless Steel Firebrick / Baffle Bracelet	160	160-FBH
1	2 piece cast iron downdraft baffle	160	C1-160
1	Top Door Gasket 3/4" Round x 4'	160	3448-kit
1	Bottom Door Gasket 5/8" Round x 4'	160	5848-kit

# Firebrick Panels for Energy Max 160



Left Side TOP	5	1-1/4" x 4-1/2" x 9"	Front	3	1-1/4" x 4-1/2" x 6-3/4"
	1	1-1/4" x 3" x 9"		1	1-1/4" x 3-3/4" x 6-3/4"
Left Side BOTTOM	3	1-1/4" x 4-1/2" x 9"	Back TOP	2	2-1/2" x 4-1/2" x 9"
Right Side TOP	6	2-1/2" x 4-1/2" x 9"		1	2-1/2" x 4" x 9"
	1	2-1/2" x 5/8" x 9"		1	2-1/2" x 2-1/4" x 9"
Right Side BOTTOM	6	2-1/2" x 4-1/2" x 9"	Back BOTTOM	3	2-1/2" x 4-1/2" x 9"
	1	2-1/2" x 5/8" x 9"		1	2-1/2" x 1-3/4" x 9"
			2 - Primary Air Louvers		

# Trouble Shooting

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1. **Problem:**

*Smoke puffs from furnace*

**Solution:**

Open bypass damper before opening door.

Check chimney draft. Check for blocked chimney or flue pipe. Use mirror to check chimney clearance.

Check ash pit – if it is too full, empty.

Make sure furnace room is not too airtight.

Make sure all of chimney mortar connections are airtight,

Check ash drawer. Make sure it's airtight.

Check chimney for possible down-draft caused by taller surrounding trees or objects. Correct with proper chimney vent cap.

Check the possibility of a cold chimney forcing cool gases backward. Remedied by properly insulating chimney with non-combustible liner – non combustible insulation.

Fuel may be too green.

Make sure no other fuel burning devices are connected to the chimney impairing the draft.

Check chimney draft, it should be .06 inches of water column. This service is provided by a certified chimney sweep.

Remove parts on right side of furnace and clean heat exchange area if necessary.

If bottom door is open it can create more draft than what chimney can handle. Therefore it can smoke out air wash or out the fire door when open.

2. **Problem:**

*Inadequate heat being delivered to your home.*

**Solution:**

Check home insulation – is it adequate?

Install hood on top of furnace to first floor.

If furnace room is warm but your home isn't, put vents in floor to circulate heat.

Is furnace the recommended BTU size for your home?

If you have a Bimetal Regulator set at high and furnace does not heat properly, shorten chain one or more notches. Do not exceed 600 degrees on top of furnace. Overheating will damage furnace.

3. **Problem:**

*Excess smoke or flames coming out door when refueling*

**Solution:**

Bypass baffle should be open before opening fire door.

Wait 15 seconds and open door SLOWLY – then refuel.

Check length of flue pipe to chimney. Your unit should be within six (6) feet of your chimney.

Make sure chimney cap is not too close to the top of the chimney.

Check chimney draft – make sure chimney flue pipe is clean and chimney is of adequate height.

4. **Problem:**

*Odor from first fire*

**Solution:**

The odor from new steel should disappear in a few hours if burning hot.

If the odor remains, call your dealer immediately. A bad weld can cause a fume leak.

5. **Problem:**

*Excessive Creosote*

**Solution:**

Make sure your unit is serviced by its own proper chimney

Check length of flue pipe and its connections. Maximum length of 6 feet horizontal run and 2 elbows.

Make sure you are burning the smallest, hottest fire to adequately heat your home.

Also see Solutions to Problem One.



LIMITED WARRANTY

**EnergyMAX**

**Models #110 and #160**

**Please read this warranty carefully!**

D.S. Stoves warrants this EnergyMAX Furnace 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.**

	<b>Time Period</b>
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 furnace.

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 furnace 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.

With Optional Coil: Never fire furnace without water in coil.

Failure to follow installation and basic operation recommendations written in this negligence abuse modifications to the furnace or over firing 600° maximum, as determined by D.S. Stoves or its authorized dealers.

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

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

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

– D.S. Stoves  
238-B Old Leacock Road,  
Gordonville, PA 17529  
717-768-3853