



A-150 Warm Air Furnace

Operating instructions and maintenance enclosed
Thoroughly read and understand instructions
Always leave this manual with stove owner

Follow the instructions within this manual. If instructions are not followed, a fire may result causing property damage, personal injury, or even death.

A carbon monoxide detector has been supplied with your stove. You must plug it in.

Danger risk of fire or explosion. Do not burn garbage, gasoline, drain oil, or other flammable liquids. Do not use chemicals or fluids to start fire.

Burn rice or buckwheat anthracite coal only

Stoves surfaces may be hot while in operation. Keep children away. Do not touch during operation

Do not connect this unit to a chimney flue serving another appliance.

Follow all local building and Zoning ordinances

1. **IMPORTANT:** Place furnace floor on a flat level surface. The end of the floor without the angle is the stoker-hopper end. Position the floor with the short angle welded to it towards the chimney this is the where the stack pipe will come out of.
2. Stand furnace on the floor, centering it so that the angles on the face of the furnace are inside the angels that are welded to furnace floor. Keep black face plate of furnace even with edge of floor.
3. Install heat exchanger to furnace. Make sure that stack and cleanout outlets are in their lowest position. Tighten nuts securely in an alternative diametric pattern to compress the rope seal between the flanges.
4. There are two legs (angles) inside furnace. Fasten to heat exchanger; adjust bolts on bottom of legs until bolts rest snugly on floor.
5. Install rope gasket around furnace exhaust pipe inside of mounting holes for heat exchanger. Rope gasket is self has a self- adhesive backing on it. It is provided in the ash tub.
6. Remove side panels from box marked sides. Using a screw driver or chisel, pry open edge in S bend on side panel.
7. Find packet of screws inside box marked top.
8. Slide S bend of jacket panel over angle on black face plate, keeping jacket side panel inside of floor angle. Do both sides.
9. Fasten rear bib of jacket with 1" screws provided to rear of furnace.
10. Place a light smear of furnace cement or high temperature silicone around fire door frame. Place fire door into furnace inspection opening. Drill a hole in top of door frame, and bottom of frame with 1/8" bit, and secure with drill screws provided in ash tub. Attach spring handle to fire door. Bend hook of spring hand open, then thread hook through predrilled hole in fire door handle, then bend hook closed. Spring handle and fire door can be found in ash tub.

11. Get lower partition out of top box (it is the larger silver piece with square hole in it). Open the S cleat bend on the top end. Slide lower center partition through blower door opening. Top of bottom partition gets threaded up between furnace and heat exchanger. Place against protruding angles, from side panels. Drill holes with 1/8" bit and secure with 1/2" screws. Top of bottom partition gets threaded down between furnace and heat exchanger and slid into S cleats on bottom partition don't secure now.
12. Mount blower motor onto blower unit (as per instructions packed with blower). Insert blower assembly into furnace, allowing 1/4" to 1/2" of blower unit to protrude beyond center partition. **Note:** Blower belt should be somewhat loose. Making belt too tight will cause excessive and rapid wear on the sleeve and bearings in both motor and blower. **Note:** blower is free standing does not get bolted to furnace. Vibration is reduced when blower sits on rubber pads.
13. Place jacket handle on blower door in pre-drilled hole. Slide washer onto handle stem. Slide through blower door. Tap lock washer until tight against inside blower door. Tighten handle latch onto handle stem with screw. Install blower door on furnace with handle on top of door.
14. In box marked top. Remove 2 jacket rings. Slide one over each stack pipe outlet and clean out opening.
15. Place top of jacket onto furnace with filter rack going over heat exchanger.
16. Drill several 1/8" holes along top partition and top and secure with 1" screws.
17. Drill several holes with 1/8" bit through furnace top and side panels and secure with 1" screws.
18. Reach inside stoker unit opening and place small hanging baffle above exhaust opening inside furnace.
19. Hang long baffle onto angles welded in upper portion of furnace. Place reinforcement angle toward heat exchanger.
20. Plenum chambers may now be installed.

21. Stoker units are shipped completely assembled. Lift stoker unit into opening, bottom of stoker has a 1/4" rod welded in place which must go inside stoker opening. Place a thick smear of furnace cement on flange of stoker and tilt into place, securing with 3/8 x 1 1/4 machine screws, washers, and nuts provided in ash tub. Remove shipping screw from gear box lid.
22. Place hopper on stoker unit, and fasten to furnace with large metal washers and nuts. The hopper bottom should lap over stoker throat approximately 1". Since the same hopper is used for several different stokers, it may be necessary to trim the opening. Bend flange down to fit inside of throat of stoker. Be sure feed mechanism is free to operate.

INSTALLING STACK PIPE The heat exchanger has 2 – stack outlets. Either one may be used to connect stove pipe to chimney. The other opening must be capped, to be used for a clean out. If stack pipe must be reduced in size, reduce stack size at thimble. It is important to run full size stack from furnace to thimble in chimney. Install barometric draft control in first full section of stack closest to furnace. Follow instructions packed with draft control, making sure draft control bearings are level and face of control is perpendicular to floor.

Install control harness. Secure timer and relay to furnace with 1/2" screws near the top above the fire door.

Install fan limit control...Into Hot Air Plenum. Timer and relay may be mounted directly to furnace jacket.

Connect 115 volt power supply to switch, black wire gets connected to open screw on switch, white wire in switch bow. Wire furnace following wiring diagram and any applicable UL and local codes. Wire stoker unit and convection blower (see wiring diagram page 13)

After making electrical connections, turn blower on. Be sure blower is running proper direction. To change blower direction, follow blower instructions on motor or install motor on the opposite side of blower.

Locate thermostat in an area where heat from furnace can freely be reached. Mount plastic wall plate of thermostat. Connect thermostat wires to screws on lower portion of wall plate. Run thermostat wire to relay on furnace and connect wires to terminals marked T. T. (note: color coding is unimportant).

STARTING FIRE: DO NOT USE AN ACCELERANT SUCH AS: Gasoline, Kerosene, Litter Fluid, Or Etc.

Put dry coal in hopper, pull coal down to cover entire grate. Crush several charcoal briquettes into smaller pieces on 1 piece of newspaper, crumble newspaper and dig it through coal, so it touches the grate. Light newspaper with a match, turn switch on, when charcoal turns red and starts to spark, place a few hand full of coal on top of charcoal. If fire moves toward bottom of grate before fire is established, coal feed can be slowed down by turning red nut counter clockwise or by flipping feed bolt to a sideward position. (Part #22 on unit specification sheet)

AFTER STARTING FIRE Allow stove and chimney to warm up. Insert draft gauge through predrilled hole in upper portion of green fire door. Open air shutter (located on the bottom of scroll between gear box and stoker motor about ½"). Then with stoker motor running and feeding coal adjust barometric draft regulator until draft gauge reads (-.02). If draft is less than a (-.02) with the barometric draft regulator closed you must close the air shutter (located at bottom of scroll between gear box and stoker motor). If draft is higher than a (-.02) you must adjust the barometric draft regulator. Move weight on barometric draft regulator left or right to obtain the (-.02). Recheck until you obtain a

SETTING TIMER The timer is factory set. Yellow clock wheel makes one revolution every 30 minutes. Each clip sticking out of yellow wheel will cause stoker to run approximately 15 seconds when clip touches switch. Timer settings will vary depending upon chimney drafts. Normal timing cycle is about one minute on, fourteen minutes off. (4 clips side by side). Four clips at zero and four clips at fifteen. If timing cycle needs to be increased, add one or two clips in both groups of clips. Or if in cases of chimney having poor draft, clips may be placed in 3 groups at numbers 0- 10- 20.

COAL FEED (Red Nut)...To increase coal feed and fire size, turn red nut clockwise (CW). To reduce coal feed and fire size, turn red nut counter clockwise (CCW)

After a fire has been established and all fresh coal that was laying on grate has burned, its time to set coal feed. When stoker unit is running steady (approximately ½ hour) fire bed should extend downward to lower portion of the grate with approximately 2" of ash on bottom of grate. When thermostat is satisfied, stoker unit will shut off.

When stoker only runs during timing cycles, the fire bed will gradually shrink to approximately 3" to 4" of red coals. After proper length of fire bed is obtained, coal feed is set.

INITIAL COAL FEED: Advance red nut all the way forward. Then turn it counter clockwise 11 or 12 turns if burning rice coal, if burning buckwheat coal turn coal feed counter clockwise 9 or 10 turns. When furnace is running for about an hour under full load grates should have about 2" of dead ash on them before falling into ash pan.

As the price of fuel continues to increase **KEYSTOKER**, continues to improve and make its products more fuel efficient. To obtain a more complete burn out of coal, a small secondary blower motor was attached to the stoker unit. **THIS MOTOR IS DESIGNED FOR CONTINUOUS RUN.**

When the large stoker motor is running on demand, small blower will assist with combustion and heat output, by producing a more intense and hotter fire. When demand cycle is completed, large stoker motor will shut off, and small secondary motor will continue to run. This will cause the coal that is already on the grate to burn, rather than to allow coal to smolder and die out in an unburned condition. This will achieve a cleaner ash, and allow more heat to be produced and absorbed into heating system.

During summer operation, the small combustion motor will force a small amount of air through grates at all times, which will cause the ash to become like powder. It also prevents the fire from going out. At the same time, it reduces the size of fire bed to approximately 1 ½" to 2" which will prevent furnace from over-heating.

Proper sizing of fire is obtained by turning red nut on feed control arm. Clockwise (CW) for more coal feed and counter clockwise (CCW) for less coal feed.

Location and final adjustment for red nut will be determined by size of coal you purchase. For rice coal, red nut might be turned down 12 turns for maximum settings, whereas for buckwheat coal, red nut might only be turned down 10 turns from maximum settings.

During winter operation, hot coals should never be pushed off the end of grate. This indicated that coal feed needs to be reduced (CCW) or if during winter operation: fire bed is too small, turn red nut (CW).

After coal feed adjustment is completed, if during summer, the convection blower runs when thermostat is not calling for heat **DO NOT ADJUST COAL FEED, REDUCE TIMER ONLY.** If fire goes out **DO NOT ADJUST COAL FEED.** Increase timer only.

CLEANING AND SERVICING It is important to clean and lubricate furnace when shutting down at the end of heating season. Corrosion of heating equipment is greatly reduced by not allowing soot to remain in furnace during summer months.

Remove and clean stack pipe, clean base of chimney. Examine chimney for blockage with a mirror. Brush off barometric damper. Clean tubes and area around tubes in heat exchanger, including entrance into chamber of furnace.

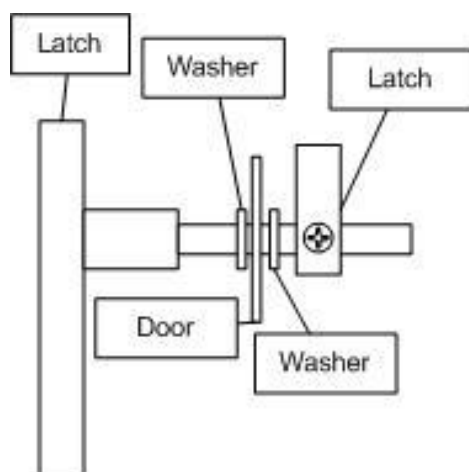
Remove clean out plate (see unit specifications) from stoker unit by removing 2 screws and vacuuming out fly ash from under grate annually.

Oil stoker motor and blower motors with SAE 20 non detergent motor oil. Oil gear box with #90 Gear Oil – Oil level should not be less than $\frac{1}{2}$ full and no more than $\frac{3}{4}$ full.

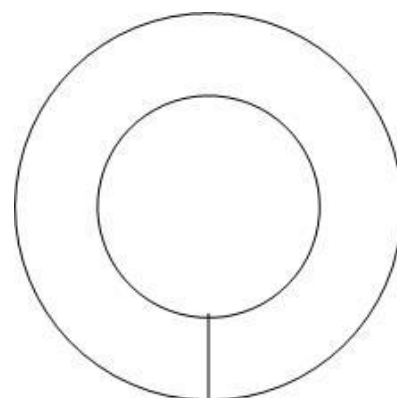
Remove all local from hopper; -remove hopper-place a few drops of oil on all moving parts, joints, and bearings to prevent freeze up.

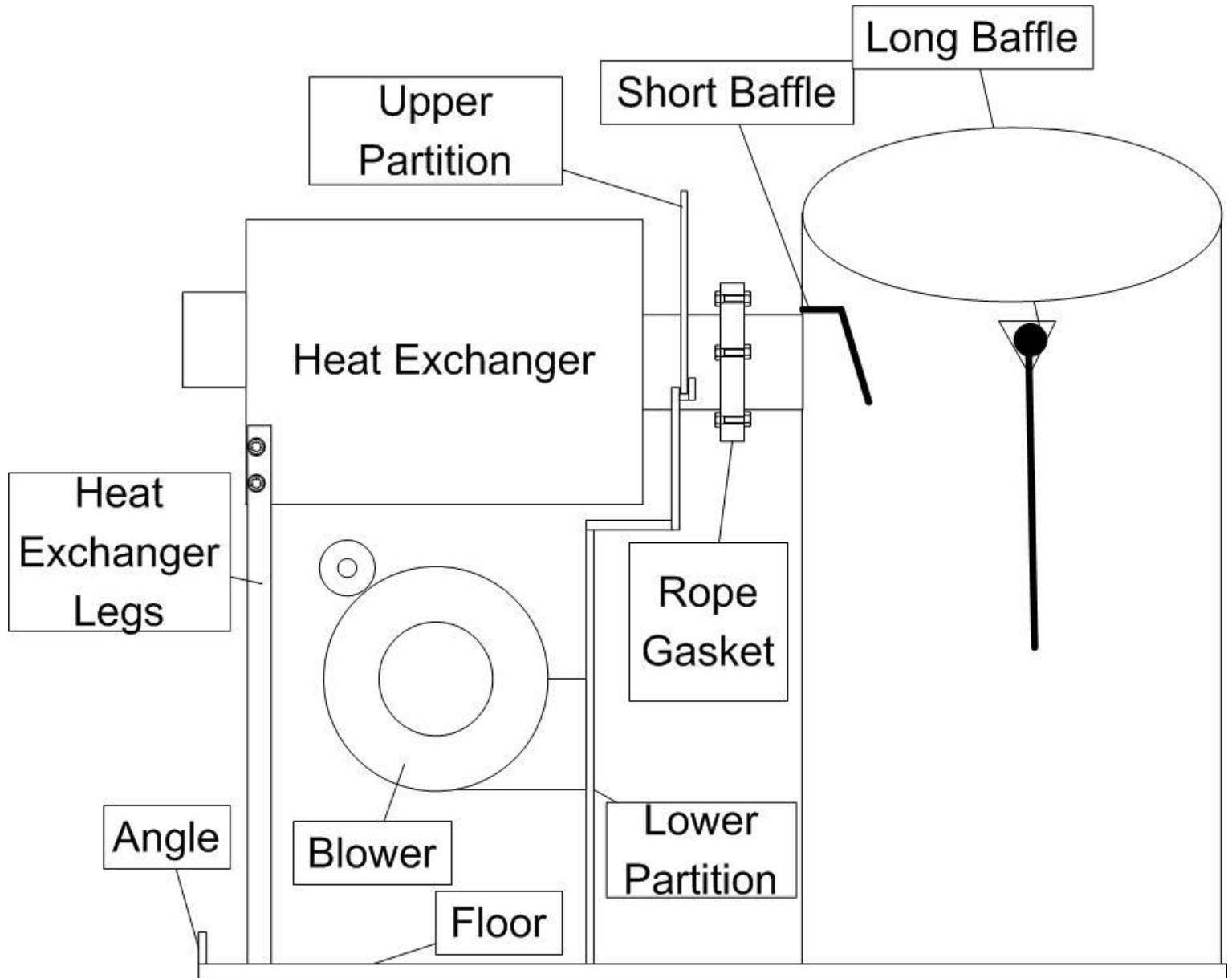
Replace air filters.

Using a chisel or brick – scrape grates smooth. Then rub grates and inside of side rails with sand paper to remove impurities that melted and fastened themselves on to grate.

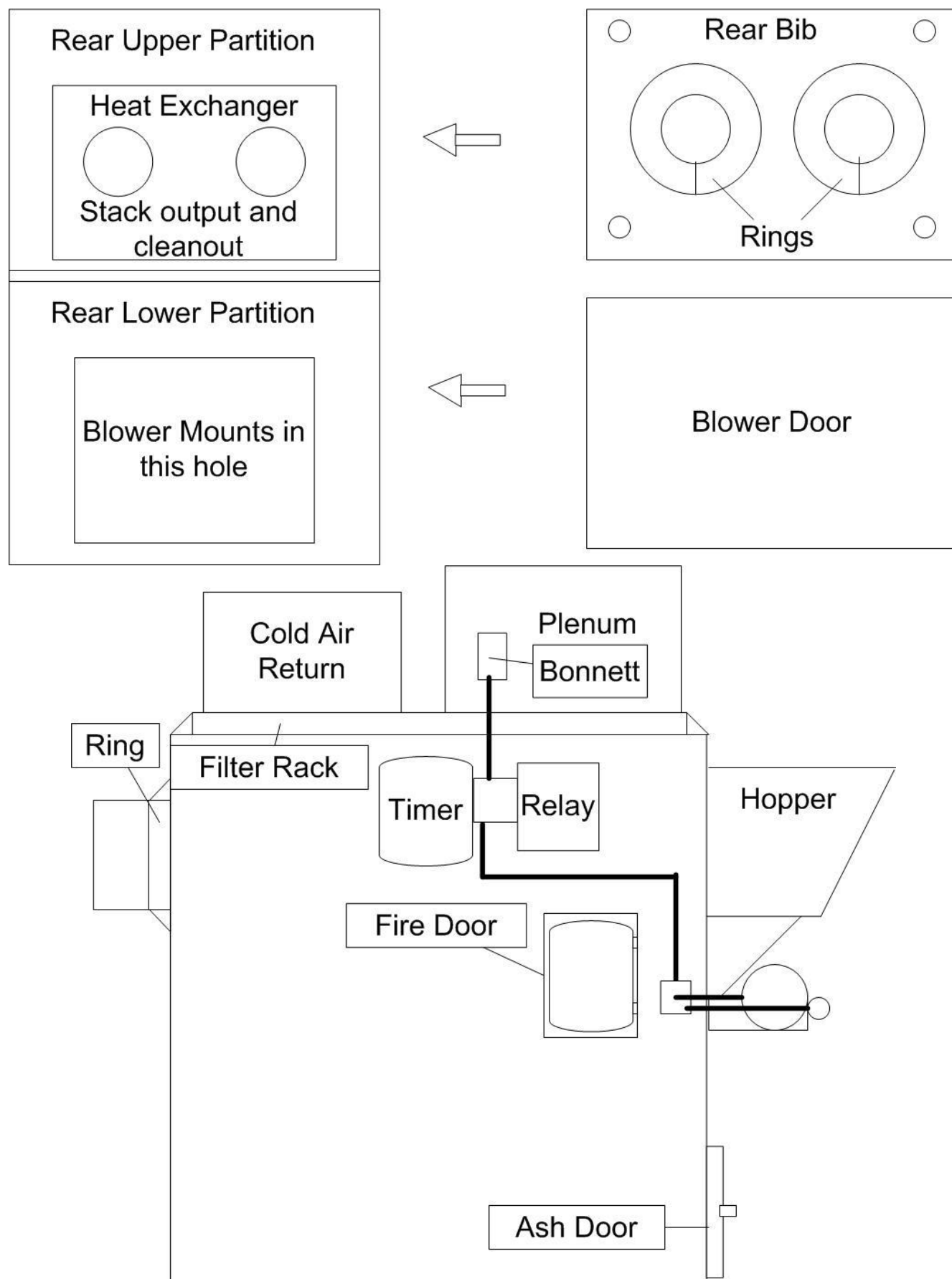


Ring



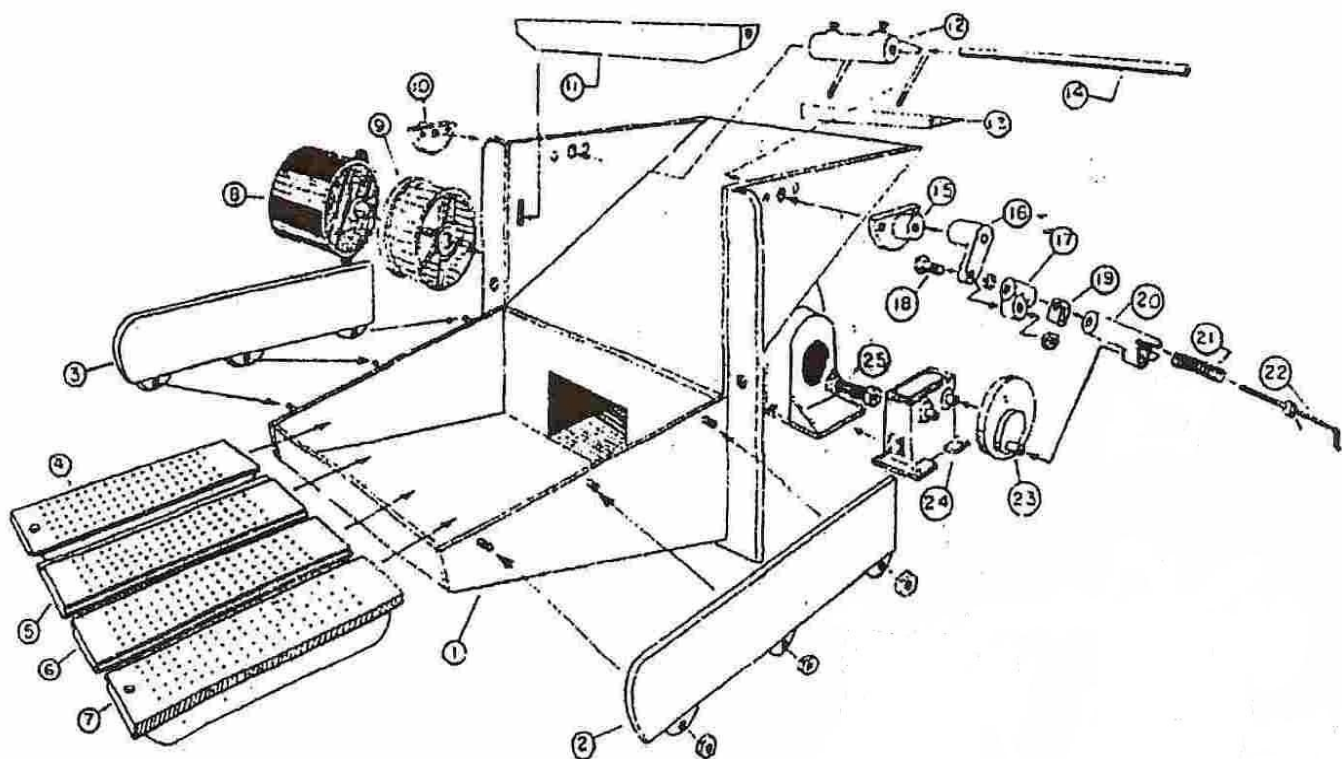


A-150 Installation Instructions



A-150 Installation Instructions

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| <ol style="list-style-type: none"> 1. Stoker Body 2. Side Rail Left K-2C 3. Side Rail Right K-1C 4. Grate K-15-1-L 5. Grate K-15-2-L 6. Grate K-15-3-L 7. Grate K-15-4-L 8. Motor 9. Blower Rotor 10. Bearing K-19 11. Throat Strap K-18 12. Pusher Bar Drive Yolk K-8-BC 13. Pusher Bar K-9-BC | <ol style="list-style-type: none"> 14. Pusher bar drive shaft 15. Bearing K-17 16. Feed Crank K-7 17. Feed Assembly Connector 18. Feed Arm Nut 19. Feed Arm Adjustment Nut 20. Feed Latch K-12 21. Feed Spring 22. Feed Bolt 23. Drive Wheel K-5 24. Gearbox K-14 25. Coupling |
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CONTROLS AND THEIR FUNCTIONS

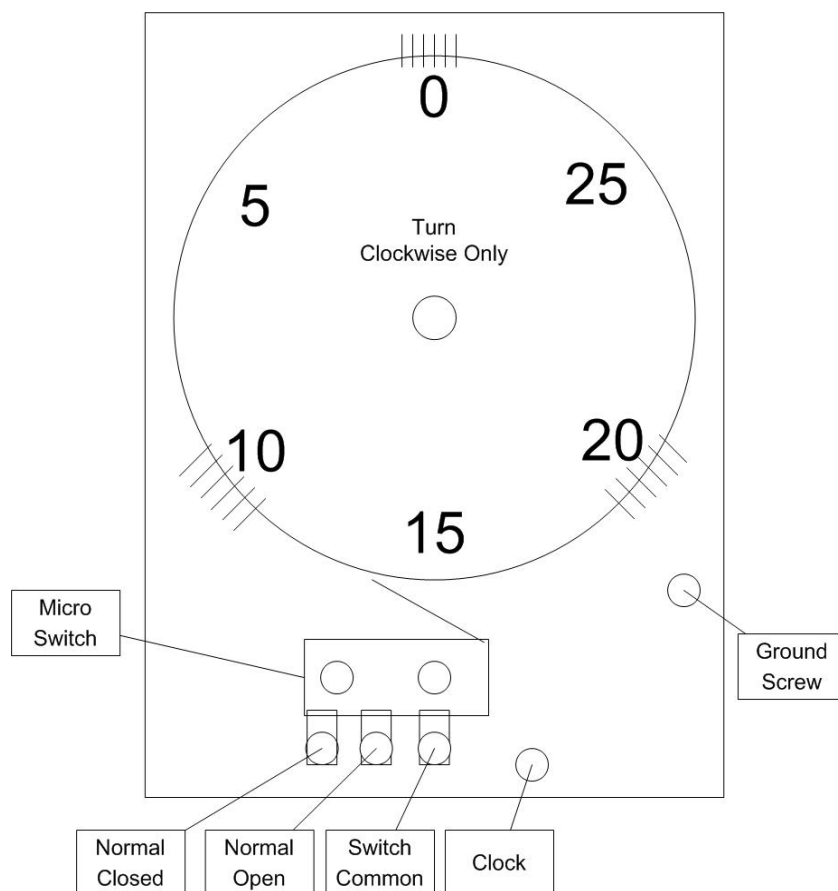
RELAY: Converts 115v to 24v for thermostat, and sends signal to gear motor to start or stop.

CONVECTION BLOWER: Located behind enclosure on the left of stove. Blows heated air into the room. It is energized by the fan and limit control.

GEAR MOTOR: Function is to drive feed mechanism (pusher bar) to slide coal from hopper onto the grate, to move the fire forward and the ash into the receptacle.

COMBUSTION MOTOR: To force air through stoker unit to burn coal.

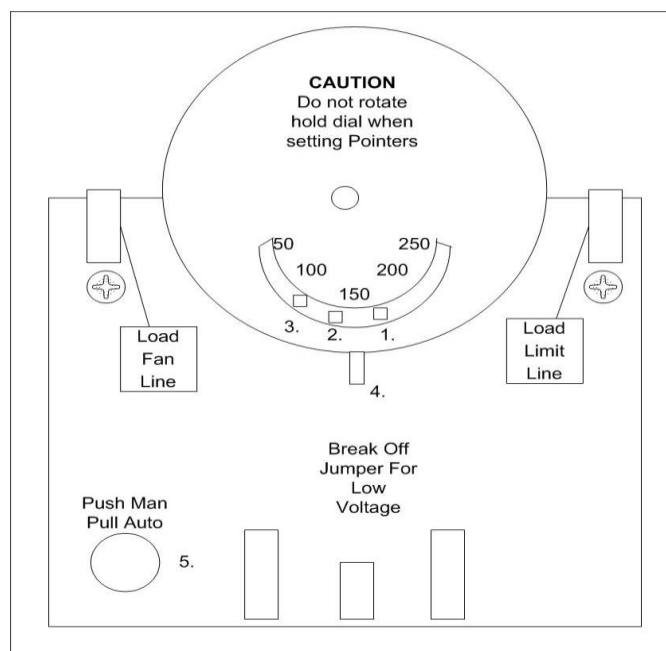
TIMER: Will activate gear motor on stoker unit, to maintain a fire during periods when no demand is made by thermostat.



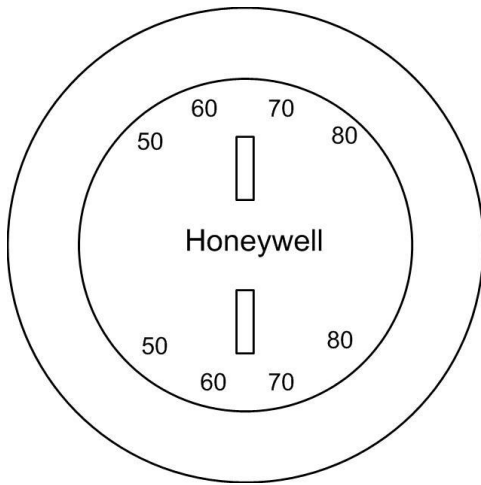
A-150 INSTRUCTIONS

FAN & LIMIT CONTROL: Serves dual purpose. 1. As a high limit, will shut off the stoker unit to prevent overheating. If internal stove temperature reaches 200 degrees, control will shut off stoker unit, until temperature drops, which will then allow stoker unit to be reactivated. 2. As a convection blower control, it starts the convection blower when internal stove temperature reaches center pointer setting. The convection blower will run as long as stove remains hot. When stove begins to cool down to low setting on control, the convection blower will shut off. Normal settings for control are: High limit (pointer on right) 200 degrees. Center pointer (fan on) 160 degrees. Left pointer (fan off) 120 degrees. White button in control must be pulled **OUT** for normal automatic operation.

1. **HIGH LIMIT POINTER**-is a safety switch that stops gear motor from pushing coal onto grate at 200 degrees (If stove gets too hot, this switch will turn off gear motor).
2. **CENTER POINTER**-turns convection blower on when internal air temperature reaches this setting (normally set around 160 degrees, but is adjustable).
3. **LOW POINTER**-turns convection blower off when internal air temperature falls to this setting (normally set around 120 degrees, but is adjustable).
4. Whatever number on silver dial is directly above this point is temperature of internal air.
5. **WHITE BUTTON**-pull out for automatic operation of convection blower. Push in for constant running of convection blower.



CONVECTION BLOWER-when running, it will take cool air from room, and force it through heated air chamber inside stove, and return heated air into room. Blower can only be activated by Fan Limit Switch.



THERMOSTAT: Top pointer is desired room temperature. Bottom pointer is thermostat. When room temperature drops below setting, combustion blower and gear motor will start. When room temperature rises, gear motor will stop.

SAFETY

THE BURNING OF FOSSIL FUELS GENERATES CARBON MONOXIDE GASES. CARBON MONOXIDE GASES ARE TOXIC, CAN CAUSE SICKNESS, AND CAN BE FATAL.

To prevent toxic carbon monoxide gases from entering the home, certain precautions must be taken.

Ash tub must be emptied on a regular basis to prevent ashes from overflowing into ash pit area. Excessive ash accumulation may impede air flow to the chimney, preventing gases to be drawn up chimney.

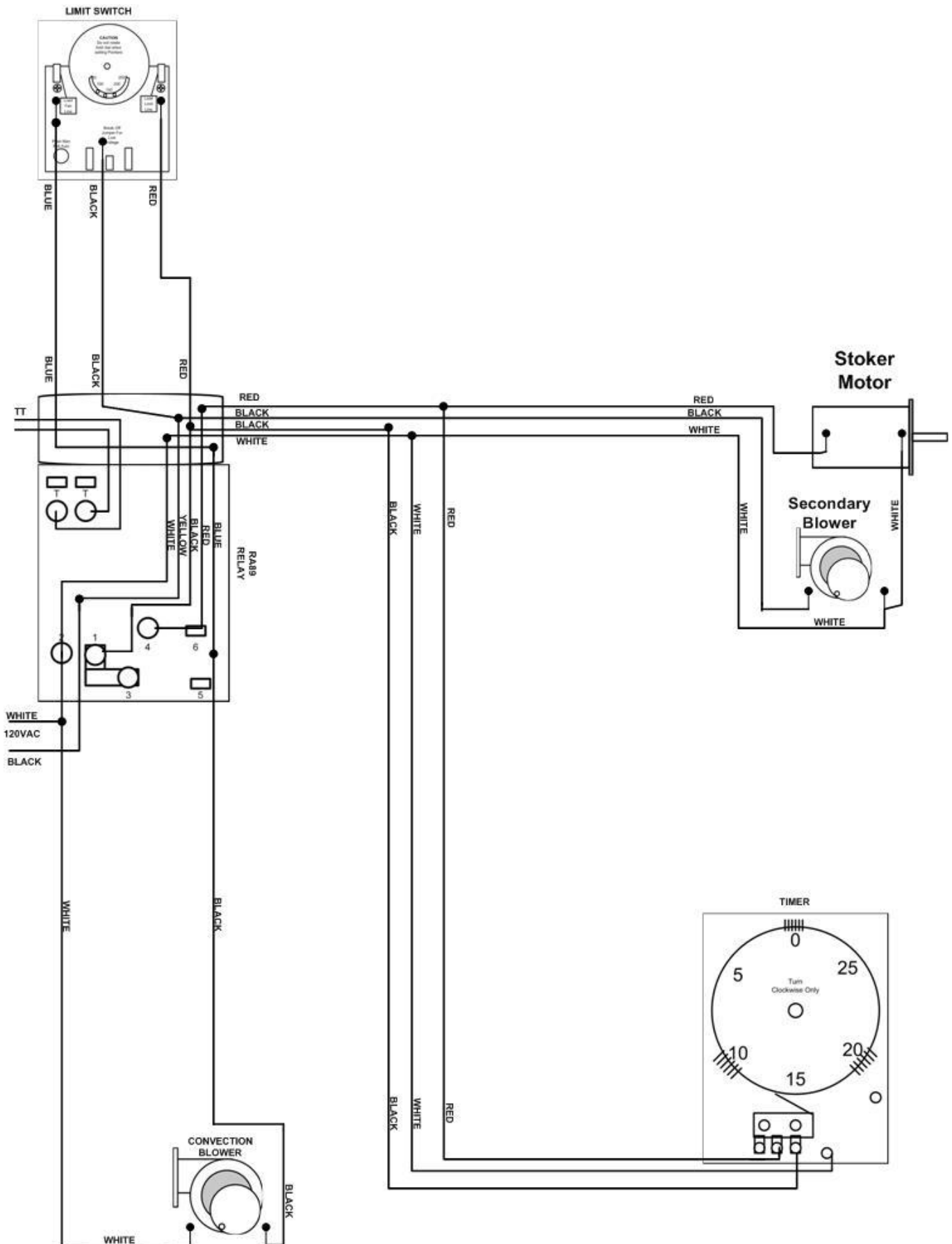
Fire and Ash doors must be closed at all times during normal operation.

It is necessary to keep some coal in hopper while stove is in operation most applications it is sufficient to clean stove and stove pipe twice during the heating season. However, under extreme weather conditions or by high demand on stove running periods, the stove and stove pipe may need more frequent cleaning. Clean as often as necessary.

CAUTION! ASH PAN IS HOT! ALWAYS WEAR GLOVES TO REMOVE ASH PAN...

Before removing ash pan, turn switch off or pull power cord plug from 110 volt outlet. Open ash door. Use a good pair of gloves to remove ash pan. Place ash pan on non-combustible surface. Slide an empty ash pan into stove. Close ash door. Turn switch on or plug power cord back into 110V outlet.

A-150 INSTRUCTIONS



TROUBLE SHOOTING HINTS

PROBLEM	POSSIBLE CAUSE	REMEDY
Stoker runs but doesn't feed coal	Feed nut backed off too far.	Increase feed-see preceding instructions.
	Obstruction in throat of stoker.	Empty hopper and remove obstruction.
	Feed mechanism tight or corroded	Empty hopper –free- use dry coal to prevent reoccurrence.
	Broken or slipping coupling	Replace
	Defective gearbox	Replace
	Feed mechanism out of adjustment	Throat bar height to be 1-3/4" to 2" (Part #11). Pusher bar (Part #12) to be approximately 3/4" behind the face (flat part) of throat bar when in its most forward position with feed nut (Part #19)
Convection blower doesn't run	Lo limit setting in Fan limit switch too high	Set Lo at 110 140
	Furnace not up to temperature.	Set Hi at 110 160
	Fire bed too small	Increase coal feed to get bigger fire.
	Defective thermostat	Replace
	Defective convection blower motor	Replace

TROUBLE SHOOTING HINTS

PROBLEM	POSSIBLE CAUSE	REMEDY
Stoker doesn't run	Main circuit breaker tripped	Reset
	Main fuse blown	Replace
	Fuse on stoker blown	Replace
	Motor out on reset	Press reset button on motor
Stoker motor goes out on reset		
	Obstruction in throat of stoker	Empty hopper and clear
	Feed mechanism tight or corroded	Empty hopper and free-soaking with penetrating oil-Use dry coal to prevent reoccurrence.
	Motor or gear motor defective	Replace

A-150 INSTRUCTIONS

A-150 Warranty

Keystone Manufacturing Company extends the following warranties to the original owner from the date of purchase.

Five Years Workmanship on stove body

Two years on grates and side rails

One year all electric controls and motors.

Warranty does not apply if damage occurs because of improper handling, operation, abuse, rust, corrosion, misuse or use beyond rated capacity.

This warranty does not apply if the product has been altered in any way after leaving the factory.

All warranty claims should be made through dealer where the appliance was originally purchased. Model, **Stoker Unit** Number 1 ½ x 3 tag (found below hopper) and original copy of the sales receipt need be presented to dealer.

If a consumer chooses to make a warranty claim directly through Keystone Manufacturing Company model, stoker unit number, and copy of the original sales receipt are required. Customer must provide a credit card which will be charged for the full retail price for the product plus shipping and handling. When defective part is returned to the company and found to be a defect within warranty period the consumer's credit card will be credited back the cost of part.

Keystone Manufacturing Company assumes no responsibility for any labor expenses, for service, product removal, reinstallation or any freight charges for parts returned to the company.

If defective in material or workmanship and if removed by the owner with in warranty period Keystone manufacturing will at their opinion repair or replace the product.

This warranty is limited to defective parts, repair, or replacement at our opinion and excludes any incidental and consequential damages connected there with.

Warranty exclusions, labor, door gasket, ash tub, hopper and paint

Furnace Information

Dealer_____

Date of purchase_____

Stoker unit number_____

Stove Model_____

WARM AIR CHECKLIST

- _____ Thermostat
- _____ Blower Motor
- _____ Draft Regulator
- _____ Control-Relay, Timer, and Limit Switch
- _____ Instructions
- _____ Spring Handle
- _____ (2) 3/8 Bolts
- _____ (6) 3/8 Washers
- _____ (4) Hopper Washers
- _____ (2) Drill Screws
- _____ Gaskets
- _____ Receptacle
- _____ Receptacle Cover
- _____ Tag
- _____ (8) Metal Screws
- _____ (2) Clamps

Pulley Sizes

- _____ A-80 1/3 Horsepower 7" Blower Pulley 1/2" Motor Pulley 41" Belt
- _____ A-150 1/3 Horsepower 7" Blower Pulley 1/2" Motor Pulley 40" Belt
- _____ A-250 1/2 Horsepower 8" Blower Pulley 1/2" Motor Pulley 45" Belt
- _____ A-350 1 Horsepower 9" Blower Pulley 5/8" Motor Pulley 51" Belt
- _____ A-450 1 1/2 Horsepower 10" Blower Pulley 5/8" Motor Pulley 53" Belt

Filter Sizes

- A-80 20" X 20"
- A-150 24" X 24"
- A-250 30" X 24"
- A-350 16" X 25" and 16" X 25"
- A-450 24" X 24" and 16" X 24"