



# Zero Clearance Stove Installation Instructions

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** 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

## Zero Clearance Stove

Safety inspection of a venting system should be performed before and after installing your new stove. Procedures to follow are those recommended by the National Fuel Gas Code, ANSI Z223.1 or refer to local codes or ordinances.

Plan the vent system layout before installation to avoid the possibility of accidental contact with concealed wiring or plumbing inside walls.

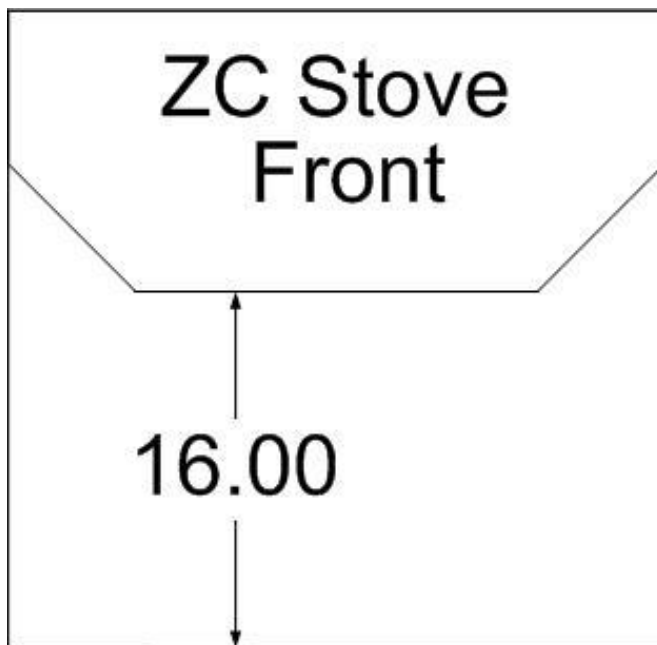
Draft adjustment must be made to ensure stove efficiency. This is checked at hole provided to right of ash door, by use of a draft gauge.

No barometric draft control is required.

After determining the location of stove, cut a hole through exterior wall 1" larger than the outer diameter of stove pipe. Seal the base plates, inner and outer with a bead of high temperature silicone sealant, or equivalent. Put stove into permanent position to obtain measurements.

From outside of home, insert 4" pipe onto exhaust air tube and secure with screws. Leave 6" extension beyond outside of home, cut excess pipe off. Insert 6" pipe through wall onto inlet air tube and secure with screws. Allow 6" pipe to be flush with outside of home. Seal perimeter of 6" pipe with sealant.

Place 4" tee on exhaust pipe. Place 4" tee cap on bottom of 4" tee. Place 4" chimney cap on top of 4" tee. Secure with screws.



### Clearances for Approved Floor Protector

## Zero Clearance to Rear Wall



### Clearances to Combustible Walls On Either Side

**Locate thermostat** in an area where heat from stove can be freely reached. Mount plastic wall plate of thermostat. Connect thermostat wires to screws on lower portion of wall plate. Run thermostat wires to Relay on stove and connect wires to terminals marked T.T. (note: color coding of thermostat wires is unimportant.) Be sure to snap thermostat onto wall plate.

Stove has 2 cycles, demand and idle. **Demand cycle** (gear motor activated)

Thermostat call for heat activates gear motor to feed coal while forcing air through grate to create a hotter fire. Fire bed should be close to lower end of grate after a continuous run of 20 to 30 minutes. If fire bed (hot coals) is too small, increase coal feed. Loss of fire may occur during idle cycles due to lack of coal feed.

Timer activates stoker unit for a preset period to maintain fire in warmer weather. Timer is a factory set to run approximately 1 minute every 10 minutes. This is adjustable, see instructions packed with timer.

**IDLE CYCLE** During the periods when thermostat or timer are not activating gear motor, exhaust motor and combustion motor will continue to run, but gear motor will not run to drive coal onto grate. This will allow fire bed to shrink to small maintenance fire.

Plug power cord into 115V outlet. Turn up thermostat. Start fire.

**USE RICE COAL ONLY.**

**Starting Fire**

**DO NOT USE AN ACCELERANT SUCH AS:** gasoline, kerosene, litter fluid, or etc. When thermostat is set higher than room temperature the stoker unit should be running. Find coal feed adjuster (painted white) on stoker unit, and while it is withdrawing, (moving toward you) turn nut counter-clockwise as far as it will go. **USE FINGERS ONLY.** Never use a wrench on the feed adjuster. Pull power cord from outlet. Fill hopper, slide coal down onto grate, covering entire grate. Light kindling, and plug cord in. When kindling is burning well, throw a few hands full of coal onto fire. After fire is established, turn coal feed adjuster in about 8 full turns, (clockwise). Remember; make coal feed adjustment with fingers only, while pusher is moving toward you. Further coal feed adjustment should be made, so that when stoker unit is running to satisfy thermostat, you have a full grate of fire, except for the last two inches of grate. The lower part of grate should have ash covering it. To fine tune the coal feed, turn the white feed adjuster nut clockwise for more coal feed or counter-clockwise for less. Turn adjuster nut one or two full turns per day, until best results are obtained. It is not necessary to readjust coal feed to start another fire. Some smoke may be visible when starting fire, but it should not persist.

After a fire has been established, remove allen set screw, a draft reading must now be taken. Insert draft gauge in hole provided to the right side of ash door. Draft should be a -.02.

**CAUTION:** Failure to install, maintain and/or operate the venting system in accordance with manufacturer's instructions could result in conditions which may produce injury and/or property damage.

The stove is equipped with a safety switch. (Fume switch) If hot coal gases are not vented outdoors, the safety switch will trip out on reset shutting off stoker unit. The fire will go out and cannot be restarted until reset on safety switch is manually reset. If safety switch trips out frequently, it is caused by:

Restricted or blocked vent tube between stove and exhaust fan. Brush or vacuum tube. Restricted or blocked exhaust pipe from stove to outside of home. Clean exhaust pipe.

**Accumulation of dust on exhaust fan blade.** Remove screws on motor mounting bracket, remove motor, and thoroughly clean fan blade. Windy conditions outside of home blowing against exhaust air. Safety switch defective. Replace control.

Do not allow ashes to overflow out of ash pan, this can cause blockage in exhaust system. Causing safety switch to trip out on reset, resulting in loss of fire. Blockage will have to be cleared before pushing reset button and restarting fire.

The Keystoker ZC stove is approved for mobile homes. The oxygen supply for combustion is not taken from the home. No preheated air from home is wasted on combustion and forced out exhaust system. The combustion air is taken from outside, drawn in, preheated, then forced into fire chamber and returned outside through exhaust system.

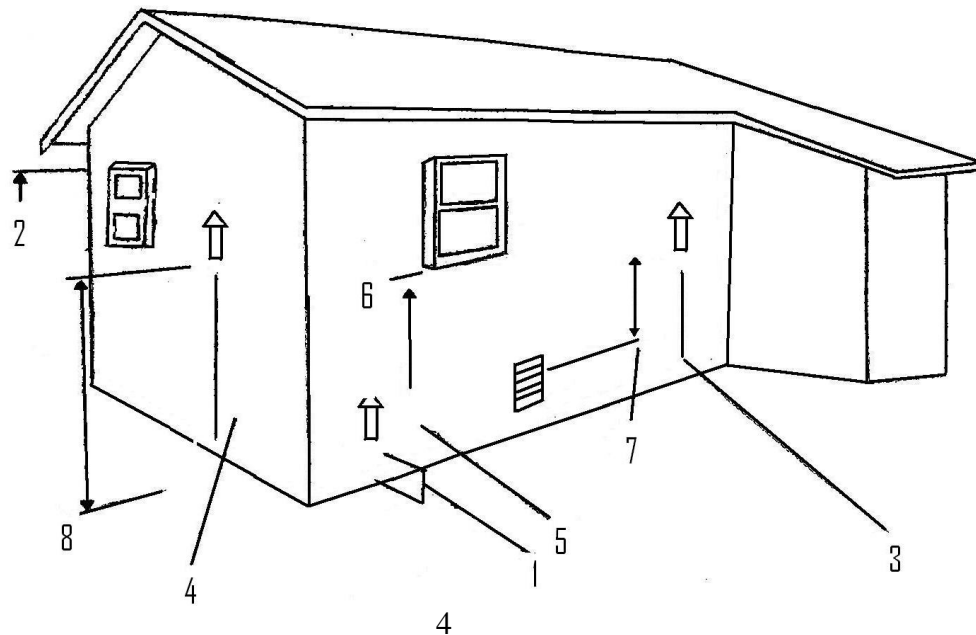
To meet U.L. **REQUIREMENTS FOR MOBILE HOMES COMBUSTION AIR MUST** be taken from outside of home. To direct vent through a combustible wall, it is necessary to use proper wall thimbles to obtain '0' degree clearance.

**MAINTENANCE FOR EXHAUST SYSTEM:**

**Motor:** Inspect and oil motor once during heating season and also at the end of heating season. Motor should rotate freely.

**Wheel:** Inspect the venter wheel once during heating season, and also at the end of heating season. Thoroughly clean any soot, ash or coating which inhibits either rotation or air flow.

**Vent System:** Inspect all vent connections annually for looseness, evidence of corrosion and for flue gas leakage. Replace, seal or tighten pipe if necessary.



## VENT TERMINATOR LOCATION

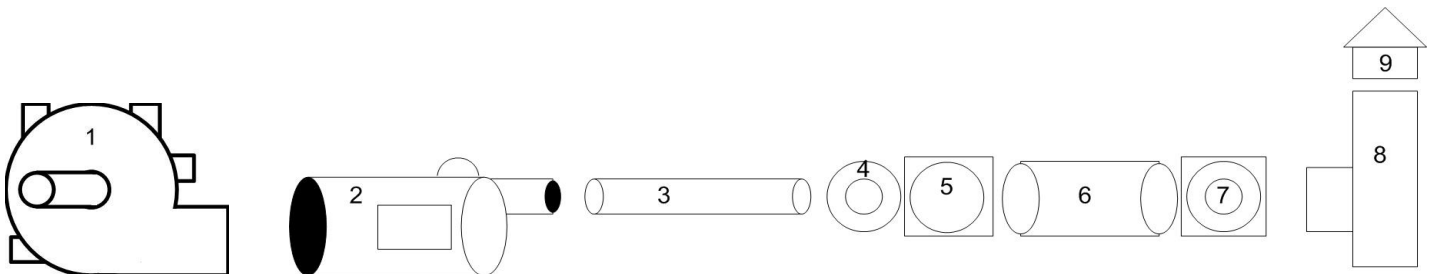
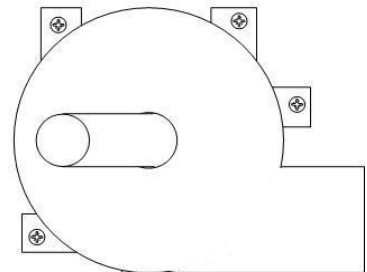
Vent terminator may not be located:

1. Less than 1 foot above grade.
2. Above or within 3 feet horizontally of oil tank or gas meter.
3. Closer than 3 feet to inside corner of home.
4. Closer than 1 foot from any opening that gasses could re-enter home.
5. Less than 4 feet below windows.
6. Less than 1 foot horizontally of door or window.
7. Less than 3 feet above any forced air inlet located within 10 feet.
8. Less than 7 feet above grade when adjacent to public walkways.

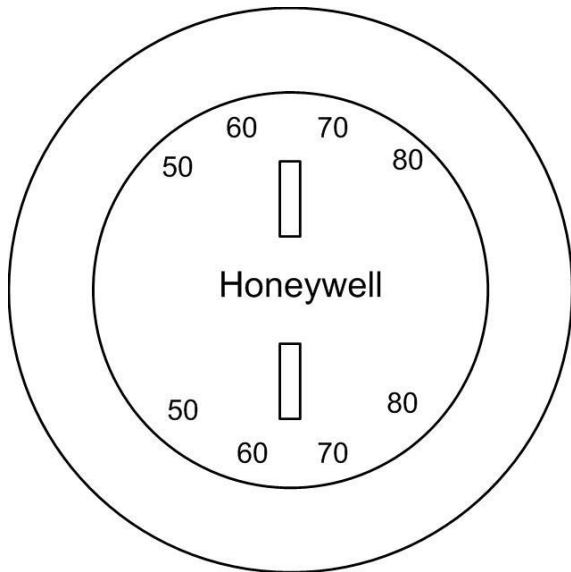
## Direct Vent Completion Kit

1. Exhaust motor
2. Exhaust system
3. 4 inch stainless steel pipe
4. 6 inch cap
5. Inside plate
6. 6 inch 24 gauge black pipe
7. Outside Plate
8. 4 inch Tee
9. 4 inch Chimney cap

Remove 4 screws to clean blades and housing



## **CONTROLS AND THEIR FUNCTIONS**



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

**Relay:** Converts 115 Volts to 24 Volts for thermostat, and sends signal to combustion blower and 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.

**Convection Blower Rheostat:** To adjust fan speed and sound of convection blower.

**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) 130 degrees. White button in control must be pulled out for normal automatic operation. If continuous operation of convection fan is desired, push white button in.

**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.

**Exhaust Motor:** To force coal gas fumes from stove to outside.

**Timer:** Will activate combustion and gear motor on stoker unit, to maintain fire during periods when no demand is made by thermostat.

**Safety Switch:** If hot coal gasses are not vented to outside, safety switch will shut off combustion and gear motor, causing fire to be extinguished. Reset button on safety switch must be manually reset before restarting fire.

### **Cleaning and Lubrication**

Stove and stove pipe should be cleaned once during heating season, and at the end of heating season. Open ash door, vacuum area thoroughly. Remove exhaust motor, clean fan blades, and vacuum air chamber. Clean and inspect exhaust system and pipe from stove to outside of home.

Oil exhaust motor and convection motor with light grade S.A.E. motor oil. Most combustion motors require no oil.

Remove dust from inside walls of stove with brush.

Remove fly ash from under grate annually by either A. or B. below:

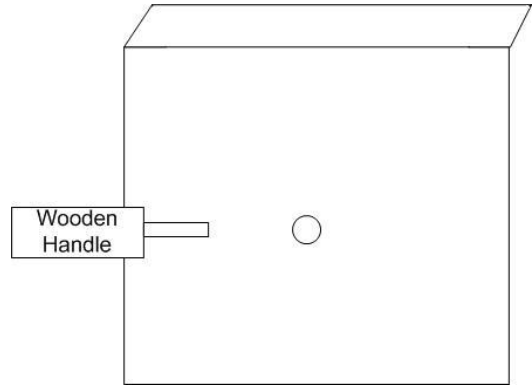
- A. Remove screw holding stoker or combustion motor, slide motor a little to left. Remove combustion air tube, slide motor out to right. Vacuum fly ash from grate chamber. Reverse procedure to reassemble.
- B. Remove nut and bolt from bottom of grate, tap grate in upward direction. Lift grate out, vacuum chamber. Clear unit of old furnace cement. Re-cement grates to create an air tight fit from start of holes to top of grate.

Place a few drops of oil on door hinges. Allow fire door and ash door to remain slightly open during periods of non-use.



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Clean glass regularly with a non-abrasive cleaner. Turn thermostat down, open fire door. Place a shield over door opening, apply cleaner. Wipe off cleaner with paper towel. Moisten a clean paper towel with water, wipe glass and dry with paper towel.



### Maintenance

1. **Motor:** Inspect and oil motor at least once a year, motor should rotate freely
2. **Wheel:** Inspect venter and exhaust wheel at least once a year to thoroughly clean soot, ash, dust or any coating which may inhibit either rotation or air flow
3. **Vent System:** Inspect all vent connections at least once a year for looseness, evidence of corrosion and for flue gas leakage. Replace seal or tighten pipe as necessary

It may be necessary to clean exhaust system and stove pipe during heating season. Remove hanging baffle above 6 inch exhaust outlet inside stove. Brush pipe in circular motion and vacuum stove pipe. To clean exhaust motor and radial fan blade, remove 4 screws on mounting bracket of exhaust fan and clean fan housing.

During annual maintenance, the ½ tube on safety fume switch must be cleaned out by vacuuming or by using a small brush. Vacuum or brush from inside of stove.

It is most important to perform the annual maintenance at the end of heating season. Residue left on the fan blade and exhaust system may cause rapid deterioration during non use.

**DIAGRAM (1)**

Shows what fire should look like when thermostat calls for heat for extended period:

- A. Unburned fresh coal supply from coal hopper
- B. Burning Coals
- C. Ash on lower end of grate (around 2")

The actual length of burning coals will vary as heat demand increases or decreases. If burning coals fall off grate, reduce coal feed by turning white adjustment nut in a counter clock-wise direction 1 or 2 full turns. Wait at least 1 hour before making any more adjustments.

When thermostat is calling for heat, the gear motor will be in continuous run, but if the fire bed remains small, increase the coal feed by turning white adjustment nut clock-wise.

Under normal draft conditions, when fire bed has reached its maximum length (with 2" of ash) flames should be touching top of interior stove plate. If flame is not reaching top of stove:

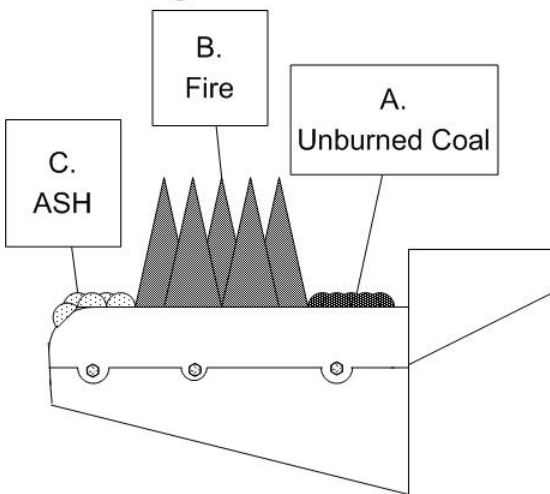
- A. Fire bed may be too thick.  
Reduce coal feed.  
Hopper end of stove is not plumb.  
Burrs may be stuck on grate, scrape grate until it is smooth.  
Not enough air flow, adjust air intake shutter on combustion motor (see check draft).

**DIAGRAM (2)**

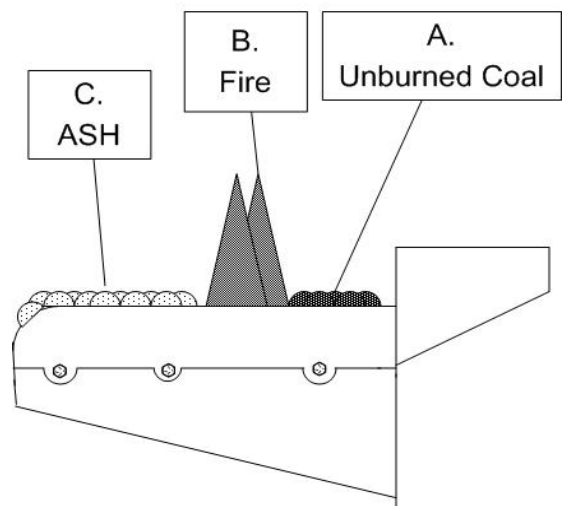
Show what fire size should look like when thermostat has not called for heat for extended periods:

- A. Unburned fresh coal supply from hopper.
- B. Burning coal (about 1-1 1/2" to 2") (low flames).
- C. Ash on lower end of grate

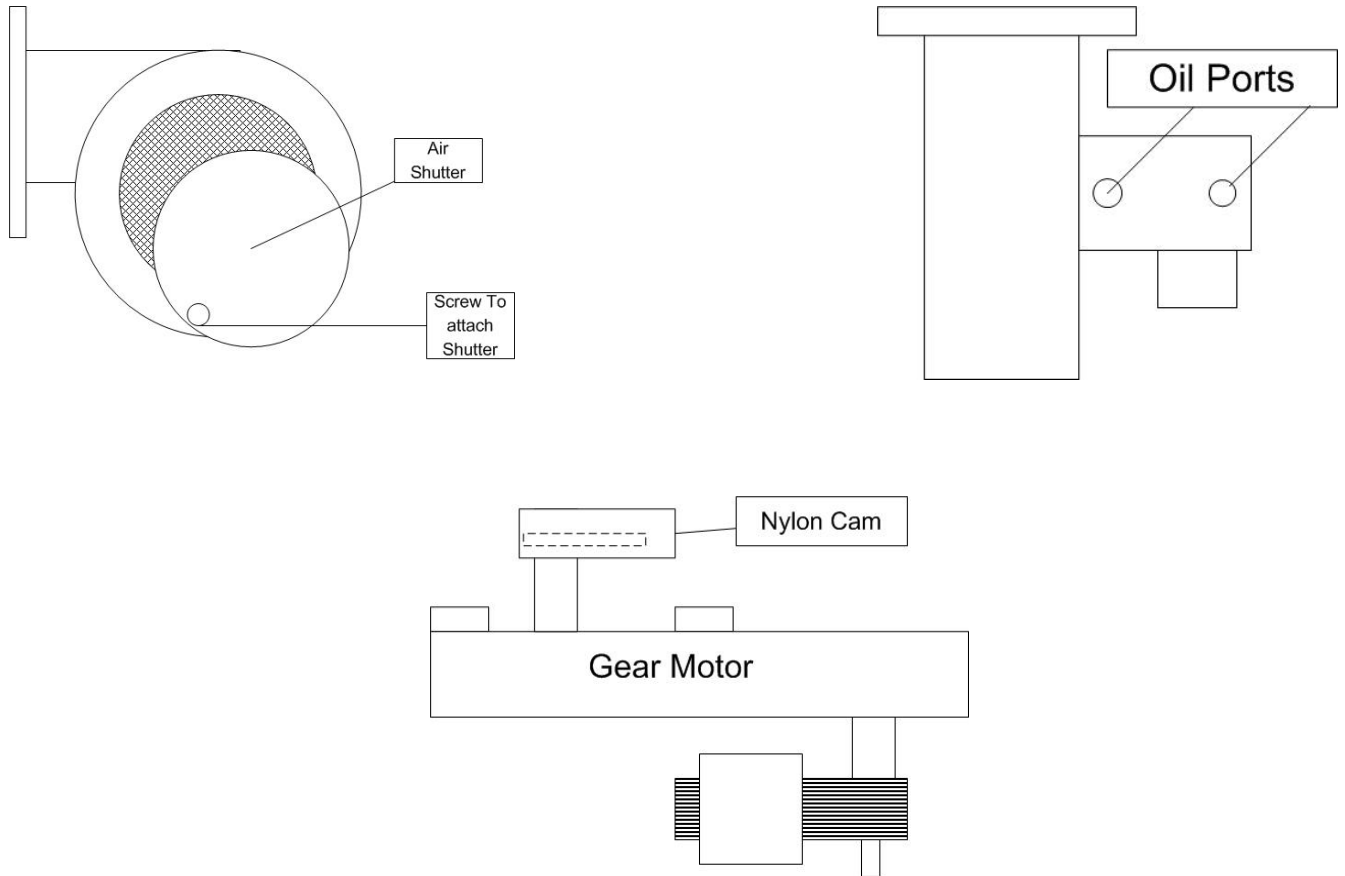
**Diagram 1**



**Diagram 2**



## Zero Clearance Stove



**PUSHER BAR:** Moves in a reciprocating motion. Activated by cam on gear motor to force coal from hopper onto grate. Also pushes ashes off bottom grate into ash pan. Length of stroke is adjustable by turning coal feed adjustment nut.

**WHITE COAL FEED ADJUSTMENT:** Turn clockwise for more coal feed, Turn counterclockwise for less coal feed.

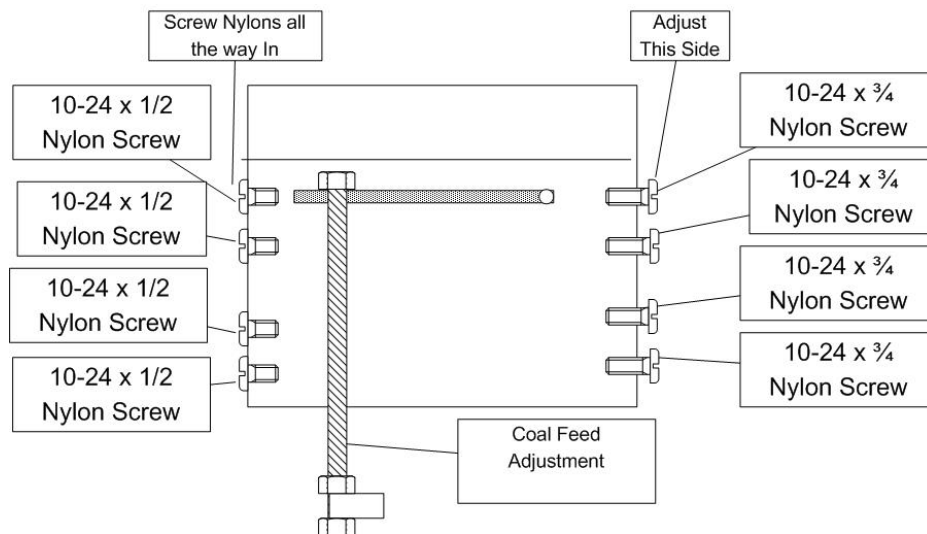
**NYLON ADJUSTING SCREWS:** To eliminate metal on metal contact. There are 8 nylon screws on the pusher bar, 4 on each side. The 4 nylon screws pictured on diagram are used to adjust the amount of sideward movement of pusher bar. When nylon screws are properly aligned, the pusher bar will slide in and out freely and have only a slight sideward movement.

**NYLON CAM:** located on gear motor. To give reciprocating motion to pusher bar shown on next page

**AIR INTAKE ADJUSTMENT SHUTTER:** adjusts amount of air flow through fire. Shown on next page

**GEAR MOTOR:** The drive shaft turns approximately 1RPM. The nylon cam on drive shaft will, when moving inward, force coal from hopper onto grate. When withdrawing, will allow coal to fall in front of pusher bar for preparation of next inward stroke. The gear motor will only run when activated by a call for heat from thermostat or when timer turns it on.

**COMBUSTION MOTOR:** Combustion motor will run all the time to force air through holes in grate to burn coal hotter. The constant running of motor will assure the maximum amount of heat is gained and will aid in a more complete burning of coal. The motor has an adjustable air shutter for regulating air flow through fire.



## **TIMER**

Unless your stove had been a special order, it will be equipped with our patented flat grate stoker unit and a timer. The timer is shown on the next page.

The purpose of a timer is to **maintain a minimum** fire when thermostat is not calling for heat.

## Zero Clearance Stove

The timer is factory set to run 1 ½ minutes every 10 minutes. The timer activates the gear motor, which will cause the pusher bar to move in a reciprocating motion, forcing coal onto grate.\

The timer has a large yellow wheel that makes 1 revolution every 30 minutes. Pins can be inserted or removed from yellow wheel. Each pin equals about 15 seconds, if needed, extra pins can be added to the present groups of pins or pins can be inserted anywhere in yellow wheel.

This section **ONLY** pertains to periods when thermostat is not calling for heat. If the fire goes out, you will have to add more pins to timer **OR** increase coal feed.

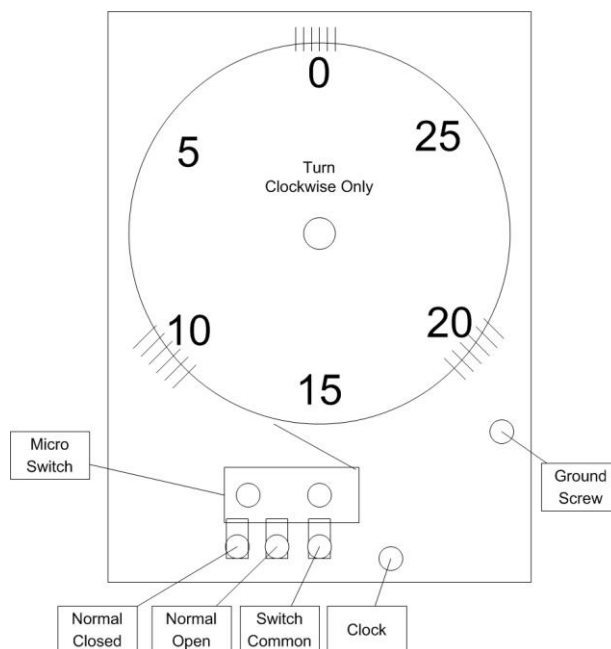
The burning coals should be the width of the grate and about 1 ½” to 2” in length. If the burning coals get any less than 1 ½” the fire may go out. **SOLUTION:** Increase coal feed.

A weak draft can also cause the fire to go out, if fire appears to be very dull, add as many extra pins to timer as needed, until fire stays lit.

### **IF FIRE STAYS LIT, BUT STOVE IS TOO HOT**

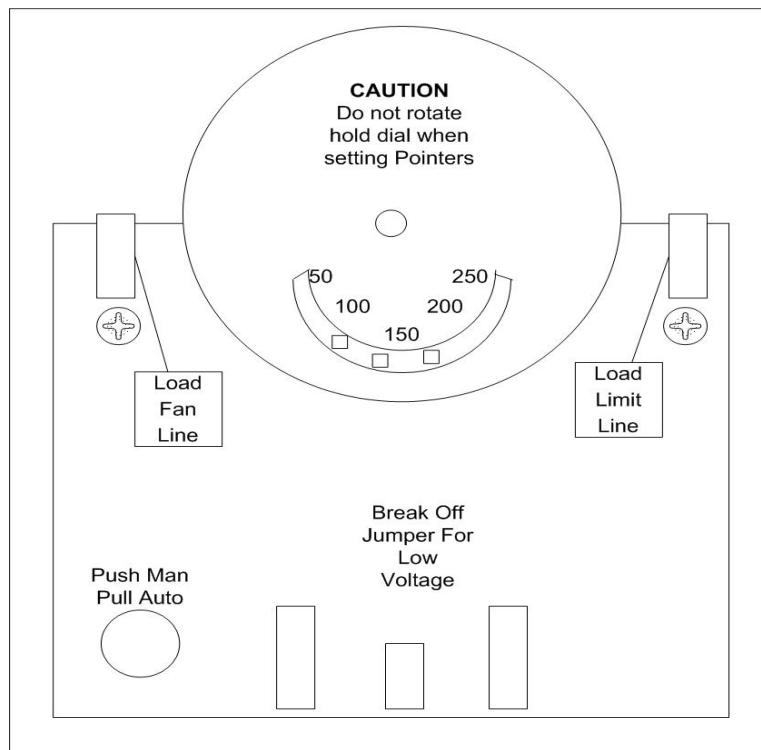
If convection blower cycles on and off often and produces too much heat, whether the fire bed is too long or timer is running too long. If you reduce coal feed or remove timer pins, do not make radical changes. Reduce coal feed 1 or 2 turns **OR** remove 1 pin from timer. Then wait several hours before making any more reductions. A sudden radical change may be too much and cause fire to go out.

Once the coal feed and timer are set and fire stays lit, without convection blower running too much, it is usually not necessary to make any more changes.



## FAN LIMIT SWITCH

1. **HIGH LIMIT POINTER**-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.



**RELAY**-receives signal from 24V thermostat to turn on or turn off gear motor.

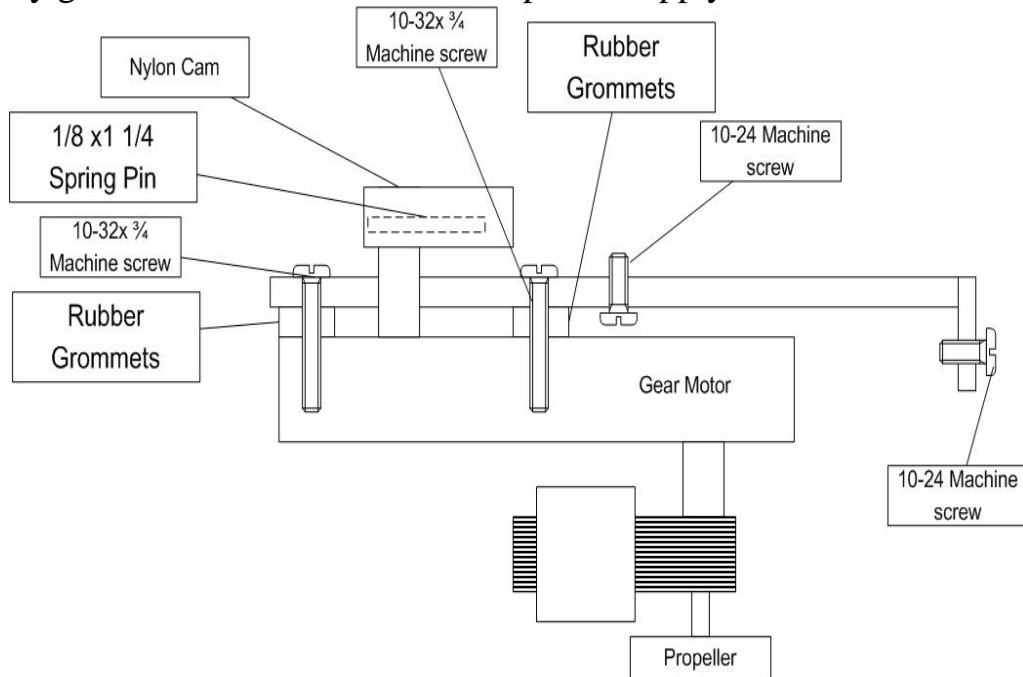
**CONVECTION BLOWER**-when running, it will take cool air from room, and force it through heated air chamber inside stove, and return heated air into room. Blower can only be activated by Fan Limit Switch.

### **HOW TO REMOVE OR REPLACE GEAR MOTOR**

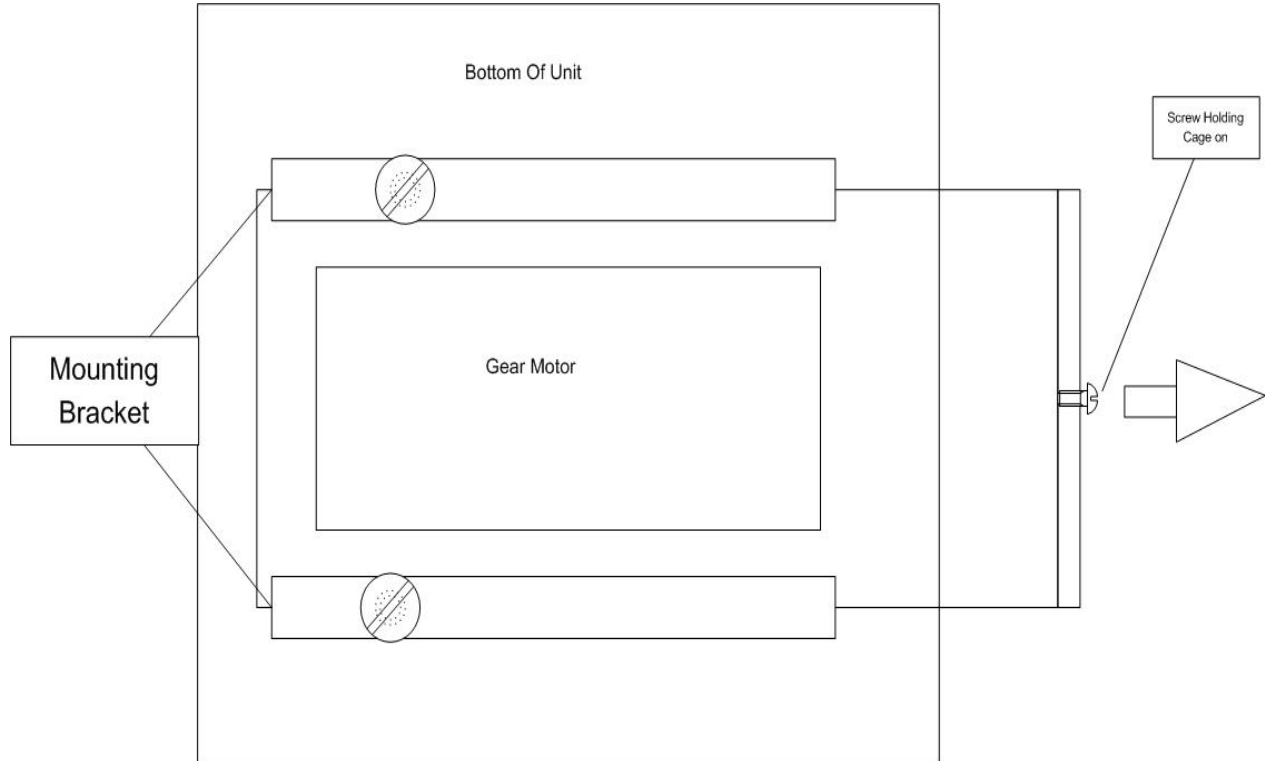
**TO REMOVE GEAR MOTOR:** FIRST... Pull power cord pug from 115V outlet. Remove 10-24 machine screw and then remove protective cage. Disconnect both blue wire nuts marked. Remove both 10-24 machine screws from mounting bracket Slide gear motor out of its track toward you, pusher bar will also come out with gear motor. While pusher bar is out of its chute, clean chute area and remove any obstructions. Check nylon screws on pusher bar (2 on each side) for wear or breakage. (Replace if necessary) Slide pusher bar in and out of chute (should move freely) check for sideward movement. Adjust nylon screws on right side to allow only a slight sideward movement.

**TO REPLACE GEAR MOTOR:** -remove (4) 10-32 machine screws that hold gear motor onto mounting bracket. Before removing gear motor from bracket, look at position of gear motor; install new motor in exact same position before reinstalling screws. Then reverse procedures and reinstall.

When replacing gear motor with a new one, both gear motor wires are black; either wire may go to black or white wire from power supply.



## Zero Clearance Stove



## **TROUBLE SHOOTING GUIDE**

**FIRE GOES OUT** See page 11 (Timer) and Page 9 Diagram (2)

**COAL KLINKERING OR FUSING TOGETHER** See page 9 Diagram (1) & (2)

**SULFUR SMELL** See page 2 (Cleaning & Lubrication)

**STOKER UNIT DOESN'T FEED COAL** See page 10 (Pusher Bar)

**PUSHER BAR IS NOT MOVING STRAIGHT** See page 10 (Pusher Bar)

**CONVECTION BLOWER RUNS TOO OFTEN** See Page 13

**CONVECTION BLOWER RUNS CONSTANTLY** Pull white button on Fan Limit Switch out for automatic operation. Clean screen and fan blades on blower.

**THERMOSTAT CALLS FOR HEAT**, but **CONVECTION BLOWER OFF TOO LONG** See Page 9 Diagram (1)



**FIRE IS LIT, BUT NOT ENOUGH HEAT**

If gear motor only runs short cycles, timer is working. When thermostat calls for heat, gear motor should run steady. If gear motor is running steady, but fire is small, increase coal feed. (See pages 11 & 12). If gear motor is not running steady, check for loose wire in Thermostat or in Relay. Check for broken thermostat wire between thermostat and Relay.

**GEAR MOTOR RUNS CONSTANTLY MAKING TOO MUCH HEAT**

Gear motor can only be activated by thermostat or timer. Remove thermostat wires from T.T. terminals in Relay, if gear motor shuts off, replace thermostat wire or Thermostat. Check timer to see if yellow wheel is turning, if not replace timer motor. Check timer switch. (See page 11 Timer)

**CONVECTION BLOWER NOT BLOWING MUCH AIR** Clean screen and fan blades on blower.

**GEAR MOTOR SHUTS OFF ON HI-LIMIT**

High Limit pointer in Fan Limit Switch is designated to shut gear motor off when internal air temperature reaches 200 degrees. If internal air temperature stays on 200 degrees, Convection Blower is not cooling stove off quickly enough. Clean screen and fan blades on blower (or See Page 13, Fan Limit Control).

**BIG FIRE BUT NOT MUCH HEAT**

Fan blades on combustion motor dirty. Brush off. Accumulated fly ash under grate. Remove combustion motor and clean under grate. Holes blocked in grate. Open holes with 1/8 center punch (See Page 9 Diagram (1)).

**TO CLEAN UNDER OR REPLACE GRATE** See Page 3 (Cleaning & Lubrication)

**NYLON CAM MELTS**

Under normal operating conditions, nylon cam will not melt. Melting of nylon cam can only be caused by a draft problem.

A blockage in chimney, chimney connector, stove pipe, or stove. Inspect and clean.

Or excessive draft, caused by high chimney, large flue, or high winds. Clean and adjust barometric damper. (Set barometric damper with a draft gauge to obtain a draft reading of -.02 to -.03, See Page 3 Draft Check)

## **IF FIRE STAYS LIT, BUT STOVE IS TOO HOT**

If convection blower cycles on and off often and produces too much heat, whether the fire bed is too long or timer is running too long. If you reduce coal feed or remove timer pins, do not make radical changes. Reduce coal feed 1 or 2 turns OR remove 1 pin from timer. Then wait several hours before making any more reductions. A sudden radical change may be too much and cause fire to go out.

## **TO ORDER PARTS**

Find the metal 1 ½” x 3” Keystoker label fastened to stoker unit body, near gear motor. The four or five digit number will be required to get proper replacement parts from your dealer.

# **SAFETY**

## **THE BURNING OF ALL FOSSIL FUELS GENERATES CARBON MONOXIDE GASES. CARBON MONOXIDE GASES ARE TOXIC, CAN CAUSE SICKNESS OR 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 chimney, preventing gases to be drawn up chimney.

Fire door and ash door must be kept closed at all times during normal operation.

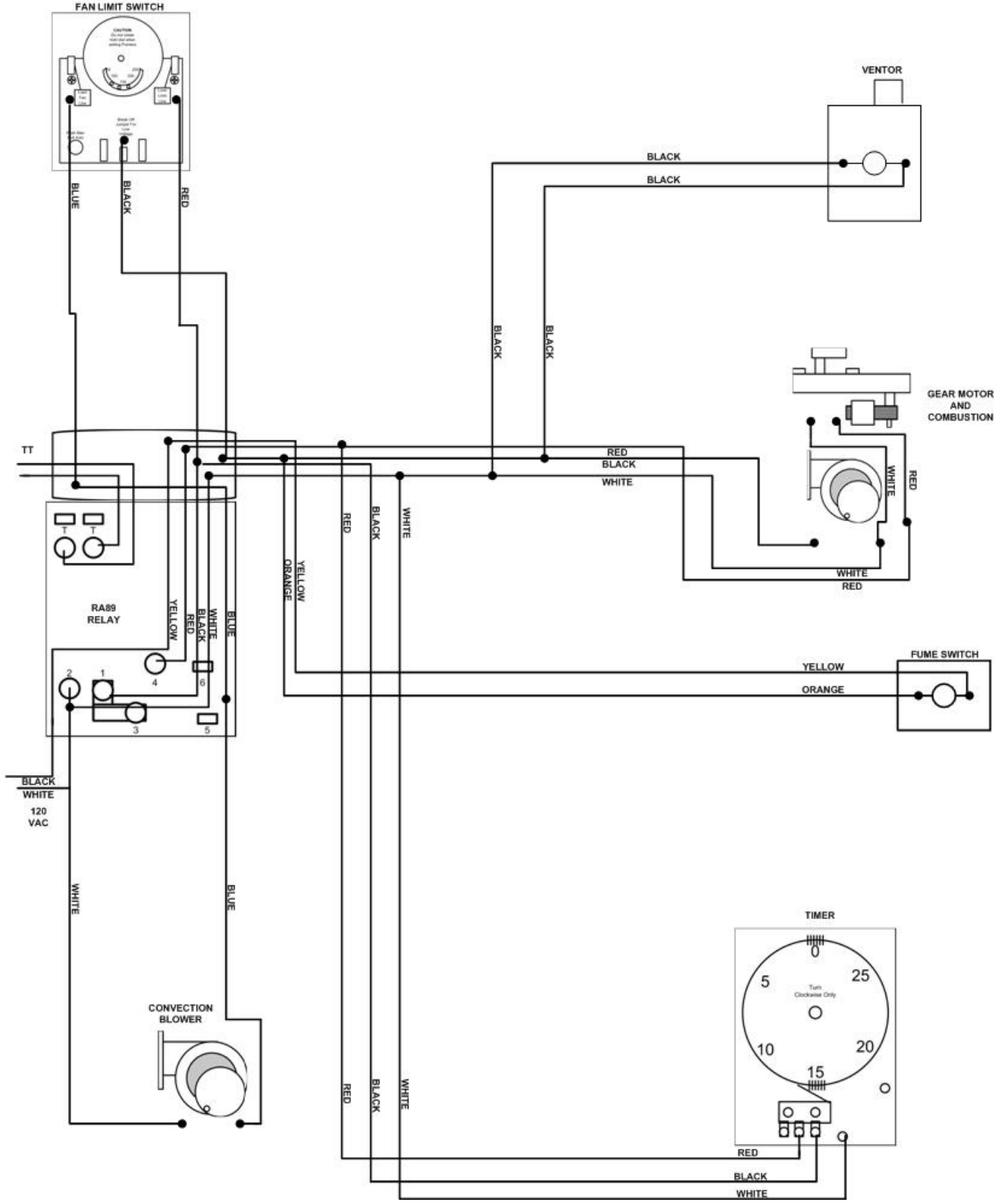
It is necessary to keep coal in hopper while stove is in operation.

In most applications it is sufficient to clean stove and stove pipe twice during heating season. However, under extreme weather conditions, or 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 Use Gloves to Remove Ash Pan

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

# Zero Clearance Stove



# Zero Clearance Stoker Stove Warranty

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

Ten 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, glass, door gasket, ash tub, hopper and paint

## Stove Information

Dealer \_\_\_\_\_

Date of purchase \_\_\_\_\_

Stoker unit number \_\_\_\_\_

Stove Model \_\_\_\_\_

# Checklist

Cleaning Brush  
Manual  
Charcoal  
Thermostat  
Carbon Monoxide detector  
Glass Cleaner Ash Tub  
4" Stainless Tee  
24" X 4" Stainless Pipe  
4" Stainless Rain Cap  
6" galv. Cap with 4" hole  
6" X 12" Black Pipe  
2 Wall Plates

Packed By \_\_\_\_\_