Waste Oil Heating Equipment
Parts, Sales, and Service
1-800-347-9575
www.nueraheat.com

NuEra

EnergyLogic and BlackGold Service Guide

Service Schedule

EnergyLogic and BlackGold heaters and boilers **MUST** be serviced annually or every 1,000 hours (whichever occurs first). If you service the machine completely on this schedule you will have trouble free operation throughout the heating season.

Tech Support – Stuck? – Cold and heater not working???

We're here to help! – We offer free tech support over the phone. We'll get your heat going as fast as possible – give us a call at 1-800-347-9575

Or visit our website: www.nueraheat.com/support for manuals, troubleshooting guides, and parts.

Parts

We stock 100% of the parts (yes, really!) for your heater. We'll get the heat back on as soon as possible.

Burner Service

Next time, ship us your burner and we'll perform complete service on it – return it to factory specs – and ship it back. All you need to do is clean the ash from the unit and replace the oil filter. Call us for details or visit our website at: www.nueraheat.com/services - click on burner service and it will get you started

Onsite Service

If you're in Alaska, Washington, or Oregon – we'll come service your machine on site. Just give us a call to schedule!

Thank you!

Thank you for your business – we truly appreciate our customers!

PTC Preheater Cleaning

The PTC preheater should be **cleaned once a year.**

Tools needed: 3/4" wrench, one gallon of over 140°F flash point parts washing cleaner

First, unplug the preheater and let it cool. Disconnect the copper lines from the inlet and outlet caps of the preheater.

Remove the mounting bolt and take the preheater off of the burner assembly. Drain the preheater into your oil tank by opening the valve.

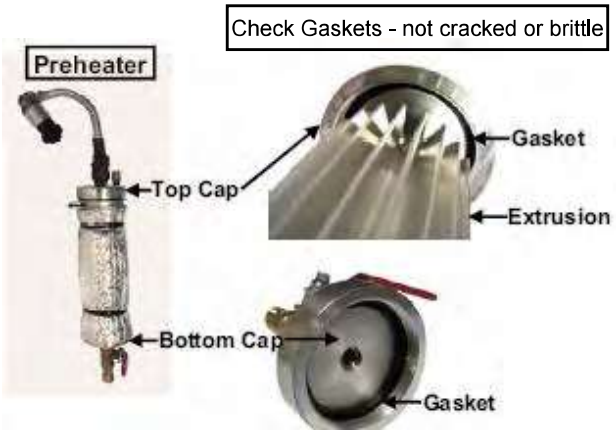
Hold the top cap securely and unscrew the housing. This exposes the finned aluminum extrusion for cleaning. Use a wire brush and non-chlorinated parts cleaning fluid or carb cleaner. You may want to fill the housing and screw it back on to let the finned extrusion soak in the cleaner before you use the wire brush.

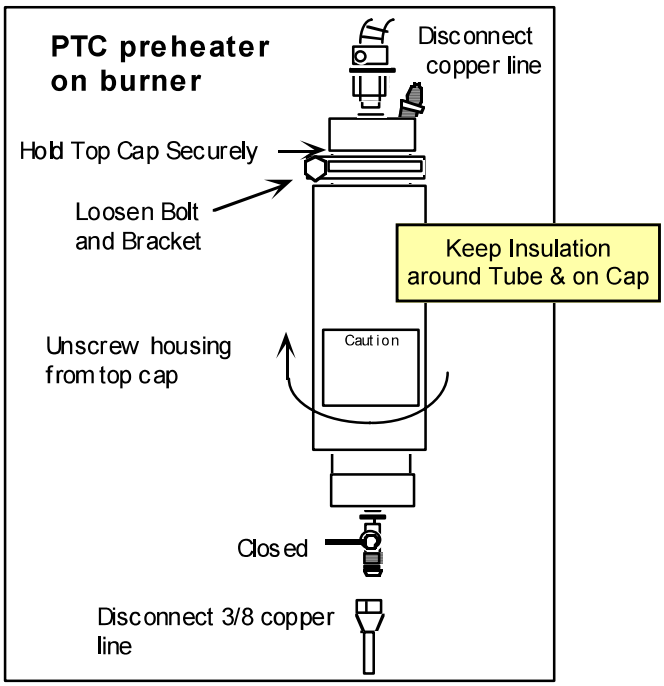
Never attempt to unscrew the finned extrusion from the outlet cap. This will damage electrical connections to the PTC heaters.

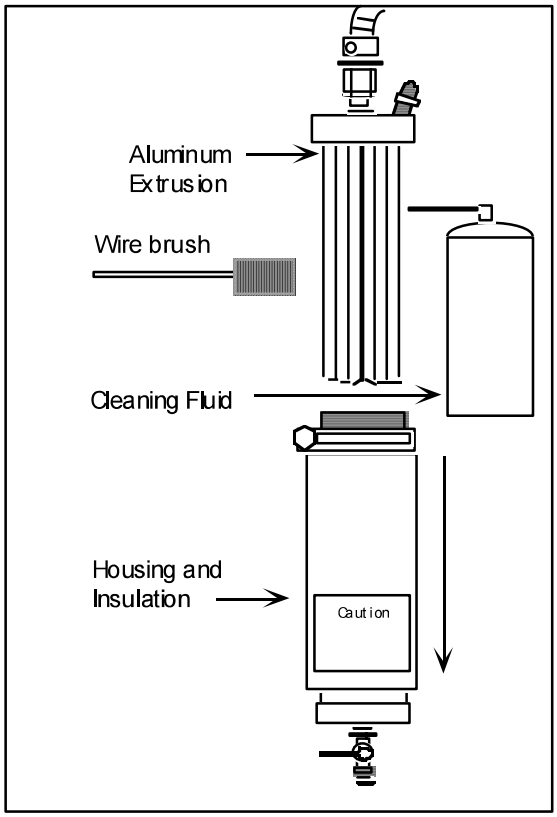
DO NOT SUBMERGE OR SPRAY wiring harness with liquid when cleaning. THIS WILL DAMAGE THE HEATERS.

Rinse the housing and inlet cap with parts cleaner. Reassemble the preheater by screwing the housing back into the top cap. **Tighten** the housing securely **by hand -** do not over tighten with wrenches!

Follow the "Burner Start Up" instructions (page 8) and run the unit to check for leaks at the top cap. If leaks occur, tighten the housing more. If leak persists, replace the cap gasket.







NOTE: When burner is off for considerable time (Summer Season, etc.) Turn OFF POWER or UPLUG BURNER so Preheater Doesn't continue to heat & evaporate - bake the oil within.

Nozzle Line Assembly Cleaning

Tools: 3/4”, 1/2” and 7/16” wrenches, 5/8” socket, pliers, vise, plain screwdriver or 1/4” nut driver, clean towel, parts cleaner, shop air.

Warning: For this service, turn off power to the heater at the circuit breaker.

Unplug the burner and disconnect the 3/8” copper fuel line from where it connects to the preheater inlet. Remove the 4 burner mounting nuts. Swing the burner open.

Disconnect the oil and air lines from the nozzle assembly with a 7/16” wrench.

Remove knurled nuts. Undo front holding screws to transformer and lift transformer open. Unplug nozzle line preheaters and slide the nozzle line assembly out from the front of the air tube.

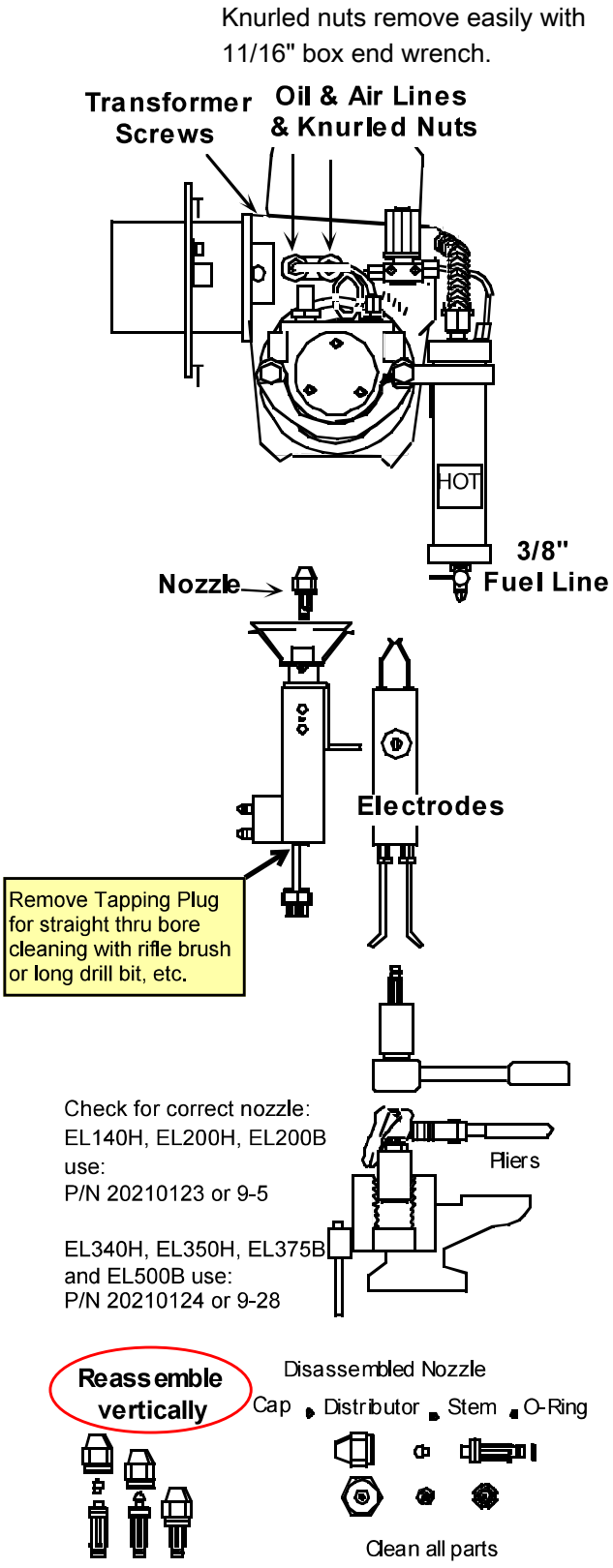
Remove electrode assembly. Set aside to avoid possible damage.

Remove the nozzle using a 5/8” socket or wrench. Use pliers and a towel (protects the nozzle stem) to **disassemble the nozzle** as shown. **Clean** all parts of the nozzle and check the o-ring for damage. It is a good idea to replace the nozzle o-ring yearly. Reassemble the nozzle, holding the stem vertically as shown below to keep the distributor in place while the cap is threaded onto the stem. Tighten the cap by hand, then tighten just a quarter to one-half turn further with a wrench. When properly assembled, you can see through the center of the nozzle.

Run parts cleaning fluid back through the block until completely free and clean of any sludge and solids. The oil port has a plug opposite the nozzle end for straight thur cleaning, with wire rifle brush or long 3/16" drill bit. **Do not get cleaning fluid on the preheaters or wiring!**

Blow shop air through the oil and air passageways of the nozzle block.

Thread the nozzle back into the nozzle block. Fasten electrodes to nozzle block and check electrode and flame retention head settings.

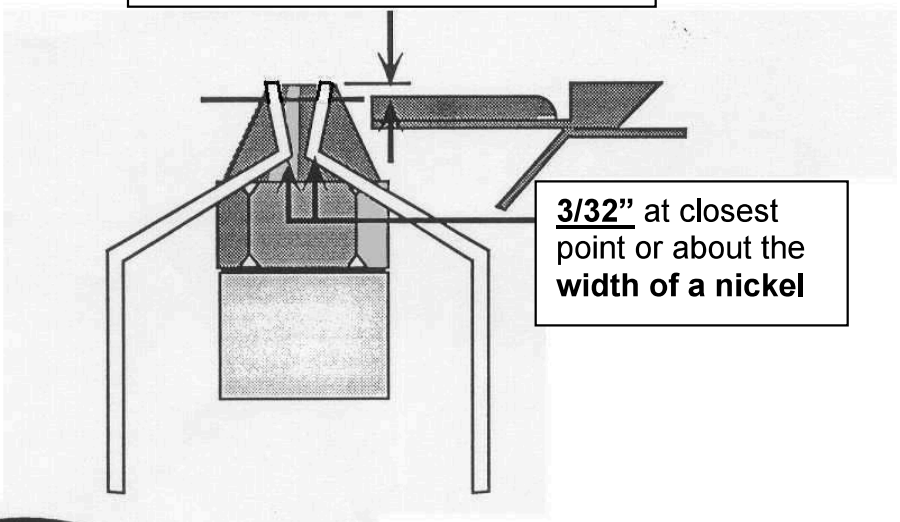


Electrode & Retention Head Settings

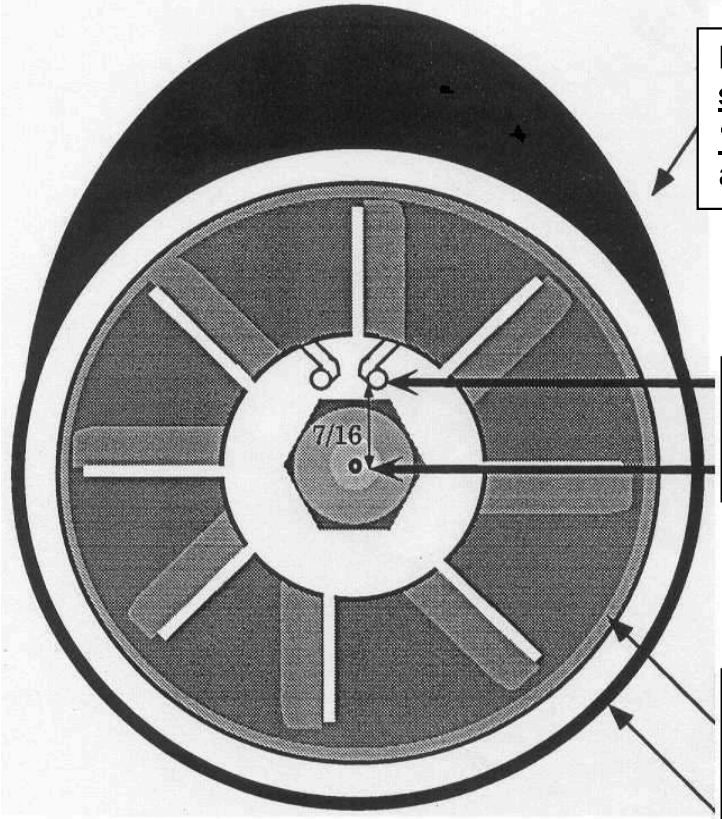
Electrode settings and Flame retention head **must mirror drawings exactly for optimum performance.**

Use needle nose pliers to move electrode arms into proper position

The end of the **nozzle extends 1/16" past the vanes** of the flame retention head and **electrode tips flush with nozzle**



3/32" at closest point or about the **width of a nickel**



Retention head is **set back** approximately **1/16"** into the end of the air tube opening

For correct electrode placement the tips of electrodes must be **7/16" above** the nozzle

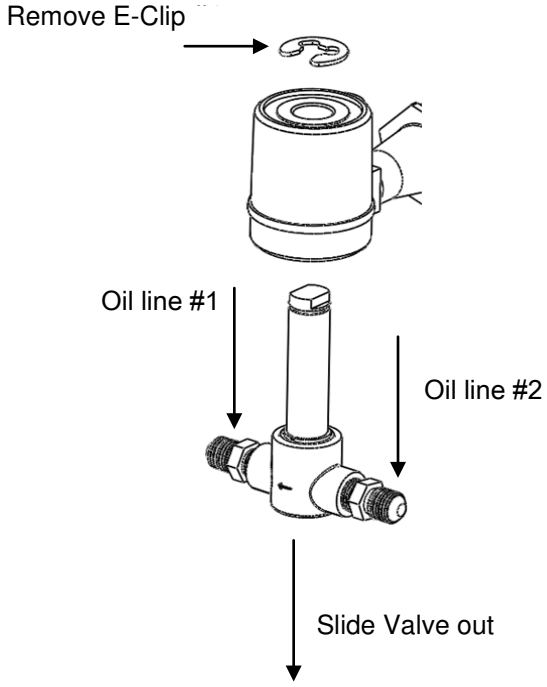
Flame retention head **must be centered** inside air tube. Spacing must be even all the way around. Re-position support legs to center

Solenoid Valve Cleaning

Tools needed:
Pliers, Screwdriver, Non-Chlorinated Parts Cleaner or Spray Degreaser, Shop Air

On the burner, remove the oil lines (1 & 2) from the inlet and outlet of the solenoid valve.

Remove the "C" Clip (4) - slide solenoid down and out of the black plastic coil which remains on the burner.

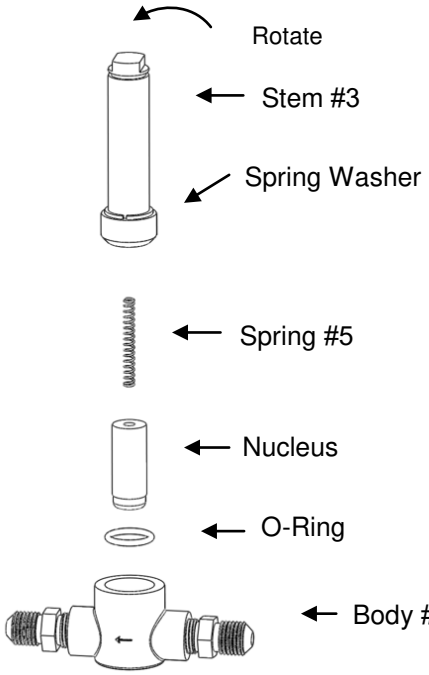


Unscrew the valve stem (3) by turning it counter-clockwise. The valve body comes away from the stem and windings.

When pulling the body away from stem, the nucleus and spring (5) will come out of the stem. Take care to avoid dropping and losing the nucleus and spring. The spring fits in the upper end of the nucleus.

Inspect the brass housing (6). Clean any debris from the inlet and outlet ports.

Remove the flared fittings, clean passages and housing behind fittings, clean inside of stem & nucleus (Aerosol Brake Cleaner, Tobacco Pipe Cleaner Wire & Q-tips work well here). Rinse the brass parts and blow air through the body to clean them thoroughly.



Replace the Nucleus, Spring and O-ring with the new parts included with the maintenance kit.

The solenoid maintenance is often overlooked but is a very important component for keeping the fuel flowing consistently to your heater.

<u>Check the 3/16" Cu Fuel Lines & Clean</u> with Carb or Brake Cleaner and pipe cleaner wire, if necessary.

Heat Exchanger and Blower Cleaning

Clean ash from the heat exchanger and flue about **every 800 to 1,000 hours** of operation.

Tools Needed: 1/2" Socket, 5/16 Socket, 3/4 Open End Wrench, Chimney Brush, Small Pipe Brush, Work Gloves, Dust Mask or Respirator, Large Trash Bag and Duct Tape

Warning: Turn off power at the circuit breaker before beginning this service. Wear protective clothing, including gloves and a dust mask or respirator.

Allow heater to cool before cleaning. Unplug burner.

Disconnect 3/8 copper fuel line where it connects to the burner assembly. Remove the 4 burner mounting nuts. Swing burner open.

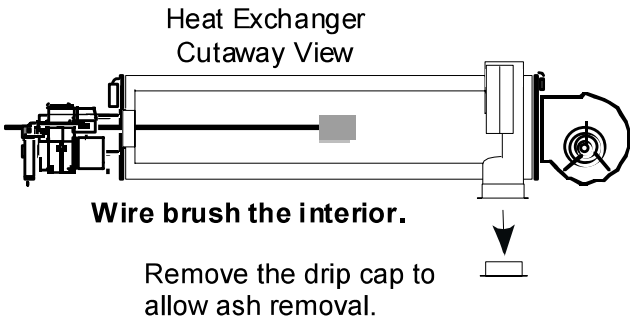
Carefully remove drip cap as shown by removing two sheet metal screws with 5/16" socket. The cap will be heavy with collected ash. Attach a trash bag to the drip leg with duct tape **or strap a 5 gallon bucket** to the cabinet to catch the ash.

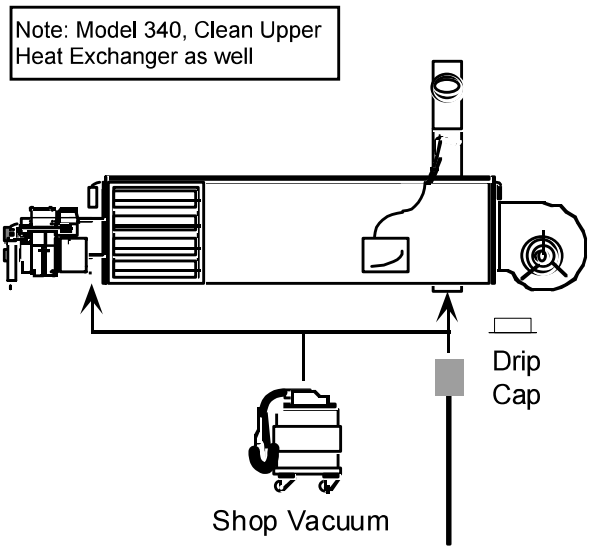
Using a 6" chimney brush or optional scraper, sweep the heat exchanger interior free of ash. Push the ash out of the heat exchanger into the bucket/bag attached to the drip leg, or use shop vacuum to remove the ash.

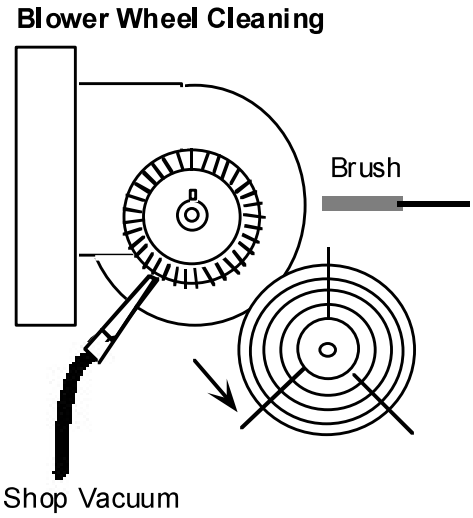
Tap the flue and allow the ash to fall into the bag. Remove the bag and run a chimney brush into the flue. Reattach the bag to the drip leg, reach through the bag to brush the ash loose from the chimney.

Remove bag and brush and dispose of ash properly. Reattach the drip cap to the drip leg. Swing burner close and reinstall nuts and fuel line.

To clean the blower wheel, remove the wire guard from the open side of the blower. Use a small pipe cleaning brush and a shop vac to clean the dirt from the blower wheel blades. Reattach the wire guard when finished.







Checks for Pump, Fuel Line & Check Valve

Remove the pump cover and clean around the gear set inlet plates. Pumps sold before 1998 will have a strainer. Clean the pump strainer if it has one. Inspect the o-rings for tears or breaks. The o-ring on the strainer will pull apart. Slide the ends of this o-ring together firmly when reinstalling on the strainer.

Check all fittings for tight seal and inspect copper tubing flares for cracks or distortions that might allow leaks. Make sure the pressure relief fitting is oriented properly with the arrow pointing toward the pump inlet.

With the inlet and outlet lines disconnected at the pump and the pressure and vacuum gauges removed, **remove check valve** from pump assembly to **clean**. Take to vise and unscrew check valve body into two halfs. Note how needle and seat are assembled. Clean and reassemble **using pipe dope** to seal body threads & fittings.

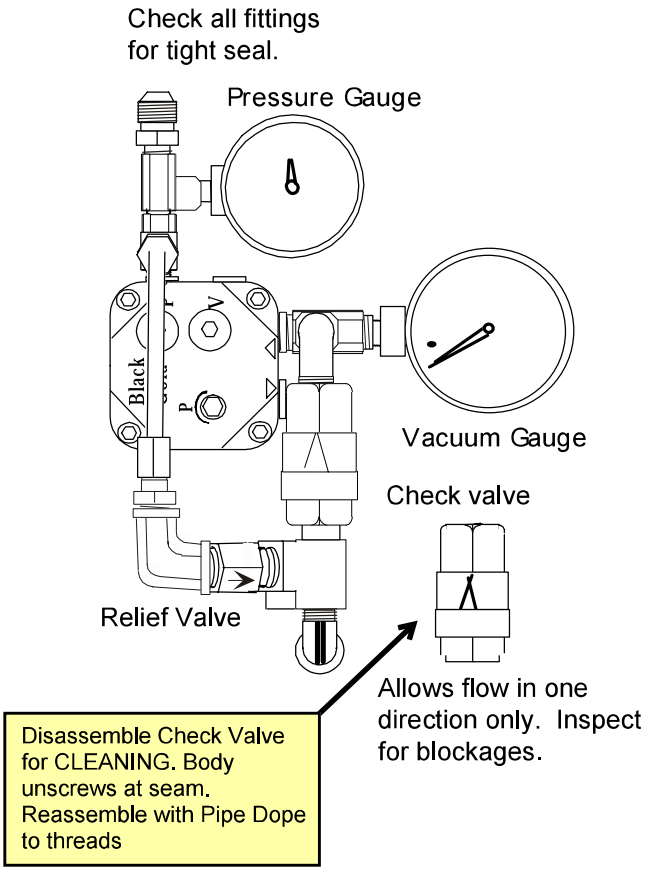
To check for suction fitting leaks, spray around the vacuum gauge (after reinstalling) and suction side fittings with soapy water. These connections should not leak. Blow air into the inlet at 30 psi maximum. Soap bubbles indicate a leak in the connection.

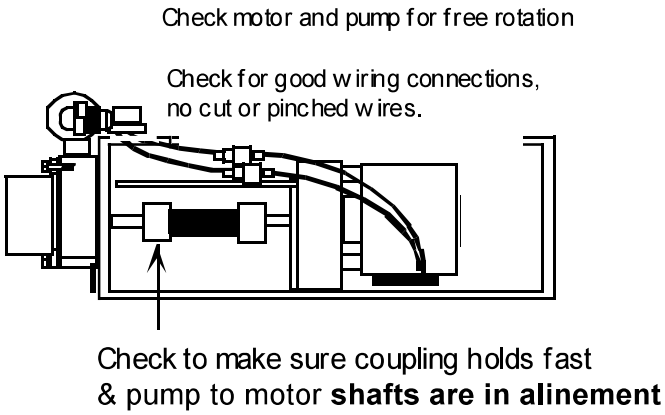
If the pump will not prime and the vacuum reading will not go to 20" with the inlet blocked, contact your Black Gold Distributor for a replacement pump.

To better check an uncertain pump, make up a short leak free inlet line (flared copper tube) and submerge into a container of clean used oil. Operate pump and check for priming, flow and for 15"+. suction with inlet plug after flow established.

Most pump failures occur with the seal on the input shaft of the pump. This usually starts as a tiny leak of oil - inspect the input shaft of the pump for signs of leaking oil.

Symptoms of a leaking shaft seal would be a heater that doesn't hold the prime overnight or over several days.





Burner Start Up

To preheat and start the burner, first make sure that the **primary strainer** (at inlet of pump assembly between pump and oil storage tank) is **full of oil** and that all fuel **connections** are tight and leak-free.

Turn the preheater valve handle so that arrow points up towards the preheater.

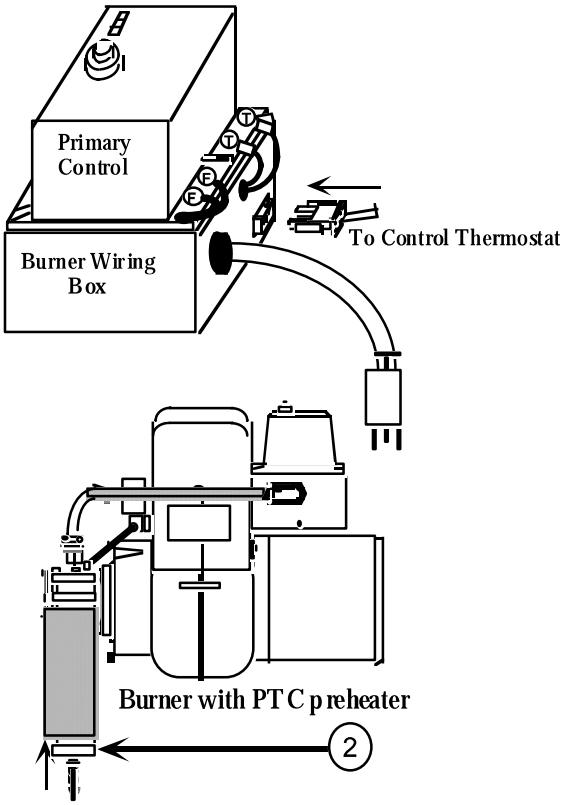
Loosen fitting going into solenoid valve (above burner, to the right of the copper tubing) to allow for bleeding of air. **Loosen the fitting at the oil preheater outlet** to allow the **copper tube to rotate away** from the burner. Caution: Use a small **container to catch oil** when it starts to bleed.

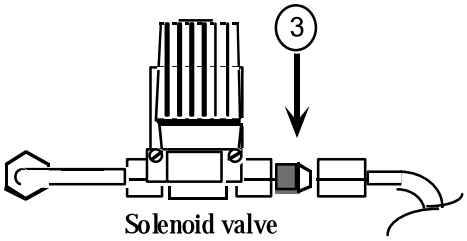
Set the wall thermostat to call for heat or **place a jumper on the "T" terminals** of the primary control (gray box on top of burner). You may need to push the red reset button on top of the primary control.

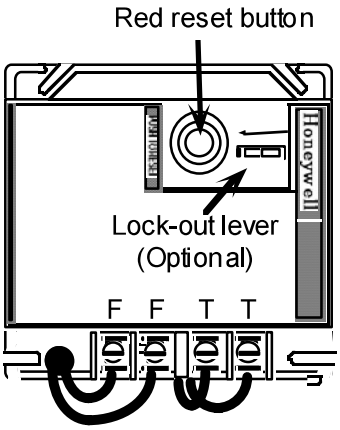
Immediately after the burner starts, **place an additional jumper wire across the "F" terminals.** Let the burner and pump run this way until you get a steady stream of oil out of the copper tubing. This **takes 5 - 10 minutes to prime the system,** you may want to initially check for flow directly out of pump discharge. **Remove jumpers** from the terminals to shut down burner. Move the lockout lever on the primary control to lock burner out. If your primary control does not have a lockout lever, set your room thermostat below room temperature. Reconnect the copper tubing to the solenoid and tighten the tubing to the preheater outlet.

Wait 20 minutes for initial preheat (HOT to Touch). **Then** push the reset **button and set your wall thermostat above room temperature to call for heat. The preheater must be 150 degrees F to close the internal thermostat and allow the burner to run.**

NOTE: Jumping the T-T terminals bypasses the preheater's internal T-stat (which is in series with the room T-stat) allowing the burner to come on when the oil is cold. Jumping the F-F terminals bypasses the fire eye safety control. (Do Not leave heater unattended with F-F jumpered !)



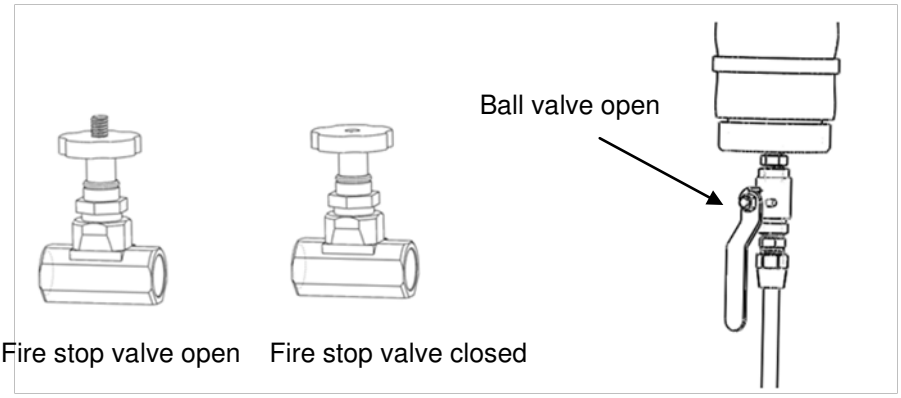




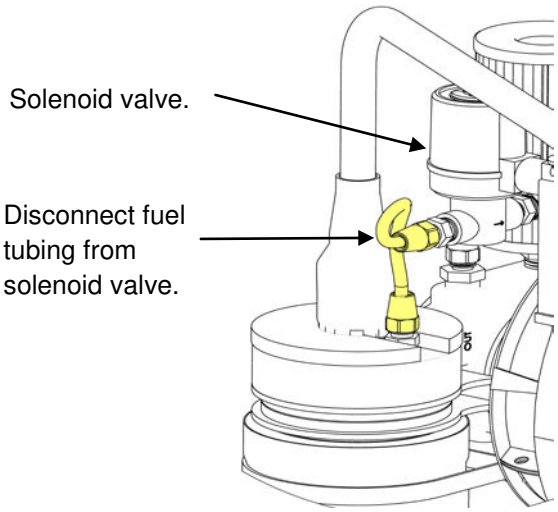
Furnace Priming Instructions

1. Ensure your Used Oil Storage tank has adequate oil. Oil Level must be above low-fuel level cutoff switch as well as the fuel pickup point. Pre Fill (if priming fresh or installing new filter) fill filter with non-synthetic ATF or used oil. ***DO NOT USE NEW MOTOR OIL WILL NOT BURN.***

2. Unplug thermostat wire connector from control module.
3. Ensure all hand valves, Fire-stop valve and ball valve are open.



4. Switch on the main power circuit to furnace, and ensure that the burner and preheater are plugged in.
5. It's good practice to have oil-absorbing rags present to catch any spills or drips
6. Use two 7/16" wrenches to disconnect small fuel tube from inlet of solenoid valve
7. Loosen Small tube fitting at preheater outlet to swivel tube away from burner, and re-tighten against preheater to seal during priming.



8. Place a container under the open end of fuel line
9. Jump 1 set of alligator clips across the red (T-T) terminals on the primary control to simulate the call for heat
10. Once burner motor starts, immediately jumper across the yellow (F-F) terminals on the primary control to simulate the cad cell sensing flame
11. It will take approximately 10-20 minutes. depending on the system and amount of fuel line used, for fuel to reach the top of the preheater
12. Continue to prime until fuel flow is a steady stream with no air bubbles present.
13. Once the stream is steady and flowing smoothly, remove the alligator clips from the primary control.
14. Reconnect fuel tubing to solenoid valve and preheater outlet
15. Plug thermostat cable back into burner, and verify that preheater ball-valve is open

Your system is primed, and assuming good condition of burner, ready to operate .

Proper Burn Adjustment

If the flue draft is .05"+, then the **flame should be bright yellow,** an orange flame indicates a fuel rich flame. To check this, wear safety glasses and use caution while viewing flame and keep back at least 18" from view port. Raise the cover on the view port, located above the left burner mounting bolt. Close the cover after checking.

With good fuel, the metering pump providing the correct amount of fuel, and the **air shutter set at 7 for Model 200** and 5 for a Model 140, the CO2 should be around 11%. The ohm reading should be between 250 and 500 ohms. There should be no black on the smoke spot. A service person can check these as follows.

See Draft Gauge Set Up and Checks (N15) for instructions on reading the **flue draft.** Make sure that it **is .05" to .06" WC while burner is running.**

Start the burner and test the CO2 following the instructions that came with the test kit. If the CO2 is not between 10-11%, loosen the air shutter lock screw and adjust the air shutter to achieve a 11% CO2. To increase CO2, close the air shutter. To decrease CO2, open the air shutter.

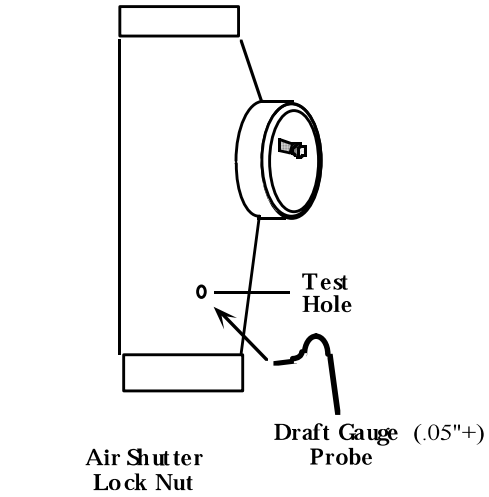
After adjusting the CO2, take a smoke test and compare it with the chart that came with your test kit. You should have a zero/trace smoke spot. Don't worry about a yellow- brown color on the smoke spot. This is normal when burning used oil because noncombustible compounds are present.

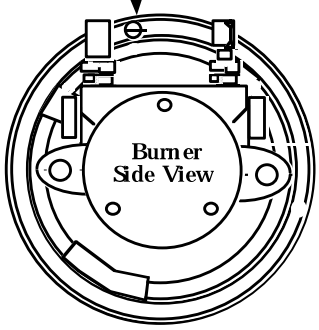
The flame should be bright yellow. Put the **draft gauge probe** back in the flue pipe test hole. During operation **a gray-white ash will build up on the probe.** This indicates normal clean combustion.

Next, take an **ohm reading.** While the burner is running, attach the leads from an analog multi-meter (a digital meter will not work) to the "F" terminals on the primary control. The reading **should be 250-500 ohms.**

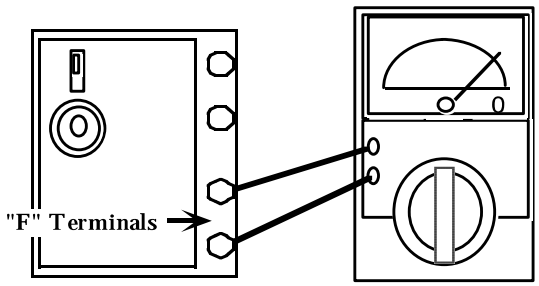
Secure all adjustment screws and nuts. Start and stop the burner several times to make sure there are no significant rumbles or pulsations.

Check the unit for any oil leaks. Then enjoy the savings from your used oil.





140H- 5 Closed air band
200H- 7 Closed air band
350H- 4 Air band on 4
200B- 7 Closed air band
375B- 6 Closed air band
500B- 9 Vary air band



Recommended Settings for a Bright Yellow/White Flame: Air Shutter: See above for shutter settings
Fuel Pump Pressure: 5-10 psi
Fuel Pump Suction/Vacuum: 0-8"
Air Compressor Output: 8 - 12 psi