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energylogic

BLACK GOLD

Maintenance Schedule & Service Guide

by Nuera Corp.

Service	Schedule	Record Date & Hour-Meter Reading		
Clean Ash From: Heat Exchanger & Flue (pg M4) Burner Head (pg M8)	Every **800-1,000 Hours**			
Check/ Replace Burner Gasket (BG part # BH441)	Annually			
Clean Blower Wheel (pg M4)	Annually			
Clean Solenoid Valve (pg M9)	Annually			
Clean **Nozzle Block** & Check/ Replace Nozzle O-Ring (pg M7)	Annually			
Replace Air Compressor Filter: (BG part # BA530) Fram CG20	Annually			
Clean PTC Preheater (pg M6)	**Annually**			
Clean Cad Cell Lens (pg T16)	Annually			
Replace Primary Strainer: Fleetguard HF6522, Wix 85614, or Baldwin BT8420	Annually, & When **Vacuum Gauge** Reads **More than 8"**			
Drain Tank Bottom (pg N7)	Check Monthly. Drain Water as Necessary.			
Clean Fuel Pickup Assembly (pg N5) *Not on BG Workbench Tank*	Annually, or When Reduced Fuel Flow			
Clean Pump Check Valve (pg T21)	Annually, or if Oil Drains Back during shutdown			
Test fire after annual maintenance & check for proper burn adjustment (S4)				

Properly Maintained, your furnace can save you thousands of $$'s each year !

ONLINE PARTS at: www.nueraheat.com or for Service Assistance & Parts Contact:

NuERA Corporation
John Clemens, nueracorp@msn.com
(800) 347-9575 Fax: (253) 661-4529
Website: www.nueraheat.com

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.

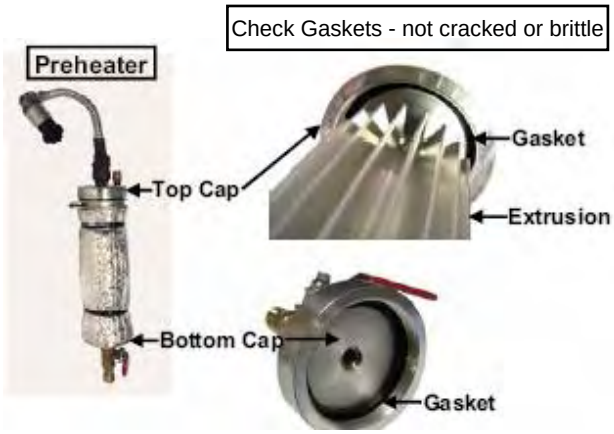
Hold the top cap securely and unscrew the housing. This exposes the finned aluminum extrusion for cleaning. Use a wire brush and non-chlorinated parts cleaning fluid or carb cleaner. You may want to fill the housing and screw it back on to let the finned extrusion soak in the cleaner before you use the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

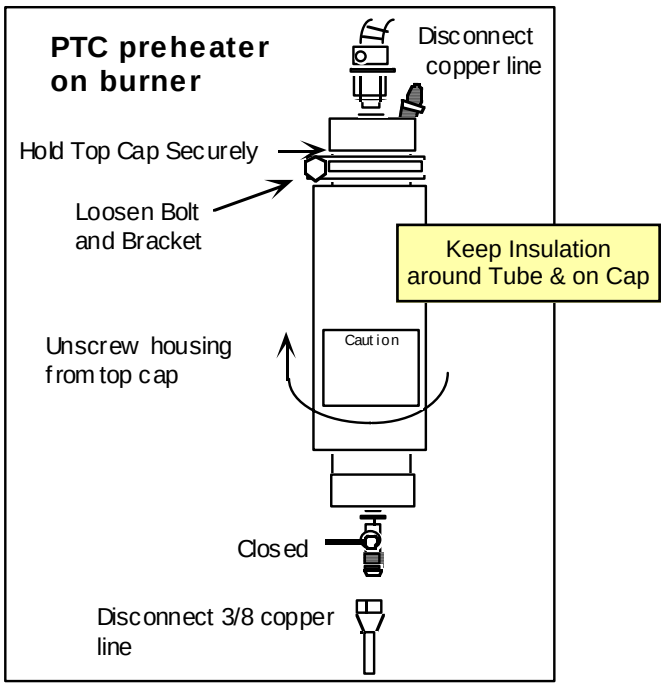
Never attempt to unscrew the finned extrusion from the outlet cap. This will damage electrical connections to the PTC heaters.

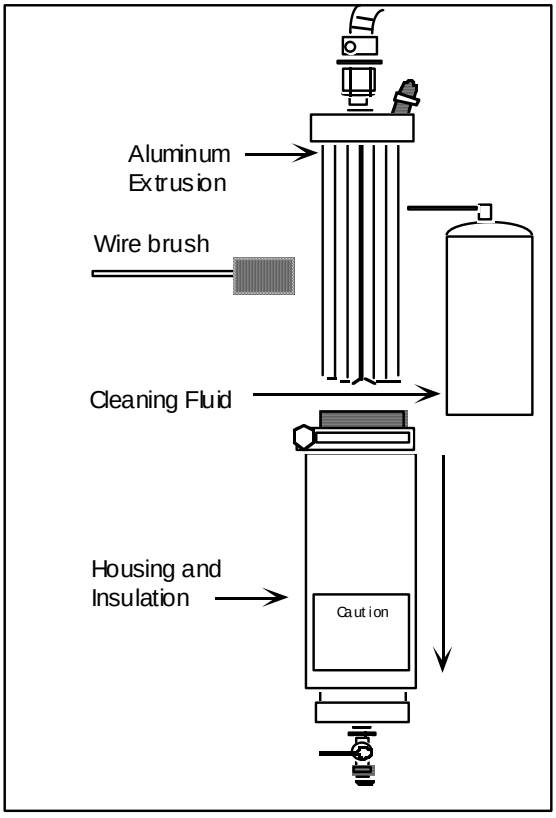
DO NOT SUBMERGE OR SPRAY wiring harness with liquid when cleaning. THIS WILL DAMAGE THE HEATERS.

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 S2) 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.

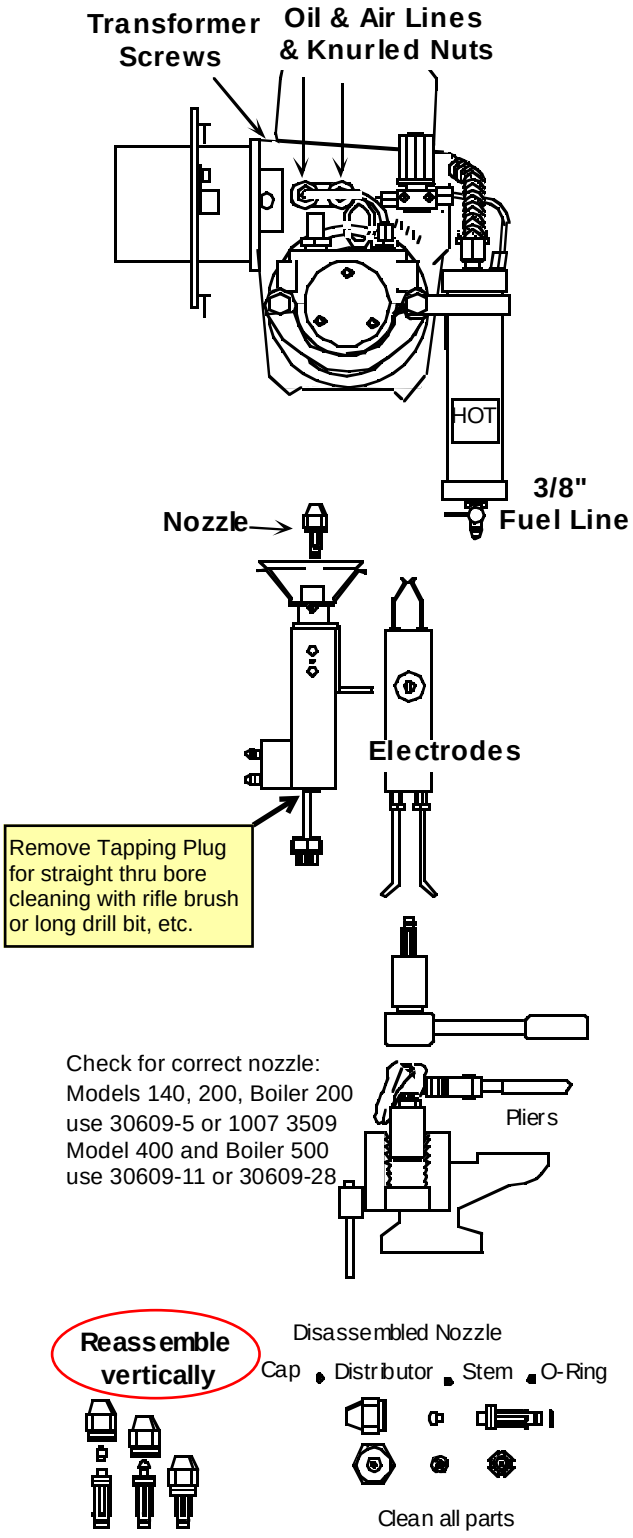
Remove electrode assembly. Set aside to avoid possible damage.

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. **See Flame Retention Head and Electrode Settings** (page M8).

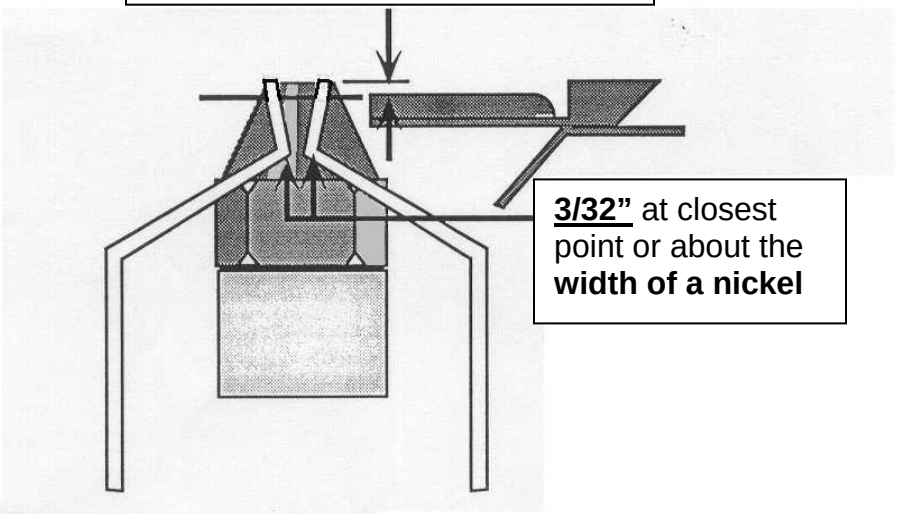


Electrode & Retention Head Settings

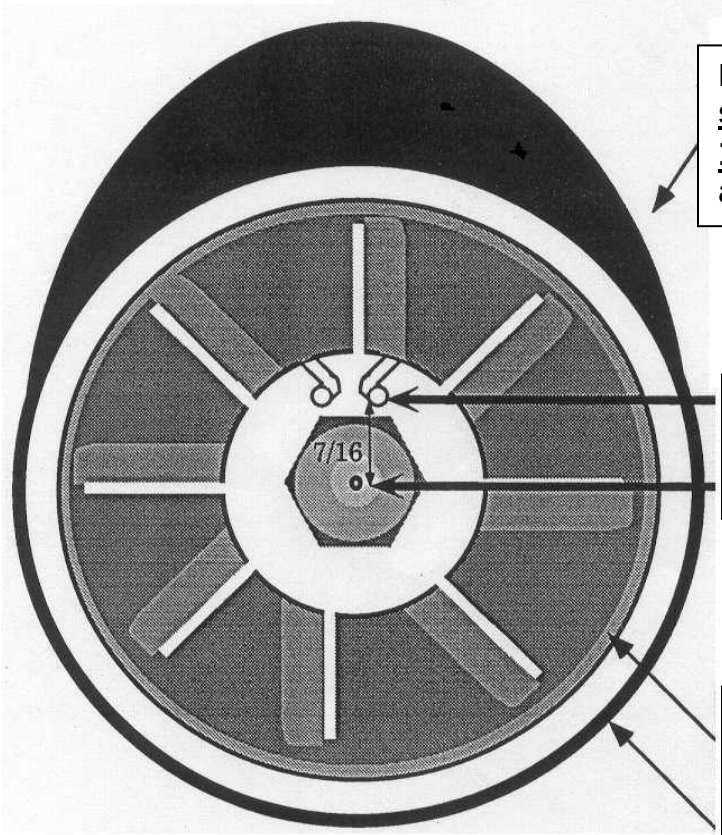
Electrode settings and Flame retention head **must mirror drawings exactly for optimum performance.**

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) from the inlet and outlet of the solenoid valve.

Loosen (do not remove) the bracket clamp screws (2) and bracket that hold the valve body in place.

Remove the C Clip (4).

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.

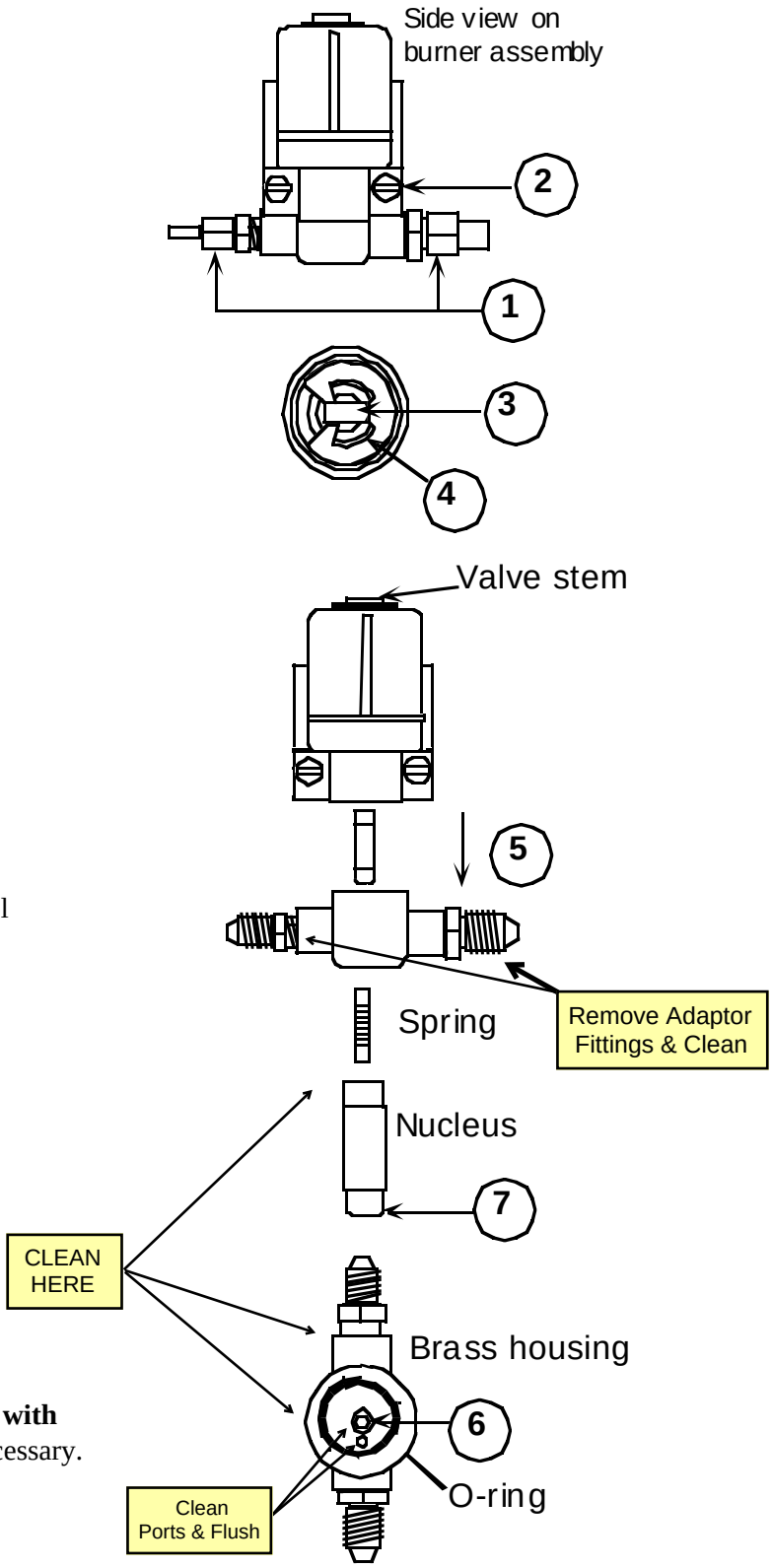
Inspect the brass housing (6). Clean any debris from the inlet and outlet ports.

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.

Inspect O-ring. Replace if damaged.

Inspect the seal on the end of the nucleus to see if it is marred or damaged (7). Replace if damaged. This is where the valve seals when it is shut off.

Reassemble in reverse order of dismantling.



<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.

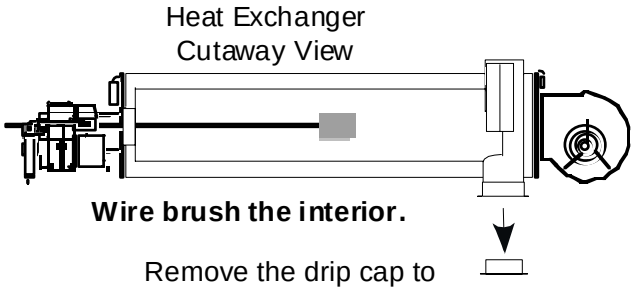
Carefully remove drip cap as shown by removing two sheet metal screws with 5/16" socket. The cap will be heavy with collected ash. Attach a trash bag to the drip leg with duct tape **or strap a 5 gallon bucket** to the cabinet to catch the ash.

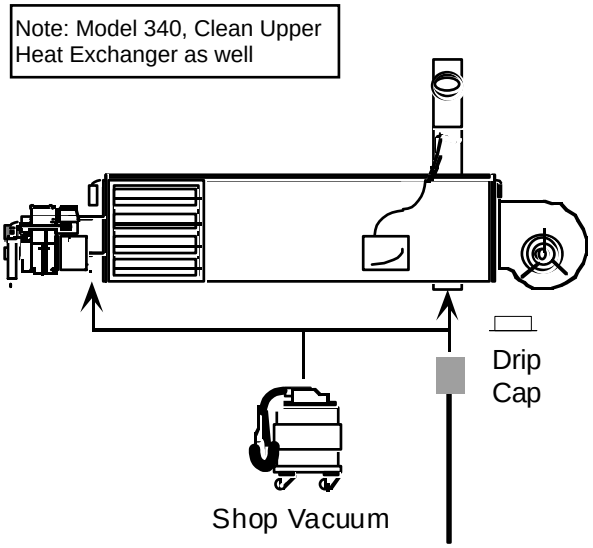
Using a 6" chimney brush or optional scraper, sweep the heat exchanger interior free of ash. Push the ash out of the heat exchanger into the bucket/bag attached to the drip leg, or use shop vacuum to remove the ash.

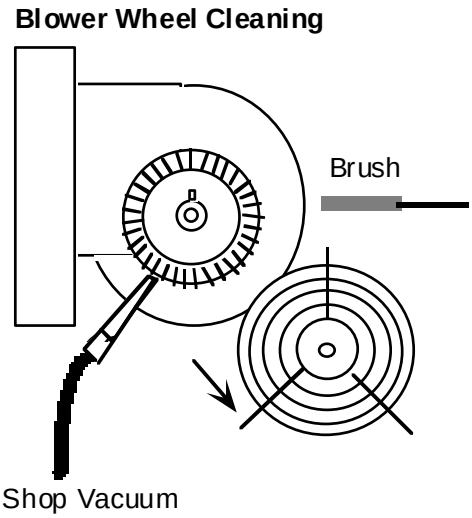
Tap the flue and allow the ash to fall into the bag. Remove the bag and run a chimney brush into the flue. Reattach the bag to the drip leg, reach through the bag to brush the ash loose from the chimney.

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.

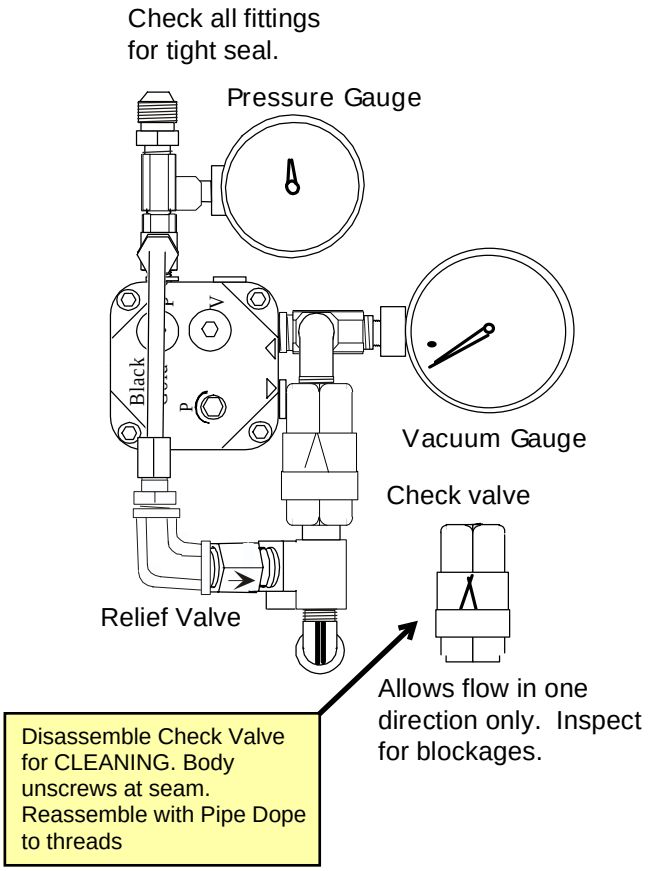
Check all fittings for tight seal and inspect copper tubing flares for cracks or distortions that might allow leaks. Make sure the pressure relief fitting is oriented properly with the arrow pointing toward the pump inlet.

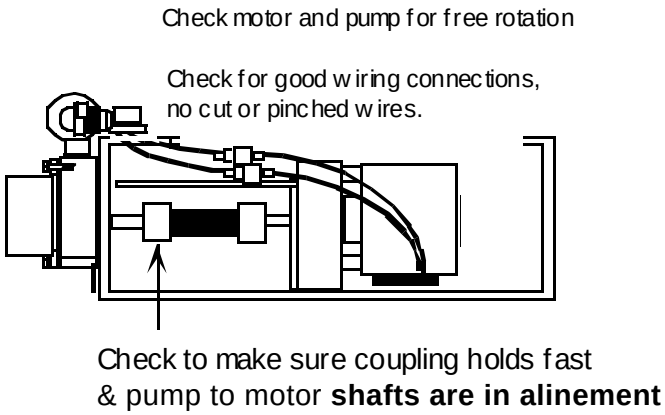
With the inlet and outlet lines disconnected at the pump and the pressure and vacuum gauges removed, **remove check valve** from pump assembly to **clean**. Take to vise and unscrew check valve body into two halfs. Note how needle and seat are assembled. Clean and reassemble **using pipe dope** to seal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





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.

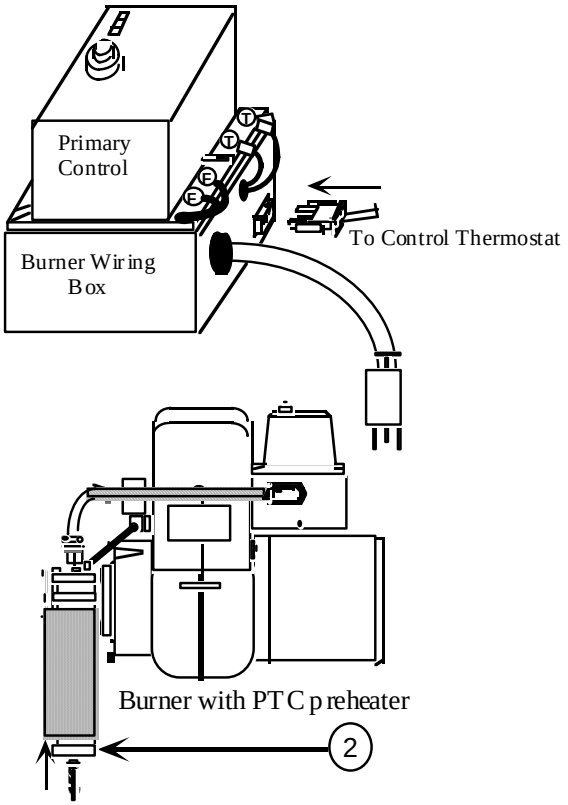
Loosen fitting going into solenoid valve (above burner, to the right of the copper tubing) to allow for bleeding of air. **Loosen the fitting at the oil preheater outlet** to allow the **copper tube to rotate away** from the burner. Caution: Use a small **container to catch oil** when it starts to bleed.

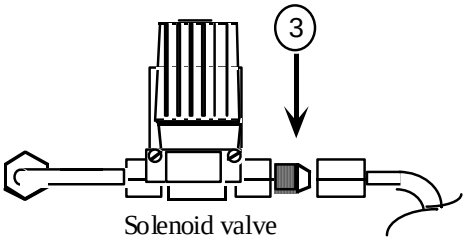
Set the wall thermostat to call for heat or **place a jumper on the "T" terminals** of the primary control (gray box on top of burner). You may need to push the red reset button on top of the primary control.

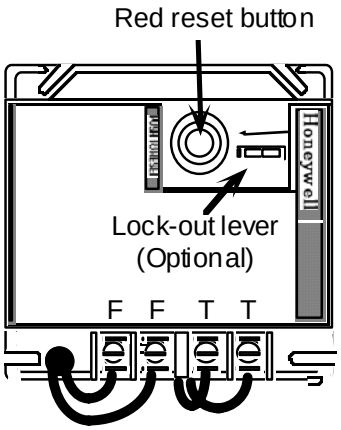
Immediately after the burner starts, **place an additional jumper wire across the "F" terminals.** Let the burner and pump run this way until you get a steady stream of oil out of the copper tubing. This **takes 5 - 10 minutes to prime the system,** you may want to initially check for flow directly out 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 !)







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.

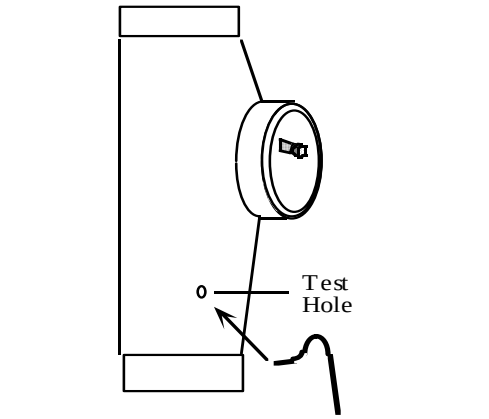
After adjusting the CO2, take a smoke test and compare it with the chart that came with your test kit. You should have a zero/trace smoke spot. Don't worry about a yellow- brown color on the smoke spot. This is normal when burning used oil because noncombustible compounds are present.

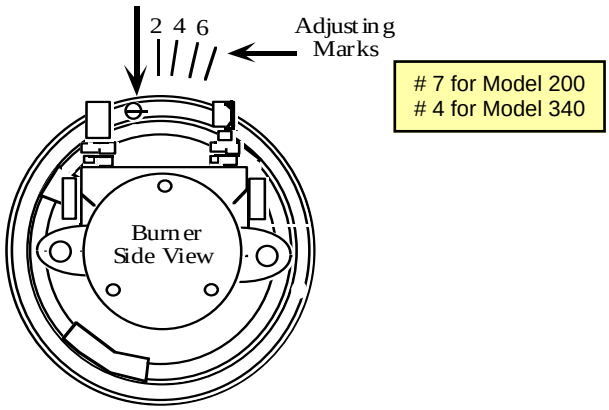
The flame should be bright yellow. Put the **draft gauge probe** back in the flue pipe test hole. During operation a **gray-white ash will build up on the probe.** This indicates normal clean combustion.

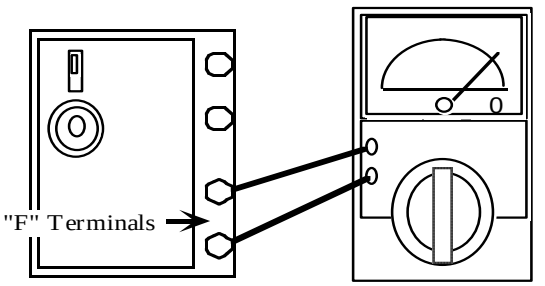
Next, take an **ohm reading.** While the burner is running, attach the leads from an analog multi-meter (a digital meter will not work) to the "F" terminals on the primary control. The reading **should be 250**-500 ohms.

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.





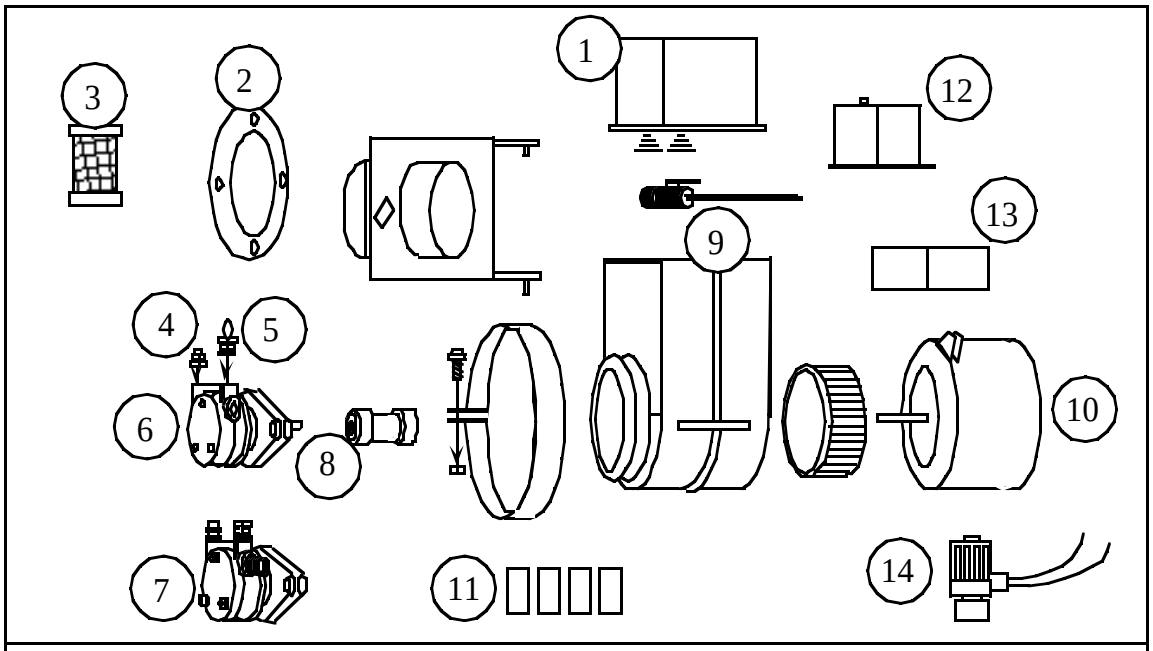


RECOMMENDED SETTINGS:
for Bright Yellow/White Flame

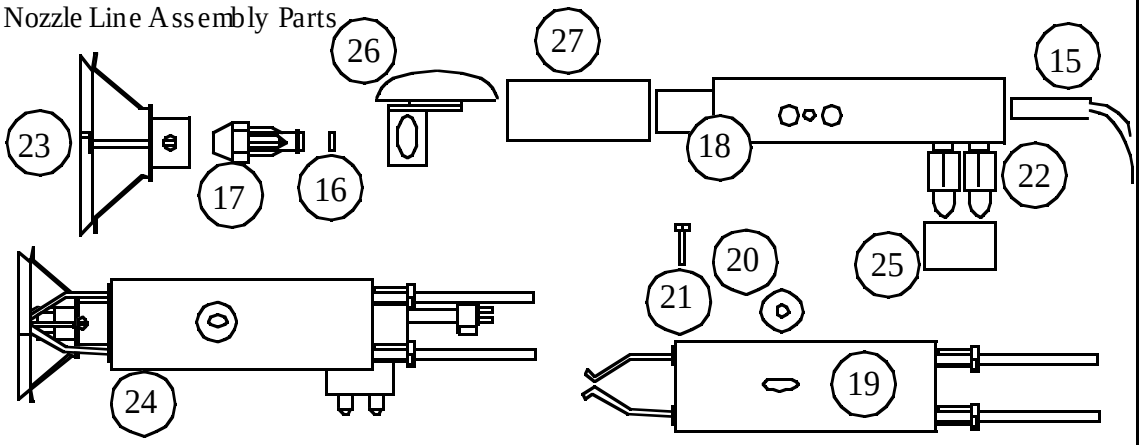
Air Shutter: Model 200 set to # 7
Model 140: # 5, Model 340: # 4
Fuel Pump Pressure: 5-10 psi
Fuel Pump Suction/Vacuum: 0-8"
Air Compressor Output: 9 psi (M200)

For Service Assistance or Parts contact:
Steve at Nuera Corp, nueracorp@msn.com
Phone: 800-347-9575, Fax: 253-661-4529

BlackGold / EnergyLogic
BURNER REPLACEMENT PARTS



Nozzle Line Assembly Parts



PARTS LIST

1) BH100 Ignition Transformer, Model 200
   BH420 Ignition Transformer, Model 340/400
2) BH440 Burner Gasket
3) BA530 Air Compressor Filter
4) BA506 Coupler Air Comp. Filter
5) BA509 Pre-set Air Regulator, M200
6) BA500 Air Compressor
8) BN200 Air Compressor Coupling
9) BH150 Cad Cell-Flame Detector Assy
10) BH250 Burner Motor, M200
11) BA520 Air Compressor Vanes
12) BH200 Primary Control
13) BH310 Burner Wiring Box
14) BR620 Solenoid Valve
15) BN854 Cartridge Heater 8.7mm
16) BN770 Nozzle O-ring
17) BN780 Nozzle #5, Model 200
    BN782 Nozzle #28, Model 340/400
18) BN750 PTC Nozzle Block w/cartridge htr.
19) BN710 1pc Electrode
22) BN726 Oil/Air Bulkhead Fitting
23) BN757 Retention Head, M200
    BN760 Retention Head, M340/400
24) BN850ASY Complete Nozzle Line Assy
26) BN747 Air Vane
27) BN748 Nozzle Block Sleeve insulation

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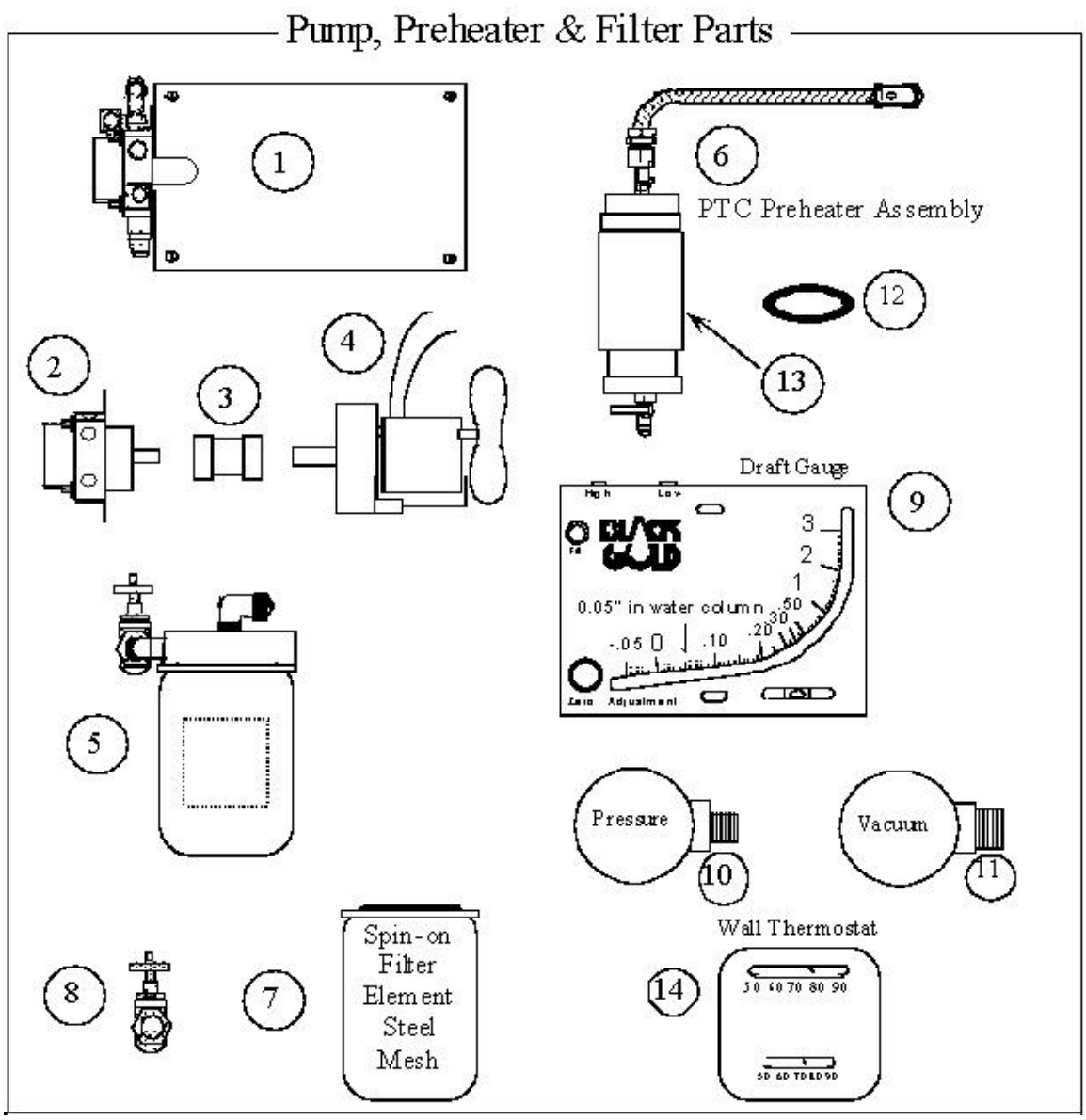
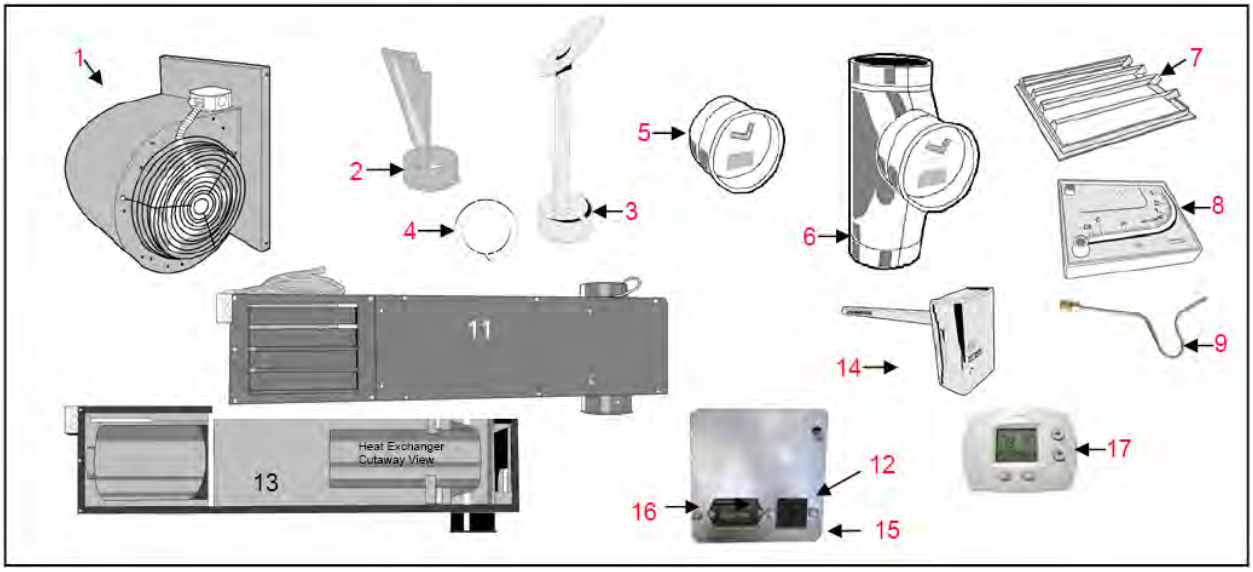


1) PP2001ASY Complete Pump Assy, M200
   PP2002ASY Complete Pump Assy, M340/400
2) PP200ASY Fuel Pump w/fittings
3) PP400 Fuel Pump Coupling
4) PP116/SRV117 300RPM Gear Motor Assy, M200
   Model 340/400 specify special gearbox 3GN3.6KA
5) PL245ASY Primary Strainer Assy
6) PH200ASY PTC Preheater, M200
   PH400ASY PTC Preheater, M340/400
7) HF105 Spin on Oil Filter (# 5144)
8) PL254 Firomatic Safety Shut off Valve
9) DG100 Draft Gauge Manometer
10) PL222 Pressure Gauge
11) PL220 Vacuum Gauge
12) PH0051 Preheater Gasket
13) PH032 Preheater Insulation
14) RT100 Room Thermostat

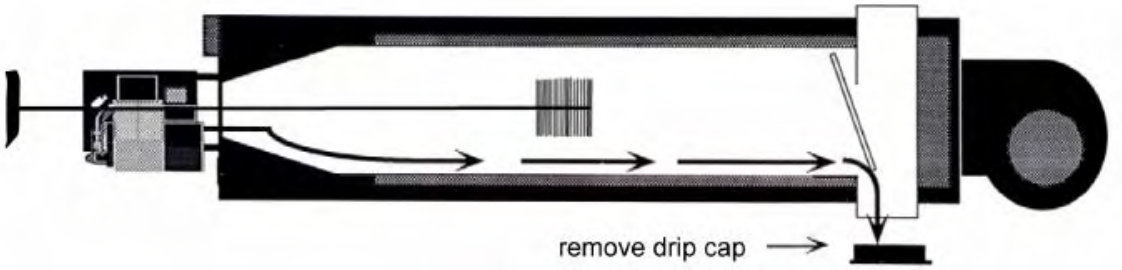
nueracorp@msn.com **800.347.9575** www.nueraheat.com

BlackGold / EnergyLogic
Furnace Cabinet & Accessories



1) CS200 Complete Squirrel Cage Blower Assy, M200
   *CS250 1/2 HP Blower Motor, M200
   *CS255 3/4 HP Blower Motor, M340/400
2) CS-DC200 Drip Cap w/ Baffle, M200
3) CS-DC340 Drip Cap w/ Baffle, M340/400
4) CS341 Gasket Drip Cap
5) FG100 7" Barometric Damper
6) FG100ASY Barometric Damper 8" Tee Assy
7) RS2015 Louver, M200
8) DG100 Draft Gauge Manometer
9) DG101 Draft Gauge Probe
10) DG102 Draft Gauge Oil-Fluid (not pictured)
11) Cabinet Assy.
12) CS130 Receptacle Burner Plug
13) RS4200 SS Heat Exchanger
14) CS110 Fan Limit Control
16) CS118 Hour Meter
17) RT100 Room Thermostat

#SRV201 Combustion chamber / heat exchanger Ash Cleanout Tool.
Has telescoping handle with removable crescent scraper, optional 6' round chimney brush.
(Provides for quick & easy straight thru ash cleanout into bag or bucket at chimney drip leg)



nueracorp@msn.com 800.347.9575 www.nueraheat.com

BlackGold / EnergyLogic
Tune Up Kit / Service Package
PN: SRV101 @ $169.00

Includes:

- BN780 – Nozzle, #30609-5
- BN710 – Electrodes, 1 pc. Assy.
- BR640 – 3/16” Cu Fuel Line (to solenoid)
- BR625 – Solenoid Valve Replacement O-ring
- BH400 – Burner Gasket
- PH051 – PTC Preheater Gasket
- PH032 – PTC Preheater Sleeve Insulation
- BA530 – Air Compressor Filter
- HF105 – 100 Mesh SS Spin-on Fuel Filter
- SVCX. – Service Excerpts w/ Check List

PN: GRF495 Pre-Filter @ $96.00

 # GRF495, GoldenRod Pre-Filter with 40 or 80 mesh Washable SS Strainer & Water Trap

PN: FT1618 Oil Drain Pan @ $139.00 (16” x 18”)

For Preheating Cold Fuels
PN: HF140 HOT FILTER Band Heater @ $89.00

140*F approx., 60 watt (filter not included**)**

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