Do Not Drain Boiler or Pull Feedwater Pump Switch while Boiler is Hot

OPERATING INSTRUCTIONS

Series 400C, 500C, 400L and 500L (Formerly SPH & SPL) ALL SIZES & ALL FUELS

Maintenance

Hang these cards where burner is installed. Also hang where the fuel equipment is located in case of a fire. The contractor installing the equipment will furnish copies of diagrams showing all of the main oil lines and controlling valves. Hang one copy of this diagram adjacent to each instruction card.

DAILY PROCEDURE

1. **Blow-down the boiler using bottom rear blow-off. Blow-down when burner is firing. Blow-down should be conducted for the duration directed by the water chemistry.**
2. **Blow-down the water column to the low water cut-off point.**
3. Check level of oil in the storage tank
4. Check the lubrication oil in the compressor oil cup, (where compressor used) fill with manufacturers recommended oil, or equivalent, when required.
5. Check the flue gas stack temperature. If it is above normal, check the fire side of the boiler for dirt, over-firing, or improper combustion.
6. When using a condensate tank, or a deaerator, check the temperature of the water supplied to the unit. If the temperature falls below 160°F, investigate for condensate return leak source.
7. Check the oil pump suction conditions. Oil pump suction should not exceed 130°F or 5 pounds of pressure.

Weekly Procedure

1. Check the combustion control operation as outlined in the check list section of the service manual. Investigate and correct at once, any failure to shut-off fuel valve.
2. Check the pressure limit shut-down as outlined in the service manual check list. During this check, observe the operation of the programming control to make sure that the operation is as described in the sequence of operation section of this manual.
3. Wipe clean the entire unit, particularly any operating parts, so that oil and dust does not accumulate.
4. Clean the oil nozzle weekly. **Do not use abrasive or metallic instruments or tools during the cleaning operation. Soak the nozzle assembly in an oil solvent for the required time.** Clean electrode insulators of any carbon deposit.
5. Replace nozzle electrode assembly in the exact position that was sent from factory.
6. If water treatment is being used, check water against check list supplied by water treatment company.

MONTLY PROCEDURE

1. Check the belt tension and adjust if required on all belt driven pumps and compressors.
2. Turn down the feedwater grease cups. Note – every three months fill feedwater grease cups with new grease (Standard Oil Company No. 18 Superia).
3. Lift the steam safety valve by the manual lever to make sure it is operating freely.
4. Clean the compressor air intake filter (where compressor used). Replace filter oil with clean oil, (use compressor lubricating oil).
5. Check rear head for flue gas leaks and tighten bolts as required. Tighten bolts evenly (uneven tightening will cause leakage). WARNING: Do not tighten bolts when the boiler components are hot. Torquing when hot may over stress the fasteners or components.

SEMI-ANNUAL PROCEDURE

1. Cool boiler **slowly** to room temperature and ensure pressure is relieved prior to any attempt to open access openings. **(WARNING: failure to cool boiler slowly will effect life of the boiler and possibly cause tubes to leak).**
2. Gradually remove all the fasteners around the rear door flange, pry the head loose from the boiler and swing it away on the davit. Provide support under rear door during this procedure.
3. Remove the remaining two upper rear panels.
4. Using flue brush and vacuum cleaner, brush through the tubes to the front end of the boiler.
5. Soot and scale may be removed from the front end of the boiler by removing the clean out cover located at the bottom of the front cover plate and inserting vacuum cleaner hose. Heavy soot and scale removal may require the front lower panel to be removed.
6. Check the rear door refractory and patch any cracks or spawls with Franset cement.
7. **Always replace the sealing rope on the edge of the rear refractory with a new rope and clean off any old cement.** The new rope may be held in the groove with cement.
8. **Replace the outer sealing rope on the upper rear panels with a new rope.** The new rope may be held in place with cement.
9. Replace the rear upper two panels.
10. Close the rear head and rear panels. Tighten all fasteners evenly to seat the sealing rope.
11. Replace the front panels if they were removed for cleaning.
12. Tighten front cover bolts evenly to seat the sealing rope.
13. Remove the peep sight glass, clean and replace. Note: Inspect the gasket and replace if necessary.
14. Flush compressor as directed in the service manual.
15. Examine belts for signs of wear. Replace worn belts before they fail to prevent unplanned shut-downs.

ANNUAL PROCEDURE

1. Follow steps 1 through 12 listed under semi-annual procedure.
2. Clean water side of boiler as follows:
   A. Drain the boiler through the blow-down valve.
   B. Remove all handhole covers and the manhole cover and replace with new gaskets.
   C. Wash down the inside (water side) of the boiler with a hose, making sure to loosen and remove all sludge out of the boiler.
   D. Inspect shell and tube surfaces for signs of corrosion or scale formation. If scale is forming (to any degree) on internal surfaces, consult your chemical supplier for boiler treatment.
   E. Using new gaskets, install the handhole covers and manhole cover.
   F. Disconnect the piping on the discharge side of the feedwater pump and inspect for scale build up. Check valves for proper operations and replace if necessary.
   G. Fill the boiler by means of the feedwater pump and reset the low water cut off.
3. ***At the time of this yearly inspection and cleaning, it is recommended.***

TO START THE BOILER

With main power breakers in the “on” position, the water supply and fuel supply systems are aligned to support boiler operation, and the burner switch is in the “off” position, perform the following steps.

1. Fill unit with water to the prescribed level.
2. Reset low water cut-off switch (on cut-off at top).
3. Turn fuel pump switch to “on” position, (motor will start) allow unit to circulate fuel from and to the fuel oil tank.
4. Turn on the electric preheater after making sure that there is fuel oil in the heater body. **Do not turn this heater on before heater body is full of oil.**
5. Turn gas pilot valve on and purge air from line.
6. If unit is gas fired, purge air from main gas line.
7. Check oil pressure on the suction side of the pump. The pressure should remain constant at any single setting between 10” vacuum or 5 P.S.I. pressure. If the gauge varies or fluctuates the oil is too hot or there is air in the fuel oil suction line.
8. Check compressor discharge pressure. Low fire pressure should range between 5 and 10 pounds and high fire between 15 and 20 pounds pressure.
9. Turn fuel valve switch to “on” position (motor should start and firing cycle will commence).
10. Turn burner switch to “on” position (motor should start and firing cycle will commence).
11. If motor does not start, check limit controls to determine which control is breaking the control circuit.
12. When the motor starts, observe the sequence of operation. Be sure it is in accordance within those shown in the service manual for the installed control system.
13. **If the water in the boiler is cold at the start, do not allow unit to go to the high fire position.**
14. When the boiler water is hot (feel the low water cut-off pipe work) the unit is warm and can be allowed to go to the high fire position.
15. It will be necessary to adjust the modulating control, for the point (pressure) at which the unit is to begin modulating back to a lower fire.
16. Check pressure limit controls by actually causing limit to break, remove front cover of control and observe operation of control.
17. Check operation of condensate tank with relation to keeping sufficient water supply available.

TO STOP BURNER

1. Pull blower and control switch.
2. Do not pull feedwater pump switch until boiler has cooled.

IF BURNER DOES NOT START

1. Check all electric fuses.
2. Check water level in boiler.
3. Check limit controls to make sure they are working.
4. Push motor reset button.
5. Push reset button on the programming control. If burner then fails to start call your York-Shipley Global Representative.

Installed by _____

Address _____

Phone _____

Date of Installation _____

693 North Hills Rd
York, PA 17402
Telephone: (717) 755-1081
Fax: (717) 755-0020

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