

## XII Service and Maintenance

**The following routine maintenance should be performed:**

**On a continuous basis:**

- 1) Keep the area around the boiler free and clear from combustible materials, gasoline, and other flammable vapors and liquids.
- 2) Keep the area around the boiler and boiler room ventilation openings clear of objects which might obstruct the flow of combustion and ventilation air.

**On an annual basis:**

- 1) Turn off electrical power and gas supply to the boiler.
- 2) Inspect the flue passages for signs of blockage. If there is any carbon in the combustion chamber or the flue passages, clean the heat exchanger before proceeding further. See the cleaning procedure on the next page.
- 3) Remove any debris found in the combustion chamber, being careful not to disturb combustion chamber insulation.
- 4) Remove all burners, noting the location of the pilot main burner. If burners show signs of deterioration, they should be replaced (some discoloration around the burner ports is normal). Clean the burners by first brushing the ports with a soft bristle brush and then vacuuming out any debris through the venturi opening.
- 5) Inspect the pilot assembly. Clean any deposits found on the electrode and grounding strap. The ideal gap between the electrode and the ground strap is 1/8". Inspect the porcelain for cracks or other deterioration. Replace pilot assembly if deterioration is found.
- 6) Inspect the combustion chamber insulation for deterioration.
- 7) Inspect the ignition cable insulation for cracks or other deterioration. If deterioration is found, replace cable.
- 8) Reinstall burners, being careful to put the pilot main burner in its original location.
- 9) Inspect all boiler wiring for loose connections or deterioration.

### CAUTION

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION. VERIFY PROPER OPERATION AFTER SERVICING.

- 10) Inspect the vent system:
  - Make sure that the vent system is free of obstructions.
  - Make sure that all vent system supports are intact.
  - Inspect joints for signs of condensate or flue gas leakage.
  - Inspect venting components for corrosion or other deterioration. Replace any defective vent components.
- 11) Inspect the boiler system for leaks.

### CAUTION

WATER LEAKS CAN CAUSE SEVERE CORROSION DAMAGE TO THE BOILER OR OTHER SYSTEM COMPONENTS. REPAIR ANY LEAKS FOUND IMMEDIATELY.

- 12) Place the boiler back in operation using the procedure outlined in "Start-up". Check the pilot line and any other gas piping disturbed during the inspection process for leaks.

## Heat Exchanger Cleaning Procedure

- 1) Turn off electrical power and gas supply to the boiler.
- 2) Disconnect the vent connector from the boiler.
- 3) Remove the blocked vent switch and the draft hood.
- 4) Remove the door panel and the top jacket panel.
- 5) Remove the burner access panels.
- 6) Remove the burners and inspect them for foreign debris and restrictions.
- 7) Clean the burners with a soft bristle brush and vacuum as necessary.
- 8) Remove the nuts and washers holding the flue collector onto the heat exchanger.
- 9) Remove the flue collector from the heat exchanger.
- 10) Clean the flue passageways using a stiff bristle brush. Be certain that all foreign material is removed from the gaps between the pins.
- 11) Clean the bottom surfaces of the heat exchanger.
- 12) Put a light in the combustion chamber and look through the flue passages from the top to verify that they have been thoroughly cleaned.
- 13) Replace the nuts and washers that hold down the flue collector.
- 14) Reseal the flue collector to the heat exchanger using furnace cement. The flue collector must be thoroughly sealed to the heat exchanger.
- 15) Reattach all the jacket components.
- 16) Reinstall burners, being careful to put the pilot main burner in its' original location.
- 17) Reinstall the draft hood. Reinstall the blocked vent switch on the skirt of the draft hood as shown in Figure 16.
- 18) Reconnect the vent system including the optional vent damper (if previously installed).

### WARNING

SOOT DEPOSITS IN THE FLUE PASSAGES ARE A SIGN THAT THE BOILER MAY BE OPERATING AT HIGH CARBON MONOXIDE (CO) LEVELS. AFTER CLEANING THE BOILER OF SOOT DEPOSITS, CHECK THE CO LEVEL IN THE FLUE GAS TO INSURE THAT THE BOILER IS OPERATING PROPERLY.

If it is necessary to check CO, use a combustion analyzer, or other instrument which is designed to measure CO in flue gas. A CO "sniffer" designed for testing CO levels in ambient air cannot be used to check boiler combustion. Take a flue gas sample by inserting a sample probe through a small (approx. 1/4") hole drilled in the draft hood pipe below the skirt. Do not take a sample until the boiler has been firing for at least five minutes. Be sure to seal the sample hole after test.

A normal CO reading for a Series 16 boiler is less than 50ppm (0.005%). A reading of more than 100ppm (0.01%) is indicative of a combustion problem.

Some causes of excessive CO include:

- Incorrectly sized main burner orifice for the altitude at which boiler is installed
- Crooked or out-of-round orifice holes (never attempt to drill orifice for this boiler in the field)
- Partially plugged flue passages
- Improper manifold pressure
- Foreign material in burner venturis or burner ports
- Leak in seal between flue collector and heat exchanger
- Inadequate supply of combustion air
- Draft hood which has been cut or modified