

Procedure for Cleaning Trinity Combustion Chamber

To maintain peak operating performance of any heat exchanger it is important that the heat exchanging surfaces be kept clean and free of foreign debris, which will act as an insulator and an obstruction to the efficient exchange of heat. Failure to clean the Trinity heat exchanger will result in the following problems:

- 1) Increase in stack temperature.
- 2) Blocked combustion passages.
- 3) Reduction in heating capacity.
- 4) Rough ignition.
- 5) Ignition failure.
- 6) Heat exchanger failure.

The main factors contributing to the build-up of dirt in the Trinity heat exchanger are as follows:

- 1) Cleanliness of the combustion air.
- 2) Sulfur content in the gas.
- 3) Level and frequency of condensation forming in the heat exchanger.
- 4) Amount of burner operation.

The build up of burnt dust and cooked-on Sulfur residue generally only occurs in the primary side of the boilers heat exchanger. The same build-up does not occur in the secondary side of the boilers heat exchanger due to the lack of direct heat from the burner acting as a catalyst and due to the presence of condensation acting to flush away any such possible build-up. This same phenomena can occur in the primary heat exchanger if it is also producing condensate, however, this generally only occurs in applications where the supply water temperature is often below 100°F while the burner is operating.

The rate of build-up will vary in every application due to variations in the above-mentioned factors. However, it is important that the boiler primary heat exchanger (combustion chamber) be checked for build-up at-least once every two heating seasons or sooner if the boiler has been converted to operate with LP Gas. Once you have established the rate of build up for each installation, you will be able to develop a cleaning schedule.



The cleaning procedure is as follows:

- 1) Turn off gas and power supply to unit.
- 2) Remove cover, and disconnect fresh-air intake pipe and gas line.
- 3) On T-Series boilers remove the left side panel and the igniter and flame probe. (Be careful not to break the igniter)
- 4) Remove wiring harnesses and tubes from combustion blower and gas valve assembly. (Carefully label the proper location for each tube removed)
- 5) Remove the burner door assembly, complete with blower and gas valve, from the heat exchanger.

- 6) Document or photograph the heat exchanger and record the duration of service. (This will aid in developing a cleaning schedule)
- 7) Using an Allen, or hex head key, remove the insulation from the back of the combustion chamber. Replace if necessary.
- 8) Vacuum out the loose combusted dust deposits and debris from the heat exchanger. Use a nylon or other nonmetallic brush to loosen surface deposits. Vacuum out again if necessary.



- 9) If you have an NTI cleaning wand Pn. 82721 you may install the wand onto the boiler where the burner door was located.

- 10) Remove the condensate trap and allow the tube to drain straight into a bucket.
- 11) Connect wand to pressure washer, and begin to wash. Push wand in and out repetitively while washing. Continue until the water exiting the condensate drain is clear. Wash for at least 5 minutes, oscillating trigger frequently. If not clean after door is removed, brush again to removed caked on material and repeat the process.



If a cleaning wand is not available, a bucket half filled with warm water and a sponge can be used. Remove condensate trap as described above and place an empty bucket under the condensate drain. Place towels in the bottom of the boiler cabinet and over the boiler controls. Soak the tubes with the sponge then scrub with the nylon brush. Continue to until passages are free and clear.

- 12) Re-apply the burner door and if necessary replace the gaskets. To properly seal the burner door assembly boilers with serial numbers lower then 02T-2152 kit #82379 for T150's or kit #82381 for T200s may be required. For other T-series boilers kit #82673 should be used.
- 13) Reconnect the wiring harnesses, combustion air intake and gas piping, check for gas leaks.
- 14) Properly reinstall the condensate trap and check the entire boiler for combustion leaks. With the gas turned off put a call for heat on and allow the boiler to reach full fan speed. Then temporarily block the exhaust vent and use a soap and water mixture to check for leaks throughout the boiler assembly.
- 15) Once no leaks are found remove the blockage from the exhaust vent and turn the gas on. Check for proper operation including smooth ignitions, proper combustion and flame signal at the low and high firing rates.