

This boiler installation is not complete until these instructions are attached adjacent to the boiler.

### FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

Service on this boiler should be undertaken only by trained and skilled personnel from a qualified service agency. Inspection should be done annually.

### FOR YOUR SAFETY

#### IF YOU SMELL GAS:

1. Open windows.
2. Don't touch electrical switches.
3. Extinguish any open flame.
4. Immediately call your gas supplier.

Your boiler should be inspected, cleaned and, if necessary, adjusted once a year. It is recommended that a trained serviceman be called for this job.

Keep the boiler and area around the boiler clear of combustible materials. Do not block the flow of air to the boiler.

### CAUTION

DO NOT ADD LARGE AMOUNTS OF COLD WATER TO A HOT BOILER.

Should overheating occur or the gas supply fail to shut off, do not turn off or disconnect the electrical supply to the pump. Instead, shut off the gas supply at a location external to the appliance.

### FILLING BOILER AND HEATING SYSTEM WITH WATER

1. Close manual air vents.
2. Fill and heat to 210°F for 15 minutes to drive off dissolved gases.
  - a. Open manual water feed valve.
  - b. Starting on the lowest floor, open the air vents one at a time until water squirts out; close valve.
  - c. Repeat with remaining vents.
  - d. Close manual water valve when correct boiler pressure is reached.

Keep the system filled by occasionally opening the air vents as in Step 2 above. Add water to make up system pressure.

### OPERATING INSTRUCTIONS

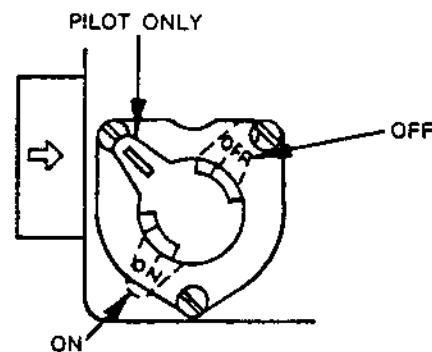
#### TO PLACE IN OPERATION

1. Turn on the electric power supply to boiler.
2. Open manual main shut-off gas valve. (Figure 1)
3. Move indicator on thermostat to call for heat.

### IF BOILER FAILS TO START

#### CHECK THE FOLLOWING

1. Check for loose connections and blown fuses.
2. Be sure the high limit control setting is above the boiler temperature.
3. Be sure thermostat is set above room temperature.
4. Make sure that gas is turned on at meter.
5. Make sure manual main shut-off valve is open. (Figure 1)
6. If the above checks do not eliminate the trouble, call your serviceman.



MANUAL MAIN SHUT OFF VALVE  
FIGURE 1

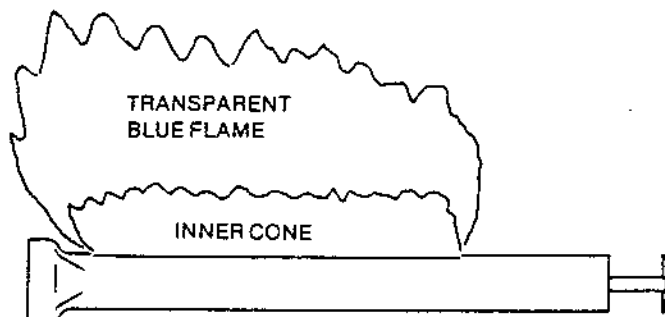
### CHECK MAIN BURNER FLAMES

Frequently check the flames of the main burners to be sure of proper operation. If you suspect the boiler is being overfired or underfired, shut-off the gas supply and call your gas utility or serviceman to measure the gas input to the boiler. Characteristics of overfiring or underfiring are as follows:

1. Overfired: Flames seem unusually large, not confined to boiler base, or lick out from under base.

2. Underfired: Flames seem unusually small; flames occur inside burner tubes.

Figure 2 below shows a proper main burner flame. The upper cone of the flame should be of a transparent blue color. Yellow-orange streaks are usually caused by burning dust and should not be confused with the pale yellow tipping usually caused by the lack of primary air. The proper amount of primary air for combustion has been built into your burners to eliminate the need for air adjustments. If yellow tipping occurs, contact your serviceman to determine its cause and make necessary adjustments.



TYPICAL MAIN BURNER FLAME  
FIGURE 2

### BOILER SERVICE AND MAINTENANCE

Leaks in the boiler and piping system must be repaired at once. Makeup water in large quantities may damage the boiler after an extended period of time. If leaks occur, stop the gas supply and gradually reduce water boiler temperature. Repair leaks before proceeding.

Do not try "homemade cures" or boiler "patent medicines" on the market under various trade names, as serious damage to the boiler, persons and/or property may result.

Periodically, check the seal afforded by any gasket installed on the boiler or heating system (circulator, etc.). If necessary, tighten all bolts sufficiently to stop leaking.

#### CAUTION

NEVER USE PETROLEUM BASED  
STOP-LEAK OR CHEMICAL  
CLEANING COMPOUNDS.

DO NOT DRAIN BOILER during periods of shutdown unless heating system is exposed to freezing temperatures. Periodically open boiler drain cock to remove impurities that have settled to the bottom of the boiler. Refill as required to correct water pressure.

If maintenance is to be performed on boiler, turn off all electrical power connections to the boiler and its auxiliaries. Clean all carbon, rust, and other deposits from the fire-side of the boiler heating surfaces (see Cleaning Boiler Heating Surfaces). If the water side of the boiler must be cleaned or inspected, open the drain valve and drain the boiler. Hose the inside of the boiler with high pressure water to remove sludge and sediment. Flush again. Replace plugs and jacket panels when all traces of sludge and sediment have been removed. Refill with fresh water and heat to release dissolved gases (see Filling Boiler and Heating System With Water). Repeated draining and filling can lead to the same consequences as adding too much makeup water—this is mainly true in areas where water is "hard" and the same precautions must be used as indicated earlier in this section.

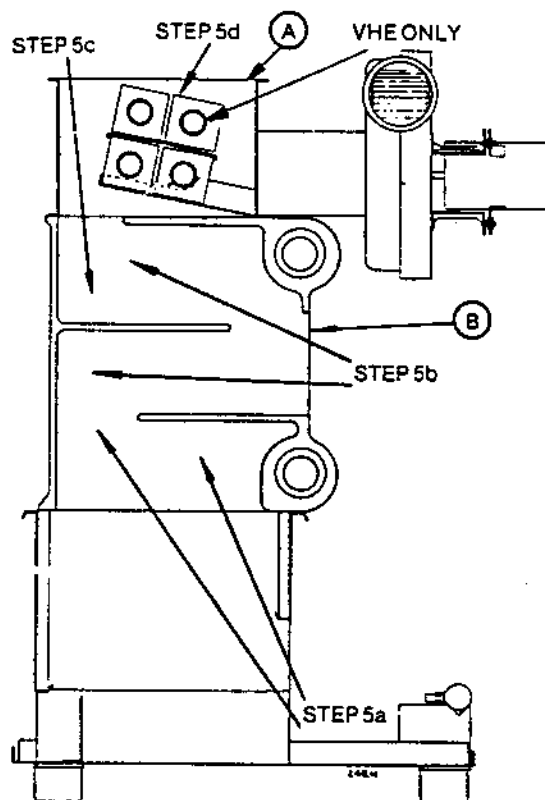
### SHUT DOWN OF BOILER

1. Close manual main shut-off gas valve.
2. Turn off main electric switch in the boiler electrical circuit.
3. Open the boiler drain cock to remove impurities. It may be necessary to drain one or two gallons of water to remove all sediment. Refill the boiler to the proper water pressure (see Filling Boiler). Boiler water does not have to be crystal clear for proper operation, but be free of sludge or sediment.
4. Drain heating and plumbing system only to prevent freezing.

### CLEANING BOILER HEATING SURFACES

After each heating season inspect the flues. Contact your serviceman if soot is found. To clean flues:

1. Shut down boiler according to Items 1 and 2 above.
2. Remove the top jacket panels. Remove the front and interior jacket panels.
3. Remove the flue collector cover (A) and front cleanout cover (B).
4. Remove the burners.
5. Refer to Figure 3 and thoroughly clean all heating surfaces with a flue brush as illustrated.
  - a. Clean bottom through the base of the boiler.
  - b. Clean middle through the cleanout port.
  - c. Clean top through the flue collector.
  - d. Clean VHE heat exchanger with water and/or compressed air. Check drain for operation after cleaning.
6. Remove all the soot from the boiler.
7. Replace the burners.
8. Replace the flue collector cover (reseal with silicone sealant if necessary) and cleanout cover.
9. Replace the jacket panels.
10. Start the boiler following the start-up procedures outlined.



Refer to Step 5 for cleaning procedures

CLEANING BOILER HEATING SURFACES  
FIGURE 3

## CHECK AND CLEAN THE MAIN BURNERS

Before the heating season starts, check and clean the main burners of dust or lint. Make sure the burners are seated in their slots at the back of the boiler with openings up.

## INSPECT BASE INSULATION

The boiler base, within the combustion zone, is lined with high temperature refractory insulation board. Periodically check that refractory is secure against all four sides of base. If refractory becomes damaged or displaced, call serviceman immediately. Do not operate boiler.

## INSPECT VENTING SYSTEM

The complete boiler venting system must be inspected for proper function and for any deterioration of materials.

For all VHE boilers and HE boilers with 3" diameter venting systems, check the gas-tight seal at all vent pipe connections. Call your serviceman to correct any joints that are not gas-tight.

Inspect all portions of the venting systems for deterioration from corrosion, physical damage, sagging, etc. Call your serviceman to correct any problems found.

## BOILER CONTROLS AND ACCESSORIES

### CIRCULATOR CARE:

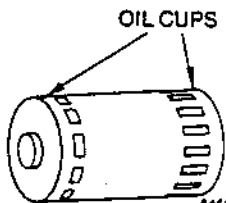
Never operate the circulator without water.

- Follow lubricating instructions on circulators that are provided with oil cups or oil holes.
- Follow venting instructions on circulators with water lubricated bearings which require no oil. Occasionally a water lubricated circulator will require manual start after a long shutdown. With system "calling for heat," bump outboard end of circulator with palm of hand and it should start. For those with plug on outboard end, remove plug (a little water will run out) and give shaft end a twist with screw driver; replace plug.

### BLOWER MOTOR

Lubricate front and back blower motor bearing at the oil cup locations shown in Figure 4 with a few drops of S.A.E. 20 motor oil every six months.

BLOWER MOTOR  
FIGURE 4



### BOILER PRESSURE

In general, the fill pressure for most heating systems is 12 pounds per square inch. Normal system pressure will change when the system is cold and rise to its highest pressure when the system is hot.

### BOILER WATER TEMPERATURE

HE/VHE hot water heating systems may be operated at temperatures up to 220°F. The high limit control may be raised or lowered depending upon your system requirements.

### WATER EXPANSION

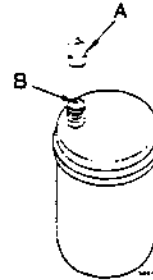
Water expands as it is heated. Tanks are used to give a place for the increased water volume to go. Contact your serviceman if you experience frequent opening of the pressure relief valve.

Open Type Expansion Tanks are located above the highest heat distributing unit in the system, usually in a closet or attic space, and are equipped with a gauge glass and an overflow pipe to a drain.

Closed Type Expansion Tanks are usually located just above the boiler but may be located at any point in the heating system.

Closed Diaphragm Type Compression Tanks use a diaphragm to separate air from water. The tank is usually located near the boiler but may be located anywhere in the system. An air eliminating device must be used on the boiler with this type of tank. The tank may be filled with a tire pump to the pressure required.

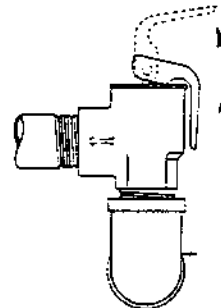
Float Type Air Vents automatically release air from the system. Should the valve leak water, remove cap A and push the valve core B in by hand to clean valve seat. Release valve B and replace cap A. For normal venting unscrew the cap two full turns.



FLOAT TYPE AIR VENT  
FIGURE 5

### WATER RELIEF VALVE

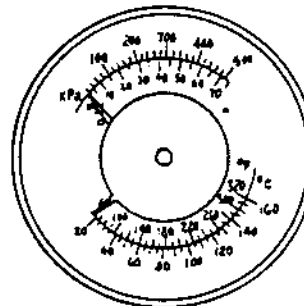
Check the relief valve at least once a year by pulling the handle (as shown in Figure 6) and allowing a small quantity of water to flow. Caution must be taken to make sure the boiler water temperature is low when making this test so the potential of severe burns from hot water or steam will be eliminated. Be sure the valve reseats properly and is entirely free from seepage. If the valve sticks or appears to be clogged, replace immediately. The valve outlet should be piped to a floor drain or near the floor. The valve discharge must not be piped to any area where freezing temperatures could occur.



MANUALLY  
OPENING  
PRESSURE RELIEF VALVE  
FIGURE 6

### PRESSURE-TEMPERATURE GAUGE

Boiler pressure in pounds-per-square-inch is indicated by the top hand (as shown in Figure 7). The bottom hand indicates water temperature in degrees Fahrenheit.



COMBINATION PRESSURE  
TEMPERATURE GAUGE  
FIGURE 7

### HOUSEKEEPING

Keep the area around the boiler clean and free of combustible materials. For your safety, do not store gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.