

# OPERATING INSTRUCTIONS

## for

### WEIL-McLAIN

### OIL BOILER

Mr. Boiler Owner:

Below, the procedure is outlined for starting your Weil-McLain Boiler including instructions for the care of your heating system.

All mechanical equipment needs occasional attention. The boiler should be inspected, cleaned and if necessary, adjusted once a year. We recommend that your serviceman be called as he has been trained for the job and will have the necessary instruments to check your boiler. This will assure you that the operation of your heating system will remain highly efficient. Your Weil-McLain boiler will give you a lifetime of heating comfort, if you follow the few simple suggestions listed on this card.

#### FILLING STEAM AND WATER BOILERS

Do not fill the boiler (except for leakage tests) until the boiler is ready to be fired. **CAUTION:** Do not add large quantities of cold feed water to any hot boiler!

**Steam Systems:** The boiler should be filled to the normal water line and fired for about 15 minutes at a low rate sufficient to keep the boiler at steaming temperature with the steam vented to drive off dissolved gases (also see Skimming Steam Boilers).

**Water Systems:** The boiler and the entire system should be filled to about 12 pounds per square inch and heated to approximately 210°F for about 15 minutes to drive off dissolved gases. Before filling the system, make sure all the system air vents are closed. Open the hand water feed valve and beginning on the lower floor, open the air vents (one at a time) until water starts to flow; then, close the vent. Repeat this throughout the building until all heat distributing units are filled with water. Close

the hand water feed valve when the correct boiler pressure is reached. After the system is in operation, keep the system filled with water by occasionally opening the air vents allowing any entrapped air to escape and adding enough make up water to maintain the correct system pressure. If your system is provided with a purge valve located in the system return piping, connect a garden-hose to the drain valve located above the purge valve. Close the purge valve and open the hand water feed valve and allow the system to purge all air. Where the system has more than one circuit, purge each circuit separately by opening each balancing valve one at a time. When the system is purged of all air, close the drain cock located above the purge valve and open the purge valve. Fill the boiler and the entire system to the correct pressure. Air in the system can interfere with circulation of water and prevent the heat distributing units from properly heating.

#### IMPORTANT: CHECK BEFORE STARTING THE UNIT

Make sure the boiler heating surfaces have been cleaned and that the boiler is filled to the correct water level or pressure. It is recommended that your oil burner serviceman be called to service your burner and check the following points:

1. Clean the strainer.
2. If there is a filter in the fuel oil line, clean it and change the cartridge.

3. Clean all lint and dust out of the fan and blower housing.
4. Check the ignition electrodes and clean or replace the nozzle.
5. Oil the burner motor with detergent free automobile engine oil.
6. Rotate the blower wheel by hand to make certain it turns free.

#### TO START THE UNIT

**CAUTION:** Do not start the burner when the combustion chamber is hot or when oil vapor is present in the boiler. Do not operate the Fuel Oil Pump for more than 2 minutes without fuel oil.

1. Make sure all oil valves in the fuel oil lines are open.
2. For one-pipe fuel oil piping systems, bleed the air out of the piping by opening the unused intake port on the Fuel Oil Pump and waiting for the oil to flow. For two-pipe fuel oil piping systems, air is automatically bled from the system piping.
3. With the main electric switch in the oil burner

electrical circuit in the off position, set the thermostat at a point above the room temperature.

4. Push the safety reset lever on the burner primary control and release.
5. Turn the main electric switch to the on position. If the burner does not start instantly, turn the main electric switch back to the off position and refer to the following section titled If Burner Fails To Start.
6. If the burner starts to operate normally, leave the main electric switch on and reset the thermostat to the desired room temperature.

#### IF BURNER FAILS TO START, CHECK FOLLOWING

1. Check for loose connections and blown fuses.
2. Make sure the thermostat temperature setting is above the room temperature.
3. Be sure all oil valves are open.
4. Be sure there is sufficient fuel oil in the tank to supply the burner.

5. Reset burner primary control by pushing the safety reset lever and releasing.
6. Push reset button on the burner motor.
7. If the burner does not start after observing the above checks, call your serviceman.

## SKIMMING STEAM BOILERS

All new boilers and steam and water piping contain oil, grease, chips, and other foreign matter. It is essential to clean new heating systems to remove these materials in order to avoid overheating of boiler metal, foaming and priming, and high maintenance costs on strainers, traps, and vents. The boiler installer should use the following procedure to clean oil, grease, and other impurities from the new boiler:

1. Close the valves in the building steam supply main(s).
2. Provide a 1¼" to 2½" skim line, with valve, from the boiler skim tapping and run this line to a convenient floor drain.
3. Fire the boiler at a low rate sufficient to keep the boiler at steaming temperature allowing the steam, along with entrained water and impurities, to discharge through the skim piping to the drain.
4. Feed the water to the boiler as required to maintain proper water level in the gauge glass. It may be necessary to cycle the burner to prevent a rise in steam pressure above several pounds.
5. Continue the boiling and skimming process for at least two hours or until the water leaving the

skim line is clear of all grease, oil and impurities. On unusual jobs, the skimming procedure may require repeating one or more times.

**CAUTION - THE USE OF CHEMICAL CLEANERS IS NOT RECOMMENDED!**

6. Drain boiler and, while boiler is warm but NOT HOT, remove safety valve and insert a hose nozzle into the opening. Flush all interior surfaces of the boiler with water under full pressure until all traces of dirt and impurities are removed and the drain water runs clear.
7. Replace safety valve; close drain cock; fill with fresh water to the water-line. Start burner and steam for 15 minutes to remove all dissolved gases; stop burner.
8. Drain boiler sufficiently to remove skim piping; plug skim tapping; refill boiler to waterline.
9. To prevent the return of impurities to the boiler from new or old piping systems, waste all condensate for several days or until no impurities are contained in the condensate. **NOTE - IT IS IMPERATIVE THAT FEEDWATER BE SUPPLIED TO MAINTAIN THE CORRECT WATER LEVEL AND THAT A LOW WATER CUTOFF IS OPERATIVE!**

## BOILER SERVICE AND MAINTENANCE

Leaks in the boiler and piping system must be repaired at once. The use of makeup water in large quantities is undesirable and may damage the boiler after an extended period of time. If serious leaks occur, stop the burner and gradually reduce boiler pressure or temperature. Do not attempt to make repairs while a steam boiler has pressure or hot water boiler temperatures are above 130°F.

Foaming or priming may occur in a steam boiler and cause large quantities of water to pass out into the steam main(s). It can be observed by violent fluctuations of water level, in the gauge glass. This trouble may be caused by dirt, oil, or precipitates in the boiler water, too high a boiler water level, a high overload on the boiler (ie, the sudden release of boiler steam pressure into the mains by action of fast operating valves), or the addition of too much boiler water treatment. With serious foaming or priming, stop the burner and decrease boiler load. Then alternately blowdown and slowly feed fresh water several times. If trouble persists, it may be necessary to skim the boiler one or more additional times.

Any problem in regard to large amounts of makeup water, extreme foaming or priming, scale in the boiler, or internal corrosion or pitting, should be referred to a company specializing in boiler water chemistry. **DO NOT** try "homemade cures" or boiler "patent medicines" on the market under various trade names, as serious damage to the boiler, personnel, and property may result.

Frequently check the boiler water level in the gauge glass of steam boilers, and check the boiler operating pressure of steam or water boilers. Test the low water cutoff by opening its blowdown valve to remove dirt, rust, and sediment, and observe that burner stops as the water level approaches the bot-

tom of the water gauge glass (gauge glass on steam boilers only).

On steam boilers, open the water gauge glass blowdown valve and blow clear; close blowdown valve. If water gauge glass leaks or breaks, close both gauge glass cocks and repair; open gauge cocks after repairing.

Periodically test boiler safety or relief valve(s) to make sure they open at the proper pressure. Make sure that the valve reseats and does not leak. Replace any defective or leaking valve.

Periodically check and if necessary, clean the boiler flues. The frequency of cleaning will depend upon the fuel used, the burner adjustments, boiler temperature, draft conditions, and other job factors. Protect the burner and controls from dust and dirt during cleaning.

**DO NOT DRAIN BOILER** during periods of shutdown unless heating system is exposed to freezing temperatures. On steam boilers, open boiler blowdown valve and flush till clear while under steam pressure. On water boilers, open boiler drain cock to remove impurities that have settled to the bottom of the boiler. Refill as required to the correct water line for steam boilers or the correct pressure for water boilers. 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 in order to protect the boiler from the corrosive action of combustion deposits (see Cleaning Boiler Heating Surfaces). Apply a thin coating of oil or grease if the boiler is to remain out of service for extended periods of time. If the water side of the boiler must be cleaned or inspected, open the blowdown valve and drain the boiler.

Remove plugs from the boiler and open the drain cock. Hose the inside of the boiler with high pressure water to remove sludge and sediment, flush again. Dry insides of boiler thoroughly, or refill with fresh water and heat to release dissolved gases (see Filling Steam and Water Boilers). Repeated

draining and filling of the boiler and/or the heating system can lead to the same consequences as adding too much makeup water – this is mainly true where the makeup water is "hard" and the same precautions must be used as indicated in the second paragraph above.

## SHUT DOWN OF BOILER

1. Turn off the main electric switch.
2. Close all oil valves in the fuel oil lines.
3. Cover the burner to protect it from dust and dampness.
4. Open the boiler drain cock to remove impurities that may have settled to the bottom of the boiler; it may be necessary to drain one or two gallons of water until all traces of sediment are gone.

- Refill the boiler to the proper water level or pressure (see Filling Heating System). Boiler water does not have to be crystal clear for proper operation, but should be free from any sludge or sediment.
5. During severe winter weather have heating system operation checked periodically or thoroughly drain your heating system.

## CLEANING BOILER HEATING (fire-side) SURFACES

At the end of every heating season, it is advisable to clean the flueways in the boiler. Soot is an effective insulator and prevents the hot gases from heating the boiler water as efficiently as possible. The frequency of cleaning will depend upon the fuel used, the burner adjustments, boiler temperature, draft conditions, and other job factors.

Normally the boiler flueways will be cleaned as described below:

1. Remove the flueway opening cover(s).
2. Cover the burner and controls.
3. Insert the wire flue brush supplied with the boiler into the flueways and thoroughly brush the flueways at all angles.

4. Remove any soot or scale from the horizontal flueways, the boiler firebox and the base of the chimney using a vacuum cleaner or brush.
5. Replace the flueway opening cover(s) making sure the original gas-tight seal is maintained.

Chemical additives which can be procured from most heating supply houses or from your fuel oil supplier can be effectively used to clean the boiler flueways; certain types of chemical additives can be added to the fuel oil while other types can be placed on the floor of the firebox. Consult your heating contractor or fuel oil supplier before using any chemicals in the boiler.

## WATER BOILER CONTROLS

### CIRCULATOR CARE:

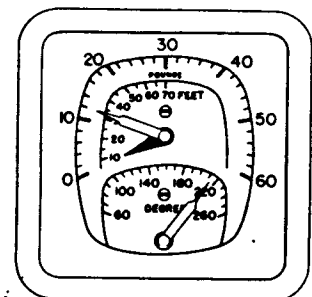
Never operate the circulator without water.

- A. Follow lubricating instructions on circulators that are provided with oil cups or oil holes.
- B. Follow venting instructions on circulators with water lubricated bearings which require no oil.

**BOILER PRESSURE:** The initial fill pressure of a hot water system is generally to 12 pounds per square inch. When the system is heated to the limit control setting, the pressure may range up to 30 pounds per square inch. Normal system pressure will fluctuate between the fill pressure, when the system is cold; and up to 20 to 28 pounds per square inch when the system is hot.

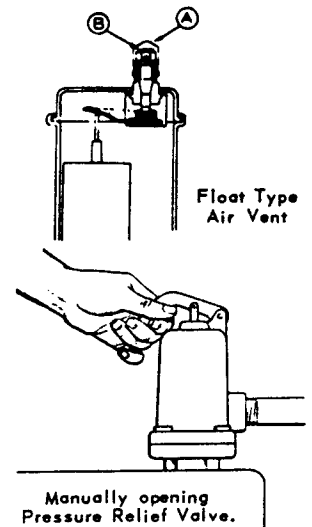
**BOILER WATER TEMPERATURE:** Modern hot water heating systems with "closed" type expansion tanks may operate at water temperatures up to 250° F. Set the high limit control at 220° F; during severe weather you may find this temperature setting needs to be raised or lowered, depending upon the characteristics of your heating system.

**PRESSURE-TEMPERATURE-ALTITUDE GAUGE:** This gauge indicates the boiler pressure in pounds-per-square-inch and in feet of water column (altitude) above the boiler by the moveable hand. The fixed hand may be changed to indicate the proper position for the moveable hand on manually filled hot water heating systems. For those systems with automatic fill valves, the fixed hand is usually left at the zero setting. The third hand indicates the boiler water temperature in degrees fahrenheit.



Combination Pressure -  
Temperature - Altitude Gauge

**FLOAT TYPE AIR VENT:** If your system is provided with a Float Type Air Vent(s) which automatically expells air from the heating system, when the system is filled with water, loosen cap **A** slowly so that particles of dirt or scale are not deposited on the valve seat by the escaping air. Should dirt or scale lodge on the valve seat causing it to leak, remove cap and push the valve core **B** in by hand to permit water to flush the valve seat clean. Release the valve core quickly and replace cap. For normal operation and venting, unscrew the cap at least two turns.

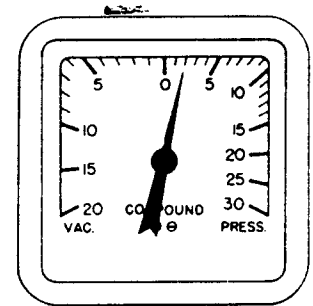


**WATER RELIEF VALVE:** Check the relief valve at least once a year by pulling the handle and allowing a small quantity of water to flow. Be sure the relief valve reseats properly and is entirely free from seepage. If the relief valve sticks or appears to be clogged, it should be repaired or replaced immediately.

## STEAM BOILER CONTROLS

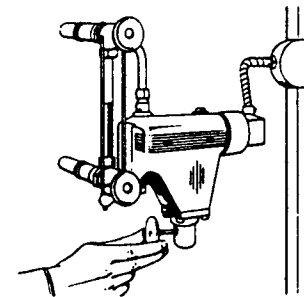
**BOILER PRESSURE.** Steam boiler pressures may range up to 15 psig maximum, but in normal residential service usually will not exceed 5 psig and may even operate under vacuum conditions at certain times.

The compound gauge used for steam boilers indicates steam pressure in pounds per square inch (psig) and boiler vacuum in inches of mercury (hg).



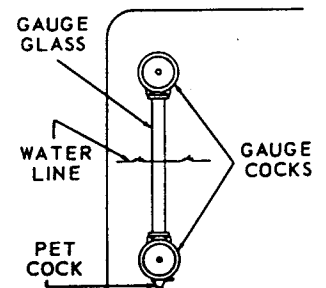
Pressure Gauge.

**CLEANING LOW WATER CUT-OFF.** Accumulated sediment in the low water cut-off should be flushed out through a blow-off valve provided for this purpose at least once each month of heating system operation. If the low water cut-off is internally mounted in the boiler, it is not possible to flush the unit by external means. It may be necessary to have it removed periodically from the boiler and cleaned by your serviceman.



Flushing Low Water Cut-off.

**CLEANING THE GAUGE GLASS.** This may be done by closing the lower gauge glass cock and carefully opening the petcock below the glass to blow water and sediment out of the gauge glass by steam pressure. Then slowly open the lower gauge glass cock, allowing a small amount of water to flush out through the open petcock. Close petcock and fully open the lower gauge glass cock. The water level should immediately rise to its proper level. If gauge glass breaks, close off both gauge cocks and loosen glass retaining nuts to remove gauge glass. Replace broken gauge glass with new gauge glass made of heavy walled pyrex. **DO NOT USE THIN GLASS TUBING!**



Gauge glass.

**CHECKING THE SAFETY VALVE.** The safety valve should open at 15 psig to prevent excessive boiler pressure. Manually open the safety valve once each year by pulling the valve lever or handle and allowing a small amount of steam to escape. This will help to assure proper operation of the safety valve if boiler pressures reach 15 psig. Be sure that the valve reseats properly and does not leak steam. If the safety valve sticks or appears to be clogged it should be repaired or replaced immediately by your serviceman.

**WEIL-McLAIN**

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HYDRONIC  
**Wm**  
DIVISION