

# OSB

## Series 2

## Oil-Fired Steam Boilers

# User's Information Manual

### Hazard definitions

- ▲ DANGER** Hazards that **will cause severe** personal injury, death or substantial property damage.
- ▲ WARNING** Hazards that **can cause severe** personal injury, death or substantial property damage.
- ▲ CAUTION** Hazards that **will or can cause minor** personal injury or property damage.
- NOTICE** Special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

The User's Information Manual provides information to the boiler owner/user for routine operation and maintenance and emergency shutdown. Detailed information on boiler installation, operation, start-up, service and parts is included in the Boiler Manual. The Boiler Manual is intended **only for use by a qualified installer/service technician**.

**▲ WARNING** **INSTALLER** — Please take time to review this User's Information Manual with the boiler owner. Explain all maintenance and service procedures.

**▲ WARNING** **Failure to adhere to the guidelines on this page can result in severe personal injury, death or substantial property damage.**

**▲ WARNING** At the beginning of each heating season, contact your qualified service technician to inspect, clean and start-up the boiler per the Boiler Manual. Failure to comply could result in boiler failure, leading to potential severe personal injury, death or substantial property damage.

### Service and maintenance

1. To avoid electric shock, disconnect electrical supply before performing maintenance.
2. To avoid severe burns, allow boiler to cool before performing maintenance.
3. You must maintain the boiler as outlined in the manual and have the boiler started up and serviced at least annually by a qualified service technician to ensure boiler/system reliability.

### Boiler water

4. DO NOT use petroleum-based cleaning or sealing compounds in boiler system. Water seal deterioration will occur, causing leakage between sections and damage to heating system components. This can result in substantial property damage.
5. DO NOT use "homemade cures" or "boiler patent medicines". Serious damage to boiler, personnel and/or property may result.
6. Continual fresh makeup water will reduce boiler life. Mineral buildup in sections reduces heat transfer, overheats cast iron, and causes section failure. Addition of oxygen and other gases can cause internal corrosion. Leaks in boiler or piping must be repaired at once to prevent makeup water.
7. DO NOT add cold water to hot boiler. Thermal shock can cause sections to crack.

### Boiler operation

8. DO NOT block flow of combustion or ventilation air to boiler. If vent or air blockage is easily accessible and removable, remove it. If blockage is not obvious or cannot be removed, have the boiler and system checked by a qualified service technician.
9. Should overheating occur or oil supply fail to shut off, turn off power to boiler **and** shut off the oil supply at a location external to the appliance.
10. DO NOT use this boiler if any part has been under water. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any burner control that has been under water.
11. Have the building monitored when it is vacant for an extended period. Safety controls can shut down the boiler at any time. The loss of heat can result in significant damage due to freezing.

### Air contamination

12. Carefully read and follow instructions on page 2.

# Please read this page first

## Air contamination

To prevent potential of severe personal injury or death, check for products or areas listed in table below before installing boiler. If any of these contaminants are found, do one of the following:

- Remove contaminants permanently. — or —
- Isolate boiler and provide outside combustion air. See applicable codes for further information. — or —
- Contact your qualified service technician to install an outside air kit (if available) for the burner. An outside air kit allows ducting of outside air directly to the burner.

Products to avoid
Spray cans containing chloro/fluorocarbons
Permanent wave solutions
Chlorinated waxes/cleaners
Chlorine-based swimming pool chemicals
Calcium chloride used for thawing
Sodium chloride used for water softening
Refrigerant leaks
Paint or varnish removers
Hydrochloric acid/muriatic acid
Cements and glues
Antistatic fabric softeners used in clothes dryers
Chlorine-type bleaches, detergents, and cleaning solvents found in household laundry rooms
Adhesives used to fasten building products and other similar products
Areas likely to have contaminants
Dry cleaning/laundry areas and establishments
Swimming pools
Metal fabrication plants
Beauty shops
Refrigeration repair shops
Photo processing plants
Auto body shops
Plastic manufacturing plants
Furniture refinishing areas and establishments
New building construction
Remodeling areas
Garages with workshops

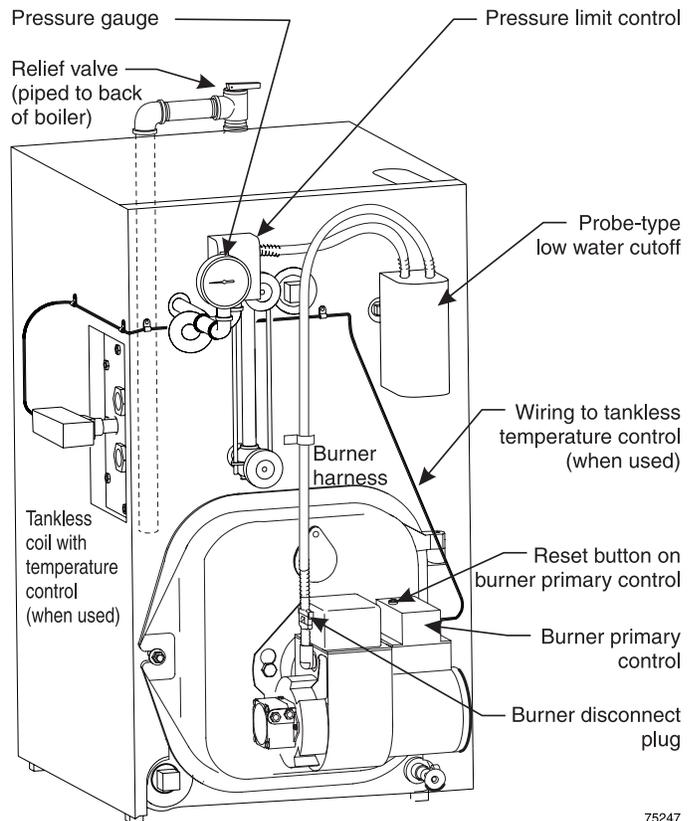
## Start-up

1. If burner does not fire, check for:
  - Boiler switch turned off?
  - Fuses blown or breaker tripped?
  - Thermostat set below room temperature?
  - Fuel valves turned off?
  - Water not visible in gauge glass?
  - Not enough oil in tank to supply burner?
2. Correct problems found in step #1. If burner does not fire, press the reset button on burner primary control only once. Repeated presses will deposit oil in chamber, creating a fire hazard.

**⚠ DANGER** Burner must never be fired when oil is in combustion chamber. Immediately call a qualified service technician.

3. If burner still does not fire, call a qualified service technician.

**Figure 1** Boiler and components



## ☐ Check daily

### Boiler area

1. Check that boiler area is free from combustible materials, gasoline and other flammable vapors and liquids. Ensure that no air-contaminating materials (see above) are present in the area.

### Pressure gauge

1. Pressure gauge must not show more than 15 psig (normally 5 psig). Contact a qualified service technician if high pressure occurs.

### Air openings

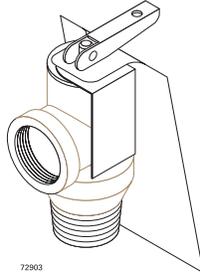
1. Verify that combustion and ventilation air openings to the boiler room and/or building are open and unobstructed.

## Check monthly

### Boiler relief valve

- After following the warning directions below, if the relief valve weeps or will not seat properly, replace the relief valve.

**⚠ DANGER** Before testing, make certain discharge pipe is properly connected to valve outlet and arranged to contain and safely dispose of boiler discharge. Wear gloves to protect your hands from hot surfaces. Verify that discharge piping is installed in accordance with this manual and the instructions on the relief valve tag. Failure to comply will expose operator and others to severe personal injury or death.



**⚠ WARNING** Safety relief valves should be reinspected AT LEAST ONCE EVERY THREE YEARS, by a licensed plumbing contractor or authorized inspection agency, to ensure that the product has not been affected by corrosive water conditions and to ensure that the valve and discharge line have not been altered or tampered with illegally. Certain naturally occurring conditions may corrode the valve or its components over time, rendering the valve inoperative. Such conditions are not detectable unless the valve and its components are physically removed and inspected. This inspection must only be conducted by a plumbing contractor or authorized inspection agency — not by the owner. Failure to reinspect the boiler relief valve as directed could result in unsafe pressure buildup, which can result in severe personal injury, death or substantial property damage.

**⚠ WARNING** Check the setting of the boiler pressure limit control. The control should never be set with a pressure above 10 psig. Operating at a higher pressure can cause damage to the boiler relief valve.

**⚠ WARNING** The boiler relief valve must be tested at least monthly during the heating season to verify the valve and discharge piping flow freely. If corrosion and/or deposits are noticed within the valve body, testing must be performed more often. A “try lever test” must also be performed at the end of any non-service period. Follow the instructions below for a “try lever test”.

- With the system at operating pressure, lift and hold the test lever fully open for at least 5 seconds to flush the valve seat free of sediment and debris. Then release lever and permit the valve to snap shut.

### Venting system

- Visually inspect all parts of the flue gas venting system for any signs of blockage, leakage or joints or deterioration of the piping. Notify your qualified service technician at once if you find any problem.

**⚠ WARNING** Failure to inspect the vent system as noted above and have it repaired by a qualified service technician can result in vent system failure, causing severe personal injury or death.

### Boiler and system piping

- Visually inspect for leaks around piping, circulators, relief valve and other fittings. Check oil lines and boiler air for signs of oil leakage. Immediately call a qualified service technician to repair any leaks.

**⚠ WARNING** Have leaks fixed at once by a qualified service technician. Continual fresh makeup water will reduce boiler life. Minerals can build up in sections, reducing heat transfer, overheating cast iron, and causing section failure.

**⚠ WARNING** Do not use petroleum-based cleaning or sealing compounds in boiler system. Severe damage to boiler and system components can occur, resulting in possible severe personal injury, death or substantial property damage.

## Periodically

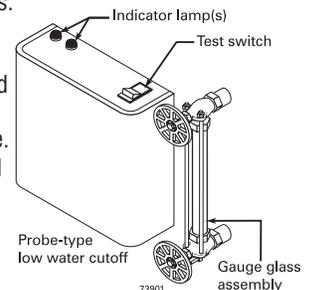
### Oil motors equipped with oil cups

- Burner motors may require oiling. Such motors are fitted with oiling cups. Use a few drops only of S.A.E. 20 detergent oil. Do not use household oils. Excessive oiling can damage motors. Do not attempt to “fill up” the oiling cup.

### Test low water cutoff(s)

#### Probe-type low water cutoff

- Turn off power to boiler and wait 5 minutes.
- Drain water to bottom of gauge glass.
- Turn on power.
- Set thermostat to call for heat. Red neon lamp on low water cutoff should light.
- Wait 5 minutes. Boiler should not fire.
- Refill boiler to correct water line. Red lamp should go off.
- Wait 5 minutes. Boiler should fire.
- Return thermostat to normal setting.



#### Float-type low water cutoff (by others, if used)

- Blowdown control and test per control manufacturer's instructions.

**⚠ DANGER** Scald potential. Do not blowdown low water cutoff unless blowdown piping has been installed according to control manufacturer's instructions. If piping is not installed, call a qualified service technician.

## End of season shutdown

- Do not drain boiler unless exposure to freezing temperatures will occur.
- Always keep manual fuel supply shut off if burner is shut down for an extended period.
  - Turn off switch to boiler.
  - Close fuel valves.
  - Turn off water feed valve.
  - Cover burner to protect from dust and dampness.

## Troubleshooting

- See page 4.

## ❑ Troubleshooting

Troubleshooting – Common problems and possible solutions		
Symptom	Common Causes	Possible Corrections
Rapid cycling — boiler turns on and off frequently	Thermostat installed where drafts or heat affect reading	Locate thermostat on inner wall away from heat sources or cool drafts.
	Heat anticipator in thermostat adjusted incorrectly	Adjust thermostat per manufacturer's instructions.
	Incorrect limit setting	Set limit according to system needs. Maximum setting is 15 psig (should not set limit higher than 12 psig). Increase limit setting to decrease cycling.
	Main air vent not working (one-pipe steam) or trap not working (two-pipe steam)	Contact service technician to check/replace main air vent or trap.
Frequent release of water through relief valve	Inoperative limit control	Call qualified service technician to replace limit control.
Need to frequently add makeup water	Leaks in boiler or piping	Have qualified service technician repair leaks at once to avoid constant use of makeup water. Makeup water can cause mineral deposits which, in turn, can cause boiler section failure.
Black water condition	Oxygen corrosion due to leaks in boiler and piping	Have qualified service technician repair at once. Keep pH of water between 7.0 to 8.5.
Popping or percolating noise heard in boiler	Mineral deposits in sections due to constant use of makeup water	Call qualified service technician to de-lime boiler, if necessary. In some cases, deposits will be too heavy to remove with de-liming procedures. Have qualified service technician repair leaks to eliminate need for constant makeup water.
	Incorrect pH of boiler water	Call qualified service technician to check pH level and correct. pH should be maintained between 7.0 to 8.5.
Water disappears from gauge glass and back out into system through return piping	Incorrect piping in Hartford loop	Call qualified service technician to inspect. Correct piping, if necessary, to agree exactly with Boiler Manual. Clean or replace check valve or vacuum breaker if required.
	Check-valve inoperative or leaking	
	Vacuum breaker inoperative	
Metal flakes found in vent outlet or vent — flueway corrosion	Contaminated combustion air supply — See page 2 in this manual.	Remove any contaminating products. See page 2 in this manual. Provide outside air for combustion. Kit available through local distributor. Have qualified service technician pipe-up kit.
	Condensation of combustion gases in boiler sections	Have qualified service technician inspect system piping and controls to verify proper regulation of return water temperature.
Some radiators or baseboard units do not heat	Main (or radiator) air vents (one-pipe steam) or traps (two-pipe steam) not operating correctly	Call qualified service technician to inspect/replace air vents or traps
	High limit set too low	Adjust high limit to higher setting.
Violent waterline fluctuations or surging	Dirt, oil or other impurities in water	Call qualified service technician to skim boiler, referring to Boiler Manual for procedure.
	Waterline too high	Correct waterline to maximum height of gauge glass, minimum height of ¼” above bottom of gauge glass.
Water passing into steam mains — priming	Incorrect piping	Call qualified service technician to inspect piping, correcting to exactly as shown in Boiler Manual, if not as shown.
	Sudden release of boiler steam pressure by action of zone valves	Call qualified service technician to inspect, adjusting valves or replacing with slow-opening valves if necessary.
Domestic water from tankless heater is hot then suddenly turns cold. — or — Domestic water from tankless heater is always lukewarm.	Mineral deposits insulate internal waterways of heater	Have qualified service technician delime or replace coil.
	Boiler stop-leak compound has been added to boiler water and is insulating outside of coil	Have qualified service technician remove and clean coil <b>and</b> drain and flush boiler to remove stop-leak.
	Incorrect mixing valve setting for tankless heater	Have qualified service technician adjust mixing valve setting.
	Domestic flow rate too high	Have qualified service technician install flow check valve set to rating of tankless heater.
	Incorrect setting on tankless heater control	Have qualified service technician raise tankless control setting. Adjust differential on tankless control to lower setting.

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