



GSA

Gas-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.

WARNING The Boiler manual is for use only by a qualified heating installer/service technician. Refer only to this User's Information Manual for your reference. Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury (exposure to hazardous materials) or loss of life. Installation and service must be performed by a qualified installer, service agency or the gas supplier (who must read and follow the supplied instructions before installing, servicing, or removing this boiler. This boiler contains materials that have been identified as carcinogenic, or possibly carcinogenic, to humans).

Propane gas odorant

WARNING **Propane boilers only** — Your propane supplier mixes an odorant with the propane to make its presence detectable. In some instances, the odorant can fade and the gas may no longer have an odor.

- Propane gas can accumulate at floor level. Smell near the floor for the gas odorant or any unusual odor. If you suspect a leak, do not attempt to light the pilot.
- Use caution when attempting to light the propane pilot. This should be done by a qualified service technician, particularly if pilot outages are common.
- Periodically check the odorant level of your gas.
- Inspect boiler and system at least yearly to make sure all gas piping is leak-tight.
- Consult your propane supplier regarding installation of a gas leak detector. There are some products on the market intended for this purpose. Your supplier may be able to suggest an appropriate device.

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

WARNING If the information in this manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

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

WHAT TO DO IF YOU SMELL GAS

- **Do not try to light any appliance.**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

Installation and service must be performed by a qualified installer, service technician or the gas supplier.

Please read this page first

WARNING Failure to adhere to the guidelines on this page can result in 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 operation

4. DO NOT block flow of combustion or ventilation air to boiler. GSA boilers are equipped with controls which will automatically shut down the boiler should the vent be blocked. Should the boiler shut down due to blockage, these devices must be reset or replaced only by a qualified installer/service technician.
5. Should overheating occur or gas supply fail to shut off, do not turn off or disconnect electrical supply to pump. Instead, shut off the gas supply at a location external to the appliance.
6. 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 gas control that has been under water.
7. 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.

Boiler water

8. 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.
9. DO NOT use "homemade cures" or "boiler patent medicines". Serious damage to boiler, personnel and/or property may result.
10. 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.
11. DO NOT add cold water to hot boiler. Thermal shock can cause sections to crack.

Air contamination

12. 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.

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

To locate Lighting Instructions:

Find your boiler model number on boiler nameplate (begins with GSA). Read the valve manufacturer’s model and name on the boiler gas valve. Locate the correct “Lighting Instruction” using the table below. Use only the Instructions applying to your boiler model and gas valve. If you are in doubt which to use, please contact your boiler installer/ technician for assistance.

GSA standing pilot With gas valve:	Boiler models	Page
Honeywell VR8200 or VR8300	GSA-075 through GSA-250	4
Robertshaw 7200	GSA-075 through GSA-175	5

Maintain your boiler using this schedule:

Service technician (covered in Boiler Manual — for use only by a qualified service technician)	Owner maintenance (see pages 6 – 8 for instructions)
ANNUAL START-UP	
<ul style="list-style-type: none"> <input type="checkbox"/> Inspect: <ul style="list-style-type: none"> • Reported problems • Boiler area • Air openings • Flue gas vent system • Pilot and main burner flames • Piping • Boiler heating surfaces • Burners and base <input type="checkbox"/> Service: <ul style="list-style-type: none"> • Gauge glass <input type="checkbox"/> Start-up: <ul style="list-style-type: none"> • Perform start-up per manual <input type="checkbox"/> Check/test: <ul style="list-style-type: none"> • Gas piping • Boiler waterline • Limit controls and cutoffs • Boiler relief valve <input type="checkbox"/> Review: <ul style="list-style-type: none"> • Review with owner 	<ul style="list-style-type: none"> <input type="checkbox"/> Daily <ul style="list-style-type: none"> • Check boiler area • Check boiler pressure gauge • Check air openings <input type="checkbox"/> Monthly <ul style="list-style-type: none"> • Check boiler and system piping • Check venting system • Check/operate boiler relief valve • Check pilot and main burner flames <input type="checkbox"/> Periodically <ul style="list-style-type: none"> • Test low water cutoff <input type="checkbox"/> End of season <ul style="list-style-type: none"> • Shut down procedure

Lighting Instructions

GSA-075 through GSA-250

Gas valve — Honeywell VR8200/VR8300

FOR YOUR SAFETY READ BEFORE LIGHTING

WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

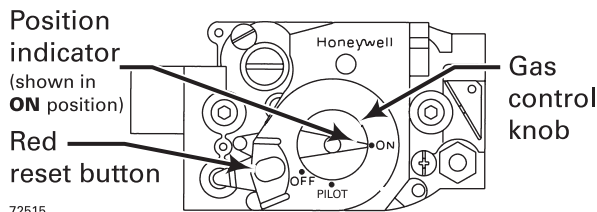
- A. This appliance has a pilot, which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
- B. Before **LIGHTING**, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.
- C. Use only your hand to push down the reset button or turn the gas control knob. Never use tools. If the knob or reset button will not operate by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

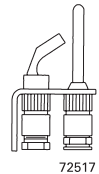
LIGHTING INSTRUCTIONS

1. **Stop!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. When equipped with **Effikal** vent damper **Model RVGP**, place service switch in **Hold Damper Open** position.
4. Turn off all electrical power to the appliance.
5. When equipped with **Johnson Controls** vent damper **Model M35**, manually rotate damper blade in direction of arrow to **Open** position indicated on damper assembly.
6. Turn gas control knob clockwise ↻ to **OFF**.
7. When equipped with vent damper, verify damper blade is in full open position.



8. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information above. If you don't smell gas, go to the next step.

9. Remove access panel located above burners.
10. Find pilot — follow metal tube from gas control. The pilot is between two burners behind the access panel.
11. Turn gas control knob counterclockwise ↺ to **PILOT**.
12. Push in red reset button and hold. Immediately light the pilot with a match. Continue to hold reset button in for about one (1) minute after the pilot is lit.
13. Release reset button. Pilot should remain lit. If pilot goes out, repeat steps 6 through 13.
 - If reset button stays depressed after release, stop and immediately call your service technician or gas supplier.
 - If the pilot will not stay lit after several tries, turn the gas control knob clockwise ↻ to **OFF** and call your service technician or gas supplier.
14. Replace access panel.
15. Turn gas control knob counterclockwise ↺ to **ON**.
16. Turn on all electric power to the appliance.
17. When equipped with **Effikal** vent damper, place service switch in **Automatic Operation** position.
18. Set thermostat to desired setting.
19. Replace front panel.



TOTURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Turn gas control knob clockwise ↻ to **OFF**.
5. Replace front panel.

Lighting Instructions

GSA-075 through GSA-175

Gas valve — Robertshaw 7200

FOR YOUR SAFETY READ BEFORE LIGHTING

WARNING If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

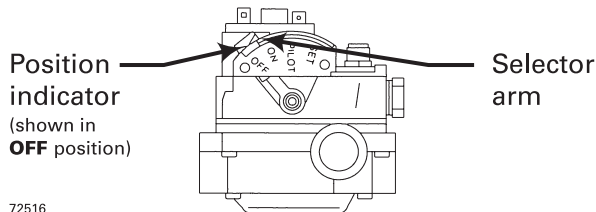
- A. This appliance has a pilot, which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
- B. Before **LIGHTING**, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.
- C. Use only your hand to push down the reset button or turn the gas control knob. Never use tools. If the knob or reset button will not operate by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

LIGHTING INSTRUCTIONS

1. **Stop!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. When equipped with **Effikal** vent damper **Model RVGP**, place service switch in **Hold Damper Open** position.
4. Turn off all electrical power to the appliance.
5. When equipped with **Johnson Controls** vent damper **Model M35**, manually rotate damper blade in direction of arrow to **Open** position indicated on damper assembly.
6. Depress and move selector arm left ↶ to **OFF**.
7. When equipped with vent damper, verify damper blade is in full open position.
8. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information above. If you don't smell gas, go to the next step.
9. Remove access panel located above burners.
10. Find pilot — follow metal tube from gas control. The pilot is between two burners behind the access panel.
11. Move selector arm on gas control right ↷ to **SET** position.
12. Hold selector arm in **SET** position and immediately light the pilot with a match. Continue to hold selector arm to **SET** for about one-half (1/2) minute after the pilot is lit.
13. Release selector arm. If pilot does not remain lit, repeat steps 6 through 13.
 - If the pilot will not stay lit after several tries, move selector arm left ↶ to **OFF** and call your service technician or gas supplier.
14. Replace access panel.
15. Turn selector arm left ↶ to **ON**.
16. Turn on all electric power to the appliance.
17. When equipped with **Effikal** vent damper, place service switch in **Automatic Operation** position.
18. Set thermostat to desired setting.
19. Replace front panel.



72516

TO TURN OFF GAS TO THE APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove front panel.
4. Depress and move selector arm left ↶ to **OFF**.
5. Replace front panel.

Maintenance procedures

WARNING The boiler should be inspected and started annually, at the beginning of the heating season, only by a qualified service technician. In addition, the maintenance and care of the boiler designated on page 3 and explained on the following pages must be performed to assure maximum boiler efficiency and reliability. Failure to service and maintain the boiler and system could result in equipment failure, causing possible severe personal injury, death or substantial property damage.

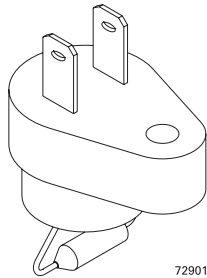
NOTICE The following information provides detailed instructions for completing the maintenance items listed in “Maintain your boiler using this schedule” on page 3. In addition to this maintenance, the boiler must be serviced and started up at the beginning of each heating season by a qualified service technician. See page 8 for “Troubleshooting” procedures for common problems.

Component information

Rollout thermal fuse element

The Rollout TFE is located above the burners. It cuts off gas flow should flame rollout occur.

WARNING Do not attempt to place boiler in operation if rollout thermal fuse element cuts off gas flow. Immediately call a service technician. Failure to do so can cause severe personal injury, death or substantial property damage.

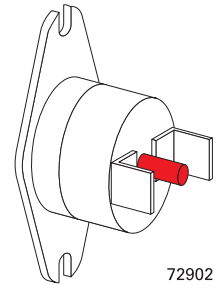


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Spill switch

The Spill switch is attached to the draft diverter. It cuts off gas flow if the vent system becomes blocked.

WARNING Do not attempt to place boiler in operation if spill switch cuts off gas flow. Immediately call a service technician. Failure to do so can cause severe personal injury, death or substantial property damage.



72902

☐ Check daily

Boiler area

WARNING To prevent potential of severe personal injury, death or substantial property damage, eliminate all materials discussed below from the boiler vicinity. If found:

8201 W. Calumet Rd.

Milwaukee, WI 53223 property damage, eliminate all materials discussed below from the boiler vicinity. If found:

- Remove products immediately from the area. If they have been there for an extended period, call a qualified service technician to inspect the boiler and vent system for possible damage from acid corrosion.
 - If products cannot be removed, immediately call a qualified service technician to install an outside combustion air source for the boiler (if not already installed).
1. Combustible/flammable materials — Do not store combustible materials, gasoline or any other flammable vapors or liquids near the boiler. Remove immediately if found.
 2. Air contaminants — See listing of contaminants on page 2.

Pressure gauge

1. Make sure the pressure reading on the boiler pressure gauge does not exceed 15 psig. Normal operation is usually less than 5 psig. At certain times the system may be under vacuum conditions.
2. Contact a qualified service technician if problem persists.

Air openings

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

☐ Check monthly

Boiler and system piping

1. Visually inspect for leaks around piping, relief valve and other fittings. 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.

Venting system

1. Visually inspect all parts of the flue gas venting system for any signs of blockage, leakage or joints or deterioration of the piping.
2. Check vent system operation:
 - a. With boiler firing, hold a candle or match below lower edge of draft diverter “skirt.” If flame does not blow out, but burns undisturbed, the vent system is working properly. If flame blows out or flickers severely, the vent system must be checked for obstructions or other causes of improper venting.
 - b. Verify the vent damper opens before burners ignite.
3. 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.

☐ Check monthly

Boiler relief valve

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

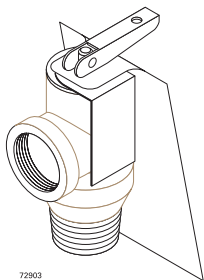
DANGER Before testing, make certain discharge pipe is properly connected to valve outlet and arranged to contain and safely dispose of boiler discharge. Wear gloves to protect your hands from hot surfaces. Verify that discharge piping is installed in accordance with this manual and the instructions on 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 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.



☐ Check monthly

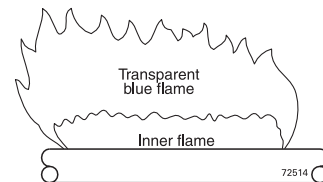
Main burner flame

Proper main burner flame (see right):

1. Yellow-orange streaks may appear (caused by dust).

Improper main burner flame:

1. Overfired — Large flames.
2. Underfired — Small flames.
3. Lack of primary air — Yellow tipping on flames (sooting will occur).



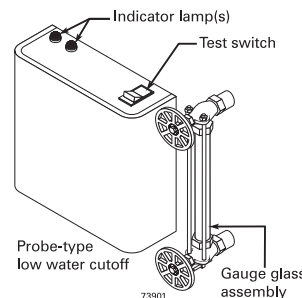
☐ Periodically

Test low water cutoff

Probe-type low water cutoff (see right)

Check probe-type low water cutoff for proper operation.

1. Turn off power to boiler and wait 5 minutes.
2. Drain water to bottom of gauge glass.
3. Turn on power.
4. Set thermostat to call for heat. Red neon lamp on lower water cutoff should light.
5. Wait 5 minutes. Boiler should not fire.
6. Refill boiler to correct water line. Red lamp should go off.
7. Wait 5 minutes. Boiler should fire.
8. Return thermostat to normal setting.



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

1. 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.

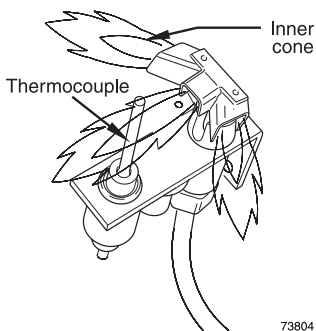
Pilot burner flame

Proper pilot flame (see right):

1. Blue flame.
2. Inner cone engulfing thermocouple.
3. Thermocouple glowing cherry red.

Improper pilot flame:

1. Overfired — Large flame lifting or blowing past thermocouple.
2. Underfired — Small flame. Inner cone not engulfing thermocouple.
3. Lack of primary air — Yellow flame tip.
4. Incorrectly heated thermocouple.



❑ End of season

Shutdown procedure

1. Follow “TO TURN OFF GAS TO APPLIANCE” on the "Lighting Instructions" on the inside of the jacket panel. You will also find these instructions on pages 4 and 5 of this manual.

Use the "Lighting Instructions" for the gas valve model installed on the boiler.

2. Do not drain system unless exposure to freezing temperatures will occur.
3. Do not drain the system if it is filled with an antifreeze solution.
4. Do not shut down boilers used for domestic water heating. They must operate year-round.

❑ 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. 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.

W-T
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