



**CGa Series 4**

**CGi Series 5**

**EG Series 7**

**PEG Series 7**

**LGB Series 2 & 3**



**Gas-Fired Boilers**

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# User Manual

## INSTALLER:

Please take time to review this User Manual with the boiler owner. Explain all maintenance and service procedures and the correct operating instructions.

### **⚠ WARNING**

***Follow the information in this manual exactly to avoid a fire or explosion. Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance. Failure to comply can result in severe personal injury, death, or substantial property damage.***

#### **— WHAT TO DO IF YOU SMELL GAS —**

- **DO NOT** try to light any appliance.
- **DO NOT** touch any electrical switch; do not use any telephone in your building.
- Immediately call your gas supplier from a phone outside the structure. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- Installation & service must be performed by a qualified installer, service technician or the gas supplier.

## How to Use This Manual

| To do the following:                  | Read and use:                                                                     | Page(s)      |
|---------------------------------------|-----------------------------------------------------------------------------------|--------------|
| Learn precautions                     | Safety warnings and information                                                   | <u>3-4</u>   |
| Prevent air contamination             | List of air contaminants to avoid                                                 | <u>5</u>     |
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# SECTION 1

## Safety

### Section Contents

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| Please Read Before Proceeding . . . . . | 3 |

### Safety Signals

The following defined terms are used throughout this manual to bring attention to the presence of hazards or other important information.

#### **⚠ DANGER**

**Danger indicates the presence of hazards that will result in severe personal injury, death, or substantial property damage.**

#### **⚠ WARNING**

**Warning indicates the presence of hazards that can result in severe personal injury, death, or substantial property damage.**

#### **⚠ CAUTION**

**Caution indicates the presence of hazards that will or can result in minor personal injury or property damage.**

#### **NOTICE**

**Notice indicates additional information that may be related to property damage, but is not related to personal injury.**

#### **IMPORTANT**

**Important indicates additional information that is important, but is not related to personal injury or property damage.**

### Please Read Before Proceeding

#### **⚠ WARNING**

**Adhere to all following guidelines and instructions in this section. Failure to adhere to these guidelines can result in severe personal injury, death, or substantial property damage.**

### Carbon Monoxide Detector —

#### **⚠ WARNING**

*This product burns gas to produce heat. The appliance must be properly installed, operated, and maintained to avoid exposure to appreciable levels of carbon monoxide and the installer is required to confirm that at least one carbon monoxide alarm is installed in the living space before the appliance is put into operation. It is important for the carbon monoxide alarms to be installed, maintained, and replaced following the alarm manufacturer's instructions and applicable local codes.*

**User:** Refer to this User Manual as your information source. Installation and service must be performed by a qualified installer or service technician.

**Installer:** Refer to the Boiler Manual and all other information shipped with the boiler for installation and service.

Please include the boiler model number and CP number when inquiring about the boiler. The model number can be found on the boiler rating label.

### Boiler Maintenance

- ☐ To avoid electric shock, disconnect all electrical supplies to the boiler before performing maintenance.
- ☐ To avoid severe burns, allow boiler to cool before performing maintenance.
- ☐ This boiler contains ceramic fiber and fiberglass materials. Refer to the maintenance section of the boiler manual for warnings and information.
- ☐ The boiler must be maintained as outlined in this manual, including annual startup and service by a qualified service technician to ensure boiler system reliability.

## Please Read Before Proceeding, continued

### Safe Boiler Operation

- Do not block flow of combustion or ventilation air to boiler. This boiler is equipped with a control that automatically shuts down the boiler if the air or vent is blocked. Remove easily accessible and removable blockages. If the boiler indicates a manual reset lockout, select <Reset Lockout> on the control display after removing a blockage. If a blockage cannot be removed, have a qualified service technician check the boiler system.
- Do not allow contaminated air to enter the boiler room, or the air inlet pipe if direct vented. See [page 5](#) for details.
- Should overheating occur, or gas supply fail to shut off, do not turn off or disconnect electrical supply to pump. Shut off the gas supply at a location external to the appliance.

### Boiler Water

- Have the boiler water chemistry checked at least annually by a qualified service technician.
- Do not use petroleum-based cleaning or sealing compounds in the boiler system. Gaskets and seals in the system may be damaged, which can result in substantial property damage.
- Do not use "homemade cures" or "boiler patent medicines." Serious injury or damage may result.
- Continual fresh make-up water will reduce boiler life. Mineral buildup in the heat exchanger reduces heat transfer, overheats the metal, and causes failure. Addition of oxygen carried in by make-up water can cause internal corrosion. Leaks in the boiler or piping must be repaired at once to prevent make-up water.
- Do not add cold water to a hot boiler. Thermal shock can cause the heat exchanger to crack.
- NEVER use automotive or standard glycol antifreeze in this boiler system, including glycol made for hydronic systems.

### Frozen Water Damage

Power outages, unattended residences or buildings, boiler component failures, or other electrical system failures in cold weather could result in frozen plumbing and water damage in a matter of hours. Consult with a boiler contractor or a home security agent to take preventative actions, such as installing a security system that operates during power outages, senses low temperature, and initiates an effective action. Consult with your boiler contractor or a home security agency.

### Damage from Water Contact

#### DANGER

***DO NOT attempt to operate any boiler if any part of the boiler, burner, or controls has been partially or fully sprayed with or submerged under water. The boiler must either be replaced or completely repaired and inspected. The boiler and all components must be in good condition and fully reliable before operation.***

***If these requirements are not met, operating the boiler will cause fire, explosion, and electrical shock hazards, leading to serious injury, death, or substantial property damage.***

**Saltwater damage:** The immediate effects of saltwater damage are like those of freshwater, with electrical components shorting out and the removal of critical lubricants. However, salt and other contaminants left behind can lead to long term issues due to the conductive and corrosive nature of salt residue. WM Technologies equipment contaminated with saltwater or polluted water will no longer be covered under warranty and should be replaced.

**Electrical damage:** If any electrical component or wiring has, or is suspected to have come into contact with water, replace the boiler.

# SECTION 2

## Operation

This section is intended to provide operating instructions and information for users.

### Section Contents

|                               |   |
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## Operating the Boiler

### Prevent Combustion Air Contamination

#### **⚠ WARNING**

***If the boiler combustion air inlet is located in any area likely to cause contamination, or if products which would contaminate the air cannot be removed, you must have the combustion air and vent re-piped and terminated to another location. Contaminated combustion air will damage the boiler, which can result in severe personal injury, death, or substantial property damage.***

To prevent potential of severe personal injury or death, check for products or areas listed in Table 1 before installing boiler. If any of these contaminants are found:

- Remove contaminants permanently.
- OR —
- Isolate boiler and provide outside combustion air.

See national, provincial or local codes for further information.

### Operating Instructions

See the warnings and operating instructions on the following pages to start and turn off the boiler. See Table 2 to locate the correct Operating Instructions for the gas valve model installed on your boiler.

*(continued on the next page)*

**Table 1** Corrosive contaminants and sources

| Products to avoid                          |                                                                       |
|--------------------------------------------|-----------------------------------------------------------------------|
| Spray cans containing chloro/fluorocarbons | Paint or varnish removers                                             |
| Permanent wave solutions                   | Hydrochloric acid and muriatic acid                                   |
| Chlorinated waxes and cleaners             | Cements and glues                                                     |
| Chlorine-based swimming pool chemicals     | Anti-static fabric softeners used in clothes dryers                   |
| Calcium chloride used for thawing          | Chlorine-type bleaches, detergents, and cleaning solvents             |
| Sodium chloride used for water softening   | Adhesives used to fasten building products and other similar products |
| Refrigerant leaks                          | Excessive dust and dirt                                               |

| Areas likely to have contaminants                 |                                                |
|---------------------------------------------------|------------------------------------------------|
| Laundry and dry cleaning areas and establishments | Auto body shops                                |
| Swimming pools                                    | Plastic manufacturing plants                   |
| Metal fabrication plants                          | Furniture refinishing areas and establishments |
| Beauty shops                                      | New building construction                      |
| Refrigeration repair shops                        | Remodeling areas                               |
| Photo processing plants                           | Garages with workshops                         |

**Table 2** Operating instructions guide

| Spark-ignited pilot      | Models                                                                     | Page     |
|--------------------------|----------------------------------------------------------------------------|----------|
| Resideo VR8204 or VR8304 | <b>CGa-25 to CGa-8</b><br><b>EG-30 to EG-75</b><br><b>PEG-30 to PEG-65</b> | <u>6</u> |
| —                        | <b>LGB Series 2</b>                                                        | <u>7</u> |
| —                        | <b>LGB Series 3</b>                                                        | <u>8</u> |

## Operating the Boiler (continued)

### CGa-25 to CGa-8, EG-30 to EG-75, PEG -30 to PEG-65

- Spark-ignited pilot
- Gas valve — Resideo VR8204 or VR8304

## FOR YOUR SAFETY READ BEFORE OPERATING



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

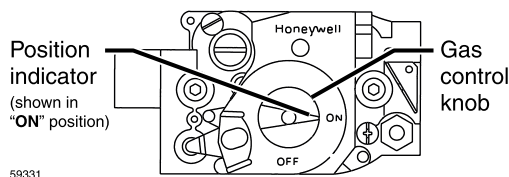
- This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
- BEFORE OPERATING**, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.
- Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- 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 phone outside the structure. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

## OPERATING INSTRUCTIONS

- STOP! Read the safety information above on this label.
- Set the "thermostats" to lowest setting.
- Turn off all electrical power to the appliance.
- Remove front panel.
- This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
- The gas control knob clockwise ↻ to "OFF".
- Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "WHAT TO DO IF YOU SMELL GAS" in the safety information above. If you don't smell gas, go to the next step.
- Turn gas control knob counterclockwise ↻ to "ON."
- Turn on all electric power to the appliance.
- Set "thermostats" to desired setting.
- If the appliance will not operate when there is a call for heat and the piping is not hot, follow the instructions "To Turn Off Gas To The Appliance" and call your service technician or gas supplier.
- Reinstall front panel.



## TO TURN OFF GAS TO THE APPLIANCE

- Set the thermostat to lowest setting.
- Turn off all electric power to the appliance if service is to be performed.
- Remove front panel.
- Turn gas control knob clockwise ↻ to "OFF." Do not force.
- Reinstall front panel.

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## Operating the Boiler (continued)

### LGB Series 2

- Spark-ignited pilot

### FOR YOUR SAFETY READ BEFORE OPERATING



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

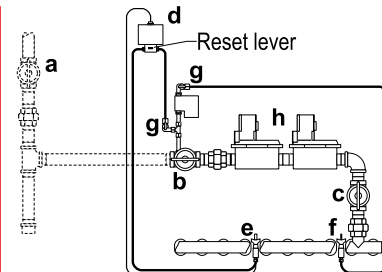
- This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the automatic pilot by hand.  
For PROPANE BOILERS ONLY: Propane boilers contain both an automatic pilot and a manual (standing) pilot. A pilot switch box controls gas flow to the manual pilot. Follow instructions below to manually light the manual pilot. Do not try to light the automatic pilot by hand.
- Before OPERATING, 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.
- Use only your hand to depress or turn gas valve handles. Never use tools. If a handle will not turn by hand, don't try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- 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.

### OPERATING INSTRUCTIONS

- STOP! Read the safety information above this label.
- Set the thermostat/operating control to the lowest setting.
- Turn off all electrical power to the appliance.
- Remove jacket front panel. On PROPANE BOILERS ONLY: Remove base access shield.
- Close gas hand valve, **b**. Close manual test firing valve, **c**. Close all pilot shutoff valve(s), **g**.
- Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "WHAT TO DO IF YOU SMELL GAS" in the safety information above. If you do not smell gas, go to step 7.
- Open pilot shutoff valve(s), **g**.
- On PROPANE BOILERS ONLY:
  - Press and hold reset lever of pilot switch box, **d**.
  - Manually light manual pilot, **e**, while holding the lever down.
  - Allow time for air to purge from the pilot line. Release lever after pilot flame has had time to heat thermocouple (about 1 minute). Pilot burner should remain lit.
- Open manual test firing valve, **c**, and gas hand valve, **b**. Follow sequence below.
- Turn on electric power to the appliance.
- Set the thermostat/operating control to desired setting.
- If boiler does not operate correctly, follow instructions under, "TO TURN OFF GAS TO APPLIANCE," below. Call your service technician or gas supplier.
- On PROPANE BOILERS ONLY: Replace base access shield.
- Reinstall jacket front panel.



Typical gas piping only — See Control Supplement for details

- a service valve
- b gas hand valve
- c manual test firing valve
- d pilot switch box (propane only)
- e manual pilot (propane only)
- f automatic pilot
- g pilot shutoff valve(s)
- h automatic gas valves, typical

### TO TURN OFF GAS TO THE APPLIANCE

- Set thermostat or operating control to lowest setting.
- Turn off all electrical power to the appliance if service is to be performed.
- Close manual test firing valve (**c**), all pilot shutoff valve(s) (**g**) and gas hand valve (**b**).
- Reinstall base access shield (on PROPANE BOILERS ONLY) and jacket front panel.

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(continued on the next page)

## Operating the Boiler (continued)

### LGB Series 3

- Spark-ignited pilot

### FOR YOUR SAFETY READ BEFORE OPERATING



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

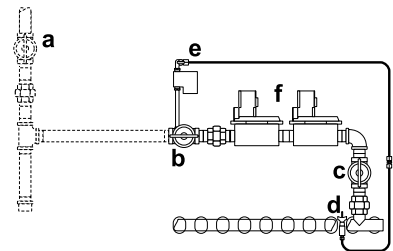
- A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the automatic pilot by hand.
- B. Before OPERATING, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.
- C. Use only your hand to depress or turn gas valve handles. Never use tools. If a handle will not turn 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.

### OPERATING INSTRUCTIONS

1. STOP! Read the safety information above this label.
2. Set the thermostat/operating control to the lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove jacket front panel.
5. Close gas hand valve, **b**. Close manual test firing valve, **c**. Close all pilot shutoff valve(s), **e**.
6. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "WHAT TO DO IF YOU SMELL GAS" in the safety information above. If you do not smell gas, go to step 7.
7. Open pilot shutoff valve(s), **e**.
8. Open manual test firing valve, **c**, and gas hand valve, **b**. Follow sequence below.
9. Turn on electric power to the appliance.
10. Set the thermostat/operating control to desired setting.
11. If boiler does not operate correctly, follow instructions under, "TO TURN OFF GAS TO APPLIANCE," below. Call your service technician or gas supplier.
12. Reinstall jacket front panel.



Typical gas piping only — See Boiler Manual for details

- a service valve
- b gas hand valve
- c manual test firing valve
- d automatic pilot
- e pilot shutoff valve(s)
- f automatic gas valves, typical

### TO TURN OFF GAS TO THE APPLIANCE

1. Set thermostat or operating control to lowest setting.
2. Turn off all electrical power to the appliance if service is to be performed.
3. Close manual test firing valve (**c**), all pilot shutoff valve(s) (**e**) and gas hand valve (**b**).
4. Reinstall jacket front panel.

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## Troubleshooting

### Common Issues and Solutions

| Symptom                                                              | Common Causes                                                                   | Possible Corrections                                                                                                                                                                                                                   |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rapid cycling — boiler turns on and off frequently</b>            | 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 (steam boiler)                                          | Set limit according to system needs. Maximum setting is 220°F. Increase limit setting to decrease cycling.                                                                                                                             |
|                                                                      | Insufficient water flow through boiler                                          | Check all valves to and from boiler. Return to proper setting.<br>Confirm circulator size.                                                                                                                                             |
| <b>Frequent release of water through relief valve</b>                | Expansion tank sized too small                                                  | Call qualified service technician to check expansion tank operation and size.                                                                                                                                                          |
|                                                                      | Flooded expansion tank                                                          | Call qualified service technician to check expansion tank operation.                                                                                                                                                                   |
|                                                                      | Inoperative limit control (steam boiler)                                        | Call qualified service technician to replace limit control.                                                                                                                                                                            |
| <b>Need to frequently add makeup water</b>                           | 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. Do not use petroleum-base stop-leak compounds. |
| <b>Black water condition</b>                                         | 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.                                                                                                                                                 |
| <b>Popping or percolating noise heard in boiler</b>                  | 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.                                                                                                                           |
|                                                                      | Insufficient water flow through boiler                                          | Check all valves to and from boiler. Return to proper setting.<br>Confirm circulator size.                                                                                                                                             |
| <b>Metal flakes found in vent outlet or vent — flueway corrosion</b> | Contaminated combustion air supply — See <a href="#">page 5</a> in this manual. | Remove any contaminating products. See <a href="#">page 5</a> in this manual.<br>Provide outside air for combustion.                                                                                                                   |
|                                                                      | Condensation of combustion gases in boiler sections                             | Have qualified service technician inspect system piping and controls to verify proper regulation of return water temperature.                                                                                                          |
| <b>Some radiators or baseboard units do not heat or are noisy</b>    | Air in system                                                                   | Bleed air from system through air vents in radiators or baseboard units.                                                                                                                                                               |
|                                                                      | Low system pressure                                                             | Fill to correct pressure.                                                                                                                                                                                                              |
|                                                                      |                                                                                 | Check for leaks in boiler or piping. Have qualified service technician repair at once.                                                                                                                                                 |
|                                                                      | High limit set too low (steam boiler)                                           | Adjust high limit to higher setting.                                                                                                                                                                                                   |

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# SECTION 3

## Maintenance

This section is intended to provide service schedules and maintenance information for users.

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|                                                   |    |
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| Maintenance Procedures — MONTHLY . . . . .        | 18 |
| Maintenance Procedures — PERIODICALLY . . . . .   | 20 |
| Maintenance Procedures — EVERY 6 MONTHS . . . . . | 22 |
| Maintenance Procedures — END OF SEASON . . . . .  | 22 |

Maintenance Overview

Servicing and Maintaining the Boiler

The boiler must be inspected and started at the beginning of the heating season every year by a qualified service technician.

The maintenance and service of the boiler listed in Figure 1 and explained in this manual must be performed to assure maximum boiler efficiency and reliability.

Figure 1 Service and maintenance schedule

| Owner Maintenance<br>(see the following pages for instructions) |                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beginning of Season                                             | <div><input type="checkbox"/> Contact your boiler service technician to inspect, service, and start up your boiler. You must have an annual start-up performed by a qualified service technician to ensure reliable operation of the boiler and system.</div>                                                              |
| Daily                                                           | <div><div><input type="checkbox"/> Check the boiler area</div><div><input type="checkbox"/> Check air openings</div><div><input type="checkbox"/> Check the pressure and temperature gauge</div></div>                                                                                                                     |
| Monthly                                                         | <div><div><input type="checkbox"/> Check boiler interior piping</div><div><input type="checkbox"/> Check venting system</div><div><input type="checkbox"/> Check air vents</div><div><input type="checkbox"/> Check boiler relief valve</div><div><input type="checkbox"/> Check automatic air vents (if used)</div></div> |
| Every 3 Months                                                  | <div><div><input type="checkbox"/> Test low water cutoff</div></div>                                                                                                                                                                                                                                                       |
| Every 6 Months                                                  | <div><div><input type="checkbox"/> Check the boiler gas and water piping</div><div><input type="checkbox"/> Operate the relief valve</div></div>                                                                                                                                                                           |
| End of Season                                                   | <div><div><input type="checkbox"/> Shut down procedure</div></div>                                                                                                                                                                                                                                                         |

⚠ WARNING

Follow the service and maintenance procedures given in this manual. Failure to perform service and maintenance could result in damage to the boiler or system. Failure to follow the directions in this manual and component literature can result in severe personal injury, death, or substantial property damage.

## Boiler Components

### Tankless Water Heater (EG and PEG only)

If boiler is used to supply domestic hot water, limit control (steam boiler) or boiler control (water boiler) should be set to supply adequate hot water. Weil-McLain tankless heaters are rated at 200°F boiler water temperature. To get rated output, set low temperature limit at 200°F.

Limit can be adjusted to meet system hot water requirements. Differential can be set to 15° and adjusted to control level. Increasing the differential will cause a slight variation in water temperature but will decrease burner on-off cycling. High limit (steam boiler) or DHW Setting (water boiler) should be set at least 20° above low temperature limit.

### Rollout Thermal Fuse Element (CGa, CGi, EG and PEG only)

Cuts off gas flow should flame roll-out occur. See Figure 2.

#### **⚠ 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 comply can result in severe personal injury, death or substantial property damage.*

### Spill Switch (CGa, EG, PEG and LGB Series 2 only)

Cuts off gas flow should vent system become blocked. See Figure 3.

#### **⚠ WARNING**

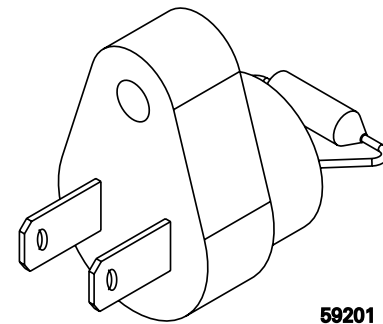
*Do not attempt to place boiler in operation if spill switch cuts off gas flow. Immediately call a service technician. Failure to comply can result in severe personal injury, death or substantial property damage.*

### Pressure Switch (LGB Series 3 and CGi only)

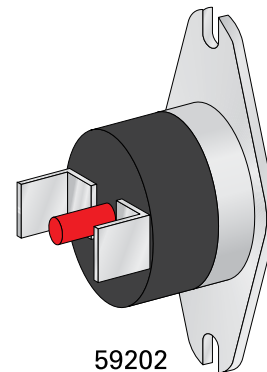
Cuts off gas flow should vent system become blocked. See Figure 4.

After resolving the fault, reset the control: press Enter (square symbol), and use the arrow keys to select YES. The fault will be reset, and the error screen should revert to default display. If fault re-occurs, contact a service technician.

**Figure 2** Rollout thermal fuse element

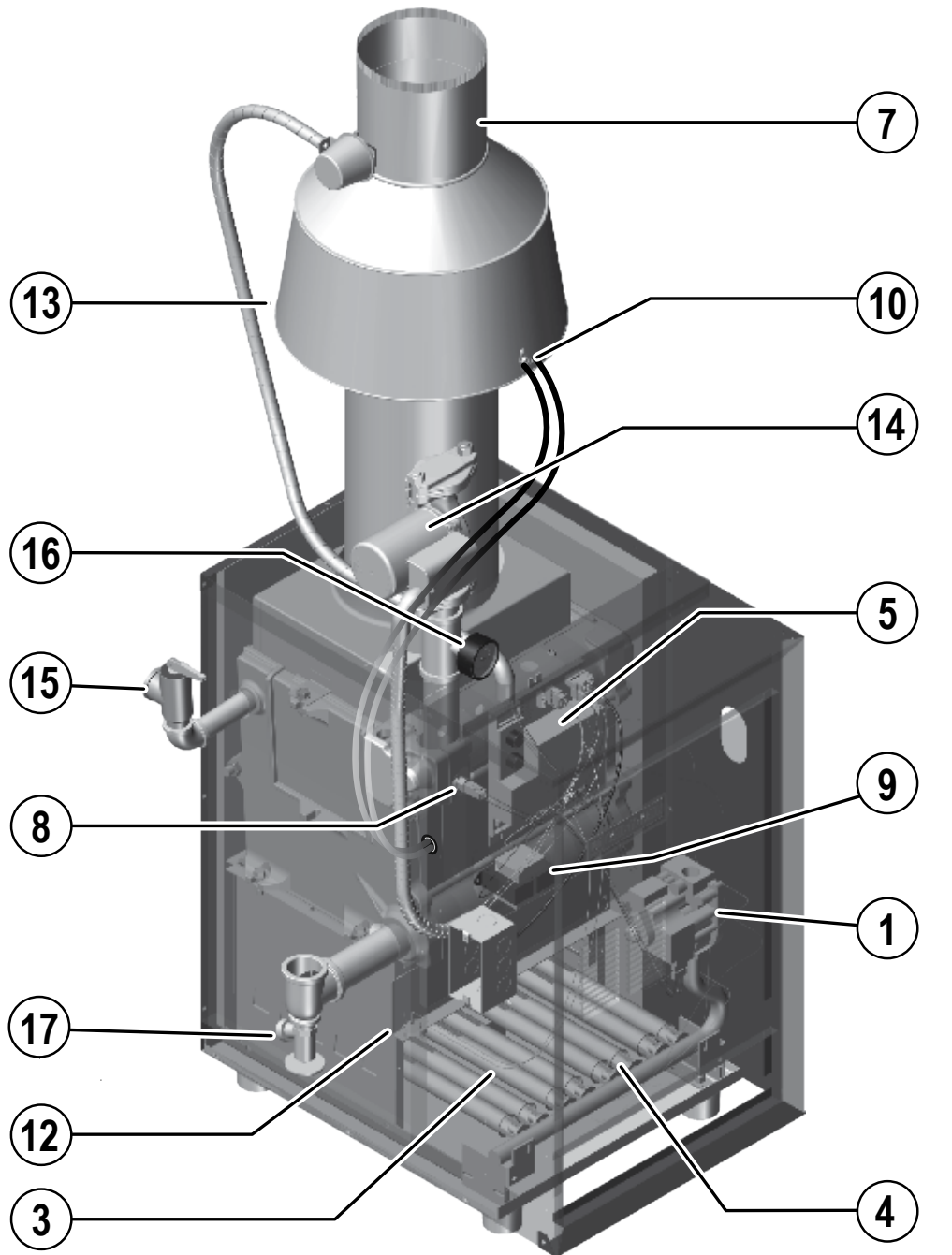


**Figure 3** Spill switch

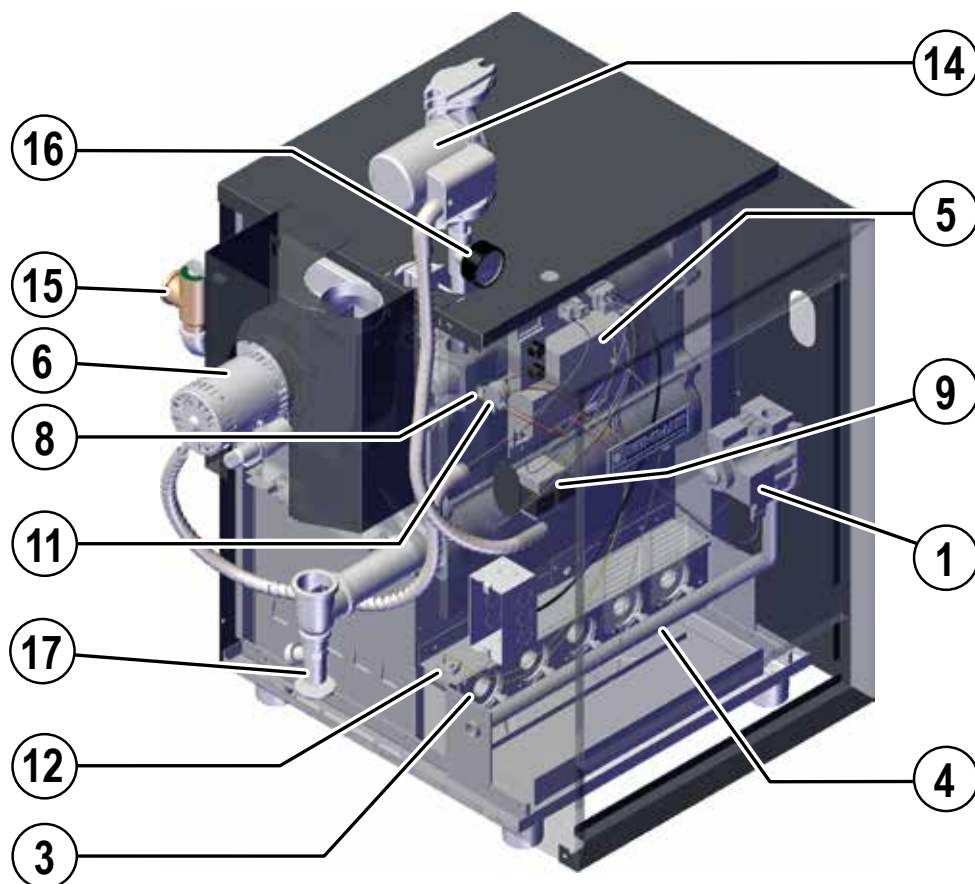


**Figure 4** Pressure switch



**Boiler Components** (continued)**CGa**

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 1) Gas valve                     | 10) Spill switch                 |
| 2) Pilot burner (Not shown)      | 12) Rollout thermal fuse element |
| 3) Main burners                  | 13) Draft hood                   |
| 4) Gas manifold/orifices         | 14) Circulator                   |
| 5) Control module                | 15) Relief valve                 |
| 7) Vent damper                   | 16) Gauge (pressure/temperature) |
| 8) Water temperature/LWCO sensor | 17) Drain valve                  |
| 9) Transformer                   |                                  |

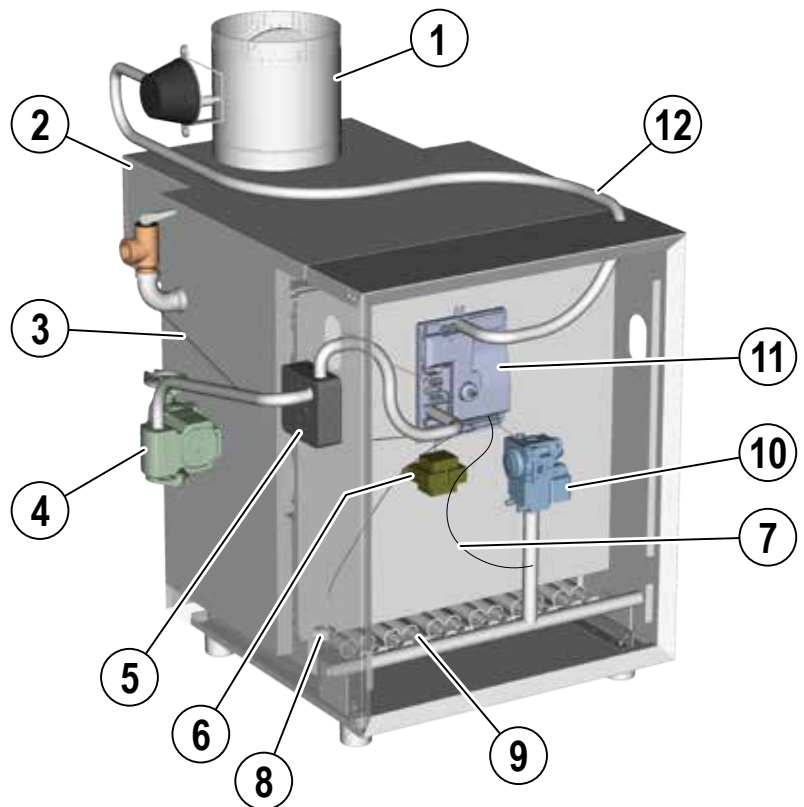
**Boiler Components** (continued)**CGi**

- |                                  |                                  |
|----------------------------------|----------------------------------|
| 1) Gas valve                     | 9) Transformer                   |
| 2) Pilot burner (not shown)      | 11) Air pressure switch          |
| 3) Main burners                  | 12) Rollout thermal fuse element |
| 4) Gas manifold/orifices         | 14) Circulator                   |
| 5) Control module                | 15) Relief valve                 |
| 6) Inducer                       | 16) Gauge (pressure/temperature) |
| 8) Water temperature/LWCO sensor | 17) Drain valve                  |

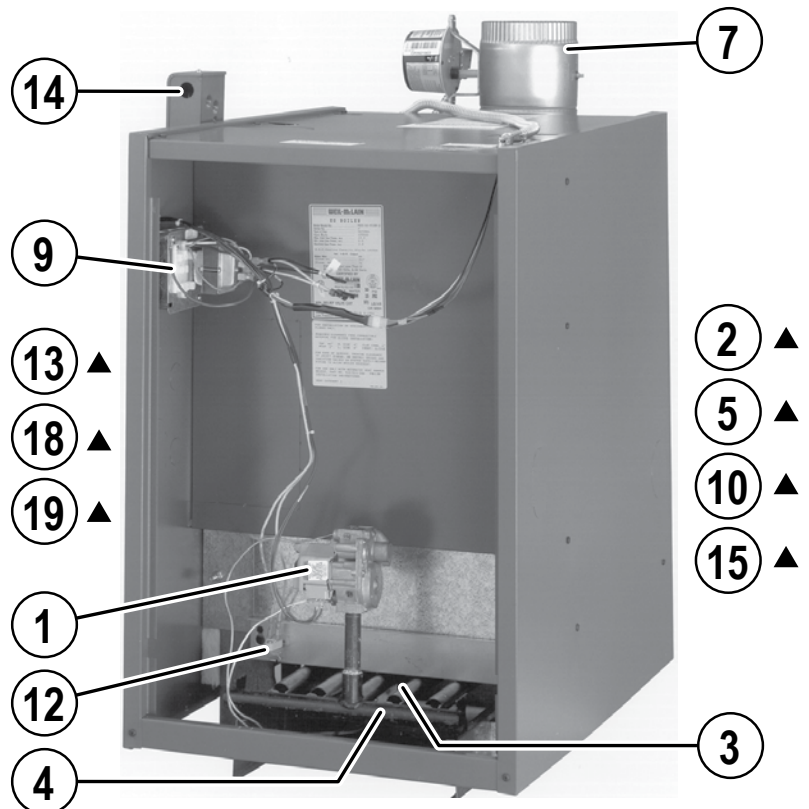


**Boiler Components** (continued)**EG Water**

- 1) Vent Damper
- 2) Draft Hood
- 3) Spill Switch Wires
- 4) Circulator (by others)
- 5) Junction Box
- 6) Transformer
- 7) Wiring Harness
- 8) Rollout Thermal Fuse Element
- 9) Main Burners
- 10) Gas Valve
- 11) Ignition Control
- 12) Damper Harness

**PEG/EG Steam**

- 1) Gas valve
- 2) Pilot burner
- 3) Main burners
- 4) Gas manifold/orifices
- 5) Control module
- 7) Vent damper
- 9) Transformer
- 10) Spill switch
- 12) Rollout thermal fuse element
- 13) Low water cutoff (steam boilers)
- 14) Limit control(s)
- 15) Draft hood
- 18) Gauge (pressure or pressure/temperature)
- 19) Gauge glass (steam only)

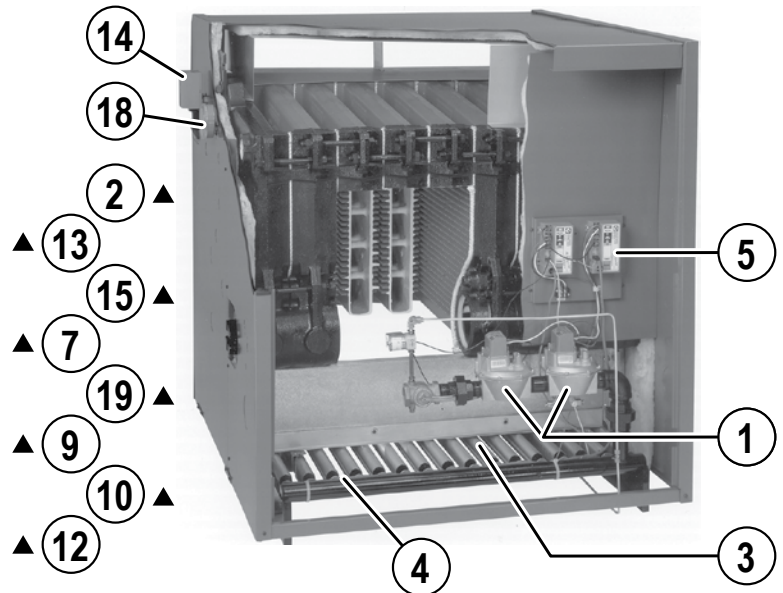


▲ Not shown

## Boiler Components (continued)

### LGB Series 2

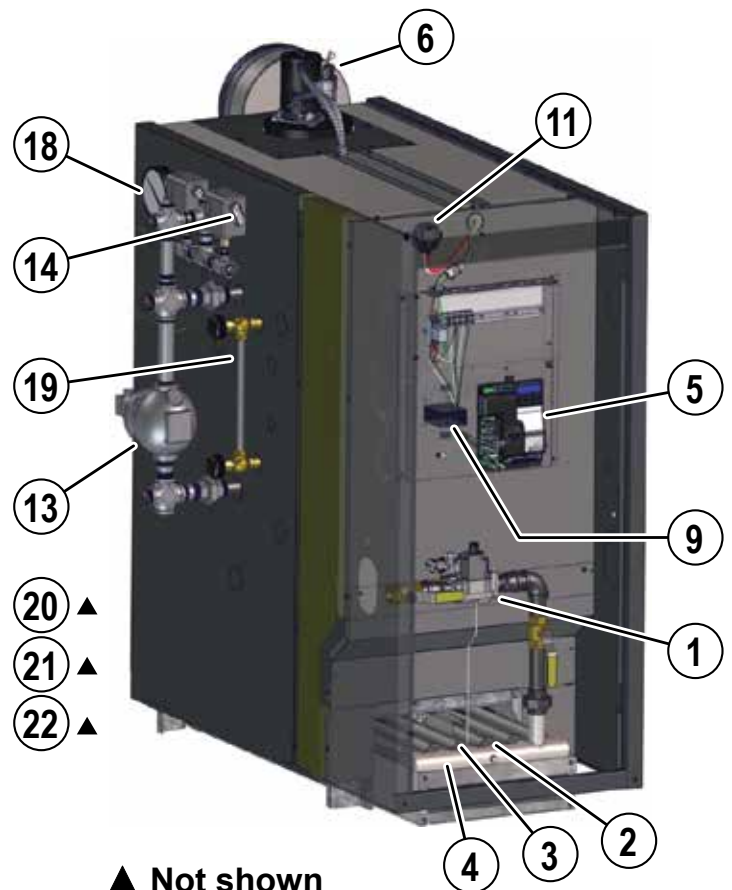
- 1) Gas valve
- 2) Pilot burner
- 3) Main burner
- 4) Gas manifold/orifices
- 5) Control module
- 7) Vent damper
- 9) Transformer
- 10) Spill switch
- 12) Rollout thermal fuse element
- 13) Low water cutoff (steam boilers)
- 14) Limit control(s)
- 15) Draft hood
- 18) Gauge (pressure or pressure/temperature)
- 19) Gauge glass (steam only)



▲ Not shown

### LGB Series 3

- 1) Gas valve
- 2) Pilot burner (with flame sense)
- 3) Main burners
- 4) Gas manifold/orifices
- 5) Control module
- 6) Inducer (with vent adapter)
- 9) Transformer
- 11) Air pressure switch
- 13) Low water cutoff (steam shown)
- 14) Limit control(s)
- 18) Gauge (pressure or pressure/temperature)
- 19) Gauge glass (steam only)
- 20) Water temperature/LWCO sensor (water only)
- 21) Main flame sense
- 22) Flue temperature switch



▲ Not shown

## Maintenance Procedures — DAILY

### Boiler Area

#### **⚠ WARNING**

***Eliminate all materials discussed below from the boiler vicinity. Failure to comply can result in severe personal injury, death, or substantial property damage.***

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 5](#).

#### **If the above materials are 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).

### Pressure/Temperature Gauge or Pressure Gauge (Steam)

1. Water boilers — Make sure the pressure reading on the boiler pressure/temperature gauge does not exceed 24 psig. Higher pressure may indicate a problem with the expansion tank or gauge.
2. Steam boilers — Make sure the pressure reading on the boiler pressure gauge does not exceed 15 psig. Higher pressure indicates a problem with the gauge or limit control.
3. Contact a qualified service technician if problem persists.

### Air Openings

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

## Maintenance Procedures — MONTHLY

### Boiler Piping

Visually inspect for leaks around piping, circulators, 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 reduces boiler life. Minerals can build up, reducing heat transfer, overheating cast iron, and causing section failure, which can result in severe personal injury, death, or substantial property damage.*

#### **⚠ 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

#### **⚠ WARNING**

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

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. CGa, EG and LGB Series 2 boilers:
  - a. With boiler firing, hold a candle or match below lower edge of draft hood "skirt." If flame does not blow out, but burns undisturbed, the vent system is working properly.
  - b. If flame blows out or flickers severely, the vent system must be checked for obstructions or other causes of improper venting.
  - c. Verify the vent damper opens before burners ignite.
3. Notify your qualified service technician at once if you find any problem.

### Boiler Relief Valve

1. Inspect the boiler relief valve (Figure 5) and the relief valve discharge pipe for signs of weeping or leakage.
2. If the relief valve often weeps:
  - a. Water boilers — the expansion tank may not be working properly.

Figure 5 Relief valve

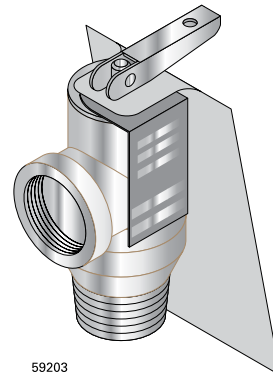
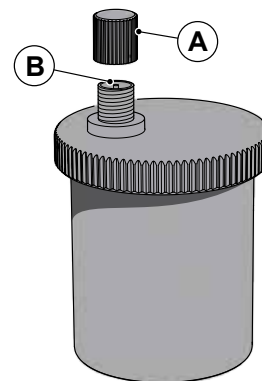


Figure 6 Automatic air vent



- b. Steam boilers — limit control may be set too high or there may be system problems.
- c. Immediately contact your qualified service technician to inspect the boiler and system.

### Automatic Air Vents (if used)

1. Remove the cap (A) from any automatic air vent in the system and check operation by depressing valve (B) slightly with the tip of a screwdriver. See Figure 6.
2. If the air vent valve appears to be working freely and not leaking, replace cap (A), twisting all the way on.
3. Loosen cap (A) one turn to allow vent to operate.
4. Have vent replaced if it does not operate correctly.

## Maintenance Procedures — MONTHLY (continued)

### Pilot Burner Flame

Proper pilot flame (Figure 7):

1. Blue flame.
2. Inner cone engulfing pilot flame sensor.
3. Pilot flame sensor glowing cherry red.

Improper pilot flame:

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

### Main Burner Flame

Proper main burner flame (Figure 8):

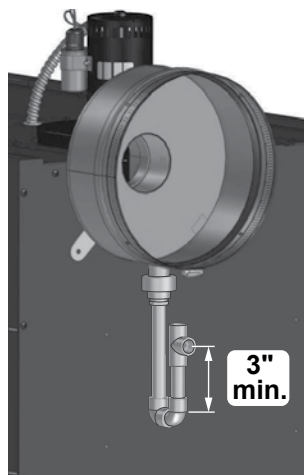
1. Yellow-orange streaks may appear (caused by dust).

Improper main burner flame:

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

### Check Condensate Drain System (if used)

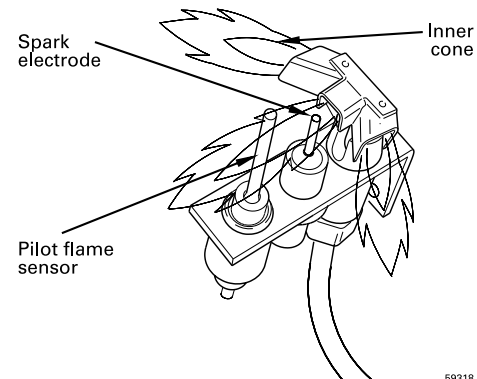
While the boiler is running, check the discharge end of the condensate drain tubing by holding your fingers in front of the opening. If you notice flue gas escaping, this indicates a dry condensate drain trap. See the following steps to fill the trap. If the condensate trap dries out on a regular basis, call your qualified service technician to inspect the boiler and condensate line and refill the condensate trap.



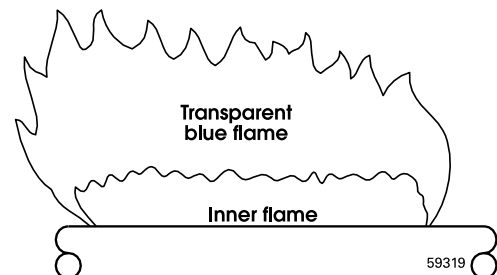
### **⚠ WARNING**

**The condensate trap must be filled with water during all times of boiler operation to avoid flue gas emission from the condensate drain line. Failure to fill the trap can result in severe personal injury or death.**

**Figure 7** Pilot burner and flame, typical



**Figure 8** Main burner flame, typical



Under some circumstances, a vent system may not produce enough condensate to keep the trap full of liquid. If the trap is not full, small amounts of flue products can be emitted into the boiler room through the condensate drain line. Follow the procedure below to fill the trap.

1. Fill the condensate trap with fresh water by pouring water into the removed trap.
  - a. Verify that the condensate assembly is unobstructed by pouring until the water runs out the end of the condensate drain line.
  - b. If the water does not run out, there is an obstruction. Proceed to the next step.
2. To remove an obstruction, remove and flush the trap and drain line.
  - a. Loosen any attachments to the supplied flexible drain hose.
  - b. Loosen the condensate trap inlet connection.
  - c. Remove and flush out the condensate trap and drain line.
  - d. Reinstall the trap and drain line. Tighten all attachments.
  - e. Pour water into the port and ensure that water runs out the end of the drain line.
  - f. If the water still does not run out, call your qualified service technician to inspect the boiler and clean or replace the condensate assembly.



## Maintenance Procedures — PERIODICALLY

### Test the Low Water Cutoff

The system is equipped with a low water cutoff. Test the low water cutoff periodically during the heating season.

### Float Type Low Water Cutoff

#### **⚠ DANGER**

**Boiler pressure and temperature must be low to avoid the potential of severe burns from steam or hot water.**

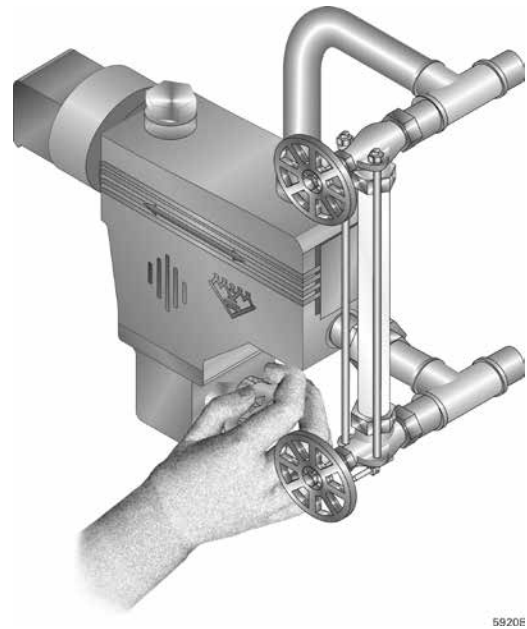
1. Clean float type low water cutoff to clear float chamber of sediment. See Figure 9.
  - a. Open blowdown valve at bottom control.
  - b. Drain water into a bucket.
2. Check float type low water cutoff for proper operation.
  - a. Turn operating control to call for heat.
  - b. Before water gets hot, drain to bottom of gauge glass. Boiler should shut off after water level lowers a few inches.
  - c. Refill boiler to correct waterline. Boiler should come back on.

### Probe Type Low Water Cutoff

Clean the probe type low water cutoff for proper operation. See Figure 10.

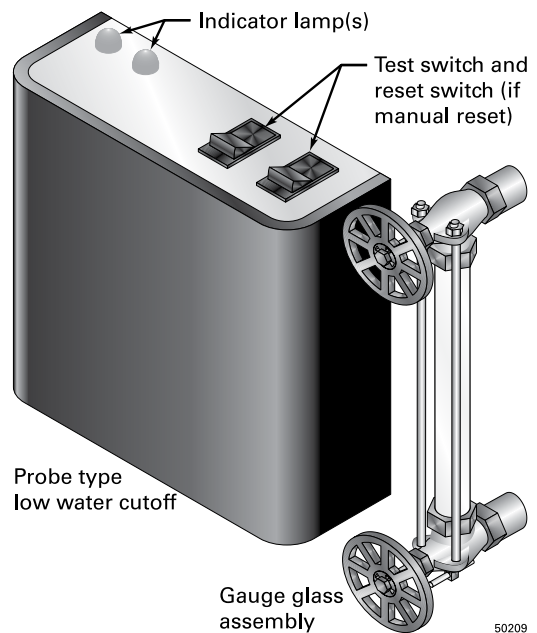
1. Turn off power to boiler and wait 5 minutes.
2. Drain water to bottom of gauge glass.
3. Turn on power.
4. Set thermostat to call for heat. Red neon lamp on lower water cutoff should light.
5. Wait 5 minutes. Boiler should not fire.
6. Refill boiler to correct water line. Red lamp should go off.
7.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

**Figure 9** Float type low water cutoff



59208

**Figure 10** Probe type low water cutoff



50209

## Maintenance Procedures — PERIODICALLY (continued)

### Integrated Type Low Water Cutoff

1. Test LWCO using control LWCO TEST button.
  - a. During burner fire, press LWCO TEST button.
  - b. Burner should shut off.

### Clean Gauge Glass

Normal waterline on a steam boiler is halfway up gauge glass. See Figure 12. Clean when needed.

#### **⚠ DANGER**

**Boiler pressure must be low to eliminate potential of severe burns.**

1. Close lower gauge cock.
2. Open pet cock.
3. Open lower gauge cock and allow a small amount of water to flush out through open pet cock.
4. Close lower gauge cock.
5. Close pet cock.
6. Open lower gauge cock.
7. If gauge glass breaks, close both gauge cocks and call a qualified service technician to replace gauge glass. Do not replace with thin glass tubing.

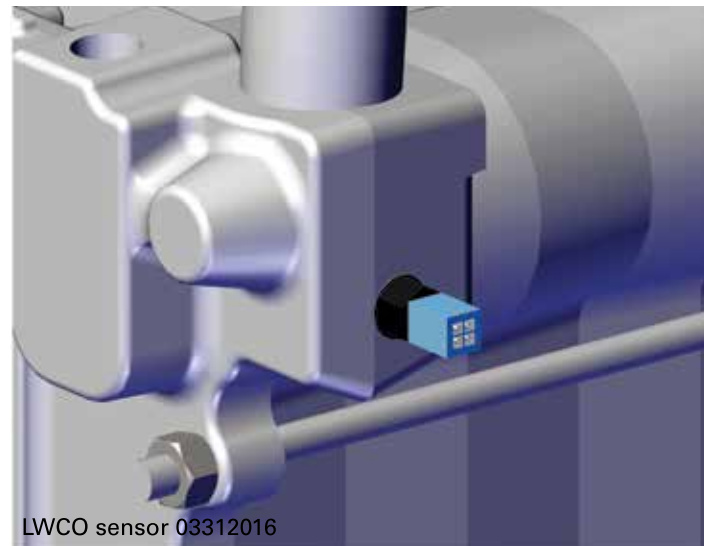
### Oil Inducer Motor (CGi Boilers)

#### **⚠ WARNING**

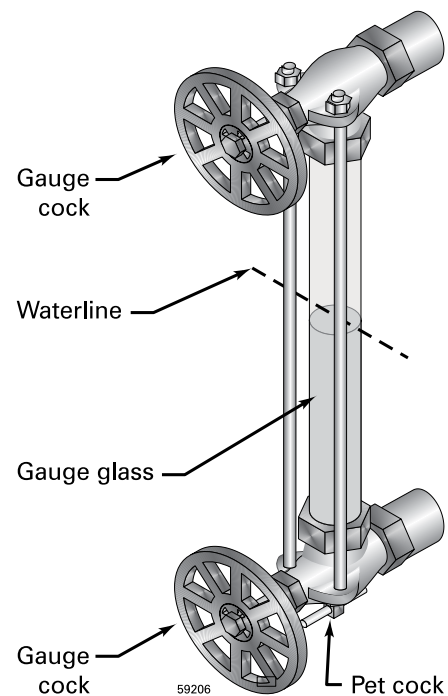
**Use only SAE 20 motor oil to lubricate the inducer motor. Do not use common universal household oils. Failure to comply can result in severe personal injury, death, or substantial property damage.**

1. Use only SAE 20 motor oil. DO NOT use household universal oils.
2. Place a few drops of oil in each of the two oiler cups on the inducer motor.

**Figure 11** Integrated type low water cutoff



**Figure 12** Gauge glass





## Maintenance Procedures — EVERY 6 MONTHS

### Operate the Boiler Relief Valve

#### **⚠ WARNING**

***A metal discharge line must be connected to a relief valve outlet and run to a safe place of disposal to avoid water damage or scalding. The discharge line must be terminated so as to eliminate possibility of severe burns should the valve discharge. This discharge line must be installed by a qualified heating installer or service technician in accordance with the instructions in the Boiler Manual. Failure to comply can result in severe personal injury, death, or substantial property damage.***

1. Before proceeding, verify that the relief valve outlet has been piped to a safe place of discharge, avoiding any possibility of scalding from hot water.
2. Read the boiler pressure/temperature gauge to make sure the system is pressurized.

3. Lift the relief valve top lever slightly, allowing water to relieve through the valve and discharge piping.
4. If water flows freely, release the lever and allow the valve to seat. Watch the end of the relief valve discharge pipe to ensure that the valve does not weep after the line has had time to drain.
  - a. If the valve weeps, lift the seat again to attempt to clean the valve seat.
  - b. If the valve continues to weep afterwards, contact your qualified service technician to inspect the valve and system.
5. If water does not flow from the valve when you lift the lever completely, the valve or discharge line may be blocked.
  - a. Immediately shutdown the boiler, following the instructions on the inside jacket top Operating Instructions.
  - b. Call your qualified service technician to inspect the boiler and system.

## Maintenance Procedures — END OF SEASON

### Boiler Shutdown Procedure

1. Follow “TO TURN OFF GAS TO APPLIANCE” on the Operating Instructions on the inside of the jacket panel. You will also find these instructions on pages 6-8 of this manual.
  - a. Use the Operating 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.

### Propane Gas Odorant

#### **⚠ WARNING**

***Propane boilers only — Comply with the following guidelines for gas leakage. Failure to comply can result in severe personal injury, death, or substantial property damage.***

- Propane suppliers mix an odorant with the propane to make its presence detectable. This 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.
- 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.



Notes

Lined area for notes, consisting of multiple horizontal lines.

