



# EGH-85 & 95 Series 4 & 5

# PFG-6 & 7 Series 6 & 7

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## Control Supplement

### Standing Pilot Boilers



**▲WARNING**

Controls must only be installed by a Weil-McLain distributor or other qualified installer/service technician in accordance with this Supplement and all applicable codes and requirements of the authority having jurisdiction. Read this Control Supplement completely before beginning the installation. If the information in this Supplement is not followed exactly, a fire, explosion, carbon monoxide emission or other hazardous conditions can result, causing severe personal injury, death or substantial property damage.



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## Please read this page first!

### Hazard definitions

The following defined terms are used throughout these instructions to bring attention to the presence of hazards of various risk levels or to important information concerning the life of the product.



Indicates presence of hazards that **will cause severe** personal injury, death or substantial property damage.



Indicates presence of hazards that **can cause severe** personal injury, death or substantial property damage.



Indicates presence of hazards that **will or can cause minor** personal injury or property damage.



Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

### Note to the installer



This system is used on gas-fired boilers without vent dampers as shipped from the factory. This system is not offered for retrofit. Any attempt to apply the system components to boilers shipped for use with a different control system will not be covered under boiler warranty and can cause severe personal injury, death or substantial property damage.



When calling or writing about the boiler, please have the boiler model number from the boiler rating label and the CP number from the boiler jacket.



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# Control installation – EGH-85 & 95 Series 4 only water boilers

### Schematic Wiring Diagram

### Ladder Wiring Diagram

**Notes**

- All wiring must be installed in accordance with:
  - U.S.A. — N.E.C. And any other national, state, or local code requirements.
  - Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
- All contacts shown without power applied (off-shelf condition).
- If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
- Refer to control component instructions packed with boiler for application information.
- Thermostat - for single zone systems, thermostat anticipator setting is 0.40 amps. For multiple zone systems using zone valves or circulators, refer to component manufacturer's instructions for application wiring and thermostat anticipator setting. BCP - For BCP connection in place of thermostat, refer to BCP installation/operation manual.
- L.W.C.O., additional high limit, etc., wired in series.
- Denotes field-installed chassis ground.
- Circulator not used with Gravity Hot Water.

**Legend**

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- THERMOPILE
- Items not provided

**WARNING** Electrical shock hazard — can cause severe injury or death. Disconnect power before installing or servicing.

**EGH 85 – 95**

- Standing pilot
- Natural gas
- Forced/Gravity Hot Water
- Without Tankless Heater

**WEIL-McLAIN**  
 Weil-McLain • 500 Blaine St. • Michigan City, IN 46360-2388  
 Part Number 550-223-738/0706



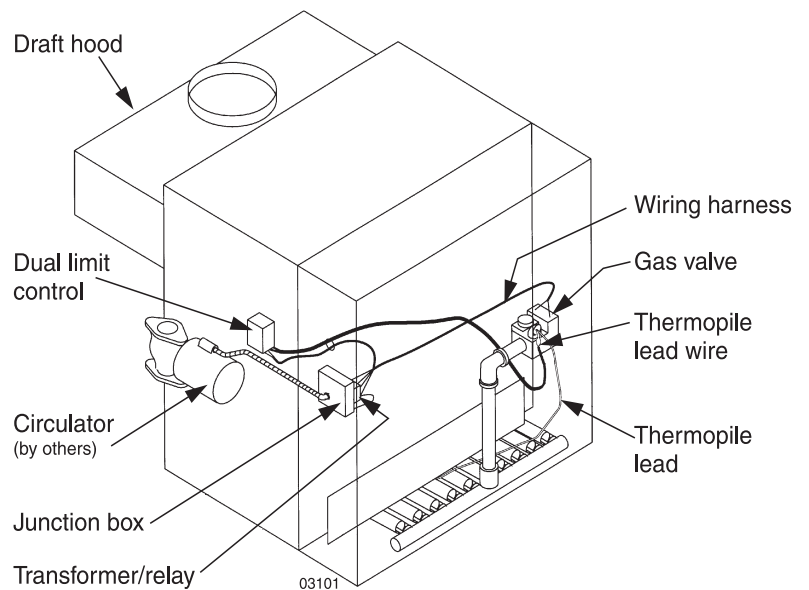
## Control installation – EGH-85 & 95 Series 4 only water boilers



For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 4, and Figure 1.
  - a. Attach junction box inside left jacket panel with #8-32 x 1/2" machine screws and green ground nuts provided.
  - b. Install transformer with plug-in relay receptacle and relay. In Canada, use chain and hook strain relief.
  - c. Operating and limit circuit wiring must be 18 gauge or heavier (as supplied with the boiler).
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.

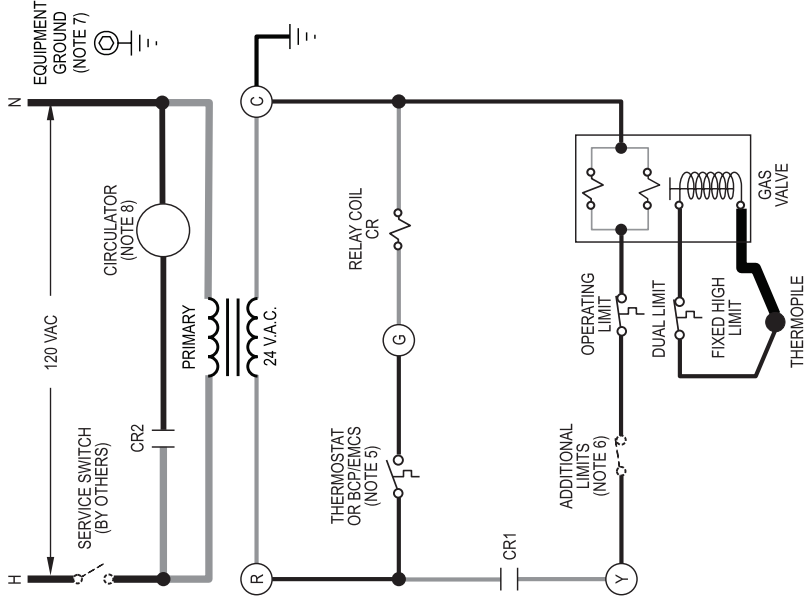
**Figure 1**





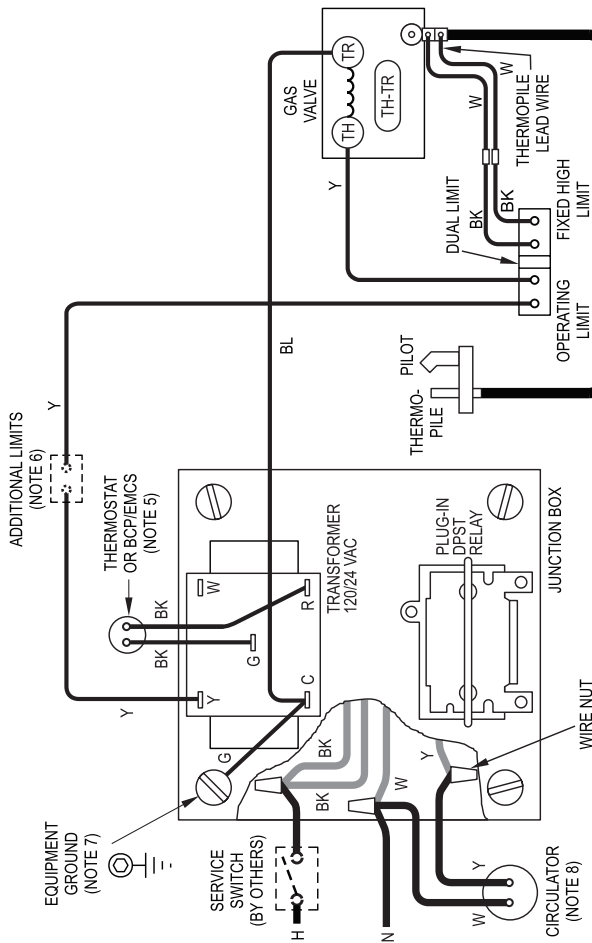
# Control installation – PFG-6 & 7 water boilers

**LADDER WIRING DIAGRAM**



- LOW VOLTAGE FIELD
- HIGH VOLTAGE FIELD
- LOW VOLTAGE FACTORY
- HIGH VOLTAGE FACTORY
- THERMOPILE

**SCHEMATIC WIRING DIAGRAM**



**WARNING**

ELECTRICAL SHOCK HAZARD, CAN CAUSE SEVERE INJURY OR DEATH. DISCONNECT POWER BEFORE INSTALLING AND/OR SERVICING.

- NOTES:
- ALL WIRING MUST BE INSTALLED IN ACCORDANCE WITH:
    - A. U.S.A. - NATIONAL ELECTRICAL CODE AND ANY OTHER NATIONAL, STATE OR LOCAL CODE REQUIREMENTS.
    - B. CANADA - C.S.A. C22.1 CANADIAN ELECTRICAL CODE PART 1 AND ANY OTHER NATIONAL, PROVINCIAL OR LOCAL CODE REQUIREMENTS.
  - ALL CONTACTS SHOWN WITHOUT POWER APPLIED-OFF SHELF CONDITION.
  - IF ORIGINAL ROLLOUT THE WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, TYPE 200°C WIRE OR ITS EQUIVALENT MUST BE USED. IF OTHER ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, TYPE 105°C OR ITS EQUIVALENT MUST BE USED.
  - REFER TO CONTROL COMPONENT INSTRUCTIONS PACKED WITH BOILER FOR APPLICATION INFORMATION.
  - THERMOSTAT - FOR SINGLE ZONE SYSTEMS, THERMOSTAT ANTICIPATOR SETTING IS 0.40 AMPS. FOR MULTIPLE ZONE SYSTEMS USING ZONE VALVES OR CIRCULATORS, REFER TO COMPONENT MANUFACTURER'S INSTRUCTIONS FOR APPLICATION WIRING AND THERMOSTAT ANTICIPATOR SETTING.
  - BCP/EMCS - FOR EMCS CONNECTION IN PLACE OF THERMOSTAT, REFER TO BCP/EMCS INSTALLATION/OPERATING MANUAL.
  - L.W.C.O., ADDITIONAL HIGH LIMIT, ETC., WIRED IN SERIES.
  - ☺ DENOTES FIELD INSTALLED CHASSIS GROUND.
  - CIRCULATOR NOT USED WITH GRAVITY WATER.

**PFG 6 & 7**

- Standing Pilot Ignition
- Natural Gas
- Forced/Gravity Water
- Without Tankless Heater



Well-McLain • 500 Blaine St. • Michigan City, IN 46360-2388  
**Part Number 550-223-737/0407**



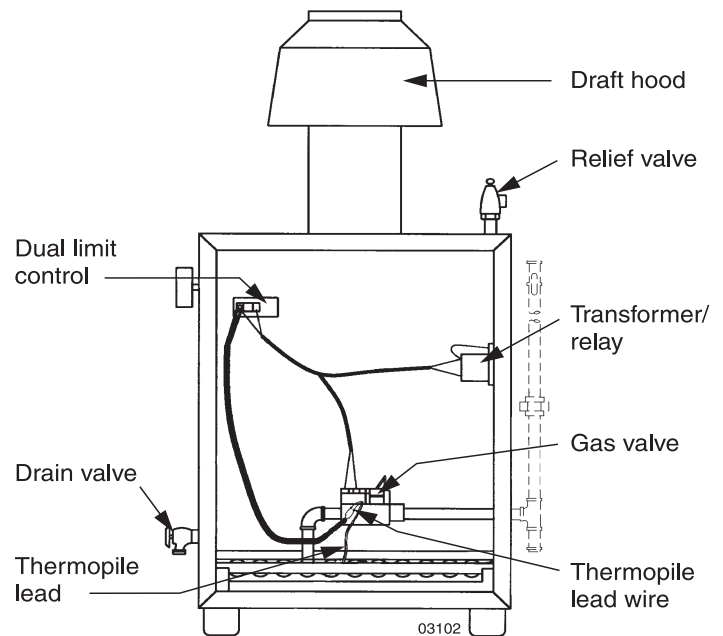
## Control installation – PFG-6 & 7 water boilers



For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 6, and Figure 2.
2. Operating and limit circuit wiring must be 18 gauge or heavier (as supplied with the boiler).
3. Bring supply wiring to boiler. Must be 14 gauge or heavier.

**Figure 2**





# Control installation – EGH-85 & 95 steam boilers

### Schematic Wiring Diagram

### Ladder Wiring Diagram

**Notes**

- All wiring must be installed in accordance with:
  - A. U.S.A. — N.E.C. And any other national, state, or local code requirements.
  - B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
- All contacts shown without power applied (off-shelf condition).
- If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
- Refer to control component instructions packed with boiler for application information.
- Thermostat - Set anticipator to match ampere draw of gas valve.
- BCP - For BCP connection in place of thermostat, refer to BCP installation/operation manual.
- L.W.C.O., additional high limit, etc., wired in series.
- ⊕ Denotes field-installed chassis ground.
- Operating control required with tankless heater.
- Adjust limit control to desired system setting. Adjust high limit to Minimum 2 psi above system setting to avoid nuisance pilot outage.

**Legend**

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- THERMOPILE
- \* Items not provided

**WARNING** Electrical shock hazard — can cause severe injury or death. Disconnect power before installing or servicing.

**Part Number 550-110-031/1112**





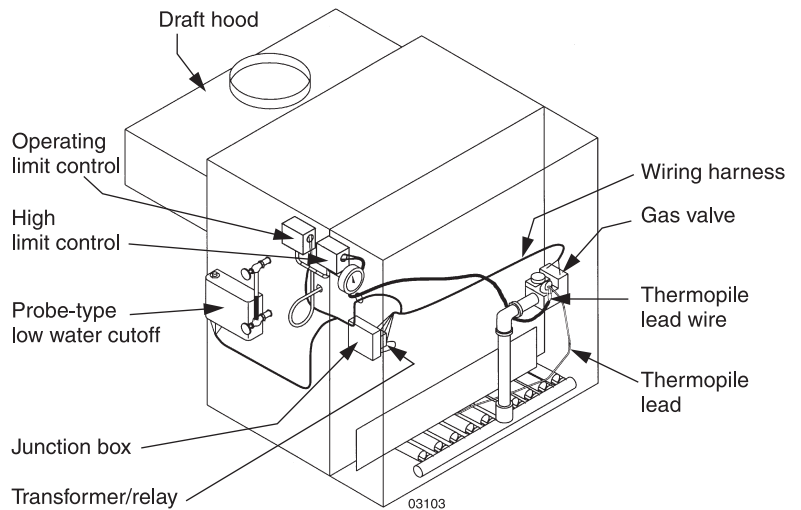
## with probe-type low water cutoff



For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 8, and Figure 3.
  - a. Attach junction box inside left jacket panel with #8-32 x 1/2" machine screws and green ground nuts provided.
  - b. Install transformer with plug-in relay receptacle and relay. In Canada, use chain and hook strain relief.
  - c. Operating and limit circuit wiring must be 18 gauge or heavier.
  
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.

**Figure 3**





# Control installation – EGH-85 & 95 steam boilers

### Schematic Wiring Diagram

### Ladder Wiring Diagram

**Notes**

- All wiring must be installed in accordance with:
  - A. U.S.A. — N.E.C. And any other national, state, or local code requirements.
  - B. Canada — C.S.A. C22.1 C.E.C. Part 1 and any other national, provincial, or local code requirements.
- All contacts shown without power applied (off-shelf condition).
- If original rollout TFE wire as supplied with the appliance must be replaced, type 200°C wire or its equivalent must be used. If other original wire as supplied with the appliance must be replaced, type 105°C or its equivalent must be used.
- Refer to control component instructions packed with boiler for application information.
- Thermostat - Set anticipator to match ampere draw of gas valve.
- BCP — For BCP connection in place of thermostat, refer to BCP installation/operation manual.
- L.W.C.O., additional high limit, etc., wired in series.
- ⊕ Denotes field-installed chassis ground.
- Operating control required with tankless heater.
- Adjust limit control to desired system setting. Adjust high limit to Minimum 2 psi above system setting to avoid nuisance pilot outage.

**Legend**

- 120 VAC FIELD WIRING
- LOW VOLTAGE FIELD WIRING
- 120 VAC FACTORY WIRING
- LOW VOLTAGE FACTORY WIRING
- THERMOPILE
- \* Items not provided

**WARNING** Electrical shock hazard — can cause severe injury or death. Disconnect power before installing or servicing.

**EGH 85 – 95**

- Standing pilot
- Natural gas
- Steam, with or without Tankless
- Float-Type Low Water Cut-Off

**WEIL-McLAIN**  
 Weil-McLain • 500 Blaine St. • Michigan City, IN 46360-2388  
 Part Number 550-223-739/0706

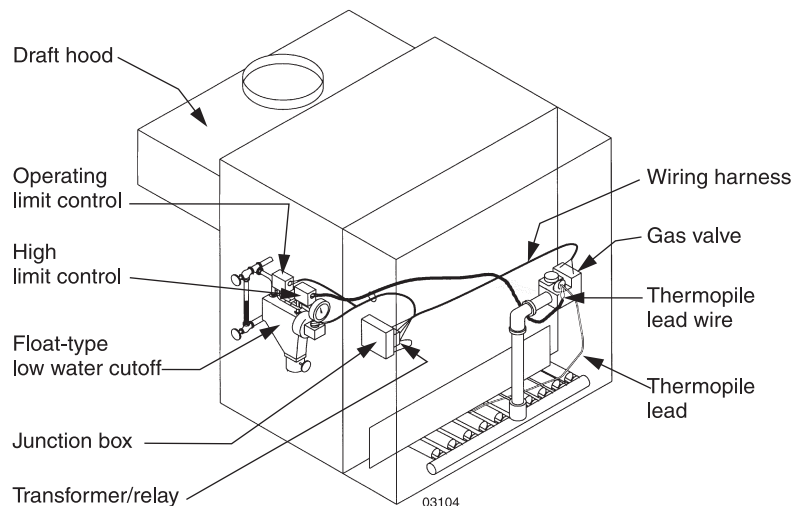
## with float-type low water cutoff

### **WARNING**

For your safety, turn off electrical power supply and turn off external gas supply valve before attempting to work on the boiler. Failure to comply can cause severe personal injury, death or substantial property damage.

1. Mount and wire controls per wiring diagram, page 10, and Figure 4.
  - a. Attach junction box inside left jacket panel with #8-32 x 1/2" machine screws and green ground nuts provided.
  - b. Install transformer with plug-in relay receptacle and relay. In Canada, use chain and hook strain relief.
  - c. Operating and limit circuit wiring must be 18 gauge or heavier (as supplied with the boiler).
2. Bring supply wiring to boiler. Must be 14 gauge or heavier.

**Figure 4**



### **Anticipator settings**

**Water** — 0.40 amps, single zone systems only. For multiple zones using zone valves or circulators, refer to component manufacturer's instructions for application, wiring and thermostat heat anticipator setting.

**Steam** — 0.20 amps.

## Checkout procedure

1. Follow all instructions in the boiler manual, including the Checkout procedure, before proceeding.
2. See page 12 for "Lighting instructions". Raise room thermostat to call for heat.
3. Gas valve will open and main burners will ignite.
4. Lower thermostat setting. Main burner flames will go out.
5. Repeat steps 1 through 3 several times to verify operation.
6. Return thermostat to normal setting.



# Lighting instructions – Robertshaw 7000ERHC

## FOR YOUR SAFETY READ BEFORE LIGHTING



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

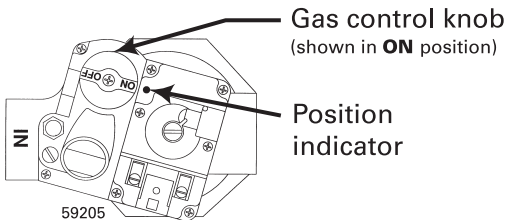
- A. This appliance has a pilot, which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
- B. Before **LIGHTING**, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See below.
- C. Use only your hand to depress or turn the gas control knob. Never use tools. If the selector arm will not depress or move 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

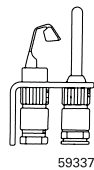
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

## LIGHTING INSTRUCTIONS

1. **Stop!** Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Depress gas control knob slightly and turn clockwise ↻ to **OFF**.
5. 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.
6. Remove access panel located above burners.
7. Find pilot — follow metal tube from gas control. The pilot is between two burners behind the access panel.
8. Turn gas control knob counterclockwise ↺ to **PILOT**.
9. Depress gas control knob and hold. Immediately light the pilot with a match. Continue to hold gas control knob in for about one (1) minute after the pilot is lit.
  - If pilot can be lit without depressing gas control knob, turn gas knob clockwise ↻ to **OFF** and call your service technician or gas supplier.
10. Release gas control knob. Pilot should remain lit. If pilot goes out, repeat steps 4 through 10.
  - If gas control knob 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.
11. Replace access panel.
12. Turn gas control knob counterclockwise ↺ to **ON**.
13. Turn on all electric power to the appliance.
14. Set thermostat to desired setting.
15. Replace front panel.



**Note:** Gas control knob cannot be turned to **OFF** unless knob is depressed slightly. Do not force.



## 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 gas control knob slightly and turn clockwise ↻ to **OFF**.
5. Replace front panel.



# Troubleshooting

## Verify proper operation after servicing



Never jumper (bypass) any device except for momentary testing as outlined in troubleshooting chart below. Substantial property damage and/or severe personal injury could occur.



Burner access panel must be in position during boiler operation to prevent momentary flame rollout on ignition of main flame. Severe personal injury or substantial property damage will result.



Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation leading to severe personal injury, death or substantial property damage.

## Before troubleshooting:

1. Have a voltmeter that can check 120VAC, 24VAC, and a continuity tester.
2. Check for 120VAC (minimum 102 to maximum 132) to boiler.
3. Be sure pilot is lit. See “Lighting instructions” on page 12 for details.
4. Make sure thermostat is calling for heat and contacts (including appropriate zone controls) are closed. Check for 24VAC between thermostat wire nuts and ground.

## Pilot does not stay lit – Troubleshooting thermopile and high limit control circuit

1. Checking thermopile open system (Figure 5):
  - a. Use an electronic multimeter, with leads fitted with alligator clips. Set meter scale to DC Millivolts.
  - b. Unscrew thermopile fitting from gas valve.
  - c. Attach one meter lead to the end of the thermopile gas valve fitting.
  - d. Attach other meter lead to thermopile lead (copper surface).
  - e. Follow Lighting Instruction label on boiler (also found in Control Supplement or User’s Information manual) to light the pilot burner only and hold the pilot flame manually. (DO NOT light main burner.)
  - f. Check the reading on the multimeter. The reading should be around 700 millivolts.
  - g. If multimeter reading is significantly less than above, replace the thermopile.
2. Checking thermopile circuit closed system (Figure 6):
  - a. Use an electronic multimeter, with leads fitted with alligator clips. Set meter scale to DC Millivolts.
  - b. Loosen the insulated terminal on the TOP thermopile lead wire enough to allow clipping a multimeter alligator clip to the spade terminal.
  - c. Attach the other multimeter lead to the thermopile lead.
  - d. Check the reading on the multimeter. The reading should be around 400 millivolts.
  - e. If reading is significantly less than 400 millivolts, check tightness of lead wire assembly in gas valve. If the connections are secure and you have checked the thermopile per step 1 above, replace the thermopile lead wire assembly.

- f. If reading on TOP thermopile lead wire is around 400 millivolts, move the multimeter alligator clip to the BOTTOM thermopile lead wire terminal and check multimeter reading.
- g. If multimeter does not read around 400 millivolts, check wiring connections and wire integrity to the limit controls.
- h. Check voltage at each limit terminal to make sure limit is closed. Correct pressure or temperature condition causing any limit to be open. Replace limit if necessary.

Figure 5

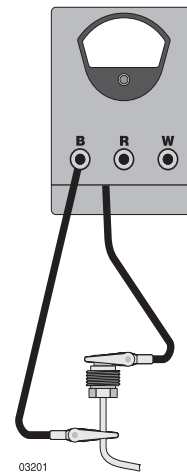
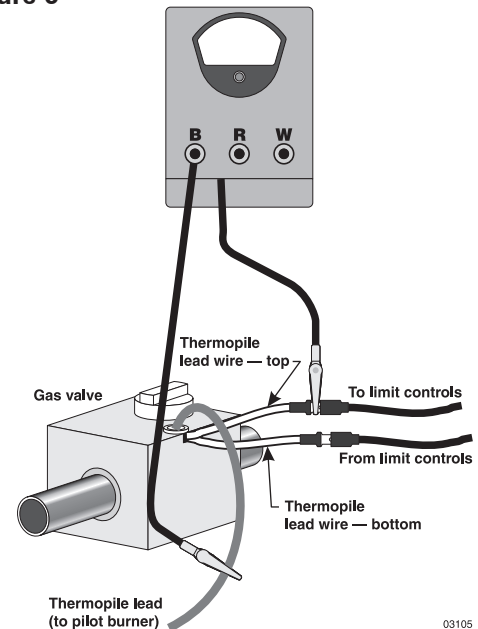


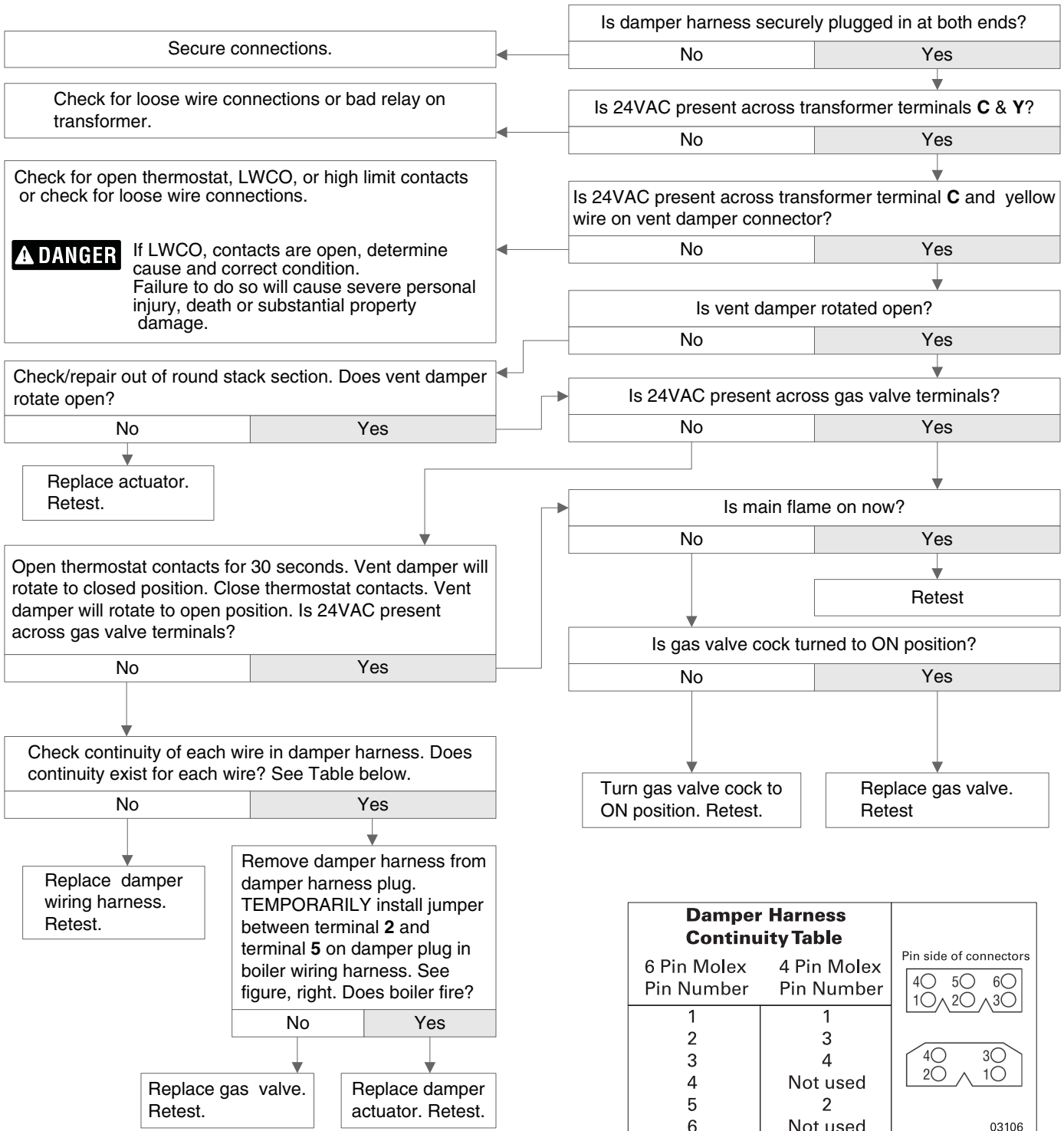
Figure 6





# Troubleshooting continued

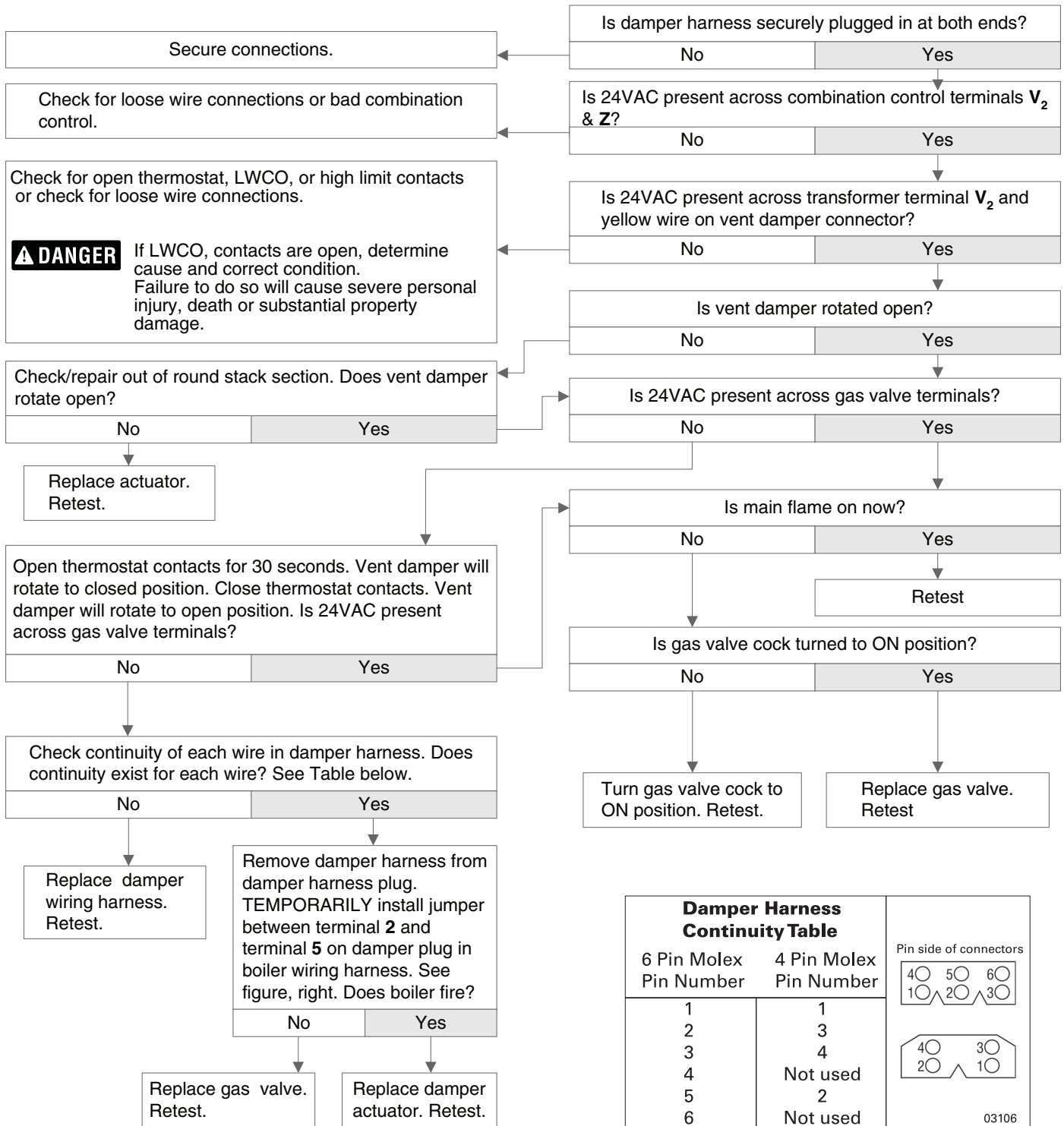
**Chart 1: Boiler will not fire - boilers without tankless**





# Troubleshooting continued

**Chart 2: Boiler will not fire – boilers with tankless**





## Parts

Description	Manufacturer	Manufacturer's part number	Weil-McLain part number
Main burner EGH-85 & 95 PFG-6 & 7	Weil-McLain		512-200-000 512-200-022
Main burner with pilot bracket EGH-85 & 95 PFG-6 & 7	Weil-McLain		512-200-001 512-200-023
Pilot burner, standing pilot	Honeywell	Q327A1642	511-330-186
Pilot Orifice Propane Gas	Honeywell	K14 388146KR	560-528-957
Thermopile, 36" long	Robertshaw	CP-2	511-724-259
Second pressuretrol wire harness			591-391-825
Thermopile lead wire, 5"			590-850-561
Gas valve $\frac{3}{4}$ " x 1", Natural gas, 24V $\frac{3}{4}$ " x 1", Propane gas, 24V	Robertshaw	7000ERHC-S7C	511-044-505 511-044-506
Wiring harness PFG-6 & 7 EGH-85 & 95, <b>Series 4 Only - Water</b> EGH-85 & 95, steam with float-type low water cutoff EGH-85 & 95, steam with probe-type low water cutoff	Weil-McLain		591-391-879 591-391-872 591-391-873 591-391-874



Weil-McLain  
500 Blaine Street  
Michigan City, IN 46360-2388  
<http://www.weil-mclain.com>