



LGB *Gas-fired boiler*

Control Supplement

LGB-4 & LGB-5 Series 2 – Natural gas Universal Control System



Contents

Installation	2
Gas piping	3
Wiring	4
Operating instructions	6
Verification testing	7
Parts	8

Refer to
**LGB • Installation •
 Start-Up • Service •
 Parts Manual**
for additional information

These terms are used throughout this manual to bring attention to the presence of hazards of various risk levels or to important information concerning the life of the product.

WARNING

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

NOTICE

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

WARNING

Control Supplement must only be used by a qualified installer/service technician. Read all instructions before installing. Failure to follow all instructions in proper order can cause severe personal injury, death or substantial property damage.



I Installation

Install pilot burner. See Figures 1a and 1b. Follow Figure 1b for pilot burner location, placing the burner with pilot bracket in the fourth position from the left for the LGB-4 and the fifth position from the left for the LGB-5, as shown.

Install gas controls and ignition control as shown in Figure 3 on page 7.

In Canada — mount rating plate on interior jacket panel.

Figure 1a

Pilot burner assembly

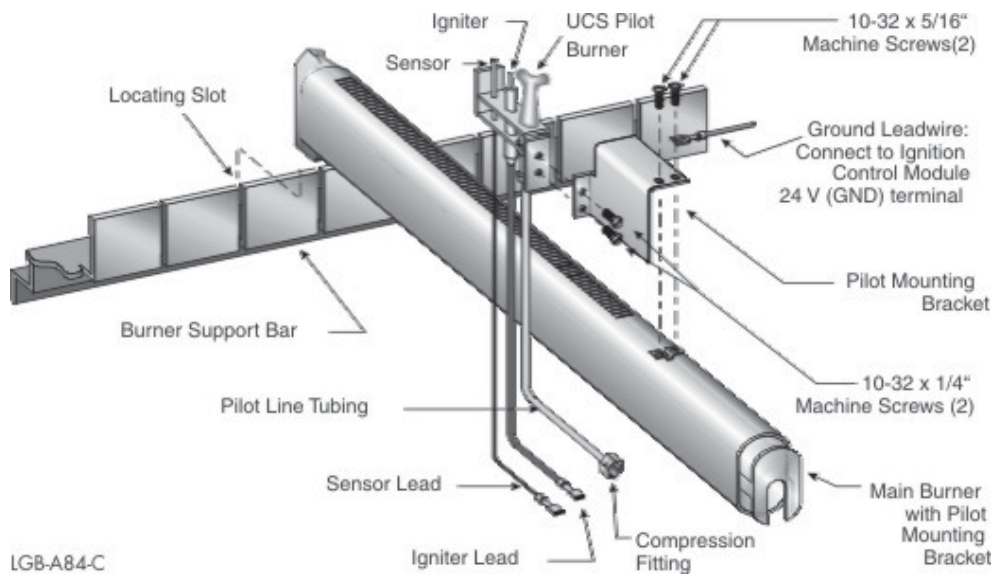
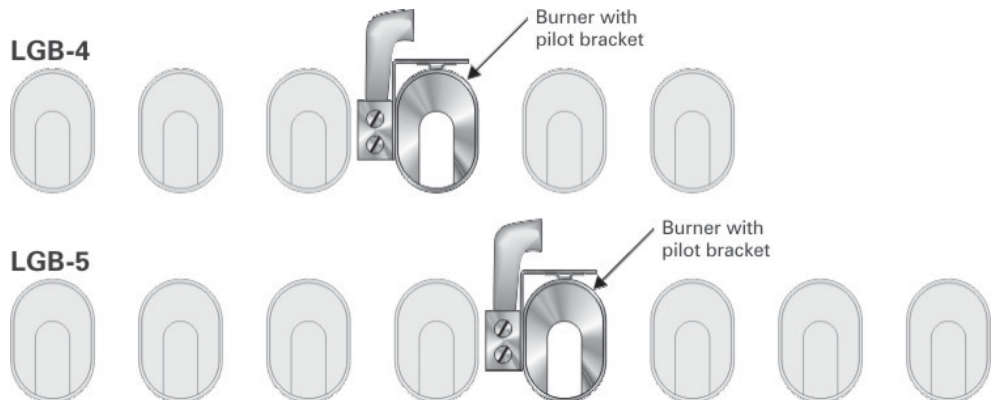


Figure 1b

Pilot location





II Gas piping

Supply pipe sizing

1. Size natural gas piping from Table 1. Size piping to provide proper inlet pressure to gas valve when operating at rated input.
 - a. Inlet gas pressure to manual main shut-off gas valve minimum 5" W.C., maximum 13" W.C.
 - b. If pressure to gas valve exceeds 13" W.C., install 100% lock-up gas pressure regulator upstream of hand valve.
 - c. To obtain approximate cubic feet per hour, divide input (Btu/hr) by 1000.
2. Size gas piping considering:
 - a. Diameter and length of gas supply piping.
 - b. Number of fittings.
 - c. Maximum gas consumption (including any possible future expansion).
 - d. Allowable pressure drop from gas meter to boiler. For pressure drops, see ANSI Z233.1 latest edition. Canadian installations must comply with B149.1 or B149.2 Installation Code.
3. Remove knockout disc from jacket panel side to which gas supply will be piped.
4. Follow good piping practices.
5. Pipe joint compound (pipe dope) must be resistant to corrosive action of liquefied petroleum gases. Apply sparingly only to male threads of pipe joints.
6. Install drip leg at inlet of gas connection to boiler. Where local code/utility requires, extend drip leg to floor.
7. Install ground joint union when required for servicing.
8. Support piping by hangers, not by boiler or its accessories.
9. Purge all air from supply piping.
10. Before operating boiler, check boiler and its gas connections for leaks.

Connect gas piping to boiler

WARNING

Do not check for gas leaks with an open flame - use bubble test. Failure to use bubble test or check for leaks can cause severe personal injury, death or substantial property damage.

- a. Close manual main shut-off valve during any pressure testing greater than 13" W.C.
 - b. Disconnect boiler and gas valve from gas supply piping during any pressure test greater than 13" W.C.
11. In Canada — manual main shut-off valve must be identified by installer.

Table 1

Gas supply pipe capacities

PIPE SIZE	Pipe length, feet *							
	(Natural gas capacities given in MBH) (Specific Gravity 0.60 @ Pressure Loss of 0.30" W.C.)							
	10	20	30	40	50	75	100	150
1 1/4"	1,050	730	590	500	440	360	305	250
1 1/2"	1,600	1,100	890	760	670	545	460	380
2"	3,050	2,100	1,650	1,450	1,270	1,020	870	710
2 1/2"	4,800	3,300	2,700	2,300	2,000	1,650	1,400	1,130
3"	8,500	5,900	4,700	4,100	3,600	2,900	2,500	2,000
4"	17,500	12,000	9,700	8,300	7,400	6,000	5,100	4,100

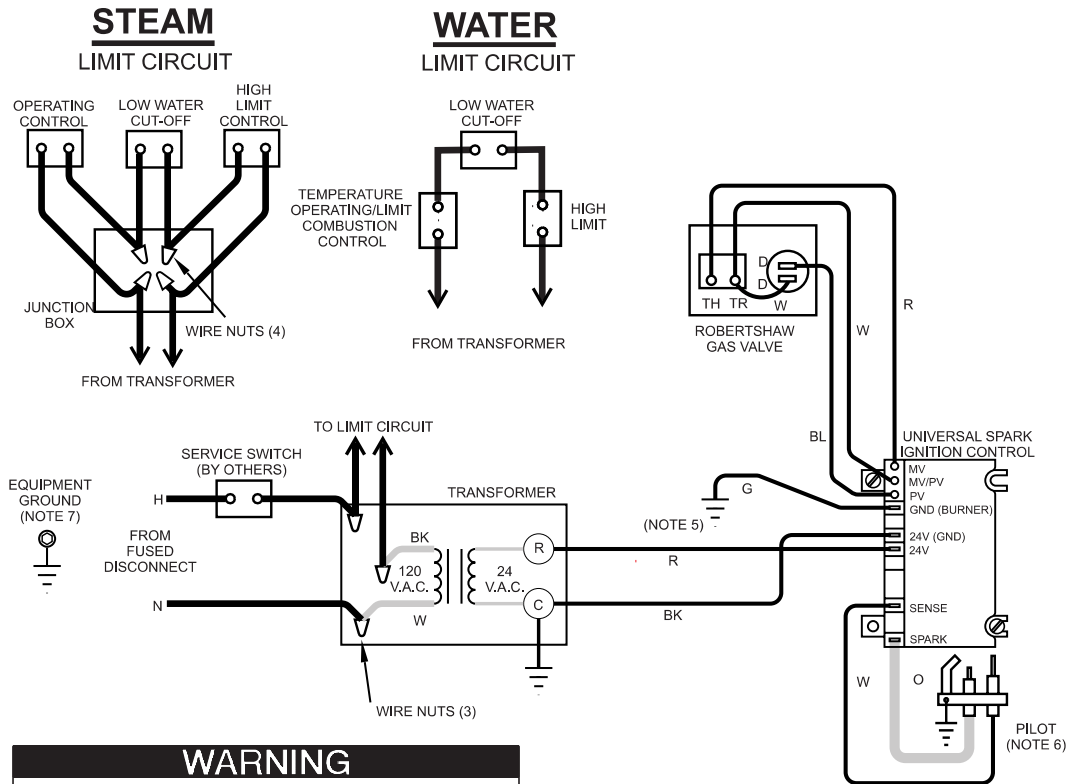
*Include measured length of gas supply piping and allowance in feet for number and size of fittings.



III

Wiring

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:
 - U.S.A. - NATIONAL ELECTRICAL CODE AND ANY OTHER NATIONAL, STATE OR LOCAL CODE REQUIREMENTS.
 - CANADA - C.S.A. C22.1 CANADIAN ELECTRICAL CODE PART 1 AND ANY OTHER NATIONAL, PROVINCIAL, OR LOCAL CODE REQUIREMENTS.
- ALL WIRING EXTERNAL TO BOILER JACKET MUST BE:
 - U.S.A. - N.E.C. CLASS 1.
 - CANADA - C.S.A. C22.1 C.E.C. PART 1.
- IF ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, TYPE 105°C OR ITS EQUIVALENT MUST BE USED, EXCEPTION, SEE NOTE 5.
- REFER TO CONTROL COMPONENT INSTRUCTIONS PACKED WITH BOILER FOR APPLICATION INFORMATION.
- REFER TO CONTROL SUPPLEMENT FOR GROUND LEADWIRE ATTACHMENT. IF ORIGINAL GROUND LEADWIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, TYPE 125 °C OR ITS EQUIVALENT MUST BE USED.
- PILOT LEADWIRES ARE NOT FIELD REPLACEABLE. REPLACE PILOT ASSEMBLY IF NECESSARY.
- DENOTES FIELD INSTALLED CHASSIS GROUND.
- ALL CONTACTS SHOWN WITHOUT POWER APPLIED-OFF SHELF CONDITION.

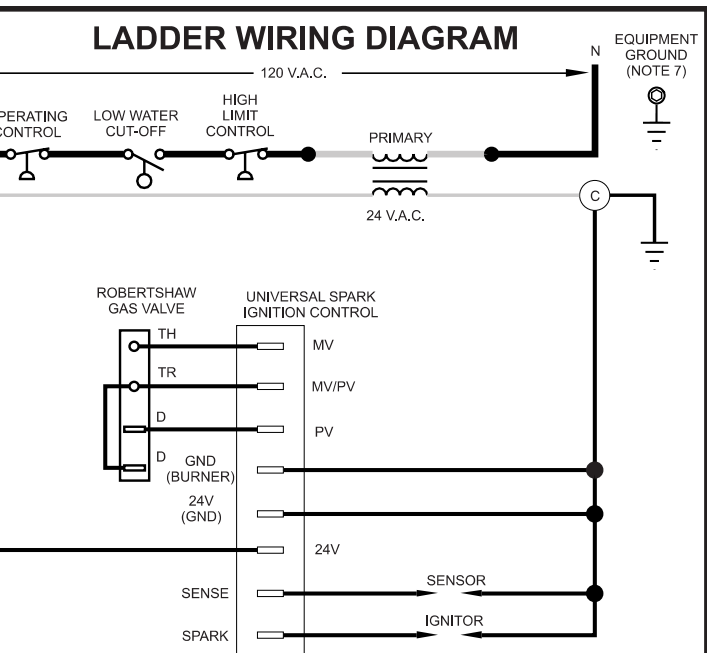
LOW VOLTAGE FIELD
HIGH VOLTAGE FIELD
LOW VOLTAGE FACTORY
HIGH VOLTAGE FACTORY
IGNITION/SENSING CABLE

LGB
Natural Gas

- Int
- Uni
- Ste
- 4 a



Figure 2 Wiring diagram



WARNING

For your safety, turn off power supply before making electrical connections to avoid possible electrical shock hazard.

WARNING

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

Wiring requirements

All wiring must be installed according to requirements of the National Electrical Code and any national, state or local code requirements having jurisdiction. All wiring external to boiler jacket must be N.E.C. Class 1. The boiler must be electrically grounded according to the National Electrical Code, ANSI/NFPA No. 70 latest edition. Use 105°C thermoplastic wire, or equivalent, if any original wire must be replaced. GND (burner) lead wires must be 125°C wire.

Canadian installations must conform to CSA C22.1 Canadian Electrical Code Part 1 and any local or provincial codes.

Wiring to boiler must be No. 14 gauge or heavier. Install in conduit.

A separate electrical circuit with a fused disconnect switch (15 amp. recommended) should be used for the boiler.

Wiring procedure

- Determine right or left electrical supply wiring.
- Attach electrical junction box to inside jacket end panel. Screws and nuts are provided.
- Attach control transformer to junction box.
- Complete wiring per wiring diagram, Figure 2, pages 4 and 5.
- Install ignition control ground connection as shown in Figure 1 and wiring diagram, Figure 2.
- In Canada — attach chain between junction box and transformer with S-hooks.

NOTICE

"Hot" side of line voltage to boiler must be wired directly to limit circuit, then fed to transformer primary.

Sequence of operation

1. Operating control begins start-up sequence.
 - a. Limit control contacts are closed.
2. Ignition control module energized.

NOTICE

On failure to sense pilot flame, control will wait 5 minutes then retry for ignition.

- a. Pilot gas valve opens.
 - b. Pilot ignition spark begins.
 - c. Pilot ignites.
 - d. Pilot proves.
 - e. Main gas valve opens.
 - f. Main burners ignite.
3. Boiler shuts down when operating control satisfied.

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 versal Control System
 am or Water
 nd 5



WEIL-McLAIN

Weil-McLain • 500 Blaine St. • Michigan City, IN 46360-2388

PART NUMBER 550-101-132/0104



IV

Operating instructions

WARNING

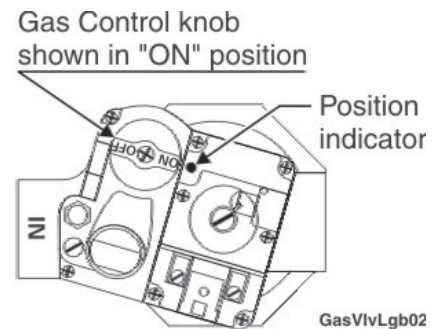
- A. This boiler is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
- B. **BEFORE OPERATING**, smell all around the boiler area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

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.
- C. 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.
 - 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.

Starting boiler

1. STOP! Read the safety information above.
2. Set the thermostat to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove *Front Panel*.
5. This appliance is also equipped with an ignition device which automatically lights the second pilot. Do not try to light this pilot by hand.
6. Close the firing valve and turn the *Gas Control* knob clockwise to "OFF."
7. 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.
8. Turn *Gas Control* knob counterclockwise to "ON," then open the firing valve.
9. Turn on all electric power to the appliance.
10. Set thermostat to desired setting.
11. If the appliance will not operate, close the firing valve and turn off gas to the boiler by rotating the *Gas Control* knob clockwise to "OFF." Turn off all electrical power. Call your service technician or gas supplier.
12. Replace *Front Panel*.





V

Verification testing

WARNING

Before starting boiler for the first time and at least annually (during annual inspection and start-up), follow the procedures below to verify boiler controls are operating correctly and that automatic gas valve properly shuts off gas flow. Failure to verify boiler operation could result in severe personal injury, death or substantial property damage.

Manual test firing valve

This boiler is equipped with a manual test firing valve — the manual gas valve piped between the gas manifold and the automatic gas valve. Closing the manual test firing valve allows verification of proper boiler operation without allowing gas flow to the manifold and allows leak testing of the automatic gas valve. Follow the procedures below.

Verify boiler control sequence

1. Follow the Operating Instructions in this Supplement to start the boiler, but **do not open the manual test firing valve**. Open all other manual gas valves as instructed. Leave the manual test firing valve closed.
2. The automatic pilot burner should light.
3. After the pilot lights, the boiler controls should activate the automatic gas valve. Use a voltmeter to verify voltage to automatic valve.
4. With no gas flow to the manifold, the boiler ignition controls should turn off the automatic gas valve after main flame ignition trial. Use a voltmeter to verify voltage to automatic valve is turned off.

Leak test automatic gas valve

1. Close manual test firing valve.
2. Open the service valve. Press down and turn automatic gas valve knob (or lever) to ON.
3. Install a hose barb into a pressure tap downstream of the automatic gas valve. Allow any accumulated gas in the line to vent off. Then connect a U-tube manometer. If the valve seals properly, there should be no gas pressure present. Remove manometer and hose barb and replace pipe plug in pressure tap.
4. Remove the manometer and plug any open pressure taps.
5. Follow Operating Instructions to place boiler in service.

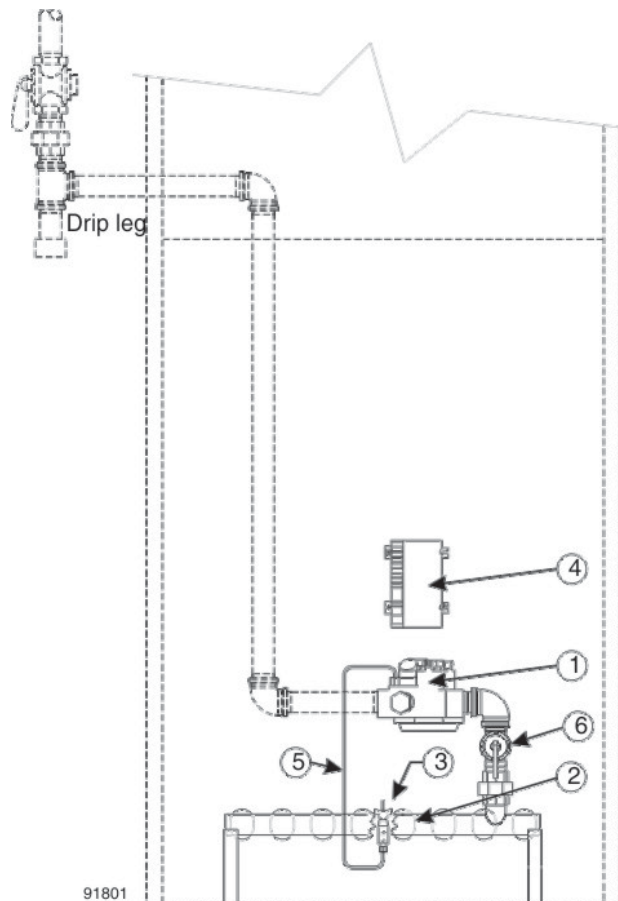
WARNING

Replace any defective components. Do not attempt to operate boiler or leave boiler in operation if any component is found to be defective or to operate incorrectly. Failure to comply could result in severe personal injury, death, or substantial property damage.



VI Parts list

Figure 3
Control and gas components



Ref. No.	Description	Vendor/Part Number	Weil-McLain Part Number
1	Gas valve – 1" NPT	Robertshaw 7000DERHC-S7C	511-044-287
2	Main burner with pilot bracket	Weil-McLain	512-200-055
3	Pilot burner	Johnson Controls Q90GE-1 Beckett Gas E48A1	511-330-218
4	Ignition control module	United Technologies 1003-511 Honeywell S8620C1003	511-330-097
5	Pilot tubing, Alum. 1/8" O.D. x 34" long	Available at Local Supply House	
6	Manual test firing valve – 1" NPT	Watts FBV3-06	511-246-290



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