

LGB *Gas-fired boiler*

Control Supplement

LGB-6 to LGB-20 Series 2 – Propane gas CSD-1 Control System



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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 damage.

WARNING

This Control Supplement must only be used by a qualified installer/service technician. Read these instructions completely before beginning the installation. Failure to follow these instructions can cause severe personal injury, death or substantial property damage.



I New installation

1. Remove all burners from base box assembly. Remove 3.95 mm natural gas main burner orifices in manifold. Install 2.40 mm propane gas main burner orifices. Use pipe dope sparingly only on male ends. Use pipe dope compatible with propane gases. Do not overtighten orifices.
2. Install pilot burners and flame sensor(s). See Figures 1 and 2 (page 3). Follow Table 1, below for electronic pilot burner (UCS), standing pilot burner (Q327) and flame sensor locations on manifold.
3. Install gas controls and ignition control panel as shown in Table 2, below and Figure 6 (page 12).
4. Attach pilot switch box to interior jacket panel. See Figure 6 (page 12). Connect thermocouple from standing pilot to switch box. Cut 60" pilot tubing into 2 pieces to make connections from pilot valve to pilot switch box and from pilot switch box to standing pilot.
5. Attach:
 - a. 550-223-710 label at boiler operating instruction label. Place so that this label reads first.
 - b. 550-223-796 label at rating label.
 - c. Wiring diagram on door (one on each base).

Table 1

Pilot burner and flame sensor locations

Boiler Model Number	Flame Sensor*		Electronic Pilot Burner*		Standing Pilot Burner*		Boiler Model Number	Flame Sensor*		Electronic Pilot Burner*		Standing Pilot Burner*	
	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2		No. 1	No. 2	No. 1	No. 2	No. 1	No. 2
LGB-6	2	--	9	--	6	--	LGB-14	2	16	13	25	8	21
LGB-7	2	--	11	--	7	--	LGB-15	2	16	13	27	8	22
LGB-8	2	--	13	--	8	--	LGB-16	2	18	15	29	9	24
LGB-9	2	--	15	--	9	--	LGB-17	2	18	15	31	9	25
LGB-10	2	--	16	--	9	--	LGB-18	2	20	16	33	9	27
LGB-11	2	--	16	--	9	--	LGB-19	2	20	16	34	9	27
LGB-12	2	--	16	--	9	--	LGB-20	2	22	16	36	9	29
LGB-13	2	14	11	23	7	19							

* From left burner

Table 2

Gas control arrangement

Boiler Model Number	Propane Carton	Inlet Pipe Size		Boiler Model Number	Propane Carton	Inlet Pipe Size	
		Left base	Right base			Left base	Right base
LGB-6	A and B	1"	--	LGB-14	I	1"	1"
LGB-7	A and B	1"	--	LGB-15	J	1"	1"
LGB-8	C and D	1"	--	LGB-16	J	1"	1"
LGB-9	C and D	1"	--	LGB-17	J	1"	1"
LGB-10	E, F and G	1 ¼"	--	LGB-18	K	1 ¼"	1"
LGB-11	E, F and G	1 ¼"	--	LGB-19	L	1 ¼"	1 ¼"
LGB-12	E, F and G	1 ¼"	--	LGB-20	L	1 ¼"	1 ¼"
LGB-13	H	1"	1"				



I New installation – continued

Figure 1

Pilot burner assembly, typical

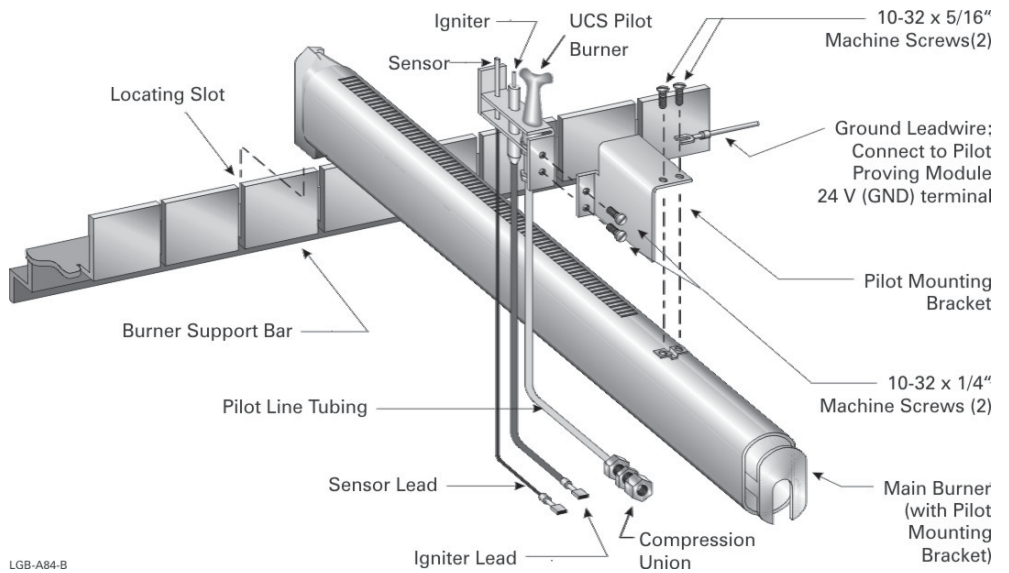
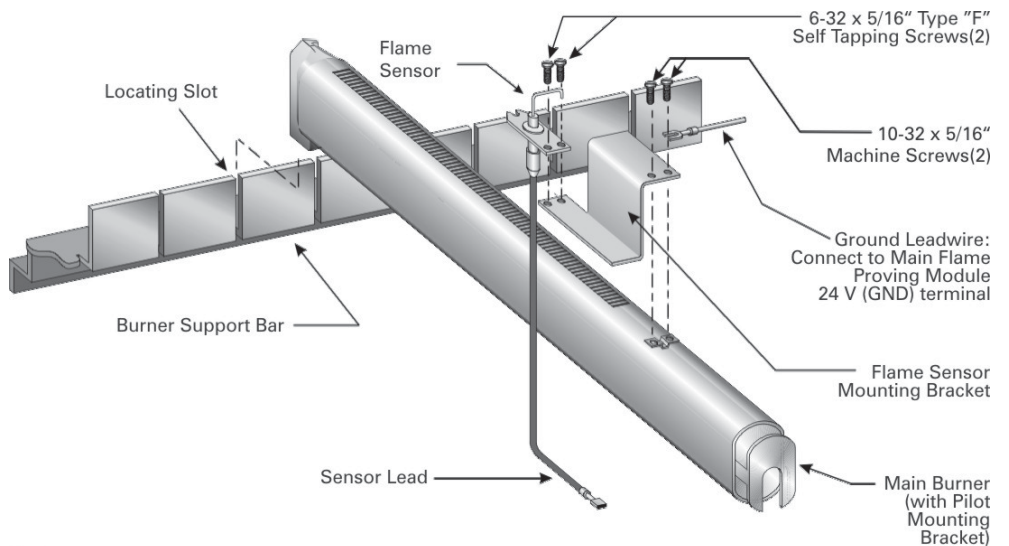


Figure 2

Main flame sensor assembly





II

Existing installation Conversion from natural gas to propane gas

WARNING

This conversion is to be installed by a Weil-McLain distributor or other qualified agency in accordance with the manufacturer's instructions and all codes and requirements of the authority having jurisdiction. Failure to follow instructions could result in serious injury or property damage. The qualified agency performing this work assumes responsibility for this conversion.

WARNING

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

1. These instructions are for use with Propane Control Cartons as listed in Gas Control Arrangement, Table 2 (page 2).
2. Remove jacket door(s) and access panel(s).
3. Disconnect wiring and tubing from existing pilot burner and main flame sensor.
4. Remove all burners. Remove 3.95 mm natural gas main burner orifices in manifold. Install 2.40 mm propane gas main burner orifices. Use pipe dope sparingly only on male ends. Use pipe dope compatible with propane gases. Do not overtighten orifices.
5. Remove and discard existing electronic pilot burner from pilot burner tube. Replace with electronic pilot burner in carton.
6. Attach Q327 standing pilot to burner tube in kit. Connect pilot tubing and thermocouple to pilot.
7. Re-install burners. See Table 1 (page 2) for location of pilot burners and flame sensor(s).
8. Attach pilot switch box to jacket. See Figure 6 (page 12). Connect thermocouple to pilot switch box. Cut 60" pilot tubing into 2 pieces to make connections from tee in pilot line to pilot switch box and from pilot switch box to standing pilot.
9. Remove natural gas valve train.
10. Install propane gas valve train and fittings from carton (See page 5, section IV, paragraph 4 of this Supplement).
11. Re-install access panel(s).
12. See Figure 6, page 12 for propane piping.
13. Wire per wiring instructions and wiring diagrams, pages 5-9. Add splices as needed.
14. Attach:
 - a. 550-223-710 label at boiler operating instruction label. Place so that this label reads first.
 - b. 550-223-796 label at rating label.
 - c. Wiring diagram over diagram on door (one on each base).
15. To place in operation, follow instructions on constant burner pilot light-up label and boiler operating label.
16. Replace jacket doors.

III

Water and steam trim components

1. Install water or steam trim components as required by CSD-1 latest edition. See the boiler manual for tapping locations.
 - a. Water boilers require:
 - a manual reset high temperature limit control in addition to the standard automatic reset limit control.
 - a manual reset low water cutoff.
 - b. Steam boilers require:
 - a manual reset high pressure limit control in addition to the standard automatic reset limit control.
 - a manual reset low water cutoff in addition to the standard automatic reset low water cutoff.



IV Gas piping

1. Contact gas supplier to size pipes, tanks and regulator.
 - a. Inlet gas pressure to manual main shut-off gas valve — minimum 11” 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.
2. Remove gas supply knockout disc from jacket panel.
3. Follow good piping practices.
4. Pipe joint compound (pipe dope) must be resistant to corrosive action of liquefied petroleum gases. Apply sparingly only to male threads of pipe joints.
5. Install drip leg at inlet of gas connection to boiler. Where local utility requires, extend drip leg to floor.
6. Install ground joint union when required for servicing.
7. Support piping by hangers, not by boiler or its accessories.
8. Purge all air from supply piping.
9. Before operating boiler, check boiler and its gas connections for leaks.

WARNING

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

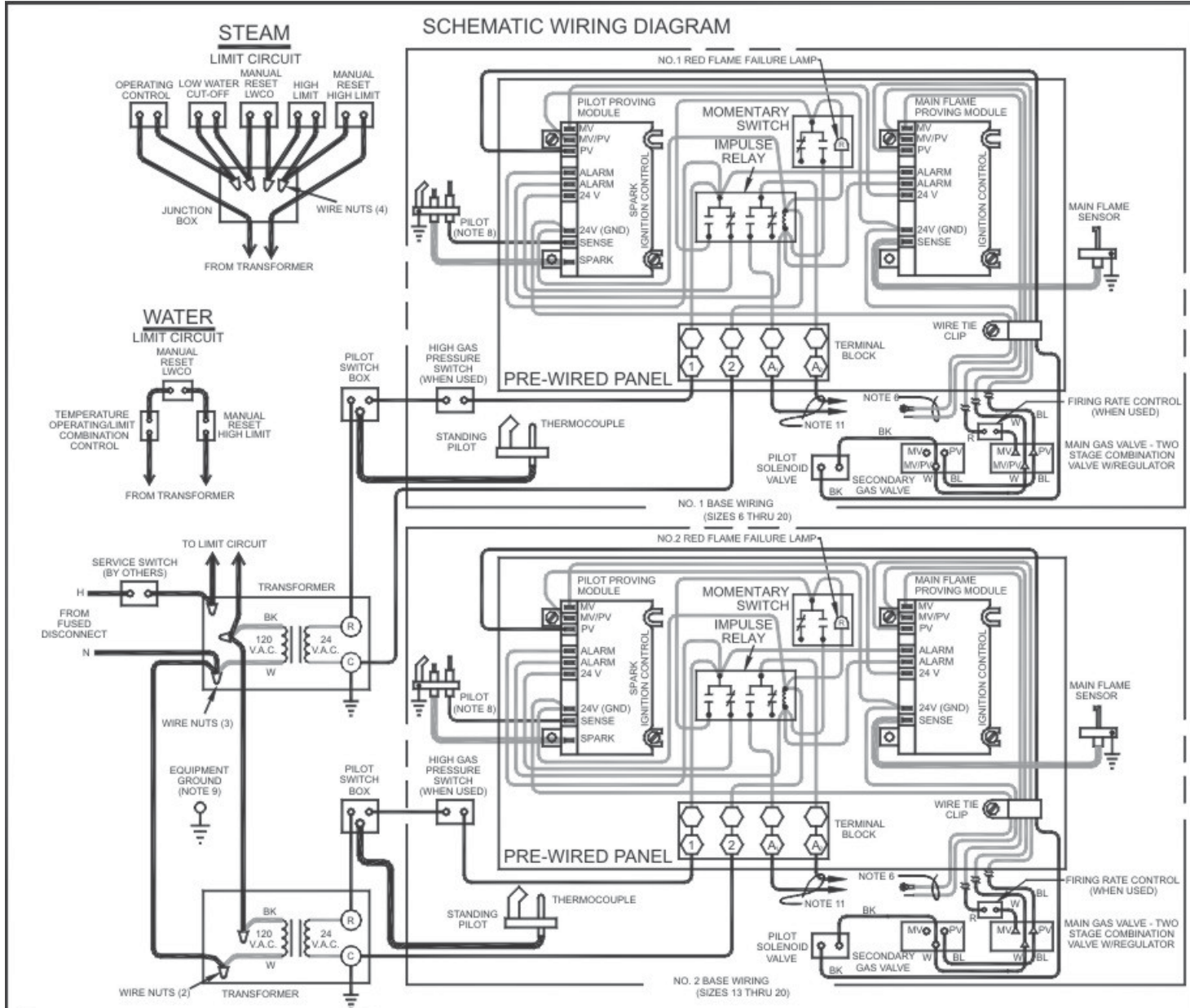
- a. Close manual main shut-off valve during any pressure testing at less than 13” W.C.
- b. Disconnect boiler and gas valve from gas supply piping during any pressure test greater than 13” W.C.

V Wiring

WARNING

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

1. All wiring must be installed in accordance with the requirements of the National Electrical Code and any additional national, state or local code requirements having jurisdiction. All wiring must be N.E.C. Class 1.
2. The boiler must be electrically grounded in accordance with the National Electrical Code, ANSI/NFPA No. 70-latest edition. Use 105 °C. thermoplastic wire, or equivalent, if any of the original wire must be replaced (except for pilot spark, sense and ground wires).
3. Supply wiring to the boiler must be No. 14 gauge or heavier. Install in conduit.
4. A separate electrical circuit with a fused disconnect switch (15 amp. recommended) should be used for the boiler.
5. Refer to wiring diagrams, Figure 3 (pages 6 and 7) and Figure 5 (page 9). See section, “Wiring procedure” on page 8.
6. Figure 5 on page 9 is the Field Wiring Diagram. See Figure 3, pages 6 and 7, for the schematic and ladder wiring diagrams.

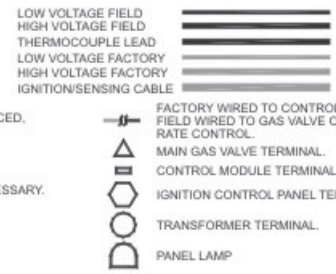


WARNING
ELECTRICAL SHOCK HAZARD, CAN CAUSE SEVERE INJURY OR DEATH. DISCONNECT POWER BEFORE INSTALLING AND/OR SERVICING.

NOTES:

1. 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.
2. ALL WIRING EXTERNAL TO BOILER JACKET MUST BE:
 - A. U.S.A. - N.E.C. CLASS 1.
 - B. CANADA - C.S.A. C22.1 C.E.C. PART 1.
3. IF ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, TYPE 105 DEGREES C OR ITS EQUIVALENT MUST BE USED. EXCEPTION, SEE NOTE 6.

4. REFER TO CONTROL COMPONENT INSTRUCTIONS PACKED WITH BOILER FOR APPLICATION INFORMATION.
5. TERMINAL ON MAIN GAS VALVE IS A SINGLE TERMINAL (COMMON) FOR LOW AND HIGH FIRE OPERATORS.
6. 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.
7. WIRES ARE FACTORY INSTALLED TO CONTROL PANEL, BUT MUST BE FIELD CONNECTED TO GAS VALVES AND FIRING RATE CONTROL TERMINALS (WHEN USED).
8. PILOT LEADWIRES ARE NOT FIELD REPLACEABLE. REPLACE PILOT ASSEMBLY IF NECESSARY.
9. DENOTES FIELD INSTALLED CHASSIS GROUND.
10. ALL CONTACTS SHOWN WITHOUT POWER APPLIED - OFF SHELF CONDITION.
11. ALARM CONTACT RATINGS - 15 AMP @ 250 VAC.



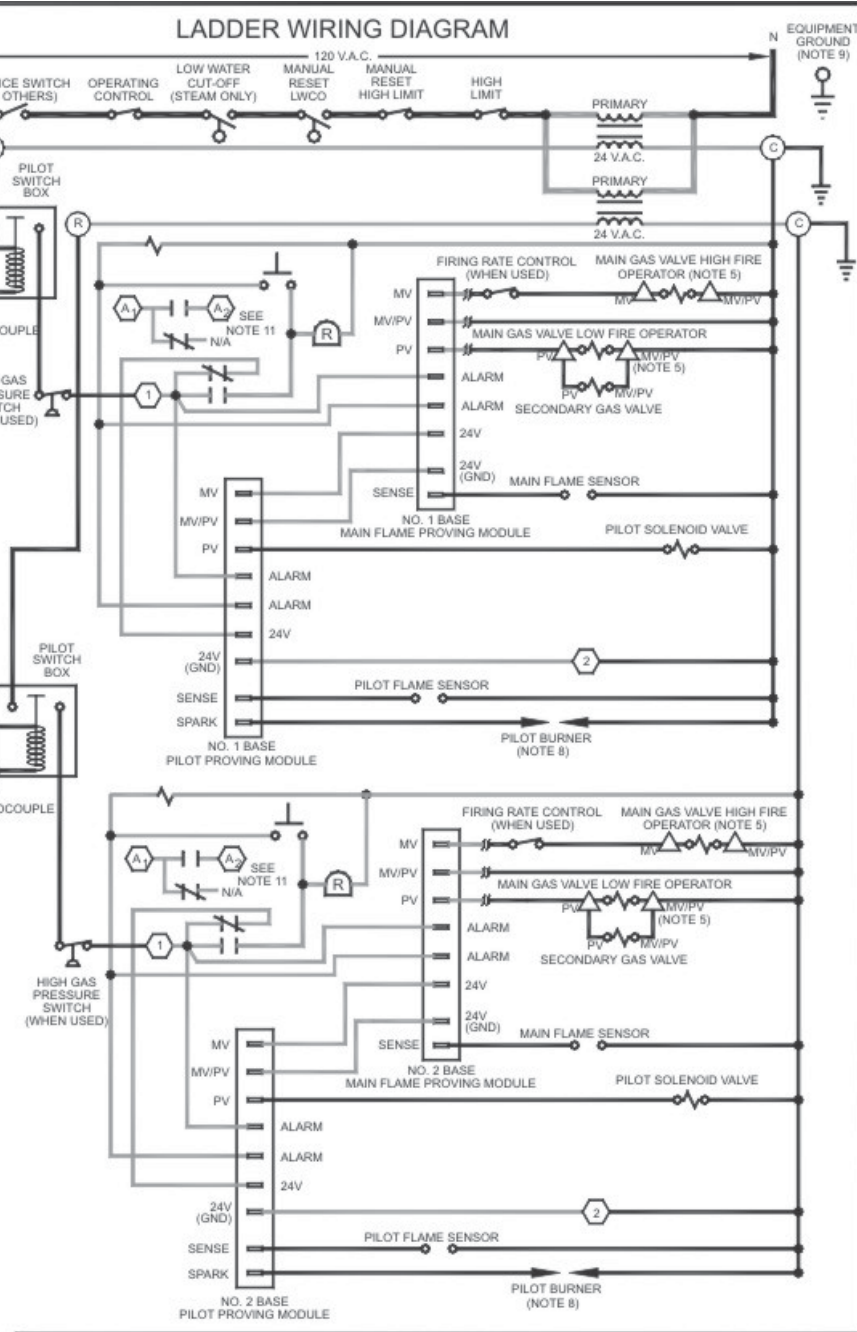


Figure 3
Wiring diagram

<p>LGB Propane Gas</p>	<ul style="list-style-type: none"> • Intermittent Pilot • CSD-1 Control System 	<p>Well-McLain • 500 Blaine St. • Michigan City, IN 46360-2388</p>
	<ul style="list-style-type: none"> • Steam or Water • 6 thru 20 	



V

Wiring – continued

Sequence of operation

1. Operating control begins startup sequence.
 - a. Limit control contacts are closed.
2. Pilot proving module energized.
 - a. Pilot solenoid opens.
 - b. Pilot ignition spark begins.
 - c. Pilot ignites.
 - d. Pilot proves.

NOTICE On failure to sense pilot flame, the pilot-proving module will wait 5 minutes, then retry for ignition. Upon 2 consecutive pilot flame failures, the control will lockout and illuminate the red lockout light.

3. Main flame proving module energized from pilot proving module.
 - a. Secondary gas valve opens.
 - b. Main gas valve opens to low fire position.
 - c. Main burners ignite at low fire.
 - d. Main flame sensor proves low fire carryover.
 - e. Main gas valve opens to high fire position.
 - f. Main burners increase to high fire.

NOTICE On failure to sense main flame, the main flame-proving module will lockout and illuminate the red lockout light.

4. For dual base assembly - operating control energizes controls for each base assembly at the same time. See steps 1 through 3 above.
5. Boiler shuts down when operating control satisfied.

NOTICE If the boiler locks out, the alarm contacts on the terminal strip (terminals A1 and A2) close. These contacts are rated to 15 amps, 250 V. To reset the boiler, push the red lockout button.

Wiring procedure

1. Determine right or left electrical supply wiring.
2. Attach electrical junction box(es) to inside jacket end panel. Screws and nuts are provided. For dual base boilers, use offset nipples (provided) to connect junction boxes together (as at right), then hang junction boxes by screwing top box to boiler jacket. See Figure 4.
3. Attach control transformer(s) to junction box(es).
4. Drill 1/8" hole in interior jacket panel midway between ignition control panel and left jacket panel. Mount wire support clip using sheet metal screw (furnished).
5. Complete wiring per diagrams, Figure 3 (pages 6 and 7) and Figure 5 (page 9). Terminate at secondary gas valve in valve junction box with wirenuts and strain relief provided.

NOTICE “Hot” side of line voltage to boiler must be wired directly to limit circuit, then fed to transformer primary(ies).
Dual Base: “R” terminal of secondaries are to supply power to bases independently of each other. Do not wire “R” terminals together.

6. Install pilot proving and main flame proving ground connections as shown in Figures 1 and 2 and wiring diagram. Route wires through wire support clip.

Figure 4

Junction box assembly dual base boilers

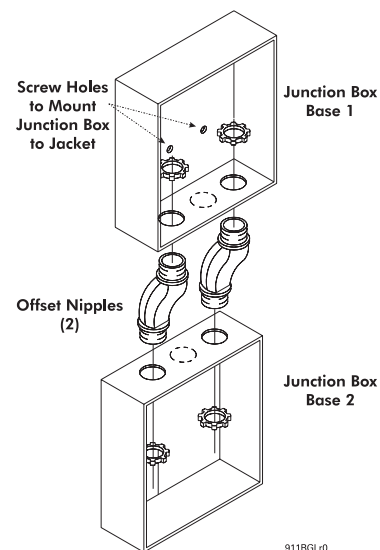
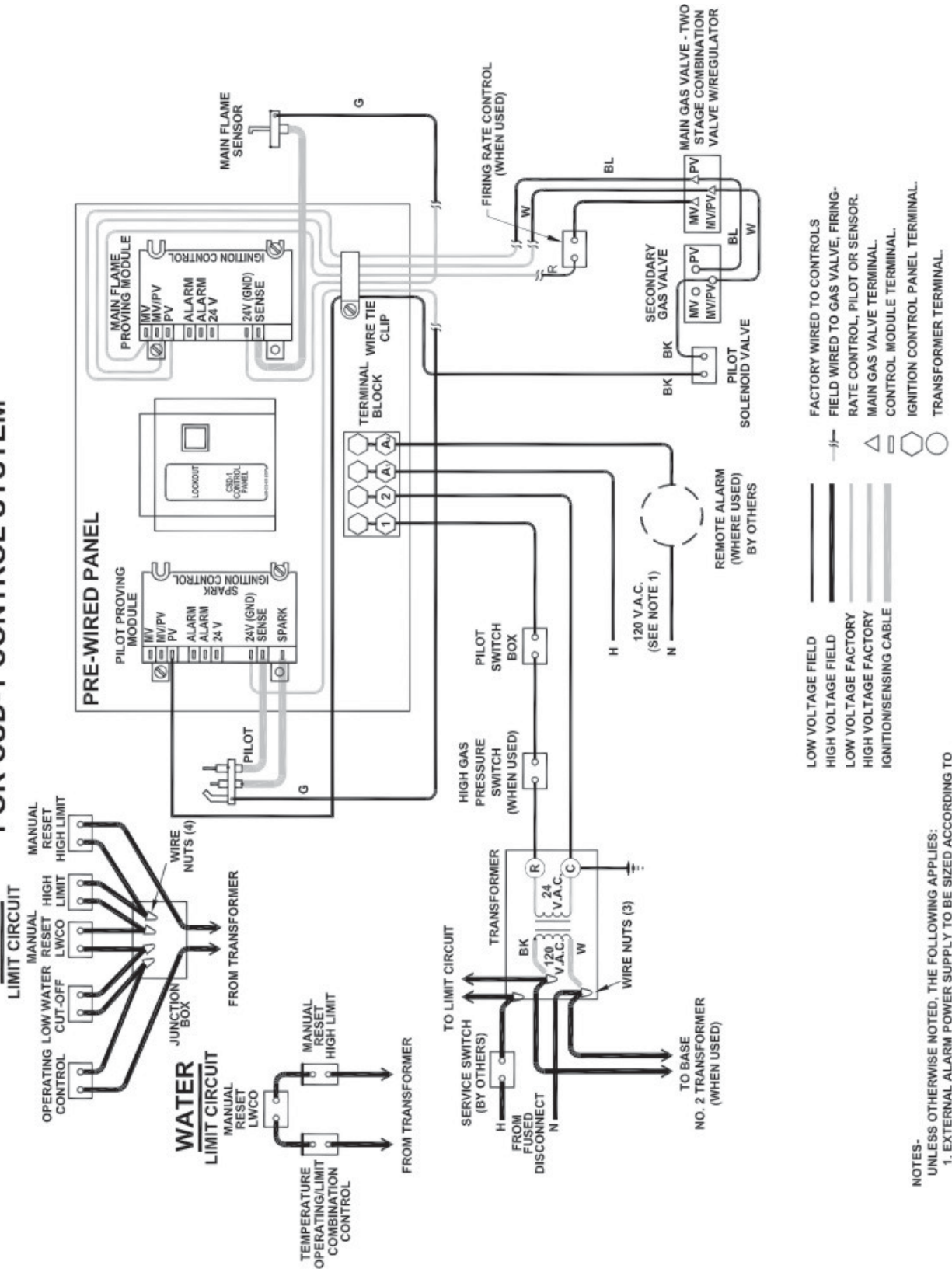




Figure 5
Field wiring diagram

FIELD WIRING DIAGRAM NO. 1 BASE FOR CSD-1 CONTROL SYSTEM



LGB-A133

NOTES:
UNLESS OTHERWISE NOTED, THE FOLLOWING APPLIES:
1. EXTERNAL ALARM POWER SUPPLY TO BE SIZED ACCORDING TO REMOTE ALARM REQUIREMENTS AND WIRED TO DRY CONTACTS A AND A . CONTACT RATING: 15 AMP @ 250 VAC.



VI

Leak test procedure

1. Remove red (MV) and blue (PV) wires from main gas valve.
2. Close main test firing valve attached to the manifold.
3. Check that both leak test valves are closed and remove plugs.
4. Attach manometer to first leak test valve.
5. Open first leak test valve and check for pressure.
6. Close first leak test valve and remove manometer.
7. Attach manometer to second leak test valve.
8. Apply call for heat to boiler.
9. Check that electronic pilot proves.
10. Open second leak test valve and check for pressure.
11. Close second leak test valve and remove manometer.
12. Remove call for heat to boiler.
13. Reinstall plugs on leak test valves.
14. Connect wiring to main gas valve.
15. Open main test firing valve attached to the manifold.

NOTICE

When checking for pressure at the leak test valves, any small pressure reading is normal. If the pressure continues to increase after opening the leak test valve, the upstream valve is leaking and should be replaced.



VII

Operating instructions

WARNING

- A. This boiler is equipped with a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly. The gas supply to this pilot is controlled by *Pilot switch box*. This boiler is also equipped with an ignition device which automatically lights a second pilot. The gas supply to this pilot is controlled by the *Gas control*. Do not try to light this pilot by hand.
- B. BEFORE OPERATING THE MANUAL PILOT, 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.

WHAT TO DO IF YOU SMELL GAS

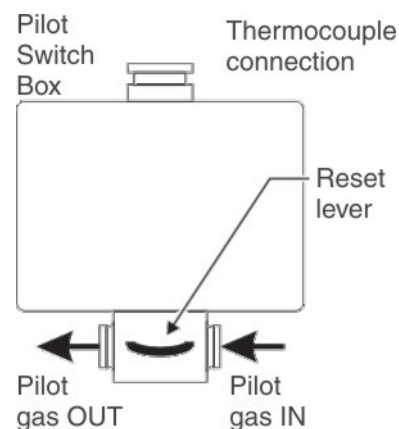
 - Do not try to light any appliance.
 - Do not touch any electric switch; do not use any phone in your building.
 - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
 - If you cannot reach your gas supplier, call the fire department.
- C. Do not use this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

WARNING

This document is intended only as a supplement to the *LGB Gas-Fired Boiler Manual*. Follow all instructions in the Manual, including those regarding start-up (found in Section VIII, "Placing boiler in operation").

Starting boiler

1. STOP! Read the safety information above.
2. Set the *Operating control* to lowest setting.
3. Turn off all electrical power to the appliance.
4. Remove the *Base access shield*.
5. Close the *Pilot shut-off valve* connected to *Manual main shut-off valve*. Close *Manual main shut-off valve*.
6. 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.
7. Open the *Pilot shut-off valve*.
8. Press and hold the reset lever on the *Pilot switch box*. Manually light the pilot while holding the lever down. Air in the gas supply line will have to purge through the line before sufficient gas will reach the pilot.
9. After purging all air, hold the *Pilot switch box* lever for about 1 minute to heat the thermocouple.
10. Release the *Pilot switch box* lever. The pilot should remain lit.
11. Open the *Manual main shut-off valve* and follow the sequence below.
12. This appliance is also equipped with an ignition device which automatically lights the second pilot. Do not try to light this pilot by hand.
13. Turn on all electric power to the appliance.
14. Set *Operating control* to desired setting.
15. If the appliance will not operate, turn off gas to the appliance by closing the *Manual main shut-off valve* and *Pilot shut-off valve*. Call your service technician or gas supplier.
16. Replace *Base access shield* and *Front panel*.

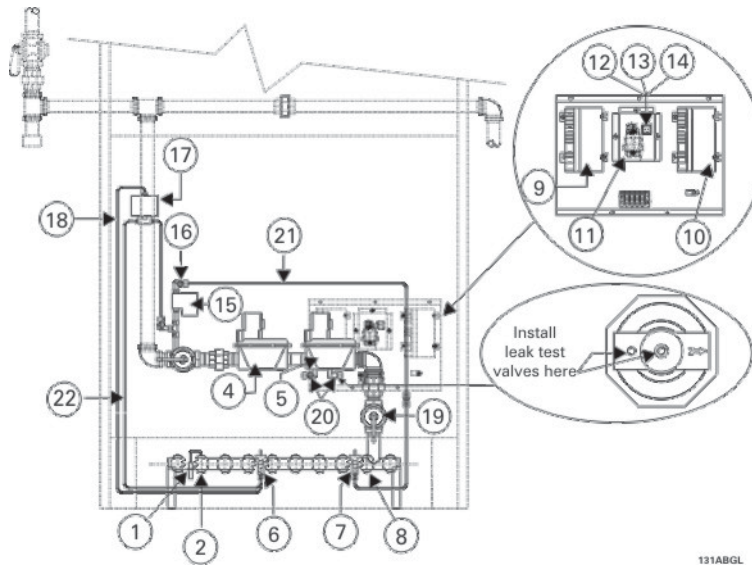




VIII

Parts list

Figure 6



131ABGL

Ref. No.	Description	Size	Vendor/Part Number	Weil-McLain Part Number
1	Main flame sensor		Honeywell 392956	511-724-274
2	Main burner with pilot bracket		Weil-McLain	512-200-055
	Main flame sensor bracket		Weil-McLain	423-300-420
3	Manual main shut-off valve	1"	Kinco-Balon 500	511-246-325
		1 ¼"	Kinco-Balon 600	511-246-330
4	Secondary gas valve	1"	Honeywell V8943A1003	511-044-191
		1 ¼"	Honeywell V8943A1111	511-044-192
5	Main gas valve	1"	Honeywell V8944L1033	511-044-346
		1 ¼"	Honeywell V8944L1041	511-044-218
6	Pilot burner, standing-repair kit propane		Weil-McLain	383-300-410
7	Pilot burner, electronic-repair kit propane		Weil-McLain	383-300-411
8	Main burner with pilot bracket		Weil-McLain	512-200-055
	Pilot burner bracket		Weil-McLain	460-005-624
9	Pilot proving module		United Technologies 1003-615	511-330-086
10	Main flame proving module		United Technologies 1003-60	511-330-085
11	Impulse relay		Potter-Brumfield S89R-11ABD1-24	510-350-226
12	Push-button switch		Honeywell AML21CBA2AA	511-624-580
			Eaton Controls ZZ1K11810K	
13	Lens cover		Honeywell AML51-C10R	511-624-581
			Eaton Controls ZZ0PM0ZA	
14	Light bulb		TI-¾ #85 (Available at Local Supply House)	
15	Pilot solenoid		Honeywell V8046C1014	511-044-039
			Johnson Controls H91ABG	
16	Pilot shut-off valve		Kinco-Balon P2R	511-246-340
17	Pilot switch box		Johnson Controls L62GB-3C	511-330-229
18	Thermocouple	48"	Honeywell Q309A	511-724-245
		1"	Watts FBV3-06	511-246-290
19	Firing valve	1 ¼"	Watts FBV3-07	511-246-292
		1 ½"	Watts FBV3-08	511-246-294
20	Leak test valve		Kinco-Balon P2R	511-246-340
21	Pilot tubing, alum. ¼ O.D. x .032-20" long			
22	Pilot tubing, alum. ¼ O.D. x .032-60" long		Available at Local Supply House	

*Contact local Weil-McLain distributor/agent for current replacement part and order number.



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