



# LGB *Gas-fired boiler*

## Control Supplement

### Flame Guardian WMBC-1A RM7895C Controller Electronic Pilot System **IRI**



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**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 Installation

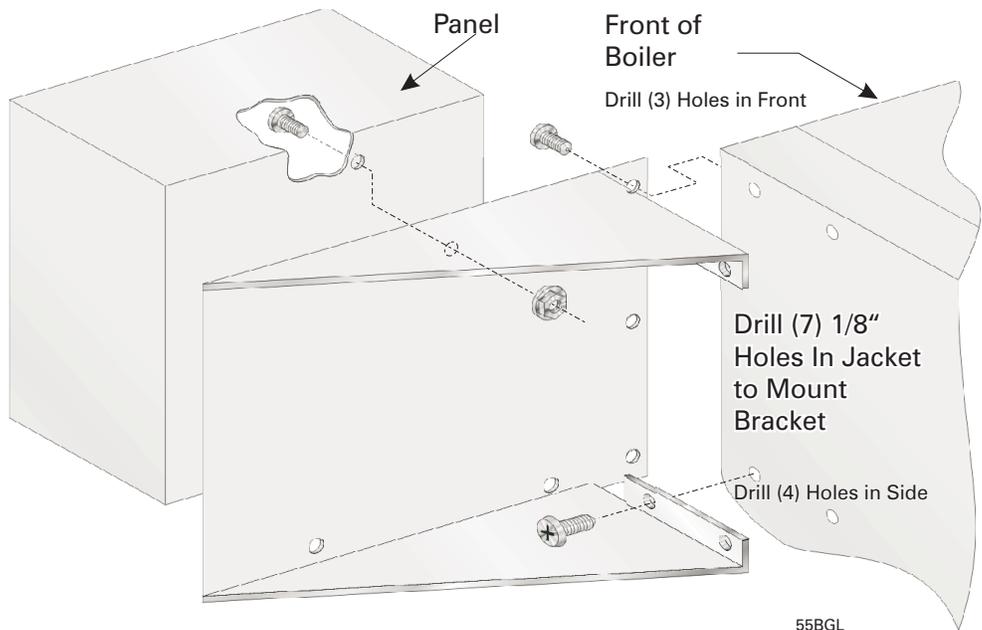
1. For use with LGB-6 through 12 boilers.
2. LOCAL INSPECTOR MUST CERTIFY BOILER FOR IRI COMPLIANCE.
3. Assemble pilot burner and flame sensor to main burners with pilot brackets. See Figures 2 and 3. Install ground wiring as shown in Figures 2 and 3.
4. Reinstall burner assemblies. See Table 1 for pilot burner and flame sensor locations.
5. Assemble control panel to boiler. See Figure 1.
6. Install gas controls as shown in Figure 4, page 4.
7. IRI installations require manual reset controls. Weil-McLain recommends installing manual controls in addition to standard as required by local inspector. Refer to the LGB Boiler Manual, “Boiler Controls” section.
  - a. Steam boilers require a manual reset Low Water Cutoff and manual reset Pressure Limit Control.
  - b. Water boilers require a manual reset Low Water Cutoff and manual reset Temperature Limit Control.

Table 1  
Pilot burner and flame sensor locations

Boiler Model	Flame Sensor *	Pilot Burner *
LGB-6	2	9
LGB-7	2	11
LGB-8	2	13
LGB-9	2	15
LGB-10	2	16
LGB-11	2	16
LGB-12	2	16

\* From left burner.

Figure 1  
Mount control panel to jacket as shown





# I Installation – *continued*

Figure 2

Q179 pilot burner assembly

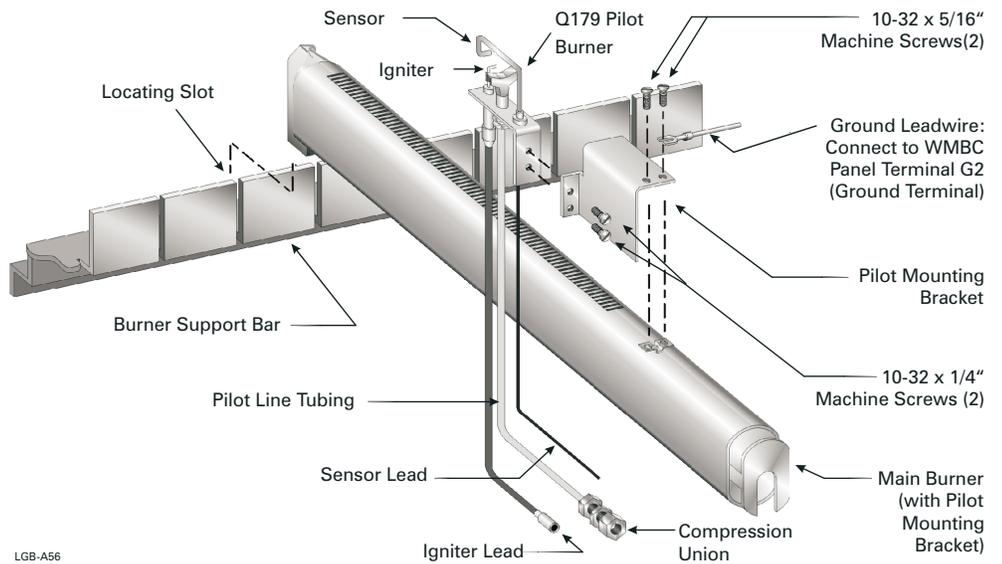
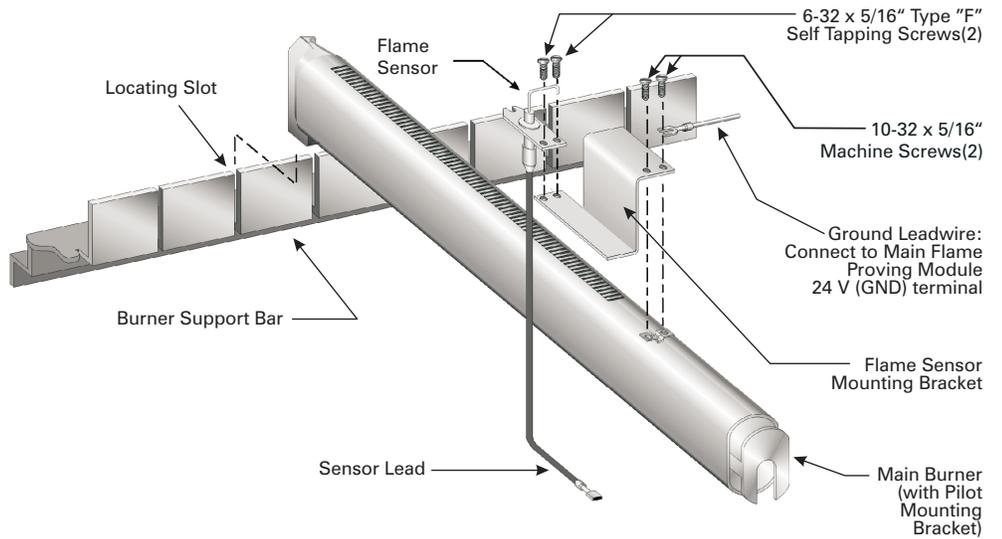


Figure 3

Main flame sensor assembly

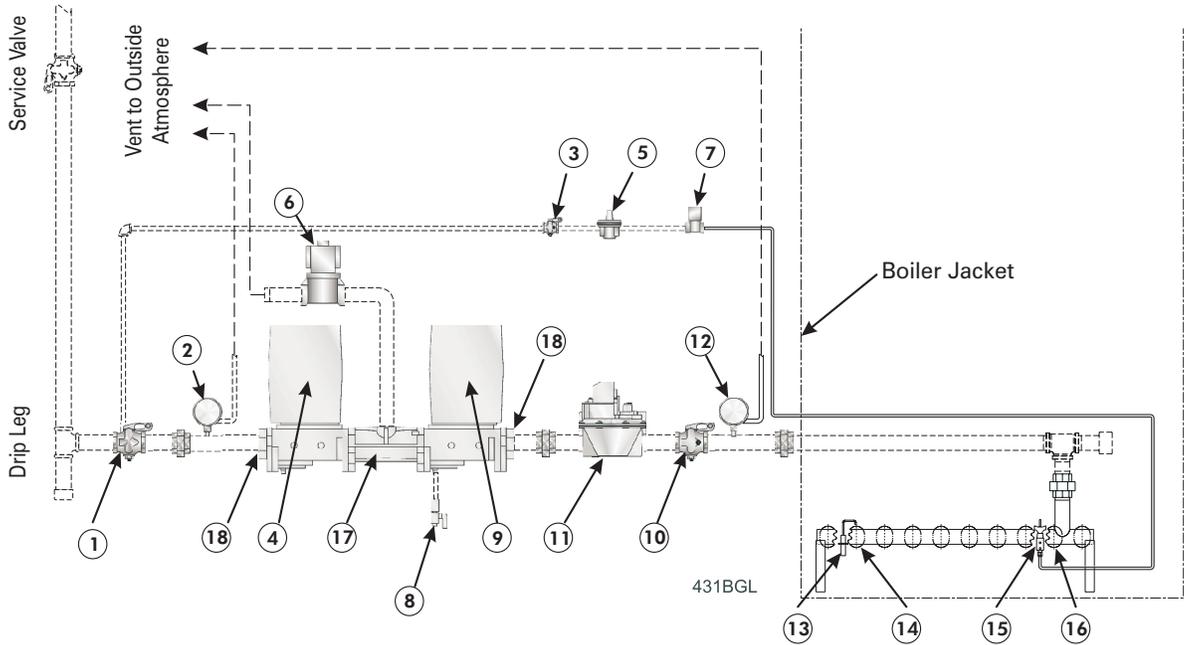




# I Installation – continued

Figure 4

IRI gas train schematic



## GAS PIPING DIAGRAM - LGB (Series 2) IRI Gas Train

- |   |   |
|---|---|
| 1 Manual main shut-off gas valve                | 10 Manual leak checking gas valve             |
| 2 Low gas pressure switch                       | 11 Regulating diaphragm gas valve (two stage) |
| 3 Pilot manual shut-off valve                   | 12 High gas pressure switch                   |
| 4 Motorized gas valve w/ on/off actuator        | 13 Main flame sensor                          |
| 5 Pilot gas pressure regulator                  | 14 Main burner with main flame sensor bracket |
| 6 Normally open solenoid vent valve             | 15 Pilot burner                               |
| 7 Pilot solenoid gas valve                      | 16 Main burner with pilot burner bracket      |
| 8 Test cock                                     | 17 Adapter, for N. O. vent valve              |
| 9 Second motorized gas valve w/ on/off actuator | 18 Pipe flanges                               |



# II

## Gas piping

1. 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 outlet to boiler. For pressure drops, see ANSI-Z223.1 – latest edition.
2. Size natural gas piping from table below. Size piping to provide proper inlet pressure to gas valve when operating at rated input.
  - a. Inlet gas pressure to manual main shutoff gas valve minimum 7” W.C. standard (5½” on special order) – maximum 13” W.C.
  - b. If pressure to gas valve exceeds 13” W.C., install positive dead-end lockup gas pressure regulator up stream of hand valve.
  - c. To obtain approximate cubic feet per hour, divide input (BTU/HR) by 1000.
3. Remove gas supply knockout disc from jacket panel.
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 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. Check all 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 shutoff valve during any pressure testing at less than 14.0 inches water column.
  - b. Disconnect boiler and gas controls from gas supply piping during any pressure test greater than 14.0 inches water column.
11. Set gas pressure switches as follows or to local inspector’s requirements:
    - a. Low – 3.0” W.C.
    - b. High – 14.0” W.C.

Table 2

Natural gas supply pipe sizing

PIPE SIZE	PIPE LENGTH, FEET (NATURAL GAS CAPACITIES, LISTED IN MBH) (Specific Gravity 0.60 @ Pressure Loss of 0.30" w.c.)							
	10'	20'	30'	40'	50'	75'	100'	150'
1¼"	1,050	730	590	500	440	360	305	250
1½"	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
2½"	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

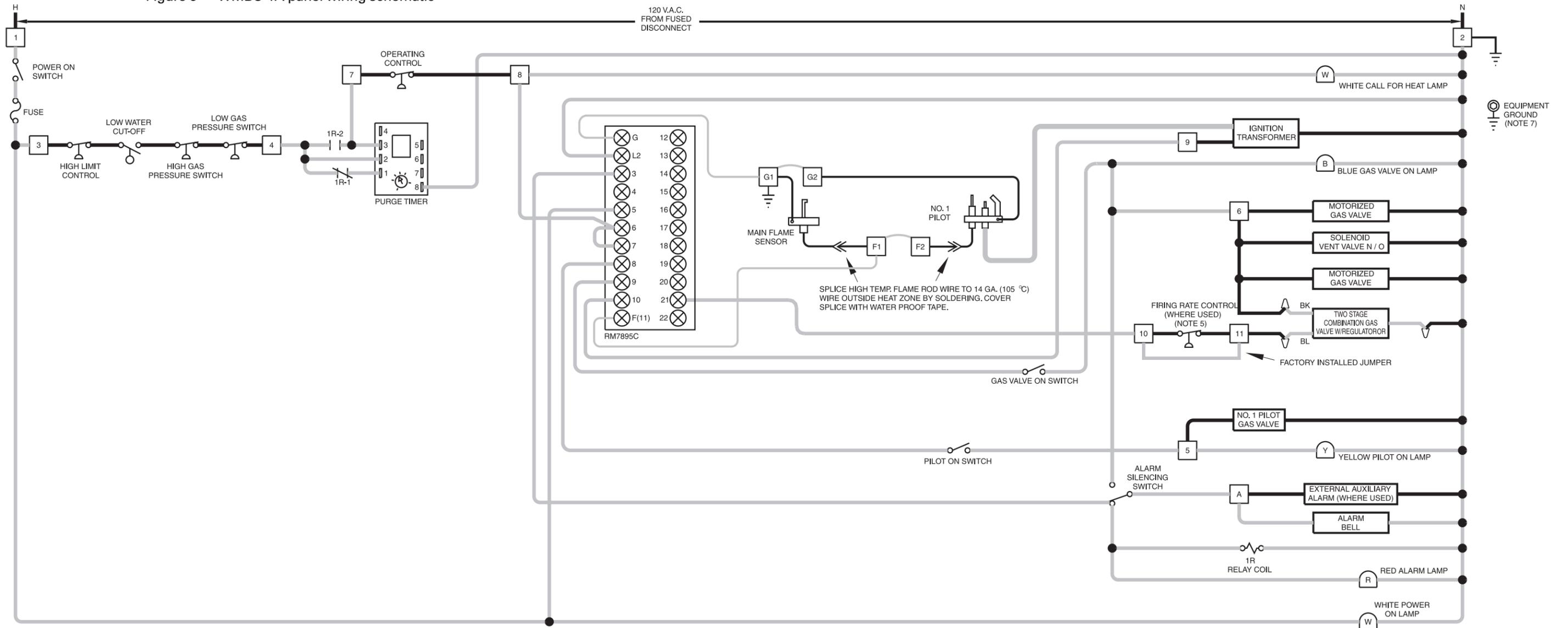
**WARNING**

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.



Figure 5 — WMBC-1A panel wiring schematic



**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 HAVING JURISDICTION.
  - CANADA - C.S.A. C22.1 CANADIAN ELECTRICAL CODE PART 1 AND ANY OTHER NATIONAL, PROVINCIAL OR LOCAL CODE REQUIREMENTS HAVING JURISDICTION.
- ALL WIRING 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.
- REFER TO CONTROL COMPONENT INSTRUCTIONS PACKED WITH BOILER FOR APPLICATION INFORMATION.
- REMOVE FACTORY INSTALLED JUMPER WHEN FIRING RATE CONTROL IS USED.
- REFER TO CONTROL SUPPLEMENT FOR GROUND LEADWIRE ATTACHMENT. IF ORIGINAL GROUND LEADWIRE AS SUPPLIED MUST BE REPLACED, TYPE 125 °C OR EQUIVALENT MUST BE USED.
- ⊕ 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



- ⊏ PURGE TIMER TERMINAL
- WMBC PANEL TERMINAL
- ⊐ WMBC PANEL LAMP
- ⊗ RM7895C CONTROL TERMINAL

**LGB**  
WMBC-1A

- WIRING DIAGRAM
- IRI 6 THRU 12

**WEIL-McLAIN**  
A United Dominion Company  
Weil McLain • 500 Blaine St • Michigan City IN, 46360-2388

PART NUMBER 550-141-839/0597WM



Figure 6 — WMBC-1A panel wiring diagram – factory wiring

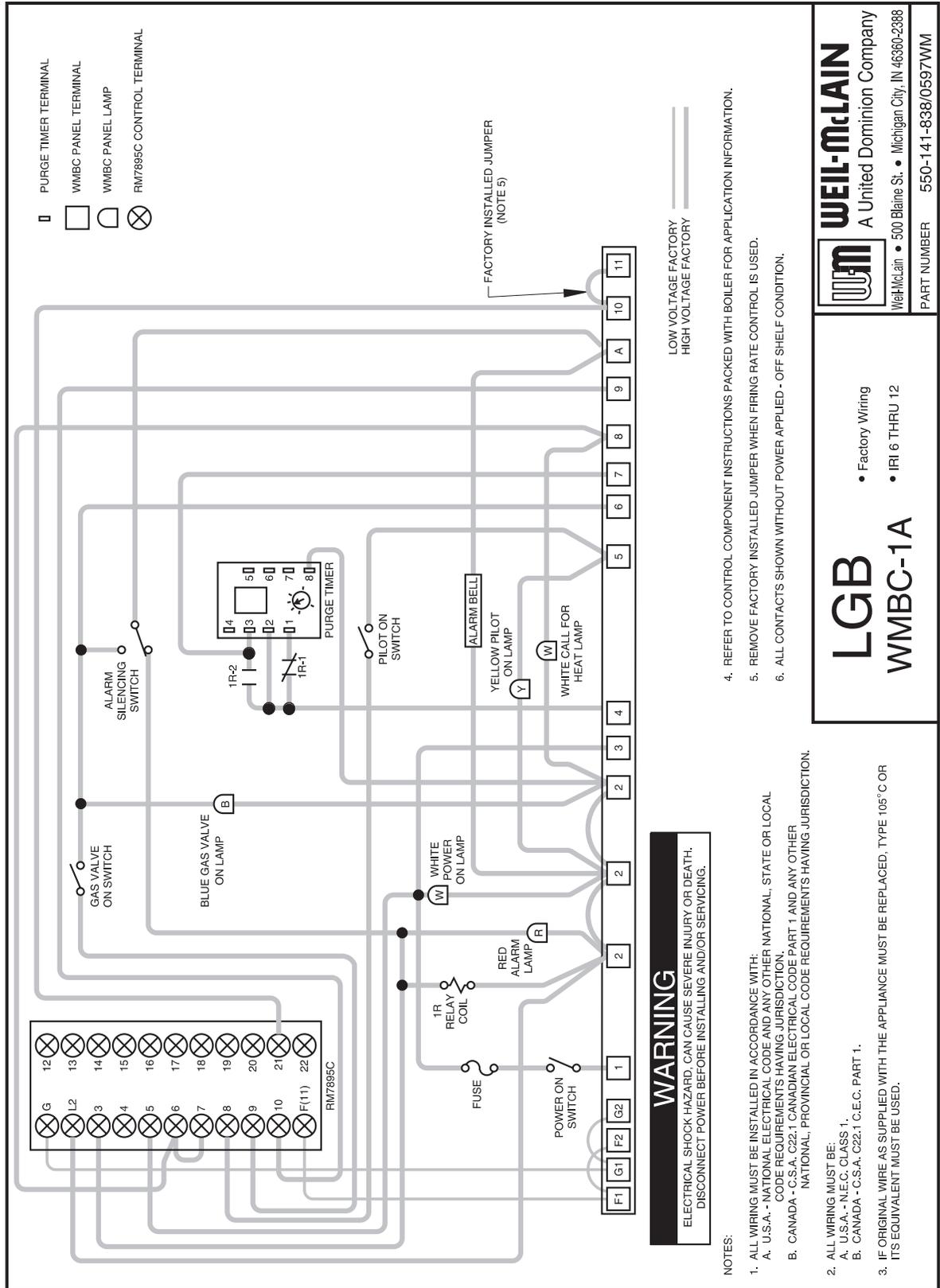
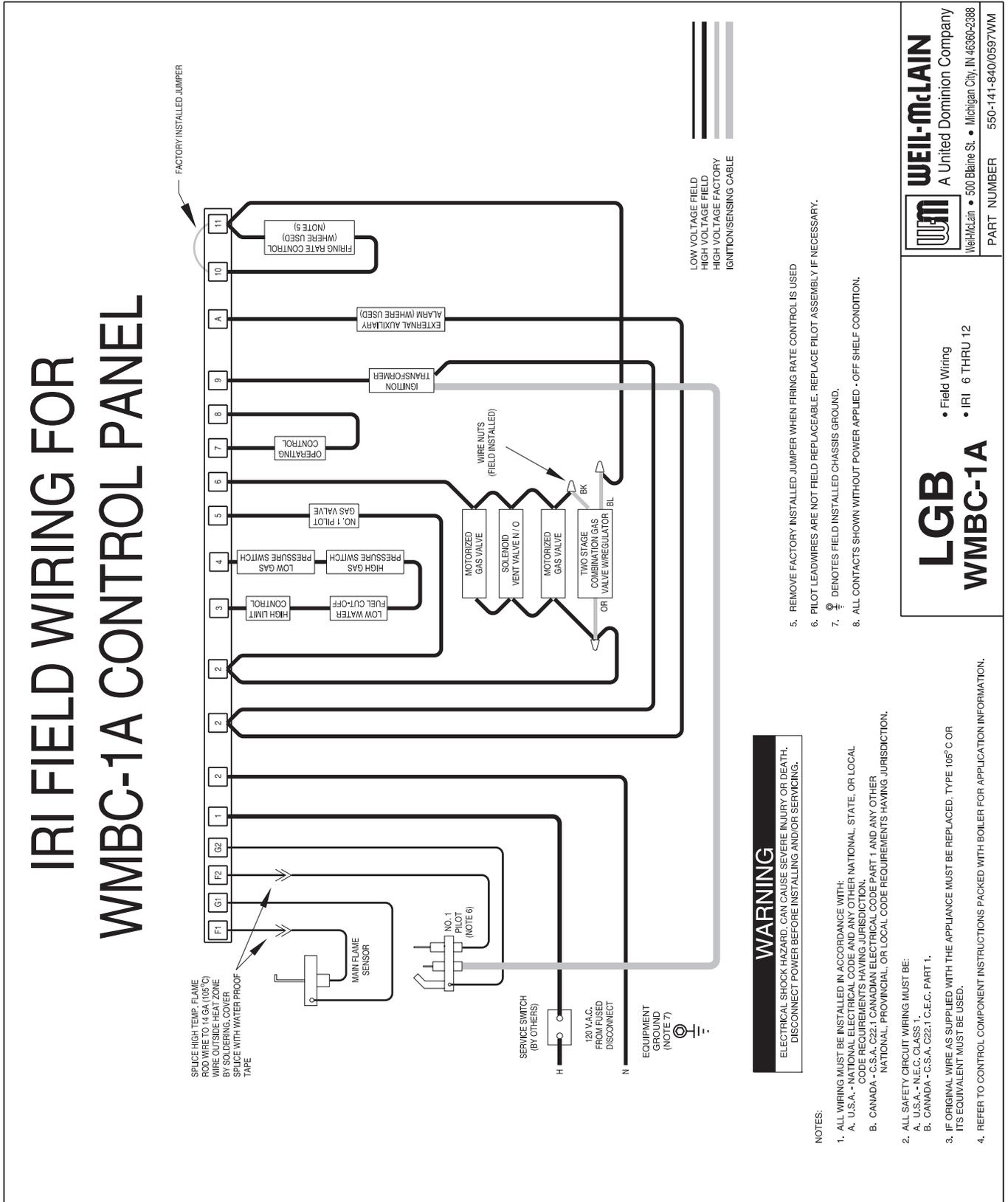




Figure 7 — WMBC-1A field wiring diagram



**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 HAVING JURISDICTION.
    - B. CANADA - C.S.A. C22.1 CANADIAN ELECTRICAL CODE PART 1 AND ANY OTHER NATIONAL, PROVINCIAL, OR LOCAL CODE REQUIREMENTS HAVING JURISDICTION.
  - ALL SAFETY CIRCUIT WIRING MUST BE:
    - A. U.S.A. - N.E.C. CLASS 1
    - B. 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.
  - REFER TO CONTROL COMPONENT INSTRUCTIONS PACKED WITH BOILER FOR APPLICATION INFORMATION.
  - REMOVE FACTORY INSTALLED JUMPER WHEN FIRING RATE CONTROL IS 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.

**LGB**  
**WMBC-1A**

• Field Wiring  
 • IRI 6 THRU 12

**WEIL-McLAIN**  
 A United Dominion Company

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

PART NUMBER 550-141-840/0597WM



## IV Start-up

**WARNING**

Turn off electrical power supply and gas supply to boiler before making the following connections and adjustment. Failure to do so can cause severe personal injury, death or substantial property damage.

1. Disable high fire by disconnecting the blue wire in the two-stage gas valve.
2. Connect manometer to gas manifold (manometer must be capable of measuring 0" to 14" W.C.).
3. Turn on electrical power supply and gas supply to boiler.
4. Fire boiler, which will light off and remain on low fire.
5. While reading manometer, turn low fire adjustment screw clockwise (Figure 5) until pressure reading is 1.2" W.C.
6. Turn off boiler.

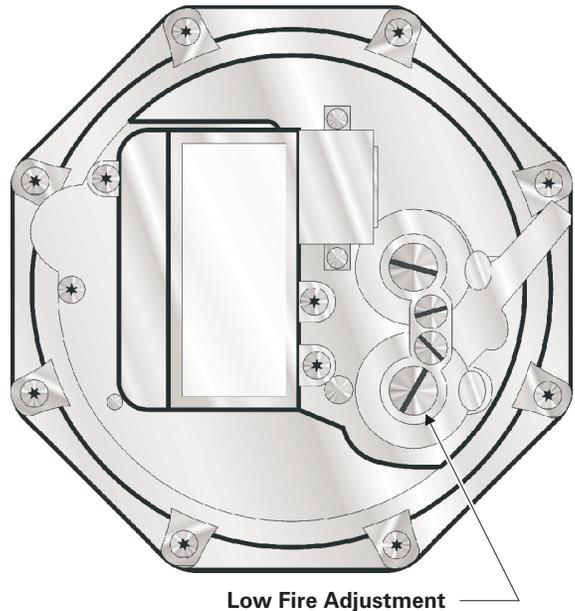
**WARNING**

Turn off electrical power supply and gas supply to boiler before the following steps. Failure to do so can cause severe personal injury, death or substantial property damage.

7. Remove manometer from manifold and plug the tapping.
8. Reconnect the blue wire in the two-stage gas valve junction box.
9. Turn on electrical power supply and gas supply to boiler.
10. Follow operating instructions label on boiler to set boiler in operation.

Figure 8

Low fire adjustment





## V Sequence of operation

1. Operating control begins startup sequence:
  - a. Limit control contacts are closed.
  - b. Purge timer is energized.
2. Flame safeguard control pilot circuit energizes after 2.0 seconds.
  - a. Pilot gas valve opens.
  - b. Ignition transformer energizes.
  - c. Yellow “pilot on” lamp lights.
  - d. Pilot ignition spark begins.
  - e. Pilot ignites.
  - f. Pilot flame proves.
3. Flame safeguard control energizes main flame circuit:
  - a. Blue “gas valve on” lamp lights.
  - b. Gas control train energizes.
  - c. Downstream gas valve opens to low-fire position.
  - d. Main burners ignite, operate at low fire.
4. Ignition transformer de-energizes after 10-second trial for ignition.
5. Pilot de-energizes after 10-second trial for main flame. Yellow “pilot on” lamp goes out.
6. Main flame sensor proves main burner operation at low fire.
7. Flame safeguard control energizes downstream gas valve to high-fire (through firing rate control, when used):
  - a. Main burners operate at high fire.
  - b. Main burners operate at low fire when water temperature or pressure reaches setting of firing rate control, when used.
8. Boiler shuts down when operating control satisfied.
9. Flame safeguard control lockout circuit energized if pilot is not proved during start-up or if main flame is not proved during run sequence.
  - a. Flame safeguard control locks out on safety.
  - b. Red “alarm” lamp, alarm relay, and alarm bell energize. Silencing switch can shut off alarm bell.
  - c. Alarm relay de-energizes purge timer.
  - d. Press reset button on flame safeguard control to permit normal start-up after correcting lockout condition.
  - e. Normal start-up resumes after purge timer automatically resets (5 minute enforced wait).



## VI

## Parts list – Table 3

Description	Size	Vendor/Part Number	Weil-McLain Part Number
Primary Control		Honeywell RM7895C1012	510-350-431
Prepurge Timing Card 2.0 Seconds		Honeywell ST7800A1005	510-350-432
Flame Amplifier		Honeywell R7847A1033	510-350-434
Electric Bulb 120V		Sylv. 120MB/CHI Min. CM8-967	*
Fuse 6 Amp.		Bussman MTH-6	*
Relay 120V DPDT		Honeywell R4222D1013	510-311-012*
Control Timer		SSAC EDRM427	510-350-430
Gas Cock, ¼ M x ¼ F		Conbraco 53-300-01	*
Pilot Regulator, ¼ NPT		Maxitrol RV20A	*
Pilot Solenoid	¼"	Honeywell V4046C Johnson Controls H91ABA	511-044-040*
Brass Union, 1/8 NPT x 1/4cc			*
Low Gas Pressure Switch		Honeywell C645A1030	511-624-550*
High Gas Pressure Switch		Honeywell C645B1013	511-624-555*
Gauge Cock	¼"	Conbraco 41-560-05	511-210-415*
Pilot Burner		Honeywell Q179C1009	511-330-181*
Pilot Bracket		Weil-McLain	460-005-624
Main Flame Sensor		Honeywell 392956	511-724-274
Main Flame Sensor Bracket		Weil-McLain	423-300-420
Main Burner with Bracket		Weil-McLain	512-200-055
Ignition Transformer		Honeywell Q624A1014	511-802-014*
Hand Valve	1"	Essex 500	*
	1 ¼"	Essex 600	*
	1 ½"	Conbraco 50-603	*
	2"	Conbraco 50-703	*
Valve Body (small - up to 2" Pipe Flanges)		Honeywell V5097A	510-744-315
Pipe Flanges (for Valve Body)	1"	Honeywell 32000109-002	511-044-170
	1 ¼"	Honeywell 32000109-003	511-044-171
	1 ½"	Honeywell 32000109-004	511-044-172
	2"	Honeywell 32000109-005	511-044-173
Actuator For Valve Body (On/Off)		Honeywell V4055A	510-744-317
Solenoid Vent Valve (Normally Open)	¾"	Honeywell V4295S	511-046-340
	1"	Honeywell V4295S	511-046-342
Adapter for small valve body (for vent valve)		Honeywell 32002513	511-044-176
Gas Valve with Regulator	1"	Honeywell V4944N1011	511-048-503
	1 ¼"	Honeywell V4944N1029	511-048-502
	1 ½"	Honeywell V4944N1037	511-048-501
	2"	Honeywell V4944N1045	511-048-500

\* Listed part can be purchased at local supply house



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