

WB 211

Controller for LED

**Retrofit Lamp WB 111 (L-864)
For Cellular Towers,
FM Towers and AM Towers**

Obstruction Lighting
System Red Only

REFERENCE INSTALLATION MANUAL

Version BS4

WB 211 Controller For LED Retrofit Lamp WB 111 (L-864) Obstruction Lighting System RED Only



This Retrofit LED lamp can be installed in your existing 300 mm RED Beacon like KG114. You will combine the **new LED technology** with your existing incandescent system and start saving at least 90% of your electrical cost **without removing your existing system**. The electrical consumption of this lamp is **18 watts (20 FPM) or 23 watts (30 FPM)**. Can be operated with an electrical supply of 120 VAC / 220 VAC 50/60 Hz.

The migration to LED technology is a very simple task, like changing your regular lamp (PS40).

Our controller will optimize the functionality and the life duration of the Lamp (WB 111). The flexibility of this lamp is unique on the market.

CONTROLLER WB 211 SPECIFICATIONS

- Can control, 5 LED Retrofit lamp WB 111 in same time (FAA STYLE A configuration A3).
- Can control DOL (L-810) Standy On or Flashing in sync with L-864 or without L-810.
- Power 120 volts / 240 volts (50 / 60 hz)
- Flash rating 30 FPM
- 7 Alarm relay (NC / NO)
- 1 Dry contact for reset purpose.
- 1 AUX output for a backup option (PS40 1000 watts / 2000 candelas)
- External Synchronisation available if needed.
- Dimensions: 11 7/8" x 13 3/4" x 6 1/2" (30x35x16.5 cm)

COMPLIANCE REPORTS

Transport Canada (CAR 621 March 2016)

Performed by Spectralux Industries Inc
Report # G1611181-R1

FAA / FCC

Performed by Intertek / ETL, NY, USA
Report # 100211677 MIN-004

NOTE

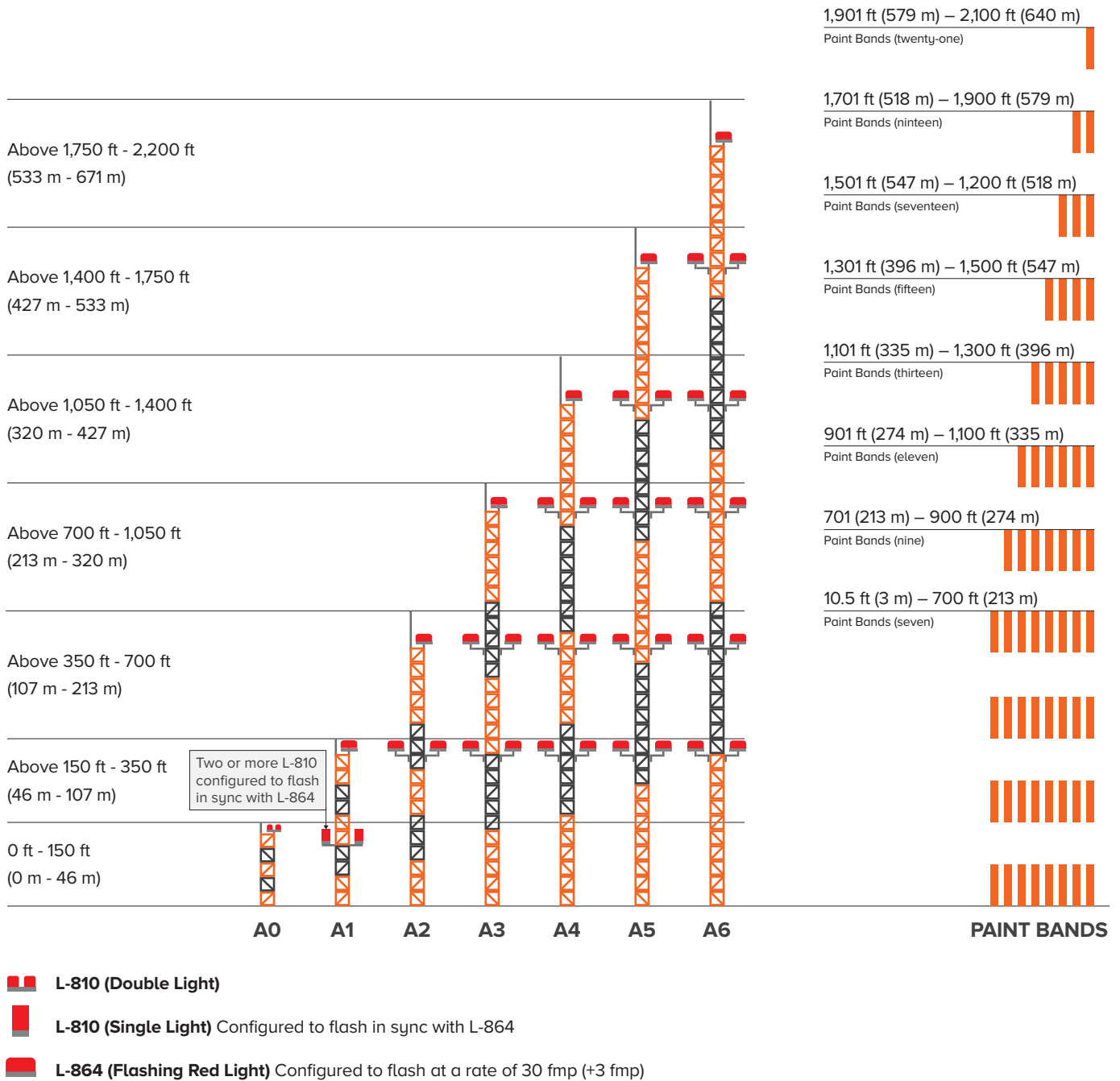
L-864 / L-810 are used by FAA and CL-864 / CL-810 by Transport Canada.

AC 70/7460-IL CHG (10/8/2016) FAA STYLE A

FIGURE A-6: Red Obstruction Light Standards (FAA STYLE A)

Day Protection = Aviation Orange / White Paint

Night Protection = 2,000 cd Red Light (32 cd Red Side lights for A1)

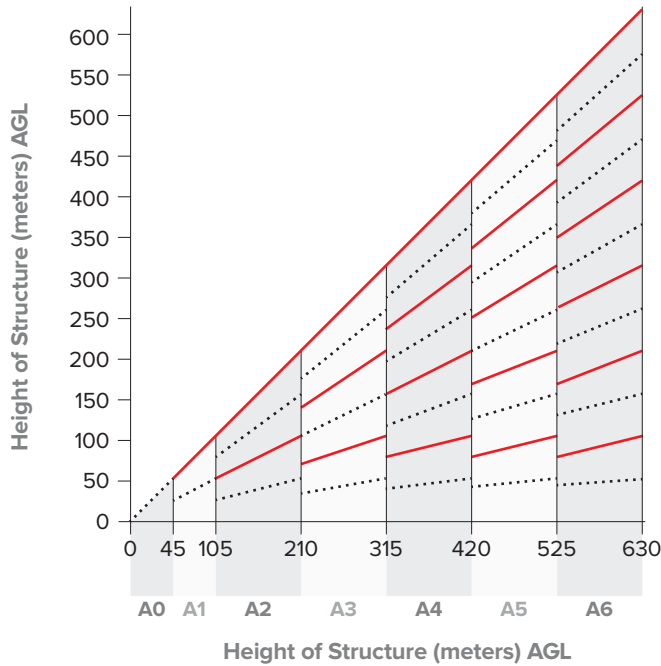


Source: AC 70/7460-IL

C621 PART VI CONFIGURATION A and A'

FIGURE 5-1: Configuration (Canadian Configuration)

Red Lighting Installation (effective 2016. 03. 01)

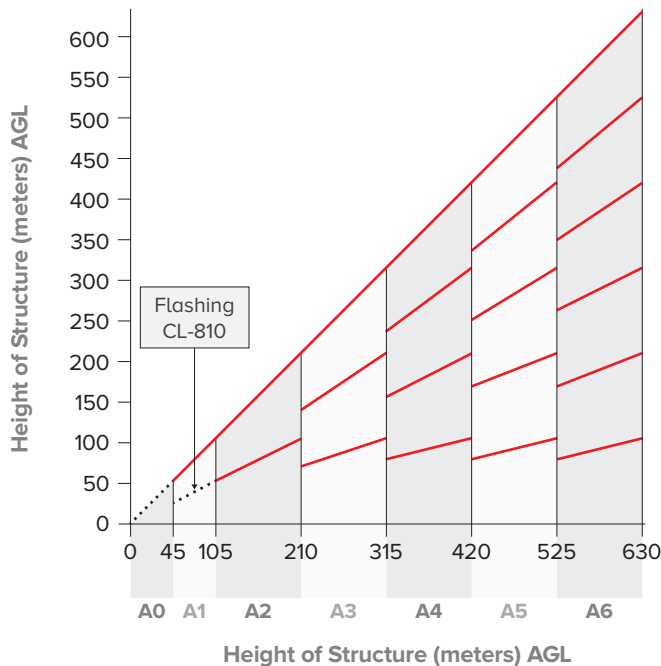


..... CL-810 (red) — CL-864 (red)

0m	<	A0	≤	45m
45m	<	A1	≤	105m
105m	<	A2	≤	210m
210m	<	A3	≤	315m
315m	<	A4	≤	420m
420m	<	A5	≤	525m
525m	<	A6	≤	630m

FIGURE 5-3: Alternative Configuration A (Canadian Configuration)

Lighting Reduction to Reduce Bird Fatalities (effective 2016. 03. 01)



NOTE 1: For A1 the CL-810 is made to flash at the same as the top CL-864 light

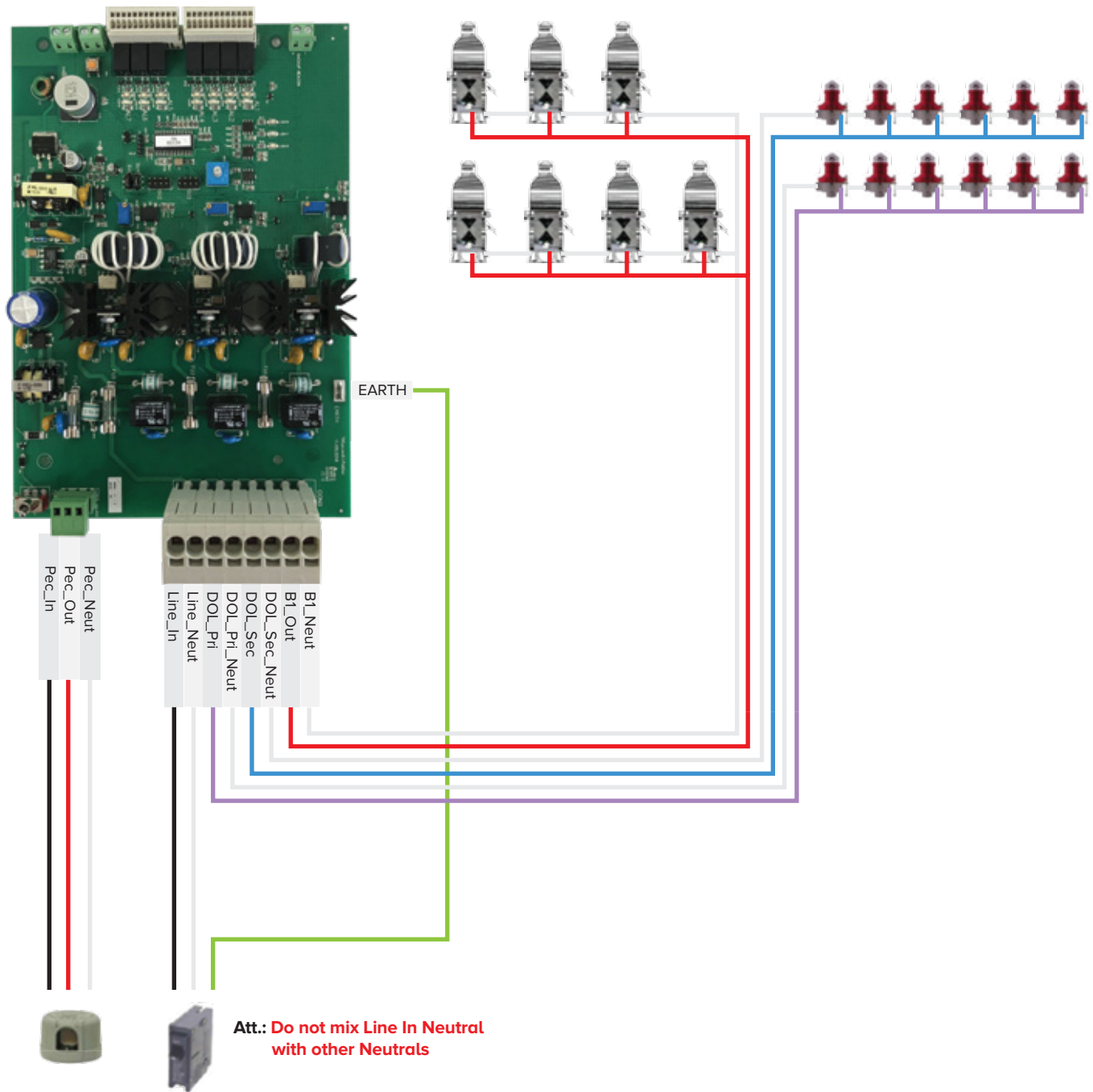
..... CL-810 (red) — CL-864 (red)

0m	<	A0	≤	45m
45m	<	A1	≤	105m
105m	<	A2	≤	210m
210m	<	A3	≤	315m
315m	<	A4	≤	420m
420m	<	A5	≤	525m
525m	<	A6	≤	630m

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DIAGRAM AND CONNECTIONS (FM - CELLULAR TOWERS)

FIGURE 1

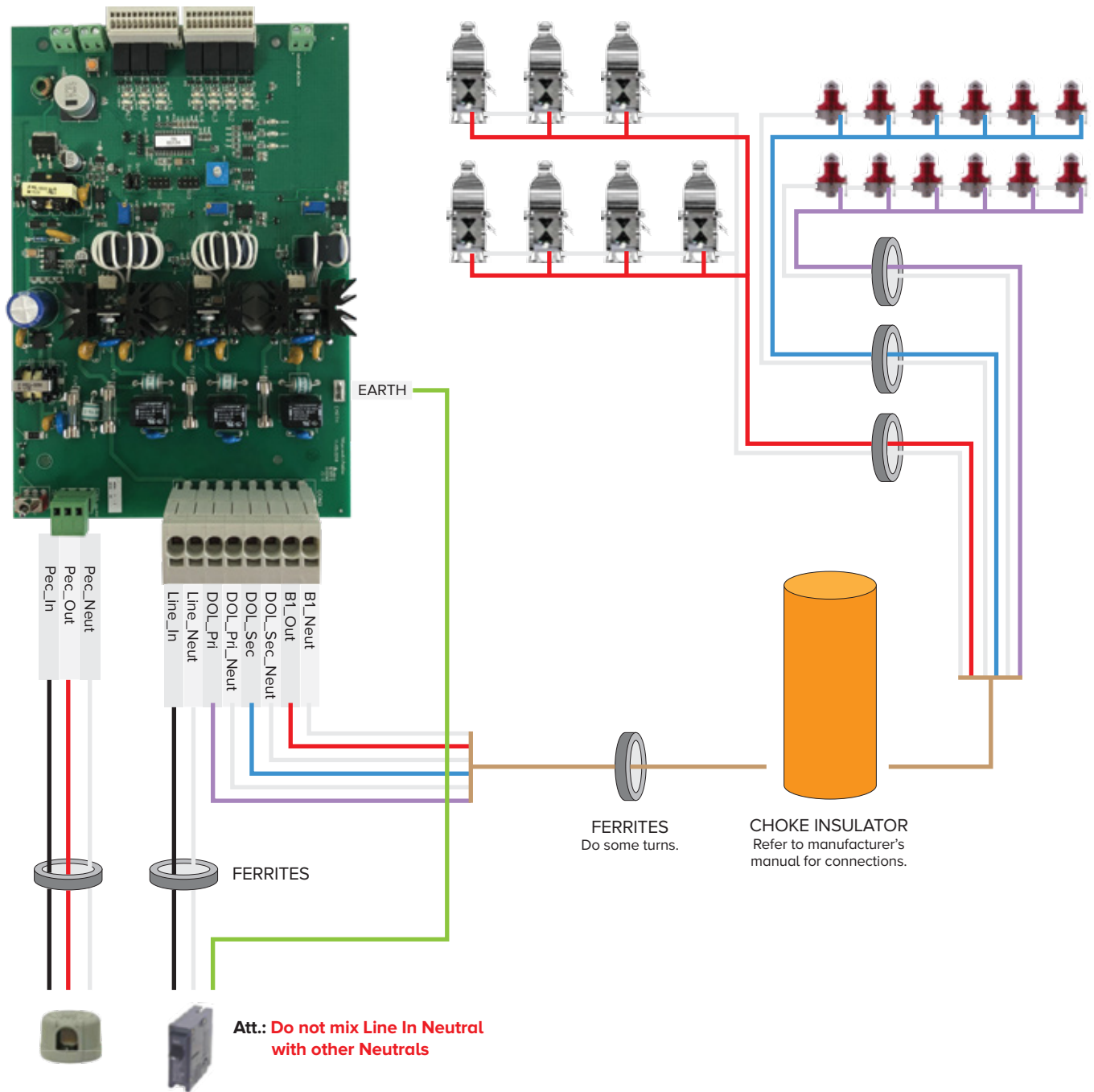


Note: If you have only one neutral in the tower. Use the B1_Neutral for the lamps connection. After, jumped Pri Neutral with Sec Neutral and B1_Neutral together. **The Line's Neutral is alone on his connector.** Finally, if you have only one electrical wire for the obstruction side markers (L-810). You used the output DOL Prim for all of your L-810.

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DIAGRAM AND CONNECTIONS (AM TOWERS WITH CHOKES)

FIGURE 1A

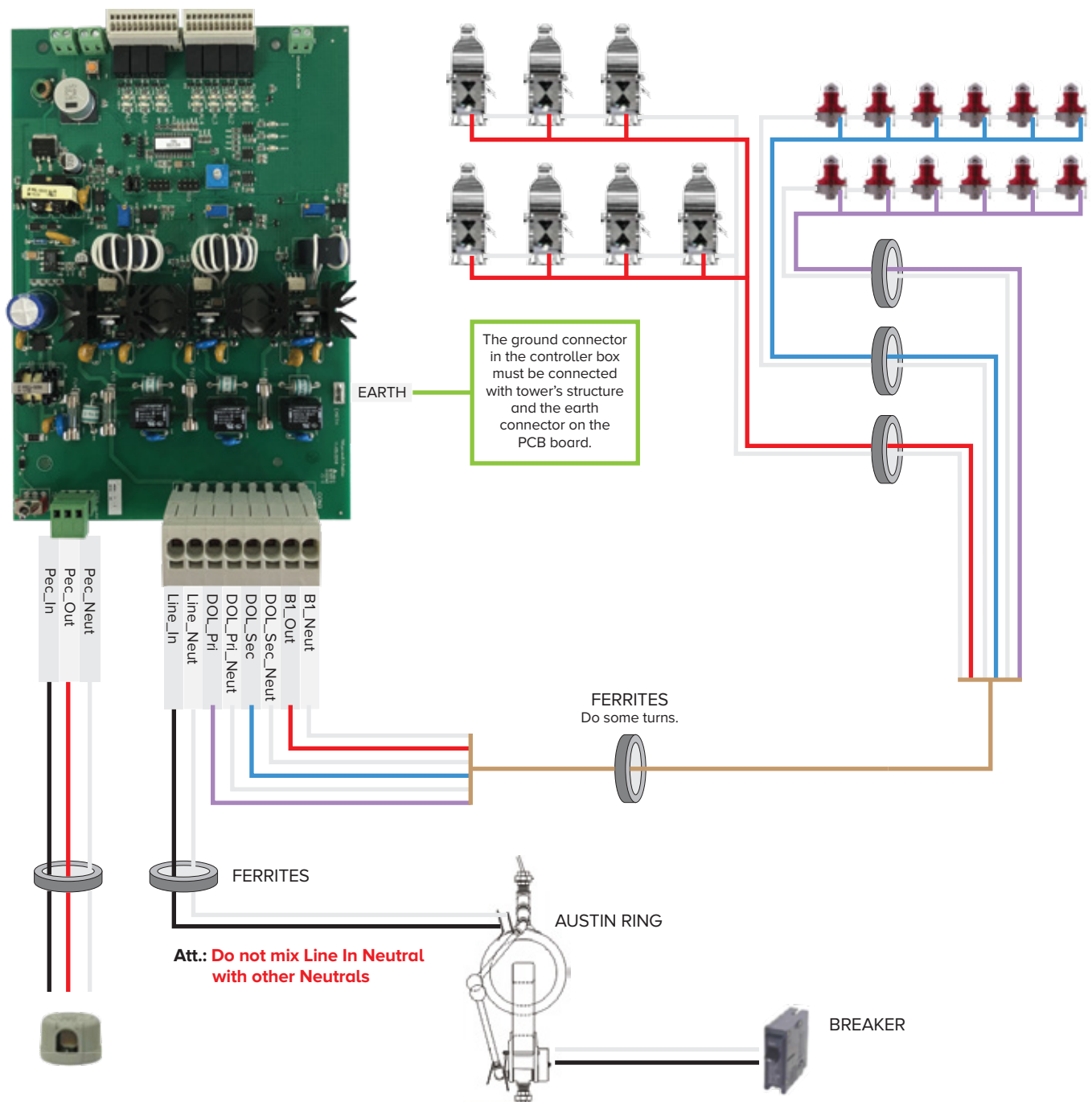


Note: If you have only one neutral in the tower. Use the B1_Neutral for the lamps connection. After, jumped Pri Neutral with Sec Neutral and B1_Neutral together. **The Line's Neutral is alone on his connector.** Finally, if you have only one electrical wire for the obstruction side markers (L-810). You used the output DOL Prim for all of your L-810.

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DIAGRAM AND CONNECTIONS (AM TOWERS WITH AUSTIN RING)

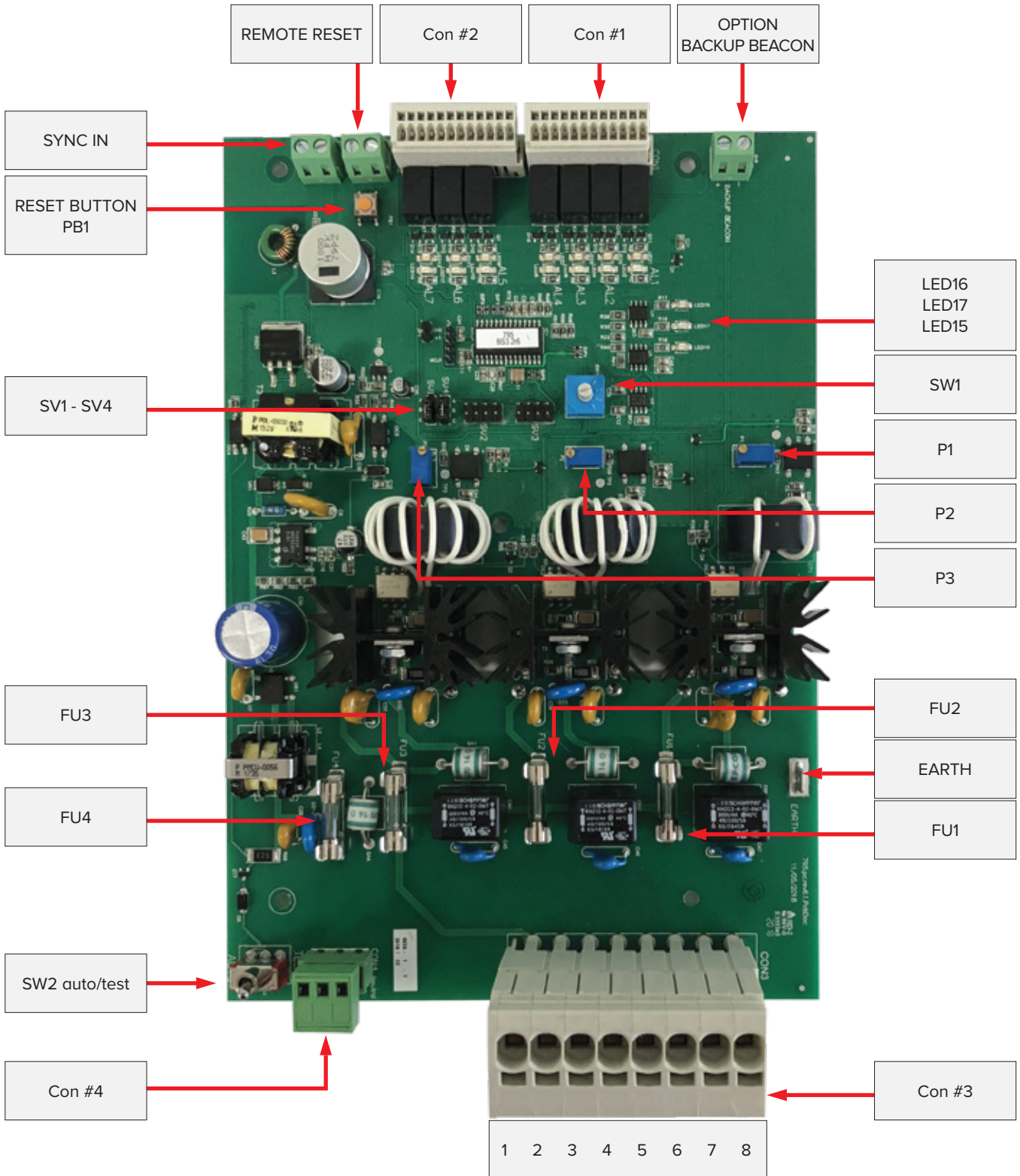
FIGURE 1B



Note: If you have only one neutral in the tower. Use the B1_Neutral for the lamps connection. After, jumped Pri Neutral with Sec Neutral and B1_Neutral together. **The Line's Neutral is alone on his connector.** Finally, if you have only one electrical wire for the obstruction side markers (L-810). You used the output DOL Prim for all of your L-810.

WB 211 CONTROL BOARD

FIGURE 2



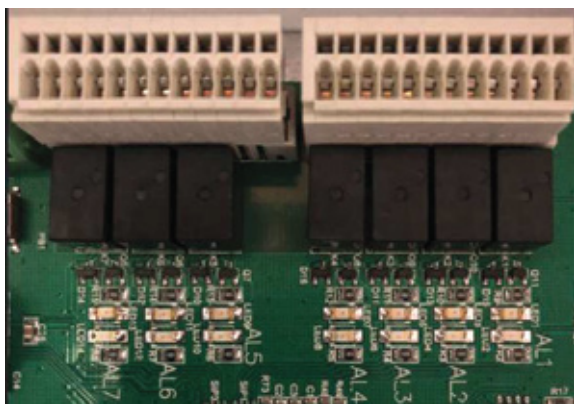
WB 211 ALARM CONNECTIONS

TABLE 1

Following the power up of the WB 211, these are the normal status of the alarms (no fault).				
AL1	Con1-12	B1_OUT	NC	AL1 Red = failure of one or more L-864 lamp AL1 Green = no failure of L-864 lamp
	Con1-11		COM	
	Con1-10		NO	
AL2	Con1-9	DOL SECONDARY	NC	AL2 Red = L-810 failure (one or more) secondary circuit AL2 Green = no failure of L-810 on the secondary circuit
	Con1-8		COM	
	Con1-7		NO	
AL3	Con1-6	DOL PRIMARY	NC	AL3 Red = L-810 failure (one or more) on the primary circuit AL3 Green = no failure of L-810 on the primary circuit
	Con1-5		COM	
	Con1-4		NO	
AL4	Con1-3	Day or Night Photocell	NC	AL4 Blue = Photocell day time operation, L-864 & L-810 OFF AL4 Green = Photocell night time operation, L-864 & L-810 ON
	Con1-2		COM	
	Con1-1		NO	
AL5	Con2-12	NA	NC	NA
	Con2-11		COM	
	Con2-10		NO	
AL6	Con2-9	Power Failure	NC	AL6 OFF = Power failure (120 or 240 V) AL6 Green = Power ON
	Con2-8		COM	
	Con2-7		NO	
AL7	Con2-6	NA	NC	NA
	Con2-5		COM	
	Con2-4		NO	

NOTE: L-864 / L-810 are used by FAA and CL-864 / CL-810 by Transport Canada.

FIGURE 3



WB 211 SV CONFIGURATION

SV 1: Operation mode of the Side Markers L-810 (Figure 4).

- B-C: The L-810 are flashing in sync with the red beacon in operation mode.
- A-B: The L-810 remain lit in operation mode.

SV 2 & 3: Are not used (Figure 4).

SV 4: Selection the Side Markers L-810 (Figure 4).

- B-C: You have some L-810 on the tower.
- A-B: You don't have any L-810 on the tower (ALM2 and 3 are jumped)

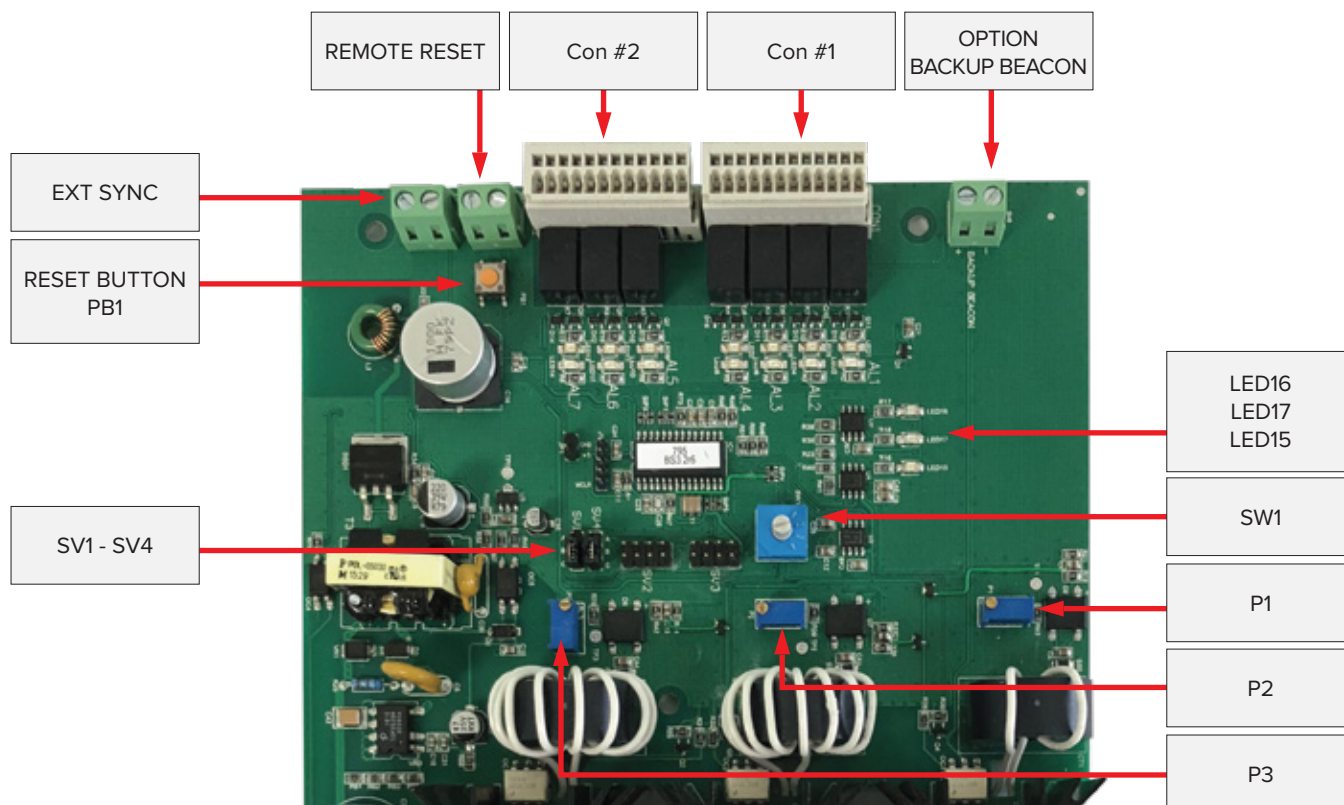
SV 5: Option: Emergency Backup Lamp (Figure 4)

SV 6: Remote Reset

SV 7: External Synchronisation

Important: Push the reset bottom after your selection (ref Figure 4)

FIGURE 4



WB 111 LAMP - Reference Installation Guide

ATTENTION

BEFORE INSTALLATION OR MAINTENANCE:

**TURN OFF THE AC POWER BREAKER (NO ELECTRICAL HAZARD)
ENSURE THAT MAST OR TOWER IS GROUNDED (NO RF HAZARD)**

1. Remove both incandescent lamps (2) from the 300mm beacon (KG 114).
2. Replace the ceramic socket (TWR23-546) at the bottom of the beacon.
3. Remove the electrical conductors from the top lamp. If you use the backup option, refer to the backup installation section in the installation checklist (next page).
4. Select 120 VAC or 220 VAC with the selector on the PCB.
5. Before inserting the WB 111 lamp in the socket, ensure it is properly aligned, with the transformer on the opposite to the terminals.
6. Align the metal plate of the WB 111 lamp with the electrical socket. (Fig. 5)
7. Applying light pressure, press down fully. Rotate a quarter turn clockwise.
8. You should feel the lamp lock in place. To confirm engagement, pull up lightly on the lamp.
9. If the lamp is not retained, repeat procedure starting at para. 6.
10. Using the green wire supplied with the lamp, connect the ground quick disconnect terminal to the body of the Beacon enclosure as show in Figure 6.
11. Return AC power using the circuit breaker.

FIGURE 5

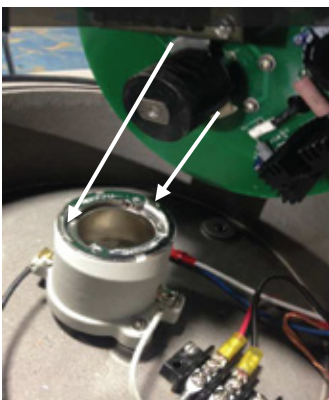


FIGURE 6



INSTALLATION CHECK LIST

WB 211 CONTROL BOX (CB) IF INSTALLED

- The control box must be professionally installed (straight and solid).
- No piercing on the top or on each side of the CB.
- Secure all the electrical connections.
- AC power: 120 VAC / 220 VAC AC breaker: 15 AMPS.
- AC cables must be 3 #14 AWG or 4 #14 AWG with the option Backup light.
- Ground cabling must be connected on structure's tower with 2 AWG gauge to the ground connector in CB
- Connect the PBC's earth connector to the ground connector in controller box (Fig. 2, Page 8).
- Connect all the cables following the diagram connections.
- Verify all the fuses size in concordance with the reference table 2
- Validate the position of each jumper on the control board of the controller (Fig. 4).
- Ferrites are installed (Fig. 1A- 1B).

WB 111 LED LAMP

- AC connections of the WB 111
- Select voltage 120 /220 VAC.
- Replace the bottom ceramic socket of the 300-mm beacon. (KG 114 or similar)
- Confirm the quality of the existing electrical cables.
- Re-test all physical connections. (screws).
- Validate the installation of the ground cabling on the lamp.
- Connect the cable from the terminal block of the CB (B1_OUT) to the WB 111 lamp.
- Isolate the top socket with the B1_OUT cable.
- Option: backup light on the highest beacon of the tower (top).
- Connect the wire from the SSR (SSR_OUT) to the socket of the highest Beacon.
- Use the same neutral white wire (White) B1_NEUT for the backup lamp.
- Install an incandescent PS40 (1000 watts) supplied exclusively by WhiteBear (gen. 2000 cd +/- 25%)
- If you have installed a safety ground on mast or tower for your protection. Removed before the startup.

WB 111 LED LAMP CABLING VALIDATION

- No cable joint with the exception of the inter-connection to the Side Markers
- Anticipate some additional cable (#14 AWG) for the backup option.
- Anticipate a loop of 1 meter at the bottom of the tower.
- Cable tie at each linear meter.

ELECTRIC PHOTOCELL

- Validate the connections on the terminal block CON4.
- The photocell must be approved by the FAA and DOT (Canada)
- The photocell must be facing true north
- Validate that there is no other light source near the photocell.
- To avoid any water issue, the installation (Lamp and Controller) must be done vertically.

DOUBLE OBSTRUCTION LIGHT L-810 (DOL)

- Jumper position on the connectors SV1 and SV4 (figure 4).
- Validate that the DOL are energized by two different circuits (prima & second.)

WB 211 ALARM INDICATORS

All LED Indicators (when RED) indicate a failure.

ALM 4 indicate the status of the photocell (green = night & blue = day)

CALIBRATION & COMMISSIONING

INTRODUCTION

The system is using a **current** loop to monitor the status of each lamp.

This current has a reference to adjust the set point, by using the potentiometers P1, P2 et P3 of the control card and the selector SW1 (Figure 2).

SW1 Position:

1. Automatic mode.
2. Adjustment point for the L-810 (DOL) lamp from the primary circuit with P3.
3. Adjustment point for the L-810 (DOL) lamp from the secondary circuit with P2.
4. Adjustment point for the WB 111 lamp with the potentiometer P1.

SW2:

Auto-Mode Control adjusts Lamp output in response to signal from connected photocell, to suit day or nighttime operation.

Test-Active puts the controller in night mode without reference to photocell.

CALIBRATION

Following your check list evaluation results, you may energize (AC) the WB 211 controller.

Ps: Refer to the Troubleshooting section, if the LED do not light on the WB 211.

I. WB 111 LAMP CALIBRATION

1. **SW2** on **TEST** mode.
2. **SW1** in position **#4**.
3. Push **PB1** to reset the system.
4. Turn the P1 potentiometer's screw **counter-clockwise** until the alarm **AL1 lights up in RED** and stop turning for 3 seconds.
5. Turn the P1 potentiometer's screw **clockwise** until the **LED 15** is 2/3 of the time **LIT**, subsequently being 1/3 of the time **OFF**, then stop turning.
6. Wait for at least 3 second and give 2 more complete **clockwise** turns.

WB 111 Lamp's calibration is done.

II.

SECONDARY CIRCUIT DOL CALIBRATION (L-810) FLASHING MODE (SV 1: B-C)

1. **SW2** in **TEST** mode.
2. **SW1** in position **#2**.
3. Create an alarm (**AL3**) by turning P3 potentiometer's screw **counter clockwise**. Leave it in alarm, therefore sending the energy to the secondary system.
4. **SW1** in position **#3**.
5. Turn the P2 potentiometer's screw **counter clockwise** until the alarm **AL2** lights up in RED and stop turning, then wait 3 seconds.
6. If **SV1** is set for flashing DOLs adjust potentiometer P2 **clockwise** until the **LED 15** dirty cycle is 2/3 **ON**, 1/3 **OFF**. If SV1 is set for continuous operation of DOLs, adjust P2 until LED15 is continuous lit.
7. Wait for at least 3 second and give 2 more complete **clockwise** turns.

Secondary DOL's calibration is done.

III.

PRIMARY CIRCUIT DOL CALIBRATION (L-810) FLASHING MODE (SV 1: B-C)

1. **SW2** still in **TEST** mode.
2. **SW1** in position **#2**.
3. Push **PB1** to reset the system.
4. Turn the **P3** potentiometer's screw **counter clockwise** until the alarm **AL3** lights up in RED and stop turning, then wait 3 seconds.
5. If SV1 is set for flashing DOLs adjust potentiometer P3 **clockwise** until the **LED 15** dirty cycle is 2/3 **ON**, 1/3 **OFF**. If SV1 is set for continuous operation of DOLs, adjust P2 until LED15 is continuous lit.
6. Wait for at least 3 second and turn 2 more complete turn clockwise.

If during this operation, the AL3 lights up, just push PB1 for a reset and return to step 5 and continue.

Primary DOL's calibration is done.

Finalize the installation and calibration process with those three steps:

1. **SW1** in position **#1**.
2. **SW2** on positon **AUTO**.
3. Push **PB1** to reset the system.

TROUBLESHOOTING

Problem: The lamp doesn't light up.

POTENTIAL SOLUTIONS

- a) Check the AC power entry and the fuses of the controller (WB 211).
- b) Check the AC power on the outputs terminals.
- c) Check the AC power on the socket of the lamp.
- d) Validate if the lamp is well installed (Step 8, Page 11).
- e) Check voltage selection.

TABLE 2

CANADA/US	LOAD		AMPS	VOLTS	TYPE
CL-810/L-810 (DOL) Primary	Up to 6	Fuse #3	2A	250	2AG
CL-810/L-810 (DOL) Secondary	Up to 6	Fuse #2	2A	250	2AG
WB 111 Lamp	Up to 5	Fuse #1	5A	250	2AG
WB 211 Controller	NA	Fuse #4	2A	250	2AG

TROUBLESHOOTING DIAGRAM WB 211

