CabLite® VR LED Lighting System Installation Manual

Cablite® VR LED Lighting System Installation Manual Rev 2.1

REV	DATE	DESCRIPTION
0.1	2/1/2017	Preliminary Release
1.0	3/8/2017	Original Release
2.0	1/4/2018	Added 2.75 Can and 24 Volt option
2.1	1/5/2018	Added new logo and TUV symbol. Removed the words "option" and "basic" from product names. Cleaned up drawings and added optional external 10k pots.

Table of Contents

1 Introduction

This manual is intended to facilitate the installation of CabLite® VR2.25/2.75 lighting system manufactured by Electronic Controls Inc. The audience of the material included in this manual is for certified installation personnel. The CabLite® VR2.25/2.75 lighting system complies with modern performance specifications and meets or exceeds code requirements. Installation and adjustments must meet local, state and national codes.

2 Warning and Disclaimer

Thank you for purchasing equipment from ECI America. We want your new equipment to operate safely. Anyone who installs or uses this equipment should read this publication (and any other relevant publications) before installing or operating the equipment.

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and usually change with time. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation and operation is in compliance with the latest revision of these codes.

At a minimum, you should follow all applicable sections of the National Fire Code, National Electrical Code, ASMEA17.1 Safety code for Elevators and Escalators and the codes of the National Electrical Manufacturer's Association (NEMA). There may be local regulatory or government offices that can also help determine which codes and standards are necessary for safe installation and operation. Equipment damage or serious injury to personnel can result from failure to follow all applicable codes and standards. We do not guarantee the products described in the publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation or operation.

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4 Conventions Used

When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a special note. Notes represent information that may make your work quicker and more efficient. The word NOTE: in boldface will mark the beginning of the text.

When you see the "exclamation point" icon in the left-hand margin the paragraph to its right will be a warning. The information could prevent injury, loss of property, or even death in extreme cases. Any waring in this document should be regarded as critical information that should be read in its entirety. The word WARNING: in boldface will mark the beginning of the text.

5   Safety Information

Know the safety hazards related to any procedure you are about to perform. Know what equipment has been specified for each specific contact and know what tools and materials you should plan to have available. Before connecting electrical wiring, take precautions to prevent accidents from happening to yourself and others around you.

ALWAYS CONSIDER SAFTY FIRST!
- Wear a hard hat when working in the hoist way.
- Wear safety glasses or goggles when using power tools
- Always wear protective gloves when installing or removing access covers, conduits, wireway or electrical devices.
- When working on car canopy, always be aware of where the sides of the car are located.
- Use properly grounded cords and power equipment (ground fault circuit interrupters).
- Make sure there are proper clearances in hoist way between the car and other devices. Before connecting wiring, cover sharp edges to keep hands and arms from being cut.
- Always know where other people are and how the elevator wiring can affect their safety.
- Safety lock and tag out procedures are always required before performing and kind of service, repair, adjustment, lubrication or inspection of power equipment.
- To reduce the danger of electrical shock, always make sure electrical connections are secure. Also make sure no bare wires are exposed after pulling cable.
- Use a circuit tester to be certain the circuit is not active before touching it.

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6 System Overview

CabLite® Vandal Resistant (VR) Led system is a general downlighting systems for use in passenger, residential and freight elevator cabs operating from one to twelve downlights. The high output, long life, low voltage LED downlights provide general interior lighting that meets or exceeds ASME A17.1, local, state and federal codes.

The CabLite® VR lighting system is available in 2 sizes. See Sections 7.2 VR2.25 Downlight Dimensions, 7.3 VR2.75 Downlight Dimensions.

- CabLite® VR2.25
- CabLite® VR2.75

In addition, there are 3 options for the CabLite VR lighting system:

- Lighting without dimming
- Lighting with dimming
- Lighting with dimming and emergency lighting

6.1 Downlights

Each downlight is equipped with 2 connectors (located on the top of the can) for stringing up to 12 lights together. See section 7 Installation for more detail. The 2 connectors are interchangeable so it does not matter which cable is connected to it. See Figure 1 - Downlight Connectors. Each downlight is secured in place with a fastening collar so above access to the ceiling panel is required.
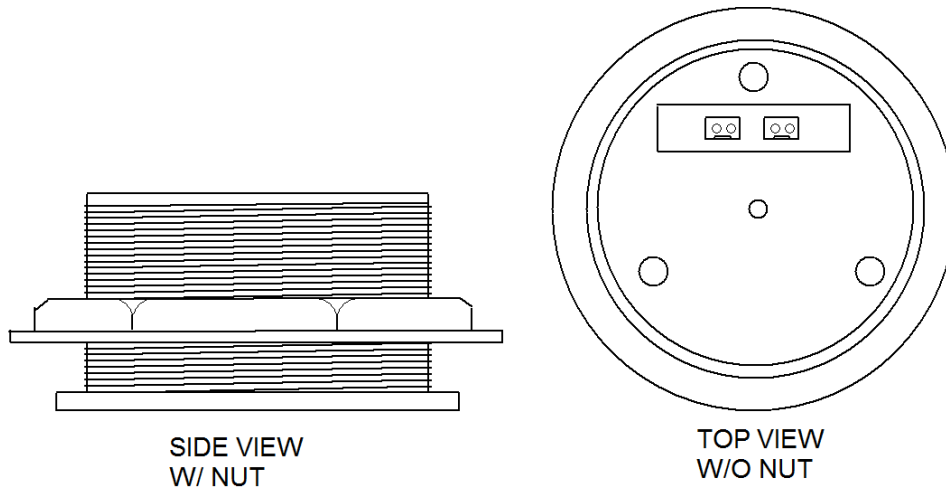

Figure 1 - Downlight Connectors

6.2 CabLite® VR without Dimming

The CabLite® VR without dimming lighting system consisting of the following:

- 1 to 12 downlights
- 12 or 24VDC power supply (mounted in gang box)
- One 8' cable for connecting first downlight
- One 4' cable for each additional downlight

- Electrical box and cover
- One #10 torx for LED removal
- Installation Manual

6.3   CabLite® VR with Dimming

The CabLite® VR with Dimming lighting system consists of the following:
- 1 to 12 downlights
- Dimmer board (factory wired and mounted in gang box)
- 12 or 24VDC power supply (factory wired and mounted in gang box)
- One 8' cable for connecting first downlight (factory wired and located in gang box)
- One 4' cable for each additional downlight
- Electrical box and cover
- One #10 Torx for LED removal
- Installation Manual

The CabLite® VR with dimming comes factory wired in its own gang box. All that is needed is to connect the prewired 8' cable to the first downlight and connect the BROWN (LINE) and BLUE (NEUT) wires to 120VAC. Refer to Figure 8 - CabLite VR with Dimming Wiring.

6.3.1   Dimmer Board

The Dimmer board (Figure 2 - Dimmer Board) allows for setting the brightness level of the LED lighting using either the onboard potentiometer or an external (customer provided) 10k potentiometer. The external POT can be located in the COP for easy access. The dimmer board comes factory prewired for easy installation.

6.3.1.1   Dimmer Board Connections
- Pin 1 is +12 or +24VDC output from supply (RED wire)
- Pin 2 is -12 or -24VDC output from supply (BLACK wire)
- Pin 3 is "+" LED output
- Pin 4 is "-" LED output
- Pins 5 & 6 are for an optional external 10K potentiometer (Customer provided) for setting brightness level in place of using on board potentiometer. This 10K POT can be located in the COP for easy access.
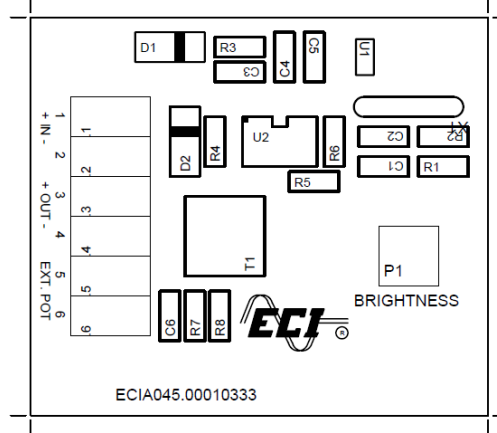
Figure 2 - Dimmer Board

6.4 CabLite® VR with Dimming and Emergency Lighting

CabLite® VR with dimming and emergency lighting includes the following:

- 1 to 12 downlights
- Emergency Light board (factory wired and mounted in gang box)
- 12 or 24VDC power supply (factory wired and mounted in gang box)
- 6-volt battery for 12VDC systems or 12 Volt Battery for 24VDC systems. (Factory wired w/ + side disconnected)
- Two 8' cables for connecting first downlights (factory wired and located in gang box)
- One 4' cable for each additional downlight
- Electrical box and cover
- One #10 torx for LED replacement
- Installation Manual

The CabLite® VR with dimming and emergency comes factory wired in its own gang box. All that is needed is to connect the prewired 8' cables to the first downlight and first emergency downlight and connect the BROWN (LINE) and BLUE (NEUT) wires to 120VAC.

Dimming and emergency lighting is included with this version CabLite VR. Brightness is controlled through the onboard potentiometer or an external 10k POT (see *Figure 9 - CabLite® VR w/ Dimming & Emergency Wiring*). A separate 8' cable is provided for emergency lighting (2 downlights).

In addition, there is a standby mode that will turn off all downlights when cab is not in use. This is achieved with a key switch connected to the STBY input pins 9 & 10 (see *Figure 9 - CabLite® VR w/ Dimming & Emergency Wiring*).

NOTE: It is important not to turn off lighting through the 110VAC input as this will engage emergency lighting and drain the battery. Use only the STBY inputs to turn off cab lighting.

6.4.1 CabLite® VR Emergency Board Connections

Refer to Figure 3 - CabLite VR Emergency Board

- Pin 1 (IN +) is +12 or +24VDC input power (RED Wire)

- Pin 2 (IN-) is -12 or -24VDC input (BLACK Wire)
- Pin 3 (OUT+) is + output for general power (AC present) Downlight String (RED Wire)
- Pin 4 (OUT-) is – output for general power downlight string (BLACK Wire)
- Pin 5 & 6 is for external potentiometer (customer provided) for brightness adjustment
- Pin 7 (EM+) is + output for EMERGENCY downlight string (2 downlights) (RED wire)
- Pin 8 (EM-) is – output for EMERGENCY downlight string (2 downlights) (Black wire)
- Pin 9 & 10 (STBY) – is for external key switch that turns all downlights off when pin 9 & 10 are closed. When closed EMERGENCY downlights will light only if AC power is lost.
- Pin 11 (BAT+) + side connection to battery
- Pin 12 (BAT-) – side connection to battery
- Pin 13 is FAULT relay common
- Pin 14 is Normally Closed contact of fault relay: Contacts open (between Common pin 13) when there is a Battery Fault
- Pin 15 is the Normally open contact of the fault relay: Contacts close (between Common pin 13) when there is a battery fault.
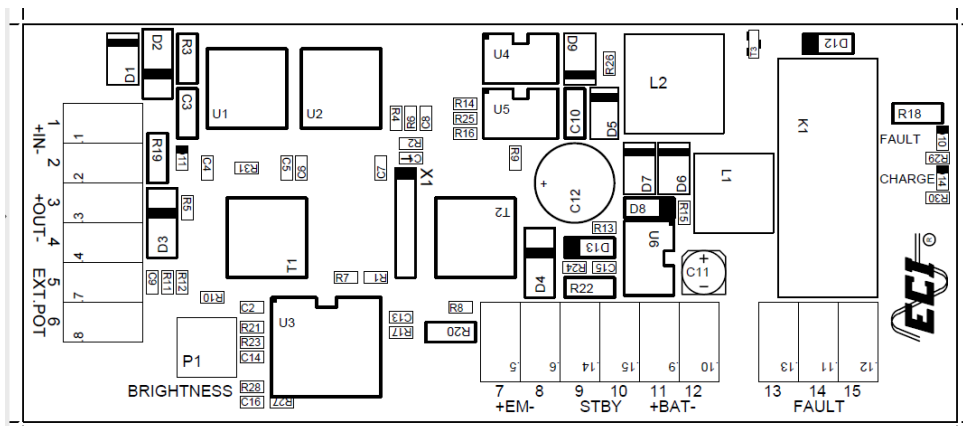

Figure 3 - CabLite VR Emergency Board

6.4.2 CabLite Emergency Board LEDs

- CHARGE – the charge LED blinks when the battery is charging and remains solid when battery is fully charged.
- FAULT – The fault LED lights when there is a problem with the battery. Wrong voltage or not charging.

7 Installation

# Be sure all power is turned off before starting installation.

Locate the positions where you want each downlight and drill the ceiling panels according to the specifications for your downlight listed in sections 7.2 VR2.25 Downlight Dimensions and 7.3 VR2.75 Downlight Dimensions .

⚠️ Be sure there is a minimum 1" clearance between the top of the downlight can and the cab top to accommodate the connectors. See Figure 6 - Installation example

7.1   Downlight Identification
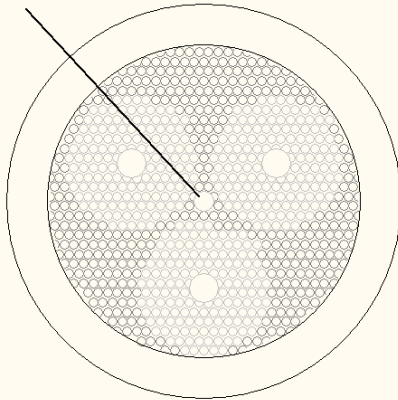
7.2   VR2.25 Downlight Dimensions
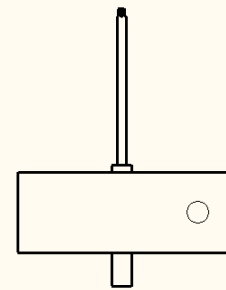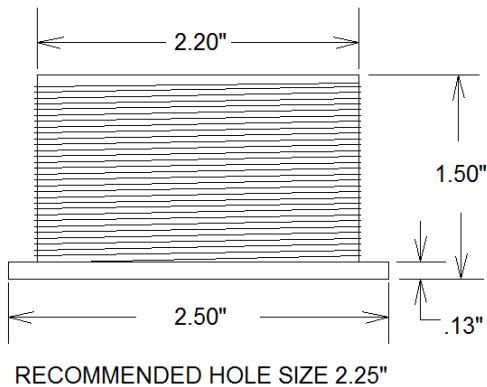

Figure 4 – VR 2.25 Downlight Dimensions
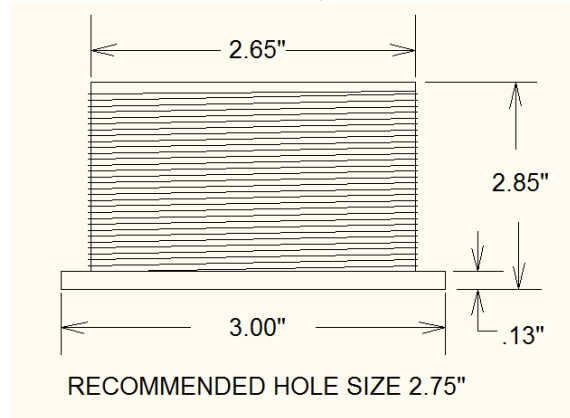
7.3   VR2.75 Downlight Dimensions

Figure 5 - VR2.75 Downlight Dimensions

7.4   Installation Diagram

A minimum of 1-inch clearance is required between the top of the can and top of car as shown in Figure 6 - Installation example. Be sure to leave a minimum 6-inch service loop at each downlight for inside cab access of LED assembly replacement. Refer to *section 8 LED Replacement.*
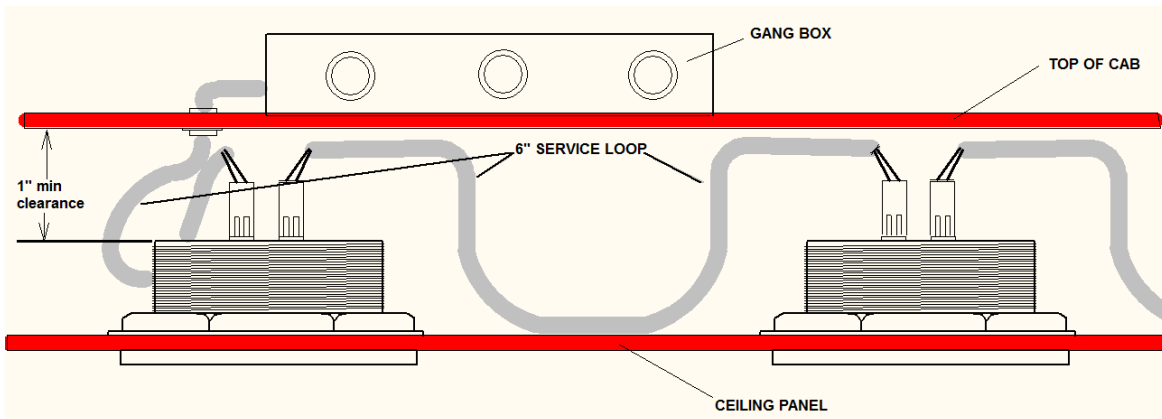

Figure 6 - Installation example

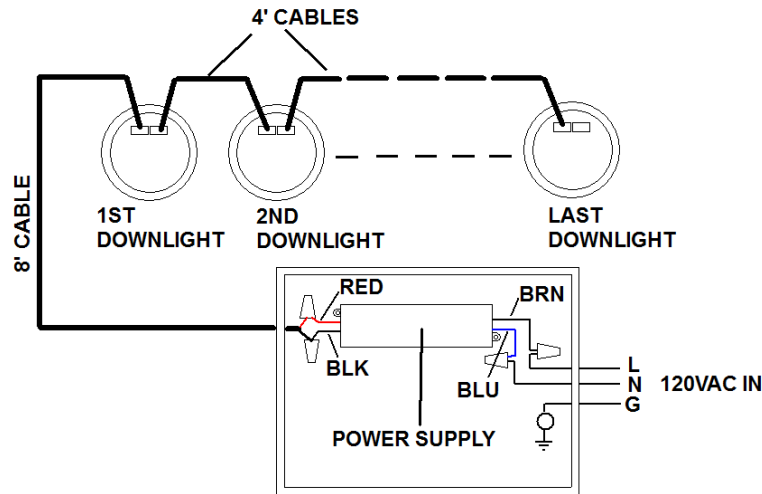## 7.5 CabLite® VR w/o Dimming Wiring Diagram

Figure 7 - CabLite VR without Dimming Wiring Diagram

Wire power supply as shown in Figure 7 - CabLite VR without Dimming Wiring Diagram.

- AC IN line – Brown wire on power supply
- AC IN neutral – Blue wire on power supply
- DC OUT + is RED wire of 8' cable
- DC OUT – is BLACK wire of 8' cable

Route the 8' cable to the first downlight and connect remaining downlights with 4' cables. The two connectors on the downlights are interchangeable so cable connection does not matter.
Once wiring is complete and cover is on power supply box, apply power to lighting system. Check that all downlights are lit.
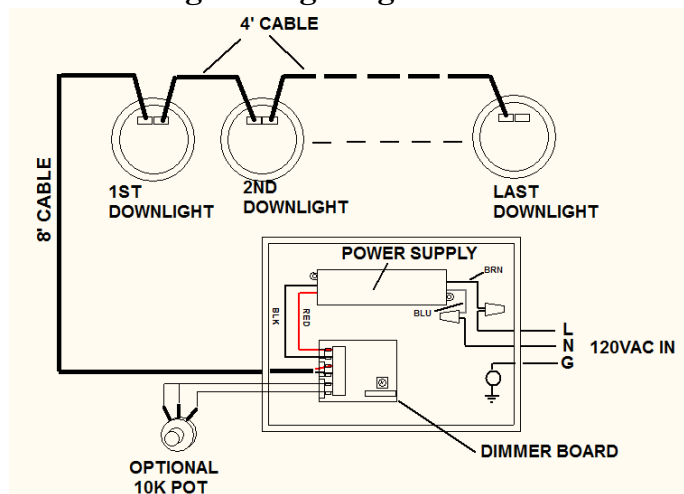
7.6 CabLite® VR w/ Dimming Wiring Diagram

Figure 8 - CabLite VR with Dimming Wiring

As previously mentioned the CabLite system power supply and dimming board are pre-wired from the factory. Route AC power through one of the punch outs of the gang box and secure cable to box with appropriate hardware. Connect AC in as shown in Figure 8 - CabLite VR with Dimming Wiring.

- AC IN line – Brown wire on power supply
- AC IN neutral – Blue wire on power supply

Route the 8' cable through another punch out of the gang box and secure to box using proper hardware. Connect the 8' cable to the first downlight and the remaining downlights with the 4' cables. The two connectors on the downlights are interchangeable so cable connection does not matter.
Apply power to lighting system and adjust brightness using the on board or external potentiometer. (See Figure 2 - Dimmer Board).
When complete install cover.

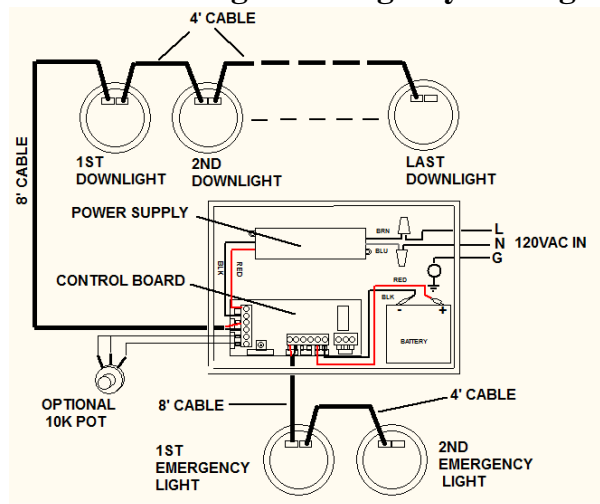## 7.7   CabLite® VR Basic w/ Dimming & Emergency Wiring

Figure 9 - CabLite® VR w/ Dimming & Emergency Wiring

As previously mentioned the CabLite® system power supply and dimming board are pre-wired from the factory. The BATTERY negative terminal is prewired to the control board and the positive terminal is left disconnected. Route AC power through one of the punch outs of the gang box and secure cable to box with appropriate hardware. Connect AC in as shown in *Figure 9 - CabLite® VR w/ Dimming & Emergency Wiring*.

- AC IN line – Brown wire on power supply
- AC IN neutral – Blue wire on power supply

Route the 8' cable through another punch out of the gang box and secure to box using proper hardware. Connect the 8' cable to the first downlight and the remaining downlights with the 4' cables. The two connectors on the downlights are interchangeable so cable connection does not matter.

The EMERGENCY lights are connected through a second 8' cable as shown in *Figure 9*. There should be two and only two downlights connected for emergency.

NOTE: Connecting more than two will shorten the emergency lighting time.

With all downlights connected, remove the plastic cover from the POS terminal of the battery and connect RED wire from control board to battery POS terminal. The EMERGENCY downlights should light at this time if battery is fully charged.

Apply AC power to CabLite system. All downlights should light. Adjust the brightness of the downlights through the on board or external potentiometer. See Figure 3 - CabLite VR Emergency Board.

When complete replace cover.

Allow 24 hours for battery to fully charge

8   LED Replacement

- Insert the #10 torx into the center hole of the lens as shown in Figure 10 - LED Removal to unscrew lens assembly.
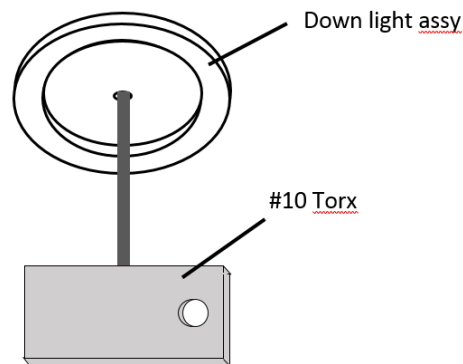

Figure 10 - LED Removal

- Drop assembly down as shown in Figure 11 - LED assembly replacement.
  Note: VR2.25 12 Volt option shown. Procedure is the same for all LED downlights.
- Disconnect the 2 connectors from assembly and connect to new assembly. Connectors positions are interchangeable.
  Note: If Power is on, the LED assembly should light once connection is made.
- Place assembly back into can and secure with #10 torx.

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IMPORTANT: Assemble should be secured finger tight. Do not over tighten.
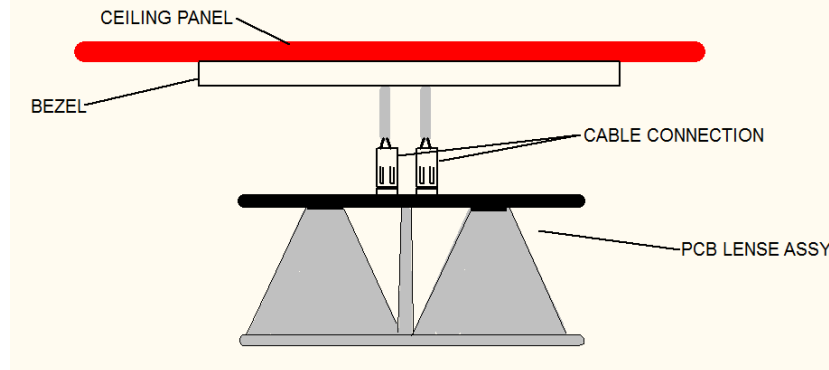

Figure 11 - LED assembly replacement

9 Trouble Shooting

9.1 One Light Does Not Turn On

1) Swap downlight with another light in string.
    a) If light still does not operate replace downlight.
    b) If downlight lights, then check original connection to downlight.
        i) Replaced cable if necessary

9.2 Lights Do Not turn On (CabLite VR w/o Dimming)

1) Check connection between power supply and first downlight.
2) Check for correct power supply output (12 or 24VDC)
    a) If no output check for 120VAc at power supply input
        i) If 120VAC present replace power supply.
    b) If power output (12 or 24VDC) is present replace 8' cable

9.3 Lights Do Not Turn On (CabLite VR w/ Dimming and Dimming/Emergency)

1) Check connection between control board and first downlight.
2) Using DVM measure between pins 3 and 4 (+OUT-) for correct DC voltage (12 or 24VDC).
    a) If correct voltage present replace 8' cable
    b) If no output check for correct DC voltage input at pins 1 and 2 (+IN-)
        i) If no input voltage at +IN- then check for 120VAC at power supply input
        ii) If 120VAC present replace power supply.
    c) If correct input present at +IN- then replace Control board.

9.4 No Emergency Lights with AC loss (CabLite® VR w/ Dimming and Emergency)

1) Check FAULT LED on control board (AC power required).
    a) If lit battery may not be fully charged or may require replacement.
2) Check connection between control board and first emergency downlight in string.
    a) Check continuity of 8' cable and replace if necessary.

3) With no AC power applied and battery connected, check for correct battery voltage (6 or 12VDC) at pins 7 and 8 (+EM-) of control board
    a) If no or incorrect voltage present, check connections between battery and control board.
        i) **NOTE that battery may not be fully charged.**
    b) Check for correct Battery voltage and replace battery in necessary.

9.5 Designated Emergency Lights Do Not Light with AC Power (CabLite® VR w/ Dimming and Emergency)

1) Check connection between control board and first downlight.
    a) Replace cable if necessary
2) Check for correct voltage (12 or 24VDC) at pins 7 and 8 (+EM-) output.
    a) If correct voltage is present replace 8' cable
    b) If no or incorrect voltage present replace emergency control board.