ESEL, Elevated Special End Light
Type: L-861SE

LED Runway Threshold/End Light

Instruction Manual

Revision 1.0
02/01/2021
MAN-FX03

In accordance with:
FAA
Advisory Circular AC-150/5345-46
Engineering Brief 67

AirportLightingCompany

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Warranty – LED Light Source Products FAA EB67D

Products manufactured by Airport Lighting Company (ALC) which use LEDs as a light source are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation per the applicable FAA Advisory Circular and against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years per FAA EB67D. ALC will correct such defects by repair or replacement, at its option, provided the products have been properly handled and stored prior to installation, properly installed and operated after installation, and provided further that the Buyer has notified ALC in writing within the warranty period and within a reasonable time after notice of such defects. Refer to handling, storage, installation and operational instructions for proper procedural guidance that must be followed to maintain warranty provisions.

This warranty is in effect for the specified term as long as the equipment, in ALC's judgment, has not been altered in such a way as to affect the equipment adversely, subject to accident, negligence, improper storage, and has been operated and maintained in accordance with accepted FAA guidelines as described in AC 150/5340-26 and ALC's published operational guidelines.

ALC reserves the right to examine products about which a claim has been made. Equipment must be presented in the same condition as when the defect was discovered. ALC also reserves the right to require the return of equipment to establish any claim.

Disclaimer: ALC's obligation under this warranty is limited to repair or replacement of defective equipment sold by ALC at no cost to Buyer. This does not include any other costs such as the cost of removal, shipping, or installation of the defective part or repaired or replaced product, including labor or any consequential damages of any kind. Warranty services provided under this agreement do not assure uninterrupted operations of LED illuminated equipment. ALC shall not be liable for any indirect or consequential damages.

ALC's liability under no circumstances will exceed its sales price of the products claimed to be defective. All transportation costs under this warranty are the responsibility of the purchaser. Replacement parts and/or equipment provided under this warranty are covered under the same terms until the expiration of the original warranty period that began upon the first installation of the equipment.

This is ALC's sole and exclusive warranty with respect to the equipment sold to the Buyer. There are no express or implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein.

ALC shall not be liable to the purchaser of this product or third parties for indirect or consequential damages, or for damages arising from the use of any options or parts other than those designated by ALC as approved products. Damage caused by lightning, flood and other natural or manmade causes are outside the scope of this warranty.

Changes from last Revision

- Initial Release

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1.0 Safety

It is not safe to work on a constant current power system when the power is on. Make sure the power is off before installing a runway light fixture. A lock out, tag out, procedure should be used. An additional safety measure is to test that the circuit is off by using a clamp-on ammeter. By using a clamp-on ammeter, clamped over the primary cable of the isolation transformer, the installer can confirm that the circuit being worked on is off by verifying that no current is flowing thru the primary cable.

2.0 Description

The High Intensity LED Runway Lights are elevated bi-directional and uni-directional runway lights. The High Intensity LED Runway Light operate on a 2.8 - 6.6 Amp series runway circuit.

FAA, certified to Advisory Circular 150/5345-46 (Current Edition): This product line meets the requirements for L862 and L862E

2.1 Catalog Ordering Information

ESEL- __ __ - __ __

Color:	Height
RG = Red / Green	14 = 14” (36cm)
GO = Green / Obscure	20 = 20” (51cm)
OG = Obscure / Green	24 = 24” (61cm)
	30 = 30” (76cm)
	Other heights available

Example: ESEL-RG-24 is 24” high with red on side A and green on side B.

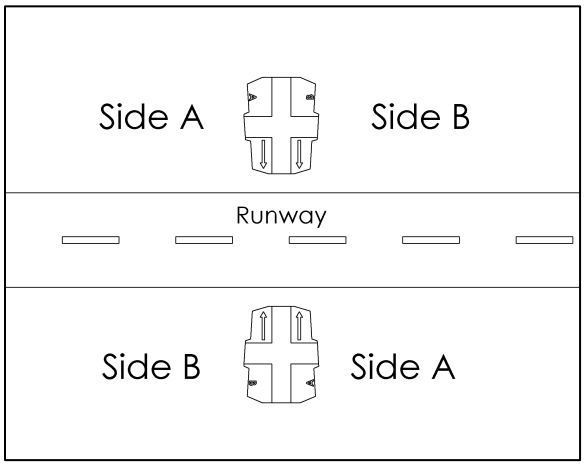

Figure 2: Light Placement

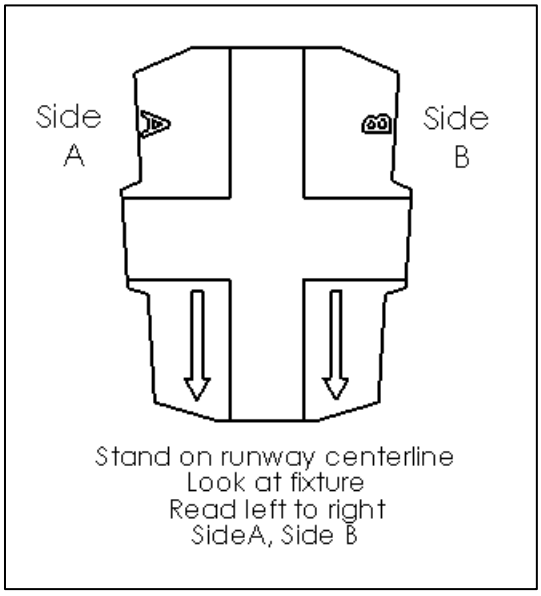

Figure 1: Side A, Side B

2.2 Fixture Loads and Required Transformer

Table 1: PF and VA

	Fixture Load	Iso Tran Load	VA	PF
Red / Green (largest load)	30.4	14.3	44.7	0.948
Green unidirectional (smallest load)	24.4	14.3	38.7	0.959

A 30/45-Watt isolation transformer is specified for all fixtures referenced in this manual.

2.3 Dimensions

Height, head assembly: 6.8 inches, (173mm)
Height, w/ slip fitter: 8.9 inches, (226mm)
Width: 5.5 inches, (140mm)
Length: 5.2 inches, (132mm)
Weight: 5 pounds, (2.3kg)

The L861SE LED Runway Light
fixtures can ship in a single box.
(9 1/8 x 7 x 5 ¾ inches) or (232 x 178 x 146mm)
9 fixtures can ship in a box.
(17 x 16 ½ x 10 inches) or (432 x 420 x 254mm)

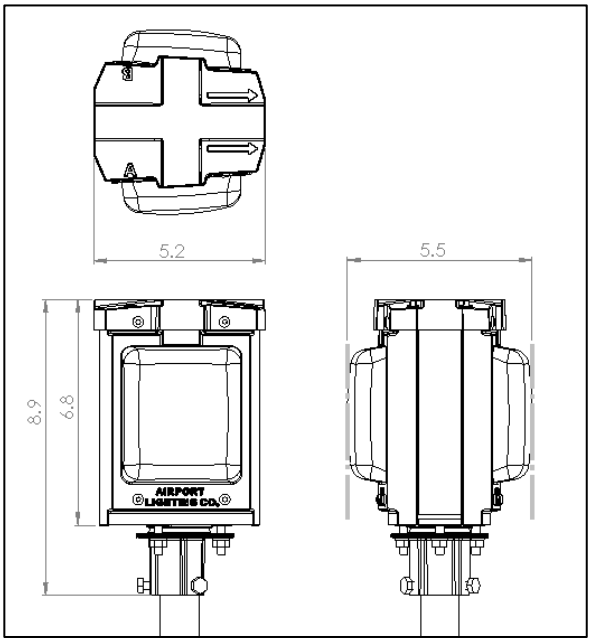

Figure 3: Fixture Dimensions

2.4 Storage.

The Elevated High Intensity fixtures should be stored indoors and kept dry.
Storage Temperature: -55C (-67F) to +55C (131F).

3.0 Installation

3.1 FAA References and Siting Requirements

The requirements for siting of high intensity runway edge lights are explained in FAA advisory circular 150/5340-30J.

The L862E fixtures, bidirectional red/green and red/red, and unidirectional red or green will come with red and/or green lens retainers to provide daytime recognition.

3.2 Installation

3.2.1 Tools Required for Installation.

7/16 wrench.
1 ½ inch wrench.

3.2.1 Tools Required for Maintenance.

7/16 wrench.
1 ½ inch wrench.
Torx T20 driver.

3.2.2 Installation Precautions.

It is not safe to work on a constant current power system when the power is on. Make sure the power is off before installing a light fixture. A Lock Out Tag Out procedure is strongly recommended. An additional safety measure is to test circuit by using a clamp on current meter. By clamping over the primary cable in the fixture can, the installer has performed an additional safety check by checking the circuit they are working on is off. At the vault make sure the Constant Current Regulator powering the circuit is off and has been tagged out. At the fixture, place a clamp-on ammeter over the primary cable and verify that the current measures zero amps.

3.2.3 Proper Transformer.

It is recommended to use the specified transformer to power the L861SE (L). A smaller transformer will not allow the fixture to work properly. An oversized transformer can be used but will not work as efficiently. A 30/45-Watt isolation transformer is specified for all fixtures referenced in this manual.

3.2.4 Pre-Assembly of Fixture.

Apply an anti-seize compound to the frangible coupling threads. Install frangible coupling to the baseplate. Fasten the column to the fixture. Pass the L-823 plug thru the frangible coupling and baseplate. Fasten the bottom of the column to the frangible coupling.

3.2.5 Final Assembly.

Connect the secondary of the isolation transformer to the fixture. Apply anti-seize compound to the 3 screws that will secure the secondary plug. Secure the secondary plug to the baseplate with the 3 screws and plug retainer. Place the baseplate gasket in position. Position the baseplate over the can so that the arrows on the fixture point towards the runway centerline. Secure the baseplate to the can.

3.3 Aim Fixture

The arrows on the fixture cap should be pointed towards the runway centerline. The shorter cross on top of the cap is used to sight the fixture for alignment with the row of edge lights, the longer member of the cross can be used to align with the threshold lights.

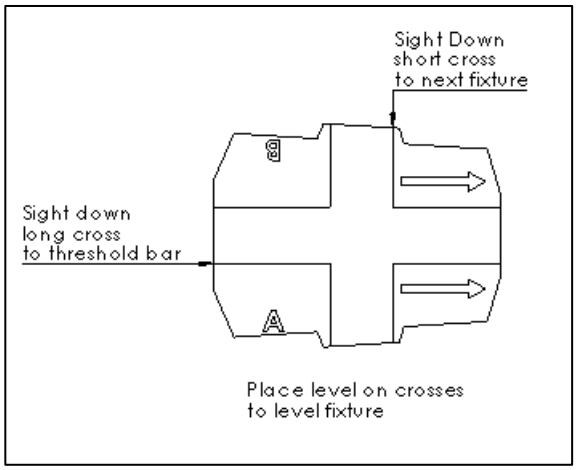

Figure 4: Fixture Aiming.

3.4 Level Fixture

Place a level on top of the cap and level the fixture. If a torpedo level is used, level in both directions of the cross. A bull's eye level can be used at the cross intersection.

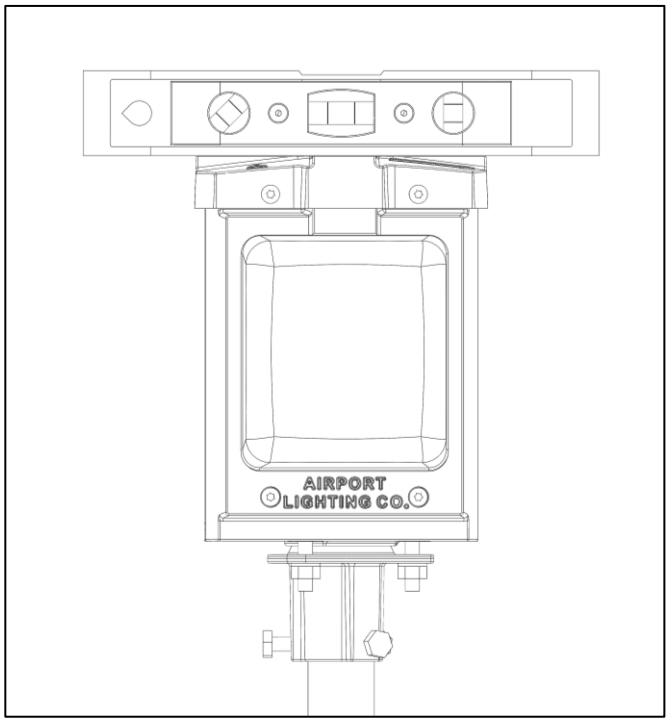

Figure 5: Leveling, Front View.

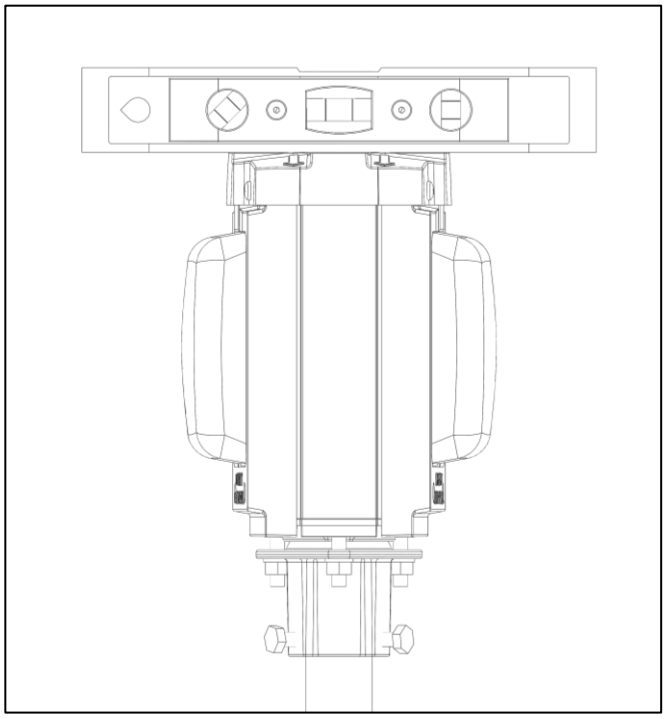

Figure 6: Leveling, Side View.

3.5 Torque Bolts

Once the fixture has been aimed and leveled, torque the ¼-20 fasteners to 64 inch-pounds (5.3 foot-pounds). Recheck the level of the fixture.

Table 2: Torque

	Inch-pounds	Foot-pounds	Newton-meters
#8	18.4	1.5	2.1
¼-20	63.6	5.3	7.2
1 ½	na	50	68
2	na	50	68

4.0 Operation

The ESEL LED product line is designed to work on a constant current electrical supply that delivers current from 2.8 amps to 6.6 amps. The fixture measures the input current and automatically adjusts the light intensity. The fixture contains an input power board, a controller, and light engine(s). The fixture senses which color will be emitted by the light engine and adjusts its power accordingly. Change of light engine to a different color requires no user adjustments.

Inspect that the fixture is properly installed and connected to the correct isolation transformer. Turn on the fixture and the LEDS come on. Step the current level and the light intensity will adjust to the correct intensity. When stepping current, allow a few seconds for the intensity to readjust.

4.1 Plug and Know LED Circuit

The ESEL light engines use a 6-pin connector. 2 of the 6 pins provide power to the LEDs. The remaining 4 pins are used to identify the light engine. When a light engine is connected to the fixture, the fixture knows which light engine has been connected. This allows the circuit to properly drive each light engine to its correct intensity.

4.2 Multiple Light Devices

The green light engine is made up of multiple LEDS. FAA requires the light engine to shut off if 25% of the LEDs fail. The circuit is constantly looking at the LEDs. When 25% or more fail, the circuit will power down within 2 minutes and a minute later it will shut the green light engine off. If the fixture is off, do not touch the fixture. There is still power going to the fixture. If a fixture appears to be off, cycle the power off and on. Observe the light engines. Replace the light engine that does not have all the LEDs working. The red light engine uses a single LED and does not adhere to the Multiple Light Devices rule. If the red is off, the LED has failed, the fixture has failed or the red light engine has become disconnected

5.0 Maintenance

5.1 Daily Maintenance

Check that all lights are working. Check that all lights have similar light output. Check that the lenses are clean.

5.2 Monthly Maintenance

Check that all fixtures are aimed properly. Check that all fixtures are level on 2 axes. Check that the fixture is secure, and all fasteners are tight. Check that all LEDs are illuminated. Clean the lenses.

6.0 Trouble Shooting

6.1 Tech Support

Outside of aiming, leveling, and cleaning, the ESEL fixture should require very little maintenance. The end user has the option to use this manual to perform advanced maintenance, to call tech support at Airport Lighting Company at (866) 212-1060 or to contact us by email at support@airportlightingcompany.com.

6.2 Troubleshooting

Table 3: Troubleshooting

Problem	Cause	Solution
Light output too low	Glass is dirty	Clean lens
	Wrong current level	Check current on CCR
	Isolation transformer too small	Install the proper sized transformer
	LED light engine is failing	Replace light engine
	Controller is failing	Replace controller
Only one side of fixture has light output	Multiple Light Device test feature is activated	See 4.2 Multiple Light Devices
	LED light engine is disconnected	Check light engine connection
	LED light engine has failed	Replace light engine
	Controller has failed	Replace controller
Both sides of fixture, no light output	Multiple Light Device test feature is activated	See 4.2 Multiple Light Devices
	Connection failed	Check all connections
	LED light engine(s) failed	Replace light engine(s)
	Controller failed	Replace controller
	Power input board failed	Replace power input board

6.3 Removing Electronic Parts.

When the light is out the cause can be in a few areas. The way to isolate the problem is to start with a known good fixture. Test each part from the inoperable fixture in the known good fixture, one at a time, until the problem is isolated. Then replace the defective part.

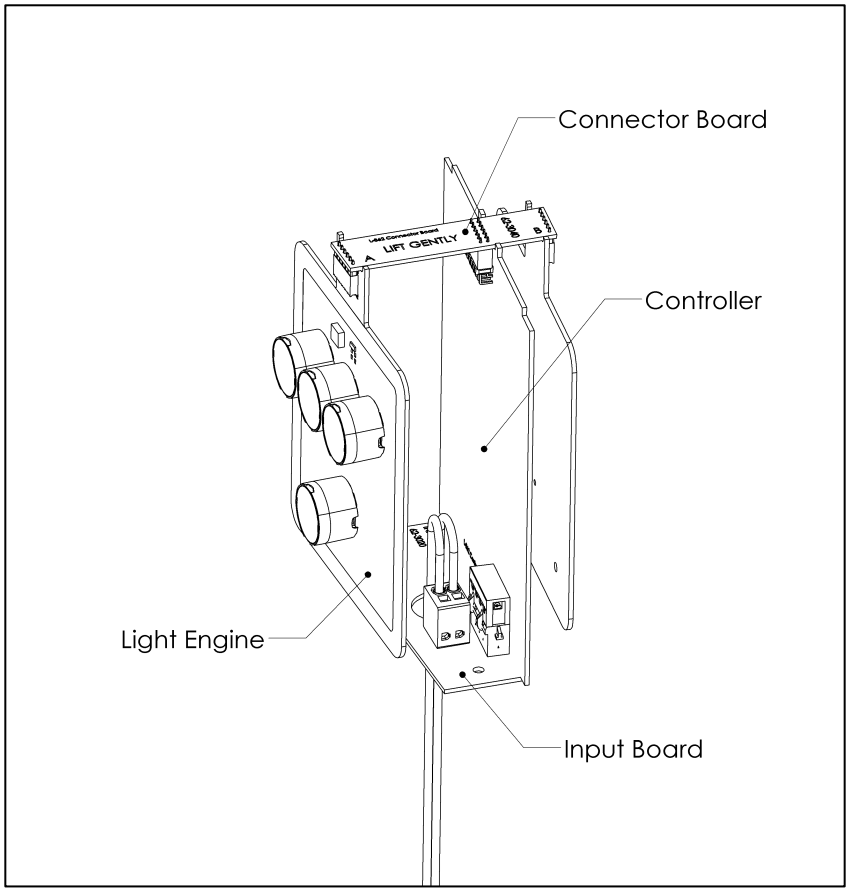

Figure 7: Electronic Component Assembly

Note which side is side A and which side is side B.
Remove the 4 screws that hold the cap in place.
Remove the cap.
Carefully pull the connector board upward to disconnect.
Remove the 2 screws that hold the side A lens retainer in place.
Remove side A LED light engine.
Remove the 2 screws that hold the Side B lens retainer in place.
Remove side B LED light engine.
Pull the controller board upward and out of the fixture.
Mark the top of the extruded body with tape.
Remove the 4 screws holding the bottom to the body.

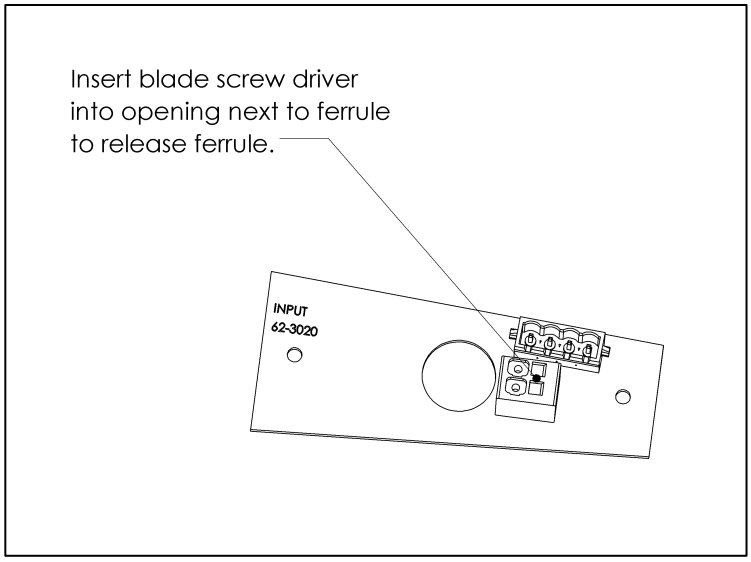

Figure 8: How to Remove Ferrule.

Insert a small blade screwdriver into the openings next to the ferrules to release the ferrules.
Remove the 2 screws holding the input board to the bottom.

6.4 Replacing Electronic Parts.

Connect the input board to the bottom with 2 screws.
Push the ferrules into the input board terminal block until the ferrules are flush with the top of the terminal block.
Position the controller board into the input board.
Slide the controller board into the body from the bottom, making sure the board is in the grooves correctly.
Connect the bottom to the body with 4 screws.
Install the connector board to the controller.
Use the cap to determine Side A and Side B.
Slide Side A light engine into the connector board.
Place the lens retainer over the light engine.
Make sure the top edges of the lens retainer and body are flush.
Install the 2 lower screws to fasten the lens retainer.
Slide Side B light engine into the connector board.
Place the retainer over the light engine.
Make sure the top edges of the lens retainer and body are flush.
Install the 2 lower screws.
Place the cap in position and apply a downward pressure while installing 4 screws.

6.5 Replacing the LED Light Engine.

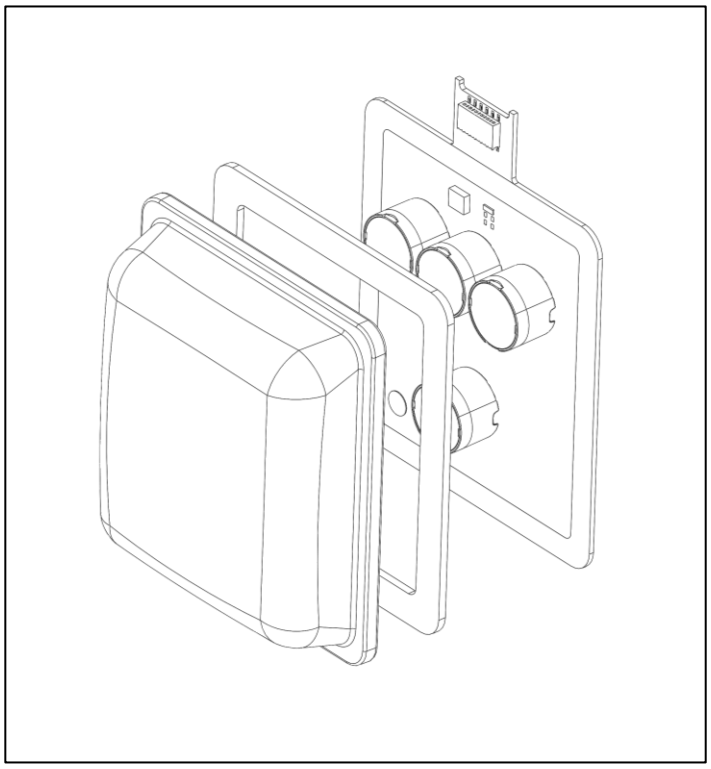

Figure 9: Lens Assembly

It is recommended to purchase the light engine as an assembly with a new glass lens. If the lens is broken and the light engine still works properly, the glass lens can be replaced. And if the lens is good, the light engine can be replaced.

6.5.1 Replacing the LED Light Engine Assembly

Remove the 4 screws that hold the cap in place.
Remove the cap.
Remove the 2 screws that hold the lens retainer in place.
Slide the LED light engine down to disconnect from the connector board.
Slide the new LED light engine into the connector board.
Place the lens retainer over the LED light engine.
Make sure the top edges of the lens retainer and body are flush.
Install the 2 lower screws to fasten the lens retainer.
Place the cap in position and apply a downward pressure while installing 4 screws.

6.5.2 Replacing the Light Engine, Lens and Gasket

Remove the LED light engine.
Cut the gasket with a box cutter.
Separate the two parts.

Peel the gasket off the parts that are going to be reused.
Use an adhesive cleaner to remove any remaining adhesive.
(Goo Gone, or De-Solv-It work well)
Use alcohol to clean the surface for the new gasket.
Clean the lens.
Peel and stick the new gasket to the lens.
Peel and stick the gasket and lens to the light engine.

7.0 Parts

High Intensity Runway Light LED Light Engines

There are 5 different light engines to choose from. There is 1 white, 1 yellow, 1 red and 2 green light engines. Each light engine meets a specification or multiple specifications. All specifications are met when the fixture is aimed properly. Table 4 shows the available light engines. All light engines work on either side of a fixture.

Table 4: Light Engines

Color	Order Code	Light Engine w/ Lens	Light Engines	LEDs	FAA
Red	R	262-1205	62-3035	1	L861SE
Green	G	262-1206	62-3036	4	L861SE

Table 5: Columns and Cords

Column and Cords part numbers		
Fixture Height	Column part number	Cord PN
14 inches (36cm)	77	262-1100
20 inches (51cm)	78	262-1101
24 inches (61cm)	78-16	262-1102
30 inches (76cm)	79	262-1103

ITEM	PART NUMBER	QTY.
1	262-1300, Cap	1
2	62-1010, Body	1
3	62-3040, PCB Connector Board	1
4	62-3010, PCB Controller	1
5	62-3020, PCB Input Board	1
6	62-1040, Bottom	1
7	62-1050, Slip Fitter	1
8	Column (see table)	1
9	62-1060, Frangible Coupling	1
10	62-1030, Retainer	1 or 2
11	62-1070, Lens	1 or 2
12	62-2020, Lens Gasket	1 or 2
13	Light Engine (see table)	1 or 2
14	99-00109, Strain Relief	1
15	99-00244, #8 Torx T20	12

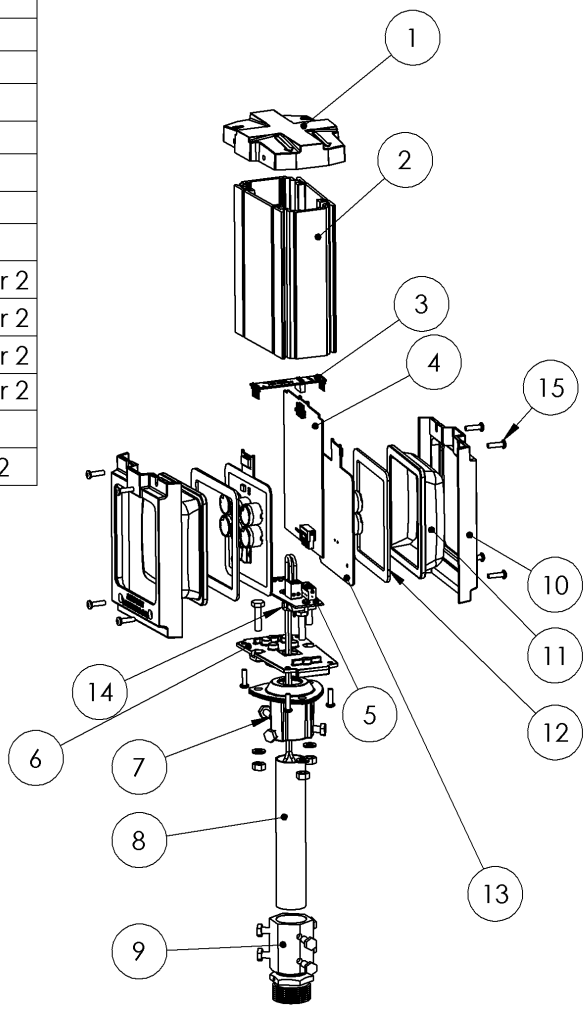

Figure 10: Parts Diagram

Table 6: Bill of Materials

Part Number	Name	Description
62-1010	Body	Extrusion body
262-1300	Cap w/ Gaskets	Die cast cap
62-1031	Lens Retainer Red	Die cast red lens retainer
62-1032	Lens Retainer Green	Die cast green lens retainer
62-1033	Lens Retainer Blank	Solid retainer, obscure side of unidirectional
62-1040	Bottom	Die cast bottom
62-1050	Slip Fitter	Die cast slip fitter
62-1060	Hex Coupling	Frangible coupling
62-1070	Lens	Glass lens
62-2020	Lens Gasket	Gasket
62-3010	PCB Controller	PCB controls unit
62-3020	PCB Input Board	PCB input connection
62-3035	PCB Light Engine Red	Red LED light engine
62-3036	PCB Light Engine Green	Green LED light engine with optics
262-1205	Light Engine assembly, Red L861SE	Red Led light engine with lens and gasket
262-1206	Light Engine assembly, Green L861SE	Green LED light engine with lens and gasket
262-1100	EHL Cord Set, 14" OAH	L-823, Style 6 for 14" (36cm) EHL Fixture
262-1101	EHL Cord Set, 20" OAH	L-823, Style 6 for 20" (51cm) EHL Fixture
262-1102	EHL Cord Set, 24" OAH	L-823, Style 6 for 24" (61cm) EHL Fixture
262-1103	EHL Cord Set, 30" OAH	L-823, Style 6 for 30" (76cm) EHL Fixture
77	Column for 14	Column for 14 (36cm)
78	Column for 20	Column for 20 (51cm)
78-16	Column for 24	Column for 24 (61cm)
79	Column for 30	Column for 30 (76cm)
99-00244	8-32 x 5/8 Torx Pan Taplite SS	Hardware, T20
903	Thread Reducer	2” NPT to 1 ½-12 NF thread reducer

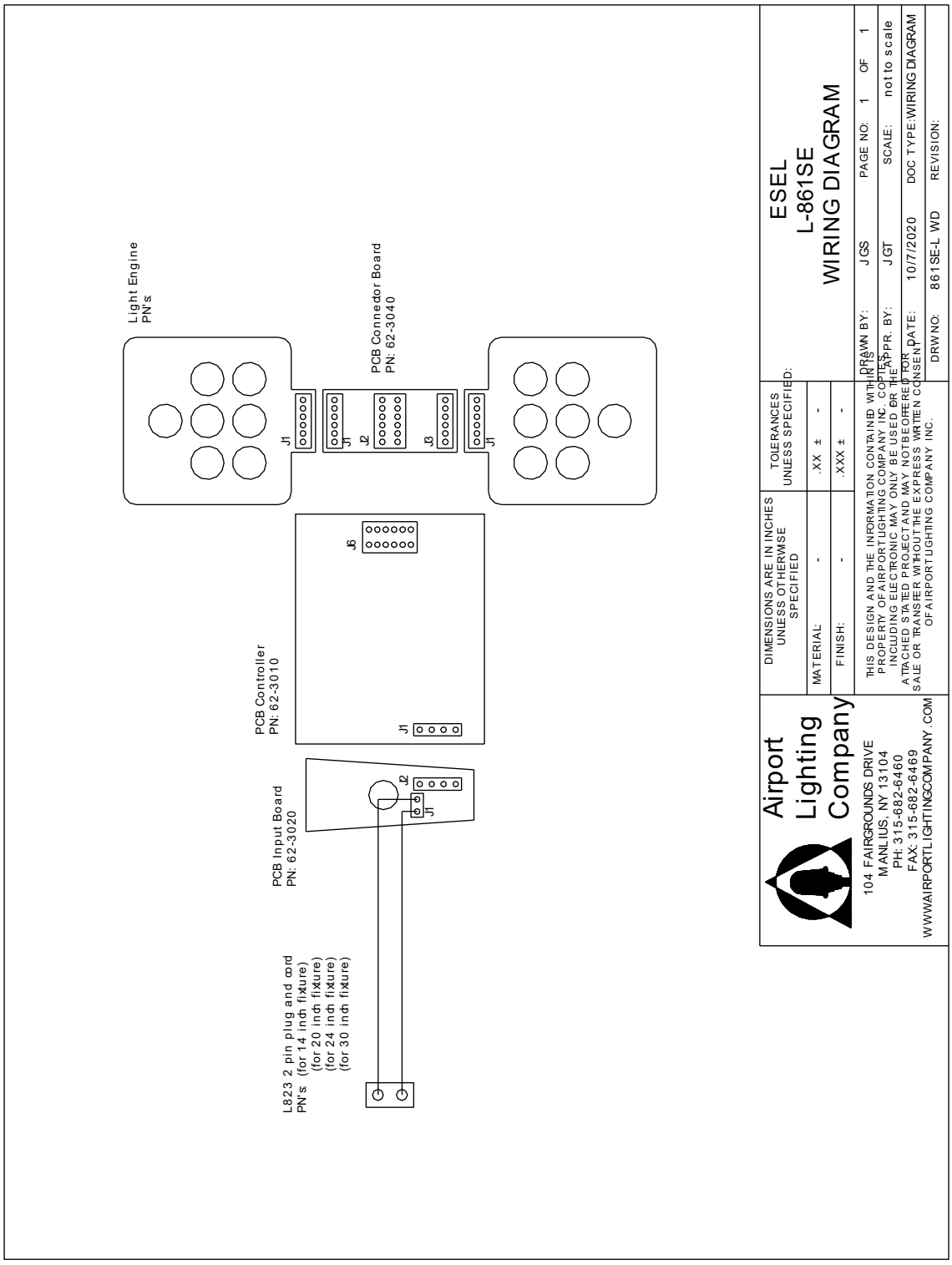

Figure 11: ESEL Wiring Diagram