L-850 A/B LED IRCL and TDZL

User Manual

96A0403, Rev. i, 2020/04/09

ADB SAFEGATE

A.0 Disclaimer / Standard Warranty

CE certification

The equipment listed as CE certified means that the product complies with the essential requirements concerning safety and hygiene. The European directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

ETL certification

The equipment listed as ETL certified means that the product complies with the essential requirements concerning safety and FAA Airfield regulations. The FAA directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

All Products Guarantee

ADB SAFEGATE will correct by repair or replacement per the applicable guarantee above, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives ADB SAFEGATE written notice of such defects after delivery of the goods to Buyer. Refer to the Safety section for more information on Material Handling Precautions and Storage precautions that must be followed.

ADB SAFEGATE reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. ADB SAFEGATE furthers reserves the right to require the return of such goods to establish any claim.

ADB SAFEGATE's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished.

ADB SAFEGATE's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by ADB SAFEGATE, warranty is limited to that extended by the original manufacturer. This is ADB SAFEGATE's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All such warranties being expressly disclaimed.

Standard Products Guarantee

Products of ADB SAFEGATE manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) which may occur during proper and normal use for a period of two years from the date of ex-works delivery, and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

Note

See your sales order contract for a complete warranty description.

FAA Certified product installed in the United States or in US Military installations guarantee

ADB SAFEGATE L858 Airfield Guidance Signs are warranted against mechanical and physical defects in design or manufacture for a period of 2 years from date of installation, per FAA AC 150/5345-44 (applicable edition).

ADB SAFEGATE L858(L) Airfield Guidance Signs are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition).

ADB SAFEGATE LED light fixtures (with the exception of obstruction lighting) are warranted against electrical defects in design or manufacture of the LED or LED specific circuitry for a period of 4 years from date of installation, per FAA EB67 (applicable edition). .

Note

See your sales order contract for a complete warranty description.

Liability

WARNING

Use of the equipment in ways other than described in the catalog leaflet and the manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in the manual.

ADB SAFEGATE cannot be held responsible for injuries or damages resulting from non-standard, unintended uses of its equipment. The equipment is designed and intended only for the purpose described in the manual. Uses not described in the manual are considered unintended uses and may result in serious personal injury, death or property damage.

Unintended uses, includes the following actions:

- Making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine ADB SAFEGATE replacement parts or accessories.
- Failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards if not in contradiction with the general rules.
- Using materials or auxiliary equipment that are inappropriate or incompatible with your ADB SAFEGATE equipment.
- Allowing unskilled personnel to perform any task on or with the equipment.

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1.0 Safety

Introduction to Safety

This section contains general safety instructions for installing and using ADB SAFEGATE equipment. Some safety instructions may not apply to the equipment in this manual. Task- and equipment-specific warnings are included in other sections of this manual where appropriate.

1.1 Safety Messages

HAZARD Icons used in the manual

For all HAZARD symbols in use, see the Safety section. All symbols must comply with ISO and ANSI standards.

Carefully read and observe all safety instructions in this manual, which alert you to safety hazards and conditions that may result in personal injury, death or property and equipment damage and are accompanied by the symbol shown below.

	WARNING Failure to observe a warning may result in personal injury, death or equipment damage.
	DANGER - Risk of electrical shock or ARC FLASH Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage. ARC Flash may cause blindness, severe burns or death.
	WARNING - Wear personal protective equipment Failure to observe may result in serious injury.
	WARNING - Do not touch Failure to observe this warning may result in personal injury, death, or equipment damage.
	CAUTION Failure to observe a caution may result in equipment damage.

Qualified Personnel

	Important Information The term **qualified personnel** is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations and have been trained to safely install, operate, maintain and repair the equipment. It is the responsibility of the company operating this equipment to ensure that its personnel meet these requirements. Always use required personal protective equipment (PPE) and follow safe electrical work practice.

1.1.1 Introduction to Safety

CAUTION

Unsafe Equipment Use
This equipment may contain electrostatic devices, hazardous voltages and sharp edges on components

- Read installation instructions in their entirety before starting installation.
- Become familiar with the general safety instructions in this section of the manual before installing, operating, maintaining or repairing this equipment.
- Read and carefully follow the instructions throughout this manual for performing specific tasks and working with specific equipment.
- Make this manual available to personnel installing, operating, maintaining or repairing this equipment.
- Follow all applicable safety procedures required by your company, industry standards and government or other regulatory agencies.
- Install all electrical connections to local code.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning prior to returning power to the circuit.

Failure to follow this instruction can result in serious injury or equipment damage

Additional Reference Materials

Important Information

- IEC - International Standards and Conformity Assessment for all electrical, electronic and related technologies.
- IEC 60364 - Electrical Installations in Buildings.
- FAA Advisory: AC 150/5340-26 (current edition), Maintenance of Airport Visual Aid Facilities.
- Maintenance personnel must refer to the maintenance procedure described in the ICAO Airport Services Manual, Part 9.
- ANSI/NFPA 79, Electrical Standards for Metalworking Machine Tools.
- National and local electrical codes and standards.

1.1.2 Intended Use

CAUTION

Use this equipment as intended by the manufacturer
This equipment is designed to perform a specific function, do not use this equipment for other purposes

- Using this equipment in ways other than described in this manual may result in personal injury, death or property and equipment damage. Use this equipment only as described in this manual.

Failure to follow this instruction can result in serious injury or equipment damage

1.1.3 Material Handling Precautions: Storage

CAUTION

Improper Storage
Store this equipment properly

- If equipment is to be stored prior to installation, it must be protected from the weather and kept free of condensation and dust.

Failure to follow this instruction can result in equipment damage

1.1.4 Material Handling Precautions: Fasteners

DANGER

Foreign Object Damage - FOD
This equipment may contain fasteners that may come loose - torque properly.

- Only use fasteners of the same type as the one originally supplied with the equipment.
- Use of incorrect combination of gaskets, bolts and nuts can create severe damages to the product installation and create safety risk .
- You need to know what base the light fixture will be installed in, in order to chose the correct gasket, bolts and nuts.
- Bolt type, length, and torque value are determined by type of base, height of spacers used, and clamp force required in FAA Engineering Brief No 83 (latest revision).
- Due to the risk of bolts vibrating loose, do not use any type of washer with the fixing bolts (such as split lock washers) other than an anti-vibration washer. Anti-vibration washers as defined in FAA EB 83 (latest edition) must be used. For installations other than FAA, use the base can manufacturer's recommendations.
- Always tighten the fasteners to the recommended torque. Use a calibrated torque wrench and apply the recommended adhesive type.
- Obey the instructions of the adhesives necessary for the fasteners.

Failure to follow these warnings may cause the fasteners to loosen, damage the equipment, potentially to loosen the equipment. This can lead to a highly dangerous situation of FOD, with potential lethal consequences.

Note

To minimize the risk of errors, the ADB SAFEGATE Sales Representative will have information on which gasket goes with which base. This information is also provided in the product Data sheets, the User Manuals and the Spare Part Lists.

CAUTION

Use of incorrect combination of gaskets, bolts and nuts can create severe damages to the product installation and create multiple safety risks.

To obtain a safe and watertight installation the O-ring and retaining bolt stated in the document must be used.

You need to know what base the light fixture will be installed in, in order to choose the correct gasket, bolts and nuts.

Failure to follow these cautions can result in equipment damage or aircraft FOD.

1.1.5 Maintenance Safety

DANGER

Electric Shock Hazard
This equipment may contain electrostatic devices

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Failure to follow these instructions can result in death or equipment damage

1.1.6 Material Handling Precautions, ESD

CAUTION

Electrostatic Sensitive Devices
This equipment may contain electrostatic devices

- Protect from electrostatic discharge.
- Electronic modules and components should be touched only when this is unavoidable e.g. soldering, replacement.
- Before touching any component of the cabinet you shall bring your body to the same potential as the cabinet by touching a conductive earthed part of the cabinet.
- Electronic modules or components must not be brought in contact with highly insulating materials such as plastic sheets, synthetic fiber clothing. They must be laid down on conductive surfaces.
- The tip of the soldering iron must be grounded.
- Electronic modules and components must be stored and transported in conductive packing.

Failure to follow this instruction can result in equipment damage

1.1.7 Arc Flash and Electric Shock Hazard

DANGER

Series Circuits have Hazardous Voltages
This equipment produces high voltages to maintain the specified current - Do NOT Disconnect while energized.

- Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.
- Only persons who are properly trained and familiar with ADB SAFEGATE equipment are permitted to service this equipment.
- An open airfield current circuit is capable of generating >5000 Vac and may appear OFF to a meter.
- Never unplug a device from a constant current circuit while it is operating; Arc flash may result.
- Disconnect and lock out electrical power.
- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in the product manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB SAFEGATE replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.
- Check the interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with airfield electrical equipment.

Failure to follow these instructions can result in death or equipment damage

2.0 L-850 A/B LED IRCL and TDZL

L-850 A/B LED IRCL and TDZL Style 3 In-pavement Lights.

2.1 About this manual

The manual shows the information necessary to:

- Install and maintain the L-850 A/B LED IRCL and TDZL Style 3 In-pavement Lights.

2.1.1 How to work with the manual

1. Become familiar with the structure and content.
2. Carry out the actions completely and in the given sequence.

L-850 A/B LED IRCL and TDZL

3.0 Introduction

This section provides an introduction to the:

- L-850A(L) Style 3 LED Runway Centerline -- IRCL Inpavement Light Fixtures.
- L-850B(L) Style 3 LED Touchdown Zone Light -- TDZL Inpavement Light Fixtures.

3.1 L-850A Style 3 LED Runway Centerline - IRCL

3.1.1 LED In-Pavement Runway Centerline Light

Compliance with Standards

FAA:	L-850A(L) AC 150/5345-46 (Current Edition) and the FAA Engineering Brief No. 67.
ICAO:	Annex 14, Vol. 1, par. 5.3.12 and Appendix 2, Figure A2-7
T/C:	Transport Canada TP 312 par. 5.3.13
CE:	Complies with the requirements of the EMC Directive 2004/108/EC

Uses

FAA L-850A(L) ICAO & T/C

- Runway centerline on category I, II, and III runway

Features

- Average LED life of 56,000 hours under high-intensity conditions and more than 150,000 hours under typical operating conditions, which significantly reduces ongoing maintenance costs and periodic re-lamping expenses, resulting in lower life cycle cost
- For white runway centerline applications, use of LED light source eliminates color shifts at lower CCR step settings. For red runway centerline applications, use of LED light source eliminates filter replacement and color shifts when viewed at various angles or CCR step settings.
- FAA Style 3—Low protrusion above ground of ≤0.25 inch reduces vibrations caused by aircraft landing gear increasing lamp life
- Can be installed on existing 6.6 A or 20 A series circuits with no modifications to existing CCR or isolation transformer
- Operates on either 3- or 5-step ferroresonant or thyristor CCRs that are designed in compliance with IEC or FAA requirements
- Very low power rating for LED lights contributes to a lower life cycle cost. Limits cost for supporting equipment, such as CCRs, to strict minimum.
- When quartz-incandescent fixtures are replaced with LED fixtures, airport staff can add more lights without increasing CCR size
- Smart electronics control current to LED, so light output matches existing incandescent fixtures.
- Smart electronics allow for a low cost and progressive evolution of the airfield lighting toward new LED-based technology.

- LED photometric peformance will be maintained longer due to a cleaner lens. Lower lens temperature prevents the “baking effect” that causes contaminants to stick to the lens surface.
- Rugged lightning protection complies with ANSI/IEEE C62.41-1991 Location Category C2 given in FAA Eng. Brief 67. Category C2 is defined as a 1.2/50µS – 8/20 µS combination wave, with a peak voltage of 10,000 V and a peak current of 5,000 A.
- Light channel in front of prism windows protects prisms from damage and prevents rubber buildup thereby maintaining optimal light output
- Includes a UL 467 rated ground lug, which accepts an AWG 6 earth ground wire
- Environment-friendly, precision-cast aluminum alloy cover, optical support, and inner cover assembly with stainless steel hardware

Electrical Supply

It is recommended that the L-850A(L) LED fixture be powered from a dedicated CCR and that separate remote controls are available. IRCL LED lights have been designed to work with any IEC- or FAA-compliant transformer up to 200 W without affecting the performance or lifetime of the light fixture or transformer. See data sheet 3033 for more details on recommended isolation transformers (XF) specified below.

L-850A(L)	Fixture Load	Isol. XF	Isol. XF Load	CCR Load
Without Heater				
Unidirectional	15 VA	20/25 W	6 VA	21 VA
Bidirectional [1]	29 VA	30/45 W	6 VA	35 VA
Bidirectional [2]	25 VA per side (50 VA total)	20/25 W per side	7.5 VA per XF	32.5 VA per side (65 VA total)
With Heater				
Unidirectional	30 VA	30/45 W	6 VA	36 VA
Bidirectional [1]	59 VA	65 W	13 VA	74 VA
Bidirectional [2]	41 VA per side (82 VA total)	30/45 W per side	9 VA per XF	50 VA per side (100 VA total)

Notes

1 One cord set

2 One cord set per side (2 total)

Operating Conditions

Temperature:	-40 °C to +55 °C (-40 °F to +131 °F)
Altitude:	Sea level to 10,000 feet (3000 m)
Relative Humidity:	Up to 100%

Dimensions: Single Cord Set / FAA

Outside diameter:	11.94 in (30.33 cm)
Bolt-circle diameter (L-868B):	11.25 in (28.58 cm)
Bottom cover depth:	3.88 in (9.9 cm)

Dimensions: Two Cord Set / FAA, ICAO, & TP 312

Outside Diameter:	11.94 in (30.33 cm)
Bolt Circle Diameter (L-868B):	11.25 in (28.58 cm)
Max. Bottom Cover O.D.:	9.94 in (25.25 cm)
Bottom Cover Depth:	3.8 in (9.65 cm) *

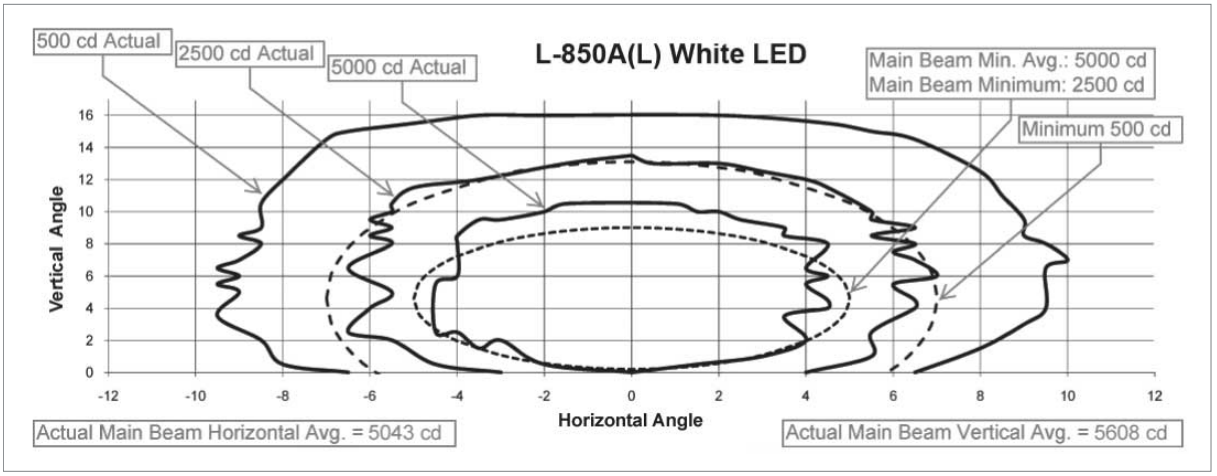
Notes

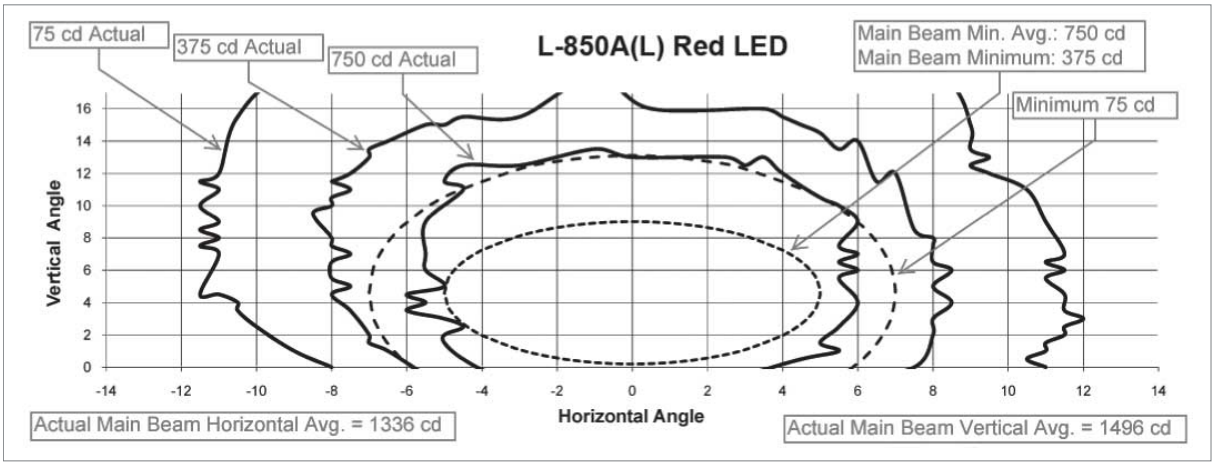
* If used in conjunction with an L-868B Top Section, the overall height of the Top Section must be 4 in (10.16 cm) minimum.

Packaging

In cardboard box:	7 × 13 × 13 in (17.8 × 33 × 33 cm)
Weight with packing:	17 lb (7.71 kg)
Weight without packing:	13.75 lb (6.24 kg)

FAA Photometric Data





3.2 L-850B Style 3 LED Touchdown Zone Light - TDZL

3.2.1 LED Runway Touchdown Zone Light

Compliance with Standards

FAA:	L-850B(L) AC 150/5345-46 (Current Edition) and the FAA Engineering Brief No. 67.
ICAO:	Annex 14, Vol. 1, par. 5.3.13 and Appendix 2, Figure A2-5.
T/C:	Transport Canada TP 312 par. 5.3.14.
CE:	Complies with the requirements of the EMC Directive 2004/108/EC.

Uses

FAA L-850B(L) ICAO & T/C

- Touchdown zone lighting on category II and III runways

Features

- Average LED life of 56,000 hours under high-intensity conditions and more than 150,000 hours under typical operating conditions, which significantly reduces ongoing maintenance costs and periodic re-lamping expenses, resulting in lower life cycle cost
- Use of LED light source eliminates color shifts at lower CCR step settings
- FAA Style 3—Low protrusion above ground of ≤0.25 inch reduces vibrations caused by aircraft landing gear in both the light fixture and the landing gear, increasing lamp life
- Can be installed on existing 6.6 A or 20 A series circuits with no modifications to existing CCR or isolation transformer
- Operates on either 3- or 5-step ferroresonant or thyristor CCRs that are designed in compliance with IEC or FAA requirements
- Very low power rating for LED lights contributes to a lower life cycle cost. Limits cost for supporting equipment, such as CCRs, to strict minimum.
- When quartz-incandescent fixtures are replaced with LED fixtures, airport staff can add more lights without increasing CCR size
- Smart electronics control current to LED, so light output matches existing incandescent fixtures.
- Smart electronics allow for a low cost and progressive evolution of the airfield lighting toward new LED-based technology.
- LED photometric peformance will be maintained longer due to a cleaner lens. Lower lens temperature prevents the “baking effect” that causes contaminants to stick to the lens surface.
- Rugged lightning protection complies with ANSI/IEEE C62.41-1991 Location Category C2 given in FAA Eng. Brief 67. Category C2 is defined as a 1.2/50µS – 8/20 µS combination wave, with a peak voltage of 10,000 V and a peak current of 5,000 A.
- Light channel in front of prism windows protects prisms from damage and prevents rubber buildup thereby maintaining optimal light output
- Includes a UL 467 rated ground lug, which accepts an AWG 6 earth ground wire
- Environment-friendly, precision-cast aluminum alloy cover, optical support, and inner cover assembly with stainless steel hardware

Operating Conditions

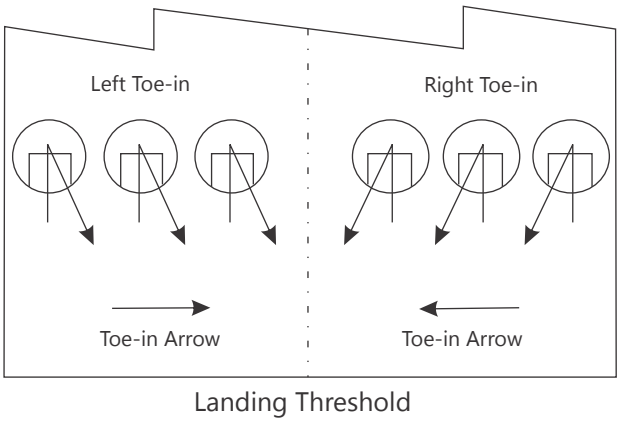
Temperature:	-40 °C to +55 °C (-40 °F to +131 °F)
Altitude:	Sea level to 10,000 feet (3000 m)
Relative Humidity:	Up to 100%

Electrical Supply

It is recommended that the L-850B(L) LED fixture be powered from a dedicated CCR and that separate remote controls are available. TDZL LED lights have been designed to work with any IEC- or FAA-compliant transformer up to 100 W without affecting the performance or lifetime of the light fixture or transformer. See data sheet 3033 for more details on recommended isolation transformers specified below.

L-850B(L)	Fixture Load	Isolation Transformer	Isol. XF Load	CCR Load
W/out heater	15 VA	20/25 W	6 VA	21 VA
W/out heater	15 VA	30/45 W	9 VA	24 VA
With heater	30 VA	30/45 W	6 VA	36 VA

Touchdown Zone Toe-in Coding



Packaging

In cardboard box:	7 × 13 × 13 in (17.8 × 33 × 33 cm)
Weight with packing:	16.5 lb (7.48 kg)
Weight without packing:	13.25 lb (6 kg)

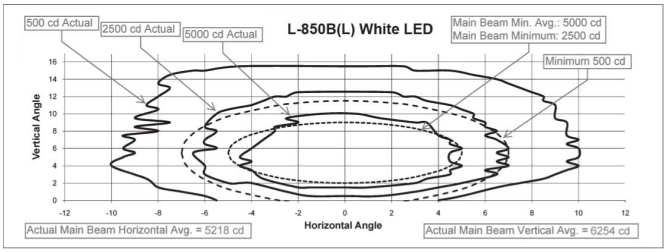
Dimensions: FAA / ICAO - Configuration 1

Outside diameter:	11.94 in (30.33 cm)
Bolt-circle diameter (L-868B):	11.25 in (28.58 cm)
Max. Bottom Cover O.D.:	6.25 in (15.88 cm)
Bottom Cover Depth:	3.88 in (9.9 cm)

Dimensions: ICAO - Configuration 2

Outside Diameter:	11.94 in (30.33 cm)
Bolt Circle Diameter (L-868B):	11.25 in (28.58 cm)
Max. Bottom Cover O.D.: - 9.94 in (25.20 cm) *down to depth of 1.63 in (4.14 cm)* - 8.69 in (25.20 cm) *from depth of 1.63 in (4.14 cm) to 3.88 in (9.86 cm)*	
Bottom Cover Depth:	3.88 in (9.9 cm)

FAA Photometric Data



4.0 Installation

Warning

Read the instructions in their entirety before starting installation.

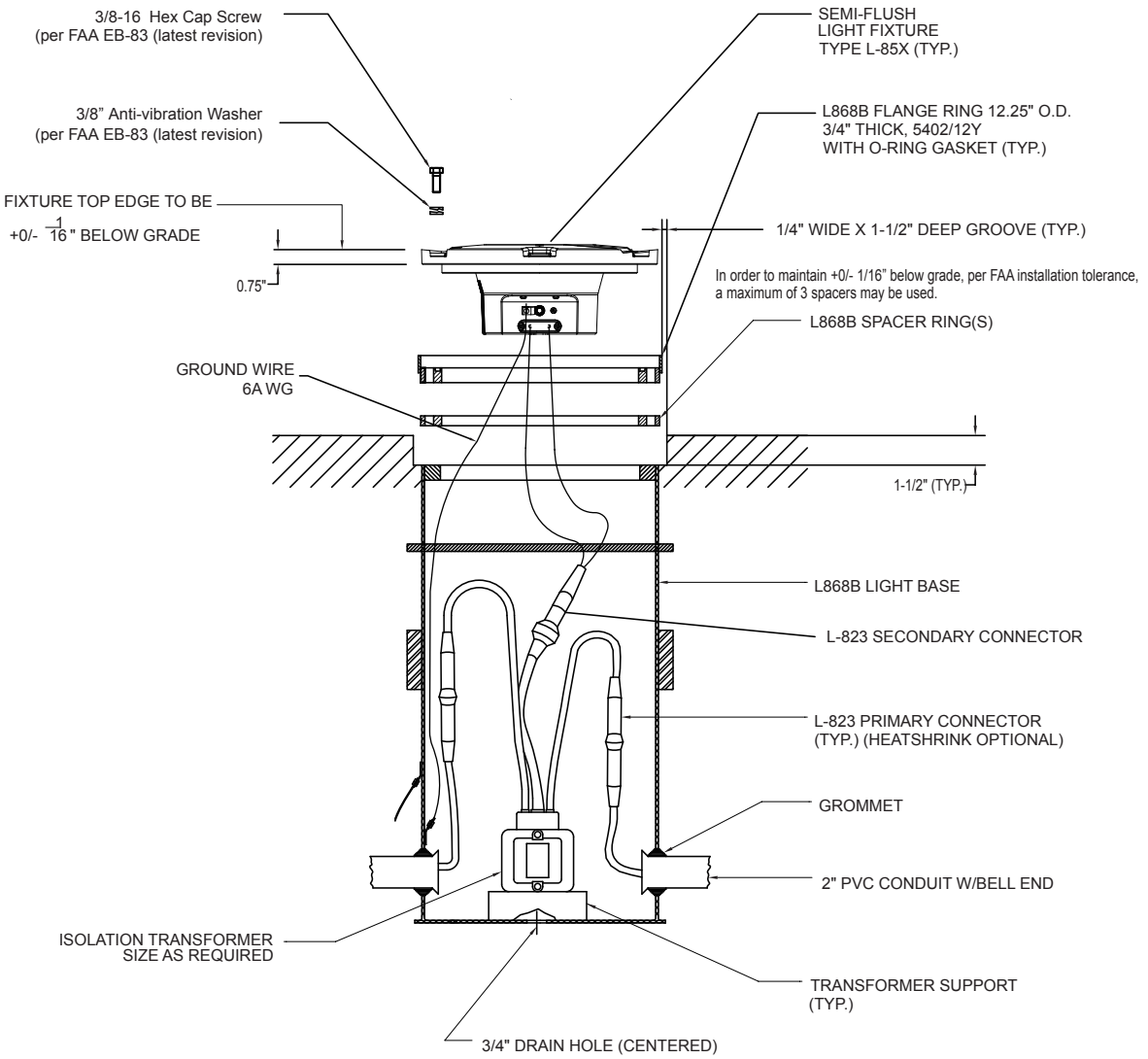
This section provides installation instructions for the L-850A and the L-850 B, LED Style 3 light fixtures.

4.1 Overview of Sequence of Work

- Electrical contractor locates new light bases and interconnecting conduit trench, and excavates for light base bottom section by saw cutting or core drilling. Electrical contractor prepares subgrade and stone subbase, sets bottom section with rebar, rigid steel conduit stubs, drain, and pours high early strength concrete-encasement excavation. Electrical contractor shall record can locations and elevations of mud plate after concrete-encasement.
- Electrical contractor excavates conduit trench, installs rigid steel and fittings, backfills conduit trench with high early strength concrete.
- General contractor prepares and installs concrete pavement. Electrical contractor makes a pilot core to find mud plate center point indent before final core-drilling.
- Electrical contractor core-drills concrete pavement. Electrical contractor installs top section, y-flange ring, space and lighting fixture, and pours epoxy joint sealer. Provide space for adjustment with spacers, maximum number of spacers shall be 3.
- See specific details as shown in FAA AC 150/5340-30 (current edition).

4.2 Typical L-868 Assembly

Figure 1: Diagram of the Fixture Installed in a 1-Piece Base Can



1. Torque according to: FAA EB-83 (latest revision).

Figure 2: Anti-vibration washer example

CAUTION

Per FAA AC 150/5340-30, Chapter 10, and FAA Engineering Brief No 83 (latest revision), it is extremely important that other types of washers, such as split washers, must not be used. Failure to use properly installed anti-vibration lock washers will cause mounting bolts to become loose. The cams (or steps) of each half of the lock washer must face each other.

4.3 Safety Considerations

Read the installation section of all system component manuals before starting these steps. A thorough understanding of system components and their requirements will promote safe and efficient installation. See FAA AC 150/5340-30, Design and Installation Details for Airport Visual Aids, and site plans and specifications for field installation of runway and taxiway in-pavement lights.

CAUTION

Failure to follow these safety procedures can result in personal injury or death.

- Allow only qualified personnel to install ADB SAFEGATE and auxiliary equipment. Use only approved equipment. Using unapproved equipment in an approved system may void FAA approvals. Observe and follow the safety instructions in this document and all other related documentation.
- Make sure all equipment is rated and approved for the environment where it is being used.
- Follow all instructions for installing components and accessories.
- Install all electrical connections in compliance with local and national codes and regulations.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local and national codes.
- Route electrical wiring along a protected path. Make sure it will not be damaged by moving equipment.
- Protect components from damage, wear and harsh environmental conditions.
- Allow ample clearance for maintenance, panel accessibility and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, reinstall them immediately after the work is completed and check them for proper functioning.
- The cord set must be protected prior to installation.

4.4 Photobiological safety

CAUTION

Photobiological safety conforming with IEC 62471

RISK GROUP 0 or 1: Optical radiation emitted from LED lights may be harmful to the eyes. Do not stare with at the light source with bare eyes at a fixture operating at high intensity. Use protection goggles or similar protection method.

Goggles with a transmission factor not higher than 5% in the 400-530 nm band have been tested and provide adequate protection.

4.5 Verify Input Requirements and Equipment Needed

The In-pavement light fixture is designed for connection to a 6.6A or 20A series lighting circuit via an L-830 (60 Hz) or L-831 (50 Hz) isolation transformer.

Make sure you have the necessary tools and materials ready for installation (not supplied). Also consider other tools that might be needed based on site-specific conditions.

Table 1: Suggested Tools and Materials for Installation and Repair

Qty.	Description	Qty.	Description
1	Torque wrench	1	Set of screwdrivers, one with 3/8" (9.525mm) minimum blade width
1	Alignment jig		
1	Diamond-faced core drill	As needed	Silicone grease
1	Diamond-faced saw, 3/8" (9.525mm) thick	As needed	Joint sealing filler
1	Crimping tool	1	Pressure test fitting assembly
1	Small water suction pump	As needed	Dow Corning Molykote® 3452 or equal (P/N 67A0095) - used on top cover prism seal
2	Eyebolts, 3/8 inch (9.525mm) diameter		
1	Lifting rod, 16 inches (406mm) long	As needed	Novagard® Silicone Versilube® G322L™ (P/N 67A0009) - used on O-ring between top cover and inner pan assembly; also may be applied to four nipples of inner pan assembly to install optical assembly
1 or 2	L-830 / L-831 isolation transformer		
1	Set of fiber brushes		
1	Set of socket wrenches, 1/2" (12.7mm) drive		

4.6 Unpack the unit

To reduce the possibility of damaging the light assembly, unpack the RELIANCE light fixtures at the installation site. If damage to any equipment is noted, file a claim form with the carrier immediately.

When receiving the light fixture, open the box and verify that the characteristics of the light fixture correspond to the design requirements, such as type, color etc. When installing an IQ0 light fixture where the function is to be activated at a later stage, make sure to register product information, such as PID/SN and position of the light fixture in, for example, a site documentation table. The information is required for remote activation and administration of IQ functionality from a substation.

4.7 Inspect on delivery

1. Inspect all packings for visible damage.
2. Open every damaged box and inspect the contents for damage.
3. Immediately fill a claim form with the carrier if any fixture is damaged.
4. Store the fixture in its original packing in a protected area.

Note
If damage to any equipment is noted, file a claim form with the carrier immediately.

Warning
Do not damage the cable insulation.

CAUTION
Do not unpack the fixture before it is at the installation site to avoid damage due to transportation and handling.

4.8 Store

Store the fixture in its original packing in a protected area. Indoor storage:

- Storage temperature: 14°F to 122°F (-10°C to +50°C).
- Humidity: <95% non condensing.

For long storage periods (longer than one year), we recommend to energize the LED lights once a year at nominal intensity (6.6 Amps) for 20 minutes.

4.9 Coding

Review the coding details for the appropriate FAA type of fixture before installation.

4.9.1 L-850A Coding

Refer to FAA AC 150/5340-30 for the location of white-white and white-red fixtures on the runway centerline. White-red fixtures have a red dot label affixed to the top of the fixture on the lens which has a red light.

The triangular arrowhead on the top of the L-850A cover designates the location of the index pin in the lower cover. The arrowhead pointer does NOT indicate any geographic orientation or placement.

4.9.2 L-850B Toe-In Location and Coding

Each L-850B light fixture is shipped with a factory-attached label indicating toe direction and location of the runway centerline (see Figure 3). Position the in-pavement light fixtures on either side of the runway so that the arrow on the sticker points to the runway centerline. The L-850B light beam must be 4 degrees toward the runway center per FAA AC 150 / 5340-30.

Figure 3: Installation of L-850B Fixture to Runway Centerline

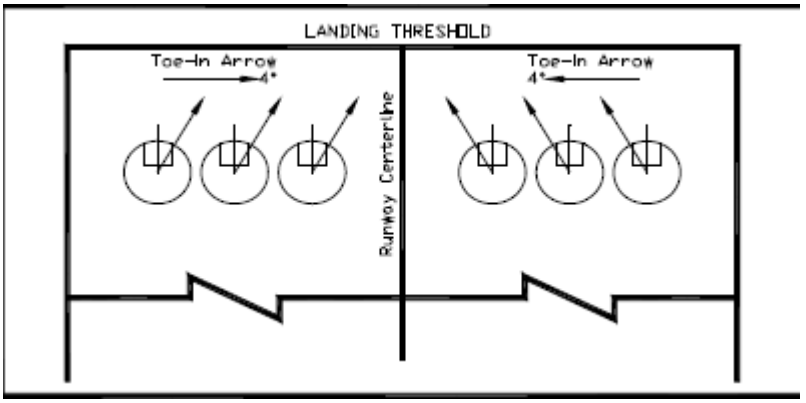


Table 2: L-850B Toe-In Labels

Label	Description
C -►	Toe-in **right** with the in-pavement light installed to the left of the centerline.
◄-C	Toe-in **left** with the in-pavement light installed to the right of the centerline.
No label	No toe-in (used if base can installed so that it is toed 4° toward the runway centerline).

Note

The triangular arrowhead on the top of the L-850B cover designates the location of the index pin in the inner cover. The arrowhead does NOT indicate direction or toe.

4.10 Installation on L-868 Base

The light assembly is shipped complete, and is ready for installation.

To install the fixture on an L-868 base, see FAA AC 150/5345-30 and the project site-specific plans and specifications for details on L-868 base installation.

Note

Mounting bolts are not supplied with the fixture. Mounting bolts and anti-rotation lock washers are normally supplied with the base can spacer or flange ring. If a flange ring is used, the bolt length is 1-1/4 inch (32mm) plus the thickness of the flange ring.

Also read the following guidelines:

1. Clean the base receptacle. Make sure the base receptacle is completely clean and dry. The mating surfaces must be clean and free of foreign particles.
2. If, present, fit an appropriate lifting tool into the two threaded holes, which are located 180° apart in the cover.

The lifting tool can be made from two 1/2 x 13 eyebolts (1-inch ID) and a 1/2-inch diameter, 16-inch (406mm) long rod or pipe inserted through the eyebolts.

CAUTION

Never hold the light fixture by the wires. Doing so may damage the insulation, break the waterproof seal and cause insulation faults and water leakage.

3. Carry the light assembly to the base.
4. Place the light assembly next to the opening in the L-868 base so that the L-823 connector can be connected with the mating receptacle from the L-830 or L-831 isolation transformer in the base. Make sure that the connection is solid and secure. Refer to the Electrical Supply section of the User manual for required isolation transformers.
5. Make sure items such as spacers, shims and gaskets are installed on the light base as indicated on site plans, specifications and drawings.
6. Position the light assembly over the L-868 base and set it onto the base. Align the light according to FAA AC 150/5345-30 and project plans and specifications. Remove the eyebolts and lifting rod.

CAUTION

Ensure that the cord set wires are NOT pinched between the base can and the fixture. Pinched wires can cause water to be drawn inside the fixture.

7. If present, lubricate the labyrinth gasket with water. soap may be added to the water (8" only).

CAUTION

Do not use silcon or any other type of grease. Avoid the use of soap that contains silicon or glycerin.

8. Attach the six fixing bolts and anti-vibration washers. [See FAA EB-83 (latest revision)]

CAUTION

Due to the risk of bolts vibrating loose, do not use any type of washer with the fixing bolts (such as split lock washers) other than an anti-vibration washer. Anti-vibration washers as defined in FAA EB-83 (latest revision).

9. Turn on the power to determine whether the LED fixture will illuminate. Operate for a minimum of five minutes.

4.11 Torquing and Installation Guidance for In-pavement Fixtures

In-pavement fixtures must be installed according to the plans and specifications; the applicable regulatory guidance; and the following guidance. The importance of using the proper fixture clamping components and bolt torque to minimize the risk for fixture failure or loosening of clamping components cannot be overemphasized. Refer to FAA Engineering Brief No 83 (latest revision) for torque and installation guidelines for this fixture.

Also see our Product Center at www.adbsafegate.com.

CAUTION

Read installation instructions in their entirety before starting installation.

- Failure to follow the installation guidance could result in bolt loosening or bolts breaking off, resulting in catastrophic failure of the fixture and/or the mounting system components.
- Failure to follow these warnings may result in serious injury or equipment damage.

4.12 Shallow base can installation

Shallow base cans may be non-load bearing or load bearing depending on location or fixture application. Following are specific requirements to insure that an either an elevated or an in-pavement fixture is properly installed.

CAUTION

Read installation instructions in their entirety before starting installation.

Fasteners:

- Make sure the power is OFF when you install or remove any fixture.
- Only use fasteners of the same type as the one originally supplied with the mounting support. See Base O-ring and Bolt Selection.
- Always tighten the fasteners to the recommended torque. Use a calibrated torque wrench and apply the recommended adhesive type.
- If this is not the case, this may cause the fasteners to loosen, damage the fixture, potentially to loosen the fixture. This can lead to a highly dangerous situation of FOD, with potential lethal consequences.
- Obey the instructions of the adhesives necessary for the fasteners.
- Only install the fixture on mounting supports:
  - That ADB Safegate has approved;
  - That are installed according to the Instruction Manual of the mounting support.
- Failure to do so can result in a highly dangerous situation of FOD, with potential lethal consequences.

Failure to follow these warnings may result in serious injury or equipment damage.

CAUTION

Proper Operation:

- The fixture is supplied from a 6.6 A series circuit;
- The series circuit is powered by a Constant Current Regulator that complies with IEC 61822;
- The transformer is an AGL series transformer that complies with IEC 61823.
- The power of the series transformer shall not exceed 200 W, for versions with the monitoring option.
- The mounting support is correctly earthed. Failure to do so will void the warranty for all damages that occur as a result of voltage surges.
- Never hold the fixture by the cable leads. This can damage the insulation, break the waterproof seal and cause insulation faults and water leakage.

Note

See the Instruction Manual of the mounting support for instructions on how to earth the mounting support.

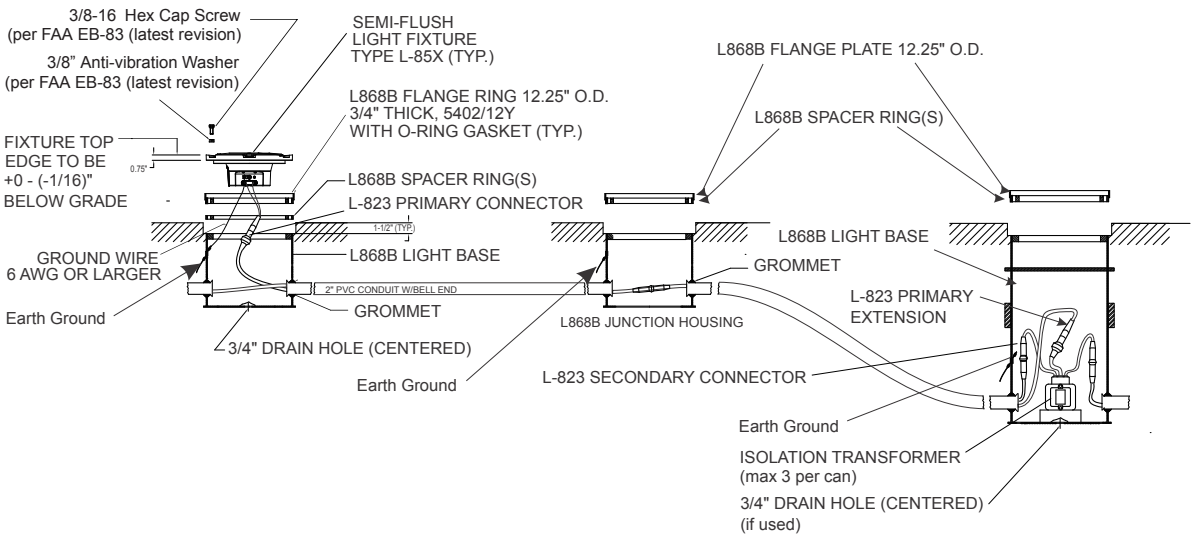
4.12.1 Installation on a Shallow Base

Installing the light fixture on a shallow base involves preparing the pavement recess and wireways, then installing the light fixture on a shallow base.

See FAA AC 150/5345-30 and the project site-specific plans and specifications for details on shallow base installation.

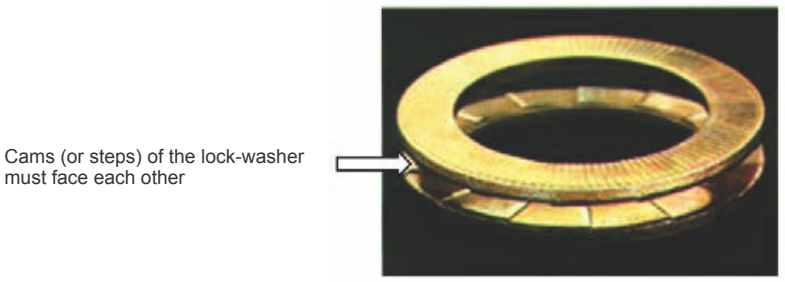
Also follow the applicable instructions in the previous section, when connecting, installing and powering the fixture.

Figure 4: Example of a Shallow Base Installation



1. Torque according to: FAA EB-83 (latest revision).

Figure 5: Anti-vibration washer example



CAUTION

Per FAA AC 150/5340-30, Chapter 10, and FAA Engineering Brief No 83 (latest revision), it is extremely important that other types of washers, such as split washers, must not be used. Failure to use properly installed anti-vibration lock washers will cause mounting bolts to become loose. The cams (or steps) of each half of the lock washer must face each other.

5.0 Maintenance

Warning
Read the instructions in their entirety before starting installation.

5.1 Maintenance Safety

DANGER

Electric Shock Hazard
This equipment may contain electrostatic devices

- Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.
- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Failure to follow these instructions can result in death or equipment damage

5.2 IRCL TDZL Maintenance Schedule

Table 3: Maintenance Schedule

Weekly	Check for dirty channel and lens.	Clean channel and prism. Refer to *Cleaning Light Channel and Prism* in this section.
Monthly (or more frequently during rainy seasons)	Check for moisture in the light fixture.	Open up the light fixture. Clean, dry, and inspect the light assembly. Replace O-ring.
Every 60 days, or whenever the light assembly is serviced	Check for improper torque on hold down bolts.	Torque six bolts holding fixture to base receptacle. Use Loctite to keep bolts tight. Refer to *Re-torquing Mounting Bolts* .
Semiannually	Check for six inches (152 mm) of water in the L-868 base.	If consistent with local airport practice, pump water from base. Remove and inspect light for water damage. Refer to *Removing Water from a L-868 Base*.
After snow removal	Check for damaged light fixtures.	Replace damaged fixtures. Use a power broom for snow removal, if practical.

5.3 Cleaning the Light Channel and Prism

To clean the light channel and prism, perform the following procedure:

1. Use a suitable fiber brush to remove all accumulated debris from the light channel (4).
2. Clean the outer surface of the prism (3) using liquid glass cleaner. If the prism is coated with a substance impervious to the cleaner, apply a suitable solvent sparingly with a wad of cotton or a patch of cloth. After the solvent has acted, remove the softened coating with a clean piece of cotton or cloth. Dry the prism gently with dry, oil-free compressed air at a pressure no greater than 10 psi (69 kN•m2) to evaporate or remove all remaining cleaner.

5.4 Removing L-868 Base Water

Warning
Turn off the circuit when checking the water level.

If consistent with airport practice, check the water level in the L-868 base on a regular schedule. If more than six inches (150 mm) of water in the light base is found, pump the water from the base and remove and inspect the entire light assembly for water damage. Cover the L-868 base with the appropriate steel cover plate after removing the light assembly.

Note
Water entering the L-868 base can become a serious problem, since freezing water can rupture the base.

5.5 Lifting Optical Unit Out of Base

To lift the optical unit from the light base, perform the following procedure:

1. Remove the six fixing screws and washers or self locking nuts.
2. Fit the appropriate lifting tool into both threaded holes located (180 degrees apart) in the cover, lift the optical unit out of the base and place the optical unit next to the base.
3. Disconnect the light fixture wires from the power wires coming from the transformer(s).
4. Mount a serviced or new light fixture as described in Installation on L-868 Base in the Installation section.
5. Take the in-pavement fixture unit back to the maintenance base where it can be serviced entirely.

Note
Never hold the light fixture by the wires. This may damage the insulation, break the waterproof seal, and cause insulation faults and water leakage.

5.6 Repair Procedures

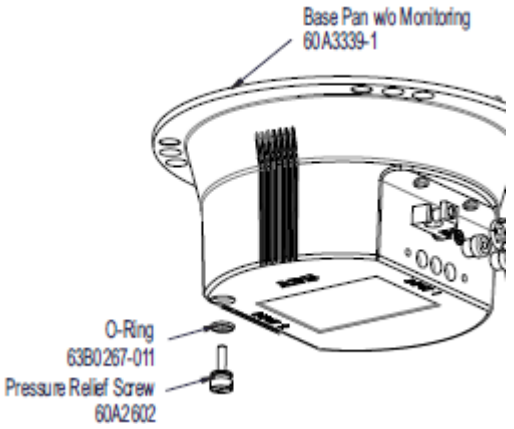
5.6.1 Opening the Optical Unit

To open the optical unit, perform the following procedure:

1. Turn the light unit upside-down.
2. See Figure 6 . Remove the pressure release screw.

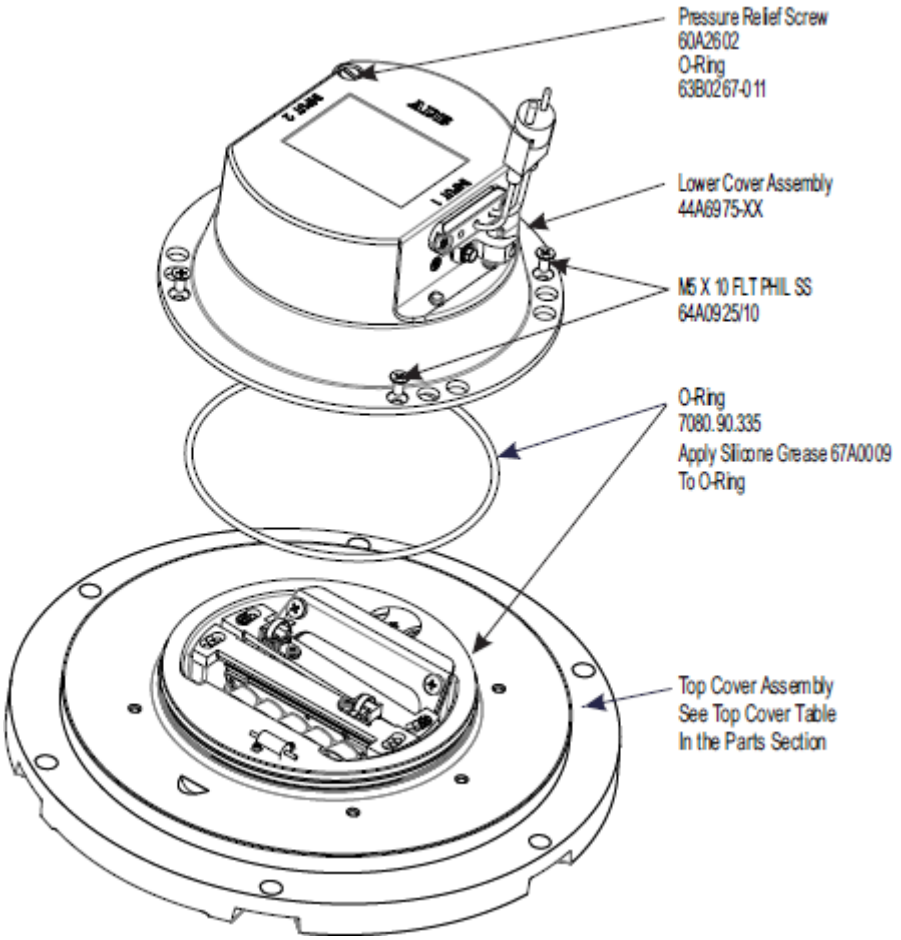
Note
Removing the pressure release screw equalizes the pressure inside and outside the fixture, making it easier to break the seal and remove the inner cover.

Figure 6: Pressure Release Screw



3. Remove the 6 screws. The use of an impact driver may be required to unlock the screws.
4. Insert small or medium flat blade screwdriver in the machined recess slot between cover and inner cover and turn the screwdriver vertically to separate the inner cover from the cover.

Figure 7: Separating Inner Cover from Top Cover

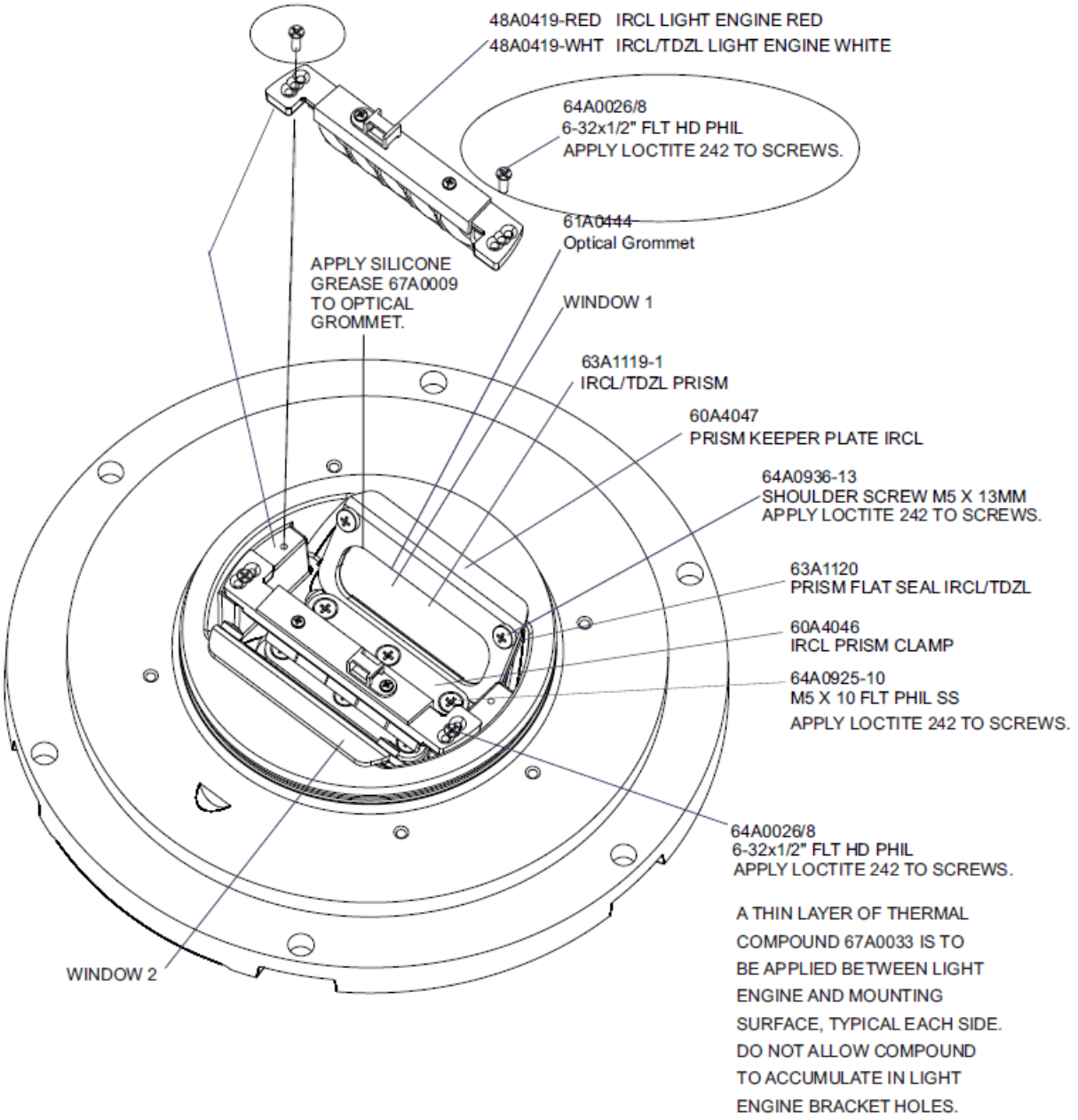


5.6.2 Removing the LED Assembly

To replace the optical unit, perform the following procedure:

1. Remove the LED Assembly by loosening screws circled below.

Figure 8: Removing LED Assembly from Light Assembly



2. Position the new optical unit with new grommet.
3. Torque the fixing screws to 3.5 ± 0.5 N•m (31 ± 4 inch-pounds).

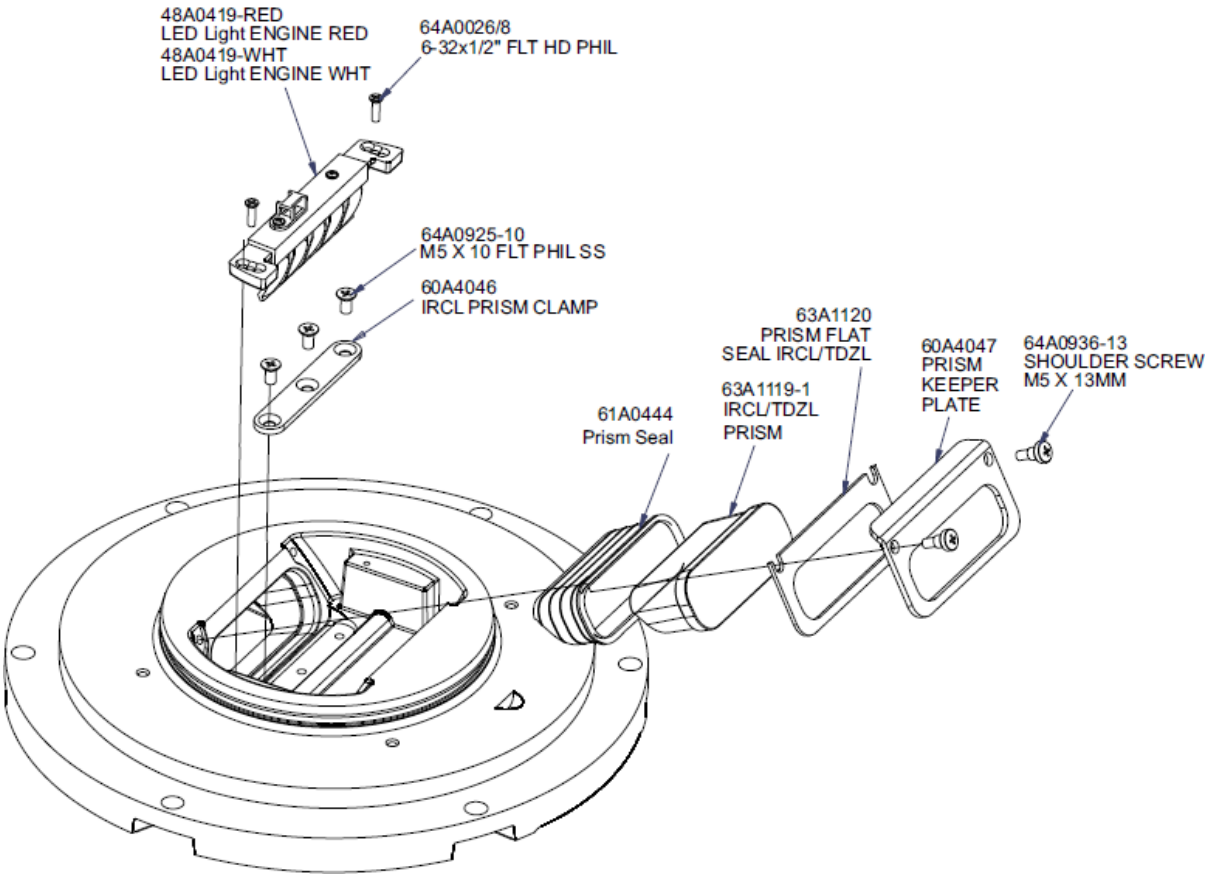
5.6.3 Replacing Prism

Replace the prism if it is broken or its surface is badly pitted or scarred.

To replace the prism, perform the following procedure:

1. Remove the prism-clamp and prism-keeper plate secured in the inner pan assembly.

Figure 9: Replacing Prism



2. See Figure 9 . Remove the flat seal.
3. Push the prism with the sock seal towards the inside of the cover.
4. Clean and degrease the prism chamber with any effective solvent.

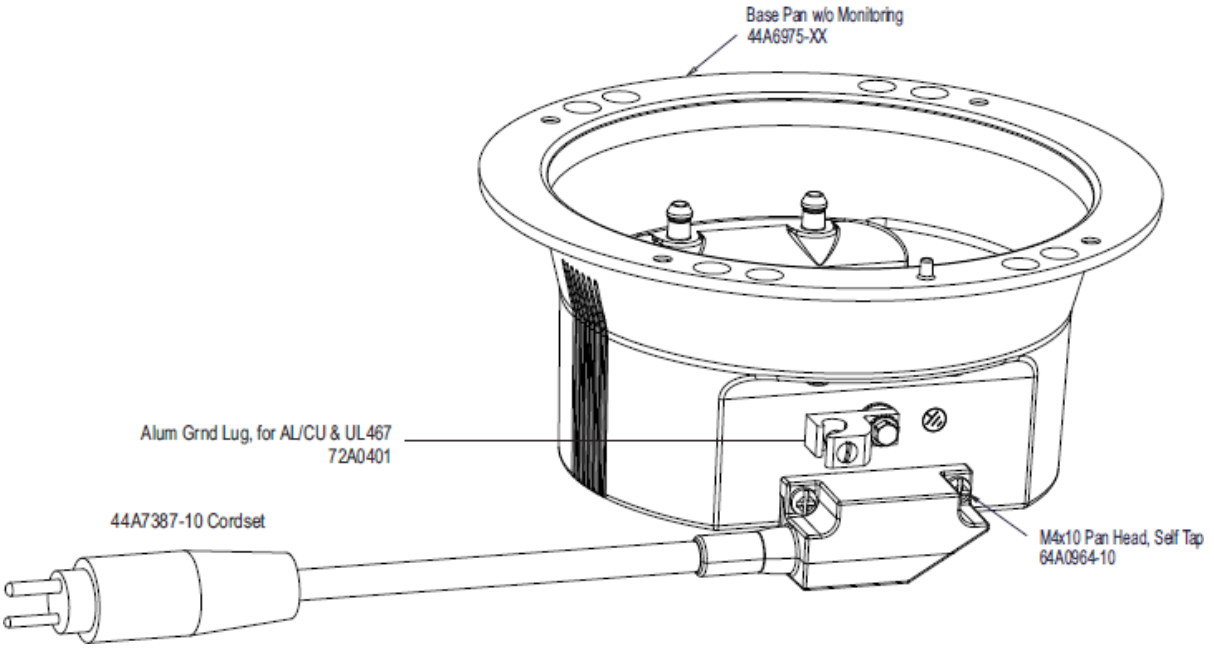
Note

Never use any abrasive substance. This will scratch or frost the prism.

5. Apply a thin layer of lubricant MOLYKOTE 3452 INERTA in the prism chamber using a small brush.
6. Install a new sock seal over the prism.
7. Push the prism/gasket assembly in the prism pocket from the inside and clean the inner surface of the prism.
8. Install a new flat seal over the prism-keeper plate.
9. See Figure 9 . Reinstall hardware with the Phillips pan head screws. Apply a droplet of sealant Loctite 270 to the last threads. Torque to 3.5 ± 0.5 N•m (31 ± 4 inch-pounds).

5.6.4 Replacing the Cord Set

Figure 10: Small Inner Pan Assembly

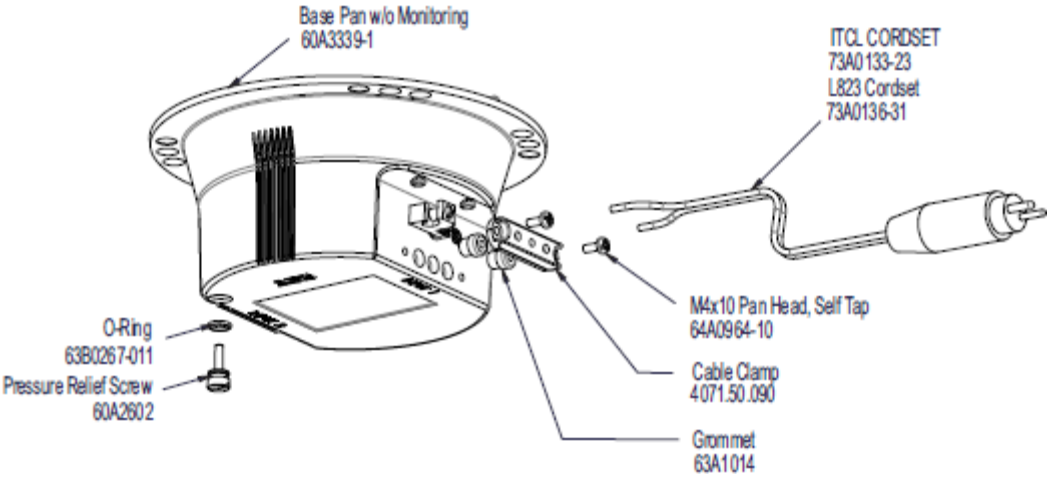


To replace the Over-mold Style 1 Cord Set:

1. Open the optical unit and remove the bottom cover.
2. Unplug the fast-on terminals from the terminal block.
3. Remove both Phillips pan head screws.
4. Cut the fast-on terminals from the cord set.
5. Pull the cord set out of the inner pan assembly.
6. Bring the new ADB Airfield Solutions over-mold cord set through the bottom pan (one wire per hole).
7. Pull the wires into the bottom pan assembly.
8. Install both Phillips pan head screws.
9. Remove about 0.2 inch (5mm) of insulation from the wires.

10. Crimp on the fast-on terminals and connect to the terminal block.

Figure 11: Pre 2014 - Small Deep Inner Pan Assembly



To replace the L-823 cord set:

11. Open the optical unit and remove the bottom cover.
12. Unplug the fast-on terminals from the terminal block.
13. Remove both Phillips countersunk screws and the cable clamp.
14. Cut the fast-on terminals from the L-823 cord set.
15. Pull the L-823 cord set out of the inner pan assembly.
16. Bring the new ADB Airfield Solutions L-823 cord set through the cable clamp (one wire per hole).
17. Put a new grommet on each of the wires. Make sure the wire grommet is facing the correct direction.
18. Pull the wires into the pan assembly.
19. Reinstall the wire clamp by means of both Phillips countersunk screws.
20. Remove about 0.2 inch (5mm) of insulation from the wires.
21. Crimp on the fast-on terminals and connect to the terminal block.

5.6.5 Wiring Diagrams

Figure 12: Two Heater, One Thermostat

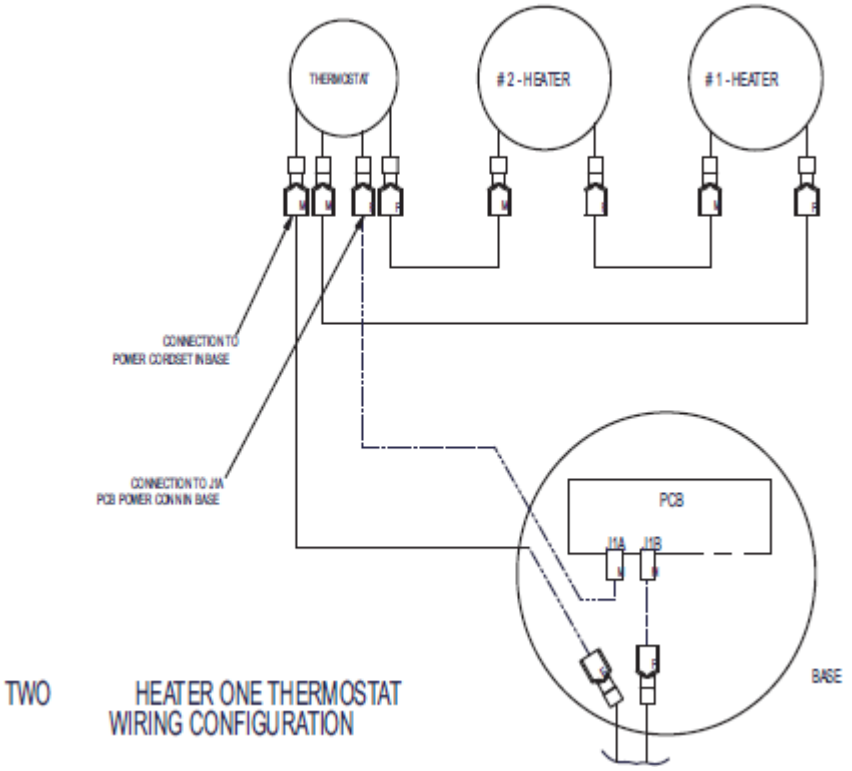
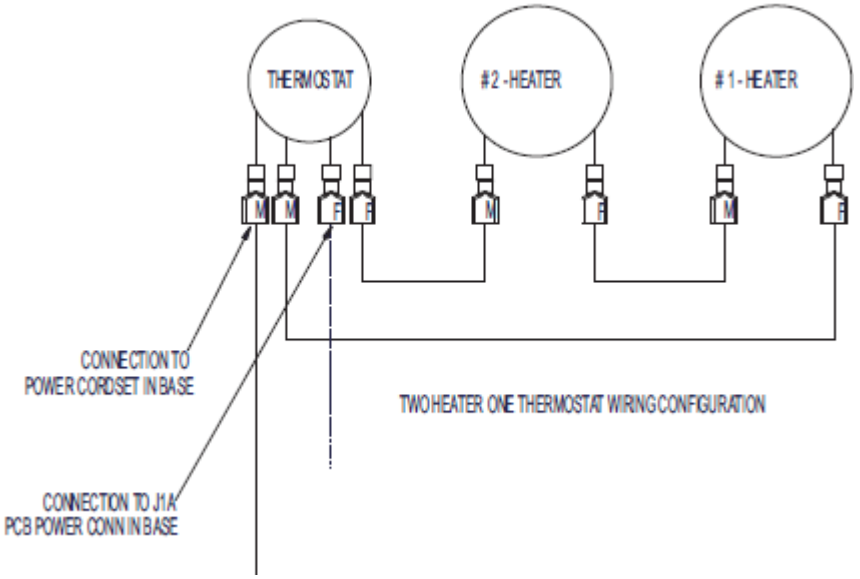
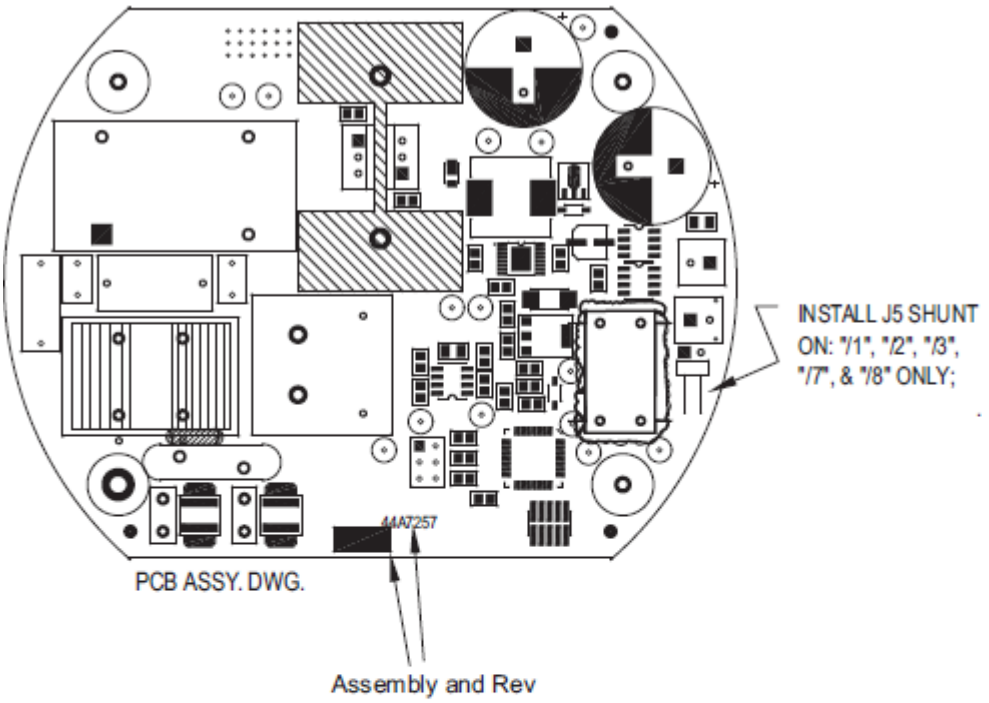


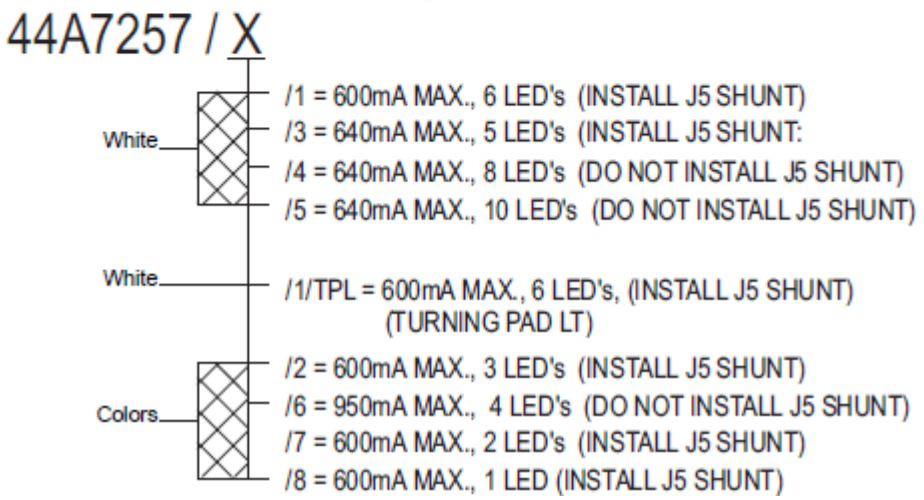
Figure 13: One Heater One Thermostat Wiring Configuration



5.6.6 PCB Configurations

Figure 14: LED PCB 44A7257/X shunt information





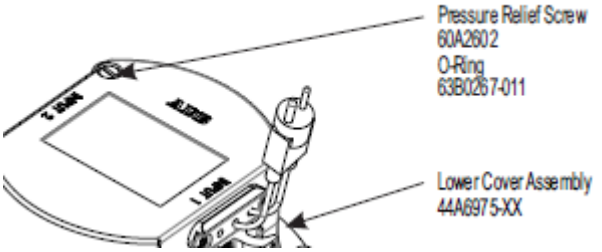
5.6.7 Closing the Optical Unit

To close the optical unit, perform the following procedure:

1. Turn the top cover upside down.
2. Make sure that the contact surfaces with the O-ring are clean and apply a light coat of high quality neutral silicone grease.
3. Install a new greased O-ring in the groove located in the top cover.

Note
Use a synthetic grease such as MOLYKOTE 3452.

4. Remove the pressure release screw.



5. Install the inner cover on top of the cover.

> **Note**
> Align the inner pan mounting holes on the top cover holes.

6. Make sure the LED assembly is correctly positioned and that the wires do not get damaged between both parts (top cover and inner cover).
7. Press the inner cover of the inner pan assembly on the top cover and secure with the countersunk screws. Apply a droplet of Loctite 222 to the last threads. Torque screws to 22 ±4 inch-pounds (2.5 ±0.5 N•m).
8. Check the watertightness of the assembly by replacing the pressure release screw with a pressure test fixture. The leak path can then be located by submerging the assembly in a tank of water while pressurizing using shop air pressure to a maximum of 20 psi. Refer to Testing for Leaks.
9. Make sure the O-ring seal for the pressure release screw is in good condition and reinstall the pressure release screw.

5.6.8 Testing for Leaks

To test for leaks, perform the following procedure:

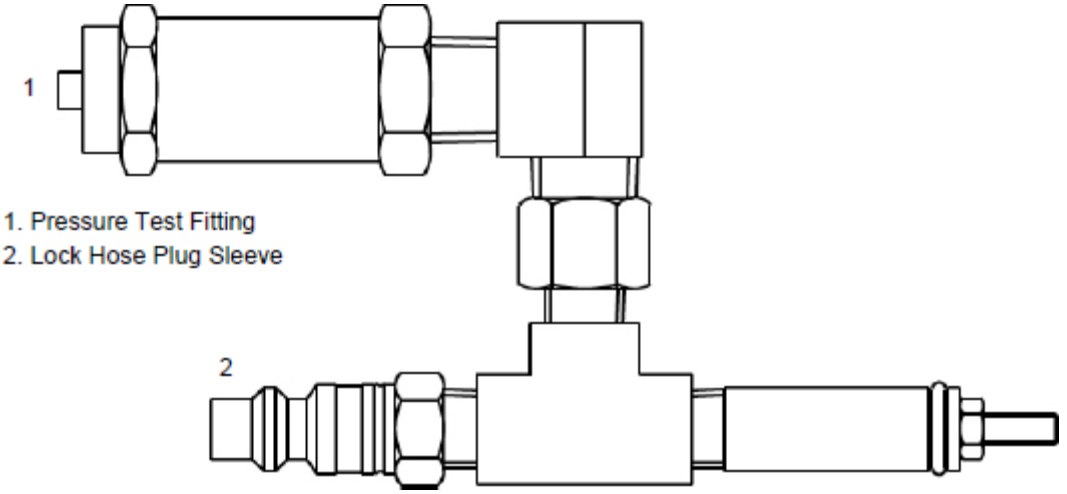
1. See Figure 15.

   Remove pressure relief screw.
2. See Figure 16.

   Screw pressure test fitting into the pressure relief port (the opening created when the pressure relief screw is removed). Screw fitting hand-tight.

Figure 15: Pressure Relief Screw

Figure 16: Pressure Test Fitting Assembly



3. Attach the shop airline to the lock hose plug sleeve (2).
4. Pressurize to 20 psi.
5. Submerge the pressure test fitting in a water tank.
   Check for air bubbles. Air bubbles indicate a leak.
6. Locate the leak source, depressurize, replace the seal that is leaking, reassemble, and retest by following steps 4 and 5.
   If leak is fixed, depressurize and reinstall the pressure release screw (1).

Go to Overview of Sequence of Work to finish.

5.7 Material Handling Precautions: Fasteners

DANGER

Foreign Object Damage - FOD
This equipment may contain fasteners that may come loose - torque properly.

- Only use fasteners of the same type as the one originally supplied with the equipment.
- Use of incorrect combination of gaskets, bolts and nuts can create severe damages to the product installation and create safety risk .
- You need to know what base the light fixture will be installed in, in order to chose the correct gasket, bolts and nuts.
- Bolt type, length, and torque value are determined by type of base, height of spacers used, and clamp force required in FAA Engineering Brief No 83 (latest revision).
- Due to the risk of bolts vibrating loose, do not use any type of washer with the fixing bolts (such as split lock washers) other than an anti-vibration washer. Anti-vibration washers as defined in FAA EB 83 (latest edition) must be used. For installations other than FAA, use the base can manufacturer's recommendations.
- Always tighten the fasteners to the recommended torque. Use a calibrated torque wrench and apply the recommended adhesive type.
- Obey the instructions of the adhesives necessary for the fasteners.

Failure to follow these warnings may cause the fasteners to loosen, damage the equipment, potentially to loosen the equipment. This can lead to a highly dangerous situation of FOD, with potential lethal consequences.

Note

To minimize the risk of errors, the ADB SAFEGATE Sales Representative will have information on which gasket goes with which base. This information is also provided in the product Data sheets, the User Manuals and the Spare Part Lists.

CAUTION

Use of incorrect combination of gaskets, bolts and nuts can create severe damages to the product installation and create multiple safety risks.

To obtain a safe and watertight installation the O-ring and retaining bolt stated in the document must be used.

You need to know what base the light fixture will be installed in, in order to choose the correct gasket, bolts and nuts.

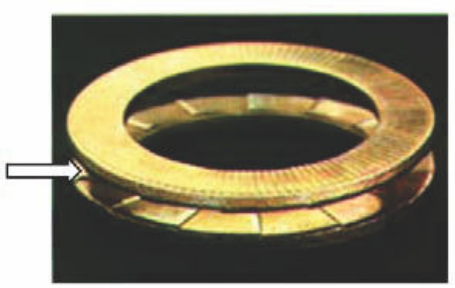
Failure to follow these cautions can result in equipment damage or aircraft FOD.

5.8 Bolt Torque Preventive Maintenance Schedule

An established schedule for checking light fixture bolt torque and bolt condition is mandatory. This is particularly true for areas that are subject to high impact loads from aircraft such as runway status lights, runway touchdown zone lights, runway centerline lights, and taxiway lead-off lights. Although AC 150/5340-26 offers a recommended schedule for periodic checks, these checks should be tailored to the facility based on local conditions such as environmental issues and runway traffic load.

1. Torque according to: FAA Engineering Brief No 83 (latest revision).

Figure 17: Anti-vibration washer example



CAUTION

Per FAA AC 150/5340-30, Chapter 10, and FAA Engineering Brief No 83 (latest revision), it is extremely important that other types of washers, such as split washers, must not be used. Failure to use properly installed anti-vibration lock washers will cause mounting bolts to become loose. The cams (or steps) of each half of the lock washer must face each other.

FAA Cert Alert No. 14-03 refers to AC 150/5340-26 for the frequency of checking bolt torque. AC 150/5340-26 (latest revision) paragraph 5.3.4.1.4, *Bi-Monthly Checks* states: "*The torque of the bolts attaching the light fixture to its base should be checked with a calibrated torque wrench – never use an impact wrench.*"

Regular inspection as outlined in FAA Engineering Brief 83 (latest edition), Canada Civil Aviation Safety Alert Document CASA 2014-05, and any other applicable regulatory guidelines is critical in insuring torque on all bolts is restored to optimum values. Bolts that loosen more often should be inspected and re-torqued on a more frequent basis.

It is especially important to maintain a regular inspection schedule for LED fixtures. Since LED fixtures operate more reliably and are not subject to removal/replacement/re-torque as frequently as would be seen with incandescent fixtures, it is even more important to implement regular torque inspections.

It is critical that remedial action be taken if bolts are found to be loose or missing during inspection. If this occurs, it is important to carefully inspect all structural elements of the mounting system as defined in Installation. Also inspect the base can for general structural conditions such as:

- Is the base can solidly mounted in the pavement, and not moving or rocking during rollovers?
- If a base can extension is present, are all extension attachment bolts tight?

If poor base can structure or mounting system components are not in accordance with regulatory requirements or are in poor condition, it is the airport's responsibility to:

- Increase the frequency of bolt torque inspection to insure that no bolts become loose or missing.
- Quickly replace/repair the mounting system components, which may include replacing the entire base can.

Airport operators must also ensure these maintenance activities are properly documented.

Digital Asset Tracking and Service Application Information

ALIS is ADB SAFEGATE's new digital asset tracking, inspection and service solution, helps airports easily register airside assets, electronically schedule and track maintenance, and record maintenance and inspection tasks in compliance with ICAO and FAA standards.

Easy to implement and use, cloud-based software enables a more reliable and fail-safe approach to asset tracking and maintenance by always using live field data and eliminating inefficiencies caused by human error. Every asset is registered using GPS data and its status recorded, so airport maintenance teams get a clearer view of maintenance schedules and history, allowing them to manage resources more effectively as well as improve the safety and longevity of airside assets. This increased visibility helps airports plan and schedule preventive maintenance, or undertake corrective maintenance more quickly, to reduce downtime and significantly improve operational availability.

https://adbsafegate.com/product-center/airfield/airside-services/ALIS-airside-maintenance

- Easily integrates electronic torque measurements and photometric measurement reports to provide a complete view of the asset's status.
- ALIS can be integrated with the AirTorque or Ingersoll Rand® QX series wrenches, which are used for accurate, ergonomic torque inspections of AGL fixtures. The applied torque can seamlessly be registered in the ALIS system as a part of the maintenance record.
- The iPhone application of ALIS – ALIS Personal – makes it easier than ever to register maintenance actions while working. It will proactively show you which assets you still need to work on and select the closest one to you automatically. ALIS Personal acts as a feedback and information device for the associated torque wrench.

6.0 Troubleshooting

Table 4: Troubleshooting Guide

Problem	Possible Cause	Corrective Action
LEDs not energizing	Loose or broken contacts	Tighten or replace, then verify that the fixture is sealed
	Moisture inside assembly causing current leakage	Open the light assembly. Clean, dry and inspect the assembly. Replace the O-ring and verify the fixture is sealed.
	Fixture wires pinched between base can and fixture	If both wires are pinched between the fixture and the base can, the isolation transformer is shorted and the LED will not energize. Replace fixture leads. Refer to Replacing the Cord Set • Use care when remounting fixture on the base can to ensure that the wires do not get pinched.
	Defective isolation transformer	Check transformer output current with a true RMS meter using a clamp-on current probe. This can be done by placing a short across the transformer secondary and verifying that proper secondary current is present. • For 6.6A/6.6A transformers, the primary and secondary currents should match. • For 20A/6.6A transformers, the secondary current should be one-third of the primary current. If the secondary current is too low or zero, replace the isolation transformer.
	Defective remote control device	Consult the remote control device's instruction manual.
	Defective LED light engine or PCB	Replace with a known good LED light engine.
		Replace with a known good PCB.
LEDs not turning on at normal level	Continuity incorrect	Verify that there is low resistance between the fixture L-823 connector pins. Compare with resistance measured on a known good fixture. Replace lamp or internal wiring.
	Isolation transformer secondary current incorrect	Check transformer current with a true RMS meter using a clamp-on current probe. This can be done by placing a short across the transformer secondary and verifying that proper secondary current is present. • For 6.6A/6.6A transformers, the primary and secondary currents should match. • For 20A/6.6A transformers, the secondary current should be one-third of the primary current. If the secondary current is too low or zero, replace the isolation transformer.

Table 4: Troubleshooting Guide (continued)

Problem	Possible Cause	Corrective Action
Distorted light beam output	Broken, damaged or wrong prism installed	Check parts list and install correct prism.
Water inside optical chamber	Damaged or missing prism seals or top cover O-ring	Replace both prism seals. Replace the top cover O-ring. Verify that the fixture is sealed. Refer to Figure 9.
	Fixture wires pinched between base can and fixture	A break in the fixture wire will cause water to be drawn into the fixture during the fixture's heating and cooling cycle (when switched on and off). Replace fixture leads. Refer to Replacing the Cord Set • Use care when remounting fixture on the base can to ensure that the wires do not get pinched.

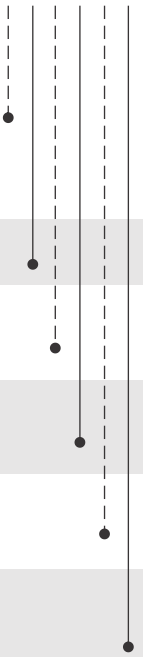
7.0 Parts

This section provides parts information for the L-850A and the L-850 B, LED Style 3 light fixtures.

7.1 IRCL-L Parts

Ordering Code

IRCL - X X X X X X



LED Colors
1 = White/White
2 = White/Red
3 = Red/Red
4 = White/Obscure
5 = Red/Obscure
7 = Yellow/Obscure

Monitoring
1 = No monitoring

Frequency
1 = 60 Hz
2 = 50 Hz[1]

Cord Set
1 = One[1]
2 = Two[2]

Arctic Option
1 = No[1]
2 = Yes

Specification
0 = FAA[1]
1 = ICAO[1]
3 = FAA with heavy-duty abrasion-resistant lens coating[3,4]
4 = ICAO with heavy-duty abrasion-resistant lens coating[3,4]

Notes

1 L-850A(L) LED 50 Hz without heater using a single cord set carries the CE Mark
2 See Dimensions section for 2 cord set specs
3 Typically used for intensive winter service where sand is applied to runways and rotating brushes are used.
4 Not ETL Certified.

Table 5: IRCL Common Spare Components

Description	Part No.
Cable clamp	4071.50.090
Cord set, dual	4072.24.950
Cord set, L-823, single (jacket)	44A7387-10
Cord set grommet, single	63A1014
Cord set terminal, female, single	70A0329
LED light engine, L-850A(L), red (FAA & ICAO)	48A0419-RED
LED light engine, L-850A(L), white (FAA & ICAO)	48A0419-WHT
LED PCB, single cord set, white/white	44A7257-5
LED PCB, single cord set, white/red and white/obscure	44A7257-4
LED PCB, single cord set, red/red	44A7257-1
LED PCB, single cord set, red/obscure	44A7257-2

Table 5: IRCL Common Spare Components (continued)

Description	Part No.
LED PCB, dual cord set	44A7228-00200
O-ring, bottom cover seal	63A1285
O-ring, pressure release screw	63B0267-011
Pressure release screw	60A2602
Prism	63A1119-1
Prism gasket sleeve	61A0444
Prism clamp	60A4046
Prism flat seal	63A1120
Prism keeper plate	60A4047

Table 6: Past IRCL-L Light Engines

LED light engine, L-850A, red (FAA) (pre-2015 units)	48A0405-RED
LED light engine, L-850A, white (FAA) (pre-2015 units)	48A0405-WHT

7.1.1 IRCL Assemblies

Table 7: IRCL-L Assemblies

IRCL Assembly	Subassembly Part Numbers	Subassembly Description
IRCL/XXXXXX	44A6975/XXX	Bottom Cover Assembly
	44A6871/XXXXX	IRCL, Top Cover
	44A7223/XXXXX	Interm. Bottom Pan Assy

7.2 TDZL-L Parts

Ordering Code

TDZL- X X X X X

Light Beam
1 = Straight
2 = Toe-in Right
3 = Toe-in Left

Monitoring
1 = No monitoring

Frequency
1 = 60 Hz
2 = 50 Hz[1]

Arctic Option
1 = No[1]
2 = Yes

Specification
0 = FAA Configuration 1[2]
2 = ICAO Configuration 2[3]
3 = FAA with heavy-duty abrasion-resistant lens coating[4,5]
4 = ICAO with heavy-duty abrasion-resistant lens coating[4,5]

Notes
1. L-850B(L) LED 50 Hz without heater carries the CE Mark
2. Comes with smaller bottom cover and standard 2-pin FAA L-823 connector
3. Comes with intermediate size bottom cover and 2-pin FAA L-823 connector. Cord set can be easily replaced without opening fixture.
4. Typically used for intensive winter service where sand is applied to runways and rotating brushes are used.
5. Not ETL Certified.

Table 8: TDZL Common Spare Components

Description	Part No.
Cable clamp	4071.50.090
Cord set, L-823 (jacket)	44A7387-10
Cord set grommet	63A1014
Cord set terminal, female	70A0329
LED light engine, L-850B(L), white (FAA & ICAO)	48A0419-WHT
LED PCB, white	44A7257-3
O-ring, bottom cover seal	63A1285
O-ring, pressure release screw	63B0267-011
Pressure release screw	60A2602
Prism	63A1119-1
Prism gasket sleeve	61A0444
Prism clamp	60A4046
Prism flat seal	63A1120
Prism keeper plate	60A4047

Table 9: Past TDZL-L Light Engine

LED light engine, L-850A, white (FAA) (pre-2015 units)	48A0405-WHT

7.2.1 TDZL Assemblies

Table 10: TDZL-L Assemblies

TDZL Assembly	Subassembly Part Numbers	Subassembly Description
TDZL/XXXXX	44A6975/310	Bottom Pan Assy Current 5 LED 600ma STL 6 C0RD
	44A6871/XXXXX	IRCL/TDZL TOP COVER
	44A7223/11100	Interm. Pan Assy,1CD,50/60HZ,Single Driver, No Monitoring

7.2.1.1 Intermediate Bottom Pan Assembly

44A7223/XXXXX

Figure 18: Intermediate Bottom Pan Assembly Diagram

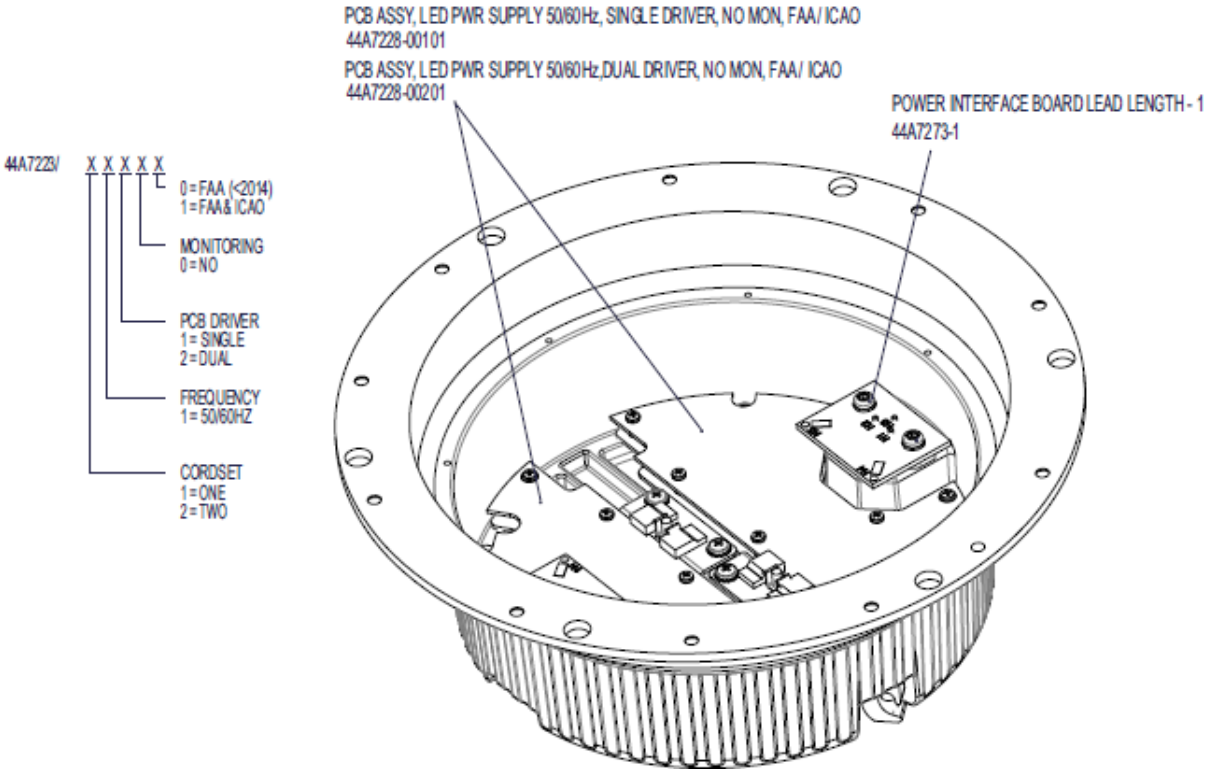
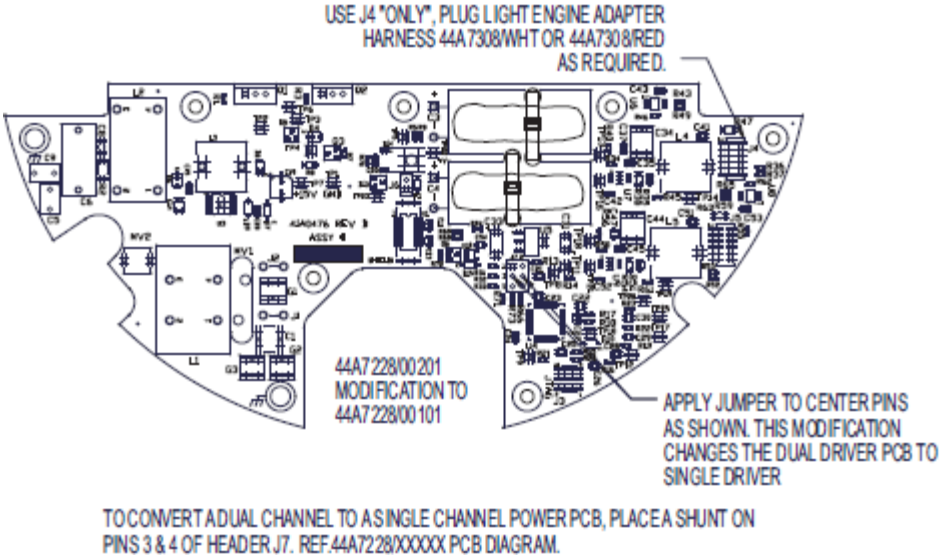


Table 11: Intermediate Bottom Pan Assembly Parts

Part Number	Description
44A7228-00101	Interm Pan PCB Assy 50/60Hz,Single Driver, No Monitoring
44A7228-00201	Interm Pan PCB Assy 50/60Hz, Dual Driver, No Monitoring
44A7273-1	Power Interface PCB Lead Length-1
60A2602	Pressure Relief Screw
63B0267-011	O RING Pressure Relief Screw
72A0401	Alum Grnd Lug, for AL/CU & UL467
4072.42.380	Cord Cable Clamp
4072.42.351	Cord 2 Conductor 18"

Figure 19: 44A7228/XXXXX



TO CONVERT A DUAL CHANNEL TO A SINGLE CHANNEL POWER PCB, PLACE A SHUNT ON PINS 3 & 4 OF HEADER J7. REF.44A7228/XXXXX PCB DIAGRAM.

7.2.1.2 Deep Small Bottom Pan Assembly

44A6975/XXX

Figure 20: Small Deep Bottom Pan Assembly Diagram

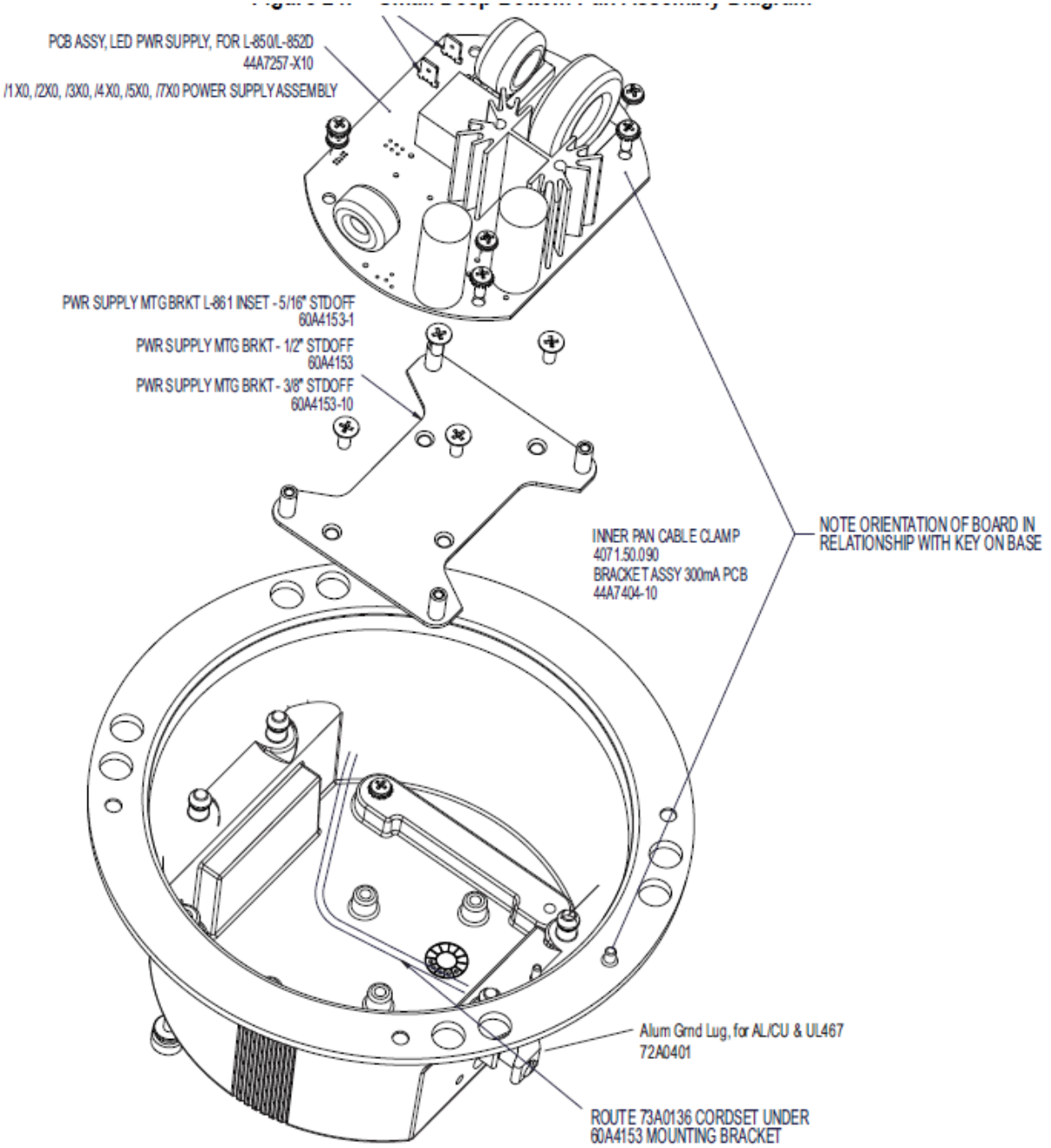


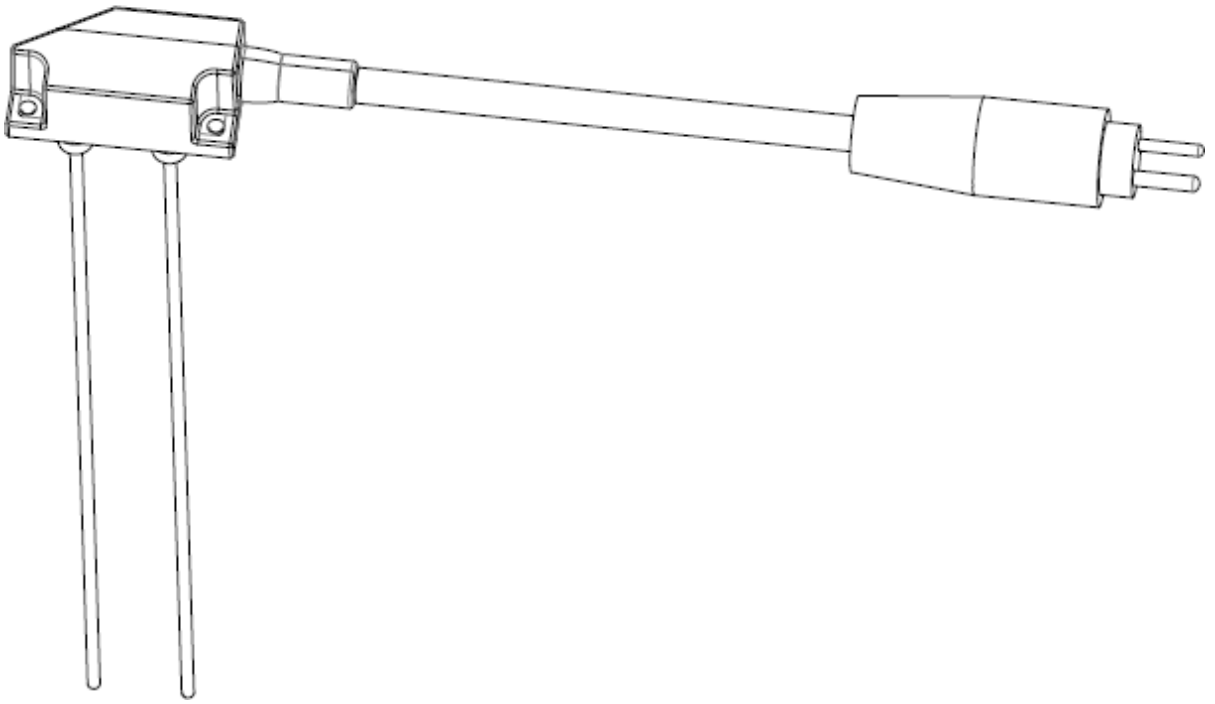
Table 12: Small Deep Bottom Pan Assembly Parts

Part Number	Description
44A7257-3	PCB PS ASSY, L850/L852D, 600mA,
60A2602	Pressure Relief Screw
60A3339-1	44A6738 1 Cord W/O Monitoring (NO MACH REQ)
60A4153-10	Pwr Supply MTG Bracket L-861 INSET 3/8"

Table 12: Small Deep Bottom Pan Assembly Parts (continued)

Part Number	Description
63B0267-011	O-Ring for Pressure Relief Screw
70A0329	FEM DISC 16-14AWG .25X.03 INS
44A7387-10	Cord Set Over-mold Style 1

Figure 21: 44A7387-10 Cordset



7.3 IRCL / TDZL Top Cover Assembly

Figure 22: L850x, 44A6871

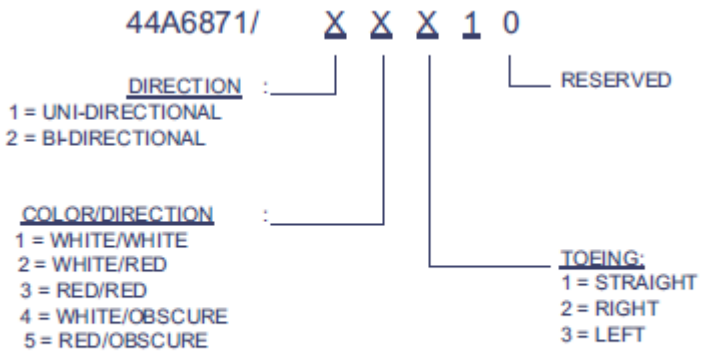


Figure 23: IRCL / TDZL Assembly (IRCL-L Bi directional Assembly Shown)

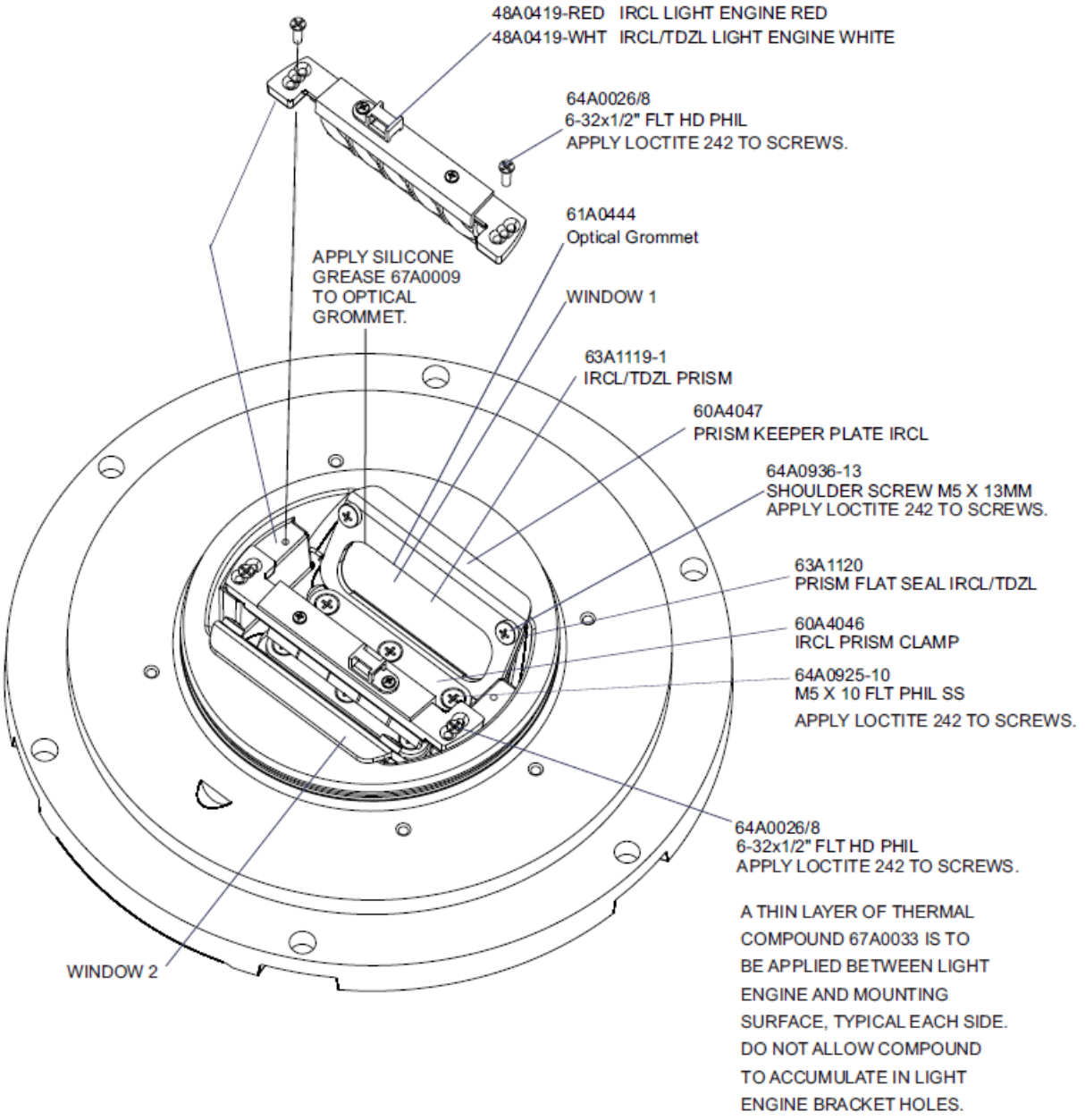


Table 13: IRCL / TDZL Top Cover and Prism Assembly Parts

Part Number	Description
48A0419-WHT	IRCL ICAO/THL LIGHT ENGINE, WHT
48A0419-RED	IRCL FAA LIGHT ENGINE, RED
48A0405-WHT	IRCL LED LIGHT ENGINE, WHT (OBS)
48A0405-RED	IRCL LED LIGHT ENGINE, RED (OBS)
60A4046	PRISM CLAMP IRCL
60A4047	PRISM KEEPER PLATE IRCL
61A0444	IRCL PRISM SOCK SEAL
62A2187-1	IRCL/TDZL TOP COVER MACHINING 1 WINDOW
63A1120	PRISM SEAL IRCL

Table 13: IRCL / TDZL Top Cover and Prism Assembly Parts (continued)

Part Number	Description
63A1119-1	IRCL/TDZL PRISM
63A1285	O-RING F-RANGE FIXTURES
61A0459	HEATER DISC, 2 LEADS W/Terminals

Figure 24: IRCL / TDZL Top Cover and Prism Assembly

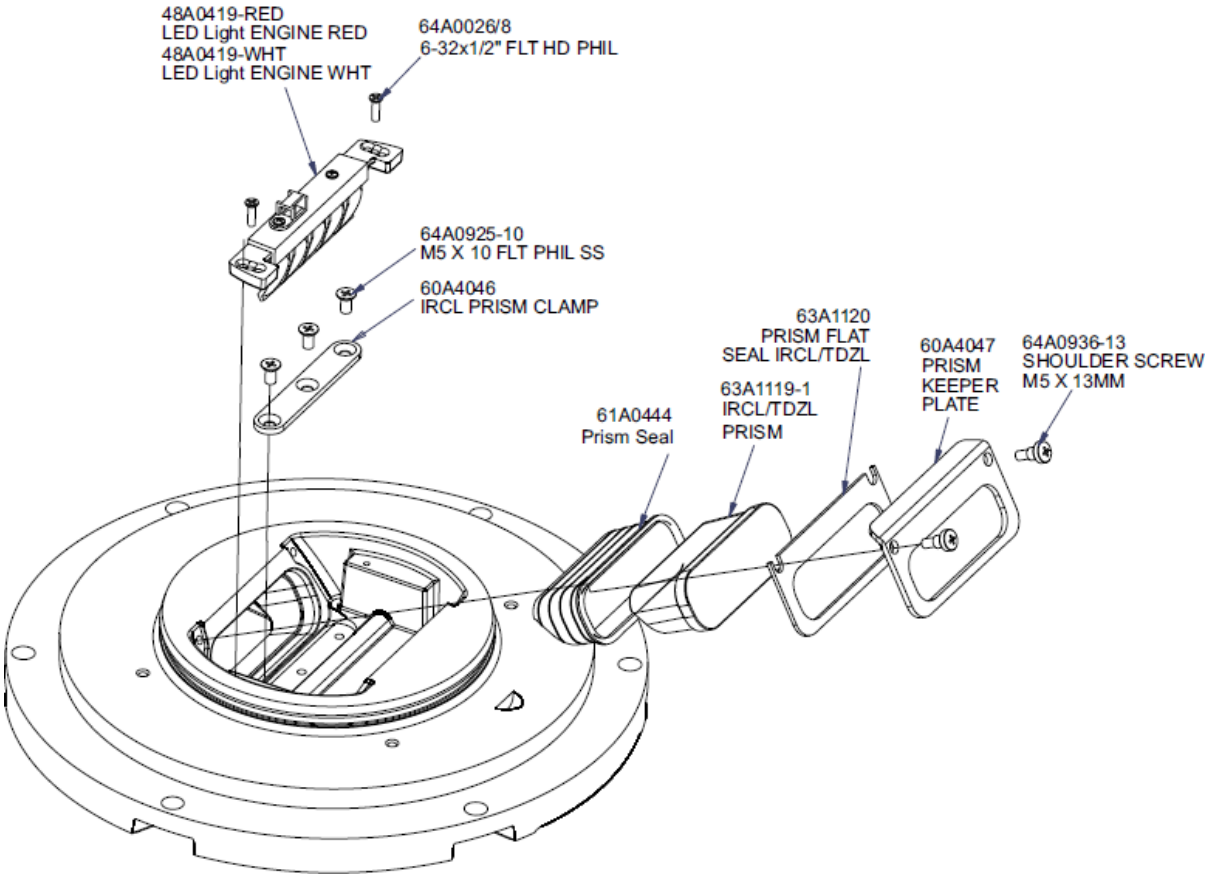
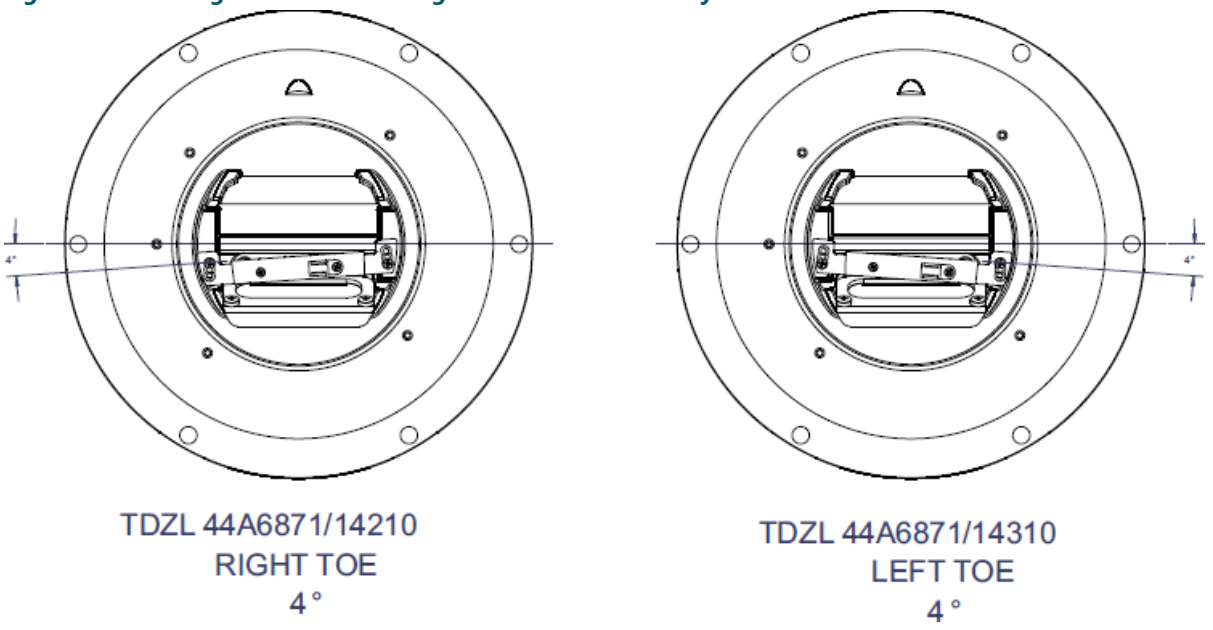


Figure 25: TDZL Right and Left Toe Alignment of LED Assembly

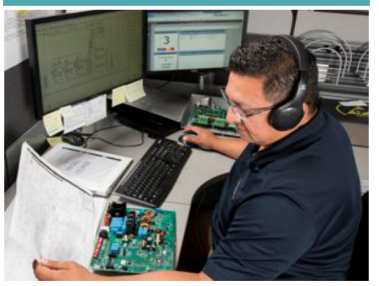


Appendix A: SUPPORT

Our experienced engineers are available for support and service at all times, 24 hour/7 days a week. They are part of a dynamic organization making sure the entire ADB SAFEGATE is committed to minimal disturbance for airport operations.

ADB SAFEGATE Support

Live Technical Support - Americas
If at any time you have a question or concern about your product, just contact ADB SAFEGATE's technical service department. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists are available 24 hours a day, seven days a week to provide assistance over the phone.
ADB SAFEGATE **Americas Technical Service & Support (US & Canada): +1-800-545-4157**
ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304
During regular business hours, you can also Chat with a Service Technician. We look forward to working with you!
Before You Call
When you have an airfield lighting or system control system problem it is our goal to support airfield maintenance staff as quickly as possible. To support this effort we ask that you have the following information ready before calling.



- The *airport code*
- If not with an airport, then company name (prefer customer id number)
- Contact phone number and email address
- Product with part number preferable or product number
- Have you reviewed the product's manual and troubleshooting guide
- Do you have a *True RMS* meter available (and any other necessary tools)
- Be located with the product ready to troubleshoot

Note
For more information, see www.adbsafegate.com, or contact ADB SAFEGATE Support via email at support@adbsafegate.com or
Brussels: +32 2 722 17 11
Rest of Europe: +46 (0) 40 699 17 40
Americas: +1 614 861 1304. Press 3 for technical service or press 4 for sales support.
China: +86 (10) 8476 0106

A.1 ADB SAFEGATE Website

The ADB SAFEGATE website, www.adbsafegate.com, offers information regarding our airport solutions, products, company, news, links, downloads, references, contacts and more.

A.2 Recycling

A.2.1 Local Authority Recycling

The disposal of ADB SAFEGATE products is to be made at an applicable collection point for the recycling of electrical and electronic equipment. The correct disposal of equipment prevents any potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling. The recycling of materials helps to conserve natural resources. For more detailed information about recycling of products, contact your local authority city office.

A.2.2 ADB SAFEGATE Recycling

ADB SAFEGATE is fully committed to environmentally-conscious manufacturing with strict monitoring of our own processes as well as supplier components and sub-contractor operations. ADB SAFEGATE offers a recycling program for our products to all customers worldwide, whether or not the products were sold within the EU.

ADB SAFEGATE products and/or specific electrical and electronic component parts which are fully removed/separated from any customer equipment and returned will be accepted for our recycling program.

All items returned must be clearly labelled as follows:

- For *ROHS/WEEE* Recycling
- Sender contact information (Name, Business Address, Phone number).
- Main Unit Serial Number.

ADB SAFEGATE will continue to monitor and update according for any future requirements for *EU directives* as and when *EU member states* implement new *regulations* and or *amendments*. It is our aim to maintain our *compliance plan* and assist our customers.

Company Addresses

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