



Incandescent In-pavement ALSF and MALSR Approach Light,
Style 2
High-Intensity / Medium-Intensity

User Manual

96A0293, Rev. H, 2020/06/26



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

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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.

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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 and purchased or funded with monies through the Airport Improvement Program (AIP) 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

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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.

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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 Operation Safety



CAUTION

Improper Operation

Do Not Operate this equipment other than as specified by the manufacturer

- Only qualified personnel, physically capable of operating the equipment and with no impairments in their judgment or reaction times, should operate this equipment.
- Read all system component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.
- 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.
- Route electrical wiring along a protected path. Make sure they will not be damaged by moving equipment.
- Never operate equipment with a known malfunction.
- Do not attempt to operate or service electrical equipment if standing water is present.
- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Never touch exposed electrical connections on equipment while the power is ON.

Failure to follow these instructions can result in equipment damage

1.1.6 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

1.1.7 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 Introduction

This section describes the ADB Safegate F-Range high intensity Style 2 approach light.

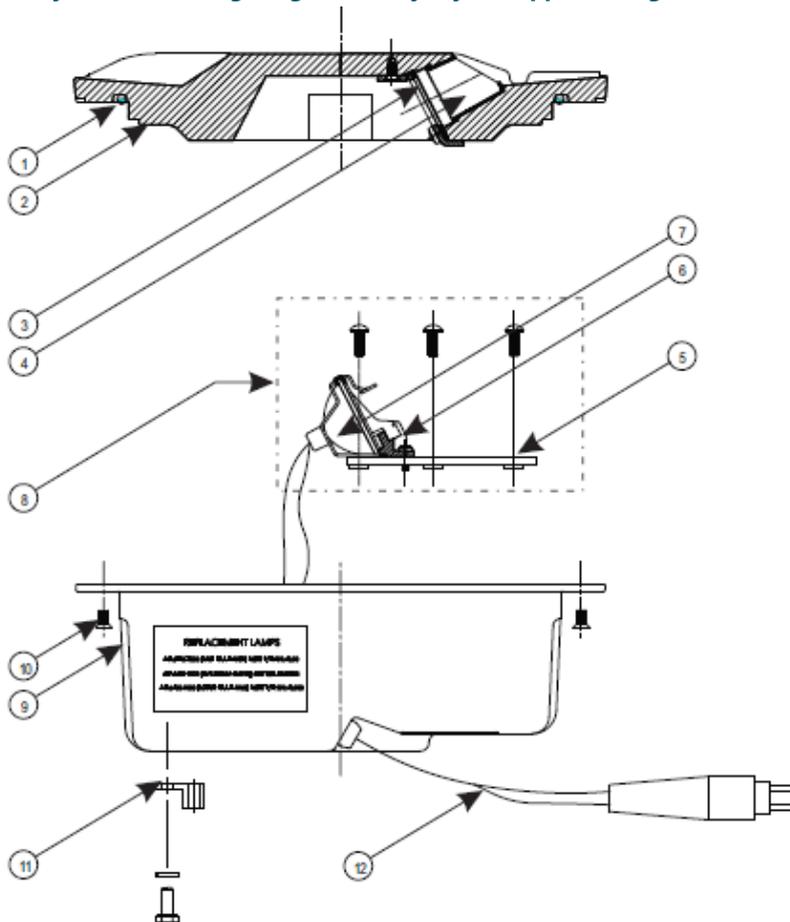
2.1 F-Range High Intensity Style 2 Approach Light

See [Figure 1](#) and [Figure 2](#). The F-Range high intensity Style 2 approach light marks the centerline, crossbar, and side row barrettes. It is manufactured in accordance with FAA specification FAA-E-2491 (to be superseded by FAA-E-2952) and to FAA-E-2968 (0.50 inches height above grade). The fixture is supplied with either no filters (white), or 3 red filters, or 3 green filters.

Figure 1: Top View of F-Range High Intensity Style 2 Approach Light



Figure 2: Cutaway View of F-Range High Intensity Style 2 Approach Light



- | | | | |
|--------------|-----------------------------|-----------------|------------------------------|
| 1. O-Ring | 4. Light Channel | 7. Lamp | 10. Phillips Flat Head Screw |
| 2. Top Cover | 5. Optical Support Assembly | 8. Optical Unit | 11. Ground Lug |
| 3. Prism | 6. Lamp Holder Assembly | 9. Inner Pan | 12. Cord Set |

2.1.1 Incandescent In-pavement ALSF and MALSR Approach Light

Compliance with Standards

FAA:	ALSF ETL Verified to FAA-E-2952 (Detail Specification for Approach Light, Chemical Resistant, High Intensity, Semi-flush Steady Burning) MALSR ETL Verified to FAA-E-2968 (Detail Specification for Semi-flush Approach Light Units for Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights)
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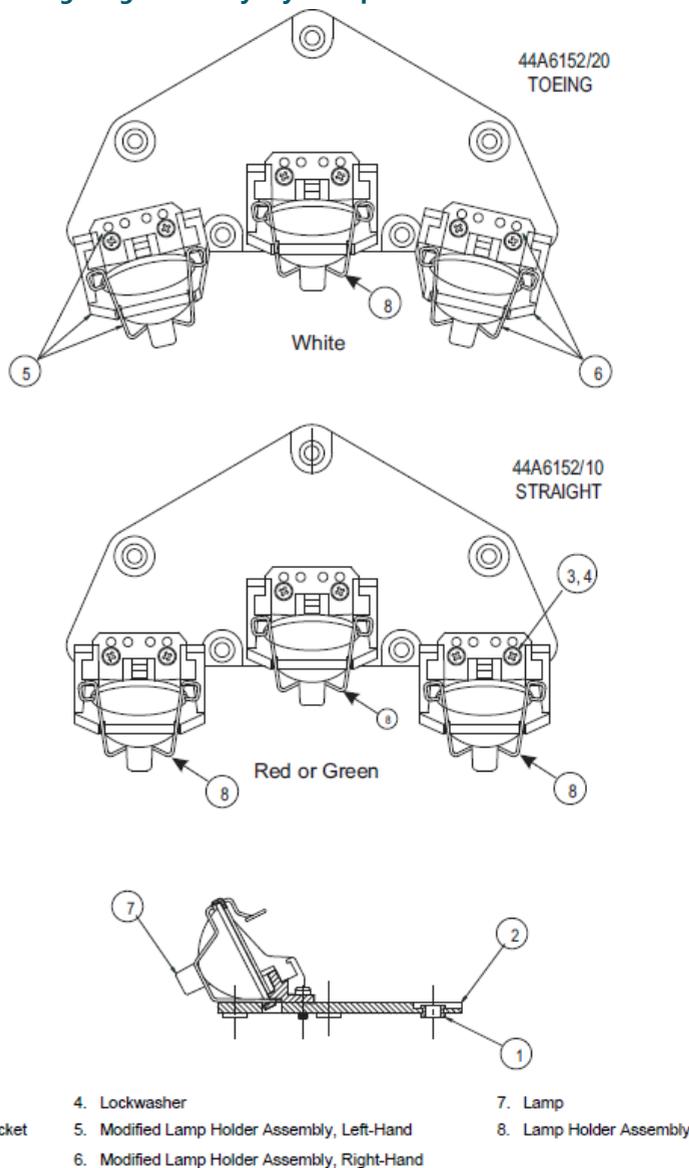
Uses

- ALSF high-intensity approach centerline, crossbar, and side row barrettes in white, green, and red
- MALSR medium-intensity approach in white and threshold in green

2.1.2 Optical Unit

See Figure 3 for the optical unit. The F-Range series light fixture optical unit consists of three unidirectional 105 W/MR16 lamps, prisms, and color filters.

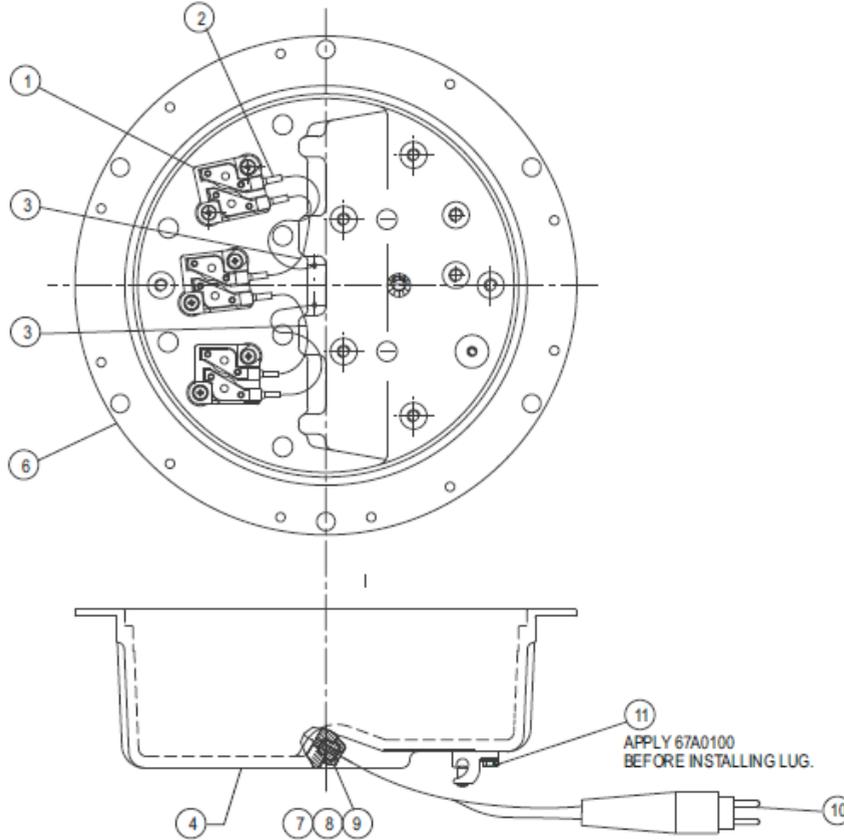
Figure 3: F-Range High Intensity Style 2 Optical Unit



2.1.3 Inner Pan Subassembly

See [Figure 4](#) . The inner pan subassembly is comprised of the inner cover (6), L-823 cordset (10), terminal block(s) (without film disc cutout) (1), fast-on connectors (2), O-ring (5), wire clamp (8), screw (9), and pressure release screw (4).

Figure 4: Inner Pan Subassembly



- | | | | |
|-----------------------|---------------------------|------------------|----------------|
| 1. Terminal Blocks | 4. Pressure Release Screw | 7. Wire Grommets | 10. Cordset |
| 2. Fast-On Connectors | 5. O-Ring | 8. Wire Clamp | 11. Ground Lug |
| 3. Cable Assembly | 6. Inner Cover | 9. Screw | |

2.1.3.1 Lamp and Filter Holder Assembly

See [Figure 2](#) . The lamp and filter holder assembly (6) consists of the lamp/filter support subassembly, lamp clip, screws, and washers. The lamp/filter support subassembly is pre- assembled at the factory.

2.1.3.2 Lamp Shorting Device

An optional lamp shorting device is available as an electrical bypass device in case of lamp failure. It closes an auxiliary circuit around the lamp within 15 seconds after lamp failure. The lamp shorting device shorts and completes the circuit when the lamp fails. This allows the other lamps to remain lighted in series-connected fixtures. It also prevents excessive volt amperes on the secondary of the isolation transformer.

2.1.3.3 F-Range High Intensity Style 2 Approach Light: Required Equipment

Refer to [Table 1](#) for required equipment that is supplied. Refer to [Table 2](#) for required equipment that is not supplied. Refer to the *Parts* section for part numbers.

Table 1: Required Equipment Supplied

Description	Quantity
F-Range high intensity Style 2 approach light	1
Instruction manual	1 per order

Table 2: Required Equipment Not Supplied

Description	Quantity
Torque wrench (0 to 200 in-lb) (0–22.6 Nt-M)	1
Alignment jig	1
Diamond-faced core drill, 13 in. (330 mm diameter)	1
Diamond-faced saw, 3/8 in. (9.525 mm) thick	1
Crimping tool	1
Small water suction pump	1
L-830 isolation transformer. Refer to Table 2-3 for required isolation transformers.	1
Eyebolt, 3/8 in. (9.525 mm) diameter	2
Lifting rod, 16 in. (406 mm) long	1
Set of fiber brushes	1
Set of socket wrenches, 1/2 in. (12.7 mm) drive	1
Set of screwdrivers, one with 3/8 in. (9.525 mm) minimum blade width	1
Silicone grease	As required
Joint sealing filler	As required

3.0 Installation



WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

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

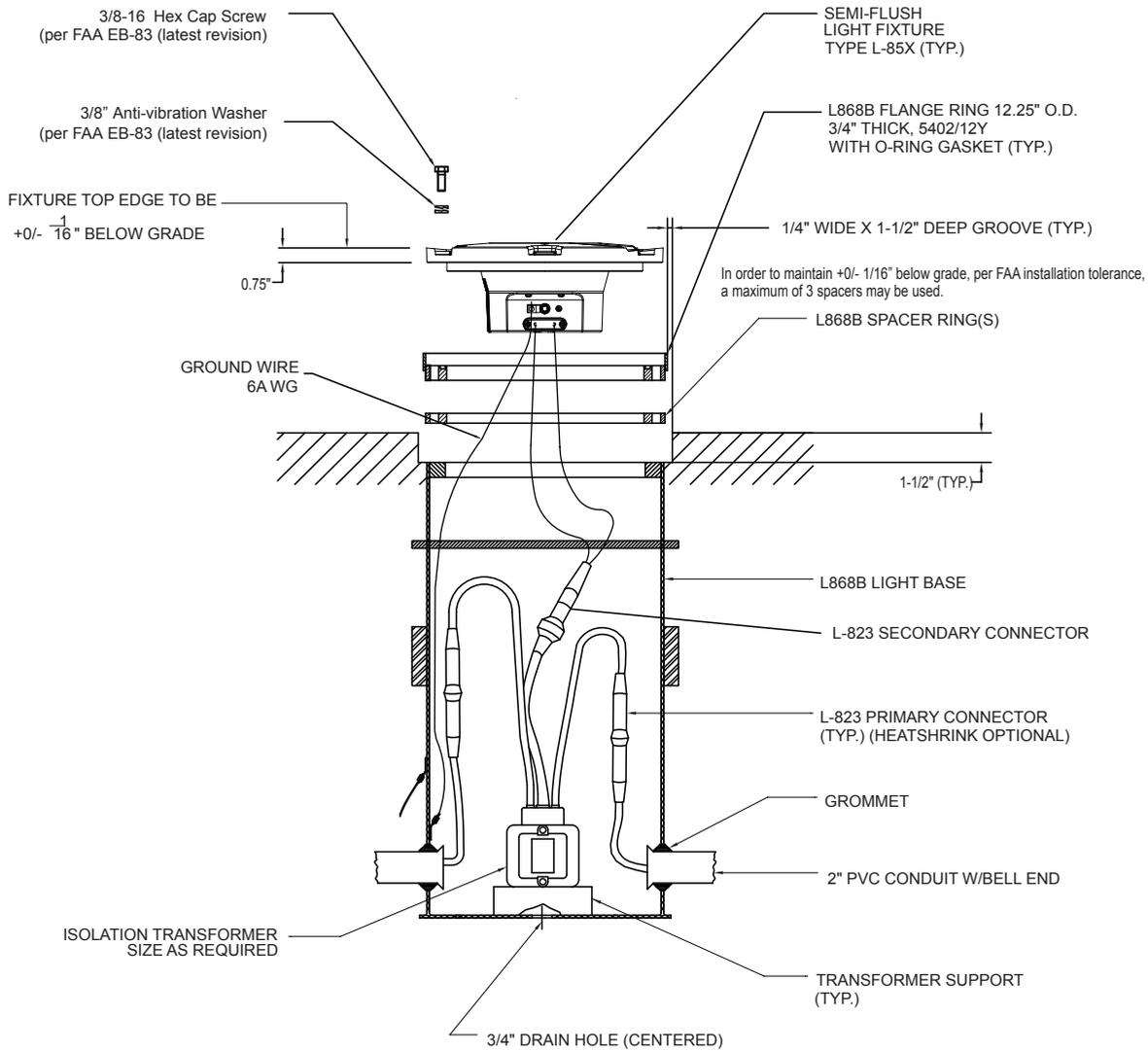
This section provides instructions for installing the F-Range approach lights. Refer to airport project plans and specifications for the specific installation instructions. The installation shall conform to the applicable sections of the National Electric Code and local codes.

3.1 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).

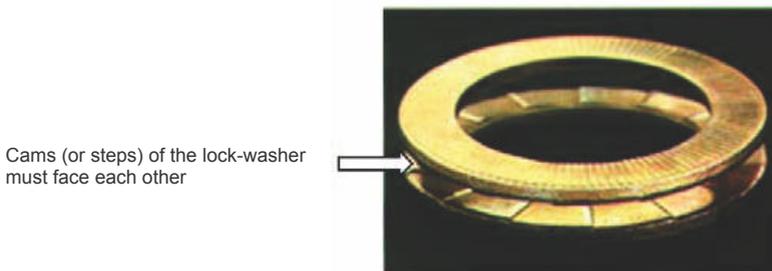
3.2 Typical L-868 Assembly

Figure 5: Diagram of the Fixture Installed in a 1-Piece Base Can



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

Figure 6: 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.

3.3 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.

3.4 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 3: 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

Table 3: Suggested Tools and Materials for Installation and Repair (continued)

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		

3.5 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.

3.6 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.

3.7 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.

3.8 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 silicon 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.

3.9 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.
-

3.10 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.

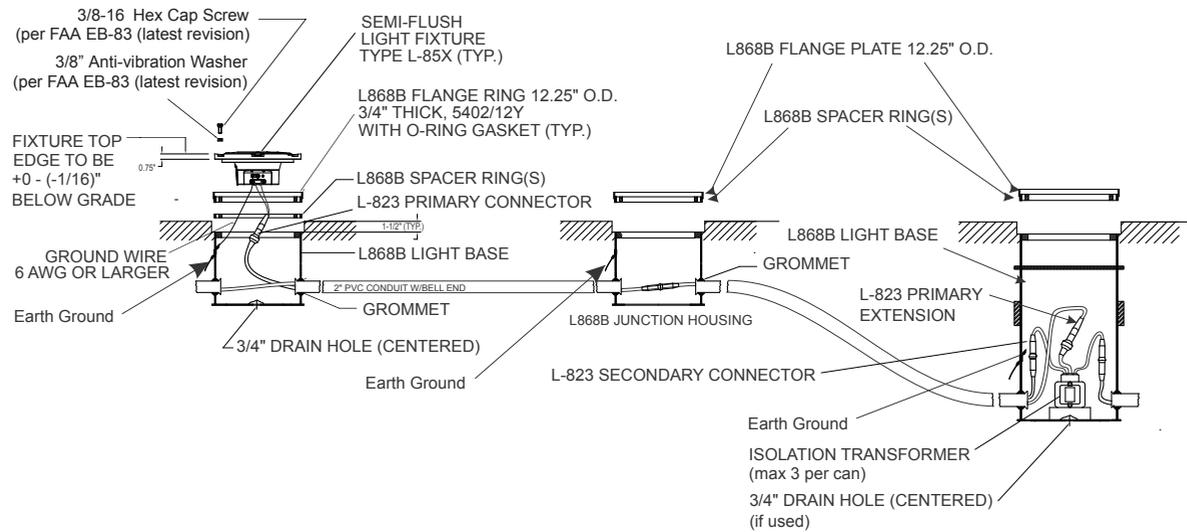
3.10.1 Installation on a Shallow Base

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.

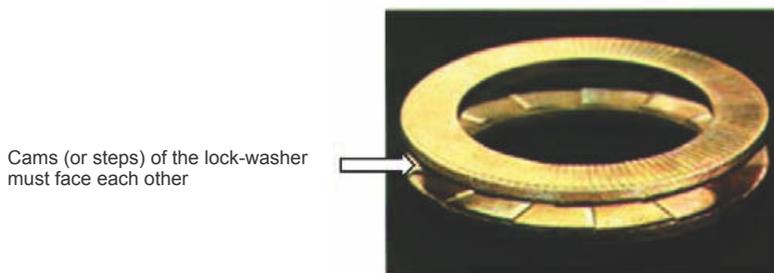
Also follow the applicable instructions in the previous section, when connecting, installing and powering the fixture.

Figure 7: Example of a Shallow Base Installation



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

Figure 8: 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.

3.11 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 ["Bolt Torqueing Maintenance"](#) for torque and installation guidelines for this fixture.

WARNING

Foreign Object Damage
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.

4.0 Maintenance



WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

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

This section provides maintenance information and procedures for the F-Range high intensity Style 2 approach light.

4.1 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

4.2 Maintenance Schedule

Service life depends upon the entire assembly being waterproof. All surfaces must be clean, dry and free of all foreign matter and all bolts must be properly tightened if the light fixture is to operate for extended periods without requiring maintenance.

To keep the F-Range light fixtures operating efficiently, follow a preventive maintenance schedule. Refer to [Table 4](#). Refer to FAA AC 150/5340-26 for more detailed information.

Table 4: F-Range Light Fixture Maintenance

Interval	Maintenance Task	Action
Daily	Check for burned-out lamp.	Replace lamp. Refer to Replacing Lamp .
	Check for dim lamp.	Clean optical surface if dirty. Check for misalignment or presence of moisture in fixture.
Weekly	Check for dirty channel and lens.	Clean channel and prism. Refer to Cleaning Light Channel and Prism .
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 to 185 5 inch-pounds (20.902 ±0.565 Nt-M). Use Loctite to keep bolts tight. Refer to Bolt Torque Preventive Maintenance Schedule .
After snow removal	Check for damaged light fixtures.	Replace damaged fixtures. Use a power broom for snow removal, if practical. Follow recommended snow removal techniques described in AC 150/5200-23.

4.3 Maintenance Procedures

This subsection describes the following maintenance procedures:

- Replacing lamp
- Cleaning light channel and prism
- Re-torquing mounting bolts
- Removing L-868 base water
- Lifting optical unit out of base
- Testing for leaks

4.4 Replacing Lamp



WARNING

Turn off the circuit before replacing lamp(s). Failure to observe this warning may result in personal injury, death, or equipment damage.

Allow time for the unit to cool. High interior temperatures may cause severe burns to personnel. Failure to observe this warning may result in personal injury.

The preferred method of maintaining the F-Range inset light is to periodically and systematically replace the light assembly and return the replaced assembly to the maintenance shop for renovation. As an alternative, you can service the light assembly in the field. It is recommended, however, that field servicing be limited to cleaning lenses and replacing lamp(s).



Note

If any lamps are out, record the location of the fixture and replace the lamp when the circuit is turned off. If one lamp burns out, it is recommended to replace all lamps.

Refer to [Replacing Lamp](#) on page 14 for lamp replacement procedure.

4.5 Cleaning Light Channel and Prism

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

1. See [Figure 2](#) . 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 with gently, dry, oil-free compressed air at a pressure no greater than 10 psi (69 KNt/m²) to evaporate or remove all remaining cleaner.

4.6 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-868B Base".



Note

Torque the six screws to 20.902 0.565 Nt-m (185 5 inch-pounds).

5. Take the inset fixture unit back to the maintenance base where it can be serviced entirely.



CAUTION

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

4.7 Testing for Leaks

To test for leaks, perform the following procedure:

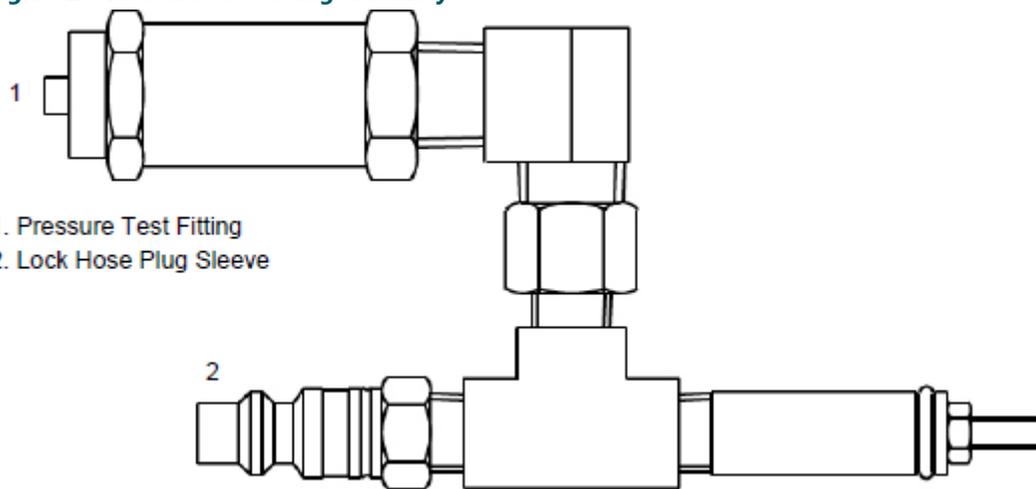
1. See [Figure 9](#).
Remove pressure relief screw.
2. See [Figure 10](#).

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

Figure 9: Pressure Relief Screw



Figure 10: 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.

4.8 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.

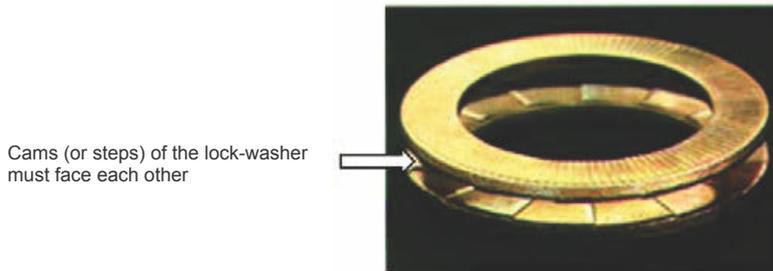
Failure to follow these cautions can result in equipment damage or aircraft FOD.

4.9 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 11: 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.

5.0 Troubleshooting



WARNING

Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

De-energize the circuit and lock out the circuit or regulator so that the circuit cannot be energized by remote means before attempting to service the fixture.

This section contains troubleshooting information. This information covers only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local ADB Airfield Solutions representative for help.

5.1 Troubleshooting Procedures

Troubleshooting procedures for the F-Range inset lights are contained here.

Table 5: Troubleshooting Steps

Problem	Possible Cause	Corrective Action
1. Lamp not energizing	Defective lamp	Replace lamp. Refer to Replacing Lamp
	Loose or broken contacts	Tighten or replace.
	Moisture inside assembly causing current leakage	Open up light assembly. Clean, dry, and inspect light assembly. Replace O-ring.
	Defective isolation transformer	Check transformer output current with meter.
	Defective Voltage Ratio Transformer MALSR ONLY	Verify input current to lamps is correct. Also verify voltage is present across the primary of the transformer
2. Lamp not turning on at normal level	Continuity incorrect	Check lamp filament and wiring for continuity.
3. Lamp output distorted	Broken or damaged lens	Replace lens.
4. Improper color	Filter broken	Replace filter.
	Filter bracket broken	Replace filter bracket assembly.
5. Short lamp life	Current too high	Check constant current regulator and isolation transformer.
	Current too high (MALSR ONLY)	Check to see if input voltage is too high Or if voltage transformer is defective.
	Water in assembly	Inspect prism. Open light assembly. Clean, dry and inspect light assembly. Replace O-ring.
		Replace lamp. Refer to Replacing Lamp
	Defective lamp	<div style="display: flex; align-items: center;"> <div style="background-color: #0070c0; color: white; padding: 2px 5px; font-weight: bold; font-size: 1.2em; margin-right: 5px;">i</div> <div> <p>Note</p> <p>Lamp interior will have a white powdery appearance if air has entered through a hole or crack.</p> </div> </div>
6. Distorted light beam output	Over-voltage	Check to see if lamp has black burns. If so, check isolation transformer output with meter. Replace isolation transformer, if defective.
	Cracked or damaged lens	Replace lens.
7. Water inside optical chamber	Damaged or missing lens seals or top cover O-ring	Replace both lens seals. Replace top cover O-ring.
	Cut or nick on L-823 cordset insulation that exposes wire	Replace insulation.

6.0 Repair

This section describes procedures for repairing and replacing parts.

It includes opening the optical unit, and replacing the lamp and filter, prism, optical unit, and L-823 cordset. It also describes how to close the optical unit.

6.1 Opening Optical Unit

To open the optical unit, perform the following procedure:

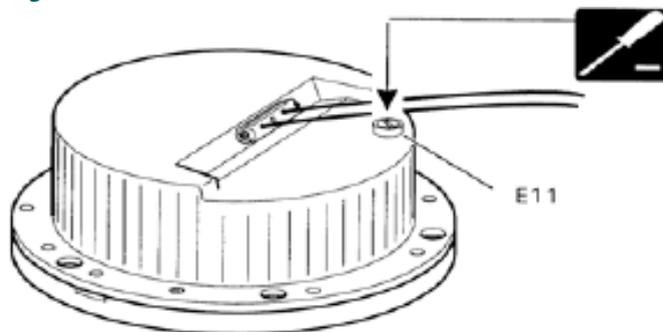
1. Turn the light unit upside-down.
2. See [Figure 12](#). Remove the pressure release screw (E11).



Note

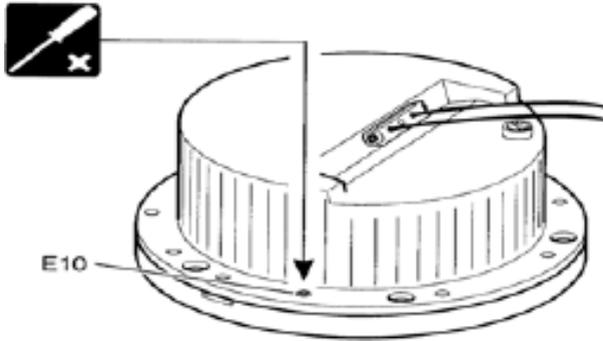
Removing the pressure release screw equalizes the pressure inside and outside the fixture, making it easier to break the seal and remove the inner cover.

Figure 12: Pressure Release Screw



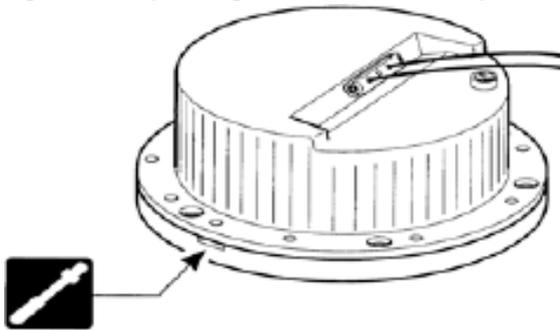
3. See [Figure 13](#). Remove the ten screws (E10). The use of an impact driver may be required to unlock the screws.

Figure 13: Removing Screws



4. See [Figure 14](#). Insert small or medium flat blade screwdriver in the machined recess slot between cover and inner cover and turn it vertically to separate the inner cover from the cover.

Figure 14: Separating Inner Cover from Top Cover2.



6.2 Replacing Lamp and Filter



WARNING

Turn off the circuit before replacing lamp(s). Failure to observe this warning may result in personal injury, death, or equipment damage.

Allow time for the unit to cool. High interior temperatures may cause severe burns to personnel.

Refer to [Table 6](#) for parts referred to in [Figure 15](#) and [Figure 16](#).

Table 6: Parts List for Replacing Lamp and Filter

Item	Part Number	Description	Quantity	Note
Item 1 on Figure 15	4071.50.160	Filter spring	1	
Item 2 on Figure 15 and Figure 16	2990.40.900	Lamp, 105 W	3	
Item 3 on Figure 15		Filter		
	63A0968	Filter, red	See note.	A
	63A0963	Filter, green	See note.	A
Item 4 on Figure 15 and Figure 16	1411.22.002	Lamp holder assembly	See note.	B, C
Item 5 on Figure 15 and Figure 16	See note.	Lamp clip	3	F

Table 6: Parts List for Replacing Lamp and Filter (continued)

Item	Part Number	Description	Quantity	Note
Item 6 on Figure 16	44A6192-2	Modified lamp holder assembly, left-hand	See note.	D
Item 7 on Figure 16	44A6192-1	Modified lamp holder assembly, right-hand	See note.	E

NOTE A: Quantity is 3 for the 44A6152-10 (red or green) optical support assembly.

NOTE B: Quantity is 3 for the 44A6152-10 optical support assembly, 1 for the 44A6152-20 optical support assembly (located in the center of the optical support plate).

NOTE C: Lamp holder assembly is also shown on Figure 6-6, Item 4.

NOTE D: Quantity is 1 for the modified lamp holder assembly left-hand for the 44A6152-20 optical support assembly.

NOTE E: Quantity is 1 for the modified lamp holder assembly right-hand for the 44A6152-20 optical support assembly.

NOTE F: The lamp clip is a part of the lamp holder assembly, part number 1411.22.002. It cannot be ordered separately.

To replace the lamp and filter, perform the following procedure:

1. Open the optical unit. Refer to [Opening Optical Unit](#) .

2. See [Figure 15](#) for the red or green optical support assembly and [Figure 16](#) for white optical support assembly.

For the red or green optical support assembly, remove the filter spring (1), filter (3), lamp (2), and lamp clip (5) from the lamp holder assembly (4).

-OR-

For the white optical support assembly, remove the lamp (2) and lamp clip (5) from the lamp holder assembly (4).

Figure 15: Red or Green Optical Support Assembly

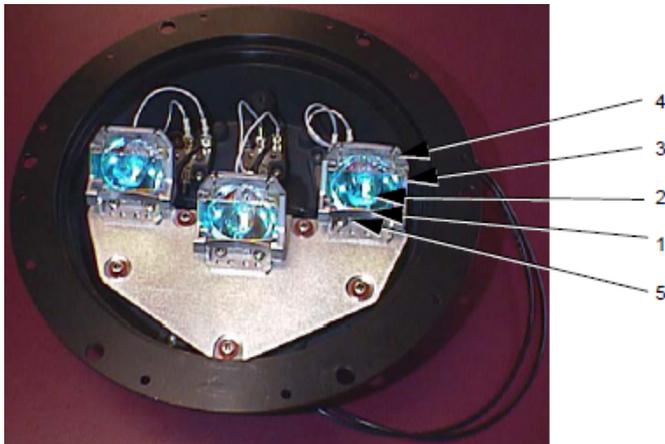
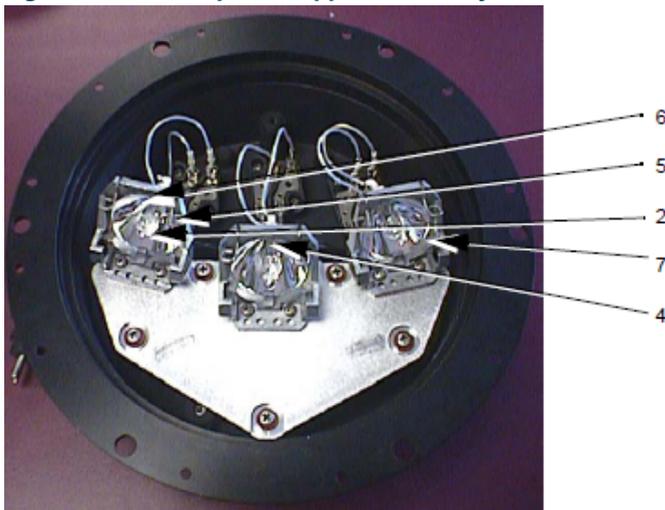


Figure 16: White Optical Support Assembly



3. Replace with new lamp and new filter.



Note

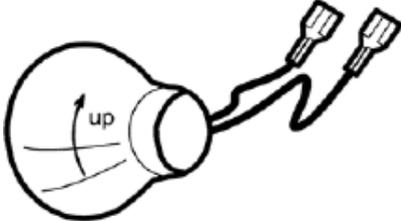
See [Figure 17](#). To optimize photometric output, make sure that the lamp is correctly positioned with the arrow pointing up.



CAUTION

Never touch the bulb of the lamp with your bare hands. It will reduce the lifetime of the lamp considerably. Should it happen, clean the bulb with alcohol.

Figure 17: Arrow Pointing Up



4. For the red or green optical support assembly, put the filter spring and filter back in. Make sure the curved part of the filter spring faces the filter.
5. Put the two parts of the lamp clip (5) in their respective notches on the lamp holder assembly.

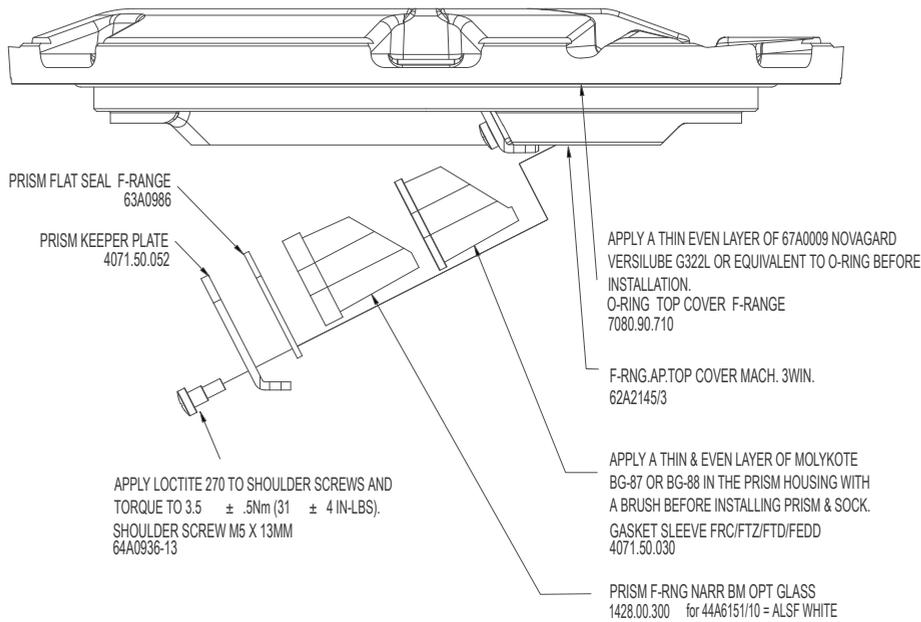
6.3 Replacing Prism

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

Refer to [Table 7](#) for parts referred to in [Figure 20](#) through [Figure 27](#).

Figure 18: Top Cover Assembly

44A6151/10 shown



CONFIG	ITEM 6 PART NUMBER	ITEM 6 PART DESCRIPTION
/10	1428.00.300	PRISM, COATED CLEAR
/20	1428.00.280	PRISM, COATED GREEN
/30	1428.00.270	PRISM, COATED RED
/11 /21	63A0993/3	PRISM, NARROW BEAM, COATED
/12	63A0993/2	PRISM F-RNG NARR BM OPT GLASS

44A6151/X X

- 20 = ALSF GREEN
- 30 = ALSF RED
- 11 = MALSR THRESHOLD 3 LAMP (GREEN)
- 21 = MALSR THRESHOLD 1 LAMP (WHITE)
- 12 = IRGL

USE 62A2145/1 TOP COVER

Table 7: Parts List for Replacing Prism

Item	Part Number	Description	Quantity
Item 1 on Figure 19 , Figure 20 , and Figure 21	1428.00.300	Prism, narrow beam, optical glass	3
Item 3 on Figure 19	4071.50.052	Prism-keeper plate	3
Item 2 on Figure 19	4017.50.360	Prism clamp	3
Item 4 on Figure 19	4071.62.630	Inner pan assembly	1
Item 5 on Figure 19	64A0925-10	Screw, M5 x 10 (for top cover assembly)	6
Item 6 on Figure 19	64A0936-13	Screw, M5 x 13 (for top cover assembly)	6
Item 7 on Figure 20	63A0986	Flat seal	3
Item 8 on Figure 21	4071.50.030	Sock seal	3

To replace the prism, perform the following procedure:

1. See [Figure 19](#) . Remove the prism-clamp (2) and prism-keeper plate (3) secured in the inner pan assembly (4).

Figure 19: Replacing Prism

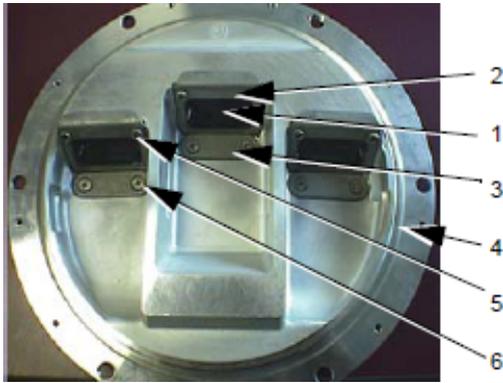


Figure 20: Flat Seal for Prism



Figure 21: Sock Seal for Prism



See [Figure 20](#) . Remove the flat seal (7).

2. See [Figure 21](#) . Push the prism (1) with the sock seal (8) towards the inside of the cover.
3. Clean and degrease the prism chamber with any effective solvent.



CAUTION

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

4. Apply a thin layer of lubricant MOLYKOTE BG87 INERTA or MOLYKOTE BG88 INERTA in the prism chamber using a small brush.
5. Install a new sock seal over the prism.
6. Push the prism/gasket assembly in the prism pocket from the inside and clean the inner surface of the prism.
7. Install a new flat seal over the prism-keeper plate.
8. See [Figure 19](#) . Reinstall hardware with the Phillips pan head screws (5, 6). Apply a droplet of sealant Loctite 270 to the last threads. Torque to 3.5 +/- 0.5 Nt-m (31 +/- 4 inch-pounds).

6.4 Replacing Optical Unit

Refer to [Table 8](#) for parts referred to in [Figure 22](#) .

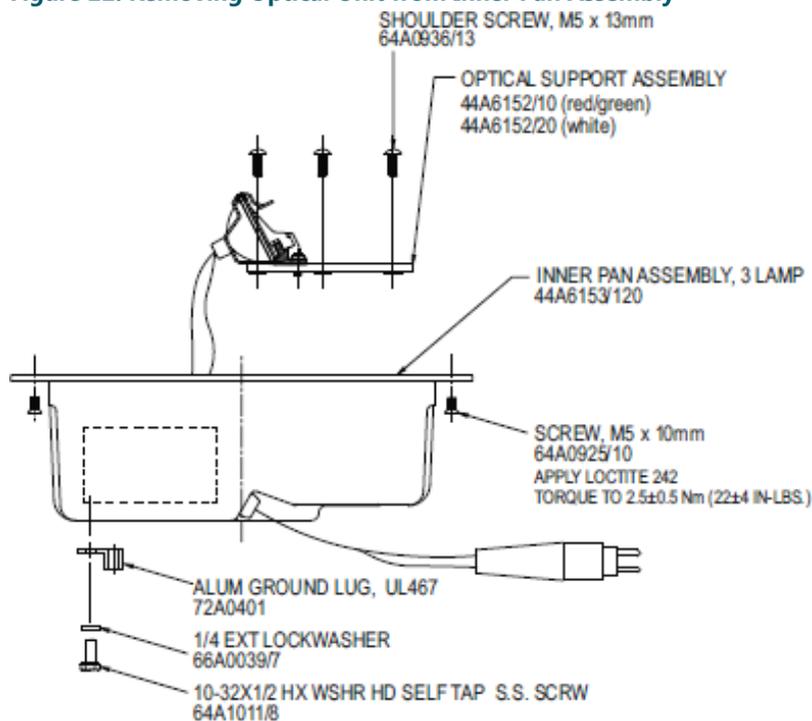
Table 8: Parts List for Replacing Optical Unit

Item	Part Number	Description	Quantity	Note
1		Optical unit	1	
	44A6152-10	Optical unit, 3 lamp, red or green		
	44A6152-20	Optical unit, 3 lamp, white		
2	44A6153-01	Inner pan assembly	1	
4	63A0222	Grommet (for optical bracket)	5	
5	64A0936-13	Screw, M5 x 13 (for optical bracket)	5	

To replace the optical unit, perform the following procedure:

1. Remove the lamp(s). Refer to [Replacing Lamp and Filter](#) on page 20.
2. See [Figure 22](#) . Remove the optical unit (1) by loosening screws (5).

Figure 22: Removing Optical Unit from Inner Pan Assembly



3. Position the new optical unit with new grommets (4).
4. Torque the fixing screws to 3.5 0.5 Nt-m (31 4 inch-pounds).

6.5 Replacing L-823 Cordset

Refer to [Table 9](#) for parts referred to in [Figure 23](#) and [Figure 24](#).

Table 9: Parts List for Replacing L-823 Cordset

Item	Part Number	Description	Quantity	Note
Item E5 on Figure 23	62A2145-3	Top cover	1	
Item F5 on Figure 23	63A1014	Grommets (for cordset)	2	
Item F6 on Figure 23	4071.50.090	Wire clamp (for cordset)	1	
Item F7 on Figure 23	7110.08.367	Screw, M4 x 10 (for cordset)	2	
Item F8 on Figure 23	73A0133-31	Cordset	1	
Item 8 on Figure 24	6111.87.140	Fast-on connector	2	

To replace the L-823 cordset, perform the following procedure:

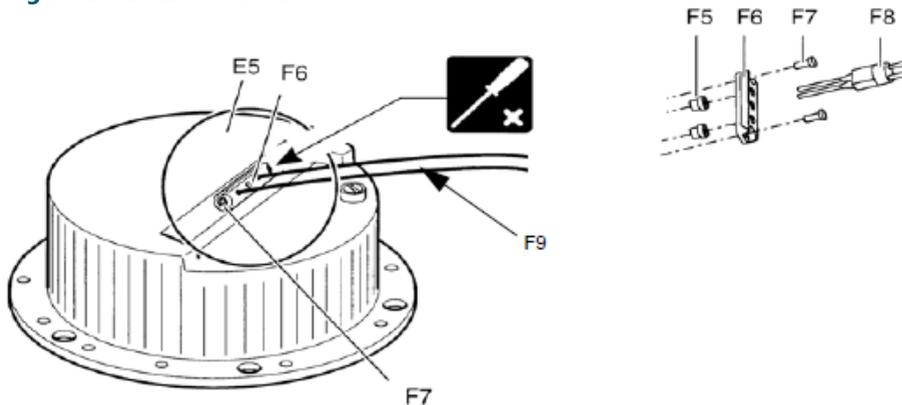
1. Open the optical unit. Refer to [Opening Optical Unit](#).
2. Remove the optical unit. Refer to [Replacing Optical Unit](#).
3. See [Figure 23](#). Remove both screws (F7) and the wire clamp (F6).



Note

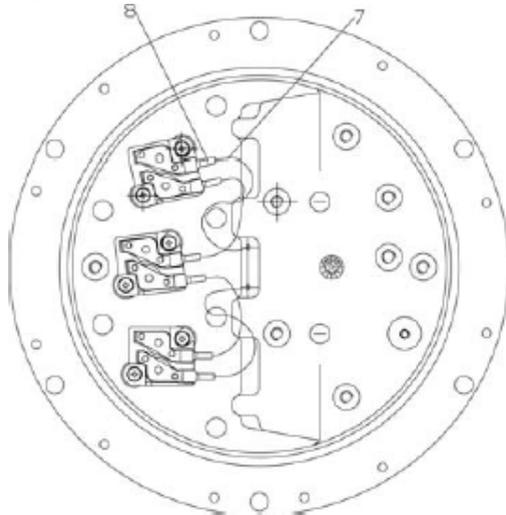
Replace the wire grommets (F5) when damaged or aged.

Figure 23: L-823 Cordset



4. See [Figure 24](#). Unplug the fast-on connectors (8) from the cable assembly wiring (7).

Figure 24: Fast-On Connectors



5. See [Figure 23](#). Pull the cordset cable assembly (F9) out of the inner cover and discard the wire grommets (F5).

6. Bring the new cable assembly (F9) through the wire clamp (F6).

7. Put a new wire grommet (F5) on each of the wires, taking care of the direction. Put the smaller diameter into the inner cover recesses.

8. Install the wires in the inner cover.

9. Reinstall the wire clamp (F6) by means of both cross recessed countersunk screws (F7).



Note

Do not torque down the screws entirely at this step.

10. Remove the insulation of the wires over about 5 mm.

11. Crimp on the new fast-on connectors and connect them to the terminals. Adjust the wires inside the inner cover.

12. Torque the screws (F7) to 31 +/- 4 inch-pounds (3.5 +/- 0.5 Nt-m).

6.6 Closing Optical Unit

Refer to [Table 10](#) for parts referred to in [Figure 25](#).

Table 10: Parts List for Closing Optical Unit

Item	Part Number	Description	Quantity	Note
1	63B0267-011	O-ring (for top cover)	1	
2	62A2145-3	Top cover	1	
3	1428.00.300	Prism	3	
4	1411.22.002	Lamp holder assembly	See note.	A, B
4	44A6192-2	Modified lamp holder assembly, left-hand	See note.	C
4	44A6192-1	Modified lamp holder assembly, right-hand	See note.	D
5	2990.40.900	Lamp, 105 W	3	
6		Optical unit	1	
	44A6152-10	Optical unit, 3 lamp, red or green		
	44A6152-20	Optical unit, 3 lamp, white		

Table 10: Parts List for Closing Optical Unit (continued)

Item	Part Number	Description	Quantity	Note
7	4071.62.630	Inner cover (of inner pan assembly)	1	
8	64A0925-10	Screw, M5 x 10	6	

NOTE A: Quantity is 3 for the 44A6152-10 (red or green) optical support assembly.

NOTE B: Lamp holder assembly is also shown on [Figure 17](#), Item 4.

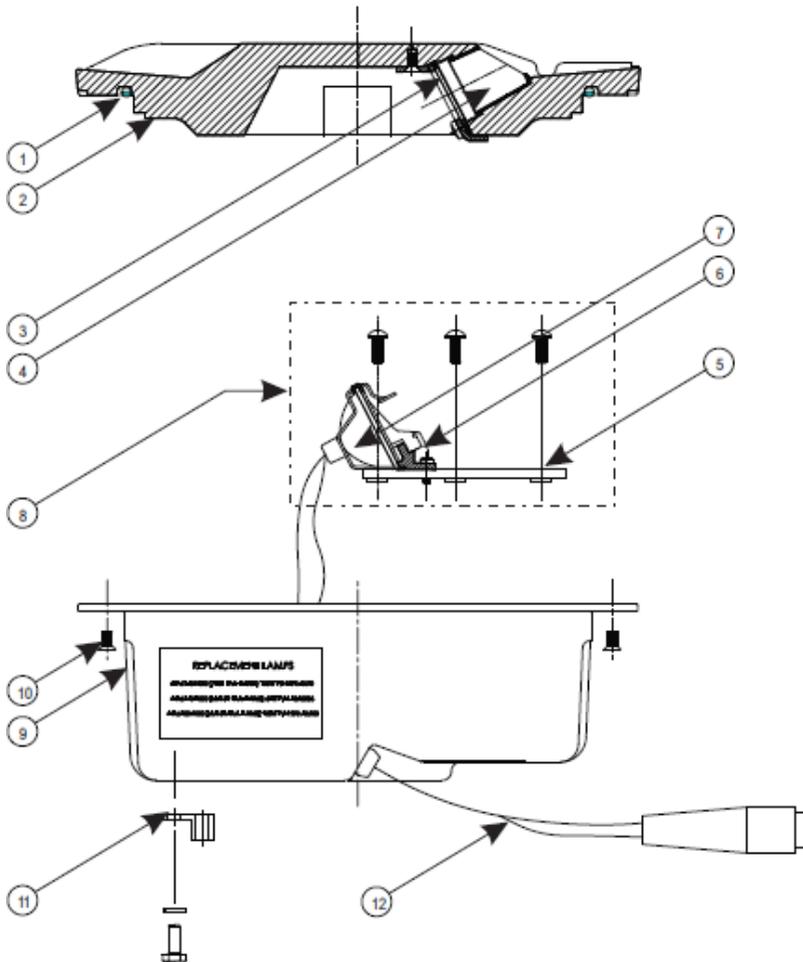
NOTE C: Quantity is 1 for the modified lamp holder assembly left-hand for the 44A6152-20 optical support assembly. See also [Figure 16](#).

NOTE D: Quantity is 1 for the modified lamp holder assembly right-hand for the 44A6152-20 optical support assembly. See also [Figure 16](#).

To close the optical unit, perform the following procedure:

1. See [Figure 25](#). Turn the top cover (2) upside down.

Figure 25: F-Range High Intensity Style 2 Approach Light Fixture



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



Note

Use a synthetic grease such as MOLYKOTE BG87 INERTA or MOLYKOTE BG88 INERTA.

4. See [Figure 12](#). Remove the pressure release screw (E11).
5. See [Figure 25](#). Install the inner cover (9) on top of the cover (2).



Note

Align the inner pan mounting holes on the top cover holes.

6. Make sure the lamp holder assembly (8) and lamp (7) are correctly positioned and that the wires of the lamps 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 (10). Apply a droplet of Loctite 222 to the last threads. Torque screws to 22 +/- 4 inch-pounds (2.5 +/- 0.5 Nt-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.

6.7 Testing for Leaks

To test for leaks, perform the following procedure:

1. See [Figure 26](#).

Remove pressure relief screw.

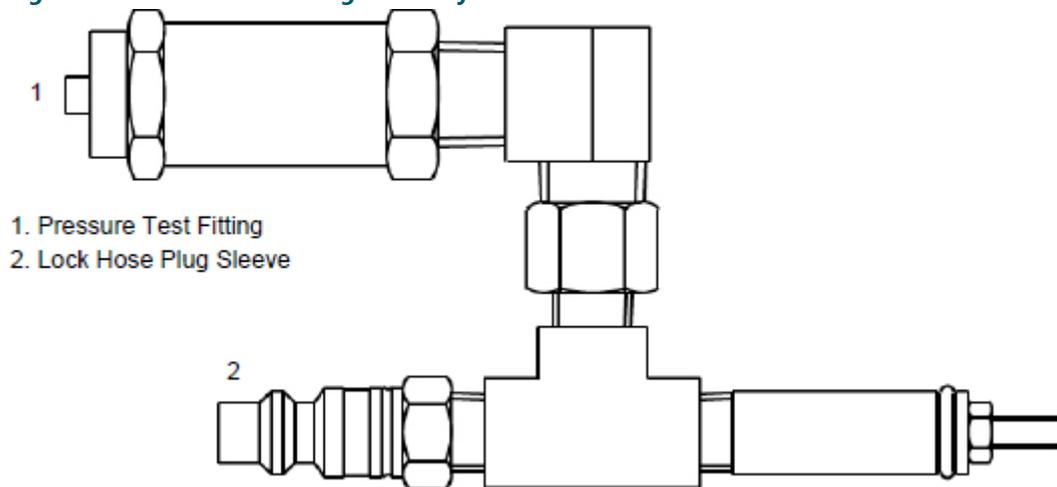
2. See [Figure 27](#).

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

Figure 26: Pressure Relief Screw



Figure 27: 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.

7.0 Parts

To order parts, call ADB Safegate Customer Service or your local representative. This subsection describes how to use the parts diagrams covered later in this section. It does not provide the actual parts list.

ALSF Ordering Code

44A6148 - X000

Color

- 1 = White (Style A)
- 2 = Green (Style B)
- 3 = Red (Style C)

Notes

- A Shorting Device is also available. If any lamp opens, the shorting device places a short on the secondary of the isolation transformer. This allows certain monitoring systems to detect a lamp out. The shorting device ordering code is 44A6143.
- To retrofit into older FAA -E-2491 applications, a flange ring is required. The flange ring ordering code is 128A145 -SS-G.

MALSR Green Ordering Code

44A6440 - 1000

Notes

- For FAA -E-2968 MALSR system, Style II, unidirectional green applications, this fixture uses three 62 W lamps and is a photometric equivalent to the older style 200 W L -850E fixtures that were used in this application. FAA -E-2968 MALSR applications are not toed.
- Encapsulated (FAA Style) isolation transformers are available for voltage - driven, medium-intensity approach lighting applications. For three 62 W lamp applications, a 186 W, 240 VAC to 28.2 VAC transformer is used (Part No. 35C0096).

MALSR White Ordering Code

44A6440 - 2000

Notes:

- For FAA -E-2968 MALSR medium-intensity system, Style I, unidirectional white applications, this fixture uses one 105 W lamp and is a photo - metric equivalent to the older style 200 W L -850B fixtures that were used in this application. FAA -E-2968 MALSR applications are not toed.
- Encapsulated (FAA Style) isolation transformers are available for voltage - driven, medium-intensity approach lighting applications. For 105 W, 240 VAC to 15.9 VAC applications, use transformer Part No. 35C0095.

7.1 F-Range IAML Parts List

Table 11: Assembly Common Parts

Description	Part No.
Cable assembly, series jumper	44A5955
Cable clamp	4071.50.090
Cord set, L-823	73A0133-35
Cord set grommet	63A1014
Cord set terminal, female	6111.87.140
Filter spring clip	4071.50.160
Lamp retainer spring	4071.58.510
O-ring, pressure release screw	63B0267-011
O-ring, top cover	MS00001-376-01
Pressure release screw	60A2602
Prism clamp	4071.50.360
Prism gasket sleeve	4071.50.030

Table 11: Assembly Common Parts (continued)

Description	Part No.
Prism keeper plate	4071.50.052
Seal, prism keeper plate	4071.50.041
Terminal block assembly w/o film disc cutout	44A6112-1

Table 12: ALSF Only Spare Components

Description	Part No.
Lamp, 105 W, 6.6 A	2990.40.900
Lamp holder assembly	1411.22.002
Lamp holder, left	44A6192-1
Lamp holder, right	44A6192-2
Prism	1428.00.300
Prism, green	1428.00.280
Prism, red	1428.00.270

Table 13: MALSR Only Spare Component

Description	Part No.
Filter, MALSR green	63A0963-1
Lamp, 62 W, 6.6 A	48A0386
Lamp, 105 W, 6.6 A	2990.40.900
Lamp holder assembly	1411.22.001
Prism	63A0993-3

Figure 28: F-Range High Intensity Style 2 Approach Light (44A6148)

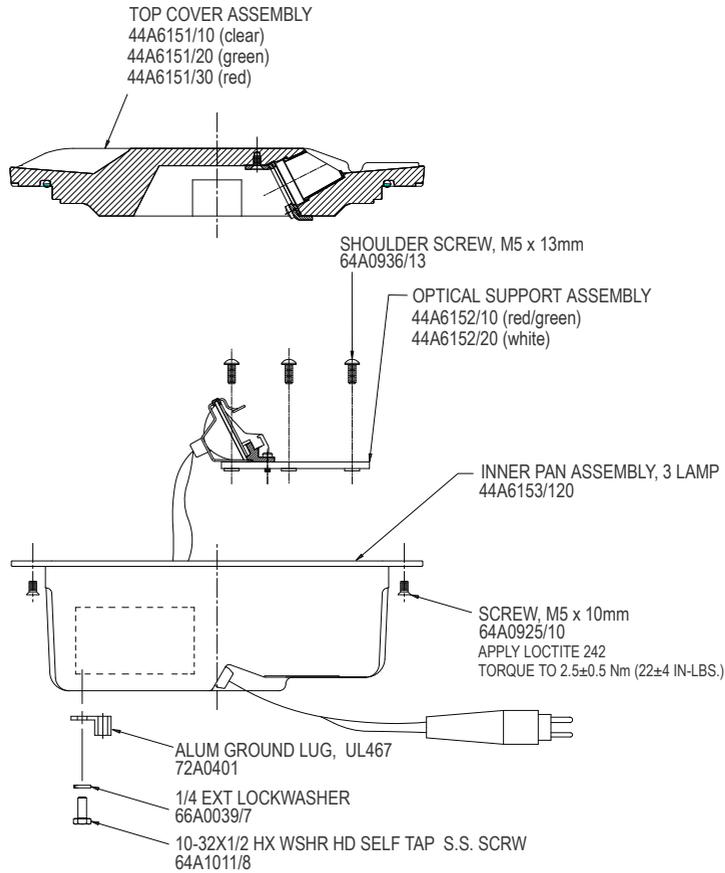
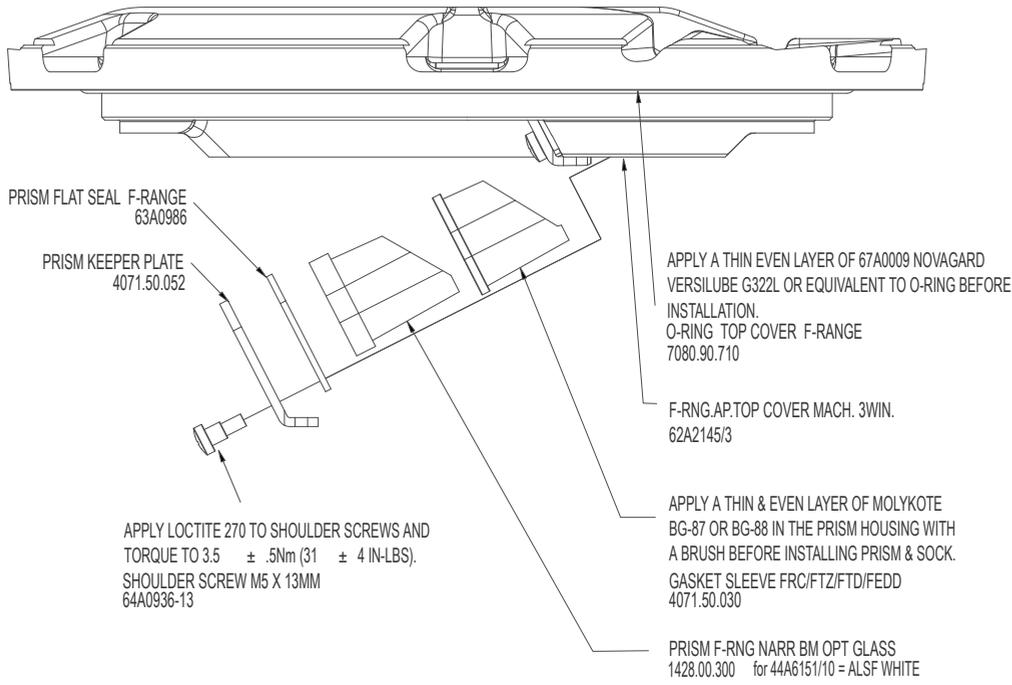


Figure 29: Top Cover 44A6151/XX1

44A6151/10 shown



CONFIG	ITEM 6 PART NUMBER	ITEM 6 PART DESCRIPTION
/10	1428.00.300	PRISM, COATED CLEAR
/20	1428.00.280	PRISM, COATED GREEN
/30	1428.00.270	PRISM, COATED RED
/11 /21	63A0993/3	PRISM, NARROW BEAM, COATED
/12	63A0993/2	PRISM F-RNG NARR BM OPT GLASS

44A6151/XX X

- 20 = ALSF GREEN
- 30 = ALSF RED
- 11 = MALS R THRESHOLD 3 LAMP (GREEN)
- 21 = MALS R THRESHOLD 1 LAMP (WHITE)
- 12 = IRGL

USE 62A2145/1 TOP COVER

Figure 30: Optical Assembly 44A6152/XX

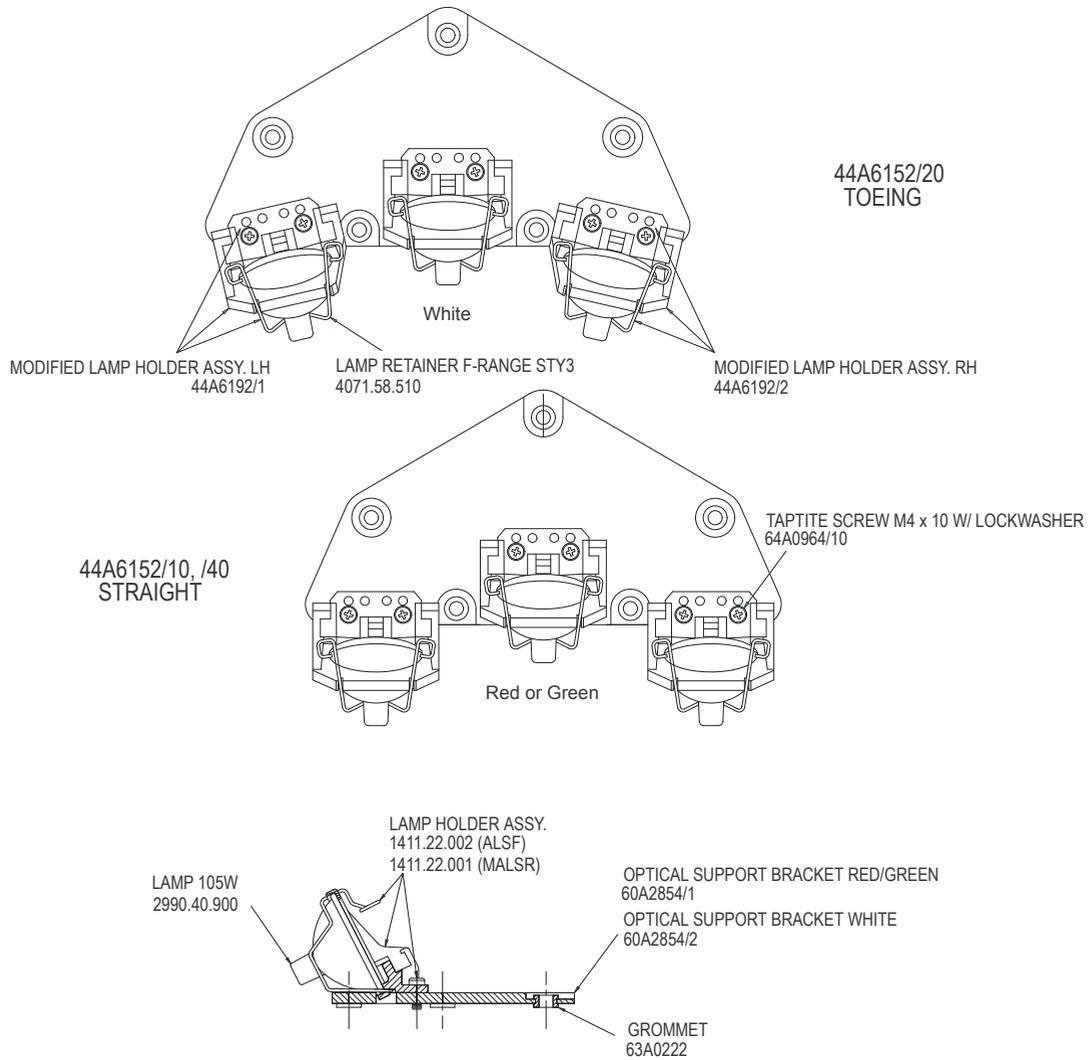
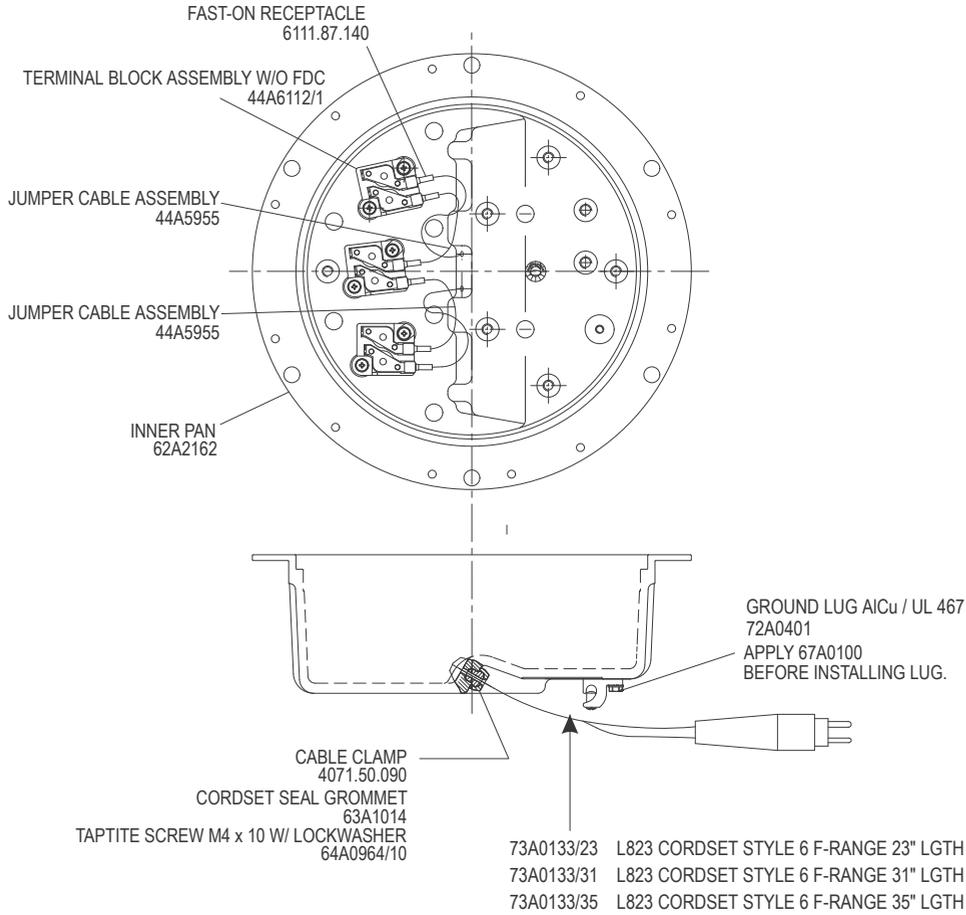


Figure 31: Bottom Cover



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**

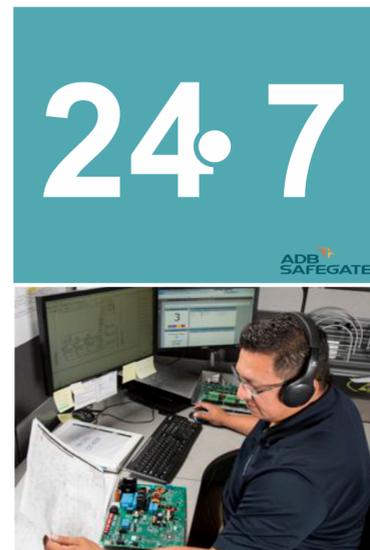
ADB SAFEGATE Americas Technical Service & Support (International): +1-614-861-1304

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 labeled 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.

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