

# AXON EQ ADAL (Adaptive Airfield Lighting) – 8-Inch and 12-Inch

**Service Road Safety System; Apron Push Back Support; Dynamic Holding Position; Follow the Green**

## User Manual

**UM-5108, Rev. 1.2.1, 2026-Nov-13**

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 C22.2 No.180:13 (R2018) regulations. The CSA directives that have been taken into consideration in the design are available on written request to ADB SAFEGATE.

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## Note

See your sales order contract for a complete warranty description.

Replaced or repaired equipment under warranty falls into the warranty of the original delivery. No new warranty period is started for these replaced or repaired products.

## Liability

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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 this 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 symbols shown below.

| | |
|---|---|
|  | WARNING<br>Failure to observe a warning may result in personal injury, death or equipment damage. |
|  | DANGER – Risk of electrical shock or ARC FLASH<br>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<br>Failure to observe may result in serious injury. |
|  | WARNING – Do not touch<br>Failure to observe this warning may result in personal injury, death, or equipment damage. |
|  | CAUTION<br>Failure to observe a caution may result in equipment damage. |
|  | ELECTROSTATIC SENSITIVE DEVICES<br>This equipment may contain electrostatic devices. |

## Qualified Personnel

| | |
|---|---|
|  | **Important Information**<br>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.<br>Always use required personal protective equipment (PPE) and follow safe electrical work practice. |


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# 1.2 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 these instructions can result in serious injury, death 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.
- CSA – C22.2 No.180:13 (R2018), series isolating transformers for airport lighting.
- 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.

# 1.3 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

**Failure to follow this instruction can result in serious injury, death and / or property and equipment damage**


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## 1.4 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 elements and kept free of condensation and dust.

**Failure to follow this instruction can result in equipment damage**

## 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 serious injury, death or equipment damage.**

## 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 OR REPLACE MALFUNCTIONING COMPONENTS ACCORDING TO INSTRUCTIONS PROVIDED IN MANUAL.

**FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN DEATH OR EQUIPMENT DAMAGE**


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## 1.7 Material Handling Precautions: Fasteners



### DANGER

**FOREIGN OBJECT DAMAGE - FOD**
THIS EQUIPMENT MAY CONTAIN FASTENERS THAT CAN LOOSEN UNLESS TORQUED PROPERLY.

- ONLY USE FASTENERS OF THE SAME TYPE AS ORIGINALLY SUPPLIED WITH THE EQUIPMENT.
- USE OF INCORRECT COMBINATION OF GASKETS, BOLTS AND NUTS CAN CAUSE SEVERE DAMAGE TO THE PRODUCT AND CREATE MULTIPLE SAFETY RISKS .
- YOU NEED TO KNOW WHAT BASE THE LIGHT FIXTURE WILL BE INSTALLED IN, IN ORDER TO CHOOSE 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).
- USE ONLY ANTI-VIBRATION WASHERS WITH THE FIXING BOLTS AS DEFINED IN FAA EB 83 (LATEST EDITION) TO AVOID THE RISK OF LOOSENING BOLTS . DO NOT USE OF ANY OTHER TYPE OF WASHER (SUCH AS SPLIT-LOCK WASHERS). FOR INSTALLATION OTHER THAN FAA, USE THE BASE CAN MANUFACTURER'S RECOMMENDATIONS.
- ALWAYS TIGHTEN THE FASTENERS TO THE RECOMMENDED TORQUE USING A CALIBRATED TORQUE WRENCH.
- APPLY THE RECOMMENDED TYPE OF ADHESIVE AND FOLLOW THE ADHESIVE INSTRUCTIONS CAREFULLY.

**FAILURE TO FOLLOW THESE WARNINGS MAY CAUSE THE FASTENERS TO LOOSEN, POSSIBLY DAMAGING THE EQUIPMENT. THIS CAN LEAD TO THE HIGHLY DANGEROUS SITUATION OF FOD, WITH POTENTIALLY 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.

## 1.8 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**


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# 2.0 About this Manual

This document includes AXON adaptive taxiway inset light fixture information with a focus on safety and step-by-step procedures for installation and maintenance..

For more information, see www.adbsafegate.com.



IMPORTANT

Read this entire document before any work is started.

This manual covers the following 12-inch and 8-inch light fixtures:

- ICAO taxiway centerline
- ICAO stop-bar

# 2.1 How to work with the Manual

- Familiarize yourself with the structure and content.
- Carry out the actions completely and in the given sequence.


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## 2.2 Abbreviations and Terms

This document may include the abbreviations and terms listed below.

| Abbreviation | Description |
|---|---|
| AGL | Airfield Ground Lighting |
| ANSI | American National Standards Institute |
| ATM | Air Traffic Movement |
| CAA | Civil Aviation Authority |
| CCR | Constant Current Regulator |
| EASA | European Union Aviation Safety Agency |
| FAA | Federal Aviation Administration |
| ICAO | International Civil Aviation Organization |
| IEC | International Electrotechnical Committee |
| IEEE | Institute of Electrical and Electronics Engineers |
| ILCMS | Individual Light Control and Monitoring System |
| LED | Light Emitting Diode |
| NATO | North Atlantic Treaty Organization |
| OFDM | Orthogonal Frequency Division Multiplexing |
| PWM | Pulse Width Modulation |
| STAC | Service Technique de l'Aviation Civile (France |
| STANAG | Standardization Agreement (NATO) |
| UFC | Unified Facilities Criteria |


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# 3.0 Introduction

ADB SAFEGATE's AXON EQ ADAL (Adaptive Airfield Lighting) fixtures represent a new era in airfield lighting technology, designed to meet the evolving needs of modern airports worldwide. Engineered for flexibility, intelligence, and reliability, ADAL lights go far beyond traditional visual aids, unlocking adaptive, scenario-based signaling that actively supports airside safety, efficiency, and sustainability.

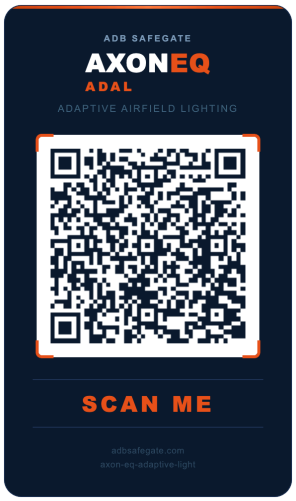
AXON EQ ADAL adaptive lights bring next-generation intelligence to airfield ground lighting. Featuring EQ with integrated LINC360 remote control and monitoring, ADAL fixtures deliver multi-color signaling that adapts to changing operational needs. ADAL empowers airports to automate guidance, optimize throughput, and future-proof their operations.

ADAL fixtures go beyond traditional visual aids. They offer adaptive, scenario-based illumination that supports airside safety, efficiency, and sustainability. These lights deliver immediate, targeted guidance for both pilots and ground personnel, responding dynamically to operational needs. Whether increasing safety during ground maneuvers, improving aircraft movements, or optimizing throughput, ADAL lights help airports address complex operational challenges.

Built for seamless integration and scalable deployment with our Linc360 ILCMS, ADAL lights offer airports the agility to adapt visual signaling across diverse operational environments and use cases. By leveraging intelligent automation and customizable signaling, airports can elevate ground movement processes, minimize risks, and future-proof their infrastructure for tomorrow's demands.

With AXON EQ ADAL light fixtures, airports are empowered to transform airside operations, making ground movement smarter, safer, and ready for the challenges ahead.

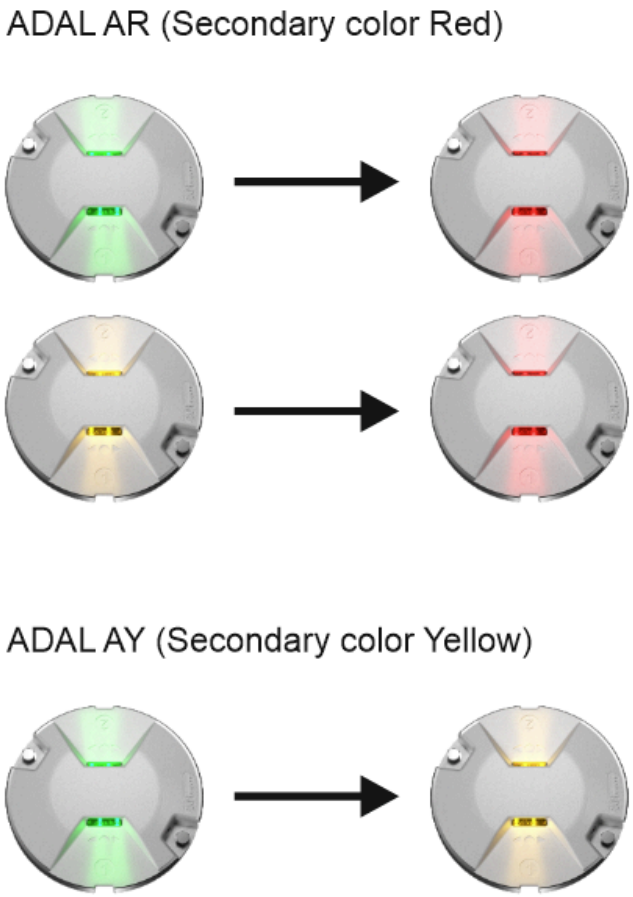
**Figure 1:** Safe Ground Movement Control Demonstration Videos




https://adbsafegate.com/what-we-do/axon-eq-adaptive-light/


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**Figure 2:** AXON ADAL Configurations





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# 3.1 Product Information

## Compliance with Standards

| | |
|---|---|
| **FAA** | AC 150/5345-46 and FAA Engineering Brief No. 67 |
| **ICAO** | Annex 14, Volume 1 |
| **IEC** | 61827 |
| **EASA** | CS-ADR-DSN |
| **STAC** | SPE/STAC/SE/E/VIS/6008 |
| **Canada** | TP 312 |
| **Australia** | MOS 139 |

CE

## Uses

**ICAO**

- Taxiway centerline
- Stop bar
- Intermediate holding position

**FAA**

- L-852C(L) taxiway centerline
- L-852K(L) taxiway centerline

## Use Cases

- Service road safety system
- Apron push back support
- Dynamic holding position
- Follow the Green

## Operational Key Benefits

By integrating AXON EQ ADAL (adaptive light) fixtures, airports can significantly elevate the safety, efficiency, and reliability of airside operations, making ground movement smarter, safer and future-ready.

- **Enhanced Safety:** Immediate, adaptive visual cues reduce risk of accidents, injuries, and incursions.
- **Operational Efficiency:** Automation streamlines ground processes, saving time and reducing fuel consumption.
- **Optimized Positioning:** ADAL lights dynamically adapt stopping points for different ground movements, maximizing resource utilization.
- **Flexibility & Scalability:** ADAL lights can be programmed for multiple scenarios, adapting to airports of any size or complexity.
- **Sustainability:** Intelligent dimming and targeted illumination help reduce energy consumption and carbon footprint.


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## Technical Features and Benefits

### Efficiency

- Fully configurable operation to adapt to customer requirement and operational needs. ADAL lights allow switching between signals/colors
- EQ has an integrated ILCMS remote for use with the LINC 360 system providing high data capacity and resisting degradation from various types of radio effects to provide a superior communication platform
- Precision aimed optics enhancing photometric performance and complementing extended LED life
- Reduced bottom pan profile allowing for very shallow base can installation
- LED pulse width modulated (PWM) at 400 Hz optimizing LED performance and eliminating perceptible flicker to a moving human observer throughout the range of brightness steps
- Operates at all steps of constant current regulator technologies designed in compliance with IEC or FAA requirements
- Low protrusion, high-intensity, Style 3 (≤ 6.35 mm) inset light fixtures
- No negative slope in front of the prisms

### Sustainability

- Latest generation LEDs providing a long-lasting light source with high efficiency and low power consumption
- Reinforced top cover substantially exceeding standards to improve durability and longevity (directional beams only)
- IP68 rated enclosure designed for harsh environments; all fastenings are stainless steel
- Reinforced prism available as an option
- Compatible with existing infrastructure allowing for direct replacement of existing LED inset fixtures

### Safety

- Improved mechanical design to strengthen and consolidate components, improving the customer maintenance experience
- Robust lightning protection complying with ANSI/IEEE C62.41-1991; Location Category C2 as required by FAA Engineering Brief 67 Category C2 is defined as a 1.2/50 µS – 8/20 µS combination wave, with a peak voltage of 10,000 V and a peak current of 5,000 A


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## Power Supply Options

- EQ with integrated ILCMS with OFDM technology for use with LINC 360 system

## Installation and Maintenance

The light fixture can be installed in a 12-inch or an 8-inch base. Gaskets are sold separately. Refer to the user manual INTEROPERABILITY appendix to identify the correct gasket and bolts for your specific base and ensure a reliable fit.

## Operating Conditions

| | |
|---|---|
| **Operating temperature** | -55 °C to +55 °C / -67 °F to +131 °F |
| **Storage temperature** | -60 °C to +80 °C / -76 °F to +176 °F |
| **Humidity** | Up to 100% |

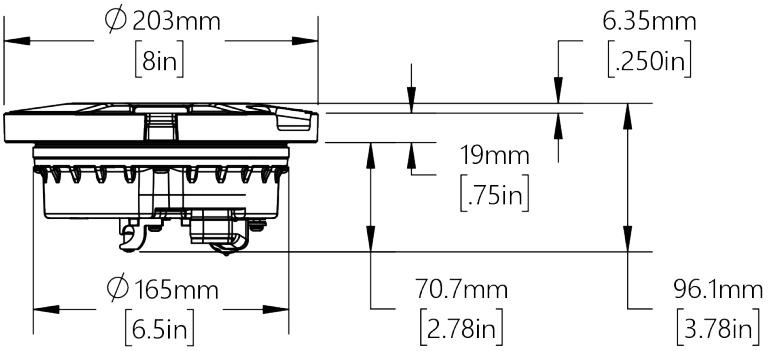

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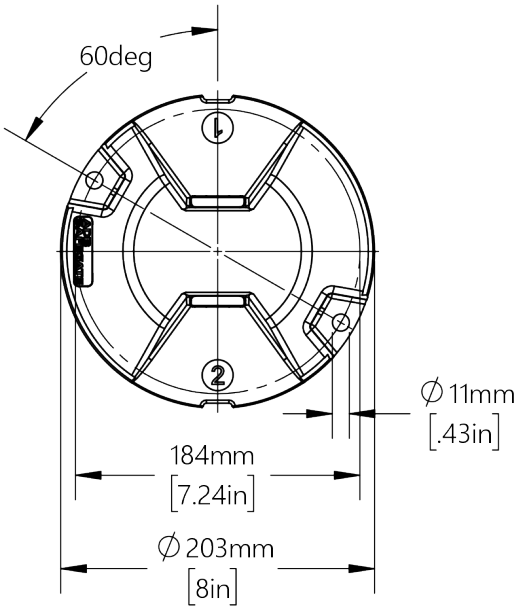
## 3.2 Dimensions and Weight

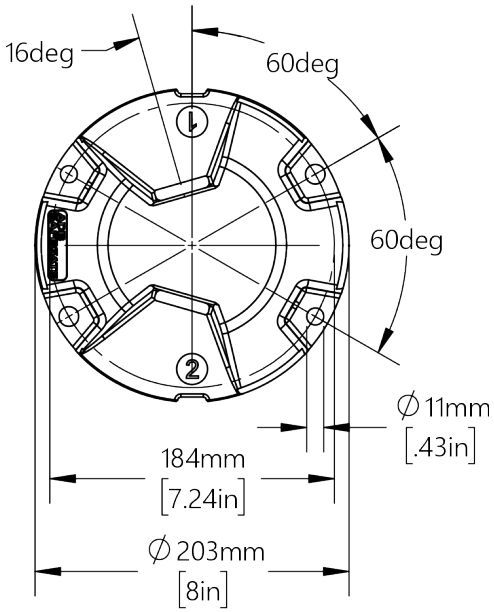
The weight and measurement of the light fixture.depends on the version

| Version | Weight | Dimension |
|---|---|---|
| **ADAL** | 6.8 kg / 15 lb (12 in) | 304 mm / 12 in |
| **ADAL** | 3 kg / 6.6 lb (8 in) | 203 mm / 8 in |

**Figure 3:** Fixture dimensions – 8-inch taxiway lights



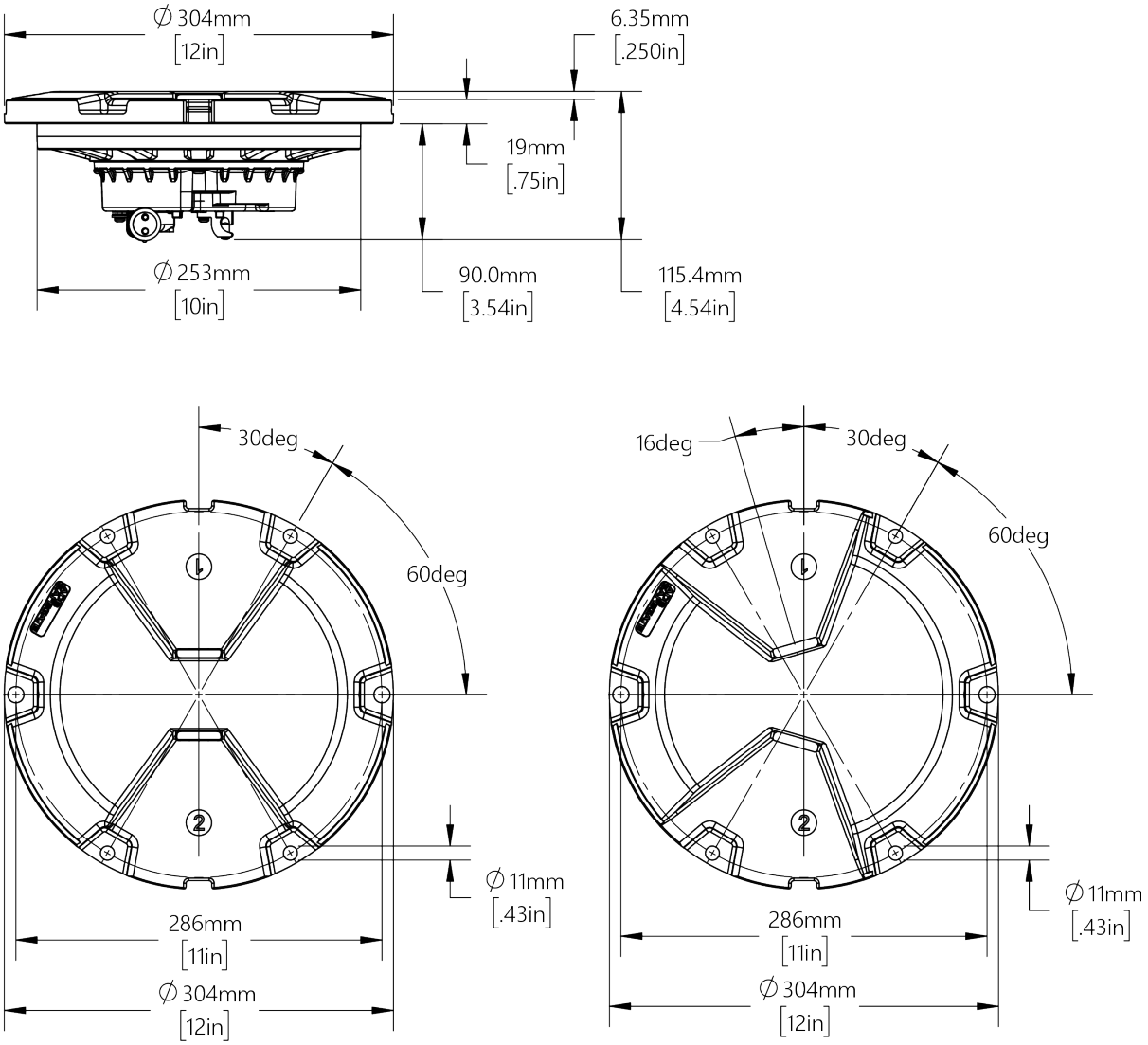





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**Figure 4:** Fixture dimensions – 12-inch taxiway lights





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# 4.0 Pre-Installation Guidelines

Effective installation starts with thorough preparation and thoughtful planning. Please review this entire section before proceeding to to ensure your process is seamless, safe, and optimized for long-term reliability.

## 4.1 Safety Considerations

- Read the installation section in its entirety before you begin installation and follow all instructions for installing components and accessories.
- Understand the requirements of all system components. This will help you install the system safely and efficiently.
- Refer to FAA AC 150/5340-30 (latest revision) for design and installation details for airport visual aids and ICAO Annex 14, Volume I, paragraph 5.3.9 for runway edge lights.
- Use the site plans and specifications for instructions about installing light fixtures.

### DANGER

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.
- 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.
- 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.
- DO NOT DAMAGE THE CABLE INSULATION.
- ALWAYS SWITCH OFF POWER TO THE SERIES CIRCUIT BEFORE INSTALLING OR REMOVING ANY FIXTURE.

## 4.2 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.


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# 4.3 Delivery Inspection and Unpacking

1. Upon receipt of goods, inspect all packaging for visible damage.
   - If packaging is damaged, open the affected packaging and check the equipment for damage. Take care not to damage the cable insulation when unpacking the equipment or when it is unpacked.

   **IMPORTANT**
   If damage to the equipment is detected, immediately complete a claim form with the carrier. The carrier may need to inspect the equipment.
2. Store the equipment in its original packaging in a clean, dry, and protected indoor area.
3. Unpack at the installation site just before installation to avoid damage during transportation and handling.

### Verify Specifications and Record Product Information

When opening the box, verify that the light fixture's specifications — such as type and color — match the design requirements. If the specifications do not match, contact ADB SAFEGATE Support.

If you are installing a fixture where control and monitoring will be activated later, record product information, including PID/SN and the fixture's location, in your site documentation table. This information is essential for enabling remote activation and effective management of control and monitoring from the substation.

# 4.4 Verify Input Requirements and Equipment Needed

Make sure that:

- The fixture is connected to a 6.6 A series lighting circuit using an L-830 (60 Hz) or L-831 (50 Hz) isolation transformer.
- The series circuit is powered by a Constant Current Regulator (CCR) that complies with IEC 61820-3-2 or FAA AC 5345-10 (latest revision).
- The isolation transformer complies with IEC 61823 or FAA AC 5345-47 (latest revision), and its power does not exceed 150 W.
- You have all necessary tools and materials ready for installation (not supplied). Consider any additional tools needed for your specific site conditions.


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# 5.0 Installation

This section provides instructions on how to install and remove in-pavement light fixtures. **Read the instructions in their entirety before starting installation.** Follow airport project plans and specifications for specific instructions. All work must meet the National Electric Code and local codes.

## Before Installation

- Read and understand Safety and Safety Considerations.
- For detailed information on compatibility with various bases and recommended torque values, refer to the INTEROPERABILITY – 12-Inch and 8-Inch appendix. For bases from other manufacturers, refer to their specifications. Use the correct gasket, bolts, and nuts for the base.



**CAUTION**

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


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# 5.1 Types of Bases

**Note**
Install the inset light fixture in a base supplied by ADB SAFEGATE, carefully following the provided instructions. If you need to install the fixture on a different base or adapter ring not supplied by ADB SAFEGATE, please contact us for guidance.

## Shallow Bases – Class 1 Direct-Mounted

**Figure 5:** Cross section

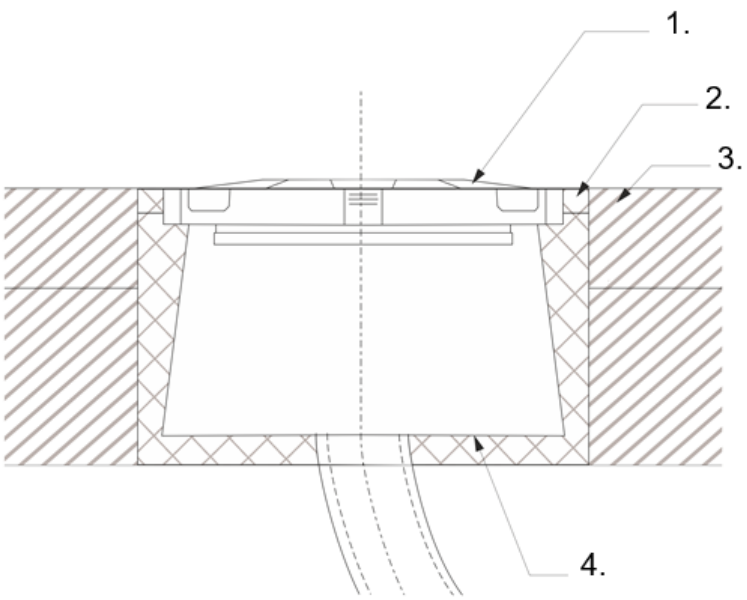



**Figure 6:** 12-inch

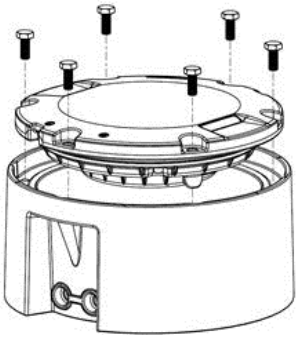
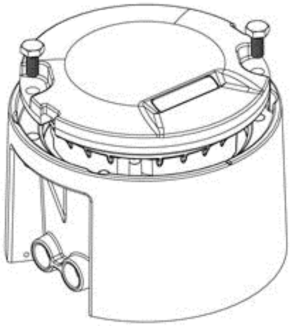


**Figure 7:** 8-inch



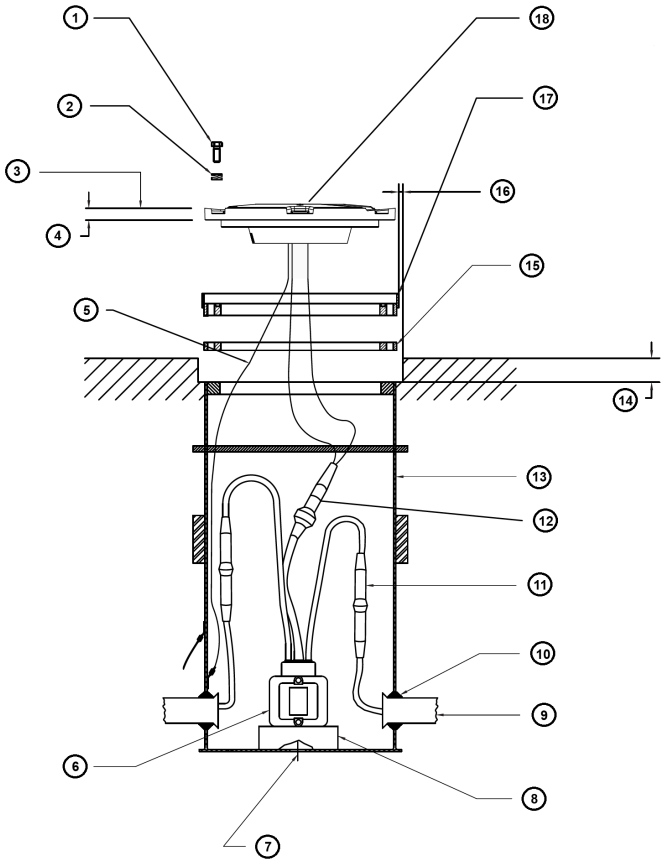
| Call-out | Description |
|---|---|
| 1. | Light |
| 2. | Resin |
| 3. | Pavement |
| 4. | Base bottom entry |

The 8-inch and 12-inch class 1, direct mounted diameter shallow base is secured in the pavement by means of resin. Correct positioning is obtained with a leveling jig with a sighting telescope. Wires between the light and the series transformer are installed either in saw cuts in the pavement filled with resin or in pipes in the lower concrete layers. Mounting an 8-inch light fixture in a 12-inch diameter base is made possible by means of dedicated adapter rings.


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## Steel Bases – FAA L-868B Size B

A 12-inch light fixture is installed in a 12-inch base. An 8-inch diameter light can be installed in an 8-inch base or, with the use of a snow ring or an adapter ring, in a 12-inch base. The bases are interconnected by means of conduits protecting the cables. The series transformer is installed under the light or in a separate pit. Torque according to: FAA EB-83 (latest revision).

| Fixture installed in a 1-piece base can | Description |
|---|---|
|  | 1) 3/8-16 hex cap screw, per the latest revision of FAA EB-83 |
| | 2) 3/8-in anti-vibration washer, per the latest revision of FAA EB-83 |
| | 3) Fixture top edge: +0/-1/16 in below grade |
| | 4) 0.75 in |
| | 5) Ground wire |
| | 6) Isolation transformer (size as required) |
| | 7) 3/4-in drain hole (centered) |
| | 8) Transformer support (typ.) |
| | 9) 2-in PVC conduit with bell end |
| | 10) Grommet |
| | 11) L-823 primary connector (typ.) (heat-shrink optional) |
| | 12) L-823 secondary connector |
| | 13) L868B light base |
| | 14) 1-1/2 in (typ.) |
| | 15) L868B spacer ring(s) [1] |
| | 16) 1/4-in-wide × 1-1/2-in-deep groove (typ.) |
| | 17) L-868B flange ring, 12.25-in O.D., 3/4 in thick, 5402/12Y, with O-ring gasket (typ.) |
| | 18) L-85X-type semi-flush light fixture (typ.) |

[1]To maintain the FAA installation tolerance of +0/-1/16 in below grade, use no more than three spacers.

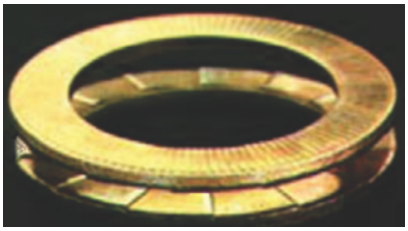

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## Anti-Vibration Washer – Installation Requirements

- Use only the specified anti-vibration lock washers, as described in FAA AC 150/5340-30, Chapter 10, and FAA Engineering Brief No. 83 (latest revision).
- Install the lock washer correctly. The cams (or steps) of each half of the lock washer must face each other. See image below.

**CAUTION**
Do not use other types of washers, such as split washers. Using the wrong washer type can cause mounting bolts to loosen.

**Figure 8:** Anti-vibration washer




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# 5.2 Installing Fixture into a Class 1 Direct-Mounted Base

## Tools Required

The following tools are recommended for installation:

- Drill / driver with 21 mm (9/16-inch) socket
- Torque wrench with 21 mm (9/16-inch) socket (Do not use an impact wrench)
- Two large flat head screwdrivers to lift edge of fixture to reposition if necessary
- One brush or cloth
- Optional - air compressor with high pressure nozzle to assure surface is free of debris

## Grounding the Fixture

If grounding the fixture, attach the braided ground strap or wire to the grounding point on the fixture using a ground lug or grounding screw and tighten to 2.5 Nm. The grounding point is marked on the bottom of the fixture.

## Mounting the Fixture in the Base

- Clean all contact surfaces of the light fixture and the base.
- Put the O-ring gasket in the gasket track.

**Note**

For detailed information on compatibility with various bases and recommended torque values, refer to the INTEROPERABILITY – 12-Inch and 8-Inch appendix.

- Place the fixture into the base. Make sure the secondary cables are inside the base and not pressed between the light and the base.

## Toe-in Alignment of the Fixture

See Toe-In section for toe-in properties of each fixture version.

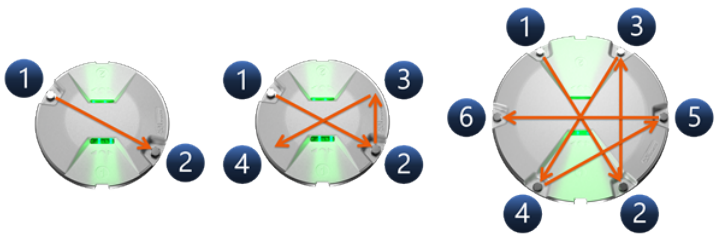
## Attaching the Fixture to the Base

Use a torque limiting box spanner (16/17 mm) or calibrated torque wrench to **pre-tighten bolts to 5 Nm** in the star torque patterns shown below. Continue tightening in the same star pattern until the final recommended torque value is reached. Refer to the INTEROPERABILITY – 12-Inch and 8-Inch appendix.

**CAUTION**

Do not use impact or high speed (>35 rpm) tools. Incorrect tightening can damage threads and fixture.

**Figure 9:** Torque pattern – for 8-inch 2-bolt, 8-inch 4-bolt and 12-inch 6-bolt





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## Installation Inspection and Water-Tightness Test

- Visually inspect the installation (the fixture must be evenly seated in the base).
- Make sure the bolt and washer are flush with the light fixture.
- Test the Light Fixture for Leaks (Water-Tightness)
- Ensure all tools and items are removed from the work area.

## Post-Installation Maintenance

After one week, the break loose torque may drop below the recommended value. This is typically due to slight settlement following installation. Perform a re-torque and visual inspection of each light fixture.

- Check for any installation issues or settlement.
- If issues are found, continue weekly inspections and investigate the cause.
- If inspection is successful, for future maintenance see Basic Maintenance Program and Recommended Maintenance Program. For best results, adjust the program using local risk assessment and data analysis.

## Dismounting the Fixture from Base

- Use two large flat blade screwdrivers to carefully remove the light fixture from its base.
- Disconnect the secondary power supply connector cable.
- Remove and **discard the O-ring gasket and bolts**. Do this every time you remove the light fixture from its base.



### CAUTION

To prevent fall and trip hazards when the base is open use a cover or spare fixture.

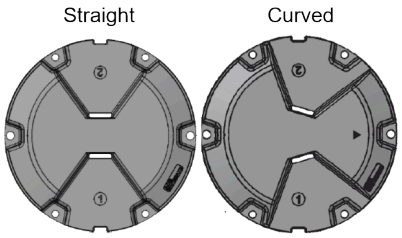

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# 5.3 Toe-In

Taxiway light fixtures are either straight (no toe-in) or provided with a built-in curved toe-in as shown below

| | |
|---|---|
| **Straight** | Fixtures with a straight light beam (no toe-in). |
| **Curved** | Fixtures with a curved top cover that directs the light beam at an appropriate angle |

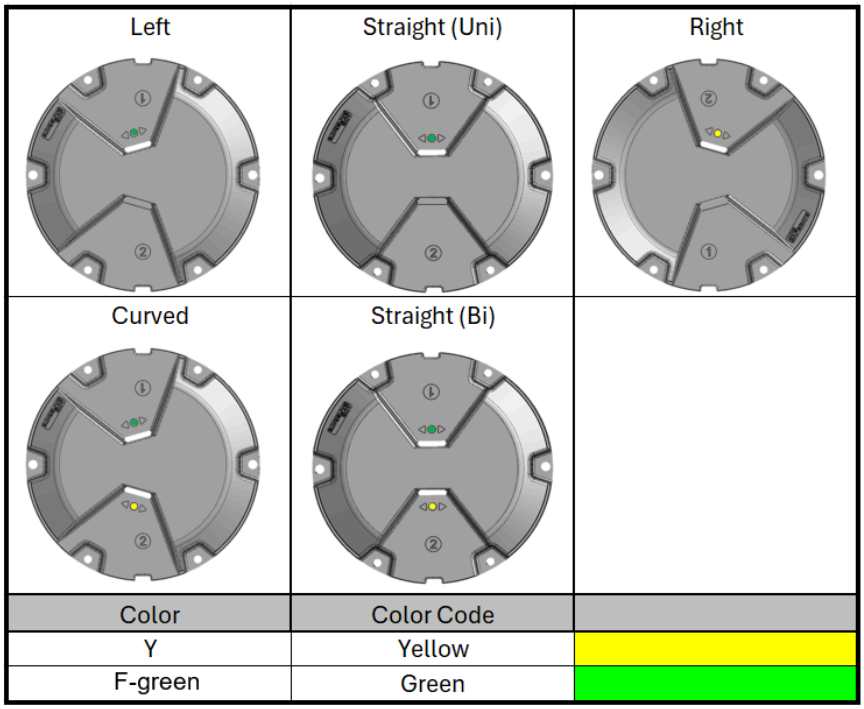
**Figure 10:** Toe-in types




## Definition of Light Emission Directions

The primary color of the light is indicated with a painted dot on the top cover in front of the prism.

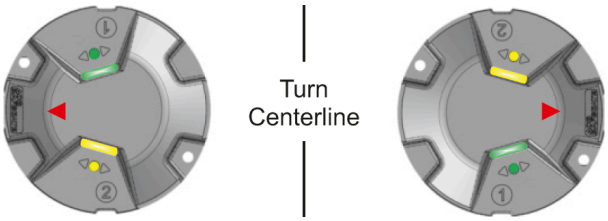
**Figure 11:** Light emission direction





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## Toe-In Color Coding




Left and right side determined by viewing fixture from interior turn radius pavement edge. Side 1 is on your left, side 2 is on your right.


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## 5.4 EQ Configuration – ILCMS Remote and Sensor

To learn more about updating or configuring our EQ light fixtures equipped with internal ILCMS remote and sensor technology, please refer to our LINC360 manuals. These comprehensive guides cover firmware updates, configuration options and instructions on integrating EQ lights into the ILCMS system.

Learn more about LINC360 at: https://adbsafegate.com/what-we-do/airfield/linc-360/


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# 6.0 Maintenance

This section describes different steps for maintenance of the light fixture. You can ensure airfield safety and visibility while maintaining the integrity and performance of the inset light fixtures by following these detailed instructions.

Before you start, make sure you have read and understand Safety instructions.

Find out the location of the light unit that needs maintenance. If the purpose is to replace an existing light unit with new one, make sure that corresponding unit is available. Find the type information on the identification tag with details of name.

Spare parts are available, if required. For more information, see www.adbsafegate.com Spare Parts, or contact ADB SAFEGATE for assistance.



**CAUTION**

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

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

Failure to follow these cautions can result in equipment damage or aircraft FOD. Refer to the INTEROPERABILITY – 12-Inch and 8-Inch appendix.

# 6.1 Basic Maintenance Program

It is important to understand that even though a LED fixture requires substantially lower maintenance in regard to the replacement of the light bulbs, some parts of the light fixture remain the same and still require the same level of maintenance (prisms, top cover, bolts).

There are recommended maintenance tasks to ensure that the equipment is in correct operating condition.

**Table 1: Maintenance tasks**

| | |
|---|---|
| **Weekly** | ▪ Visual inspection of the light fixture.<br>▪ Removal of dust from external surfaces of the light fixture. |
| **Monthly** | ▪ Check optical window for cleanliness, mechanical damage or moisture/condensation on the inside of the prism<br>▪ Check for improper torque on mounting bolts. Re-torque if needed. |
| **Bi-yearly** | ▪ Check for presence of water in mounting support by unscrewing and lifting light fixture from base and check for water ingress and corrosion. Replace gasket between light fixture and base. |
| **Yearly** | ▪ Detailed inspection of the light fixture<br>▪ Check of the body resistance, check for mechanical damage (for example cracks around the prism windows).<br>▪ Clean optical windows |
| **After snow removal** | ▪ Check for damaged light fixtures. Any damaged light fixtures should be replaced and brought in and properly investigated and repaired. |

**A daily function check is referred to in the document:**

*ICAO, Airport Services Manual Part 9, Airport Maintenance Practice and FAA AC 150/5340-26A, Maintenance of airport visual aids facilities*.

Any issues found during maintenance tasks should be corrected accordingly and properly documented.

A proper asset management system, such as ADB SAFEGATE's CORTEX Service, helps to store and document data. The system gives important information about local conditions. Use this information for preventive maintenance planning. Preventive maintenance can reduce the need for reactive maintenance. For more information visit https://adbsafegate.com/services/airside-maintenance/


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# 6.2 Recommended Maintenance Program

## Service Life and Inspection Intervals

All products have an expected service life. Service life is the lifetime of the product and reaching the end means that it is no longer serviceable and should be replaced.

There are several key external factors that influences the service life of a product.

- Aircraft traffic movements
- Location on the airfield
- Inspection and maintenance frequency
- Chemical usage

## Air Traffic Movements (ATM)

The expected lifetime of a light fixture will be highly impacted by the traffic volume and the number of aircraft that are mechanically putting stress on the light fixtures. Airports with a higher traffic volume will have a light fixture with a shorter expected lifetime than an airport with a lower traffic volume.

The ATM can be divided into three categories for the recommendation of inspections as well as for the expected lifetime of a light fixture.[1]

- 0-100k movements/year
- 100k-200k movements/year
- >200k movements/year

[1]Based on ADB SAFEGATE's field experience and investigation made in close collaboration with an independent consultant and the airport team.

## Location on the Airfield

The expected lifetime of a light fixture is highly dependent on the location where it is installed on an airfield. Three different areas have been defined by color categorization that are exposed to a different degree of mechanical impact. These three categories are used as a basis for the recommendation of inspections as well as for the expected lifetime of a light fixture.

- **Red** – Touch Down Area defined as 6m from either side of the runway centerline for a distance starting from 50m before the TDZ markings and extending to 200m beyond the TDZ markings as seen from the landing direction.
- **Red** – Rapid Exit Taxiway centerline lights from the runway centerline to 50m beyond the edge of the runway.
- **Amber** – All runway areas outside the Red areas.
- **Amber** – All taxiway areas outside the Red areas, including taxiway intersections for which more than 50% of the aircraft traffic turn more than 45 degrees.
- **Green** – Areas outside Red and Amber areas



**NOTICE**

A reliable means of recording the location history of fittings (i.e. ADB SAFEGATE's CORTEX Service) is recommended to ensure that the maximum duration in critical red areas of the runway is not exceeded.


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## 6.2.1 Inspection Intervals and Expected Service Life

To ensure reliable performance, optimize your airside operations and extend expected service life, refer to the Recommended Inspection Intervals table, the Detailed Inspection Checklist, and the Visual Inspection Checklist below to plan inspections.

### Recommended Inspection Intervals

Based on the air traffic movements (ATM) and location on the airfield, the following table was created for recommended inspection intervals:

| ATM | Red | | Amber | | Green | |
|---|---|---|---|---|---|---|
| | Visual inspection | Detailed inspection | Visual inspection | Detailed inspection | Visual inspection | Detailed inspection |
| <100k | 2 months | 1 year | 6 months | 3 years | 1 year | 3 years |
| 100k-200k | 2 months | 1 year | 4 months | 2 years | 1 year | 3 years |
| >200k | 1 month | 6 months | 2 months | 1 year | 1 year | 3 years |

### Visual Inspection Checklist

- **Prism Condition:** Confirm the prism is clean, free of cracks, and clear for optimal visibility.
- **Gasket Integrity:** Check that all gaskets are intact and show no signs of deterioration, supporting a reliable seal.
- **Moisture Check:** Ensure there is no moisture or condensation inside the prism, safeguarding against potential electrical or optical issues.
- **Corrosion Assessment:** Inspect the top cover, prism area, and bolts for any signs of corrosion. Early detection helps maintain a connected airfield and smarter, data-driven decision making.
- **Bolt Torque Verification:** Verify that all nuts and bolts are torqued according to specification, ensuring safety and long-term reliability.

### Detailed Inspection Checklist

- **Physical Inspection:** Unbolt the light fixture and carefully lift it from the base for a thorough assessment.
- **Water Ingress:** Examine both the light fixture and base, focusing on the mating surfaces, for any signs of water ingress or corrosion.
- **Corrosion:** For deep base installations (L-868), check for water accumulation. If water exceeds 6 inches in depth, arrange for removal of excess water.
- **Damage Assessment:** Inspect both the light fixture and base for any physical damage that could impact performance.
- **Gasket Replacement:** Replace the gasket between the light fixture and base to maintain a watertight seal and dependable operation.
- **Inspection Frequency:** For aging units that have reached over 75% of their expected lifetime, we recommend halving inspection intervals to ensure continued reliability.
- **Policy Tracking:** Track and record policies in direct relation to the age of each AGL unit, supporting proactive maintenance and asset longevity.
- **Rotation of AGL in Critical Areas:** To optimize performance, rotate AGL units in critical areas as part of your maintenance program.
- **Data Recording for Asset Management:** Record location rotation and individual asset data. Keeping accurate records with a proper asset management system, such as ADB SAFEGATE's CORTEX Service, empowers smarter, better decisions regarding maintenance and asset management.. For more information visit https://adbsafegate.com/services/airside-maintenance/



**Note**

Data for justification is essential when relaxing the frequency of certain maintenance tasks, such as torque management,


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## Expected Service Life for Critical Areas

With effective asset management — such as CORTEX Service — and a strong data capture strategy, you can adjust these guidelines to fit your local needs. The service life may change depending on your specific conditions.

The table below shows the recommended service life.

| | |
|---|---|
| **RED Zone - ATM <100k** | 15 years |
| **RED Zone - ATM 100k-200K** | 10 years |
| **RED Zone - ATM >200k** | 7 years |

If you have any questions or need support, please contact your local sales representative. We are here to help you review your local conditions and create a clear maintenance plan. Together, we can optimize the service life of your investment.


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## 6.2.2 Preventive Maintenance and Regular Inspections

Preventive maintenance and regular inspections will help extend the service life of the light fixture, reduce overall maintenance costs, and minimize downtime from reactive maintenance tasks.

A proper asset management system, such as ADB SAFEGATE's CORTEX Service, helps to store and document important information about local conditions. Use this information for preventive maintenance planning.

CORTEX Service is ADB SAFEGATE's digital solution for asset tracking, inspection, and maintenance.This system helps airports:

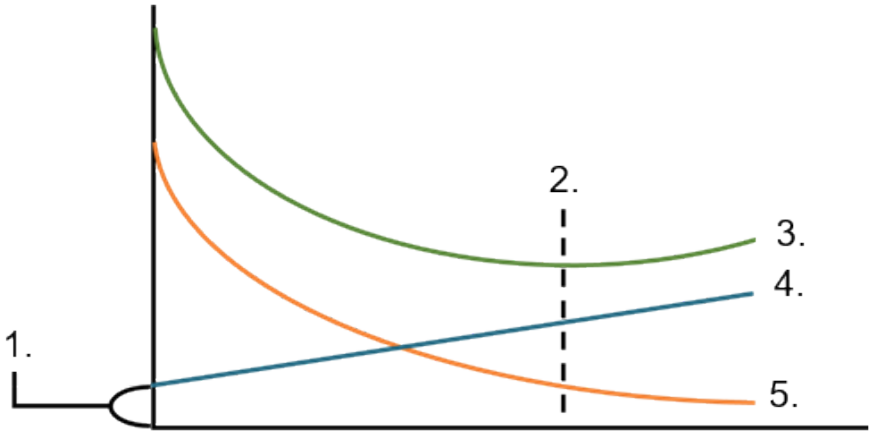
- Register airside assets.
- Schedule and track maintenance tasks electronically.
- Record inspections and maintenance activities according to ICAO and FAA standards.

CORTEX Service stores important data. It gives information about local conditions. Maintenance teams can use this information for preventive maintenance planning. This helps reduce unexpected repairs.

For more details, visit: https://adbsafegate.com/services/airside-maintenance/

Regular inspections and well-defined preventive maintenance planning will help to reduce the overall maintenance cost and reduce downtime from reactive maintenance tasks.

**Figure 12:** Maintenance cost graph




| Call-out | Description |
|---|---|
| 1. | Minimum level of preventative maintenance |
| 2. | Minimum total maintenance cost |
| 3. | Total maintenance cost |
| 4. | Preventative maintenance cost |
| 5. | Reactive maintenance cost |


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## 6.2.3 Cleaning

Regular cleaning of the prisms is crucial for maintaining light quality and fixture efficiency.

### Disclaimer:

ADB SAFEGATE gives specific cleaning instructions and recommendations for its airfield light fixtures and signs. Following these guidelines helps ensure best performance and long service life.

If you use a cleaning method that is different from ADB SAFEGATE's recommendations, you do so at your own risk. ADB SAFEGATE is not responsible for any damage, reduced performance, or failure caused by improper cleaning.

### Safety Precautions

1. Make sure the light fixture is turned off at the main power source to eliminate electrical hazards.
2. Use safety gloves to protect your hands and safety glasses to shield your eyes from dust and debris.

### Basic Cleaning Procedure

1. Gently dust the prism with a soft, dry brush or cloth to get rid of any loose dirt or dust.
2. Remove any rubber build-up using a plastic scraper.
3. Dip a soft, non-abrasive microfiber cloth or sponge into lukewarm water mixed with pH-neutral soap.

   Clean the surface of the prism using small, gentle circular motions.
4. Thoroughly rinse off with water and dry prism with a soft, lint-free cloth to prevent water spots and ensure clear illumination.


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## Removing Stubborn Rubber Build-up or Compacted Snow

- Cleaning chemicals and/or de-icing liquids with a pH of 11 or less may be used in cases where pH-neutral soap is not enough. See Approved Chemicals for Cleaning and Protocol for Introducing New Chemical Solutions. After applying chemicals, rinse all surfaces thoroughly with clean fresh water to remove any residue, as leftover chemicals can damage adhesives, gaskets, and other components, causing corrosion or reduced performance.



### CAUTION

The extensive application of chemical cleaners and/or de-icing liquids may damage the light fixtures and underground electrical components, leading to corrosion and increased maintenance requirements and costs.

Do not use abrasive cleaners or pads that can scratch the prism surface.

Sapphire prisms, can be sensitive to certain chemicals as they are made by bonding a thin sapphire slab to a glass prism. Always test cleaning chemicals for compatibility with sapphire prisms to avoid weakening the adhesive bond. See Protocol for Introducing New Chemical Solutions.

- High-pressure water jets may also be used for stubborn build-up ensuring the minimum distance of 165 mm (6.5 inches) is maintained and the water pressure does not exceed 80 bar (1300 psi) to prevent damage to the gaskets, high-pressure water jets may be employed for cleaning.
- After cleaning, gently and thoroughly dry prism with a soft, lint-free cloth to prevent water spots and ensure clear illumination.

## Approved Chemicals for Cleaning

The following chemicals are tested for compatibility with ADB SAFEGATE light fixtures:

- Potassium Acetate
- Potassium Formate
- Sodium Acetate
- Sodium Formate

## Protocol for Introducing New Chemical Solutions

- Verify the intended use of the chemical on similar materials and products, adhering to ADB SAFEGATE recommendations.
- Initially, conduct tests on a few units to ensure there is no damage to the light fixture or gaskets before applying the chemical to a larger installation.


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# 7.0 Workshop Maintenance

This section gives step-by-step instructions for safe and correct workshop maintenance. The design of your light fixture may be different from the picture, depending on the application. Always follow the described work flow and use the specified torque levels.

**Before you start:**

- Read and understand Safety and Safety Considerations.
- Remember that all maintenance that requires opening the light fixture must be done in a dedicated maintenance area.
- If you remove a light fixture from its base, cover the base or install a spare light fixture to prevent hazards.
- Only authorized personnel should disassemble fittings. This should be done with prior agreement from ADB SAFEGATE.

**The workshop maintenance chapter includes the following sections:**

1. Open the light fixture and disconnect the bottom pan from the top cover
2. Replace the bottom pan assembly
3. Replace the top cover assembly
4. Reset the fail-open converter
5. Replace the secondary cable – SJO cord set
6. Replace the secondary cable – style 6 and French 3-pin cord set
7. Replace the LED wire harness
8. Replace the light engine assembly
9. Replace the prism and its gasket
10. Connect the bottom pan to the top cover and close the light fixture
11. Test the light fixture for leaks (water-tightness)


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# 7.1 Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover

**Tools and equipment to be used:**

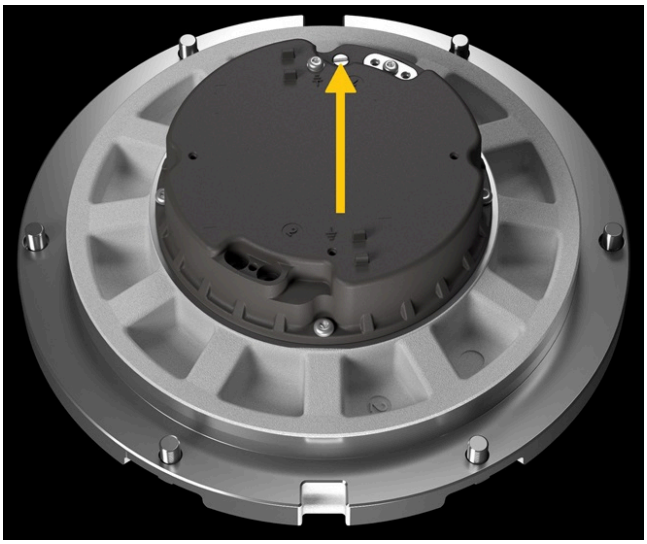
- A soft cloth big enough to cover the light fixture.
- A flat-head screwdriver
- A screwdriver or a variable-speed torque drill driver with a T30 Torx bit for 12-inch light fixture or a T25 Torx bit for an 8-inch light fixture.

**ATTENTION**
DO NOT use an impact driver

**Procedure**:

1. Put the soft cloth on a sturdy surface and place the light fixture on the cloth with the top cover facing down. (The soft cloth is to protect the top cover from scratches).
2. Remove and discard the four fixation screws.
3. Loosen the pressure release screw.

**Figure 13:** Pressure release screw

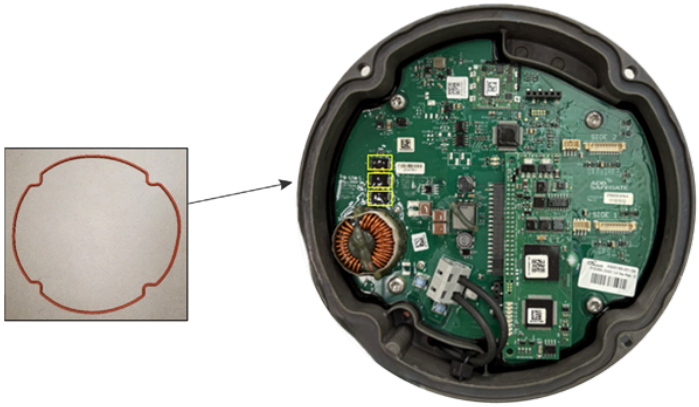


4. Lift the bottom pan carefully turning it over (converter side up). Make sure you do not damage the cables when opening the light fixture.
5. Disconnect the wires between the converter and the light engine.
6. Disconnect the wires between the converter and the arctic kit heater(s) – if applicable.


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7. Remove the gasket from the o-ring groove and discard.

**Figure 14:** Gasket (o-ring)




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## 7.2 Replace the Bottom Pan Assembly

1. Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover.
2. Replace the bottom pan assembly.
   Make sure to **use new gasket and screws when replacing the bottom pan**.
3. Connect the Bottom Pan to the Top Cover and Close the Light Fixture

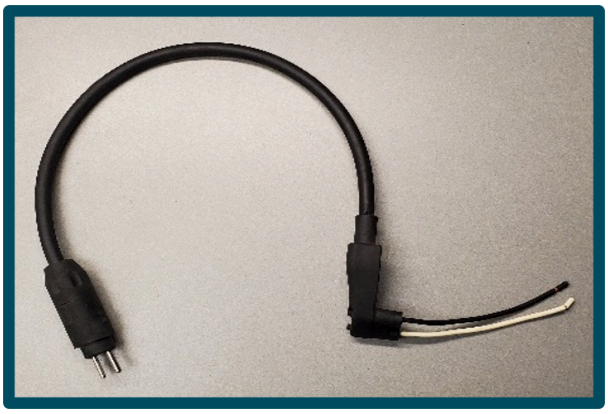
## 7.3 Replace the Top Cover Assembly

1. Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover.
2. Remove light engine assembly. See step 2 in Replace the Light Engine Assembly
3. Replace the old top cover with a new top cover assembly.
4. Attach light engine assembly. See step 3 in Replace the Light Engine Assembly
5. Connect the Bottom Pan to the Top Cover and Close the Light Fixture


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# 7.4 Replace the Secondary Cable – SJO Cord Set

**Figure 15:** SJO cord set



**Tools to be used:**

- Screwdriver or variable-speed torque drill driver with T20 Torx bit
- Small flat head screwdriver or insert tool, part no : 236-332

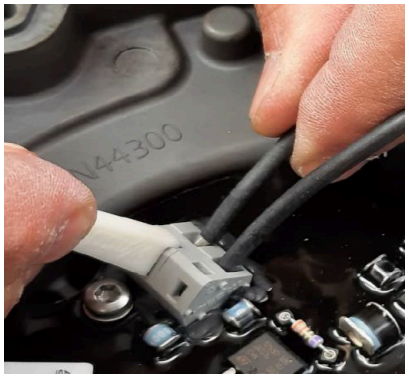
**Figure 16:** Insert tool



**Procedure:**

1. Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover.
2. Release the secondary cable wires from the converter:
    a. Place a small flat-head screwdriver into one of the the openings (or two of the openings with insert tool).
    b. Gently press down on the screwdriver (or insert tool) to open the cable hole and insert/remove one of the secondary cables.
    c. Gently release the downward pressure to lock the cable into place .
    d. Repeat steps a-c for the other wire.

**Figure 17:** Releasing/locking secondary wires with insert tool

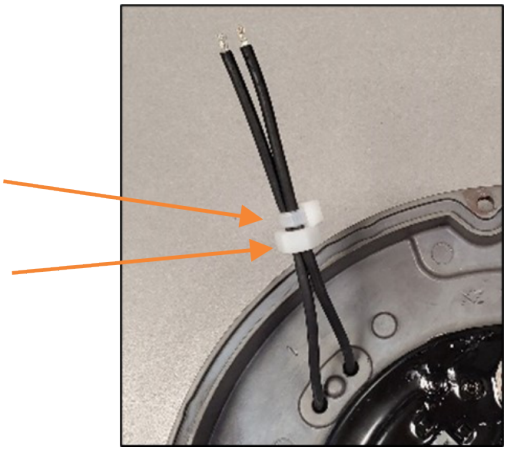




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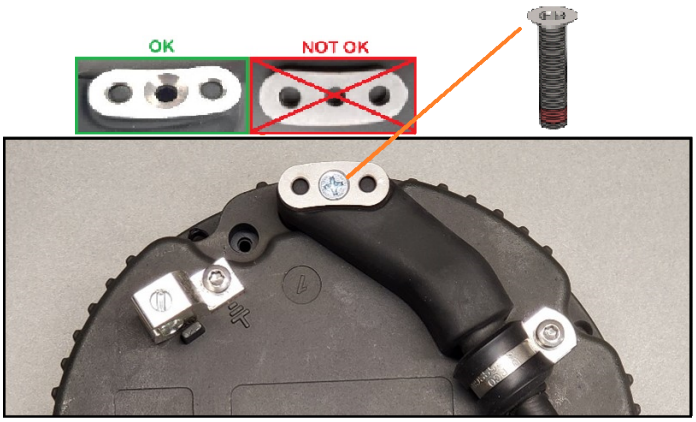
3. Cut the wire tie and remove the nylon hex nut.
   Make sure to **discard the old hex nut.**

**Figure 18:** Wire tie and nylon hex nut



4. Flip the bottom pan converter side down and remove the bolt and cord set retainer disc.
   Make sure to **discard the old bolt and cord set retainer disc**

**Figure 19: Cord set retainer disc and bolt** (SJO jacketed cable)

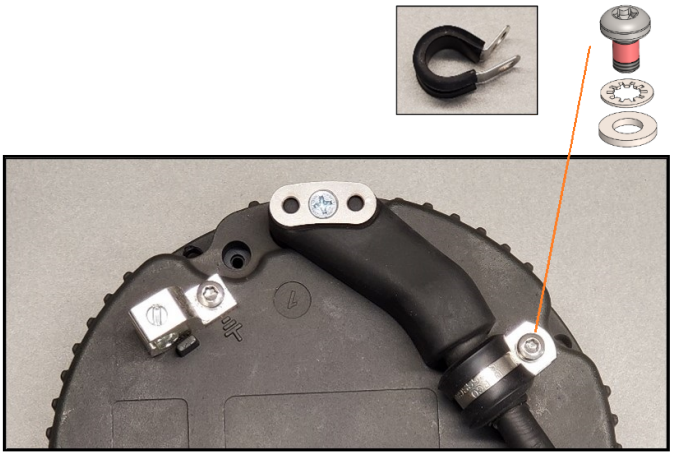




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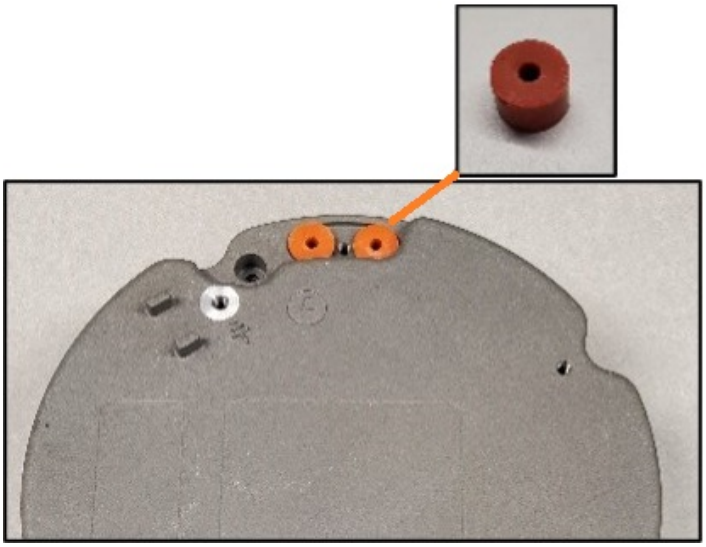
5. Open the cable clamp by removing the bolt, washer and lock washer of the cable clamp. Make sure to **discard the old bolt, washer and lock washer of the cable clamp.**

**Figure 20:** Cable clamp, bolt, washer and lock washer



6. Remove and discard the old secondary cable.
7. Remove and discard the old cable gland gaskets and install new cable gland gaskets.

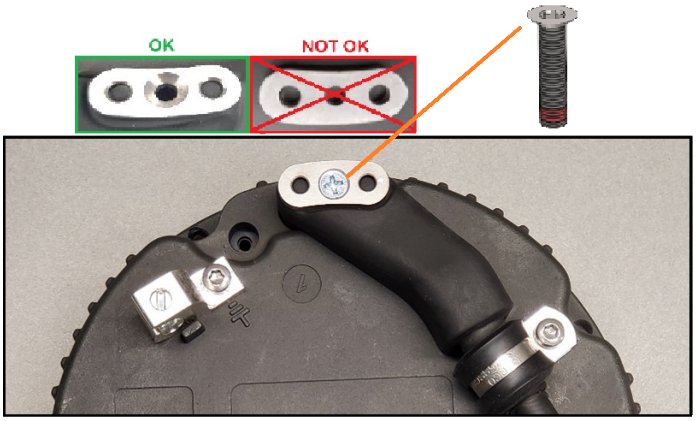
**Figure 21:** Cable gland gasket




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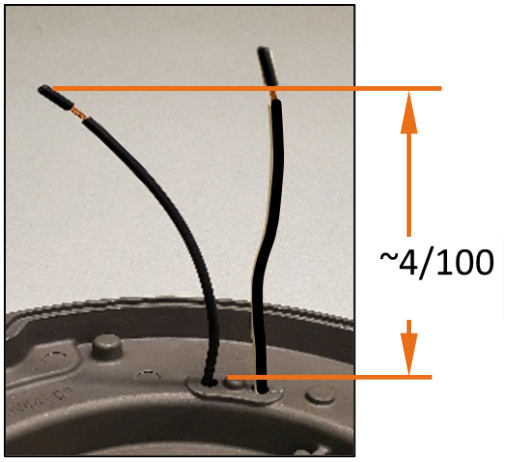
8. Install the new cord-set retainer disc and bolt (M4x10) **tightening the bolt about halfway** so the wires can move freely through the gland gaskets.

**Figure 22: Cord set retainer disc and bolt** (SJO jacketed cable)




9. Insert the wires of the new secondary cable through the loosened gland gaskets feeding them through the bottom pan and flip the bottom pan converter side up.
   Hold the inserted cables in place while flipping so they do not exit the bottom pan.
10. Pull approximately 4 inches (100 mm) of the secondary cable through the cord set retainer disc plate.
    Make sure the 4 inches of the cable are on the converter side (the inside) of the bottom pan.

**Figure 23:** Installation of secondary cable

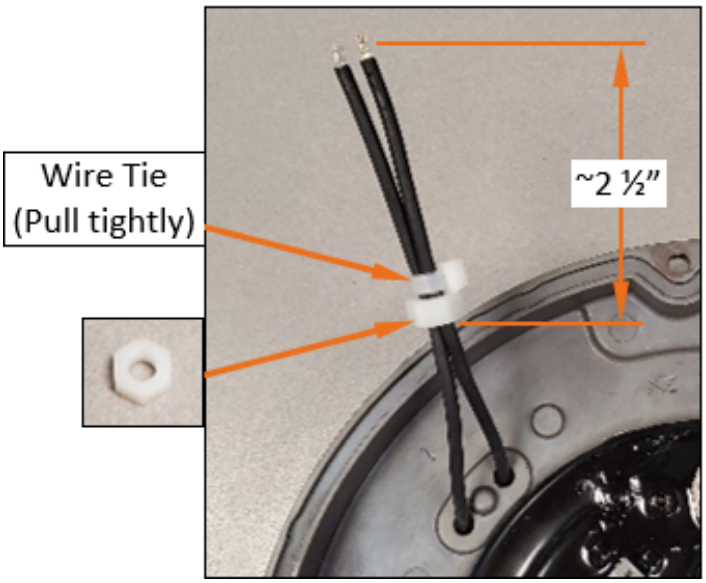




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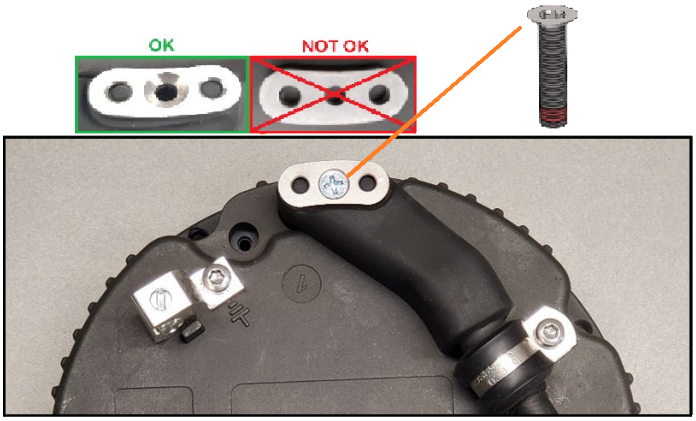
11. Place the new nylon hex nut around the secondary cables and secure them tightly with a wire tie at a position of approximately 2½ inches (64 mm) from the end of the cables.

**Figure 24:** Wire tie and nylon hex nut




12. Flip the bottom pan converter side down and tighten the new cord-set retainer bolt at 26 in-lbs (3 Nm).

**Figure 25: Cord set retainer disc and bolt** (SJO jacketed cable)

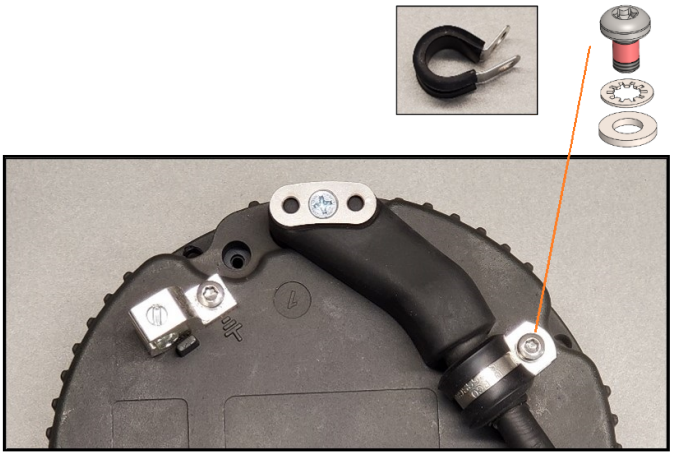




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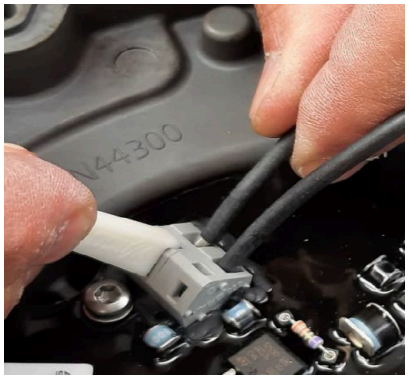
13. Inert the jacketed cable into the cable clamp and tighten the bolt, washer and lock washer of the cable clamp at 26 in-lbs (3 Nm) to fix the cable into place.

**Figure 26:** Cable clamp, bolt, washer and lock washer



14. Flip the bottom pan one last time and lock the secondary cables into the converter:
    a. Place a small flat-head screwdriver into one of the the openings (or two of the openings with insert tool).
    b. Gently press down on the screwdriver (or insert tool) to open the cable hole and insert/remove one of the secondary cables.
    c. Gently release the downward pressure to lock the cable into place .
    d. Repeat steps a-c for the other wire.

**Figure 27:** Releasing/locking secondary wires with insert tool

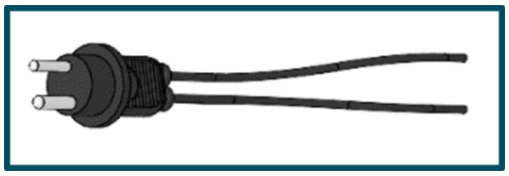


15. Connect the Bottom Pan to the Top Cover and Close the Light Fixture


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# 7.5 Replace the Secondary Cable – Style-6 and French 3-pin Cord Set

**Figure 28:** Style 6 cord set



**Tools to be used:**

- Screwdriver or variable-speed torque drill driver with T20 Torx bit
- Small flat head screwdriver or insert tool, part no : 236-332

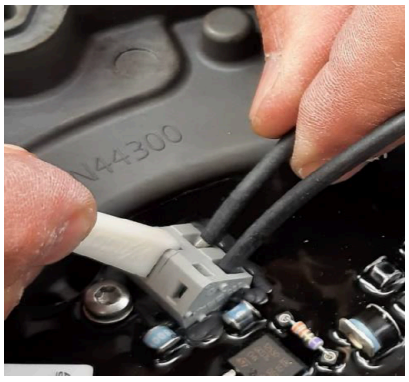
**Figure 29:** Insert tool



**Procedure:**

1. Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover.
2. Release the secondary cable wires from the converter:
   a. Place a small flat-head screwdriver into one of the the openings (or two of the openings with insert tool).
   b. Gently press down on the screwdriver (or insert tool) to open the cable hole and insert/remove one of the secondary cables.
   c. Gently release the downward pressure to lock the cable into place .
   d. Repeat steps a-c for the other wire.

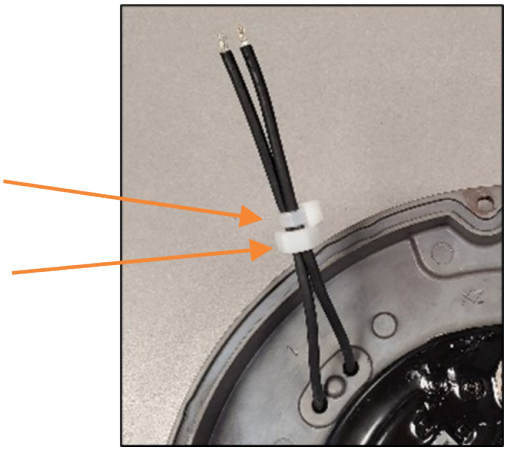
**Figure 30:** Releasing/locking secondary wires with insert tool




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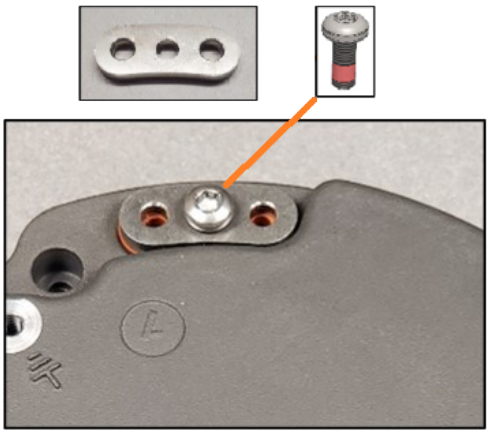
3. Cut the wire tie and remove the nylon hex nut.
   Make sure to **discard the old hex nut.**

**Figure 31:** Wire tie and nylon hex nut



4. Flip the bottom pan converter side down and remove the bolt and cord set retainer disc.
   Make sure to **discard the old bolt and cord set retainer disc**

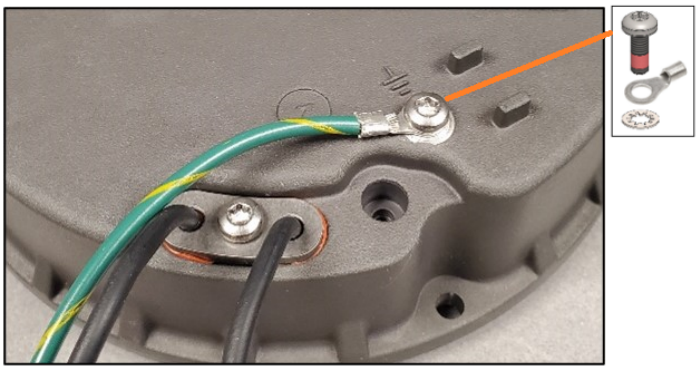
**Figure 32: Cord set retainer disc and bolt**




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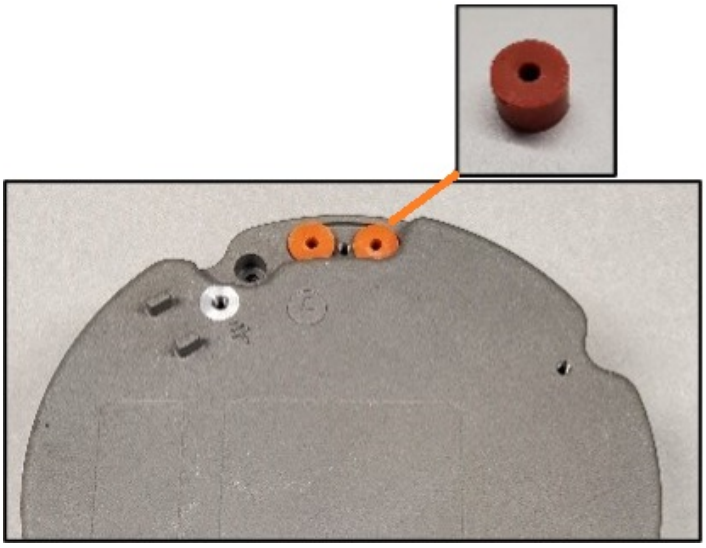
5. Disconnect the ground wire from the bottom pan and discard the bolt and washer.
   Bolt and washer ordered separately as "Grounding kit Style 6".

**Figure 33:** Ground wire, bolt and washer



6. Remove and discard the old secondary cable.
7. Remove and discard the old cable gland gaskets and install new cable gland gaskets.

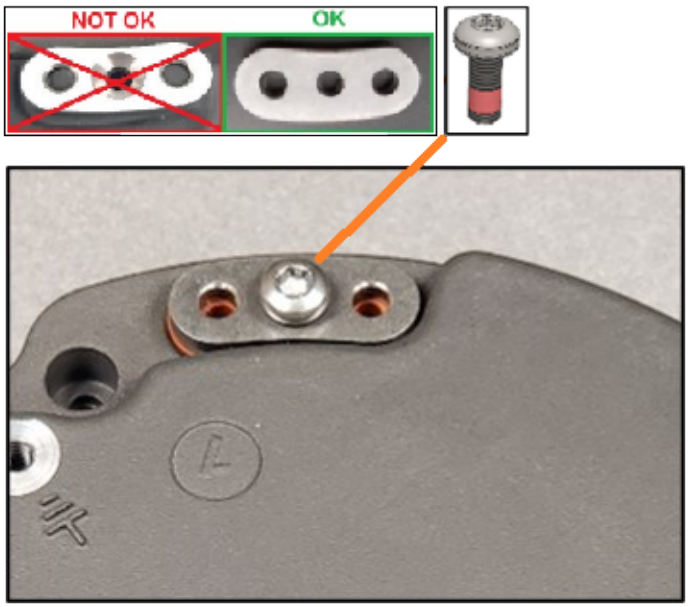
**Figure 34:** Cable gland gasket




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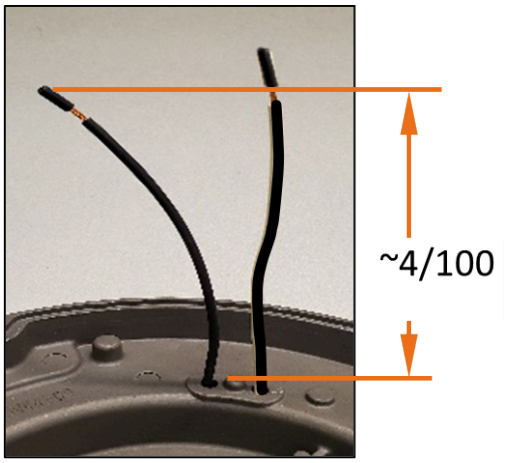
8. Install the new cord-set retainer disc and bolt (M4x10) **tightening the bolt about halfway** so the wires can move freely through the gland gaskets.

**Figure 35:** Cord set retainer disc and bolt




9. Insert the wires of the new secondary cable through the loosened gland gaskets feeding them through the bottom pan and flip the bottom pan converter side up.
   Hold the inserted cables in place while flipping so they do not exit the bottom pan.
10. Pull approximately 4 inches (100 mm) of the secondary cable through the cord set retainer disc plate.
    Make sure the 4 inches of the cable are on the converter side (the inside) of the bottom pan.

**Figure 36:** Installation of secondary cable

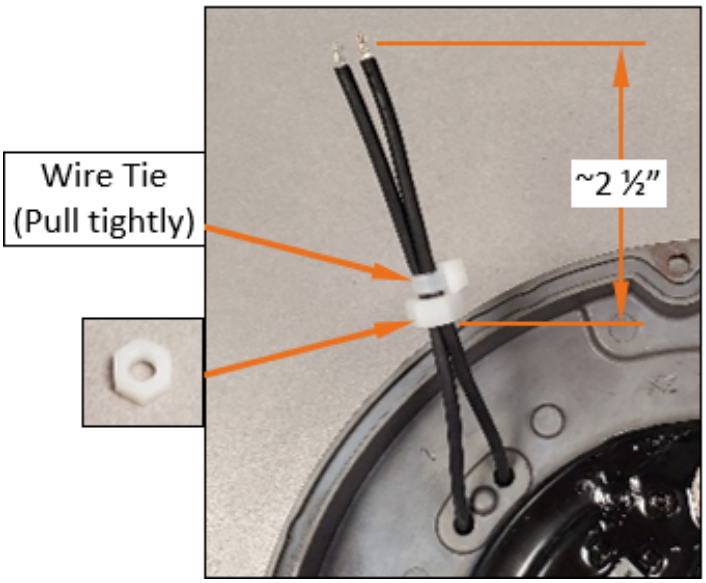




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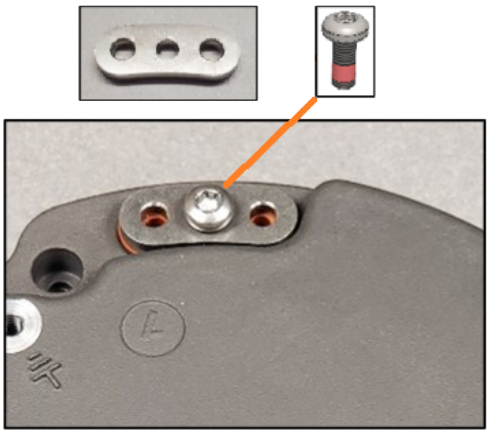
11. Place the new nylon hex nut around the secondary cables and secure them tightly with a wire tie at a position of approximately 2½ inches (64 mm) from the end of the cables.

**Figure 37:** Wire tie and nylon hex nut




12. Flip the bottom pan converter side down and tighten the new cord-set retainer bolt at 22 in-lbs (2.5 Nm).

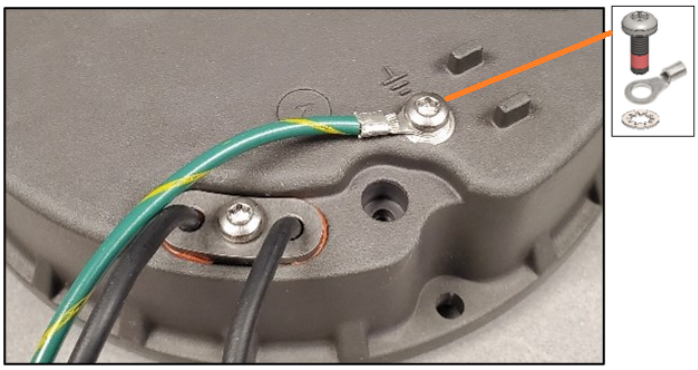
**Figure 38: Cord set retainer disc and bolt**




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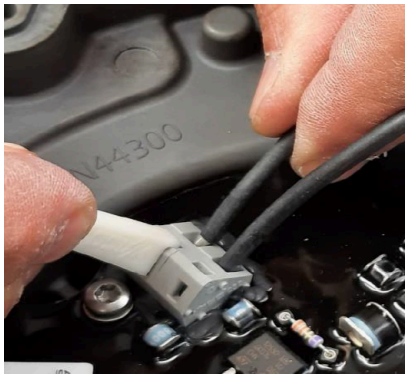
13. Connect the ground wire to the bottom pan and tighten the bolt and washer at 26 in-lbs (3 Nm).
    Bolt and washer ordered separately as "Grounding kit Style 6".

**Figure 39:** Ground wire, bolt and washer



14. Flip the bottom pan one last time and lock the secondary cables into the converter:
    a. Place a small flat-head screwdriver into one of the the openings (or two of the openings with insert tool).
    b. Gently press down on the screwdriver (or insert tool) to open the cable hole and insert/remove one of the secondary cables.
    c. Gently release the downward pressure to lock the cable into place .
    d. Repeat steps a-c for the other wire.

**Figure 40:** Releasing/locking secondary wires with insert tool




15. Connect the Bottom Pan to the Top Cover and Close the Light Fixture


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## 7.6 Replace the Light Engine Assembly

### Note

- **Replace all light engines at the same time** whenever one is replaced for optimal performance and reliability.
- Discard the blue protection spacers and gasket provided at delivery.
  They are intended for transportation protection only.
- Replacement light engine assemblies include the power wire harness already attached.

**Tools to be used:**

- Screwdriver or variable-speed torque drill driver with a Torx bit.

### ATTENTION

DO NOT use an impact driver

**Procedure:**

1. Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover.
2. Remove the screws from the light engine assembly and remove the light engine assembly from the fixture.
   Make sure to **dispose of the old screws.**

   **Figure 41:** Light engine assembly
3. Attach the light engine assembly onto the top cover with new .
   Make sure you tighten the screws in the correct order (refer to the image below).

   **Figure 42:** Mounting sequence
4. Connect the Bottom Pan to the Top Cover and Close the Light Fixture


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# 7.7 Replace the Prism and its Gasket



## IMPORTANT

**Replace all prisms at the same time** whenever one is replaced for optimal performance and reliability.

All prisms must be replaced if there is water in the fixture or if any prism is cracked.

**Tools to be used:**

- Screwdriver or variable-speed torque drill driver with Torx bit.



## ATTENTION

DO NOT use an impact driver

**Procedure:**

1. Open the Light Fixture and Disconnect the Bottom Pan from the Top Cover.
2. Remove light engine assembly. See step 2 in Replace the Light Engine Assembly
3. Remove the prism and the prism gasket by pushing from the outside (under the top cover) and clean the prism cavity.
   Make sure to **dispose of the old prism and gasket.**
4. Install a new prism gasket into the prism cavity of the top cover.
   Make sure the longer slanted part of the gasket is facing the center of the fixture.
5. Press a new prism into the prism gasket. Keep applying pressure for a few seconds until the prism is in place.
   Clean the prism surfaces with a clean rag or wipe to remove any fingerprints.
6. Attach light engine assembly. See step 3 in Replace the Light Engine Assembly
7. Connect the Bottom Pan to the Top Cover and Close the Light Fixture

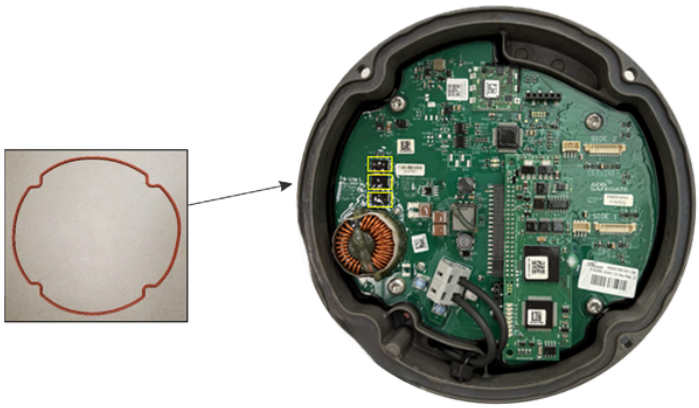

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## 7.8 Connect the Bottom Pan to the Top Cover and Close the Light Fixture

1. Clean all the contact surfaces and housing of the light fixture carefully.
2. Press a new gasket into the o-ring groove and make sure it is seated correctly.

> **IMPORTANT**
> The o-ring gasket must always be changed when the fixture is disassembled.

**Figure 43:** Gasket (o-ring)

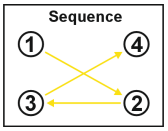


3. Connect the wire between the converter and the light engine.
4. Connect the wire between the converter and the arctic kit heater – if applicable.
5. Turn the top cover over (converter side down) carefully placing it over the bottom pan and making sure the poka-yoke pin is aligned correctly.

> **IMPORTANT**
> Make sure you do not pinch the wires or the gasket between the top cover and bottom pan contact surface.

6. Attach the top cover to the bottom pan:
   a. Torque the four new fixation screws in the star pattern shown below at 53 in-lbs (6 Nm) for 12-inch lights or 31 in-lbs (3.5 Nm) for 8-inch lights.

      **Figure 44:** Star pattern




   b. Re-torque in the same pattern and at the same torque value.
7. Test the Light Fixture for Leaks (Water-Tightness)


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# 7.9 Test the Light Fixture for Leaks (Water-Tightness)

**Note**
A compressor, or a manual car tire pump, equipped with a manometer is required to check the light fixture for watertightness.

**Tools to be used:**

- Flat head screwdriver
- Pressure test fitting tool to be used (pt no.44A6104/A) for watertight testing

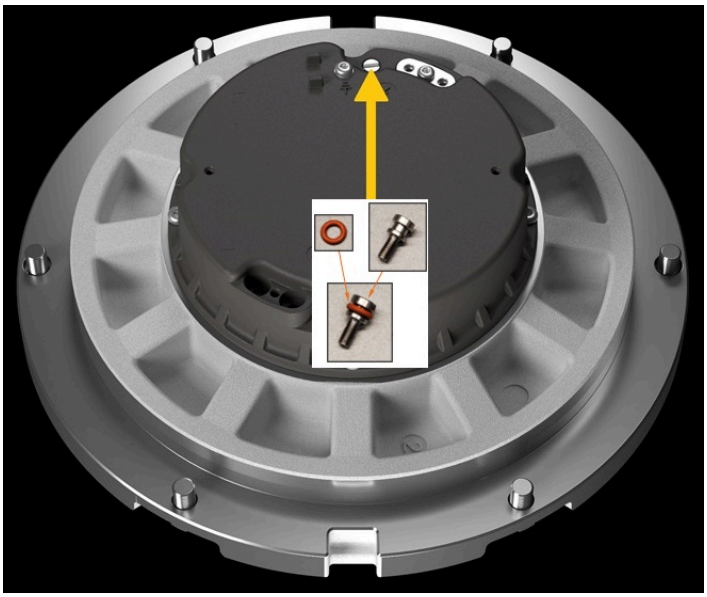
**Figure 45:** Pressure test fitting tool



**Procedure:**

1. Remove the pressure release screw and discard.

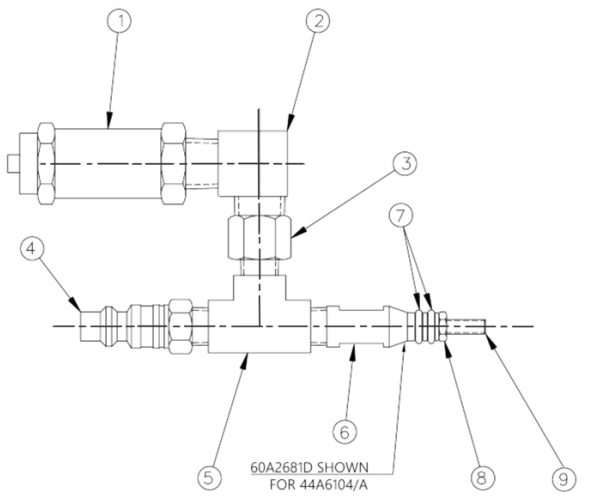
   **Figure 46:** Pressure release screw




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2. Hand-tighten the pressure test fitting tool into the pressure-relief port. (The pressure-relief port is the opening where you removed the pressure release screw.)

**Figure 47:** Pressure test fitting tool




| |
|---|
| 1) Pop — safety valve |
| 2) 90 deg., elbow, female X male, brass, ¼ in |
| 3) Adapter, female — male, ¼ x 1/8 in, brass |
| 4) Sleeve — lock hose plug, ¼ in coupler |
| 5) Tee, brass, 1/8 in |
| 6) Pressure test fitting, body |
| 7) O-ring, silicone, size 008, 1/16 in W X 3/16 in |
| 8) M4 hex Jam nut, 18-8 SS |
| 9) Pressure test fitting stud |

3. Attach the shop airline (4) to the lock hose plug sleeve.
4. Using a compressor or a manual car tire pump equipped with a manometer, pressurize to 20 psi (130 kPa). **Never exceed a pressure of 22 psi (150 kPa)** inside the light fixture. A higher pressure may cause injuries and damage the light.
5. Submerge the pressure test fitting into a water tank.
6. Wait 3 minutes and check if air leaks out between:
   - The bottom pan and the top cover
   - The prism and and the top plate
   - The watertightness valve and top plate
7. If the fixture is watertight, depressurize and install a new pressure release screw at 26 in-lbs (3 Nm).
   If air leaks out of the light fixture, it is not watertight and must be repaired:
   - Release the air from the light.
   - Open the light fixture.
   - Re-check the mating (contact) surfaces and gaskets.
   - Close the light fixture.
   - Repeat steps 1-6.
   - If air continues to leak, contact your ADB SAFEGATE representative for support.


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# 8.0 Ordering Codes

## 8.1 LED ADAL Taxiway

### Ordering Code

| | Application | Standard(s) | Market Specific | Dimensions | Prism | Beam Orientation | Toe-in | Color - Side 1 (Left) | Color - Side 2 (Right) | Power and Monitoring | Connector and Cable | Options | Version |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RS | ☐☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Application**
AR = ADAL Taxiway 2nd Color Red
AY = ADAL Taxiway 2nd Color Yellow

**Standard(s)**
2 = FAA
3 = ICAO

**Market Specific**
0 = None
1 = Buy American Preference (BAP)
2 = Anodized Finish

**Dimensions**
1 = 8-inch (203 mm) diameter, 2 bolt
2 = 12-inch (305 mm) diameter, 11.25-inch BC (285 mm)
3 = 8-inch (203 mm) diameter, 4 bolt

**Prism**
S = Standard prism
R = Reinforced prism

**Beam Orientation**
1 = Unidirectional
2 = Bidirectional

**Toe-in**
C = Curved, L-852K(L)
N = Narrow, L-852C(L)
W = Wide

**Color - Side 1 (Left)**
F = F-Green
G = G-Green (MOS and ICAO special)
Y = Yellow[1]
N = None

**Color - Side 2 (Right)**
F = F-Green
G = G-Green (MOS and ICAO special)
Y = Yellow[1]
N = None

**Power and Monitoring**
R = 2.8 - 6.6 A, EQ Integrated LINC 360

**Connector and Cable**
1 = 1 x Style 6 2-Pole Plug, 2 Individual Wires
2 = 1 x Style 1 2-Pole Plug, Jacketed SO 2 Core Cable
5 = 1 x Flat 3-Pole Plug, 3 Individual Wires[2]

**Options**
0 = None
1 = Arctic Kit

**Version**
1 = Version 1

### Ordering Code Notes

1. AR application only.
2. Not ETL submitted or not applicable to FAA market.


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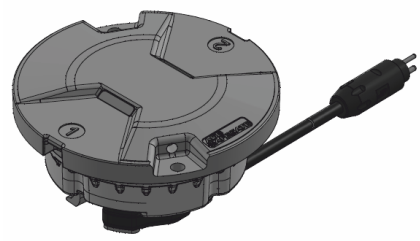
# 9.0 Spare Parts

Spare parts are available for light fixtures with and without the control and monitoring functionality.

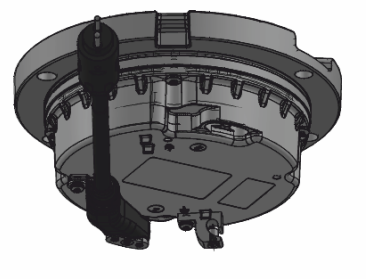
For more information, see http://www.adbsafegate.com/ and the spare part lists, or contact ADB SAFEGATE for assistance.

# 9.1 Versions and Exploded View

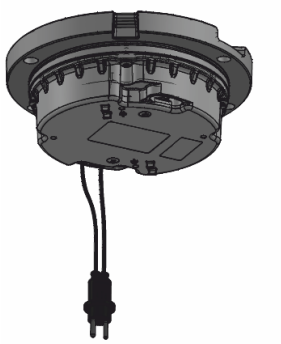
**Figure 48:** Cord set options



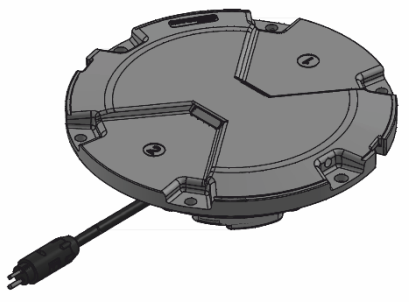
Taxiway Inset 8"
2-bolt version
(4-bolt not shown)



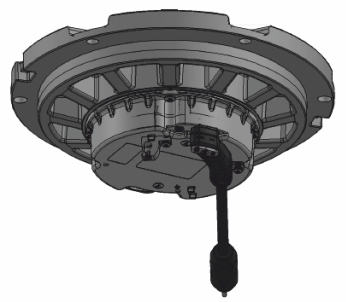
Taxiway Inset 8" with
Style-1 jacketed cord set



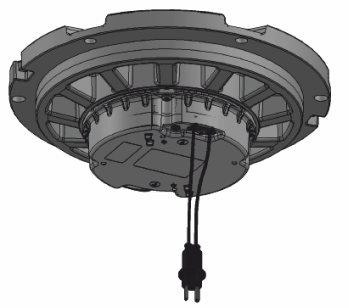
Taxiway Inset 8" with
Style-6 cord set



Taxiway Inset 12"



Taxiway Inset 12" with
Style-1 jacketed cord set

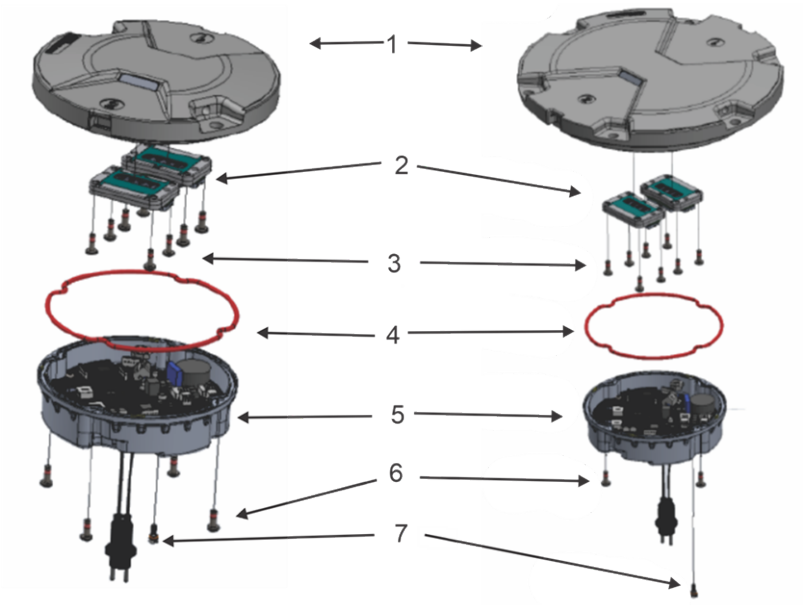


Taxiway Inset 12" with
Style-6 cord set


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## Partial Exploded View — Spare Part Assemblies

### Figure 49: 8-inch (left) and 12-inch (right)




| Call-out | Description | Assembly number |
|---|---|---|
| 1 | Top cover assemblies | SP.AS00135-XXX (8-inch)<br>SP.AS00136-XXX (12-inch) |
| 2 | Light engine assemblies | SP.AS00332-XXX (without arctic kit)<br>SP.AS00333-XXX (with arctic kit) |
| 3 | Mounting screws, light engine | SP.MFPM5PT-714-01 |
| 4 | Gasket, bottom pan | SP.MS00005-000-01 |
| 5 | Bottom pan assemblies | SP.AS00021-XXX |
| 6 | Mounting screws, bottom pan | SP.MFPM5PT-714-01 |
| 7 | Pressure release screw | SP.MF00090-000-01 |


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## 9.2 Illustrations

**Figure 50:** 8-inch top cover assembly

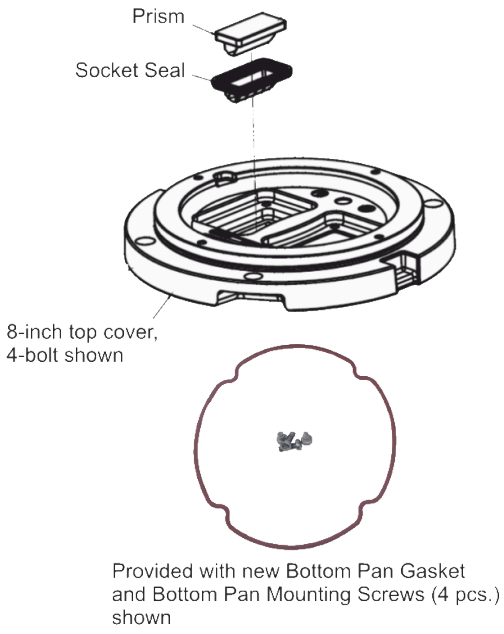



**Figure 51:** 12-inch top cover assembly

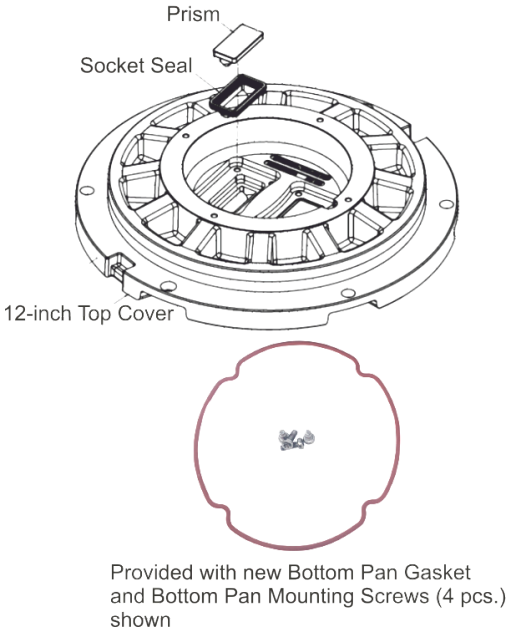



**Figure 52:** 8-inch bottom pan assembly

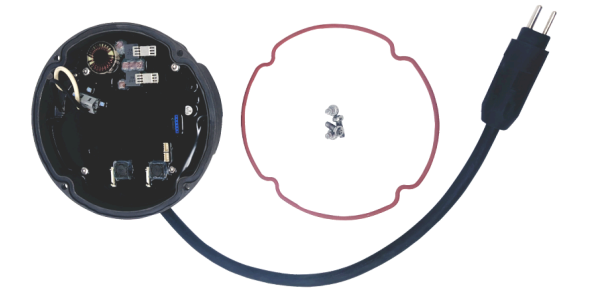



**Figure 53:** Prism spares




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**Figure 54:** Ground lugs, package of 5



**Figure 55:** Cable Clamps, package of 5



**Figure 56:** Mounting screws, package of 100



**Figure 57:** Pressure release screws, package of 5




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## 9.3 Taxiway ADAL Light

### Note

- Each top cover and bottom pan assembly includes a gasket and mounting screws for the bottom pan.
- Each bottom pan assembly includes a power supply and a cord set. Style 1 includes a ground lug. A ground screw is not included for style 6 and 3-pole bottom pan assemblies.
- Each prism kit includes a prism, a gasket, a protection pad (if applicable), a keeper plate, and mounting screws.
- Each light engine and heater kit assembly includes mounting screws.
- Each light engine assembly includes an attached wire harness.
- BAP stands for "Buy American Preference".

| Top cover assemblies, 12-inch | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Unidirectional straight, standard prism | 1 | 1 | SP.AS00136-S1S |
| Unidirectional straight, reinforced prism | 1 | 1 | SP.AS00136-S1R |
| Unidirectional side 1 curved, standard prism | 1 | 1 | SP.AS00136-C1S |
| Unidirectional side 1 curved, reinforced prism | 1 | 1 | SP.AS00136-C1R |
| Unidirectional side 2 curved, standard prism | 1 | 1 | SP.AS00136-C2S |
| Unidirectional side 2 curved, reinforced prism | 1 | 1 | SP.AS00136-C2R |
| Bidirectional, straight, standard prism | 1 | 1 | SP.AS00136-SBS |
| Bidirectional, straight, reinforced prism | 1 | 1 | SP.AS00136-SBR |
| Bidirectional curved, standard prism | 1 | 1 | SP.AS00136-CBS |
| Bidirectional curved, reinforced prism | 1 | 1 | SP.AS00136-CBR |

| Top cover assemblies, 8-inch (2-bolt) | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Unidirectional straight, standard prism | 1 | 1 | SP.AS00135-S1S |
| Unidirectional straight, reinforced prism | 1 | 1 | SP.AS00135-S1R |
| Unidirectional side 1 curved, standard prism | 1 | 1 | SP.AS00135-C1S |
| Unidirectional side 1 curved, reinforced prism | 1 | 1 | SP.AS00135-C1R |
| Unidirectional side 2 curved, standard prism | 1 | 1 | SP.AS00135-C3S |
| Unidirectional side 2 curved, reinforced prism | 1 | 1 | SP.AS00135-C3R |
| Bidirectional straight, standard prism | 1 | 1 | SP.AS00135-S5S |
| Bidirectional straight, reinforced prism | 1 | 1 | SP.AS00135-S5R |
| Bidirectional curved, standard prism | 1 | 1 | SP.AS00135-C5S |
| Bidirectional curved, reinforced prism | 1 | 1 | SP.AS00135-C5R |

| Top cover assemblies, 8-inch (4-bolt) | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Unidirectional straight, standard prism | 1 | 1 | SP.AS00135-S2S |
| Unidirectional straight, reinforced prism | 1 | 1 | SP.AS00135-S2R |
| Unidirectional side 1 curved, standard prism | 1 | 1 | SP.AS00135-C2S |
| Unidirectional side 1 curved, reinforced prism | 1 | 1 | SP.AS00135-C2R |
| Unidirectional side 2 curved, standard prism | 1 | 1 | SP.AS00135-C4S |
| Unidirectional side 2 curved, reinforced prism | 1 | 1 | SP.AS00135-C4R |
| Bidirectional straight, standard prism | 1 | 1 | SP.AS00135-S6S |


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| Top cover assemblies, 8-inch (4-bolt) | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Bidirectional straight, reinforced prism | 1 | 1 | SP.AS00135-S6R |
| Bidirectional curved, standard prism | 1 | 1 | SP.AS00135-C6S |
| Bidirectional curved, reinforced prism | 1 | 1 | SP.AS00135-C6R |

| Light engine assemblies, 12-inch and 8-inch, without arctic kit heater | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| AR, F-green / red, curved (L-852K) | 1 or 2 | 1 | SP.AS00332-CFR |
| AR, F-green / red wide | 1 or 2 | 1 | SP.AS00332-WFR |
| AR, F-green / red narrow (L-852C) | 1 or 2 | 1 | SP.AS00332-NFR |
| AR, yellow / red, curved (L-852K) | 1 or 2 | 1 | SP.AS00332-CYR |
| AR, yellow / red wide | 1 or 2 | 1 | SP.AS00332-WYR |
| AR, yellow / red narrow (L-852C) | 1 or 2 | 1 | SP.AS00332-NYR |
| AY, F-green / yellow, curved (L-852K) | 1 or 2 | 1 | SP.AS00332-CFY |
| AY, F-green / yellow, wide | 1 or 2 | 1 | SP.AS00332-WFY |
| AY, F-green / yellow, narrow (L-852C) | 1 or 2 | 1 | SP.AS00332-NFY |

| Light engine assemblies, 12-inch and 8-inch, with arctic kit heater | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| AR, F-green / red, curved (L-852K), AK | 1 or 2 | 1 | SP.AS00333-CFR |
| AR, F-green / red, wide), AK | 1 or 2 | 1 | SP.AS00333-WFR |
| AR, F-green / red, narrow (L-852C), AK | 1 or 2 | 1 | SP.AS00333-NFR |
| AR, yellow / red, curved (L-852K), AK | 1 or 2 | 1 | SP.AS00333-CYR |
| AR, yellow / red, wide, AK | 1 or 2 | 1 | SP.AS00333-WYR |
| AR, yellow / red, narrow (L-852C), AK | 1 or 2 | 1 | SP.AS00333-NYR |
| AY, F-green / yellow, curved (L-852K), AK | 1 or 2 | 1 | SP.AS00333-CFY |
| AY, F-green / yellow, wide, AK | 1 or 2 | 1 | SP.AS00333-WFY |
| AY, F-green / yellow, narrow (L-852C), AK | 1 or 2 | 1 | SP.AS00333-NFY |

| Bottom pan assemblies | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| EQ converter, style 6 cord set | 1 | 1 | SP.AS00021-R13 |
| EQ converter, 3-pole cord set | 1 | 1 | SP.AS00021-R1F |
| EQ converter, style 1 SJO jacketed cord set | 1 | 1 | SP.AS00021-R1J |

| Cord sets | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| L-823 style 1, bottom pan | 1 or 2 | 5 | SP.73A0193/1 |
| L-823 style 6, bottom pan | 1 or 2 | 5 | SP.73A0136/18 |
| 3-pole, bottom pan | 1 or 2 | 5 | SP.SGEFR500160 |
| Cable retaining clamp, for style 1 cord set | 1 or 2 | 5 | SP.MB00003-013-01 |
| Ground lug kit | 1 | 5 | SP.72A0401 |
| Grounding kit style 6 (bolt and washer) | 1 or 2 | 100 | SP00102-100-01 |


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| Prism kits | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Standard, package of 10 | 1 or 2 | 10 | SP.4072.40.412 |
| Reinforced, package of 10 | 1 or 2 | 10 | SP.4072.42.090 |
| Gaskets, package of 10 | 1 or 2 | 10 | SP.4072.40.421 |

| Screws and gaskets | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Screws, pressure release with o-ring, package of 5 | 1 | 5 | SP.MF00090-000-01 |
| Gaskets, 8-inch bottom pan, package of 10 | 1 | 10 | SP.MS00005-000-01 |
| Screws, 8-inch bottom pan, package of 100 | - | 100 | SP.MFPM5PT-714-01 |
| Screws, mounting light engine assemblies, package of 100 | - | 100 | SP.MFPM4PT-710-01 |

| Wire harnesses | Quantity per | | Spare part code |
|---|---|---|---|
| | Fitting | Spare part | |
| Please replace complete light engine | | | |

## Note

Component availability or design may change without prior notice due to unforeseen circumstances. This document will be updated as needed to reflect the latest information from ADB SAFEGATE. We reserve the right to correct errors or adjust pricing as required.

For more information or assistance with ordering spare parts, contact ADB SAFEGATE, see www.adbsafegate.com.


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# 10.0 POWER TABLES

### 8-inch and 12-inch light fixtures without arctic kit (heater)

| Fixture type – 1 cord set | Fixture load | Isolation transformer | | CCR load |
|---|---|---|---|---|
| | | Wattage | Load | |
| ADAL AR, bidirectional | 20 VA | 45 W | 6 VA | 26 VA |
| ADAL AY, bidirectional | 14 VA | 25 W | 6 VA | 20 VA |
| ADAL AR, unidirectional | 15 VA | 25 W | 6 VA | 21 VA |
| ADAL AY, unidirectional | 11 VA | 25 W | 6 VA | 17 VA |

### 8-inch and 12-inch light fixtures with arctic kit (heater)

| Fixture type – 1 cord set | Fixture load | Isolation transformer | | CCR load |
|---|---|---|---|---|
| | | Wattage | Load | |
| ADAL AR, bidirectional | 76 VA | 100 W | 12 VA | 88 VA |
| ADAL AY, bidirectional | 50 VA | 65 W | 8 VA | 58 VA |
| ADAL AR, unidirectional | 47 VA | 65 W | 8 VA | 55 VA |
| ADAL AY, unidirectional | 47 VA | 65 W | 8 VA | 55 VA |

ADAL lights feature adaptive output, meaning the power consumption varies depending on the output signal. For proper transformer and CCR sizing, please use the fixture load listed above. Refer to the table below for detailed power consumption values corresponding to various signal usage.

| Fixture type – TC (L-852C),TK (L-852K) and TW | Fixture load |
|---|---|
| ADAL, bidirectional, red/red | 20 VA |
| ADAL, bidirectional, TC (L-852C),TK (L-852K),TW, green/green | 14 VA |
| ADAL, bidirectional, TC (L-852C),TK (L-852K),TW, yellow/yellow | 14 VA |
| ADAL, unidirectional, TC (L-852C),TK (L-852K),TW, green or yellow | 11 VA |

**Note**

- EQ fixtures:
  - The isolation transformer must have an additional 8 VA available above the fixture load for communication bandwidth. Size transformer to next size up to assure additional 8 VA coverage
  - Legacy BRITE II or AGLAS 2 systems — Order "M" power supply
- Additional voltage loss not included in the above table which must be factored into the circuit load calculation:
  - Primary cables will result in a higher CCR load
  - Longer secondary cables may result in a larger size isolation transformer requirement
- Efficiency of the isolation transformer depends on the manufacturer of the transformer


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# Appendix A: Cable Loss

The formula for measuring the cable resistance **R** (in ohms) for a single conductor is calculated with following formula:

**$R = \rho \times (L / A)$**

Where:

- **R** = resistance of the cable (in ohms, Ω)
- **ρ** = resistivity of the conductor material (in ohm-meters, Ω·m)
- **L** = length of the conductor (in meters, m)
- **A** = cross-sectional area of the conductor (in square meters, $m^2$)

**Example**: for 1 km of 2.5 $mm^2$ copper conductor (where the the resistivity (ρ) is 1.72 10-8 ($m^2$), the resistance R is calculated as follows:

(1.72 10-8) × 1000 / (2.5 10-6 $m^2$) = 6.88 ohms

The loss (Watt) is then R × $I^2$ or 6.88 ohms × $6.6^2$ $A^2$= 299.69 W/km or 0.299 W/m.

The loss (Watt) for a secondary cable with 2 conductors is thus 2 × 0.299 = 0.599 or 0.6 W/m.

As such we can calculate:

- Secondary cable for a 2.5 $mm^2$ Cu-wire (2 conductors): 0.6 W/m
- Secondary cable for a 4 $mm^2$ Cu-wire (2 conductors): 0.4 W/m
- Primary cable for a 6 $mm^2$ Cu-wire (1 conductor): 0.12 W/m

The cable between the isolation transformer and the lamp adds losses that cannot be ignored when dimensioning the circuits and selecting rating for secondary transformers and regulators.

---

**WARNING**

Cable lengths should not exceed 100 meters.

---

For a secondary cable of e.g., 20 m of 2.5 $mm^2$ CU-wire, 20 m × 0.6 W/m = 12 W equals the additional loss to be taken into account.

For a primary cable of e.g., 100 m of 6 $mm^2$ CU-wire, 100 m × 0.12 W/m = 12 W equals the additional loss to be taken into account.


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# Appendix B: INTEROPERABILITY – 12-Inch and 8-Inch

## Base installation – O-ring selection and retaining bolts 12-inch

The O-ring is required for 12-inch light fixtures. For corresponding 12-inch base, refer to the ordering code in the data sheet.

### CAUTION

Use of incorrect combination of gaskets, bolts and nuts can cause multiple safety risks and severe damage to product.

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

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

**Failure to follow these precautions can result in equipment damage and/or aircraft FOD.**

**Table 2: Interoperability matrix – 12-inch**

| Base type | Required O-ring | Bolt installation | | Stud installation | |
|---|---|---|---|---|---|
| | | Required dimension | Recommended torque[3] | Required nut | Recommended torque[3] |
| RELIANCE 12 in 150 mm<br>ERNI 12 in ED12-190 | O-ring D259, 3×5, 7<br>SP.013114/10pc<br>SP.013115/100pc | 1411.20.482<br>Metric screw kit 12 in<br>M10×25 mm | 40 Nm+locking washer[2] | 1411.20.500<br>Self-locking nut kit 12 in<br>M10xH=100 | 35 Nm |
| Thorn 12 in 150 mm | | | 40 Nm+locking washer[2] | | 35 Nm |
| 12 in Eurobase | | | 21 Nm + Loctite 2701 or 638 | | 21 Nm[1] |
| L-868 deep can with flange | | 1411.20.452<br>UNC screw kit | reference EB83 | NA | NA |

1. Do not use Loctite or washer with self-locking nut
2. Max height 2 mm
3. Do not use SO jacketed cord style 1

### Note

If the use of Loctite is not necessary or obligatory, then it is recommended to use a suitable lubricant when fastening the bolts. Use nickel or graphite grease, but do NOT use copper-based grease as it stimulates corrosion.


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## Base installation – O-ring selection and retaining bolts 8-inch

### CAUTION

Use of incorrect combination of gaskets, bolts and nuts can cause multiple safety risks and severe damage to product.

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

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

**Failure to follow these precautions can result in equipment damage and/or aircraft FOD.**

**Table 3: Interoperability matrix – 8-inch**

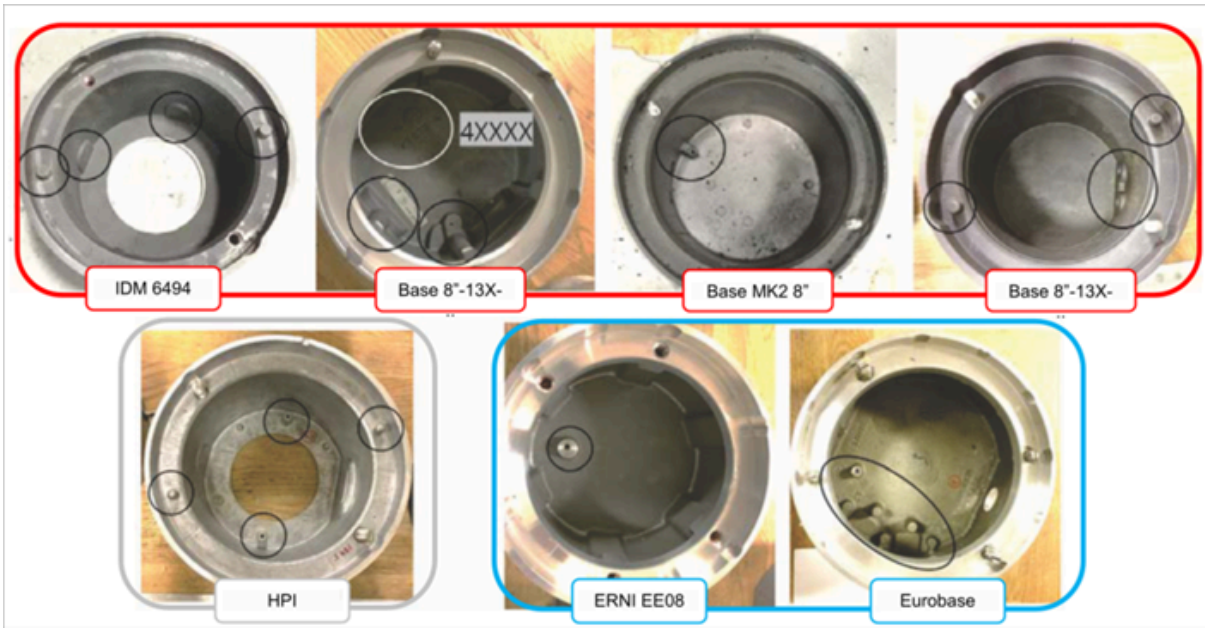
| Base type | Required O-ring | Bolt installation | | Stud installation | |
|---|---|---|---|---|---|
| | | Required dimension | Recommended torque[3] | Required nut | Recommended torque[3] |
| RELIANCE 8 in 135 mm<br>Thorn 8 in 100 mm<br>Thorn 8 in 133 mm<br>IDM 6494 120 mm<br>Adapter ring SG/Thorn/ID 8–12 in | Red O-Ring<br>SGE.SP24523/10 pc<br>SGE.SP24526/100 pc | 1411.20.522<br>Metric screw kit 8 in<br>M10x25mm | 40 Nm+locking washer[2] | 1411.20.430<br>Self-locking nut kit 8 in<br>M10xH100 | 35 Nm |
| ERNI 8 in EE08 150 mm<br>ERNI 8 in ED08 133 mm | Blue O-Ring<br>SGE.SP24521/10 pc<br>SGE.SP24524/100 pc | | | | |
| 8 in Eurobase<br>Adapter ring ADB 8–12 in | | | 21 Nm + Loctite 2701 or 638 | | 21 Nm[1] |
| 8 in HPI | Grey O-Ring<br>SGE.SP24522/10 pc<br>SGE.SP24525/100 pc | | | | |

1. Do not use Loctite or washer with self-locking nut
2. Max height 2 mm
3. Do not use SO jacketed cord style 1

The pictures below show photos of the bases mentioned above and the frame shows the color of the intended gasket (o-ring).


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**Figure 58:** Shallow bases





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# Appendix C: Snow Plowing Guidelines

## Introduction

ADB SAFEGATE inset light fixtures are engineered with a low protrusion height to minimize the risk of damage during snow plowing, compared to medium or high protrusion alternatives. Select fixtures offer reinforced prisms (see Reinforced Prisms) or sapphire prisms for increased scratch resistance and extended product lifetime.

Consistent adherence to airport winter operations guidelines is essential to protect in-pavement airfield ground lights from snow plow damage. This manual provides a summary of key airport operator specifications and additional recommendations to help prevent damage to inset lights throughout winter operations.

- FAA AC 150/5200-30D – Airport Winter Safety and Operations
- FAA AC 150/5220-20A – Airport Snow and Ice Control Equipment
- FAA AC 150/5340-26C – Maintenance of Airport Visual Aid Facilities
- FAA EB85 – Ductile Snow Plow Protection Ring and Installation Procedures
- ACRP Report 123 – A Guidebook for Airport Winter Operations

## Winter Operation Training

Many airports conduct dry-run winter operations training ahead of the winter season. To maximize safety and efficiency, we recommend performing tests and simulations on designated sections of taxiways or runways that are equipped with the relevant fittings. This proactive approach helps identify potential issues early, minimizing the risk of damage to airfield luminaires and maintenance vehicles during snow plowing.

### ATTENTION

Pay special attention to inset light fixtures with glass domes, especially if the dome is unprotected or set higher than standard fixtures due to omni-directional requirements. A direct hit from a snowplow blade can damage the glass dome and must be avoided.

Set the snowplow blade height high enough to prevent contact with the glass dome, even under snow pressure. Always adjust and check snowplow equipment during training and operations to reduce the risk of damage to these fixtures.

## Preparation

You can take some steps before snow or ice removal to make the process easier:

- **Anti-icing chemicals:** Before precipitation forms, use only approved anti-icing chemicals to prevent strong ice bonds and assist with melting. Ensure pH does not exceed 11.
- **Pre-heating:** Switch on in-pavement lights at maximum intensity 30–40 minutes prior to removal. This helps melt snow and ice and reduces fixture damage.

## Snow and Ice Removal Practices

A combination of snow plows, rotary runway brooms, de-icing chemicals and blowers should be used for comprehensive snow and ice removal.

**Snow plows:**

- Adjust the blade to maintain a small distance above the pavement surface, minimizing contact with in-pavement lights.
- Reduce vehicle speed for added protection.

**Rotary runway brooms:**

- Use rotary brooms to remove residual snow from in-pavement light fixtures for a thorough finish.

**De-icing chemicals:**

- Use only approved de-icing chemicals to break down the ice structure, lower its freezing point and cause it to melt. Ensure pH does not exceed 11.

For detailed guidance, see Snow Plows, Rotary Brooms and De-Icing Chemicals.


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## Note

For frequent snow removal, high-strength steel snow plow rings are recommended to better absorb impact and protect aluminum alloy in-pavement lights. For detailed design and installation information, consult FAA Engineering Brief 85.

## Snow Plows

**Snow plow angle and speed:**

- Limit plow speed to 40 km/h or less; when crossing over in-pavement fixtures, reduce to below 10 km/h or lift blades.
- Maintain movable segment mechanics; adjust and control plow angles per manufacturer recommendations.
- If frequent prism damage occurs, adjust the snow plow swivel angle to better align with the vehicle's driving line.
- Adapt settings to temperature and snow quantity, following supplier recommendations.

**Cutting edge material and structure:**

- Equip snow plows with plastic cutting edges made from polyurethane, rubber, or similar materials.
- Regularly check for wear and abrasion marks; replace worn down plastic immediately. Avoid exposure of metal portions.

**Figure 59:** Well-aligned plastic cutting edge



- Ensure plastic segments are well-aligned and free of vertical or horizontal steps, which increase risk of luminaire damage.

**Figure 60:** Signs of wear on plastic cutting edge




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**Cutting edge height:**

- Set the plow blade/cutting edge slightly above ground level (10–15 mm clearance) when stationary.

**Figure 61:** Cutting edge without clearance



- Remaining snow/ice should be removed with rotary brooms or approved chemicals.
- Use casters, shoes, or support wheels to maintain clearance during operation; avoid steel wheels and protruding bolts with less than 20 mm clearance.

**Figure 62:** Snow plow with support wheels




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## Rotary Brooms

Rotary runway brooms play a vital role in both snow and ice removal, helping to maintain a connected airfield for smarter, data-driven decision making.

- **Snow removal:** Rotary brooms are highly effective at clearing snow from in-pavement light fixtures, often outperforming plow blades in removing the final layers.
- **Ice removal:** The type of broom used is critical. In some cases, brooms may "polish" the ice, which can reduce runway traction. Select broom types carefully for ice removal operations.

**Bristle selection and maintenance:**

- Bristles are available in steel or poly varieties.
  - **Steel bristles** cut through ice but can accelerate wear and scratching of glass prisms, impacting light photometry.
  - **Poly bristles** are ideal for flipping or wiping away snow with minimal impact on fixtures.
- To reduce wear and damage, avoid using steel bristles when possible, or use a mix of steel and poly bristles (e.g., one-third steel).
- Always check for adequate contact pressure, especially during pre-winter dry-run tests.
- Inspect bristle wear according to manufacturer recommendations and replace brooms as needed. Worn bristles become stiffer and can significantly increase wear on light fixtures, particularly the prisms.
- Avoid using silica or glass sand. If their use is necessary, remove as soon as operational conditions allow and use rotating brushes at low speed.

## De-Icing Chemicals

In some cases, chemicals may be necessary to remove compacted snow from in-pavement light fixtures. To protect your airfield equipment, we recommend using these solutions sparingly. Excessive chemical application can increase the risk of damage to both the fixtures and underground electrical components, leading to additional maintenance and costs. For best results, ensure that chemical solutions do not exceed a pH value of 11. This precaution helps safeguard your lighting systems and supports dependable, long-term airside operations/

Ensure pH value does not exceed 11 to safeguard lighting systems and minimize additional maintenance.

ADB SAFEGATE light fixtures are tested to work with common airfield chemicals, including:

- Potassium Acetate
- Potassium Formate
- Sodium Acetate
- Sodium Formate

## Reinforced Prisms

Using reinforced prisms, such as "sapphire™" prisms available in the AXON range, can significantly extend maintenance intervals. These prisms are approximately four times harder than standard glass, offering increased durability when steel brushes are required. While not scratch-proof, sapphire prisms can help increase service life and reduce maintenance frequency.


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# Appendix D: Support

Your airport needs fast, reliable support when technical issues affect operations. ADB SAFEGATE provides 24/7 phone support by experienced technical service and support teams to help you troubleshoot issues and reduce disruption.

For general product information, solutions and more, visit the ADB SAFEGATE website, www.adbsafegate.com.

### Global Technical Service & Support

For support in Europe, the Middle East, Africa and Asia Pacific, contact ADB SAFEGATE's technical support specialists. Trained in all areas of system issues, troubleshooting, quality control and technical assistance, our highly experienced Technical support specialists offers 24/7 phone support.

- Europe: **+32-2-722-17-11**
- China: **+86-10-8476-0106**
- Middle East and Africa: **+971-4-452-7575**

### Live Technical Support – Americas

For support in the Americas, contact ADB SAFEGATE's U.S.-based technical support specialists. The team provides support for airfield lighting products, power and control systems, weather systems, and Safedock A-VDGS.

Phone support is available 24/7.

- United States: **+1-800-545-4157**
- Canada: **+1-905-631-1597**

You can also reach the Americas support team by email during regular business hours:

- Airfield Technical Service: techservice.us@adbsafegate.com
- Apron (previously Gate) Technical Service: gateservice.us@adbsafegate.com
- Weather Customer Service: CustomerServiceWeather@adbsafegate.com

### Before You Call

Help us resolve your issue faster by having the right information ready before you contact Technical Support.

### For Airfield Lighting, Control Systems, and Weather Product Issues

Please review the following before calling:

- Review the product manual and troubleshooting guide.
- Be near the product and ready to troubleshoot.
- Have a True RMS Multimeter available, along with any other necessary tools.
- Have the following information ready:
  - Airport code
  - Company name, phone number, and email address
  - Product number or part number, if available

### For Safedock A-VDGS Issues

Please collect the following information before calling:

- Gate number
- Flight number
- Aircraft type
- Time of the event
- Description of the issue
- Any actions already taken to resolve the issue
- CCTV footage of the incident, if available, to help align the event with the Safedock log file


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# D.1 Recycling

## D.1.1 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.

## D.1.2 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 European Union (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 Restriction of Hazardous Substances ( *RoHS*)/Waste Electrical and Electronic Equipment (*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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## Company Addresses

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