F-Range Low Profile Type L-852A/C
Style 3 Inset Lights

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ETL Certified to FAA Specification
AC 150/5345-46B

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Record of Changes

Page	Rev	Description	EC No.	Checked	Approved	Date
	A	Released manual.	00009	WT	VP	9/15/98
7-2	B	Changed part number for F-Range inset light from 44A4727 to 44A4827.	00021	WT	VP	10/1/98
7-3, 7-4	C	Changed part number for green filter from 1428.20.010 to 1428.32.010.	00093	WT	VP	2/1/99
7-4, 7-6, 7-7	D	Changed the names of lamp and filter holder assembly and optical support plate to reflector/lamp support; and optical support assembly to optical assembly. Changed the following part numbers: optical assembly from 44A4810-XX to 44A4846; reflector/lamp support from 44A4809 to 4071.50.481; bidirectional top cover from 4071.80.220 to 62A2126-2, and film disc cutout from 1420.22.410 to 470118. Added unidirectional top cover to the Recommended Parts List and the complete listing of BOM items to the Optical Assembly Parts List.	00124	WT	VP	4/8/99
2-4, 2-5 7-1 thru 7-8	E	Added graphics and write-up for prism. Added parts to parts list. Figure 7-2 changed.	00203	WT	VP	6/29/99
6-1,6-2	F	Reversed steps 2 and 3 of the procedure for opening the optical unit so that the pressure release screw would be removed before the main pan screws.	00478	AR	WT	5/10/00
All	G	Changed to new title page. Changed ADB to ADB Airfield Solutions.	00696	AR	WT	5/16/01
ALL	H	Assign p/n for	01354	WT	WT	2/7/05

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Warranties

Products of ADB Airfield Solutions manufacture are guaranteed against mechanical, electrical, and physical defects (excluding lamps) for a period of one year from the date of installation or a maximum of two years from the date of shipment and are guaranteed to be merchantable and fit for the ordinary purposes for which such products are made.

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Disclaimers

This manual could contain technical inaccuracies or typographical errors. ADB Airfield Solutions reserves the right to revise this manual from time to time in the contents thereof without obligation of ADB Airfield Solutions to notify any person of such revision or change.

Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and ADB Airfield Solutions disclaims any liability for damages or detriments suffered as a result of reliance on the information given herein or the use of products, processes or equipment to which this manual refers. No warranty is made that the use of the information or of the products, processes or equipment to which this manual refers will not infringe any third party's patents or rights. The information given does not release the buyer from making their own experiments and tests.

Section 1
Safety

1. Introduction

This section contains general safety instructions for using your ADB Airfield Solutions 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. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- refer to the FAA Advisory Circular AC 150/5340-26, *Maintenance of Airport Visual Aids Facilities*, for instructions on safety precautions.
- observe all safety regulations. To avoid injuries, always remove power prior to making any wire connections and touching any parts. Refer to FAA Advisory Circular AC 150/5340-26.
- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of 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.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

2. Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.

WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

2. Safety Symbols *(contd.)*

WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Wear safety goggles. Failure to observe may result in serious injury.

CAUTION: Failure to observe may result in equipment damage.

3. Qualified Personnel

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 see that its personnel meet these requirements.

4. Intended Use

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

ADB Airfield Solutions cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking 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 Airfield Solutions replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your ADB Airfield Solutions equipment
- allowing unqualified personnel to perform any task

5. Installation

Read the installation section of all system component manuals before installing your equipment. A thorough understanding of system components and their requirements will help you install the system safely and efficiently.

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

- Allow only qualified personnel to install ADB Airfield Solutions and auxiliary equipment. Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- 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.

6. Operation

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.

6. Operation *(contd.)*

- 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.
- 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.

7. Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

8. Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with ADB Airfield Solutions equipment are permitted to service this equipment.

- Always use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Connect all disconnected equipment ground cables and wires after servicing equipment. Ground all conductive equipment.
- Use only approved ADB Airfield Solutions replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

8. Maintenance and Repair *(contd.)*

- Check interlock systems periodically to ensure their effectiveness.
- Do not attempt to service electrical equipment if standing water is present. Use caution when servicing electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.

Section 2
Description

1. Introduction

This section describes the ADB Airfield Solutions F-Range low profile series inset lights referred to in Table 2-1.

Table 2-1. F-Range Series Light Fixtures

F-Range Type	Function
L-852A	Used on taxiway centerline straight sections and clearance bar with a runway visual range (RVR) of ≥1200 ft
L-852C	Used on taxiway centerline straight sections and clearance bar with an RVR of <1200 ft

See Figure 2-1. The F-Range inset light fixtures are available in unidirectional or standard bidirectional, and are designed to provide visual guidance along the taxiway centerline. It is manufactured in accordance with FAA specification AC 150/5345-46B, Style 3 (≤ ¼ inch Height Above Grade).

1. Introduction *(contd.)*

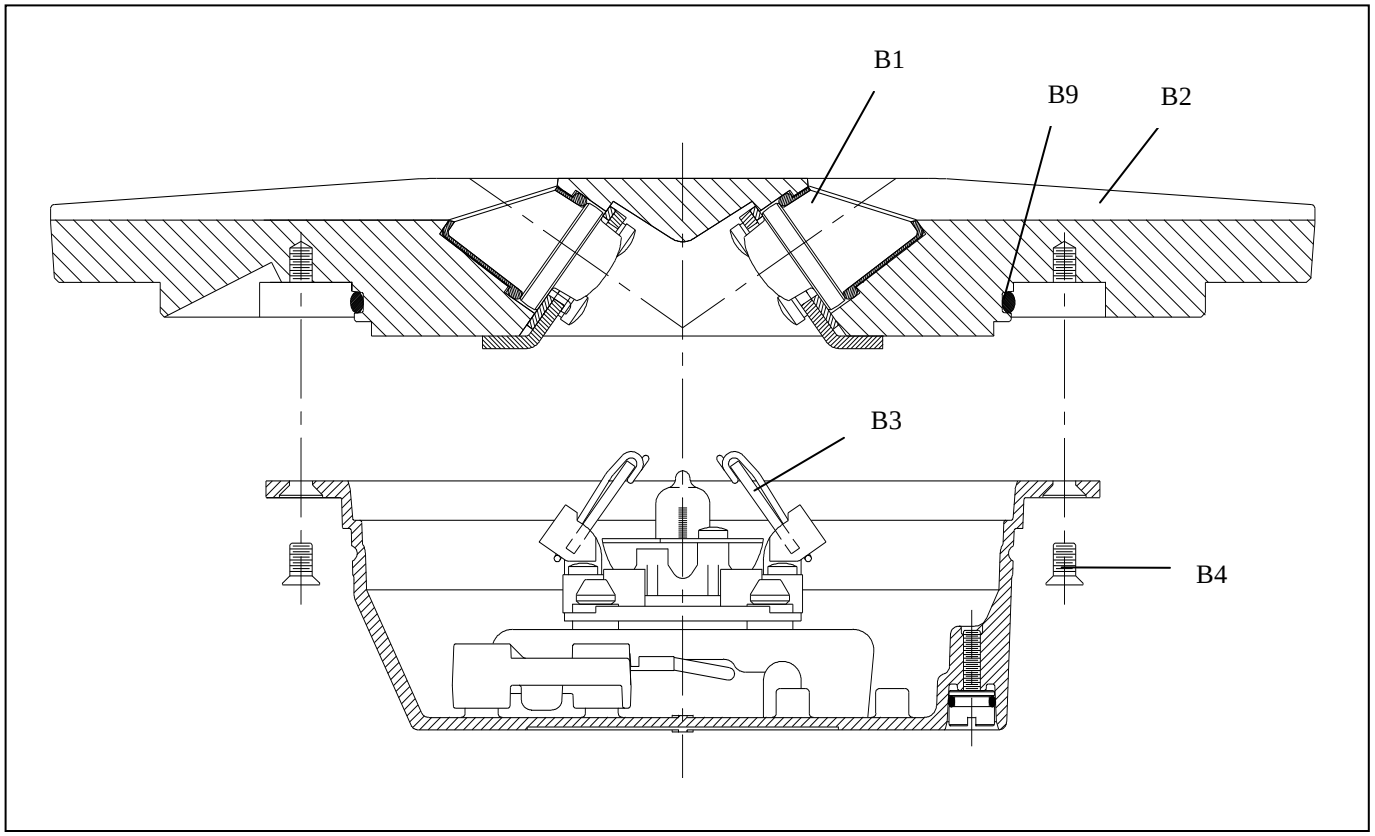


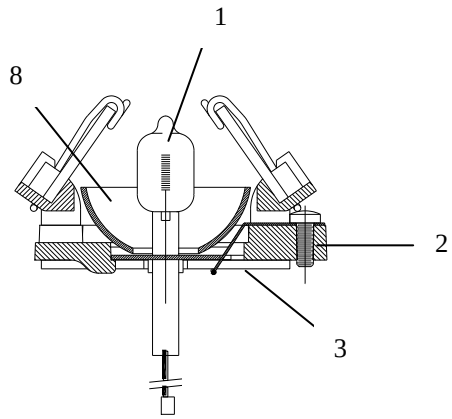
Figure 2-1. Cross-Sectional View of F-Range Inset Light Fixture (Typical Configuration)

B1 Prism
B2 Light Channel
B3 Optical Unit
B4 Phillips Flat Head Screw
B9 O-Ring

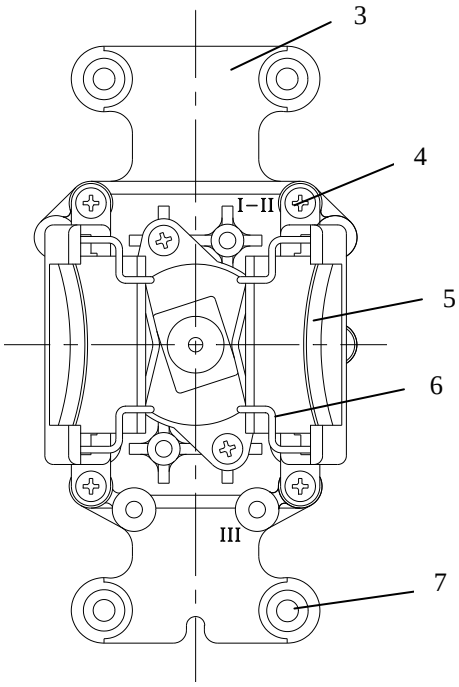
2. Optical Unit

See Figures 2-2 and 2-3. The F-Range series light fixture optical unit consists of one lamp, color filters, and two prisms.

2. Optical Unit *(contd.)*



Section View



Top View

Figure 2-2. L-852A/C Optical Unit

1. Lamp
2. Reflector/Lamp Support
3. Optical Unit
4. Phillips Head Screw
5. Lower Filter Spring
6. Retainer Spring
7. Grommet
8. Reflector

2. Optical Unit *(contd.)*

Lamps

Refer to Table 2-2 for L-852A/C lamps.

Table 2-2. Lamps

F-Range Type	Number of Lamps	Lamp Wattage (W)	Type of Lamp	Lamp Current
L-852A	One	45	PK30d	6.6 A
L-852C	One	45	PK30d	6.6 A

Filters

Refer to Table 2-3 for L-852A/C filters.

Table 2-3. L-852A/C F-Range Filters

F-Range Type	Light Direction	Light Beam	Optional Filter Colors
L-852A	Unidirectional and bidirectional	Narrow	Green, yellow
L-852C	Unidirectional and bidirectional	Narrow	Green, yellow

Prisms

See Figure 2-3 for the L-852A/C F-Range prisms. Refer to Table 2-4 for differences in the prisms.

Table 2-4. L-852A/C Prisms

F-Range Type	Description
L-852A	• Has flat face. • Has convex area extending the full width of the prism. Has Roman numeral I above convex area on lamp side face. • Used only with 45 W/PK30d lamp.
L-852C	• Has flat face. • Has convex area inset from each end approximately 3/8 in. Has Roman numeral II above convex area on lamp side face. • Used only with 45 W/PK30d lamp.

Prisms *(contd.)*

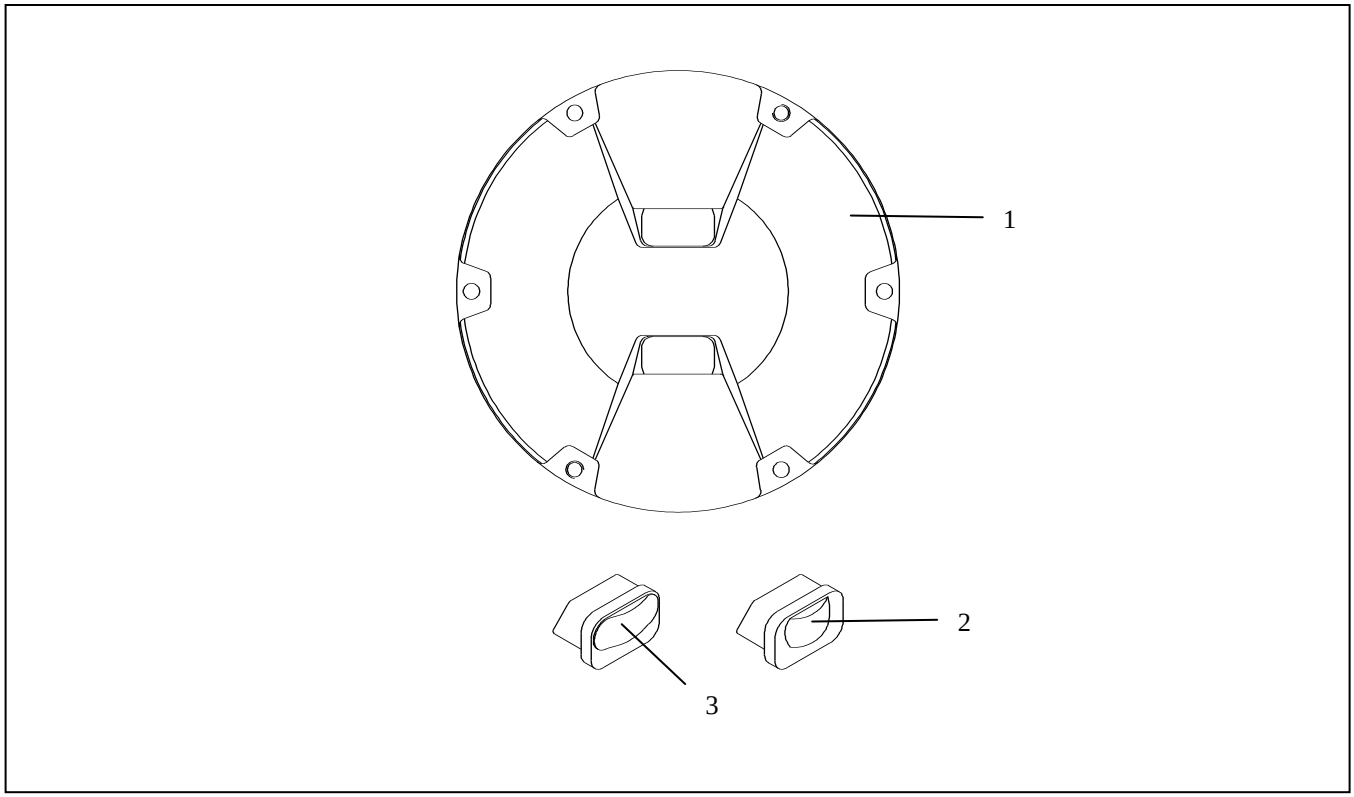


Figure 2-3. L-852A/C Prisms

1. L-852A/C F-Range Inset Light
2. L-852C Prism (Lamp Side Face)
3. L-852A Prism (Lamp Side Face)

3. Inner Pan Subassembly

See Figure 2-4. The inner cover assembly is comprised of the inner cover (3), L-823 cordset (1), terminal block (with or without film disc cutout) (2), and pressure release screw (4).

3. Inner Pan Subassembly
(contd.)

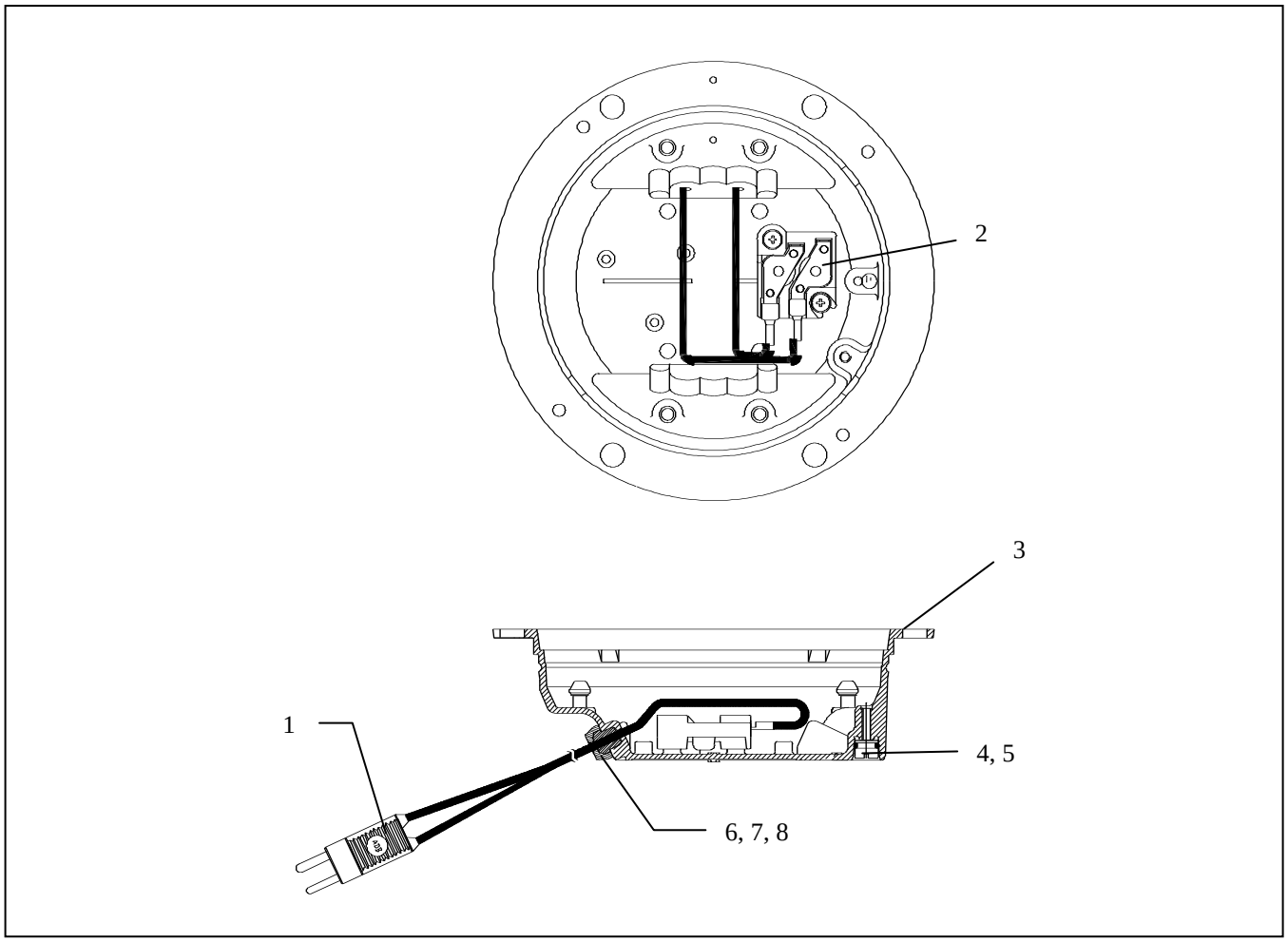


Figure 2-4. Inner Pan Subassembly

1. L-823 Cordset
2. Terminal Block
3. Inner Cover Assembly
4. Pressure Release Screw
5. O-Ring
6. Grommets
7. Inner Cover Cable Clamp
8. Screws

4. Reflector/Lamp Support Assembly

See Figure 2-2. The reflector/lamp support assembly consists of the reflector/lamp support (2) and the retainer spring (6). The reflector/lamp support subassembly is pre-assembled at the factory. The retainer spring is a replaceable item.

5. Optional Film Disc Cutout

An optional film disc cutout is available as an electrical bypass device in case of lamp failure. It closes an auxiliary circuit around the lamp within 15 seconds of lamp failure. The film disc cutout shorts and completes the circuit when the lamp fails. This allows the other lamps to remain lighted in series-connected fixtures. It also prevents excessive voltage on the secondary of the isolation transformer. The film disc cutout must be replaced (if used) when the lamp is replaced.

CAUTION: Do not use a film disc cutout if circuit has monitoring. This will prevent the monitoring system from functioning properly.

See Figure 2-5 for F-Range light fixture inner pan subassemblies with and without film disc cutouts.

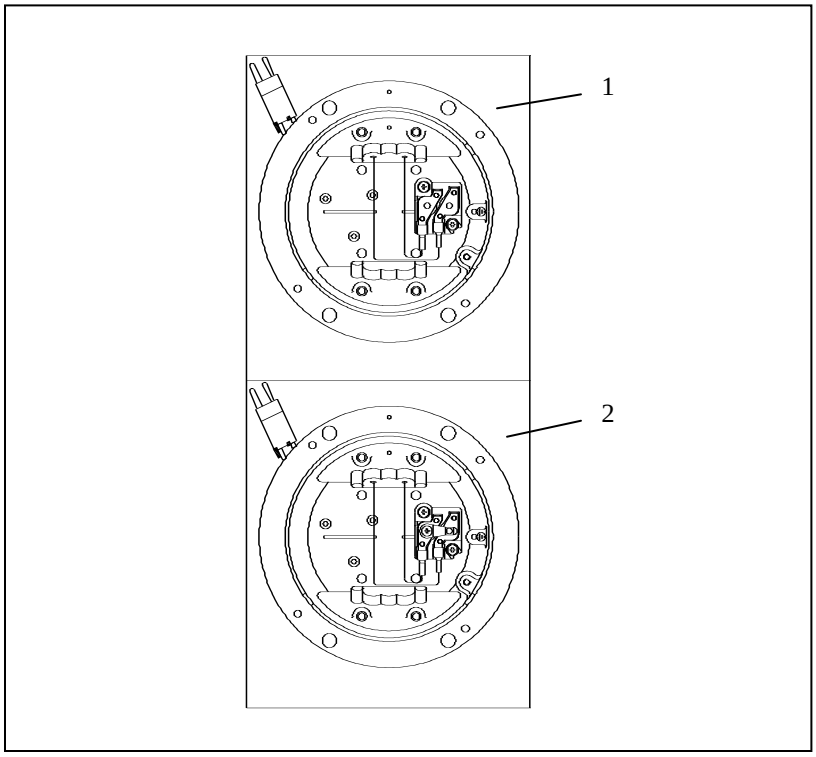


Figure 2-5. L-852A/C, One Lamp, With/Without Film Disc Cutout

1. Without Film Disc Cutout
2. With Film Disc Cutout

6. F-Range Light Fixture: Required Equipment

Refer to Table 2-5 for required equipment that is supplied. Refer to Table 2-6 for required equipment that is not supplied. Refer to the *Parts* section for part numbers.

Table 2-5. Required Equipment Supplied

Description	Quantity
F-Range inset light, with lamp	1
Instruction manual	1 per order

Table 2-6. Required Equipment Not Supplied

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

7. Specifications

This subsection provides specifications for the F-Range inset light fixtures.

Lamps

Refer to Table 2-2 for lamps.

Filter Colors

Refer to Table 2-3 for filter colors.

Isolation Transformers

Refer to Table 2-7 for required isolation transformers.

Table 2-7. Required Isolation Transformers for L-852A/C Taxiway Inset Light Fixture (45 W/PK30d Lamp)

Lamp	Series Circuit	Isolation Transformer	Watts	Amperes	Hz
45 W	6.6 A	L-830-1	45	6.6/6.6	60
45 W	20 A	L-830-2	45	20/6.6	60

Rated Lamp Life

Refer to Table 2-8.

Table 2-8. Rated Lamp Life

F-Range Type	Lamp Wattage	Rated Lamp Life (Hours)
L-852A	45 W	1000
L-852C	45 W	1000

Light Beam

180 degrees bidirectional (standard)

Mounting

The F-Range light fixtures mount on an optional ADB Airfield Solutions shallow base or on a 12-inch- (304.8-mm-) diameter deep L-868B light base. Refer to Table 2-9 for connectors supplied.

Table 2-9. Connectors Supplied

F-Range Fixture	Connector Supplied
L-852A/C fixture with shallow base	Main lead assembly
L-852A/C fixture without shallow base	L-823 connector

Environmental Operating Conditions

The F-Range light fixture is designed to operate under the conditions presented below for temperature, altitude, and relative humidity.

Temperature

-55 to + 55 °C (-67 to +131 °F)

Altitude

Sea level to 10,000 feet (3000 m)

Relative Humidity

Up to 100 %

Dimensions

Diameter: 11.94 in. (303.28 mm)

Bolt-circle diameter: 11.25 in. (285.75 mm)

Weight

11.6 lb (5.262 kg) (approximate)

Section 3
Installation

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

1. Introduction

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

2. Unpacking

Each unit is individually packaged in a durable, cushioned, corrugated cardboard carton. To avoid unnecessary damage to the light assembly, unpack the carton at the installation site.

To unpack the carton, open the flaps and carefully remove the top packing material. Thread an eyebolt into each of the two opposite threaded holes. Run a rod through the eyebolts and lift the light assembly from the shipping carton. Set the light assembly in a protected area.

If damage to any equipment is noted, file a claim form with the carrier immediately. The carrier may request to inspect the equipment.

3. Input Requirement Summary

The F-Range light fixture is designed for connection to a 6.6 A or 20 A series lighting circuit via an L-830 isolation transformer. Refer to Table 2-7.

4. Installation Procedure

Installing the F-Range light fixture involves preparing the pavement recess and wireways and installing the light fixture on an L-868B base. Install the light fixture on a shallow base, if applicable.

Pavement Recess Preparation

To prepare the pavement recess, follow the guidelines below.

- See Figure 3-1. Drill the recess in the pavement. For the light fixture, drill the hole a minimum of 4.5 in. (104.3 mm) deep.

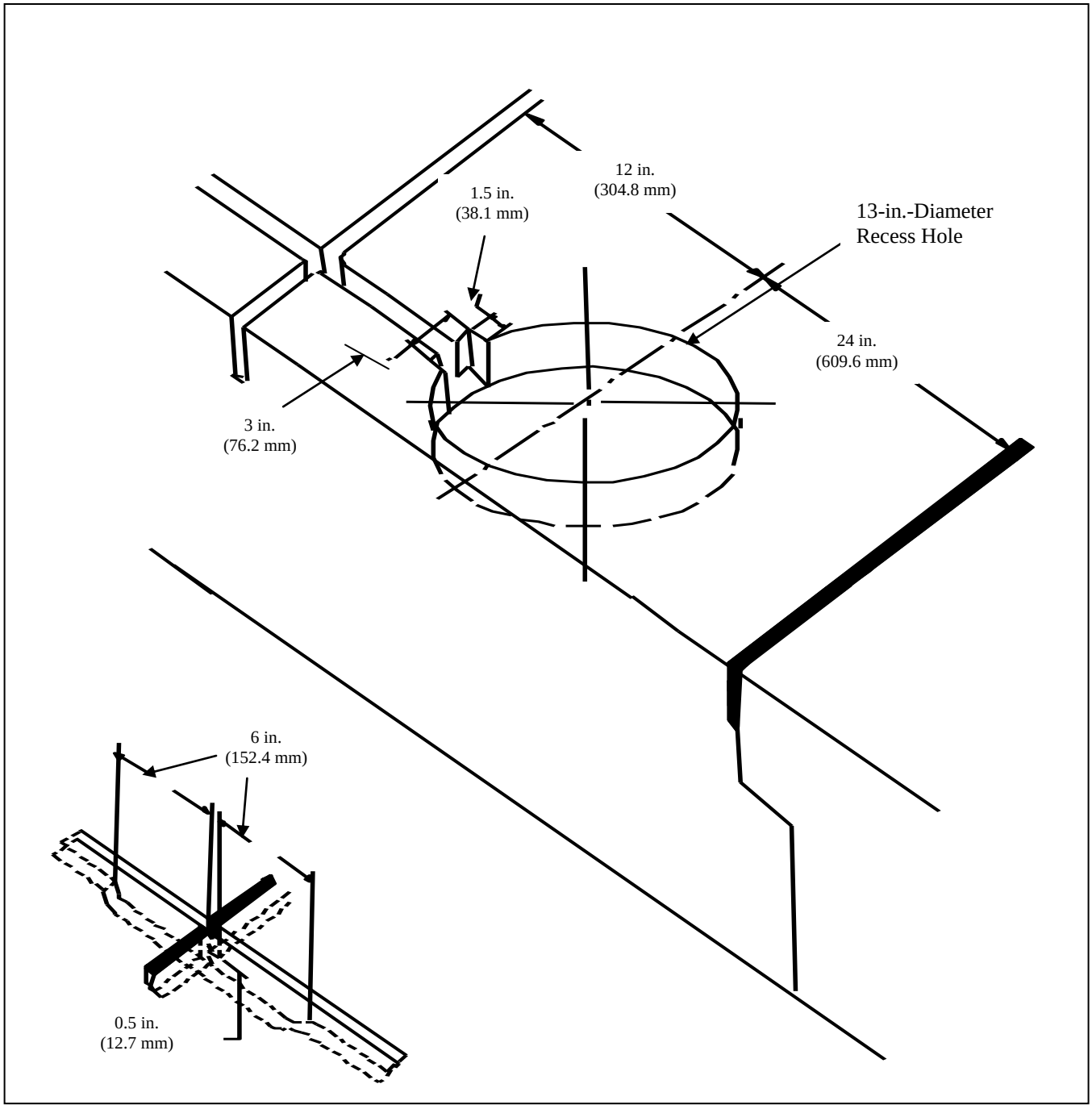


Figure 3-1. Preparing Pavement Recess and Wireways for Shallow Base Installation

Pavement Recess Preparation *(contd.)*

- Make sure the recess size and depth are maintained within specified limits.
- The recess side walls must be perpendicular to the pavement surface.
- The bottom surface must be flat or slightly concave to ensure that the base receptacle is resting securely and in true position.
- The recess can best be drilled using a 13-in.- (330-mm-) diameter diamond-faced core drill in a sturdy, stable drill rig.

Wireways Preparation

To prepare wireways, follow the guidelines below.

- See Figure 3-1. The wireways should be sawn using a 3/8-in.- (9.525-mm-) thick diamond-faced saw.
- When the wireways cross construction joints, the sawcuts should extend 1-1/4-in. (31.75 mm) below the existing joint for a distance of 6 in. (152.4 mm) on each side of the joint.
- Fill to 1 in. (25.4 mm) from the top of the pavement with an appropriate joint sealing filler in accordance with Item P-605 or P-606 of FAA publication *Standard Specifications for Construction of Airports*. Item P-605 should be used with asphalt, and Item P-606 with concrete.

Installation on L-868B Base

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

To install the F-Range light fixture on the L-868B base, perform the following procedure:

1. Clean the base receptacle. Make sure that the base receptacle does not contain water and is completely clean and dry. The mating surfaces must be clean and free of foreign particles.
2. Slide a 16-inch- (406-mm-) long rod through the 3/8-inch- (9.525-mm-) diameter eyebolts and carry the light assembly to the base. Align the light assembly with the runway for proper light direction.
3. Place the light assembly beside the opening in the L-868B base so that the L-823 connector can be connected with the mating receptacle from the L-830 isolation transformer in the base. Make sure that the connection is solid and secure. Refer to Table 2-7 in *Specifications* in the *Description* section for required isolation transformers.

Installation on L-868B Base *(contd.)*

4. Turn on the power. Operate the light assembly for a minimum of five minutes. Turn off the power and allow the light assembly to cool.

5. Position the light assembly over the L-868B base and set onto the base. Align the light to the runway centerline. Make sure all spaces, shims, and gaskets are in place before installing light fixture on the base. Remove the eyebolts and lifting rod.

6. Turn on the power to check that the lamp will illuminate. Operate for a minimum of five minutes.

CAUTION: The light assembly will be hot after this test. Allow time for assembly to cool before proceeding.

7. Apply one drop of Loctite AV to each of the six light assembly mounting bolts. Install the six bolts and lockwashers. Torque the bolts to 185 ±5 inch-pounds (20.902 ±0.565 Nt-m). Torque across the corners. Refer to *Retorquing Mounting Bolts* in the *Maintenance* section.

Installation on ADB Airfield Solutions Shallow Base

To install the F-Range light fixture on an ADB Airfield Solutions shallow base, perform the following procedure:

1. Splice the light assembly leads to AWG 16 wires with suitable pre-insulated connectors, crimped with the proper tool.

2. Train the leads and AWG 16 wires carefully so they run along the bottom of the sawed wireways.

   NOTE: Small wads of plastic insulating tape may be used to wedge the leads and cables in the bottom of the wireways if necessary. Refer to Table 2-7 for the appropriate isolation transformer required for installation between the fixture and the series lighting circuit.

3. Make sure the O-ring is seated in the O-ring groove before bolting the fixture to the shallow base.

4. Lightly sand blast and clean with solvent all external surfaces that will be bonded into the runway, except for the wire entrance seal. This is done to make sure an adequate bond between the shallow base and sealer exists.

CAUTION: Do not handle the light fixture by the leads. This can break the waterproof seal and cause electrical leakage.

Installation on ADB Airfield Solutions Shallow Base *(contd.)*

5. See Figure 3-2. Use an alignment jig to align the light assembly. The jig has three positioning screws that fit into the tapped holes holding the light fixture to the shallow base.

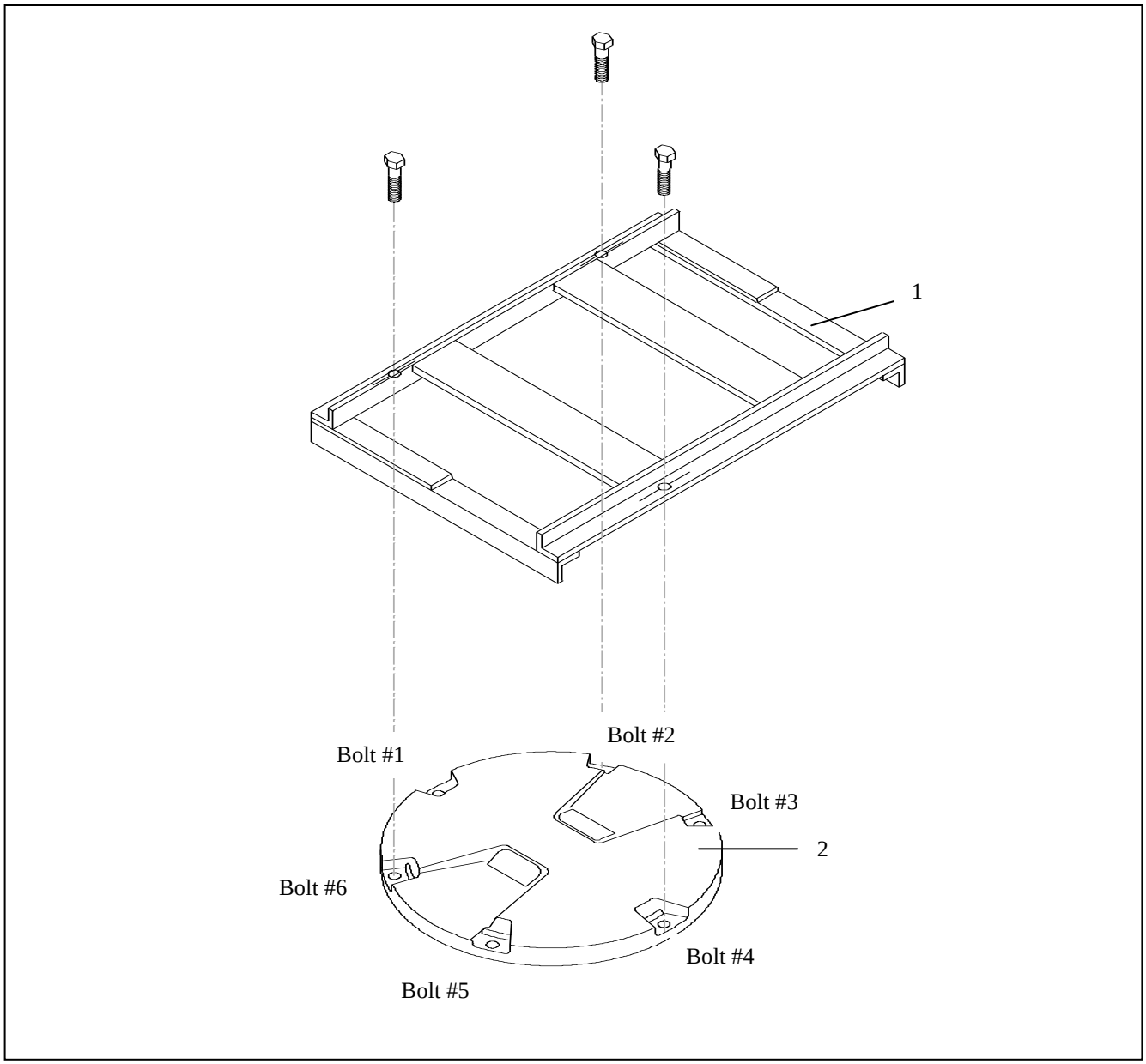


Figure 3-2. Alignment Jig

1. Alignment Jig
2. F-Range Light Fixture Assembly

Installation on ADB Airfield Solutions Shallow Base *(contd.)*

6. To attach the alignment jig, remove bolts #1, 2, and 3 from the light fixture.

7. Secure the jig with the three screws provided with the fixture. Contact the ADB Airfield Solutions Sales Department if further information is required concerning the jig.

   NOTE: It may be necessary to place temporary plugs for blocking the wireway entrance into the drilled holes or recess. The plugs will retain the sealer during the setting of the light assembly.

8. Cover the bottom of the shallow base completely with a P-606 paste-type sealer. Place a sufficient quantity of P-606 paste material in the drilled hole to force material out when the base is inserted. This ensures a bond between the bottom of the shallow base and the drilled hole.

   NOTE: When the base is placed in the recess, sealer material should be forced up the sides of the base at least 1/8 in. (3.175 mm).

   NOTE: The jig is used to position the light assembly with arrows on the top of the fixture pointing along the taxiway centerline.

9. If necessary, place a weight on the jig to hold the light assembly in proper position.

10. Fill the remainder of the space between the sides of the base and the drilled recess with a liquid sealer to a level 3/4 in. (19 mm) below the pavement surface. The jig should be left in place until the sealer reaches its initial set.

11. If any voids are present around the shallow base after the initial set, they should be filled with P-606 paste and all excess sealer removed. Remove the jig for complete visibility of voids.

12. Fill the top 3/4 in. (19 mm) gap between the fixture and pavement with flexible sealing material to minimize water penetration and pavement deterioration.

13. Apply grade AV Loctite to the bolt threads, and reinstall the three bolts and lockwashers. Torque bolts to 185 ±5 in-lb (20.9 ±.6 Nt-m).

14. Fill the wireways completely with a polyester compound and let it cure at least 24 hours before disturbing, unless otherwise specified. Refer to AC 150/5345-4C for construction and sealing instructions for wireways.

Section 4
Maintenance

1. Introduction

This section provides maintenance information and procedures for the F-Range light fixtures.

2. Maintenance Schedule

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

To keep the F-Range light fixtures operating efficiently, follow a preventive maintenance schedule. Refer to Table 4-1. Refer to FAA AC 150/5340-26 for more detailed information.

Table 4-1. F-Range Light Fixture Maintenance

Interval	Maintenance Task	Action
Daily	Check for burned-out lamp.	Replace lamp and film disc cutout, if used. Refer to *Replacing Lamp* in this section.
	Check for dim lamp.	Clean optical surface if dirty. Check for misalignment or presence of moisture in fixture.
Weekly	Check for dirty channel and prism.	Clean channel and prism. Refer to *Cleaning Light Channel and Prism* in this section.
Monthly (or more frequently during rainy seasons)	Check for moisture in the light fixture.	Open up the light fixture. Clean, dry, and inspect the light assembly. Replace O-ring.
Every 60 days, or whenever the light assembly is serviced	Check for improper torque on holddown bolts.	Torque six bolts holding fixture to base to base receptacle to 185 ± 5 in-lb (20.902 ±0.565 Nt-m). Use Loctite to keep bolts tight. Refer to *Retorquing Mounting Bolts* in this section.
Semi-annually	Check for six inches (152 mm) of water in L-868B base.	Pump water from base. Remove and inspect light for water damage. Refer to *Removing L-868B Base Water* in this section.
After snow removal	Check for damaged light fixtures.	Replace damaged fixtures. Use a power broom for snow removal, if practical. Follow recommended snow removal techniques described in AC 150/5200-23.

3. Maintenance Procedures

This subsection describes the following maintenance procedures:

- replacing lamp
- cleaning light channel and prism
- retorquing mounting bolts
- removing L-868B base water
- lifting optical unit out of base

Replacing Lamp

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

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

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

NOTE: If any lamps are out, record the location of the fixture and replace the lamp when the circuit is turned off.

Refer to *Replacing Lamp* in the *Repair* section for lamp replacement procedure.

Cleaning Light Channel and Prism

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

1. See Figure 2-1. Use a suitable fiber brush to remove all accumulated debris from the light channel (B2).

Cleaning Light Channel and Prism *(contd.)*

2. Clean the outer surface of the prism (B1) using liquid glass cleaner. If the prism is coated with a substance impervious to the cleaner, apply a suitable solvent sparingly with a wad of cotton or a patch of cloth. After the solvent has acted, remove the softened coating with a clean piece of cotton or cloth. Dry the prism with gently, dry, oil-free compressed air at a pressure no greater than 10 psi (69 KNt/m^2) to evaporate or remove all remaining cleaner.

Retorquing Mounting Bolts

When retorquing mounting bolts, apply one drop of Grade AV Loctite to each of the six 3.8-inch- (9.525-mm-) diameter mounting bolts. Torque the bolts to 185 ±5 inch-pounds (20.902 ± 0.565 Nt-m). Torque the bolts across the corners.

See Figure 3-2. To torque the outer bolts across corners, tighten bolts in noted sequence: #1 and #4, then #2 and #5, then #3 and #6.

NOTE: Applying more than one drop of Loctite to the screw and bolt threads will create future difficulty in removal of the bolts.

NOTE: After several relampings, threaded holes may accumulate with dirt and excessive Loctite. If this occurs, screws may not seat properly. Clean holes with light weight oil or diesel fuel using a small fiber brush. Wipe the holes clean with alcohol to remove all oil or diesel fuel and dirt. Clean with dry, oil-free, low-pressure air.

Removing L-868B Base Water

Turn off the circuit when checking water level.

Check the water level in the L-868B base on a regular schedule. If more than six inches (152.4 mm) of water in the light base is found, pump the water from the base and remove and inspect the entire light assembly for water damage. Cover the L-868B base with the appropriate steel cover plate after removing the light assembly.

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

Lifting Optical Unit Out of Base

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

1. Remove the six fixing screws and washers.

2. Fit the appropriate lifting tool into both holes located (180° apart) in the cover, lift the optical unit out of the base and place the optical unit next to the base.

Lifting Optical Unit Out of Base *(contd.)*

3. Disconnect the light fixture wires from the power wires coming from the transformer(s).

4. Mount a serviced or new light fixture as described *in Installation on L-868B Base* in the *Installation* section.

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

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

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

Section 5
Troubleshooting

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

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

1. Introduction

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

2. Troubleshooting Procedures

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

Problem	Possible Cause	Corrective Action
1. Lamp not energizing	Defective lamp	Replace lamp and film disc cutout (if used). Refer to *Replacing Lamp* in the *Maintenance* section.
	Loose or broken contacts	Tighten or replace.
	Moisture inside assembly causing current leakage	Open up light assembly. Clean, dry, and inspect light assembly. Replace O-ring.
	Defective isolation transformer	Check transformer output current with meter.
2. Lamp not turning on at normal level	Continuity incorrect	Check lamp filament and wiring for continuity.
3. Lamp output distorted	Broken or damaged prism	Replace prism.
4. Improper color	Filter broken	Replace filter bracket assembly.
	Filter bracket broken	Replace filter bracket assembly.
5. Short lamp life	Current too high	Check constant current regulator and isolation transformer.
	Water in assembly	Inspect prism. Open light assembly. Clean, dry and inspect light assembly. Replace O-ring.
	Defective lamp	Replace lamp and film disc cutout (if used). Refer to *Replacing Lamp* in the *Maintenance* section. **NOTE:** Lamp interior will have a white powdery appearance if air has entered through a hole or crack.
	Overvoltage	Check to see if lamp has black burns. If so, check isolation transformer output with meter. Replace isolation transformer, if defective.
6. Distorted light beam output	Wrong prism installed	Check parts list and install correct prism.
7. Water inside optical chamber	Damaged or missing prism seals or top cover O-ring	Replace both prism seals. Replace top cover O-ring.

Section 6
Repair

1. Introduction

This section describes procedures for repairing and replacing parts. It includes opening the optical unit, and replacing the film disc cutout assembly, lamp, filter, prism, optical unit, and cable set assembly. It also describes how to close the optical unit.

2. Opening Optical Unit

To open the optical unit, perform the following procedure:

1. Turn the optical unit upside-down.

2. See Figure 6-1. Remove the pressure release screw (F9).

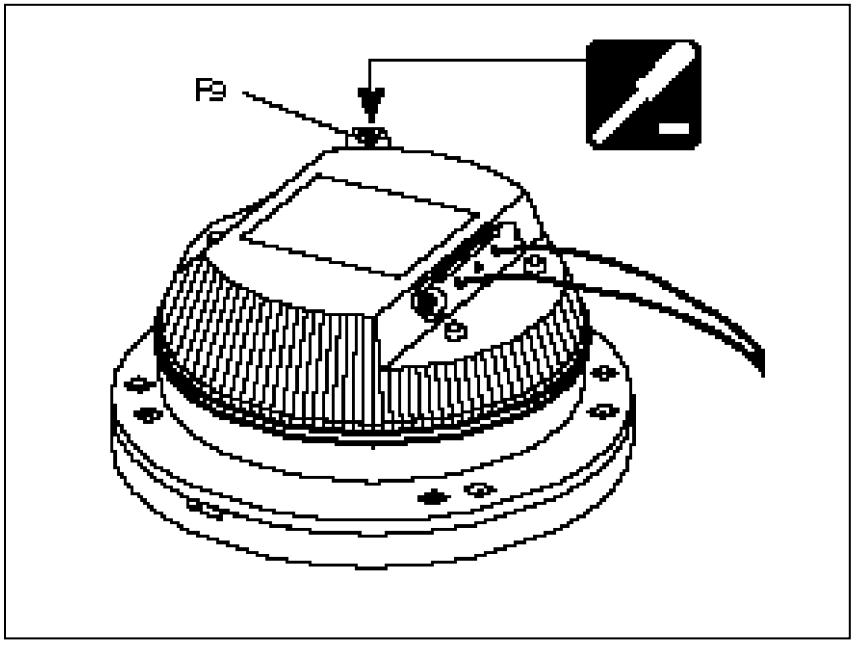


Figure 6-1. Removing Pressure Release Screw

2. Opening Optical Unit *(contd.)*

3. See Figure 6-2. Remove the four Phillips flat head screws (F4). The use of an impact driver may be required to unlock the screws.

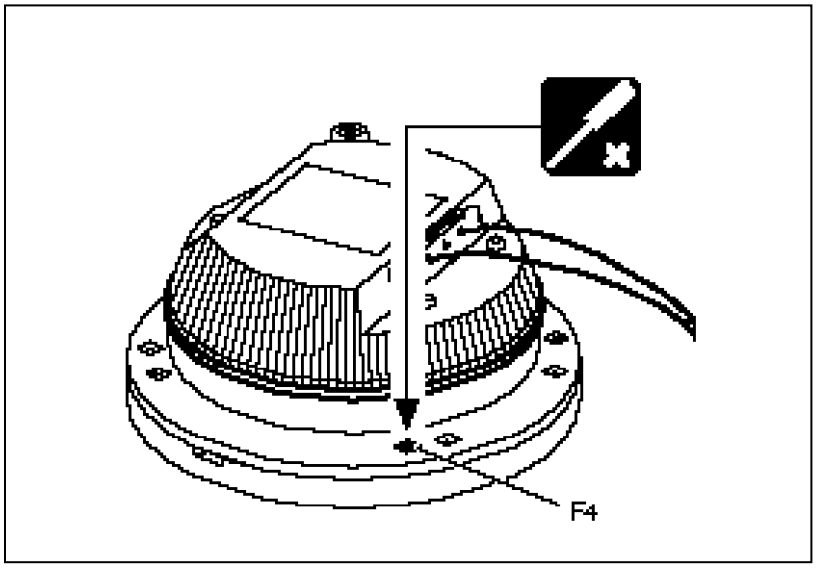


Figure 6-2. Removing Screws

4. See Figure 6-3. Insert small or medium flat blade screwdriver in the machined recess between cover and inner cover and turn it vertically to separate the inner cover from the cover.

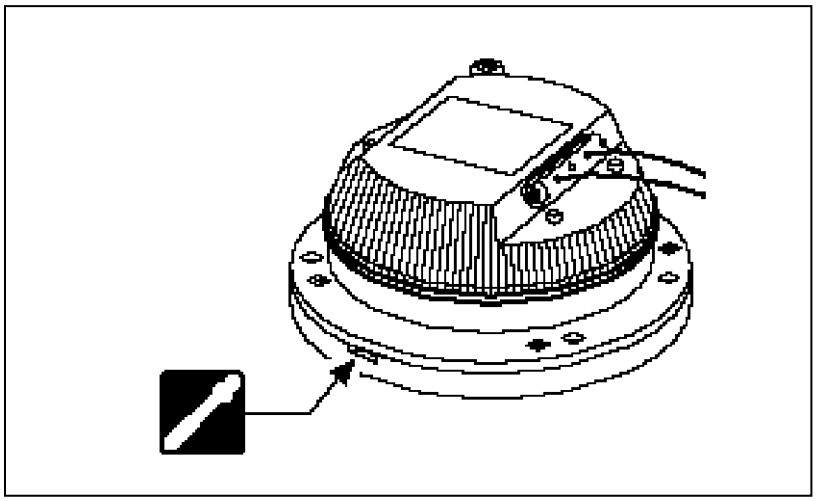


Figure 6-3. Separating Inner Cover from Top Cover

3. Replacing Film Disc Cutout Assembly

To replace the film disc cutout assembly, perform the following procedure:

1. Remove the inner cover from the bottom of the top cover.

2. See Figure 6-4. Disconnect the lamp from the terminals on the terminal block (1).

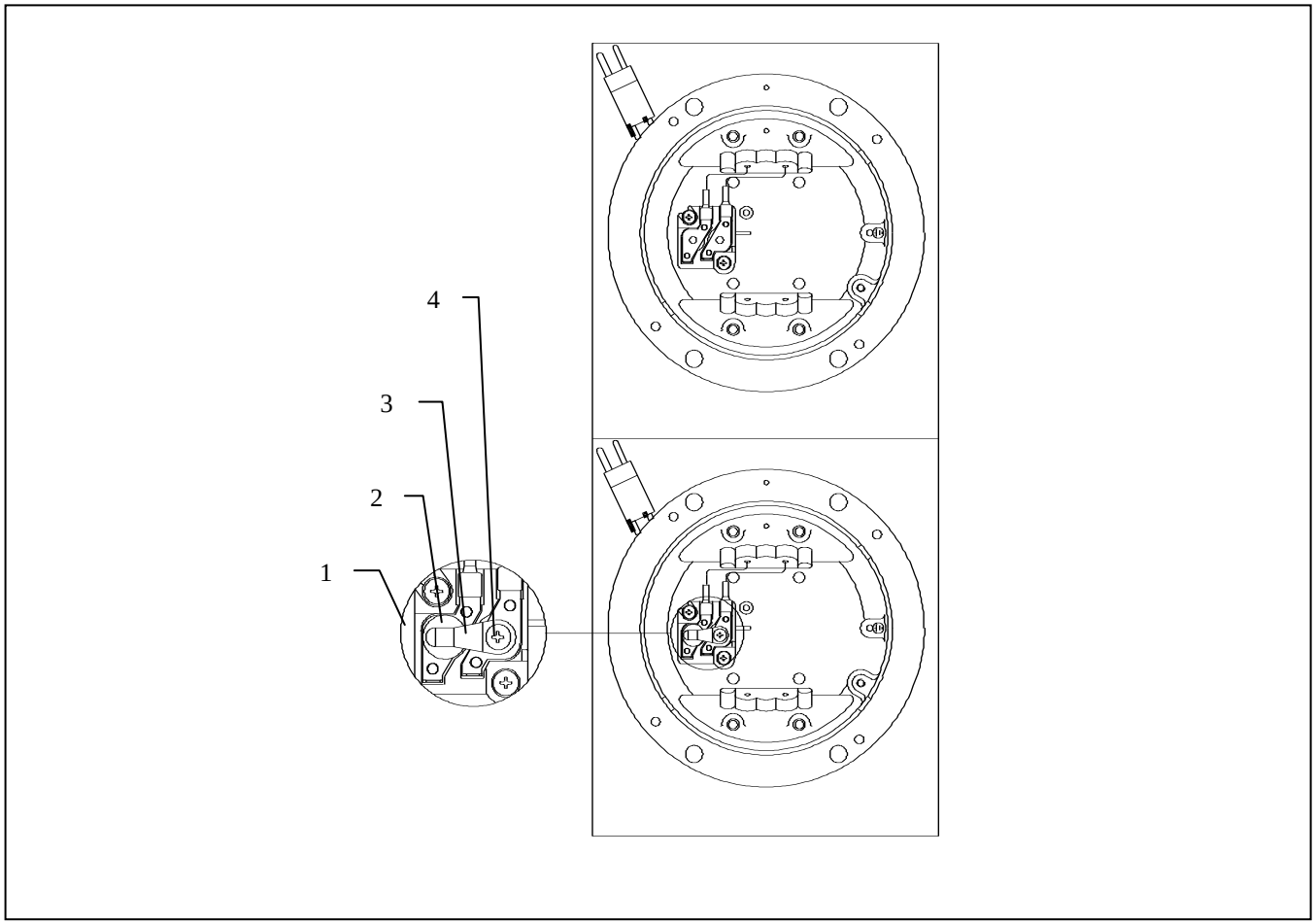


Figure 6-4. Replacing Film Disc Cutout Assembly

1. Terminal Block
2. Film Disc Cutout
3. Film Disc Cutout Clip
4. Spring Clip Screw

3. Replacing Film Disc Cutout Assembly *(contd.)*

3. Grasp the optical plate assembly and pull straight up.

4. Using a Phillips head screwdriver, loosen or remove the spring clip screw (4).

5. Remove installed film disc cutout (2) and replace with the new film disc cutout.

   NOTE: Make sure that the small button on the side of the film disc cutout is pointed up.

6. Reassemble all components in reverse order as removal. Inner cover assembly is now ready to reinstall on the top cover.

4. Replacing Lamp

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

WARNING: Allow time for the unit to cool. High interior temperatures may cause severe burns to personnel. Failure to observe this warning may

To replace the lamp, perform the following procedure:

1. See Figure 6-5. Lift the optical unit from the inner cover. Refer to *Replacing Optical Unit* in this section for a more complete view of the inset light.

4. Replacing Lamp *(contd.)*

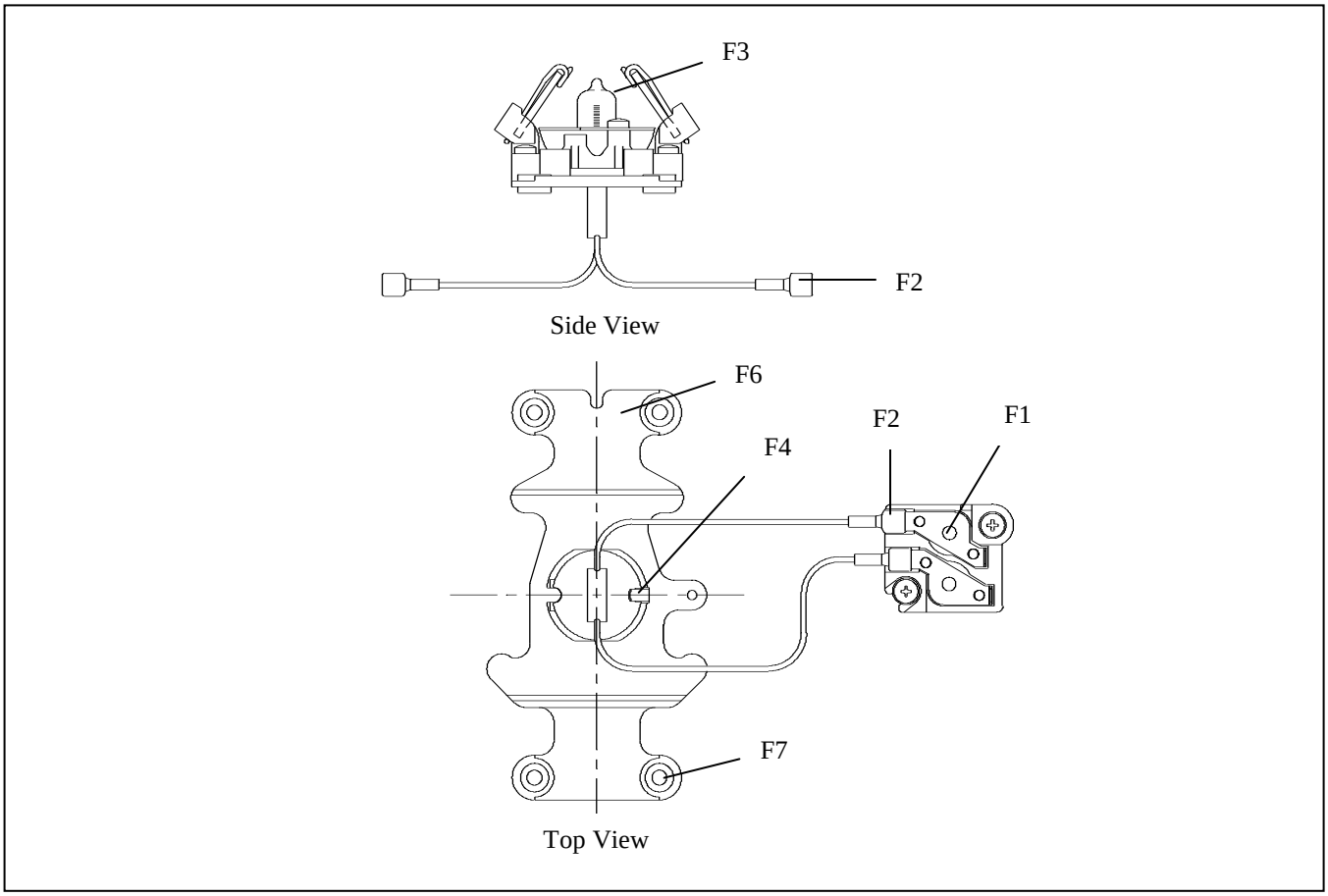


Figure 6-5. Replacing Lamp

2. Unplug the fast-on (F2) connectors from the terminal block (F1).

3. Pull back on the locking tab (F4) located in the rectangular opening in the bottom of the lamp base flange. Lift and rotate the lamp slightly to remove the lamp (F3).

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

4. Install the new lamp by first aligning the rectangular slot in the lamp base with the locking tab (F4). Using your fingers, push lamp against the locking tab on the lamp and the lamp will snap into place.

5. Plug the fast-on connectors (F2) into the terminal block (F1).

4. Replacing Lamp *(contd.)*

6. Reinstall the optical unit (F6) over the four location pins in the bottom of the inner cover. Refer to *Replacing Optical Unit* in this section for location pins.

   NOTE: Replace the grommets (F7) when damaged or worn.

7. If a cut-out is used, position a new disc (small button side up) in the terminal block. Rotate the cut-out clip on top of the cut-out and hold while tightening the screw. Make sure that the pressure applied by the clip on the film disc is sufficient to assure good contact. If the film disc is loose, remove the clip and bend it slightly to increase its pressure.

5. Replacing Filter

To replace the filter, perform the following procedure:

1. See Figure 6-6. Release the retainer spring (C1).

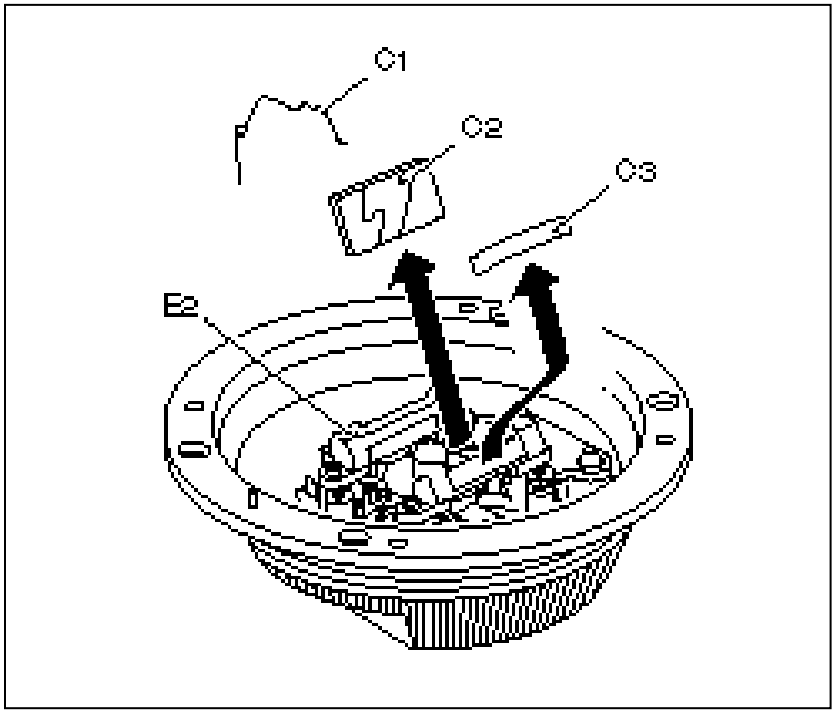


Figure 6-6. Replacing Filter

2. Lift the filter (C2) and the filter spring (C3) out of the lampholder (E2).
3. Place a new filter in the lampholder filter slot.
4. Reinstall the filter spring (C3).
5. Relatch the retainer spring (C1).

6. Replacing Prism

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

To replace the prism, perform the following procedure:

1. See Figure 6-7. Remove the prism-keeper plate (B5) and the flat gasket (B4).

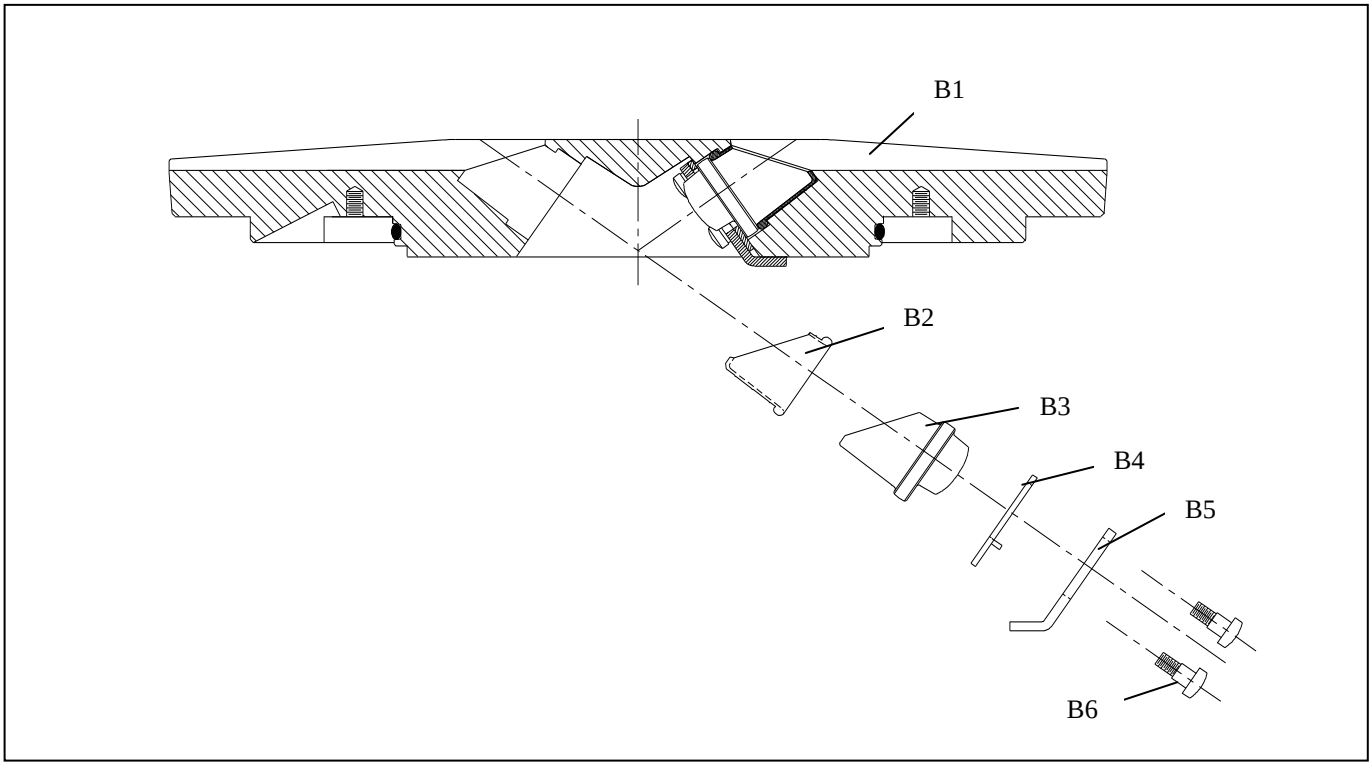


Figure 6-7. Replacing Prism

2. Push the prism with the sleeve gasket (B2) towards the inside of the cover.

3. Clean and degrease the prism chamber with any effective solvent.

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

4. Apply a thin layer of lubricant MOLYKOTE 67A0095BG87 INERTA or MOLYKOTE 67A0095BG88 INERTA in the prism chamber using a small brush.

5. Install a new sleeve gasket (B2) over the prism (B3).

6. Push the prism/gasket assembly in the prism pocket from the inside and clean the inner surface of the prism.

6. Replacing Prism *(contd.)*

7. Install a new flat gasket (B4) over the prism-keeper plate (B5).

8. Reinstall hardware with the Phillips pan head screws (B6). Apply a droplet of Loctite 270 to the last threads. Torque to 3.5 ± 0.5 Nt-m (31 ± 4 inch-pounds).

7. Replacing Optical Unit

To replace the optical unit, perform the following procedure:

1. See Figure 6-8. Remove the lamp (E1). Refer to *Replacing Lamp* in this section.

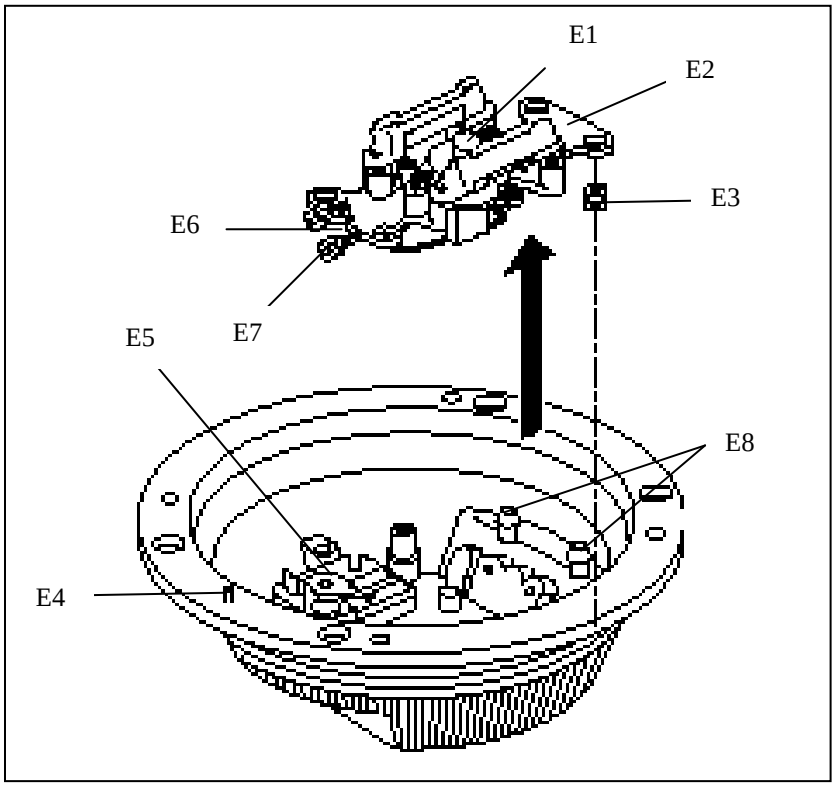


Figure 6-8. Installing Optical Unit

2. Remove the optical unit (E2) by lifting it up from the inner cover manually.

3. Position the lampholder on the optical support.

CAUTION: Align the lampholder by fitting the lampholder notch (E6) over the lampholder alignment pin (not shown). The lampholder alignment pin is on the same side of the inset light as the index alignment pin (E4). Using any other inset light alignment procedure may damage the lampholder.

4. Plug the fast-on connectors (E7) into the terminal block (E5).

5. Install the new optical unit with new grommets (E3).

7. Replacing Optical Unit *(contd.)*

6. Clip the optical unit to the four location pins (E8) on the inner cover.
7. Reinstall the lamp. Refer to *Replacing Lamp* in this section.
8. Close the optical unit. Refer to *Closing Optical Unit* in this section.

CAUTION: Make sure that when you place the inner cover on the top cover, the index pin hole on the top cover is aligned with the index pin (E4) on the inner cover. Not aligning the F-Range inset light by the index pin could crack the inner pan and cross-thread the countersunk screws.

8. Replacing L-823 Cordset

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

1. Remove the optical unit. Refer to *Replacing Optical Unit* in this section.
2. See Figure 6-9. Unplug the fast-on terminals (F2) from the terminal block (F1).

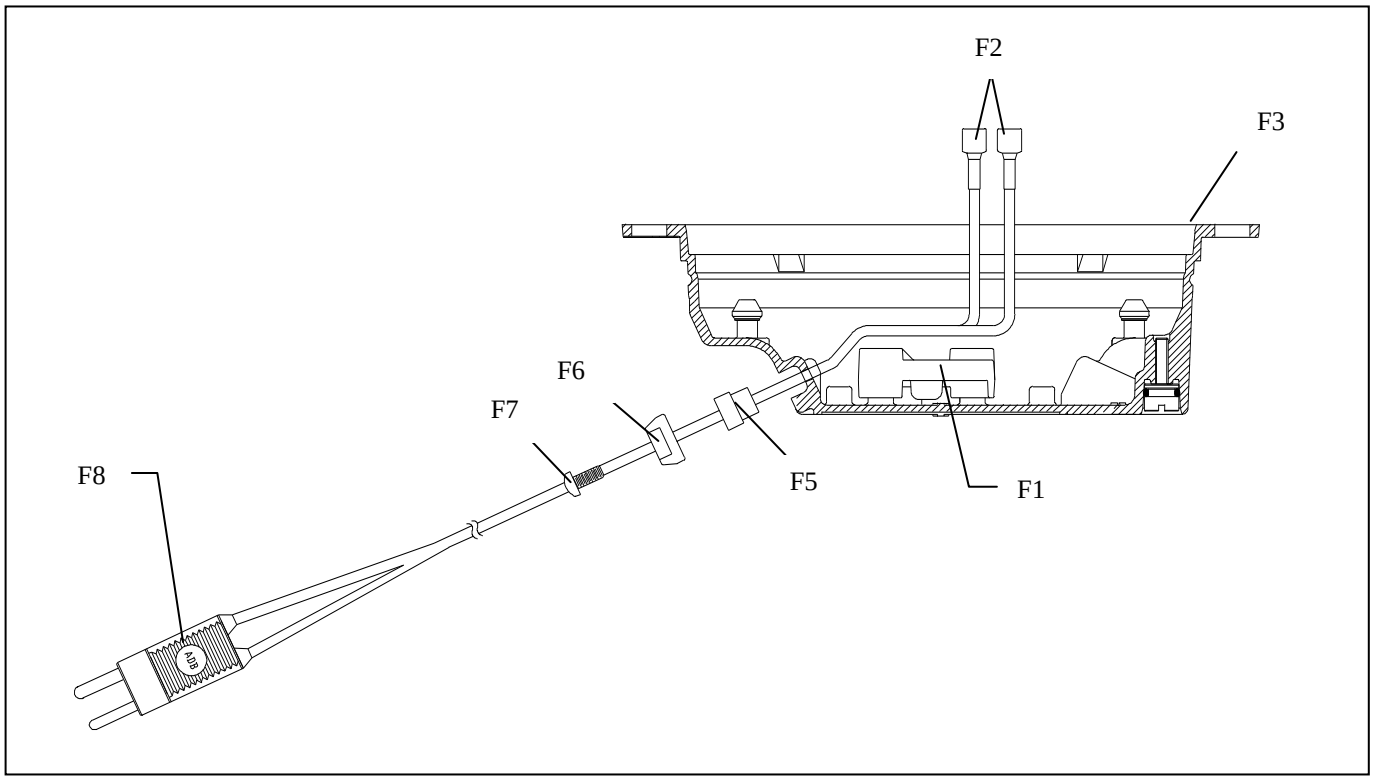


Figure 6-9. L-823 Cordset

8. Replacing L-823 Cordset *(contd.)*

3. Remove both Phillips countersunk screws (F7) and the wire clamp (F6).
4. Cut the fast-on terminals (F2) from the L-823 cordset (F8).
5. Pull the L-823 cordset out of the inner cover (F3).
6. Bring the new ADB Airfield Solutions L-823 cordset through the wire clamp (F6) (one wire per hole).
7. Put a new wire grommet (F5) on each of the wires. Make sure the wire grommet is facing the right direction.
8. Install the wires in the inner cover (F3).
9. Reinstall the wire clamp by means of both Phillips countersunk screws (F7).
10. Remove 5 mm of the insulation from the wires.
11. Crimp on the fast-on terminals (F2) and connect to the terminal block (F1).

9. Closing Optical Unit

To close the optical unit, perform the following procedure:

1. See Figure 6-10. Turn the cover (B1) upside down.

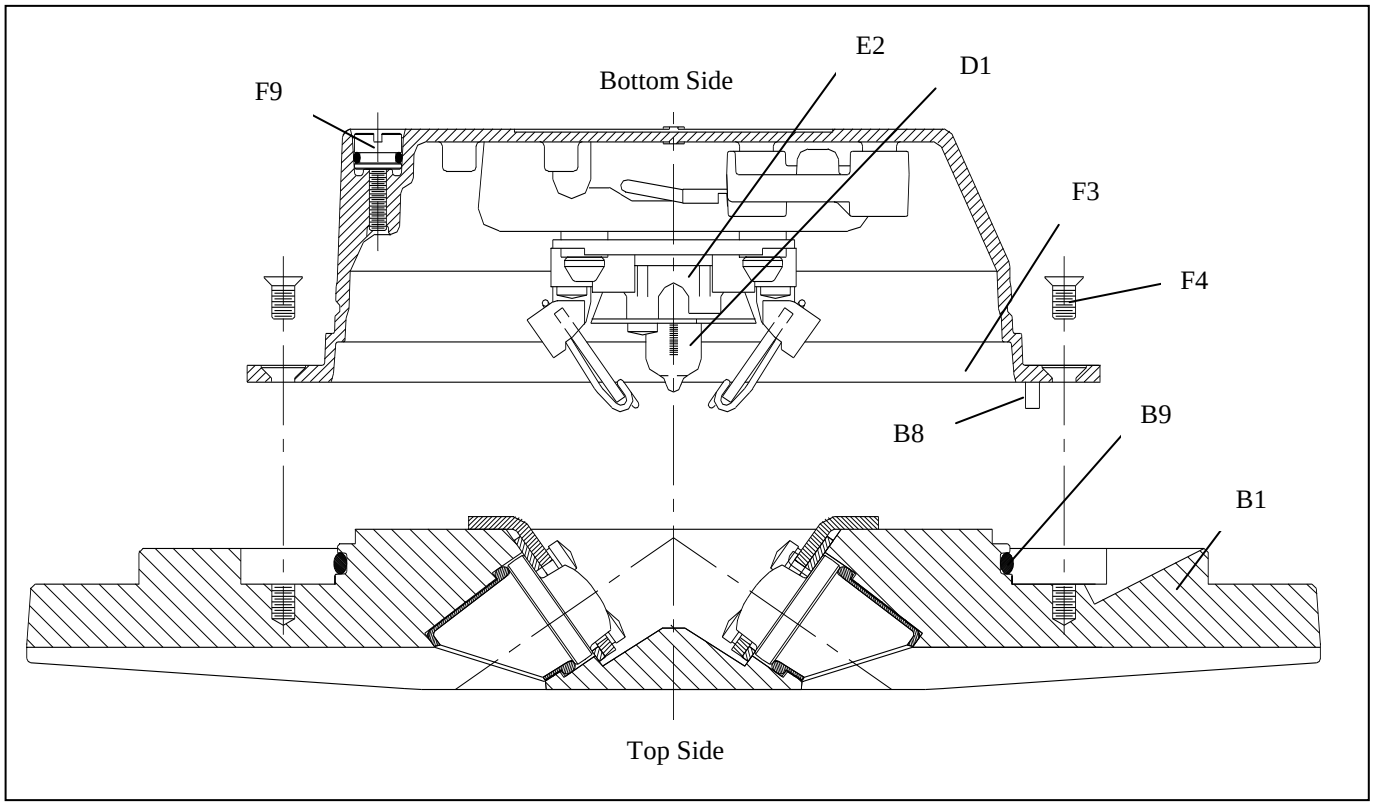


Figure 6-10. Upside Down View of F-Range Light Fixture

9. Closing Optical Unit *(contd.)*

2. Make sure that the contact surfaces with the O-ring are clean. Apply a light coat of high quality neutral silicone grease.

3. Install a new greased O-ring (B9) in the groove located in the top cover.

   NOTE: Use a synthetic grease such as MOLYKOTE 67A0095BG87 INERTA or MOLYKOTE 67A0095BG88 INERTA.

4. If necessary, remove the pressure release screw (F9).

5. Install the inner cover (F3) on top of the cover (B1).

6. Make sure the lampholder (E2) and lamp (D1) are correctly positioned and that the wires of the lamps do not get damaged between both parts (cover and inner cover).

7. Align the index pin (B8) on the inner cover with the index pin hole on the top cover.

CAUTION: Make sure that when you place the inner cover on the top cover, the index pin hole on the top cover is aligned with the index pin (B8) on the inner cover. Not aligning the F-Range inset light by the index pin could crack the inner pan and cross-thread the countersunk screws (F4).

8. Press the inner cover on the cover and secure with the countersunk screws (F4). Apply a droplet of Loctite 222 to the last threads. Torque screws to 2.5 ±0.5 Nt-m (22 ±4 inch-pounds).

9. Check the watertightness of the assembly by replacing the pressure release screw (F9) with a pressure test fixture. The leak path can then be located by submerging the assembly in a tank of water while pressurizing using shop air pressure to a maximum of 20 psi.

10. Reinstall the pressure release screw (F9).

Section 7
Parts

1. Introduction

To order parts, call ADB Airfield Solutions Customer Service or your local representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

2. Using the Illustrated Parts List

This subsection describes how to use the illustrated parts list covered later in this section. It does not provide the actual parts list.

The Item column numbers correspond to the numbers that identify parts in illustrations following each parts list. NS (not shown) indicates that a listed part is not illustrated.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

The Part Number column gives the ADB Airfield Solutions part number.

Item	Description	Part Number	Quantity	Note
S1	Assembly	xxxxxxxx	1	A
NS	Part	xxxxxxxx	1	
H1	Part or Assembly			
	Part/Assembly for option 1	xxxxxxxx	2	
	Part/Assembly for option 2	xxxxxxxx	2	
T1	Assembly	xxxxxxxx	1	
	• Part	xxxxxxxx	1	
	• Part	xxxxxxxx	2	
NOTE A				

The Quantity column contains the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

The Note column contains letters that refer to notes at the end of each parts list. Notes contain special ordering or product/part version information.

3. L-852A/C F-Range Low Profile Light Fixture (PK30d Lamp) Part Numbering System

This subsection describes the F-Range low profile light fixture part numbers for the L-852A/C (PK30d lamp).

3. L-852A/C F-Range Low Profile Light Fixture (PK30d Lamp) Part Numbering System *(contd.)*

Figure 7-1 shows how to determine the part number for a particular L-852A/C F-Range light fixture.

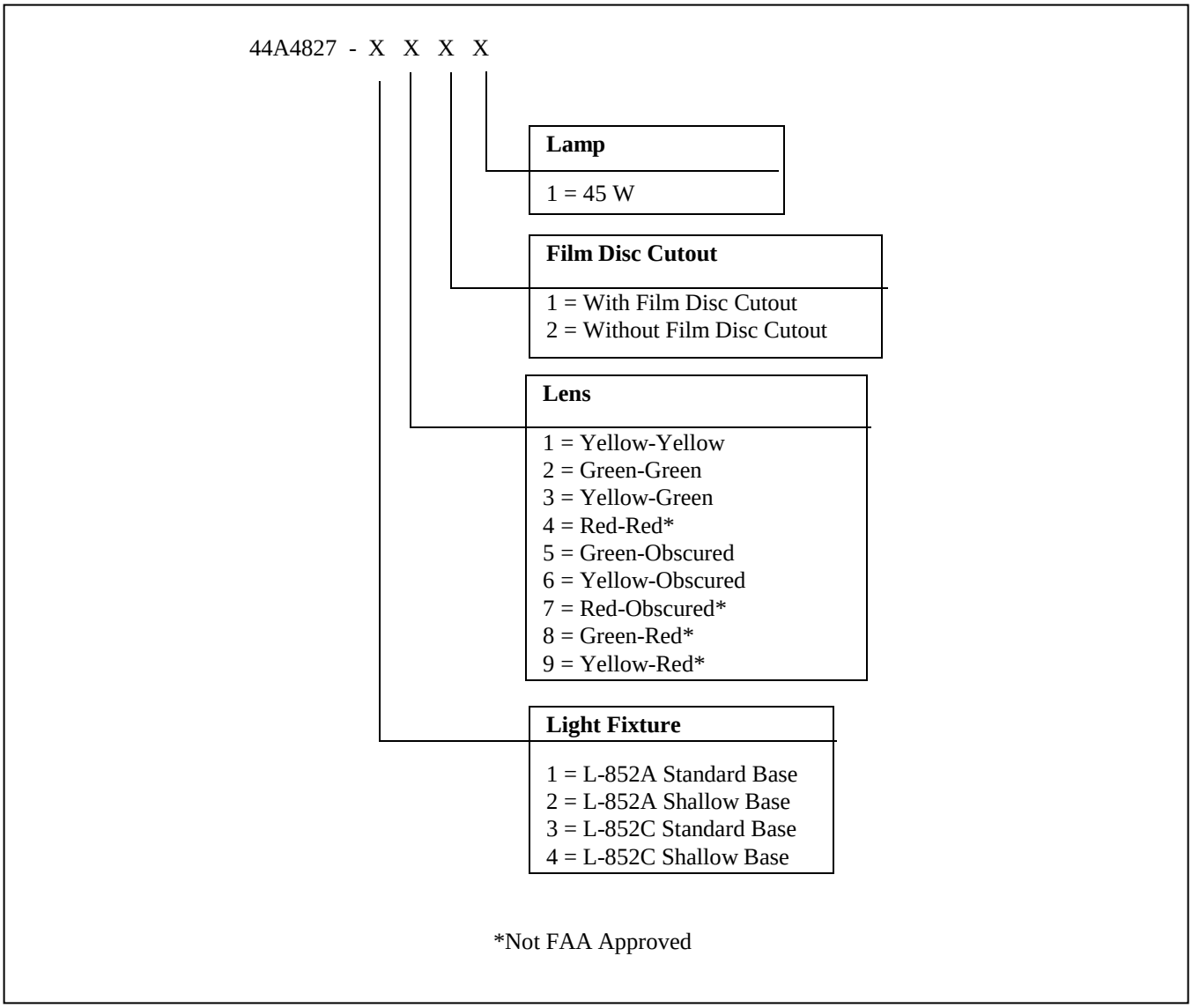


Figure 7-1. L-852A/C F-Range Inset Lights Part Numbers

4. F-Range Light Fixture Parts List

See Figure 7-2.

Item	Description	Part Number	Quantity	Note
1	O-ring, silicone, Parker #2-258, inner pan	7080.90.335	1	A
2	Flat seal	4071.50.440	1 or 2	B
3	Prism		1 or 2	B
	Prism, L-852A, PK30d lamp	1428.00.180		
	Prism, L-852C, PK30d lamp	1428.00.170		
4	Top cover assembly		1	
	Top cover assembly, L-852A, bidirectional	44A4807-11		
	Top cover assembly, L-852A, unidirectional	44A4807-12		
	Top cover assembly, L-852C, bidirectional	44A4807-21		
	Top cover assembly, L852C, unidirectional	44A4807-22		
5	Prism seal	4071.50.430	1 or 2	A, B
6	Prism-keeper plate	4071.50.450	1 or 2	B
7	Screw, pan head Phillips, M5 x 13	64A0936-13	4 or 8	B
8	Lamp assembly 45 W/PK30d, 6.6 A, L-852A/C	2990.48.360	1	
9	Filter spring	4071.57.160	1 or 2	B
10	Reflector	4071.50.490	1	
11	Filters		1 or 2	B
	Filter, yellow, L-852A/C	1428.20.220		
	Filter, green, L-852A/C	1428.32.010		
	Filter, red, L-852A/C	1428.20.230		C
12	Screw, M4 x 10 (for optical unit)	7110.08.367	7	
13	Filter support	4071.50.571	1	
14	Lamp spring	4071.50.580	1	
15	Reflector/lamp support	4071.50.481	1	
16	Grommet (for optical unit)	63A0222	4	
17	Optical assembly	44A4846	1	D

NOTE A: Part and part number are the same for all fixtures.
NOTE B: The unidirectional light fixture has a quantity of 1; the bidirectional has a quantity of 2.
NOTE C: Not FAA approved.
NOTE D: Refer to *Optical Unit Parts List* in this section for individual components.

Continued on next page

4. F-Range Light Fixture Parts List *(contd.)*

Item	Description	Part Number	Quantity	Note
18	Inner pan assembly Inner pan assembly, L-852A/C without film disc cutout Inner pan assembly, L-852A/C with film disc cutout	 44A4811-25 44A4811-15	1	
19	Screw, flat head Phillips, M5 x 10 (for inner pan assembly)	64A0925-10	4	
20	Inner pan	4071.59.040	1	
21	Terminal block assembly	44A5872	1 or 2	
22	Film disc cutout	47A0118	1	A
23	Cutout spring clip	4071.50.130	1	A
24	Pressure release screw	4070.77.150	1	A
25	O-Ring (for the pressure release screw)	7080.90.016	1	A
26	Female termination	6111.87.140	2 or 4	
27	Grommet (for cordset)	6126.01.031	2 or 4	
28	Clamp (for cordset)	4071.50.090		
29	Screw, M4 x 10 (for cordset)	7110.08.367	2 or 4	
30	Cordset	73A0133-31	1 or 2	
31	Shallow base assembly Shallow base assembly with plywood cover Shallow base assembly only	 44D0465-1 62D0335-1	1	A

NOTE A: Part and part number are the same for all fixtures.
NS: Not Shown.

4. F-Range Light Fixture Parts List *(contd.)*

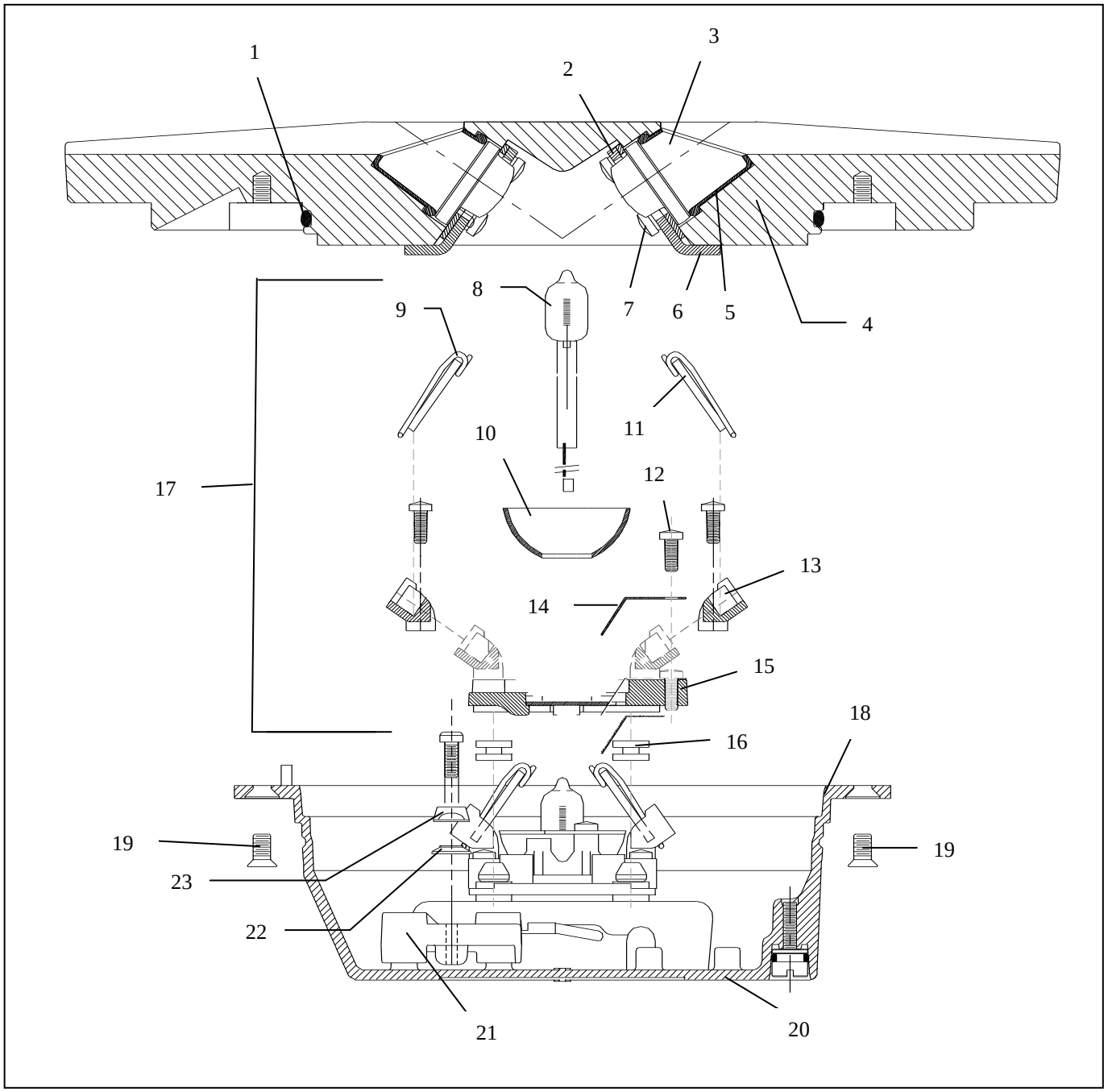


Figure 7-2. F-Range Light Fixture (Part 1 of 3)

4. F-Range Light Fixture Parts List *(contd.)*

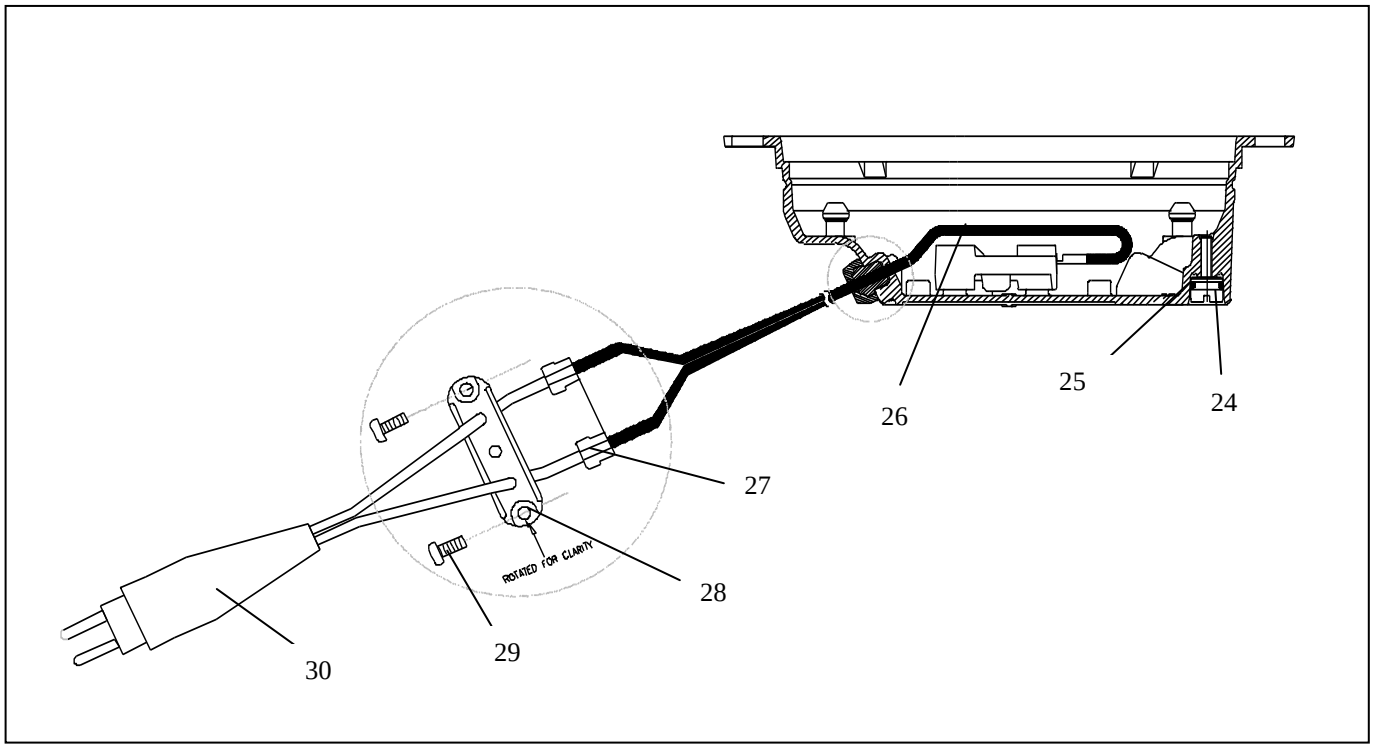


Figure 7-2. F-Range Light Fixture (Part 2 of 3)

4. F-Range Light Fixture Parts List *(contd.)*

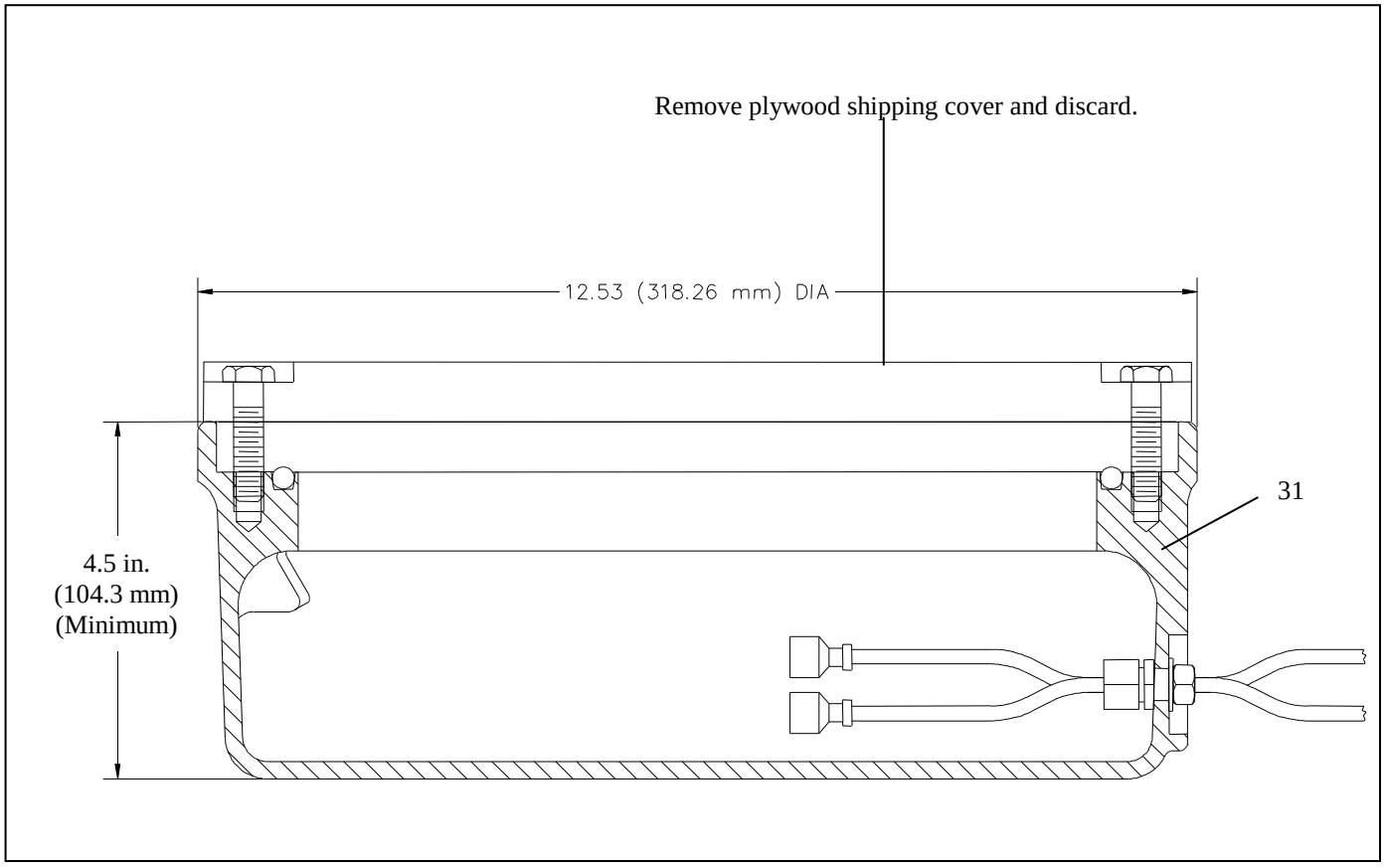


Figure 7-2. F-Range Light Fixture (Part 3 of 3)

5. Optical Unit Parts List

See Figure 7-2 (Part 1 of 3). The optical unit part number is 44A4846.

Item	Description	Part Number	Quantity	Note
8	Lamp, 45 W, 6.6 A PK30d quartz	2990.48.360	1	
10	Reflector	4071.50.490	1	
12	Screw, taptite, M4 x 10	7110.08.367	7	
13	Filter support	4071.50.571	2	
14	Lamp spring	4071.50.580	1	
15	Reflector/lamp support	4071.50.481	1	
16	Grommet	63A0222	4	

6. Recommended Spare Parts

See Figure 7-2 (Part 1 of 3).

Item	Description	Part Number	Note
1	O-ring, silicone, Parker #2-258	7080.90.335	A
3	Prism		
	Prism, L-852A, PK30d lamp	1428.00.180	
	Prism, L-852C, PK30d lamp	1428.00.170	
4	Top cover , L-852A/C		
	Top cover, unidirectional	62A2126-1	
	Top cover, bidirectional	62A2126-2	
6	Prism keeper plate	4071.50.450	A
8	Lamp assembly, 45 W/PK30d, 6.6 A, L-852A/C	2990.48.360	A
9	Filter spring	4071.57.160	A
11	Filters		
	Filter, yellow, L-852A/C	1428.20.220	
	Filter, green, L-852A/C	1428.32.010	
	Filter, red, L-852A/C	1428.20.230	B
15	Reflector/lamp support	4071.50.481	A
16	Grommet (for optical unit)	4070.72.640	A
17	Optical unit, L852A/C, bidirectional and unidirectional	44A4846	A
Not Shown	Molykote lubricate (prism seals)	67A0095	A

NOTE A: Part and part number are the same for all fixtures.
NOTE B: Not FAA approved.