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COOPER Crouse-Hinds

Instruction Manual



*In-pavement ICAO Runway Edge
Light Fixture*

ANNEX 14, APPENDIX 2, Figure A2-10, A2-3

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Crouse-Hinds Division
Airport Lighting Products
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Instruction Manual
ICAO Runway Edge Light Fixture

1.0 Revisions

Revision	Issue/Reissue Letter Number	Description	Checked	Approved
A	A207-092	INITIAL RELEASE	2/13/07	KWF
B	A208-001	Revised copyright to 2008; pg. 1 & 7, added YX, XY, CX & XC versions; pg. 2, added or uni-directional to 6.1 fixture description	1/2/08	PG
C	A208-107	Added –GY & -YG versions and related data	6/2/08	PG
D	A209-153	Updated to include the 21480-X Lens replacement kit, which includes the P/N 21477 Lens Bracket and the P/N 21479 Lens gasket; Added note on how to address fixtures build and installed before these changes were made in June 2009. Revised copyright to 2009.	9/24/09	

Instruction Manual
ICAO Runway Edge Light Fixture**2.0 Limited Product Warranty**

THE FOLLOWING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT BY WAY OF LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

Crouse-Hinds Airport Lighting Products (the “Company”) warrants to each original Buyer of Products manufactured by the Company that such Products are, at the time of delivery to the Buyer, free of material and workmanship defects, provided that no warranty is made with respect to:

- (a) any Product which has been repaired or altered in such a way, in the Company’s judgment, as to affect the Product adversely;
- (b) any Product which has, in the Company’s judgment, been subject to negligence, accident or improper storage;
- (c) any Product which has not been operated and maintained in accordance with normal practice and in conformity with recommendations and published specification of the Company; and;
- (d) any Products, component parts or accessories manufactured by others, but supplied by the Company (any claims should be submitted directly to the manufacturer thereof).

Crouse-Hinds Airport Lighting Products’ obligation under this warranty is limited to use of reasonable efforts to repair or, at its’ option, replace, during normal business hours, at any authorized service facility of the Company, any Products, which in its judgment, proved not to be as warranted within the applicable warranty period. All costs of transportation of Products, claimed not to be as warranted and of repaired or replacement Products to or from such service facility, shall be borne by Purchaser. The Company may require the return of any Product claimed not to be as warranted to one of its facilities as designed by the Company, transportation prepaid by Purchaser, to establish a claim under this warranty. The cost of labor for installing a repaired or replacement product shall be borne by Purchaser. Replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period of the Products upon which they are installed to the same extent as if such parts were original components thereof. Warranty services provided under the Agreement does not assure uninterrupted operations of Products; The Company does not assume any liability for damages caused by any delays involving warranty service. The warranty period for the Products is 24 months from date of shipment or 12 months from date of first use whichever occurs first.

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This equipment is normally used or connected to circuits that may employ voltages that are dangerous and may be fatal if accidentally contacted by operating or maintenance personnel. Extreme caution should be exercised when working with this equipment. While practical safety precautions have been incorporated in this equipment, the following rules must be strictly observed:

3.1 Keep Away from Live Circuits

Operating and maintenance personnel must at all times observe all safety regulations.
DO NOT PERFORM MAINTENANCE ON INTERNAL COMPONENTS OR RE-LAMP WITH POWER ON.

3.2 Resuscitation

Maintenance personnel should familiarize themselves with the technique for resuscitation found in widely published manuals of first aid instructions.

**IMPORTANT*****IMPORTANT:***

See FAA Advisory Circular AC 150/5340-26 for additional information.

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5 Part Number Explanation

8506 A - XX - XX

FIXTURE TYPE: _____

850 = RUNWAY
6 = MODEL 6

C-H STYLE: _____

A = ICAO FIGURE A2-10 AND A2-3

COLORS: _____

CC = CLEAR TOE-LEFT, CLEAR TOE-RIGHT
CY = CLEAR TOE-LEFT, YELLOW TOE-RIGHT
YC = YELLOW TOE-LEFT, CLEAR TOE-RIGHT
YX = YELLOW TOE-LEFT, BLANK TOE-RIGHT
XY = BLANK, TOE-LEFT, YELLOW TOE-RIGHT
CX = CLEAR TOE-LEFT, BLANK TOE-RIGHT
XC = BLANK TOE-LEFT, CLEAR TOE-RIGHT
GY = GREEN TOE LEFT, YELLOW TOE RIGHT
YG = YELLOW TOE LEFT, GREEN TOE RIGHT

L-823 CONNECTION: _____

P1 = ONE PLUG
P2 = TWO PLUGS (CC, CY, YC, GY, YC ONLY)

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ICAO Runway Edge Light Fixture**6 General Description****6.1 ICAO Runway Edge Light**

The Crouse-Hinds ICAO Runway Edge Light is a Style II, ($\leq 1/2$ inch) fixture that meets the photometric requirements of ICAO Annex 14 Fixture A2-10 and A2-3 with the appropriate lamps and colored lens/lenses installed. It is designed for installation at the runway edge or any other location where visual guidance of moving aircraft is desirable. The fixture is designed to fit on a FAA L-868 (do not install on shallow base), steel, size B light base per FAA AC 150/5345-42 (latest version), and have a total height above grade/ground level of $< .500$ inch. The fixture is bi-directional or uni-directional. It is weatherproof and will endure roll over loads without damage. The light fixture consists of a 1-piece aluminum optical assembly. The aluminum optical assembly is mounted to a light base with six bolts (3/8-16 UNC x 7/8 lg., stn. stl.) and lock washers (3/8, stn. stl.) The aluminum housing has a sand cast bottom cover that is attached using 6 screws. A silicone o-ring is used to provide a watertight seal between the inner cover and the optical housing. The lamps are secured to an installed bracket, which is fastened to the bottom housing using vibration isolators. Electrical connections are made at one or two feed-thru assemblies in the inner cover. The feed-thru has an ITS verified L-823 plug for connecting to FAA L-830/ L-831 Isolation Transformers. The outer lens is held into the aluminum housing with a bracket, gasket, molded elastomeric boot and 2 screws. The light beam color is obtained by coloring the lens to the appropriate color for the application. All hardware is type 18-8 stainless steel. The complete light unit is 11.94 inches in diameter, 5.13 inches deep, and weighs 16 lbs.



CAUTION:
Never handle the light assembly by the leads as this can break the waterproof seal.

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The style 2 runway edge lights are shipped complete and are ready for installation as received. Installation of a light unit is to be done with primary POWER OFF and SECURED. At each light location, install a steel, Size B, 24 inch deep minimum, L-868 Light Base per FAA AC 150/5340-4 (latest revision). Place the properly sized isolation transformer(s) in the light base and make necessary primary power connection using L-823 connectors. The light unit requires a 6.6A secondary transformer. Verify that the mounting flange on the light base is clean and the o-ring (optional on deep cans) is coated with Dow Corning FS 1292 grease and is in place on the light base. Connect the plug from the light unit to the secondary of the previously installed isolation transformer. Installation tool, Crouse-Hinds P/N 19999, will ease in the installation and removal of the light unit. The threaded eyebolts on the lifting tool screw into threaded holes in the light fixture. Lower the light unit straight down onto the base. The light fixture is subject to optical misalignment or mechanical damage if not seated properly. Secure the light fixture to the base with six 3/8-16 UNC x 7/8 lg., stn. stl. bolts and lock-washers and tighten to 225 -0 +10 in-lbs. (18ft-lbs.). It is recommended that Loctite 242 be used on the mounting bolts to prevent loosening due to vibration.

8 Maintenance

The preferred method of maintaining these lights is to periodically and systematically replace the units and return it to the maintenance shop for renovation. As an alternative, the units can be serviced in the field. However, it is recommended that field servicing be limited to cleaning the lens only as described in section 8.1.

**NOTICE*****NOTICE:***

Warranty is void if other than Crouse-Hinds ALP parts are used to relamp or rebuild the fixture.

8.1 Cleaning Lenses

With a compressed air blast or suitable brushes, remove all accumulated debris from the light channel. Clean the outer lens surface with a detergent solution. If the lens is coated with a substance impervious to the detergent, a suitable solvent should be sparingly applied with a wad of cotton or a patch of cloth on the end of a wood splint. After the solvent has acted the remaining solvent and softened coating should be removed with a clean piece of cotton or cloth. Care should be taken to avoid excessive contact between the solvent and the lens seal. Remove all remaining solvent from lens and seal. A gentle air blast may be used.

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The lamp is hot when fixture is energized and remains hot for a short time after fixture is turned off.

Remove and secure power to the fixture. Turn the fixture upside down and remove the six screws holding the inner cover to the light housing. Disconnect the lamp leads. Inspect the feed-thru terminal for signs of corrosion. Replace feed-thru assemblies per paragraph 8.5. Install the new lamps by reversing the procedure above **making sure that the Teflon tubing completely covers the lamp terminals.** Inspect/replace the optical housing's o-ring per paragraph 8.3. Assemble the inner cover onto the light housing. Tighten the mounting screws to 30 in-lbs. Perform a pressure test as described in paragraph 8.6. Clean the mounting flange area of the base. Place the fixture into the base. Apply Loctite 242 (P/N 10048-30), per manufacturer's instructions, to all mounting bolts and immediately torque them to 225 -0+10 in-lbs.

8.3 O-Ring Replacement**NOTICE****NOTICE:**

*A bad o-ring seal is the most common cause of inset fixture leaks.
A new o-ring must be installed every time the
Optical Assembly is opened*

Remove the old o-ring from the groove in the optical housing. Carefully clean the o-ring groove and flange mating surface on the inner cover. Take care not to damage the mating surface. Clean the new o-ring (P/N 21385) with denatured alcohol. Position the new o-ring in the center of the groove and press it into place. Torque the inner cover screws to 30 in-lbs. Perform a pressure test as described in paragraph 8.6. Clean the mounting flange area of the base. Place the fixture into the base. Apply Loctite 242 (P/N 10048-30), per manufacturer's instructions, to all mounting bolts and immediately torque them to 225 -0+10 in-lbs..

**NOTICE****NOTICE:**

*The groove is designed to be wider than the o-ring. This provides room for the displacement of the o-ring when compressed between the housing and mating surface.
Properly tightened screws are important in obtaining a complete seal.*

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ICAO Runway Edge Light Fixture**8.4 Lens Replacement**

If an outer lens is broken, leaks, or is badly pitted or scarred, it must be replaced. It is highly recommended that this task be performed in a clean shop environment. Lens Replacement Kit P/N 21480-X contains all necessary parts to change a lens. **Remove and secure power to the fixture.** Turn the fixture upside down and remove the six screws holding the inner cover to the light housing. Remove the lens retaining bracket screws from the light housing. Remove the lens retaining bracket and discard the lens-retaining gasket. Firmly push the lens/boot assembly from the outside of the light housing; discard the old lens and boot. Thoroughly clean the lens opening with isopropyl alcohol and let dry. Inspect the lens opening for scratches or pits; a damaged lens-opening surface will not seal properly. Place a new lens boot (P/N 21277) over the replacement lens (P/N 21276-X). Apply a thin coat of Dow Corning FS 1292 grease over the entire outside surface of the lens boot. Align the lens/boot assembly in the lens opening and press it into place. Verify that the lens boot is not pinched in the lens opening. Using a new lens-retaining gasket (P/N 21479), fasten the lens-retaining bracket (P/N 21477) to the light housing. Torque the mounting screws to 30 in-lbs. Inspect/replace the optical housing's o-ring per paragraph 8.3. Assemble the inner cover onto the light housing. The screw-hole patterns in the inner cover and light housing are offset to insure proper alignment. Torque the mounting screws to 30 in-lbs. Perform a pressure test per paragraph 8.6. Clean the mounting flange area of the base. Place the fixture into the base. Apply Loctite 242 (P/N 10048-30), per manufacturer's instructions, to all mounting bolts and immediately torque them to 225 - 0+10 in-lbs.

NOTE: Lighting Fixtures built/installed before June 2009 will require the 21276-X Lens Replacement Kit. The 21276-X Kit contains the P/N: 21101 lens-retaining gasket and the P/N: 21100 lens-retaining bracket. Lighting Fixtures built/installed after June 2009 require the 21480-X as listed above.

8.5 Power Lead/ Feedthru Replacement

The power leads are connected to water tight feedthrus in the inner cover. There is a coating of RTV over the connections, and an epoxy material to encapsulate the entire assembly. The power cord and feedthru components can be replaced, but shipping restrictions prohibit Crouse-Hinds from supplying the epoxy encapsulating material. The complete inner cover assembly, with leads is part number 21286-X. Follow the instructions below to rebuild the power lead/feedthru assembly.

Remove and secure power to the fixture. Turn the fixture upside down and remove the six screws holding the inner cover to the light housing. Remove the Teflon leads inside the cover. Cut the power leads off at the encapsulating material. Using a hammer and chisel, separate the encapsulating material from the inner cover. Be careful to not damage the inner cover. Remove and discard the feedthru assemblies. Carefully clean the feed-thru mounting area in the inner cover, inspect for any mechanical damage that would prevent a water tight

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seal. Replace the feedthru components, refer to Figure 6 for part numbers and orientation. Replace the Teflon leads inside the cover. Replace the optical housing's o-ring per paragraph 8.3. Assemble the inner cover onto the light housing. The screw-hole patterns in the inner cover and light housing are offset to insure proper alignment. Torque the mounting screws to

30 in-lbs. Perform a pressure test per paragraph 8.6. Clean the mounting flange area of the support ring. Place the optical assembly into the base. Apply Loctite 242 (P/N 10048-30), per manufacturer's instructions, to all mounting bolts and immediately torque them to 225 -0+10 in-lbs.

8.6 Pressure Test

A light fixture should be subjected to a 20-psi air pressure test to verify that it is waterproof whenever it has been opened or components have been replaced. A tire valve style pressure fitting is located on the bottom of the inner cover. Pressurize the fixture to 20-psi then place it in a tub of water or use a soap solution to locate escaping air bubbles. Carefully inspect the areas around the lens, inner cover seal, and feed-thru adapter for leaks. Relieve the internal air pressure before installing the fixture or attempting to repair a leak.



WARNING:

Do not exceed 20-psi when pressure testing the fixture. Serious injury and/or permanent damage to the fixture may result if a higher air pressure is used. Once the pressure test is complete, be sure to relieve the air pressure.

8.7 Cleanliness and Workmanship

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

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- In order to insure maximum light fixture life, the installed units should be subject to a maintenance program in accordance with the following: A daily operation check should be made of the lighting fixture. The lights should be energized and visually inspected. If any fixtures are out, the location of the fixture should be recorded and the lamps replaced at a time when the circuit is de-energized. (See Section 8.2)
- 8.8.1 Regular cleaning is necessary in order to insure that inset lighting fixtures operate at maximum efficiency. The lens should be cleaned periodically with a soft cloth and solvent. The weather and the location of the fixtures will dictate the regularity and type of cleaning.
- 8.8.2 Snowplow operators should exercise extra care not to strike the light fixtures with snowplow blades (use rubber blades for added protection to the fixture.) After snowplow removal operations, inspect all light fixtures to locate and replace if necessary, any damaged Light Assemblies. Passes over the light rows should be made with a power broom only if practical. Whenever snowplows must traverse in-pavement light fixtures, they should be traveling at less than 5 mph or have the blades lifted clear of the fixture. Recommended snow removal techniques are described in AC 150/5200-23.
- 8.8.3 The light is designed to exclude both ground and surface water from entering. If the lights are not properly maintained (i.e., bolts tightened and seals in good condition) water may enter the fixture. To prevent this from occurring, it is recommended that each fixture be inspected for the presence of water at least once a month. More frequent inspection is desirable during and following rainy seasons.
- 8.8.4 ICAO runway edge light hold-down bolts should be checked for proper torque (225 +5, - 0, in-lbs.) at least once every three months or whenever a fixture is serviced regardless of the season. Light fixtures in and around the Touchdown Zone area are especially prone to vibration damage if the mounting bolts are not properly torqued. The mounting surface of the light base must be clean and free of foreign matter when checking mounting bolts.
- 8.8.5 If any fixture contains water, the water should be removed and the entire fixture cleaned and dried. Perform a pressure test per paragraph 8.6 to locate the source of the leak. Replace the o-ring (21385), see Section 8.3.

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9 Parts Lists

ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	SEE TABLE	HOUSING, OPTICAL, ASS'Y, ICAO RUNWAY EDGE
2	1	21385	O-RING, SIZE #2-273, 70 DUROMETER, SILICONE, POST CURED
3	1	SEE TABLE	COVER, BOTTOM, ASS'Y, ICAO RUNWAY EDGE
4	A/R	21295-210	BRACKET, BASE, ASS'Y, ICAO RUNWAY EDGE
4	A/R	21448	BRACKET, BASE, ASS'Y, ICAO RUNWAY EDGE 2.3 – 2.10
5	8	20356	GROMMET
6	4	19143-2	SPACER
7	4	10B08-019D16	PAN HD, #10-32 x .5 LG, SSTL
8	6	10000-470	SCREW, 100° FLAT HD/DRI-LOC, #10-32 x 7/16 LG, 18-8 SS
9	A/R	21128	105 WATT LAMP
10	A/R	10047-417	MALE TERMINAL FOR LEAD ASSEMBLY
11	1	2707	INSTRUCTION MANUAL
12	A/R	21480-X	LENS REPLACEMENT KIT C=Clear; Y = YELLOW

NOTE: Lighting Fixtures built/installed before June 2009 will require the 21276-X Lens Replacement Kit. The 21276-X Kit contains the P/N: 21101 lens-retaining gasket and the P/N: 21100 lens-retaining bracket. Lighting Fixtures built/installed after June 2009 require the 21480-X as listed above.

P/N	ITEM 1	ITEM 3
8506A-CC-P1	21287-7	21286-1
8506A-CC-P2	21287-7	21286-2
8506A-CY-P1	21287-6	21286-1
8506A-CY-P2	21287-6	21286-2
8506A-YC-P1	21287-5	21286-1
8506A-YC-P2	21287-5	21286-2
8506A-YX-P1	21287-9	21286-1
8506A-XY-P1	21287-11	21286-1
8506A-CX-P1	21287-8	21286-1
8506A-XC-P1	21287-10	21286-1
8506A-GY-P1	21287-12	21286-1
8506A-GY-P2	21287-12	21286-2
8506A-YG-P1	21287-12	21286-1
8506A-YG-P2	21287-12	21286-2

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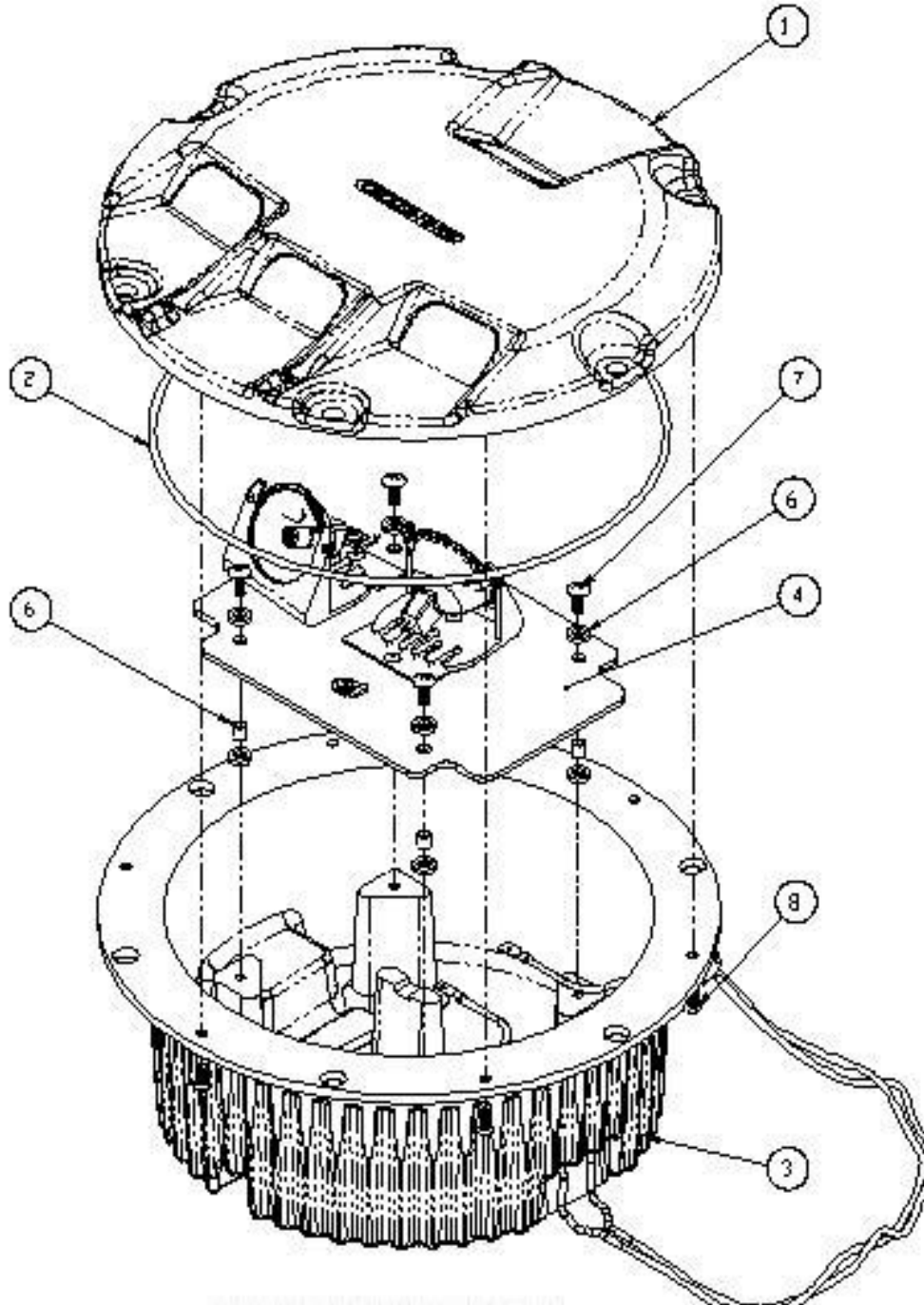


Figure 1: Exploded View of Fixture

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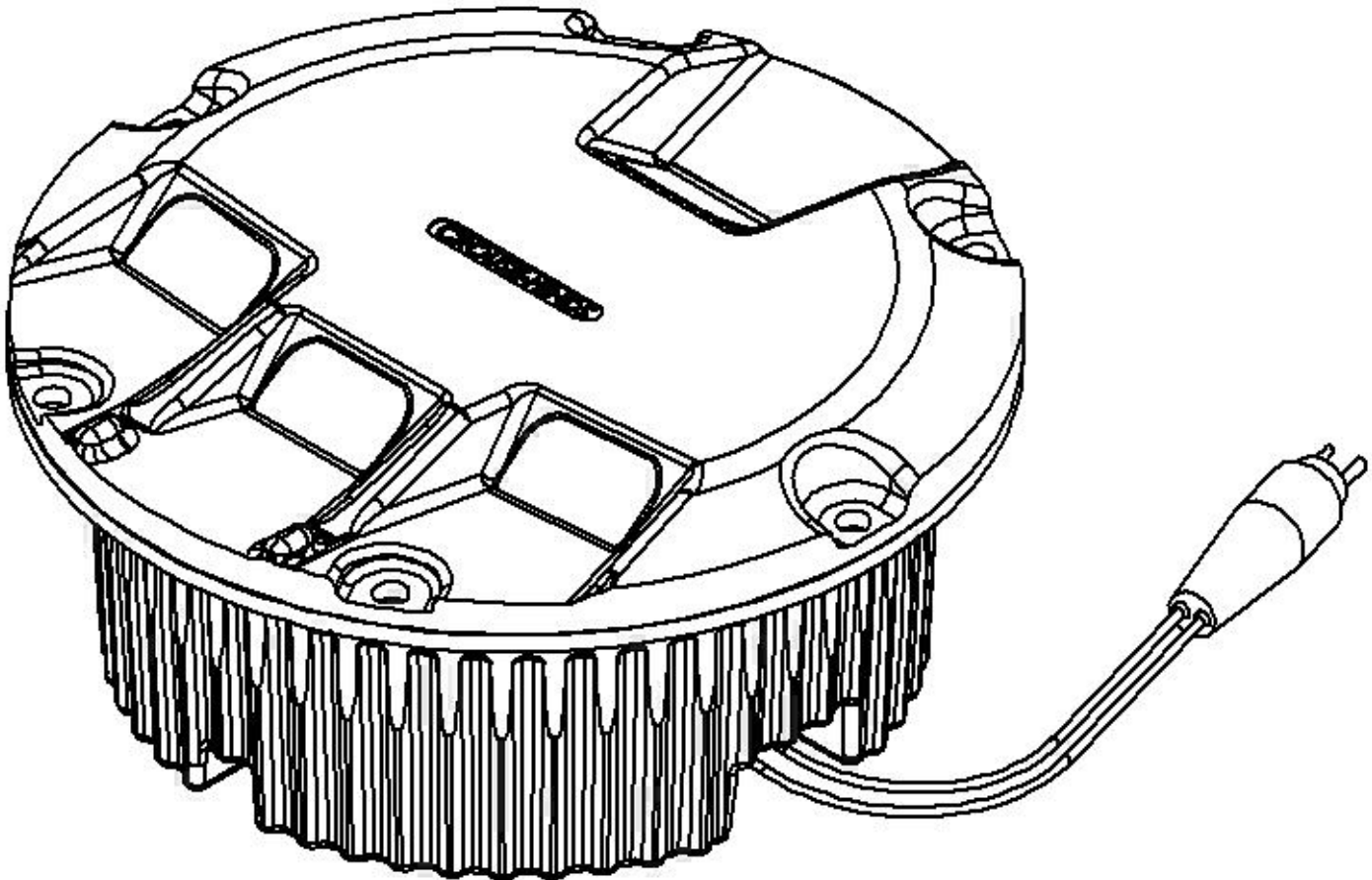


Figure 2: Isometric View of Fixture

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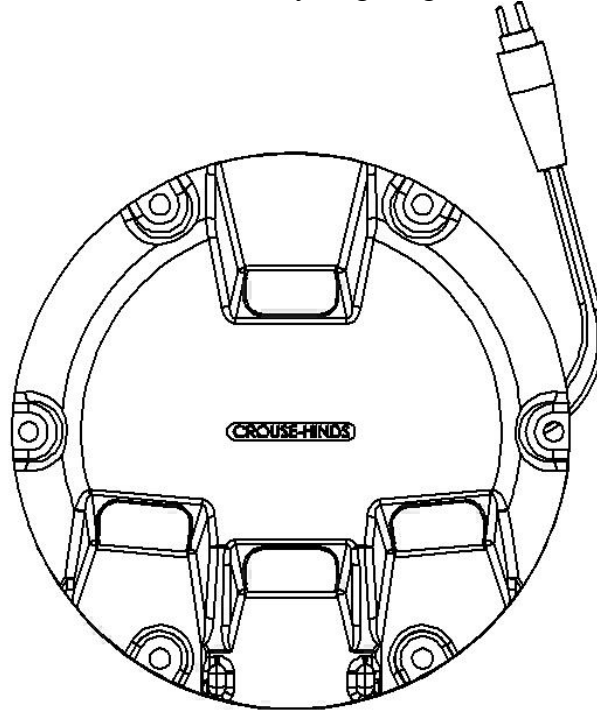


Figure 3: Top View of Fixture

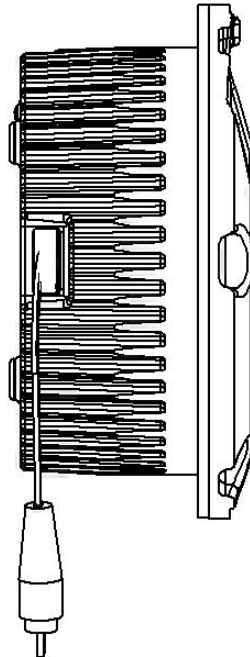


Figure 4: Side View of Fixture

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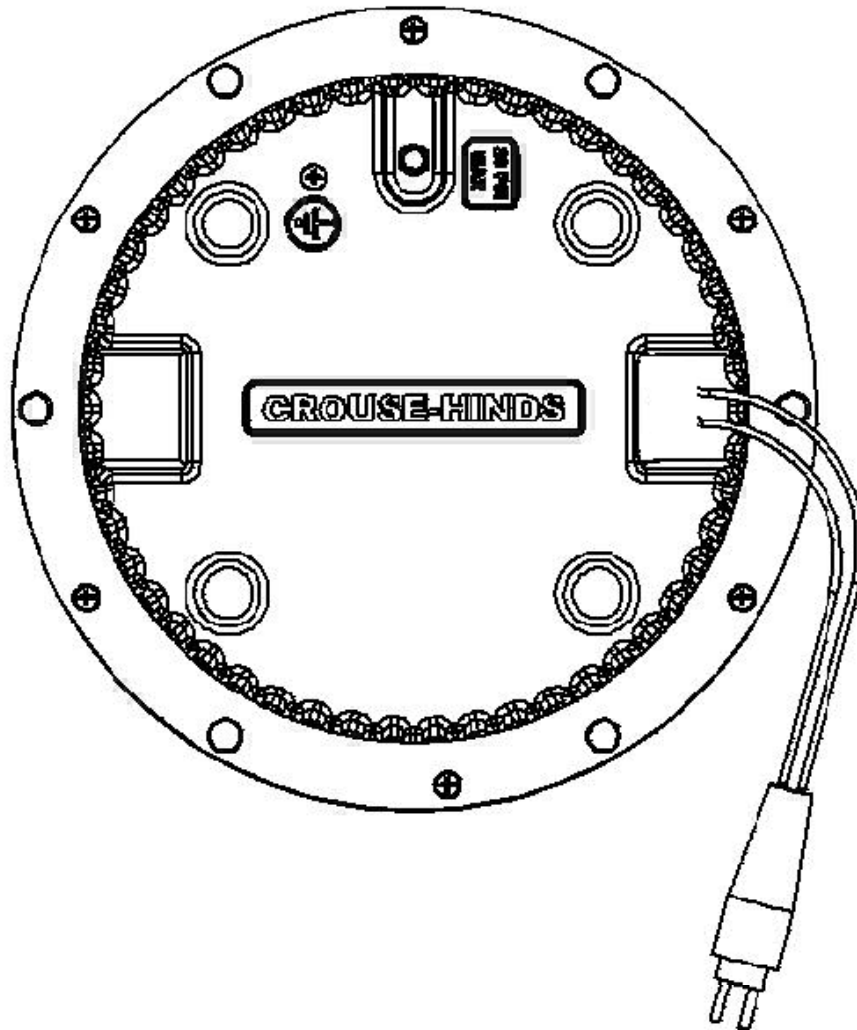
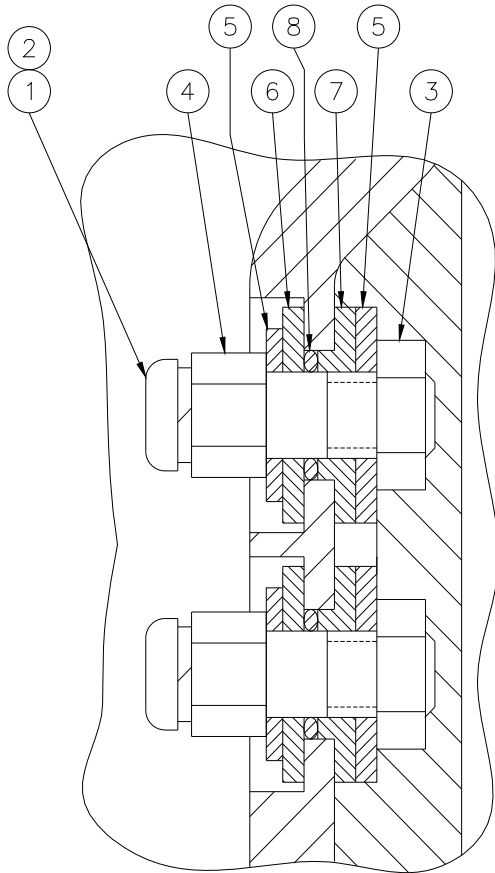


Figure 5: Bottom View of Fixture

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FEEDTHRU REPLACEMENT INSTRUCTIONS

1. Torque item 3 to 30 in-lbs
2. Coat items 3, 4, 5 and lead terminals, on the outside of the cover only, with item 10. Allow to cure for 8 hours.
3. Encapsulate feedthru assembly with Emerson & Cummings catalyst 9 / resin 2651 or Mavidon catalyst 4195B / resin 4195A. Allow to cure per manufacturer's instructions. The wire leads exit the bottom of the inner cover, not the sides. A temporary dam must be placed across the inner cover side to hold the epoxy in place as it cures.

NOT SHOWN	A/R	A/R	10048-63	RTV 116
NOT SHOWN	1	2	21038	LEAD ASSEMBLY, L-823
8	2	4	10035-33-010	O-RING
7	2	4	10030-100	WASHER, SHOULDER, INSULATING
6	2	4	10030-108	WASHER, FLAT, INSULATING
5	4	8	10030-57	WASHER, FLAT, SS, #1/4
4	2	4	20017	LEAD LUG
3	2	4	10K04-025D	NUT, HEX, SS, #1/4-20
2	2	4	11A12-016D	LOCKWASHER, SPLIT, #8, SS
1	2	4	10A06-016D10	SCREW, PAN HD, #8-32X5/16, SS
ITEM NO.	21286-1 QTY	21286-2 QTY	PART NUMBER	DESCRIPTION

Figure 6: Feedthru detail