

DOCUMENT	9013
REVISION	E
March 20, 1998	



Instruction Manual



*Semi-Flush Inset Approach
Threshold and Runway End Lights
Part Number Series: 850EA-B*

Cooper Industries
Crouse-Hinds Division
Airport Lighting
Products

1200 Kennedy Road
Windsor, CT 06095

Copyright © 2006 Cooper Technologies Company

For Parts or Technical Service Call (60) 683-4300

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

REVISIONS				
REVISION NUMBER	ISSUE/REISSUE LTR NUMBER	DESCRIPTION	CHKD	APPROVED
A	A91-212	Revised to incorporate 20453-1 shallow base, option "V" details and other general information or corrections.	8/9/91PG	REL
B	A91-298	Pg. 12, deleted item 6; pg. 23, revised 3.4.2; pg. 26 & 27, added item 14 to P/N 20763-1 & item 16 to P/N 20764-1, P/N 20763-1 was 20629-2, P/N 20764-1 was 20621-2; Item 1 P/N for 20764-1 was 20620-1; Item 1 P/N for 20763-1 was 20620; Pg. 28, deleted item 6, P/N 10048-101 Pyro-Putty #653, Item 5 P/N was 20621-2 (300W) or 20629-2 (150W); Pg. 29, added lens fixture 20734 & deleted 20750 Pyro-Putty kit; Pg. 34, P/N 20764-2 was 20621-12 & P/N 20764-1 in note was 20621-2; Pg. 35, P/N 20763-1 in note was 20629-2; Pg. 36, P/N 20764-3 was 20621-4 & P/N 20764-1 in note was 20621-2.	11/15/91 PG	REL
C	A94-438	Deleted "V" Option information from pages vi, 2, and 35	12/2/94 DCW	REL
D	A98-083	Entire manual revised and put into Word	3/4/98 RBM	3/7/98 JMM
E	A98-122	Page 28, item 14 desc. was screw, etc.; Page 28, 20984-3, deleted item 12; Page 29, item 12 p/n was 10B02-019D12; Page 30, added Optical Assembly part number	3/20/98 RBM	3/26/98 JMM

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

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 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 Company's judgment, as to affect the Product adversely;*
- (b) any Product which has, in 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 Company; and,*
- (d) any Products, component parts or accessories manufactured by others but supplied by Company (any claims should be submitted directly to the manufacturer thereof).*

Crouse-Hinds Airport Lighting Product's obligation under this warranty is limited to use reasonable effects to repair or, at its option, replace, during normal business hours at any authorized service facility of 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. Company may require the return of any Product claimed not to be as warranted to one of its facilities as designed by 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 do not assure uninterrupted operations of Products; 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.

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

SAFETY NOTICES

This equipment is normally used or connected to circuits that may employ voltages which 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:

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.

RESUSCITATION

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

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

TABLE OF CONTENTS

Title Page.....	i
Revisions.....	ii
Limited Product Warranty.....	iii
Safety Notices.....	iv
Table of Contents.....	v
1.0 General.....	1
2.0 Installation Instructions, Shallow Base Receptacle.....	13
3.0 Maintenance.....	22
Parts List - Part Number Series 850EA-B.....	28
Parts List - Inner Cover Assembly.....	29
Recommended Spares.....	30
Construction Materials.....	31
Critical Installation Instructions.....	36
Table 1 - Part Number Explanation.....	2
Table 2 - Fixture Characteristics.....	3
Figure 1-1 - ICAO Light Identification.....	4
Figure 1-2 - USAF Light Identification.....	5
Figure 2-1 - ICAO Fixture Spacing.....	6
Figure 2-2 - USAF Fixture Spacing.....	7
Figure 2-3 - NATO Fixture Spacing.....	8
Figure 3-1 - USAF Instrument Runway Approach Lighting.....	9
Figure 3-2 - NATO Instrument Runway Approach Lighting Type II..	10
Figure 4 - Inset Light Fixture Top View.....	11
Figure 5 - Section A-A Inset Light Fixture Assy Interior.....	12
Figure 6 - Pavement Coring Detail Shallow Base & Wireways.....	14
Figure 7 - Shallow Base Bonding Detail.....	16
Figure 7A - Shallow Base Bonding Detail, P/N 20452-S234.....	17
Figure 8 - Shallow Base Mounting Details.....	18
Figure 9 - Suggested Barrette Shallow Base Wireway Configuration.	19
Figure 10 - Suggested L-868 Steel Base Installation.....	20
Figure 11 - Inset Light Fixture Lamp Wiring.....	26
Figure 12 - Inner Cover Assembly.....	27
Figure 13 - Option "A" Detail.....	35

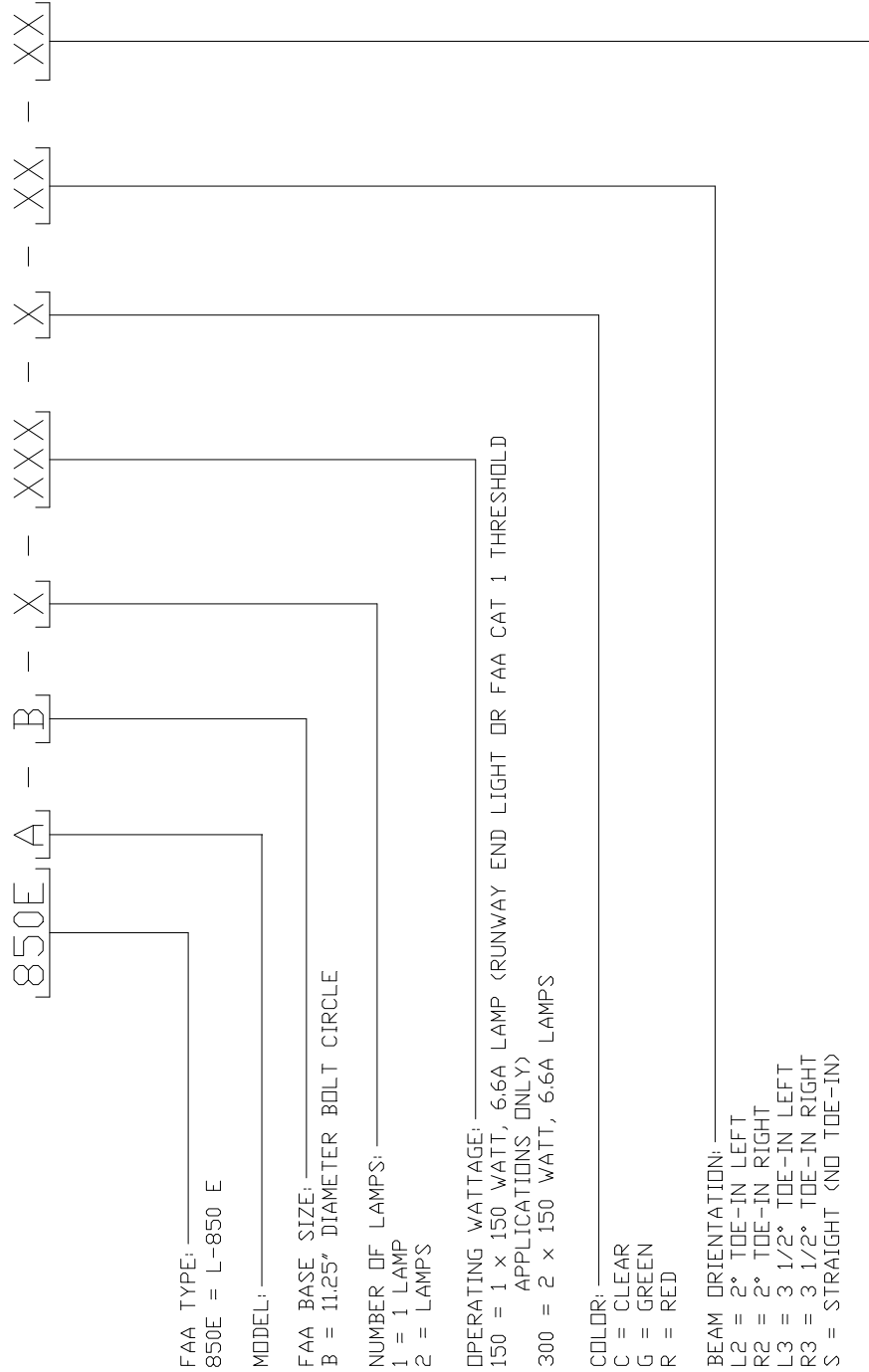
**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

1.0 GENERAL

- 1.1 The Crouse-Hinds Inset Threshold and Approach Light Assembly is a fixture designed for installation in runway thresholds, overruns and any other locations where visual guidance of moving aircraft or vehicles is desirable. It is weatherproof and is designed to withstand roll-over loads without damage. The light fixture is unidirectional. The Inset Light fixture (see Table 1) is interchangeable in any Base Receptacle per Type L-868 Size B Bases per AC 150/5345-42B, thereby permitting replacement of any Inset Light fixture without the necessity of removing the Base Receptacle from the pavement. The Inset Light fixture is 12 inches in diameter and extends .94 inches above ground level.
- 1.2 The Inset Light fixture consists of an o'ring sealed unit containing the lamp/reflector assembly, lenses and inner cover assembly. The Inset Light fixture is housed in a ductile iron casting which has the correct toe-in angle for the application specified pre-drilled in the fixture mounting bolt circle.
- 1.3 A shallow Base Receptacle (P/N 20453-1 or 20452-S234) consists of a cadmium plated, ductile iron casting containing the connectors for electrically connecting to the Inset Light fixture. The Base Receptacle is designed for cementing in place in a hole drilled in the pavement. The hole, or recess, in which it fits should be per Figure 6.
- 1.4 For installation purposes, the shallow base receptacle (P/N 20453-1 or 20452-S234) has a lead exit point as shown by Figure 6 "Handhole" location.
- 1.5 Shallow Bases and L-868 Cans used in conjunction with the 850EA-B Series Inset Lights are to be installed with two of the base holes 180° apart perpendicular with the runway centerline. Bases shall not be rotated to accommodate inset fixture toe-in.
- 1.6 Crouse-Hinds part number 850EA-150-G-S, with L-823 Style 6 connector, is qualified to FAA L-850E.

INSTRUCTION MANUAL
 SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
 PART NUMBER SERIES: 850EA-B

PART NUMBER EXPLANATION



FAA TYPE: 850E = L-850 E
 MODEL:
 FAA BASE SIZE: B = 11.25" DIAMETER BOLT CIRCLE
 NUMBER OF LAMPS:
 1 = 1 LAMP
 2 = LAMPS
 OPERATING WATTAGE:
 150 = 1 x 150 WATT, 6.6A LAMP (RUNWAY END LIGHT OR FAA CAT 1 THRESHOLD APPLICATIONS ONLY)
 300 = 2 x 150 WATT, 6.6A LAMPS
 COLOR:
 C = CLEAR
 G = GREEN
 R = RED
 BEAM ORIENTATION:
 L2 = 2° TOE-IN LEFT
 R2 = 2° TOE-IN RIGHT
 L3 = 3 1/2° TOE-IN LEFT
 R3 = 3 1/2° TOE-IN RIGHT
 S = STRAIGHT (NO TOE-IN)

OPTIONS:
 NM = HIGH STRENGTH CASTING (STANDARD CASTING MATERIAL IS DUCTILE IRON)
 A = 2 x 150 WATT, 6.6A LAMPS, SERIES CIRCUIT (ONLY ONE LAMP ENERGIZED AT A TIME), RUNWAY END LIGHT OR FAA CAT 1 THRESHOLD LIGHT APPLICATIONS ONLY

TABLE 1

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

LIGHT TYPE, BEAM COLOR & SPECIFYING AGENCY	TOE-IN ANGLES	
	CATEGORY I & MILITARY	CATEGORY II & / OR III
THRESHOLD, GREEN BEAM, ICAO	3-1/2°	3-1/2°
THRESHOLD, GREEN BEAM, USAF (INCLUDES WING BAR)	0°	0°
THRESHOLD, GREEN BEAM, NATO	0°	0°
THRESHOLD, GREEN BEAM, FAA L-850E	0°	N/A
THRESHOLD WING BAR, GREEN BEAM, ICAO	2°	2°
THRESHOLD WING BAR, GREEN BEAM, NATO	0°	0°
RUNWAY END LIGHT, RED BEAM, ALL	0°	0°
CENTER LINE BARRETTE, WHITE BEAM, ICAO & MILITARY	0°	0°
SIDE ROW BARRETTE, RED BEAM, ICAO	N/A	2°
SIDE ROW LIGHT, RED BEAM, USAF	N/A	2°
SIDE ROW BARRETTE, RED BEAM, NATO	N/A	0°
TERMINATING BAR, RED BEAM, USAF	2°	N/A
TERMINATING BAR, RED BEAM, NATO	0°	0°
PRE THRESHOLD BAR, RED BEAM, USAF	2°	N/A
WING BAR, INBOARD, RED BEAM, NATO	0°	0°

N/A = NOT APPLICABLE

SEE FIGURES 1,2 AND 3.

TABLE 2
RUNWAY LIGHT FIXTURE CHARACTERISTICS

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

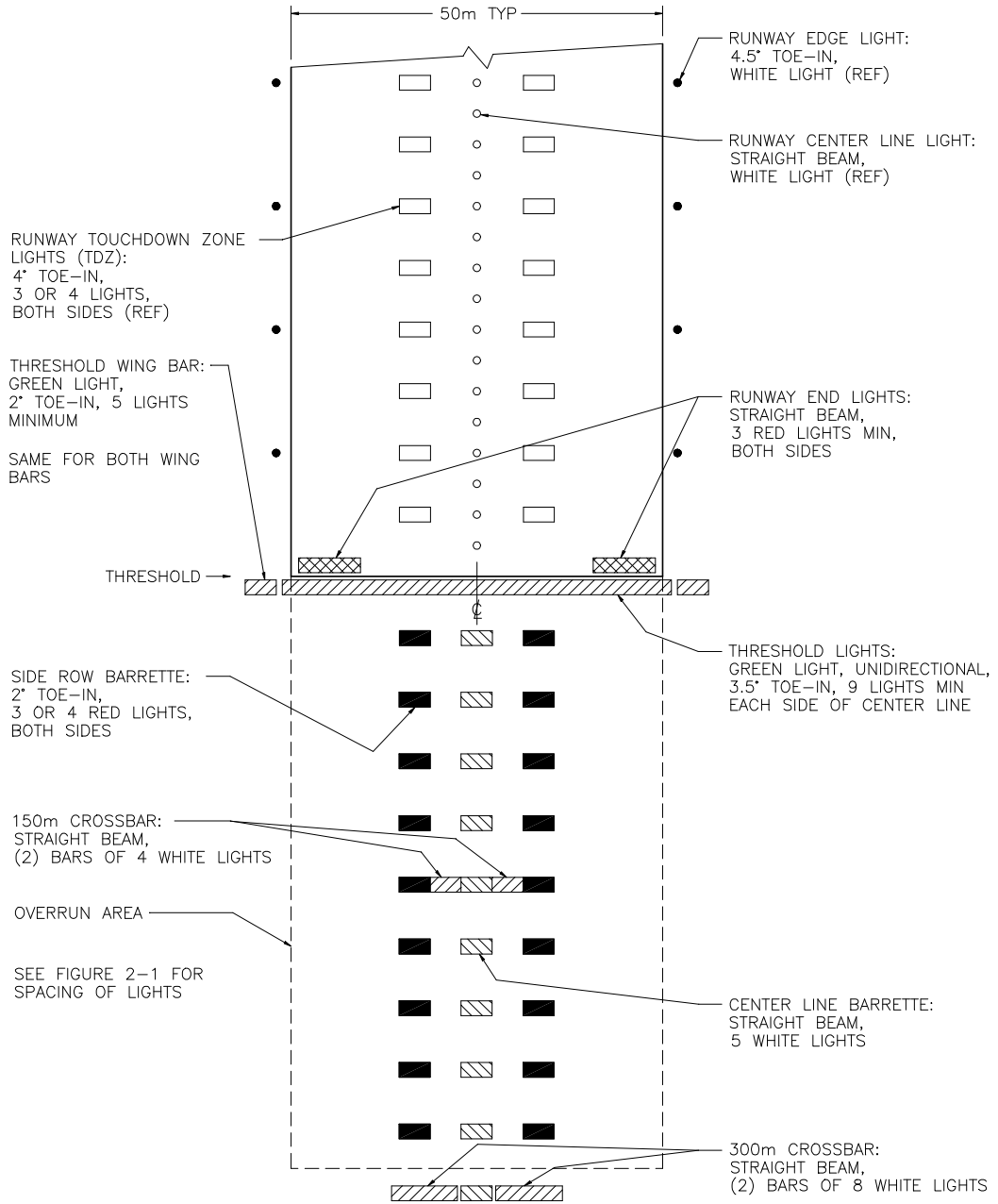


FIGURE 1-1
ICAO LIGHT IDENTIFICATION

INNER 300m APPROACH AND RUNWAY LIGHTING FOR PRECISION APPROACH RUNWAYS CATEGORY II AND III

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

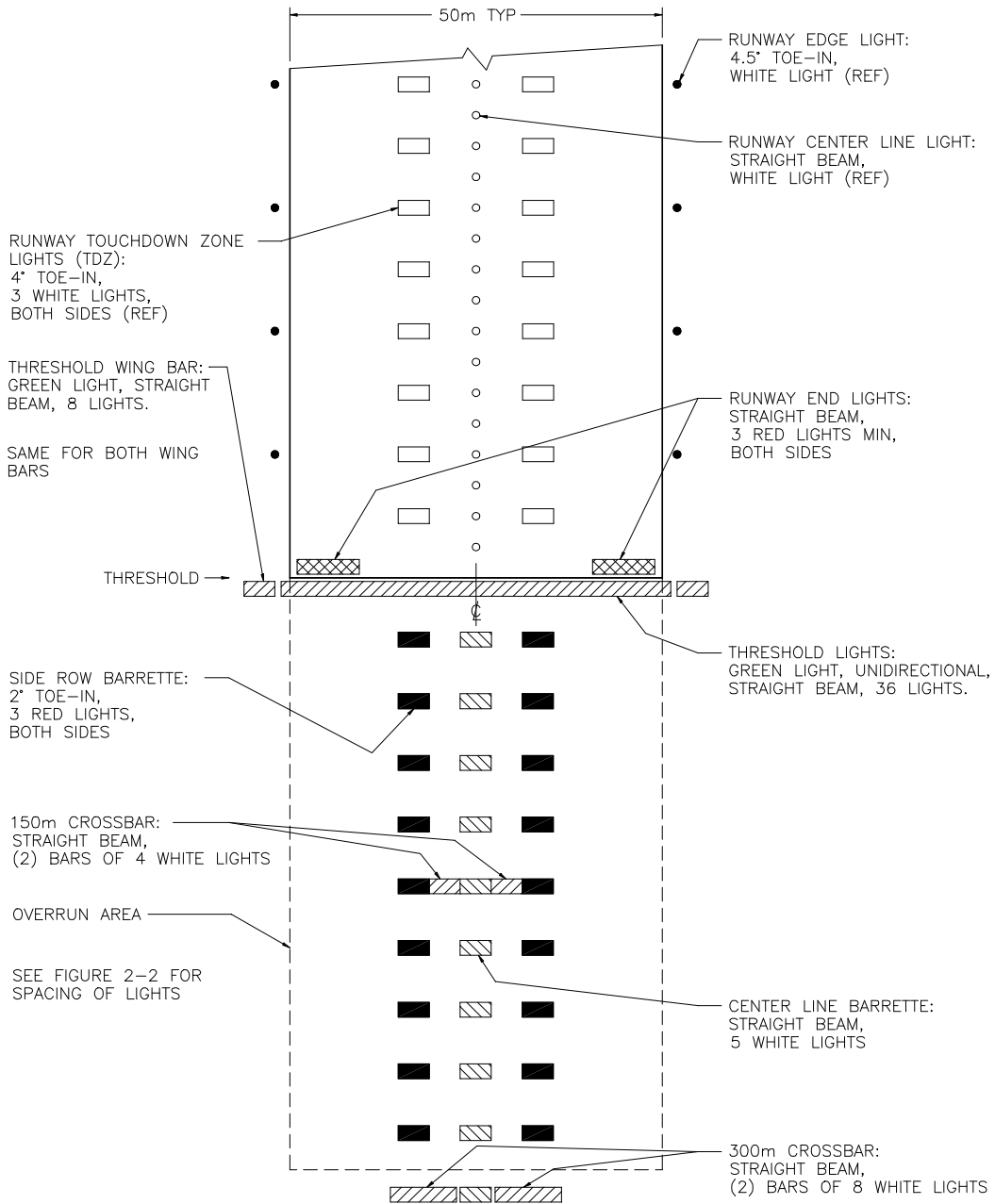


FIGURE 1-2
USAF LIGHT IDENTIFICATION

INNER 300m APPROACH AND RUNWAY LIGHTING FOR PRECISION APPROACH RUNWAYS CATEGORY II AND III

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

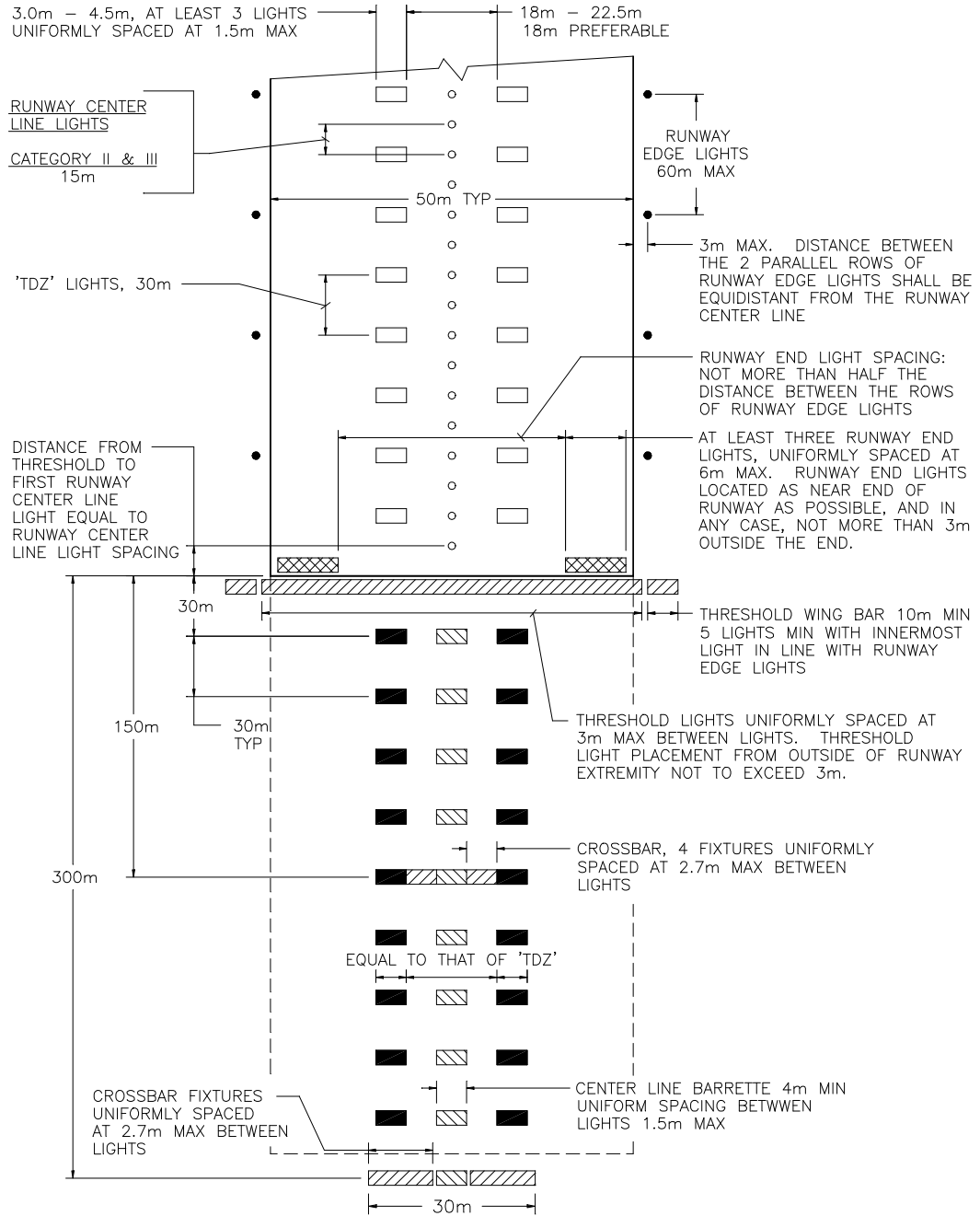


FIGURE 2-1
ICAO FIXTURE SPACING

INNER 300m APPROACH AND RUNWAY LIGHTING FOR PRECISION APPROACH RUNWAYS CATEGORY II AND III

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

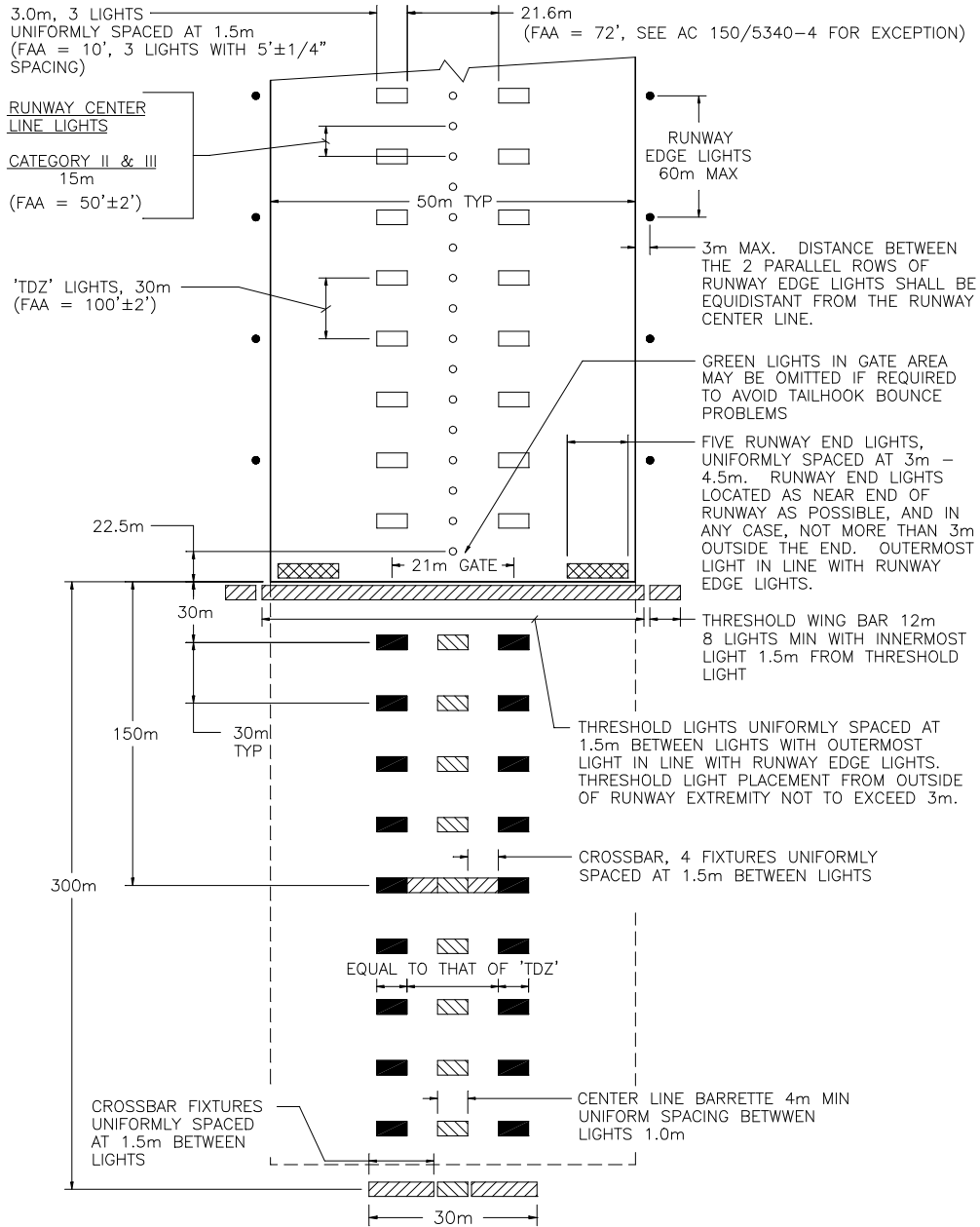


FIGURE 2-2
USAF FIXTURE SPACING

INNER 300m APPROACH AND RUNWAY LIGHTING FOR PRECISION APPROACH RUNWAYS CATEGORY II AND III

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

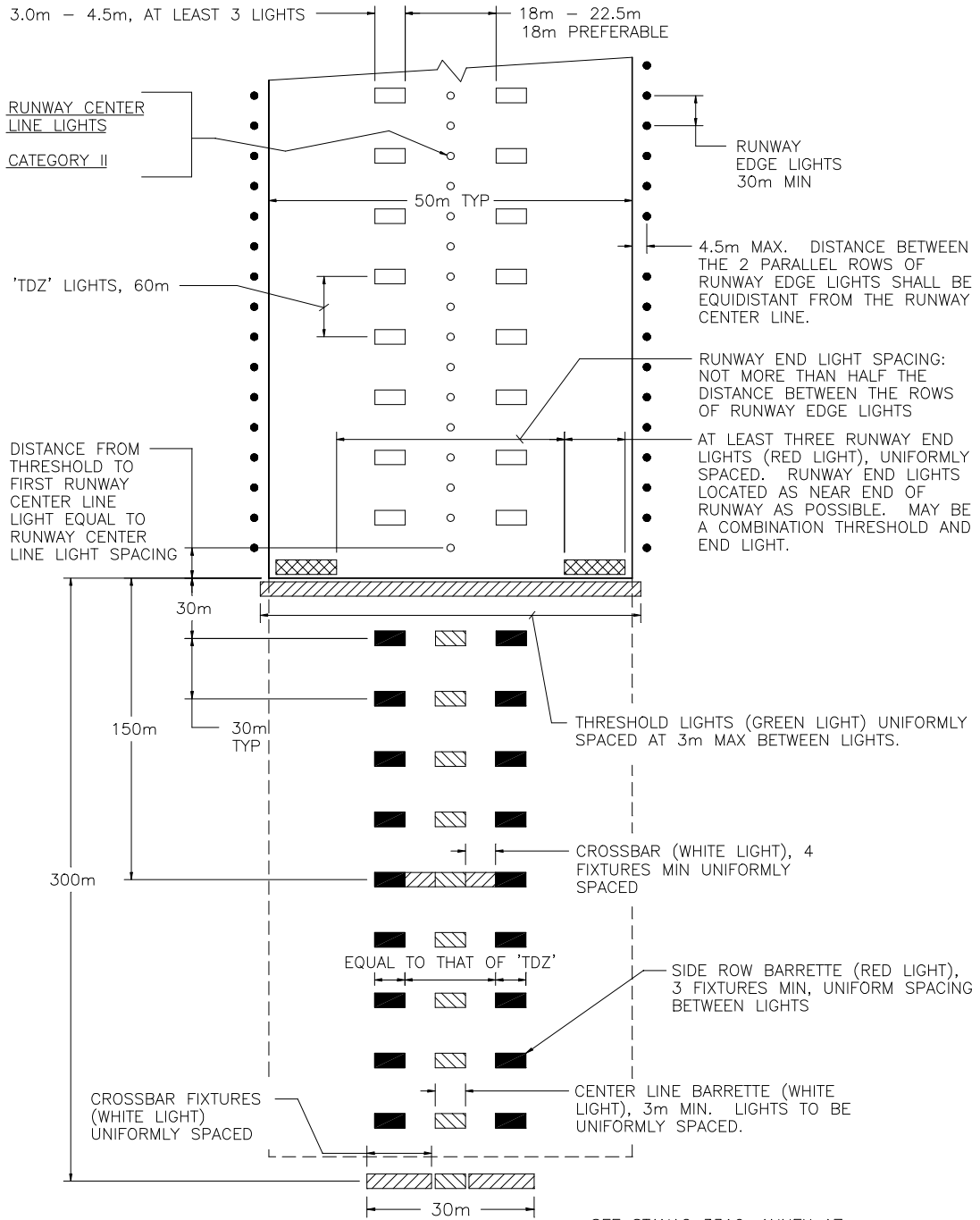


FIGURE 2-3
NATO FIXTURE SPACING

INNER 300m APPROACH AND RUNWAY LIGHTING FOR PRECISION APPROACH RUNWAYS CATEGORY II

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

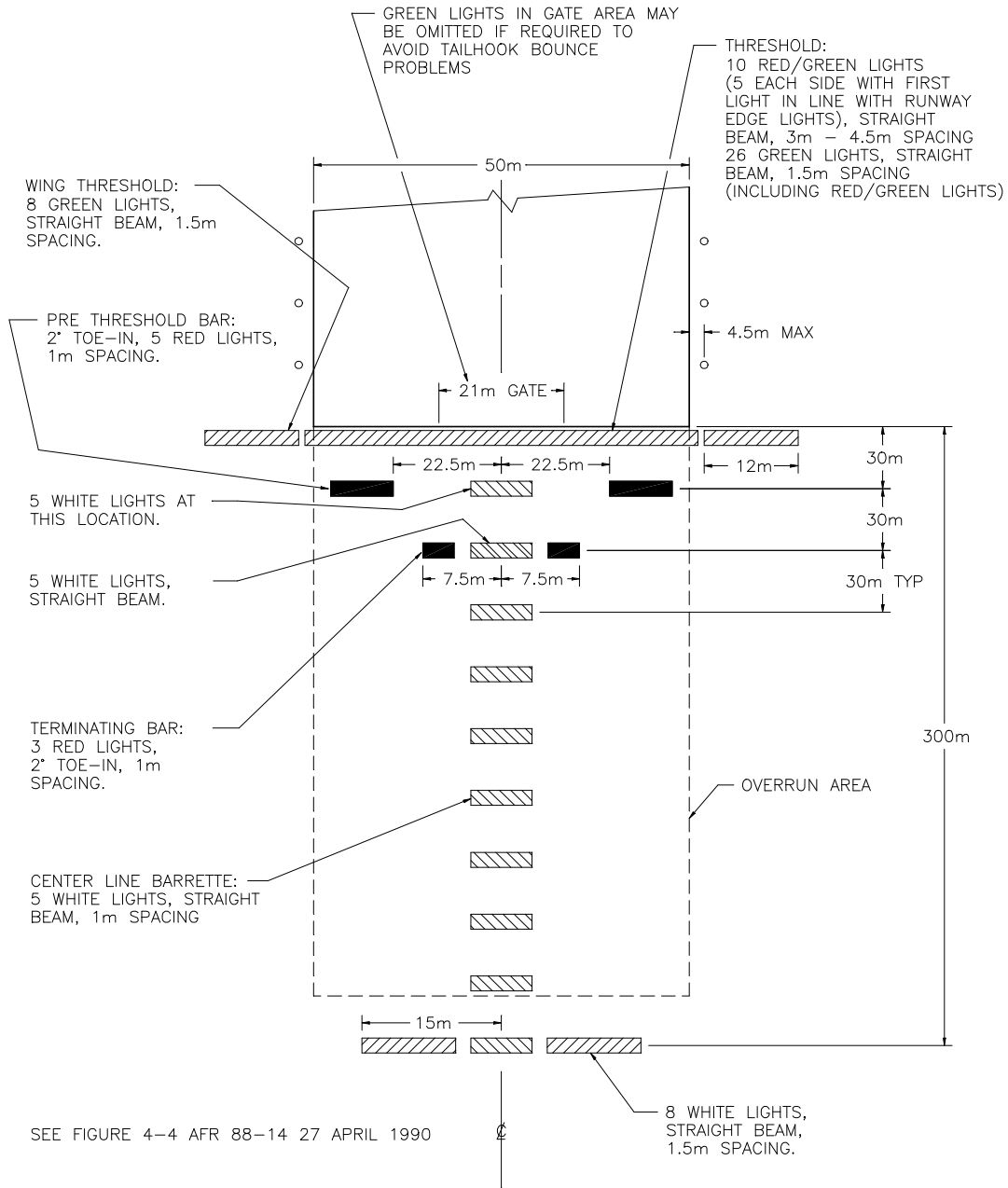


FIGURE 3-1
USAF INSTRUMENT RUNWAY APPROACH LIGHTING

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

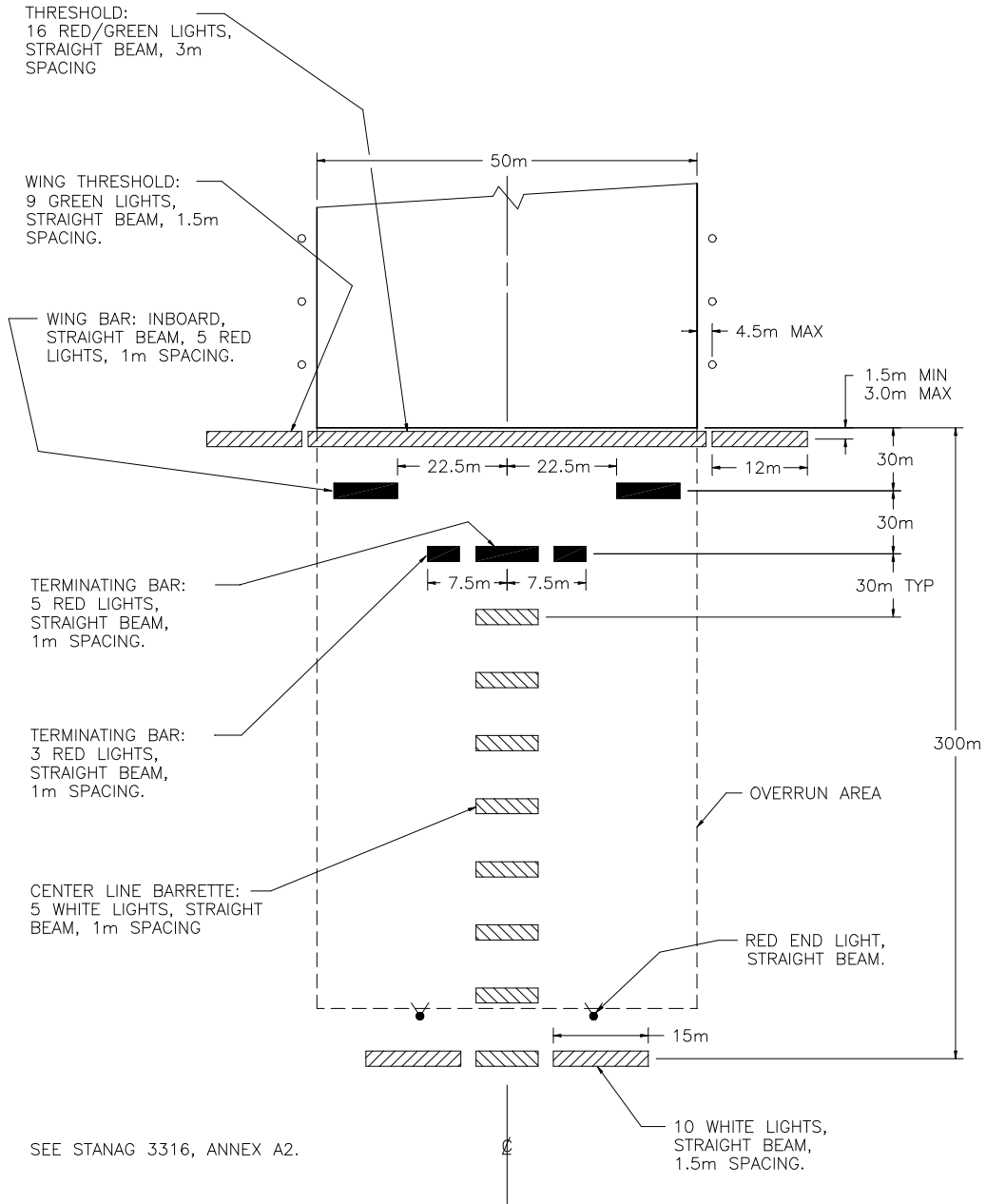


FIGURE 3-2

NATO INSTRUMENT RUNWAY APPROACH LIGHTING TYPE II

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

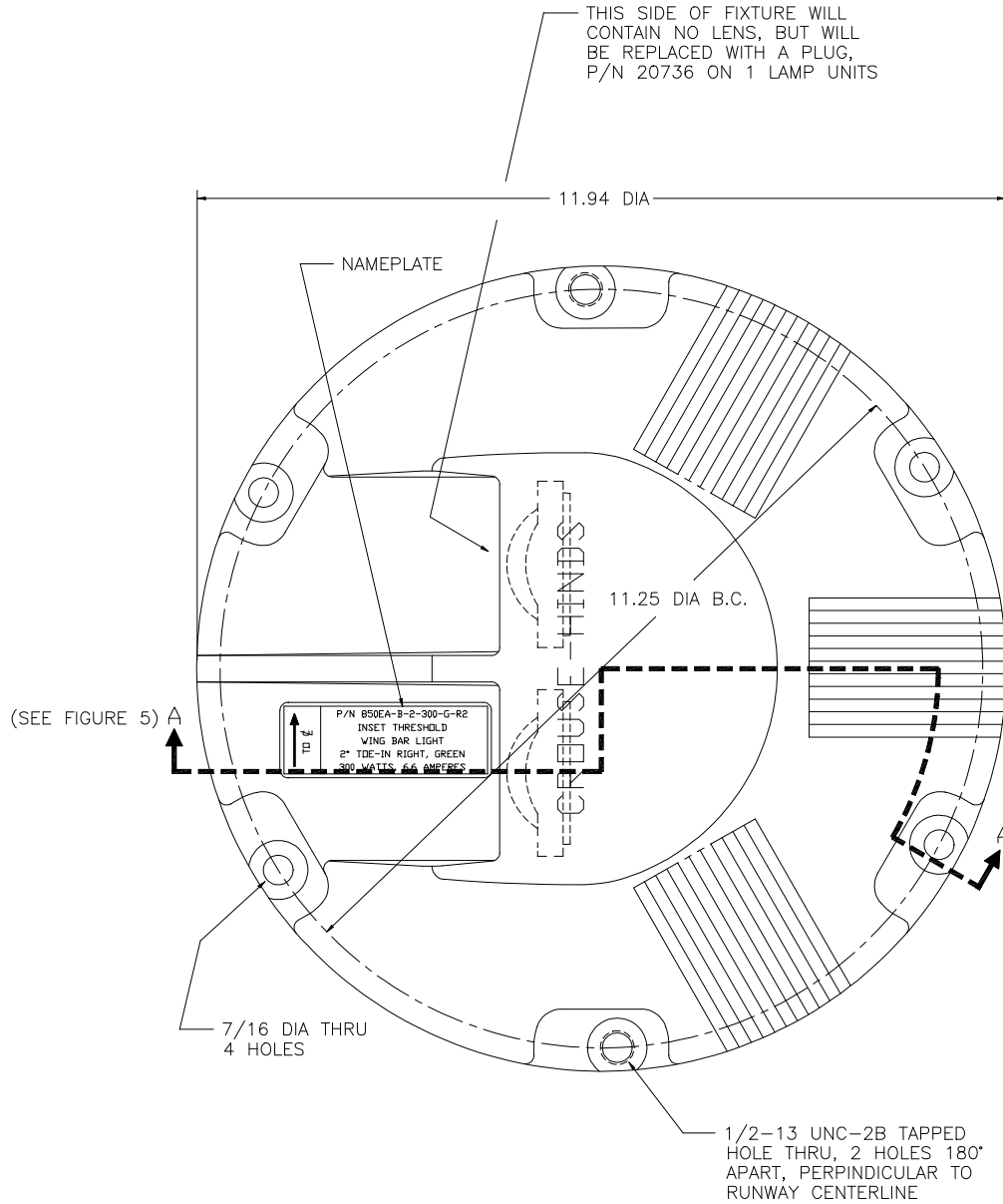
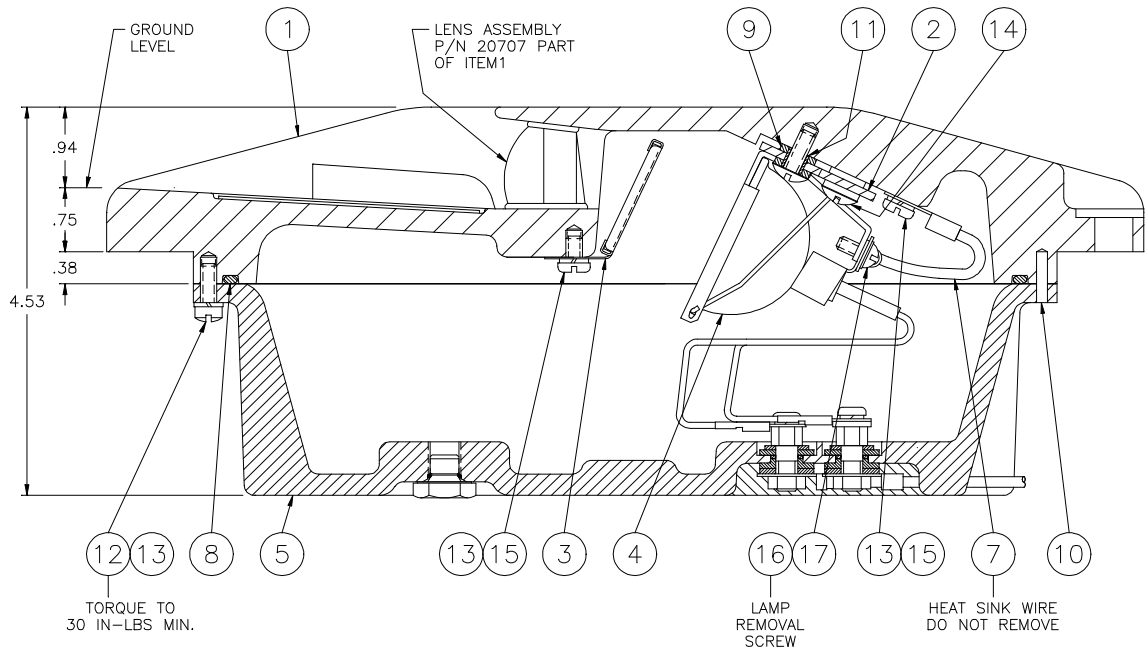


FIGURE 4

INSET LIGHT FIXTURE TOP VIEW

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B



NOTE: ALL SCREWS ARE SECURED WITH LOCTITE 242

FIGURE 5
SECTION A-A
INSET LIGHT FIXTURE INTERIOR
REFER TO PARTS LIST - PAGES 28 & 29

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

2.0 INSTALLATION INSTRUCTIONS

2.1 Pavement Recess and Wireways for Shallow Base Receptacle **(P/N 20453-1 or 20452-S234)**

Drill recess in pavement as illustrated in Figure 6. Be sure that the recess size and depth are maintained within the specified limits. The recess side walls must be perpendicular to the pavement surface. The bottom surface must be flat or slightly concave to assure that the Shallow Base Receptacle rests securely and in true position. The recess can best be drilled using a diamond-faced core drill in a sturdy, stable rig.

2.1.1 The wireways should be sawed using a diamond-faced saw, as shown in Figure 6 and 9. When wireways cross construction joints, the sawcuts should extend 1 inch below the existing joint for a distance of six inches each side of the joint. Fill to one inch from top of the pavement with an appropriate joint sealing filler in accordance with Section E, page 32.

2.1.2 Prior to installation of the Shallow Base Receptacle, or wires, be sure that all surfaces of the recess and the wireways are clean and dry. If any of these surfaces are damp, it is desirable that they be dried and blown clean with a compressed air blast.

2.1.3 It is recommended that the Shallow Base Receptacle, recess and the wireways in the pavement be a temperature of not less than 50°F (10°C) before starting installation (unless the adhesive compounds used are designed for curing at a lower temperature).

2.2 Shallow Base Receptacle Installation (P/N 20453-1 or 20452-S234)

CAUTION

NEVER HANDLE THE INSET LIGHT FIXTURE OR SHALLOW BASE RECEPTACLE BY THE LEADS AS THIS CAN BREAK THE WATERPROOF SEAL.

2.2.1 If specified, the Inset Light fixture may be supplied with a shallow base receptacle (P/N 20453-1 or 20452-S234) as a completely assembled unit with three bolts sealed to prevent removal without detection. The remaining three bolts can be removed to accommodate a P/N 19583 Installation Fixture.

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

PART NO	A DIM	B ANGLE
20453-1	5 1/2	90
20452-S234	4 3/4	30

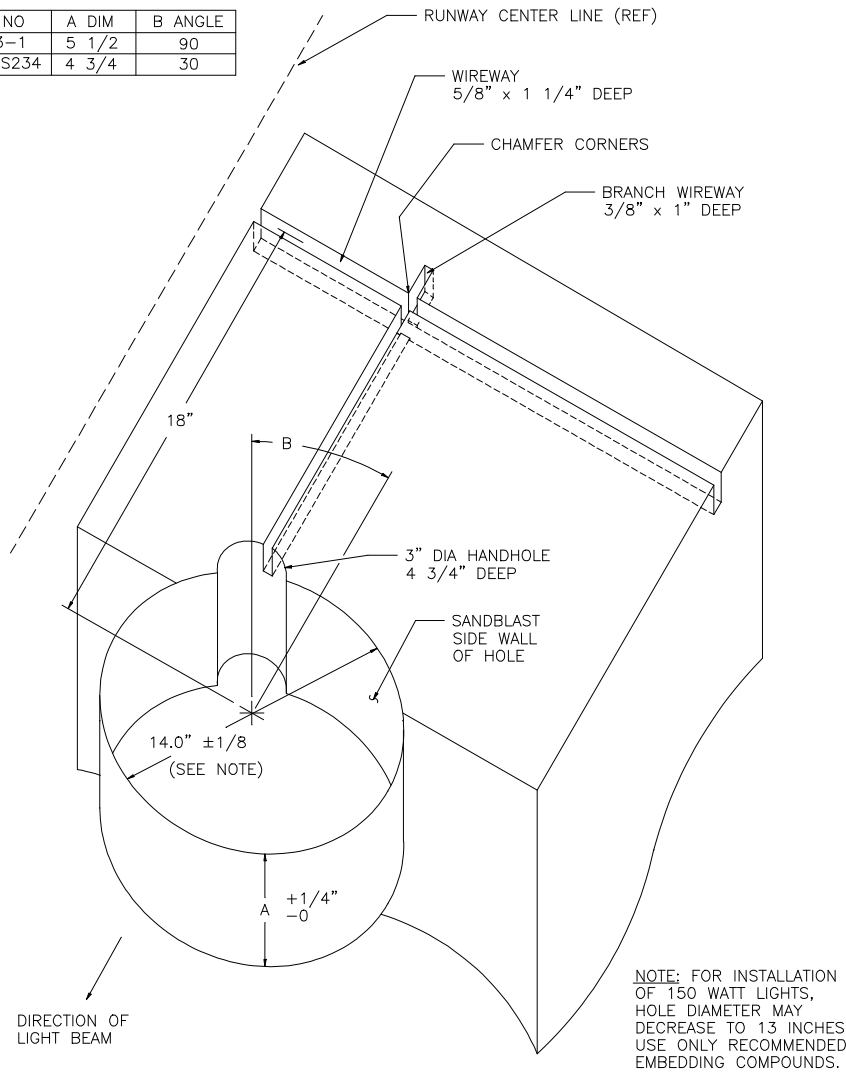


FIGURE 6

PAVEMENT CORING DETAIL
SHALLOW BASE & WIREWAYS

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

2.2.2 Splice the Light Assembly leads to the power cables using squeeze connectors, crimped with the proper tool. The splices to the fixture leads should be made at staggered locations. Insulate each splice carefully using either heat shrinkable insulating tubing (ScotchTite Heat Tubing or equal) properly applied or three layers of plastic electrical insulating tape applied with half overlap.

Train the leads and power cables carefully so they run along the bottom of the sawed wireways. Small wads of plastic insulating tape may be used to wedge the leads and cables in the bottom of the wireways if necessary. See Figures 7 and 8.

2.2.3 Prior to placing the Shallow Base Receptacle in the drilled hole, all external surfaces which will be bonded into the runway must be cleaned with a solvent to ensure an adequate bond between Receptacle and sealer. An alignment jig (P/N 19583-2) should be used to align the Shallow Base Receptacle. Remove the plywood cover from the shallow base before attaching alignment jig. Retain the hardware and cover. The jig has positioning tubes which fit over the bolt holes on the Shallow Base Receptacle. After the jig is located on the Shallow Base Receptacle, it can be secured with the three bolts provided with the alignment jig. The “V” notches in the jig are then used to align the fixture with properly surveyed markings which will locate the light parallel with the runway centerline (see Figure 8). It may be necessary to place temporary plugs for blocking the wireways entrance into the drilled hole or recess. The plugs will retain the sealer while it cures.

2.2.4 With the jig attached to the Shallow Base Receptacle, completely cover the bottom of the Shallow Base with grout or sealer material. See Figure 7. A sufficient quantity (1 inch thick) of paste material should be placed in the drilled hole to assure a bond between the bottom of the Shallow Base Receptacle and the drilled hole. When the Shallow Base Receptacle is placed in the drilled hole, sealer material should be forced up to the side of the Shallow base at least 1/8 inch. The handle on the jig is used to position and align the Light Assembly (as shown in Figure 8). A weight may be placed on the jig to hold the Shallow Base Receptacle in position. The remainder of the space between the sides of the Shallow Base and the drilled hole should be filled with grout or sealer to a level 3/4 inch below the pavement surface as shown in Figure 7. The jig should be left in place until the grout or sealer reaches its initial set. If any voids are present around the Shallow Base Receptacle after the initial set (remove jig for complete visibility), they should be filled and all excess material removed. Install flexible (rubber) sealer, see section E around the top 1 inch of the shallow base. Be sure to allow sufficient set time. Follow manufacturers instructions.

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

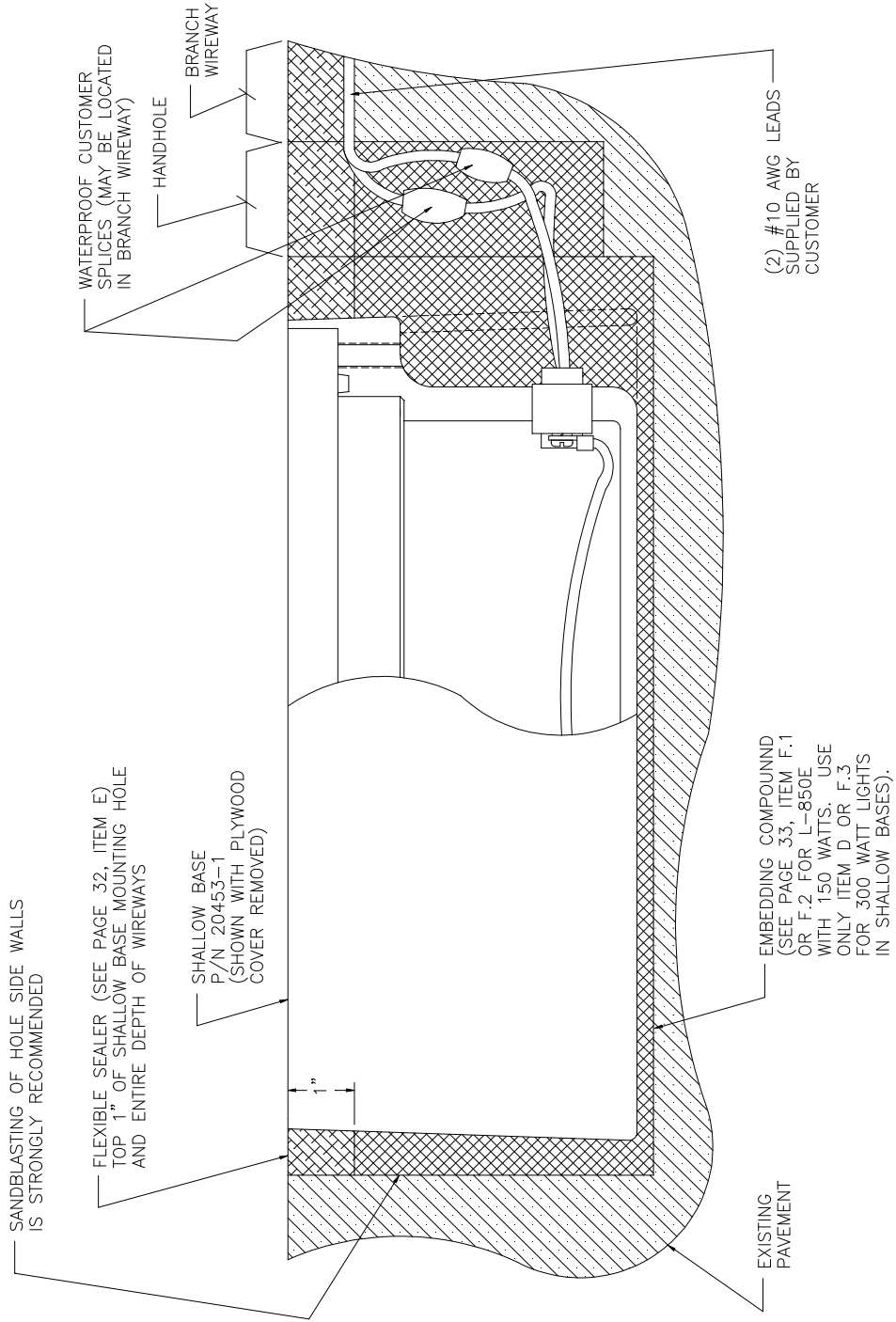


FIGURE 7
SHALLOW BASE BONDING DETAIL
P/N 20453-1

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

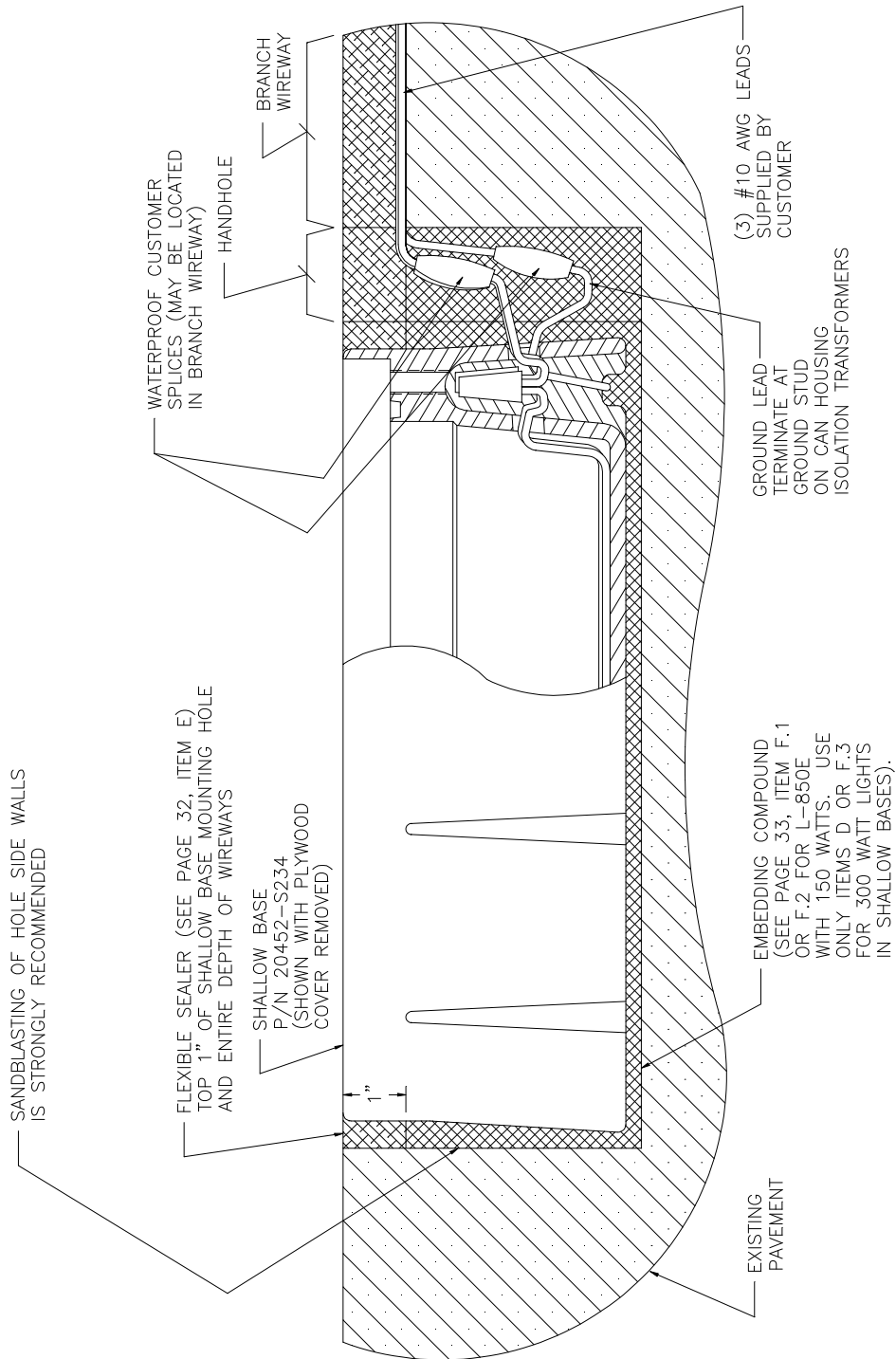
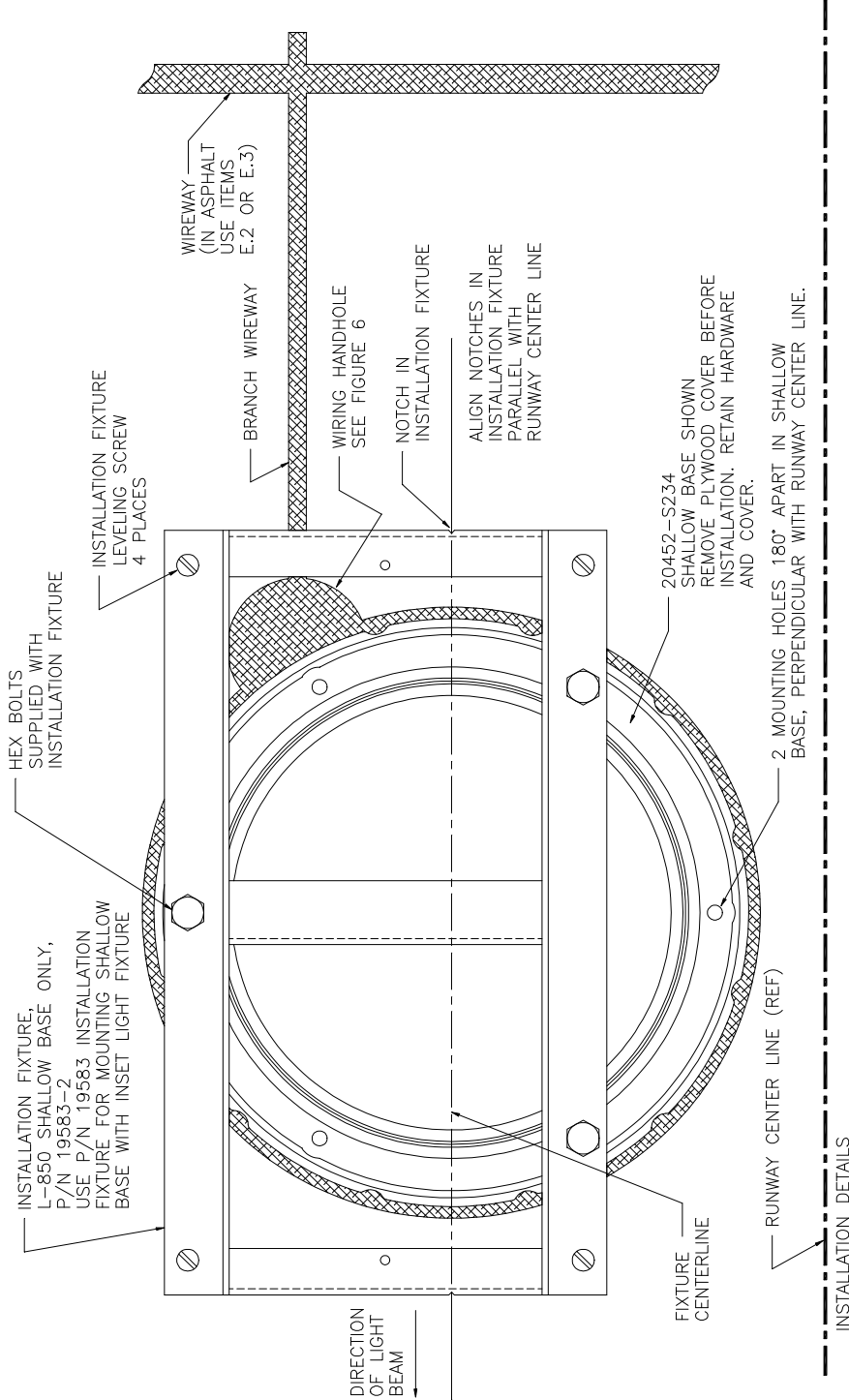


FIGURE 7A
SHALLOW BASE BONDING DETAIL
P/N 20452-S234

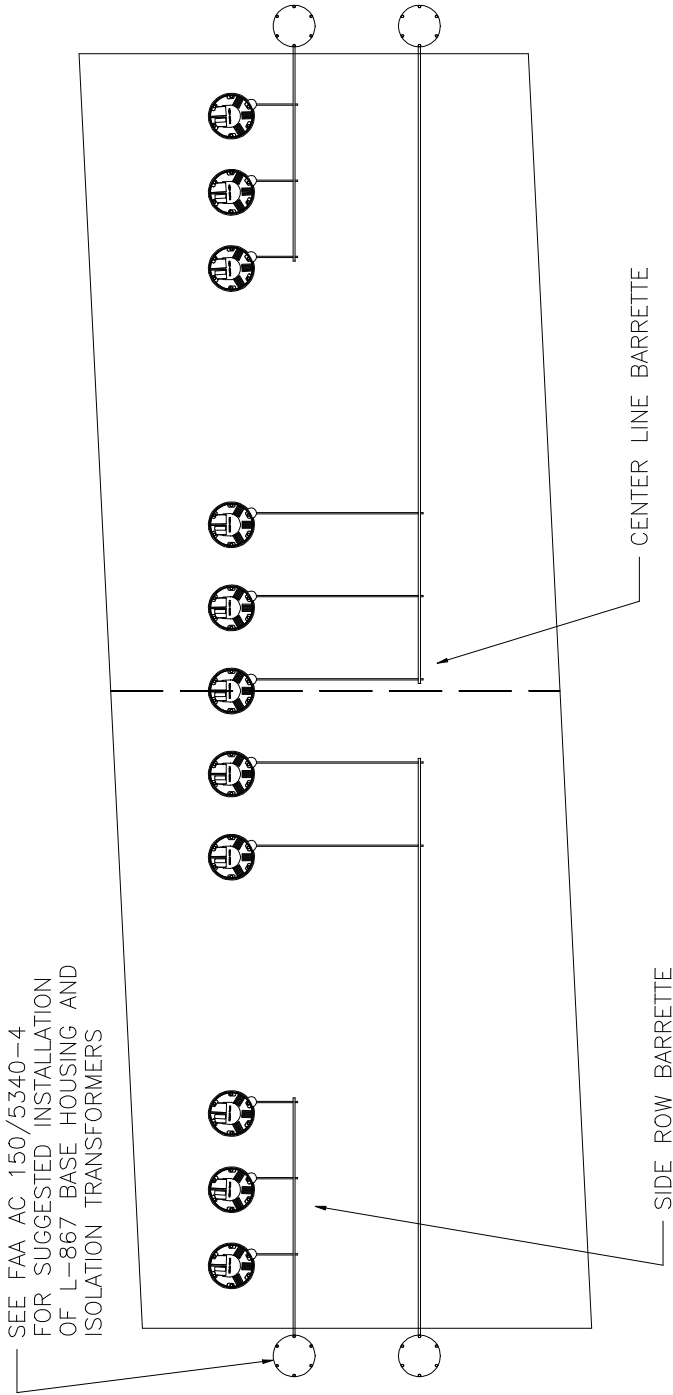
INSTRUCTION MANUAL
 SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
 PART NUMBER SERIES: 850EA-B



- INSTALLATION DETAILS
1. PLACE THE INSTALLATION FIXTURE ON THE SHALLOW BASE AND SECURE TO SHALLOW BASE WITH THE THREE HEX HEAD BOLTS PROVIDED. BE SURE LEADS FROM SHALLOW BASE WILL EXIT TO HANDHOLE.
 2. PLACE EMBEDDING COMPOUND IN BOTTOM OF SHALLOW BASE MOUNTING HOLE.
 3. PRESS SHALLOW BASE INTO HOLE AND LEVEL AS REQUIRED USING FOUR INSTALLATION FIXTURE LEVELING SCREWS.

FIGURE 8
 SHALLOW BASE MOUNTING DETAILS

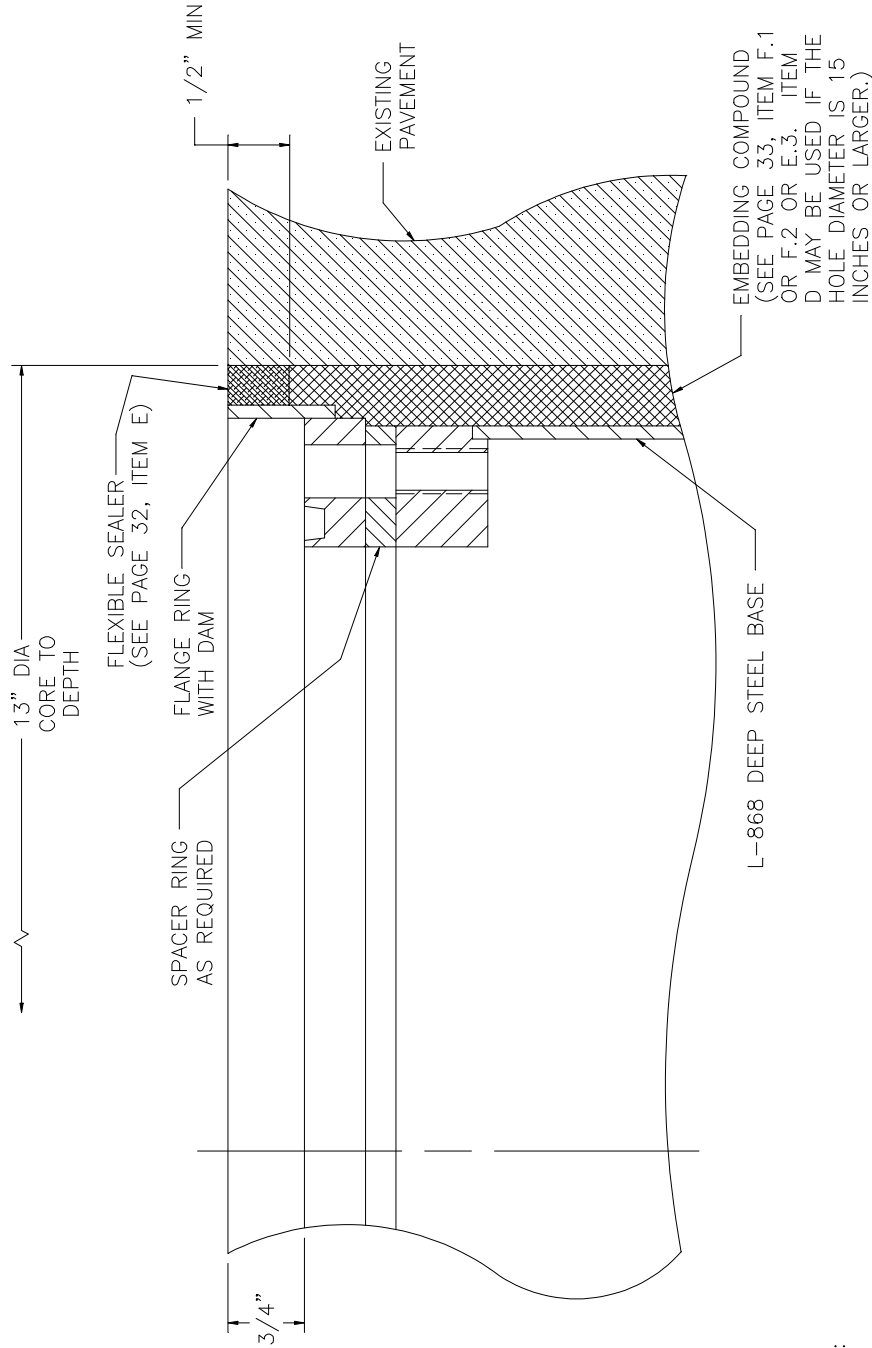
INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B



NOTE: NO MORE THAN 3 ISOLATION TRANSFORMERS TO BE LOCATED INSIDE ANY ONE L-867 DEEP BASE

FIGURE 9
SUGGESTED BARRETTE SHALLOW BASE WIREWAY CONFIGURATION
(INSET LIGHTS SHOWN ON 20452-S234 SHALLOW BASES)

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B



NOTES:

1. BE SURE TWO HOLES 180° APART ARE PERPENDICULAR WITH RUNWAY CENTER LINE.
2. USE INSTALLATION FIXTURE RECOMMENDED BY MANUFACTURER.

FIGURE_10
SUGGESTED L-868 STEEL BASE INSTALLATION

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

- 2.2.5 When the Shallow Base Receptacle is in its final position, the Inset Light fixture may now be installed. Install the Inset Light fixture by connecting its plug to the receptacle in the Shallow Base. Orient and secure the Inset Light fixture to the Shallow Base using the six 3/8-16 bolts and six 3/8 lockwashers provided with the Shallow Base. One drop of Loctite Grade 242 should be applied to the bolts before installation. Torque bolts to 18 foot pounds (225 +0/-10 inch pounds).
- 2.2.6 Fill the wireways completely with an approved compound and let cure for at least 24 hours before disturbing, unless otherwise specified. See FAA AC 150/5340-4C for additional information for construction and sealing instructions for wireways.
- 2.3 Inset Light Fixture Installation on Deep Can L-868 Size B Transformer Housing
- Inset Light fixtures are shipped complete, including the lamp, and are ready for installation as received. Be sure that the flange on the Transformer Housing is clean before installing the Optical Assembly. Connect the plug from the Inset Light fixture on the transformer housing.
- 2.3.1 The six bolts (with lockwashers) should then be torqued to 18 foot pounds (225 +0/-10 inch pounds). A drop of removable Loctite Grade 242 on a bolt will prevent loosening.
- 2.3.2 See Figure 1, 2 and 3 for Inset Light fixture Location and Installation Details.

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

3.0 MAINTENANCE

The preferred method of maintaining these lights is to periodically and systematically replace the Inset Light fixture and return the replaced assembly to the maintenance shop for renovation. As an alternative, the Inset Light fixture can be serviced in the field, but it is recommended that field servicing be limited to cleaning the lenses as described in paragraph 3.1 below and to lamp replacements as described in paragraph 3.2.2. See Figures 4 and 5.

3.1 Cleaning the Lenses

Remove the Inset Light fixture from the Base Receptacle by loosening the six bolts and gently lifting the assembly out of the base recess. With a compressed air blast or suitable brushes, remove all accumulated debris from the light channel, then clean the outer surface of the light lenses with a detergent solution. If the light lenses are 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 suitable 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 gasket. The lenses should be subjected to a gentle air blast to evaporate or remove all remaining solvent.

3.2 Relamping

Remove the Inset Light fixture from the Base Receptacle and clean the lenses if necessary.

3.2.1 Remove the Inner Cover Assembly from the Inset Light. If there is water in the light, find and repair the leak.

3.2.2 The lamp assembly can easily be removed. See Figure 5. Install the new lamp assembly. On units that use two lamp assemblies, both lamps should be replaced at the same time regardless if only one lamp is burned out.

CAUTION

TOUCHING THE QUARTZ BULB WITH YOUR BARE FINGERS MAY SERIOUSLY SHORTEN THE LAMP LIFE. IF THE QUARTZ BULB HAS BEEN TOUCHED, WIPE IT CAREFULLY WITH A PIECE OF LENS CLEANING TISSUE OR SIMILAR MATERIAL MOISTENED WITH ISOPROPYL ALCOHOL.

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

- 3.2.3 Examine the o’ring carefully. If the o’ring is stretched or torn, or has a permanent set or other defect which would prevent it from forming a watertight seal, it must be replaced with a new o’ring. If a new o’ring is required, follow the procedure given in paragraph 3.3.1 through 3.3.3.
- 3.2.4 Reinstall the Inner Cover Assembly. Apply one drop of Loctite Grade 242 before installing screws and torque to 30 inch pounds.
- 3.2.5 Replace the Inset Light fixture in its original orientation. Apply one drop of Loctite 242 before installing bolts and torque to 18 foot pounds (225 +0/-10 inch pounds).

3.3 Replacing O’Rings

Every time the Inset Light fixture is removed from the Shallow Base Receptacle, the Shallow Base o’ring must be examined as described in paragraph 3.2.3 and replaced if necessary.

- 3.3.1 Remove all particles of the old gasket from the o’ring groove by gentle scraping. Be sure not to damage the bottom and sides of the groove.
- 3.3.2 For all -150 version fixtures, coat the o’ring with a thin layer of Dow-Corning No. FS 1292 Lubricant. Carefully position the new o’ring in the center of the groove and press gently into place.
- 3.3.3 For all -300 version fixtures, **DO NOT** coat the o’ring with lubricant, the high operating temperature of these versions can cause the lubricant to outgas. Carefully position the new o’ring in the center of the groove and press gently into place.

3.4 Replacing Lens

If a lens is broken or its surface is badly pitted or scarred, the lens and gasket must be replaced. The lens may be replaced as specified below.

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

- 3.4.1 With Inset Light fixture out of the Shallow Base Receptacle, remove the inner cover assembly, lamp assembly and lamp bracket assembly. Remove all particles of the old lens, lens seal and adhesive from slot. Suggestion: CUT AROUND THE OUTSIDE OF SEAL USING A SHARP INSTRUMENT, USING A BLOCK OF HARD WOOD PLACED AGAINST THE INSIDE OF THE LENS, HAMMER UNTIL LENS SLIDES OUT. To remove excess gasket and sealant, a rotary wire brush attached to an electric drill is recommended. Sandblasting lens opening is not recommended.
- 3.4.2 Clean the lens opening with alcohol and dry thoroughly. Apply one thin coat of RTV primer, Crouse-Hinds P/N 10048-3. Allow to dry one hour minimum, 60 hours maximum, at room temperature. Apply RTV 106, Crouse-Hinds P/N 10048-2, to the lens assembly and to the inside of the lens opening. Orient the lens as shown in Figure 5, and carefully slide it into position using Crouse-Hinds Lens Alignment Jig, P/N 20734. Lay a bead of RTV 106 along the top, bottom, and sides of the back side of the lens. Form the bead into a fillet along the top and bottom and fill any gaps between the housing and the lens. Do the same to the front of the lens except for the top and bottom. Suggestion: All bonding should be done when the relative humidity is at least 50%. Rainy days are ideal. After at least five days curing, remove the protective tape from the lens and place the casting in an oven and bake at 475°F for one hour. This is important to insure long life of the seal, and to reduce the chances of the RTV outgassing at high temperature.

3.3.4 Pressure Test

The assembly should then be given a pressure check at 20 psi. This can be done by fitting the inner cover with an air line. The cover (with o'ring) is then screwed into place, (30 inch pounds), and internal pressure applied. A soap solution can be used to check for escaping bubbles around the light lenses.

3.5 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.

NOTE: See Parts List and Figures 5 and 12 for location of parts.

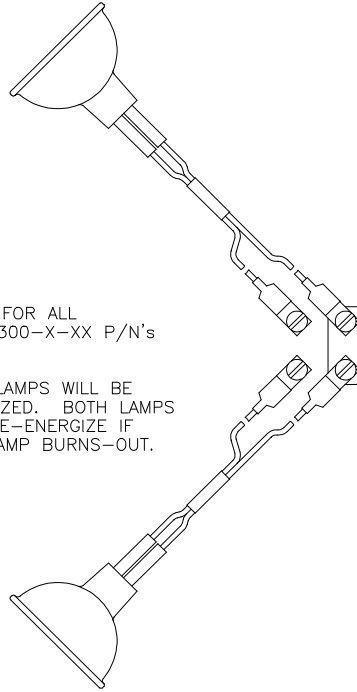
**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

3.6 Maintenance Program

In order to insure maximum Inset Light fixture life, the installed units should be subject to a maintenance program in accordance with the following: (Contact Crouse-Hinds Sales for information on factory service.)

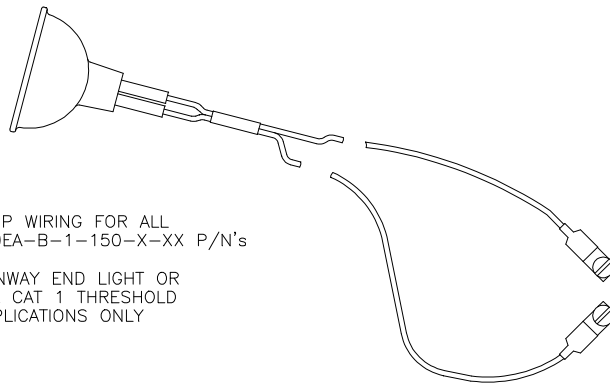
- 3.6.1 A daily operation check should be made of the lighting fixture. The lights should be energized and visually inspected. If any lamps are out, the location of the fixture should be recorded and the lamps replaced at a time when the circuit is de-energized. (See paragraph 3.2).
- 3.6.2 Regular cleaning is necessary in order to insure that in-runway lighting fixtures operate at maximum efficiency. The lens and channel in front of the lens should be cleaned periodically. The regularity and type of cleaning will be dictated by the weather and the location of the fixtures.
- 3.6.3 Snowplow operators should be warned in writing to exercise extra care not to strike the light fixtures with steel snowplow blades. After snow 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 either traveling at less than 5 mph or have the blades lifted clear of the fixtures. Recommended snow removal techniques are described in AC 150/5380-2A. Lights made of a special alloy to resist plow damage are available on special order.
- 3.6.4 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 and become a serious problem. 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 following rainy seasons.
- 3.6.5 Inset Light fixture hold-down bolts should be checked for proper torque in accordance with paragraph 3.2.5 at least once every three months or whenever a fixture is serviced regardless of season.
- 3.6.6 If any fixture contains water, the water should be removed and the entire fixture cleaned and dried. The o'rings should be replaced, the fixture leak tested (para. 3.4.3), repaired and reinstalled as specified here. Some airports have a maintenance contract with Crouse-Hinds Airport Lighting Products and return optical units to the factory for repair. Call Crouse-Hinds for details.

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**



LAMP WIRING FOR ALL
850EA-B-2-300-X-XX P/N's

NOTE: BOTH LAMPS WILL BE
ENERGIZED. BOTH LAMPS
WILL DE-ENERGIZE IF
ONE LAMP BURNS-OUT.



LAMP WIRING FOR ALL
850EA-B-1-150-X-XX P/N's

RUNWAY END LIGHT OR
FAA CAT 1 THRESHOLD
APPLICATIONS ONLY

FIGURE 11
INSET LIGHT FIXTURE LAMP WIRING

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

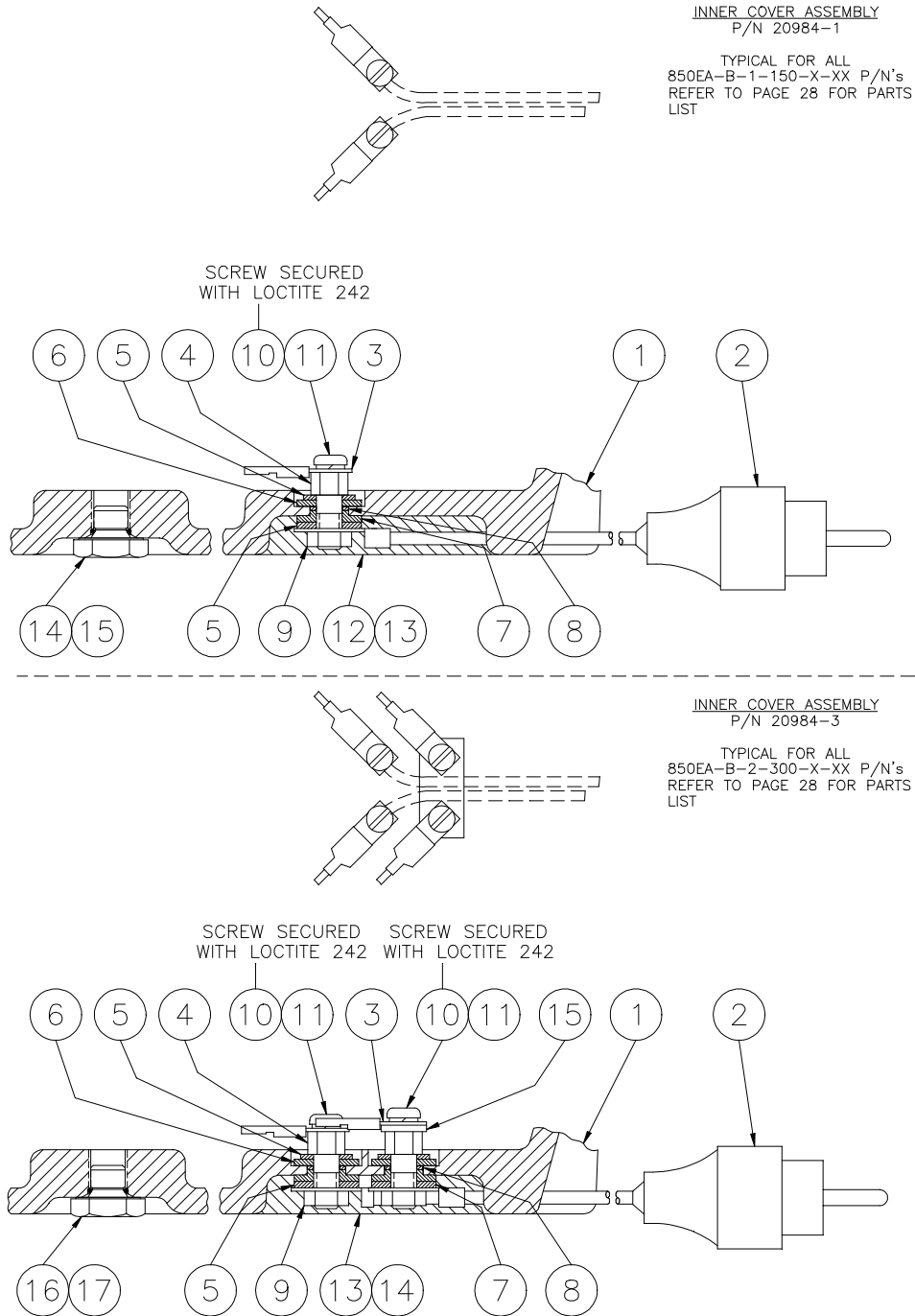


FIGURE 12

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

PARTS LIST**INNER COVER ASSEMBLY P/N 20984-1**

<u>ITEM #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	20982-1	Inner Cover
2	21038	Plug Assembly, L-823
3	10047-525	Tab
4	20017	Lead Lug
5	10030-57	Washer, Flat
6	10030-108	Washer, Flat, Insulating
7	10030-100	Washer, Shoulder, Insulating
8	10035-33-010	O'ring
9	10K04-025D	Hex Nut, Jam, 1/4-20, SS
10	10A06-016D10	Screw, Pan Hd., #8-32 x 5/16 Lg, SS
11	11A12-016D	Lockwasher, Split, #8, SS
12	10048-36	Catalyst
13	10048-49	Resin
14	19967	Plug
15	10035-33-011	O'ring

INNER COVER ASSEMBLY P/N 20984-3

<u>ITEM #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	20982-2	Inner Cover
2	21038	Plug Assembly, L-823
3	10047-525	Tab
4	20017	Lead Lug
5	10030-57	Washer, Flat
6	10030-108	Washer, Flat, Insulating
7	10030-100	Washer, Shoulder, Insulating
8	10035-33-010	O'ring
9	10K04-025D	Hex Nut, Jam, 1/4-20, SS
10	10A06-016D10	Screw, Pan Hd., #8-32 x 5/16 Lg. SS
11	11A12-016D	Lockwasher, Split, #8, SS
13	10048-36	Catalyst
14	10048-49	Resin
15	10037-376	Straddle Plate
16	19967	Plug
17	10035-33-011	O'ring

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

PARTS LIST

PART NUMBER SERIES 850EA-B

ITEM #	PART #	DESCRIPTION
1	20700-S-D	Optical Assembly, Straight Beam
1	20700-L2-D	Optical Assembly, 2° Toe-In Left
1	20700-R2-D	Optical Assembly, 2° Toe-In Right
1	20700-L3-D	Optical Assembly 3 1/2° Toe-In Left
1	20700-R3-D	Optical Assembly, 3 1/2° Toe-In Right

Note: "D" = Standard ductile iron casting.

"D1" = Standard ductile iron casting with one lens opening
(for 850EA-B-1-150-X-XX P/N's)

2	20704-1	Lamp Bracket Assembly, 1 Lamp Unit
	20704-2	Lamp Bracket Assembly, 2 Lamp Unit
3	20708-R	Filter Assembly, Red
	20708-G	Filter Assembly, Green
4	20710	Lamp Assembly
5	20984-3	Inner Cover Assembly (All 850EA-B-2-300-X-XX P/N's)
	20984-1	Inner Cover Assembly (All 850EA-B-1-150-X-XX P/N's)
6		
*7	20721	Heat Transfer Strap
8	10035-33-270	O'ring
9	20356	Grommet
10	10038-14	Spring Pin, 1/8 Dia. x 1/2 Lg., SS
11	19413-1	Spacer, 1/4 dia. x .245 Lg., SS
12	10B02-019D20	Screw, Fillister Hd., #10-32 x 5/8 Lg., SS
13	11A12-019D	Lockwasher, Split, #10, SS
14	10B08-019D16	Screw, Truss Hd., #10-32 x 1/2 Lg., SS
15	10B06-019D10	Screw, Pan H., #10-32 x 5/16 Lg., SS
*16	10A07-016D12	Screw, Round Hd., #8-32 x 3/8 Lg., SS
*17	11A22-016D	Lockwasher, Internal Tooth, #8, SS

* = Part of Item 2 Lamp Bracket Assembly.

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B

RECOMMENDED SPARES

<u>DESCRIPTION</u>	<u>PART NUMBER</u>	<u>NUMBER REQUIRED</u>
Optical Assembly	20700-XX-D	5
Lamp Assembly, 150W, 6.6A	20710	100
O'ring	10035-33-270	25
Lens Assembly	20707	50
RTV 106	10048-2	3.3 oz.
Primer, RTV	10048-3	1.3 oz.
Lens Fixture	20734	1
Loctite, Grade 242	10048-30	1
Epoxy Kit	20327	1
Hardware Kit for 20452-S234 Shallow Base Receptacle	*20606-2	100
Hardware Kit for 20453-1 Shallow Base Receptacle	**20606-2	100
*P/N 20606 consists of:		
Bolt, Hex Hd., 3/8-16 x 7/8" Lg., 410 stn stl, black oxide finish	20033	6
Lockwasher, 3/8, stn stl	11A21-037D	6
O'ring	18874-1	1
**P/N 20606-2 consists of:		
Bolt, Hex Hd., 3/8 -16 x 1" Lg., 410 stn stl., black oxide finish	20033-2	6
Lockwasher, 3/8, stn stl	11A21-037D	6
O'ring	18874-1	1

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

CONSTRUCTION MATERIALS

Materials to be used for the installation of Crouse-Hinds Airport Light Bases must conform to the following:

A. **CAST IN PLACE BASES**

When FAA Type L-868 deep base bottom sections are to be secured with concrete, the concrete should meet the requirements of FAA Advisory Circular 150/5370-10, Item P-501. The twenty-eight (28) day compressive strength must be at least 5,000 psi minimum.

B. **BASES AND EXTENSIONS IN ASPHALT OR BITUMINOUS MATERIAL**

When deep L-868 steel bases are installed in asphalt, the selection of materials becomes very important to a successful installation. Only pretested and approved products should be used and the instructions in Figure 10 must be followed. Attention to detail is the key to success. Item D may be useful.

C. **SOURCES OF MATERIAL**

The materials and suppliers listed below (paragraphs D, E, F, G and H) have been reviewed by Crouse-Hinds Engineering. Proper use of the products listed below will result in successful installation. If substitute products are to be used, contact Crouse-Hinds Engineering for technical assistance in evaluating any alternatives. The use of materials not approved by Crouse-Hinds in writing may void all warranties.

D. **GSB-25 HIGH EARLY STRENGTH CONCRETE** (Embedding Material)

GSB-25 is a combination of DURAPATCH HIWAY fast setting concrete patch applied after the inside diameter of the cored hole has been brushed with EVERBOND acrylic bonding agent. The combination of these two products will bond the patch material to the surrounding asphalt or concrete.

This material is available from L&M Construction Chemicals, Inc., 14851 Calhoun Road, Omaha, Nebraska 68152

Telephone: (800) 362-3331
(402) 453-6600
Facsimile: (402) 453-0244

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

E. FLEXIBLE SEALERS (FOR RUNWAY INSET LIGHTS)

Refer to Figures 7 and 8. Section “E” items are not structural products and are only to be used for sealing around the tope of the lights and in wireways.

The products listed below are the only products approved for use with this approach light. These products have various set times and this must be considered in making your selection.

E.1 RTV silicone Rubber, on part sealant #890SL

Dow Corning Corp.
Midland, Michigan 48686-0994

Telephone: (517) 496-6000

NOTE: See Dow Corning Silicone Pavement Sealant Installation Guide for Highway/Airport Products. To obtain a copy, call (517) 496-4000 or Fax (517) 494-4374.

E.2 Two-Component Cold Applied SOF-SEAL

W.R. Meadows 2100 Monroe Street P.O. Box 2284 York, PA	Alternate:	Sof-Seal Hot Applied (Melt only once)
---	------------	---

Telephone: (717) 792-2627
Facsimile: (717) 792-0151

SOF-SEAL is an all-purpose sealant that performs equally well in either cement or asphalt for filling voids or cracks.

E.3 Nitrite Rubber, one part sealant, evaporation cure

W.R. Ruscoe Company
Box 2746
Akron, Ohio

Telephone: (216) 253-8148
(704) 525-1852
Facsimile: (704) 5225-1859

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

Use 983-Q-B for large cracks and voids 1/2 inch or larger. Use 974-Q-B for voids under 1/2 inch. This is a tough and resilient product. Excellent adhesion. Good from -60°F to +300°F.

E.4 Two-Component Liquid-Applied Urethane

ICS Coating Systems
P.O. Box 1960
Chandler, Arizona 85244

Telephone: (602) 345-6150 or (800) 367-3939
Facsimile: (602) 345-6147 or (702) 364-9725

440R Black Urethane (Part A and Part B) -40°F to +200°F

(Caution: Concrete or asphalt surfaces must be dry before application.)

An alternative to the above is:

Urethane Plastics, Inc.
550 West Crowther Avenue
Placentia, CA 92670
Telephone: (714) 996-1100

UT-6430 Black (Gel Time 45 minutes)

F. EMBEDDING COMPOUNDS (to support Light Bases)

F.1 MAGNOBOND 65094 (See Figure 7) (meets P-606 Spec.)

Mangnolia Plastics, Inc.
5547 Peachtree Ind. Blvd.
Chamblee, Georgia 30341-2296
(404) 451-2777
FAX: (404) 451-5376

Note: P-606 can only be used with lights up to 200 watts at 12 inch diameter. For 300 watt lights, use item D or F.3.

F.2 P-606 Electraseal

Koch Materials Co.
4900 South Mason Avenue
Chicago, IL 60638
(708) 458-4330

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

F.3 Magnolia Plastics Inc.
Epoxy Potting Compound #3265

G. MIXERS

In order to mix the various chemicals referenced in D, E, and F above, we recommend JIFFY MIXER CO., INC. 4120 Tigris Way, Riverside, CA 92503-4843, Telephone: (714) 272-0834

<u>MODEL NO.</u>	<u>CONTAINER SIZE</u>	<u>SHAFT</u>	
		<u>DIA.</u>	<u>LENGTH</u>
HS-2	1-2 Gal.	1/4"	14 3/4"
ES	2-5 Gal.	3/8"	20 1/2"
PS-1	5-10 Gal.	1/2"	20 1/2"
PS-2	10-50 Gal.	1/2"	40"

H. PENETRATING CONCRETE CRACK FILLERS (PCC)

1. VERSAFILL Penetrating Crack Filler exhibits exceptional penetrating action. May be obtained from:

HENKEL POLYMERS DIV.
5325 South 9th Avenue
LaGrange, IL 60525-3602

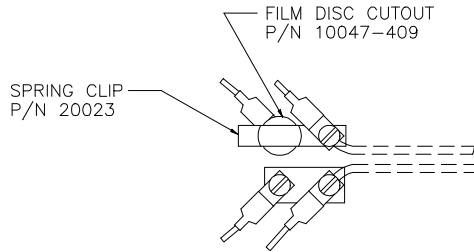
Tel: (708) 579-6150
(800) 237-4037
(817) 448-8901

2. SEALATE T-70 moisture insensitive curing system.
20 Jones Street
New Rochelle, NY 10801-6024

Tel: (914) 636-1000
Fax: (914) 636-1282

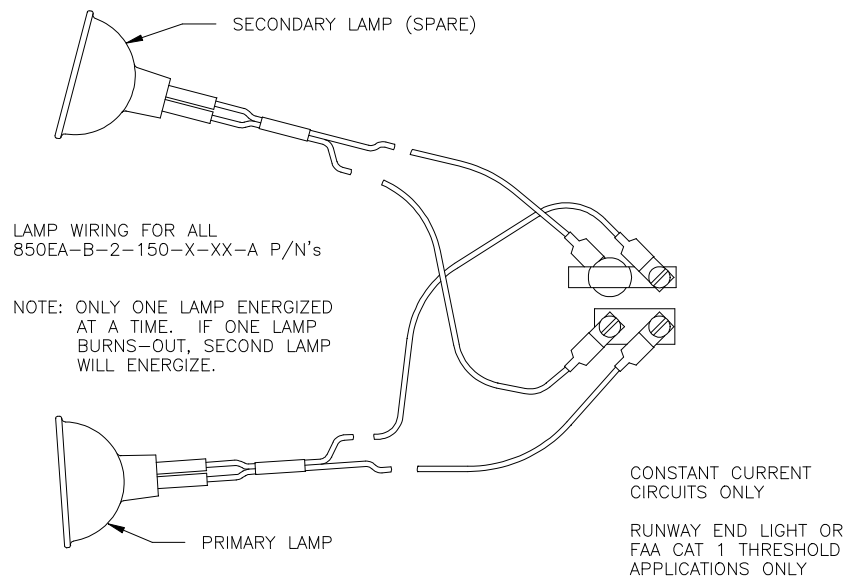
The above material may be used if cracks appear in concrete or in the L&M GSB-25 (Item D) embedding material.

INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B



INNER COVER ASSEMBLY
P/N 20984-4
TYPICAL FOR ALL
850EA-B-2-150-X-XX-A P/N's

NOTE: ALL INNER COVER PARTS IDENTICAL TO P/N 20984-3 INNER COVER EXCEPT AS NOTED.



NOTE: WHEN RELAMPING, BE SURE TO CHANGE FILM DISC CUTOUT, OTHERWISE PRIMARY LAMP WILL NOT LIGHT.

FIGURE 13
OPTION "A" DETAIL

**INSTRUCTION MANUAL
SEMI-FLUSH INSET APPROACH THRESHOLD AND RUNWAY END LIGHTS
PART NUMBER SERIES: 850EA-B**

CRITICAL INSTALLATION INSTRUCTIONS

1. Review carefully pages 13 to 21 of this manual before attempting to install these lights.
2. When installing lights rated at 300 watts, use only item D (page 31) or F.3 (page 34) to embed the lights. See Figures 6 and 7.
3. These lights are shock and vibration resistant when properly installed. However, do not drop the light fixture as damage to the glassware may result.
4. For parts and technical service please call:

Phone: (860) 683-4300

Fax: (860) 683-4354
5. Asphalt used on runways and taxiways around inset light fixtures should be (this is a recommendation only) stabilized by the addition of GILSONITE or by using Trinidad Lake Asphalt or approved equal.