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# Hali-Brite®

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## Installation and Maintenance Manual



### HBM 320 L-802M Military Airport Rotating Beacon

Hali-Brite® Inc.  
1119 Madison St  
Brainerd, MN 56401  
Tel: 800.553.6269  
Fax: 218.454.0972  
[www.halibrite.com](http://www.halibrite.com)

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# 1 Introduction

## **1.1 About this Manual**

The information in this manual is provided to assist installation and maintenance personnel in the proper installation, upkeep, and maintenance of the HBM 320 Military Airport Rotating Beacon. This manual also includes installation and maintenance instructions for all equipment sold as options to the basic unit.

## **1.2 Model Configurations**

L802M6116: 120 VAC, 60 Hz, Class I (-30°C to +55°C)  
L802M6125: 220-240 VAC, 50 Hz, Class I (-30°C to +55°C)  
L802M6126: 220-240 VAC, 60 Hz, Class I (-30°C to +55°C)  
L802M6216: 120 VAC, 60 Hz, Class 2 (-55°C to +55°C)  
L802M6225: 220-240 VAC, 50 Hz, Class 2 (-55°C to +55°C)  
L802M6226: 220-240 VAC, 60 Hz, Class 2 (-55°C to +55°C)

## **1.3 Warranty**

Hali-Brite® products 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. Hali-Brite® will correct by repair or replacement, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, and provided further that Buyer gives Hali-Brite® written notice of such defects after delivery of the goods to Buyer. Hali-Brite® reserves the right to examine goods upon which a claim is made. Said goods must be presented in the same condition as when the defect therein was discovered. Hali-Brite® further reserves the right to require the return of such goods to establish any claim. Hali-Brite's obligation under this guarantee is limited to making repair or replacement within a reasonable time after receipt of such written notice and does not include any other costs such as the cost of removal of defective part, installation of repaired product, labor or consequential damages of any kind, the exclusive remedy being to require such new parts to be furnished. Hali-Brite's liability under no circumstances will exceed the contract price of goods claimed to be defective. Any returns under this guarantee are to be on a transportation charges prepaid basis. For products not manufactured by, but sold by Hali-Brite®, warranty is limited to that extended by the original manufacturer. This is Hali-Brite's sole guarantee and warranty with respect to the goods; there are no express warranties or warranties of fitness for any particular purpose or any implied warranties of fitness for any particular purpose or any implied warranties other than those made expressly herein. All

such warranties being expressly disclaimed. Details and values given in this manual are average values and have been compiled with care. They are not binding, however, and Hali-Brite® 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 buyers from making their own experiments and tests.

### **1.4 Disclaimers**

This manual is published for informational purposes only and the information provided should not be considered as all-inclusive or covering all contingencies. If further information is required, Hali-Brite® Inc. should be contacted. Sale of the product shown in this manual is subject to Hali-Brite's terms and conditions including, but not limited to, the Hali-Brite® Warranty. Such terms and conditions are available upon request. Hali-Brite's warranty will not apply to any products which have been "so repaired or altered outside the manufacturer's plants as, in the manufacturer's judgment, to affect its reliability and performance."

No warranties, express or implied, including warranties of fitness for a particular purpose or merchantability, or warranties arising from course or dealing or usage of trade, are made regarding the information, recommendations, and descriptions contained herein. The manufacturer is not responsible and will not be held liable in contract or in tort (including negligence) for any special, indirect or consequential damages, including injury or damage caused to vehicles, contents or persons, by reason of the installation of any Hali-Brite® product or its mechanical or electrical failure.

# 2 Safety Precautions

To help you install and maintain this equipment safely and efficiently make sure you read and understand all safety information in this manual prior to performing any procedure. Failure to do so may result in personal injury, property damage, or possible death.

## 2.1 Safety Statements

The following safety statements are used throughout this manual. They will alert you to possible safety hazards and conditions that could result in personal injury, death, or property and equipment damage.

***CAUTION: Indicates hazards or unsafe practices that could result in minor personal injury, product, or property damage.***

***WARNING: Indicates hazards or unsafe practices that could result in severe personal injury or death.***

***DANGER: Indicates immediate hazards that will result in severe personal injury or death.***

## 2.2 General Practices

Read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.

- Do not attempt to assemble or install this equipment if it has been damaged from shipping.
- Do not attempt to install or maintain this equipment if you or the equipment is standing in water.
- Only qualified personnel should perform maintenance on this equipment.
- Always use proper tools (as mentioned in this manual) to perform installation and maintenance.
- Use proper hand and eye protection as needed when installing or maintaining this equipment.
- Make sure you have adequate first aid supplies available when installing this equipment.

- Do not modify this equipment as this could create a safety hazard and void your Hali-Brite® warranty.
- Use only Hali-Brite® replacement parts.
- Read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- Follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.
- 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.
- Protect components from damage, wear, and harsh environment conditions.
- Allow ample room for maintenance, wiring accessibility, and cover removal.

### **2.3 Electrical Practices**

- Do not attempt to make electrical connections with the power on.
- Disconnect and lock out electrical power before touching any electrical connections.
- 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 moving equipment will not damage it.
- 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.
- Always use rated electrical tools when performing electrical work.
- Always make sure electrical connections are tight.
- Make sure electrical covers are in place after installation.

- Do not touch hot lamps with bare hands.

## **2.4 Qualified Personnel**

Qualified personnel are those that are trained and experienced with installing or maintaining Hali-Brite® equipment. Only qualified personnel should install or maintain Hali-Brite® equipment and auxiliary features.

No one should:

- Attempt to install or perform maintenance on this or any Hali-Brite® equipment if they are physically impaired or under the influence of alcohol or non-prescription drugs.
- Maintain or install this equipment without correct training, supervision or experience in mechanical or electrical equipment.
- Attempt to maintain or install this equipment without the correct tools as specified in this manual.

## **2.5 Proper Usage**

Always use this equipment as specified in this manual. Improper usage may result in serious personal injury, property damage, or possible death.

- Do not make any modifications that have not been recommended by Hali-Brite®.
- Do not use any replacement parts that are not purchased from Hali-Brite®.
- Hali-Brite® 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.

# 3 Specifications

## 3.1 Electrical and Optical Specifications

FAA Type .....	L-802M
Input Voltage.....	120VAC +/-10% or 220-240VAC, 50/60 Hz
Power Consumption.....	793W (Class I), 1193W (Class 2)
Lenses.....	One clear (dual beam), one green
Lamps.....	320W Metal Halide, Pulse Start
Rated Average Lamp Life .....	20,000 hours
Beam Intensity .....	per FAA A/C 150/5345-12
Rotation Speed .....	6 RPM (18 flashes per minute)

## 3.2 Physical Specifications

Dimensions .....	Height: 41.25 inches (104.8 cm)
.....	Width: 23.6 inches (60 cm)
Mounting Dimensions.....	Four ½ inch (12.7 mm) holes in a rectangular pattern: (4"x 16") (101.6 x 406.4 mm)
Product Weight.....	155 lb. (71 kg)
Shipping Weight .....	250 lb. (114 kg)

## 3.3 Environmental Specifications

Operating Temperature (Class I) .....	-30°C (-22°F) to +55°C (+131°F)
Operating Temperature (Class 2) .....	-55°C (-67°F) to +55°C (+131°F)
Heater (Class 2 only).....	400W heating element
Turns On .....	Adjustable, -18 to 10°C (0-50°F)
Humidity .....	0% to 100%
Altitude .....	Sea level to 10,000 feet (3000 m)
Wind.....	Velocities to 100 mph (161 km/h)



# 4 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.**

## **4.1 Unpacking**

Handle equipment very carefully to prevent component damage. Note any exterior damage to the carton/crate that might lead to detection of equipment damage. Open the top of the carton/crate. Remove foam packing from the top of the box. Carefully lift the unit out of the box.

**CAUTION: Do not lift the unit by the head. Failure to observe this warning may result in equipment damage.**

Unpack the carton/crate upon receipt and check the contents and it's condition. If you note any damage to any equipment, file a claim with the carrier immediately. The carrier may need to inspect the equipment.

Spare fuses, a spare belt, and a wiring diagram are located in the pocket inside the housing door.

## **4.2 Tools and Supplies Needed**

Equipment Required But Not Supplied

Wrenches  
Set of Screwdrivers  
Set of Pliers  
Voltmeter  
Insulation Tester  
Level  
Lightning Rod (if required)  
Ground Wire (for lightning rod)  
Liquid Glass Cleaner  
Input Power Cable  
½" Liquid-Tight Conduit Fitting

## **4.3 Installation**

The HBM 320 rotating beacon comes completely assembled except for installation of a customer-supplied input power cable.

### 4.3.1 Mounting

Open the front door on the cabinet. Inspect the interior to make sure all parts are tight and have not been damaged during shipment. Close the door and tighten the latches.

Determine the beacon mounting location, and drill four 1/2" holes in the platform, spaced as shown in Figure 1.

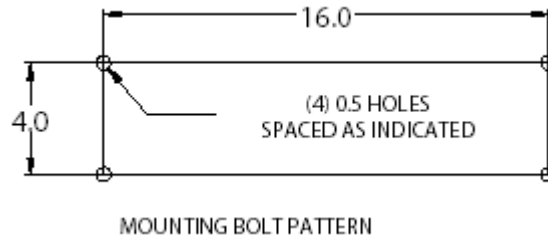


Figure 1

If the surface is not level, spacers or shims will be needed. Place a level on top of the weather cap and use shims as necessary under the four corners to bring the beacon to level. Install and tighten the mounting bolts, four each #1/2-13 bolts, length as required.

### 4.3.2 Wiring

See Figure 2 to locate the power connection point. The power cord enters the beacon chassis through the hole in the base, and attaches to the white terminal block in the lower right corner.

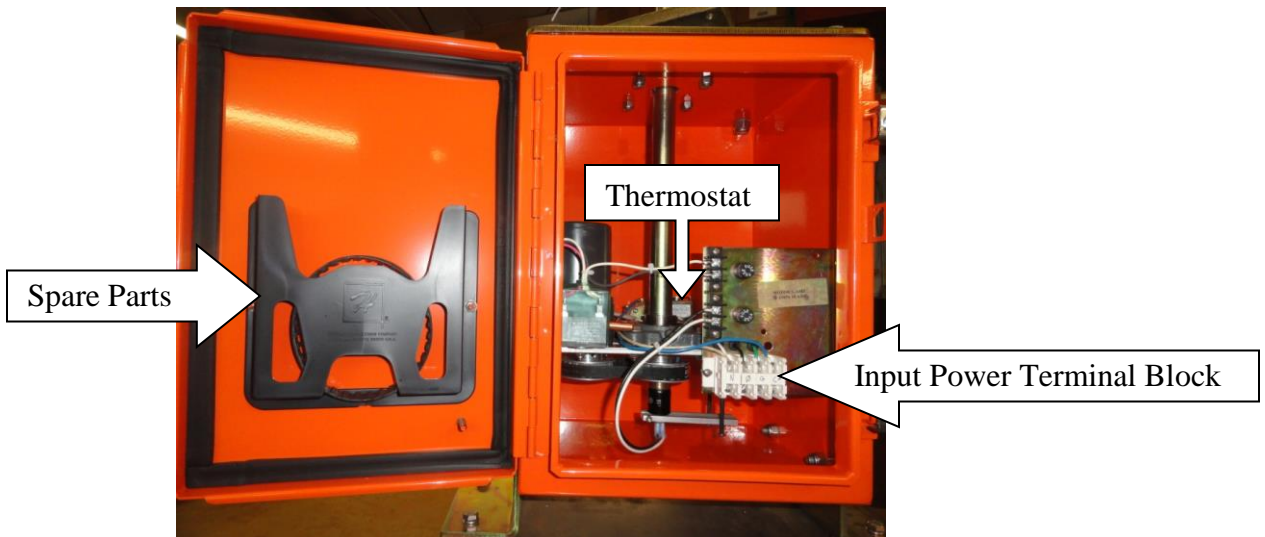


Figure 2

To install the input power cable, perform the following procedure:

1. Unscrew the two door latches and open the chassis door.
2. Route the cable through the hole in the bottom of the chassis. Install a ½" liquid-tight conduit fitting in the chassis hole.
3. Connect the power cord at the terminal strip as follows: Attach the black wire (120 VAC) to the terminal marked  $\emptyset$ , the white wire (neutral) to the terminal marked **N**, and the green wire (ground) to the terminal marked **G**.

#### **4.3.3 Optional Heater Wiring (Class 2 only)**

The optional heater assembly consists of a 400-watt heating element and thermostat. The heater assembly should be connected through a power cord to a separate circuit breaker, so that it may remain operable when the beacon is turned off. The circuit breaker should be switched off during the summer months. The heater has an adjustable thermostat (see Figure 2), and is factory-set to activate when the temperature drops below +0°F (-18°C). The gearbox lubricant is warmed and this facilitates rotation of the beacon when it is energized.

The power connections for the heater are located on the same terminal block as the main beacon power connections (see Figure 2). Attach the black wire (120 VAC) to the terminal marked  $\emptyset^C$ , the white wire (neutral) to the terminal marked **N**, and the green wire (ground) to the terminal marked **G**.

#### **4.3.4 Beam Angle Adjustment**

All beacons are shipped from the factory preset at an elevation angle of 5 degrees, per FAA requirements. To adjust to a different angle, refer to Section 5.2.2.

# 5 Maintenance

## 5.1 Maintenance Schedule

<u>Interval</u>	<u>Task</u>
Daily	Inspect for lamp failure and proper rotation.
Bi-monthly	Inspect cleanliness of glass. Clean as necessary.
Annually	Inspect all electrical connections. Replace beacon lamps at 30,000 hours.

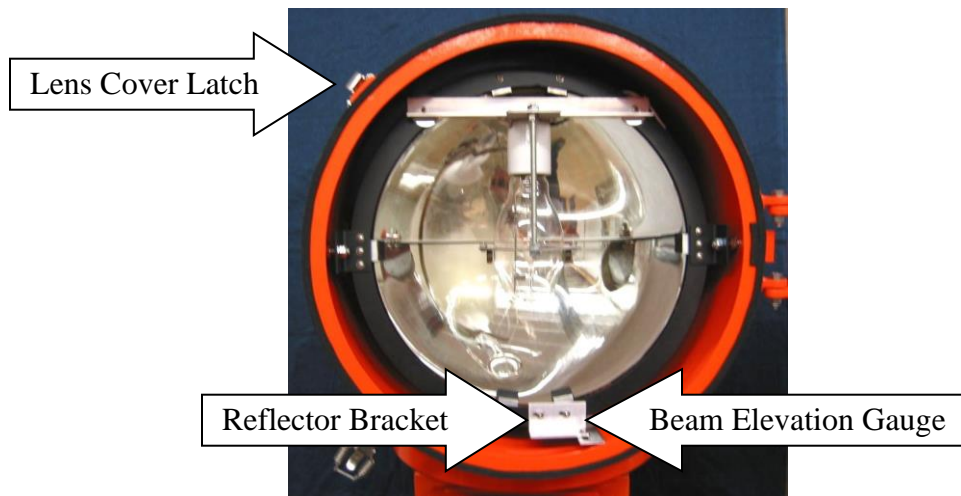


Figure 3

## 5.2 Maintenance Procedures

### 5.2.1 Lamp Replacement

**WARNING:** The lens temperature can be as high as 373 °F (189 °C). Allow one-half hour for the lamps to cool before opening the lens cover. Failure to observe this warning may result in personal injury or equipment damage.

1. Disconnect and lock out power to the beacon.
2. Unlatch the 2 lens cover latches as shown in Figure 3, and open the lens cover door.
3. Unscrew the lamp out of the socket.
4. Clean the reflector with glass cleaner.

5. Clean the new lamp with glass cleaner. After cleaning, do not touch the lamp glass with your fingers.
6. Install the lamp by screwing it straight into the socket. Take care not to bend or damage the lamp support ring.
7. Close the head cover door, and latch the 2 cover latches. Align the edge of the lens cover with the edge of the housing before tightening the latches.
8. Repeat this procedure to change the other lamp in the head.
9. Reconnect power to the beacon.

### **5.2.2 Beam Angle Adjustment**

All beacons are shipped from the factory preset at an elevation angle of 5 degrees, per FAA requirements.

To adjust the beacon beam to a different angle, perform the following procedure:

1. Disconnect and lock out power to the beacon.
2. Open the lens cover door on the beacon head by unlatching the 2 cover latches (see Figure 3).
3. Locate the beam elevation gauge as shown in Figure 3.
4. Loosen the Phillips-head reflector bracket attachment screw located at the edge of the beam elevation gauge. Do not loosen it more than 2 turns.
5. Grasp the reflector bracket, next to the beam elevation gauge, and rotate the reflector until the edge of the reflector bracket indicates the desired elevation on the elevation gauge.
6. Tighten the Phillips-head screw loosened in Step #4 above.
7. Close the head cover door, and latch the 2 cover latches. Align the edge of the lens cover with the edge of the housing before tightening the latches.
8. Repeat this procedure to change the elevation of the other lamp in the head.
9. Reconnect power to the beacon.

### **5.2.3 Lens Cleaning**

Clean lenses periodically with alcohol or glass cleaner and soft cloth. Wipe dry with a clean soft cloth.

### **5.2.4 Lubrication**

All moving parts are permanently lubricated and will not require further attention.

# 6 Repair

## 6.1 Cover Lenses

Cover lenses are replaced as follows:

1. Locate the six metal clips located around the edge of the lens.
2. Loosen the screw on each of the clips, and rotate the clip to clear the edge of the lens. **Caution—support the lens so it does not fall out of the housing.**
3. Lift the lens out of the lens cover.
4. Inspect the weatherstripping in the lens cover, and replace as necessary.
5. Install the new lens in the lens cover.
6. Rotate the six metal clips back into position and tighten the clip screws.

## 6.2 Fuses

The HBM 320 has a 10 amp lamp fuse and a ½ amp motor fuse. The fuses are located on the Control Panel, directly inside the door of the chassis, as shown in Figure 4. Spare fuses are located in the pocket inside the chassis door.

## 6.3 Timing Belt

To replace the timing belt:

1. Disconnect and lock out power to the beacon.
2. Unplug the two wires from the rotating coupling (see Figure 4).
3. Loosen the four screws on the motor, with a 5/32" Allen wrench and 3/8" wrench.
4. Slide the motor to the right and remove the old timing belt.
5. Install the new timing belt.
6. Tighten the timing belt by sliding the motor to the left. Retighten the four motor screws. The belt should have 1/8" deflection after tightening.  
**Caution--do not over tighten.**
7. Reconnect the two lamp wires to the rotating coupling.
8. Reconnect power to the beacon.

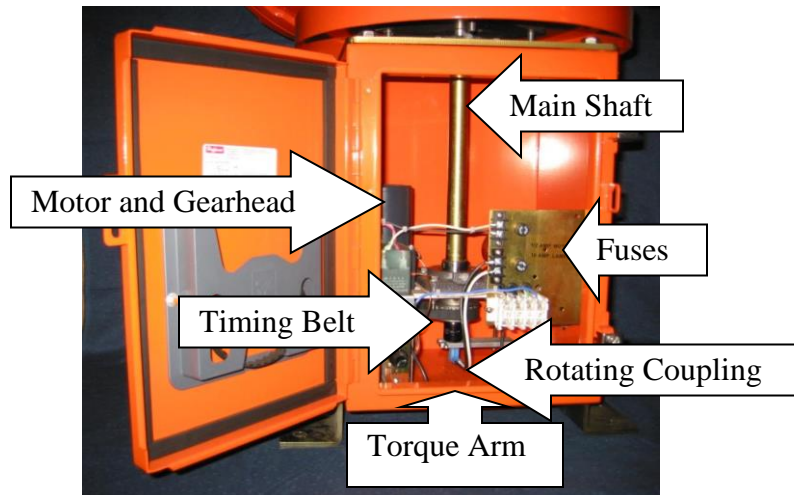


Figure 4

## 6.4 Rotating Coupling

Perform the following steps to replace the rotating coupling:

1. Disconnect and lock out power to the beacon.
2. Remove the two wires from the bottom of the rotating coupling (see Figure 4).
3. Locate the torque arm, mounted to the end of the rotating coupling. Loosen the cap screw in the torque arm, and remove the torque arm.
4. Loosen the setscrew in the bottom of the main shaft, and remove the rotating coupling.
5. Insert the new rotating coupling into the end of the main shaft, and tighten the setscrew. **Caution: Do not over tighten.**
6. Reinstall the torque arm, and tighten the cap screw. **Caution: Do not over tighten.**
7. Place the black wire on the center tab of the rotating coupling, and the white wire on outer tab of the rotating coupling.
8. Reconnect power to the beacon.
9. The Mercotac rotating coupling contains a small amount of mercury, and should be recycled. Recycling instructions are on the last page of this manual.

## 6.5 Lamp Ballast

To replace a lamp ballast, perform the following steps:

1. Disconnect and lock out power to beacon.
2. Open the lens cover of the affected lamp (see Figure 3).
3. Note the elevation setting on the elevation gauge (see Figure 3).
4. Locate the reflector bracket attachment screw, adjacent to the elevation gauge (see Figure 5).

5. Grasp the bottom edge of the reflector, and support it while removing the reflector bracket attachment screw. Gently allow the reflector to pivot and rest against the ballast assembly, as shown in Figure 5.
6. Locate the terminal block on the ballast assembly. Note the wire colors and locations. Remove the 4 wires from the top of the terminal block.
7. Locate and remove the 2 screws attaching the ballast assembly to the beacon housing.
8. Lift the front of the ballast assembly and slide it out of the housing, taking care not to damage the reflector assembly.
9. Slide the new ballast assembly into place, and align the holes for the 2 ballast assembly screws.
10. Replace the 2 ballast assembly screws.
11. Reconnect the 4 wires to the top of the ballast assembly terminal block.
12. Rotate the reflector back to its operating position, and install the reflector bracket attachment screw.
13. Adjust the reflector bracket to the proper beam elevation, and tighten the bracket attachment screw.
14. Close and latch the lens cover.
15. Reconnect power to the beacon.

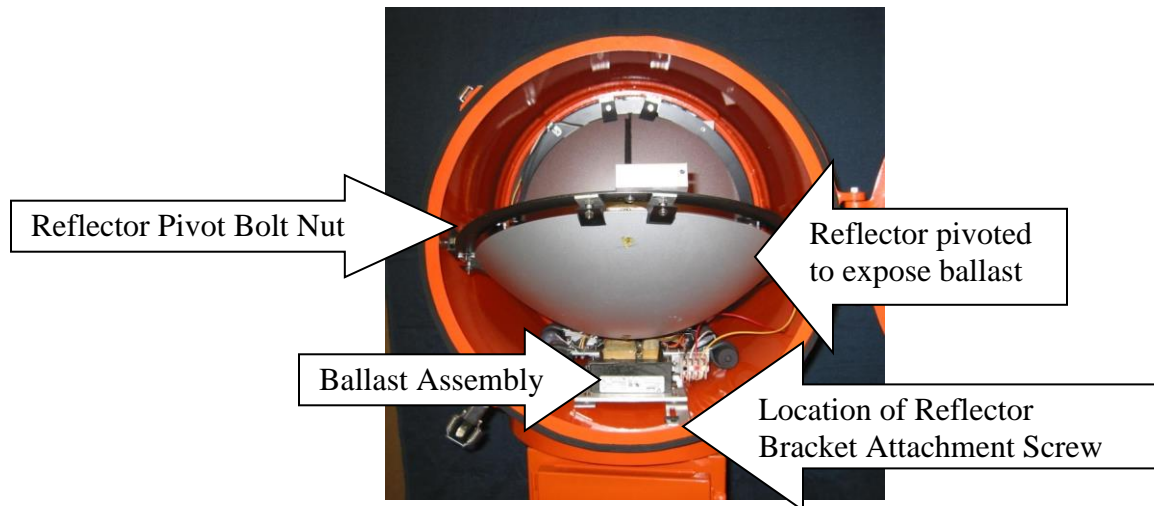


Figure 5

## 6.6 Motor and Gearhead

1. Disconnect and lock out power to the beacon.
2. Loosen the four cap screws that hold the motor in place, and slide the motor to the right (see Figure 4).
3. Remove the timing belt.
4. Remove the setscrews in the motor gear, and remove the gear. (**NOTE:** There are two setscrews in each hole.)
5. Disconnect the motor black wire from control panel.
6. Disconnect the wires from the capacitor.
7. Remove the nuts from the four motor cap screws.

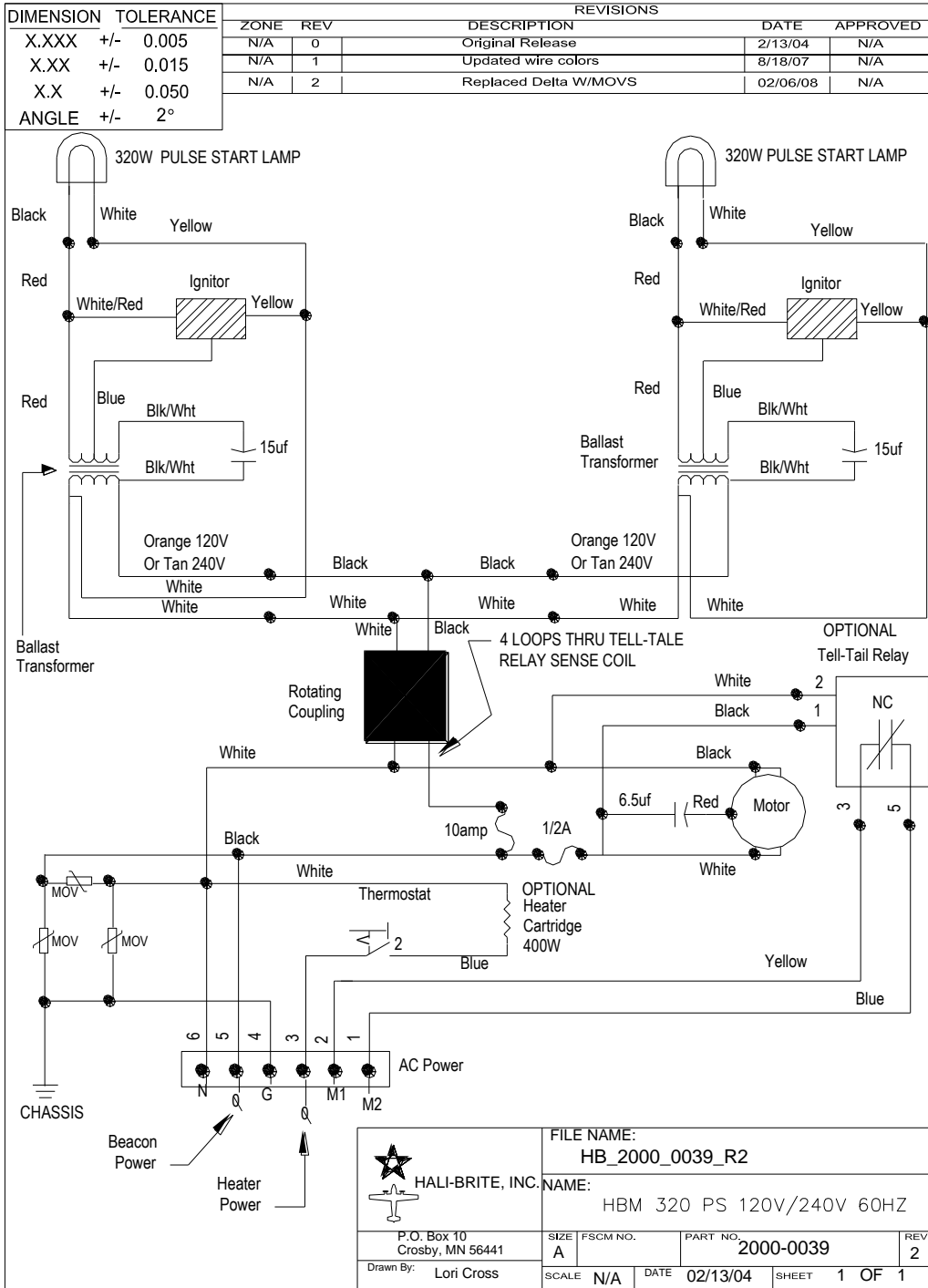


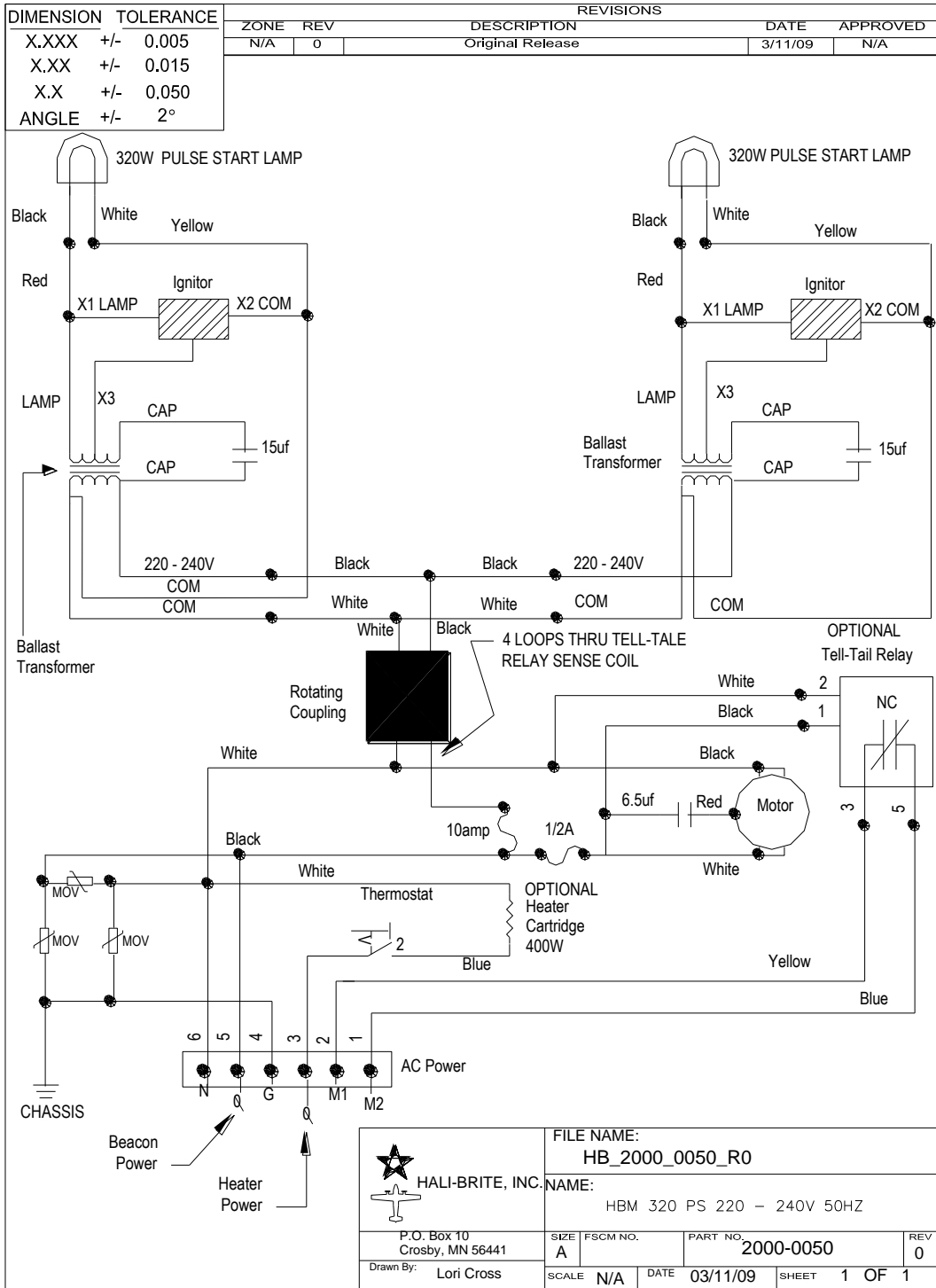
8. Remove the motor and gearhead.
9. If replacing only the motor, separate the old motor from the gearhead, and replace with the new motor.
10. If replacing only the gearhead, separate the gearhead from the motor, and replace with the new gearhead.
11. Install the new motor and gearhead, using the four cap screws and nuts.
  - a. (**NOTE 1:** Make sure the shaft of the gearhead is to the right.)
  - b. (**NOTE 2:** Make sure the wires of the motor are facing out.)
12. Reinstall the gear on the shaft of the gearhead, and tighten the setscrews.
13. Reinstall the belt on the two gears, and tighten the belt by sliding the motor to the left, and tighten the cap screws and nuts. (**NOTE:** Adjust the timing belt for no more than 1/8" deflection when tight.)
14. Reconnect the wires to the motor capacitor. Red wire on the left side, and the two white wires on the right side.
15. Reconnect the black wire to the neutral on control panel.
16. Reconnect the power to the beacon.

# 7 Replacement Parts and Wiring Diagrams

## Replacement Parts

<b>Part Number</b>	<b>Description</b>
2300-0002	Fuse, 1/2 amp, motor
2300-0003	Fuse, 10 amp, lamp
0200-0027	Ballast Assembly, 120/240 VAC 60 Hz
0200-0029	Ballast Assembly, 240 VAC 50 Hz
5000-0007	Motor Pulley
1800-0000	Rotating Coupling
4100-0014	Motor
2500-0007	Gearhead
3700-0031	Installation and Maintenance Manual
2800-0057	Lens, aviation green
2800-0056	Lens, aviation clear
0600-0004	Timing Belt Military
7300-0017	Weatherstripping, Head Lens and Head Door
0100-3854	White side mirror assembly
0100-3855	Green side mirror assembly
3300-0030	ELEVATION LABEL HBM 320
3400-0136	LAMP 320Watt GE 45666
5000-0006	Main Shaft Pulley





# MERCOTAC CONNECTOR RECYCLING

Thank you for returning your used Mercotac connectors for recycling and not disposing them in the trash or landfill. The used connectors will be sent to a licensed mercury recycling facility where the liquid mercury is retrieved for future use through an environmentally safe distillation process.

## HOW TO RETURN MERCOTAC CONNECTORS:

Used Mercotac connectors should be returned to Mercotac Inc. by UPS Ground shipping only. Do not send Mercotac connectors through the U.S. Mail. Mercotac Inc. provides free shipping within the 48 contiguous United States. Please contact Mercotac, Inc. for these shipping instructions. The used Mercotac connectors should be shipped to:

Mercotac Inc.  
Attn: Returns  
6195 Corte Del Cedro  
Carlsbad, CA 92011

## HOW TO PACKAGE:

The Mercotac connectors should be tightly sealed in a plastic bag using twist ties or a similar closure and then packaged with cushioning in a sturdy box. This completed Recycling Form must be included in the box with the shipment.

## RETURNED CONNECTORS: (PACKING LIST)

<u>Model</u>	<u>QTY.</u>	<u>Model</u>	<u>QTY.</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

## FROM:

Company: \_\_\_\_\_

Contact: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone #: \_\_\_\_\_

Do you require a receipt?      Y      N  
                                              

Fax receipt to (      ) \_\_\_\_\_

## FOR MERCOTAC USE

Received by: \_\_\_\_\_

Date received: \_\_\_\_\_

Date Faxed: \_\_\_\_\_

- 1) Verify information on form and complete above.
- 2) Place used Mercotac connectors in Recycling container.
- 3) If required Fax receipt .
- 4) File completed form in Recycle File Folder,Engineering



6195 Corte Del Cedro, Carlsbad California 92011  
Telephone (760) 431-7723 • Fax (760) 431- 0905  
Email: info@mercotac.com