ANTI-COLLISION LIGHT SYSTEMS INSTALLATION AND SERVICE MANUAL JANUARY, 2007

Approved under
STC SA6NE
STC SA21NE
STC SA615EA
STC SA800EA

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Document #05131A

WHELEN AVIATION LIGHTING

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INTRODUCTION TO WHELEN ANTI-COLLISION STROBE LIGHTING SYSTEMS, STC SA800EA/STC SA615EA/STC SA6NE/ STC SA21NE

Whelen's Anti-Collision Strobe Light Systems are approved under STC SA615EA, STC SA800EA, STC SA6NE, and STC SA21NE, manufactured under PMA as an approved anti-collision light for all aircraft, when installation is accomplished in accordance with the following instructions.

Whelen's Anti-Collision Strobe Light Systems are designed and approved specifically for General Aviation Aircraft, to comply to FAR 91.205(c) (3) (visual flight rule night) requirements.

Whelen's approved Anti-Collision Strobe Light Systems can be installed on all aircraft by completing the installation with reference to this Installation and Service Manual, and the appropriate technical data listed below:

ADVISORY CIRCULAR 43.13-1A, Chapter 11, Sections 1, 2, 3 and 7, Electrical Systems.

ADVISORY CIRCULAR 43.13-2A, Chapters 1 and 2, Radio Installations.

ADVISORY CIRCULAR 43.13-2A, Chapter 4, Anti-Collision Light Installations.

ADVISORY CIRCULAR 20.21, 12-3-64, Application of Glass Fiber Laminates in Aircraft.

ANTI-COLLISION AND POSITION LIGHT REQUIREMENTS, LOCATIONS, & DISTRIBUTION PATTERNS

All aircraft must have an approved anti-collision light and position light system for nighttime operations. The position lights consist of an Aviation Red on the left side, an Aviation Green on the right, and an Aviation White taillight (REF. FAR 23.1389).

The anti-collision lighting system is required under FAR PART 91.205(c)(3). There are different requirements affecting different aircraft. These aircraft are categorized by the date of application for type certificate. Home built aircraft are determined by the date of issuance of the Experimental Operating Limitations. The different categories are as follows:

Aircraft for which type certificate was applied for after April 1, 1957 to August 10, 1971:

These anti-collision systems must produce a minimum of 100 effective candela in Aviation Red or White (REF. FAR 23.1397), 360º around the aircraft's vertical axis, 30º above and below the horizontal plane (REF. FAR 23.1401).

Aircraft for which type certificate was applied for after August 11, 1971 to July 18, 1977:

These anti-collision systems must produce a minimum of 400 effective candela in Aviation Red or White (REF. FAR 23.1397), 360º around the aircraft's vertical axis, 30º above and below the horizontal plane (REF. FAR 23.1401).

Aircraft for which type certificate was applied for after July 18, 1977:

These anti-collision systems must produce a minimum of 400 effective candela in Aviation Red or White (REF. FAR 23.1397), 360º around the aircraft's vertical axis, 75º above and below the horizontal plane (REF. FAR 23.1401).

*The position lights must be wired independently of anti-collision lights.

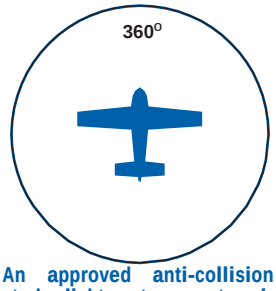
GENERAL AVIATION MINIMUM POSITION LIGHTING REQUIREMENTS

For compliance to FAR Part 23.1385 through 23.1397, VFR flight rule night requirements on a General Aviation aircraft, you must have a TSO,d Aviation Red forward position light on the left and an Aviation Green forward position light on the right. See Figure 7, page 4.

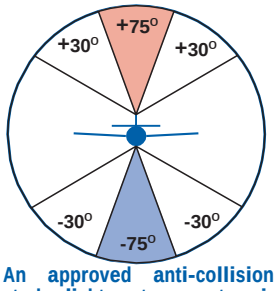
These are normally mounted on the most outward extremity of the airframe so they can project their light directly in front of the aircraft 0 degree to 110 degrees left and right horizontally, and 180 degrees up and down vertically, unobstructed by any part of the aircraft.

The tail position light must project its Aviation White light toward the rear of the aircraft, 70 degrees horizontally left and right from 0 degree straight back behind the aircraft, 180 degrees up and down, 0.04 Steradian (131.36 sq. degrees) interference is allowable, reference FAR Part 23.1387(c). More than one light is acceptable.

POSITION LIGHTS AND ANTI-COLLISION LIGHT DISTRIBUTION PATTERNS REQUIREMENTS

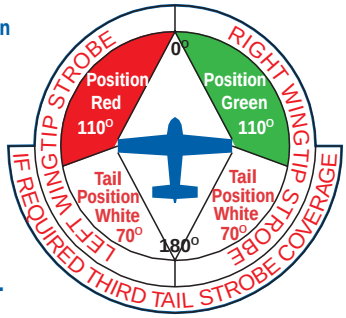


An approved anti-collision strobe light system must project light 360° around the aircraft's vertical axis. One or more strobe lights can be used.



An approved anti-collision strobe light system must project light + or - 30° above and below the horizontal plane of the aircraft. One or more strobe lights can be used. The + or - 75° projected light is required since July 18, 1977.

Approved light pattern in the horizontal plane. The anti-collision wingtip mounted lights must converge within 1200 feet directly in front and rear of the aircraft on center line. If the wingtip strobe light convergence is greater than 1200 ft. in back of the aircraft, a 3rd light is necessary.



LOCATIONS ON THE AIRCRAFT FOR ANTI-COLLISION STROBE LIGHTS, TO COMPLY TO THE LIGHT PATTERN REQUIREMENTS.

VERTICAL FIN

One anti-collision strobe light mounted on the vertical fin will meet the minimum requirements on most aircraft. A half red and half white lens is recommended.

WINGTIP

Two wingtip strobe lights that protrude beyond the wingtip, their light converging in front and back of the aircraft within 1200 ft. is an approved anti-collision strobe light system.

ENCLOSED WINGTIP

Enclosed wingtip anti-collision strobe lights, require a third strobe light on the tail or vertical fin, to fill in the required light envelope. This is an approved anti-collision system.

FUSELAGE

In a fuselage mounted anti-collision strobe light system, a minimum of two strobe lights are necessary to get the required vertical coverage. This is an approved anti-collision system.

AIRCRAFT NOT SPECIFICALLY MENTIONED ON THE ELIGIBILITY LIST

ANTI-COLLISION LIGHT INSTALLATION PROCEDURES STC SA800EA / STC SA615EA / STC SA21NE

The following information is to assist in the installation of a custom Whelen anti-collision strobe light system on any aircraft, and how to return the aircraft back to service with compliance to FAR Part 91.205(c) (3).

1. Choose the anti-collision light system which is most applicable to the aircraft.
2. With reference to the STC's "Limitation and Conditions" for field of coverage requirements. Check the field of coverage of the proposed location.
3. These STC's document that Whelen's anti-collision strobe lights meet the requirements as specified in AC 43.13-2A, Chapter 4, PAR.51 (a and b) (1). STC SA615EA covers replacement of original equipment, STC SA800EA and STC SA21NE cover installation of new anti-collision light systems.
4. Vertical fin mounted anti-collision strobe beacons will conform to the FAR 23.1401, 0.5 steradian (1642 sq. degrees) maximum solid angle blockage requirements on most standard configurations (CAM 3 and FAR Part 23) high or low wing type aircraft. An average solid angle blockage for an installation of this type is 1324 sq. degrees.
5. Fuselage mounted anti-collision light systems require two (2) anti-collision strobe beacons to get the +/– 75 degrees required. Two lights mounted in this manner exceed the steradian requirements of 21,600 sq. degrees total coverage.
6. Fuselage mounted anti-collision lights should be located on the fuselage center line to reduce reflection on the wings as much as possible. They should be mounted near the trailing edge of the wing, to reduce cockpit reflection.

APPROVED METHOD OF DETERMINING ADEQUATE COVERAGE OF WING AND TAIL STROBE LIGHT INSTALLATIONS

The most practical system is the approved wingtip anti-collision strobe light system. These systems consist of two or more lights to complete the anti-collision light requirement. There is no question as to their complying to the field of coverage when the installation is completed (Reference to the following instructions).

The acceptable distance for the two wingtip anti-collision strobe lights to converge in front and back of the aircraft on center line is 1200 feet. If both wingtip anti-collision strobe lights can be seen at 1200 feet or less directly in front and back of the aircraft, it is considered a point of light source, therefore a third light is not necessary.

The wingtip anti-collision light must be located in such a way that it will project light +/– 75 degrees above and below the horizontal axis of the aircraft, and the summation of the 2 or 3 lights will project light 360 degrees around the vertical axis.

PILOT AND CREW INTERFERENCE: In some installations it will be necessary to mask the strobe lighthead assembly to reduce pilot annoyance. This interference problem varies from one aircraft to another of the same model, due to paint schemes and colors. The Navigation Light Detector will be a source of reflection and should be reduced in size, or masked as necessary. A small aluminum or plastic plate mounted between the navigation light and the wingtip protruding up or down as required (like some plastic navigation light detectors, and trimmed to shadow the objectionable reflected area) is simple and very effective.

The solid angle blockage must be reviewed after installing any masking that will disturb the 360 degrees by +/– 75 degrees pattern. The aforementioned type masking used on wingtip lighting seldom interferes with this pattern.

ESTABLISHING SOLID ANGLE BLOCKAGE WITH REFERENCE TO AC 43.13-2A, CHAPTER 4.

1. To determine the vertical angles to use with reference to Figure 7 and 8 of the aforementioned chapter 4, attach a long string to the subject light source location.
2. Fix a navigational-type plotter or protractor to the string with weighted thread fixed to the center of the scale for a plumb bob.
3. Level the aircraft or determine the offset angle.
4. Pull the string over the point of solid angle blockage (Ref. Fig. 6 page 4). Any angles greater than +/– 75 degrees vertical are not a factor.
5. Apply the vertical and horizontal angles to the graph paper (Ref. Fig. 4.8 and instructions in text of paragraph b6 & c of Chapter 4).

A flight test will be performed by properly certified pilot with reference to paragraph 52(a) (b) of Chapter 4.

COMPLETING THE ANTI-COLLISION LIGHT INSTALLATION

1. Check all avionics systems for interference from this installation, reference AC 43.13-2A, Chapter 4, Paragraph 52(b).
2. A flight check will be performed by a properly certificated pilot with reference to AC 43.13-2A, Paragraph 52(a) and (b).
3. If a solid angle blockage document must be established, it should be performed after all masking has been installed and all flight testing is completed. See page 3 of this manual.
4. **WATERPROOFING OF STROBE LIGHT INSTALLATIONS:** When necessary to waterproof the installation of a strobe light mounting to the aircraft, apply GE (silicone rubber) RTV 102 (or equivalent) around the open area where water could get in.
5. Label all switches and breakers, install Pilot Warning Placard.
6. Up-date aircraft records and complete form 337.

STROBE SYSTEM WIRING

Interconnecting Cable

1. The Whelen interconnecting cable shall be secured in place with approved aviation techniques.
2. **The cable shall not parallel ADF, Gyro or Flux Gate compass leads closer than 12 inches.**
3. **Reference should be made to AC 43.13-1B, Chapter 11, Sections 3 and 7, when routing and fishing the interconnecting cable.**
4. **Leave a service loop at the strobe lighthead end, to allow access to the connector for flash tube replacement without having to disassemble the aircraft.**
5. CABLE COLORING CODE:

   PIN 1 RED - (Anode)

   PIN 2 BLACK - (Cathode, flash tube ground)

   PIN 3 WHITE - (Trigger)

   SHIELD - Ground at the power supply end only

Caution: When pins 1 and 2, or pins 2 and 3 are reversed, the system will appear to operate normally, however this condition will cause premature flash tube failure.

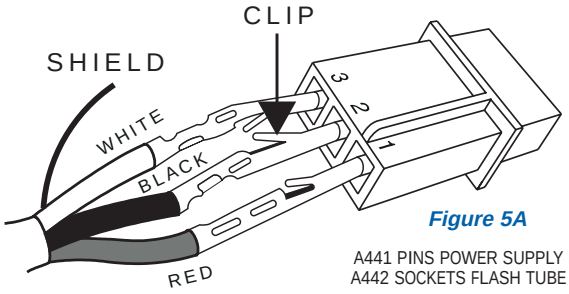


Figure 5A

A441 PINS POWER SUPPLY END
A442 SOCKETS FLASH TUBE END

Observe Color and Pin Numbers

The retaining clip on the side of each pin or socket of the A441 and A442 connector assemblies must be bent out (Reference illustration, Figure 5A shown above) so that they positively snap into the AMP 3 position socket nylon connector housing.

If it is not possible to get a good grip, it is recommended that the pins and sockets be soldered to prevent burning of the wires.

Intermixing Strobe Light System Equipment

Observe Color and Pin Numbers

Cables Connecting Strobe Lights *MUST BE* Connected Correctly!

Whelen Engineering and Aero-flash wiring between light assemblies and remote power supplies are identical as pictured below in Figure 5B.

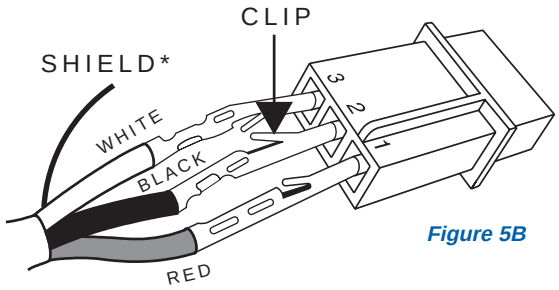


Figure 5B

Grimes and SDI (Hoskins) wiring between light assemblies and remote power supplies are identical as pictured below in Figure 5C.

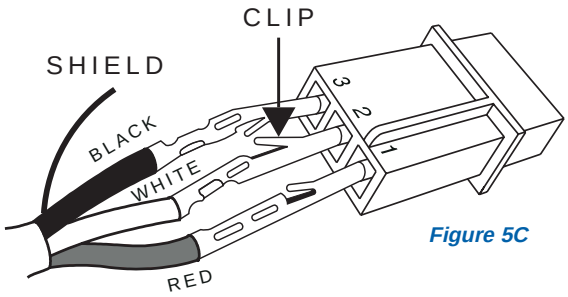


Figure 5C

Both Grimes and SDI sometimes use MS (Cannon Type) connectors:

Position A = RED (Anode), Position B = White or Blue (Trigger), Position C = (Cathode) Black or Yellow

INSTALLATION CABLE KITS

All Kits include required connectors for hooking up the strobe light to the power supply only, warning placards and the Installation Service Manual. Cable is 16 gauge 3/c shielded. The cable diameter is .275". The weight is .050 lbs. per linear foot. Kits do not include switches or breakers. In order to maintain the integrity of the installation, one of the following installation kits must be used. If the installer chooses to use different cable, it must have the same or better electrical characteristics.

Model Number	Part Number	Description
HS5	01-0750215-00	5' Cable Kit
HT10	01-0750218-00	10' Cable Kit
HS30	01-0750214-00	30' Cable Kit
HD60	01-0750206-00	60' Cable Kit
HDT390	01-0750205-00	90' Cable Kit
HT	01-0750216-00	Install Kit Only No Cable

REPLACEMENT CONNECTORS

Model Number	Part Number	Description
A441	01-0430011-00	3 Position Male Connector with Pins
A442	01-0410823-00	3 Position Female Connector with Sockets
A444	02-0230007-00	2 Position Male Connector with Pins
A446	02-0230085-00	2 Position Female Connector with Sockets

STROBE POWER SUPPLY INSTALLATION

INSTALLATION PROCEDURES:

Location

1. Consider areas or locations designated by the aircraft manufacturer. Do not mount the strobe power supply closer than three (3) feet of the ADF loop.
2. For alternate locations, consider areas such as the cabin baggage compartment, the floor under the seat, nonstructural bulkheads, firewalls, etc.
3. If necessary, fabricate support brackets or shelves, and attach them to the aircraft structure to provide a mounting surface that will withstand the inertia forces stipulated in chapters 1 & 3 of AC 43.13-2A.
4. An "IA" or other representative of the FAA must approve documentation of structural integrity of the fabricated installation.
5. When installing the strobe light power supply in an inverted position, drill a 3/16" diameter hole in the lowest corner of the cover to provide for moisture drainage. Care must be taken not to let the drill protrude into the power supply, for it will inflict damage to the electronic components.
6. Specifically call out the location of the strobe light power supply on FAA form 337.

Wiring

WARNING!!! STROBE LIGHT POWER SUPPLIES ARE POLARITY SENSITIVE. REVERSING THE INPUT POLARITY WILL CAUSE SEVERE DAMAGE TO THE POWER SUPPLY!

Steps below: Ref. AC 43.13-1B, Chapter 11, Sections 1, 2, 3 & 7.

1. Choosing wire size of A+ input lead, refer to Paragraph 444 "Electric Wire Chart" Figure 11.7 & 11.7A, with reference to "Strobe Light Model Current" requirement chart on page 6 & 11, and "Wire and Circuit Protection Chart" Figure 11.1.
2. Shielded wire is not generally necessary, but has proven effective in reducing the possibility of radio interference.
3. The power supply shall acquire its power from a low impedance source such as the alternator or generator end of the electrical buss as close to the battery as possible. Do not ground power supply to airframe. This can attenuate emi/rfi noise to airframe causing it to act as an antennae for interference in aircraft audio & electrical systems.
4. For penetrating pressure hull, refer to the aircraft service manual.
5. Check all avionics systems for interference.

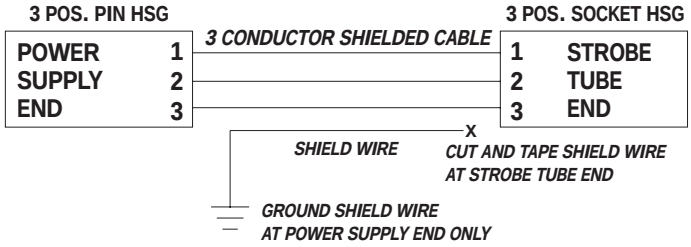
Important Note:

Your new strobe power supply has an additional circuit built-in to prevent self-ionization (steady glowing) of the strobe tubes. In some cases, when replacing older power supplies, the bare shield wire in the existing harness is pinned together at each end with the black wire. The following modification must be made to ensure proper operation.

1. At the strobe tube end of the cable, cut the shield wire and tape it off **(DO NOT CUT THE BLACK WIRE)**.
2. At the power supply end of the cable, cut the shield wire and connect it to a good ground **(DO NOT CUT THE BLACK WIRE)**.
3. This must be done for each strobe light connection (See Figure 6A).

Figure 6A

PIN 1 = RED (ANODE)
PIN 2 = BLACK (CATHODE)
PIN 3 = WHITE (TRIGGER)
SHIELD = RFI DRAIN TO GROUND



MODEL HDACF
STROBE POWER SUPPLY ASSEMBLY

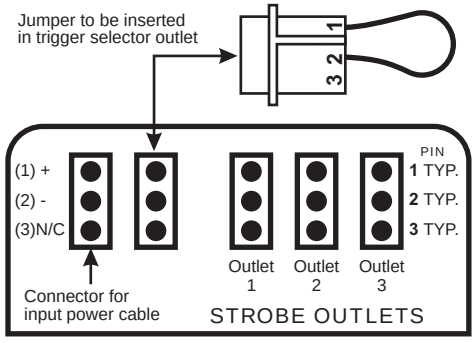
FAA/PMA APPROVED

Specifications

Model Number . . . . . HDACF
Part Number 01-0770028-05
Current Draw . . . . . 7.0 Amps @ 14 Volts D.C.
3.5 Amps @ 28 Volts D.C.
Weight . . . . . 2.1 lbs.
Length . . . . . 5.50”
Height . . . . . 2.37”

Operation

This power supply will operate up to 3 strobe lighthead assemblies. When operating two lights in the alternating mode, 42 joules of power are produced for each light. While in simultaneous mode, power to each light is 21 joules. When operating 3 lights, strobe outlet 1 produces 42 joules of power and alternates with strobe outlets 2 & 3 (producing 21 joules each) that flash simultaneously (see Figure 7B).



STROBE HOOK-UP
PIN 1 - RED - ANODE
PIN 2 - BLACK - CATHODE
PIN 3 - WHITE - TRIGGER

Figure 7A

Trigger Function

Jumping pins 1 and 2 on the trigger plug will provide an alternating flash pattern between strobe outlet 1 and strobe outlet(s) 2 and/or 3. Installing a switch in series with the jumper will allow strobe outlets 2 & 3 to be turned off, while strobe outlet 1 remains on (see Figure 7B).

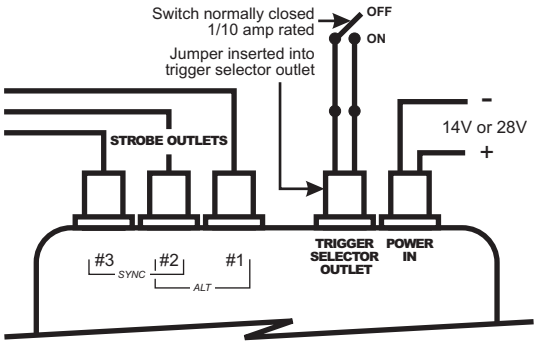


Figure 7B

Dimensions

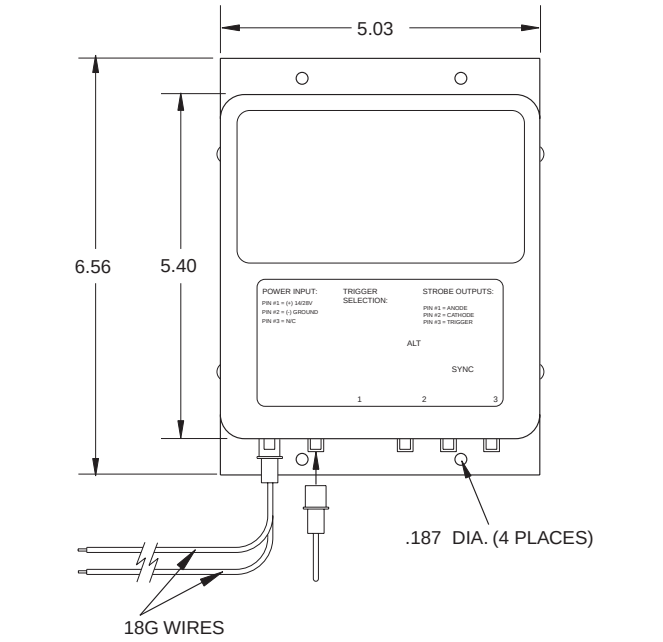


Figure 7C

Mounting

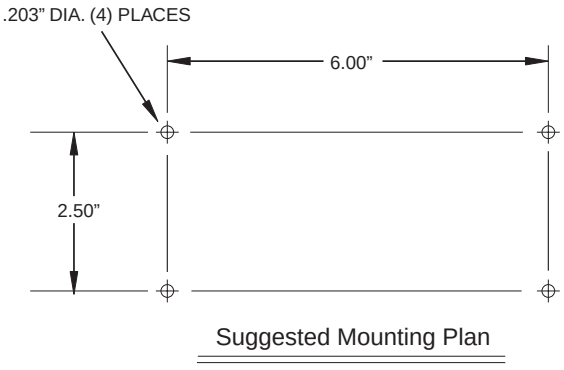


Figure 7D

MODEL A490ATSC
STROBE POWER SUPPLY

FAA/PMA APPROVED

Specifications

Model Number A490ATSC
Part Number 01-0770062-03
Position Lights - Current Draw . . . . . 4.0 Amps @ 14 Volts D.C.
2.0 Amps @ 28 Volts D.C.
Weight . . . . . 1.7 lbs.
Length . . . . . 5.00”
Width . . . . . 3.12”
Height . . . . . 3.06”

Operation

This power supply will operate ONE strobe lighthead assembly at 34 joules of power. It is equipped to flash up to five (5) other like units simultaneously when an 18 gauge wire is connected to outlet 3 on the input power connector.

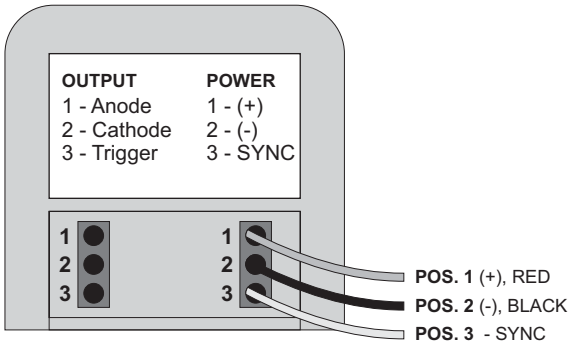


Figure 8A

Looking at the power supply connectors with the mounting plate flat on a bench, the left connector is the strobe outlet. The right connector is the power input and synchronization.

Left Connector (Power Output)

Pin 1. (Top) - RED wire/anode
Pin 2. (Center) - BLACK wire/cathode
Pin 3. (Bottom) - WHITE wire/trigger

Right Connector (Power Input)

Pin 1. (Top) - RED wire/13 to 30 volt, positive input
Pin 2. (Center) - BLACK wire/ground
Pin 3. (Bottom) - Synchronization pin/If synchronization is desired, connect an 18 gauge wire between pin 3 on each power supply.

Dimensions

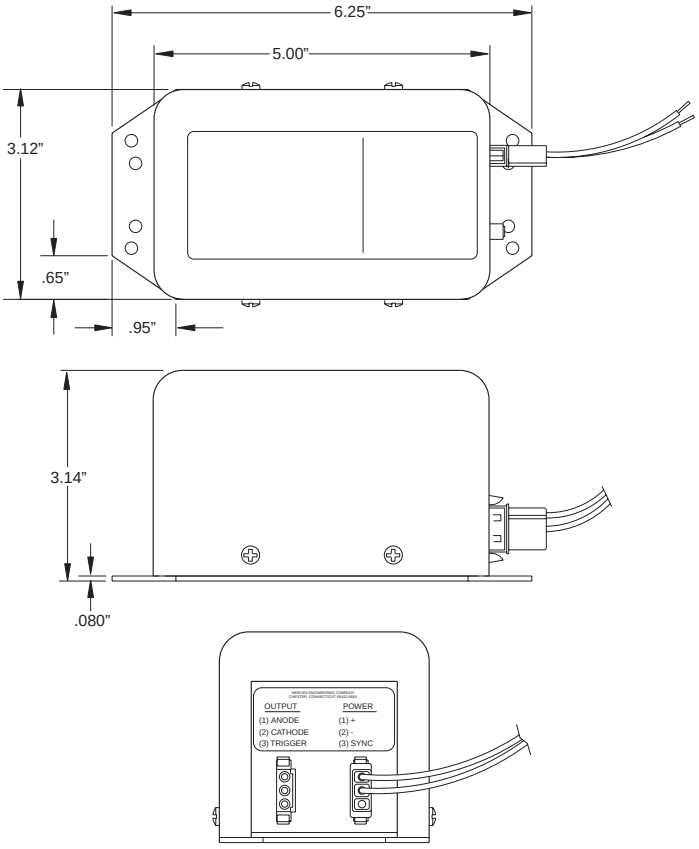


Figure 8B

Mounting

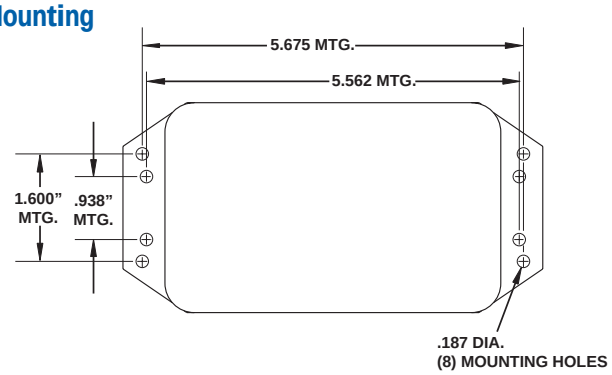


Figure 8C

MODEL A490TCF STROBE POWER SUPPLY

FAA/PMA APPROVED

Model Number A490TCF
Part Number 01-0770006-08

MODEL A490TCCF STROBE POWER SUPPLY

FAA/PMA APPROVED

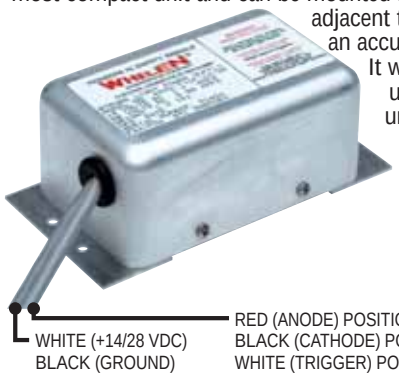
Model Number A490TCCF
Part Number 01-0770006-09

Specifications (Both Models)

Current Draw . . . . . 1.7 Amps @ 14 Volts D.C.
0.85 Amps @ 28 Volts D.C.
Weight . . . . . 1.2 lbs.
Length . . . . . 5.00”
Width . . . . . 3.12”
Height . . . . . 2.38”

Operation

MODEL A490TCF: This model operates one strobe lighthead. It is our most compact unit and can be mounted in the wingtip and/or the tail adjacent to the lighthead. It produces an accumulated 19 joules of power. It will only meet 400 ECP when used with the A470A-W. This unit can not be synchronized. This power supply operates from 10 to 30 volts DC. (Not approved for use with red strobe light).



Dimensions

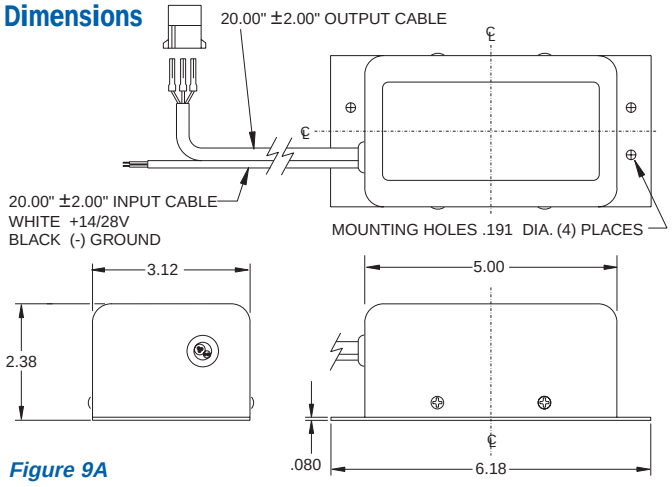


Figure 9A

Mounting

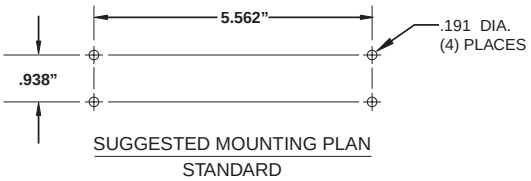
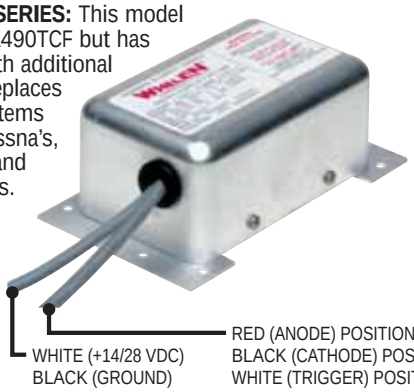


Figure 9B

Operation

MODEL A490TCCF SERIES: This model is the same as the A490TCF but has a mounting plate with additional holes that directly replaces factory installed systems on single engine Cessna’s, Aero Commanders and Grumman Americans.



Dimensions

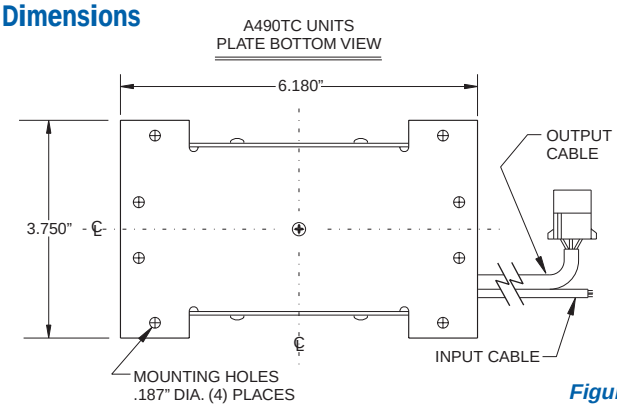


Figure 9C

Mounting

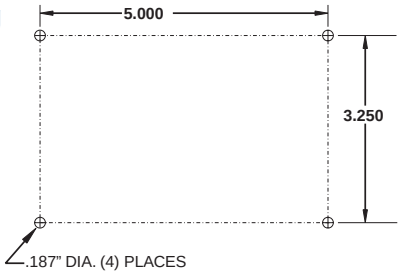


Figure 9D

MODEL 70900( )-SERIES FLASHING ANTI-COLLISION LIGHT ASSEMBLY

Specifications

Model Number 7090004
Part Number 01-0770900-04
Operational Voltage . . . . . 14 VDC nominal
Average Input Current . . . . . 0.85 Amps
Peak Input Current . . . . . 4.5 Amps @ .25 Seconds
Weight . . . . . 1.5 lbs.

Model Number 7090005
Part Number 01-0770900-05
Operational Voltage . . . . . 28 VDC nominal
Average Input Current . . . . . 0.425 Amps
Peak Input Current . . . . . 2.25 Amps @ .25 Seconds
Weight . . . . . 1.5 lbs.

TSO-C96a CLASS III APPROVED

Models 7090004 & 7090005, are designed to replace existing light assemblies with the 3-3/4" Dia. mounting pattern. (Ref. Whelen HRCFA series, 90081 Series, and the "old style" rotating beacons). It has the same mounting hole pattern. No modification to the aircraft is required.

Operation

Equipment Limitations: The Model 70900 series LED anti-collision light assembly meets the requirements of FAR 23.1401, 25.1401 and 91.205(c)(3). "If certification for night operations is requested, the airplane must have an anti-collision light system that consists of one or more approved anti-collision lights located so that their light will not impair the flight crew members vision or detract from the conspicuity of the position lights."

Continued Airworthiness: The 70900 series LED anti-collision light assembly is designed with 10 vertical columns consisting of 3 LEDs each. Should any one LED or any vertical column fail, the unit must be repaired or replaced.

Installation Procedures: The following information is to assist in the installation of a Whelen LED Flashing Anti-collision Light System.

1. The installation procedure described in the following text will be confined to a single light installation, but is identical for multiple light installations.
2. Prepare the aircraft for means to secure the LED Flashing Anti-collision Light assembly (see reference AC 43.13-2A, Ch. 4).
3. 14 and 28 VDC (+) and (-) ground leads equipped with an appropriate sized breaker to be supplied to the LED Flashing Anti-collision Light Assembly System. Both leads must be connected by an approved FAA connection. Insure that the wire leads and the pressure venting tube are all clear of any obstructions and ty-wrap as required. The pressure venting tube may be trimmed to minimum length of 1" from base.
4. Install the light assembly by securing to aircraft using #6-32 x 3/8" (maximum length) approved hardware. **Note:** Lens mounting screws installed at 5-7 in./lbs. of torque.
5. Check all avionics systems for interference from this installation.
6. A flight check should be performed by a properly certified pilot.
7. All inverted (bottom) mounted units shall require waterproofing of the unused mounting holes. An application of single-part silicone (RTV) or equivalent applied into mounting holes is recommended (see illustration on page 11, Fig.11A). Inverted and/or standard mounted units, when necessary, may require waterproofing around any open area where water could get in. Specifically, the lens to the flasher base assembly, and the flasher base assembly to the aircraft.
8. Update aircraft records, complete Form 337 and obtain FAA field approval for installation. **If not covered under STC eligibility list.**

Dimensions

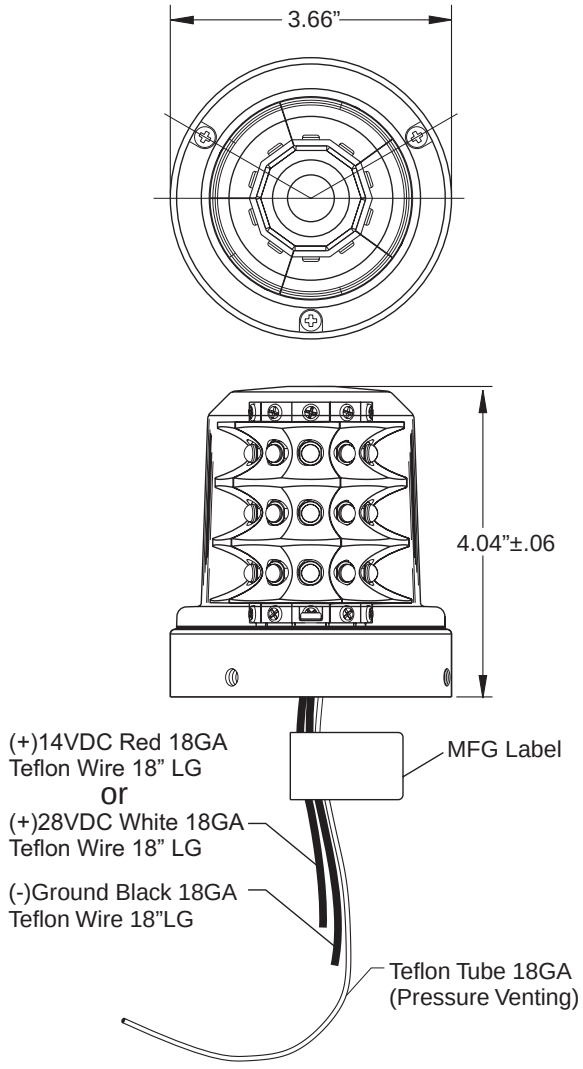
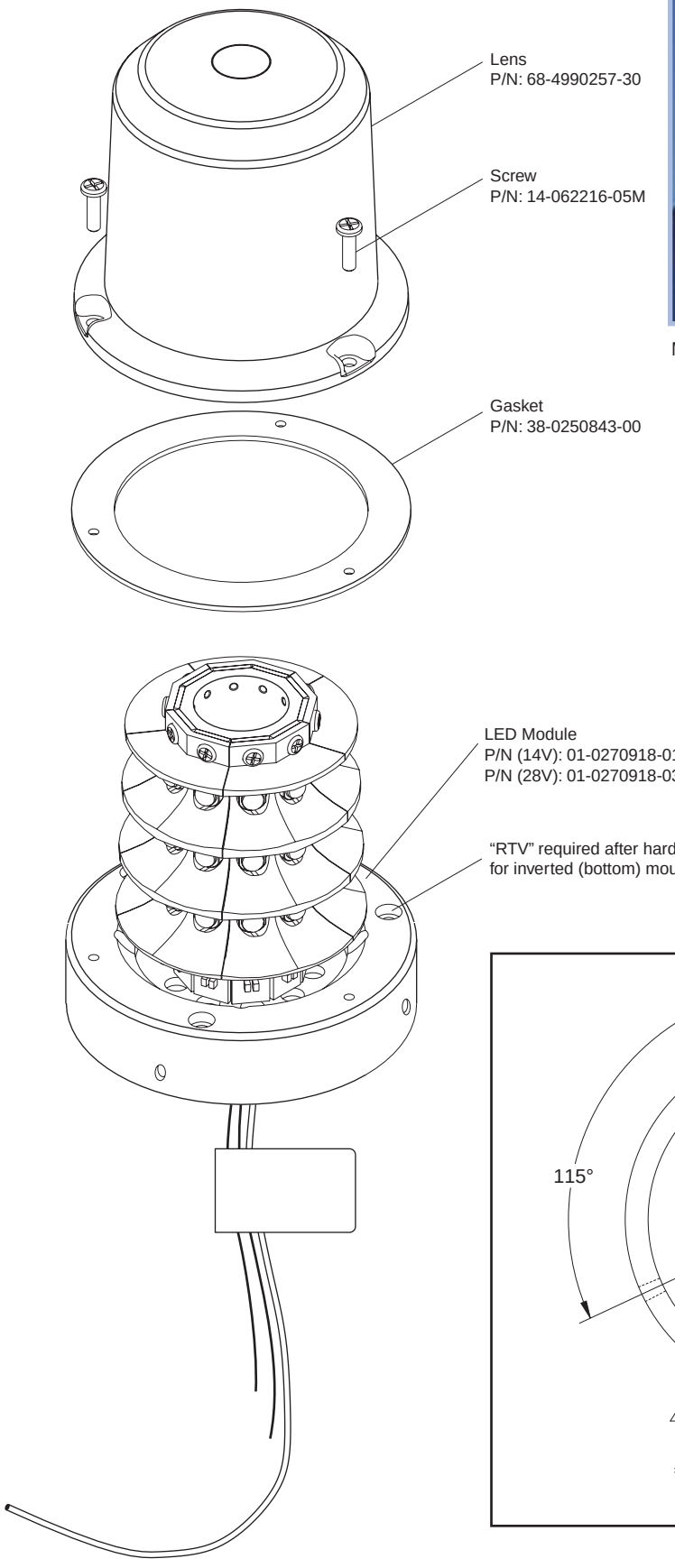
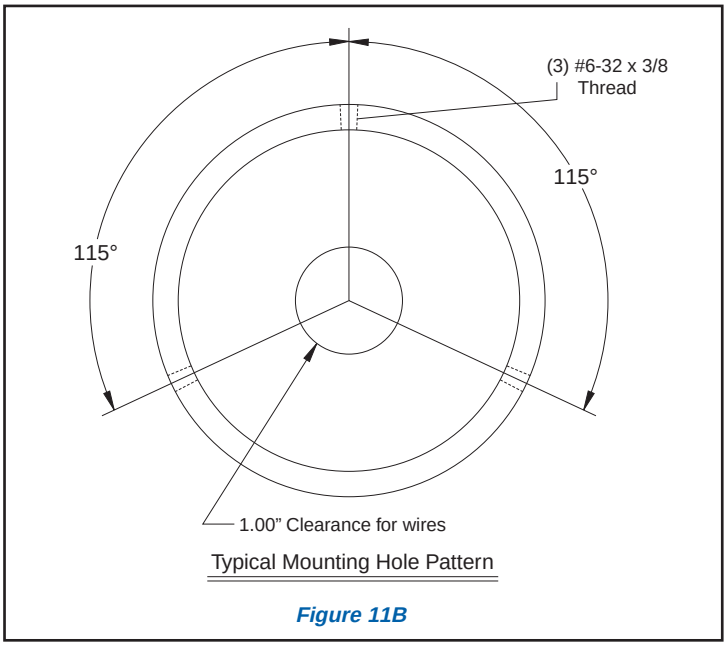


Figure 10A

Figure 11A



Model 70900 series LED installation



Typical Mounting Hole Pattern

Figure 11B

MODEL 71055 SERIES
ANTI-COLLISION LIGHT ASSEMBLY

Specifications

Model Number 7105500
Part Number 01-0771055-00
Operational Voltage . . . . . 14 VDC
Average Input Current . . . . . 1.2 Amps
Peak Input Current . . . . . 6 Amps @ 0.25 Seconds
Weight . . . . . 0.55 lbs.

Model Number 7105501
Part Number 01-0771055-01
Operational Voltage . . . . . 28 VDC
Average Input Current . . . . . 0.6 Amps
Peak Input Current . . . . . 3 Amps @ 0.25 Seconds
Weight . . . . . 0.52 lbs.

TSO-C96a CLASS III APPROVED

Operation

Equipment Limitations: The Model 71055 Series LED anti-collision light assembly meets or exceeds the requirements of FAR 23.1401, and FAR 91.205(c)(3).

Continued Airworthiness: The 71055 Series LED anti-collision light assembly is designed with 6 vertical columns consisting of 2 LED's each. Should any one LED or any vertical column fail, the unit must be repaired or replaced. Periodically inspect the lens and replace if there is excessive scratching, discoloration or cracking.

Installation Procedures: The Model 71055 is a self contained flashing beacon that requires no external flasher or power supply. In some installations, it may be necessary to remove several existing components. When replacing flashing halogen beacon assemblies, the flasher box and ballast resistor (if present), and associated wiring, need to be removed. When replacing strobe light assemblies, the strobe power supply must be removed. In both cases, 18 gage DC voltage wires, A+ & Ground (-), must be continued from the location of the previous box, (flasher or power supply), to the location of the new LED beacon.

The following information is to assist in the installation of a Whelen LED Flashing Anti-collision Light System.

1. The installation procedure described in the following text will be confined to a single light installation, but is identical for multiple light installations.

2. Using the "suggested mounting hole pattern" prepare the aircraft for means to secure the LED Flashing Anti-collision Light assembly. Remove any existing mounting adapters.

3. 14 / 28 VDC (+) and (-) ground leads equipped with an appropriate sized breaker to be supplied to the LED Flashing Anti-collision Light Assembly System. Both leads must be connected by an approved FAA connection. Insure that the wire leads and the pressure venting tube are all clear of any obstructions and ty-wrap as required.

4. Install the light assembly by first removing the lens. Remove the adapter plate. Attach the adapter plate to the aircraft mounting holes. Refer to page 2. Reinstall the light assembly and lens.

5. Check all avionics systems for interference from this installation.

6. A flight check should be performed by a properly certified pilot.

7. All inverted (bottom) mounted units shall require waterproofing of the flasher base assembly to the aircraft. Note: Drill a 1/8" hole in the center of the lens for bottom mount units.

8. Update aircraft records, complete Form 337 and obtain FAA field approval for installation. **If not covered under STC eligibility list.**

TSO-C96a CLASS III APPROVED: The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in aircraft. The article may be installed only if performed under 14 CFR part 43 or the applicable airworthiness requirements.

Dimensions

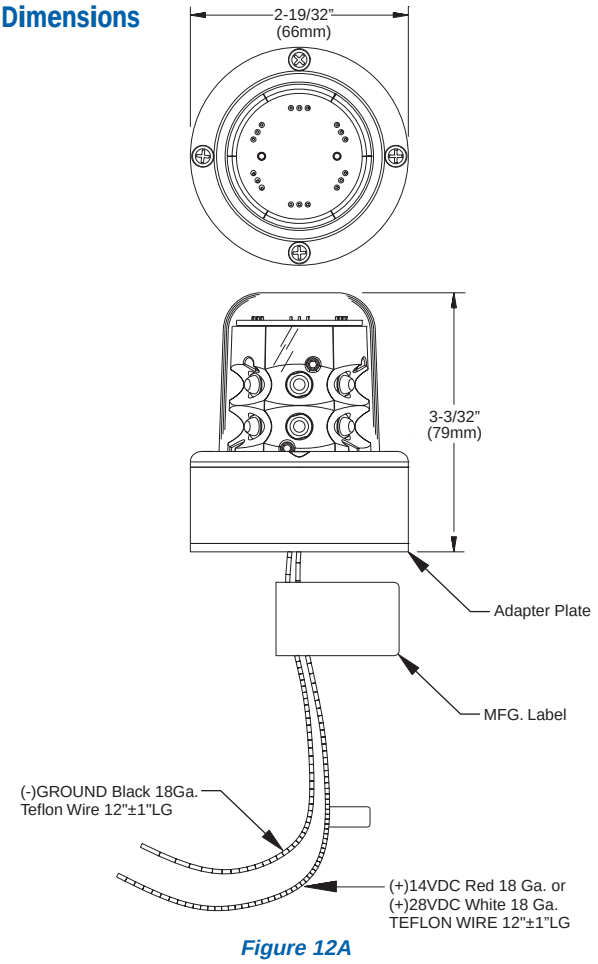
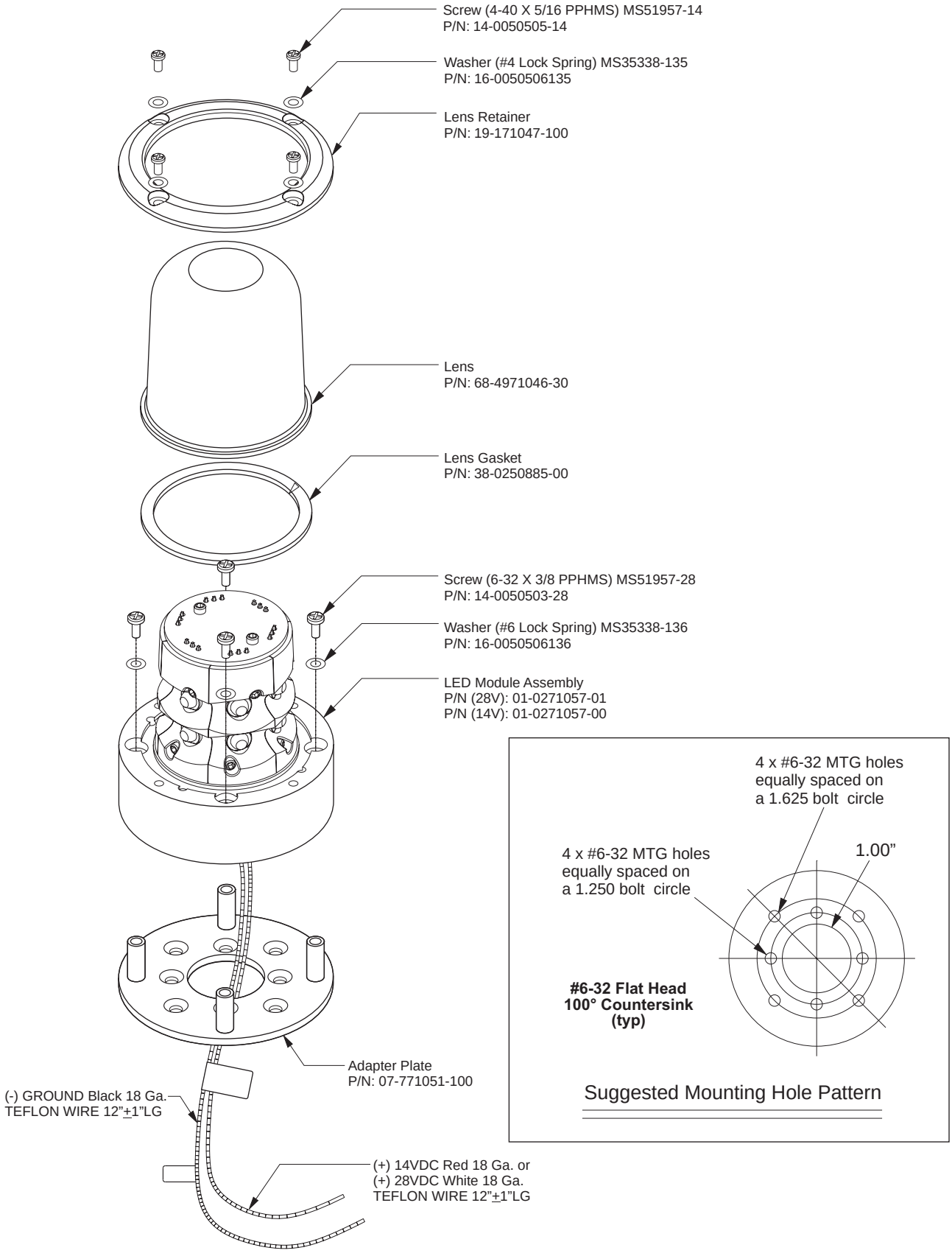


Figure 12A

Figure 13A



MODEL HRCFA SELF-CONTAINED STROBE ANTI-COLLISION LIGHT ASSEMBLY

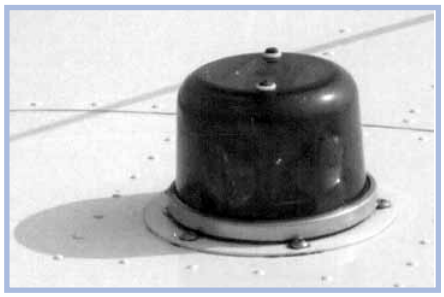
FAA/PMA APPROVED

Model Number	Part Number	Description
HRCFAR	01-0770029-29	standard assembly, Red lens
HRCFAW	01-0770029-30	standard assembly, White lens
HRCFAS	01-0770029-31	standard assembly, Split Red/White lens
HRCFADR	01-0770029-32	radio shielded, Red lens
HRCFADW	01-0770029-33	radio shielded, White lens
HRCFADS	01-0770029-34	radio shielded, Split Red/White lens

MODEL SACF SELF-CONTAINED STROBE ANTI-COLLISION LIGHT ASSEMBLY

FAA/PMA APPROVED

Model Number	Part Number	Description
SACF	01-0770030-01	Aviation White lens



Specifications (both models)

Input Voltage . . . . . 14 to 28 Volts D.C.
Current Draw . . . . . 3.2 Amps @ 14 Volts D.C.
1.6 Amps @ 28 Volts D.C.
Weight . . . . . 1.5 lbs.
Diameter . . . . . 3.7”

A440 Mounting Adapter

The model A440 Mounting Adapter, is for fuselage installations for the HRCFA series, and the SACF series.

Model Number	Part Number	Description
A440	19-130074-009	mounting adapter

Installation

The HRCFA & SACF self-contained strobe light assemblies are interchangeable with Rotating Beacons on any aircraft with a 3.75 inch diameter fairing or mounting adapter. It is not necessary to change any of the existing wiring, or circuit breakers. The light assembly must be properly mounted to comply with FAR Part 91.205(c-2) & (c-3). When necessary (such as fuselage installation), the Whelen model A440 mounting adapter must be used.

Mounting

1. Remove the existing beacon.
2. Make the necessary wiring connections using the existing wiring. Positive (+) to the WHITE wire, and Ground (-) to the BLACK wires protruding from the light assembly. All connections must use FAA approved techniques.

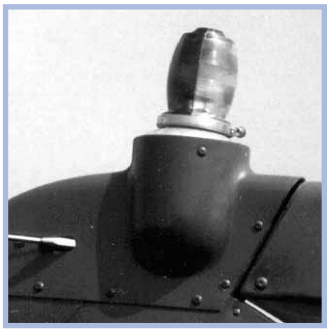
Note: It is recommended to ground the unit to the buss bar or the battery. Using the airframe as ground may produce EMI/RFI interference.

3. Remove the three (3) 6-32 x 3/8” mounting screws from the light assembly. Do not use longer screws, damage to the unit may occur.
4. Insert light assembly into mounting location and attach using screws as mentioned in step 3. There are two sets of mounting screw locations on the unit for installation versatility (unit may be sealed around periphery with RTV or equivalent).
5. If the A440 mounting adapter is used, attach light assembly to adapter using screws as mentioned in step 3 (unit may be sealed around periphery with RTV or equivalent).
6. If light assembly is mounted in an inverted position, drill a 1/8” diameter hole in lens as indicated on the lens label. For the model SACF series, remove the RTV plug from the hole in the lens.
7. When installing the light assembly in a rudder mount location, rudder balance must be checked with reference to the aircraft’s service manual. The weight and balance should equal the original rotating beacon.
8. Check all avionics systems for interference from the installation with reference to AC 43.13-2a, Chapter 4, paragraph 52 (b).
9. Label all switches and breakers, install pilot warning placard.
10. Update aircraft records and complete FAA form #337.

Flash Tube Replacement

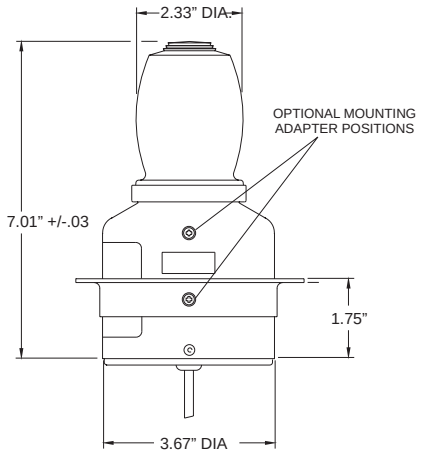
1. When a flash tube failure occurs, remove the #6 Phillips head screw on the clamp ring. Be careful not to lose the #6 hex nut.
2. Remove the clamp ring.
3. Lift the lens assembly & gasket off the strobe tube.
4. Lift the strobe tube and carefully unplug the connector.
5. Replace with new strobe tube assembly.
6. Attach all parts as required. See parts breakdown for replacement part numbers.

Before with Rotating Beacon

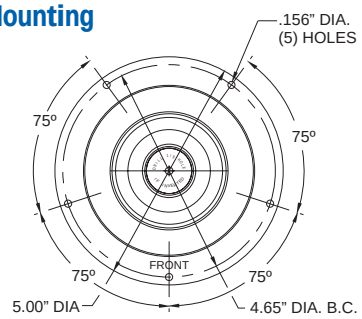


After with Strobe Light

Dimensions



Mounting



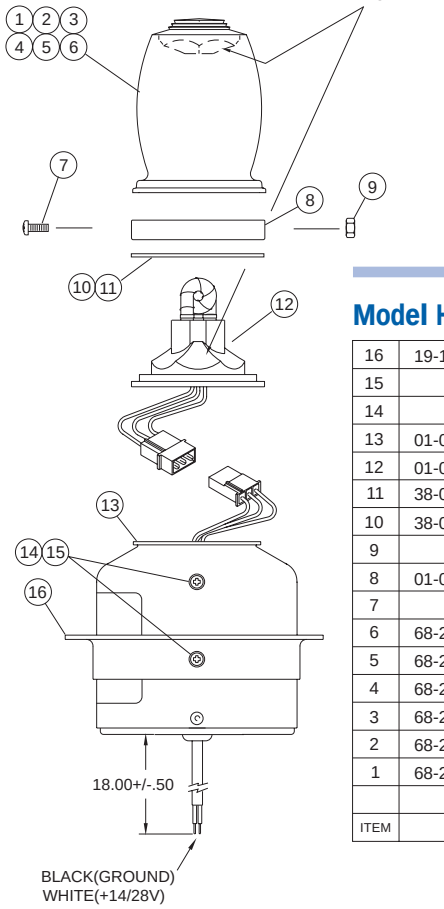
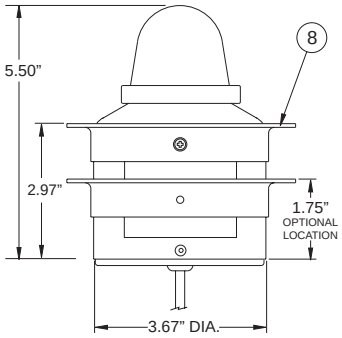


Figure 13A

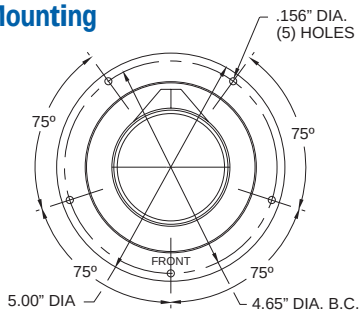
Model HRCFA Parts List

ITEM	PART NUMBER	DESCRIPTION
16	19-130074-100	A440 MOUNTING FLANGE (OPTIONAL)
15	N/A	#6 INT. TOOTH LW(MS35333-71)
14	N/A	#6-32x3/8 PPHMS(MS51957-28)
13	01-0770619-00	POWER SUPPLY ASSEMBLY
12	01-0770044-02	A469B FLASH TUBE ASSY.
11	38-0250429-00	RFI GASKET
10	38-0230840-00	GASKET
9	N/A	#6-32 X 5/16 SS HEX NUT (MS35649-264)
8	01-0450685-00	CLAMP RING
7	N/A	#6-32x1/2 PPHMS(MS51957-30)
6	68-2170504R60	LENS, A402ADS
5	68-2170504R30	LENS, A402ADW
4	68-2170504R50	LENS, A402ADR
3	68-2170504-60	LENS, A402AS
2	68-2170504-30	LENS, A402AW
1	68-2170504-50	LENS, A402AR

Dimensions



Mounting



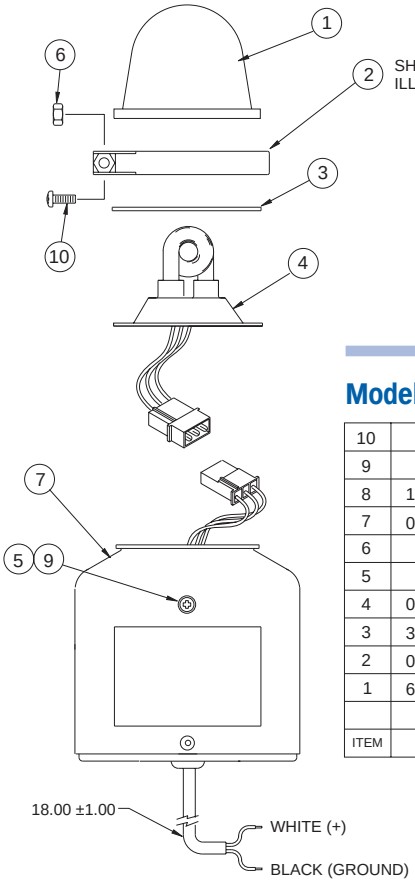


Figure 13B

Model SACF Parts List

ITEM	PART NUMBER	DESCRIPTION
10	N/A	#6-32 x 1/2 PPHMS (MS51957-30)
9	N/A	#6 INT TOOTH L/W (MS 35333-71)
8	19-130074-100	A440 MOUNTING FLANGE (OPTIONAL)
7	01-0770619-00	POWER SUPPLY HR-CF 14/28V
6	N/A	#6-32 x 5/16 SS HEX NUT (MS35649-264)
5	N/A	#6-32 x 3/8 PPHMS (MS51957-28)
4	02-0350053-00	SA406 FLASH TUBE ASSEMBLY
3	38-0230946-00	GASKET
2	01-0450685-00	CLAMP RING
1	68-4230044-30	SA402 LENS (CLEAR)

STROBE LIGHTHEAD ASSEMBLIES

MODEL A470A SERIES

FAA/PMA APPROVED

Model Number	Part Number	Description
A470AR	01-0770019-18	standard assembly, Red lens
A470AW	01-0770019-19	standard assembly, White lens
A470AS	01-0770019-20	standard assembly, Split Red/White lens
A470ADR	01-0770019-21	radio shielded assembly, Red lens
A470ADW	01-0770019-22	radio shielded assembly, White lens
A470ADS	01-0770019-23	radio shielded assembly, Split Red/White lens

Specifications

Weight . . . . . 0.3 lbs.
Exposed Height . . . . . 3.75”
Diameter . . . . . 2.5”

MODEL A450 SERIES

FAA/PMA APPROVED

Model Number	Part Number	Description
A450	01-0770032-00	standard assembly, Clear lens

Specifications

Weight . . . . . 0.3 lbs.
Exposed Height . . . . . 2.25”
Diameter . . . . . 2.5”

MODEL H102 & H103 SERIES

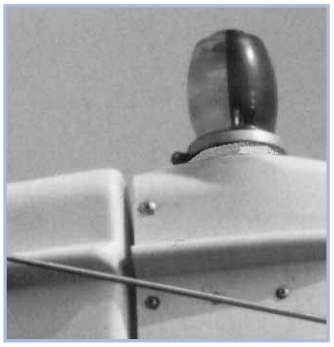
Model Number	Part Number	Description
H102	07-730068-000	flush mount adapter
H103	11-230079-000	rotating beacon mount adapter

H102

H103

Quartz Type Flasher Replacements

Before with Quartz Light



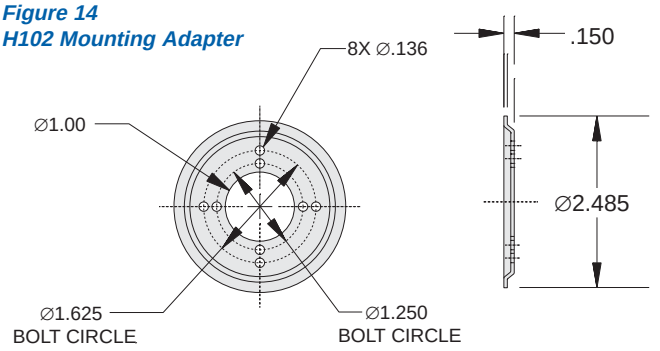
After with Remote Strobe Light

The A450 and A470A remote anti-collision strobe lighthead assemblies are direct replacement for the quartz-type flasher, using the original or the H102 “B” mounting adapter.

The H102 “B” mounting adapter is mounted in the aircraft’s structure, with four (4) MS 20470 AD4 rivets, or four (4) 6-32 screws and self-locking nuts. Drill out the center hole in the skin to allow access to the strobe head connector.

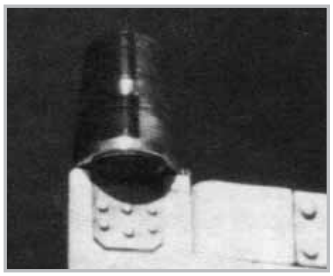
Model A470A Installation

Figure 14
H102 Mounting Adapter



Vertical Fin and Rudder Mounting of Anti-Collision Strobe Lights

Rudder mounted anti-collision lights should be located top center of the rudder hinge center line, or rudder balance must be established after installation. Refer to AC 43.13-2A, Chapter 4, Paragraph 55(e), “Rudder Installation”. The rudder or fin cap is excellent for shadowing the prop and cabin area if the light is mounted far enough back.



NOTE: Mounting an A450 or A470A strobe lighthead assembly on a vertical fin or rudder, can be accomplished by fabricating a mounting adapter similar to the ones shown in illustrations.

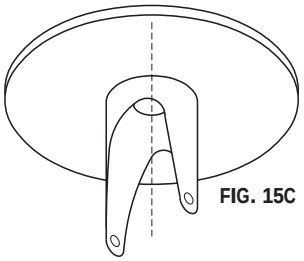


FIG. 15C

Round or streamline tubing cut to fit rudder or vertical fin welded to 2 /12” OD .40” thick disc. (Reference AC 43.13-1B, Chapter 2, Section 2).

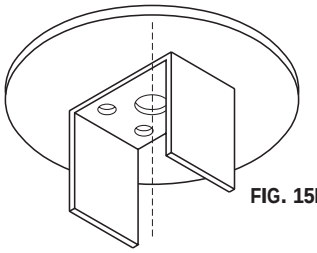


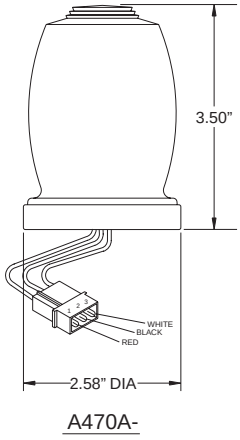
FIG. 15D

Metal bracket shaped to fit the vertical fin or rudder with 2 1/2” OD .040” thick disc riveted in place. (Reference AC 43.13-1B, Chapter 2).

Fabrication and installation of these mounting brackets are referenced in this approved installation manual, and AC 43.13-1B and 2A.

Documentation of structural integrity of the fabricated installation must be approved by an “IA” or other representative of the FAA. Conformity inspections will be performed with reference to approved techniques, and procedures specified in this manual (see page 3).

Dimensions



A470A-

QTY						ITEM	PART NUMBER	DESCRIPTION
-	-	-	-	-	-	17	02-0350600-01	LENS ASSY, MASKED (WHITE)
1	1	1	1	1	1	15	N/A	#6-32 X 5/16 SS HEX NUT (MS35649-264)
	—	—	1	1	1	12	38-0230840-00	GASKET
—	1	1	1	1	1	11	N/A	#6-32 X 1/2 PHILLIPS PHMS(MS51957-30)
1	1	1	1	1	1	10	01-0770044-02	FLASHTUBE ASSY (A469B)
1	1	1	—	—	—	9	38-0250429-00	GASKET, SHIELDED
1	1	1	1	1	1	8	01-0450685-00	CLAMP RING Ø.50
1	—	—	—	—	—	6	68-2170504R60	LENS ASSY, R S - (RED/WHITE)
—	1	—	—	—	—	5	68-2170504R30	LENS ASSY, R S - (WHITE)
—	—	1	—	—	—	4	68-2170504R50	LENS ASSY, R S - (RED)
—	—	—	1	—	—	3	68-2170504-60	LENS ASSY. (RED/WHITE)
—	—	—	—	1	—	2	68-2170504-30	LENS ASSY, (WHITE)
—	—	—	—	—	1	1	68-2170504-50	LENS ASSY, (RED)
*							01-0770019-23	STROBE ASSY, R S - R/W (A470A-D-R/W)
	*						01-0770019-22	STROBE ASSY, R S - WHITE (A470A-D-W)
		*					01-0770019-21	STROBE ASSY, R S - RED (A470A-D-R)
			*				01-0770019-20	STROBE ASSY. - RED/WHITE (A470A-R/W)
				*			01-0770019-19	STROBE ASSY. - WHITE (A470A-W)
					*		01-0770019-18	STROBE ASSY. - RED (A470A-R)

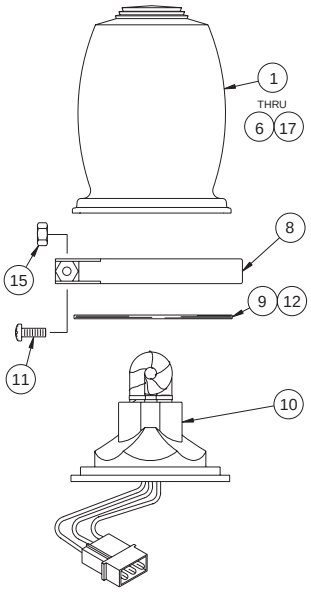
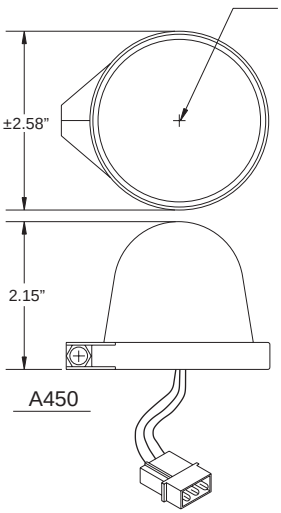


Figure 15A



A450

QTY.	ITEM	PART NO.	DESCRIPTION
1	6	N/A	#6-32 X 5/16 SS HEX NUT (MS35649-264)
1	5	68-4230044-30	LENS(CLEAR)
1	4	01-0450685-00	CLAMP RING Ø.50
1	3	N/A	#6-32 X 1/2 PHILLIPS PHMS(MS51957-30)
1	2	38-0230946-00	GASKET, LENS .046" THK
1	1	02-0350053-00	FLASH TUBE ASSY.
*		01-0770032-00	A450 STROBE LIGHT HEAD ASSEMBLY

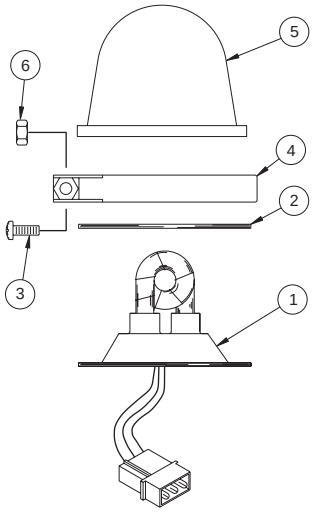


Figure 15B

MODEL A650PG/PR SERIES WINGTIP STROBE ANTI-COLLISION/POSITION LIGHT ASSEMBLY

FAA/PMA APPROVED

Model Number	Part Number	Description
A650PG14	01-0770054-00	position green, 14 volt
A650PG28	01-0770054-01	position green, 28 volt
A650PR14	01-0770054-02	position red, 14 volt
A650PR28	01-0770054-03	position red, 28 volt
A650PGD1	01-0770054-04	position green, 14 volt, radio shielded
A650PGD2	01-0770054-05	position green, 28 volt, radio shielded
A650PRD1	01-0770054-06	position red, 14 volt, radio shielded
A650PRD2	01-0770054-07	position red, 28 volt, radio shielded

Specifications

Position Lights - Current Draw . . . . . 2.0 Amps @ 14 Volts D.C.
1.0 Amps @ 28 Volts D.C.

Weight . . . . . .6 lbs.
Length . . . . . .3.84”
Width . . . . . .1.7”
Height . . . . . .2.4”

Installation

The A650 Series must be properly mounted to comply with FAR Part 91.205(c-2) & (c-3). The light assembly must be mounted so that the light distribution pattern is not obstructed by any parts of the aircraft. A limited amount of obstruction is permitted (Ref. FAR Part 23.1401 for anti-collision lights, and PAR 23.1387 for position lights).

The baseplate must be mounted parallel to the vertical and horizontal centerlines of the aircraft to project the patterns properly. These assemblies are interchangeable with the Grimes model A1285 position light.

Mounting

1. If necessary, fabricate the mounting pattern using dimensions found in Figure 16B (**Note -** A 1” diameter hole is needed for the connector to pass through).
2. Make the necessary wiring connections using 18 gauge wire for the position lights, and Whelen 16 gauge 3/c cable for the strobe lights. All connections must use FAA approved techniques.
3. Remove the (6-32 x .312) retainer mounting screw and retainer.
4. Attach the base assembly to the wingtip using (3) #6-32 countersunk screws (unit may be sealed around periphery with RTV or equivalent).
5. Re-attach lens retainer.

Wiring

1. The strobe connector should plug into the Whelen 16 gauge interconnecting cable, or a Whelen strobe power supply.

   Observe the following strobe color coding:

   PIN 1 - RED (Anode)
   PIN 2 - BLACK (Cathode)
   PIN 3 - WHITE (Trigger)

Caution: When pins 1 & 2 or pins 2 & 3 are reversed, the system will appear to operate normally, however this condition will cause premature flash tube failure.

2. Connect the forward position light wires as follows, using 18 gauge approved aviation wire or cable:

   RED - +14 or +28 volts (depending on aircraft voltage)
   BLACK - (-) Ground

Dimensions

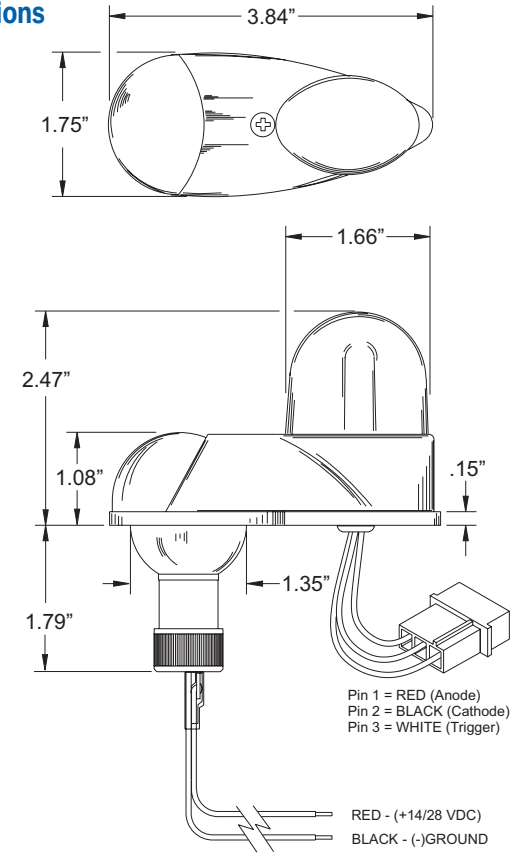


Figure 16A

Mounting Diagram

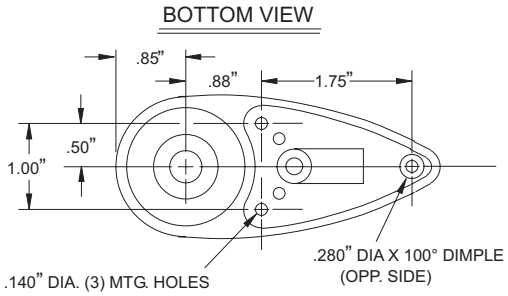


Figure 16B

Before

After/With Modified Wingtip

A650 Wingtip Strobe Light Installation on Later Model Cessna Wingtips with Shortened Light Base

Because Cessna has modified the Type E Series Wingtip Navigation Light, by cutting off the back 1.3 inch, and designed their wingtip to fit in closer to the light, it will be necessary to do a little fiberglass work when completing this installation. The A650 can be installed on these Cessnas in the manner below, and instructions above.

1. Remove the wingtip and the navigation light assembly.
2. Take a complete Model W1285 navigation light with an A650 head assembly installed, or an A650-PR or -PG, and place it in position on the wingtip. Mark around the navigation light base plate to get an outline of the navigation light profile on the wingtip.
3. File or trim away the excess wingtip material, to allow the navigation light and the A650 strobe light assembly to fit neatly in place. Allow at least 0.060 inch clearance around the A650 strobe head assembly and the wingtip.
4. To fill in the hole in the wingtip made by this trimming, and to provide a platform for the navigation and strobe light assembly, mount the navigational light base plate on the wingtip using the two (2) forward screws with a sheet of polyvinyl between the wingtip and the base plate for a parting agent. Tape the polyvinyl back over the wingtip to form a seal, so it is possible to apply a polyester resin putty, or epoxy putty like “Bondo”, on the inside of the tip. Build up the trimmed area with this putty, as to have about 1/4 inch of material under and in back of the base plate. Prepare the surface and the putty material in accordance with the putty manufacturer’s instructions, to assure a good bond to the wingtip.
5. Remove the navigation light base plate and parting agent.
6. To improve the appearance of this installation, fill the indentation on the outside of the wingtip with the aforementioned putty, and file the excess material to a clean profile before painting.
7. Drill the third mounting screw hole for the navigation light, and complete the installation, reference the enclosed information.

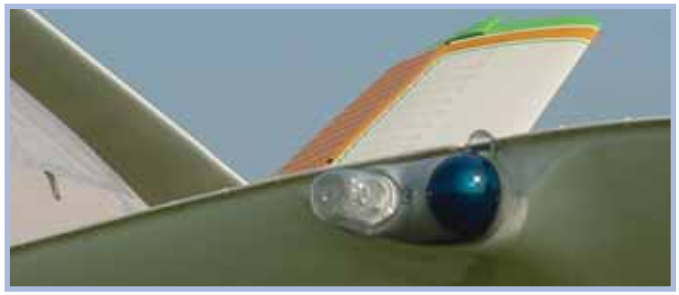
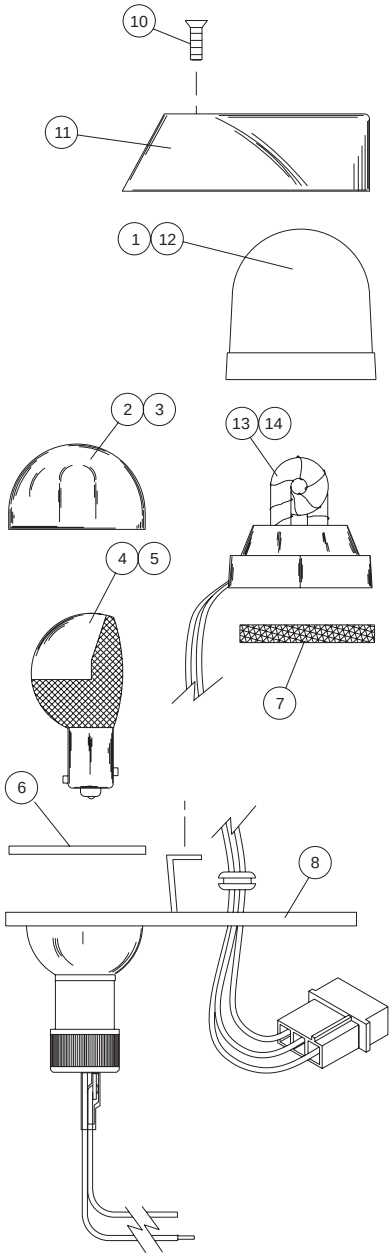


Figure 17A



Replacement Parts

14	02-0250276-03	FLASH TUBE ASSEMBLY (MOLEX CONNECTOR)
13	02-0250276-00	FLASH TUBE ASSEMBLY (A610)
12	68-2290005-30	LENS, FLASHTUBE (A612)
11	19-170052-009	RETAINER, LENS (A626)
10	N/A	#6-32 X 5/16 PHILLIPS FHMS(MS51959-27)
8	02-0350003-01	BASE PLATE ASSEMBLY (W1285-2)
7	38-0130106-00	GASKET, FLASHTUBE, (A427-3)
6	38-0230021-00	GASKET, LENS (W1283)
5	34-0414020-65	LAMP, 14V (W129014)
4	34-0428020-65	LAMP, 28V (W1290-28)
3	68-4230020-40	LENS, GREEN (W1284G)
2	68-4230020-50	LENS, RED (W1284R)
1	02-0350072-35	LENS, CLEAR (A626D)
	68-2290005-34	LENS, RFI COATED
ITEM	PART NUMBER	DESCRIPTION

INSTALLATION OF MODEL A610

Model Number	Part Number	Description
A610	02-0250276-00	standard unit, 6" leads

Specifications

A610 Flash Tube Weight . . . . . .0.09 lbs.

A612

A610

MODEL A612

Model Number	Part Number	Description
A612	68-2290005-30	standard clear lens
A612D	68-2290005-34	radio shielded, clear lens

Specifications

A612 Lens Weight . . . . . .0.08 lbs.

Operation

The Model A610 flash tube and the Model A612 glass lens are used for installing wingtip strobes in single engine Cessna's 1972 and later. The existing position light retainer is modified to accommodate the lens, and the flash tube is mounted directly behind. The unique magnifying design of the A612 lens increases the light intensity by two to three times in the horizontal plane. Lenses meet material requirements of MIL-C-7989B class B.

A610 Dimensions

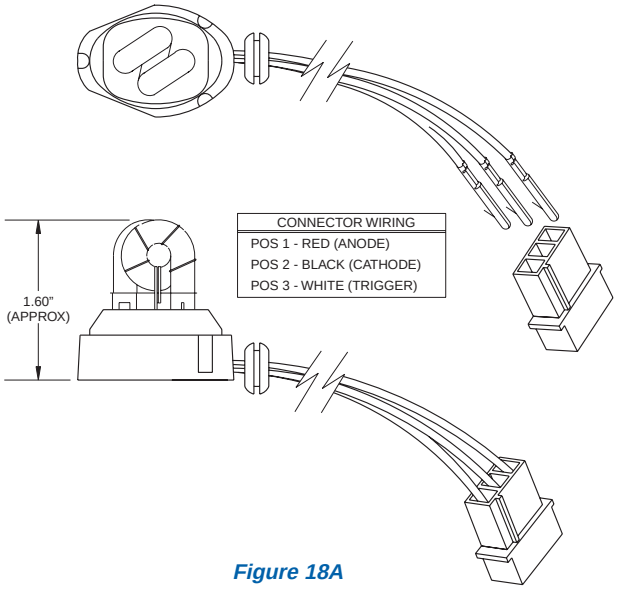


Figure 18A

A612 Dimensions

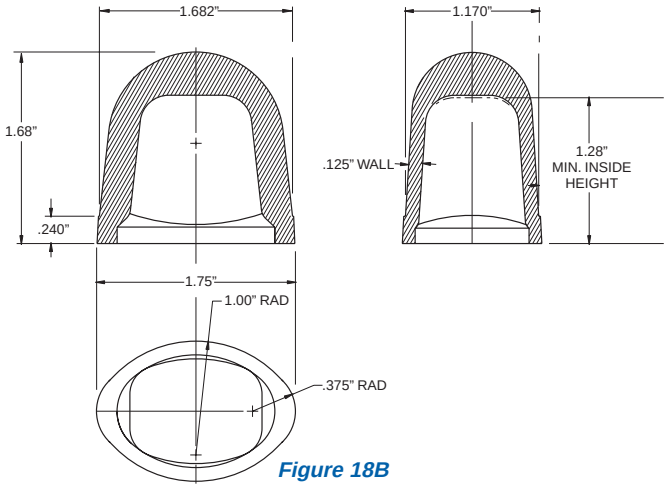


Figure 18B

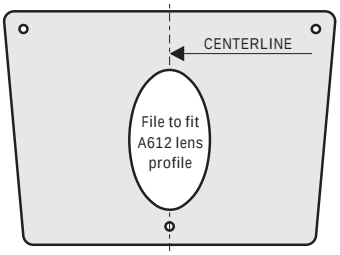
Late Model Single Engine Cessna Wingtip Strobe Light Installation of A610 and A612

Before

After

1. Remove the position light lens retainer being careful not to drop the red or the green lens.
2. Establish a center line on the Cessna lens retainer, referencing to the lens retainer center mounting screw, and position light base plate rear mounting screw.

Figure 18C



3. Scribe the A612 lens profile as shown in illustration above, the object being to have the strobe light centered over the position light base plate.
4. Trim or fit an opening to the scribe line to fit the A612 lens. Due to the uneven surface of the Cessna lens retainer, the A612 will contact only the front and rear radius.
5. Place the sponge rubber pad supplied under the A610 flash tube to firm the assembly. RTV is recommended to secure lens in the modified retainer.
6. The flash tube interconnecting cable is routed through square holes in the rear bulkhead of the position light area.
7. Install the modified position light lens retainer, A610 flash tube and A612 lens, using original hardware.

MODEL A625 SERIES INSTALLATION

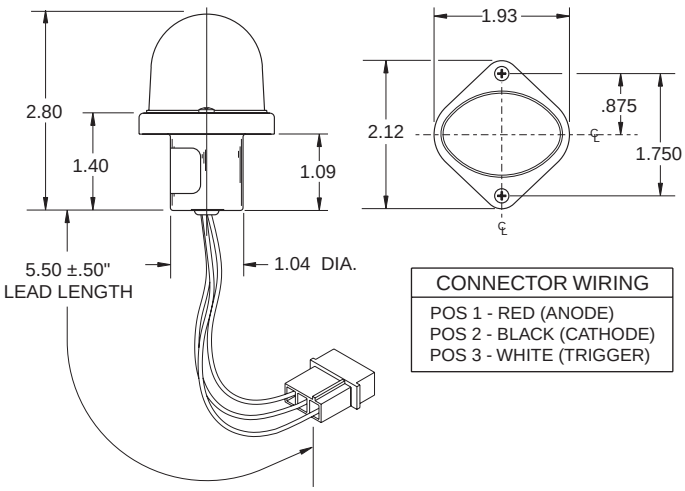
FAA/PMA APPROVED

Model Number	Part Number	Description
A625	01-0770058-03	standard unit, clear lens
A625D	01-0770058-13	radio shielded, clear lens

Specifications

Weight . . . . . 0.2 lbs.
Exposed Height . . . . . 1.7"

Dimensions



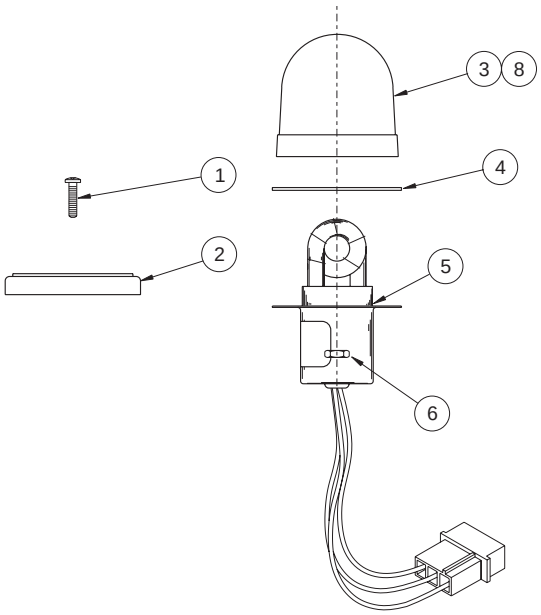


Figure 19A

Spare Parts

QTY.		ITEM	PART NUMBER	DESCRIPTION
1	-	8	68-2290005-34	LENS, RFI COATED
2	2	6	N/A	#4-40 HEX NUT, BRASS
1	1	5	02-0370338-00	A627 FLASHTUBE ASSY.
1	1	4	38-0250074-00	GASKET,
-	1	3	68-2290005-30	LENS, CLEAR
-	1	2	19-170057-009	RETAINER, LENS
2	2	1	N/A	#4-40 X 1/2 PPHMS (MS51957-17)
*			01-0770058-13	STROBE LIGHT ASSY. MODEL A625D
	*		01-0770058-03	STROBE LIGHT ASSY. MODEL A625

A625 Strobe Light Assembly

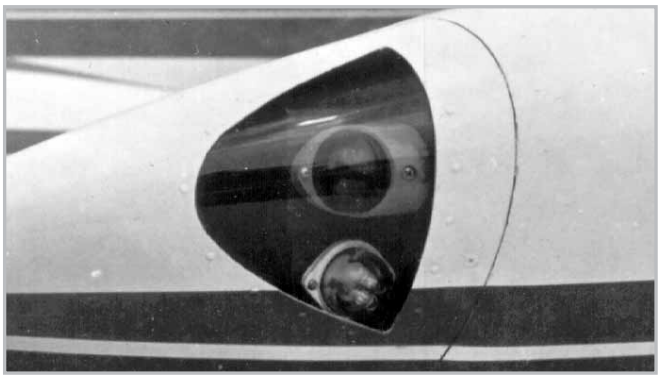
The A625 strobe lighthead assembly fits into a 1.1 inch hole. The mounting screws are 1.75 inch center to center. It protrudes 1.7 inch outside the aircraft's skin, and 1.1 inch inside the aircraft.

When installing an A625 strobe lighthead assembly on the rudder, refer to the aircraft's MAINTENANCE and/or SERVICE MANUAL for accepted procedures for balancing the rudder before returning the aircraft to service.

Mount the anti-collision strobe lighthead assembly as close to the stabilizer center line as practical, to eliminate backscatter as much as possible for the horizontal surface.

When installing the A625 strobe lighthead assembly in an enclosed area like a Beech enclosed wingtip or tail cone, maintain at least 0.060 inch clearance around the lens to the plastic cover. The A625 mounts conveniently just behind the forward position light on Cessna's conical camber wingtip. Make sure that the navigation light pattern is not interrupted when installing the A625 strobe light head on a wingtip. The A612 lens is not considered an obstruction.

A625 INSTALLATION IN CESSNA 300 OR 400 SERIES WINGTIP TANKS. The A625 fits just under the navigation light, on an adapter plate of 0.032 inch aluminum, approximately 2-3/8 inches x 3-1/2 inches. Fit this plate between the navigation light and its mounting surface, and locate the A625 strobe head below the navigation light.



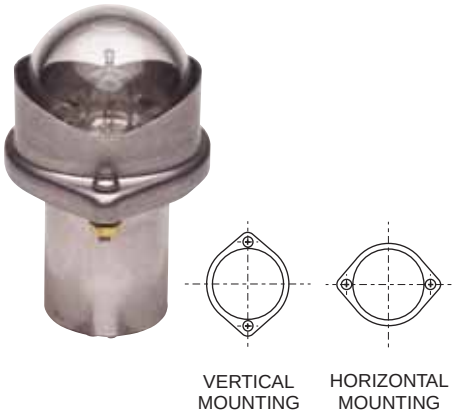
Bend and trim the adapter plate as necessary, so that the A625 clears the transparent window that covers the navigation light area 0.060 inch minimum.

The conduit for the navigation light wire is very small. To get the necessary wires to operate the strobe light and the navigation light through this conduit, use a 20 gauge wire, with less that 0.060 inch OD. It has been found that the Belden 8502 or 8308, has an 0.058 inch OD.

MODEL A500A SERIES INSTALLATION

FAA/PMA APPROVED

Model Number	Part Number	Description
A500AV14	01-0770024-00	vertical mount, 14 volt
A500AV28	01-0770024-01	vertical mount, 28 volt
A500AH14	01-0770024-02	horizontal mount, 14 volt
A500AH28	01-0770024-03	horizontal mount, 28 volt
A500AVD1	01-0770024-04	vertical mount, 14 volt, radio shielded
A500AVD2	01-0770024-05	vertical mount, 28 volt, radio shielded
A500AHD1	01-0770024-06	horizontal mount, 14 volt, radio shielded
A500AHD2	01-0770024-07	horizontal mount, 28 volt, radio shielded



Specifications

Weight . . . . . 0.3 lbs.
Exposed Height . . . . . 1.7”
Diameter . . . . . 1.5”

Operation

Combination Strobe/Tail Navigation Light used when the wingtip anti-collision lights are mounted in an enclosure and can’t provide 360º of strobe coverage. It is a direct replacement for the standard tail position light. Available in a radio-shielded version. Voltage (14 or 28), and mounting, (horizontal or vertical) must be specified when ordering.

Dimensions

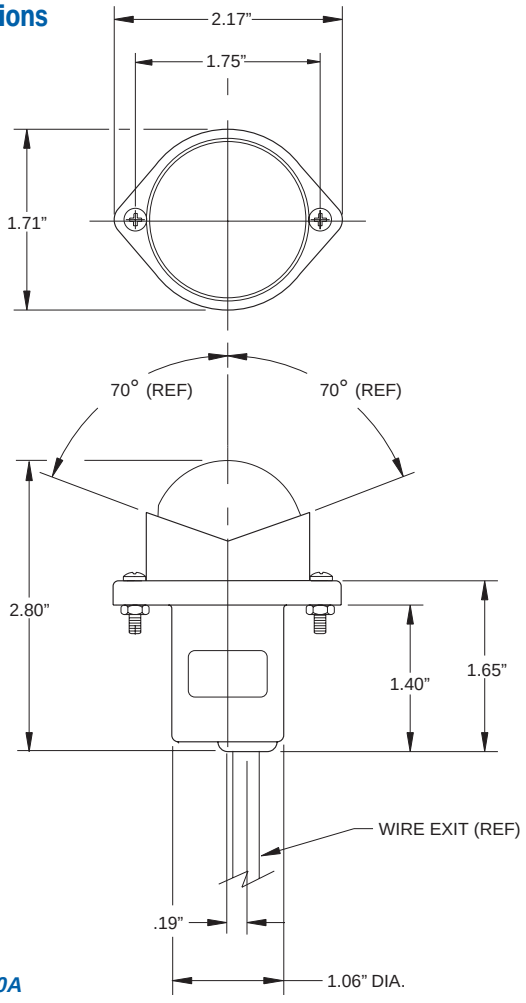


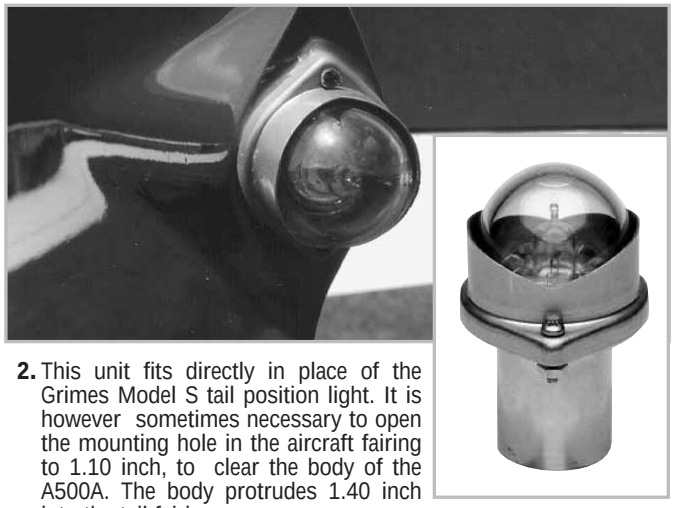
Figure 20A

CONNECTING WIRING OF THE A500A TO THE A441 AMP 3 POSITION PIN CONNECTOR HOUSING, AND THE A444 AMP 2 POSITION PIN HOUSING CONNECTOR.

Anode	RED wire	Pin 1 of A441
Cathode	BLACK wire	Pin 2 of A441
Trigger	WHITE wire	Pin 3 of A441
Position Light A+	BLUE wire	Pin 1 of A444
Position Light Ground	BLUE wire	Pin 2 of A444

Installation

1. Remove the Model S tail position light by removing the two (2) retainer ring screws.



2. This unit fits directly in place of the Grimes Model S tail position light. It is however sometimes necessary to open the mounting hole in the aircraft fairing to 1.10 inch, to clear the body of the A500A. The body protrudes 1.40 inch into the tail fairing.
3. Establish the proper light pattern of the A500A tail position light. The retainer shield must be located so that the bottoms of the V notches are vertical (parallel to the rudder) to shadow the light so it will produce a horizontal light pattern of 70 degrees left and right of straight back of aircraft.

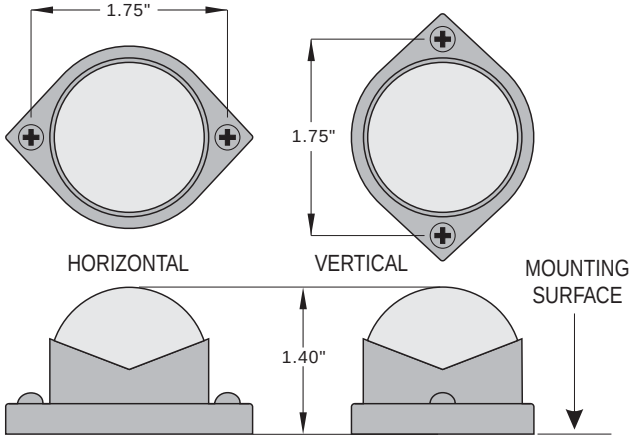
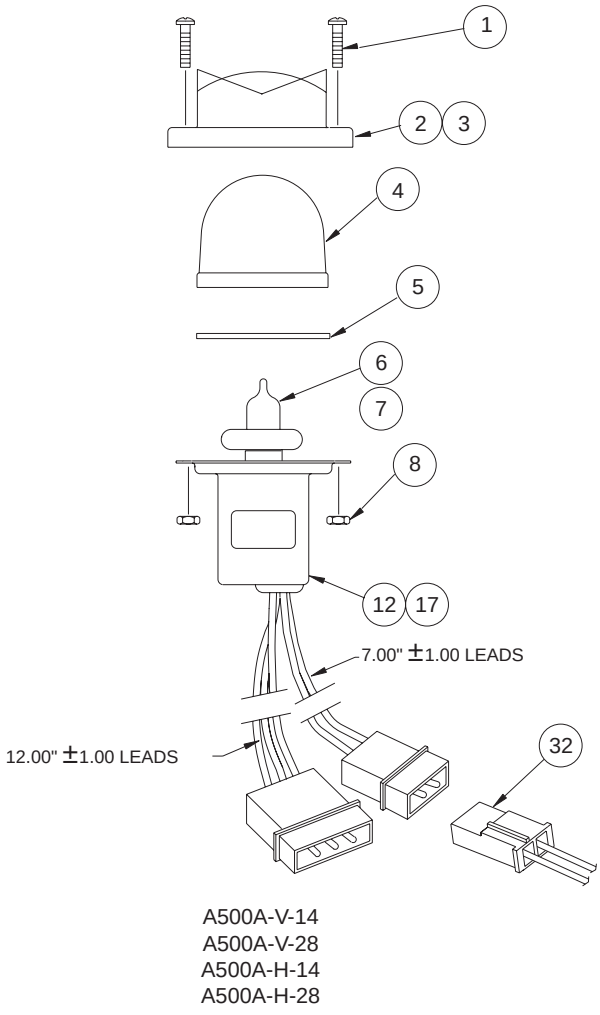


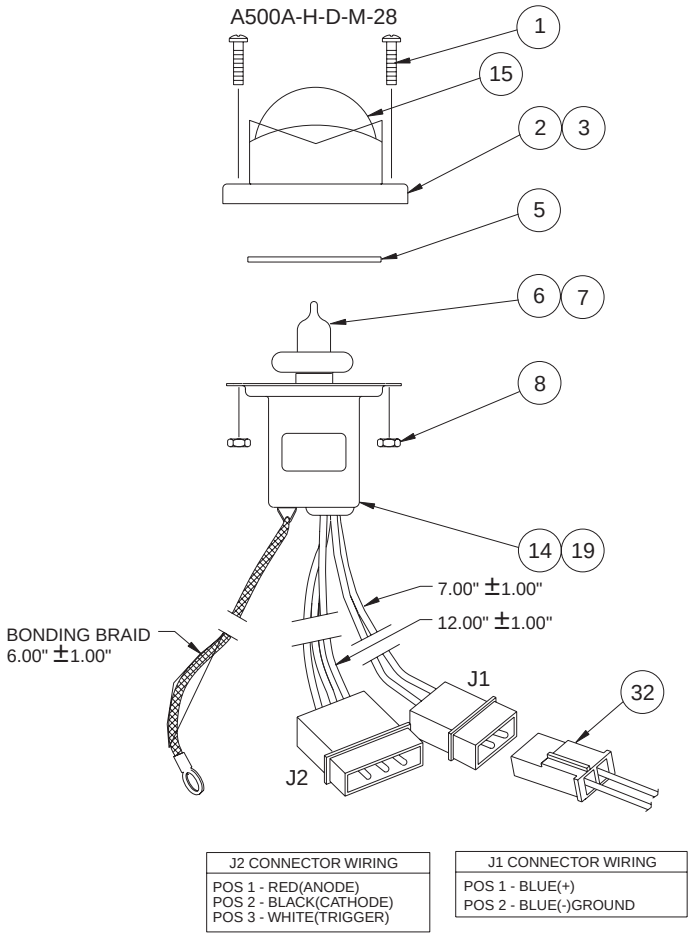
FIG. 20B

A500A Spare Parts



A500A-V-14
A500A-V-28
A500A-H-14
A500A-H-28

A500A-V-D-14
A500A-V-D-28
A500A-H-D-14
A500A-H-D-28
A500A-V-D-M-14
A500A-V-D-M-28
A500A-H-D-M-14
A500A-H-D-M-28



J2 CONNECTOR WIRING
POS 1 - RED(ANODE) POS 2 - BLACK(CATHODE) POS 3 - WHITE(TRIGGER)

J1 CONNECTOR WIRING
POS 1 - BLUE(+) POS 2 - BLUE(-)GROUND

Figure 21A

Model A500A Installation

QUANTITY								ITEM	PART NUMBER	DESCRIPTION
1	1	1	1	1	1	1	1	32	46-0750698-00	PIGTAIL
-	-	-	-	-	-	-	-	19	02-0350375-01	FLASH TUBE AND SOCKET ASSY (A506DM)
1	1	1	1	—	—	—	—	15	68-4270002-34	LENS, RFI COATED
1	1	1	1	—	—	—	—	14	02-0350375-00	FLASH TUBE AND SOCKET ASSY (A506D)
—	—	—	—	1	1	1	1	12	02-0350034-00	FLASH TUBE AND SOCKET ASSY (A506)
2	2	2	2	2	2	2	2	8	● = N/A	HEX NUT,#4-40 X 1/4 A.F. BRASS
1	—	1	—	1	—	1	—	7	34-0428070-64	LAMP,ESG HALOGEN (28 VOLT) (A508-28)
—	1	—	1	—	1	—	1	6	34-0412070-63	LAMP,ERC HALOGEN (14 VOLT) (A508-14)
1	1	1	1	1	1	1	1	5	38-0230002-00	GASKET (A455)
—	—	—	—	1	1	1	1	4	68-4270002-30	CLEAR GLASS PLAIN DOME (A457A)
-	-	-	-	-	-	1	1	3	19-0150350-02	RETAINER,MASK(VERTICAL)
-	-	-	-	1	1	-	-	2	19-0150350-01	RETAINER,MASK(HORIZONTAL)
2	2	2	2	2	2	2	2	1	● = N/A	#4-40 X 1/2 PHILLIPS PHMS(MS51957-17)
*									01-0770024-07	TAIL POS & STROBE LT ASSY (A500A-H-D-28)
	*								01-0770024-06	TAIL POS & STROBE LT ASSY (A500A-H-D-14)
		*							01-0770024-05	TAIL POS & STROBE LT ASSY (A500A-V-D-28)
			*						01-0770024-04	TAIL POS & STROBE LT ASSY (A500A-V-D-14)
				*					01-0770024-03	TAIL POS & STROBE LT ASSY (A500A-H-28)
					*				01-0770024-02	TAIL POS & STROBE LT ASSY (A500A-H-14)
						*			01-0770024-01	TAIL POS & STROBE LT ASSY (A500A-V-28)
							*		01-0770024-00	TAIL POS & STROBE LT ASSY (A500A-V-14)

MODEL A600 PG/PR SERIES INSTALLATION

FAA/PMA APPROVED

Model Number	Part Number	Description
A600PG14	01-0790006-00	position green, 14 volt
A600PG28	01-0790006-01	position green, 28 volt
A600PR14	01-0790006-02	position red, 14 volt
A600PR28	01-0790006-03	position red, 28 volt
A600PGD1	01-0790006-04	position green, 14 volt,radio shielded
A600PGD2	01-0790006-05	position green, 28 volt, radio shielded
A600PRD1	01-0790006-06	position red, 14 volt, radio shielded
A600PRD2	01-0790006-07	position red, 28 volt, radio shielded

Specifications

Position Lamps Power Consumption Total . . . . . 4.0 Amps @ 14 VDC; 2.0 Amps @ 28 VDC
Weight . . . . . 0.8 lbs.
Length . . . . . 5.63”
Width . . . . . 1.7”
Exposed Height . . . . . 2.4”

Operation

Wingtip anti-collision, forward position, and tail position lights, all in one compact unit. Tail position light eliminates the need for a tail mounted position light. Available in 14 or 28 volts, and in a radio-shielded version. The forward position lamp is 26 watts and the taillight lamp is 25 watts.

Installation

The A600 Series must be properly mounted to comply with FAR Part 91.205(c-2) & (c-3). The light assembly must be mounted so that the light distribution pattern is not obstructed by any parts of the aircraft. A limited amount of obstruction is permitted (Ref. FAR Part 23.1401 for anti-collision lights, and PAR 23.1387 for position lights).

The convergence of the two wingtip tail position must occur within 1200 feet directly behind the aircraft to comply with field of coverage requirements. The baseplate must be mounted parallel to the vertical & horizontal centerlines of the aircraft to project the patterns properly.

Mounting

1. If necessary, fabricate the mounting pattern using dimensions found in figure 22A.
2. Make the necessary wiring connections using 18 gauge wire for the position lights, and Whelen 16 gauge 3/c cable for the strobe lights. All connections must use FAA approved techniques.
3. Remove the two (6-32 x .312) retainer mounting screws and retainer.
4. Attach the base assembly to the wingtip using (3) #6-32 countersunk screws (unit may be sealed around periphery with RTV or equivalent).
5. Re-attach lens retainer (see figure 23A).

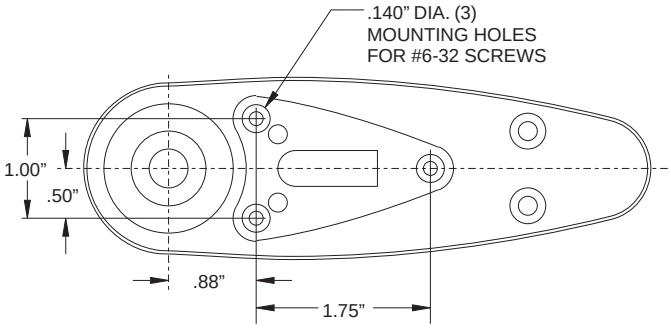


Figure 22A

Wiring

1. The strobe connector should plug into the Whelen interconnecting cable, or a Whelen strobe power supply.

   Observe the following strobe color coding:

   PIN 1 - RED (Anode)
   PIN 2 - BLACK (Cathode)
   PIN 3 - WHITE (Trigger)

   Caution: When pins 1 & 2 or pins 2 & 3 are reversed, the system will appear to operate normally, however this condition will cause pre-mature flash tube failure.

2. Connect the forward position light wires as follows:

   RED - +14 or +28 volts (depending on aircraft voltage)
   BLACK - (-) Ground

3. The tail position light has no polarity, as noted by both wires being BLUE. Connect one BLUE wire to +14 or +28 volts (depending on aircraft voltage). Connect the other BLUE wire to ground (see figure 22B)

Dimensions

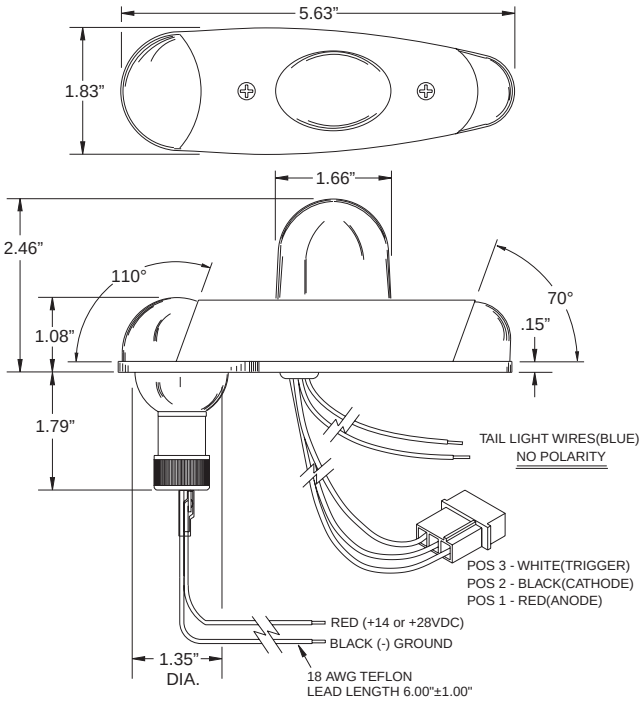


Figure 22B

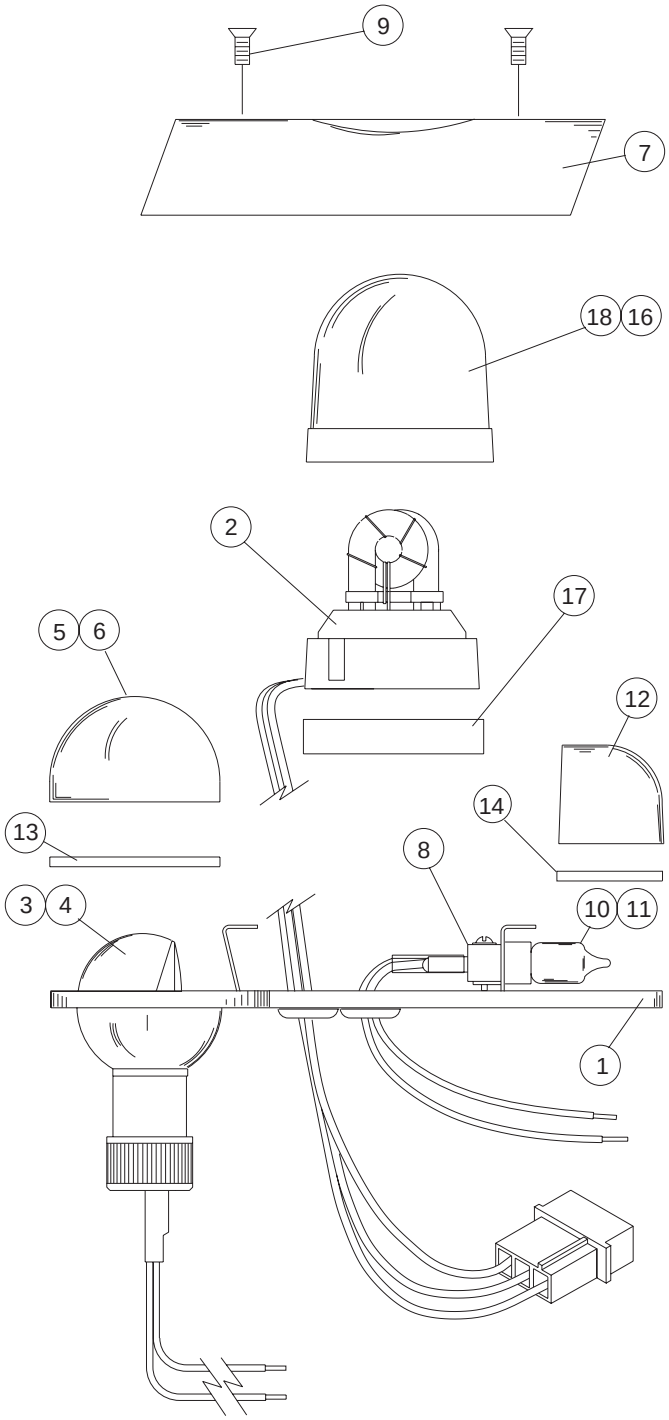


Figure 23A

A600 Replacement Parts

ITEM	PART NUMBER	DESCRIPTION
18	68-2290005-30	LENS, CLEAR(A612)
17	38-0130107-00	GASKET(A427-4)
16	68-2290005-34	LENS, RFI COATED
14	38-0130090-00	GASKET(A616)
13	38-0230021-00	GASKET(W1283)
12	68-4250066-30	LENS, TAIL POSITION(A615)
11	34-0428070-64	LAMP, 28V(A508-28)
10	34-0412070-63	LAMP, 14V(A508-14)
9	N/A	#6-32 X 5/16 PHILLIPS FHMS (MS51959-27)
8	02-0350260-00	SOCKET ASSY.(A507)
7	19-170049-009	LENS RETAINER(A606)
6	68-4230020-50	LENS, RED(W1284-R)
5	68-4230020-40	LENS, GREEN(W1284-G)
4	34-0428020-65	LAMP, 28V(W1290-28)
3	34-0414020-65	LAMP, 14V(W1290-14)
2	02-0250276-00	FLASH TUBE ASSEMBLY(A610)
1	02-0350259-00	BASEPLATE ASSY.(A605)

Model A600 Installation

MODEL A650 SERIES INSTALLATION

FAA/PMA APPROVED

Model Number	Part Number	Description
A650	01-0770053-00	standard unit
A650D	01-0770053-13	radio shielded

Specifications:

Weight . . . . . 0.2 lbs.
Exposed Height . . . . . 2.4”

A650 Operation

Converts existing **Whelen W1285** position lights into a position/anti-collision light system by removing the existing retainer and replacing it with the A650 assembly. Available in a radio-shielded version.

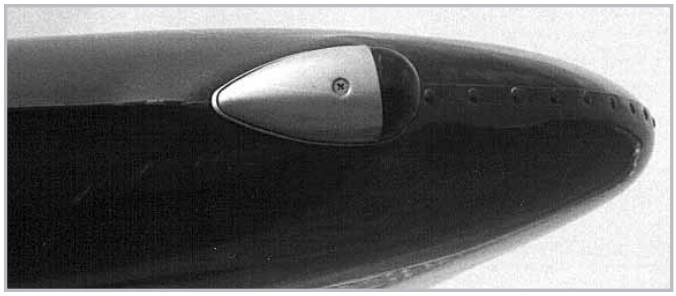
A650 Wingtip Strobe Light.

To install the Whelen A650 strobe lighthead assembly on the aircraft, proceed with the following instructions:

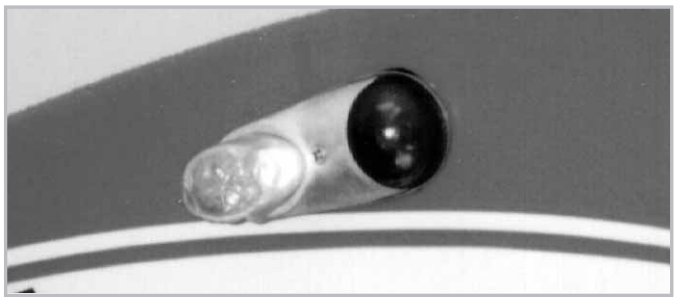
1. Remove the wingtip navigation light and wingtip, when necessary.
2. Install the nylon three position AMP pin connectors A441 on the end of the flash tube wires (RED in pin 1, BLACK in pin 2, and WHITE in pin 3).
3. Assemble the navigation light assembly on the wingtip using the A650 strobe light assembly as the navigation light lens retainer.

a. Install the rubber pad (supplied in kit) on the position light base plate under the A610 flash tube, if necessary to make the lens firm in its mounting.

4. In some installations it will be necessary to mask the A650 strobe light, to reduce pilot annoyance. The Navigation Light Detector will be a source of reflection, and should be reduced in size or masked as necessary. A small aluminum or plastic plate, mounted between the navigation light and the wingtip, protruding up or down as required (like some plastic navigation light detectors), and trimmed to shadow the objectionable reflected area, is most effective. This reflection problem varies from one aircraft to another, due to aircraft design and paint color scheme, and must be checked on every installation.



Before



After/with Modified Wingtip

Dimensions

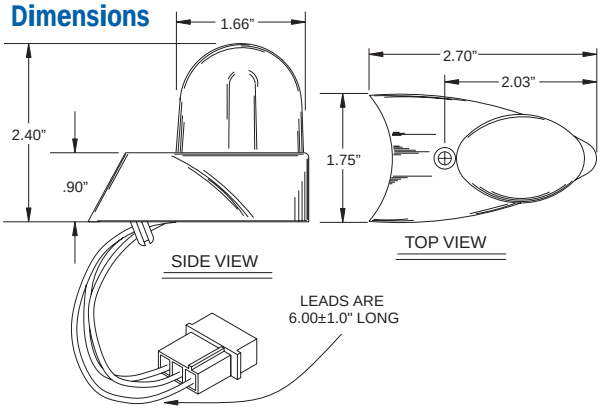


Figure 24A

A650 Spare Parts

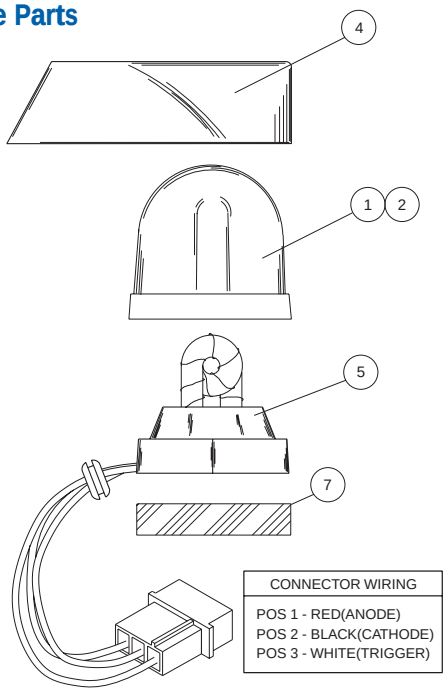
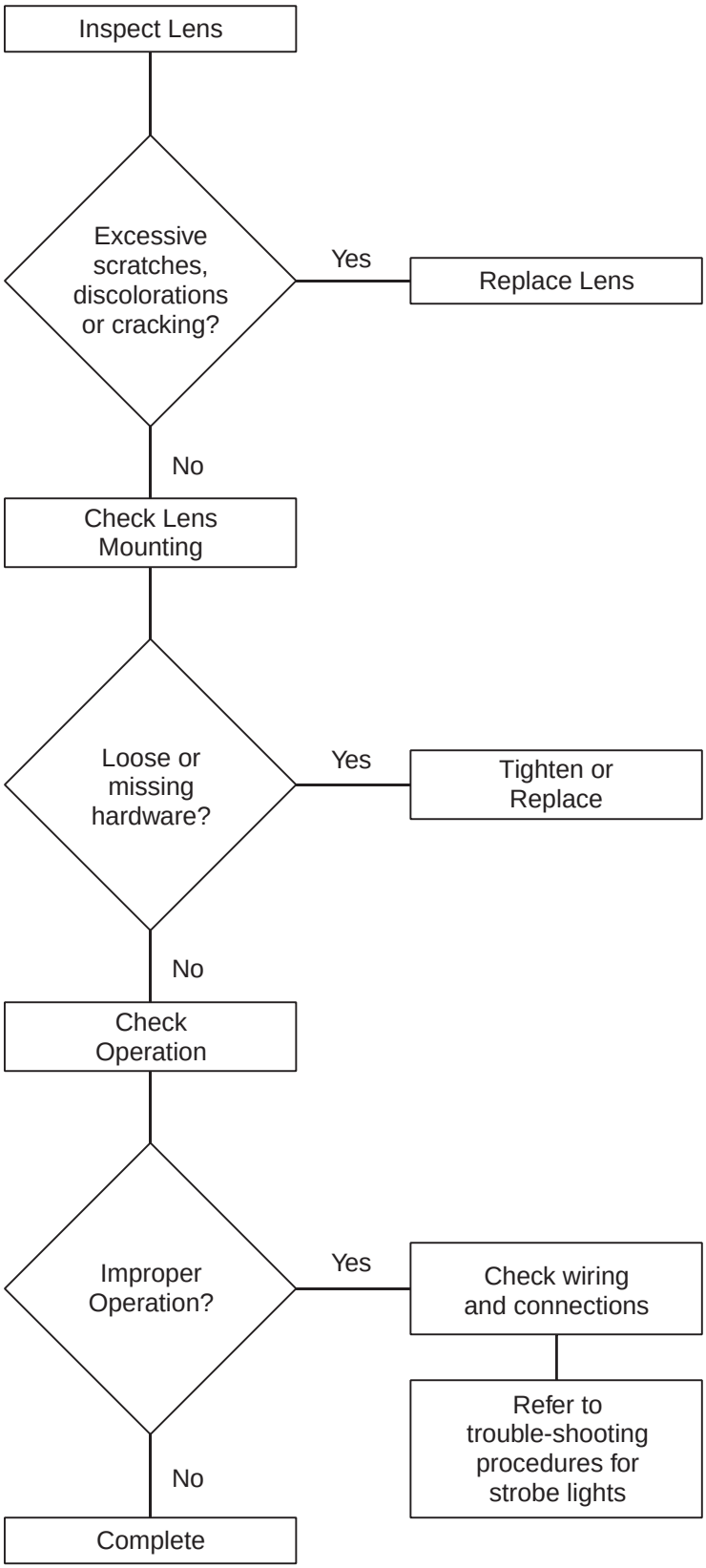


Figure 24B

QTY.		ITEM	PART NUMBER	DESCRIPTION
1	1	7	38-0130106-00	A427-3 GASKET
1	1	5	02-0250276-00	FLASHTUBE ASSEMBLY(A610)
-	1	4	19-170052-009	RETAINER,LENS(A626)
1	-	2	68-2290005-34	LENS RFI COATED
-	1	1	68-2290005-30	LENS, CLEAR(A612)
*			01-0770053-13	A650-D STROBE ASSY.(SHIELDED/CLEAR)
	*		01-0770053-00	A650 STROBE ASSY.

STROBE POWER SUPPLY CROSS REFERENCE REPLACEMENT LISTING

Old Part Number	Old Model Number	Description	Current Replacement
A413,HS-41-14	HS,41	Single strobe unit, SingleFlash, 14 VDC, 33 joule	**Model HDACF** P/N 01-0770028-05
A413,HS-41-28	HS,41	Single strobe unit, SingleFlash, 28 VDC, 33 joule	
A413,HD-14	HD	Dual strobe unit, SingleFlash, 14 VDC, alternating	
A413,HD-28	HD	Dual strobe unit, SingleFlash, 28 VDC, alternating	
A413,HD-42-14	HD,42	Dual strobe unit, SingleFlash, 14 VDC, alternating 33 joule	
A413,HD-42-28	HD,42	Dual strobe unit, SingleFlash, 28 VDC, alternating 33 joule	
A413,T2-14	HD,T2	Dual strobe unit, SingleFlash, 14 VDC, simultaneous, 16 joule	
A413,T2-28	HD,T2	Dual strobe unit, SingleFlash, 28 VDC, simultaneous, 16 joule	
A413,T2-DF-14	HD,T2,DF	Dual strobe unit, DoubleFlash, 14 VDC, simultaneous, 16 joule	
A413,T2-DF-28	HD,T2,DF	Dual strobe unit, DoubleFlash, 28 VDC, simultaneous, 16 joule	
A413,T3-14	HD,T3	3 strobe unit, SingleFlash, 14 VDC, w/trigger function	
A413,T3-28	HD,T3	3 strobe unit, SingleFlash, 28 VDC, w/trigger function	
A413,HD,DF-14	HD,DF	3 strobe unit, DoubleFlash, 14 VDC	
A413,HD,DF-28	HD,DF	3 strobe unit, DoubleFlash, 28 VDC	
A413,T3-DF-14	HD,T3,DF	3 strobe unit, DoubleFlash, 14 VDC, w/trigger function	
A413,T3-DF-28	HD,T3,DF	3 strobe unit, DoubleFlash, 28 VDC, w/trigger function	
A413A,HDA-DF-14	HDA,DF-14	4 strobe unit, DoubleFlash, 14 VDC	
A413A,HDA-DF-28	HDA,DF-28	4 strobe unit, DoubleFlash, 28 VDC	
A413A,HDA-DF-14/28	HDA,DF-14/28	4 strobe unit, DoubleFlash, 14 or 28 VDC	
A413A,HDA-CF-14/28	HDA,CF-14/28	4 strobe unit, CometFlash®, 14 or 28 VDC	
A412A,HS-14	HS,14	Single strobe unit, SingleFlash, 14 VDC	**Model A490TSC** P/N 01-0770062-03
A412A,HS-28	HS,28	Single strobe unit, SingleFlash, 28 VDC	
A412A,HS,DF-14	HS,DF-14	Single strobe unit, DoubleFlash, 14 VDC	
A412A,HS,DF-28	HS,DF-28	Single strobe unit, DoubleFlash, 28 VDC	
A490,TS-14	HTS	Single strobe unit, SingleFlash, 14 VDC	
A490,TS-28	HTS	Single strobe unit, SingleFlash, 28 VDC	
A490A,TS,DF	HTS-DF	Single strobe unit, DoubleFlash, 14 or 28 VDC	
A490A,TS,CF-14/28	HTS-CF	Single strobe unit, CometFlash®, 14 or 28 VDC	
A490,T-14	HT	Single strobe unit, SingleFlash, 14 VDC	**Model HTCF** P/N 01-0770006-08
A490,T-28	HT	Single strobe unit, SingleFlash, 28 VDC	
A490,T,DF-14	HT,DF	Single strobe unit, DoubleFlash, 14 VDC	
A490,T,DF-28	HT,DF	Single strobe unit, DoubleFlash, 28 VDC	
A490,T,DF-14/28	HT,DF	Single strobe unit, DoubleFlash, 14 or 28 VDC	
A490,T,CF-14/28	HT,CF	Single strobe unit, CometFlash®, 14 or 28 VDC	
A490,TC,DF-14	HTC,DF	Single strobe unit, DoubleFlash, 14 VDC w/mtg. plate	**Model HTCCF** P/N 01-0770006-09
A490,TC,DF-28	HTC,DF	Single strobe unit, DoubleFlash, 28 VDC w/mtg. plate	
A490,TC,DF-14/28	HTC,DF	Single strobe unit, DoubleFlash, 14 or 28 VDC w/mtg. plate	
A490,TC,CF-14/28	HTC,CF	Single strobe unit, CometFlash®, 14 or 28 VDC w/mtg. plate	
	HR,14	Self-Contained Strobe, 14 VDC	**Model HRCFA** P/N 01-0770029-( ) Specify lens color R=Red, W=White S=Split Red/White
	HR,28	Self-Contained Strobe, 28 VDC	
	HR,DF,14	Self-Contained Strobe, DoubleFlash 14 VDC	
	HR,DF,28	Self-Contained Strobe, DoubleFlash 28 VDC	
	HR,DF,14/28	Self-Contained Strobe, DoubleFlash 14 or 28 VDC	
	HR,DFA,14/28	Self-Contained Strobe, DoubleFlash 14 or 28 VDC (A402A lens)	


Inspect Lens
Excessive scratches, discolorations or cracking?
Yes
Replace Lens
No
Check Lens Mounting
Loose or missing hardware?
Yes
Tighten or Replace
No
Check Operation
Improper Operation?
Yes
Check wiring and connections
Refer to trouble-shooting procedures for strobe lights
No
Complete

STROBE SYSTEM TROUBLE-SHOOTING

TROUBLE-SHOOTING PROCEDURES FOR AVIATION ANTI-COLLISION STROBE LIGHT SYSTEMS

WHEN REPAIRING WHELEN ANTI-COLLISION STROBE LIGHT SYSTEMS, USE ONLY WHELEN FAA APPROVED HARDWARE. BE CAREFUL OF STROBE LIGHT PARTS THAT ARE SIMILAR IN APPEARANCE!

The Whelen Aviation Strobe Light is a condenser discharge strobe light system. A condenser is charged to approximately 450 volts DC, then discharged across a xenon flash tube at controlled intervals. The condenser is parallel across the xenon flash tube that is designed to hold off the 450 volts DC applied, until the flash tube is triggered by an external pulse. This pulse is generated by a solid-state timing circuit in the power supply.

When trouble-shooting a strobe light system, first determine if the trouble is with the flash tube or the power supply. This can be accomplished by replacing the flash tube assembly with a good operating flash tube, or with the use of a Whelen Strobe Check unit.

Whelen's power supplies are protected against a short or open circuit on the output. In either case, the power supplies will effectively turn themselves off when subjected to a shorted output of a xenon flash tube that refuses to flash.

WARNING: Strobe light power supplies are meant to be used, not to remain in an inactive state. Use them at all times, this will improve their proper functioning. Any strobe light power supply that has been out of service for a long period of time is subject to failure because the electrolytic condenser loses the polarity formation. **A strobe light power supply not having been used for one year or longer is vulnerable to failure, applies to 1993 & older units.**

If this is the case, it is recommended to start operating the system on a voltage that is reduced by 25 percent for 10 to 15 minutes before putting the power supply into normal service. This will prevent overheating of the condenser while they reform. If the power supply, after a long period of non use, is operated at full voltage immediately, there is an excellent possibility that the condenser will become overheated.

POWER SUPPLY TEST PROCEDURES

THE POWER SUPPLY IS A **HIGH VOLTAGE** DEVICE. LET THE POWER SUPPLY BLEED DOWN FOR 10 MINUTES AFTER TURNING OFF POWER BEFORE HANDLING.

WARNING: Reverse polarity of the input power, for just an instant, will permanently damage the power supply. This damage is sometimes not immediately apparent, but will cause failure later on.

External trigger switching is not provided on the A413A, HDA-DF Strobe Light Power Supply (Reference A413,T3-DF old style strobe light power supply, outlet #1). Do not short out high voltage for extended length of time; it will cause overheating of the output diodes and cause possible failure.

A normal operating power supply emits an audible tone. If there is no sound emitted, investigate.

1. Determine that there is a proper input voltage at the power supply. If this test is positive go to step 2.
2. Clear all possible shorts at the power supply, by disconnecting the output cables from the power supply outlets, and connect an operating strobe lighthead assembly or a Strobe Check unit directly to the power supply outlet, then apply the required voltage to the power supply input. If this application proves positive the power supply is in working condition, and the problem may be with the interconnecting cables.

CABLE CONTINUITY CHECK PROCEDURES

If pins 1 and 3 are reversed, or if there is a short between pins 1 and 2 of the interconnecting cable, the power supply will be rendered non-operable until the short is cleared. A short of this type will not cause any permanent damage to the power supply. However a discharge of the condenser across pin 1 and pin 3 will destroy the trigger circuit in the power supply.

1. Check for continuity between the connectors of each interconnecting cable:

   Pin 1 to pin 1 (red wire = anode +).

   Pin 2 to pin 2 (black wire = flash tube ground -).

   Pin 3 to pin 3 (white wire = trigger).

2. Check for shorts between pins 1 and 2, pins 1 and 3, and pins 2 and 3 of the interconnecting cable.

NOTE: When pins 1 and 2, or pins 2 and 3 are reversed, the system will appear to operate normally, but these conditions will cause early flash tube failure, and void the flash tube warranty.

XENON FLASH TUBE PROCEDURES

1. A xenon flash tube can be very photosensitive. One will flash normally when exposed to an external light source, but may become hard to fire when subjected to darkness.
2. They will become hard firing with age, or when exposed to a very high temperature. A hard firing tube will sometimes operate with the engine running, but will fail when operated on a low battery.
3. They can develop a leak through eggshelling of the glass, or a leak can develop around the seal of the wire to the glass. This is caused by hot and cold cycling of normal operating of the system.
4. They can go into self-ionization (continuously glow a light blue), thus rendering the entire system non-operational until flash tube is replaced. This most likely occurs when the input voltage is highest. This can be checked by turning the system off. When turning the system back on, it generally will operate normally for a few flashes before going back into self-ionization.

ANY OF THE ABOVE MENTIONED CONDITIONS ARE REASONS FOR REPLACEMENT OF THE XENON FLASH TUBE.

NOTE: Installing one new flash tube in any multi-head strobe light system, will sometimes cause the remaining old flash tube to misfire or skip. This signifies that the old flash tube is nearing the end of it's service life. However, to check the questionable flash tube, install it in a system and apply a reduced voltage, approximately 20 percent, to the input to the power supply. If the flash tube will operate at this reduced level, it still has a great deal of service life in it.

WHELEN'S (CometFlash® "CF" Strobe Light System) consists of four high energy pulses per burst of light, 45 bursts of light per light.

NOTE: Whelen Engineering does not recommend attempting to repair their strobe light power supplies in the field. It is recommended to take advantage of our 48-hour Repair Service.

R.F.I. and E.M.I. Problems (Radio Noise)

Whelen Engineering strobe light power supplies are designed with a low pass filter built in to keep R.F.I. and E.M.I. down to a minimum, however, sometimes there will be interference in the radios by the strobe light system. Most always, this is an installation problem, not a strobe light power supply problem.

The power supply should acquire its power from a low impedance source, such as the alternator or generator end of the electrical buss. Historically, the rotating beacon or strobe light circuit breaker is added on the electrical buss at the opposite end, with the radio in between the strobe breaker and the low impedance end of the electrical buss. Any noise generated by the power supply will be transmitted into the radio through the A+ input lead to the radio. Most of the new radio equipment manufactured today has inadequate input filtering, and any noise on the electrical buss is amplified in the radio and produced through the speaker and/or head phones loud and clear.

Two things can be done to alleviate the problem:

1. Connect the strobe light circuit breaker to the low impedance end of the electrical buss, using a 16 gauge jumper, as close to the battery as possible.
2. Install additional filtering in the radio A+ line, or provide an isolated A+ source for the radios by installing a filter choke in series with the radio input power lead and a filter adapter to ground and reference all radios to their filter. This will also improve the radio system from other line noises. REF 2200 mfd@50V Capacitor.

Frequently the noise is not on the A+ lead but is conducted through the ground circuit. Alternator, electrical motor, fuel pumps and strobe light power supplies draw heavy current through the ground circuit of the aircraft's frame. Any voltage drop in the ground circuit between the battery ground and the radio ground can look like a signal to the radios.

When the speaker, head phone and microphone use the aircraft's ground for return to the radios, one will always experience some interference. The amount of interference depends upon how much potential difference there is between the two ground points. Isolating the audio grounds from the airplane ground at the speaker, head phone and microphone junctions, and grounding the aforementioned with the radio at one central ground point, will eliminate the majority of all ground inducted radio noise.

Do not parallel any audio leads with any power lead supplying energy to a noise generator; (i.e.) alternator, electric motor or DC choppers such as inverters and strobe light power supplies.

The interconnecting cable between the power supply and the remote strobe lighthead assembly radiate very little, for the output circuit of the power supply is very low impedance. They can radiate RF like an antenna if the shield is not terminated to ground. The radiation of RF energy is reduced to a minimum by properly terminating the shield at one end or the other, generally the power supply end, but which ever proves the quietest ground. Do not terminate both ends.

When installing a strobe light system, provide a good ground and a low impedance source to the strobe light power supply. Eliminate ground loops in audio circuits by using a centrally located ground point for all audio grounds.

Whelen Engineering has available RF shielded flash tubes and strobe lighthead assemblies to suppress the trigger pulse or clicking sometimes heard in the radios.

If noise problems persist, and the procedures described have not cleared them up, please contact the Whelen Engineering Company for assistance.

STROBE SYSTEM TESTER

Description

A strobe system tester designed to determine the reason the strobe light system is not working properly. This kit contains an instruction sheet and a trouble shooting procedure sheet. Test power supplies and interconnecting cables. It also comes with an adapter for testing Grimes and Hoskins strobe light systems.

Model Number	Part Number	Description
6542600	01-0765246-00	Strobe System Tester

Please Order Part Number: 01-0765246-00.

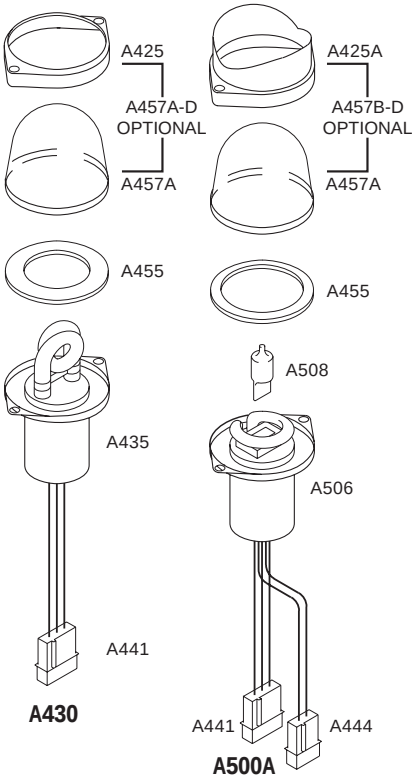
Photos Show Typical Installations

PARTS BREAKDOWN - AIRCRAFT STROBE BEACONS

Model Number	Part Number	Description
5068500	01-0450685-00	Clamp Ring Assy.
A402AR	68-2170504-50	Optic Lens, Red
A402AS	68-2170504-60	Optic Lens, Split, Red/White
A402AW	68-2170504-30	Optic Lens, White
A424	11-430005-100	Taillight, Mounting Cup
A425	19-130000-100	Taillight, Lens Retainer
A425AH	19-0150350-01	Retainer, Horizontal Mount
A425AV	19-0150350-02	Retainer, Vertical Mount
A426	19-190000-009	Retainer for A428 Lens
A427	02-0250274-00	Strobe Tube Assy.
A427-4	38-0130107-00	Gasket/Spacer for A428 Lens
A428	68-4290001-30	Lens
A428C	02-0350033-00	Lens, Radio Shielded
A428D	02-0350057-00	Lens/Retainer Assy Radio Shielded
A435	02-0350054-00	Strobe Tube Assy, A430 Series
A440	19-130074-009	Mounting Adapter Ring
A441	01-0430011-00	Kit, 3 Pin Connector & contacts
A442	01-0410823-00	Kit, 3 Socket Connector & contacts
A443	02-0230081-00	Trigger Jumper Plug for HDACF
A444	02-0230007-00	Kit, 2 Pin Connector & contacts
A446	02-0230085-00	Kit, 2 Socket Connector & contacts
A455	38-0230002-00	Gasket, A457A Lens
A457A	68-4270002-30	Lens
A457AD	02-0350038-35	Lens, Shielded
A457BDH	02-0350038-37	Lens/Retainer Assy, Radio Shielded, Vertical Mounting
A457BDV	02-0350038-36	Lens/Retainer Assy, Radio Shielded, Horizontal Mounting
A469A	01-0770044-00	Strobe Tube Assy.(non reflective base)
A469B	01-0770044-02	Strobe Tube Assy.
A469D	01-0770044-01	Radio Shielded Strobe Tube Assy.
A469DK	01-0710834-00	Radio Shielding Kit for A469A
A504	06-150058-001	Disc, Lamp Socket for A555A Series
A506	02-0350034-00	Strobe Tube/Socket Assy. For A500A
A507	02-0350260-00	Lamp Socket for A555A Series
A50814	34-0412070-63	Halogen Lamp 14V 25 Watt
A50828	34-0428070-64	Halogen Lamp 28V 25 Watt
A605	02-0350259-00	Base Plate Assy. For A600 Series
A606	19-170049-009	Retainer for A600 Series
A610	02-0250276-00	Strobe Tube
A612	68-2290005-30	Magnifying Lens for A610
A612D	02-0350071-35	Lens/Retainer Assy. Radio Shielded used on A600 Series
A615	68-4250066-30	Taillight Lens used on A600 Series
A616	38-0130090-00	Gasket for A615 Taillight Lens
A626	19-170052-009	Retainer for A650 Series
A626D	02-0350072-35	Lens/Retainer Assy. for A650 Series, Radio Shielded
H102	07-730068-000	Mounting Adapter for A470A Series
H103	11-230079-000	Mounting Adapter for A470A Series 3-3/4 dia mounting pattern
SA402	68-4230044-30	Lens, Clear for SACF & A450 Series
SA406	02-0350053-00	Strobe Tube for SACF & A450 Series
SA4181	38-0230104-00	Gasket for SA402 Lens
W1282	19-150002-009	Lens Retainer for W1285 Series
W1283	38-0230021-00	Gasket for W1284 Lens
W1284G	68-4230020-40	Position Light Lens, Green
W1284R	68-4230020-50	Position Light Lens, Red
W12852	02-0350003-01	Base Plate Assy.
W129014	34-0414020-65	Position Light Lamp, 14V
W129028	34-0428020-65	Position Light Lamp, 28V

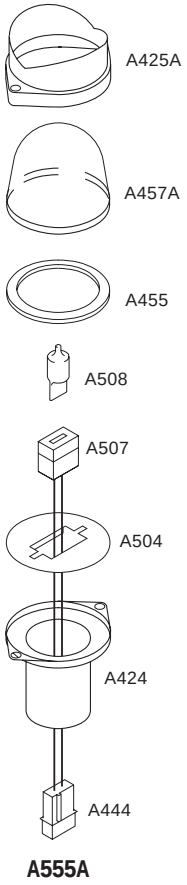
A copy of the Whelen warranty regarding products described on these pages may be obtained free of charge from the Whelen Engineering Company, Inc., Chester, Connecticut 06412.

PARTS BREAKDOWN - AIRCRAFT STROBE BEACONS

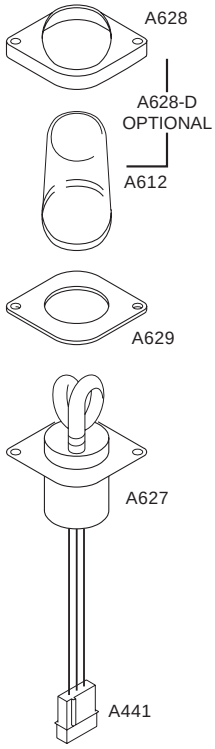


A430

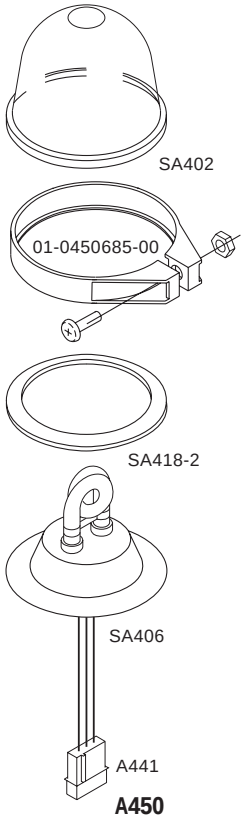
A500A



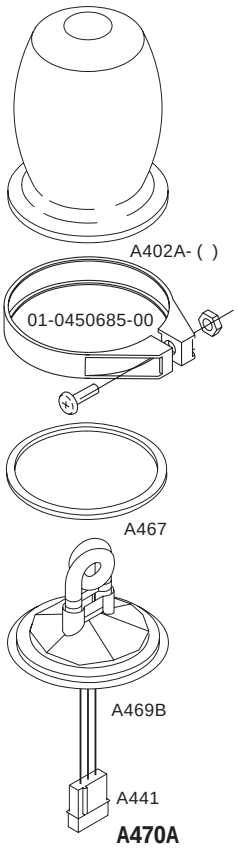
A555A



A625

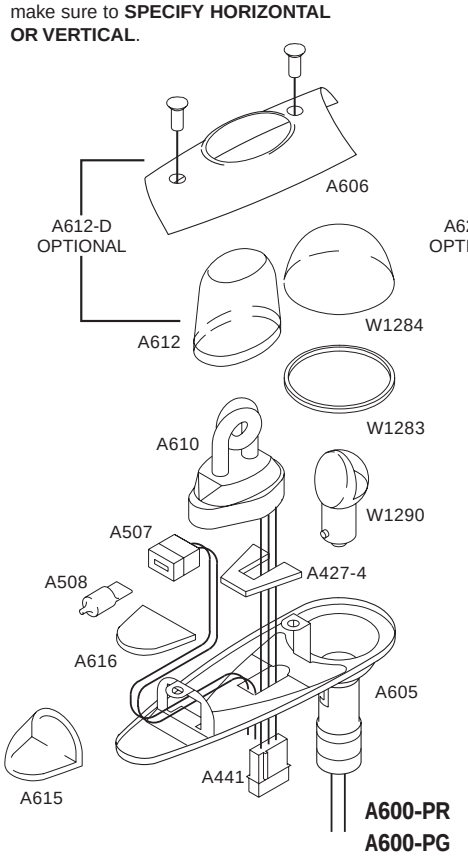


A450

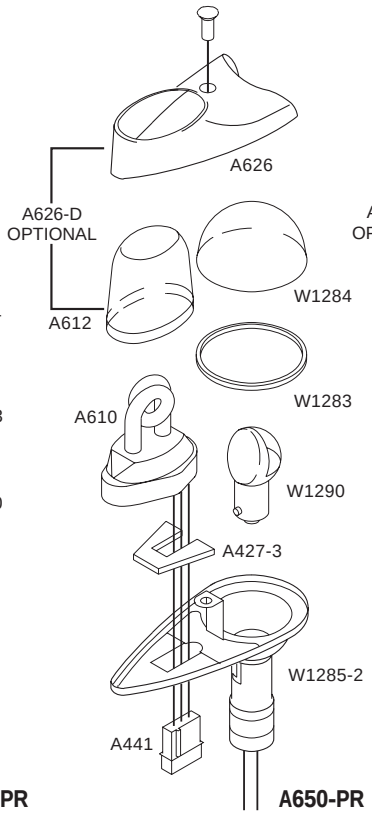


A470A

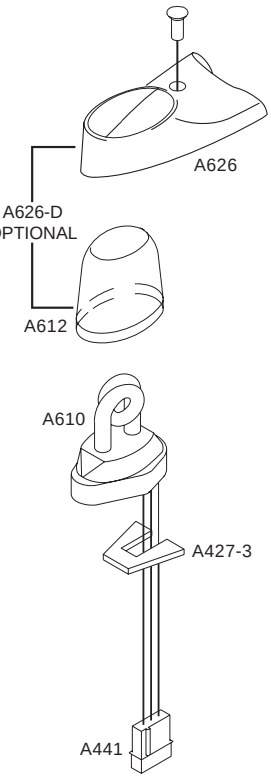
IMPORTANT NOTE:
When ordering models A500A and A555A, or lens assembly part number A457B-D, make sure to **SPECIFY HORIZONTAL OR VERTICAL**.



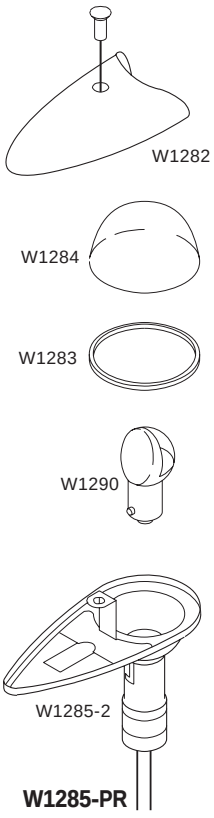
A600-PR
A600-PG



A650-PR
A650-PG



A650



W1285-PR
W1285-PG

PIONEERS IN SAFETY SIGNALS

WHELEN®

ENGINEERING COMPANY, INC.

AVIATION DIVISION

Effective: November 1, 2006

Subject: Whelen STC Permission Statement

To Whom It May Concern:

Whelen Engineering Company hereby authorizes qualified aviation installers to use the following STC installation data to modify aircraft for installation of Whelen Anti-Collision lighting systems:

SA615EA
SA800EA
SA6NE
SA21NE

Jim Olson
Vice President
Aviation Lighting Products

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA615EA

This Certificate issued to Whelen Engineering Company, Inc.
Route 145, Winthrop Road
Chester, Connecticut 06412-0684

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3, 6, 23, 27 *of the* Civil Air/Federal Aviation *Regulations.*

Original Product Type Certificate Number: See Attached Eligibility List dated June 18, 1999

Make:

Model:

Description of Type Design Change:

Installation of Whelen Anti-Collision Strobe Light Systems, Part Number 01-0770006-( ), 01-0770028-( ), 01-0770029-( ), 01-0770062-( ), 01-0770900-( ), and 01-0771055-( ), as replacement for originally installed anti-collision lights, when installed in accordance with Whelen Anti-Collision Light Systems Installation and Service Manual, dated January 2007, or later FAA-approved revision.

Limitations and Conditions:

(See continuation sheet 2 of 6)

The STC holder will provide each person it permits to use this certificate to alter the product written evidence of the agreement in a form acceptable to the Administrator.
This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: February 19, 1968

Date of issuance: May 14, 1968

Date reissued:

Date amended: February 22, 2007

See page 2 for amendment history.

By direction of the Administrator

(Signature)

Robert G. Mann
Manager, Boston Aircraft Certification Office

(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA615EA
Date Amended: February 22, 2007

Limitations and Conditions (Continued):

1. These lights comply with the anti-collision light standards of the FARs as follows:

   a. With the red or combined red/white lens; those effective on or prior to August 10, 1971.
   b. With the white lens; those effective on August 11, 1971.

2. Install the following placard Whelen Part No. A421, or other FAA approved equivalent:

WARNING

TO AVOID OPTICAL ILLUSION AND SEVERE VERTIGO, TURN
ANTI-COLLISION LIGHTS OFF UPON ENTERING CLOUDS, FOG OR HAZE

3. The aircraft listed on the Eligibility List are those which have had both the physical installation of the lights substantiated and the field of coverage checked including the 20° mask. Aircraft not included in the list can use these lights when the physical installation and field of coverage is substantiated as indicated in the Whelen Anti-Collision Light Systems Installation and Service Manual, May 2005, Document No. 05131, Rev -, or later FAA-approved revision, section titled "Aircraft Not Specifically Mentioned on the Eligibility List".

4. The approval of this change in type design applies basically to aircraft listed on the attached eligibility list. This approval should not be extended to other aircraft of these models on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of the aircraft. This determination should include a night flight check as specified in AC 43.13-2, Chapter 4, Paragraph 42a.

NOTE: Aircraft whose application for type certificate was made before April 1, 1957, may, but need not, comply with the field of coverage requirements of FAR 23(27).1401(b). Compliance with FAR 91.33(c) may be shown provided the light installation is in accordance with data approved prior to August 11, 1971, and the applicable criteria of Advisory Circular 43.13-2 are met.

AMENDMENT HISTORY:

This STC has been previously amended on the following dates:

7/15/68, 7/19/68, 11/25/68; 1/17/69, 2/18/69, 4/18/69; 3/3/70, 12/10/70; 4/21/71, 9/14/71; 5/18/72, 9/22/72, 11/7/72; 7/21/76; 10/4/78; 3/26/81, 8/5/81, 8/25/81; 5/21/82; 7/16/91; 6/7/99; 6/18/99; 6/17/05

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA615EA

Date Amended: February 22, 2007

ELIGIBILITY LIST June 18, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Aero Commander	*100, 100-180	1A21
	111	A11SO
	112	A12SO
	500, 500-A, 500-B, 500-S, 500-U, 520, 560, 560A, 560E	6A1
	560F, 680, 680E, -F, 720 680FL, 680FL(P), 680T, V, W, 681, 690, 685	2A4
American Aviation	*AA-1, *AA-1A	A11EA
	AA-5	A16EA
Beech	23, A23, A23A, A23-19, -24, -19A, B19, M19A, B23, C23, A24, A24R	A1CE
	35, A35, B35, C35, D35, E35, F35 G35, 35R	A-777
	H35, J35, K35, M35, N35, P35, S35, V35, V35A, V35B, 35-33, 35-A33, 35-B33, 35-C33, 35-C33A, 36, A36, E33, E33A, E33C, F33, F33A, F33C	3A15
	50(L-23A), B50(L-23B), C50, D50(L-23E), D50A, D50B, D50C, D50E, E50(L-23D, RL-23D), F50, G50, H50, J50	5A4
	95-55, 95-A55, 95-B55, 95-B55B(T-42A) 95-B55D, 95C55, 95, B95, B95A, D95A, E95, D55, D55A, E55, E55A, 56TC, A56TC, 58	3A16
	65(L23F), A65, A65-8200, 65-8200, 65-80 65-A80-8800, 65-B80, 65-88, B90, C90, 65-90, 65-A90, 65-A90-1, (U-21A, RU-21A, RU-21D), 65-A90-2, (RU-21B), 65-A90-3 (RU-21C), 70	3A20

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA615EA
Date Amended: February 22, 2007

ELIGIBILITY LIST June 18, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Beech (Cont'd)	60, A60	A12CE
	99, 99A, 100	A14CE
Bellanca	14-19-3A, 17-30, 17-30A, 17-31A 17-31ATC	1A3
	7EC, 7ECA, 7FC, 7GC, 7GCA, 7GCAA, 7GCB, 7GCBA, 7GCBC, 7HC, 7JC, 7KCAB	A-759
Bell	***206A, 206B 206L, 206L-1, 206L-3, 206L-4, 407	H2SW
	47B, B3, D, D1, E, G, G-2, H-1	H-1
	47G-2A, -2A-1, -3, -3B, -3B-1, -3B-27 4, -4A, -5, -5A	2H3
	47J, K, J-2, J-2A	2H1
Britten Norman	BN-2, -2A, -2A-2, -2A-6, -2A-8	A17EU
	BN-2A, MK.III	A29EU
Cessna	150, 150A, B, C, D, E, F, G, H, J, K, L, M, A150K, A150L, A150M, 152, A152	3A19
	172, 172A, B, C, D, E, F, G, H, I, K, L, M, N, P	3A12
	175, 175A, B, D, P172D, 172RG	3A17
	177, 177A, B	A13CE
	177RG	A20CE
	180, 180A, B, C, D, E, F, G, H, J, K	5A6
	182, 182A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, T182, R182, TR182	3A13
	185, 185A, B, C, D, E, A185E, A185F	3A24
	188, 188A, B, A188, A188A, A188B, T188C	A9CE

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA615EA
Date Amended: February 22, 2007

ELIGIBILITY LIST June 18, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Cessna (Cont'd)	206, P206, P206A, B, C, D, E, TU206A, B, C, D, E, F, G, TP206A, B, C, D, E, U206, U206A, B, C, D, E, F, G	A4CE
	207, 207A, T207, T207A	A16CE
	210, 210A, 210B, 210C, 210D, 210E, 210F, T210F, 210G, T210G, 210H, T210H, 210J, T210J, 210K, 210-5(205), 210-5A(205A), T201K, 210L T210L, T210M, T210N, 210N, P210N	3A21
	310, 310A, B, C, D, E, F, G, H, I, J, 310J-1, E310J, 310K, L, N, P, T310P, 310Q, T310Q	3A10
	*320, A, B, C, D, E, F, 320-1, 340	3A25
	*336	A2CE
	337, 337A, B, C, D, E, F, T337D, E F, G	A6CE
	*401, 401A, B, 402, 402A, B, 411, 411A 421, 421A, 414, 421B	A7CE
DeHavilland of Canada	DHC-2, MK. I, MK. II, MK. III	A-806
	DHC-3	A-815
	DHC-6, Models 1, 100, 110, 200, 210, 300	A9EA
Fairchild Hiller	FH-1100	H2WE
Helio	H-250, H-295, H-391, H-391B, H-395 H-395A	1A8
Hughes	269A, 269A-1, 269B, 269C	4H12
	369, A, H, HM, HS, HE	H3WE

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA615EA

Date Amended: February 22, 2007

ELIGIBILITY LIST June 18, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Piper	**PA-11	A-691
	**PA-12	A-780
	**PA-14	A-797
	**PA-15	A-800
	**PA-16	1A1
	**PA-17	A-805
	**PA-18 Series, PA-19	1A2
	**PA-20	1A4
	**PA-22 Series	1A6
	**PA-25 Series	2A8
	PA-23, PA-23-160, *PA-23-235 *PA-23-250, *PA-E23-250	1A10
	PA-24, -24-250, -24-260, -24-400	1A15
	PA-28-140, -28-150, -28-151, -28-160, -28-161, -28-180, -28-235, -28S-160, -28R-180, -28S-180, -28-181, -28R-200, -28R-201, -28R-201T, -28RT-201, -28RT-201T, -28-201T, -28-236	2A13
	PA-30, PA-39	A1EA
	PA-31P	A8EA
	PA-31, PA-31-300, 325, 350	A20SO
	PA-32-260, -300, -32S-300	A3SO

NOTES TO ELIGIBILITY LIST:

*1. Aircraft as marked require specific attention to proper balancing of the rudder. Refer to the Manufacturer's Service Manual for balancing instructions.

**2. Installations on these aircraft require prior or concurrent installation of STC SA4-977.

***3. The Model HS-24 replaces the Anti-Collision beacon supplied in Bell's Night Flying Kit, P/N 206-706-303 on Models 206A and 206B.

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA800EA

This Certificate issued to Whelen Engineering Company, Inc.
Route 145, Winthrop Road
Chester, Connecticut 06412-0684

certifies that the change in the type design for the following product with the limitations and conditions thereof as specified hereon meets the airworthiness requirements of Part 3, 6, 23, 27 *of the* Civil Air/Federal Aviation *Regulations.*

Original Product Type Certificate Number : See Attached Eligibility List dated September 8, 1999

Make :

Model :

Description of Type Design Change:

Installation of Whelen Anti-Collision Strobe Light System, Part Numbers 01-0770019-( ), 01-0770024-( ), 01-0770030-( ), 01-0770031-( ), 01-0770032-( ), 01-0770053-( ), 01-0770054-( ), and 01-0770058-( ), and applicable associated power supplies, in accordance with Whelen Anti-Collision Light Systems Installation and Service Manual, May 2005, Document No. 05131, Rev -, or later FAA-approved revision.

Limitations and Conditions:

(See continuation sheet 2 of 8)

The STC holder will provide each person it permits to use this certificate to alter the product written evidence of the agreement in a form acceptable to the Administrator.
This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application : May 2, 1969

Date of issuance : November 14, 1969

Date reissued :

Date amended : June 17, 2005

See page 3 for amendment history.

By direction of the Administrator

(*Signature*)

Richard B. Noll
Manager, Boston Aircraft Certification Office

(*Title*)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

FAA Form 8110-2(10-68) Page 1 of 8 *This certificate may be transferred in accordance with FAR 21.47.*

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA800EA
Date Amended: June 17, 2005

Limitations and Conditions (Continued):

1. The Anti-Collision Lights listed under Description of Type Design Change meet the requirements of FAR 23 and the similarly numbered sections of FAR 27 as follows:

   a. 23.1397(c), 23.1401(c), (d), (e), effective August 11, 1971

   b. 23.1401(f) in effect on August 10, 1971.

   c. Part numbers 01-0770019-19 and 01-0770019-22 with power supplies approved under STC SA615EA meet FAR 23.1401(f) effective August 11, 1971.

   d. Part numbers 01-0770054-00 through 01-0770054-07, 01-0770058-03, and 01-0770058-13 with power supplies producing a minimum of 20 joules per flash meet FAR 23.1401(f) effective August 11, 1971.

2. To complete the approval of these lights as anti-collision light systems, the installations on individual aircraft must be checked to show compliance with FAR 23.1401(b) (Field of Coverage); unless the "Anti-Collision Light Systems Installation and Service Manual", Document 05131, Rev -, or later FAA approved revision, specifically indicates that a particular installation has been checked for compliance with the aforementioned sub-section.

   NOTE: The aforementioned installation and Service Manual contains an acceptable method for checking the adequacy of coverage when using two lights (wing tips) or three lights (wing tips and tail lights). For some other acceptable methods, see Advisory Circular AC 43.13-2, Chapter 4, Paragraph 46b(2). Installations made in accordance with STC SA800EA Amendments prior to 9/14/71 need only be checked for obstructed visibility to meet anti-collision light requirements.

3. Install the following placard, Whelen Part No. A421-1, or other FAA approved equivalent, in view of the pilot:

   WARNING

   TURN OFF STROBE LIGHTS WHEN TAXING IN VICINITY OF OTHER
   AIRCRAFT OR DURING FLIGHT THROUGH CLOUDS, FOG OR HAZE.
   STANDARD POSITION LIGHTS TO BE ON FOR ALL NIGHT OPERATIONS.

4. On all helicopter installations, install the following placard in view of the pilot:

   THE WHITE STROBE LIGHT MUST BE TURNED OFF
   DURING ALL NIGHT TAKEOFFS AND LANDINGS.

5. The modifications approved by this STC can be installed in conjunction with those approved by STC SA615EA or STC SA738EA as delineated in the "Anti-Collision Light Systems Installation and Service Manual", Document 05131, Rev -, or later FAA approved revision.

(See continuation sheet 3 of 8)

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA800EA
Date Amended: June 14, 2005

Limitations and Conditions (Continued):

6. On Mitsubishi MU-2B, MU-2B-10, -20, -15, -30 aircraft: Whelen's Mitsubishi MU-2B, -10, -20, -15, -30 Wing Tip and Tail Strobe Light Installation Procedure", dated 19 February 1971, is required in addition to the "Anti-Collision Light Systems Installation and Service Manual", Document 05131, Rev -, or later FAA approved revision.

7. This approval should not be incorporated in any aircraft for these specific models on which other approved modifications are incorporated, unless it is determined that the interrelationship between this change and any of those previously incorporated approved modifications will not introduce any adverse effect upon the airworthiness of the aircraft. This determination should include a night flight check as specified in AC 43.13-2, Chapter 4, Paragraph 42A.

NOTE: Aircraft whose application for type certification was made before April 1, 1957, may but need not, comply with the field of coverage requirements of FAR 23(27).1401(b). Compliance with FAR 91.33(c) may be shown provided the light installation is in accordance with data approved prior to August 11, 1971, and applicable criteria of Advisory Circular 43.13-2 are met.

AMENDMENT HISTORY:

This STC has been previously amended on the following dates:

11/20/69; 4/23/70, 12/10/70; 5/26/71, 9/14/71; 5/18/72, 9/22/72, 11/7/72; 7/21/76, 7/30/76; 12/30/77; 2/21/78, 10/4/78; 5/17/79; 3/26/81, 8/5/81, 8/25/81; 5/21/82; 7/16/91; 11/22/93; 6/7/99; 6/18/99; 9/8/99

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA800EA
Date Amended: June 17, 2005

ELIGIBILITY LIST
September 8, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Aero Commander	*100, 100-180	1A21
	111	A11SO
	112	A12SO
	500, 500A, 500B, 500-S, 500-U, 520, 560, 560A, 560E	6A1
	560F, 680, 680E, -F, 720 680FL, 680FL(P), 680T, V, W, 681, 690, 685	2A4
American Aviation	*AA-1, *AA-1A	A11EA
	AA-5	A16EA
Beech	23, A23, A23A, A23-19, -24, -19A, B19, M19A, B23, C23 A24, A24R	A1CE
	35, A35, B35, C35, D35, E35, F35, G35, 35R	A-777
	H35, J35, K35, M35, N35, P35, S35, V35, V35A, V35B, 35-33 35-A33, 35-B33, 35-C33, 35-C33A, 36, A36, E33, E33A, E33C, F33, F33A, F33C	3A15
	50(L-23A), B50(L-23B), C50 D50(L-23E, D50A, D50B, D50C, D50E, E50(L-23D, RL-23D), F50, G50, H50, J50	5A4
	95-55, 95-A55, 95-B55 95-B55B(T-42A), 95-B55D, 95C55, 95, B95, B95A, D95A, E95, D55, D55A, E55, E55A, 56TC, A56TC, 58	3A16

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA800EA
Date Amended: June 17, 2005

ELIGIBILITY LIST
September 8, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Beech (Cont'd)	65(L-23F), A65, A65-8200, 65-80, 65-A80, 65-A80-8800, 65-B80, 65-88, B90, C90, 65-90, 65-A90, 65-A90-1, (U-21A, RU-21A, RU-21D), 65-A90-2, (RU-21B), 65-A90-3, (RU-21C), 70	3A20
	60, A60	A12CE
	99, 99A, 100	A14CE
Bellanca	14-19-3A, 17-30, 17-30A, 17-31A, 17-31ATC	1A3
	7EC, 7ECA, 7FC, 7GC, 7GCA, 7GCAA, 7GCB, 7GCBA, 7GCBC, 7HC, 7JC, 7KCAB	A-759
Bell	206A, 206B, 206L, 206L-1, 206L-3, 206L-4, 407	H2SW
	47B, B3, D, D1, E, C, C-2, H-1	H-1
	47G-2A, -2A-1, -3, -3B, -3B-1, -3B-27, -4, -4A, -5, -5A	2H3
	47J, K, J-2, J-2A	2H1
Britten Norman	BN-2, -2A, -2A-2, -2A-6, -2A-8	A17EU
	BN-2A, MK.III	A29EU
Cessna	120, 140	A-768
	140A	5A2
	150, 150A, B, C, D, E, F, G, H, J, K, L, M, A150K, A150L, A150M, 152, A152	3A19

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA800EA
Date Amended: June 17, 2005

ELIGIBILITY LIST
September 8, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Cessna (Cont'd)	170, 170A, 170B	A-799
	172, 172A, B, C, D, E, F, G, H, I, K, L, M, N, P	3A12
	175, 175A, B, D, P172D 172RG	3A17
	177, 177A, B	A13CE
	177RG	A20CE
	180, 180A, B, C, D, E, F, G, H, J, K	5A6
	182, 182A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, T182, R182, TR182	3A13
	185, 185A, B, C, D, E, A185E, A185F	3A24
	188, 188A, B, A188, A188A, 188B, T188C	A9CE
	190, 195, 195A, B	A-790
	206, P206, P206A, B, C, D, E, TU206A, B, C, D, E, F, G, TP206A, B, C, D, E, U206, U206A, B, C, D, E, F, G	A4CE
	207, 207A, T207, T207A	A16CE
	210, 210A, 210B, 210C, 210D, 210E, 210F, T210F, 210G, T210G, 210H, T210H, 210J, T210J, 210K, 210-5(205), 210-5A(205A), T210K, 210L, T210L, T210M, T210N, 210N, P210N	3A21

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number SA800EA
Date Amended: June 17, 2005

ELIGIBILITY LIST
September 8, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Cessna (Cont'd)	310, 310A, B, C, D, E, F, G, H, I, J, 310J-1, E310J, 310K, L, N, P, T310P, 310Q, T310Q	3A10
	*320, A, B, C, D, E, F, 320-1, 340, 340A	3A25
	*336	A2CE
	337, 337A, B, C, D, T337D, 337E, T337E, 337F, T337F, T337G	A6CE
	*401, 401A, B, 402A, B, 411, 411A, 421, 421A, 414, 421B	A7CE
DeHavilland of Canada	DHC-2 MK. I, MK. II, MK. III	A-806
	DHC-3	A-815
	DHC-6, Models 1, 100, 110, 200, 210, 300	A9EA
Fairchild Hiller	FH-1100	H2WE
Grumman	G-164, G-164A, G-164B	1A16
Helio	H-250, H-295, H-391, H-391B, H-395, H-395A	1A8
Hughes	269A, 269A-1, 269B, 269C	4H12
Piper	**PA-11 **PA-12 **PA-14 **PA-15	A-691 A-780 A-797 A-800

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA800EA

Date Amended: June 17, 2005

ELIGIBILITY LIST
September 8, 1999

AIRCRAFT MANUFACTURER	MODEL	TYPE CERTIFICATE
Piper (Cont'd)	**PA-16	1A1
	**PA-17	A-805
	**PA-18 Series, PA-19	1A2
	**PA-20	1A4
	**PA-22 Series	1A6
	**PA-25 Series	2A8
	PA-23, PA-23-160, *PA-23-235 *PA-23-250, *PA-E23-250	1A10
	PA-24, -24-250, -24-260, -24-400	1A15
	PA-28-140, -28-150, -28-151, -28-160, -28-161, 28-180, -28-235, -28S-160, -28R-180, -28S-180, -28-181, -28R-200, -28R-201, -28R-201T, -28RT-201, -28RT-201T, -28-201T, -28-236	2A13
	PA-30, PA-39	A1EA
	PA-31P	A8EA
	PA-31, PA-31-300, 325, 350	A20SO
	PA-32-260, PA-32-300, -32S-300	A3SO
Mooney	M20B, C, D, E, F, G	2A3
Mitsubishi	MU-2B, MU-2B-10, -15, -20, -30	A2PC
Univair (Stinson)	108, 108-1, -2, -3, -5	A-767

NOTES TO ELIGIBILITY LIST:

*1. Aircraft as marked require specific attention to proper balancing of the rudder. Refer to the Manufacturer's Service Manual for balancing instructions.

**2. Installations on these aircraft require prior or concurrent installation of STC SA4-977.

United States of America

Department of Transportation — Federal Aviation Administration

Supplemental Type Certificate

Number SA21NE

This certificate, issued to Whelen Engineering Company, Incorporated
Deep River, Connecticut 06417

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air Regulations.

Original Product — Type Certificate Number: A3SO
Make: Piper
Model: PA-32A

Description of Type Design Change:

Installation of Whelen A600-PR and A600-PG anti-collision strobe with forward and tail position light assemblies as replacements for wing tip lights installed in accordance with STC SA800EA.

Limitations and Conditions:

1) STC SA800EA must be accomplished prior to or at the same time as this change.

2) This approval shall not be incorporated in any aircraft of this specific model on which other approved modifications are incorporated,

(continued on Page 2 of 2)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: January 6, 1978
Date of issuance: March 1, 1978

Date reissued:
Date amended:

By direction of the Administrator
Louis R Musacchio
(Signature)
LOUIS R. MUSACCHIO
Chief, Engineering & Manufacturing Branch
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2 (10-68)

United States of America
Department of Transportation—Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA21NE

LIMITATIONS AND CONDITIONS:

(continued)

unless it is determined that the interrelationship between this change and any of those previously incorporated approved modifications will not introduce any adverse effect upon the airworthiness of the aircraft.

3) The minimum effective intensity requirements of FAR 23.1401(f), effective August 11, 1971, will be met when the A600-PR and A600-PG are used with power supplies producing a minimum of 20 joules per flash.

...END...

NOTES

WARRANTY AND SERVICE REPAIR STATIONS

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