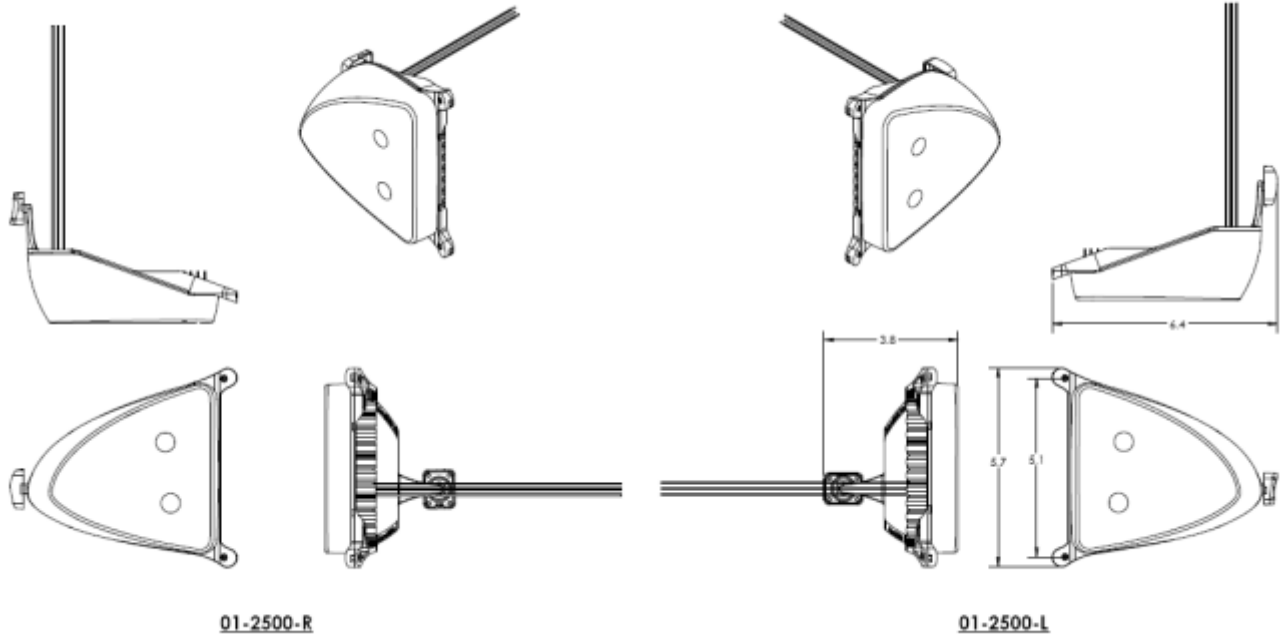


Document 0002-0005  
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**Installation Guide:**  
**AeroSun Vx Wingtip Installation Procedures**  
**P/N 01-2500**  
**LED Landing/Taxi light with**  
**built-in pulse recognition mode**

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## Installation Preparation

Before initiating the installation process, gather the following tools and supplies:

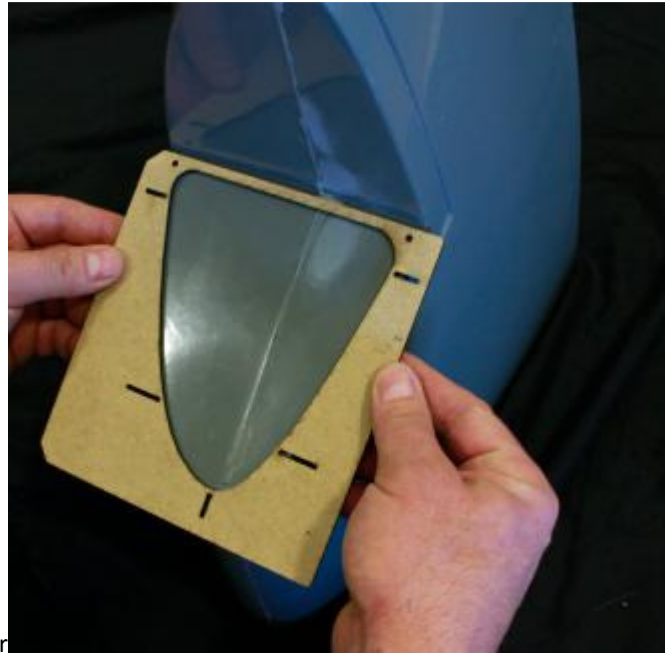
### Tools/Supplies

- 1) Sharpie—Extra Fine Point Pen
- 2) #0 x 1/8" Flat Bladed Screwdriver
- 3) (1) roll 1" wide 3M Blue masking tape
- 4) (4) 6"x 2" Duct Tape Strips
- 5) 3/8" Cordless Drill Motor
- 6) 1/8" Drill Bit
- 7) 5/32" Drill Bit
- 8) 100 Degree CS Bit
- 9) (2) 1/8" Cleco
- 10) Cleco Pliers
- 11) Rivet Gun
- 12) Dremel Tool (or die grinder)
- 13) 1.5" dia x .060" Cutoff Disk
- 14) 5/8" dia, 80 grit sanding drum
- 15) (1) sheet 80-150 grit sandpaper
- 16) Left and Right printed 1:1 pattern template
  - a. **09-2500-R Template Tool**
  - b. **09-2500-L Template Tool**
- 17) **(4) #6-32x1.5" stainless machine screw**
- 18) **(4) .150"dia thin flat washer**
- 19) **(4) .1" x .24"OD x .030"x16lb/in Compression Springs**
- 20) **(8) .125" x .25" Aluminum mandrill, Aluminum body rivet**

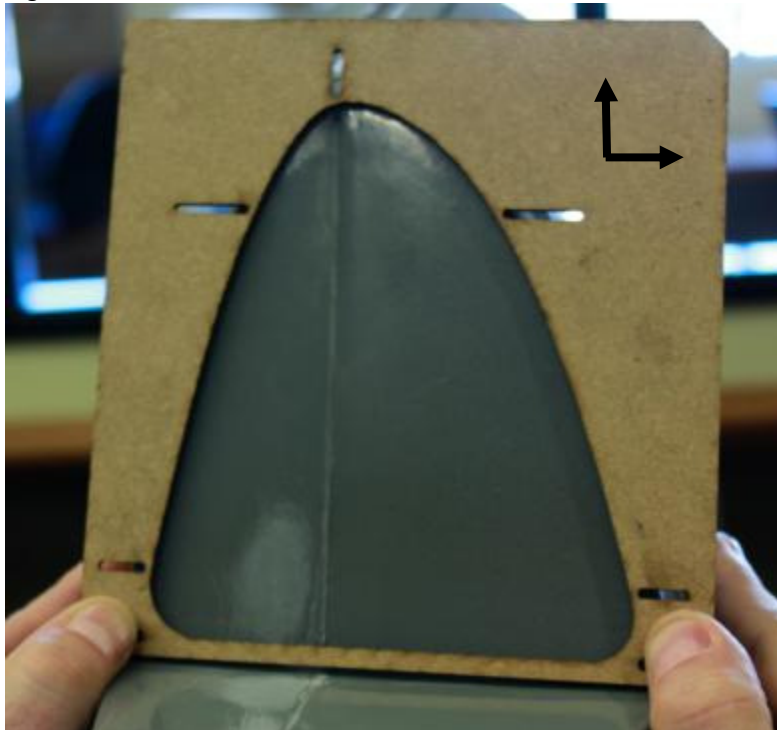
**\* Items included in Installation Kit**

## Step 1: Locate and Fix Wingtip Cutout

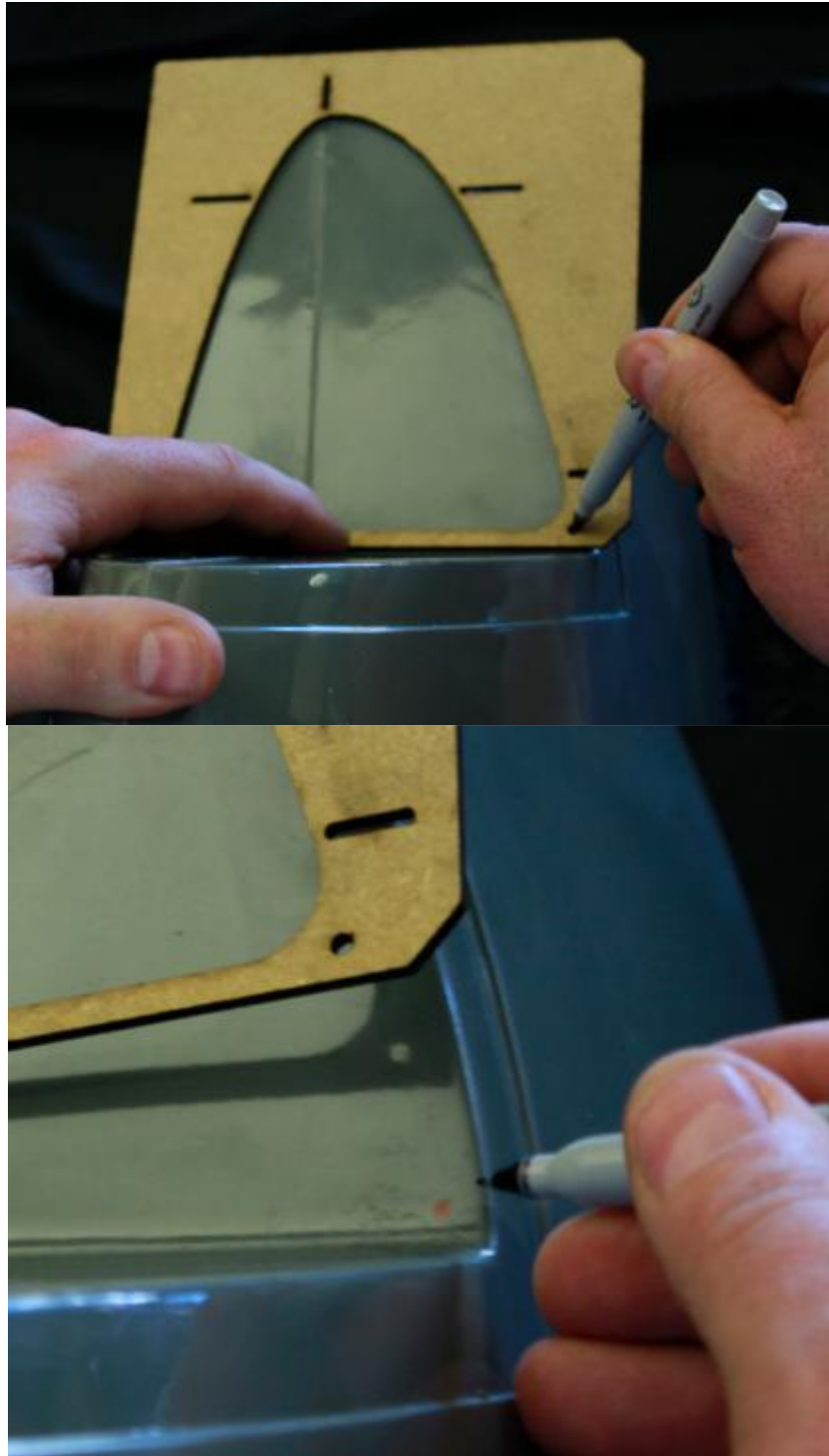
- 1) Using either the full-scale print out of the mount template sheet or the optional Template Jig (shown below); locate the Right wingtip and Right Template (09-2500-R). **Note: the template is clearly marked “-L” or “-R” and the notched corners should always be oriented in the upward direction.**



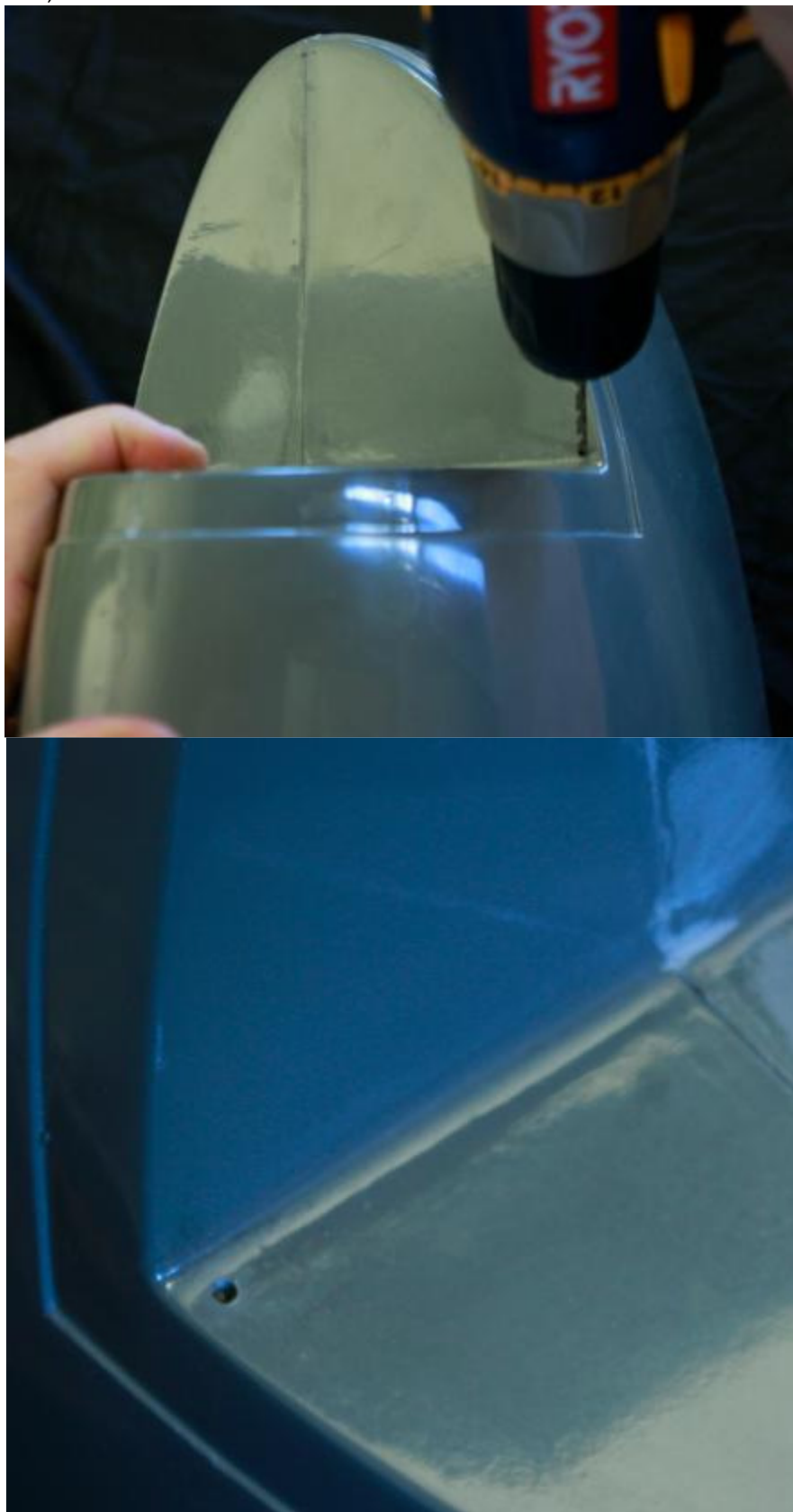
- 2) While pressing mount template firmly against the intersection of the aft and lateral faces of the wingtip, locate template so that all four gage windows have roughly an equal reveal. Also, use the forward gage window to align the jig with the leading edge of the wing.



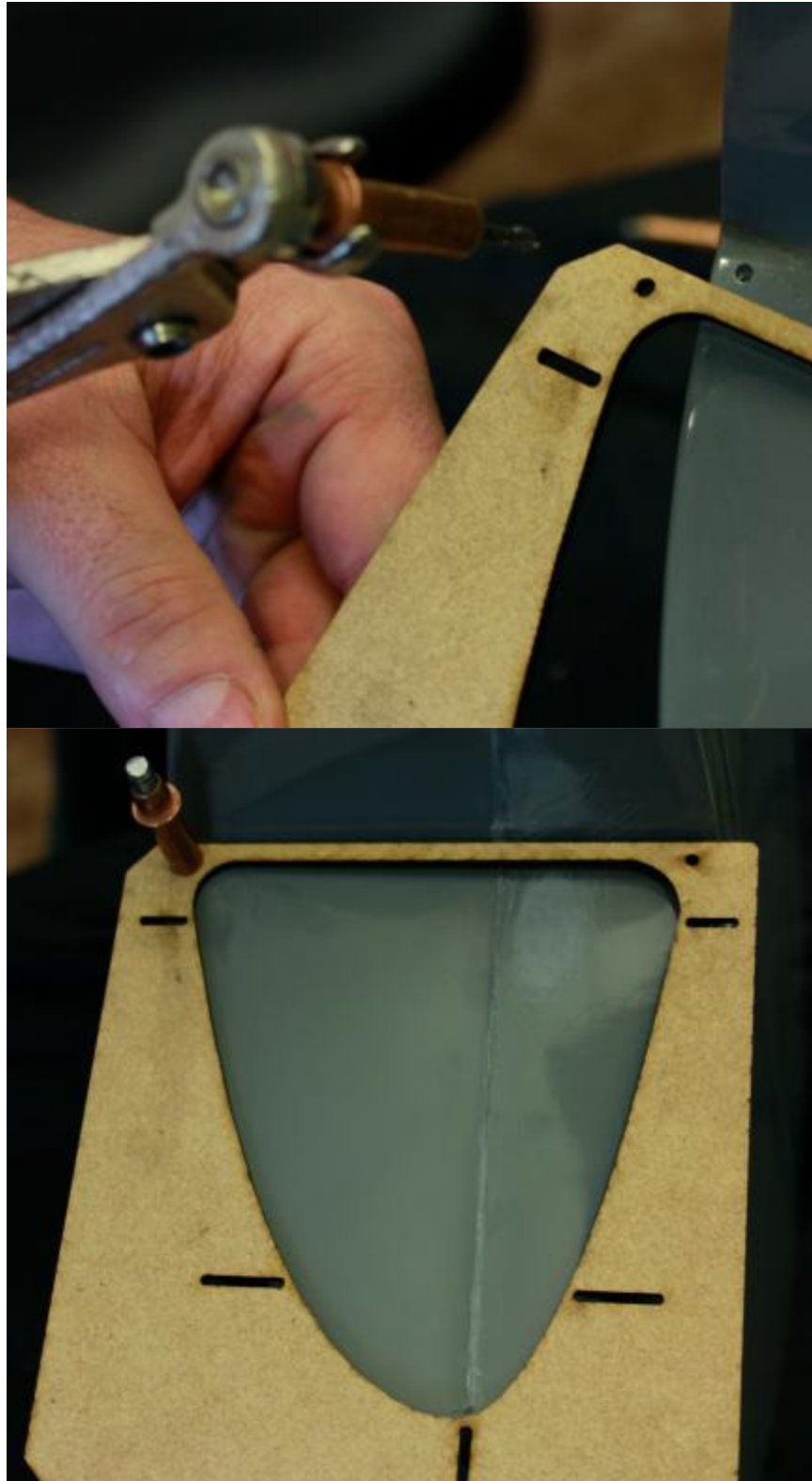
- 3) Once properly located, hold the jig in-place with one hand and use a Sharpie Fine Tip pen to locate the center of one side of the Mount Holes.



4) Using an 1/8" drill bit, drill the marked hole



- 5) Using a 1/8" Cleco, fix the template to the new hole. Ensure the template is pressed against the rear bulkhead and is aligned parallel, then mark and drill the other Mount Hole, then Cleco the second hole to fix the template in-place.

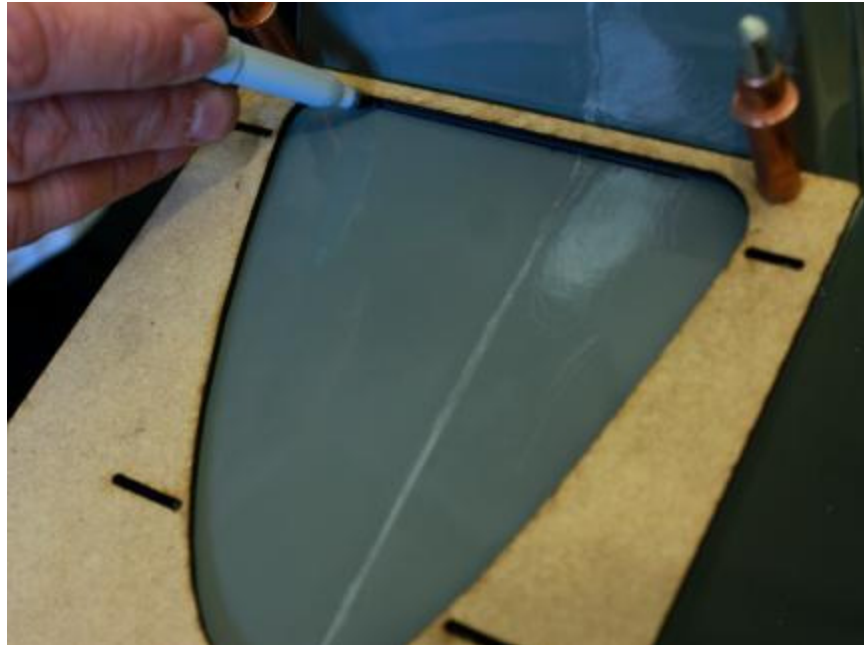






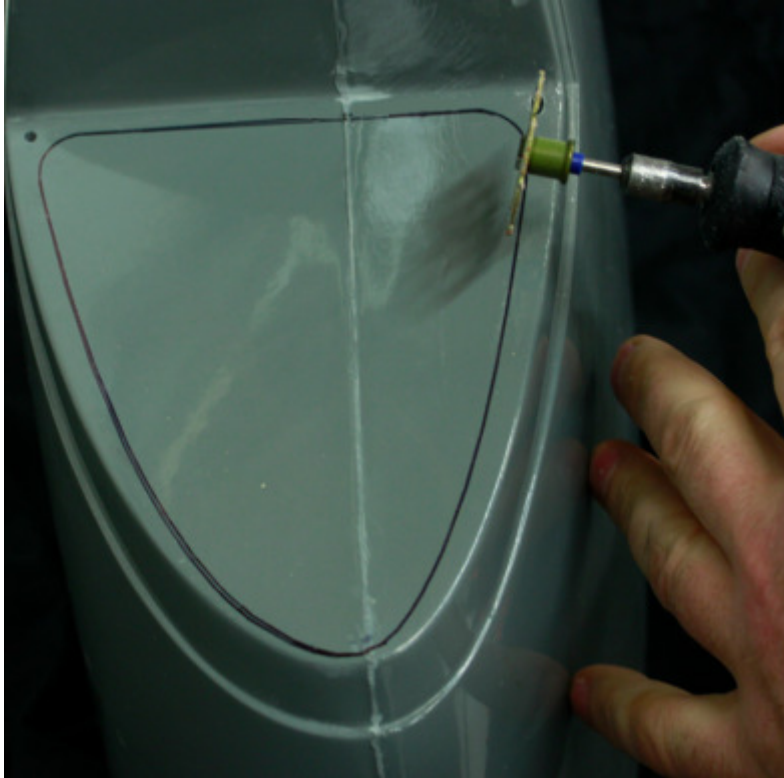


- 6) With the template securely held in-place with the two Cleco's and gently pressing down on the front, top edge of the template, use the Sharpie pen to carefully trace the inner perimeter of the template cutout section.
- 7) Remove the template to reveal the traced line.
- 8) After the template is removed use a 5/32" drill bit to open the 1/8" holes to final size.



## Step 2: Pre-Cut Wingtip Cutout

- 1) Using die cutter or Dremel tool and a 1.5" diameter cutting wheel, cut to the **INSIDE** of the traced line. **NOTE: Be sure to leave the traced line visible and only cut up to it, since final fit and finish will be done via the sanding process and final fit.**



- 2) Using a 80-150 grit ½" sanding drum attachment, smooth the cut edges and corners while being diligent to keep inside the marked lines. While sanding, keep the tool aligned with the forward section (in plane) of the wingtip (i.e. keep tool axis in-line with the forward direction of the aircraft).



- 3) After the wingtip cutout has been 'roughed out' with the sanding tool, use 80-150 grit paper (folded over to form a pad) to further smooth out the cut lines and blending with the corners. **NOTE: This sanding step will remove the majority or all of the witness line traced from the template, but be cautious not to over sand or extend the boundary!**



### Step 3: Prepare AeroSun Vx Light Assembly

- 1) Using 3M Blue 1" wide Masking Tape, pre-tear and set aside 6 strips of tape:
  - a. 4- 8" long
  - b. 2- 2" long
- 2) Using one of the 8" long pieces of tape, place it at the center-bottom of in inside edge of the light and wrap it smoothly around the outside perimeter. **Note: Do not remove the factory protective plastic until you are ready to use the light and after it installed for the final time. If there are wrinkles in the plastic where the tape is placed, simply rub them smooth before placing tape over the area.**



- 3) Repeat the process on the opposite side of the light using the end of the first tape strip as the beginning point for the opposite side of tape strip. **Note: The goal is to get two-layers of tape around the light perimeter.**



- 4) Using the two 2" long strips of tape, fill in the 'V-section void' at the tip of the light





- 5) When complete, the light should be covered with two layers of tape around the perimeter with the factory-applied protection film still firmly applied underneath the tape. The light is now ready to begin pre- fitting into the wingtip.



## Step 4: Pre-Fitting AeroSun Vx Light Assembly into Wingtip

- 1) Begin process by placing the light assembly in the precut hole and mark the interference areas with a Sharpie pen. Remove the light and use 80-150 grit sandpaper pad to sand away the marked area, then retry the fit process. **Note:** *Picture below shows the initial interference coming from the inboard upper and lower corners of the light assembly, thus the radius of the hole cutout must be decrease (sharper) than currently shown.*





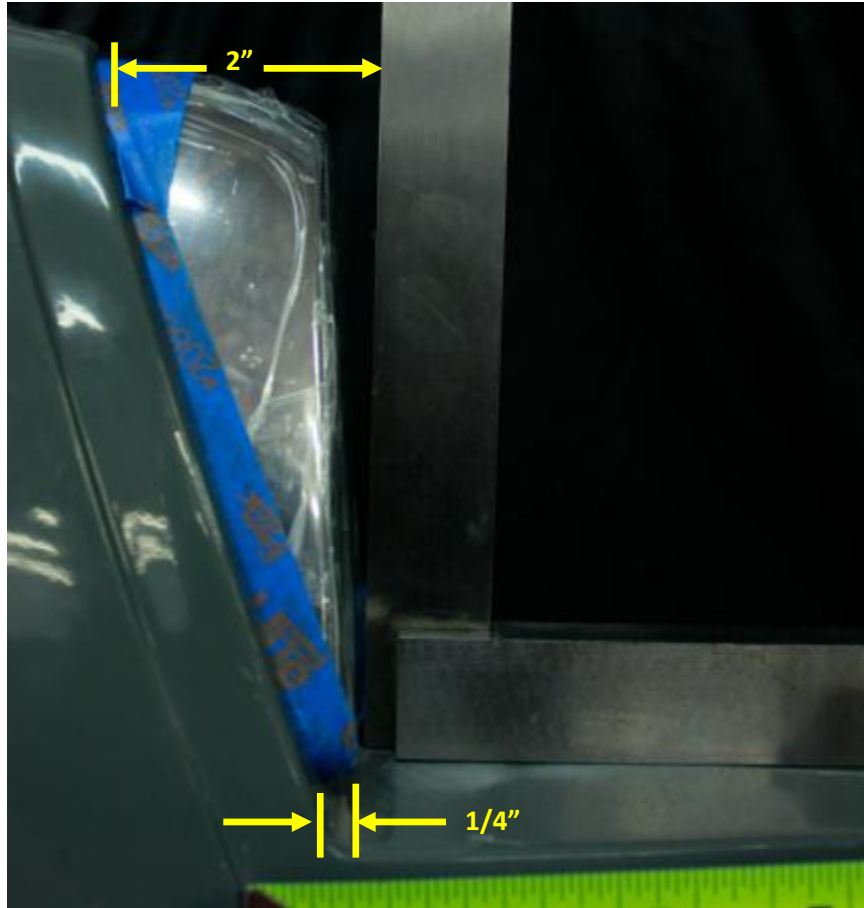
- 2) Carefully repeat the process above while using gentle, but deliberate sanding motions on the areas that need increased tolerance (Be patient and be sure to check the entire perimeter while not getting myopic on one area).



- 3) With time and patience the light assembly will settle into the sanded opening with varying degrees of interference around the perimeter.



- 4) The light assembly can be considered a near final fit once it can be installed in the opening where the inner edge protrudes forward roughly  $\frac{1}{4}$ " while the outboard edge is roughly 2" forward of the aft wingtip bulkhead.



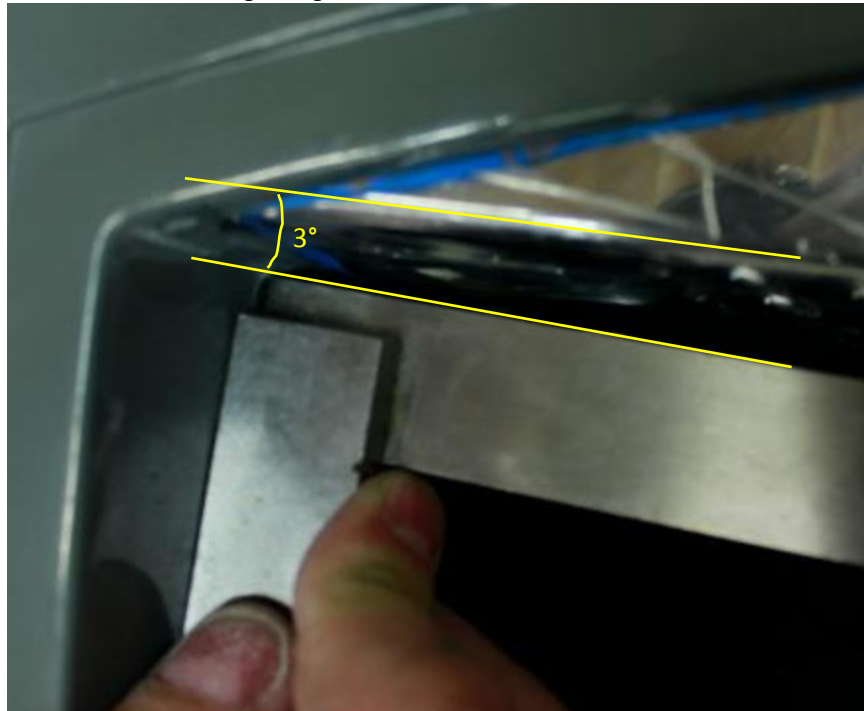
- 5) Once the light is located as shown in Step 4, the process of finalizing the perimeter gap tolerance can begin. This process is the most critical and will take the most time and patience, the criticality is based on how well the product will appear when finished, **PLEASE BE PATIENT!** Using a single thickness of 80-150 grit sandpaper, place the rough side toward the wingtip cutout and attempt to insert the sandpaper in the gap between the light and cutout while holding a slight forward pressure on the light assembly. Once a tight gap is located (paper will not slide into gap), reduce the forward pressure of the light and allow the paper to slip between the housing and cutout. Reapply the pressure then pull forward on the sandpaper which will begin to remove the extra material on the cutout while it creates a perfect offset geometry of the master shape of the light assembly. Repeat this process until there is equal gap around the entire light housing.



- 6) The light is in the proper location and the gaps are adequate when it can be placed in the opening far enough that the pivot mount is within .15" from the inside surface of the outboard edge of the wingtip. And the two mount tabs are within .150" to the inside surface of the upper and lower wingtip. (RV7 wingtip shown)



- 7) The other metric to determine a correct fit is to insure the front face of the light is within 3deg of perpendicular to the inboard bulkhead when the inner light edge is flush to the aft surface.



- 8) When complete, the light assembly will fit in the opening in its most forward position (canted outward) which will have approximately 1/2" of inner edge reveal of the inside edge of the light.





## Step 5: Preparing Light Assembly

- 1) The light assembly must now be prepped for test fitting into the wingtip and setting the Pivot Mount in its final location.
- 2) Using #6 mount machines screws pre-set the threads on both mount tabs by threading the screw from the back side of the light.



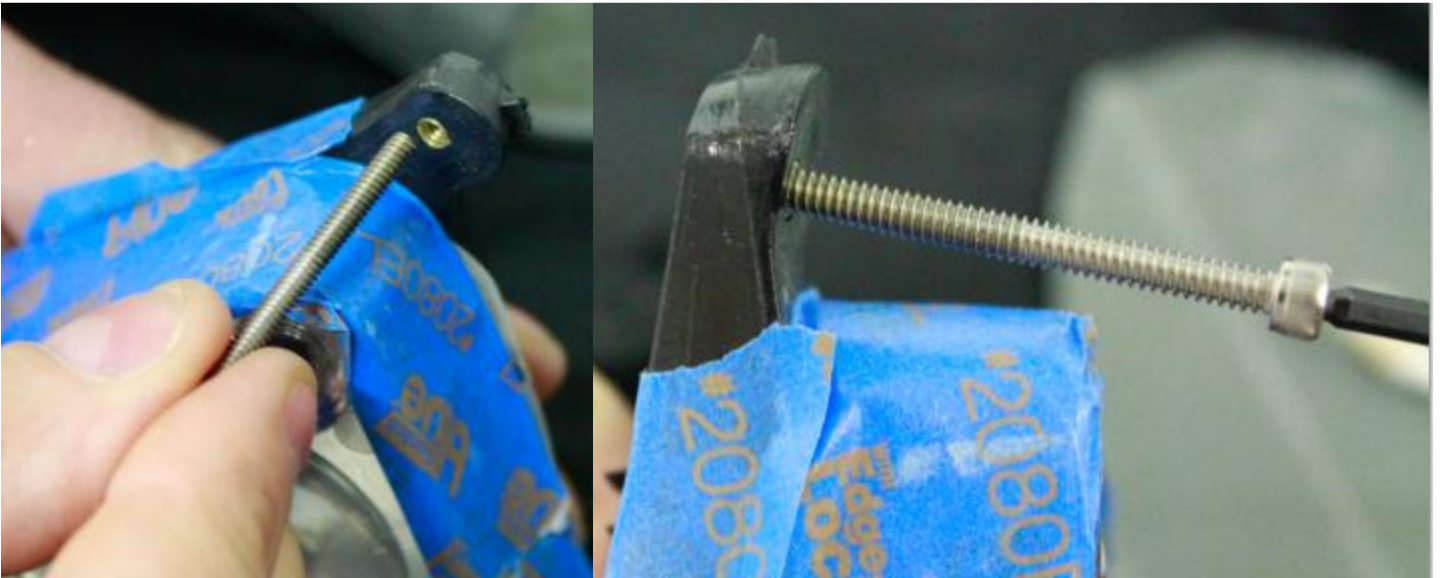
- 3) Using cutting oil or similar, apply a liberal amount of oil near the bottom of the screw threads



- 4) A) Using the appropriate drive tool (Allen wrench or screw driver), continue to thread the machine screw through the insert until approximately ½” protrudes through the front side. B) Apply more lubricant to the protruding threads then remove the screw. **Note: You may have to apply more lubricant through this process to eliminate seizing--the machine screw should not require excessive twist pressure to thread it through.**



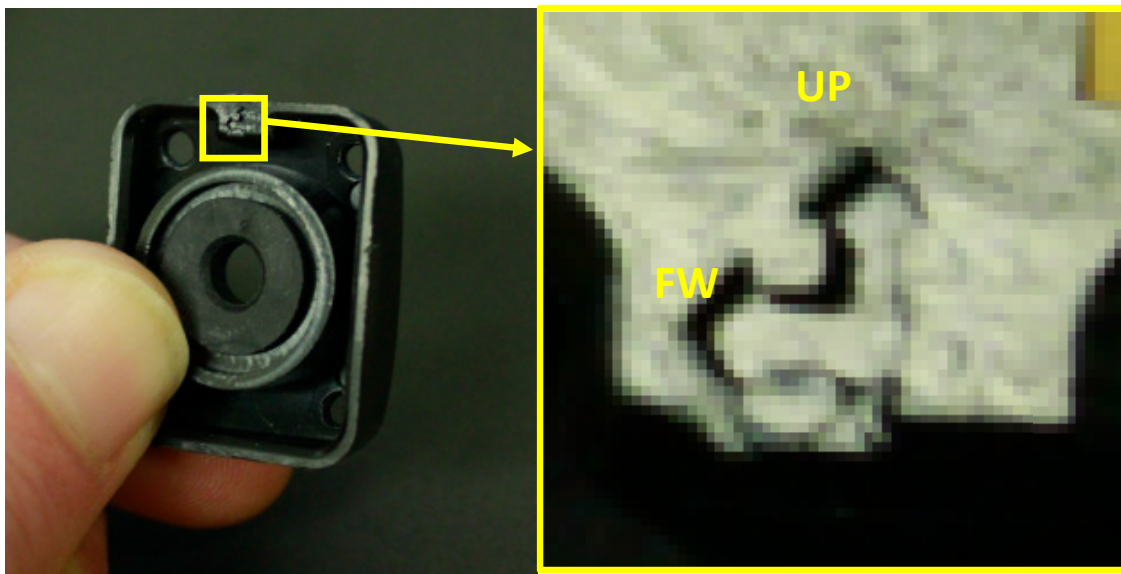
- 5) Using the same machine screw, now thread it from the front side of the Mount Tab (**be extra careful not to cross-thread during insertion**). **Note: Ensure that proper alignment is maintained when attempting to thread the machine screw through the insert.**



- 6) Thread the machine screw through the insert until it protrudes through the backside, and then remove the machine screw. The Threaded insert is now properly prepared and ready for use.



- 7) Repeat the prior procedure for all four Mount Tabs (both lights.)
- 8) Locate the Pivot Mount (01-2506-R) Rubber Isolator (00-8513). Insert the Rubber Isolator where one side of the groove is inserted into the inner rib of the Pivot Mount. **Note: The Pivot Mount has a UCS (Universal Coordinate System) Icon embossed on the top inner tab of the part.** To Identify the correct Pivot Mount to the associated side--when held in the installation position, the arrows must always point Upward and Forward (direction of flight) (Right side is shown below).

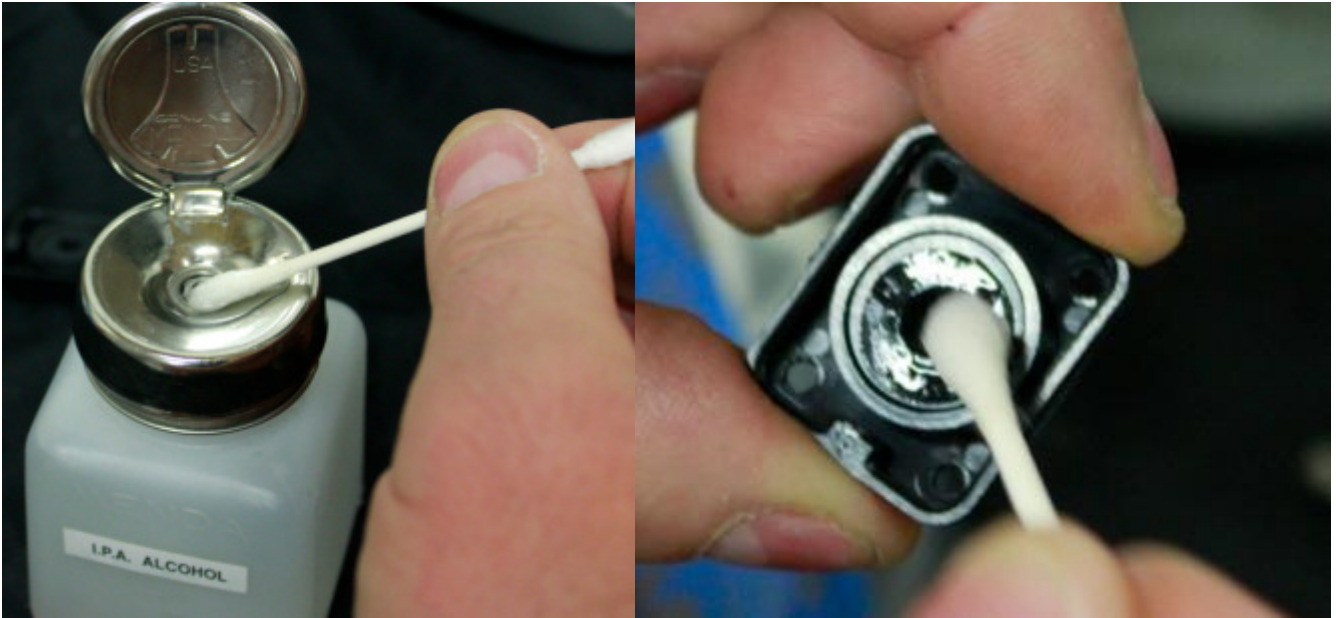




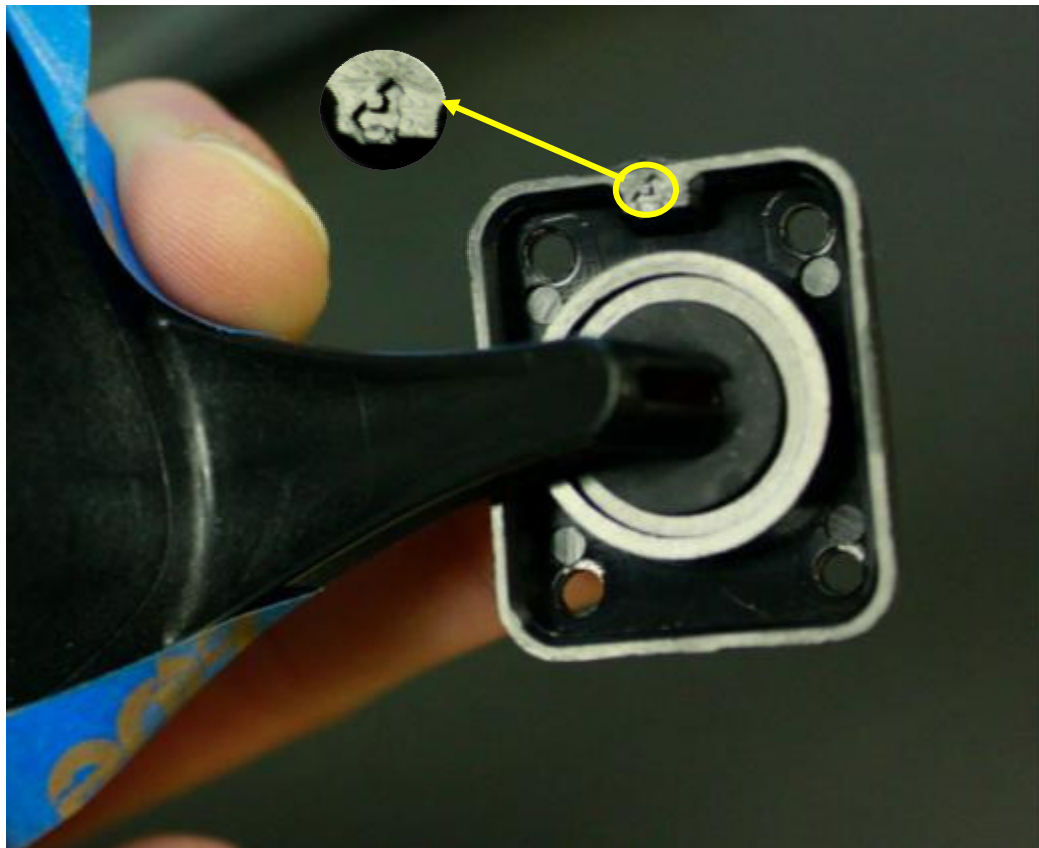
- 9) Using a small standard screw driver, gently press around the perimeter of the Rubber Isolator until it is securely fastened inside of the Pivot Mount. When finished, both sides of the Rubber Isolator flange should straddle the inner ring of the pivot mount and will slide freely from side to side. The Mount Assembly is now ready for installation to the Light Assembly.



10) Using a liberal amount of IPA, wet the inner surface of the Rubber Isolator

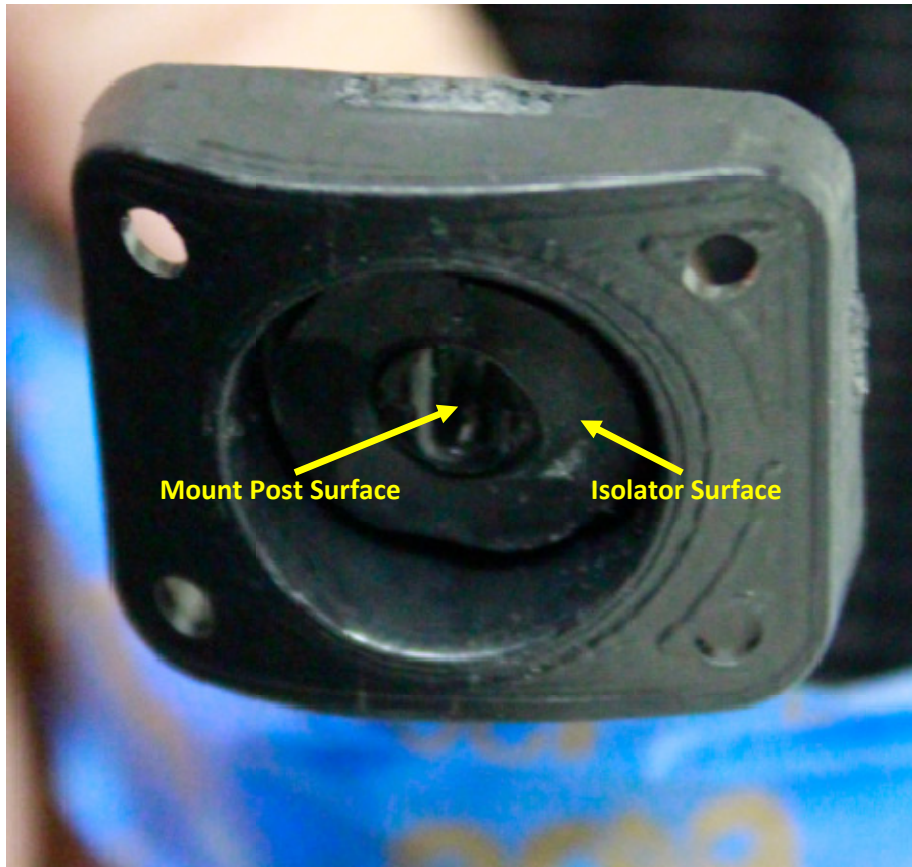


11) Using a slight twisting motion and forward pressure, insert Mount Assembly on the Mount Post of the Light Assembly. **Note: Ensure the flat side of the Mount Assembly is facing inward (toward the Light Assembly)**

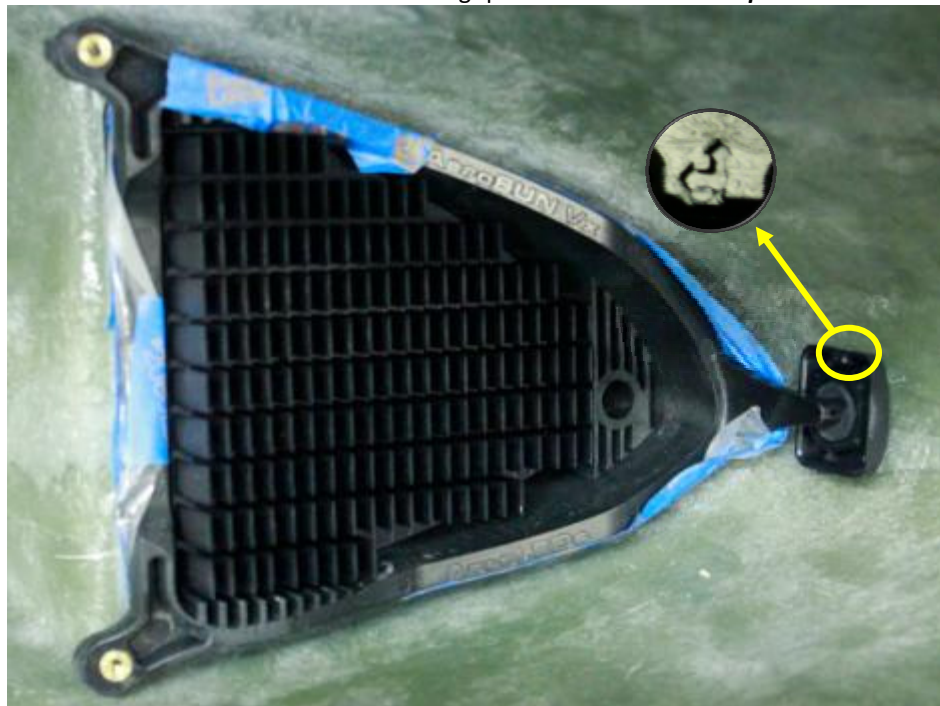


## Step 6: Locate and Install Pivot Mount in Wingtip

- 1) Ensure the Pivot Mount Assembly is installed where the Mount Post is flush or slightly extended (.05") beyond the outer surface of the Rubber Isolator. (shown in upright position ready for pre-fit)

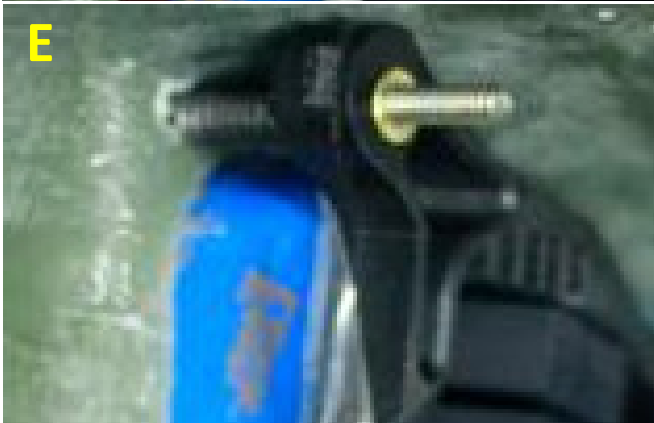


- 2) With the Mount Assembly rotated in the upward position (UCS arrows pointed up and forward) and installed on the Light Assembly, install and located it from the backside of the wingtip **Note: UCS arrows are pointed UP and FWD**





- 3) A) Insert the #6 machine screw through the top hole; B) place the spring over the screw shank. C) While holding the Light Assembly in place with one hand, carefully line up the machine screw with the threaded mount hole. D) Using extreme caution not to cross-thread the screw, carefully thread it until fully extended beyond the Mount Tab. Repeat the process for the other Mount Tab and machine screw.



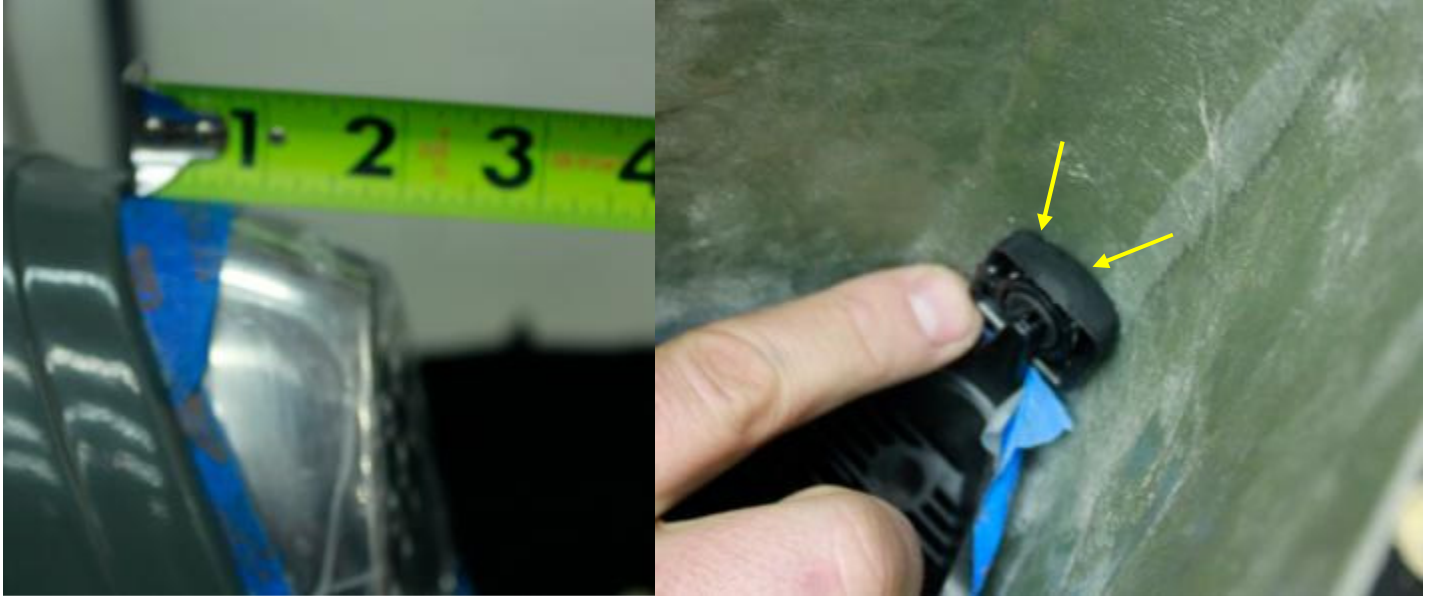
- 4) Thread both machine screws until approximately  $\frac{3}{4}$ " of the thread is sticking through the Mount Tab



- 5) With the inboard section of Light Assembly secured with the two machine screws. The final clearance between the wingtip and Light assembly can be done. Repeating the same procedure used for the rough fit in **Step 4.5**; use a single piece of 80-150 grit sandpaper to check the perimeter gap. While pressing on the back, outboard edge of the Light Assembly, sweep the perimeter of the gap and increase tolerance where needed.



- 6) Final fit and gap tolerance is obtained when the light outboard face is approximately 2" ahead of the wingtip bulkhead AND the Pivot Mount Assembly is adjacent to the wingtip inner surface.



### Installation Option A-Drill and Rivet Pivot Mount

- 1) While keeping forward pressure on the Light Assembly, drill one of the mount holes through the outside skin of the wingtip using the 1/8" drill bit, then Cleco the hole using the 1/8" Cleco from the outside.

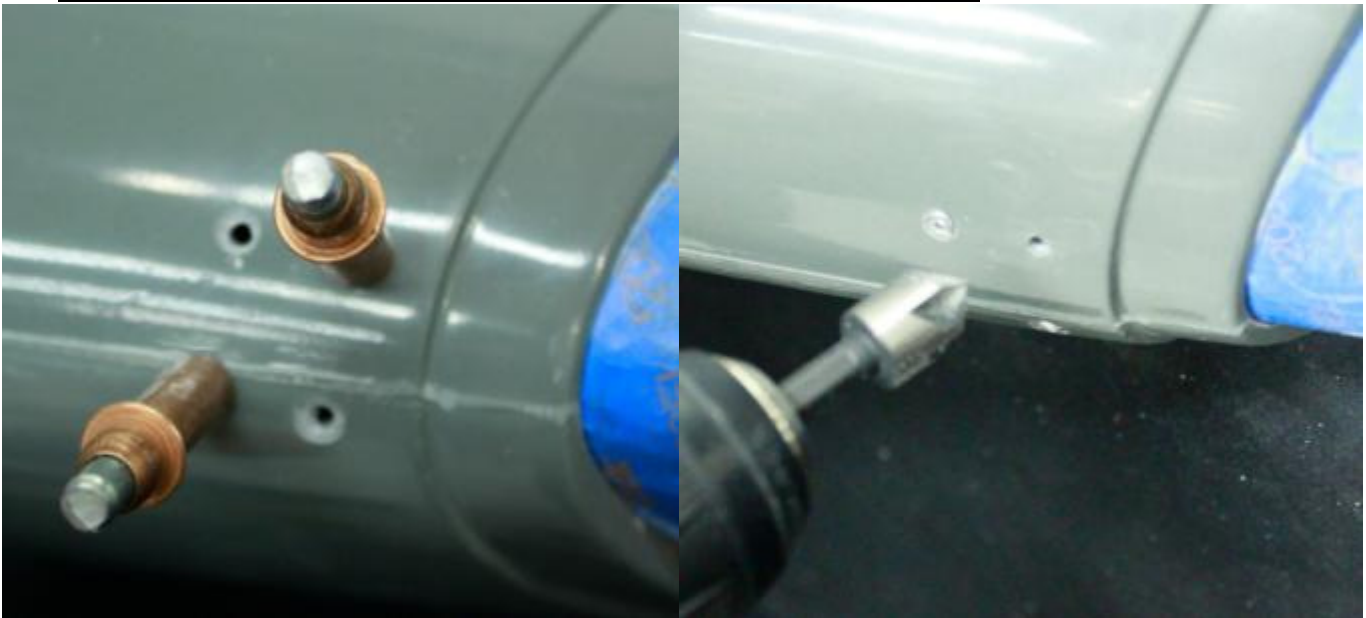




- 2) Repeat the drill process on the hole diagonal to the first hole while pressing the Pivot Mount firmly against the wingtip inner wall, then secure it with the other Cleco



- 3) With the Mount Tap firmly located finish drilling the remaining two holes use a countersink bit to prepare the two holes to accept an aluminum-mandril 1/8" rivet. **NOTE: Do not use steel or steel mandril rivets. The only acceptable rivet is aluminum rivet with aluminum mandril—steel rivets will destroy the Mount holes.**





- 4) Remove the Cleco from both holes and repeat the process to prepare the other two holes for the rivet process. **Note: Prior to the rivet process it is optional and advisable to prepare the back side of the Pivot Mount and wingtip skin to add a structural adhesive (or epoxy and microfiber) before riveting the Pivot Mount in place.**



## Installation Option B-Bonded Pivot Mount

Based on preference and installation requirements, the Pivot Mount can be bonded to the inner skin via structural adhesive, thereby alleviating the requirement to drill holes and eliminating the requirement to fill and refinish the outer surface of the wingtip. To accomplish this, the Pivot mount must be bonded in-place using a structural adhesive or epoxy and microfiber mix.

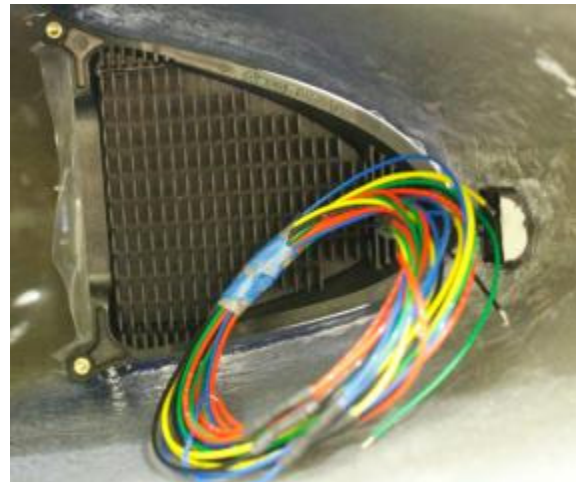
- 1) Prepare facing sides of bonded areas of the Pivot Mount and inside skin of wingtip by sanding them with 100-80 grit sand paper.



- 2) Install Pivot Mount onto Mount Post. Apply a small piece of masking tape to the back side of the Pivot Mount to provide a barrier that will eliminate the structural adhesive from migrating.



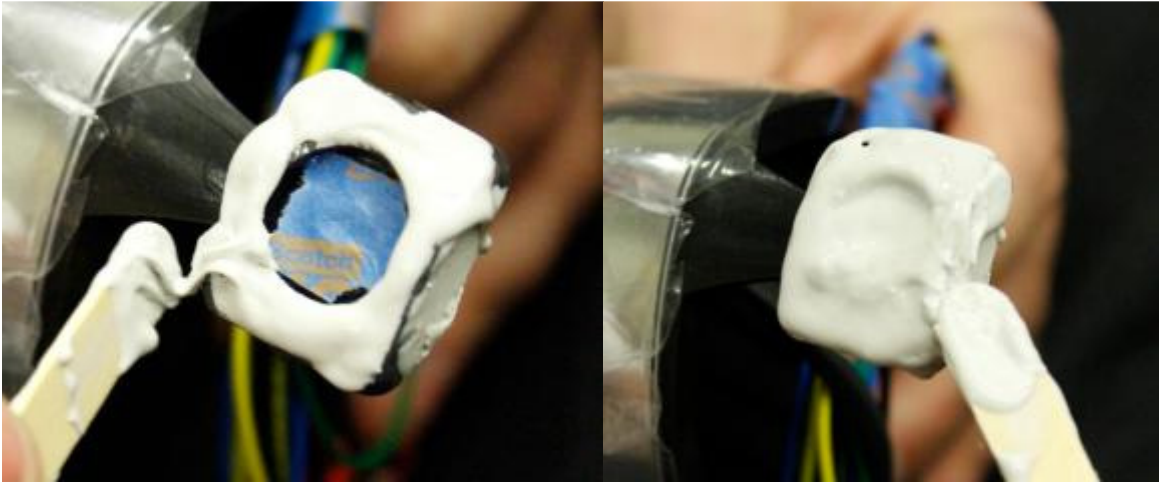
- 3) Test fit the light assembly to ensure it fits in the opening and allows the Pivot Mount to come within .1" on the inner skin of the wingtip surface.



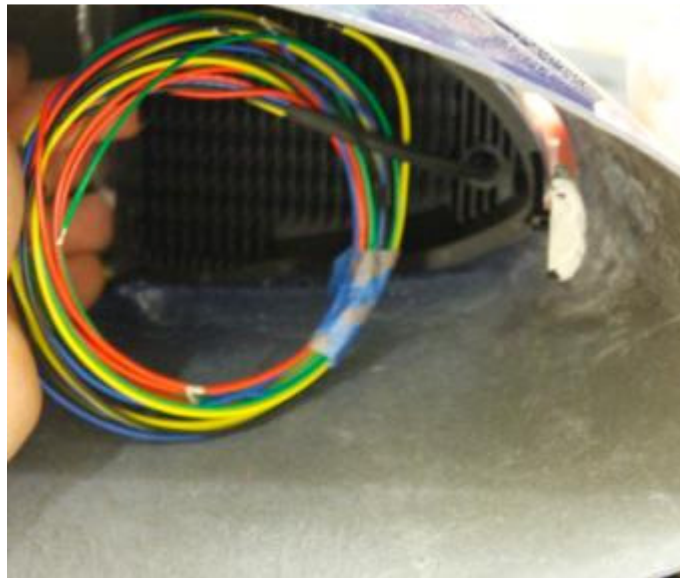
- 4) Using a structural adhesive or epoxy and microfiber, gather the required tools to properly mix and apply the adhesive.



- 5) Apply a liberal amount of adhesive to surfaces of Pivot Mount, allowing material to bridge the inner recess.

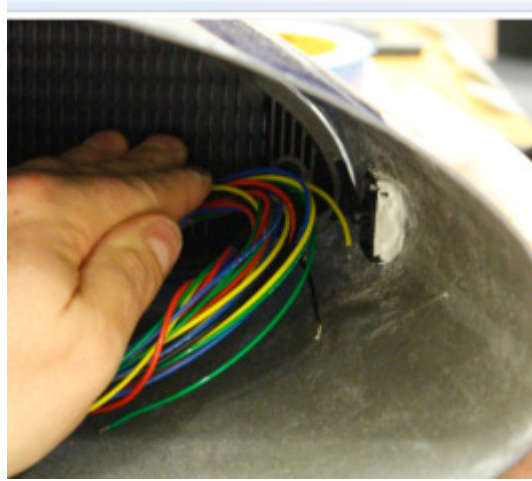


- 6) Carefully install the light assembly by leading with the inboard section, ensuring not to allow the adhesive to contact the inner wingtip skin until it is close to its final position.





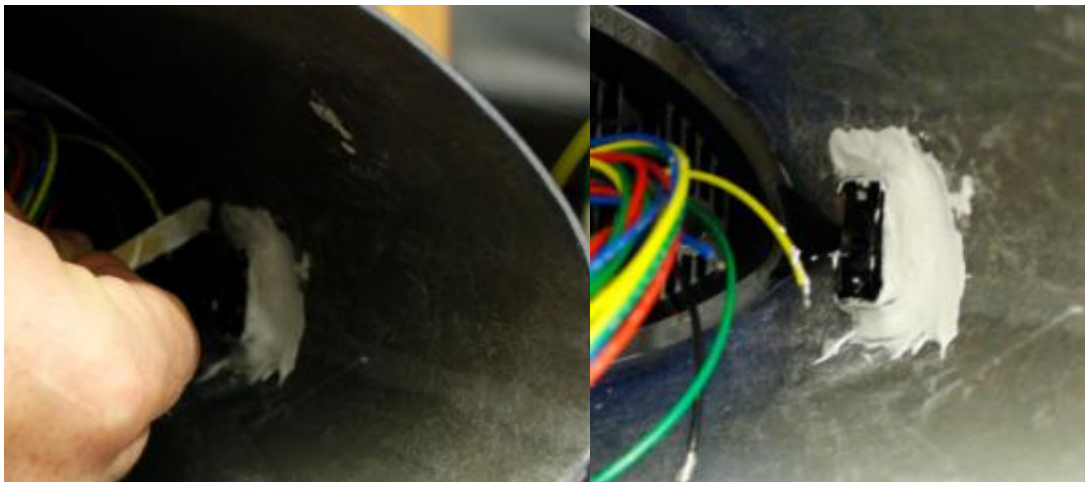
- 7) While holding the light assembly in-place with forward pressure, install the two mount screws by carefully threading them into the light assembly and ensure the Pivot Mount is firmly pressed against the inner wingtip skin.



- 8) Once both mount screws are in-place and while still holding forward-pressure on the light assembly, apply a 6" strip of duct tape between the wingtip and light assembly (top and bottom) to help hold the light assembly in-place.



- 9) Using the applicator stick, distribute the adhesive equally and apply additional adhesive if required to ensure there is ample contact area between components.



10) Allow the adhesive to cure and remove the duct tape.

11) To ensure adequate clearance between the light assembly and the wingtip cutout, repeat the process listed in Step 6.5.



**NOTE:** There must always be clearance between the light assembly and cutout throughout the entire adjustment range of the light. Always check the clearance using a strip of paper placed in the gap and sweep the perimeter to verify clearance.

12) F

13) F

14) F

## Step 7: Final System Check

- 1) When finished there should be a consistent/even gap of approximately .030”-.050” between the wingtip opening and Light Assembly, to allow full movement in the adjustment range. **NOTE: Use extreme caution when adjusting light assembly to ensure there are not any binding or pinch points when moving the light during the adjustment phase. Verify there is ample space between components by sweeping a .030” gage (typical business card) after every adjustment—THE LIGHT ASSEMBLY MUST NOT BE TOUCHING THE WINTIP OPENING WHEN IN FINAL POSITION!**
- 2) To ensure that the Light Assembly is installed properly and with its full features available, the following guidelines are used as a reference:
- 3) Range of Motion
  - a. Tilt Range
    - i. Up: 3deg
    - ii. Down: 3deg
  - b. Pan Rang
    - i. Inboard: 3deg
    - ii. Outboard: 3deg
- 4) For ease and quality of painting the wingtip, it is **HIGHLY RECOMENDED** to remove the Light Assembly until the final stages of aircraft construction.
- 5) It is **HIGHLY RECOMMENDED** to keep the protective factory cover affixed to the Light Assembly until the pre-flight stages of aircraft construction.

## Step 8: Location of Pulsar Series NAV/ACS Light

- 1) To ensure best performance of the AeroSun Vx and Pulsar NS light assembly, proper location of the Pulsar must be determined. Place a tape line from the apex of the leading edge of the wingtip to the mid-section of AeroSun Vx Lens.



- 2) Place a mark at 3" from the aft edge of the wingtip cutout



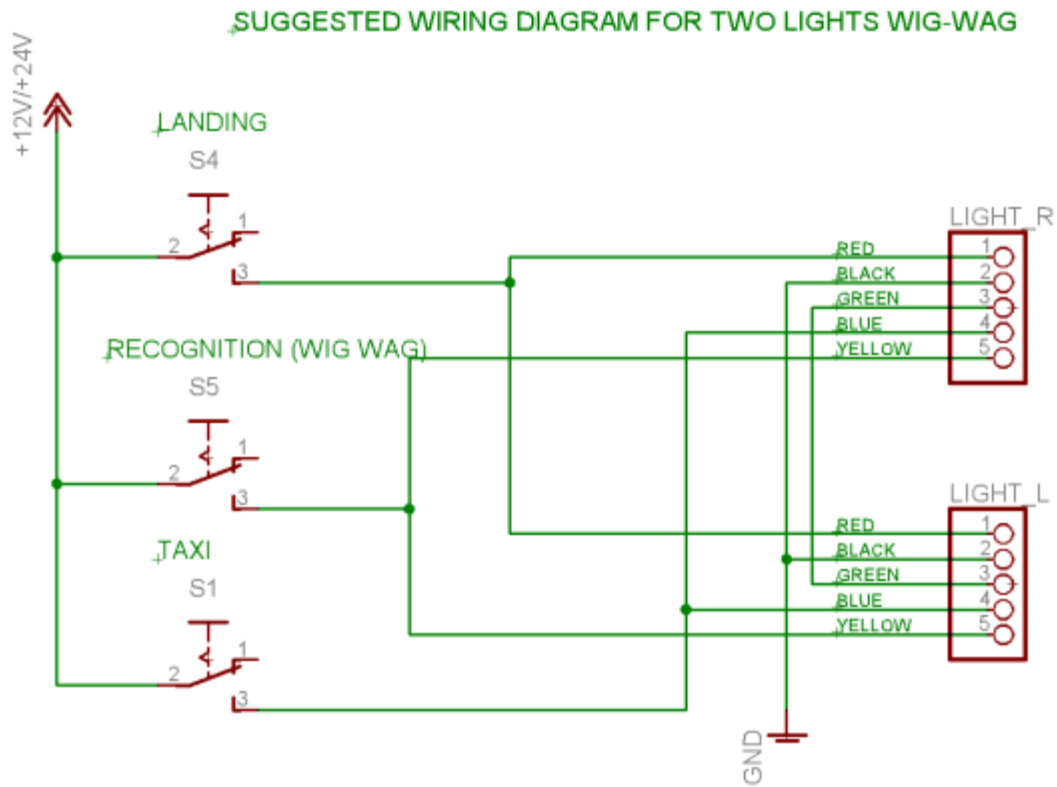


- 3) Carefully align the centerline of Pulsar Mount with the tape line while aligning the front hole centers and mark & drill the hole. Drill and attach one of the mount locations, then repeat the process for the final two holes.



## Wiring Instructions

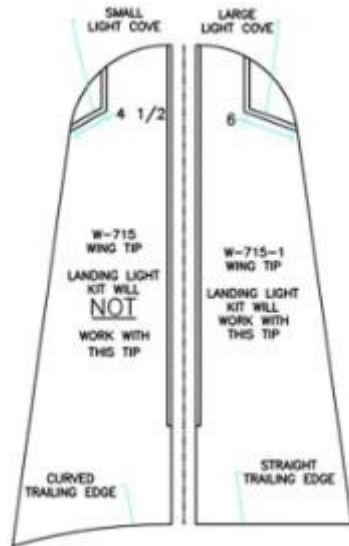
The following pages describe the wiring configuration for a pair of VX landing/taxi/recognition lights. The red, yellow and black wires are 18 gauge, and the blue and green wires are 20 gauge.



## Installation Eligibility of the AeroSun Vx by RV Model

Posted on the VAF forum by Dean Wilkinson, AeroLEDs CTO, 03/28/2014:

**RV-6:** The RV-6 can accept the Aerosun Vx if the owner purchases a set of the W-715-1 wingtips from Van's. Van's tells us that the W-715-1 wingtip fairings will fit the RV-6. The W-715-1 wingtip fairings have the larger light cove that the Aerosun Vx requires to be installed:



**RV-7:** Any RV-7 that was built with the W-715-1 wingtip fairings can accept the Aerosun Vx. If your airplane has the older W-715 fairings then an upgrade to the W-715-1 wingtip fairings to be able to install the Aerosun Vx. All kits that were shipped from 2005 on should have the W-715-1 fairings.

**RV-8:** Any RV-8 that was built with the W-715-1 wingtip fairings can accept the Aerosun Vx. If your airplane has the older W-715 fairings then an upgrade to the W-715-1 wingtip fairings to be able to install the Aerosun Vx. All kits that were shipped from 2005 on should have the W-715-1 fairings.

**RV-9:** A conversion kit is being developed that will allow the light cove to be enlarged using a fiberglass insert that will make the light cove big enough to accept the Aerosun Vx.

**RV-10:** A conversion kit is being developed that will allow the light cove to be enlarged using a fiberglass insert that will make the light cove big enough to accept the Aerosun Vx.

**RV-14:** The RV-14 uses the RV-10 wingtip fairing, so the same conversion kit that works for the RV-10 will work for the RV-14.

## Revision Table

Revision Number	Effective Date	Inserted By	Page Numbers Revised
IR	02/14/2014	Nate Calvin	All
A	05/16/2014	Nate Calvin	All
B	10/02/2014	Dean Wilkinson	38