



AEROLEDS™
A **WHELEN®** AEROSPACE COMPANY

Installation Instructions

AeroSun Vx



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1 System Description

AeroSun™ VX Landing and Taxi Light is designed specifically for Vans RV wingtips. In addition to its standard operation as a landing/taxi light, the AeroSun™ VX features integrated Pulse or "WigWag" significantly increasing recognition in broad daylight as well as night operations to help avoid midair collisions and bird strikes while drawing half the current. Ideal for installations in aluminum aircraft/composite aircraft, where some airflow within the wing cutout exists.

2 Model Numbers

Model	Part Number	Description	Voltage (V)	Current (Amps)	Power (W)	Weight (oz)
AeroSun VX	01-2500-L	Landing	14	8.5*	120*	31*
		Taxi		3.5*		
	01-2500-R	Landing	28	2.2*		
		Taxi		1.9*		

Pair = *

3 Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under **14 CFR, §43.16** and **14 CFR, §91.403** of the Federal Aviation Regulations unless an alternative program has been FAA approved. There is no additional airworthiness limitations associated with this equipment and/or installation.

4 Instructions for Continued Airworthiness

AeroSun series LED landing/taxi light assembly contains no user serviceable items. Should any LED fail, unit must be replaced.

Interval	Inspection	Remedy	Notes
Pre-Flight	<ul style="list-style-type: none">• Perform a functional check and observe that all LEDs are illuminated	<ul style="list-style-type: none">• If all LEDs are not illuminated replace light as soon as is practicable	<ul style="list-style-type: none">• Lights are not user serviceable.• Lights are very bright and to reduce eye strain during inspection use an optical filter such as dark glasses or welding goggles.
Annually, unless the OEM specifies a shorter interval	<ul style="list-style-type: none">• Perform a functional check and observe that all LEDs are illuminated• Check mounting, connections, and wire integrity	<ul style="list-style-type: none">• If all LEDs are not illuminated, the light must be replaced• Adjust or replace wiring, and connectors as required	

Table 2

4.1 General Installation

Consult **AC 43.13-1B Ch 11** for guidance on acceptable methods, techniques, and practices. Procedures contained herein are not intended to conflict with procedures set forth by aircraft OEM, nor do they supersede FAA approved manuals and FAA regulations.

For retrofit installation existing circuit breaker or fuse may typically be used.

4.2 Procedures

1. Reference the airframe manufacturer's maintenance manual to complete the following steps
2. If the AeroLEDs light(s) chosen for installation are higher wattage than the light(s) being removed, ensure the Electrical Load is not appreciably affected and ensure that all circuit components (circuit breaker, wire, switches, relays, etc., as applicable) are appropriate for the light(s) being installed
3. Prepare aircraft for maintenance:
 - a. Disconnect aircraft power and ground
 - b. Ensure all switches are in the OFF position
 - c. Attach maintenance warning tags
 - d. Pull landing/taxi light circuit breakers
 - e. Remove light covers to gain access to lamp assembly(s) and bracket(s)
 - f. Remove existing lamp(s) from brackets, mark and retain hardware
 - g. Record weight of removed lamps
4. This installation procedure is for single or multiple light installations. Wiring diagrams are provided for single, dual, and quad light installations. For lights without pulse, existing aircraft wiring, switches and breakers may be utilized.
5. **Versions with Pulse:** Pulse function is a self-contained feature and does not require use of external control circuitry. An additional wire, switch, or switch position will be required to enable pulse mode, and for multiple lights an additional synchronization wire installation will be required.
6. Refer to aircraft manufacturer's service manual and/or illustrated parts catalog to identify landing and/or taxi light system installed in your aircraft. This will provide information on location of components and assembly details
7. Mount LED light with a minimum 4-inch clearance to exhaust system components unless adequate heat shielding is utilized to block radiant heat.
8. Reference airframe manufacturer's current maintenance manual and install LED light(s) in brackets using retained hardware
9. Ensure alignment key is fitted to bracket
10. Install suitable aircraft approved connectors or splices to connect landing light assemblies to wires routed from switch in accordance with wiring diagram(s).
11. Screw terminals are not polarity sensitive
 - a. Yellow wire is used to power pulse mode
 - b. Blue and green wires are low current signals for synchronization in two light installations
 - c. Install an appropriate aircraft approved switch and circuit breaker of correct rating for lights installed for pulse function. Original landing light switch/switches may be used.
12. Placard switches appropriately.
13. Verify proper operation of LED light(s), in both pulsing and steady functions (as appropriate to installation)

14. Using appropriate aircraft maintenance manual, verify light angle has not changed, and is oriented & aimed in accordance with manufacturer's instructions
15. Reinstall associated light hardware IAW aircraft maintenance manual
16. Perform an operational check of the light(s) to determine that the installed light(s):
 - a. Generate no objectionable glare to the pilot
 - b. Do not adversely affect the pilot by halation
 - c. Provide enough light for night operations, including hovering and landing
 - d. Will not adversely affect any installed systems or equipment with EMI/RFI interference
17. Record installation with appropriate logbook entry

Note: The use of shielded cable is recommended although not required for installation.

It is recommended that ground connections for all lights be made at a single location on aircraft central ground bus. This "single point ground" scheme helps to eliminate ground loops and ground bounce that can occur when using airframe as a ground.

⚠ WARNING: This product can expose you to chemicals including Methylene Chloride which is known to the State of California to cause cancer, and Bisphenol A, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

5 Step Instructions

5.1 Materials

- 5.1.1 Gather following tools and supplies for install
 1. Extra fine point permanent marker
 2. #0 x 1/8" flat bladed screwdriver
 3. One (1) roll 1" wide masking tape
 4. Four (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° countersink bit
 9. Two (2) 1/8" Cleco fasteners
 10. Cleco pliers
 11. Rivet gun
 12. Rotary tool or die grinder
 13. 1.5" dia x 0.06" cut-off wheel attachment
 14. 5/8" dia, 80 grit sanding drum attachment
 15. One (1) sheet 80-150 grit sandpaper
 16. Template - 1:1 pattern (01-2510) provided with light order
 17. Four (4) #6-32x1.5" stainless steel machine screw
 18. Four (4) 0.15" dia thin flat washer
 19. Four (4) 0.1" x 0.24" OD x 0.03" x 16 lb/in compression springs
 20. Eight (8) 0.125" x 0.25" aluminum mandrel, aluminum body rivet

5.2 Removal

- 5.2.1 Prepare aircraft for maintenance:
 - a. Verify all switches are in OFF/NORMAL position
 - b. Attach maintenance warning tags
 - c. Pull landing/taxi light circuit breakers
- 5.2.2 Reference airframe manufacturer's current maintenance manual to remove any light covers in order to gain access to lamp assembly(s) and bracket(s).
- 5.2.3 Disconnect connection to positive aircraft power.
- 5.2.4 Disconnect ground from aircraft power.
- 5.2.5 Remove existing lamp(s) from brackets, mark and retain hardware.
- 5.2.6 Record weight of removed lamps.

5.3 Locate and Fix Wingtip Cutout

- 5.3.1 Locate right-side wingtip and use template (01-2510).

Note: template notched corners should always be oriented in upward direction.

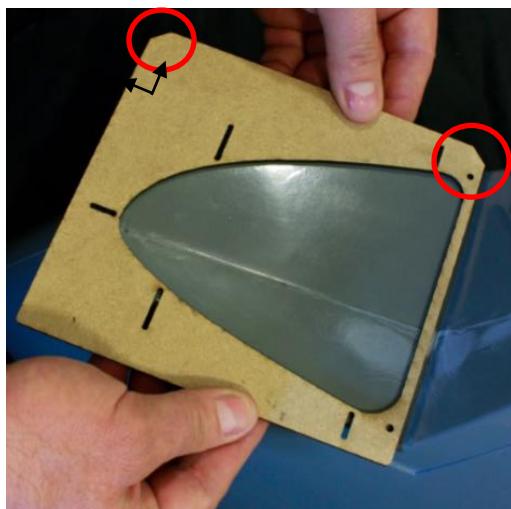


Photo 5-1

- 5.3.2 Press template firmly against intersection of aft and lateral faces of wingtip. Position template so all four gauge windows have an equal reveal. Use forward gauge window to align template with leading edge of wing.

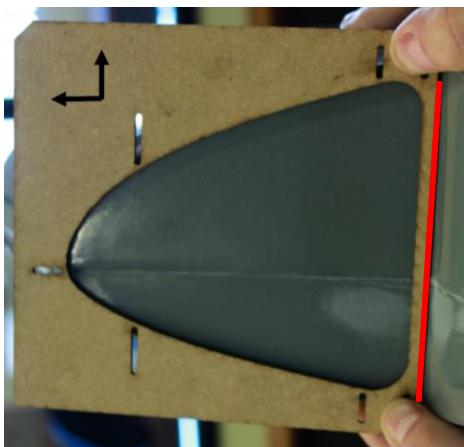


Photo 5-2

5.3.3 With template in place, hold and use extra fine point marker to mark center of one mount hole.



Photo 5-3

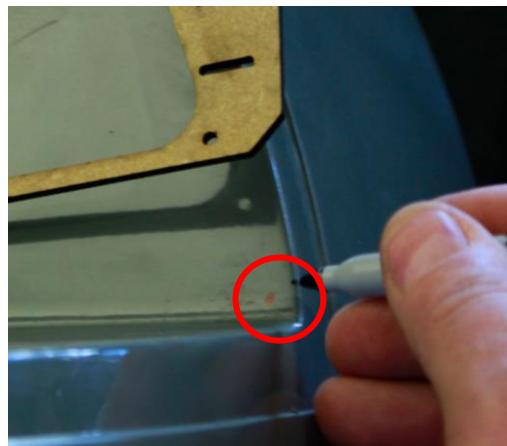


Photo 5-4

5.3.4 Use an 1/8" drill bit to drill marked hole.



Photo 5-5



Photo 5-6

5.3.5 Use a 1/8" Cleco fastener and secure template to new hole.



Photo 5-7

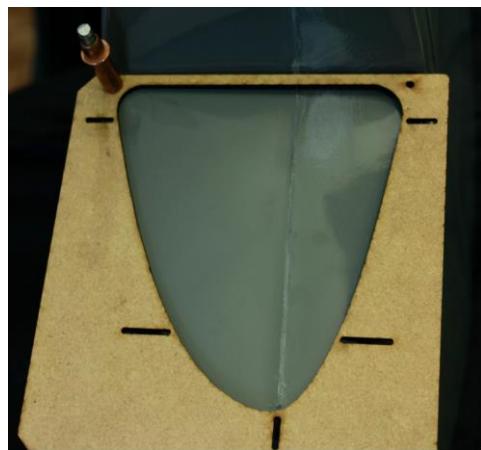


Photo 5-8

5.3.6 Verify template is pressed against rear bulkhead, aligned parallel, mark and drill second mount hole.

5.3.7 Use remaining 1/8" Cleco fastener and secure template to second hole.

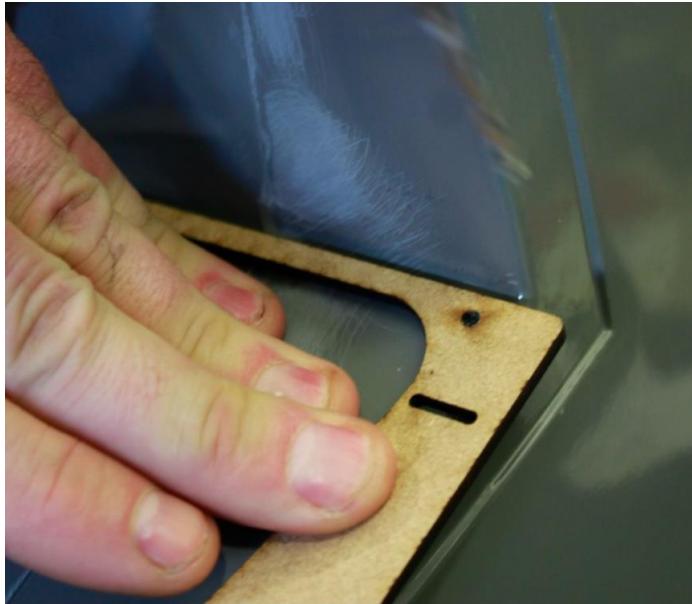


Photo 5-9



Photo 5-10

5.3.8 Hold template securely in place and gently press on front, top edge of template.

5.3.9 Use extra fine point marker to carefully trace inner perimeter of template.

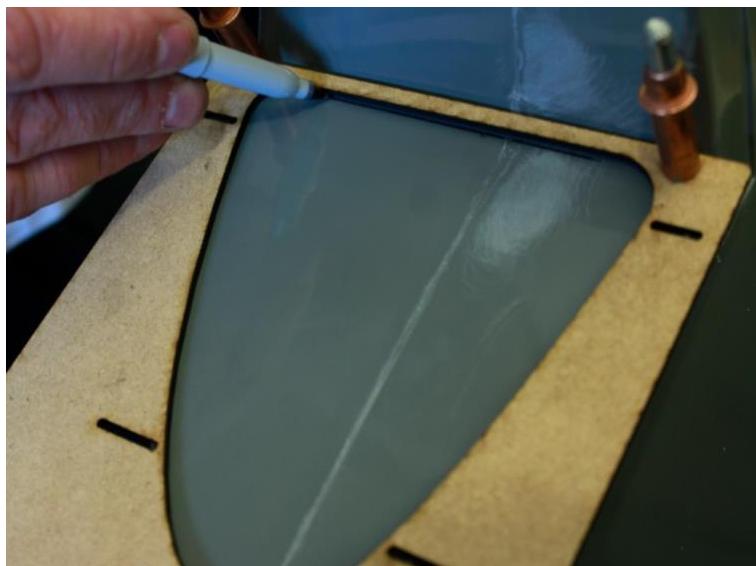


Photo 5-11

5.3.10 Remove Cleco fasteners and template to reveal traced line.

5.3.11 After template is removed, use a 5/32" drill bit to open mounting holes to final size.

5.4 Precut Wingtip Cutout

5.4.1 Use rotary tool and 1.5" diameter cutting wheel, cut INSIDE of traced line.
NOTE: Leave traced line visible and only cut up to it.



Photo 5-12

5.4.2 Staying within marked lines, use an 80-150 grit $\frac{1}{2}$ " sanding drum attachment to smooth cut edges and corners
Note: Keep alignment with forward section (in plane) of wingtip (i.e. keep tool axis in line with forward direction of aircraft).



Photo 5-13

5.4.3 Use 80-150 grit paper (folded over to form a pad) to further smooth out cut lines and blend corners.
NOTE: This sanding step will remove majority or all of witness line traced from template. DO NOT over sand or extend boundary.



Photo 5-14



Photo 5-15

5.5 Prepare AeroSun Vx Light Assembly

5.5.1 Prep and set aside six strips of 1" wide masking tape:
a) Four 8" lengths
b) Two 2" lengths

5.5.2 Use one 8" length of tape to place at center-bottom inside edge of light and wrap it smoothly around half of outside perimeter to tip of light
Note: Do not remove factory protective plastic until light is ready for use after final installation. If wrinkles are found in plastic where tape is placed, simply rub smooth before placing tape over area.



Photo 5-16



Photo 5-17

5.5.3 Repeat process on opposite half of light, use end of first tape strip as starting point for new tape strip.

5.5.4 Repeat steps 5.5.2 and 5.5.3 for second tape layer around light perimeter.



Photo 5-18



Photo 5-19

5.5.5 Use two 2" lengths of tape to fill in v-shaped void at tip of light

5.5.6 Light should be covered with two layers of tape around perimeter with factory-applied protection film still firmly applied underneath tape.



Photo 5-20

5.6 Pre-fitting AeroSun Vx Light Assembly into Wingtip

- 5.6.1 Place light assembly in precut hole and mark interference areas with an extra fine point permanent marker.
- 5.6.2 Remove light and use 80-150 grit sandpaper pad to sand away marked area,
Note: Photo 5-21 shows initial interference coming from inboard upper and lower corners of light assembly, stating gap around light and housing must be increased than currently shown.



Photo 5-21

- 5.6.3 Carefully repeat steps 5.6.1-5.6.2 while using gentle, deliberate sanding motions on areas that need increased tolerance.
- 5.6.4 Be patient and check entire perimeter while not getting fixated on one area. When light assembly fully settles into sanded opening without any interference with wingtip, you can move to next steps of installation before you finalize final gap. Fit is near completion when gap is .030" to .050" and inner edge of light protrudes roughly $\frac{1}{4}$ " and outer edge protrudes roughly 2" from aft wingtip bulkhead.



Photo 5-22



Photo 5-23



Photo 5-24

- 5.6.5 Use 80-150 grit sandpaper, place rough side toward wingtip cutout and attempt to insert sandpaper in gap between light and cutout while holding a slight forward pressure on light assembly.
- 5.6.6 Once a tight gap is located (paper will not slide into gap), reduce forward pressure of light and allow paper to slip between housing and cutout.
- 5.6.7 Reapply pressure then pull forward on sandpaper, this will begin to remove extra material on cutout while it creates a perfect offset geometry of master shape of light assembly.
- 5.6.8 Repeat this process until there is equal gap around entire light housing.

Note: This process is most critical and will take time and patience. Criticality is based on how well the finished product will appear, PLEASE BE PATIENT!



Photo 5-25

- 5.6.9 Light assembly is in proper location and gaps are adequate when:
 - a. Light can be placed in opening far enough that pivot mount is within 0.15" of inside surface of outboard edge of wingtip
 - b. Two mount tabs are within 0.15" of inside surface of upper and lower wingtip.



Photo 5-26

5.6.10 Another metric to determine a correct fit is, to ensure front face of light is within 3° of perpendicular to inboard bulkhead when inner light edge is flush to aft surface.

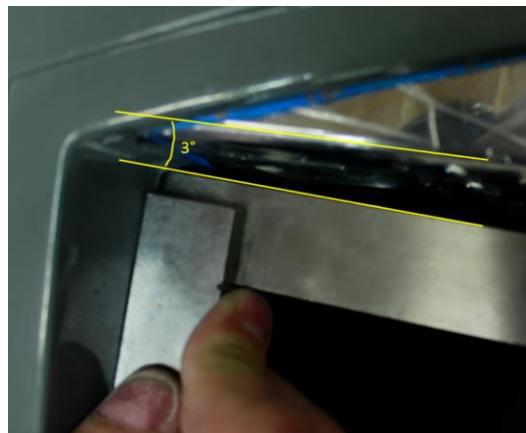


Photo 5-27

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



Photo 5-28

5.6.12 Using #6 mount machine screws, pre-set threads on both mount tabs by threading screw from back side of light.



Photo 5-29

5.6.13 Use cutting oil or similar and apply a liberal amount of oil near bottom of screw threads



Photo 5-30



Photo 5-31



Photo 5-32

5.6.14 Use appropriate drive tool (Allen wrench or screwdriver), continue to thread machine screw through insert until approximately $\frac{1}{2}$ " protrudes through front side.

5.6.15 Apply more lubricant to protruding threads then remove screw.

Note: You may have to apply more lubricant through this process to eliminate seizing. Machine screw should not require excessive twist pressure to thread.

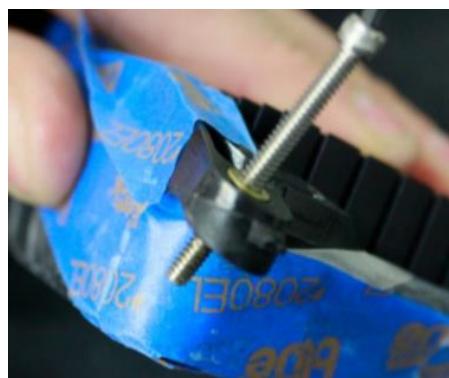


Photo 5-33

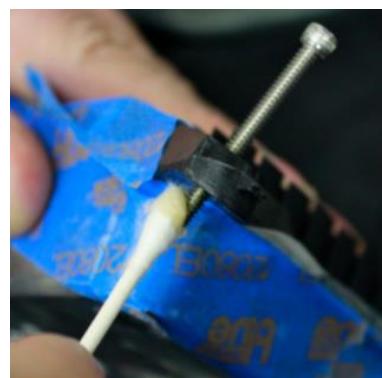


Photo 5-34

5.6.16 Use same machine screw and thread it from front side of mount tab (be extra careful not to cross-thread during insertion).

Note: Maintain proper alignment when attempting to thread machine screw through insert.

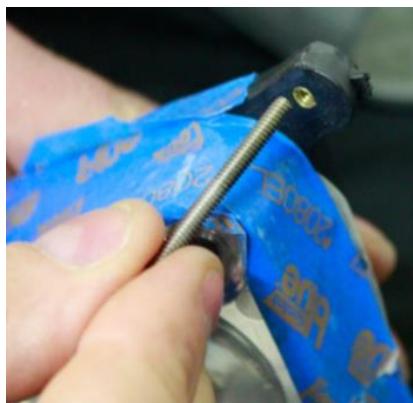


Photo 5-35

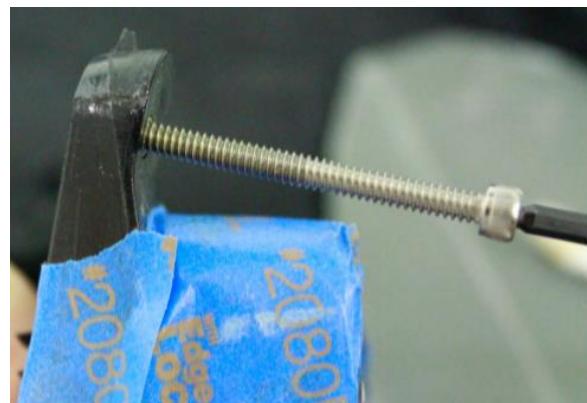


Photo 5-36

5.6.17 Thread machine screw through insert until it protrudes through backside
5.6.18 Remove machine screw, threaded insert is now properly prepared and ready for use.
5.6.19 Repeat steps 5.6.12-5.6.18, for all four Mount Tabs (both lights)



Photo 5-37

5.6.20 Collect Pivot Mount (01-2506-R) and Rubber Isolator (00-8513)
5.6.21 Insert Rubber Isolator where one side of groove is inserted into inner rib of Pivot Mount
Note: Pivot Mount has a UCS (Universal Coordinate System) Icon embossed on top inner tab of part. To Identify correct Pivot Mount to associated side--when held in installation position, arrows must always point Upward and Forward (direction of flight) (Right side is shown below).

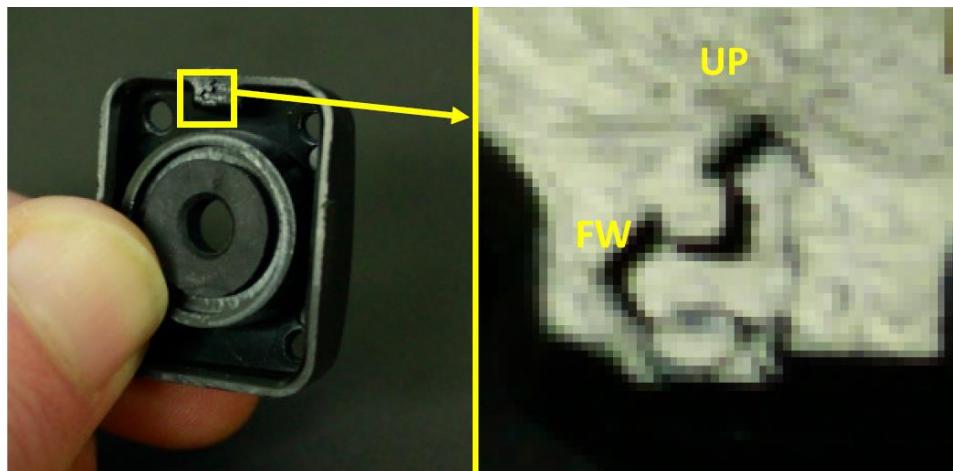


Photo 5-38

5.6.22 Use a small standard screwdriver and gently press around perimeter of Rubber Isolator until securely fastened inside of Pivot Mount

5.6.23 Both sides of Rubber Isolator flange should straddle inner ring of pivot mount and will slide freely from side to side

5.6.24 Mount Assembly is now ready for installation to Light Assembly.



Photo 5-39

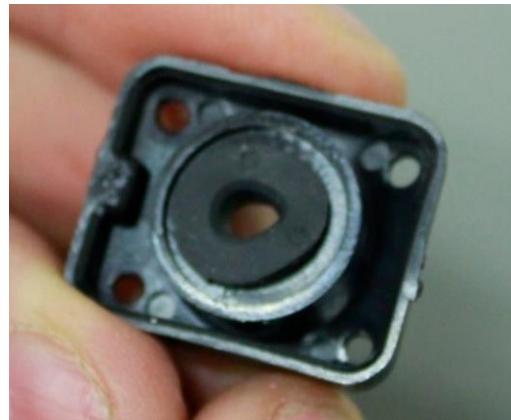


Photo 5-40



Photo 5-41



Photo 5-42

5.6.25 Use a liberal amount of IPA and wet inner surface of Rubber Isolator



Photo 5-43



Photo 5-44

5.6.26 Use a slight twisting motion and forward pressure to insert Mount Assembly on Mount Post of Light Assembly

Note: Ensure flat side of Mount Assembly is facing inward (toward Light Assembly)

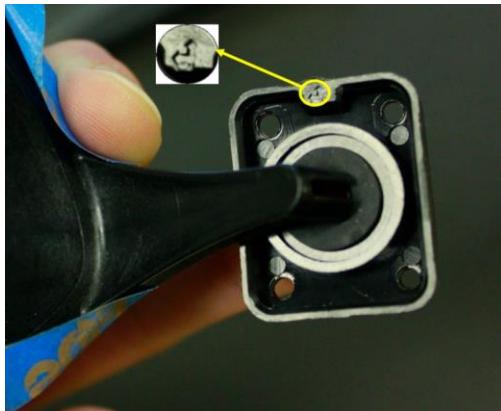


Photo 5-45

5.7 Locate and Install Pivot Mount in Wingtip

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

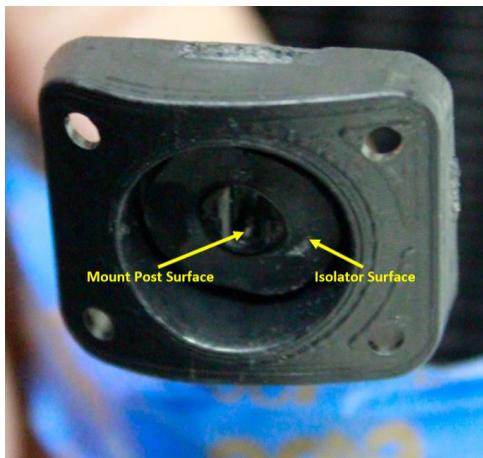


Photo 5-46

5.7.2 With Mount Assembly rotated in upward position (UCS arrows pointed up and forward) and installed on Light Assembly, install and locate it from backside of wingtip

Note: UCS arrows are pointed UP and FWD

- A. Insert #6 machine screw through top hole
- B. Place spring over screw shank
- C. Hold Light Assembly in place and carefully line up machine screw with threaded mount hole
- D. Use extreme caution not to cross-thread screw, carefully thread it until fully extended beyond Mount Tab
- E. Thread both machine screws until approximately $\frac{3}{4}$ " of thread is sticking through Mount Tab

5.7.3 Repeat step 5.7.2 for remaining Mount Tab and machine screw

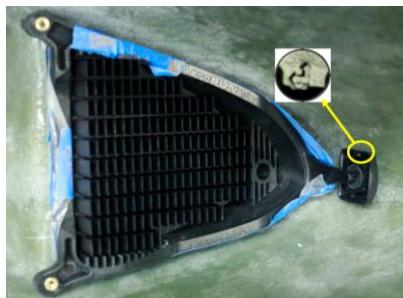


Photo 5-47



Photo 5-48



Photo 5-49



Photo 5-50



Photo 5-51



Photo 5-52



Photo 5-53

- 5.7.4 With inboard section of Light Assembly secured with two machine screws, final clearance between wingtip and Light assembly can be done
- 5.7.5 Repeat steps 5.6.5 thru 5.6.8 to check perimeter gap
- 5.7.6 While pressing on back, outboard edge of Light Assembly, sweep perimeter of gap and increase tolerance where needed



Photo 5-54

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



Photo 5-55



Photo 5-56

5.8 Installation Option A: Drill and Rivet Pivot Mount

- 5.8.1 While keeping forward pressure on Light Assembly, use 1/8" drill bit to drill one mount hole through outside skin of wingtip
- 5.8.2 From outside, use 1/8" Cleco to secure hole



Photo 5-57



Photo 5-58

5.8.3 Repeat drill process on hole diagonal to first hole while pressing Pivot Mount firmly against wingtip inner wall, secure it with Cleco



Photo 5-59



Photo 5-60

5.8.4 With Mount Tap firmly secured, finish drilling remaining two holes. Use countersink bit to prepare two holes to accept an aluminum-mandrel 1/8" rivet

NOTE: DO NOT use steel or steel mandrel rivets. An aluminum rivet with aluminum mandrel, is only acceptable rivet. Steel rivets will destroy Mount holes.



Photo 5-61



Photo 5-62

5.8.5 Remove Cleco from both holes

5.8.6 Repeat steps 5.8.1 - 5.8.4 to prepare other two holes for rivet process



Photo 5-63



Photo 5-64

5.9 Installation Option B: Bonded Pivot Mount

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

- 5.9.1 Use 100-80 grit sandpaper to prepare facing sides of bonded areas of Pivot Mount and inside skin of wingtip



Photo 5-65



Photo 5-66

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



Photo 5-67

5.9.4 Test fit light assembly to verify it fits in opening and allows Pivot Mount to come within .1" on inner skin of wingtip surface

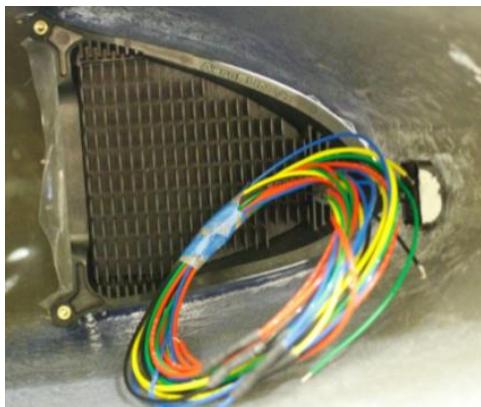


Photo 5-68

5.9.5 Use structural adhesive/epoxy and microfiber, gather required tools to properly mix and apply adhesive



Photo 5-69

5.9.6 Apply a liberal amount of adhesive to surfaces of Pivot Mount, allowing material to bridge inner recess

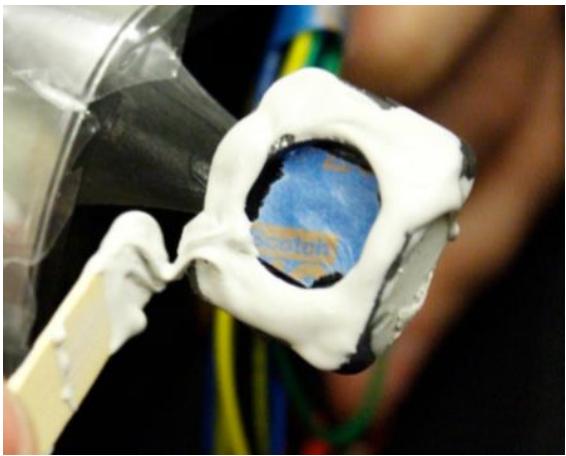


Photo 5-70

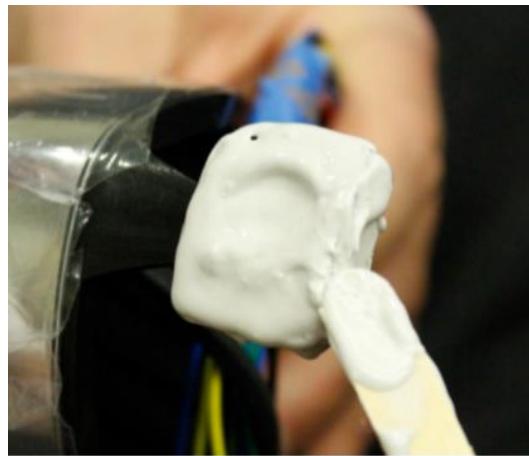


Photo 5-71

5.9.7 Carefully install light assembly by leading with inboard section
NOTE: DO NOT allow adhesive to contact inner wingtip skin until close to final position

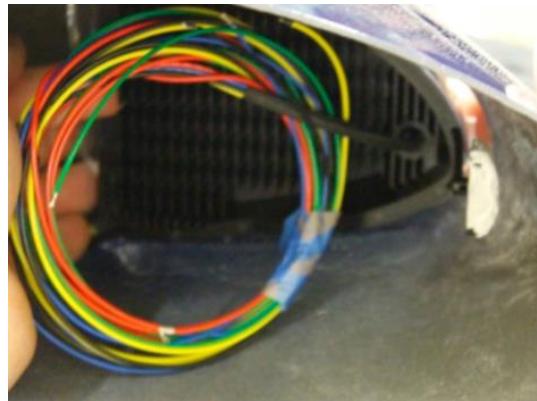


Photo 5-72

5.9.8 Hold light assembly in-place with forward pressure and carefully thread two mount screws into light assembly
5.9.9 Ensure Pivot Mount is firmly pressed against inner wingtip skin.

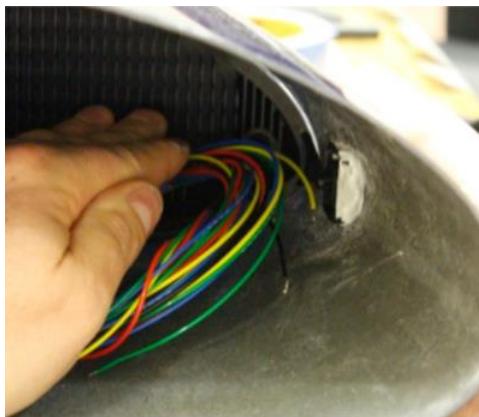


Photo 5-73

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



Photo 5-74

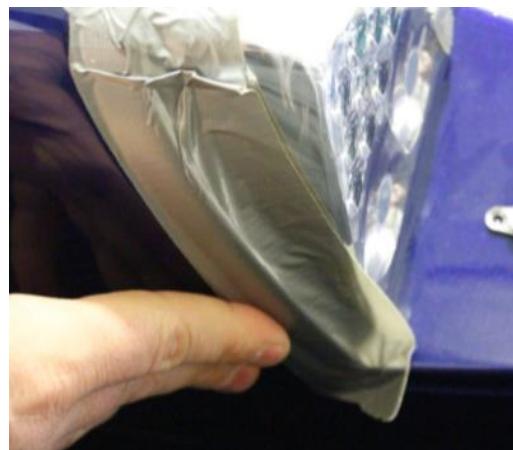


Photo 5-75

5.9.11 Use an applicator stick and distribute adhesive equally

5.9.12 If required, apply additional adhesive to ensure there is ample contact area between components.



Photo 5-76



Photo 5-77

5.9.13 Allow adhesive to cure and remove duct tape.

5.9.14 To ensure adequate clearance between light assembly and wingtip cutout, repeat steps 5.6.5 - 5.6.8

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



Photo 5-78

5.10 Final System Check

5.10.1 When finished there should be a consistent/even gap of approximately .030"-.050" between the wingtip opening and Light Assembly, to allow full movement of adjustment range

NOTE: Use extreme caution when adjusting light assembly to ensure there are not any binding or pinch points when moving light during adjustment phase

5.10.2 Verify there is ample space between components by sweeping a .030" gage (typical business card) after every adjustment—

NOTE: LIGHT ASSEMBLY MUST NOT BE TOUCHING WINGTIP OPENING WHEN IN FINAL POSITION!

5.10.3 To ensure Light Assembly is installed properly and with its full features available, the following guidelines are used as a reference

Range of Motion:

a) Tilt Range

- i. Up: 3deg
- ii. Down: 3deg

b) Pan Range

- i. Inboard: 3deg
- ii. Outboard: 3deg

5.10.4 For ease and quality of painting wingtip, it is HIGHLY RECOMENDED to remove Light Assembly until final stages of aircraft construction.

5.10.5 It is HIGHLY RECOMMENDED to keep protective factory cover affixed to Light Assembly until pre-flight stages of aircraft construction.

5.11 Location of Pulsar Series Nav/ACS Light

5.11.1 To ensure best performance of both AeroSun Vx and Pulsar NS light assemblies, proper location of Pulsar light assembly must be determined

5.11.2 Place a tape line from apex of leading edge of wingtip to mid-section of AeroSun Vx Lens.

5.11.3 Place a mark at 3" from aft edge of wingtip cutout



Photo 5-79



Photo 5-80

5.11.4 Carefully align centerline of Pulsar Mount with tape line while aligning front hole centers, mark & drill hole

5.11.5 Drill and attach one mount location, then repeat process for final two holes.



Photo 5-81



Photo 5-82

5.12 Residual Instructions

- 5.12.1 Reference airframe manufacturer's current maintenance manual and install LED light(s) in brackets using retained hardware.
- 5.12.2 Install suitable aircraft-approved connectors to wires coming from landing light assemblies and wires routed from switch using wiring diagram in section 0 of this document.
Note: non-pulsing version only has screw terminals for #8 ring terminals and does not support the pulse function.
- 5.12.3 Screw terminals are not polarized, so power and ground can be connected to them in either order. Positive wire for powering pulse mode is connected to yellow wire. Follow wiring diagrams for connecting blue and green synchronization wires for two and four light installations.
- 5.12.4 If installing a light with a pulse function, install an appropriate aircraft-approved switch and circuit breaker of correct rating for lights installed
- 5.12.5 Original landing light switch/switches may be used
- 5.12.6 Placard switches appropriately
- 5.12.7 Power up aircraft and verify proper operation of LED light(s) in both pulsing and steady functions (as appropriate to installation)
- 5.12.8 Use appropriate aircraft maintenance manual, verify light angle has not changed and is oriented and aimed in accordance with manufacturer's instructions.
- 5.12.9 Perform EMI test to verify there is no interference caused by light installation.
- 5.12.10 Reinstall any light cover(s) removed to gain access to lamp assembly(ies) and bracket(s).
- 5.12.11 Enter appropriate logbook entry detailing work, and if necessary, fill out and submit appropriate form 337 for work accomplished.
- 5.12.12 Perform an operational check of landing/taxi light(s) in accordance with 14CFR, §91.407 (b)(c) to determine installed landing/taxi light(s) provide enough light for night operations in accordance with 14CFR, §23.1383.
- 5.12.13 Weight & balance change from standard position light assemblies to LED landing light assemblies is considered negligible.

5.13 Troubleshooting

- 5.13.1 Check for bus voltage at power input wire to light, reestablish power if inadequate power is found.
- 5.13.2 Check for excessive resistance at light ground and repair if necessary.
- 5.13.3 Remove and bench check light if wiring is verified good.

For questions or additional information, please contact AeroLEDS tech support at 1-208-850-3294

6 Wiring Diagram

6.1 Dual AeroSun Vx Landing/Taxi Lights with Pulse

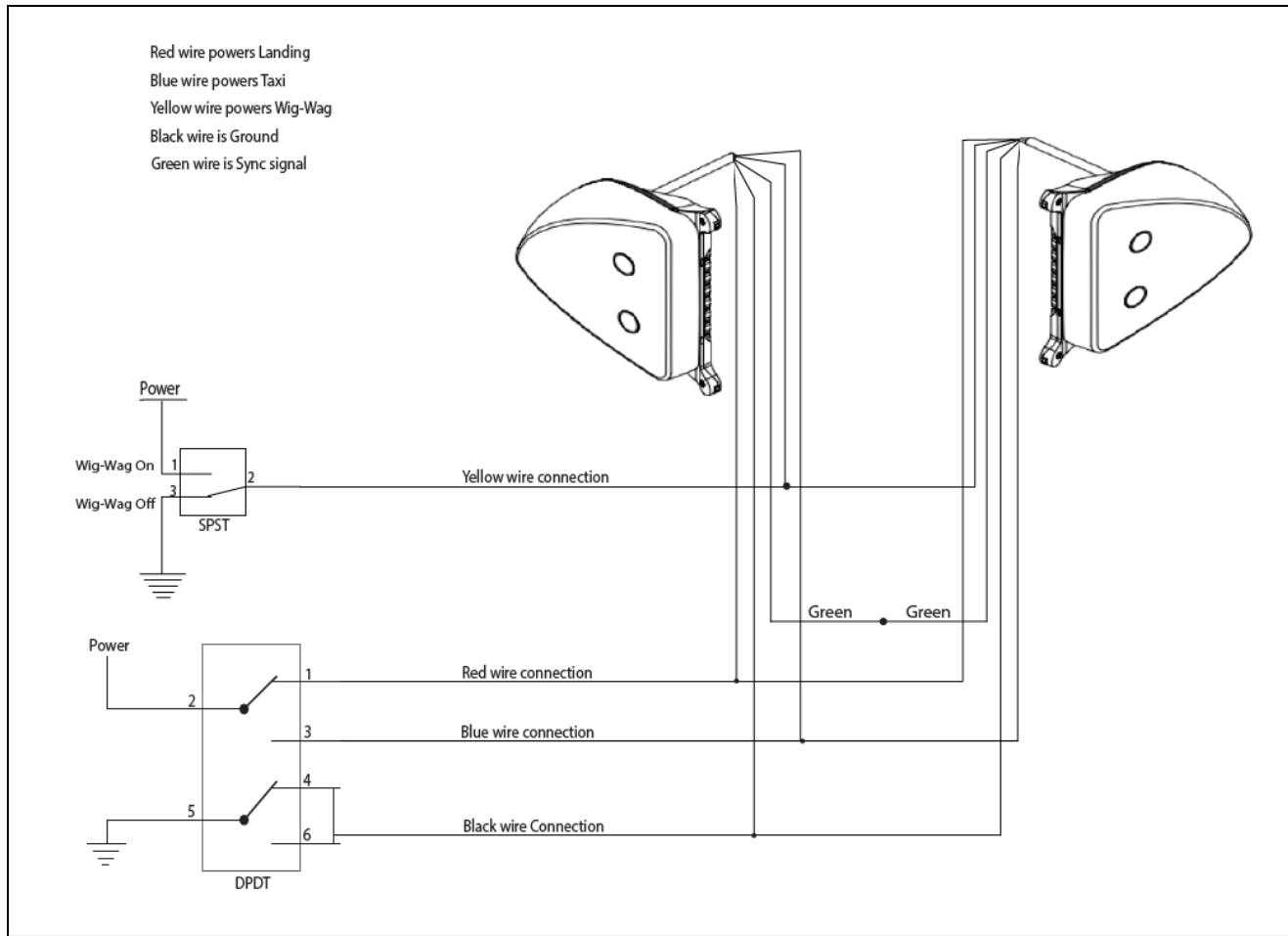


Photo 6-1

6.2 Dimensional drawing (for reference only)

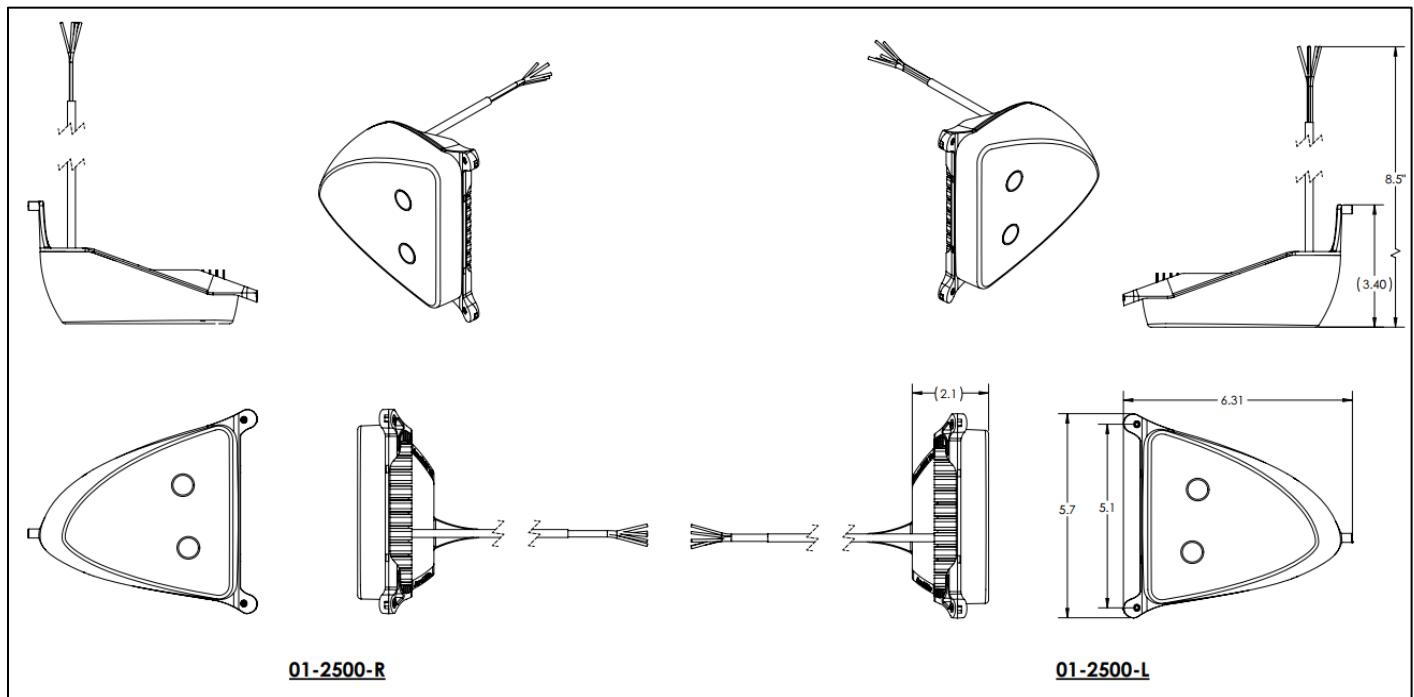


Photo 6-2