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TOTAL PERFORMANCE

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# SERVICE BULLETIN SB-00043

**Date Released:** September 6, 2023

**Date Effective:** September 6, 2023

**Subject:** RV-10 & RV-14 elevator skin cracks

**Affected Models:** RV-10, RV-14/14A without fuel tank sealant fillets applied to the aft elevator spar

**Required Action:** Inspect elevator skins for cracks. If cracks are found, stop-drill and add blind rivets prior to further flight. At or before the next condition inspection, apply fuel tank sealant to interior of skins.

**Time of Compliance:** Inspect for cracks before further flight.

If cracks are not present, you may continue to comply with this service bulletin via the prescribed inspection no less than every 12 months, or you may complete the modifications described in this service bulletin for aircraft without cracks.

If cracks are present: before further flight, stop drill the cracks and install additional rivets. At or before the next condition inspection, and apply fuel tank sealant to the interior of the elevator skins.

**Level of Certification:** EAB: Owner (certification not required)
*Check the rules of the local controlling authority/agency and the operating limitations for your aircraft.*

**Synopsis:**

Data from the field shows that the elevator skins on the RV-10 and RV-14/14A can crack around the rivets where the E-1007/E-00907 Rear Spar is attached. See Figure 1 below for visual examples of cracks.

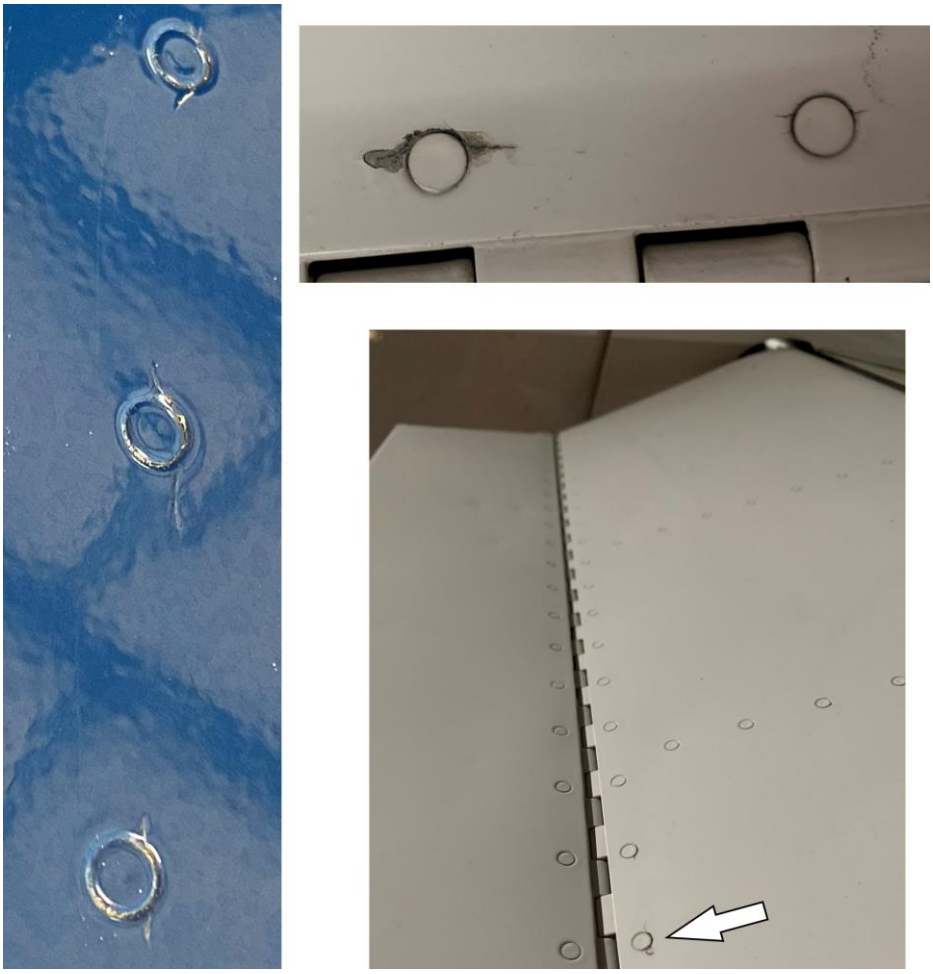

**FIGURE 1:** CRACKED ELEVATOR SKINS ON RV-10 AND RV-14A

If these cracks are found, their growth should be arrested by stop-drilling, and the skin attachment to the rear spar must be reinforced with additional rivets. This must be done immediately and before further flight.

To prevent the formation and growth of these cracks, a fillet radius of fuel tank sealant is applied on the interior of the elevator, where the rear spar meets the skins. Elevators with cracked skins must have the sealant applied at or before the next annual condition inspection. This may be done preventively on elevators that are not cracked.

**Materials Required:**

The following materials are required to achieve compliance with this Service Bulletin:

- SB-00043 KIT
- Rivets to reinforce cracked regions, if needed (see Step 4):
  NAS1097AD4-3.5, CCC-32, and/or MK-319-BS
- Plywood and 2x2 lumber scraps

**Method of Compliance:**

Step 1: Identify the row of AN426AD3 rivets that connects the elevator skin to the E-1007/ E-00907 Rear Spar. They are highlighted in Figure 2:

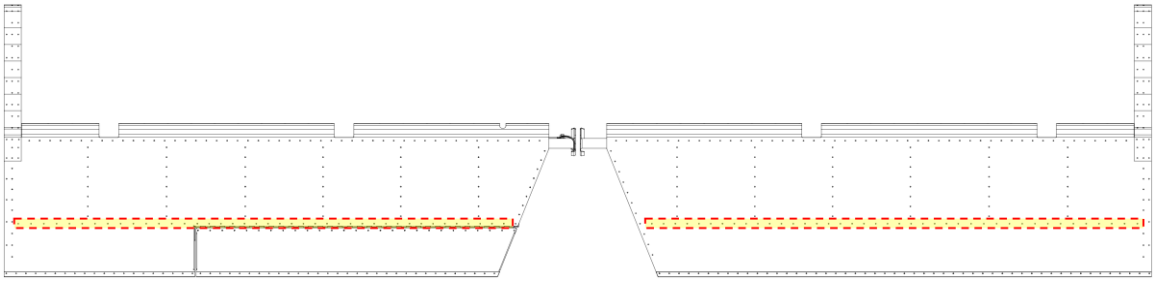

**FIGURE 2:** AN426AD3 RIVETS CONNECTING RV-14 ELEVATOR SKIN TO REAR SPAR. (RV-10 IS SIMILAR, ALSO HAS TRIM TAB ON RIGHT SIDE)

Step 2: Inspect the skin around these rivets for cracks, both on the upper and lower surfaces of the elevator. See Figure 1.

**NOTE: If no cracks are observed, you may either proceed to Step 22 to complete the service bulletin via ongoing inspections or you may modify the elevators with fuel tank sealant installation as described below beginning with Step 5.**

Step 3: Stop-drill any crack tips using a 1/16 to #40 drill bit and deburr the holes. Drill all the way through the skin but not through the rear spar. Ensure that all skin material is removed from within each hole. It is acceptable to remove a small amount of material from the rear spar's outermost surface at the bottom of each stop-drilled hole. See Figure 3.

**FIGURE 3:** STOP-DRILLED CRACKS ON RV-14A ELEVATOR

Step 4: Install a rivet at the midpoint between existing AN426AD3 rivets, on each side of any rivet that has one or two stop-drilled cracks. See Figure 4.

In the region directly ahead of the trim tab, NAS1097AD4-3.5 rivets ("oops" rivets) are recommended. Elsewhere, because it is not possible to access the rear spar flanges, blind rivets such as CCC-32 or MK-319-BS are recommended.

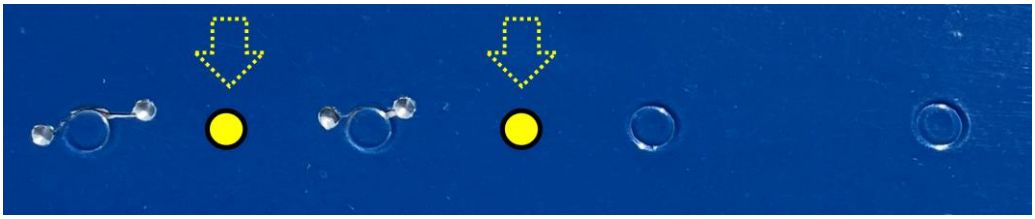

**FIGURE 4:** LOCATIONS WHERE RIVETS SHOULD BE INSTALLED

**NOTE: If cracks were found, the following steps must be performed at or before the next annual condition inspection. If no cracks were found, we recommend that the following steps be performed preventively to eliminate the recurring inspection requirement.**

Step 5: Remove the elevator from the airplane. See Kit Assembly Instructions Section 11. It is recommended that the elevator be placed in a "V block" jig with the trailing edge down. See Figure 5.

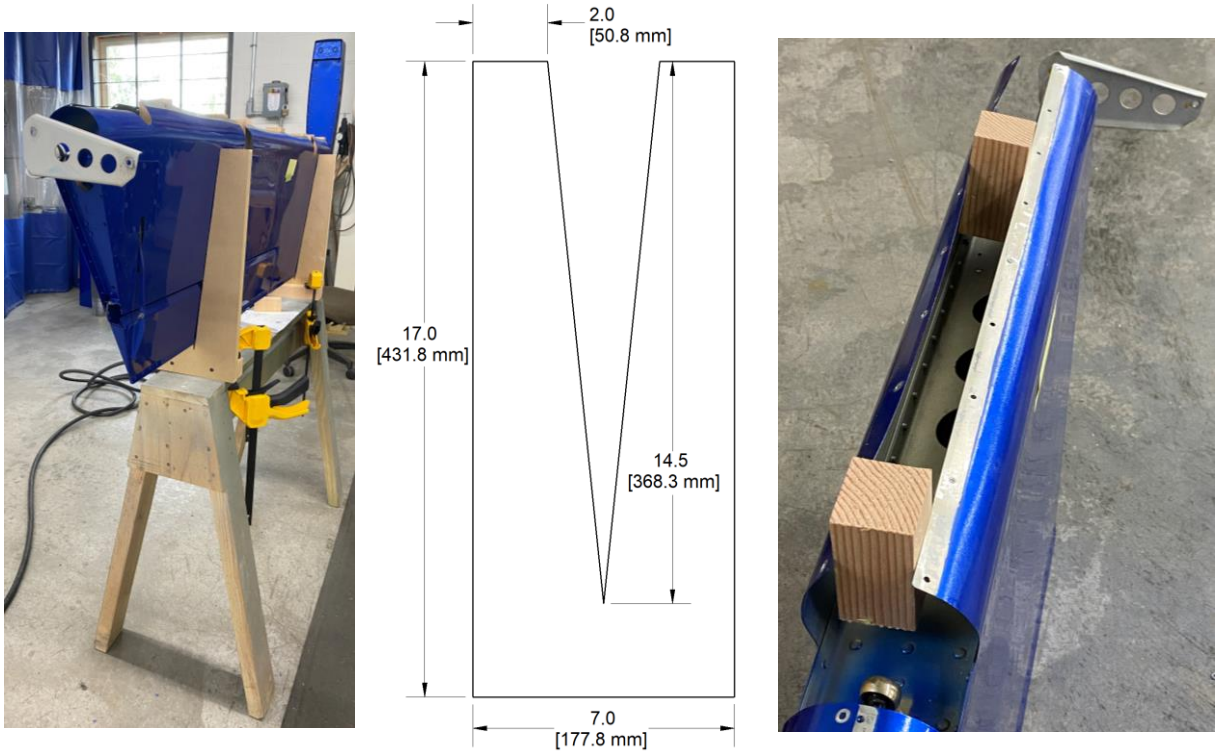


**FIGURE 5:** ELEVATOR ON V-BLOCK JIG,
WITH WOODEN BLOCKS IN LEADING EDGE

Step 6: Remove the AD-41-ABS rivets along the leading edge; There are 23 to 29 rivets on each elevator leading edge.

Step 7: Use small blocks of wood to hold the skins apart at the leading edge. Eight segments of two-by-two (1.5x1.5) work well, each 3 in. [76.2 mm] in length, placed vertically so that one square end rests on the forward spar.

Step 8: Use a shop vac to clean the interior of the elevator and remove any drill shavings and rivet tails.

Step 9: Cut the 3/8 aluminum tube (AT0-035X3/8) to a length of 15 in. [38.1 cm], then deburr and radius the outer edge of the tube, so that it can be slid over a sheet of aluminum with minimal chance of scratching it.

Step 10: Attach the tube to the end of the shop vac hose and seal the opening with duct tape. Use it to vacuum the region where the skins meet the rear spar. See Figure 6.

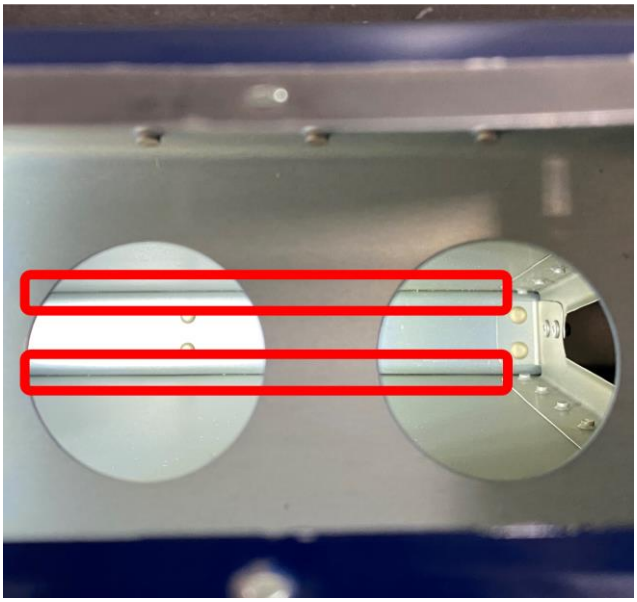

**FIGURE 6:** REGION TO BE VACUUMED AND CLEANED

Step 11: Clean the surfaces where the E-1007/ E-00907 Rear Spar meets the elevator skin, on both the upper and lower sides. Use a solvent such as wax/grease remover or denatured alcohol to remove dust, dirt, and grease as thoroughly as possible for the sake of tank sealant adhesion.

To clean as close to the corners as possible, use a soft implement such as a small sponge or a rag wrapped around the end of a small piece of wood shaped like a wedge or cone. Attach this assembly to the end of a rod or tube and insert through the lightening holes in the E-1002/ E-00902 Front Spar.

Wait until all solvents have fully evaporated. You may wish to speed up the process by using an air nozzle or other device to blow air through the elevator until it's fully dry.

Step 12: Push the MC-236-B1/2 fuel sealant nozzle into the end of the aluminum tube and score the nozzle surface with the tube edge, then remove the nozzle tip by cutting the nozzle about a 1/4 in. [6.4 mm] longer than the score mark indicates. See Figure 7.

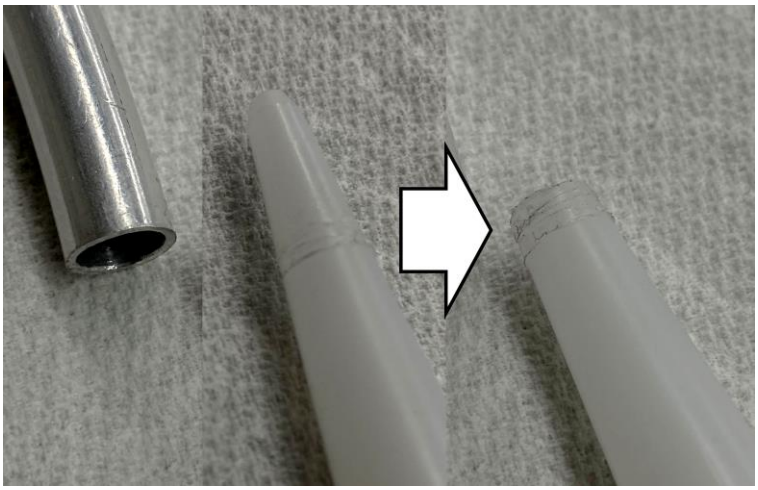

**FIGURE 7:** CUTTING THE SEALANT NOZZLE

Step 13: Insert the cut end of the nozzle into the end of the aluminum tube, then attach them using strong tape such as duct tape or packing tape. See Figure 8.

**NOTE: For Step 14, we recommend using the "Tool Sealant Gun", available on the Van's Aircraft web store. See Figure 8.**

**FIGURE 8:** SEALANT GUN WITH 3/8 ALUMINUM TUBE ATTACHED WITH TAPE TO NOZZLE OF MC-236-B1/2 FUEL TANK SEALANT CONTAINER

**NOTE: For Step 14, bending the tip of the tube can help the placement and shape of the sealant fillet. We recommend a bend of 20 to 30 degrees, 1 in. [25.4 mm] from the tip. For getting around the counterbalance extensions at the tips, bend the entire tube into a wide arc. See Figure 9.**

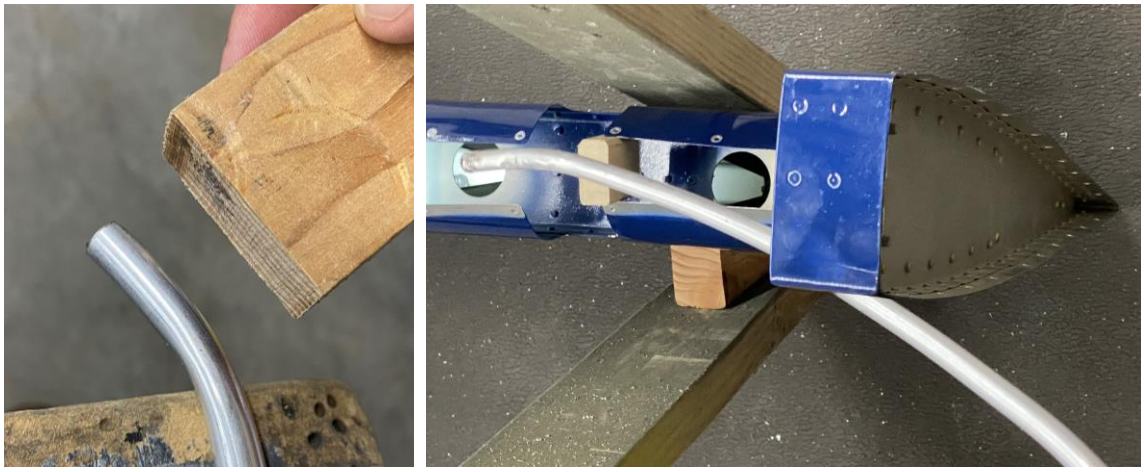

**FIGURE 9:** BENDING THE TUBE

Step 14: Prepare and apply fuel-tank sealant to form a fillet radius on both the upper and lower sides where the E-1007/ E-00907 Rear Spar meets the elevator skin. The sealant can be applied through the lightening holes in the E-1002/E-00902 Front Spar. Ensure that the sealant makes contact both with the skin and with the spar. See Figure 10.

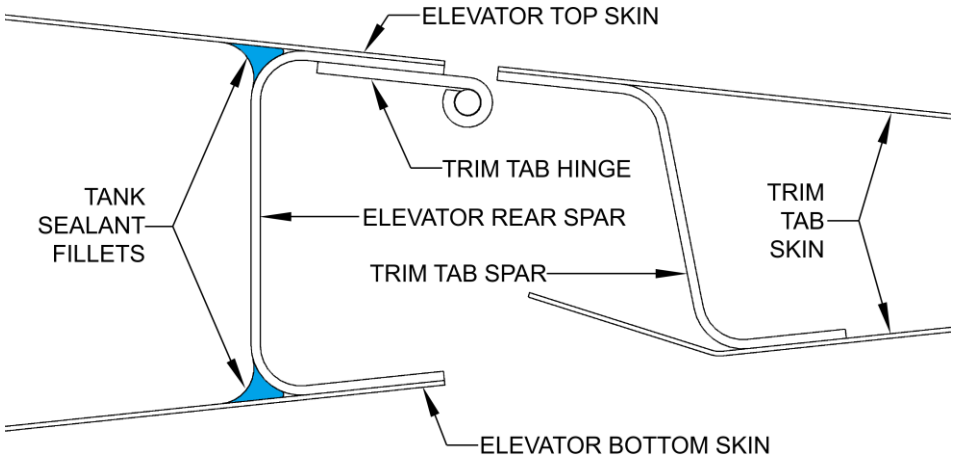


**FIGURE 10:** FUEL TANK SEALANT FILLET RADIUS WHERE REAR SPAR MEETS ELEVATOR SKINS

We recommend applying sealant by pushing the tube at an angle, so that the radius fillet is created by the edge of the tube. In each rib bay, apply sealant from the center to one rib by pushing in one direction, then from the center to the other rib by pushing in the

other direction. The fillet radius can most easily be shaped by the edge of the tube when the tip of the tube is at a 45-degree angle to the rear spar. (If the tip is bent at 20-30 degrees relative to the rest of the tube, then most of the tube can be angled by as little as 20-30 degrees off the vertical, or by as much as 60-70 degrees). See Figure 11.

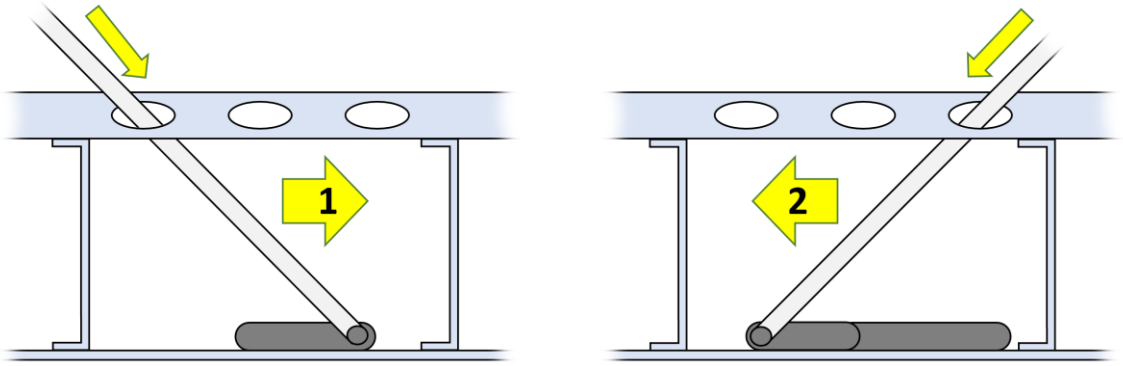


**FIGURE 11:** FUEL TANK SEALANT APPLICATION DIRECTION

**NOTE: Minimize the application of excess sealant, i.e. sealant in addition to the fillet radii in the corners. It is not necessary for a sealant fillet to continuously span from one rib to the next. Gaps are acceptable, especially next to the ribs. After all sealant has been applied, scrape off as much excess material as is practical. We recommend cutting and sanding the end of a popsicle stick or tongue depressor into a spatula-like edge and taping it to the end of a rod to create a small scraper. See Figure 12.**

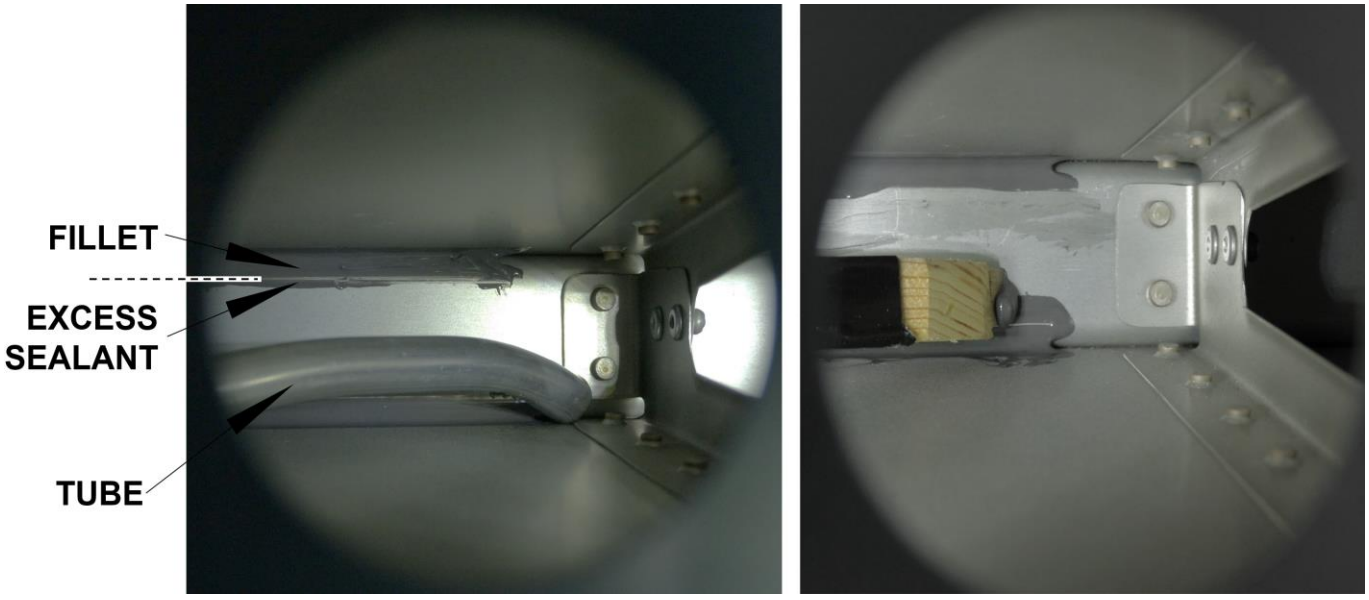


**FIGURE 12:** EXCESS SEALANT

Step 15: Wait for the fuel tank sealant to cure, then close the leading edge by installing forty-eight (48) AD-41-ABS rivets to reconnect the upper skin to the lower skin. See KAI Section 9.

Step 16: Position the E-01414 Counterweight immediately aft of the E-614 Counterweight on the right (inboard) side of the left elevator tip. See Figure 13.

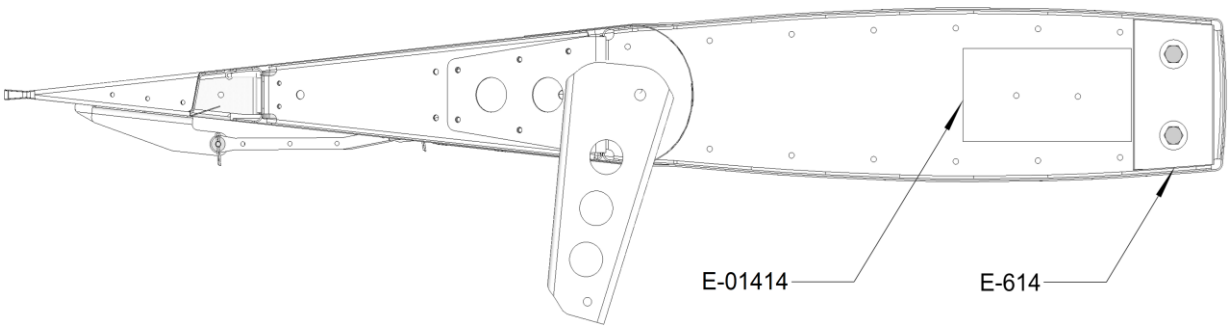


**FIGURE 13:** E-1414 POSITION

Step 17: Using the E-01414 as a guide, match-drill #30 a hole through the webs of the E-903 and E-904 Tip Ribs.

Step 18: Cleco the E-01414 to the ribs.

Step 19: Match-drill #30 a second hole.

Step 20: Using two LP4-3 rivets, attach the E-01414 Counterweight to the tip ribs.

Repeat Steps 15 through 19 for the right elevator.

Step 21: Reinstall the elevators onto the airplane. See KAI Section 11.

Step 22: Make a logbook entry indicating compliance with SB-00043 per the requirements of the controlling authority/agency.

Place a copy of this notification in the back of the maintenance manual for your aircraft. Add the name and date of the service information to the Addendum Documents List at the front of the Maintenance Manual.

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