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SERVICE LETTER 00089

Date Released:	June 17, 2024
Date Effective:	June 17, 2024
Subject:	RV-10 Wing Laser Cut Root Component Replacement
Affected Models:	RV-10 with wings containing the following laser cut parts: W-1010-L/R or W-1010-L/R-1, W-1025B-L/R, W-1029A-L/R, and W-1029B-L/R.
Required Action:	Inspect the area surrounding fastener holes in the laser cut parts for fatigue cracks—cracks propagated beyond the dimple of a flush rivet, or past the head of a universal head rivet. If fatigue cracks are present, replace the affected laser cut parts with punched parts, as outlined in this Service Letter.
Time of Compliance:	Inspect within 200 flight hours or at the next annual inspection, whichever is earlier. If fatigue cracking is not present, you may continue to comply with this Service Letter via ongoing inspection no less than every 12 months or 200 flight hours, whichever is first. Upon or before reaching 1000 flight hours, the alternate fix must be conducted as outlined in this Service Letter, at which point compliance has been met without need for ongoing inspection. If fatigue cracking is present, the modifications required by this Service Letter must be completed before further flight.
Supersedes Notice:	None
Labor Required:	3 Hours (Time given for remediation of QuickBuild Wings, as delivered. Wings progressed past this point may require additional time).
Level of Certification:	Check the rules of the local controlling agency and the operating limitations for your aircraft.

Synopsis:
Following reports from the field of irregular holes and cracked dimples in laser-cut sheet metal parts, an investigation was conducted to review the prevalence of these defects and the effect they have on the structure of aircraft parts and assemblies. The service-life of laser-cut structures has been evaluated through conservative analysis, computer simulations and mechanical testing of representative structural joints, sub-assembly details, and full assemblies. Based on the results of analysis and testing, Van's Aircraft has classified each part that was manufactured via the laser-cutting process into two categories: Parts that are Recommended for Replacement and parts that are Acceptable for Use. These classifications have been made out of an abundance of caution, and all parts classified as Acceptable for Use are functionally equivalent to punched parts. For more information about the use of laser cut parts in RV Kit Aircraft, please see https://www.vansaircraft.com/lasercutpartsreference.

The W-1010-L/R (or W-1010-L/R-1) Inbd Wing Rib, W-1025B-L/R Flap Hinge Rib, W-1029A-L/R and W-1029B-L/R Torque Tube Support Brackets have been classified as Recommended for Replacement. These components are of a critical nature and/or experience occasional high load events that make them more susceptible to fatigue damage.

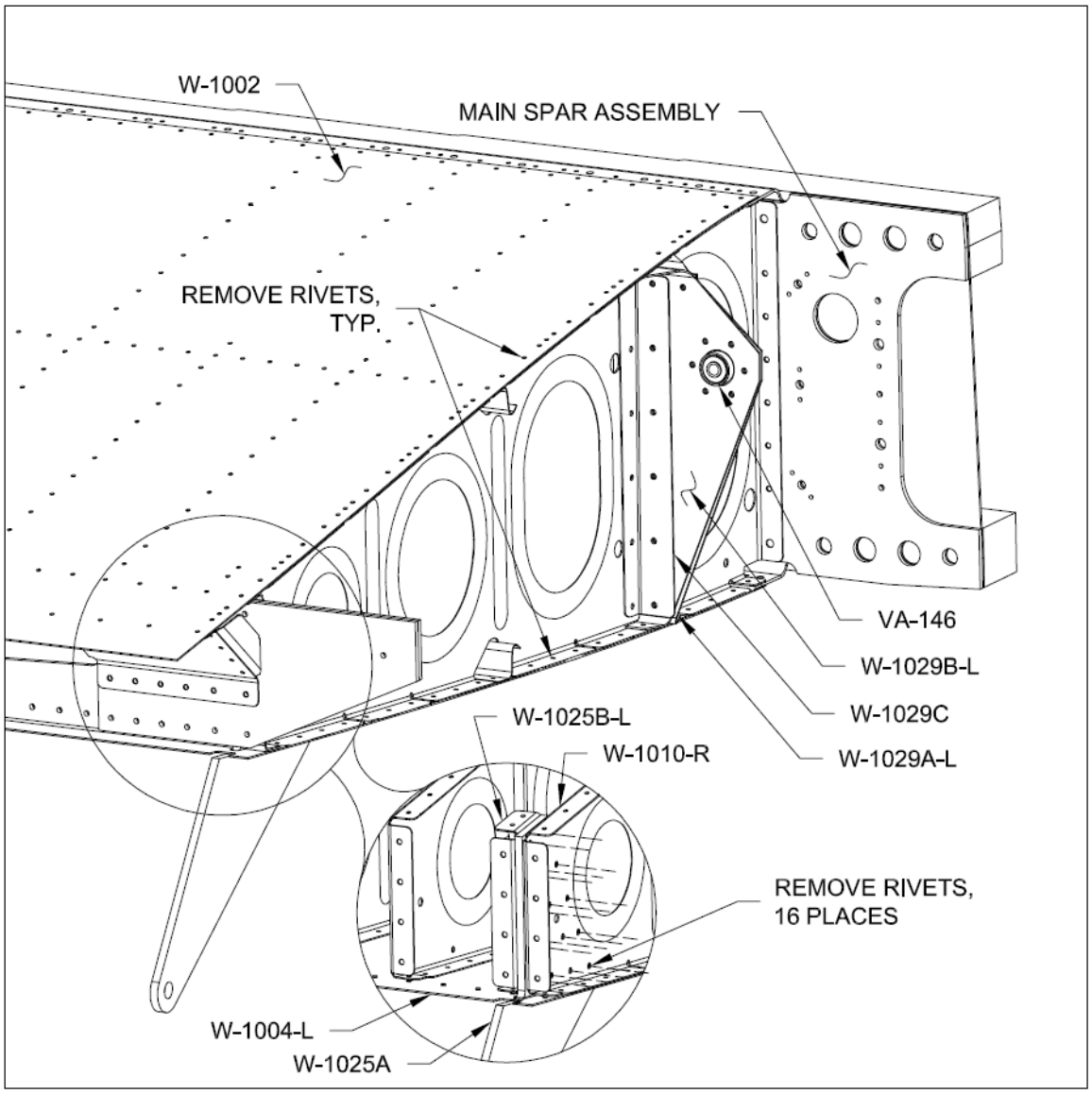

FIGURE 1: LEFT WING ROOT AREA

The listed components are to be replaced with a CNC punched component of the same part number, or the modified components included in this Service Letter. Affected wing assemblies may be at various stages of completion and contain some or all affected components. The following service information is representative of a wing assembly that has been completed and contains laser cut instances of all the components listed above. Where applicable, in-process steps may be omitted to represent the level of completion found in each individual case.

Materials Required:
The following materials are required to complete the steps necessary to achieve compliance with this Service Letter 00089.

Purchase: SL-00089 KIT

Method of Compliance:

Step 1: Inspect the wing assembly and confirm the components identified for replacement are laser-cut.

NOTE: Refer to "Parts Identification Guide" at https://www.vansaircraft.com/lasercutpartsreference to aid in identification of laser-cut parts.

Step 2: Inspect the laser cut parts for fatigue cracks. If no fatigue cracks are present you may proceed to Step 42 to complete this service letter via ongoing inspections, or you may replace the affected parts as described below.

Step 3: Remove wing(s) from the fuselage to gain access to the wing root. Reference Section 44 of the KAI (Kit Assembly Instructions).

Step 4: Remove the WD-1014 Torque Tube assembly. Reference Section 23 of the KAI.

Step 5: Remove the Fuel Tank. Reference Section 18 of the KAI.

NOTE: The following steps detail procedures for the left wing. Mirror all steps shown below for the right wing.

Step 6: Remove rivets fastening the W-1025A to the W-1010-R and W-1025B-L as shown in the detail view of Figure 1. Remove the W-1025A, set aside for reinstallation in a later step.

Step 7: Remove all rivets joining the W-1002 Top Inbd Wing Skin to the W-1010-R, including those common with the W-1029A-L and W-1029B-L. See Figure 1.

Step 8: Remove all rivets joining the W-1004 Bottom Inbd Wing Skin to the W-1010-R, including those common with the W-1029A-L and W-1029B-L. See Figure 1.

Step 9: Remove all fasteners joining the W-1010-R to the Main Spar Assembly. See Figure 1.

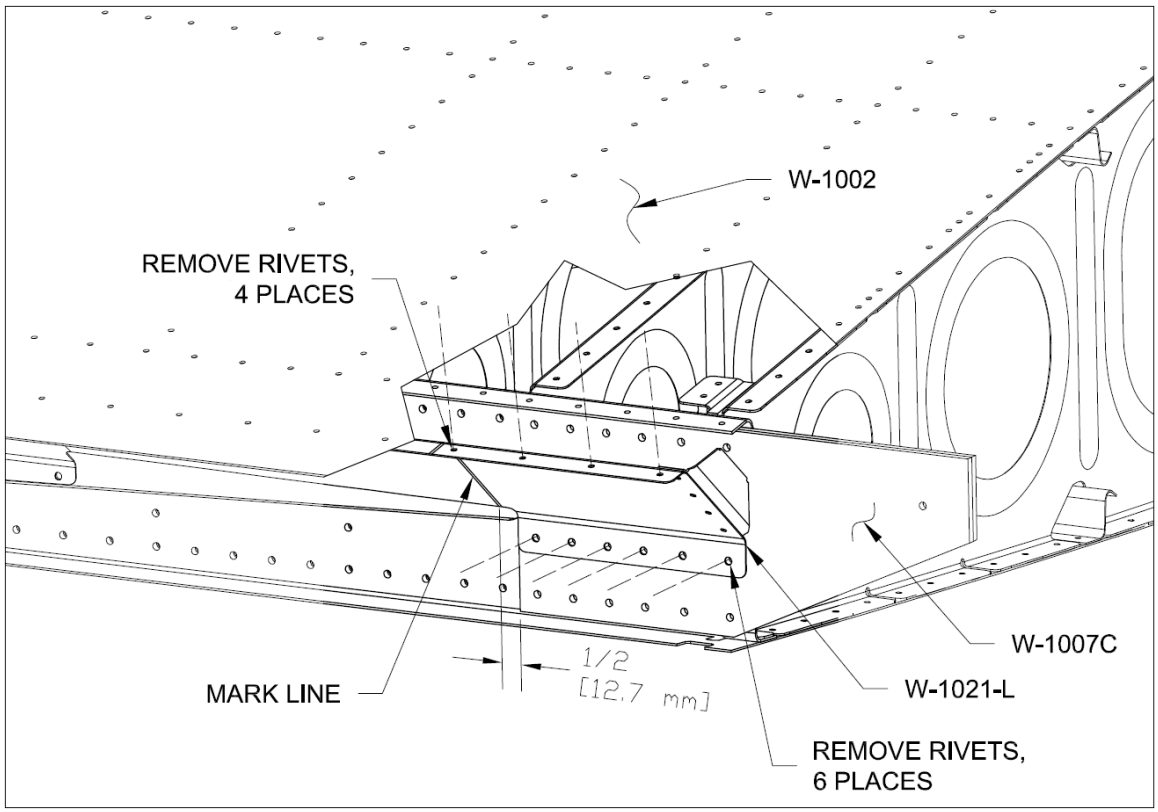

FIGURE 2: REMOVING FLAP GAP FAIRING RIVETS

Step 10: Remove the six inboard-most rivets fastening the W-1021-L Flap Gap Fairing to the W-1007C and underlying structure as shown in Figure 2.

Step 11: Remove the four inboard-most rivets fastening the W-1021-L to the W-1002 as shown in Figure 2.

Step 12: Measure and mark a line on the W-1021-L, 1/2 in. [12.7 mm] offset from, and parallel to, the outboard edge of the W-1007C. See Figure 2.

Step 13: Deburr and smooth any sharp edges on the stainless shims included with the SL-00089 KIT.

Insert the stainless shims between the W-1021-L and W-1007B, and between the W-1021-L and W-1002 to protect the skin and spar while cutting the W-1021-L in the following step. See Figure 3. If necessary, the stainless shims can be secured with double-sided tape.

NOTE: The protective shims installed in the previous step should be considered a backup to careful cutting in the following step, not relied on for protection of the spar and skin.

Step 14: Being careful to not cut the spar or the skin, use the grinder with an abrasive cut-off wheel to separate the W-1021-L along the line previously marked. See Figure 3.

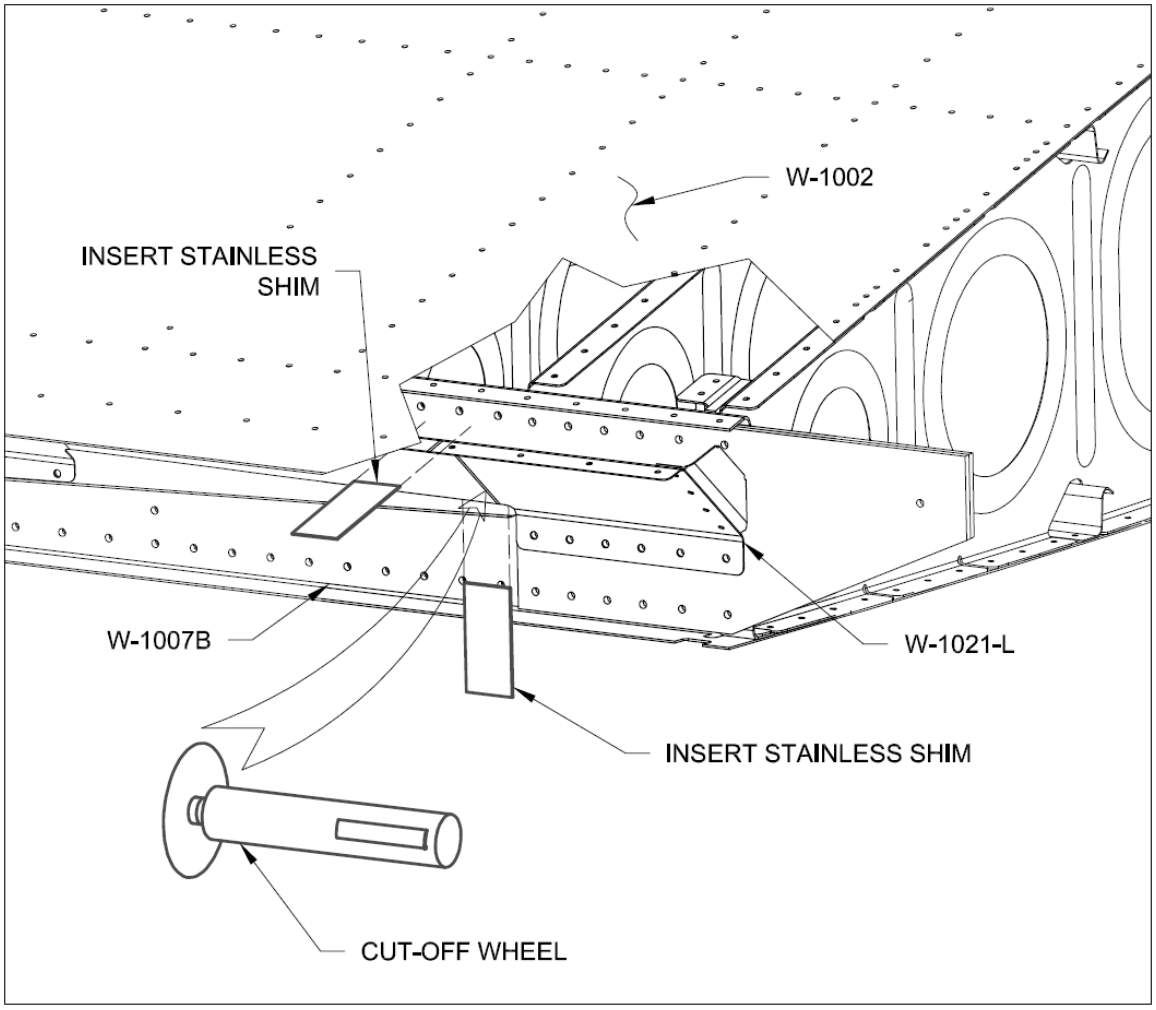

FIGURE 3: CUTTING THE W-1021-L

Step 15: Remove all rivets fastening the W-1010-R to the Rear Spar Assembly. See Figure 4.

Step 16: Remove all rivets fastening the W-1025B-L to the W-1002, W-1004-L, and Rear Spar Assembly. See Figure 4.

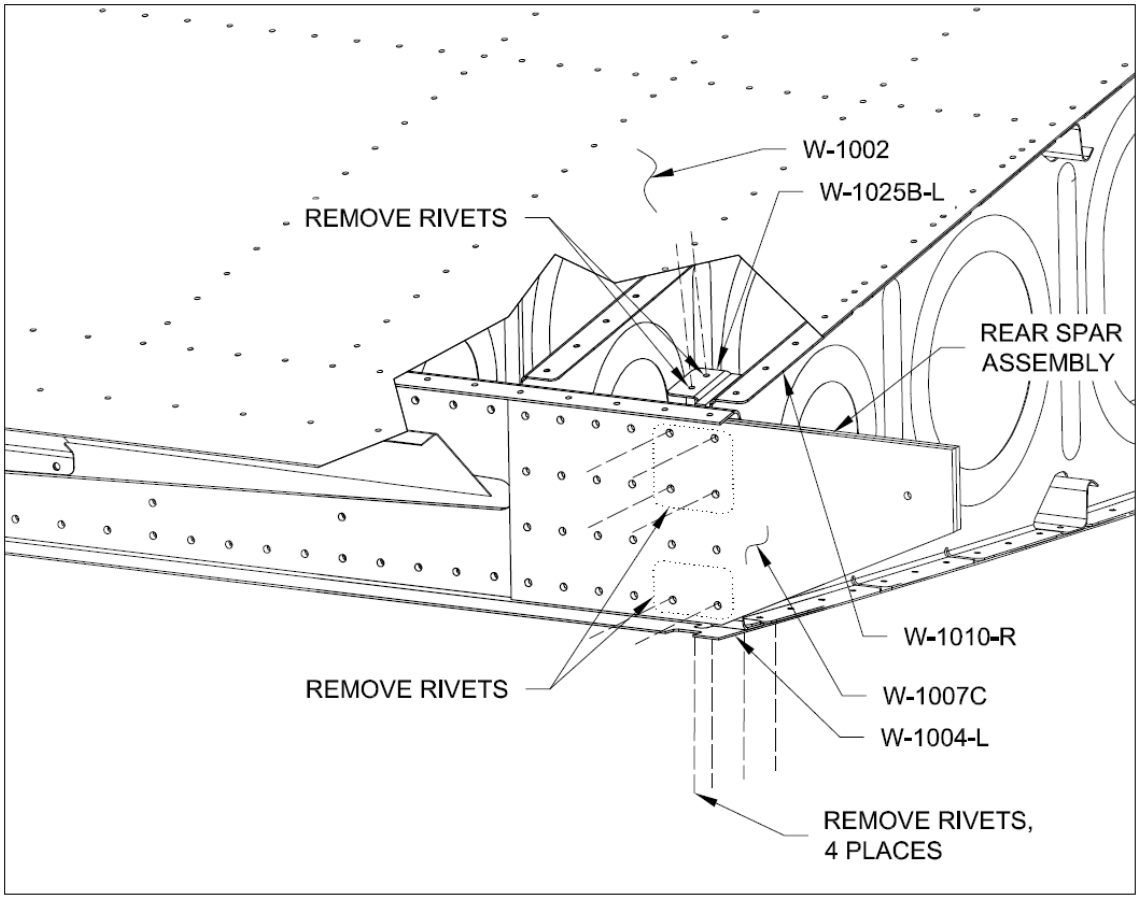

FIGURE 4: REMOVING REAR SPAR RIVETS

Step 17: Dimple the #40 holes in the top flange, and the #30 holes in the bottom flange of the W-1021-L-MOD, allowing it to nest flush with the W-1002 and W-1007C. See Figure 5.

Step 18: Cleco the W-1021-L-Mod to the W-1007C, and W-1002 as shown in Figure 5. The top flanges of the W-1021-L-MOD and W-1021-L must not interfere with each other when clecoed. Trim away interference of the flanges as required.

NOTE: Use care while match-drilling the holes in the following step in order to avoid pressing the drill bit into the spar or skins. Use of a drill-stop is recommended to keep drill penetration to the minimum required.

Step 19: Match-Drill #30 the three holes from the W-1021-L-Mod into the W-1021-L as shown in Figure 5.

Step 20: Remove the W-1021-L-Mod and deburr the holes drilled in the W-1021-L.

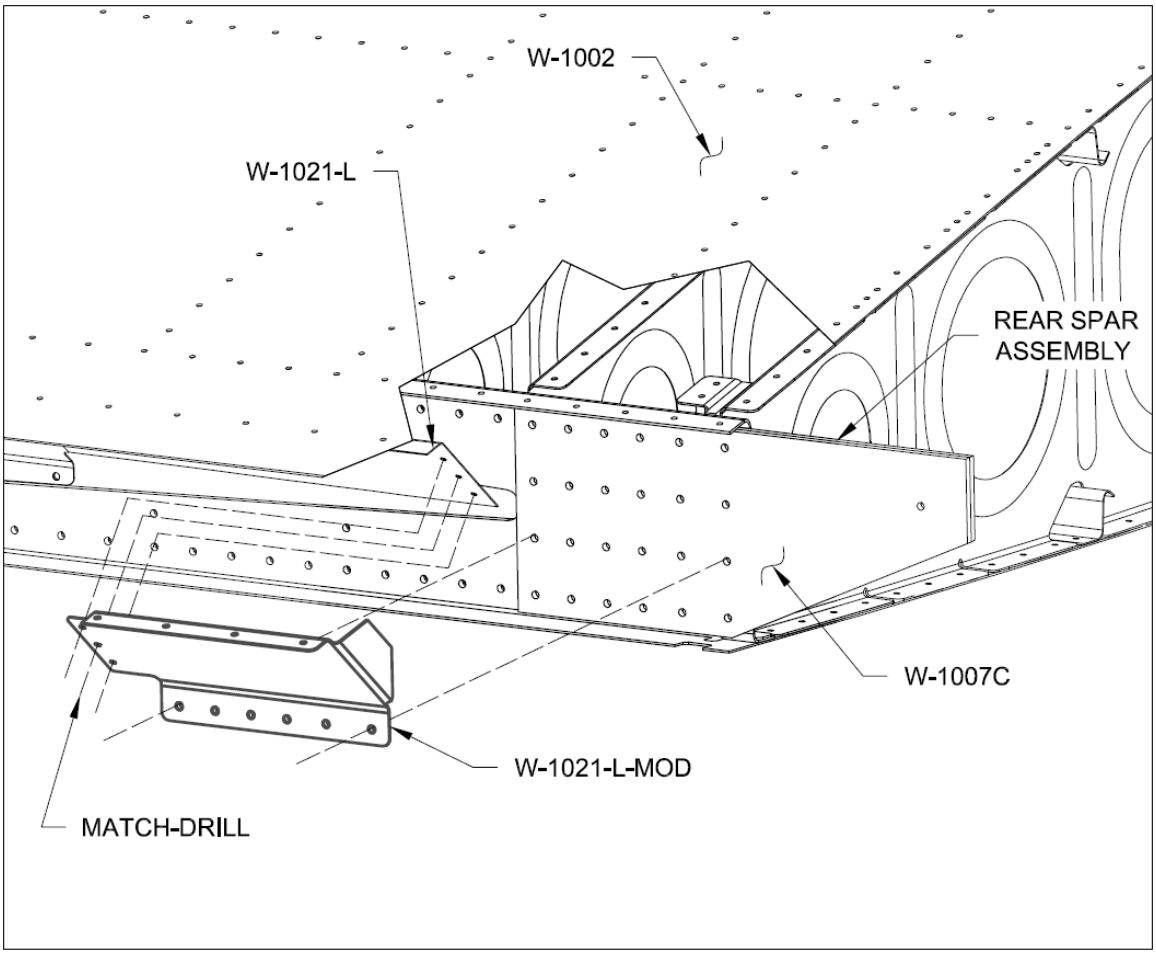

FIGURE 5: MATCH-DRILLING THE W-1021-L

Step 21: Remove the laser cut W-1010-R and W-1025B-L from the wing. It may be necessary to reroute or remove air-data and electrical lines to allow removal of these ribs. In certain cases, cutting and later splicing these lines may be required.

Step 22: Drill out all rivets required to remove the Torque Tube Support Bracket Assembly from the W-1010-R. Continue drilling out all fasteners needed to disassemble the bracket, and set aside the VA-146, W-1029C, W-1029D, W-1029E for reuse. Reference Figure 6.

Step 23: Prep the W-1010-R-1-Mod for installation by dimpling the rivet and screw holes to correspond with their mating features in the W-1002 and W-1004 Wing Skins. See Section 16 and Section 20 of the KAI.

Step 24: Upsize the tooling holes and install the snap bushings into the W-1010-R-1-MOD as shown in Figure 6.

Step 25: Reassemble and rivet the Torque Tube Support Bracket Assembly with the replacement W-1029A-L and W-1029B-L, reusing the W-1029C, W-1029D, W-1029E, and VA-146. See Figure 6.

Step 26: Rivet the Torque Tube Support Bracket Assembly to the W-1010-R-1-MOD as shown in Figure 6.

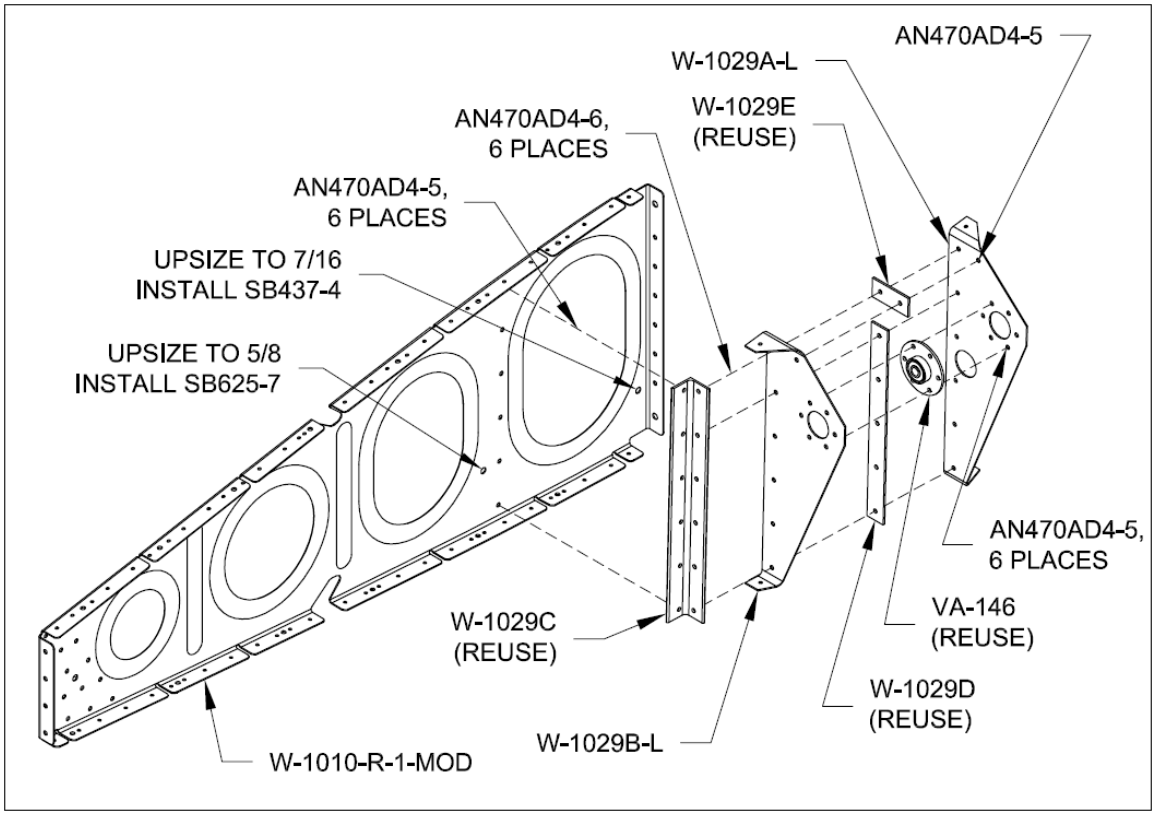

FIGURE 6: TORQUE TUBE SUPPORT BRACKET ASSEMBLY

Step 27: Prep the W-1025B-L for installation by dimpling the #40 holes common with the W-1002 and W-1004 Wing Skins.

NOTE: The following steps and figures outline reinstallation of the ribs and brackets into the inboard wing bay. There are locations where the original fasteners may be substituted with an upsized, blind rivet as called out in the figures. Use of the upsized, blind rivets is required where holes were either enlarged or oblongated during rivet removal. The upsized, blind rivets can also be used to ease installation in locations that would have limited access for bucking solid rivets. The rivet substitutions called out have an equivalent or greater strength and durability.

NOTE: When installing the Cherrymax pulled rivets included in this service letter, please refer to KAI Section 5 and the Van's Aircraft YouTube video about preparing the rivets for installation.

NOTE: The correct size to drill for a 5/32 Cherrymax Rivet is #20.

Step 28: Inspect the W-1025A to determine which/if any of the #30 holes will be upsized to #20.

If upsizing all holes due to deformation or for ease of reconstruction, proceed to the next step.

If only some of the holes will be upsized, note the specific locations on the replacement W-1010-R-1-MOD (which will be visible when assembled).

Step 29: Cleco the replacement W-1025B-L into position as shown in Figure 7.

Step 30: Cleco the W-1010-R-1-MOD into position as shown in Figure 7.

Step 31: Cleco the W-1025A into position between the W-1025B-L and W-1010-R-1-MOD. See Figure 7.

Step 32: Final-Drill #20 any of the holes common to the W-1025A, W-1010-R-1-MOD, and W-1025B-L which were previously deemed for upsizing in Step 28
.
Remove the W-1025A, W-1010-R-1-MOD, and W-1025B-L.

Step 33: Deburr and prime the W-1025A, W-1010-R-1-MOD, and W-1025B-L.

Step 34: Cleco the W-1025B-L into the wing, and rivet to the W-1002, W-1004-L, and Rear Spar Assembly as shown in Figure 7. Note the single instance of a longer rivet required in the aft-most hole in the bottom flange of the W-1025B-L as called out in the detail view of Figure 7.

Step 35: Cleco the W-1010-R-1-MOD into the wing.

Step 36: Rivet the W-1010-R-1-MOD to the Rear Spar Assembly using the rivets called out in Figure 7.

Step 37: Cleco and then rivet the W-1025A to the W-1025B-L and W-1010-R-1-MOD as shown in the detail view in Figure 7.

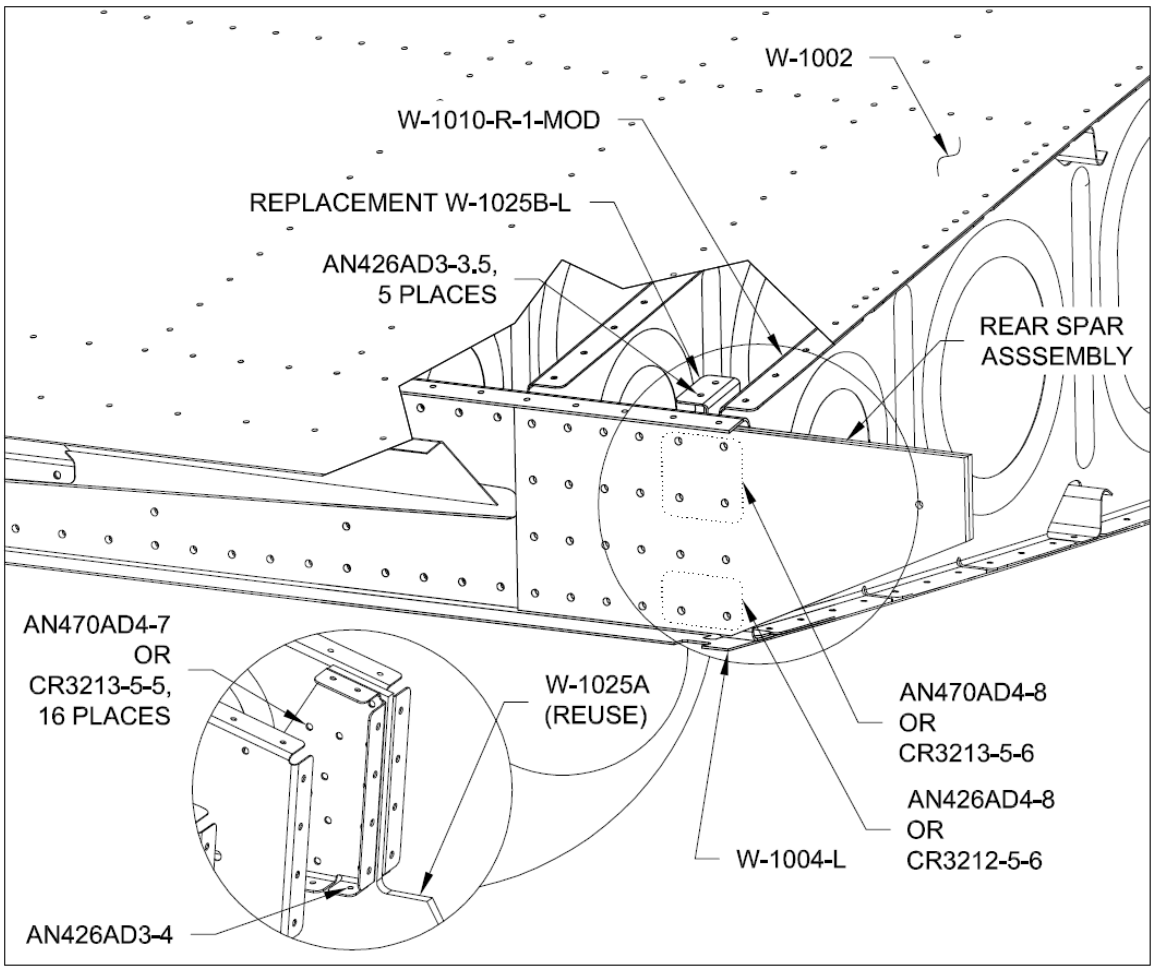

FIGURE 7: RIVET CALL-OUTS FOR REAR SPAR AREA

Step 38: Rivet the W-1010-R-1-MOD and appropriate nutplates to the W-1002 and W-1004-L as shown in Section 16 and Section 20 of the KAI.

Step 39: Fasten the forward flange of the W-1010-R-1-MOD to the Main Spar Assembly in accordance with Section 14 of the KAI. The solid rivets here may be substituted with CR3213-5-4.

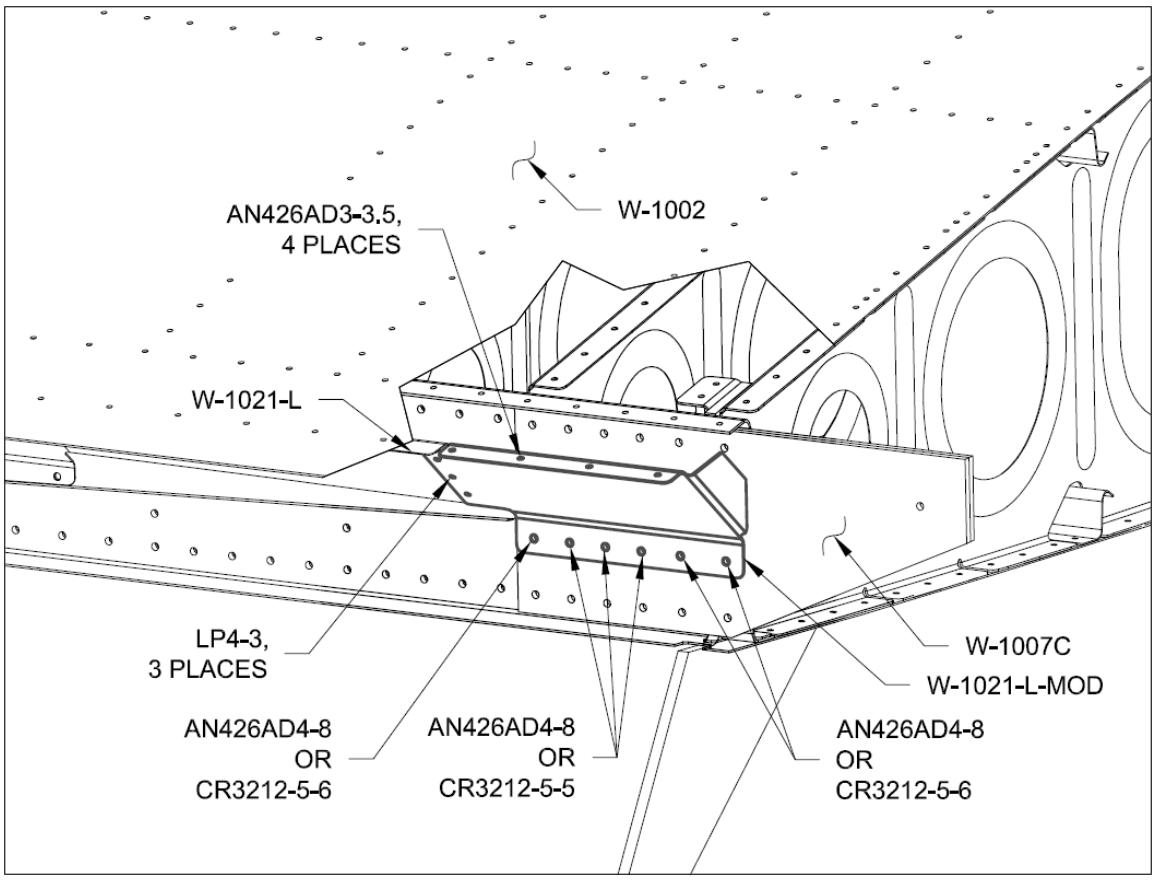

FIGURE 8: FLAP GAP FAIRING RIVETS

Step 40: Rivet the W-1021-L-MOD to the W-1002, W-1021-L, and Rear Spar Assembly as called out in Figure 8.

Step 41: Reassemble the wing per the KAI.

Section 18: Fuel Tank
Section 23: Aileron Actuation
Section 44: Wing Attachment

Step 42: Make a logbook entry indicating compliance with this service document, method of compliance (inspection or parts replacement), and what parts were installed (if any) 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.

If you are no longer in possession of this aircraft, please forward this information to the present owner/operator and immediately notify Van's Aircraft, Inc. via email at registrations@vansaircraft.com.

Information regarding establishing/transferring aircraft ownership, registration and licensing is available at: https://www.vansaircraft.com/qr/transfer-of-ownership/