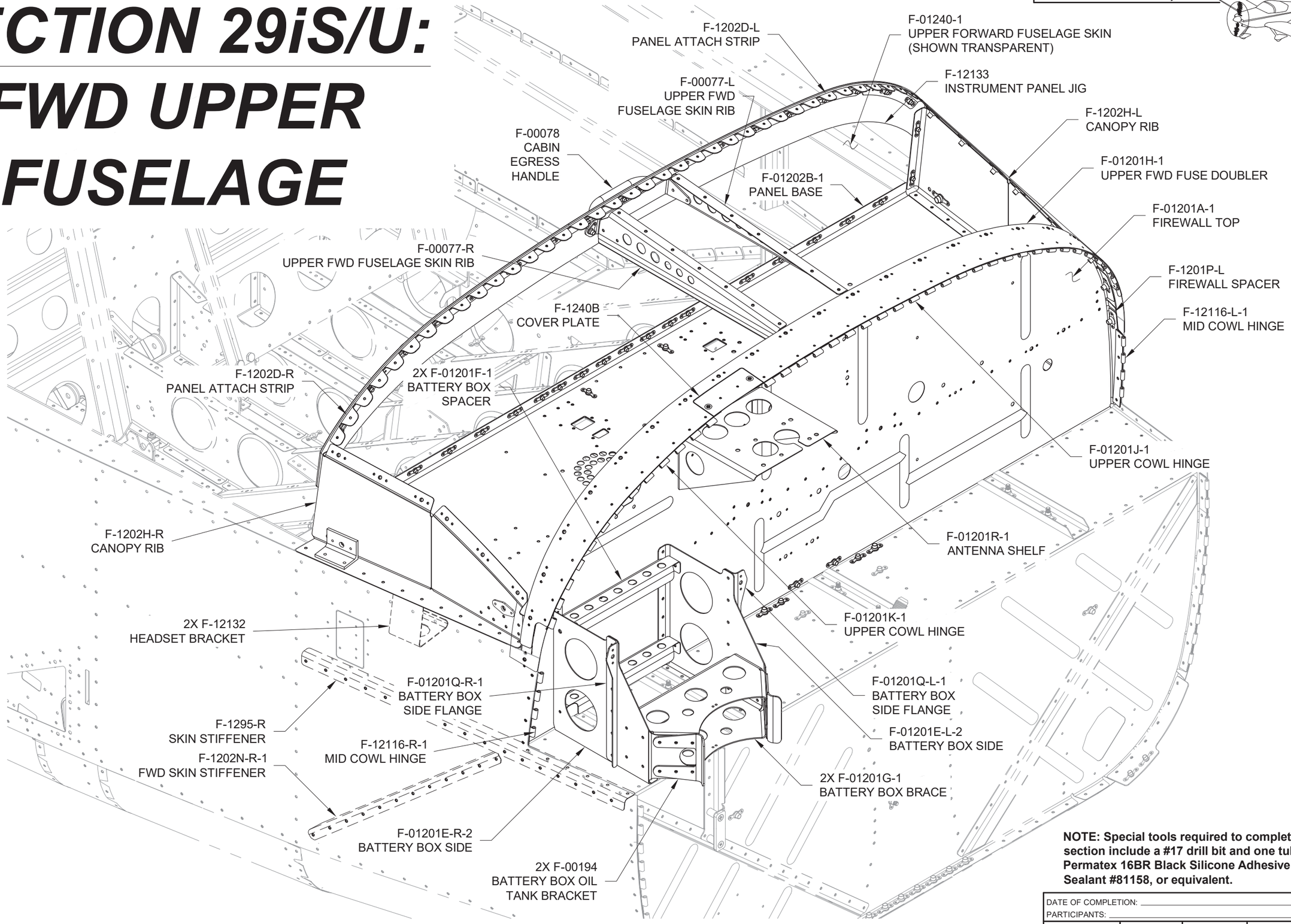
SECTION 29iS/U: FWD UPPER FUSELAGE



NOTE: Special tools required to complete this section include a #17 drill bit and one tube of Permatex 16BR Black Silicone Adhesive Sealant #81158, or equivalent.

DATE OF COMPLETION: _____
PARTICIPANTS: _____

Step 1: Make the F-01201J-1 and F-01201K-1 from AN257-P4 piano hinge per the dimensions in Figure 1. Remove the hinge pin before cutting the parts to length.

Set aside the hinge pin for cowl installation.

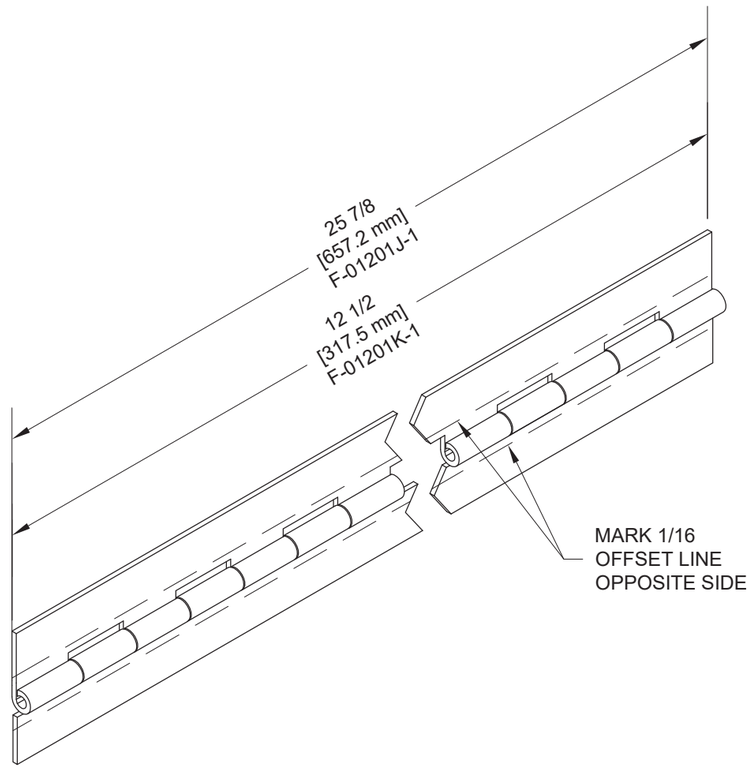


FIGURE 1: UPPER COWL HINGES

Step 2: Mark two lengths of AN257-P4 piano hinge to make the F-12116-L-1 and F-12116-R-1 per the dimensions in Figure 2. Remove the hinge pin then cut the hinge to length.

Set aside the hinge pin for cowl installation.

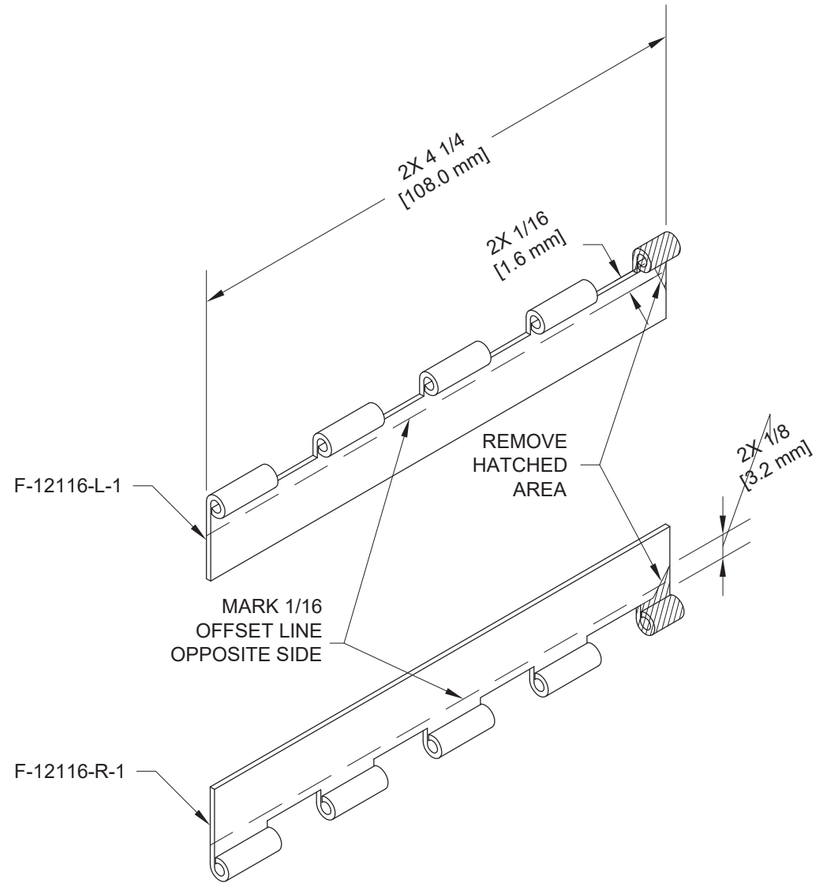


FIGURE 2: MID COWL HINGES

NOTE: Refer to Figure 1 for all of the steps on this page.

Step 1: Dimple the F-1201P to make the F-1201P-L & -R. Dimple the corresponding screw holes in the F-01201A-1 first, then dimple the rivet holes in the F-01201A-1. See Detail A.

Step 2: Cleco the F-1201P-L & -R and the two nutplates to the F-01201A-1. Rivet the ***top rivets only*** as shown in Detail A.

Step 3: Machine countersink #40 the nutplate rivet holes in the F-01201H-1.

Step 4: Final-Drill #17, deburr, then dimple the screw holes in the F-01201H-1.

Step 5: Dimple the screw holes in the F-01201A-1 upper flange.

Step 6: Bend the F-01201H-1 by hand until it approximates the curvature of the F-01201A-1. The F-01201H-1 can be laid flat on a table and the part can be carefully worked over the edge. Take care not to crease or wrinkle the part.

Step 7: Rivet the F-01201H-1 to the F-01201A-1 using the nutplates.

Step 8: Bend the F-01201J-1 and F-01201K-1 until they approximate the curvature of the F-01201H-1.

Step 9: Clamp the F-01201J-1 and F-01201K-1 to the F-01201H-1 as shown.

Align the offset lines on the hinges with the forward edge of F-01201H-1 as shown in Detail B.

The hinges should protrude at least 1/16 [1.6 mm] to 3/32 [2.4 mm] beyond the F-01201H-1 along their entire lengths.

Step 10: Starting at the center and working outboard, match-drill #40 the F-01201H-1 into the upper cowl hinges. Cleco each hole before drilling the next. A clamp next to the drill location will minimize chip entrapment.

Remove and deburr the parts.

Step 11: Machine countersink #40 the hinge rivet holes in the F-01201H-1.

Step 12: Rivet the F-01201J-1 and F-01201K-1 to the F-01201H-1.

Step 13: Attach nutplates to the F-01201A-1 as shown. Dimple the nutplates as required.

Step 14: Rivet the F-01201R-1 to the F-01201A-1.

Step 15: Dimple the rivet holes in the lower flange of the F-01201A-1 as shown.

These parts are now the Upper Firewall Assembly

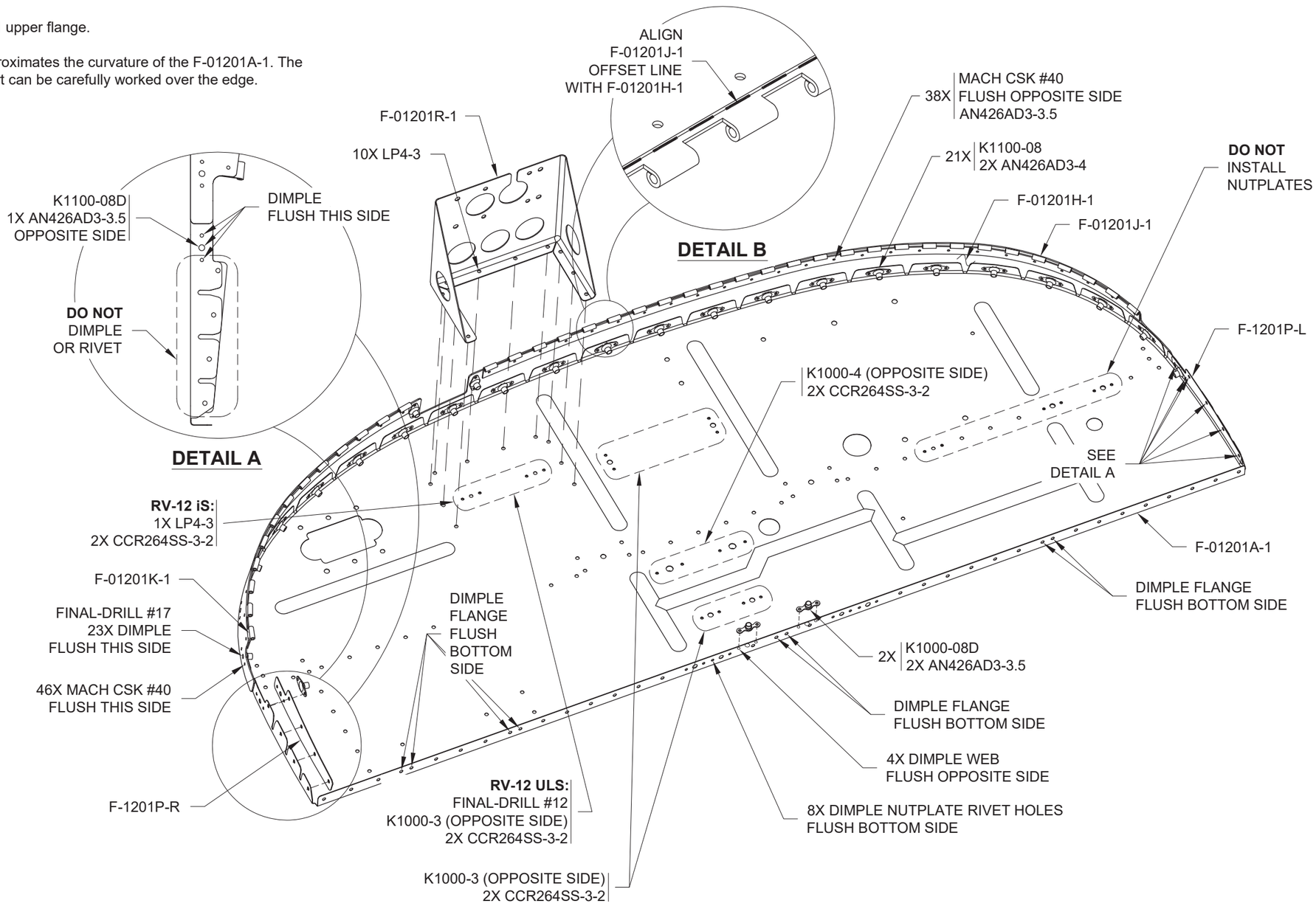


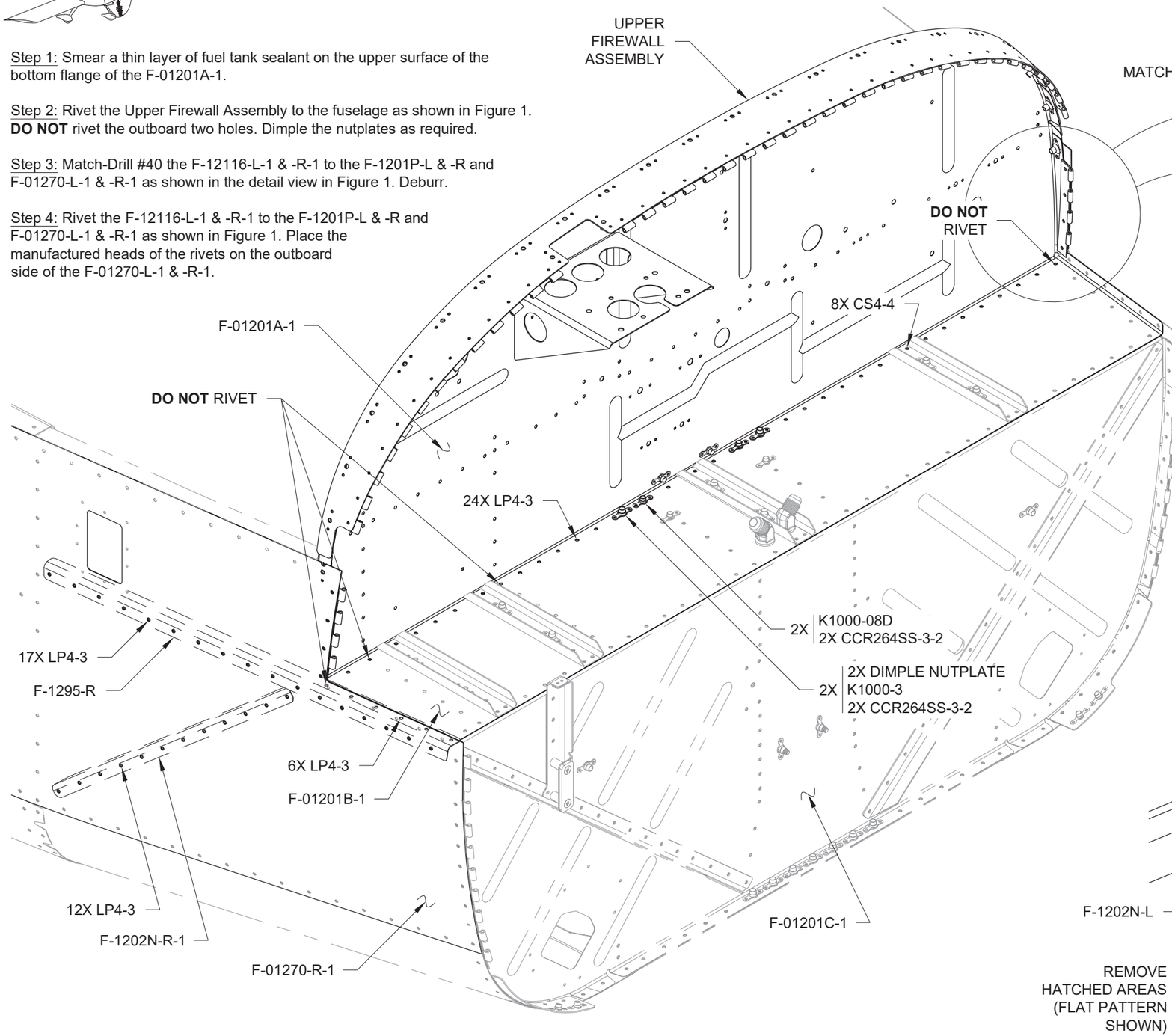
FIGURE 1: UPPER FIREWALL ASSEMBLY

Step 1: Smear a thin layer of fuel tank sealant on the upper surface of the bottom flange of the F-01201A-1.

Step 2: Rivet the Upper Firewall Assembly to the fuselage as shown in Figure 1. **DO NOT** rivet the outboard two holes. Dimple the nutplates as required.

Step 3: Match-Drill #40 the F-12116-L-1 & -R-1 to the F-1201P-L & -R and F-01270-L-1 & -R-1 as shown in the detail view in Figure 1. Deburr.

Step 4: Rivet the F-12116-L-1 & -R-1 to the F-1201P-L & -R and F-01270-L-1 & -R-1 as shown in Figure 1. Place the manufactured heads of the rivets on the outboard side of the F-01270-L-1 & -R-1.



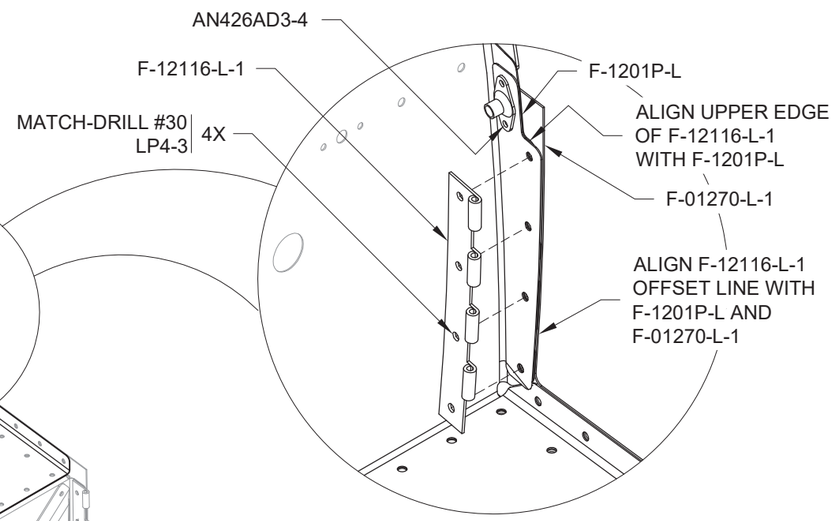


FIGURE 1: ATTACHING THE UPPER FIREWALL ASSEMBLY
(SOME PARTS NOT SHOWN FOR CLARITY)

Step 5: Separate the F-1202N-1 and F-1295 as shown in Figure 2.

Step 6: Apply a bead of fuel tank sealant to the underside of the F-01201B-1 where the F-01201B-1 meets the fuselage side skins.

Step 7: Rivet the F-1202N-L-1 & -R-1 to the F-1270-L-1 & -R-1 as shown in Figure 1.

Step 8: Rivet the F-1295-L & -R to the F-1270-L-1 & -R-1, and F-01201B-1 as shown in Figure 1.

Step 9: Seal the firewall with fuel tank sealant: apply a bead of fuel tank sealant around the perimeter of the F-01201A-1 and F-01201C-1 (on the aft side of both). Pay special attention to the bend relief notches and corner gaps. Use a popsicle stick to form a smooth fillet.

Step 10: Use a light on the forward side to verify that the firewall is fully sealed.

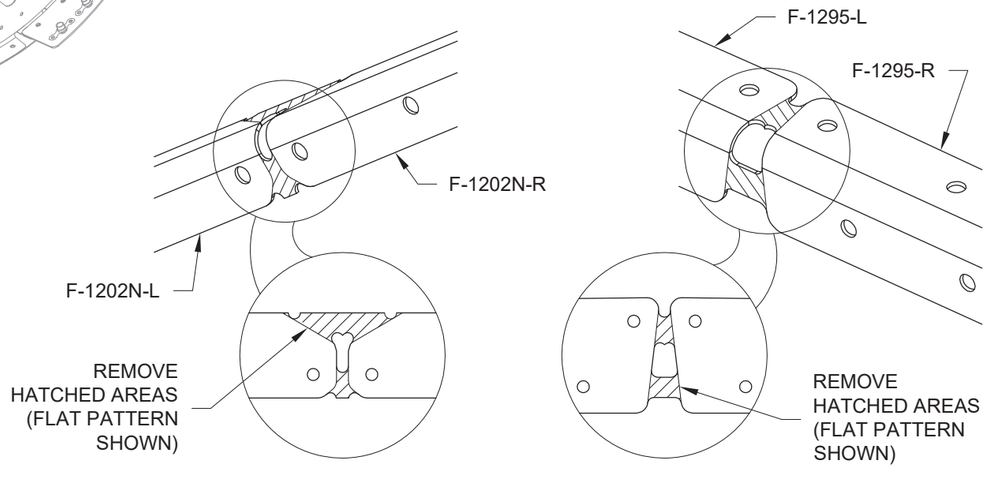


FIGURE 2: SEPARATING THE STIFFENERS
(FLAT PATTERNS SHOWN)

Step 1: Separate the F-1202M as shown in Figure 1.

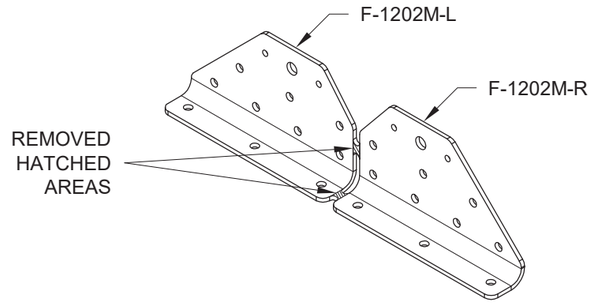


FIGURE 1: SEPARATING THE CANOPY ATTACH DOUBLERS

Step 2: Separate the F-01201Q-1 as shown in Figure 2.

Step 3: Machine countersink #40 and attach nutplates to the F-01201Q-L-1 & -R-1 as shown in Figure 2.

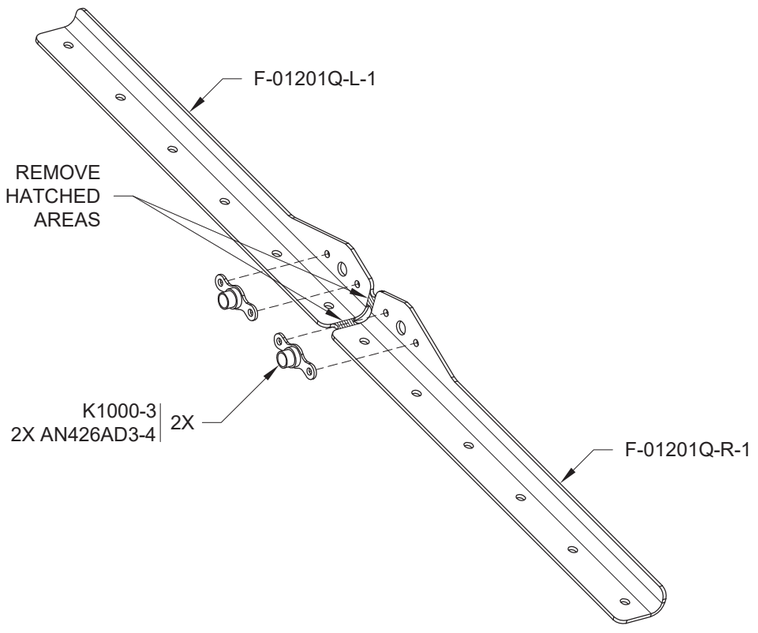


FIGURE 2: SEPARATING THE BATTERY BOX SIDE FLANGES

Step 4: Separate the F-1202D, then dimple the F-01202D-L & -R as shown in Figure 3.

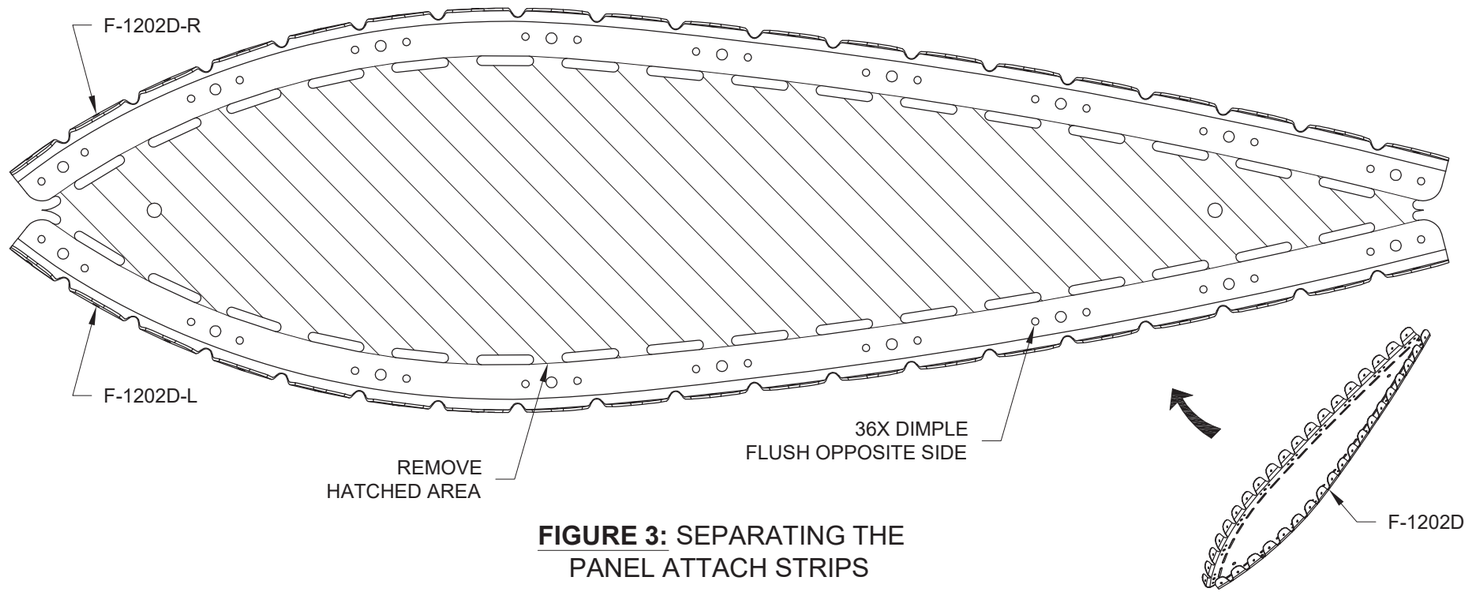


FIGURE 3: SEPARATING THE PANEL ATTACH STRIPS

Step 5: Separate the F-01202C as shown in Figure 4.

Step 6: Dimple the rivet hole in the F-01202C-L as shown in Figure 4.

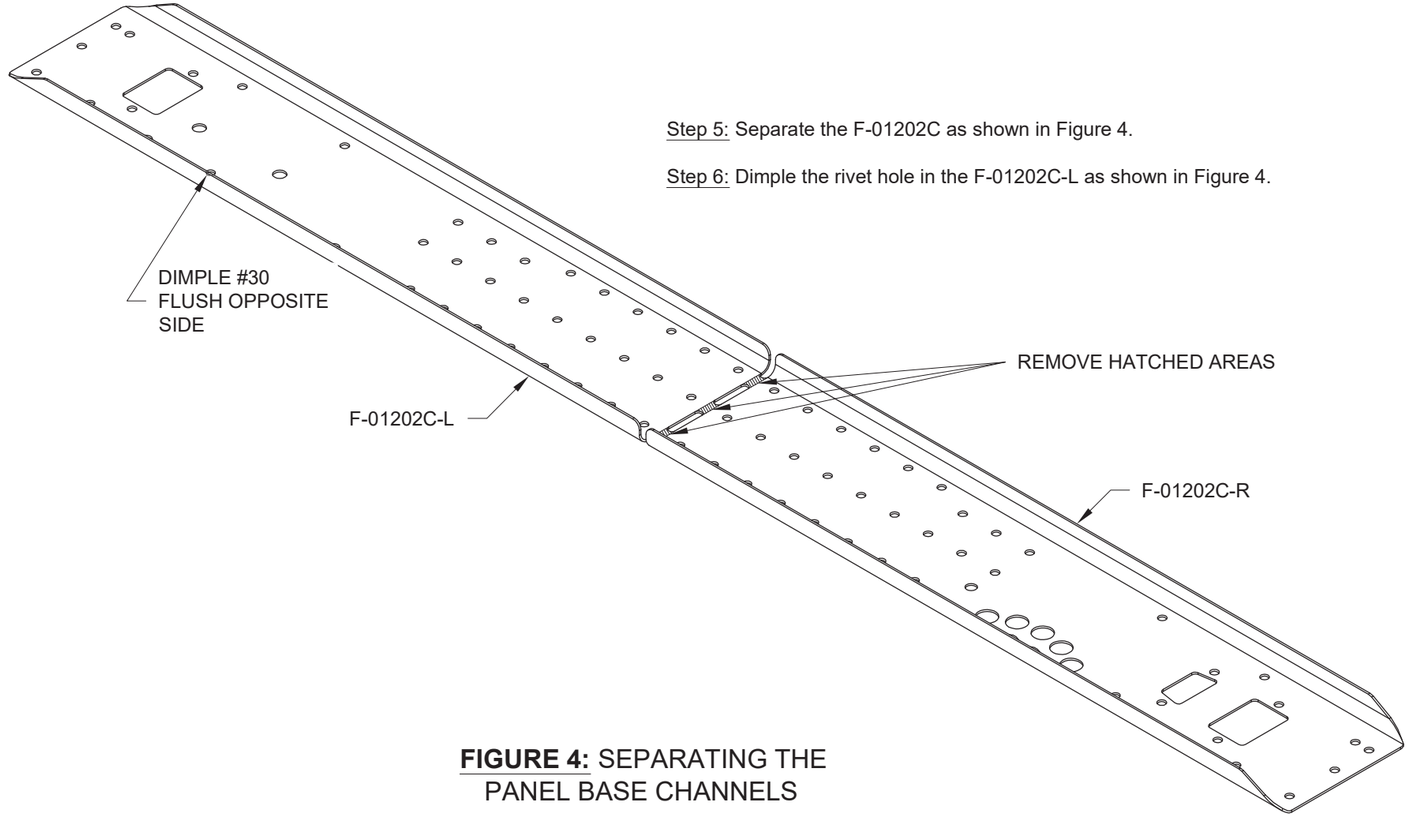


FIGURE 4: SEPARATING THE PANEL BASE CHANNELS

Step 1: Cut two pieces of AA6-125X1X1 angle and mark as shown in Figure 1.

Step 2: Fabricate the F-1202Y by match-drilling the holes in the F-1202H-L & -R into the angles as shown in Figure 2. Align the centerline marks with the nutplate screw holes and ensure that the bottom surfaces of the parts are in the same plane (i.e. placed on the same flat surface).

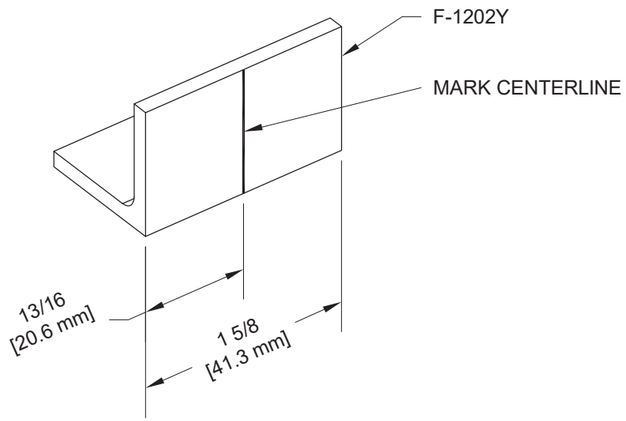


FIGURE 1: MAKING THE STRUT ATTACH ANGLE

NOTE: Refer to Figure 2 for the following steps.

Step 3: Machine countersink the rivet holes in the F-1202M-L flush on the outboard side that correspond to the web of the F-1202H-L as shown.

Step 4: Machine countersink #40 the rivet holes in the upper and aft flanges of the F-1202H-L.

NOTE: Do not dimple the #40 rivet holes in the web of the F-1202H-L that correspond to the F-12191 Canopy Hinge Spacer.

Step 5: Dimple the #30 rivet holes in the web of the F-1202H-L that correspond to the F-1202M-L flush on the outboard side.

Step 6: Machine countersink #40 the rivet holes in F-12191 Canopy Hinge Spacer.

Step 7: Final-Drill #17, deburr, then dimple the nutplate screw holes in the upper flanges of the F-1202H-L.

Step 8: Cleco the F-1202M-L and F-1202Y to the F-1202H-L.

Step 9: Final-Drill 1/4 the forward nutplate screw hole as shown. Remove the clecos and deburr.

Step 10: Rivet the F-1202M-L, F-1202Y, F-12191, and all of the nutplates to the F-1202H-L.

Step 11: Repeat the above steps for the F-1202H-R.

The F-1202H-L & -R and attached parts are now the left and right Canopy Rib Assemblies.

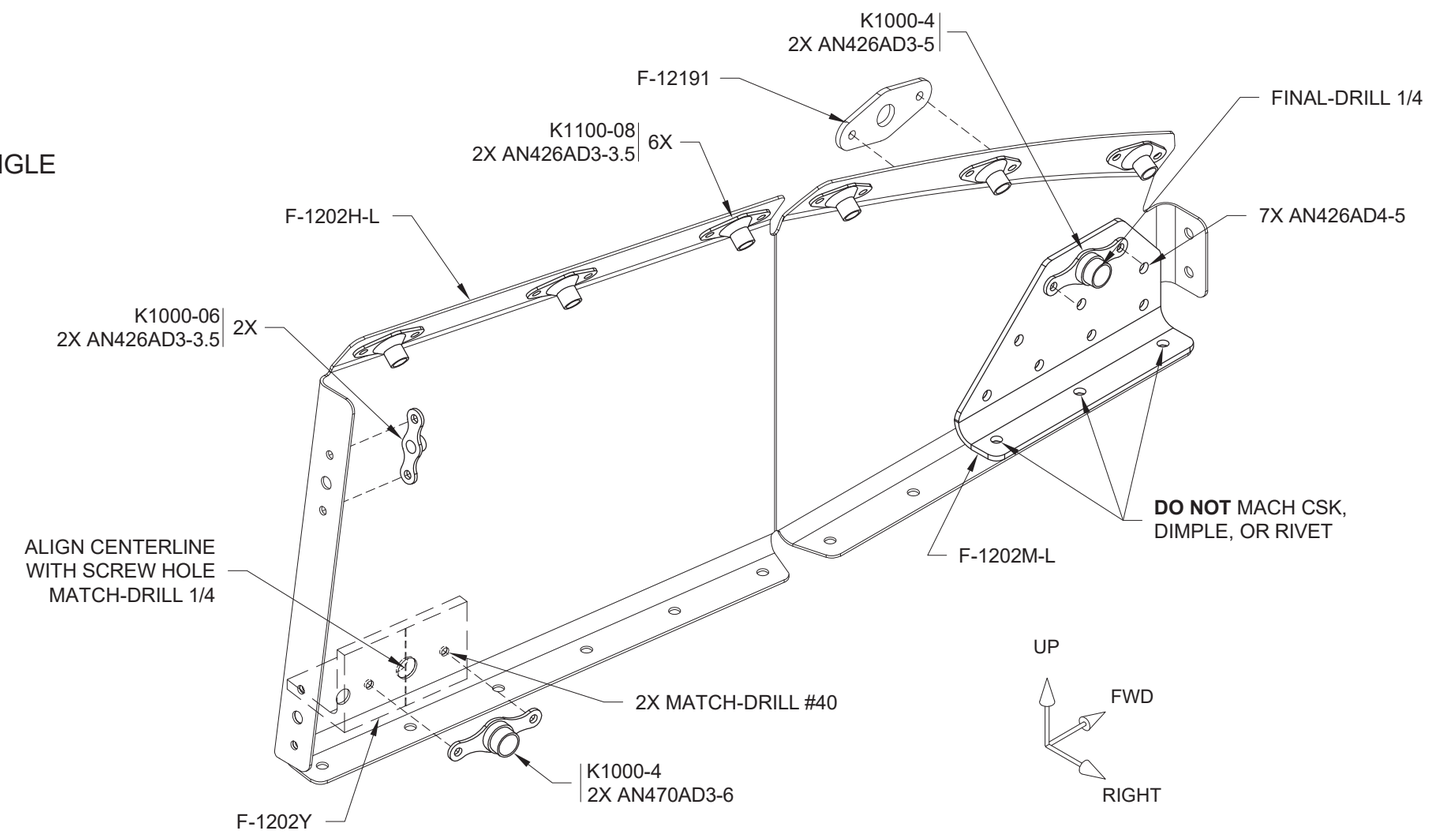


FIGURE 2: MAKING THE CANOPY RIB ASSEMBLIES
(LEFT SIDE SHOWN)

NOTE: Refer to Figure 1 for the following steps:

Step 1: Dimple then rivet the nutplates to the aft flange of the F-01202B-1.

Step 2: Rivet the nutplates to the web of the F-01202B-1. Dimple the nutplates as required.

Step 3: Dimple the one rivet hole in the web of the F-01202B-1 as shown. Dimple this hole using the dies only. Place one die against a solid surface and hit the other die with a hammer.

Step 4: Cleco together, then match-drill #30 all of the rivet holes in both WD-1204 into the F-01202B-1.

Step 5: Rivet the F-01202C-L & -R and both WD-1204 to the web of the F-01202B-1 as shown in Figure 2. Place the manufactured heads of the rivets on the bottom face of the F-01202C-L & -R.

Step 6: Rivet F-12193 to F-01202B-1 as shown in Figure 1

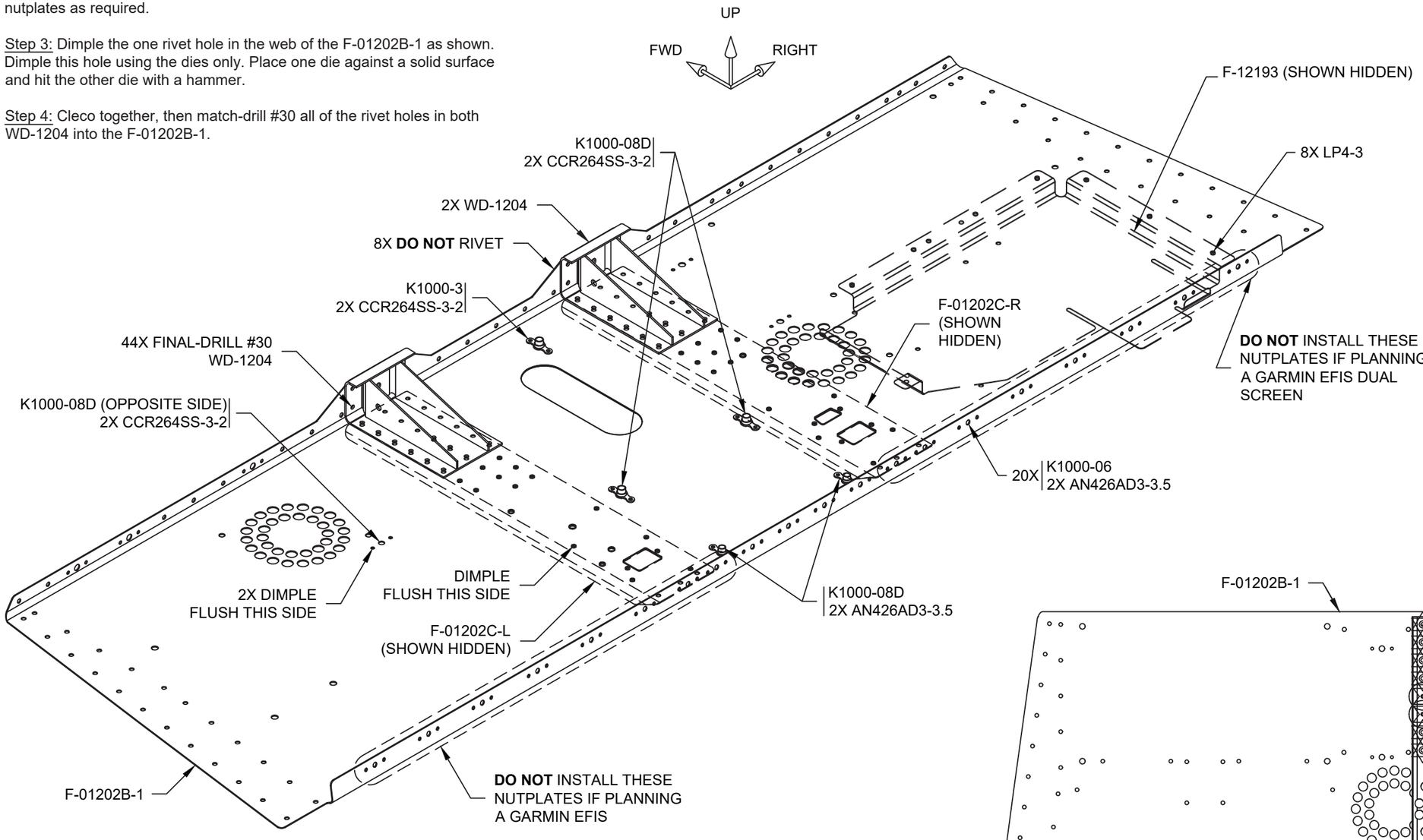


FIGURE 1: RIVETING THE PANEL BASE CHANNELS

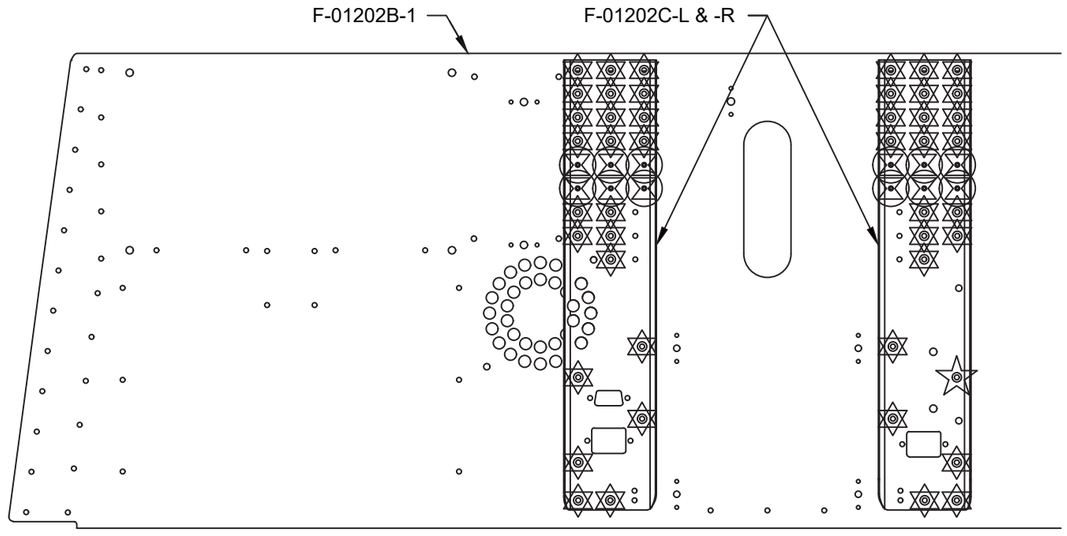


FIGURE 2: PANEL BASE CHANNEL RIVET DIAGRAM
(BOTTOM VIEW LOOKING UP)

NOTE: Refer to Figure 1 for all of the steps on this page.

Step 1: Cleco the F-01202B-1 to the F-01201A-1. Verify that the aft edge of the F-01202B-1 abuts the forward edges of the F-1234-L & -R and that the left and right edges of the F-01202B-1 align with the fuselage side skins.

Step 2: Match-Drill #30 the holes common to the F-01202B-1 and F-1255-L & -R as shown. Remove the F-01202B-1

Step 3: Cleco the Canopy Rib Assemblies to the F-01202B-1 and match-drill #30 the holes from the F-01202B-1 into both F-1202Y. Remove the Canopy Rib Assemblies.

Step 4: For the forward four holes in the left and right edges of the F-01202B-1, rivet the F-01202B-1 to the F-1255-L & -R as shown.

Step 5: Rivet the Canopy Rib Assemblies and both F-12132 to the F-01202B-1 and F-1255-L & -R. The F-12132 attach to the bottom surface of the F-01202B-1.

Step 6: Rivet the F-01202B-1 to the F-1255-L & -R.

NOTE: To aid in cleaning the engine compartment, place the manufactured heads of the rivets on the forward face of the F-01201A-1.

Step 7: Rivet the F-01202B-1 and Canopy Rib Assemblies to the F-01201A-1. Rivet the nutplates common to the F-01202B-1 and F-01201A-1.

Step 8: Seal the lower outboard edges of the Canopy Rib Assemblies with fuel tank sealant.

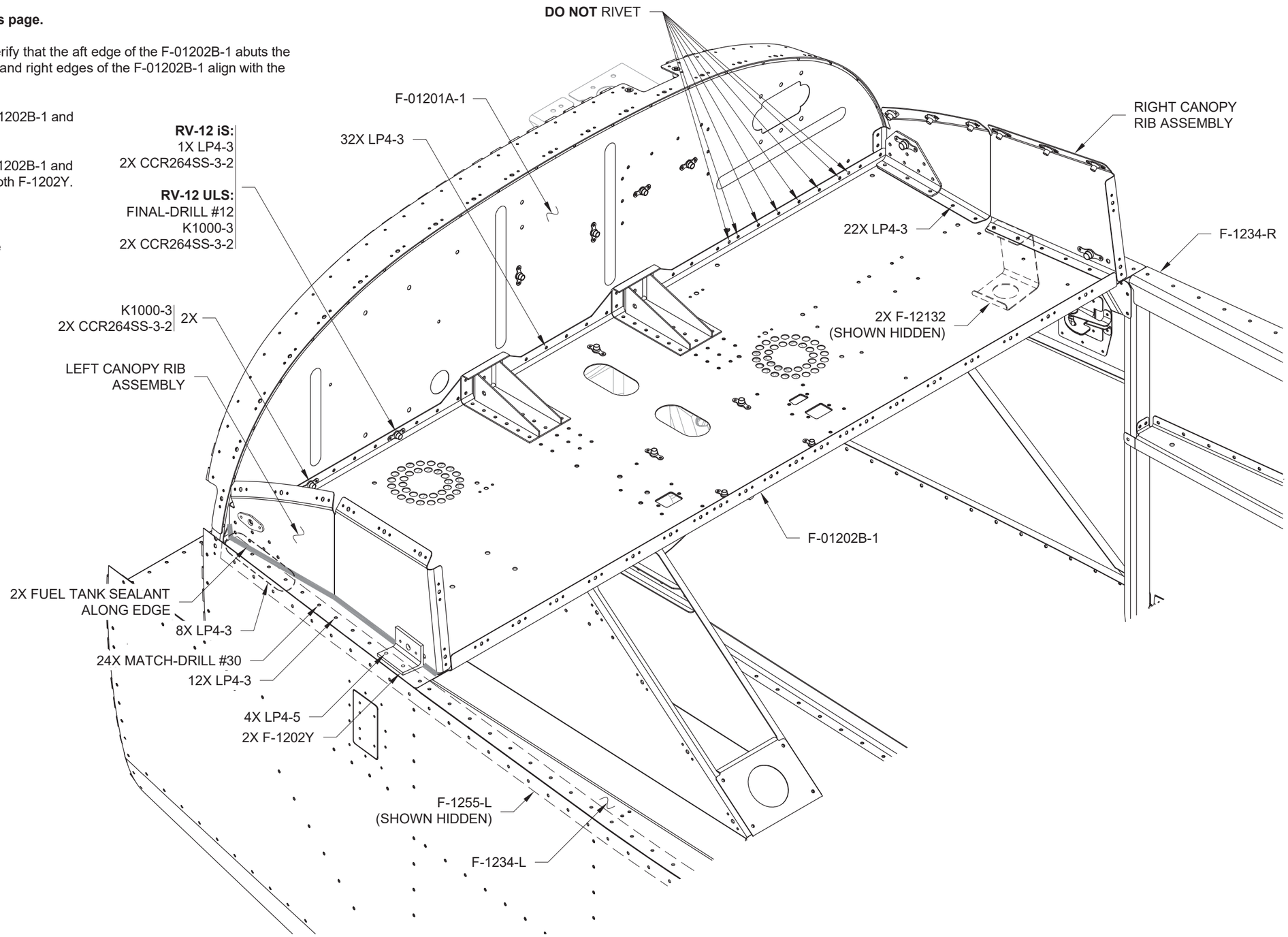


FIGURE 1: INSTALLING THE PANEL BASE

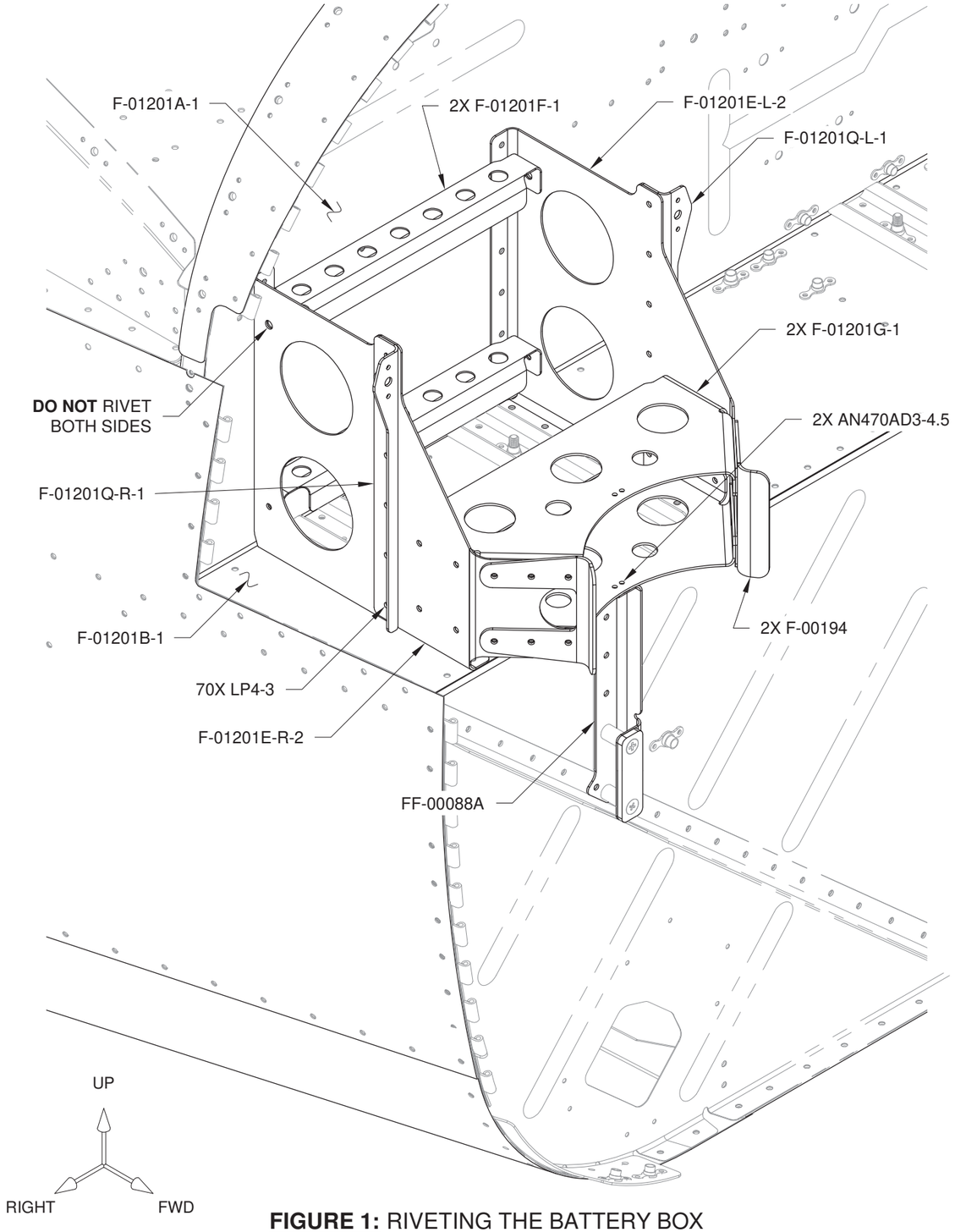


FIGURE 1: RIVETING THE BATTERY BOX

NOTE: Refer to Figure 1 for Steps 1 through 7.

Step 1: Rivet the F-01201Q-L-1 & -R-1 to the F-01201E-L-2 & -R-2. Place the manufactured heads of the rivets on the outboard sides of the F-01201E-L-2 & -R-2.

Step 2: Rivet the upper and lower F-01201F-1 to the F-01201A-1. Note that there are fewer rivets in the lower F-01201F-1.

Step 3: Rivet the F-01201E-L-2 & -R-2 to the F-01201A-1 and F-01201B-1.

Step 4: Rivet the lower F-01201F-1 to the F-01201E-L-2 & -R-2.

Step 5: Cover the head of each rivet on the F-01201A-1, F-01201B-1, and F-01201C-1 with a thin layer of fuel tank sealant.

Step 6: Rivet the lower F-01201G-1 to the FF-00088A.

Step 7: Rivet the upper and lower F-01201G-1 as well as the two F-00194 to the F-01201E-L-2 & -R-2.

Step 8: Fabricate the F-1240C from the provided AS3-025 material as shown in Figure 2.

Step 9: Match-Drill #40 the F-1240C to the F-1240B.

Step 10: Test fit the F-1240B to the fuselage to determine which side goes up. Deburr and dimple all of the holes in both pieces.

Step 11: Rivet the F-1240C to the F-1240B. See Figure 2.

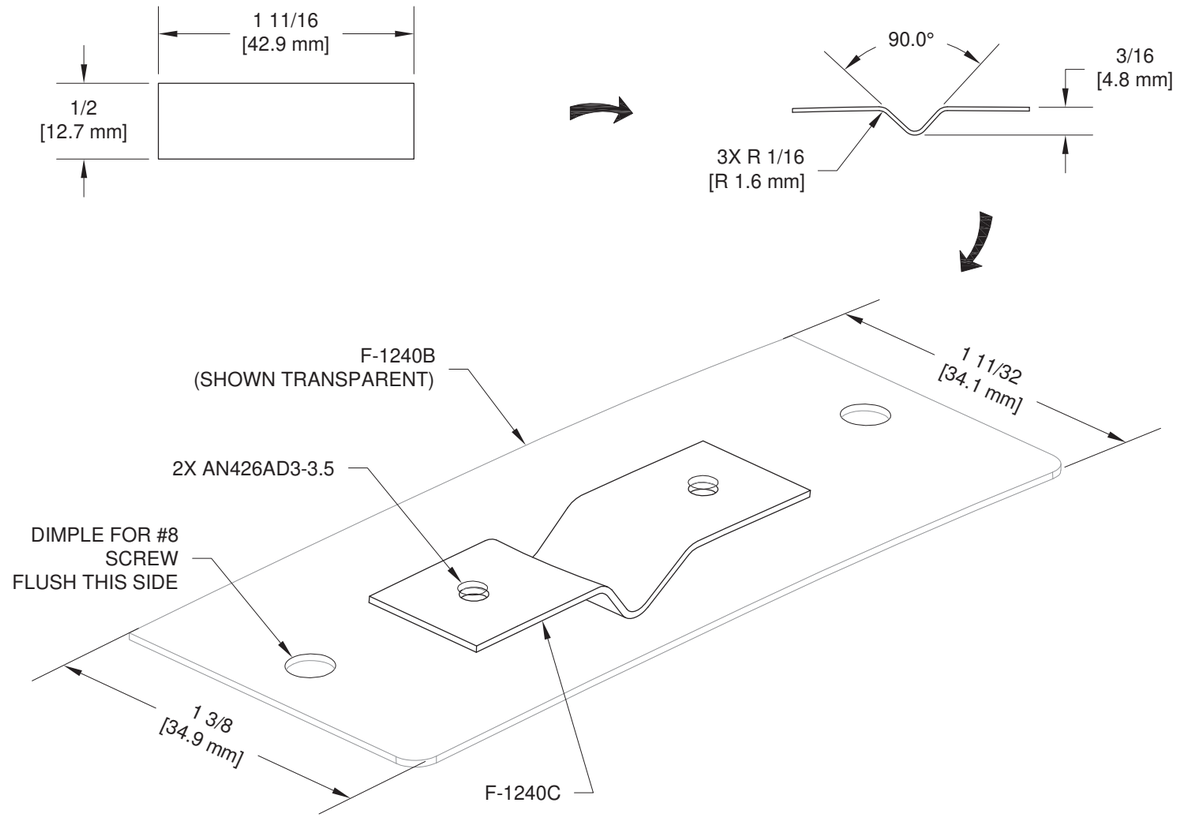


FIGURE 2: MAKING THE F-1240C CLIP

NOTE: Refer to Figure 1 for the following steps:

Step 1: Carefully curve the left and right sides of the F-01240-1 down by hand. The F-01240-1 should be curved enough that the forward edge presses against the Canopy Rib Assemblies when installed.

Step 2: Final-Drill #17, deburr, and dimple the holes in the left, right, and forward edges of the F-01240-1.

Step 3: Dimple the holes in the aft edge of the F-01240-1.

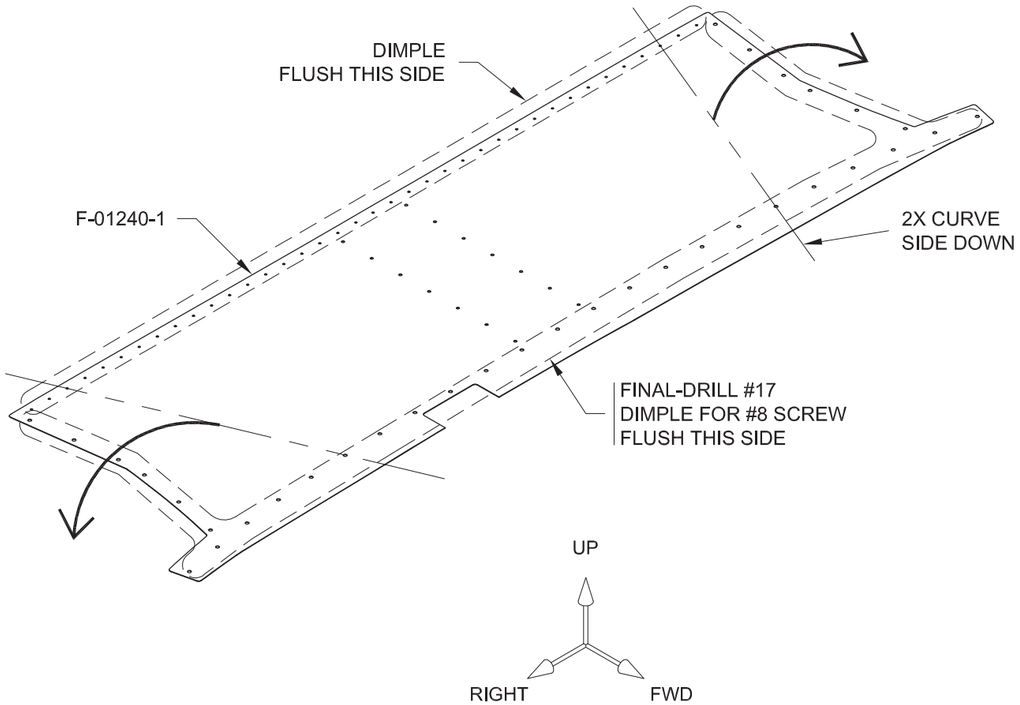


FIGURE 1: ROLLING THE UPPER FORWARD FUSELAGE SKIN

NOTE: Refer to Figure 2 for the following steps:

Step 4: Dimple the F-00077-L & -R.

Step 5: Machine countersink #40 the nutplate rivet holes in the F-00078.
Now would be a good time to prime/paint the F-00078 as desired.

Step 7: Rivet the F-00077-L & -R to the F-00078.

Step 6: Rivet the nutplates to the F-00078.

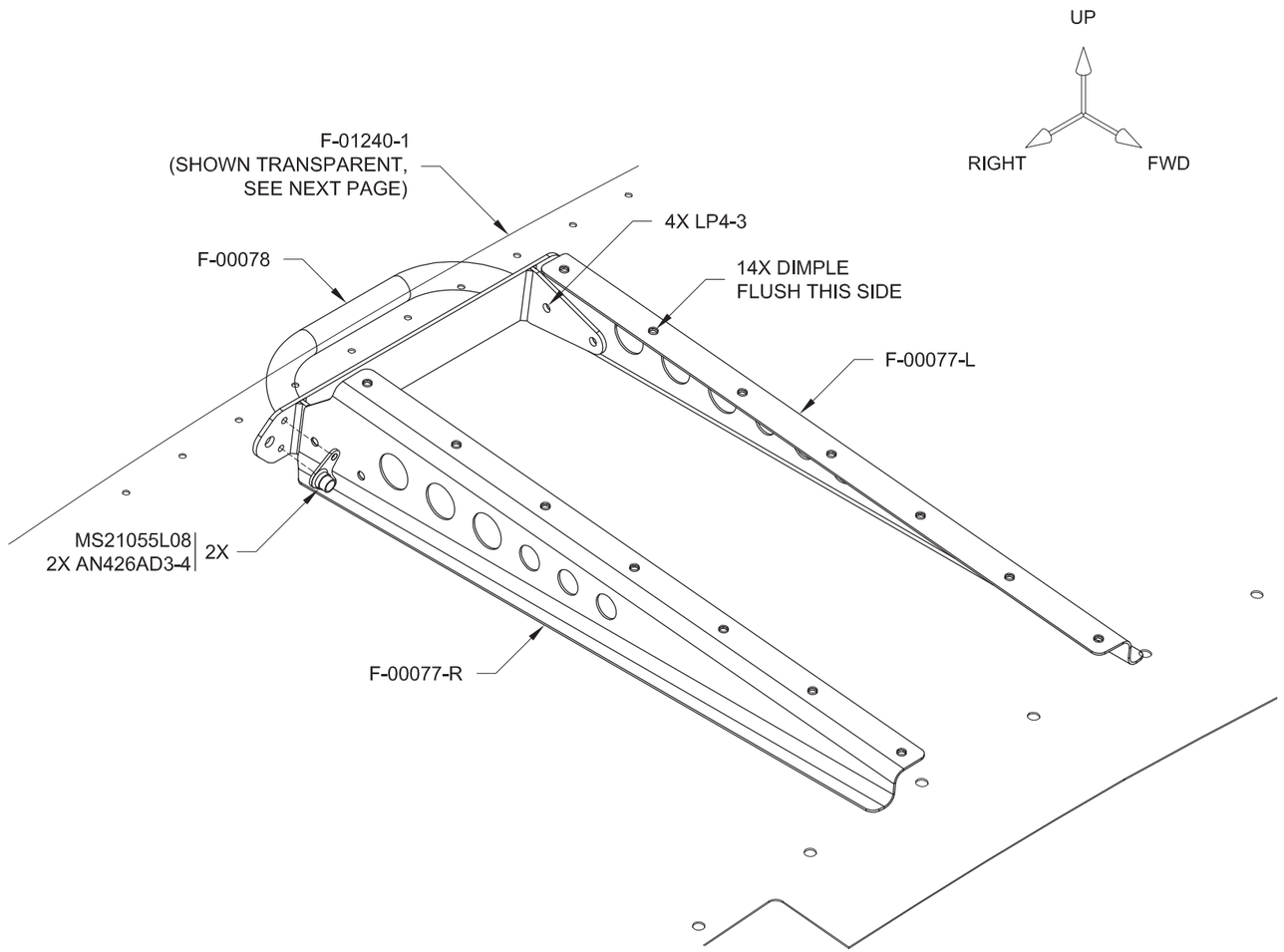


FIGURE 2: PREPARING THE EGRESS HANDLE

NOTE: Refer to Figure 1 for all of the steps on this page.

NOTE: The sealant and release agent used in the following steps must allow later disassembly of the parts.

Step 1: Apply a release agent (e.g. Boelube) to the F-01240-1 where it will mate with the F-01201H-1.

Step 2: Clean the surface of the F-01201H-1 where it will mate with the F-01240-1.

Step 3: Apply an approximately 1/16-thick bead of Permatex 16BR Black Silicone Adhesive Sealant #81158, or equivalent, along the entire length of the F-01201H-1 as shown. Apply per manufacturer's directions.

Step 4: Attach the F-01240-1 to the F-01201A-1, F-01270-L-1 & -R-1, and Canopy Rib Assemblies with screws.

Step 5: Attach the F-1240B to the F-01240-1 with screws.

Step 6: Dimple then rivet the nutplates to the F-1202D-L & -R.

Step 7: Working inboard to outboard, cleco then rivet the F-1202D-L & -R to the F-01240-1.

Step 8: Rivet the F-00078 (i.e. the F-00077-L & -R) to the F-01240-1. See Figure 2 on the previous page.

Step 9: Attach the F-12133 to the F-1202D-L & -R and F-00078 with screws.

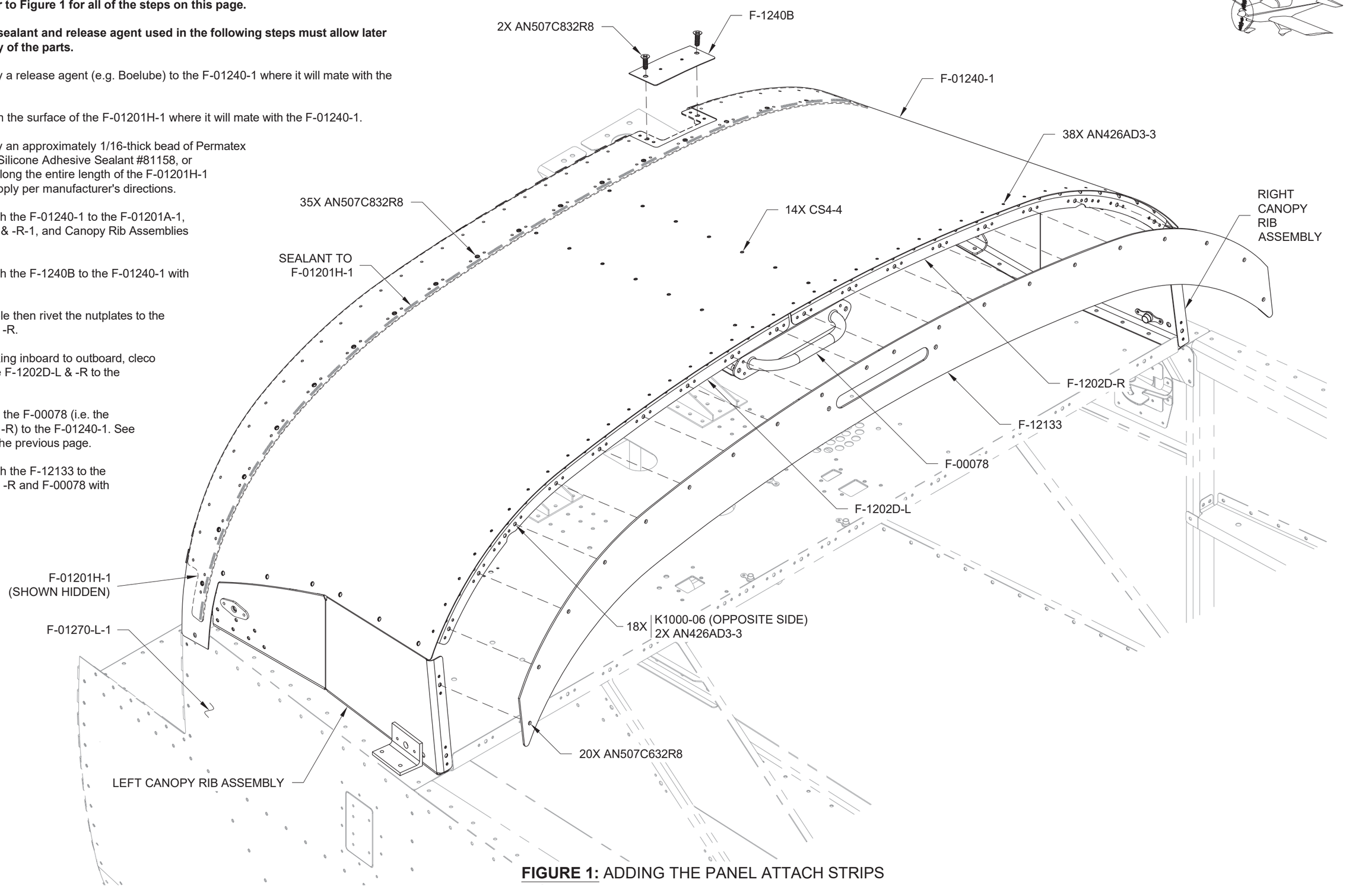


FIGURE 1: ADDING THE PANEL ATTACH STRIPS

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