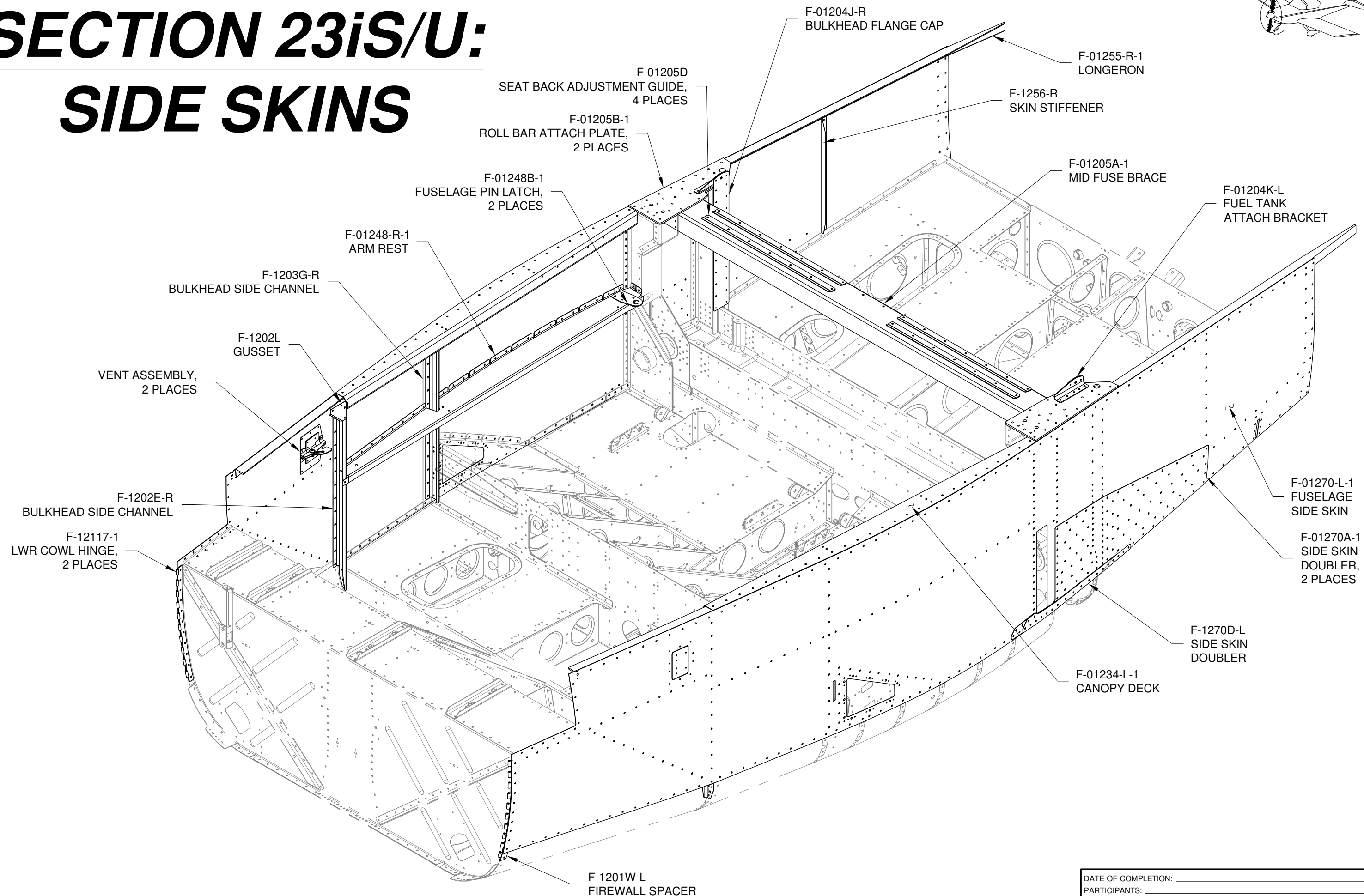
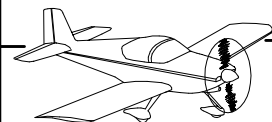


# SECTION 23iS/U: SIDE SKINS





**NOTE:** This page describes making the left longeron. The right is a mirror of the left.

**Step 1:** Mark a line on F-01255-L-1 as shown in Figure 1.

**Step 2:** Trim the corner on the aft end of the F-01255-L-1 as shown in Figure 1.

**CAUTION:** If not properly secured/positioned, the 1/2 inch socket in the following step can be ejected from the vise at high velocity.

**Step 3:** Open the angle of F-01255-L-1 with a padded vise and 1/2 inch socket as shown in Figure 4. Alternatively, the F-01255-L-1 can be placed face down on a flat surface and the vertex can be hit with a heavy soft faced hammer. The angle should be progressively adjusted from 0 degrees change at the marked line to the full angle specified in Figure 5 at the forward end of the longeron. See also Figure 1.

**Step 4:** Clamp F-01255-L-1 in a padded vise at the marked line as shown in Figure 1. Use a crescent wrench, as shown in Figure 3, to twist F-01255-L-1 inboard per the dimensions in Figure 1. The twist should be progressive from no twist at the marked line to the full amount at the forward end of the longeron.

When finished, the entire top surface of the F-01255-L-1 should be planar including the just-twisted portion. See Figure 5.

**Step 5:** Deburr the edges of F-01234-L-1.

**Step 6:** Position F-01234-L-1 and F-01255-L-1 as shown in Figure 2. Use a scrap piece of .025 thick aluminum to simulate F-01270-L-1. F-01234-L-1 overhangs F-01255-L-1 by .025 inches.

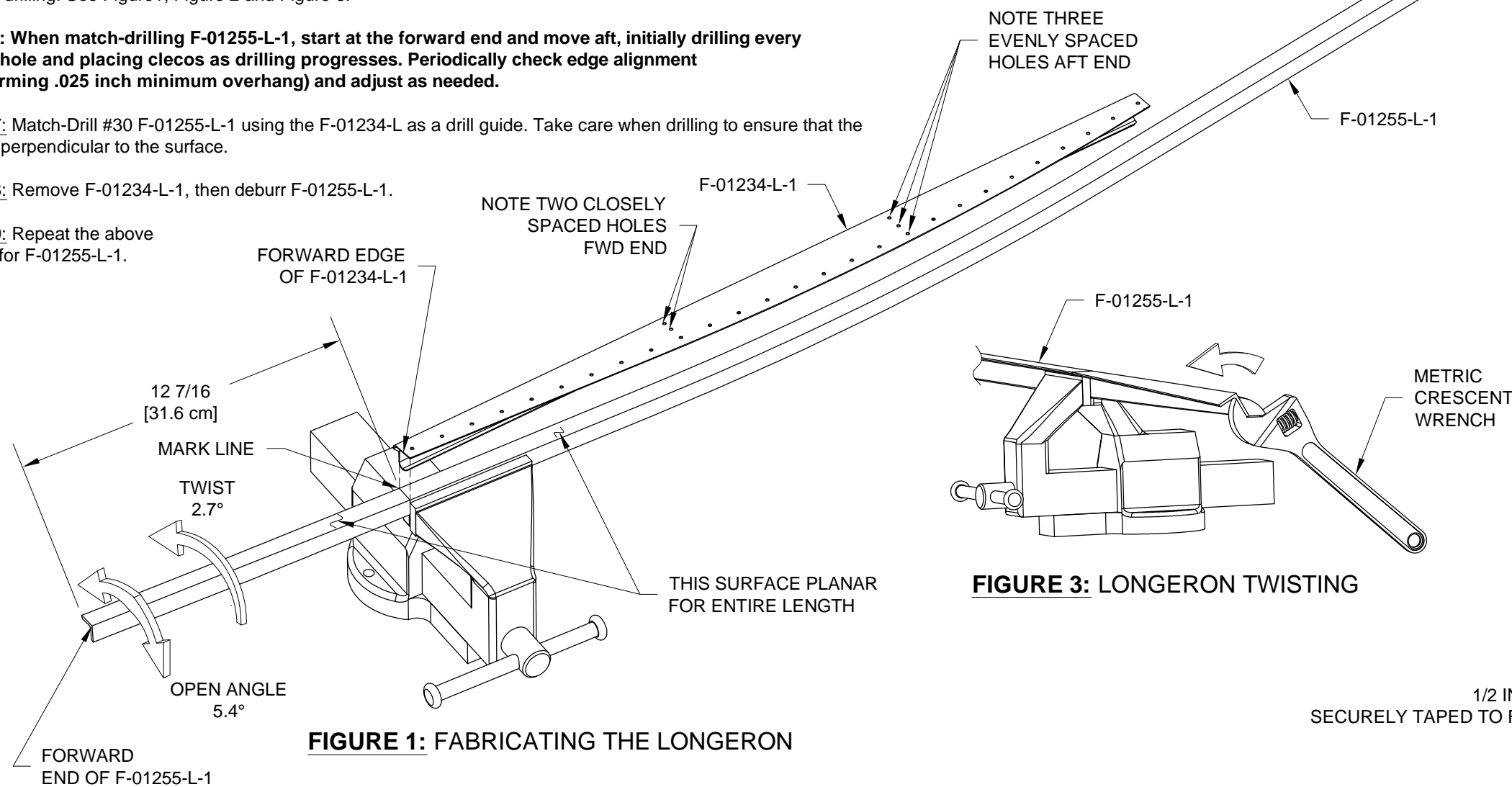
With the forward edge of the F-01234-L-1 intersecting the marked line on F-01255-L-1 as shown in Figure 6, clamp F-01234-L-1 to F-01255-L-1 for match-drilling. See Figure1, Figure 2 and Figure 6.

**NOTE:** When match-drilling F-01255-L-1, start at the forward end and move aft, initially drilling every other hole and placing clecos as drilling progresses. Periodically check edge alignment (confirming .025 inch minimum overhang) and adjust as needed.

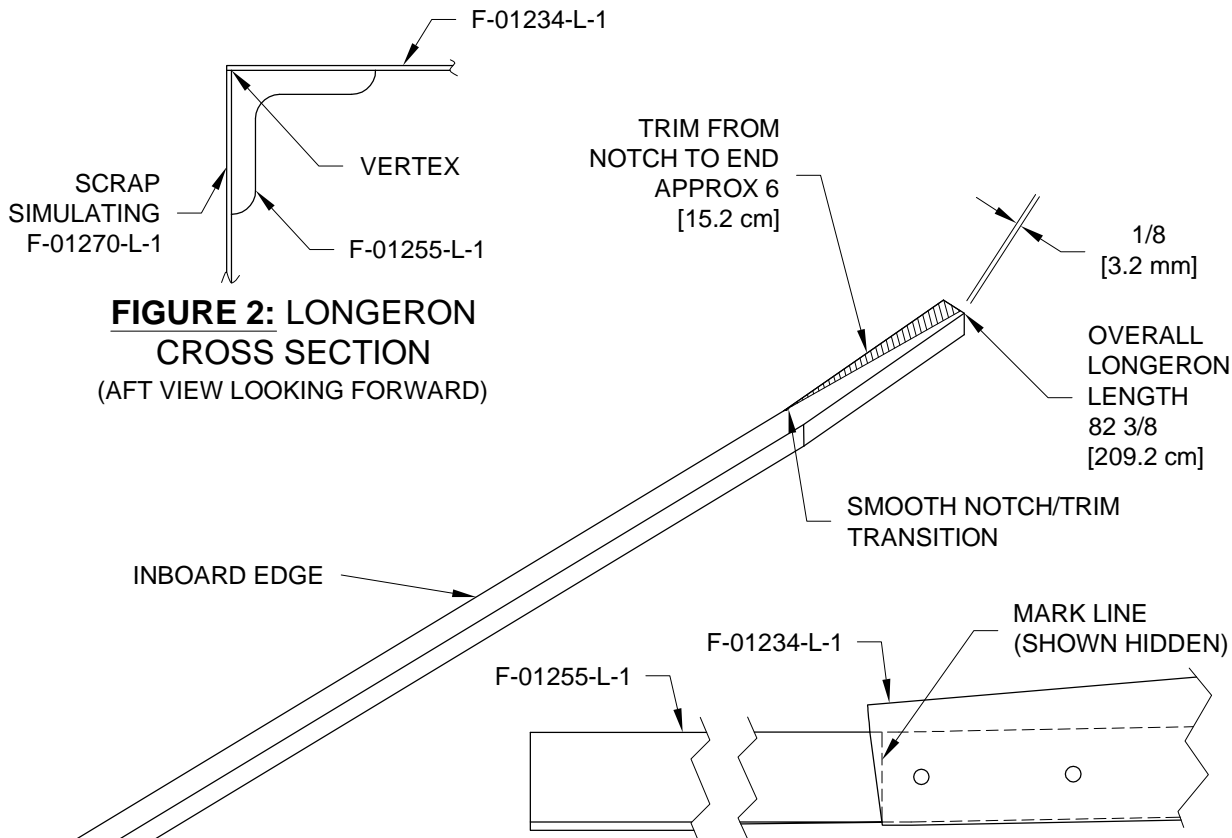
**Step 7:** Match-Drill #30 F-01255-L-1 using the F-01234-L as a drill guide. Take care when drilling to ensure that the drill is perpendicular to the surface.

**Step 8:** Remove F-01234-L-1, then deburr F-01255-L-1.

**Step 9:** Repeat the above steps for F-01255-L-1.

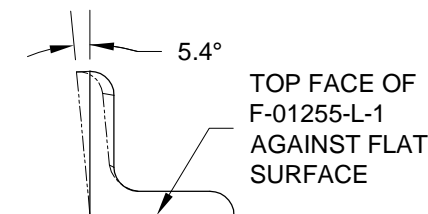


**FIGURE 1: FABRICATING THE LONGERON**

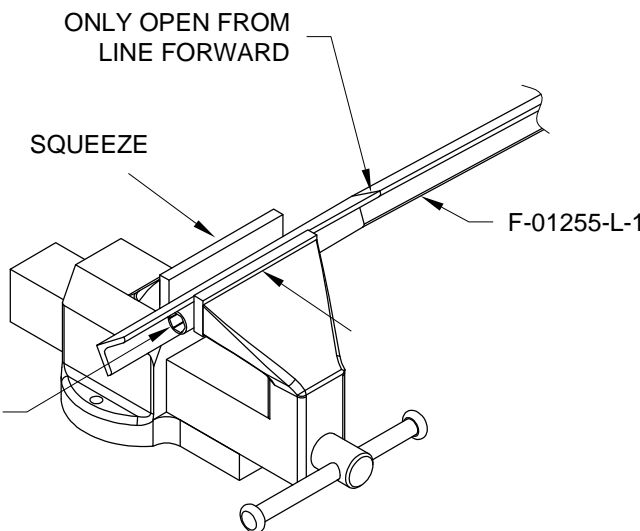


**FIGURE 2: LONGERON CROSS SECTION (AFT VIEW LOOKING FORWARD)**

**FIGURE 6: MATCH-DRILL POSITION (TOP VIEW)**



**FIGURE 5: FINISHED TWIST & OPEN (FRONT VIEW)**

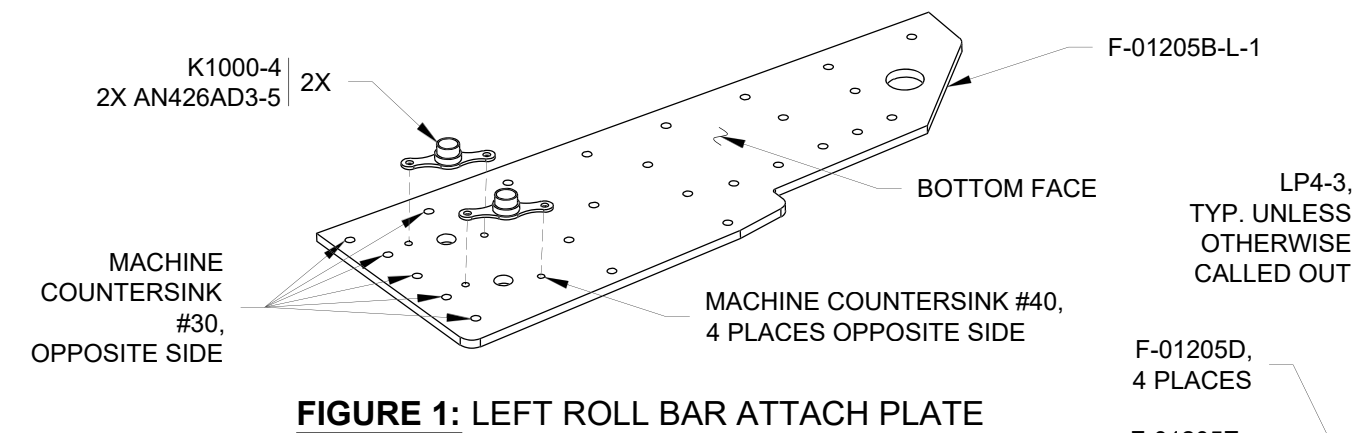


**FIGURE 4: LONGERON OPENING**



Step 1: Machine countersink the top face of each F-01205B-1 as shown in Figure 1 to create mirrored left and right parts F-01205B-L-1 & -R-1.

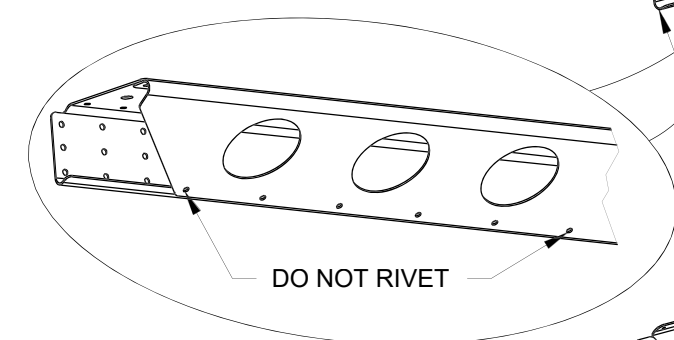
Step 2: Rivet nutplates to F-01205B-L-1 & -R-1 as shown in Figure 1 (temporarily thread a bolt into each nutplate while riveting).



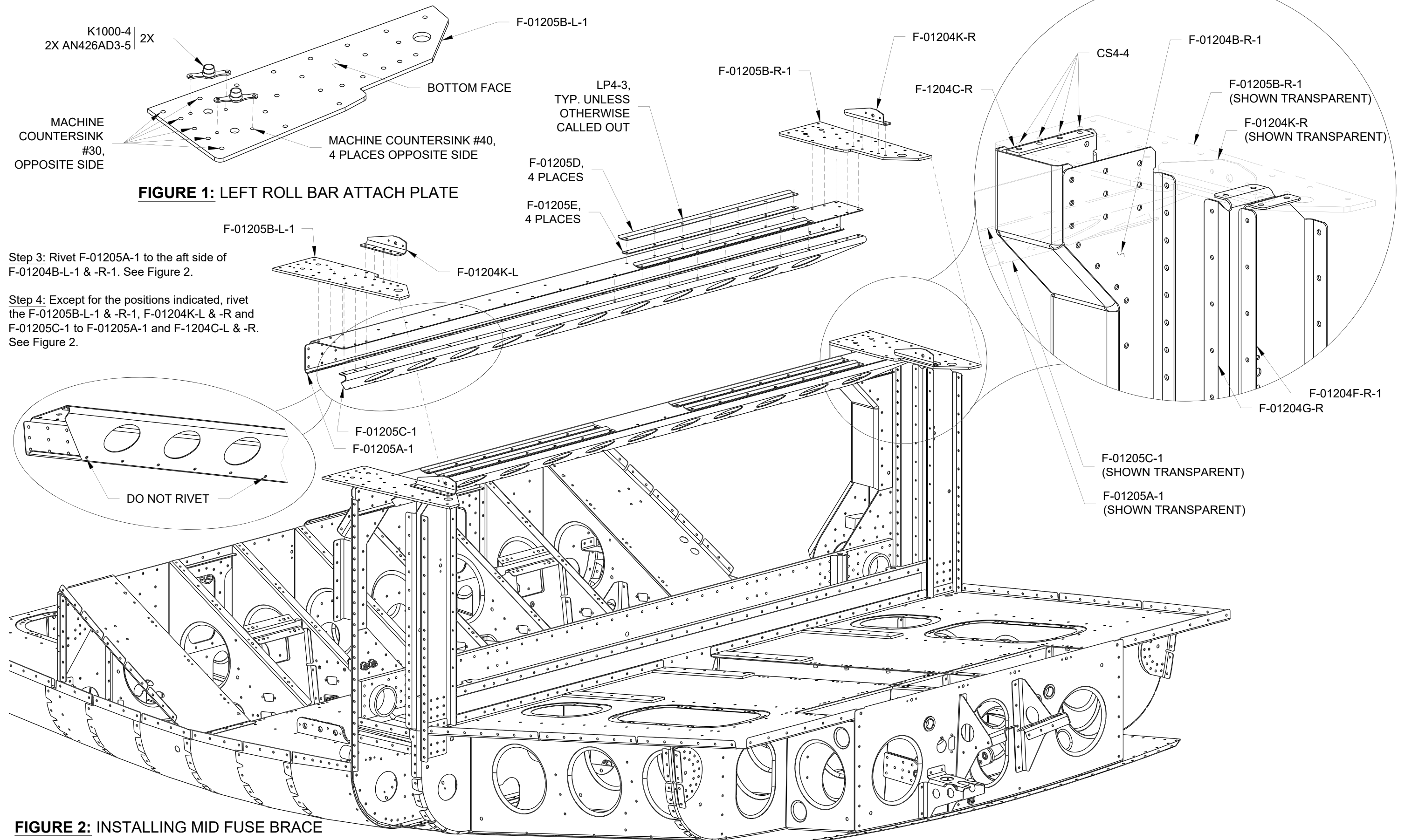
**FIGURE 1: LEFT ROLL BAR ATTACH PLATE**

Step 3: Rivet F-01205A-1 to the aft side of F-01204B-L-1 & -R-1. See Figure 2.

Step 4: Except for the positions indicated, rivet the F-01205B-L-1 & -R-1, F-01204K-L & -R and F-01205C-1 to F-01205A-1 and F-1204C-L & -R. See Figure 2.



Step 5: Rivet F-01205D and F-01205E onto the F-01205A-1 as shown in Figure 2 (only the right side is shown, mirror what is shown for the left).



**FIGURE 2: INSTALLING MID FUSE BRACE**

**NOTE:** The steps on this page show only the right side. Mirror the following operations for the left.

**NOTE:** The two F-01204J are not symmetrical when installed (see locations of upper #30 holes). A specific side must be countersunk to make a left and a right hand part.

**Step 1:** Machine countersink the rivet holes in one of the F-01204J to create a right hand part as shown in Figure 1.

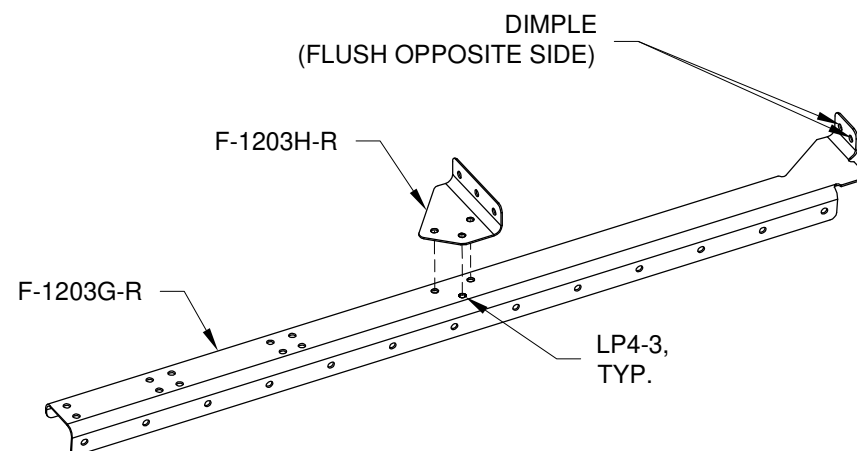
MACHINE COUNTERSINK  
24 PLACES  
AN426AD3-3.5  
24 PLACES

**Step 2:** Rivet the F-01204J-R to the F-01204F-R-1, F-01204G-R, and F-01204K-R as shown in Figure 1.

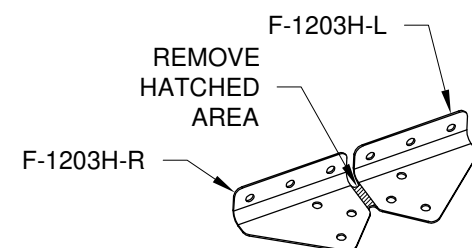
**Step 3:** Cut apart then deburr F-1203H-L & -R as shown in Figure 2.

**Step 4:** Dimple the two holes in the end of F-1203G-R as indicated in Figure 3.

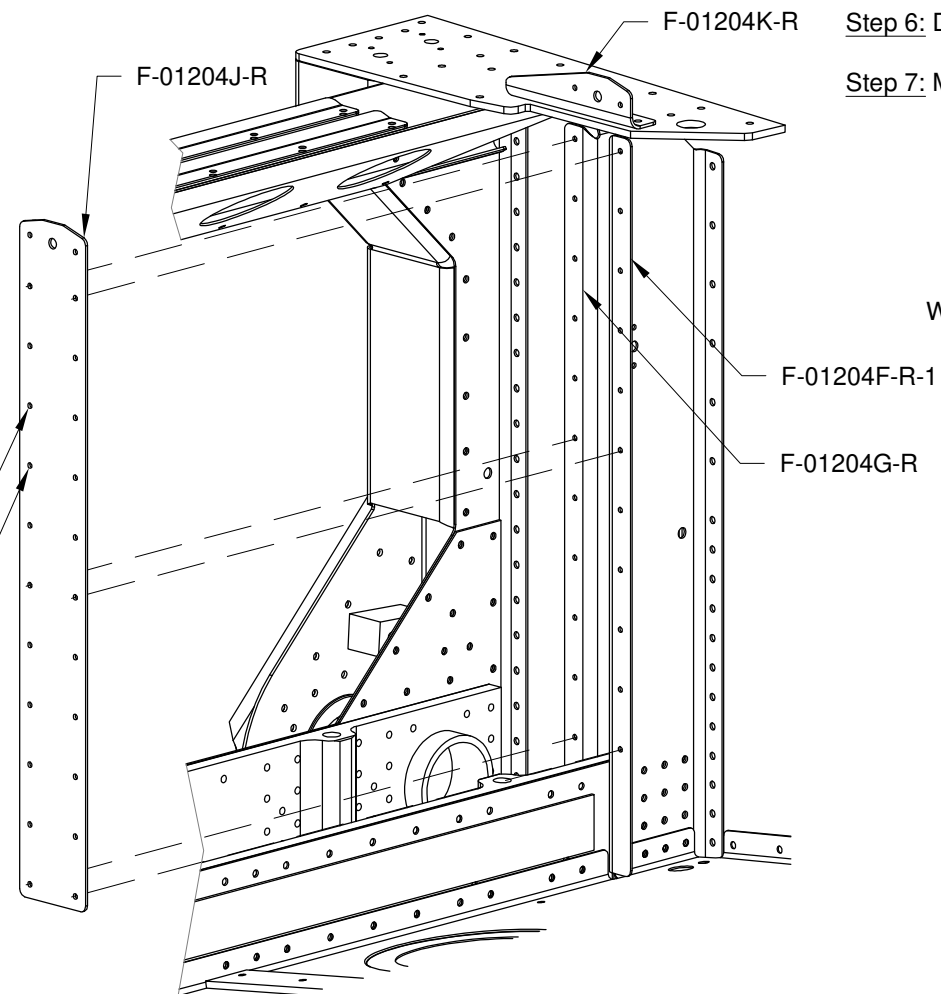
**Step 5:** Rivet F-1203H-R to F-1203G-R as shown in Figure 3.



**FIGURE 3:** INSTALLING THE ARM REST BRACKET



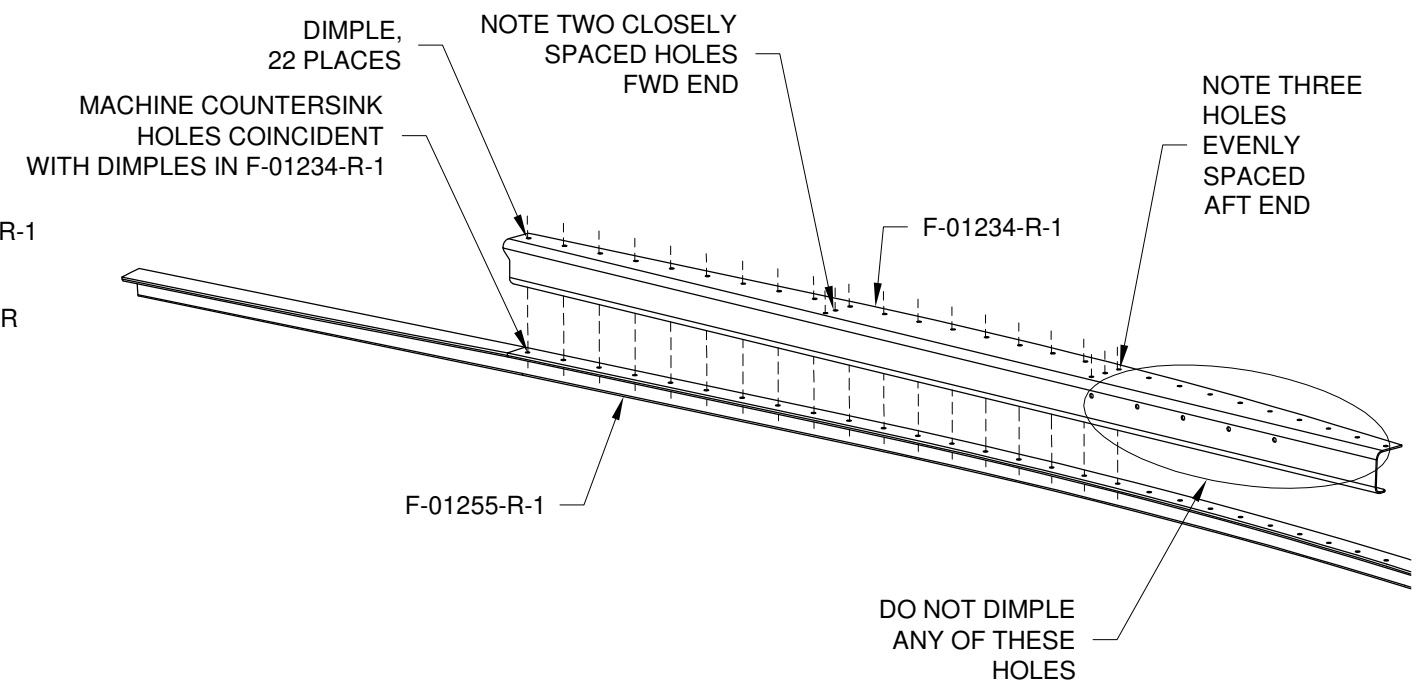
**FIGURE 2:** SEPARATING THE ARM REST BRACKETS



**FIGURE 1:** F-01204J INSTALLATION

**Step 6:** Dimple the holes in F-01234-R-1 except as indicated in Figure 4.

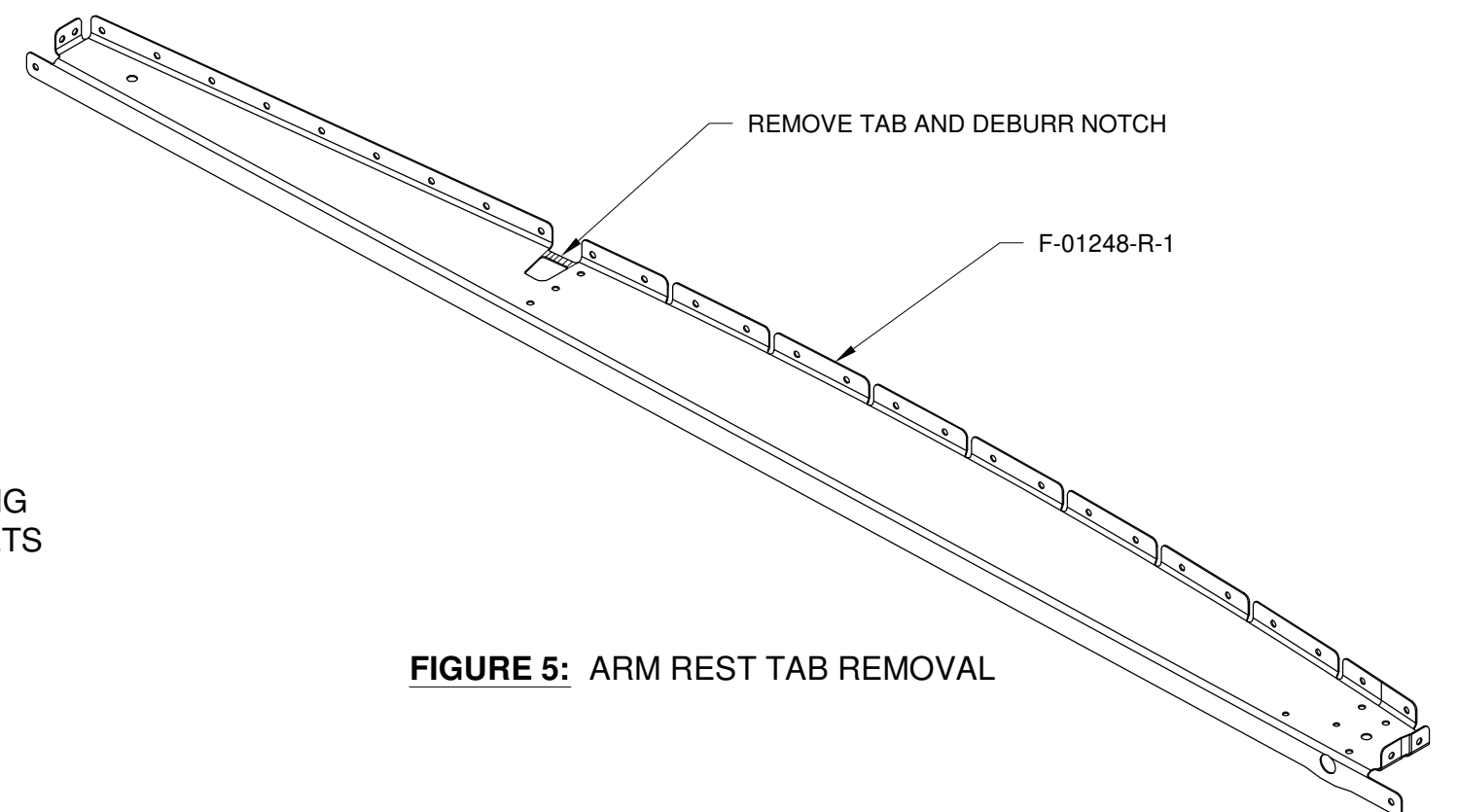
**Step 7:** Machine countersink the match-drilled holes in F-01255-R-1 that correspond to the holes just dimpled in F-01234-R-1.



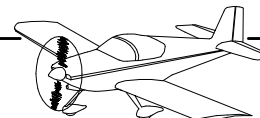
**FIGURE 4:** COUNTERSINKING CANOPY DECK

**Step 8:** Remove the tab from the notch in F-01248-R-1 as shown in Figure 5.

**Step 9:** Repeat and mirror Steps 1 through 8 for the left side.



**FIGURE 5:** ARM REST TAB REMOVAL



**NOTE:** The following steps are for the right side. Mirror what is shown for the left.

**NOTE:** Reference Figure 1 for Steps 1-4.

Step 1: Rivet F-1202E-R to F-01202F-1. Rivet F-1203G-R to F-01203A-1.

Step 2: Match-Drill #30 the forward tab of F-01248-R-1 to F-1202E-R and the aft tab to F-1204H.

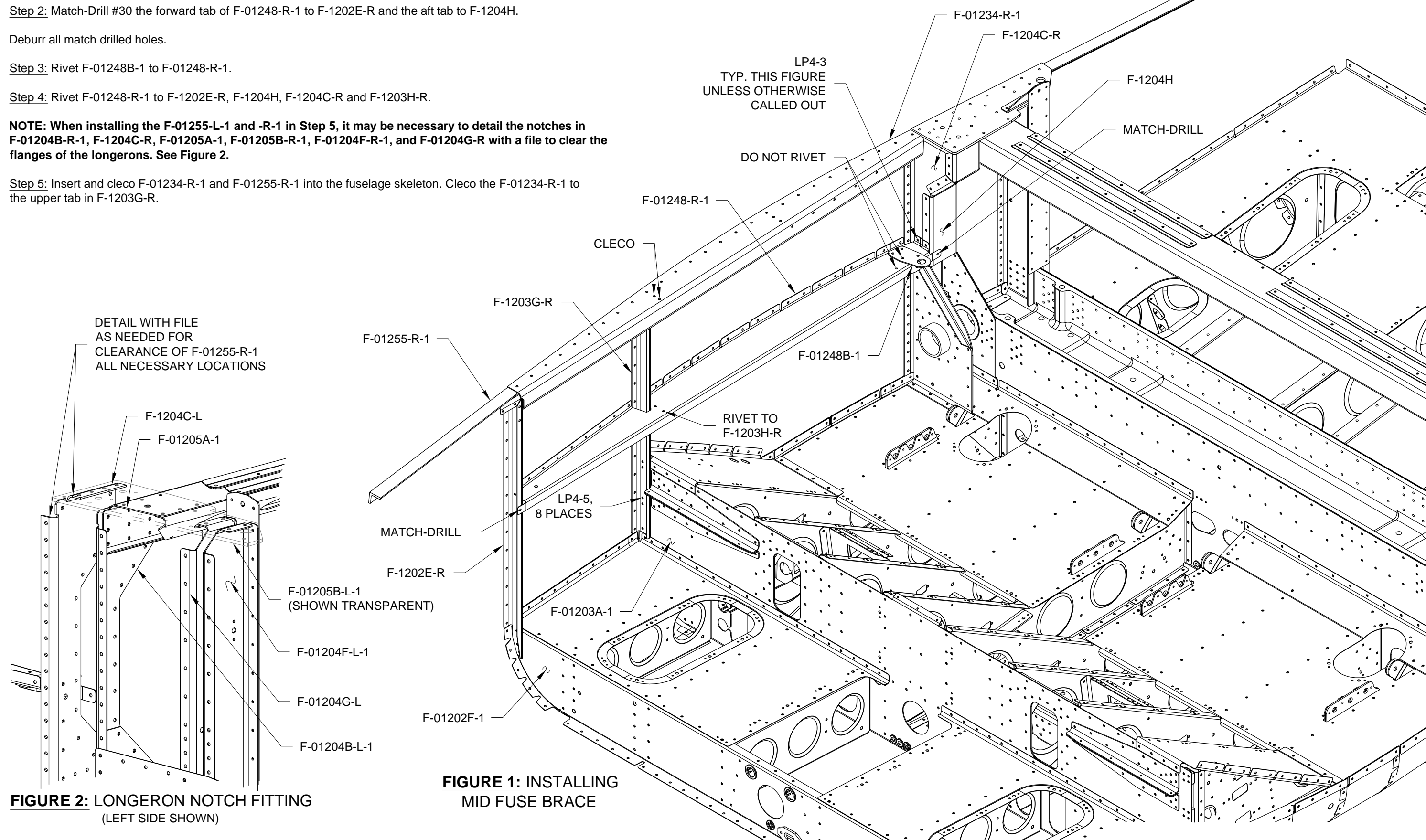
Deburr all match drilled holes.

Step 3: Rivet F-01248B-1 to F-01248-R-1.

Step 4: Rivet F-01248-R-1 to F-1202E-R, F-1204H, F-1204C-R and F-1203H-R.

**NOTE:** When installing the F-01255-L-1 and -R-1 in Step 5, it may be necessary to detail the notches in F-01204B-R-1, F-1204C-R, F-01205A-1, F-01205B-R-1, F-01204F-R-1, and F-01204G-R with a file to clear the flanges of the longerons. See Figure 2.

Step 5: Insert and cleco F-01234-R-1 and F-01255-R-1 into the fuselage skeleton. Cleco the F-01234-R-1 to the upper tab in F-1203G-R.



**FIGURE 2:** LONGERON NOTCH FITTING  
(LEFT SIDE SHOWN)

**FIGURE 1:** INSTALLING  
MID FUSE BRACE

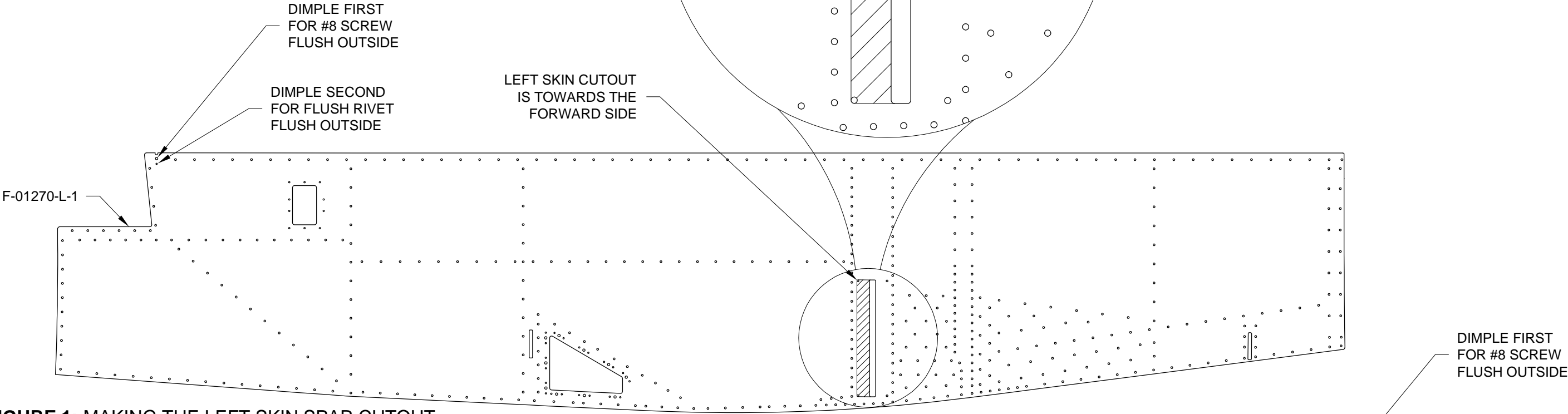


Step 1: Cut out the wing spar penetration holes in F-01270-1 to make F-01270-L-1 & -R-1. Start by marking out the shaded areas labeled in Figures 1 and 2.

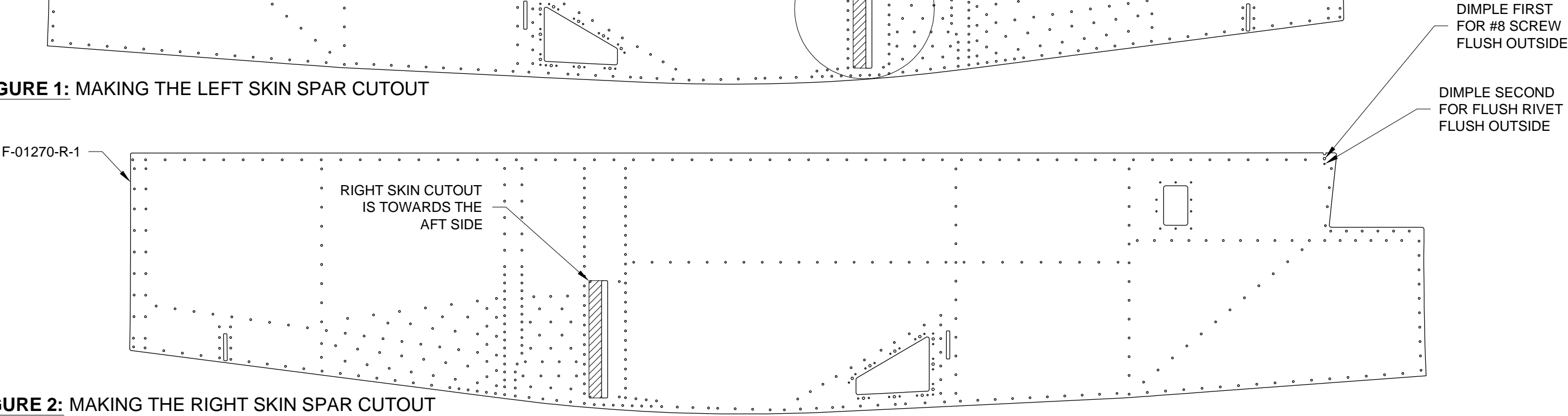
Step 2: Drill a large hole inside the hatched areas shown in Figures 1 and 2. Use snips to cut close to, but not at the edge of the hatched area. Snip around a final time removing material up to the trim line around the hatched area. Deburr the edge of the hole.

Step 3: Clearly mark F-01270-L-1 & -R-1 left and right! A number of builders have installed the skins on the wrong side!

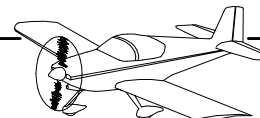
Step 4: Dimple the screw, then the rivet hole in F-01270-L-1 & -R-1 as shown in Figures 1 and 2.



**FIGURE 1: MAKING THE LEFT SKIN SPAR CUTOUT**



**FIGURE 2: MAKING THE RIGHT SKIN SPAR CUTOUT**



**NOTE: See Figure 1 for all steps on this page.**

**Step 1:** Rivet F-1202L to F-1202E-L & -R.

**Step 2:** Cleco F-01270-L-1 & -R-1 (double check left and right), F-01270A-1 and F-1270D to the fuselage. Align the aft edge of F-01234-L-1 & -R-1 with the forward edge of F-01205B-L-1 & -R-1.

Align the vertex of F-01255-L-1 & -R-1 with the upper edge of F-01270-L-1 & -R-1. See Page 23iS/U-02 Figure 2. Clamp both parts together.

Align the outboard edge of F-01205B-L-1 & -R-1 with the vertex of F-01255-L-1 & -R-1. Clamp both parts together.

**Step 3:** Match-Drill #30 all holes common between F-01270-L-1 & -R-1, F-01270A-1, F-1270D and F-01255-L-1 & -R-1. Match-Drill #30 all holes common between F-01205B-L-1 & -R-1 and F-01255-L-1 & -R-1.

**Step 4:** Machine countersink 120° the hole locations in F-1270D that use flush rivets to make F-1270D-L & -R. See Page 23iS/U-10 Figure 2 for locations.

**Step 5:** Remove and deburr F-01255-L-1 & -R-1, F-01270-L-1 & -R-1, F-01270A-1 and F-1270D-L & -R. Prime F-01255-L-1 & -R-1. Trim the tab from the aft edge of F-01270-L-1 & -R-1 as shown in the detail view. Break the bottom and aft edge of both side skins (see Section 5.10).

**Step 6:** Dimple the nutplate holes around the triangular opening in F-01270-L-1 & -R-1 (flush outboard side). The top center nutplate hole is inaccessible with a 3 in. yoke. Dimple these holes using the dies only. Place one die against a solid surface and hit the other with a hammer. Rivet nutplates to these holes as shown.

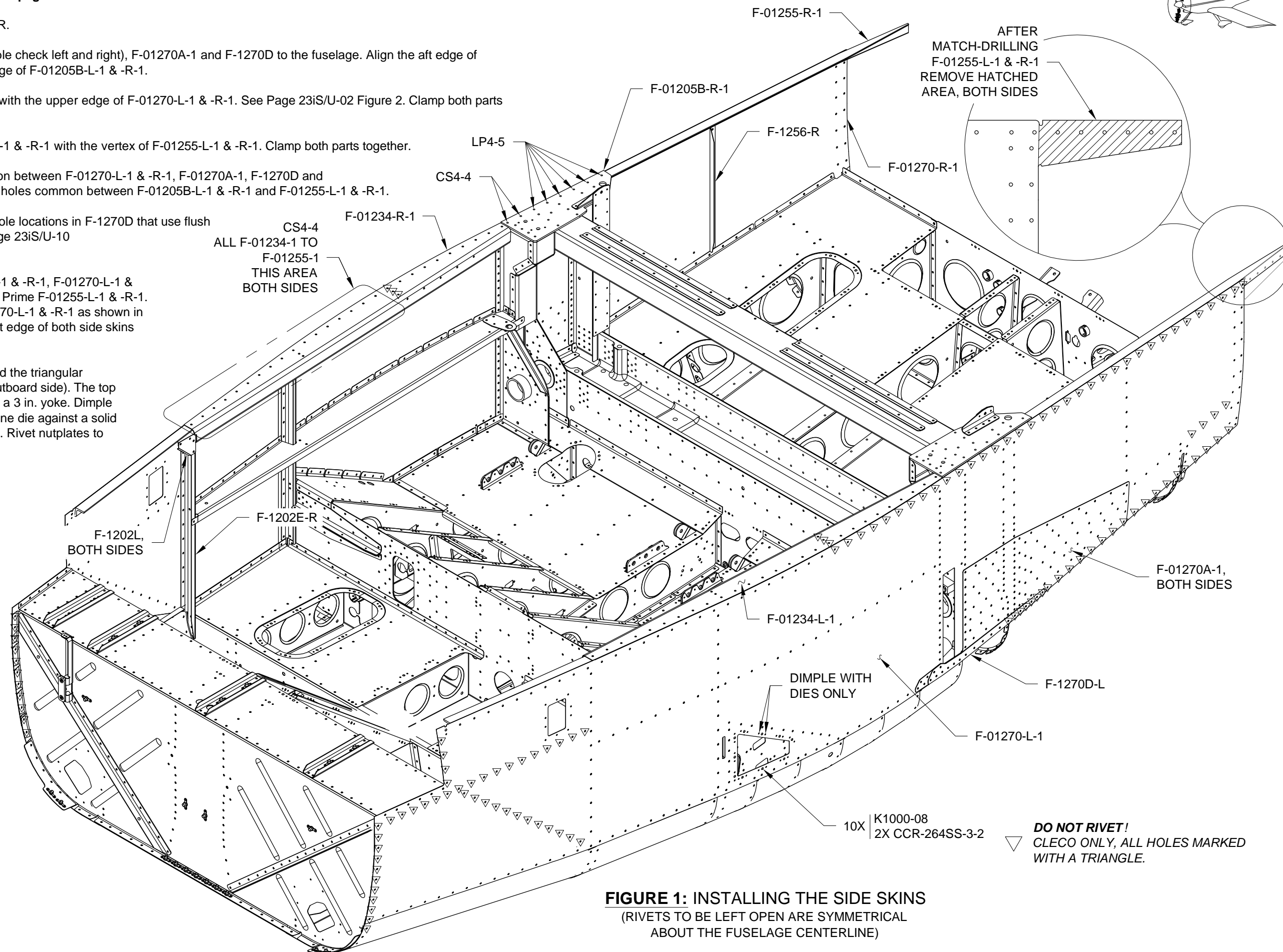
**CAUTION: Do not rivet the holes marked with a triangle in Figure 1! Cleco these holes for later assembly.**

**NOTE: When riveting, start with the Cherry Rivets in F-01270A-1 and F-1270D-L & -R first. Cherry Rivets require a precise hole. Through holes should not be drilled out.**

**Step 7:** Rivet the F-01270-L-1 & -R-1, F-01270A-1 and F-1270D-L & -R, F-01255-L-1 & -R-1, F-01205B-L-1 & -R-1 and F-01234-L-1 & -R-1 to the fuselage as shown.

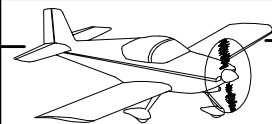
See 23iS/U-10 Figure 1 for rivet locations.

**Step 8:** Separate the F-1256-L & -R. Rivet the F-1256-L & -R to F-1270-L-1 & -R-1.



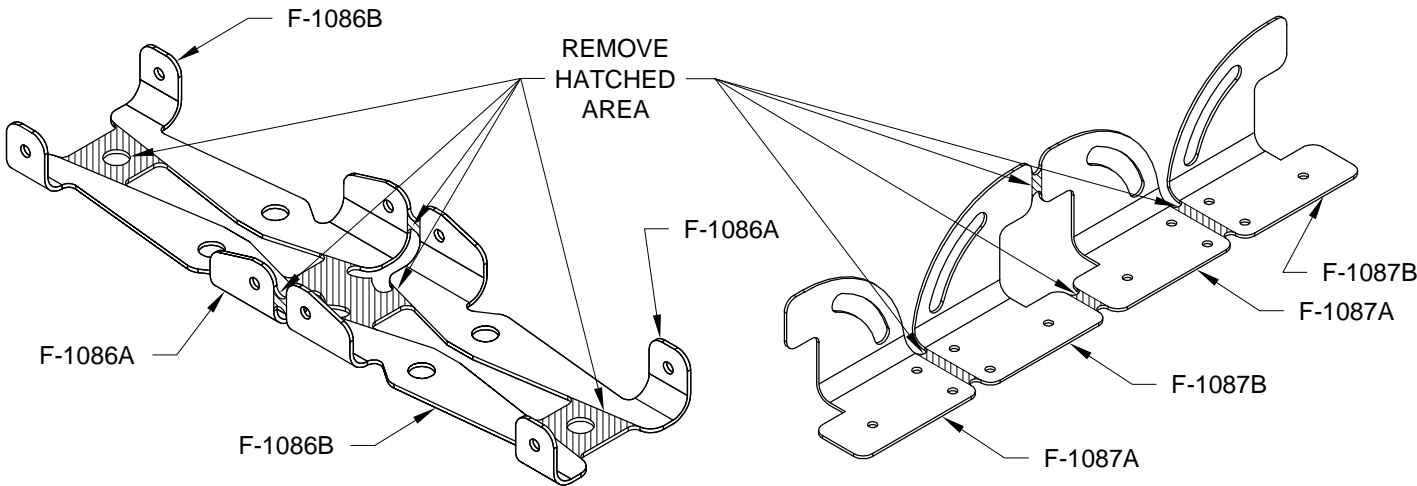
**FIGURE 1: INSTALLING THE SIDE SKINS**  
(RIVETS TO BE LEFT OPEN ARE SYMMETRICAL ABOUT THE FUSELAGE CENTERLINE)





**NOTE:** Make two vent door assemblies. The instructions on this page show the left side assembly. Repeat these steps for the right side of the aircraft.

**Step 1:** Separate F-1086 into F-1086A and F-1086B parts as shown in Figure 1. Separate F-1087 into F-1087A and F-1087B parts as shown in Figure 2.



**FIGURE 1: CUTTING APART THE VENT BRACKETS**

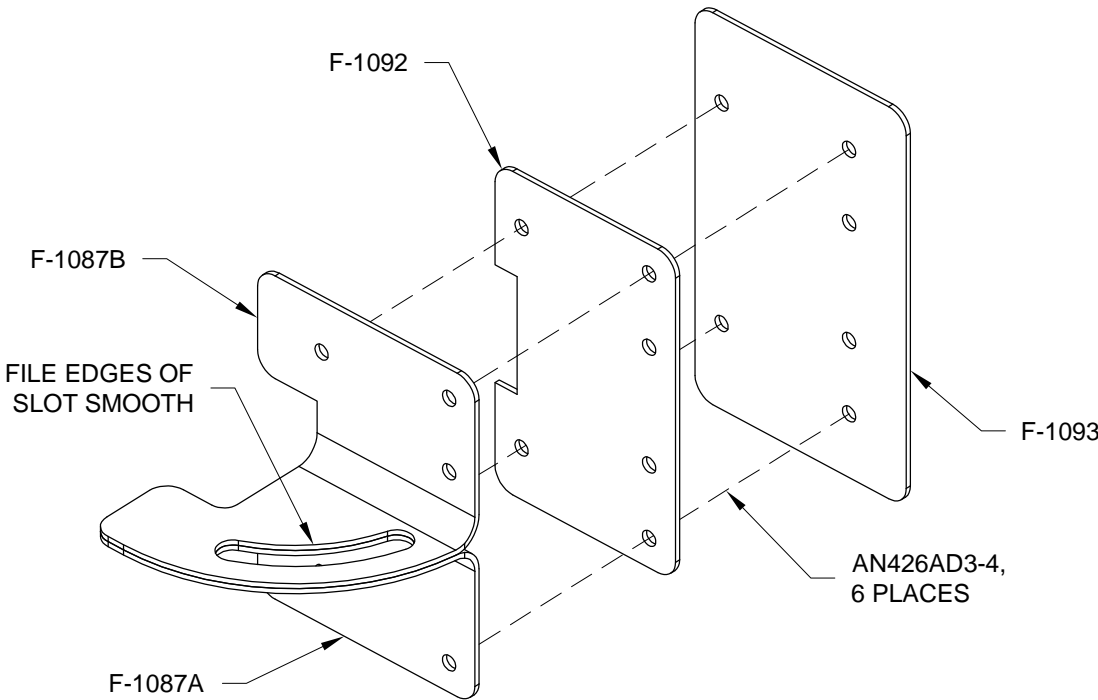
**FIGURE 2: CUTTING APART THE VENT SLIDES**

**Step 2:** Cleco together, final-drill #40 all common holes then deburr F-1087A, F-1087B, F-1092 and F-1093 as shown in Figure 3.

**Step 3:** Machine countersink the holes in F-1093 for flush rivets on the outboard side of the aircraft.

**Step 4:** File the edges of the slot smooth in F-1087A and F-1087B. Check that an AN525-10R7 screw smoothly slides along the entire length of the slot.

**Step 5:** Rivet the parts together to make the Vent Door Subassembly shown in Figure 3.



**FIGURE 3: VENT DOOR SUBASSEMBLY**

**Step 6:** Machine countersink one side of the VENT-00004 VENT KNOB for SCREW #4-40X3/8 SMS.

**Step 7:** Insert the tab portion of the Vent Door Subassembly fully into the slot of the VENT-00004 centered on the tab, orient the previously countersunk hole towards the bottom of the vent door as shown in Figure 4.

**Step 8:** Match Drill #43 the Vent Door Subassembly using the hole in the VENT-00004.

**Step 9:** Tap 4-40, the VENT-00004 and Vent Door Subassembly.

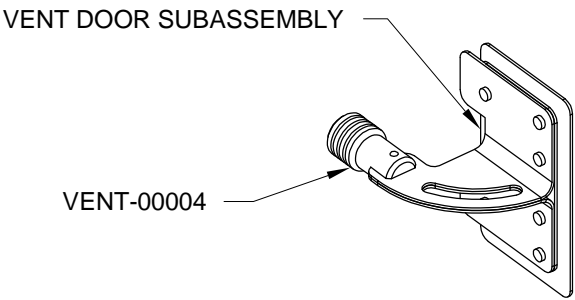
**Step 10:** Remove the VENT-00004 from the Vent Door Subassembly.

**NOTE:** A small block of wood is helpful to keep the tabs of F-1086A and F-1086B separated.

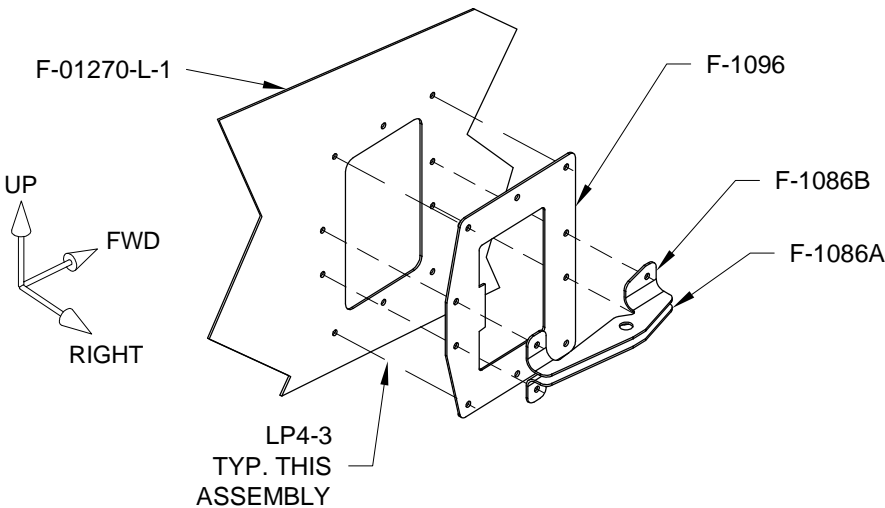
**Step 11:** Cleco then final-drill #30 all common holes between F-1086A, F-1086B and F-1096 to F-01270-L-1 as shown in Figure 5.

Disassemble, deburr then rivet the parts together.

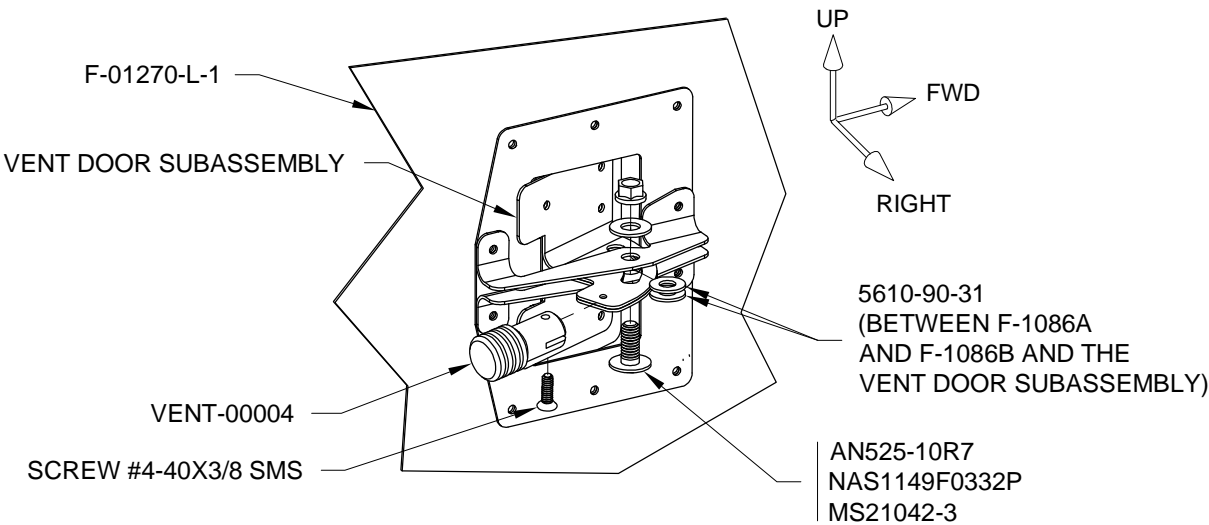
**Step 12:** Install the Vent Door Subassembly and VENT-00004 Vent Knob as shown in Figure 6.



**FIGURE 4: INSTALLING THE VENT KNOB**

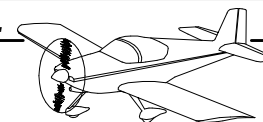


**FIGURE 5: ASSEMBLING THE VENT DOUBLER AND BRACKETS**



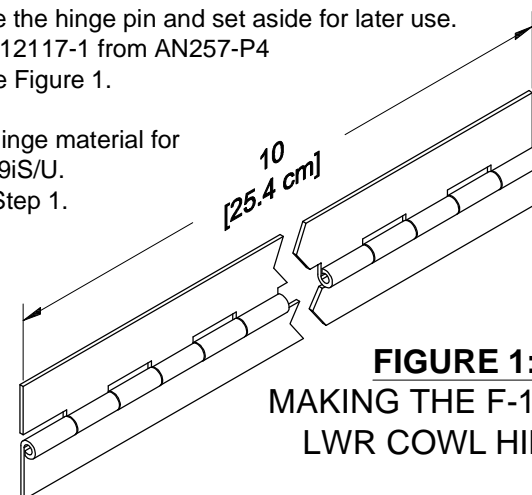
**FIGURE 6: INSTALLING THE VENT DOOR SUBASSEMBLY**





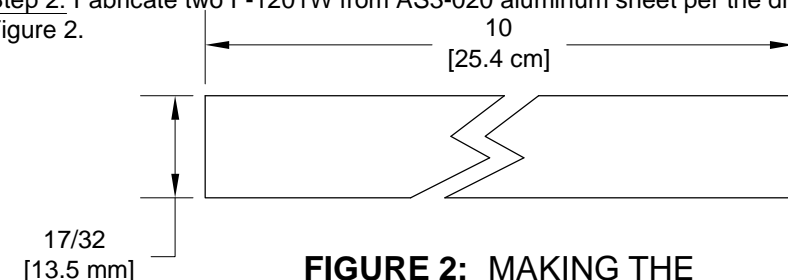
Step 1: Remove the hinge pin and set aside for later use.  
Fabricate two F-12117-1 from AN257-P4 piano hinge. See Figure 1.

Retain unused hinge material for use in Section 29iS/U.  
See 29iS/U-02 Step 1.



**FIGURE 1:**  
MAKING THE F-12117-1  
LWR COWL HINGE

Step 2: Fabricate two F-1201W from AS3-020 aluminum sheet per the dimensions in Figure 2.



**FIGURE 2:** MAKING THE  
FIREWALL SPACERS

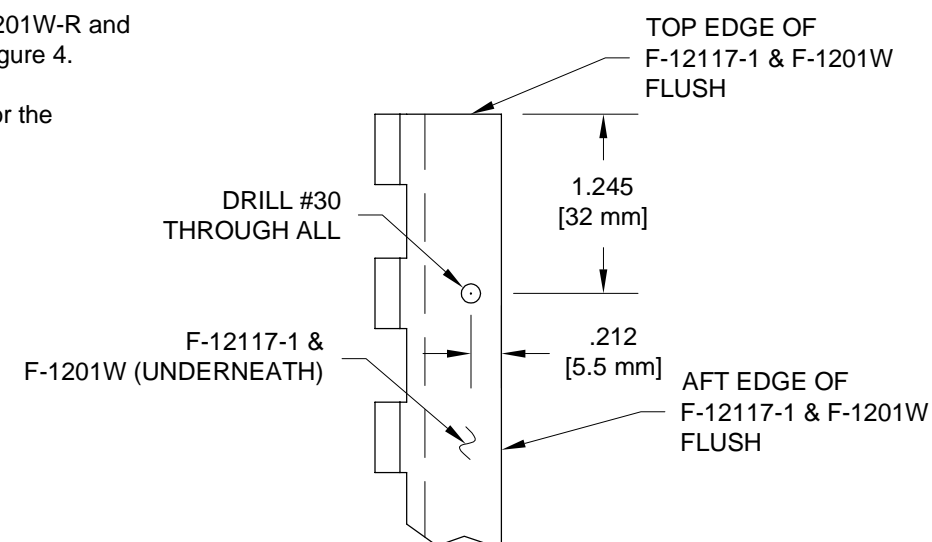
Step 3: Clamp F-1201W and F-12117-1 together with the top and aft edges flush to each other. Mark, punch, then drill #30 the hole shown in Figure 3. Separate and deburr each part when finished.

Step 4: Cleco F-1201W-R and F-12117-1 to fuselage as shown in Figure 4. Align the aft edge of F-1201W-R and F-12117-1 parallel to the face of F-01201C-1 and clamp the parts together.

Step 5: Match-drill #30 F-12117-1 and F-1201W-R to the fuselage as shown in Figure 4. Install clecos as drilling progresses.

Step 6: Deburr, then rivet the F-1201W-R and F-12117-1 to the fuselage. See Figure 4.

Step 7: Repeat the above steps for the left side of the aircraft.



**FIGURE 3:** DRILLING INITIAL  
GUIDE HOLE IN F-1201W & F-12117-1

CLECO  
GUIDE HOLES

MATCH-DRILL #30,  
10 PLACES  
BOTH SIDES

LP4-3,  
TYP.

F-1201W-R  
(UNDER F-12117-1)  
BOTH SIDES

F-12117-1  
BOTH SIDES

TOP EDGE OF  
F-12117-1 & F-1201W  
FLUSH

F-01201C-1

AFT EDGE OF  
F-12117-1 & F-1201W  
FLUSH

**FIGURE 4:** INSTALLING THE LWR COWL HINGES

