

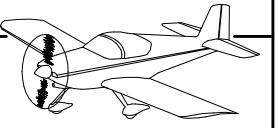
TOTAL PERFORMANCE
VAN'S AIRCRAFT

14401 Keil Road NE, Aurora, Oregon, USA 97002

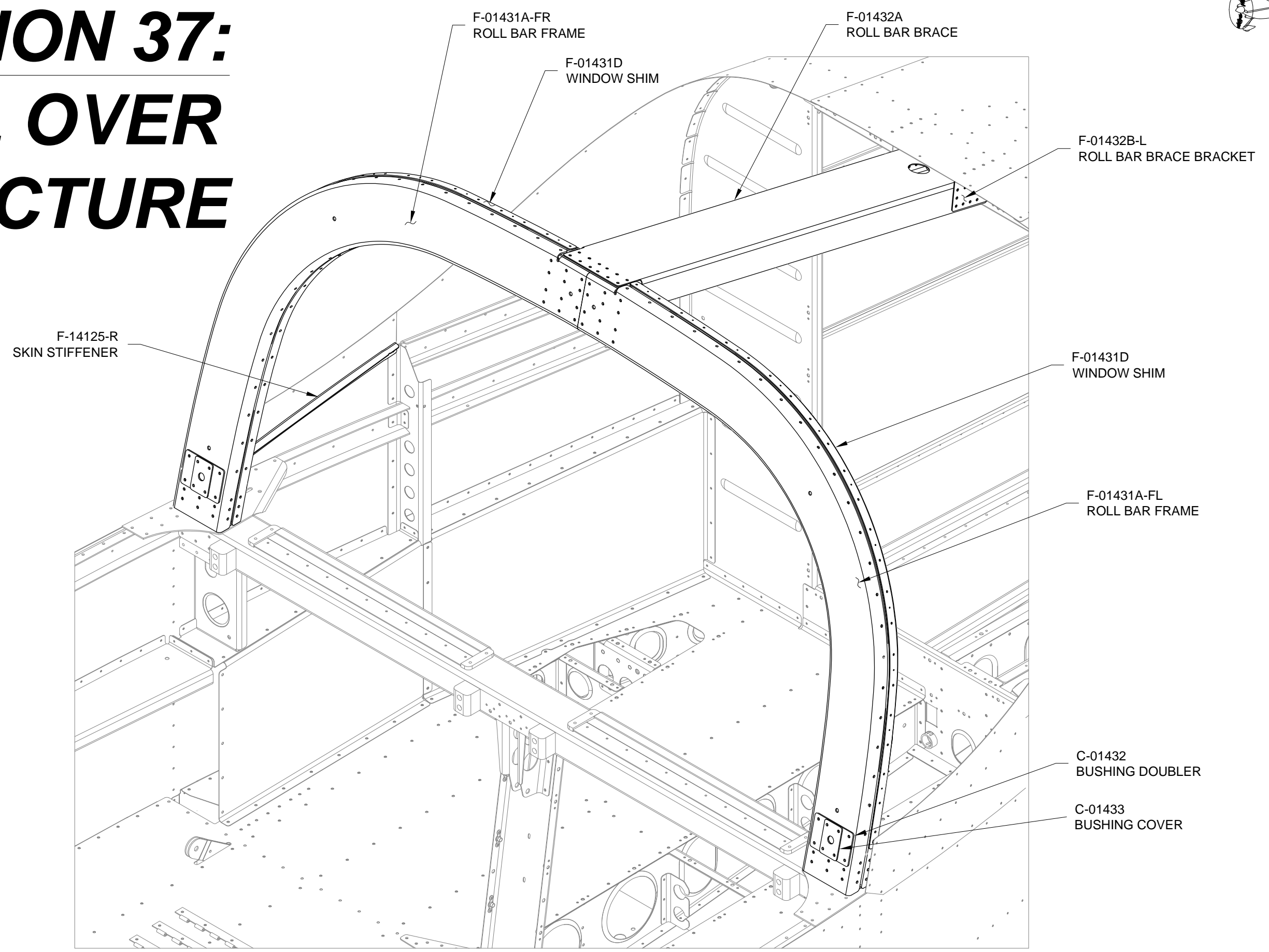
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REVISION DESCRIPTION:

Page 37-06 MEMO: In Figure 1, revised LP4-3 rivet call-outs for clarity.



SECTION 37: ROLL OVER STRUCTURE





Step 1: Separate the F-01432B-L & F-01432B-R Roll Bar Brace Brackets by removing the hatched areas as shown in Figure 1.

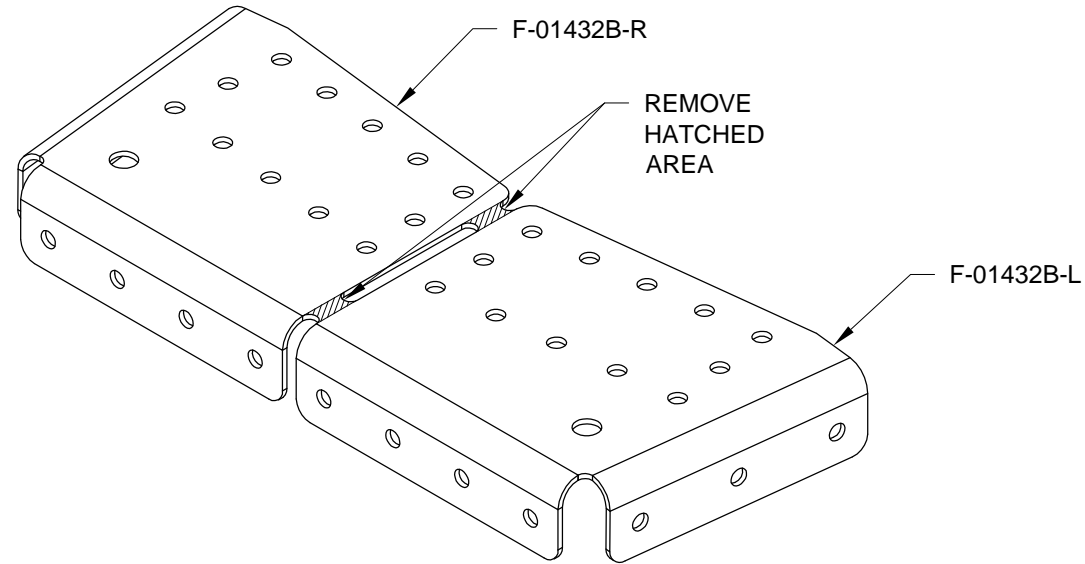


FIGURE 1: SEPARATE LEFT AND RIGHT BRACE BRACKETS

Step 2: Dimple the F-01432B-L & F-01432B-R Roll Bar Brace Brackets and F-01432A Roll Bar Brace where indicated in Figure 2.

Step 3: Rivet the F-01432B-L & F-01432B-R Roll Bar Brace Brackets to the F-01432A Roll Bar Brace using Figure 2 rivet call-outs.

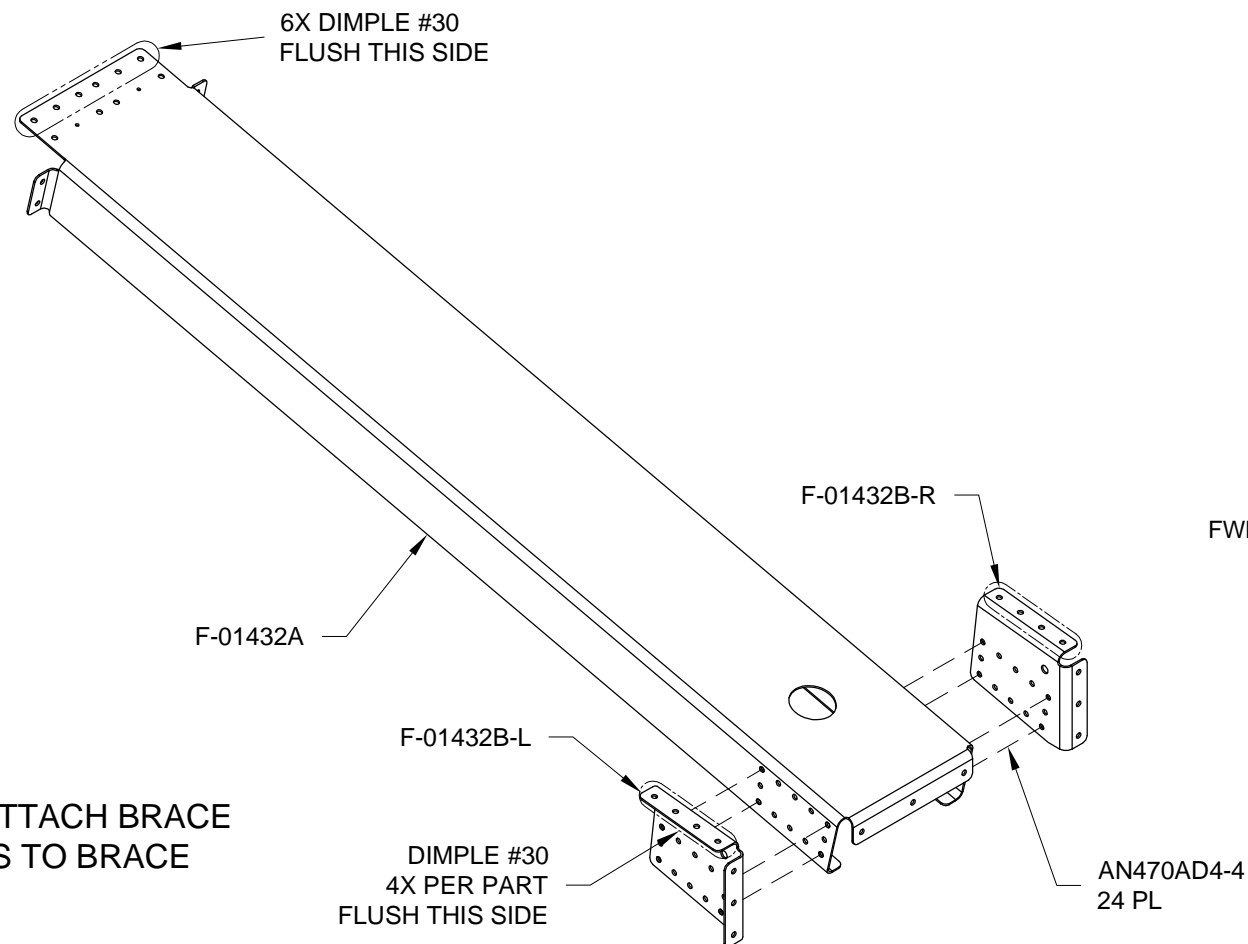


FIGURE 2: ATTACH BRACE BRACKETS TO BRACE

NOTE: For Steps 4-5, the Roll Bar Frame Assemblies may be Removed from the Fuselage Assembly after the two bottom outer and two top center rivets have been installed in the F-1231E Roll Bar Splice Plate. This will hold the frames in the proper alignment.

Step 4: Cleco the F-01431A-FL & -FR Roll Bar Frames to the F-1231D Roll Bar Base on both sides of the fuselage. Rivet the F-1231E Roll Bar Splice Plate to the roll bar frames using the rivets called out in Figure 3. This is now the FWD Roll Bar Assembly. Remove the FWD Roll Bar Assembly from the fuselage.

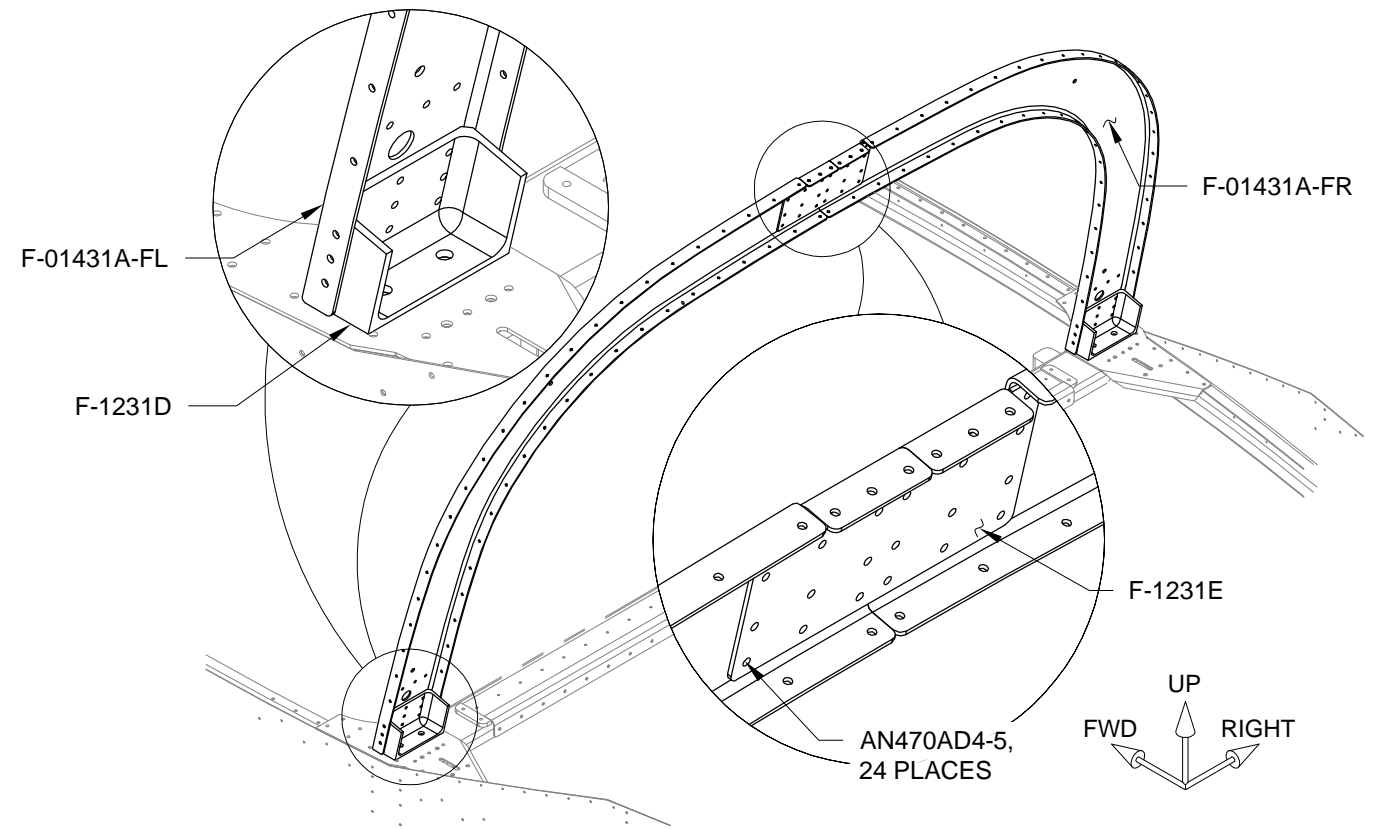


FIGURE 3: FWD ROLL BAR FRAME ASSEMBLY

Step 5: Cleco the F-01431A-AL & -AR Roll Bar Frames to the front face of the F-1231D Roll Bar Base on both sides of the fuselage. Rivet the F-1231E Roll Bar Splice Plate to the roll bar frames to create the AFT Roll Bar Frame Assembly. See Figure 4 for rivet callouts.

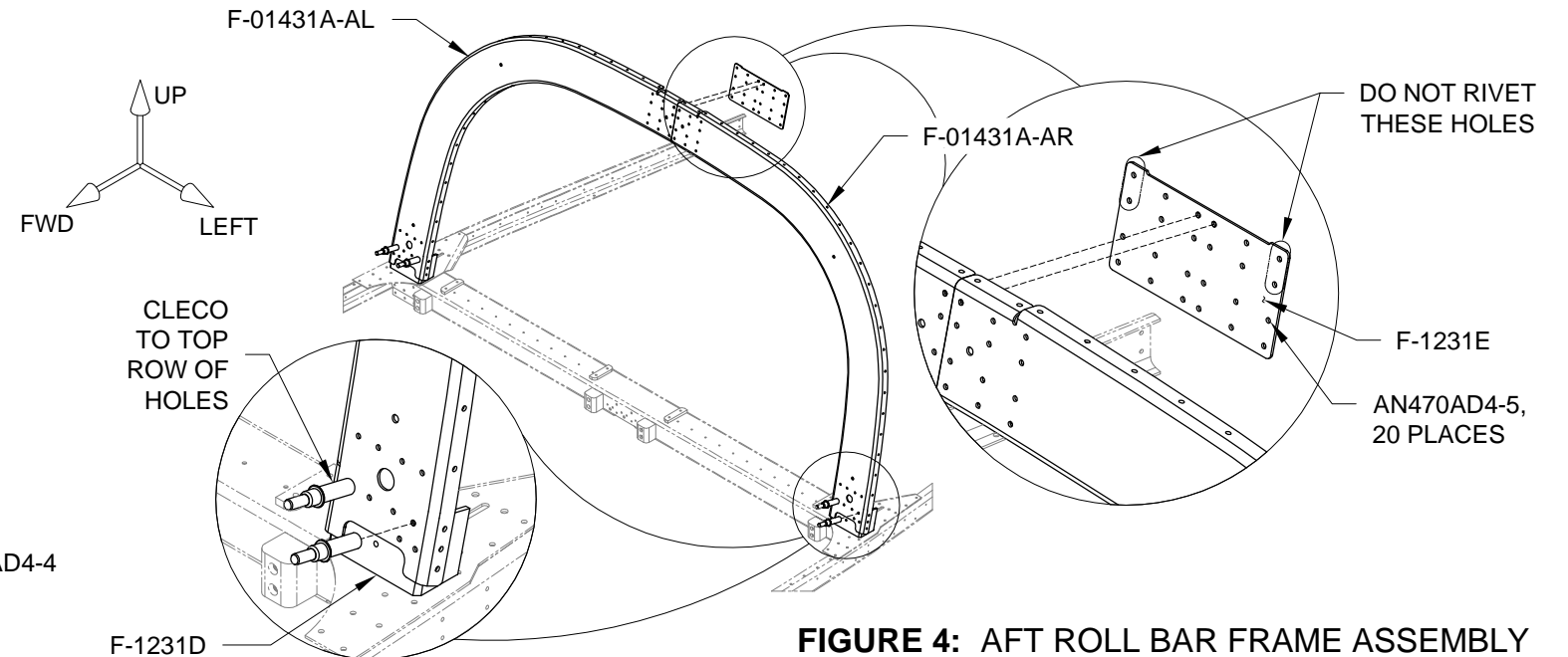
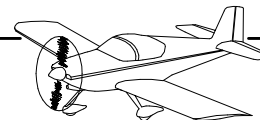


FIGURE 4: AFT ROLL BAR FRAME ASSEMBLY



NOTE: Use care to not kink parts across rivet holes while forming.

Step 1: Study Figure 1 to determine the forward edge of the F-01431B Outbd Roll Bar Strap. Run the Outbd Strap back and forth over the edge of a table to add curvature where needed. The profile does not have to be final installed shape, but it should be close enough to make roll bar frame assembly less difficult.

Step 2: Repeat the forming operation described in Step 1 for the F-01431C Inbd Roll Bar Strap.

Step 3: Cleco the F-01431B Outboard Roll Bar Strap to the outboard flanges of the Fwd Roll Bar Frame Assembly. Note that the outboard roll bar strap nests below the outboard flanges, but above the short center flange as shown in Figure 1.

Step 4: Cleco the F-01431C Inboard Roll Bar Strap to the inside of the inboard flange of the Fwd Roll Bar Frame Assembly.

Fit the Aft Roll Bar Frame Assembly to the Fwd Roll Bar Assembly with the inboard roll bar strap inside of the inboard flange, and cleco the Aft Roll Bar Frame Assembly to the inboard roll bar strap.

Step 5: Cleco the F-01431D Window Shims to the outer surface of the Aft Roll Bar Frame Assembly and to the F-01431B Outboard Roll Bar Strap. See Figure 1.

NOTE: The Ø.063 [1.6 mm] holes in the F-01431D Window Shims are drilled later. Do not drill at this time.

Step 6: Final-Drill #30 all #40 holes in the Roll Bar Frame Assembly and cleco. Trapped drill shavings will shift the way parts nest and lead to problems later. Keep the parts tight together and clear away shavings as needed during the final-drill process.

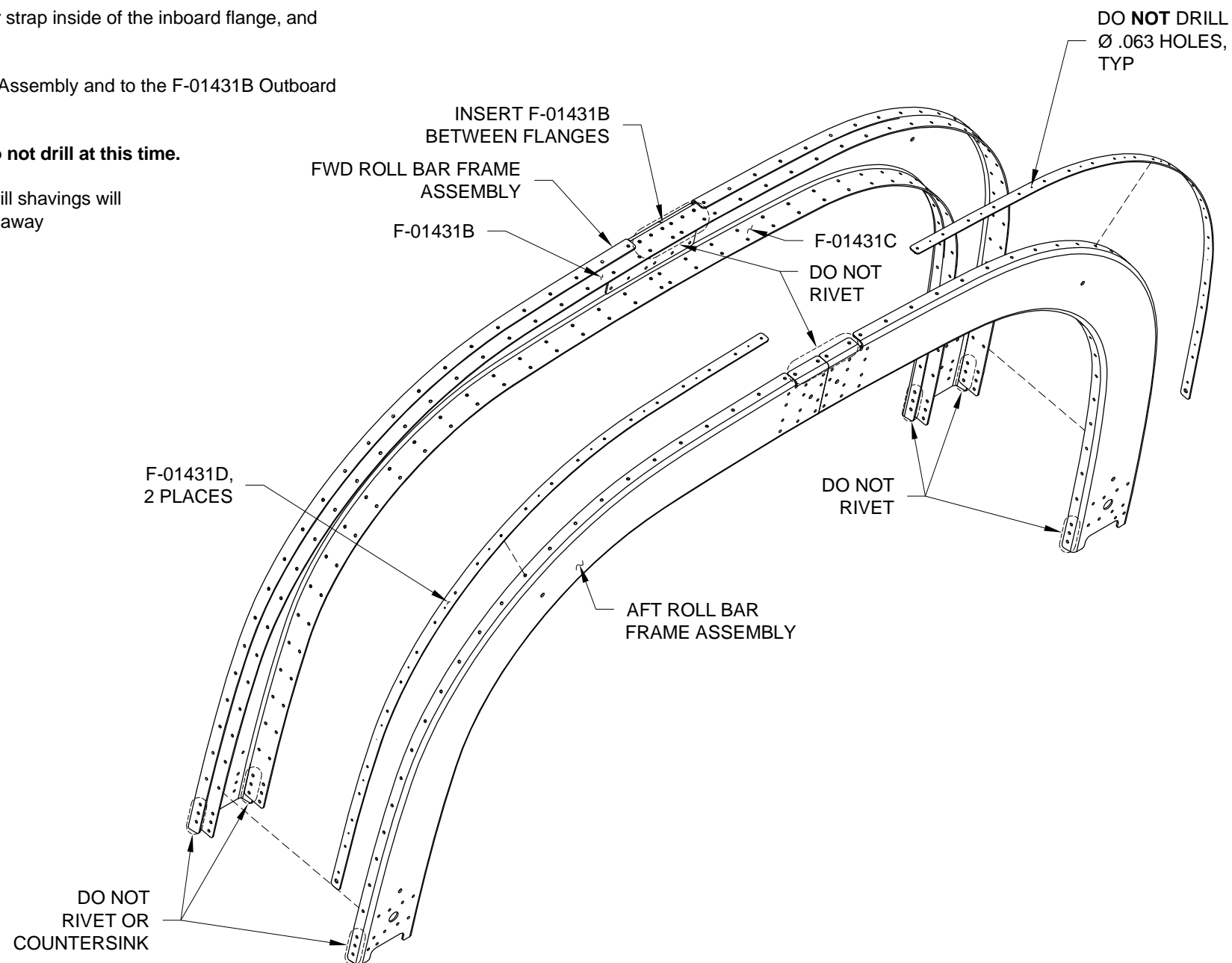
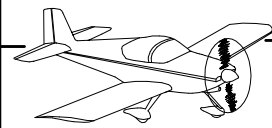


FIGURE 1: EXPLODED ASSEMBLY



Step 1: Mark the parts of the Roll Bar Frame Assembly so that they can be reassembled in the same position.

Disassemble the Roll Bar Frame Assembly and deburr parts. Prime parts if desired.

Step 2: Machine countersink the outboard flanges of the Fwd Roll Bar Frame Assembly for the AN426 rivets called out in Figure 1. Exclude the holes common to F-1231D Roll Bar Bases and the short center flanges.

Step 3: Machine countersink the F-01431B Outbd Roll Bar Strap for the dimpled F-01432A Roll Bar Brace as called out in Figure 2.

Step 4: Machine Countersink the #30 holes in the F-01431D Window Shims for the CS4 Rivets called out in Figure 1.

NOTE: Do not rivet locations marked in Figures 1 and 2 until later in the assembly process!

Step 5: Rivet the Fwd Roll Bar Frame Assembly to the F-01431B and F-01431C Roll Bar Straps using the hardware called out in Figure 1.

Step 6: Rivet the aft C-01432 Bushing Doublers to the Aft Roll Bar Frame Assembly as shown in Figure 1 Detail.

Install the BUSHFBZ.502X.377X.375 Bushings called out in the Figure 1 Detail, then rivet the C-01433 Bushing Covers in place as shown.

Step 7: Push the Aft Roll Bar Frame Assembly onto the F-01431B and F-01431C Roll Bar Straps and cleco together with the F-01431D Window Shims. Lay the assembly on a flat surface to ensure that there is no twist and rivet using the rivets called out in Figure 1.

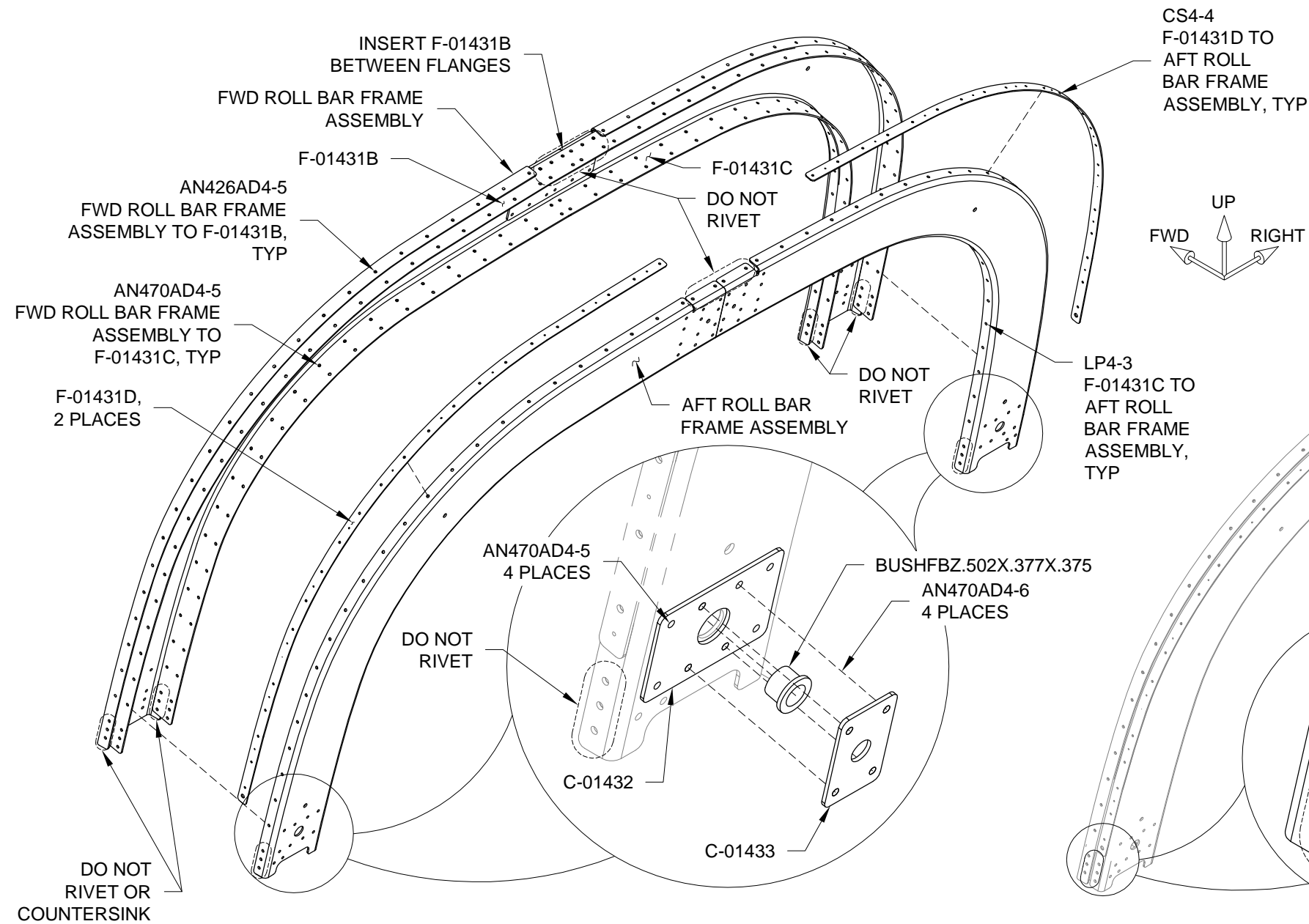


FIGURE 1: EXPLODED ASSEMBLY

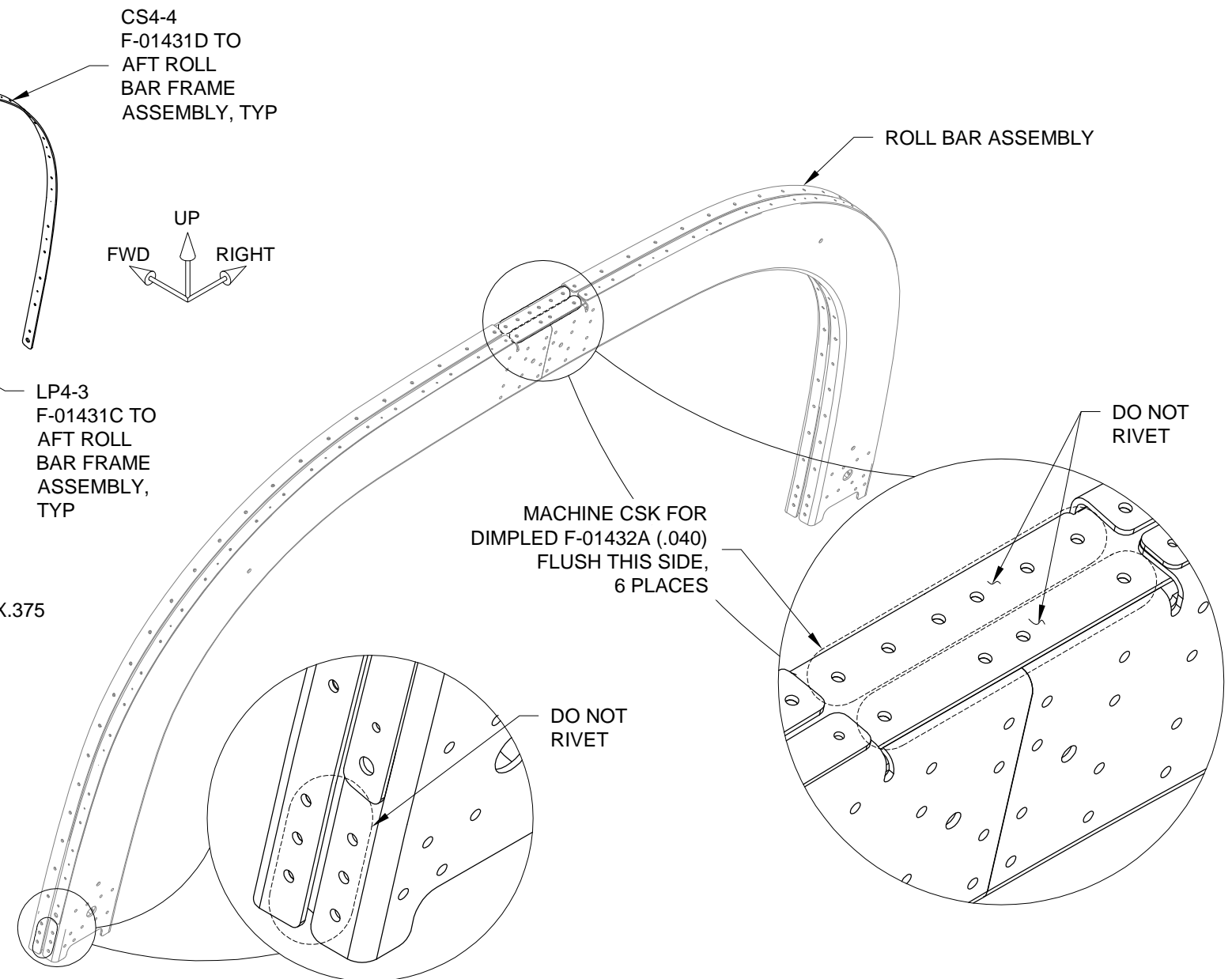
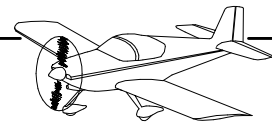


FIGURE 2: ROLL BAR ASSEMBLY



Step 1: Remove clecos from the F-01474-L &-R Aft Fuse Top Side Skins as required to temporarily pull the top skins away from F-01470 Fuselage Side Skins and Roll Bar Assembly. See Figure 1 and Figure 3.

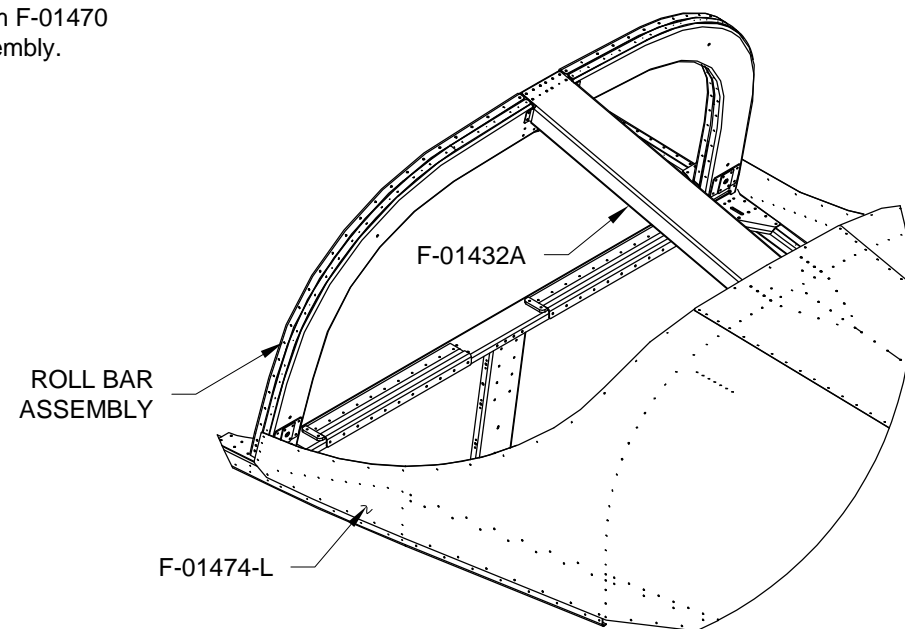


FIGURE 1: CLECO TO ROLL BAR BRACE

Step 3: Temporarily cleco the F-01432A Roll Bar Brace to the F-01406C Bulkhead and the top of the Roll Bar Assembly to establish final alignment. See Figure 1 and Page 37-07.

Step 4: Use a 12" drill bit for drill chuck clearance when match-drilling the lower inboard holes of the Roll Bar Assembly to the F-1231D Roll Bar Bases.

Match-Drill #30 the roll bar bases (shown in Figure 3). Use the holes on the outboard and inboard sides of the Roll Bar Assembly as guides.

The outboard holes may be accessed by carefully pulling back the F-01474-L &-R Aft Fuse Top Side Skins.

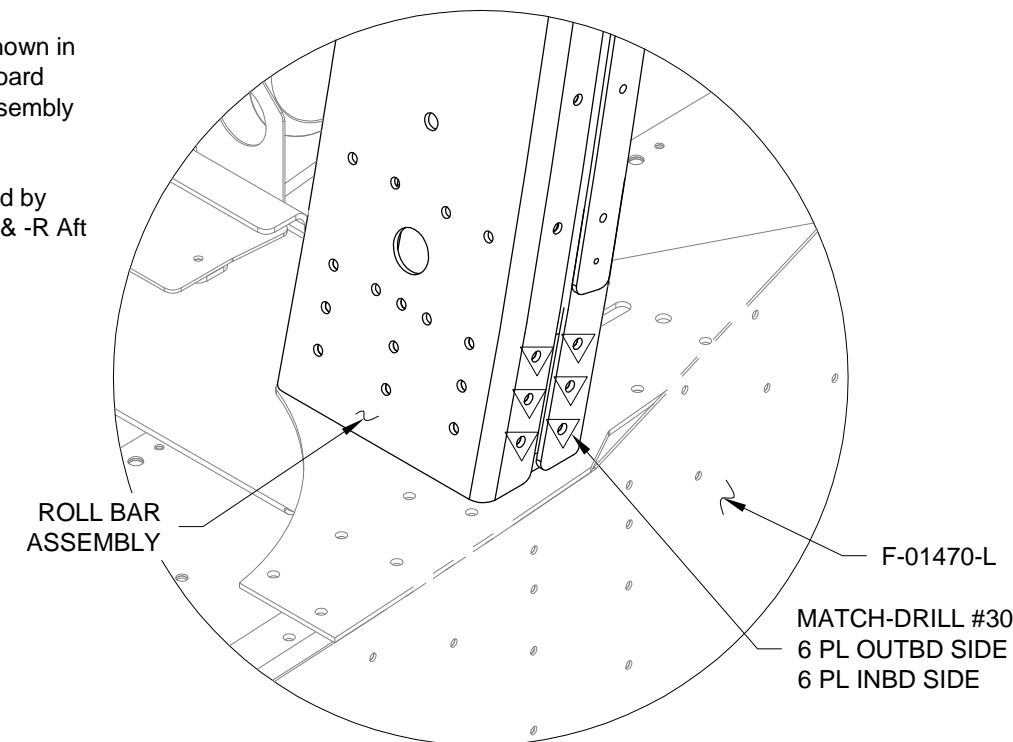


FIGURE 3: MATCH-DRILL ROLL BAR BASES

NOTE: Except where separate instructions and/or figures exist for both left and right sides of the aircraft, only the left side parts, assemblies, or installations will be shown.

It is the builder's choice as to whether to complete all steps for the left side before repeating those steps for the right side or to complete each step for both left and right sides before moving to the next step.

Step 2: Cleco the Roll Bar Assembly to the F-01231D Roll Bar Bases as shown in Figure 2. If the F-01431B & C Roll Bar Straps interfere with Roll Bar Assembly sliding over the roll bar braces, they may be pushed into proper position by accessing them from the back side while the roll bar is lowered onto the roll bar bases.

Use a hammer and block of wood to tap on the forward face of the Roll Bar Assembly to ensure that it is seated tightly against the F-1231D Roll Bar Bases and that the flanges are properly positioned.

Cleco the remaining holes on the forward face to hold the Roll Bar Assembly in Place.

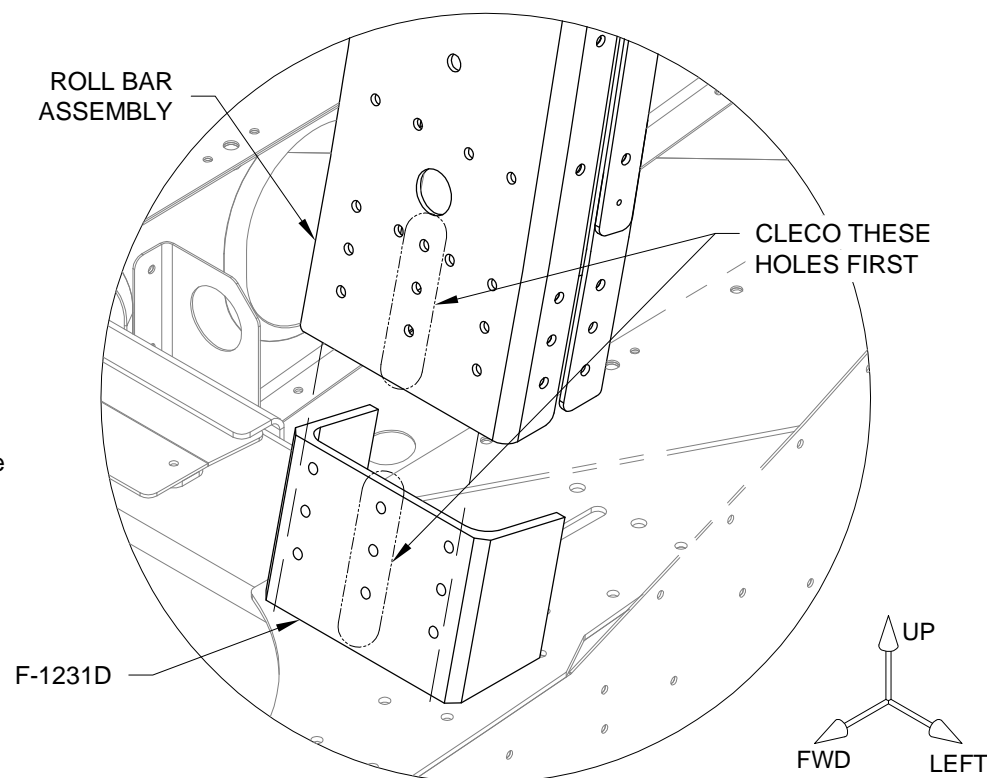
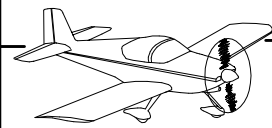


FIGURE 2: TEMPORARILY INSTALL ROLL BAR ASSEMBLY ONTO BASES



Step 1: Cleco the C-01432 Bushing Doubler to the front half of the Roll Bar Assembly as shown in Figure 1.

Step 2: Match-Drill #30 the F-1231D Roll Bar Bases as called out in Figure 1.

Remove the Roll Bar Assembly and deburr the holes.

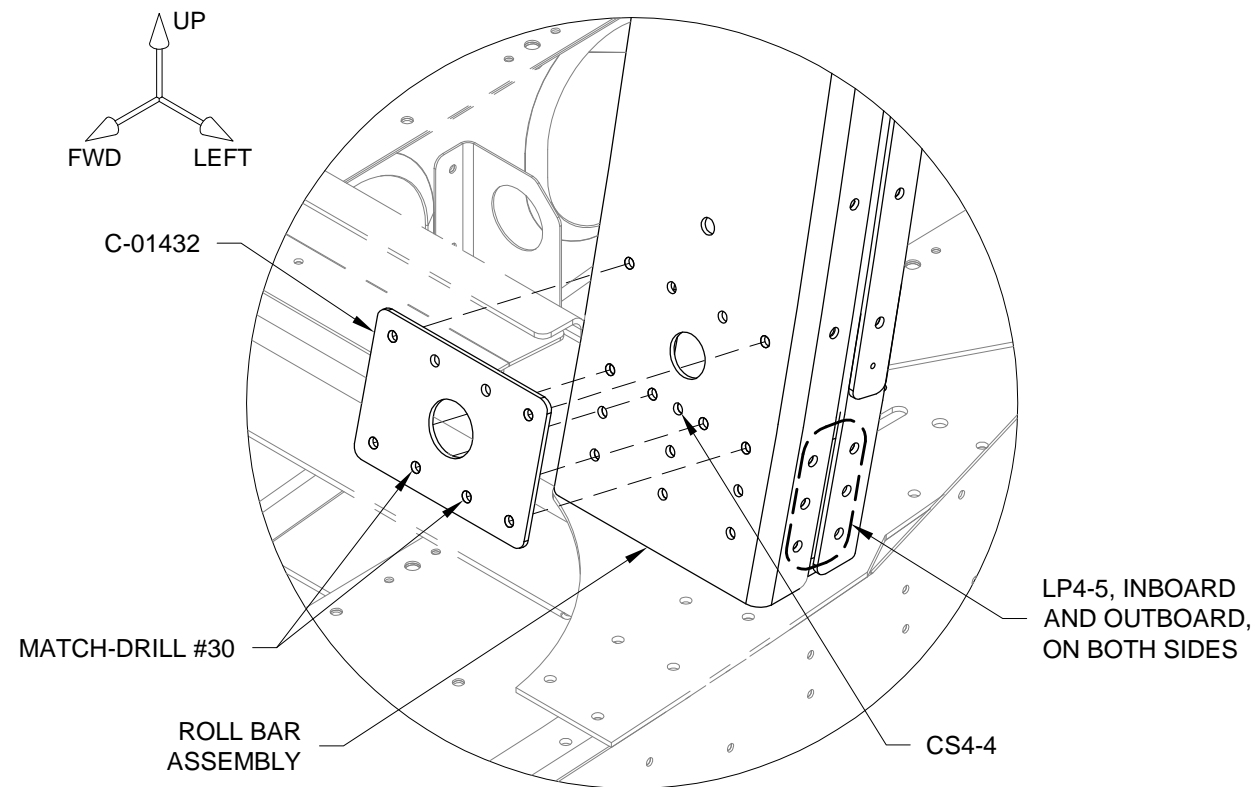
Step 3: Reinstall Roll Bar Assembly onto F-1231D Roll Bar Bases as shown in Figure 1.

Cleco the F-01432A Roll Bar Brace to the Roll Bar Assembly and to the F-01406C Bulkhead Assembly. See Page 37-07 Figure 1.

Step 4: Machine countersink the Roll Bar Assembly for the indicated CS4-4 rivet. See Figure 1.

Step 5: Rivet one CS4 flush rivet per side to the Roll Bar Assembly as shown in Figure 1.

Step 6: Rivet the side flanges of the Roll Bar Assembly to the F-01431D Roll Bar Base as shown in Figure 1.



**FIGURE 1: MATCH-DRILL ROLL BAR BASE
(LEFT SIDE SHOWN)**

Step 7: Rivet the forward C-01432 Bushing Doubler to the Roll Bar Assembly and the F-01431D Roll Bar Base using Figure 2 rivet call-outs.

Install rivets in the six remaining holes in the forward face of the Roll Bar Assembly. See Figure 2.

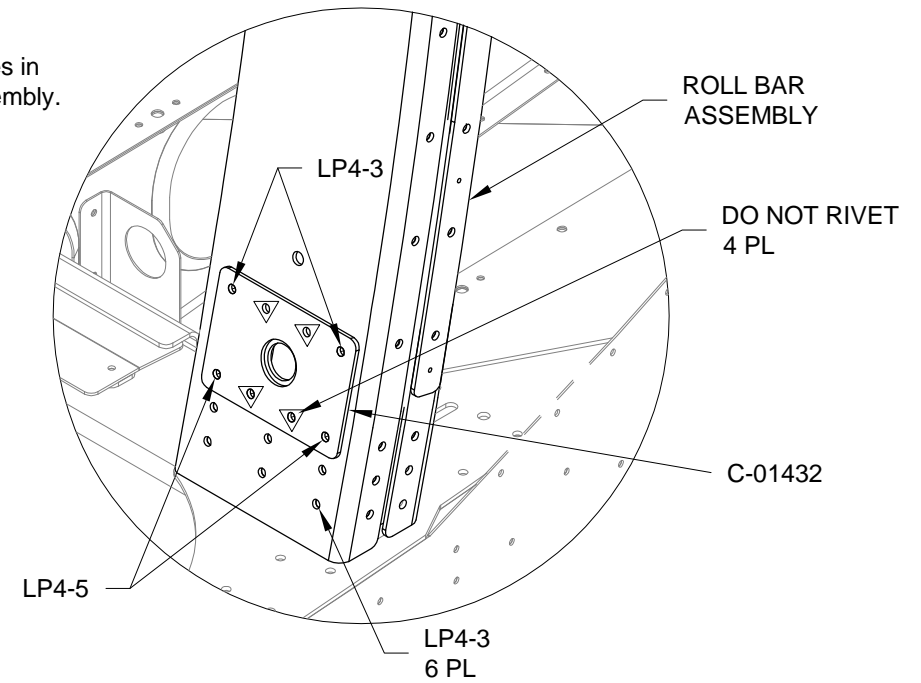


FIGURE 2: ATTACH FWD BUSHING DOUBLER

Step 8: Insert the BUSHFBZ.502X.377X.375 Flanged Bushings into the Roll Bar Assembly as shown in Figure 3.

Step 9: Rivet in place the C-01433 Bushing Covers using Figure 3 rivet call-outs.

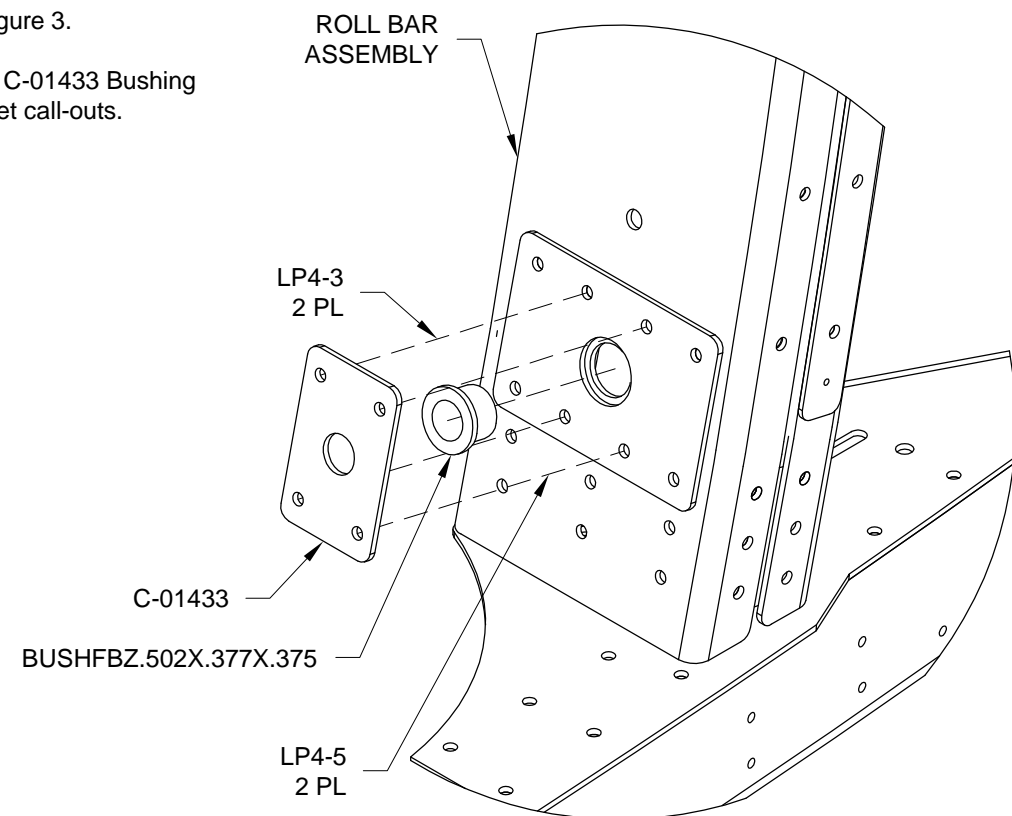
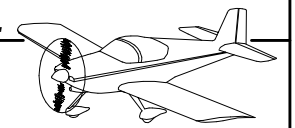


FIGURE 3: INSERT BUSHINGS & ATTACH COVERS



Step 1: Rivet the F-01432A Roll Bar Brace to the Roll Bar Assembly using Figure 1 rivet call-outs.

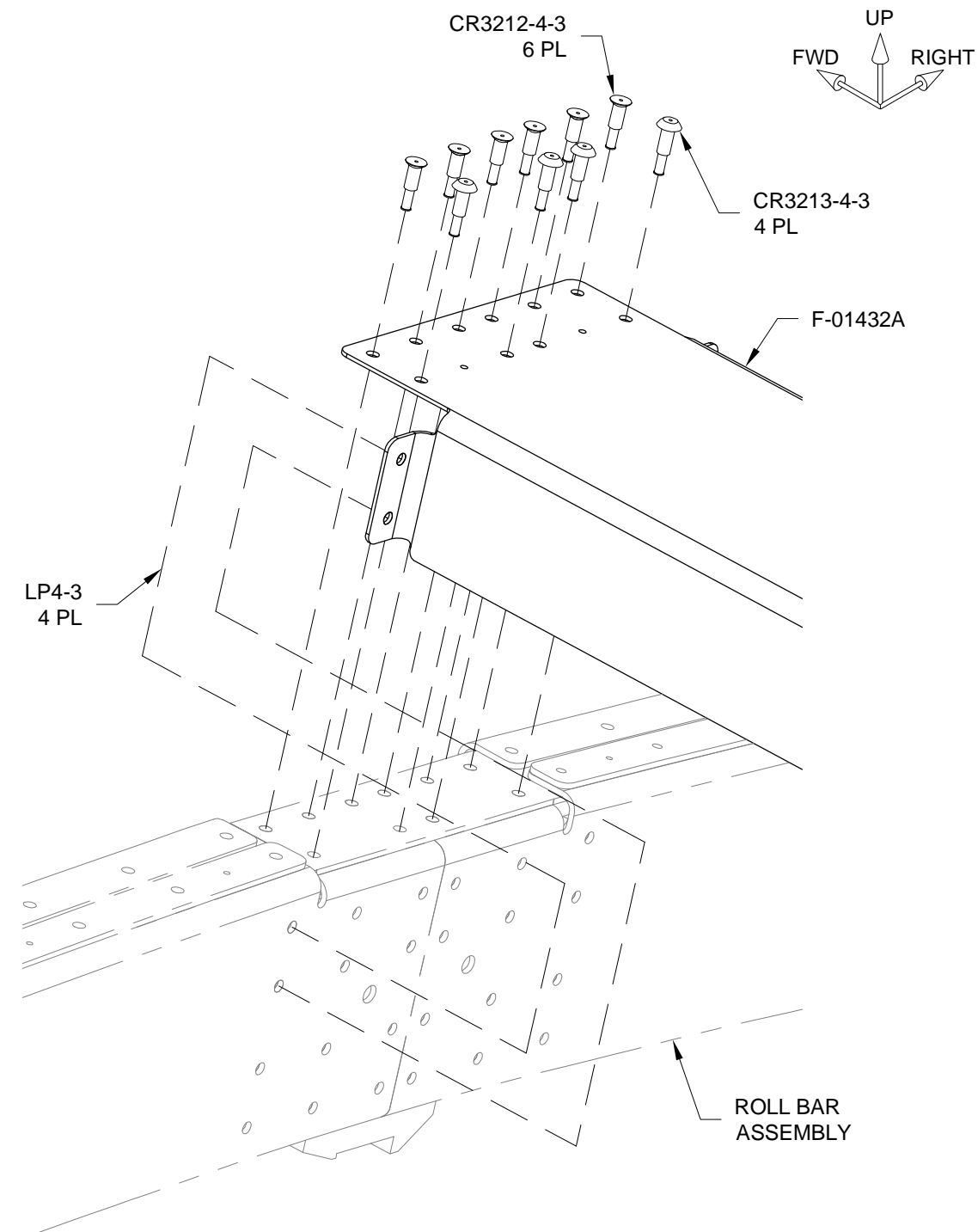


FIGURE 1: ATTACH BRACE TO ROLL BAR ASSEMBLY

Step 2: Rivet the F-01432B-L & -R Roll Bar Brace Brackets to the F-01406C Bulkhead, F-01475A Skin Doubler, and F-01475 Aft Fuse Top Skin using Figure 2 rivet call-outs. Also see Figure 3 for reference.

Step 3: Rivet the F-01432A Roll Bar Brace to the F-01406C Bulkhead. Use Figure 2 rivet call-outs.

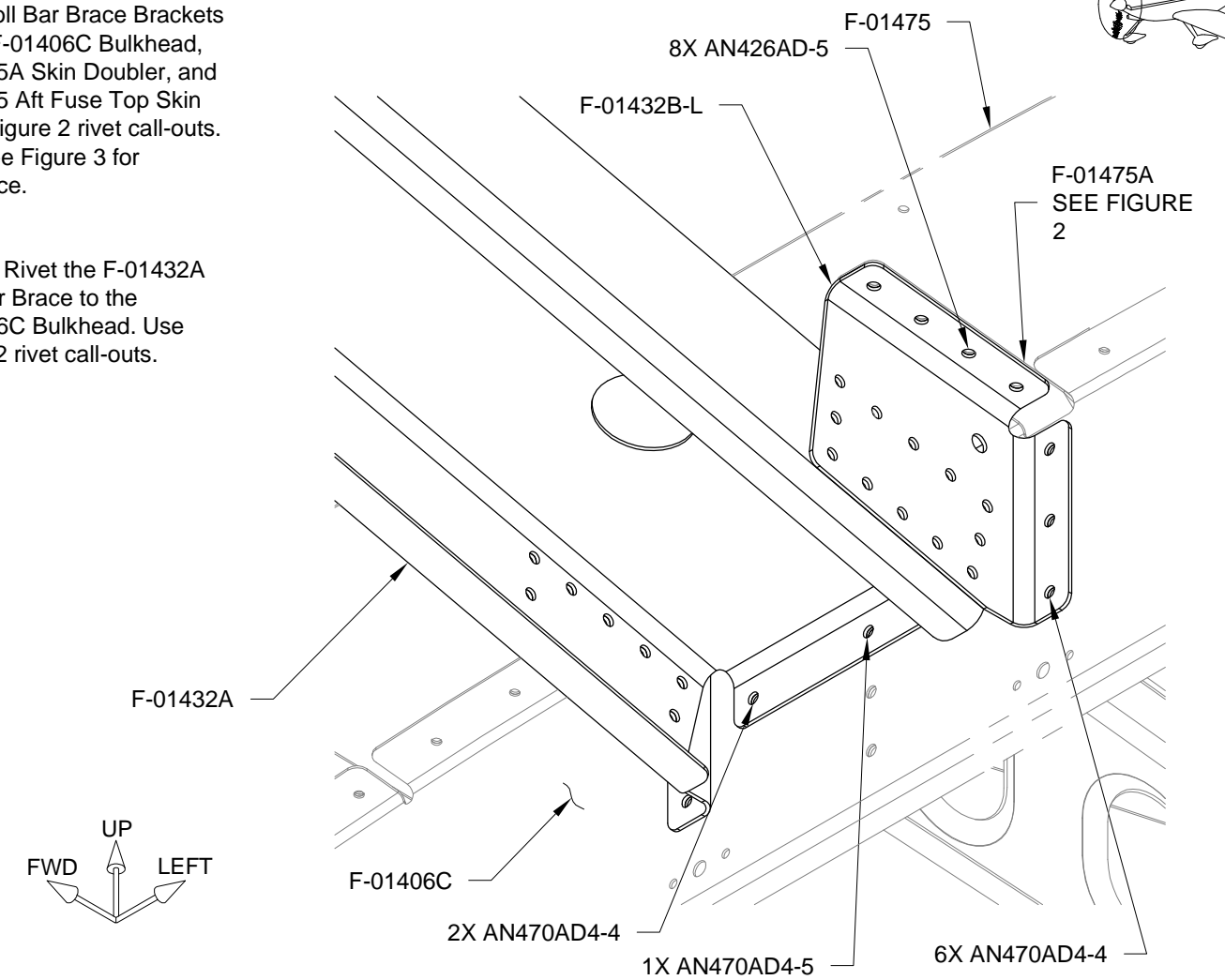
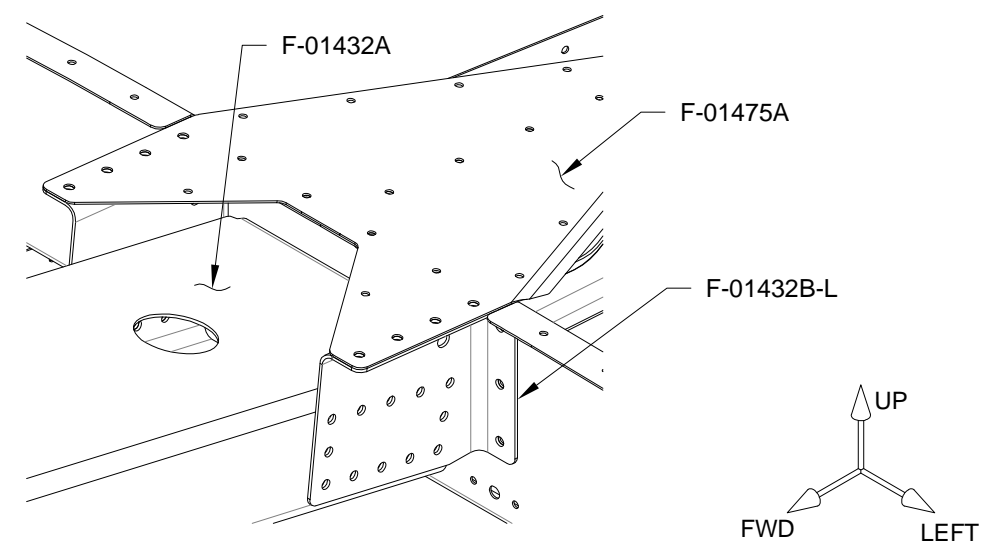
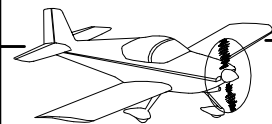


FIGURE 2: RIVET BRACE & BRACKETS TO STRUCTURE



**FIGURE 3: (FOR REFERENCE ONLY)
RIVET BRACE & BRACKETS TO STRUCTURE
(F-01475 AFT FUSE TOP SKIN NOT SHOWN FOR CLARITY)**



Step 1: Separate the F-14125 Skin Stiffener to make -L & -R parts as shown in Figure 1.

Step 2: Dimple the #40 holes in the F-14125-L and F-14125-R Skin Stiffeners.

Step 3: Flute the F-14125 Skin Stiffener flanges indicated in Figure 1 to remove curvature from other flange. Test fit the skin stiffener against F-01474-L skin until good hole alignment is obtained. See Figure 2 for location.

Step 4: Cleco the F-14125-L Skin Stiffener to the F-01470-L Fuselage Side Skin and F-01474-L Aft Fuse Top Side Skin as shown in Figure 2.

Step 5: Rivet the F-14125-L Skin Stiffener to the F-01474-L Aft Fuse Top Side Skin and the F-01470-L Fuselage Side Skin using Figure 2 rivet call-outs. Leave open the forward most hole.

Step 6: Rivet the F-01474-L and F-01470-L Skins to the F-01418A-L Fwd-Mid Fuse Longerons using the rivets called-out in Figure 2. Be sure to leave open the forward most hole as shown in Figure 2.

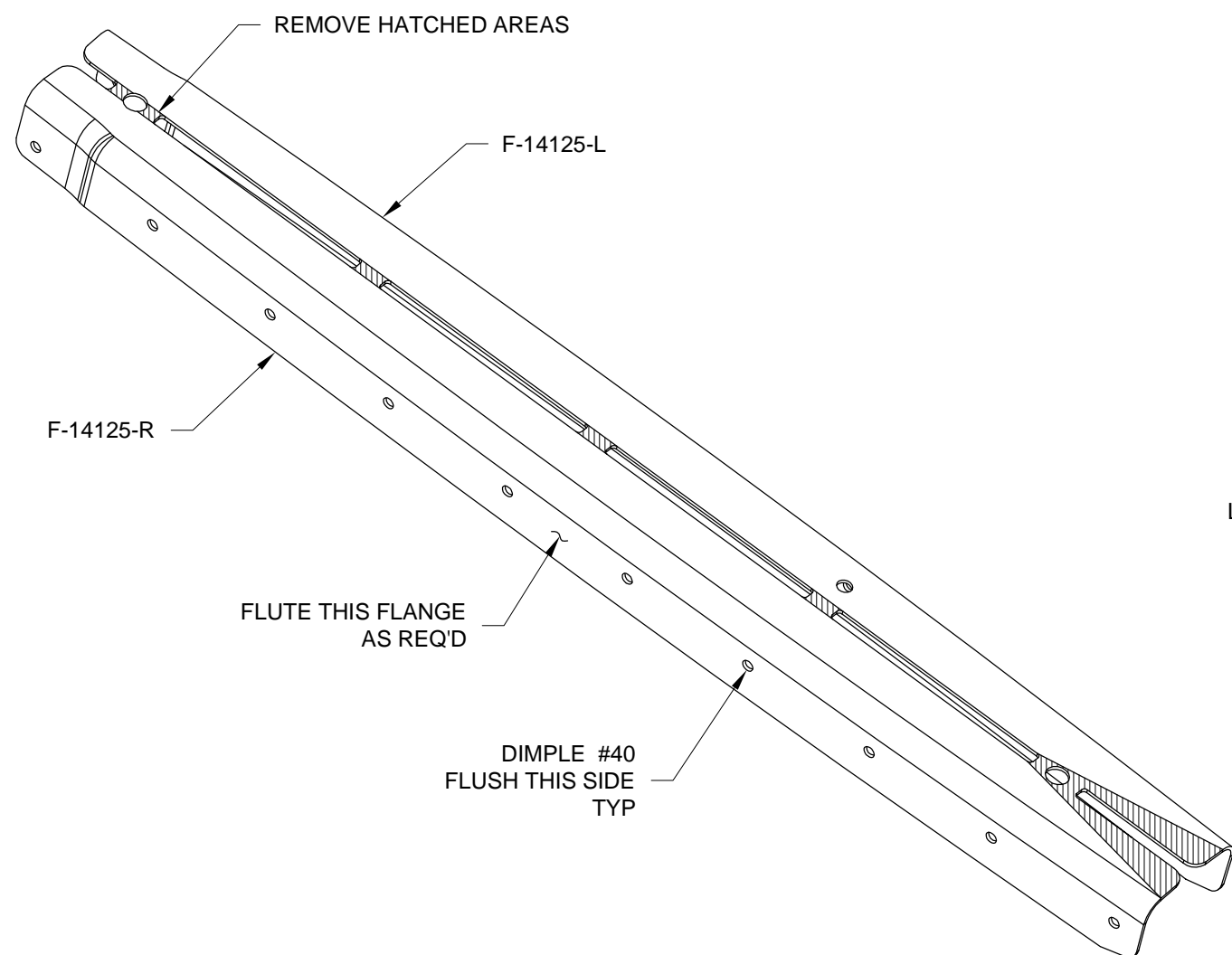


FIGURE 1: SEPARATE & DIMPLE SKIN STIFFENER

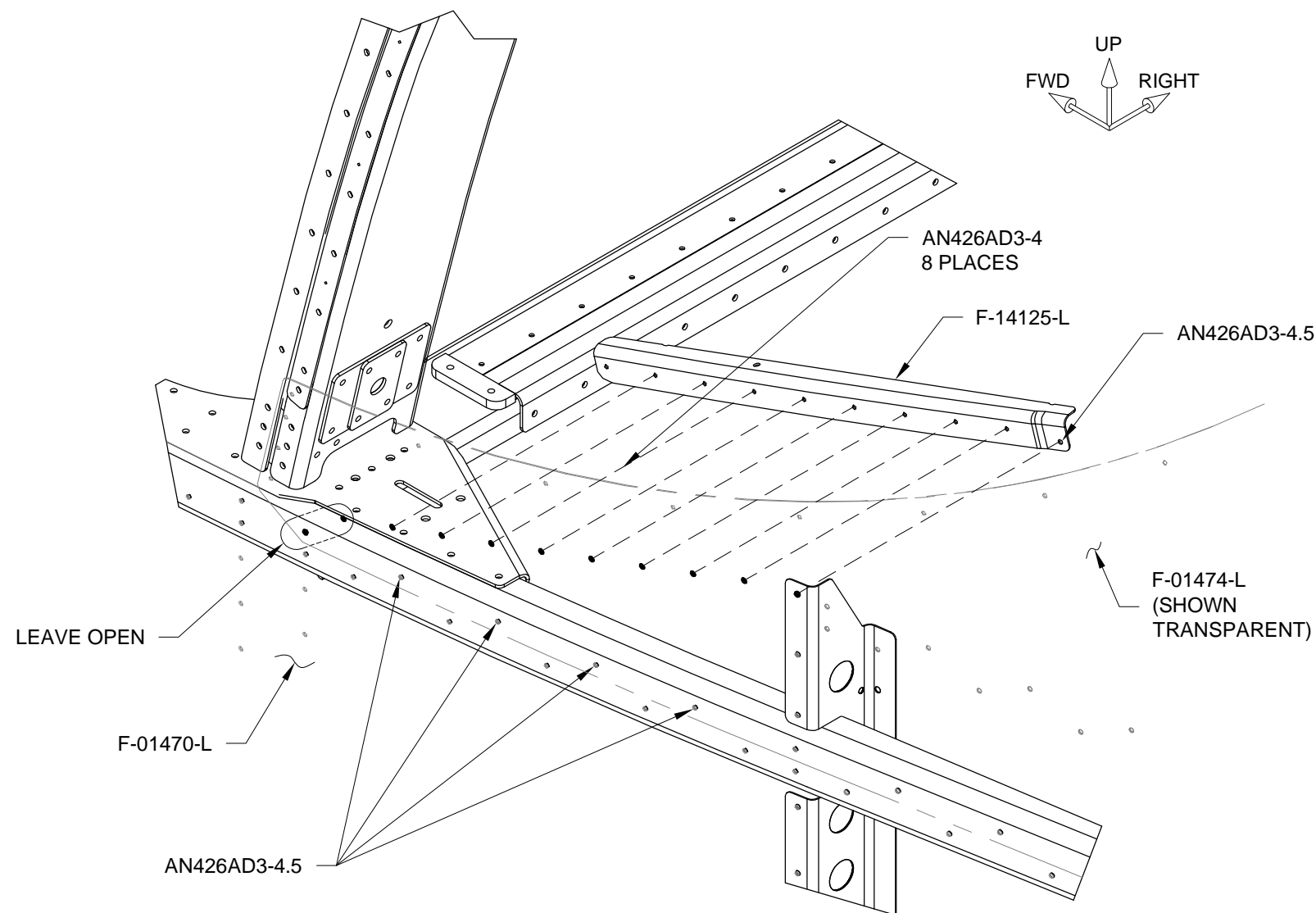


FIGURE 2: ATTACH SKIN STIFFENER TO SIDE AND TOP SKINS