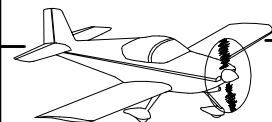


SECTION 13: MAIN SPAR



NOTE: The Main Spar is supplied assembled and gold anodized for corrosion resistance. The spar assembly consists of upper and lower step bars attached to one side of a C-channel spar web with a doubler plate attached to the other side of the web. The flanges of the C-channel spar web face aft. The inboard end of the spar has large holes for attaching to the fuselage. The upper spar step bar is longer and thicker than the lower spar step bar. **Be sure that you know "up", "down", "inboard", and "outboard" on your spar assembly.**

Step 1: Cleco the **W-1006E-L** Main Spar Web Extension to the **W-SPAR ASSY-L** Spar Assembly - Left using four **W-1006F** Spar Splice Plates. Correct orientation of the main spar web extension places the "extra" hole in one of the flanges on the bottom. See Figure 1. Final-Drill the spar splice plates to the spar assembly and web extension using a #30 drill.

Step 2: Mark or label the four **W-1006F** Spar Splice Plates "Upper Fwd", "Lower Aft", etc. so that when they are riveted in place their location and orientation will be the same as when they were final-drilled. See Section 5C for more information on marking parts.

Step 3: Un-cleco the four **W-1006F** Spar Splice Plates and **W-1006E-L** Main Spar Web Extension from the **W-SPAR ASSY-L** Spar Assembly - Left and deburr holes in all parts. Prime the spar splice plates and main spar web extension if/as desired.

Step 4: Re-cleco the four **W-1006F** Spar Splice Plates and **W-1006E-L** Main Spar Web Extension to the **W-SPAR ASSY-L** Spar Assembly - Left and install rivets as shown in Figure 1.

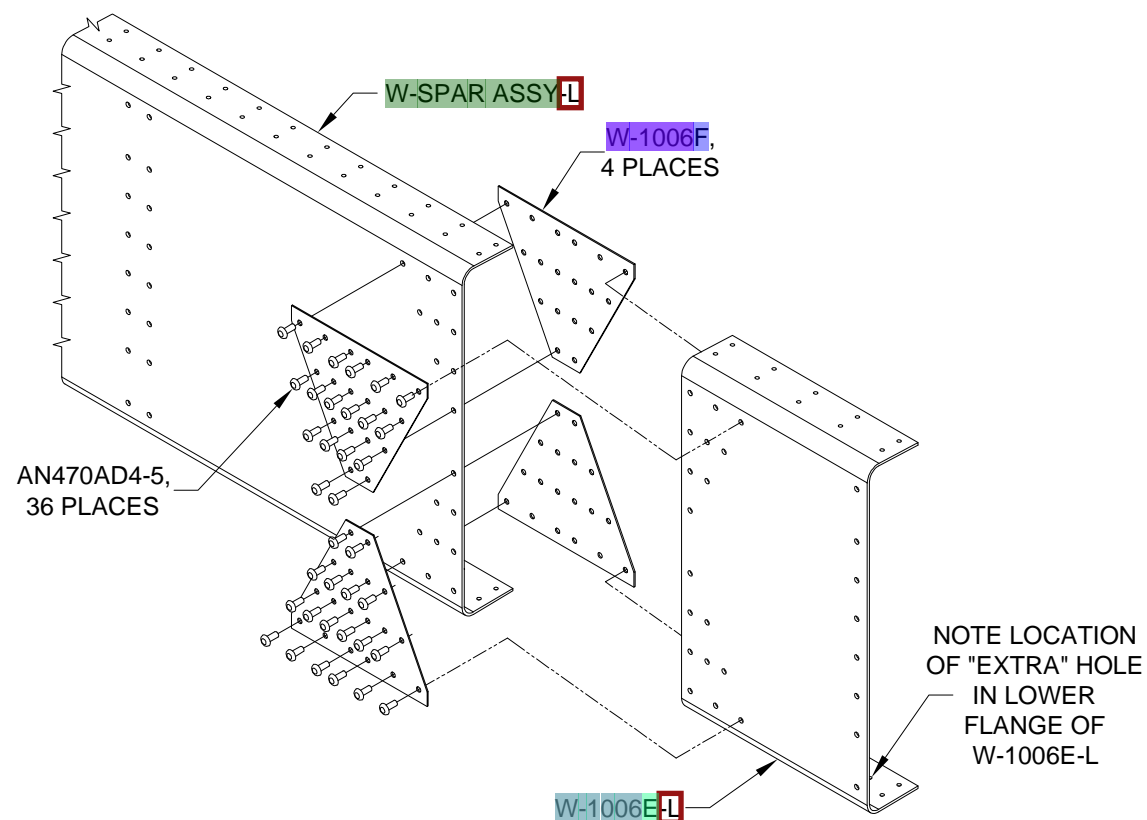


FIGURE 1:
MAIN SPAR WEB EXTENSION
INSTALLATION

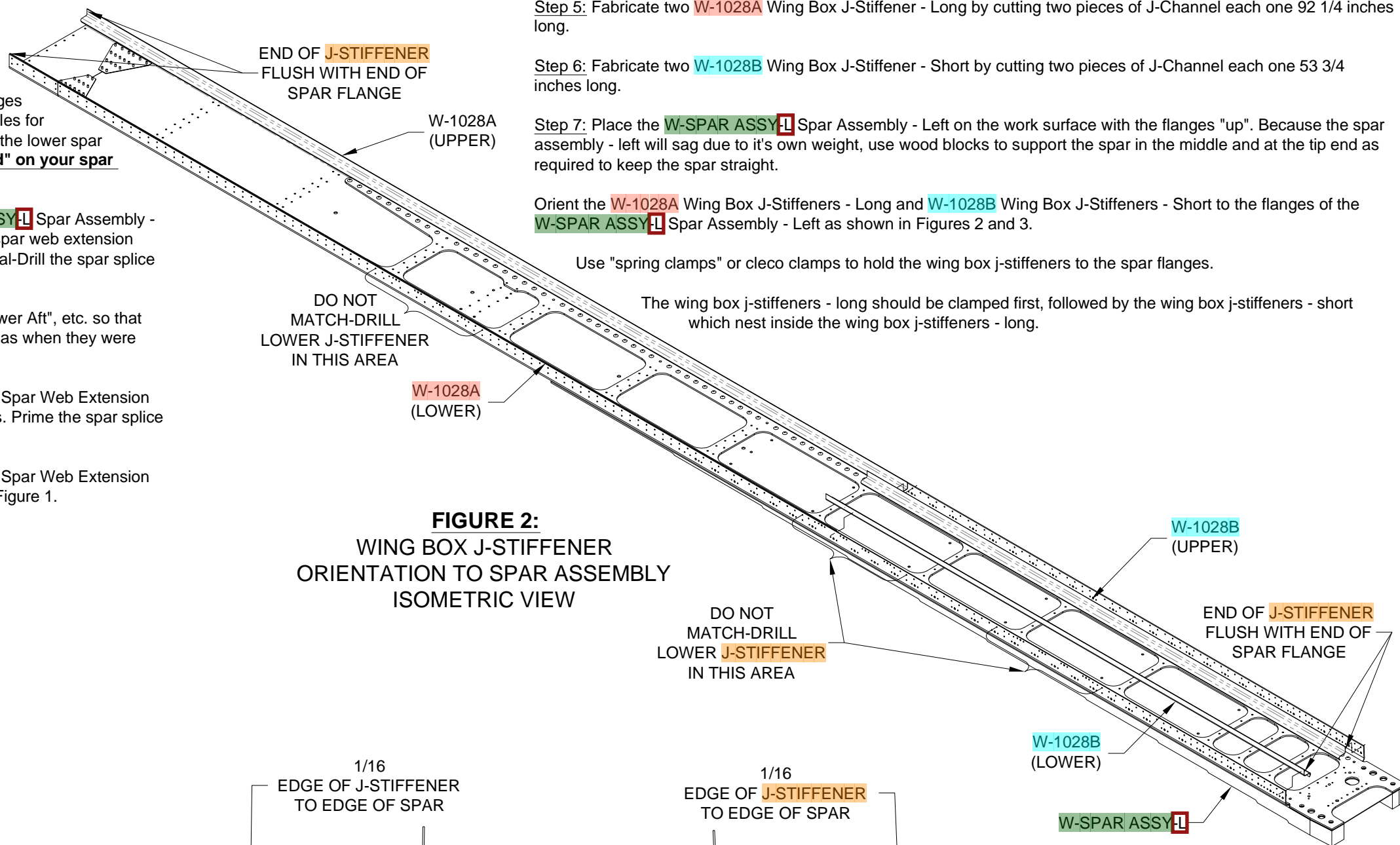


FIGURE 2:
WING BOX J-STIFFENER
ORIENTATION TO SPAR ASSEMBLY
ISOMETRIC VIEW

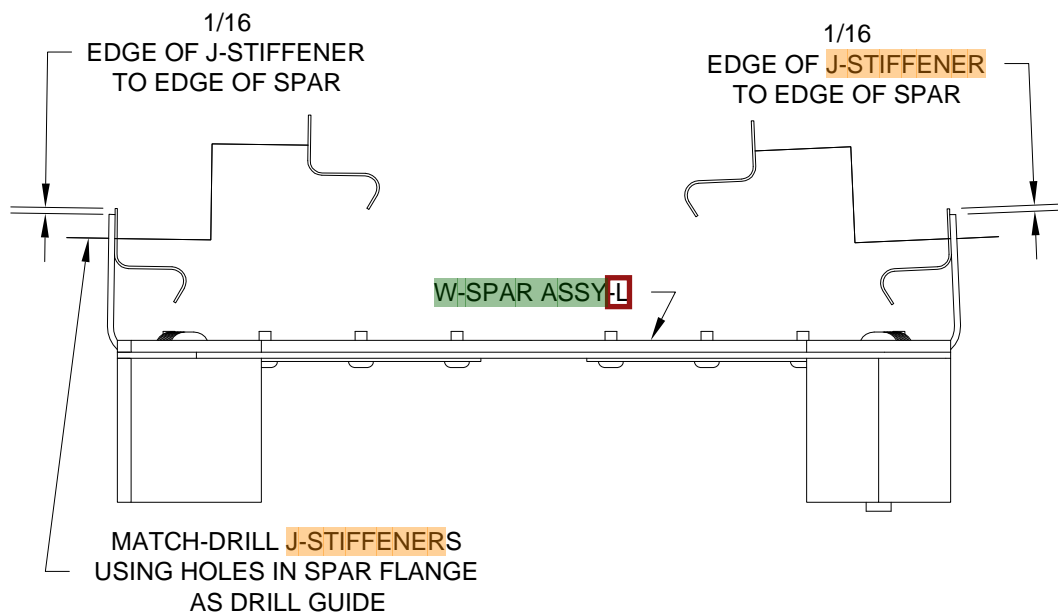


FIGURE 3:
WING BOX J-STIFFENER
ORIENTATION TO SPAR ASSEMBLY
END VIEW

Step 5: Fabricate two **W-1028A** Wing Box J-Stiffener - Long by cutting two pieces of J-Channel each one 92 1/4 inches long.

Step 6: Fabricate two **W-1028B** Wing Box J-Stiffener - Short by cutting two pieces of J-Channel each one 53 3/4 inches long.

Step 7: Place the **W-SPAR ASSY-L** Spar Assembly - Left on the work surface with the flanges "up". Because the spar assembly - left will sag due to it's own weight, use wood blocks to support the spar in the middle and at the tip end as required to keep the spar straight.

Orient the **W-1028A** Wing Box J-Stiffeners - Long and **W-1028B** Wing Box J-Stiffeners - Short to the flanges of the **W-SPAR ASSY-L** Spar Assembly - Left as shown in Figures 2 and 3.

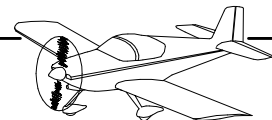
Use "spring clamps" or cleco clamps to hold the wing box j-stiffeners to the spar flanges.

The wing box j-stiffeners - long should be clamped first, followed by the wing box j-stiffeners - short which nest inside the wing box j-stiffeners - long.

Step 8: Using a #40 drill, match-drill the **W-1028A** Wing Box J-Stiffeners - Long and **W-1028B** Wing Box J-Stiffeners - Short to the flanges of the **W-SPAR ASSY-L** Spar Assembly - Left using the aft most row of 3/32 inch diameter holes in the spar flanges as drill guides. See Figure 3. Do NOT match-drill the lower wing box j-stiffeners in the three areas on the lower spar flange shown in Figure 2 and in Page 13-5, Figure 2.

Insert clecos in the holes as match-drilling progresses along the length of the wing box j-stiffeners. Monitor the position of the wing box j-stiffener relative to the spar flange (see Figure 3) as match-drilling progresses and make corrections as required.

After match-drilling, remove the wing box j-stiffeners, mark them for the left wing, then set them aside for later use during wing assembly.



Step 1: Except for holes already match-drilled, run a #40 drill through all the 3/32 holes in the flanges of the **W-SPAR ASSY-L** Spar Assembly - Left.

Step 2: Machine Countersink the nutplate attach rivet holes in the flanges of the **W-SPAR ASSY-L** Spar Assembly - Left. Machine countersink those rib to spar flange attach rivet holes that are in line with the nutplate attach rivet holes and are inboard of the most outboard fuel tank attach nutplate.

Countersink just deep enough to fit the head of an AN426AD3 rivet. Read Section 5E for more information on countersinking and dimpling. The fuel tank skin attach nutplate locations are shown in Figure 1. The wing access plate attach nutplate locations are shown in Figure 3.

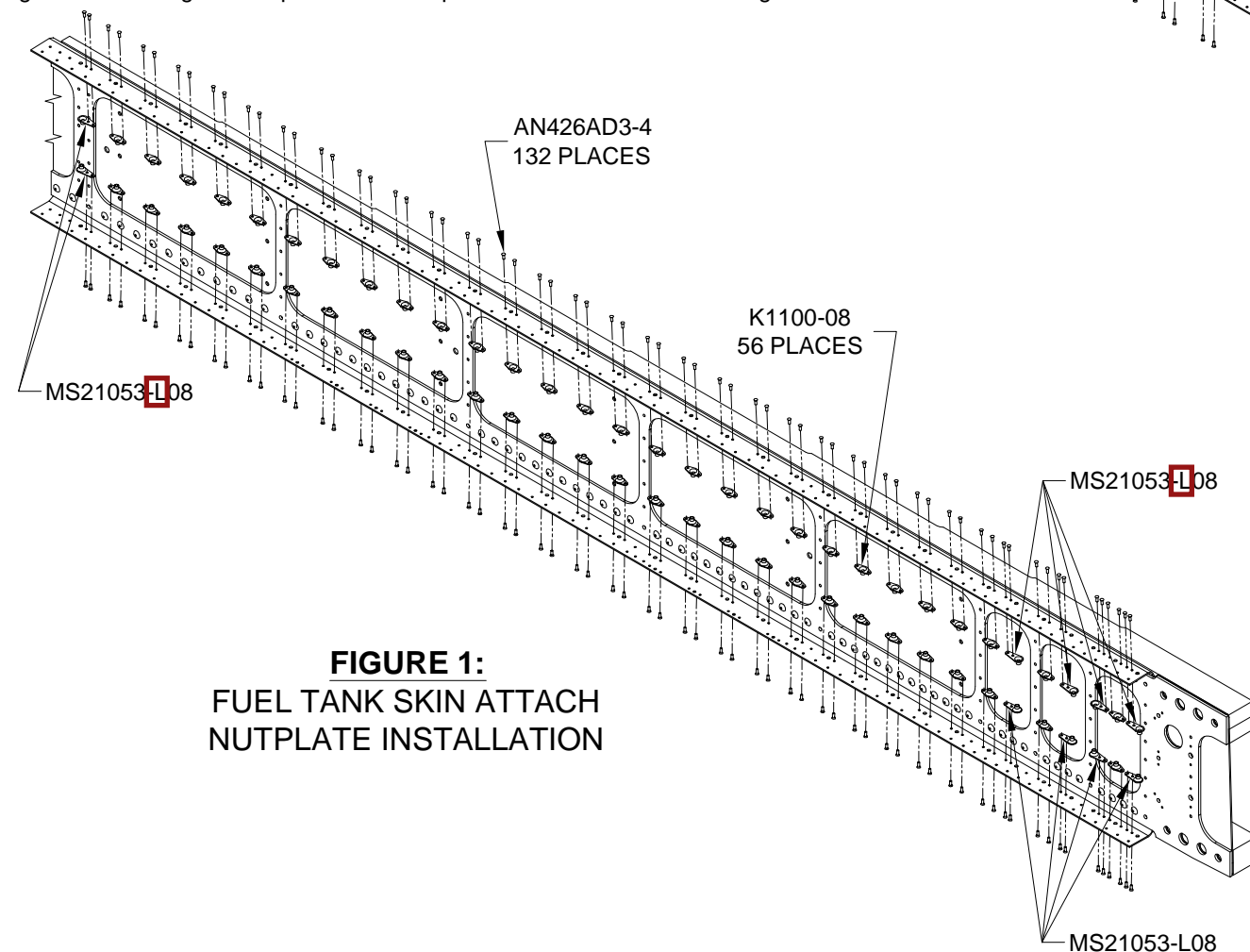


FIGURE 1:
FUEL TANK SKIN ATTACH
NUTPLATE INSTALLATION

Step 3: Machine Countersink the skin and rib attach rivet holes in the flanges of the **W-SPAR ASSY-L** Spar Assembly - Left. Countersink just deep enough to fit the dimples in the wing skins. Make a dimple test sample by drilling and dimpling a scrap of .032 aluminum for an AN426AD3 rivet. See Section 5E.

Step 4: Rivet the fuel tank skin attach nutplates to the **W-SPAR ASSY-L** Spar Assembly - Left as shown in Figure 1.

Step 5: Machine Countersink the fuel tank attach screw holes. See Figure 2 for details of the countersunk hole. Make a dimple test sample by drilling #19 and dimpling a scrap of .032 aluminum for a #8 flush head screw. Use a #30 pilot countersink cutter in a microstop countersink cage to enlarge the screw holes in the spar just enough for the test dimple to fit smoothly. The #30 pilot will center in the nutplate well enough to keep the countersink round and concentric.

Step 6: Rivet the wing access plate attach nutplates to the **W-SPAR ASSY-L** Spar Assembly - Left as shown in Figure 3.

Step 7: Machine Countersink the wing access plate attach screw holes. See Figure 4 for details of the countersunk hole. Make a dimple test sample by drilling #27 and dimpling a scrap of .032 aluminum for a #6 flush head screw. Use a #40 pilot countersink cutter in a microstop countersink cage to enlarge the screw holes in the spar just enough for the test dimple to fit smoothly. The #40 pilot will center in the nutplate well enough to keep the countersink round and concentric.

Step 8: Spot prime the areas where the anodize finish was removed during countersinking in steps 5 and 7. See Section 5A for more information on priming aluminum.

Step 9: Left Side Only: Enlarge the existing 9/32 inch diameter hole in the **W-SPAR ASSY-L** Spar Assembly - Left to 3/8 inch and install a snap bushing as shown in Figure 3.

LEFT SIDE ONLY:
ENLARGE HOLE TO
3/8 AND INSTALL
SNAP BUSHING

FIGURE 3:
WING ACCESS PLATE ATTACH
NUTPLATE INSTALLATION

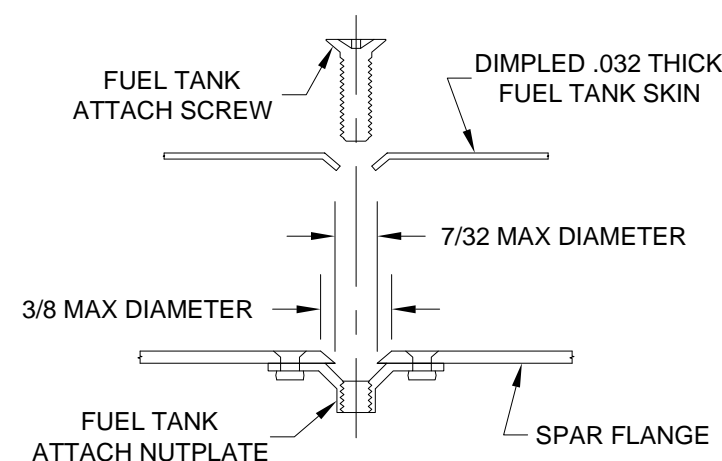


FIGURE 2:
FUEL TANK ATTACH
COUNTERSINK DETAIL

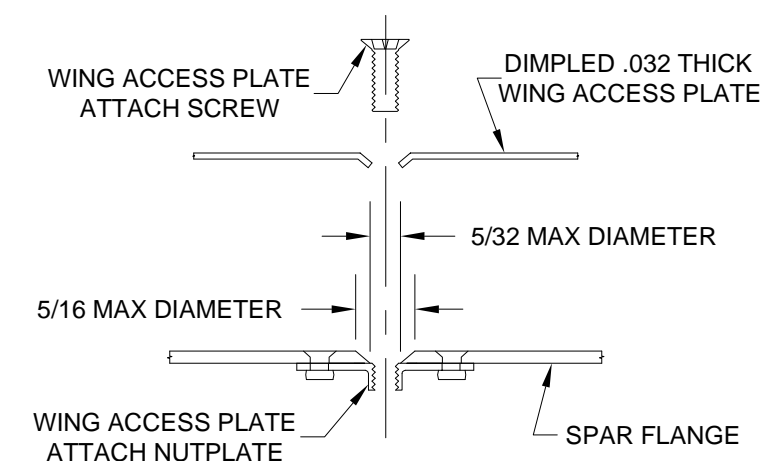
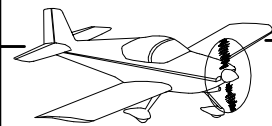


FIGURE 4:
WING ACCESS PLATE ATTACH
COUNTERSINK DETAIL



VAN'S AIRCRAFT, INC.

Step 1: Run a #40 drill through all the 3/32 diameter fuel tank attach nutplate and wing attach nutplate rivet holes in the web of the W-SPAR ASSY-L Spar Assembly - Left. See Figure 1.

Step 2: Run a #30 drill through the three spar doubler to spar web rivet holes in the web of the W-SPAR ASSY-L Spar Assembly - Left. See Figure 1.

Step 3: Machine Countersink the nutplate attach rivet holes in the web of the W-SPAR ASSY-L Spar Assembly - Left. Countersink just deep enough to fit the head of an AN426AD3 rivet. The countersinks for the fuel tank attach nutplate rivet holes are on the forward side of the spar assembly and the countersinks for the wing attach nutplate rivet holes are on the aft side of the spar assembly. See Figure 1.

Step 4: Machine Countersink the aft side of the W-SPAR ASSY-L Spar Assembly - Left for the three AN426AD4 rivets shown in Figure 1. Countersink just deep enough to fit the head of an AN426AD4 rivet. Install the three rivets as shown in Figure 1.

Step 5: Rivet the fuel tank attach nutplates and wing attach nutplates to the W-SPAR ASSY-L Spar Assembly - Left as shown in Figure 1.

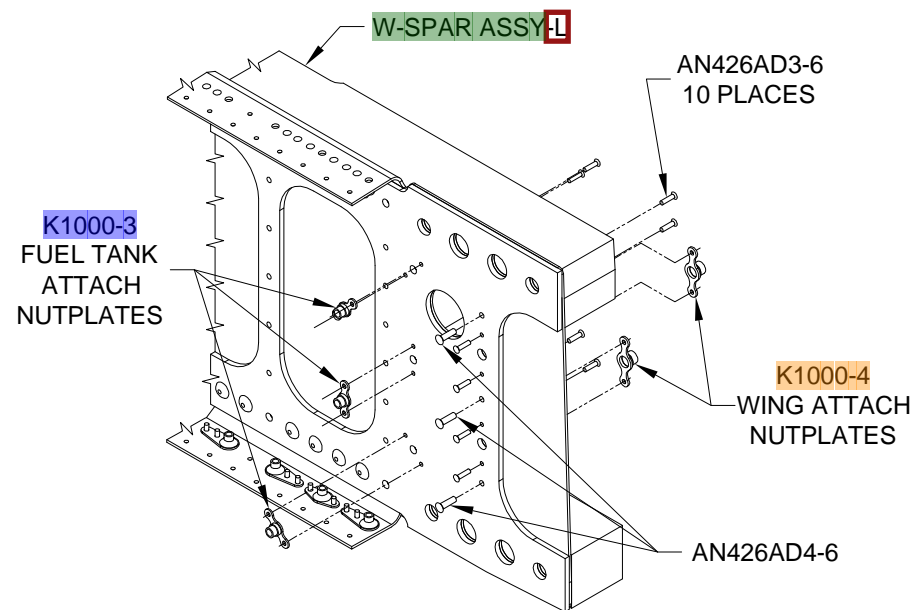


FIGURE 1:
FUEL TANK AND WING ATTACH
NUTPLATE INSTALLATION

Step 6: Fabricate the W-1020 Tie-Down Bracket from a piece of AEX TIE-DOWN by cutting to length, tapping, and drilling a pilot hole as shown in Figure 2.

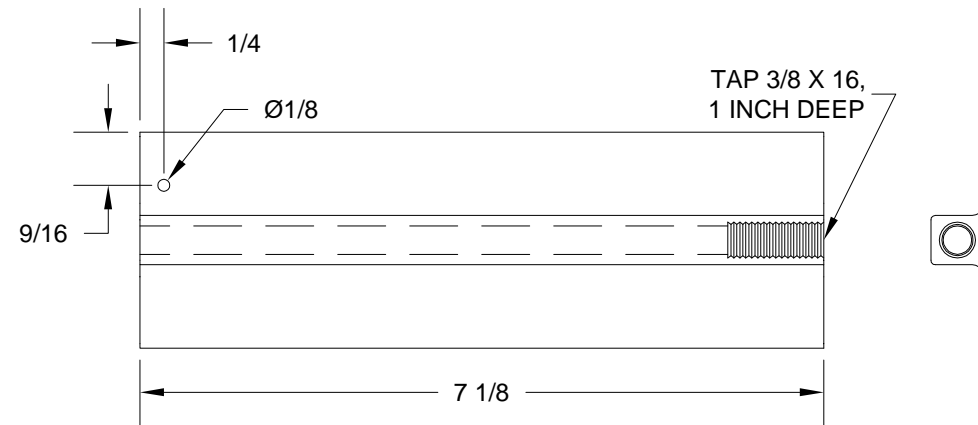


FIGURE 2:
TIE DOWN BRACKET FABRICATION

Step 7: Cleco the W-1020 Tie-Down Bracket to the W-SPAR ASSY-L Spar Assembly - Left as shown in Figure 3. The upper edge of the tie-down bracket rests against the bottom surface of the upper spar step-bar. Using a #30 bit, match-drill holes in the tie-down bracket using the pre-punched #30 holes in the spar assembly as drill guides. Insert clecos in the holes as they are drilled. Using a #12 bit, match-drill holes in the tie-down bracket using the pre-punched 3/16 holes in the spar assembly as drill guides. See Figure 3.

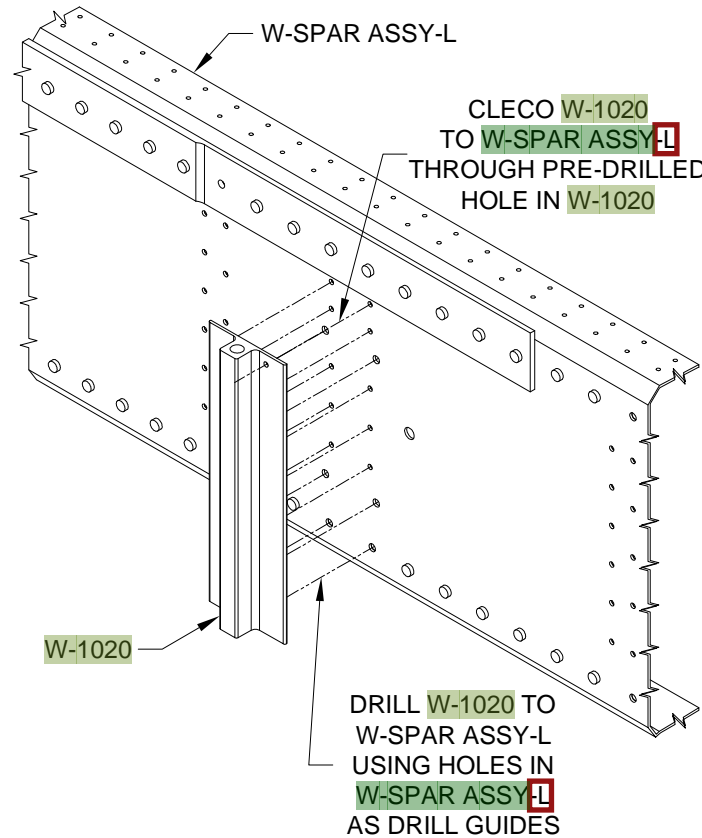


FIGURE 3:
FITTING TIE DOWN BRACKET
TO SPAR ASSEMBLY

Step 8: Remove the W-1020 Tie-Down Bracket from the W-SPAR ASSY-L Spar Assembly - Left. Using a #40 bit, match-drill the nutplate attach rivet holes in the W-1020 Tie-Down Bracket as shown in Figure 4. Use the nutplates as drill guides for properly locating the holes.

Step 9: Machine countersink the aft side of the W-1020 Tie-Down Bracket for the heads of the nutplate attach rivets. See Figure 4. Deburr all holes in the tie-down bracket.

Step 10: Prime the W-1020 Tie-Down Bracket. See Section 5A for more information on priming aluminum.

Step 11: Rivet nutplates to the W-1020 Tie-Down Bracket as shown in Figure 4.

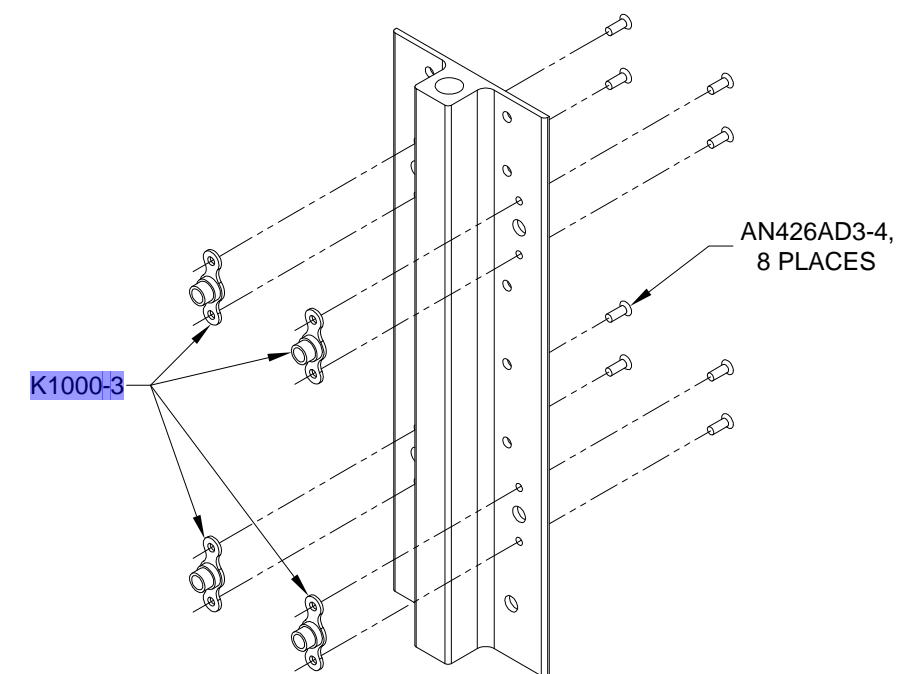


FIGURE 4:
TIE-DOWN BRACKET
NUTPLATE INSTALLATION

Step 1: Clean the powder coating from the insides of the holes in the **W-823PP** Aileron Bellcrank Brackets by running a #12 drill through the two smaller holes and a 1/4" drill through the single larger hole.

Attach the **W-1020** Tie-Down Bracket and two aileron bellcrank brackets to the **W-SPAR ASSY-L** Spar Assembly - Left as shown in Figure 1.

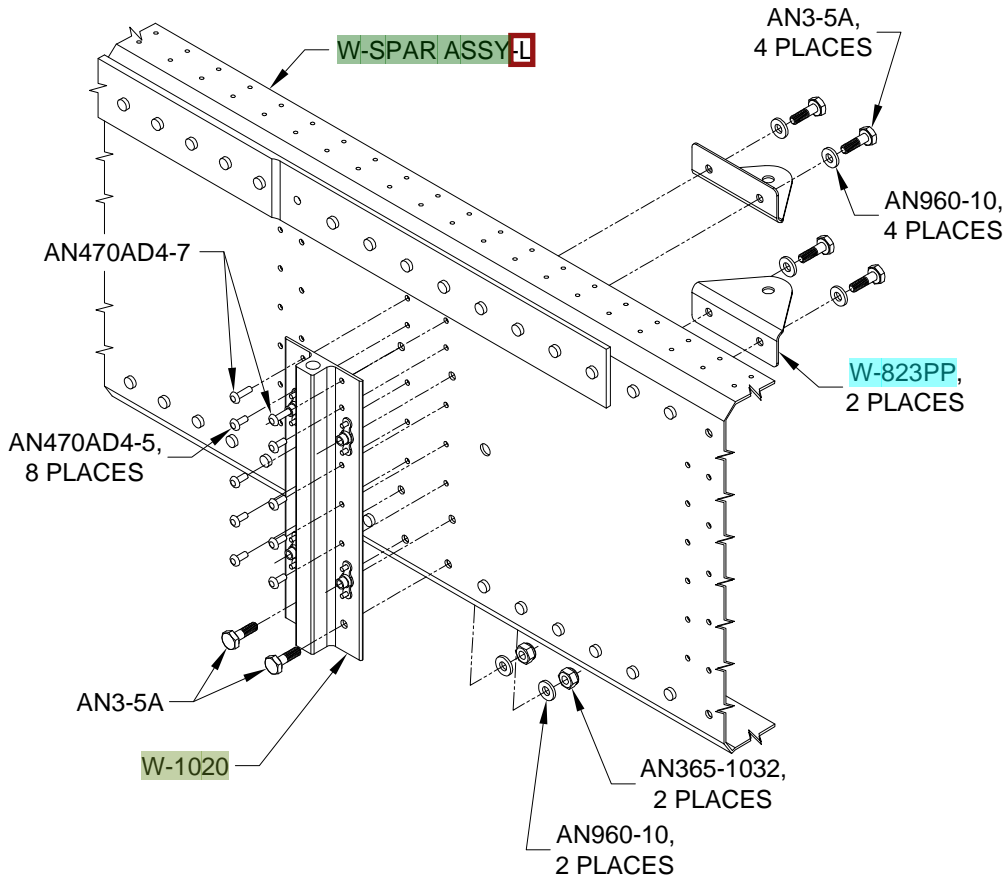
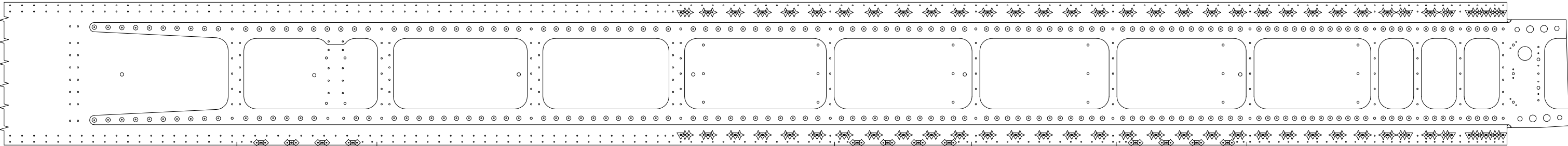


FIGURE 1:
TIE-DOWN BRACKET AND
AILERON BELLCRANK BRACKET
INSTALLATION

- ▽ FUEL TANK SKIN ATTACH
- ▣ ACCESS PLATE ATTACH
- ◇ ACCESS PLATE NUTPLATE ATTACH
- ✧ FUEL TANK SKIN NUTPLATE ATTACH

NO SYMBOL = SKIN or SKIN AND RIB or RIB ATTACH



DO NOT
MATCH-DRILL
LOWER **J-STIFFENER**
IN THIS AREA

FIGURE 2:
MAIN SPAR FLANGE HOLE
IDENTIFICATION DIAGRAM

DO NOT
MATCH-DRILL
LOWER J-STIFFENER
IN THIS AREA

DO NOT
MATCH-DRILL
LOWER **J-STIFFENER**
IN THIS AREA



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