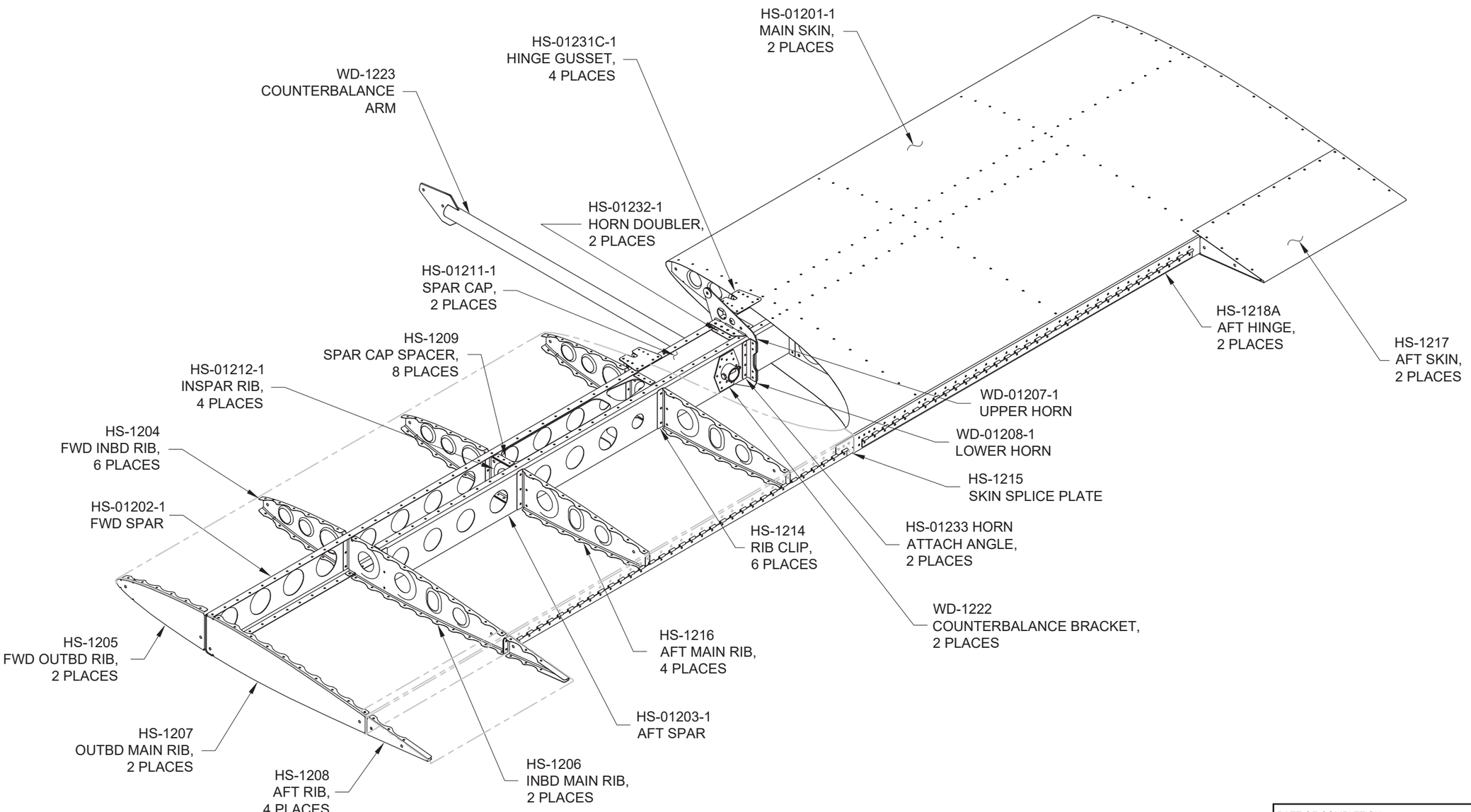
SECTION 9iS/U:
STABILATOR



DATE OF COMPLETION: _____

PARTICIPANTS: _____

Step 1: Machine countersink the HS-01231A-1 Hinge Angle per the Figure 1 call-out.

Step 2: Separate the hinge angles as shown in Figure 1. Two of the hinge angles are used in the inboard hinge assembly as noted in Figure 1.

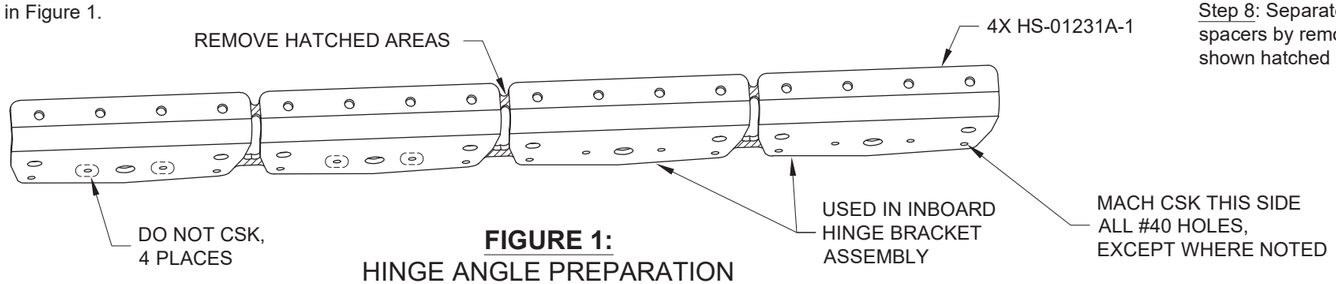


FIGURE 1:
HINGE ANGLE PREPARATION

Step 3: Machine countersink the #40 holes in the two F-12191 Hinge Spacers. Dimple the #40 holes in the two F-12192 Hinge Spacers. Radius the forward edge of each F-12191 and F-12192. Reference Page 9iS/U-04, Figure 1.

Step 4: Rivet together two Inboard Hinge Bracket Assemblies using the parts shown in Figure 2.

Step 5: Rivet together two Outboard Hinge Bracket Assemblies using the parts shown in Figure 3.

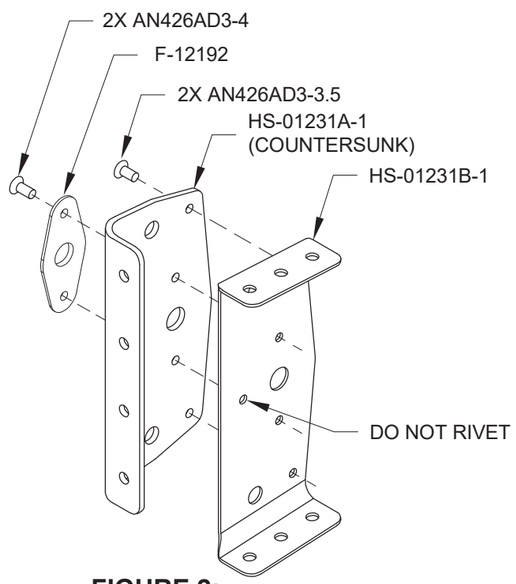


FIGURE 2:
INBOARD HINGE BRACKET ASSEMBLY

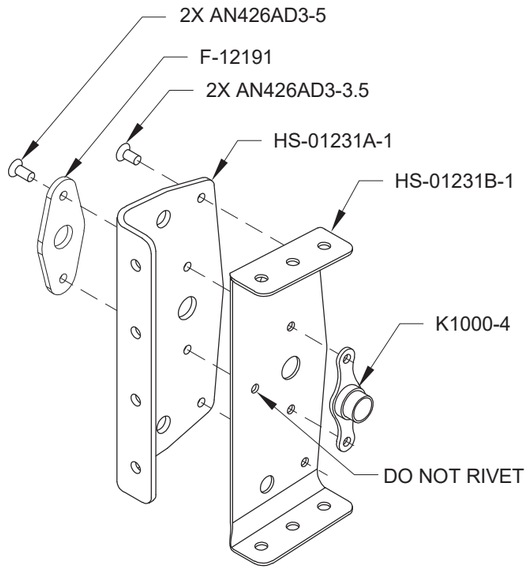


FIGURE 3:
OUTBOARD HINGE BRACKET ASSEMBLY

Step 6: Separate the HS-01233 Horn Attach Angles. See Figure 4.

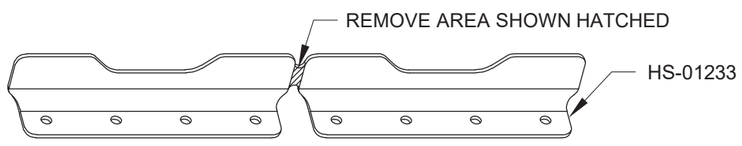


FIGURE 4:
HORN ATTACH ANGLE SEPARATION

Step 7: Machine countersink the #40 holes in the HS-1209 Spar Cap Spacers per the Figure 5 call-out.

Step 8: Separate the spar cap spacers by removing the material shown hatched in Figure 5.

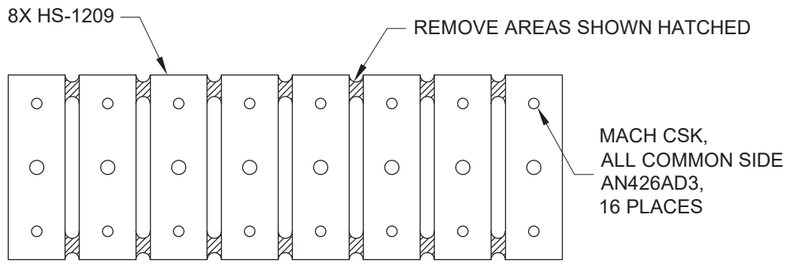


FIGURE 5:
SPAR CAP SPACER PREPARATION

NOTE: The proper orientation of the spars (top, bottom, forward, aft) is critical throughout the Stabilator assembly. Make sure that all spar flange holes align with spar cap holes.

Step 9: Cleco the spar cap spacers, the HS-01212-1 Inspar Ribs and the two HS-01211-1 Spar Caps together as shown in Figure 6. Orient the spar caps so that the horn attachment hole pattern in the upper spar cap aligns with the same hole pattern in the lower spar cap, and the countersunk holes in the spar cap spacers face away from the inspar ribs. Orient the inspar ribs with the tooling holes positioned as shown in Figure 6. When all the parts are oriented correctly the holes in the web of each rib will align when sighting through all of the ribs from one end.

Mark the assembly for Top and Forward, see alignment arrows in Figure 6.

Step 10: Rivet the spar caps, inspar ribs, and spar cap spacers together using the rivets shown in Figure 6 to create the Spar Cap Assembly.

Remove any remaining clecos.

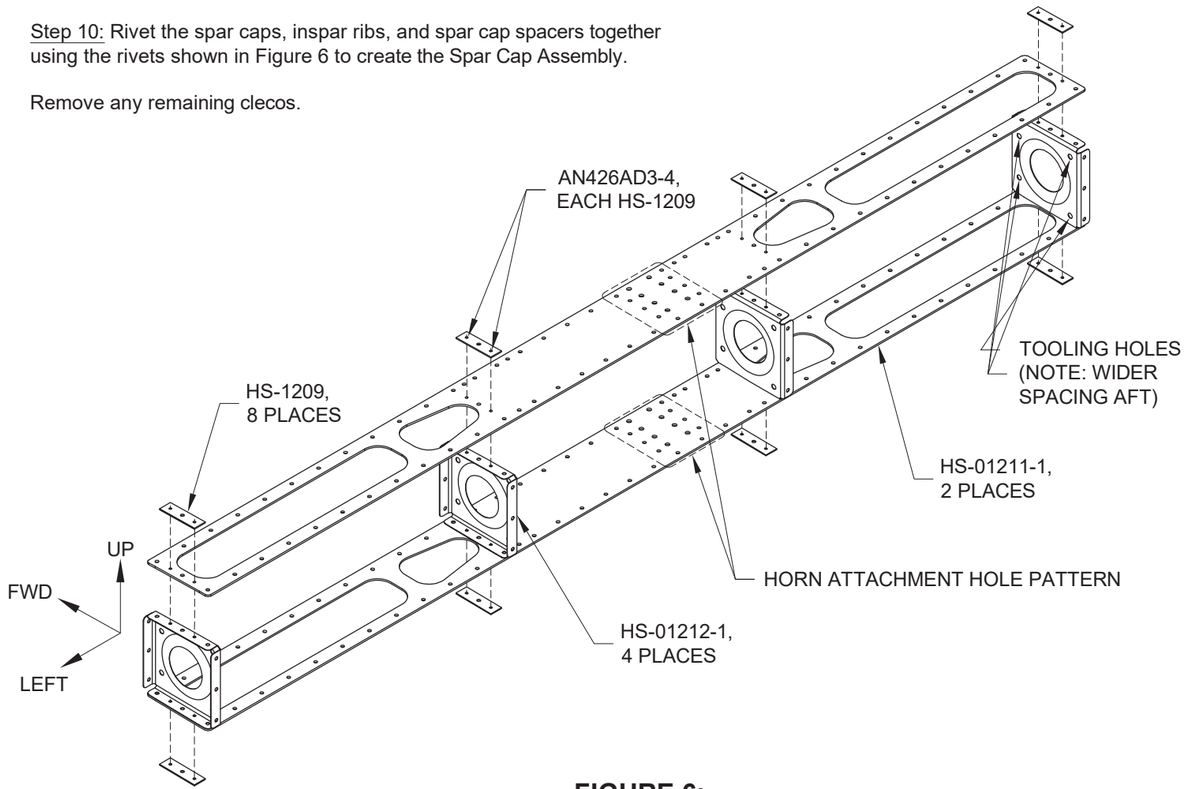


FIGURE 6:
SPAR CAP ASSEMBLY

Step 1: Cleco the HS-01202-1 Fwd Spar and HS-01203-1 Aft Spar to the Spar Cap Assembly as shown in Figure 1 to create the Spar Box Assembly.

Step 2: Rivet only the outboard HS-01233 Horn Attach Angle to the aft spar as shown in Figure 1.

Step 3: Cleco the HS-01232-1 Horn Doubler and WD-01207-1 Upper Horn (Identify the upper horn by the 3/16 inch identifier hole) to the fwd spar and HS-01211-1 Spar Cap. Align the fwd holes in the horn laterally with the smaller #30 holes in the fwd spar while clecoing into position. Clamp the horn to the horn attach angle. Final-Drill the #20 holes in the upper horn into the Spar Box Assembly. Cleco in several locations during final-drilling to keep the parts firmly clamped together.

Step 4: Using a 12" long #30 drill bit, match-drill the holes in the horn into the outboard horn attach angle ensuring that the drilled holes are perpendicular to the surface of the horn (not angled toward the rear spar). This requires forcing a curve in the drill bit by pushing the middle towards the spar, and maintaining pressure as drilling proceeds. The hole will become enlarged if the drill bit is allowed to straighten before it is stopped and carefully extracted .

Repeat Steps 3 and 4 for the WD-01208-1 Lower Horn.

Step 5: Cleco the inboard HS-01233 into position, clamp and match-drill through the outboard HS-01233 and horns from the right side.

Step 6: Final-Drill #12 the cable attachment holes in the horns as called out in Figure 1.

Step 7: Mark the orientation of the horn doublers for exact reinstallation, then remove them from the Spar Box Assembly along with the horns and inboard HS-01233.

Deburr the holes.

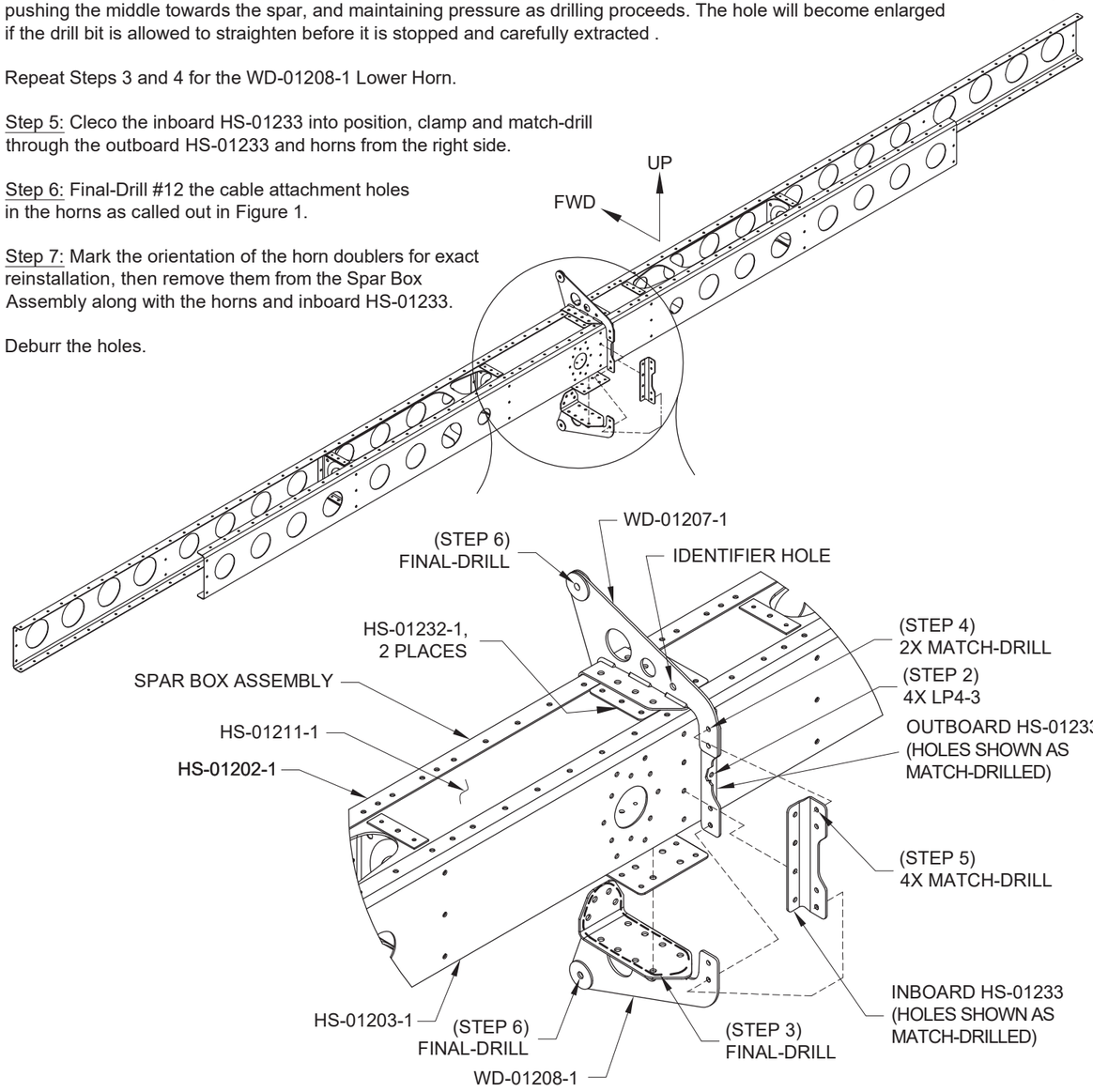


FIGURE 1:
UPPER AND LOWER HORN FINAL-DRILL

Step 8: Final-Drill #30 all of the holes in the plate of the WD-1222 Counterbalance Brackets.

Step 9: Align each bracket to the corresponding holes in the spars. Turn both brackets 90° from the installed position and cleco them to the spars, as shown in Figure 2, Detail A-A.

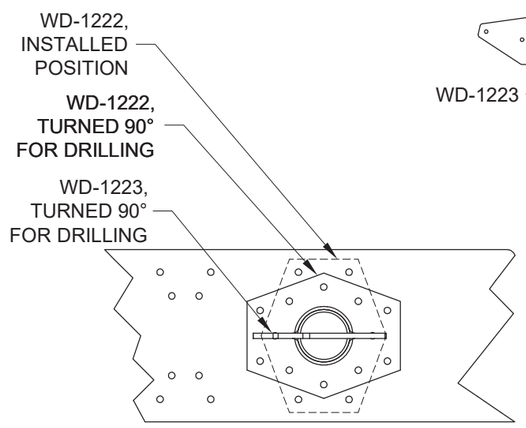
Step 10: Insert the WD-1223 Counterbalance Arm through the forward bracket (clecoed to the fwd spar) and the Spar Box Assembly, then into the aft bracket. Align the aft ends of the arm and aft bracket flush, clock the arm as shown in Figure 2 and clamp to the bracket.

Step 11: Match-Drill #30 the two holes from the neck of each bracket into the arm. Cleco each hole when drilled. Final-Drill #12 each bracket by drilling into one side, through the arm, and out the other per the call-out in Figure 2, Detail B-B. Temporarily insert an AN3-14A bolt after final-drilling the first hole.

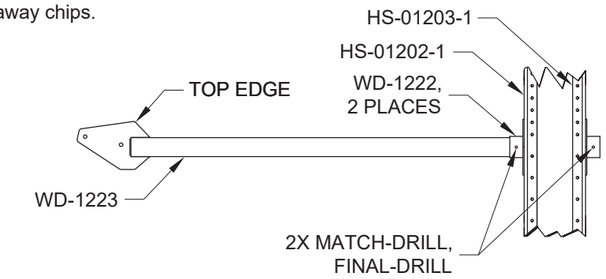
Step 12: Rotate the arm and brackets 90° after match-drilling. Make sure the top edge of the arm (see call-out in Figure 2, Detail B-B) is re-oriented with the top side of the Spar Box Assembly. Mark the brackets in relation to the spars and the arm.

Remove the arm and brackets, remove the spars from the Spar Cap Assembly, deburr the holes, and clear away chips.

Set aside the arm until Section 11iS/U.



DETAIL A-A



DETAIL B-B

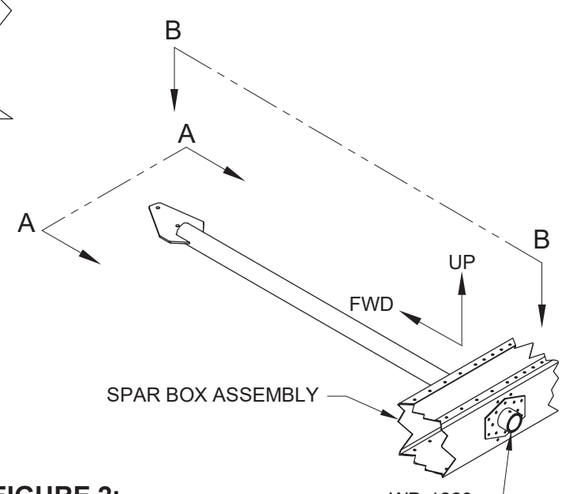


FIGURE 2:
COUNTERBALANCE ARM MATCH-DRILL
(NOT IN INSTALLED ORIENTATION)

Step 1: Rivet the Hinge Bracket Assemblies to the HS-01202-1 Fwd Spar as shown in Figure 1.

Step 2: Temporarily install the Hinge Stop hardware as shown in Figure 1.

Step 3: Rivet the forward WD-1222 Counterbalance Bracket to the fwd spar. See Figure 1. Observe orientation markings to ensure correct part and placement.

Step 4: Rivet the WD-1222 to the HS-01203-1 Aft Spar as shown in Figure 2. Observe orientation markings to ensure correct placement.

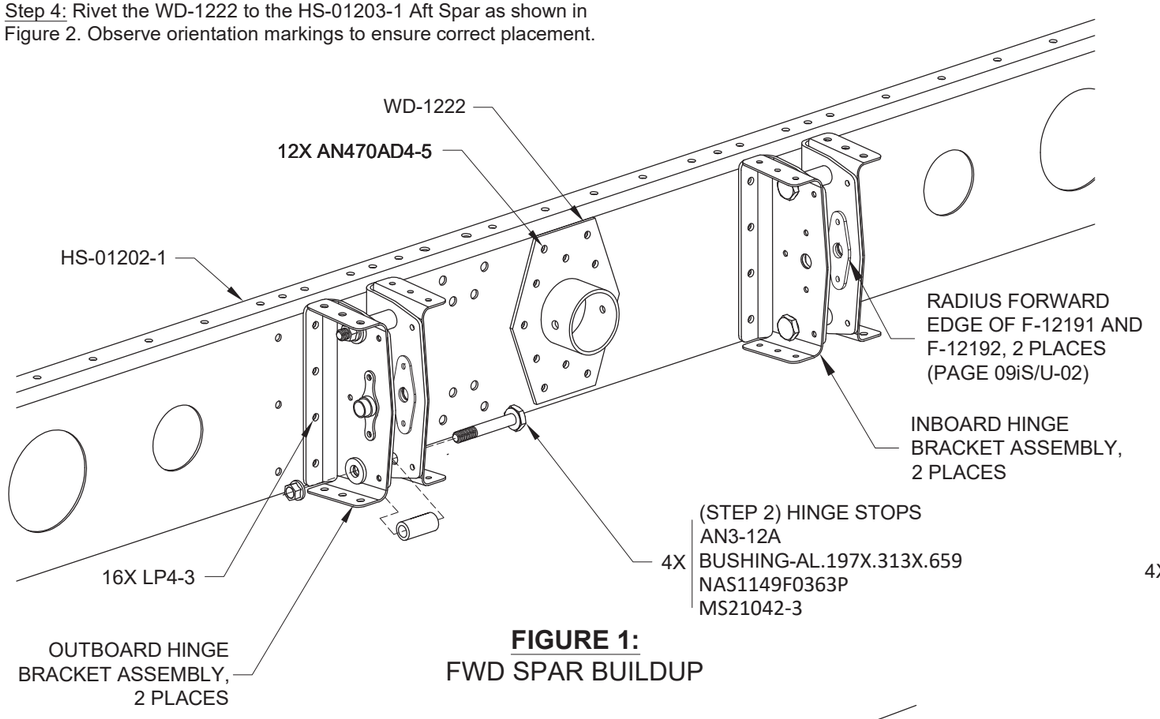


FIGURE 1:
FWD SPAR BUILDUP

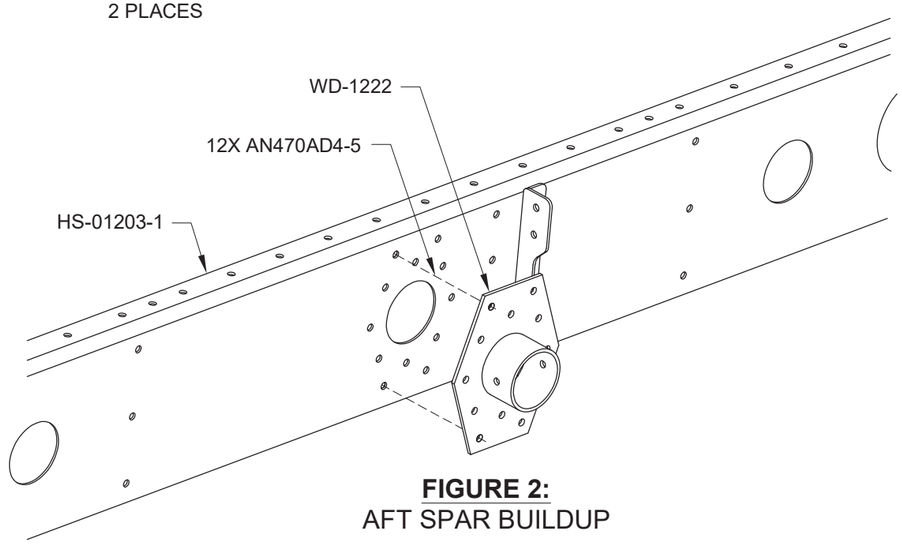


FIGURE 2:
AFT SPAR BUILDUP

Step 5: Reassemble the Spar Box Assembly by clecoing the fwd spar, aft spar, and HS-01232-1 Horn Doublers to the Spar Cap Assembly.

Step 6: Rivet only the area shown in Figure 3 on the top and bottom of the Spar Box Assembly.

Step 7: Cleco the WD-01207-1 Upper Horn, WD-01208-1 Lower Horn and inboard HS-01233 Horn Attach Angle to the Spar Box Assembly as shown in Figure 3.

Step 8: Rivet the inboard HS-01233 to the aft spar.

Step 9: Rivet the horns to the Spar Box Assembly and horn attach angles with the rivets called out in Figure 3.

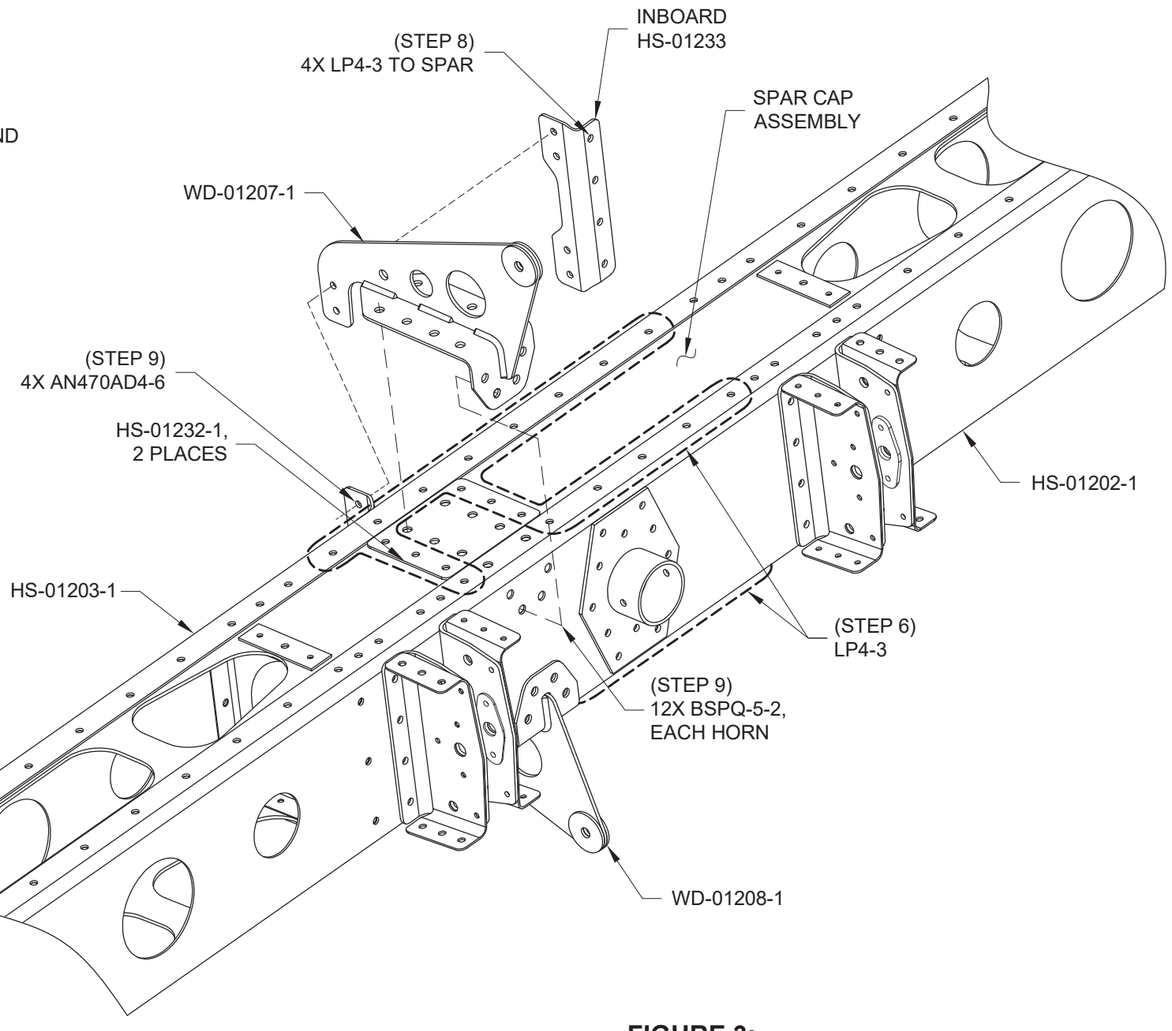


FIGURE 3:
RIVETING THE SPAR BOX ASSEMBLY

Step 1: Separate the HS-1214 Rib Clips by removing the material shown hatched in Figure 1.

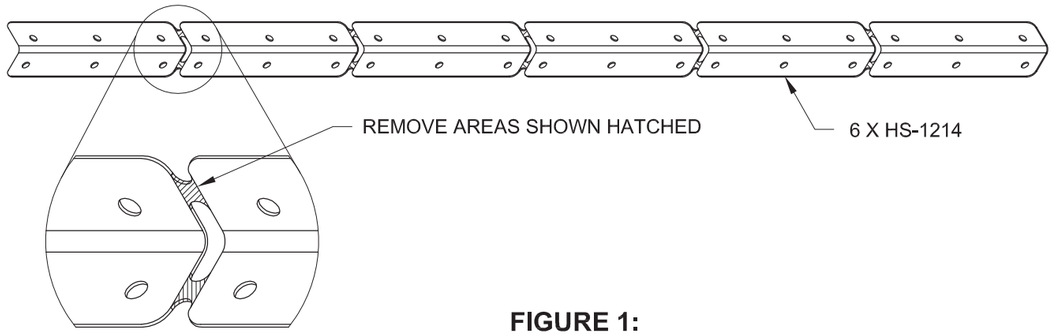


FIGURE 1:
RIB CLIP SEPARATION

Step 2: Rivet the rib clips to the HS-01203-1 Aft Spar per the call-outs in Figure 2.

Note the flange orientation of each rib clip, and ensure that all three holes of each rib clip align to all three holes of the aft spar before riveting.

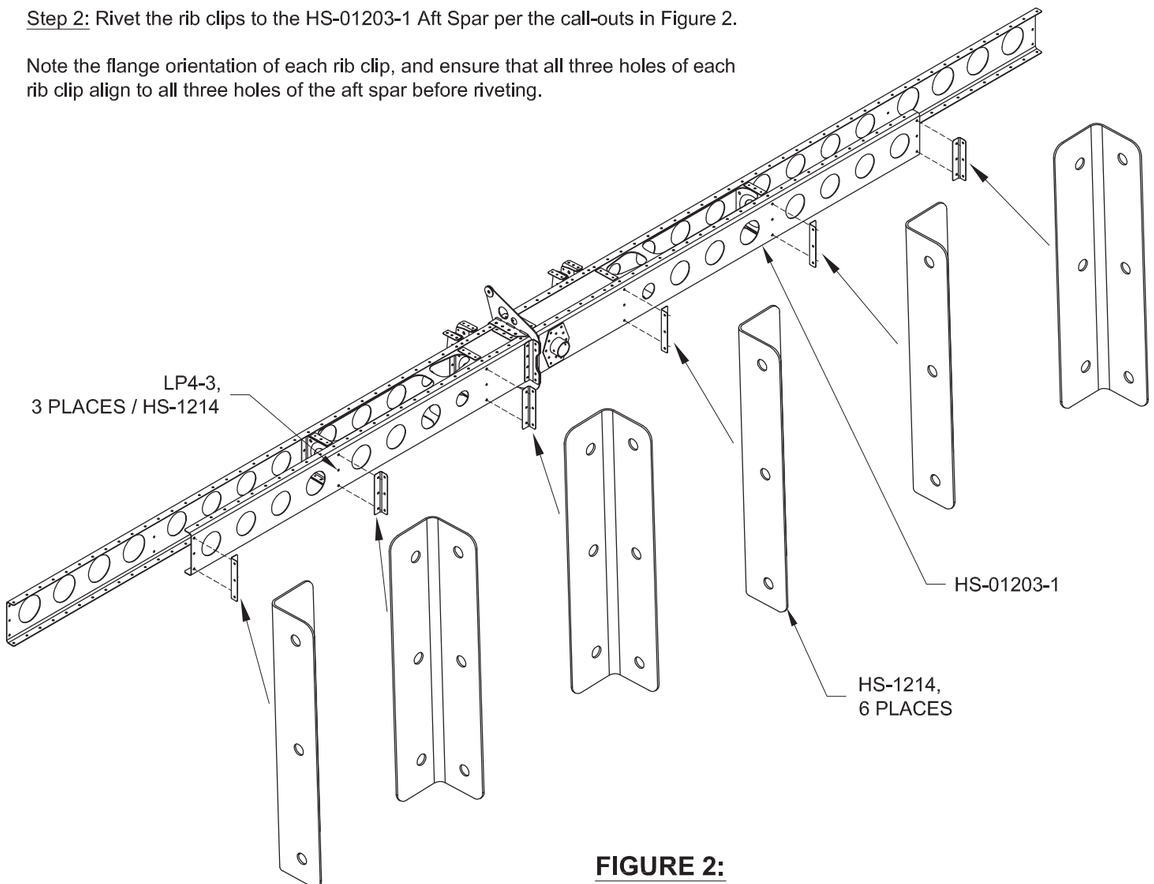


FIGURE 2:
RIB CLIP INSTALLATION

NOTE: If the optional Stabilator Tip Fairings are to be installed, refer to Section 12A for tip rib installation to avoid the need to drill off and replace ribs.

Step 1: Radius the edges at the narrow end of the HS-1204 Fwd Inbd Ribs and HS-1205 Fwd Outbd Ribs as shown in Figure 1.

A great way to form the radius is with a fine file. Deburr all of the ribs.

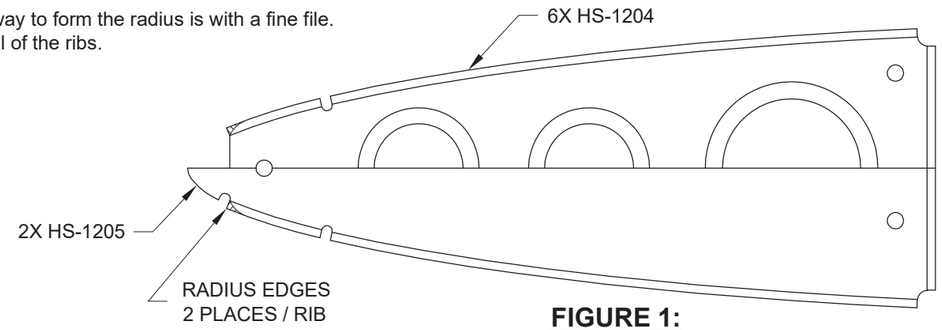


FIGURE 1:
FWD RIB PREPARATION

NOTE: Figure 2 illustrates the installation of the ribs for the right side of the stabilator. Steps 2, 3, and 4 describe installation for the ribs on the right side of the stabilator. Installation for the ribs on the left side of the stabilator is a mirror of the right. Perform the remaining steps on this page on both sides of the stabilator. Flute the ribs as necessary per Section 5N. Optional tip ribs from Section 12A are shown for reference.

Step 2: Rivet the HS-1216 Aft Main Ribs and the HS-1206 Inbd Main Rib to the HS-1214 Rib Clips per the call-outs in Figure 2.

Step 3: Rivet the fwd inbd ribs to the HS-01202-1 Fwd Spar per the Figure 2 call-outs. Include the forward flange of the HS-1206 Inbd Main Rib when installing the third from the center fwd inboard rib. Orient all the rib flanges as shown in Figure 2.

Step 4: Rivet the HS-1205 Fwd Outbd Rib to the HS-1207 Outbd Main Rib through the fwd spar. Orient the flanges of the fwd outbd rib and the outbd main rib so that they point inboard as shown in Figure 2.

Hereafter refer to the Spar Box Assembly with all of the ribs attached as the Stabilator Skeleton Assembly.

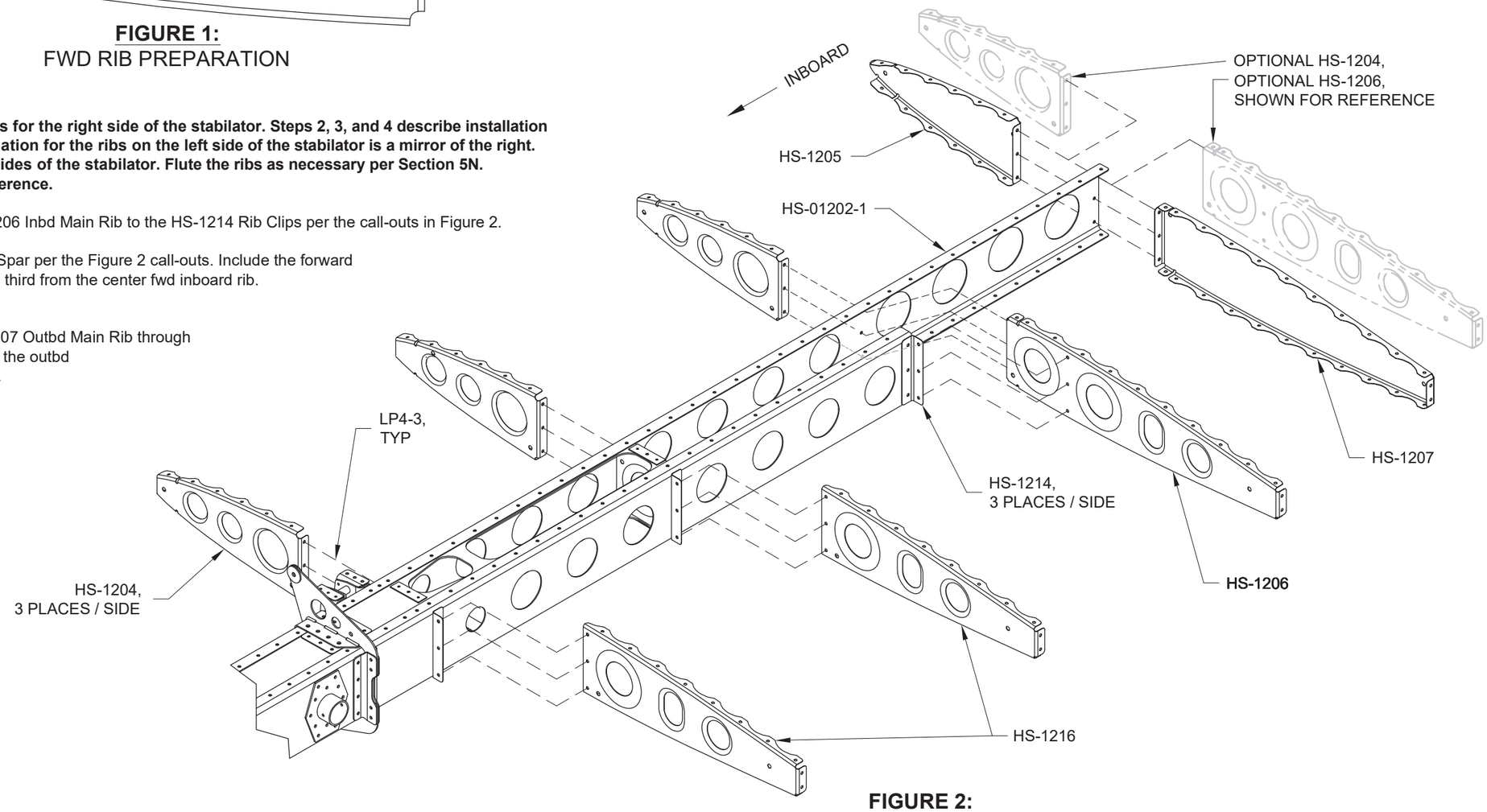


FIGURE 2:
STABILATOR SKELETON ASSEMBLY

Step 1: Mark one of the HS-01201-1 Main Skins as HS-01201-1-R to designate the Right Main Skin. Mark the other main skin as HS-01201-1-L to designate the Left Main Skin.

Step 2: Cleco the main skins to the Stabilator Skeleton Assembly as follows (see Figure 1):

Cleco approx. ⅓ of the holes in the bottom side of one of the main skins to the Skeleton Assembly.

Guide the upper aft flange of the main skin to the outside of the lower aft flange, then cleco the top surface of the skin to the Skeleton Assembly.

Complete this step with the first main skin, then repeat this step for the remaining main skin.

NOTE: The narrowed outboard portion of the aft flange on the right main skin will be exposed, and on the left main skin it will be covered by the other flange.

Step 3: Cleco the HS-01231C-1 Hinge Gussets in place as shown in Figure 2.

Final-Drill #30 the holes indicated in Figure 2, remove, deburr, and reinstall the gussets.

Step 4: Remove the Hinge Stop hardware shown on Page 09iS/U-04, Figure 1 to facilitate riveting.

Step 5: Rivet the main skins and hinge gussets onto the Skeleton Assembly except where called out in Figure 2.

Step 6: Permanently install the hinge stop hardware as shown on Page 09iS/U-04 Figure 1.

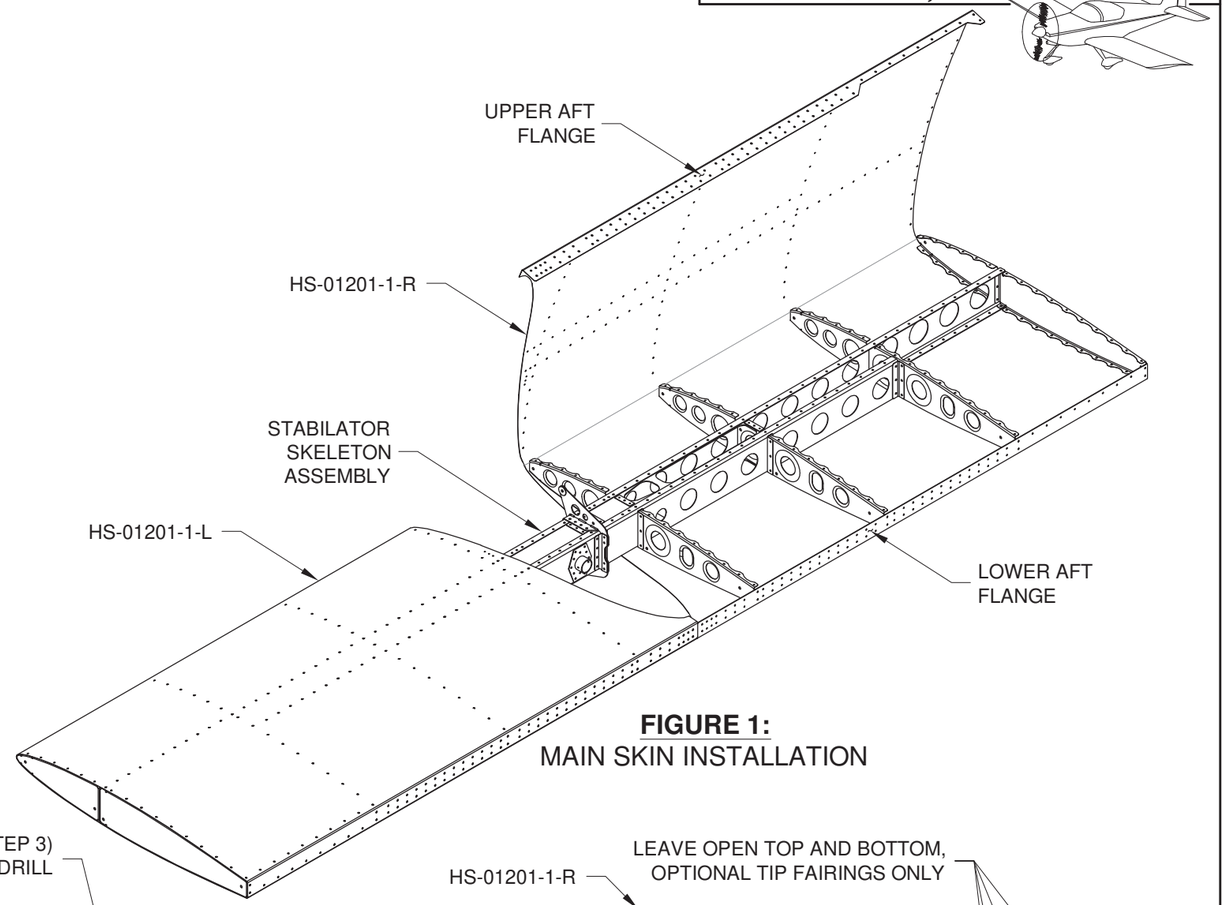


FIGURE 1:
MAIN SKIN INSTALLATION

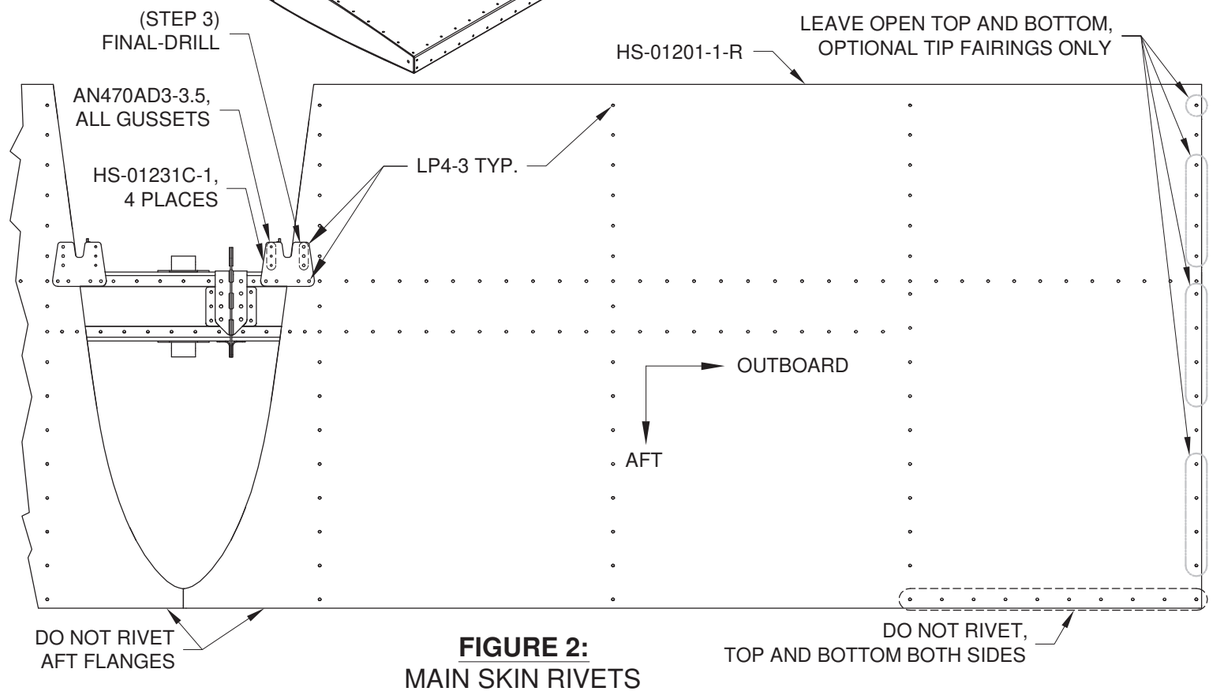


FIGURE 2:
MAIN SKIN RIVETS

Step 1: Cleco the HS-1215 Skin Splice Plate to the aft flanges where the HS-01201-1-R & -1-L Main Skins meet as shown in Figure 1.

Step 2: Match-Drill #52 the .063 [1.6mm] holes in the skin splice plate into the aft flanges of the main skins as shown in Figure 1.

Remove the skin splice plate, deburr, and clear away any chips.

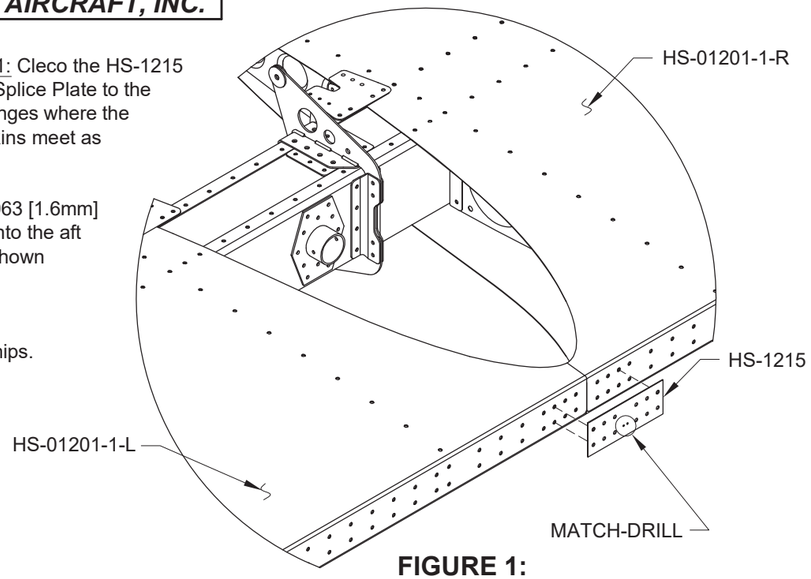


FIGURE 1:
SKIN SPLICE PLATE MATCH-DRILL

NOTE: Step 3 through Step 5 describe installation for parts on the right side of the Stabilator Assembly, installation for parts on the left side is a mirror of the right.

Step 3: Rivet the HS-1218A-R Aft Hinge to the right main skin. Include the HS-1216 Aft Main Ribs when riveting the holes common to the aft hinge, main skin and aft main ribs. Include the skin splice plate, on the inside surface of the aft flanges, when riveting the holes common to the aft hinge, main skin and skin splice plate. See Figure 2.

Step 4: Rivet one of the HS-1208 Aft Ribs through the main skin aft flanges to the HS-1207 Outbd Main Rib. Rivet the other aft rib through the main skin to the HS-1206 Inbd Main Rib. Orient the rib flanges as shown in Figure 2.

Step 5: Rivet all of the remaining holes in the aft flanges of the main skin. See Figure 2.

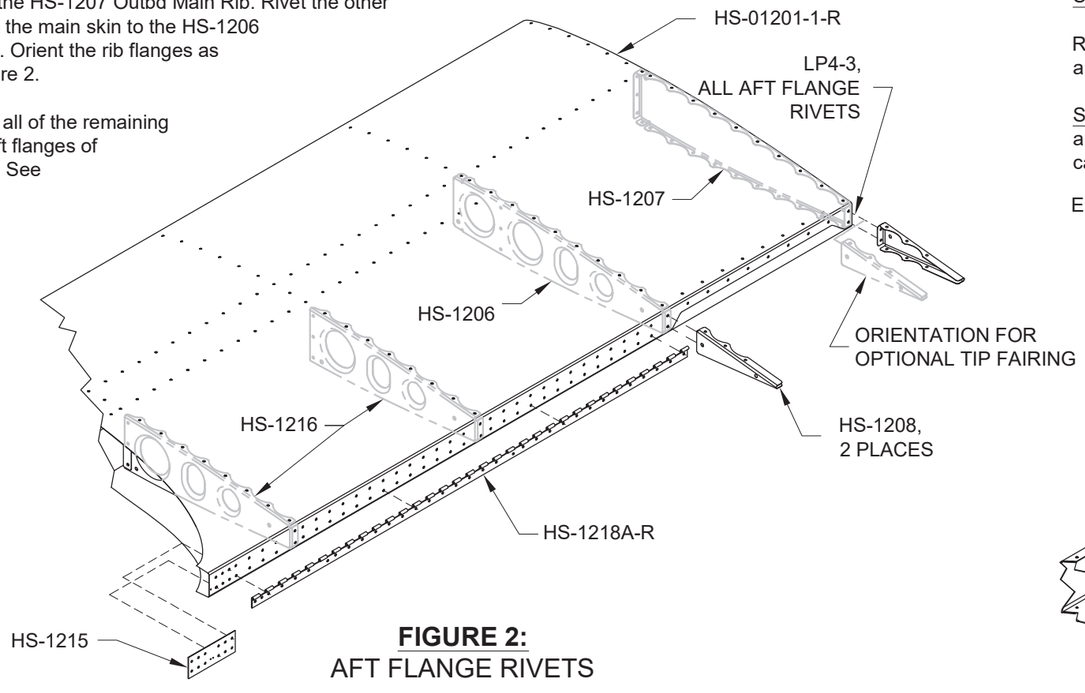


FIGURE 2:
AFT FLANGE RIVETS

Step 6: Separate the HS-1217 Aft Skins by removing the material called out in Figure 3.

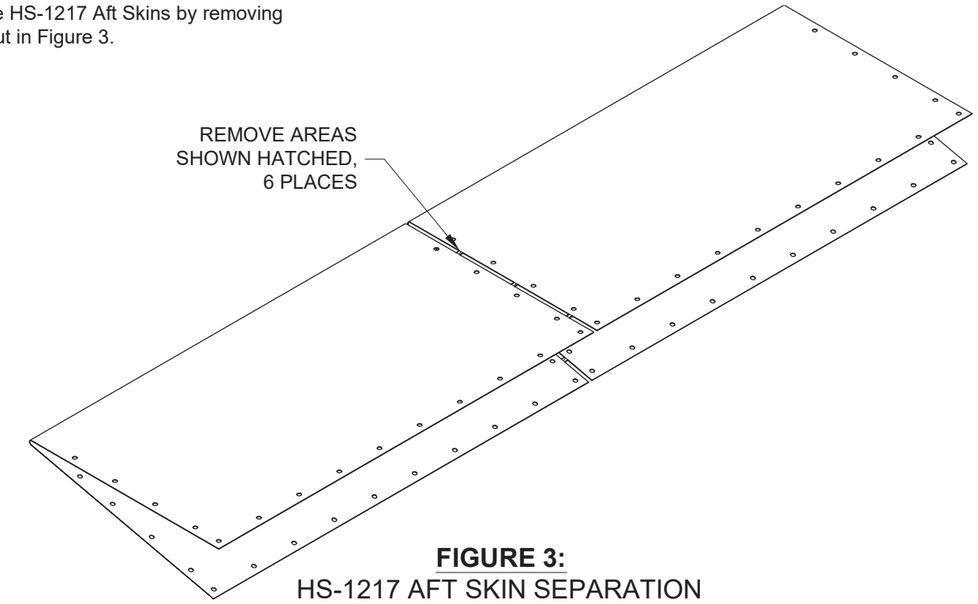


FIGURE 3:
HS-1217 AFT SKIN SEPARATION

NOTE: Figure 4 illustrates the installation of the HS-1217 Aft Skin for the right side of the Stabilator Assembly. Installation for the HS-1217 on the left side is a mirror of the right.

Step 7: Pinch the aft edge of the HS-1217 aft skin until the open end lays flat on the aft edge of the main skin. Cleco the aft skin to the main skin and the aft ribs.

Step 8: Match-Drill #30 the holes from the aft skin into the aft ribs called out in Figure 4.

Remove the aft skin, deburr the holes and clear away any chips.

Step 9: Rivet the aft skin to the aft ribs and the main skin using the rivets called out in Figure 4.

END OF SECTION

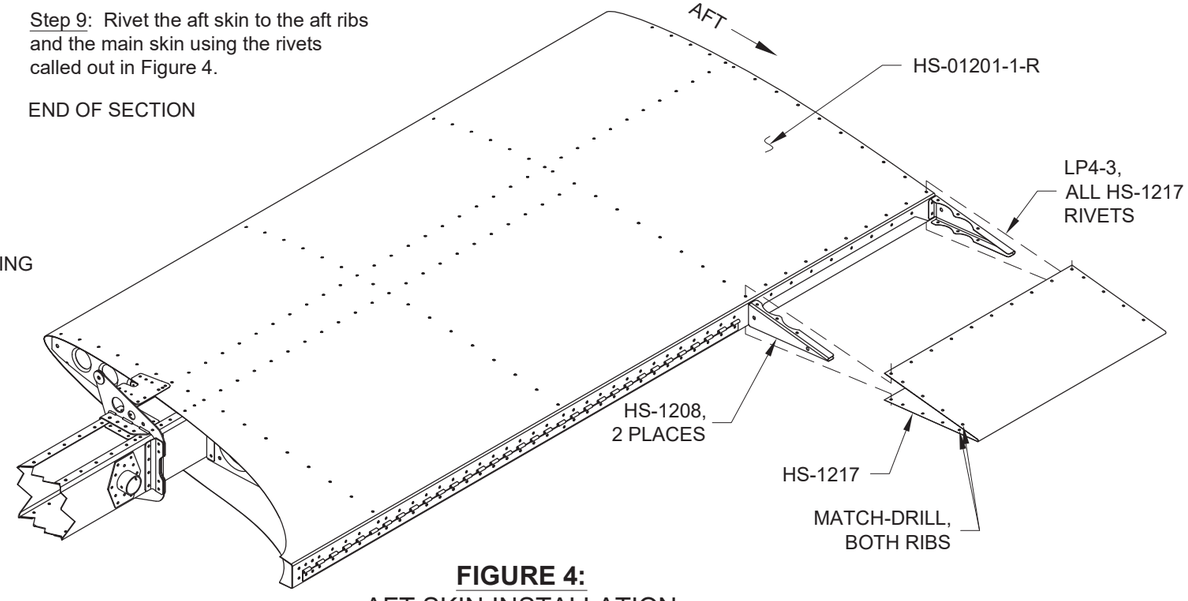


FIGURE 4:
AFT SKIN INSTALLATION