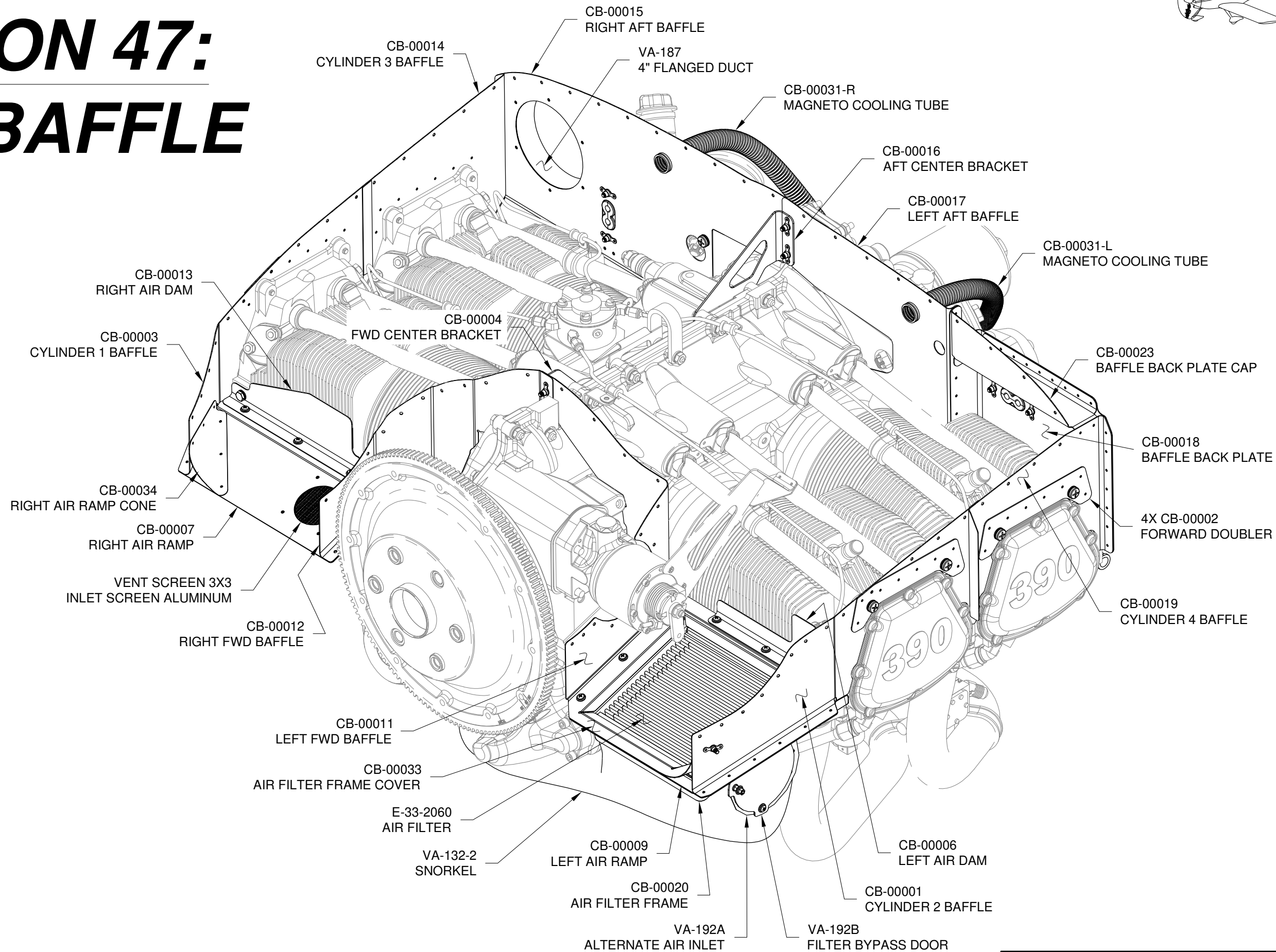


SECTION 47: COWL BAFFLE





NOTE: The RV-14 cowl baffles were designed to fit the Lycoming IO-360 or IO-390 engine with a front-mounted propeller governor. Some parts may require minor trimming due to differences in engine crankcases.

Step 1: Mark and trim one CB-00002 Forward Doubler to match the contour of the CB-00003 Cylinder 1 Baffle as shown in Figure 1.

Step 2: Mark and trim one CB-00002 Forward Doubler to match the contour of the CB-00001 Cylinder 2 Baffle as shown in Figure 2.

Step 3: Dimple the CB-00003 Cylinder 1 Baffle and CB-00001 Cylinder 2 Baffle as shown in Figure 1 and Figure 2.

Step 4: Cleco one forward doubler to each baffle as shown in Figures 1, 2, 3, and 4.

Step 5: Match-Drill #30 the two holes in the CB-00003 Cylinder 1 Baffle into its forward doubler as shown in Figure 1.

Step 6: Separate the forward doubler from the CB-00003 Cylinder 1 Baffle.

Enlarge the partial hole in the forward doubler to approximately $\text{Ø}3/16$ in. [$\text{Ø}4.8$ mm] with a round file. See Figure 1.

Step 7: Match-Drill #30 the hole in the CB-00001 Cylinder 2 Baffle into its forward doubler as shown in Figure 2.

Step 8: Rivet the forward doublers to the baffles as shown in Figures 1, 2, 3, and 4.

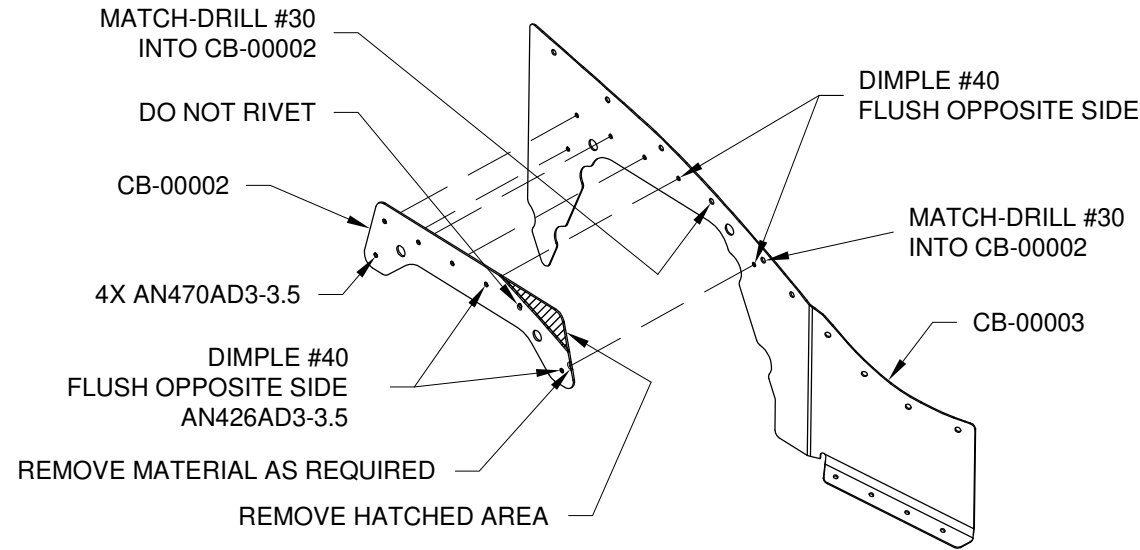


FIGURE 1: CYLINDER 1 BAFFLE

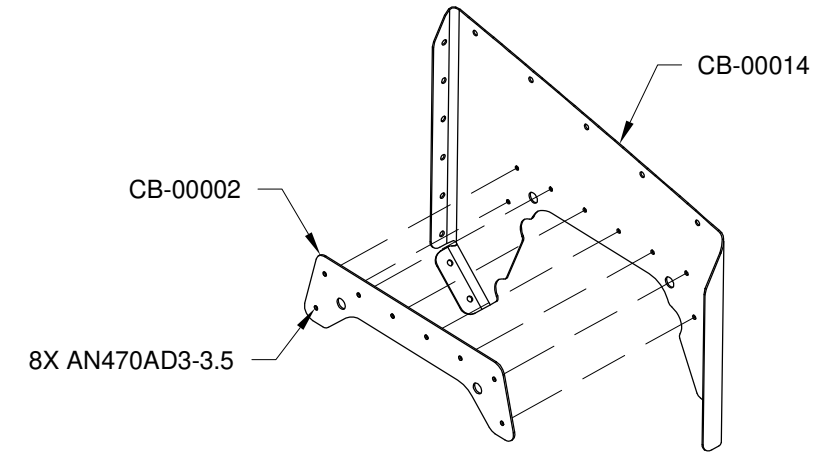


FIGURE 3: CYLINDER 3 BAFFLE

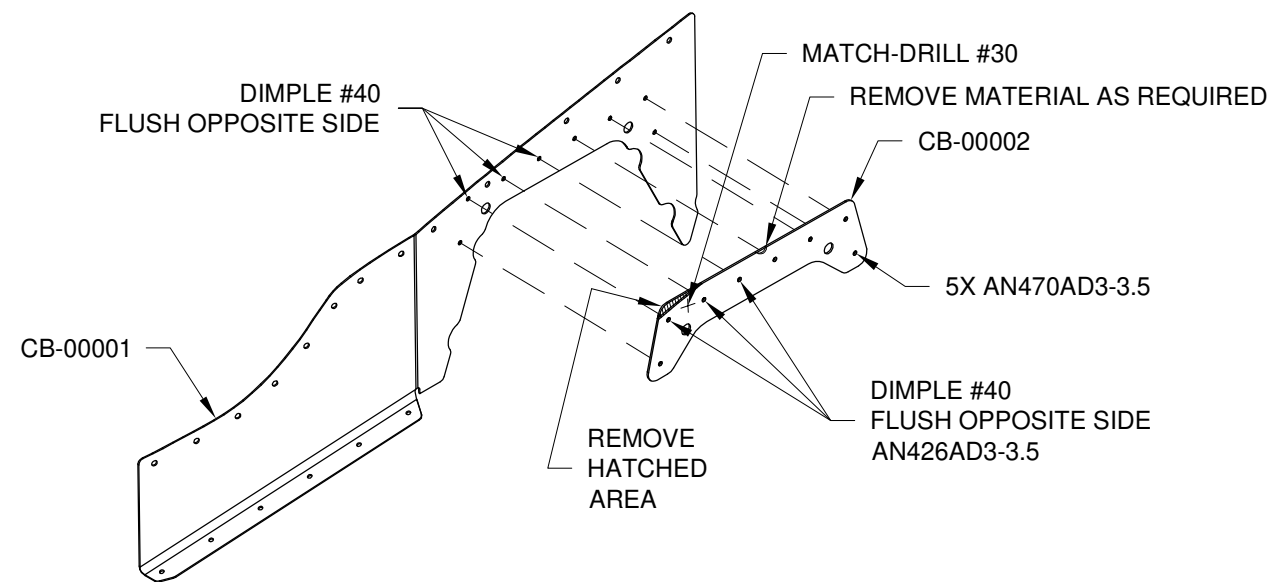


FIGURE 2: CYLINDER 2 BAFFLE

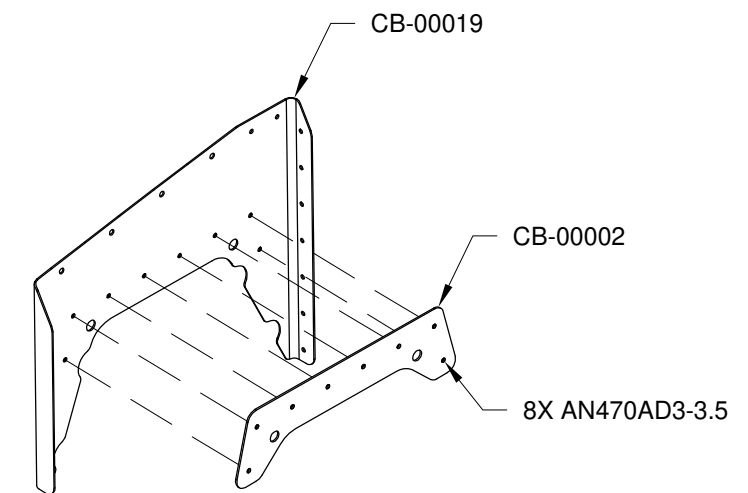


FIGURE 4: CYLINDER 4 BAFFLE



NOTE: Refer to Figure 1 for Steps 1-7:

Step 1: Use a step drill to enlarge the 5/8 [15.9 mm] hole in the CB-00017 Left Aft Baffle to 11/16 as shown.

Step 2: Final-Drill #27 the holes in the lower flanges of the left aft baffle and CB-00018 Baffle Back Plate.

Step 3: Dimple the #40 nutplate rivet holes in the baffle back plate.

Step 4: Rivet the nutplate to the left aft baffle.

Step 5: Dimple, then rivet, the nutplates to the baffle back plate.

Step 6: Cleco the left aft baffle and baffle back plate together. Machine countersink the rivet holes as shown.

Step 7: Cleco, then rivet together, the left aft baffle, CB-00023 Baffle Back Plate Cap, and baffle back plate as shown in Figure 1.

Step 8: Cleco, then rivet, the CB-00019 Cylinder 4 Baffle to the baffle back plate cap and baffle back plate as shown in Figure 2.

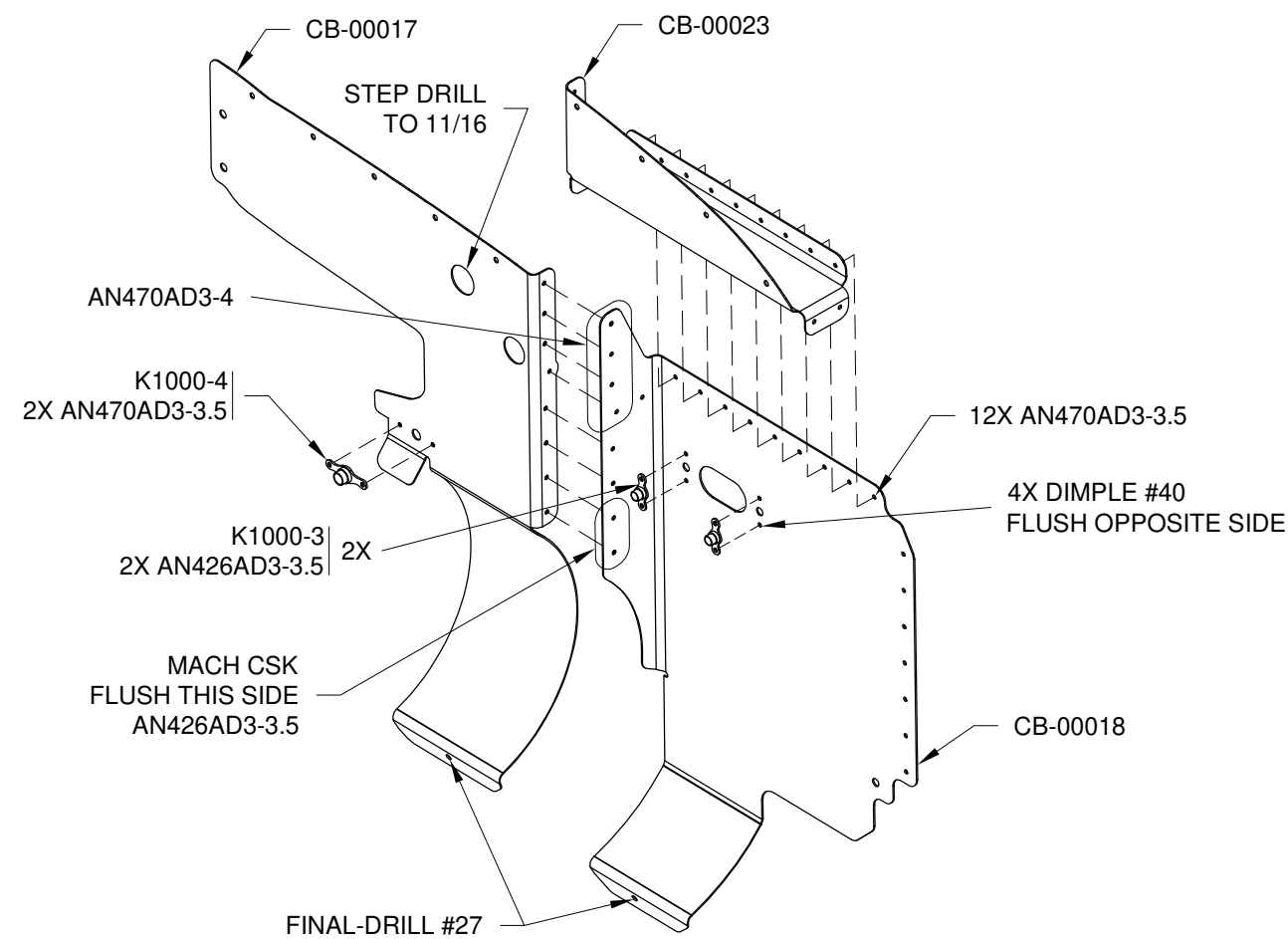


FIGURE 1: LEFT AFT BAFFLE

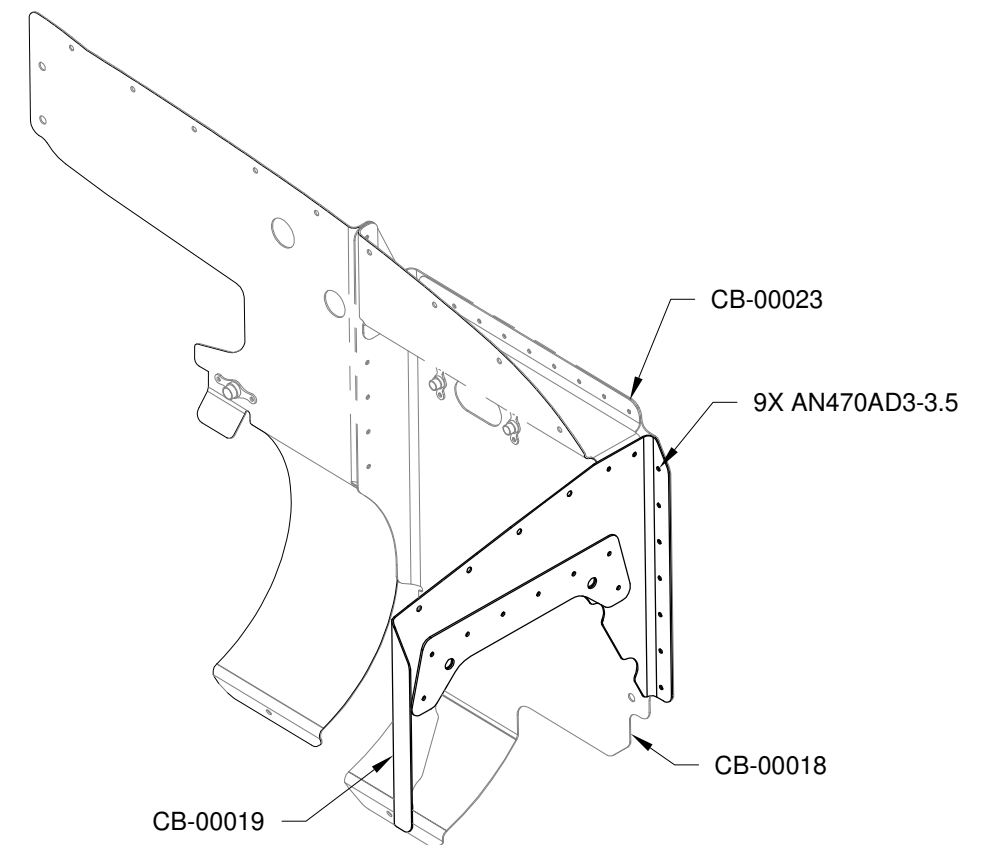


FIGURE 2: ATTACH CYLINDER 4 BAFFLE



Step 1: Trim the CB-00015 Right Aft Baffle as shown.

Step 2: Use a step drill to enlarge the 5/8 [15.9 mm] hole in the right aft baffle to 11/16.

Step 3: Final-Drill #27 the hole in the lower flange of the right aft baffle.

Step 4: Dimple the #40 nutplate rivet holes in the right aft baffle as shown.

Step 5: Dimple, then rivet, the nutplates to the right aft baffle as shown.

Step 6: Machine countersink the CB-00010 Baffle Mount as shown.

Step 7: Rivet the baffle mount to the right aft baffle.

Step 8: Center, then clamp, the VA-187 4" Flanged Duct to the large hole in the right aft baffle.

Step 9: Match-Drill #30 the flanged duct mounting holes into the right aft baffle.

Step 10: Remove the flanged duct and deburr the holes in both parts.

Step 11: Cleco, then rivet, the flanged duct to the right aft baffle.

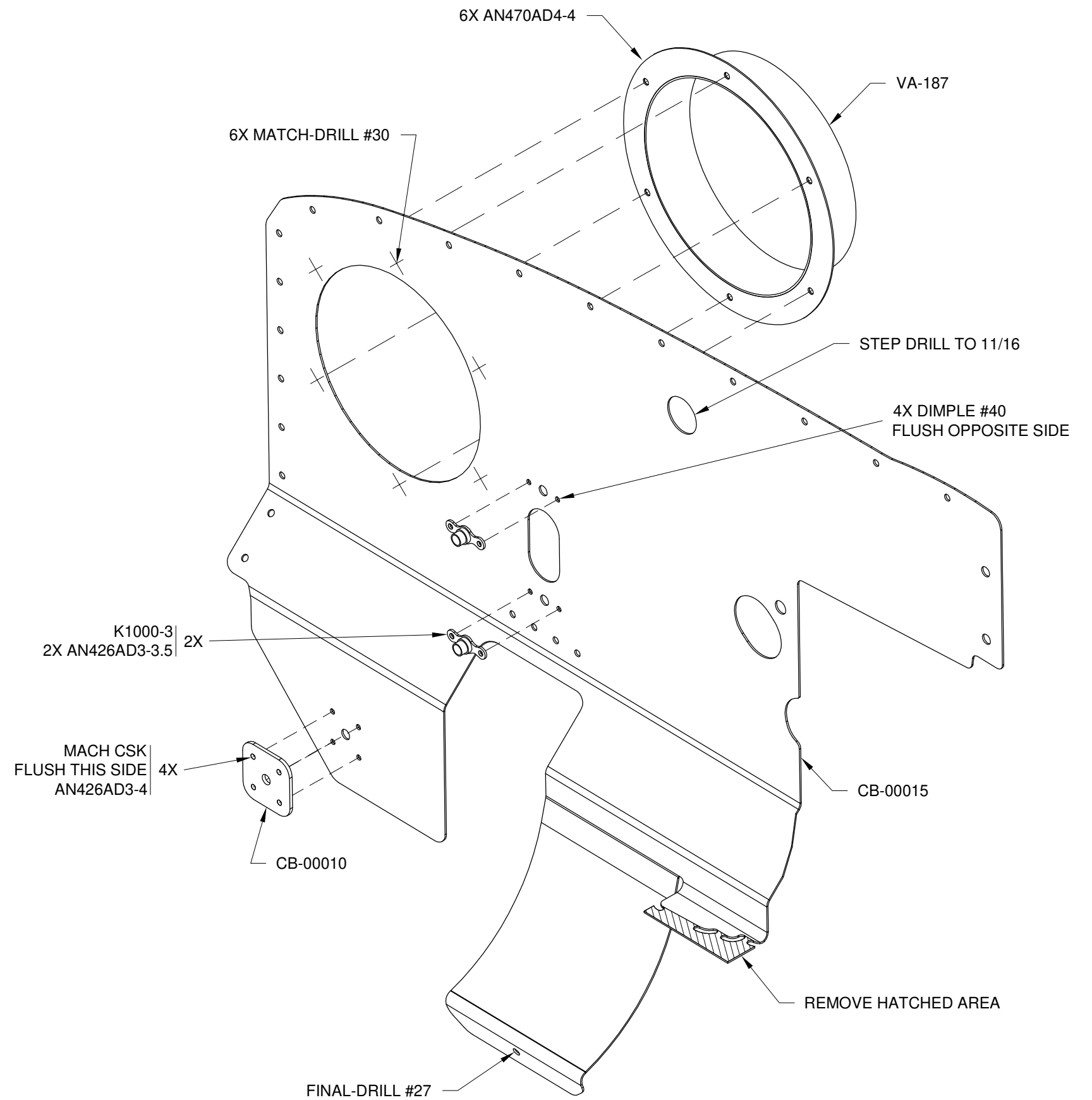


FIGURE 1: RIGHT AFT BAFFLE



Step 1: Final-Drill #27 the hole in the lower flange of the CB-00028 Cylinder 3 Bridge.

Step 2: Cleco, then rivet, the CB-00029 Cylinder 3 Bridge Left and CB-00030 Cylinder 3 Bridge Right to the cylinder 3 bridge as shown.

Step 3: Trim the edges of the bridge left and bridge right as required to fit the CB-00015 Right Aft Baffle.

Step 4: Rivet the cylinder 3 bridge to the right aft baffle as shown.

Step 5: Cleco, then rivet, the CB-00014 Cylinder 3 Baffle to the right aft baffle as shown.

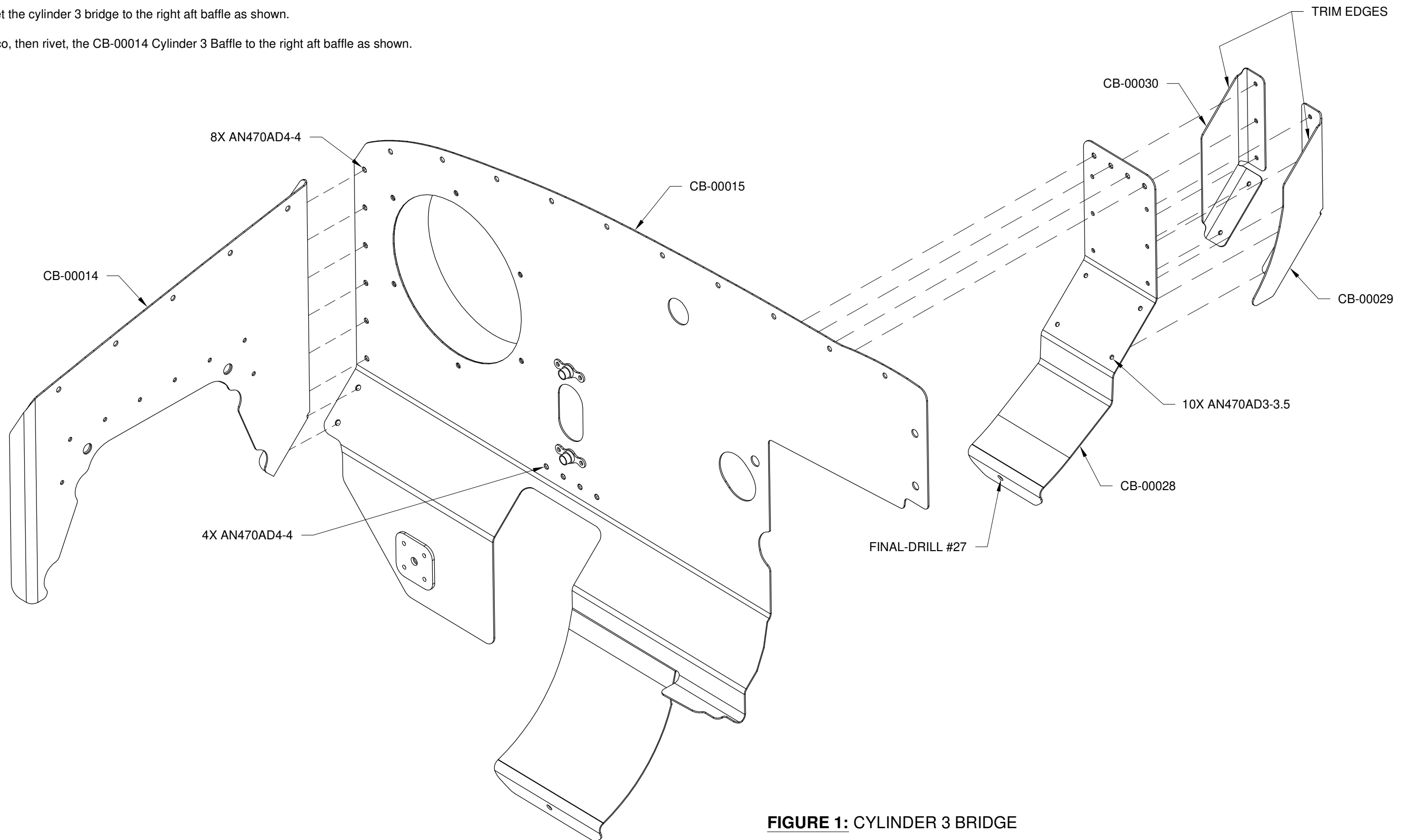
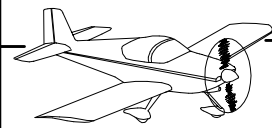


FIGURE 1: CYLINDER 3 BRIDGE



Step 1: Machine countersink the nutplate rivet holes in the CB-00016 Aft Center Bracket as shown in Figure 1.

Step 2: Rivet the nutplates to the aft center bracket as shown in Figure 1.

Step 3: Remove the three engine case bolts from the top of the engine as shown in Figure 2.

Step 4: Attach the aft center bracket and CB-00004 Fwd Center Bracket to the engine using the three engine case bolts and associated engine hardware. Use new internal-tooth lock washers.

Step 5: Tighten the fwd center bracket hardware finger-tight.

Step 6: Torque the aft center bracket hardware to 96 inch-lbs.

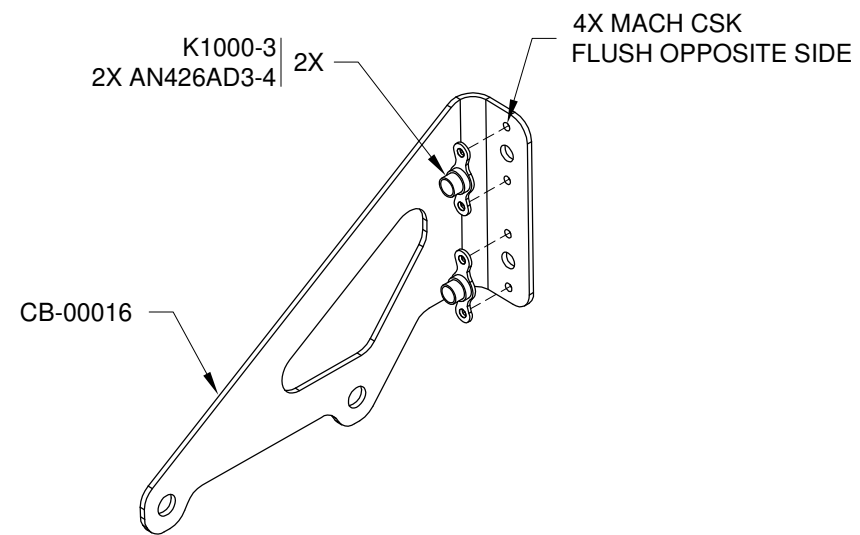


FIGURE 1: AFT CENTER BRACKET

USE HARDWARE SUPPLIED WITH ENGINE EXCEPT FOR NEW MS35333-40

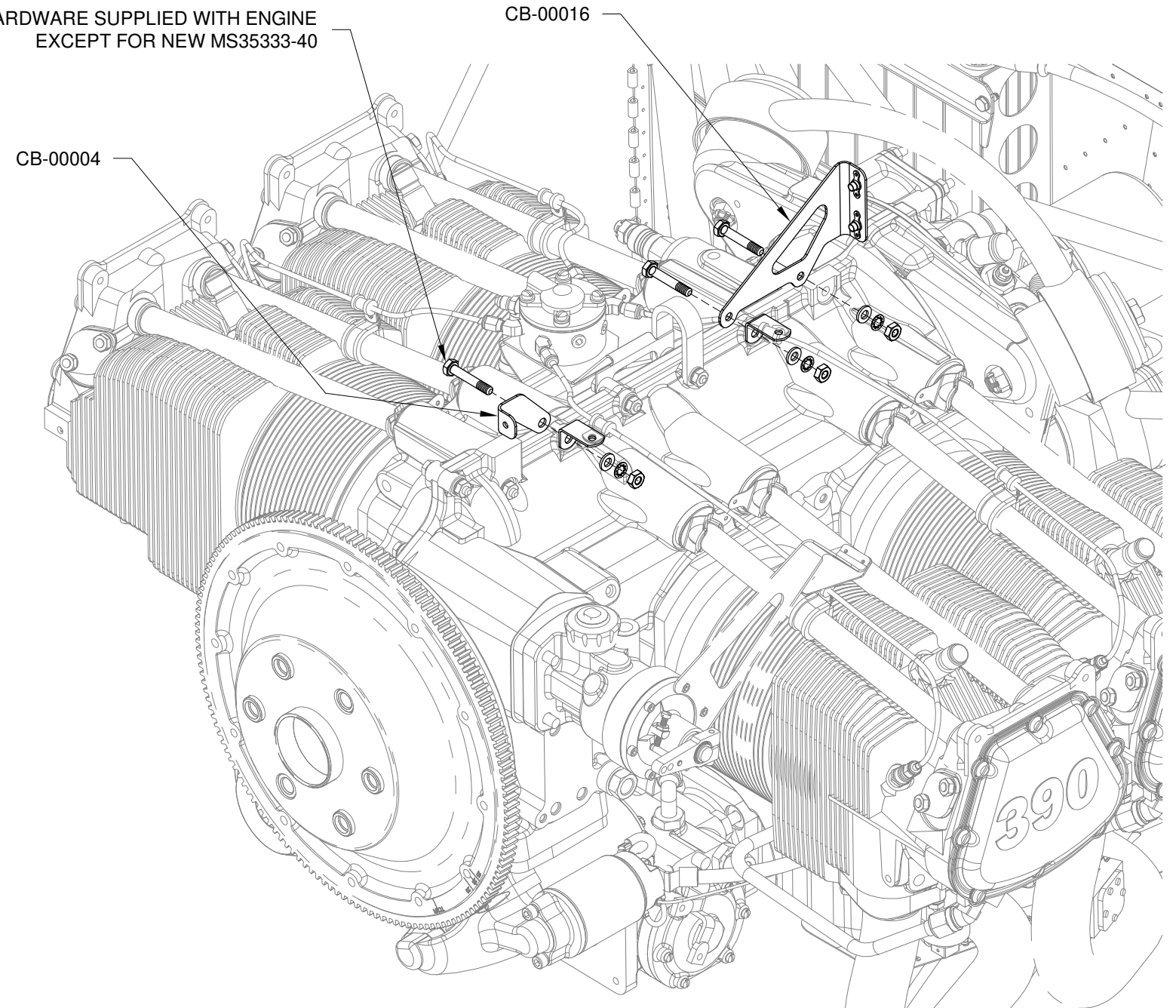
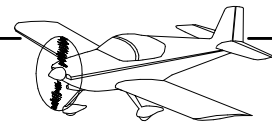


FIGURE 2: ATTACH BRACKETS



Step 1: Apply strips of RTV sealant (approximately 1/32 [0.8 mm] thick) to the baffles as shown in Figure 1 and Figure 2.

If using an RTV that is not self-etching, scuff and clean the metal before RTV application.

For a nicer appearance: mask the application areas with tape, apply the RTV, and immediately remove the tape while the RTV is still wet.

NOTE: It is easier to install the right aft baffle if you temporarily disconnect the oil return line fitting from the number 3 cylinder and gently push the line downward. Temporarily remove the engine oil filler tube if required.

Step 2: Fit the aft baffles to the engine as shown in Figure 3.

Step 3: Trim the baffles to conform to the engine crankcase and valve covers as required.

Step 4: Attach the aft baffles to the engine as shown in Figure 3.

Only tighten the CB8-31 hardware finger-tight.

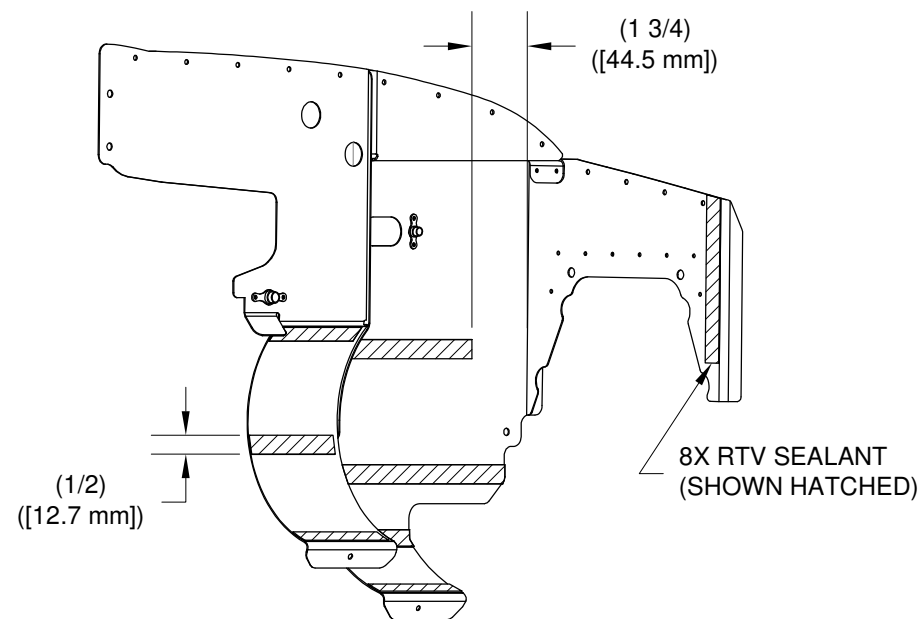
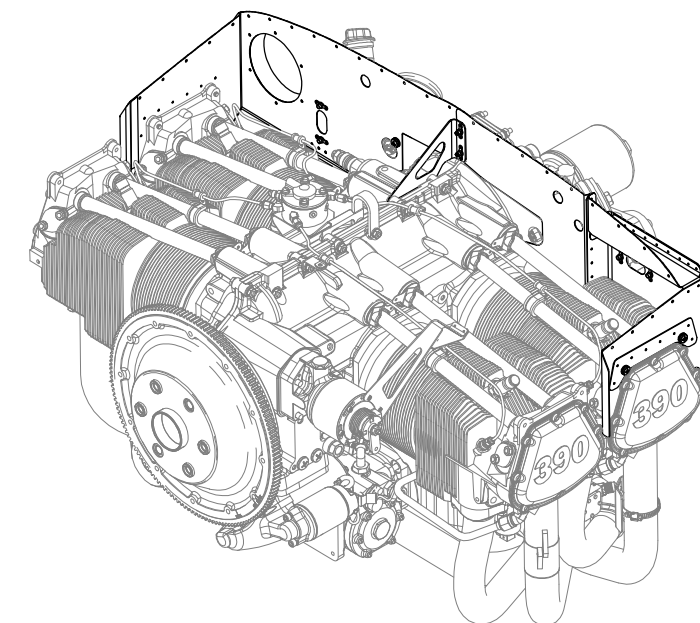


FIGURE 1: RTV SEALANT - LEFT AFT BAFFLE

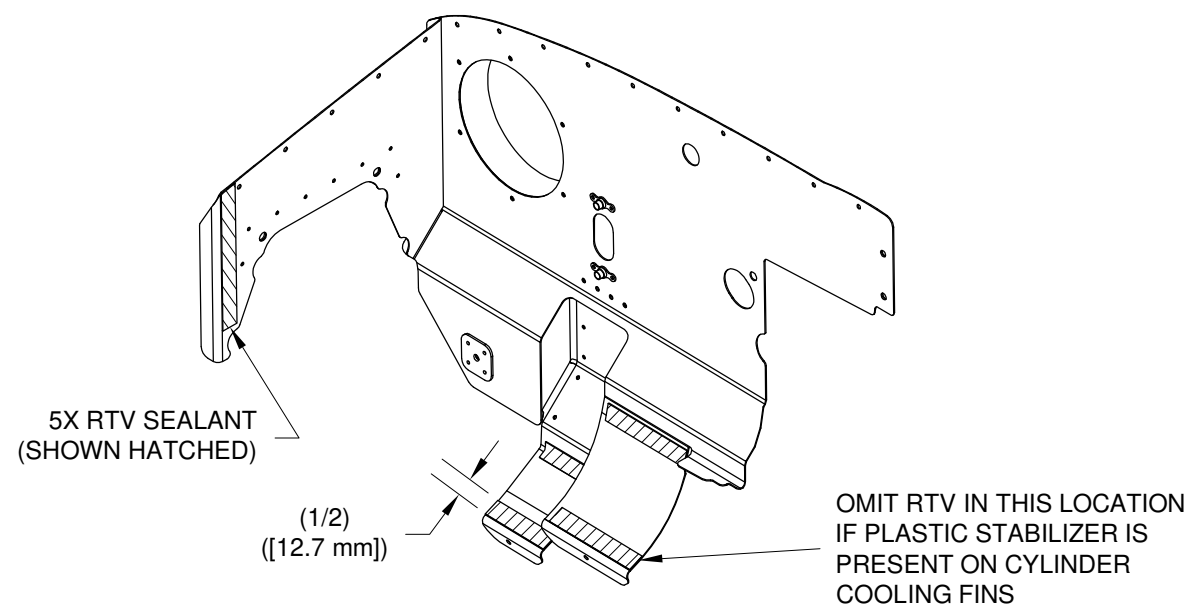


FIGURE 2: RTV SEALANT - RIGHT AFT BAFFLE

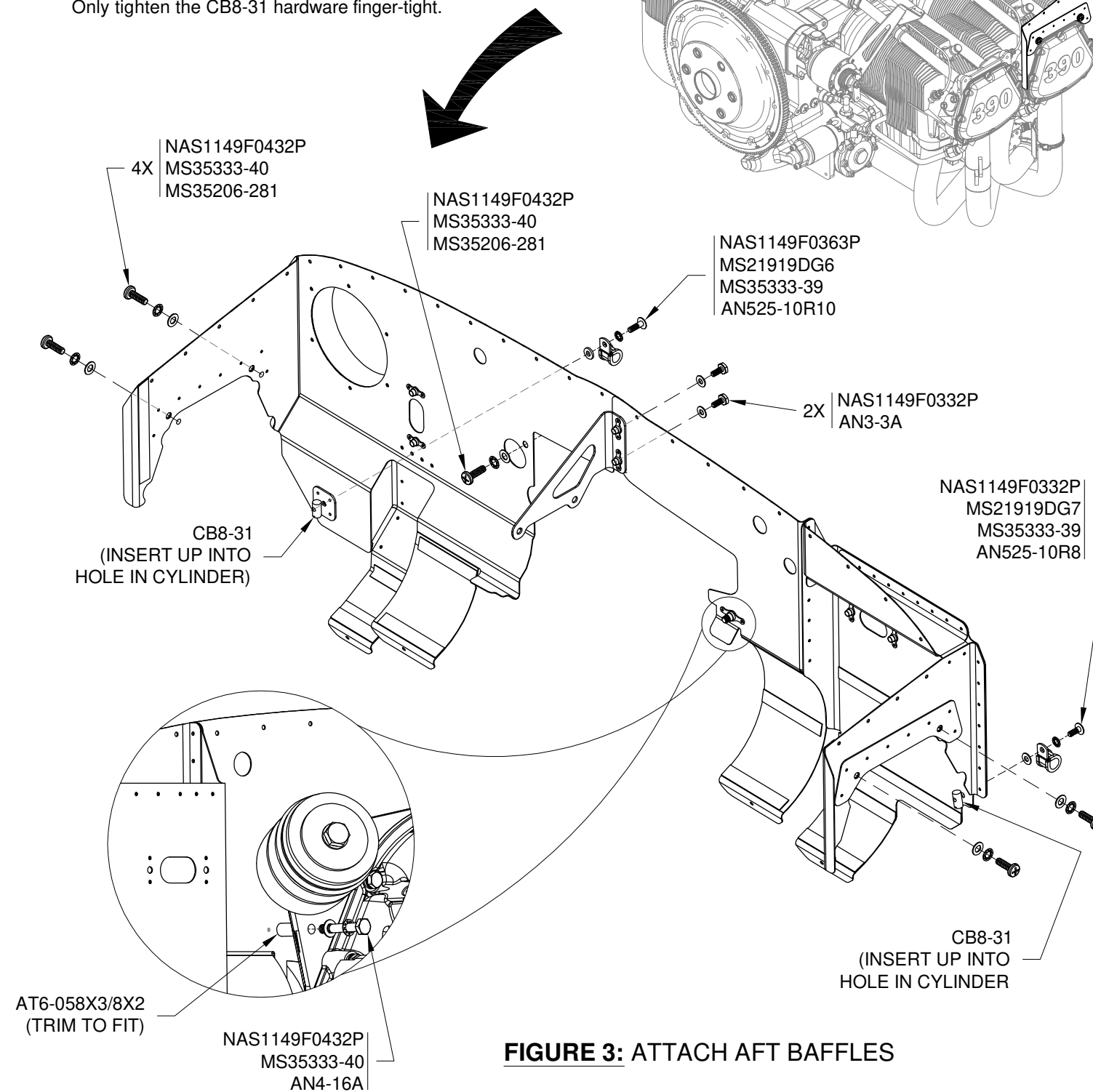


FIGURE 3: ATTACH AFT BAFFLES



Step 1: Final-Drill #27 the holes in the lower flanges of the CB-00009 Left Air Ramp as shown in Figure 1.

Step 2: Trim the CB-00020 Air Filter Frame to the scribe line around the flange and to the scribe line around the bottom of the opening.

Step 3: Test-fit the air filter frame to the left air ramp. Radius the aft edge of the air filter frame as required.

Step 4: Center the opening in the air filter frame on the opening in the left air ramp and securely clamp the frame in place.

Step 5: Match-Drill #19 the holes in the left air ramp into the air filter frame as shown in Figure 2.

Step 6: Remove the air filter frame.

Step 7: Sand the underside of the air filter frame flanges as required to produce flat surfaces for the nutplates.

Step 8: Use #8 screws to temporarily attach nutplates to the lower surface of the air filter frame as shown in Figure 2.

Step 9: Match-Drill #40 the nutplate rivet holes into the air filter frame.

Step 10: Machine countersink the nutplate rivet holes in the air filter frame.

NOTE: Review Section 5.18 regarding setting solid rivets in fiberglass.

Step 11: Rivet the nutplates to the air filter frame as shown in Figure 2.

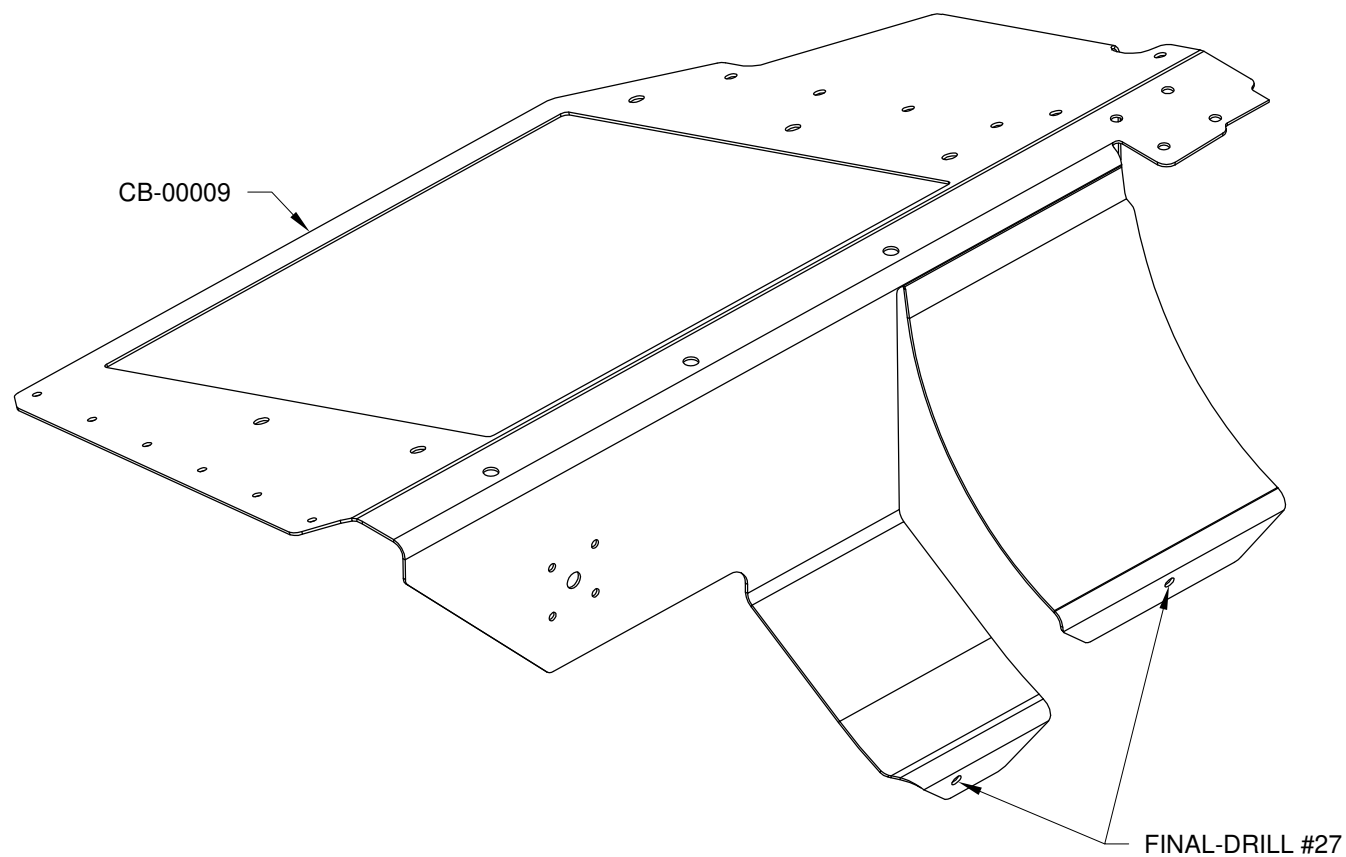


FIGURE 1: DRILL LEFT AIR RAMP

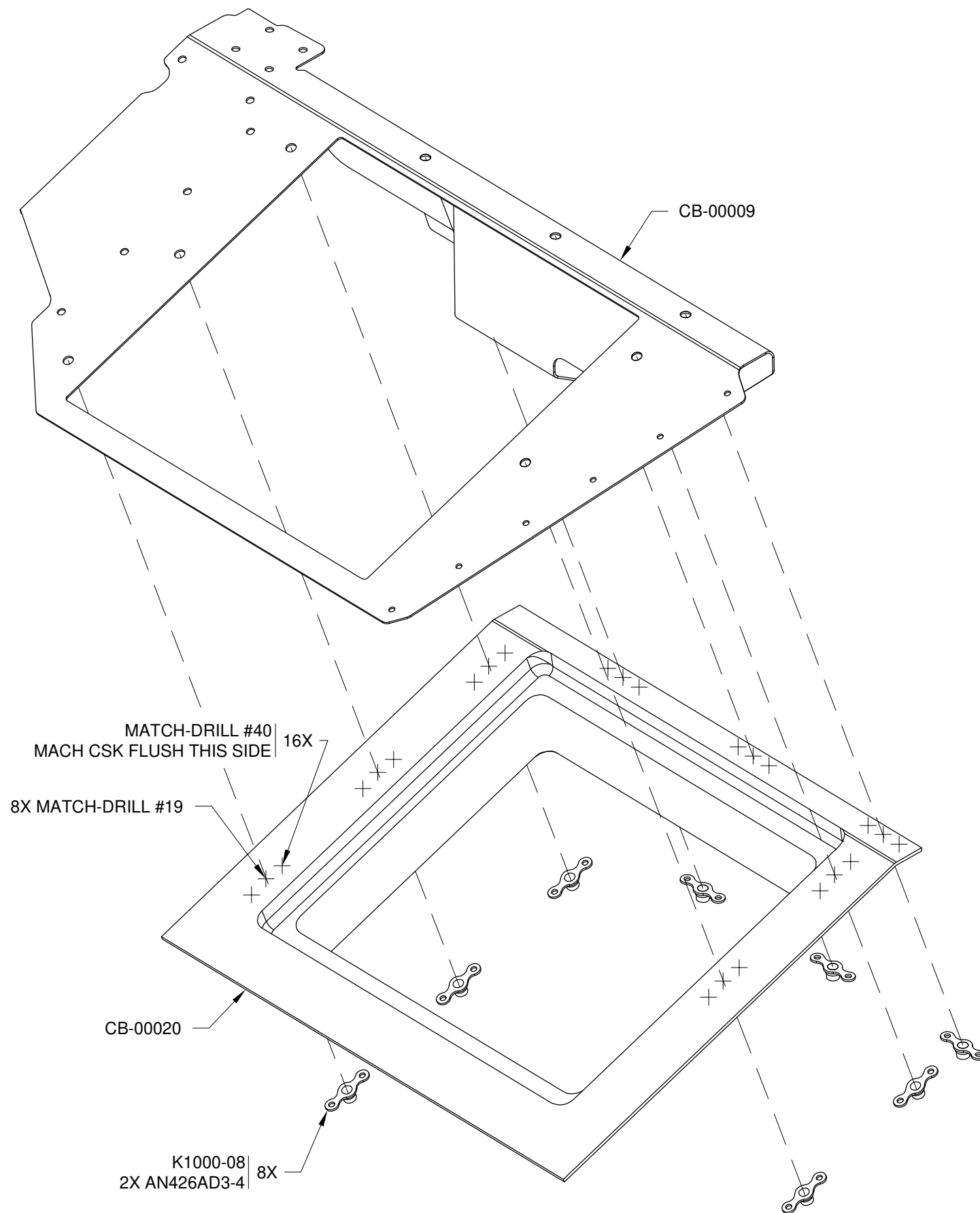


FIGURE 2: PREP AIR FILTER FRAME



Step 1: Attach the CB-00020 Air Filter Frame to the CB-00009 Left Air Ramp with one screw on each side.

Step 2: Mark, then trim, the forward edge of the air filter frame flange as shown.

Step 3: Attach the air filter frame to the left air ramp as shown.

Step 4: Rivet the CB-00008 Left Fwd Baffle Mount to the left air ramp as shown.

Step 5: Machine countersink the CB-00010 Baffle Mount as shown.

Step 6: Rivet the baffle mount to the left air ramp.

Step 7: Cleco the CB-00011 Left Fwd Baffle to the left air ramp.

Step 8: Rivet the CB-00001 Cylinder 2 Baffle to the left air ramp as shown.

Step 9: Attach the CB-00006 Left Air Dam to the left air ramp as shown.

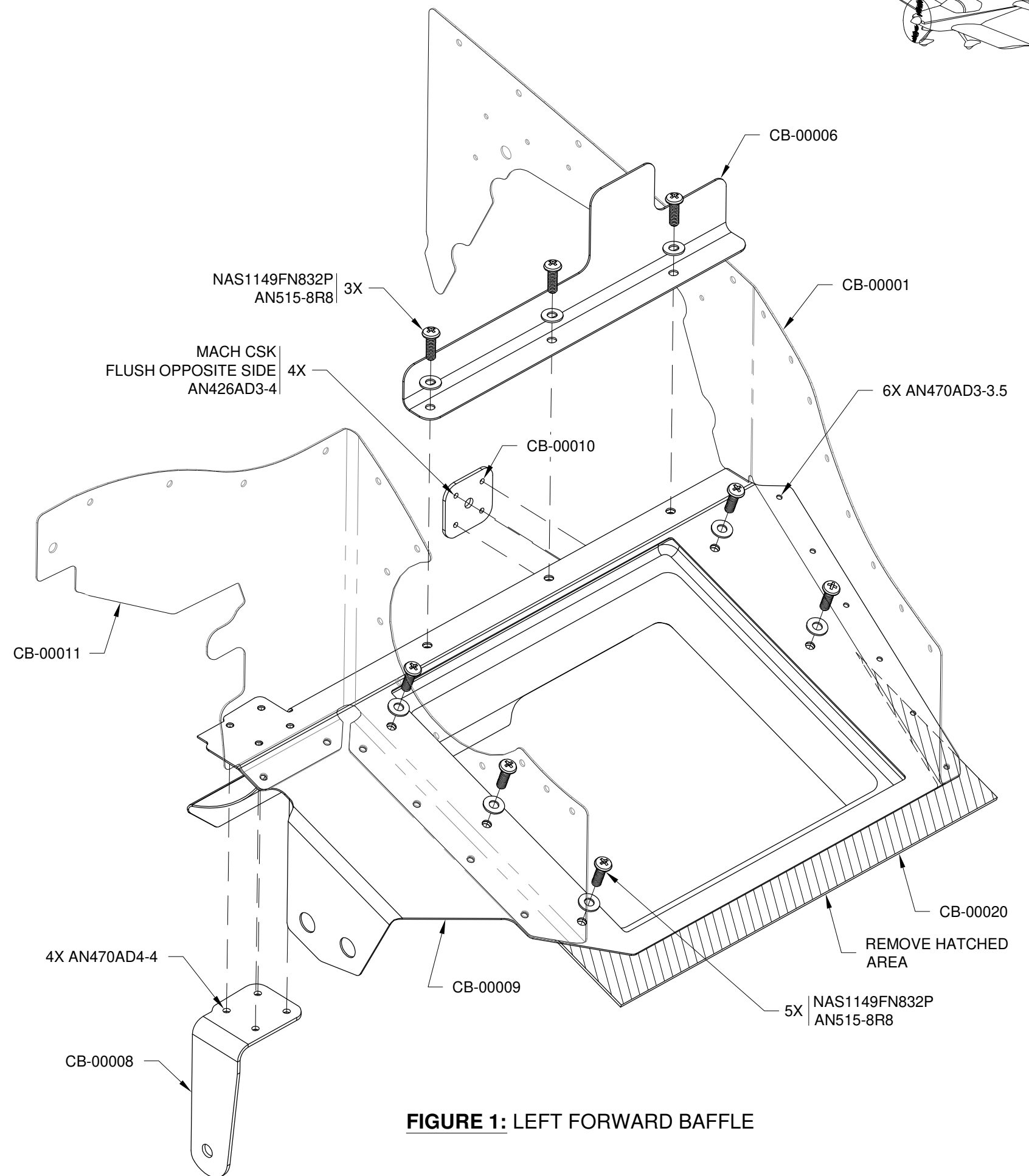


FIGURE 1: LEFT FORWARD BAFFLE



Step 1: Final-Drill #27 the holes in the lower flanges of the CB-00007 Right Air Ramp.

Step 2: Dimple #40 the nutplate rivet holes in the right air ramp as shown.

Step 3: Rivet the nutplates to the right air ramp as shown.

Step 4: Center the VENT DL-03 SCAT Tube Flange on the hole in the right air ramp and cleco at two diagonally opposite corners.

Step 5: Final-Drill #30, then deburr, the four holes in the SCAT tube flange and the corresponding holes in the the right air ramp.

Step 6: Scuff and clean the surfaces of the SCAT tube flange and right air ramp where they contact each other.

Apply RTV sealant around the perimeter of the Inlet Screen Aluminum VENT SCREEN 3X3 where it contacts the duct flange. This will prevent the screen from caving in if a curious marsupial should press upon it with a paw.

Step 7: Rivet the SCAT tube flange and vent screen to the right air ramp as shown.

Step 8: Attach the CB-00013 Right Air Dam to the right air ramp as shown.

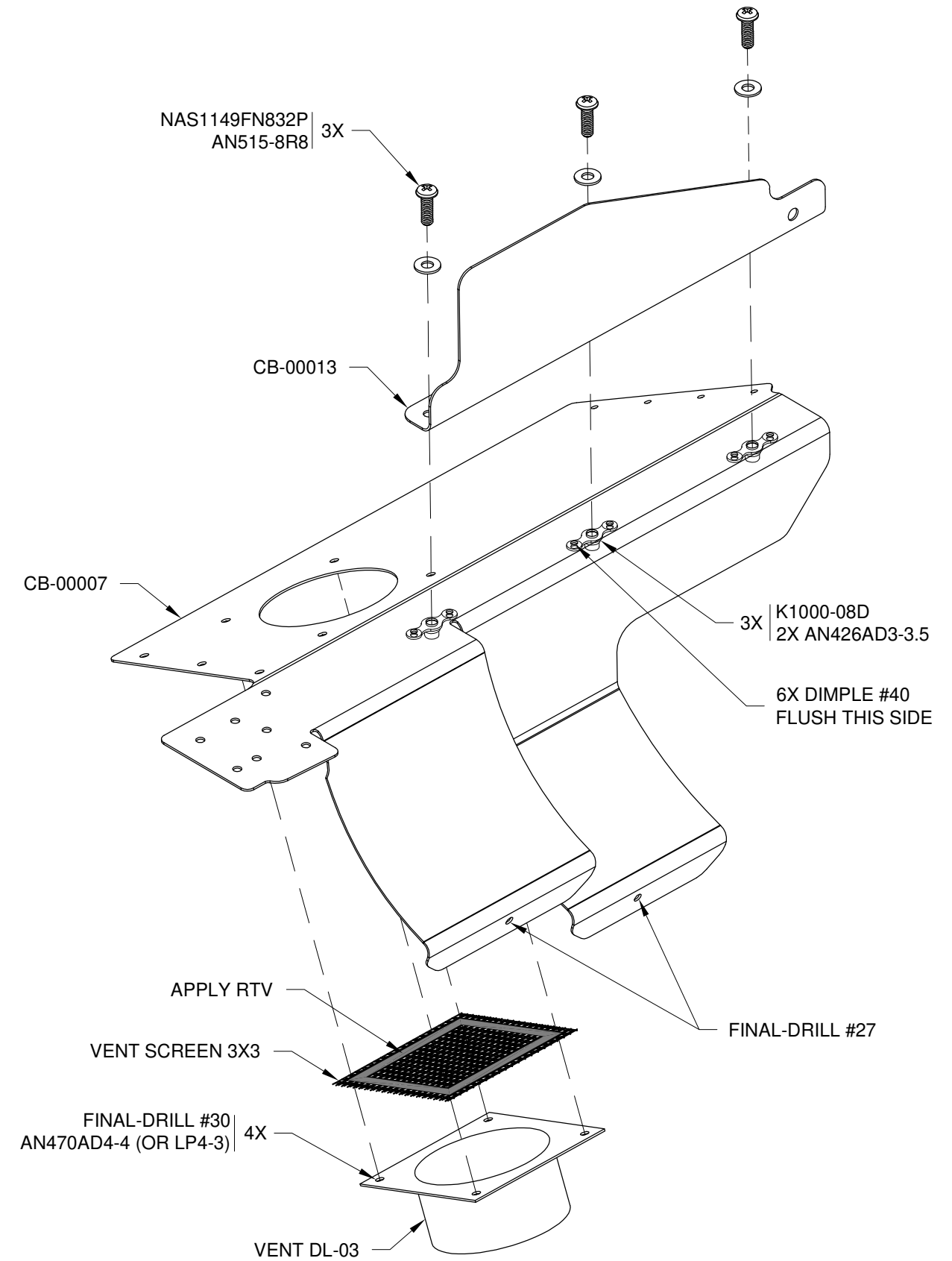
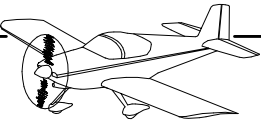


FIGURE 1: RIGHT AIR RAMP



Step 1: Dimple #40 the nutplate rivet holes in the CB-00012 Right Fwd Baffle as shown.

Step 2: Dimple, then rivet, the nutplate to the right fwd baffle as shown.

Step 3: Rivet the right fwd baffle and CB-00005 Right Fwd Baffle Mount to the CB-00007 Right Air Ramp as shown. Rivet the indicated hole first.

Step 4: Rivet the CB-00003 Cylinder 1 Baffle to the right air ramp as shown.

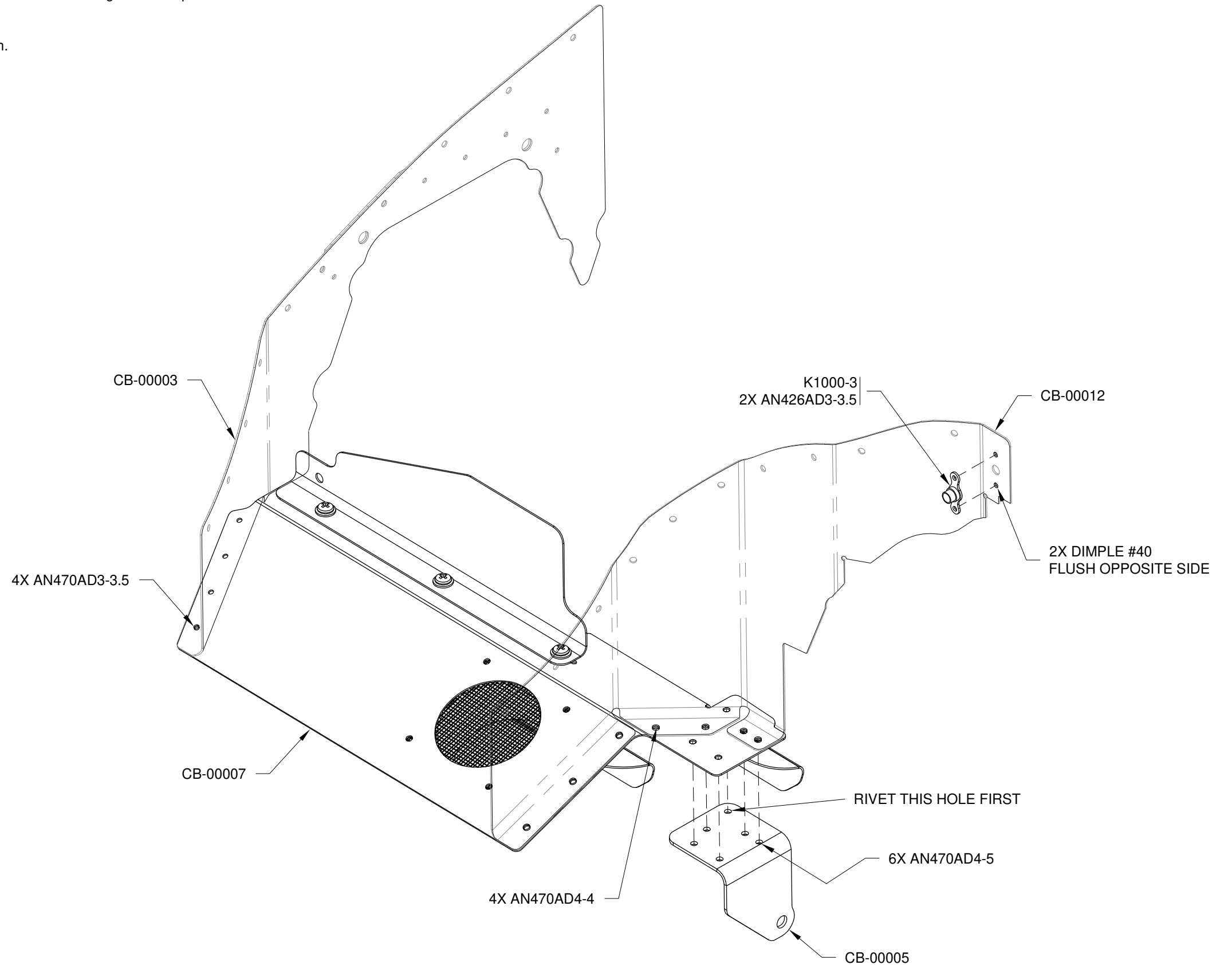
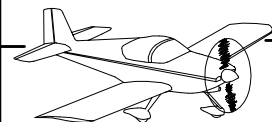


FIGURE 1: RIGHT FORWARD BAFFLE



Step 1: Apply strips of RTV sealant (approximately 1/32 [0.8 mm] thick) to the baffles as shown in Figure 1 and Figure 2.

If using an RTV that is not self-etching, scuff and clean the metal before RTV application.

For a nicer appearance: mask the application areas with tape, apply the RTV, and immediately remove the tape while the RTV is still wet.

NOTE: The propeller governor control cable bracket must be removed when fitting the left forward baffle to the engine.

NOTE: It is easier to install the left forward baffle if you temporarily disconnect the oil return line fitting from the number 1 cylinder and gently push the line downward.

Step 2: Fit the forward baffles to the engine (see figure on next page).

The aft edges of the CB-00003 Cylinder 1 Baffle and CB-00001 Cylinder 2 Baffle slip inboard and underneath the forward edges of the CB-00014 Cylinder 3 Baffle and CB-000019 Cylinder 4 Baffle, respectively.

Step 3: Trim the baffles to conform to the engine crankcase and valve covers as required.

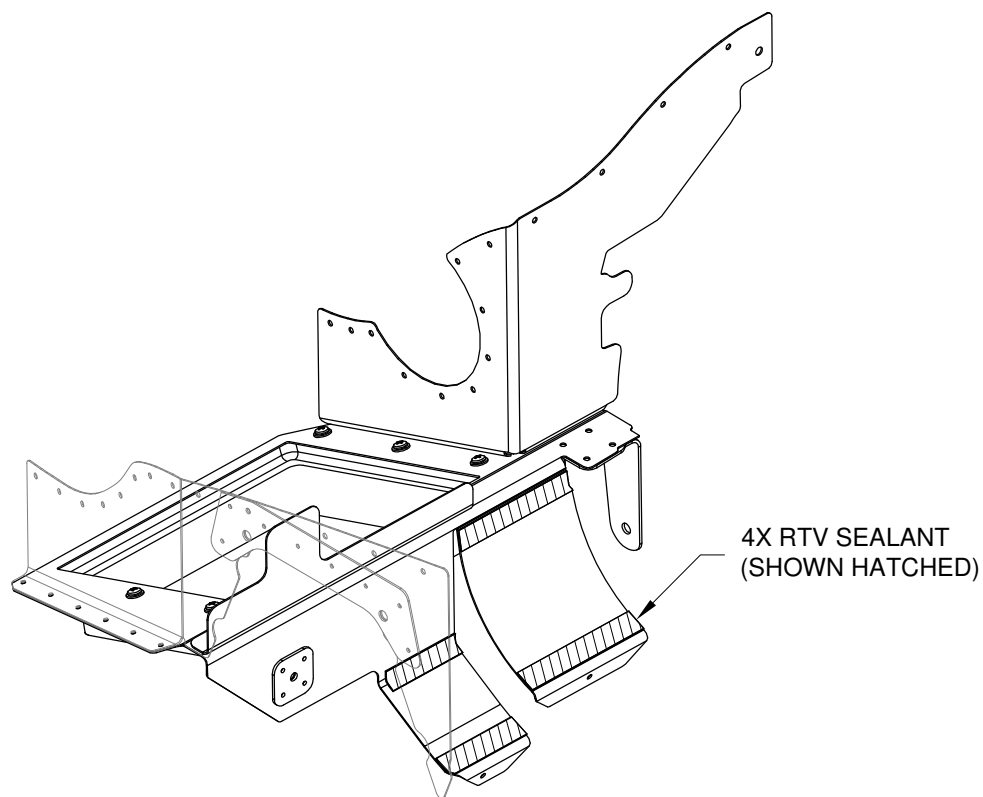


FIGURE 1: RTV SEALANT - LEFT FORWARD BAFFLE

Step 4: Rivet the CB-00011 Left Fwd Baffle to the CB-00009 Left Air Ramp as shown in Figure 3.

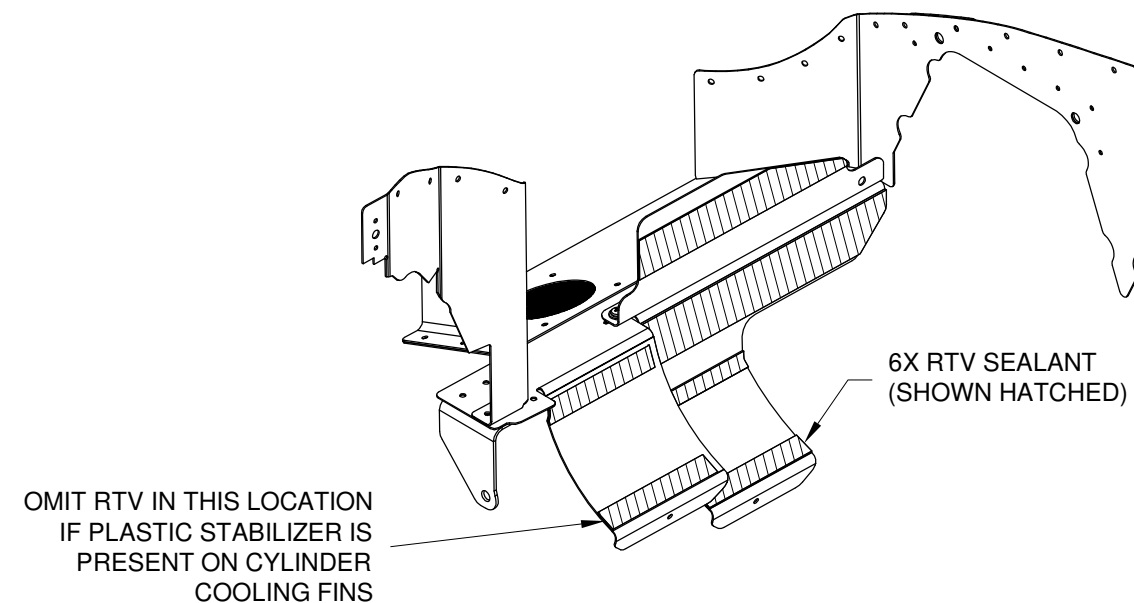


FIGURE 2: RTV SEALANT - RIGHT FORWARD BAFFLE

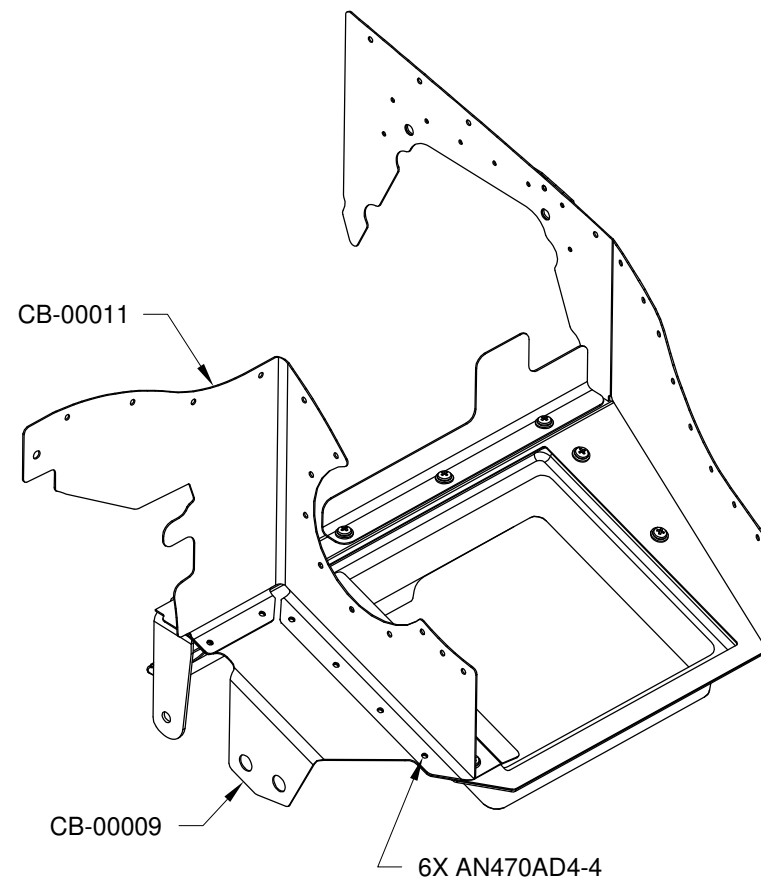
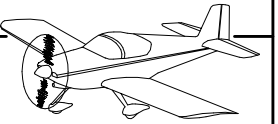


FIGURE 3: RIVET BAFFLE



Step 1: Attach the forward baffles to the engine as shown in Figure 1 and Figure 2.

Step 2: Fully tighten the hardware attaching the CB-0004 Fwd Center Bracket to the engine. See Figure 1.

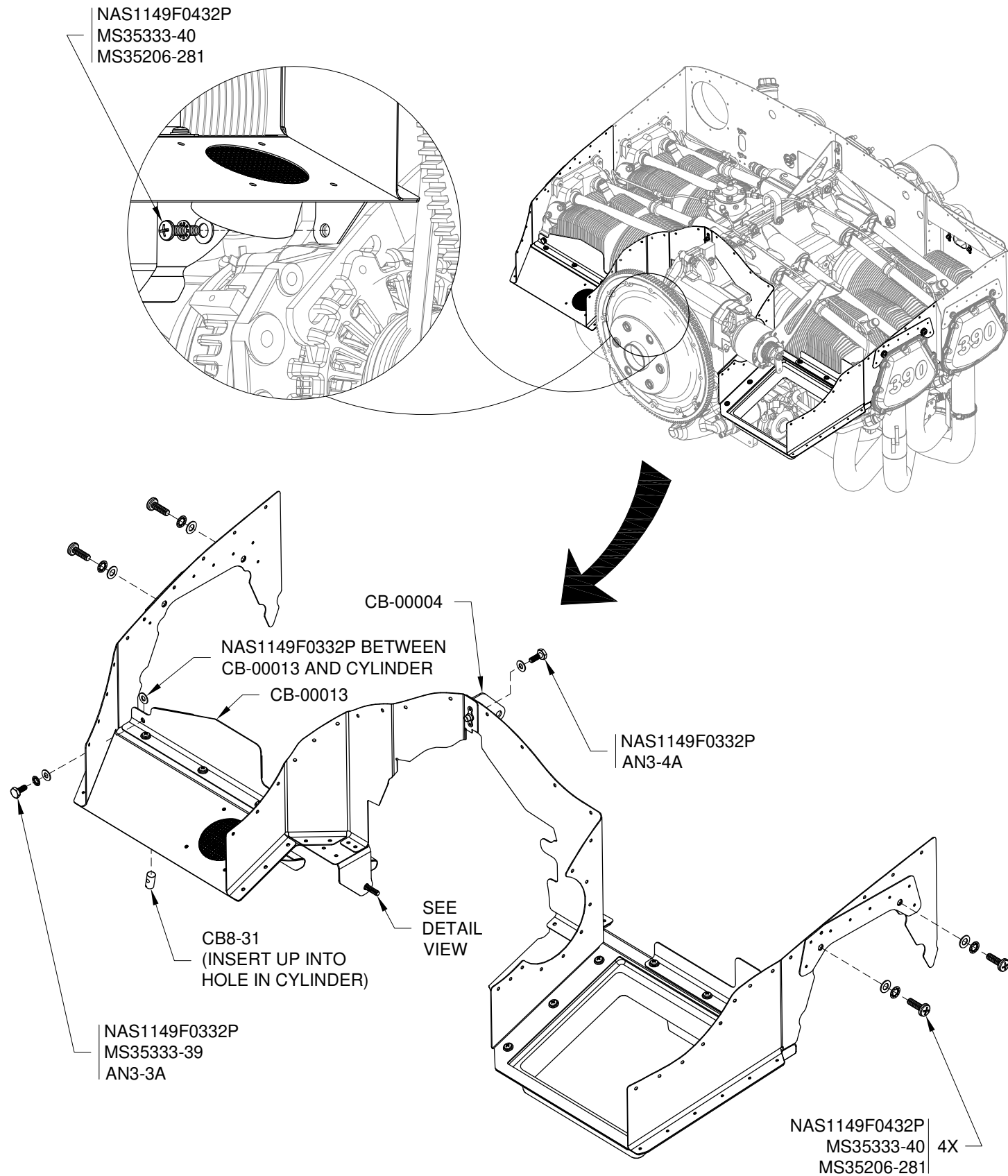


FIGURE 1: ATTACH FORWARD BAFFLES

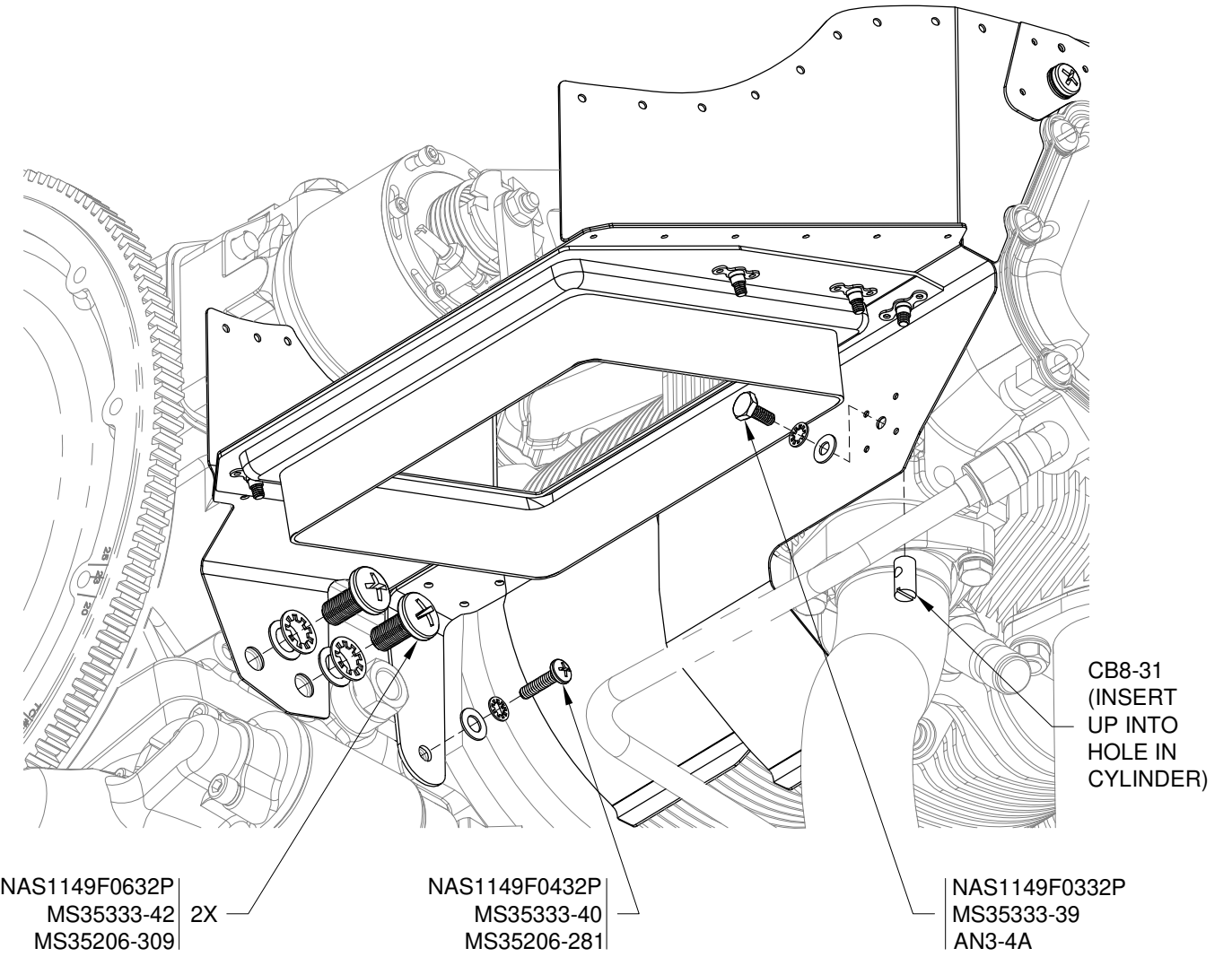
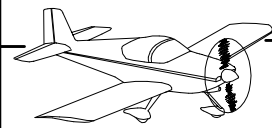


FIGURE 2: ATTACH FORWARD BAFFLES - LEFT UNDERSIDE



Step 1: Cut two 10 7/8 [276.2 mm] lengths of SSP-120 Stainless Pin.

Step 2: Fabricate the CB-00025 Outbd Tension Rods from the SSP-120 Stainless Pin as shown in Figure 1.

When cutting the threads, chamfer the rod ends before starting, go slowly, use lubricant, and frequently clear metal chips.

Step 3: Cut two 10 7/32 [259.6 mm] lengths of SSP-120 Stainless Pin.

Step 4: Fabricate the CB-00026 Inbd Tension Rods from the SSP-120 Stainless Pin as shown in Figure 2.

Step 5: Fabricate one or more CB-00037 Tension Rod Tubes from PT-062X1/4 Plastic Tube.

Slip the tubes over the tension rods as required to prevent the tension rods from chafing on the engine.

Step 6: Attach the tension rods to the baffles through the holes in the lower flanges as shown in Figure 3.

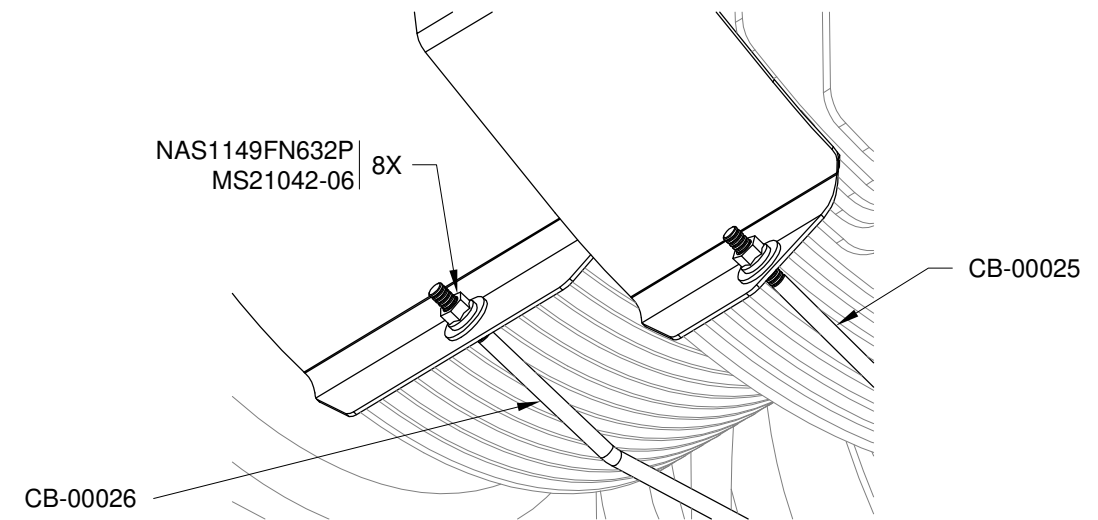


FIGURE 3: ATTACH TENSION RODS
(LEFT FWD SIDE SHOWN)

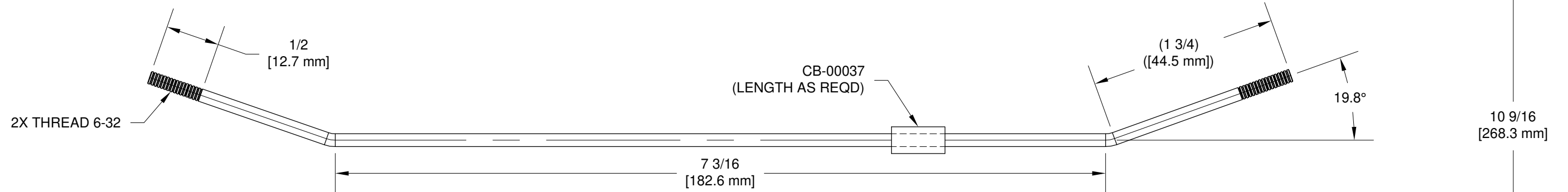


FIGURE 1: CB-00025

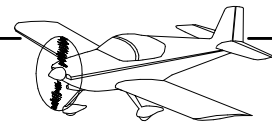
(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!)



FIGURE 2: CB-00026

(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!)

16
[406.4 mm]



Step 1: Mark the flange of the VA-132-2 Snorkel with a line offset 1 in. [25.4 mm] from the outlet opening. Use a permanent marker. See Figure 1.

Step 2: Measure and record the distance from the bore of the fuel injector servo air intake to the edge of the fuel injector servo flange (typically 7/8 in. [22.2 mm]) at four locations as shown in Figure 2.

Mark the edge of the fuel injector servo flange where each of the four measurements was taken.

Step 3: Seal the fuel inlet of the fuel injector servo with Mylar packing tape. See Figure 3.

Step 4: Seal the air inlet of the fuel injector servo with Mylar packing tape. See Figure 3.

Step 5: Remove the CB-00020 Air Filter Frame from the CB-00009 Left Air Ramp.

Step 6: Insert the snorkel into the air filter frame and cleco the air filter frame to the left air ramp. See Figure 4.

Step 7: Subtract each distance recorded in Step 2 from 1 in. [25.4 mm] to determine the offset distances (e.g. (1 in. - 7/8 in. = 1/8 in.) or [25.4 mm - 22.2 mm = 3.2 mm]).

Step 8: Adjust the snorkel until the distances between the line marked on the snorkel and the four marks on the edge of the fuel injector servo flange equal the four corresponding offset distances (e.g. 1/8 in. [3.2 mm]).

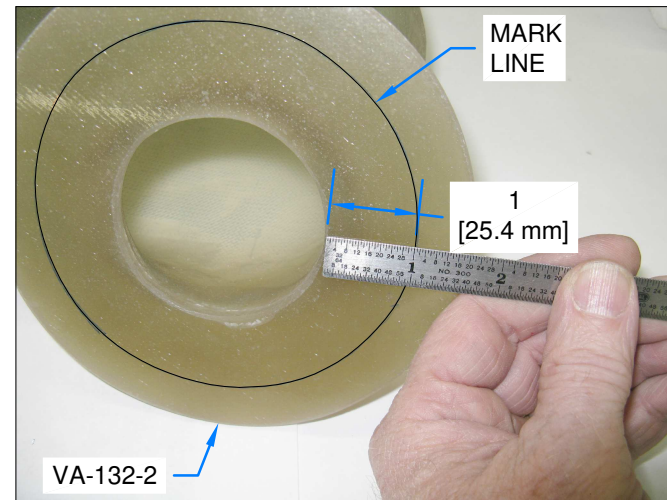


FIGURE 1: MARK SNORKEL

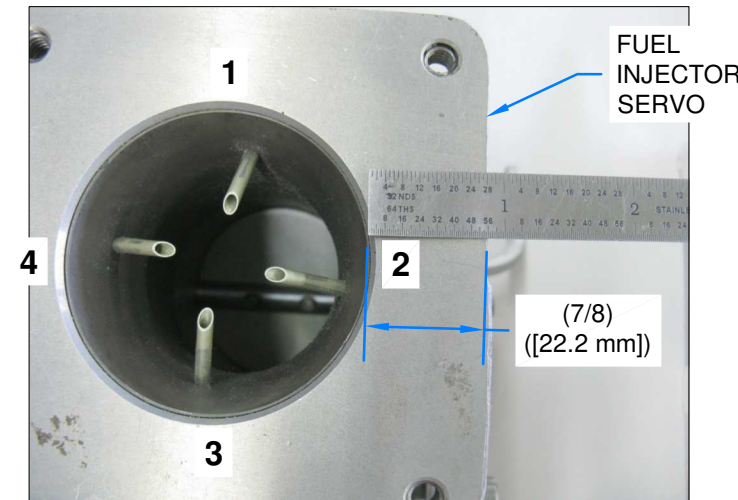


FIGURE 2: MEASURE FUEL INJECTOR SERVO

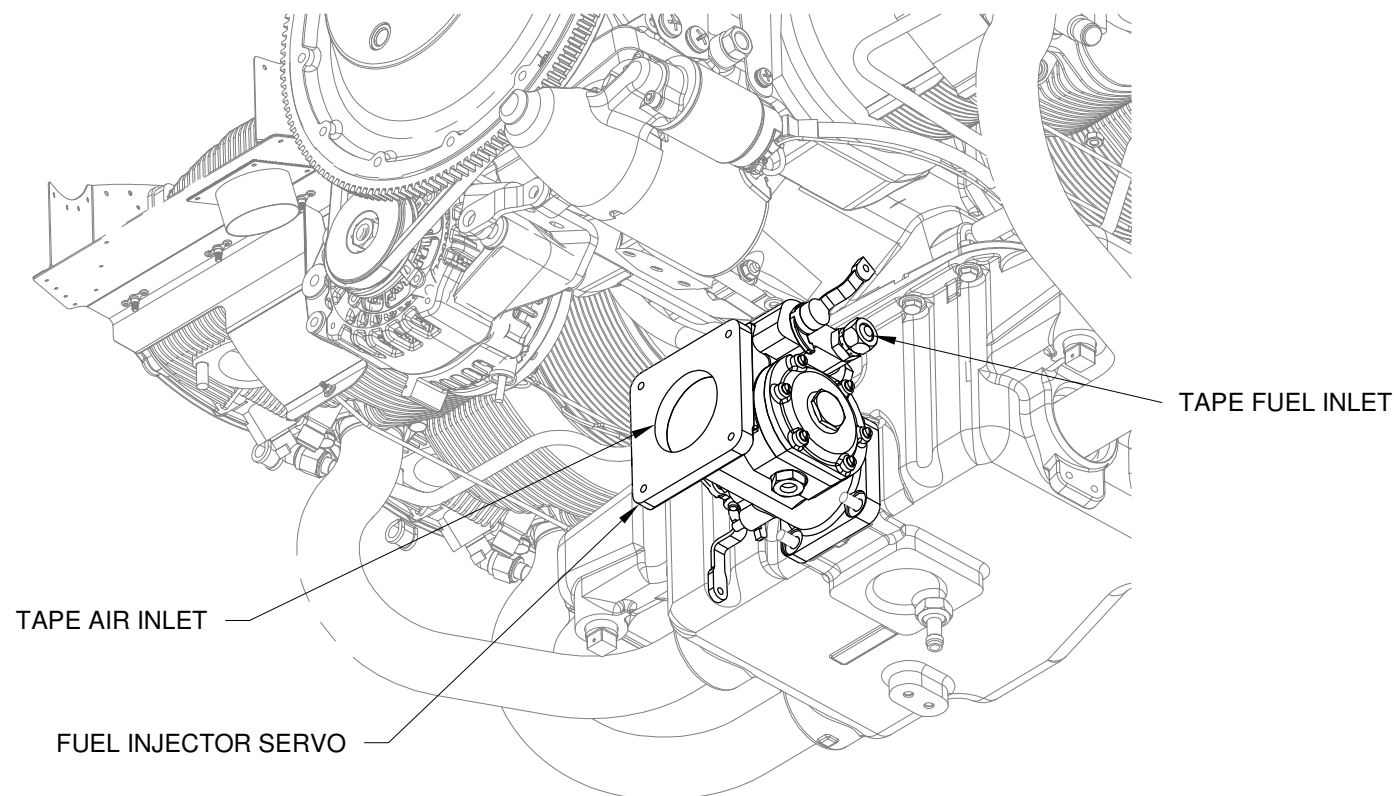


FIGURE 3: SEAL INJECTOR SERVO

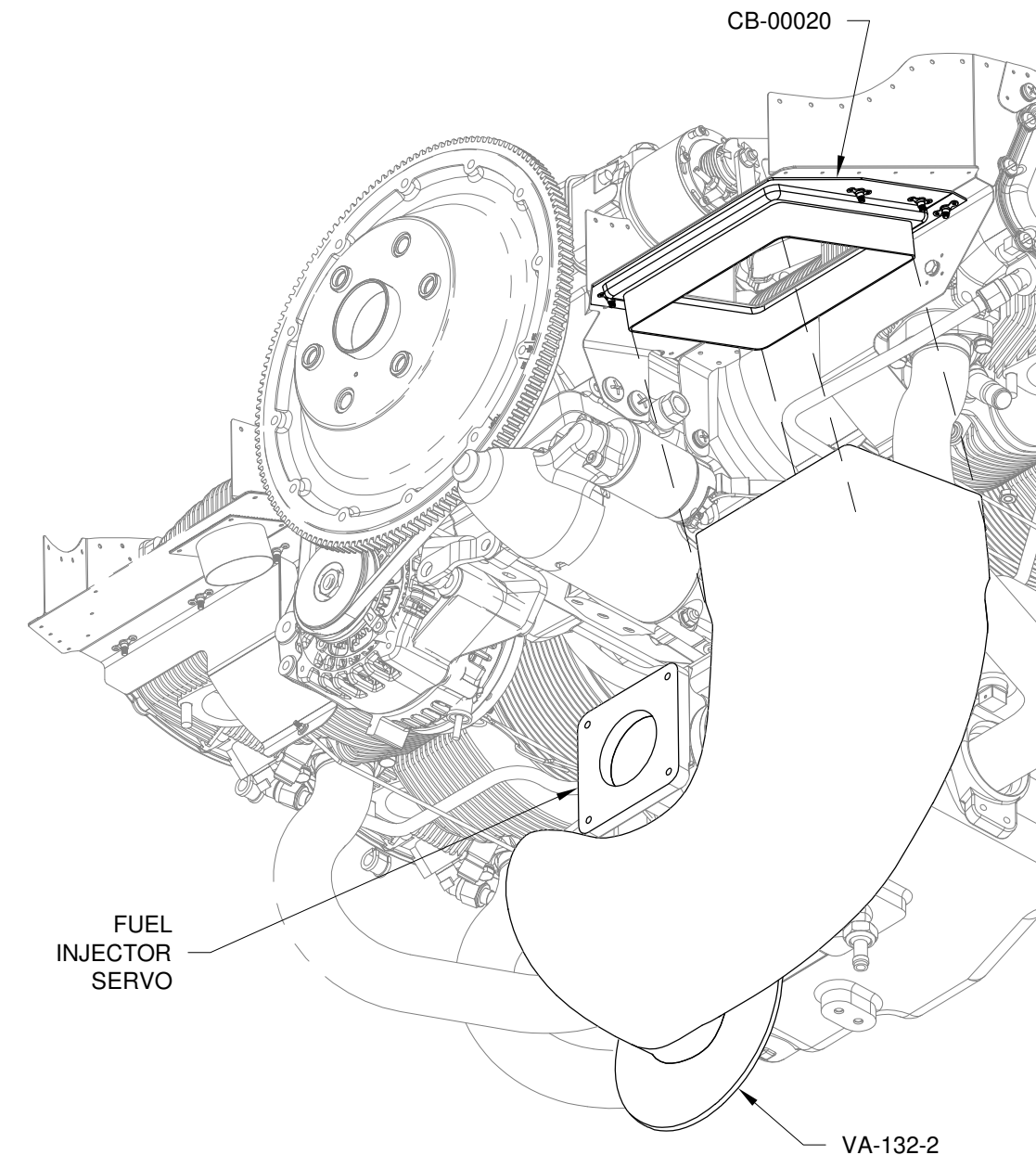


FIGURE 4: INSERT SNORKEL

Step 1: Clamp the snorkel to the fuel injector servo flange with spring clamps. See Figure 1.

Step 2: As much as possible, mark the lower edge of the air filter frame onto the snorkel with a permanent marker. This will be referred to as the frame indicator line. See Figure 2.

Step 3: Remove the snorkel and air filter frame from the aircraft.

Step 4: Align the frame indicator line with the lower edge of the air filter frame. Finish marking the rest of the frame indicator line onto the snorkel.

Step 5: Remove the snorkel from the air filter frame.

Step 6: Mark a line around the snorkel 1 1/4 in. [31.8 mm] above the frame indicator line.

Remove the material above this line (a final more-accurate trim will be done later).

Step 7: Sand/grind the outside of the snorkel above the frame indicator line until the snorkel fits within the frame without distorting and the snorkel perimeter is roughly the same thickness all the way around.

Step 8: Insert the snorkel into the air filter frame and attach the air filter frame to the left air ramp with all of the screws. See Page 47-09.

Step 9: Adjust the snorkel until the distance between the line marked on the snorkel and the four marks on the edge of the fuel injector servo flange equal the four corresponding offset distances (e.g. 1/8 in. [3.2 mm]).

Step 10: As much as possible, trace the outline of the fuel injector servo flange onto the aft face of the snorkel flange with a permanent marker.

Step 11: Remove the snorkel and air filter frame from the aircraft.

Step 12: Center the CB-00035 Snorkel Drill Template on the snorkel flange within the traced outline of the fuel injector servo.

Clamp the drill template in place.

Step 13: Finish marking the rest of the outline of the fuel injector servo flange onto the snorkel using the drill template. See Figure 3.

Step 14: Drill #40 four pilot holes in the snorkel flange using the drill template as a guide. See Figure 2.

Step 15: Remove the drill template.

Step 16: Remove any material from the snorkel flange that lies outside the traced outline of the fuel injector servo. See Figure 2 and Figure 4.

Step 17: Final-Drill 1/4 the four holes in the snorkel flange.

Step 18: Remove material from the forward side of the snorkel flange around the four holes so that the heads of the attach bolts will lie flush when installed.

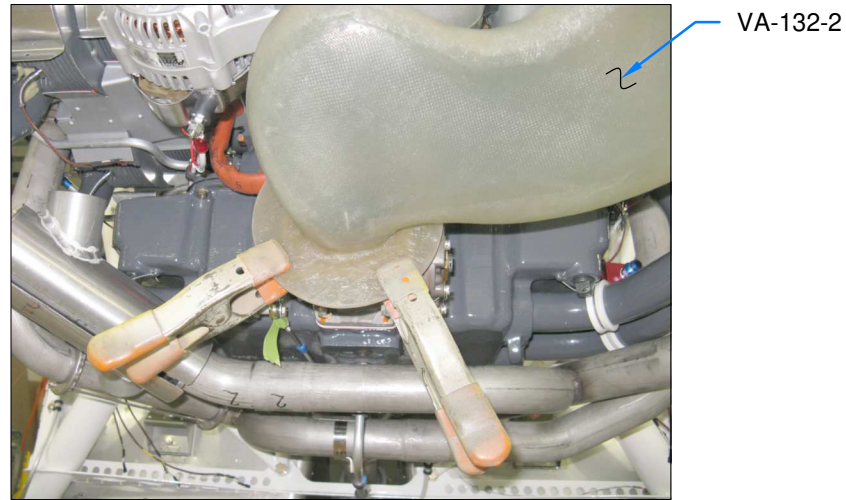


FIGURE 1: CLAMP SNORKEL

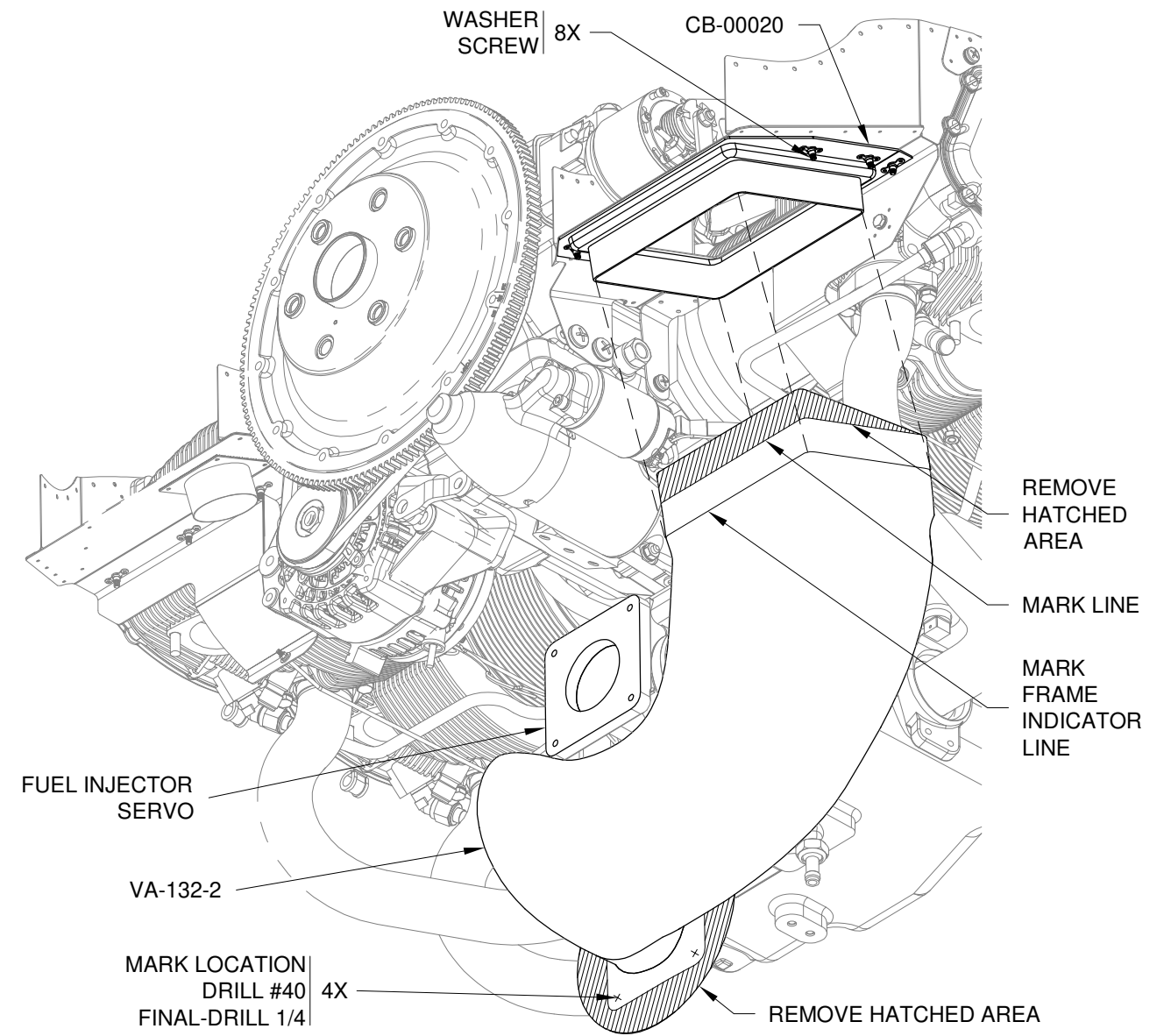


FIGURE 2: TRIM SNORKEL

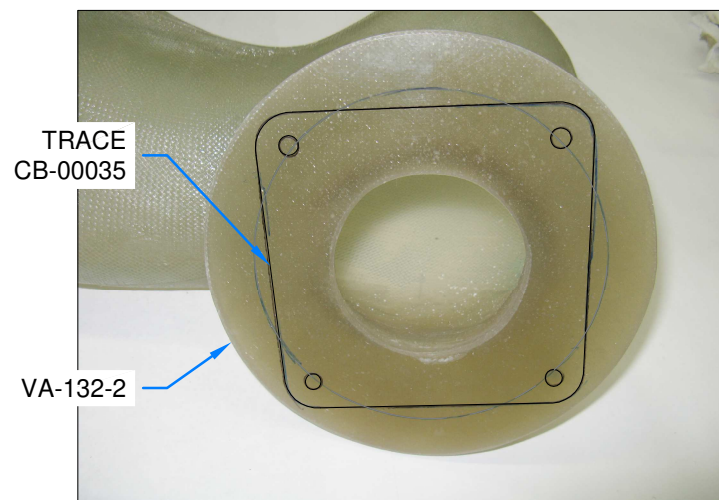


FIGURE 3: SNORKEL FLANGE - BEFORE

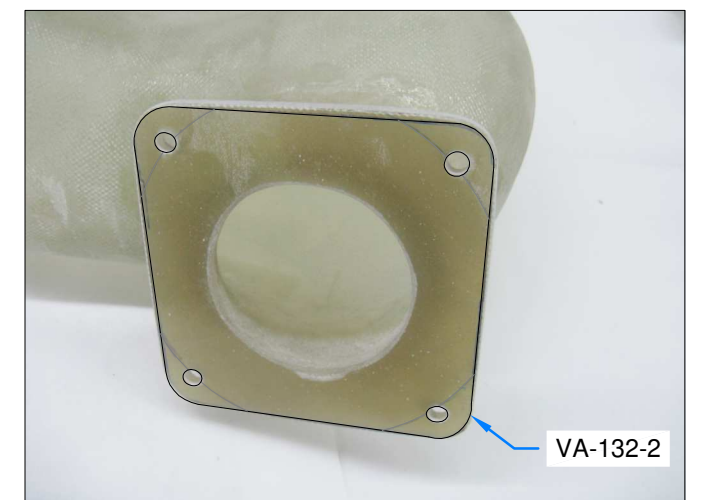
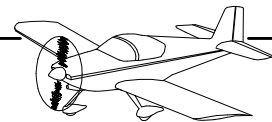


FIGURE 4: SNORKEL FLANGE - AFTER



Step 1: Insert the VA-132-2 Snorkel into the CB-00020 Air Filter Frame and attach the air filter frame to the CB-00009 Left Air Ramp with all of the screws.

Step 2: Attach the snorkel flange to the fuel injector. Tighten the bolts finger-tight. Use a round file to elongate any holes with minor misalignment. See Figure 1.

Step 3: Verify that the snorkel flange lies flush with the fuel injector servo flange on all four sides.

If a gap exists on one side, sand the face of the snorkel flange on the side that is opposite the gap. Use a flat sanding block. Check the flushness of the flange and sand as required until the gap is eliminated. Alternatively, roughen the face of the snorkel flange and use epoxy/flox to mold a new flange against the fuel injector.

Step 4: Insert the snorkel into the air filter frame and attach the air filter frame to the left air ramp with all of the screws.

Step 5: Attach the snorkel flange to the fuel injector. Tighten the bolts finger-tight.

Step 6: Use an angle drill to drill #40 two alignment holes in each of the four sides of the air filter frame and snorkel. See Figure 1.

Step 7: Remove the snorkel and air filter frame from the aircraft.

Step 8: Cleco the air filter frame to the snorkel at the alignment holes.

Step 9: Mark the upper edge of the snorkel for trimming where it meets the air filter frame as shown in Figure 2.

Step 10: Remove the snorkel from the air filter frame and trim the snorkel to the line marked in the previous step.

Step 11: Roughen, then clean the contact areas common to the snorkel and air filter frame. Use medium-grit sandpaper. See Figure 3.

Step 12: Attach the air filter frame and snorkel to the aircraft. Cleco the snorkel to the air filter frame.

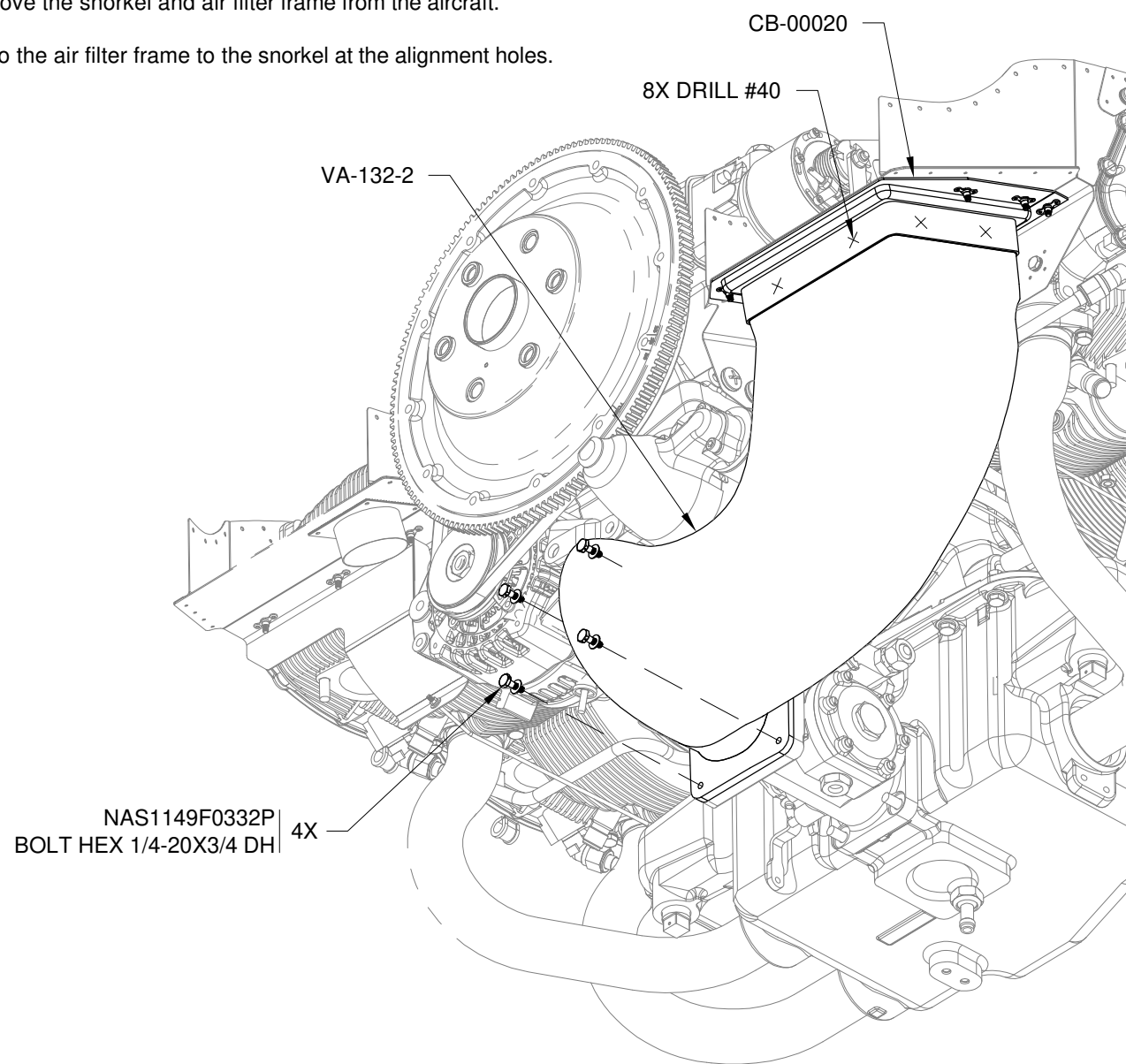


FIGURE 1: BOLT & DRILL SNORKEL

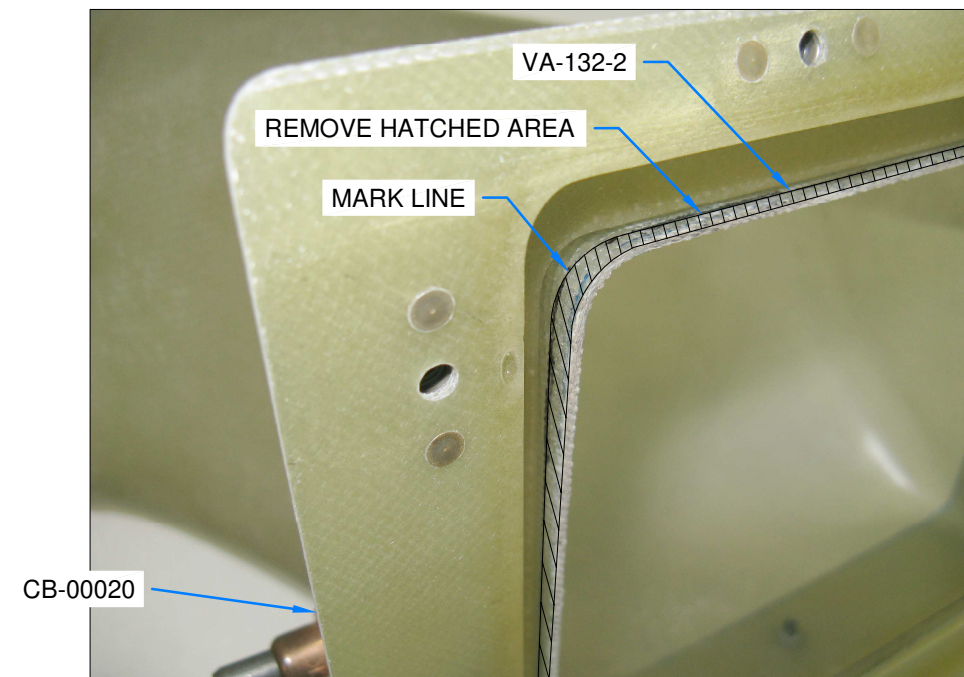


FIGURE 2: TRIM UPPER EDGE

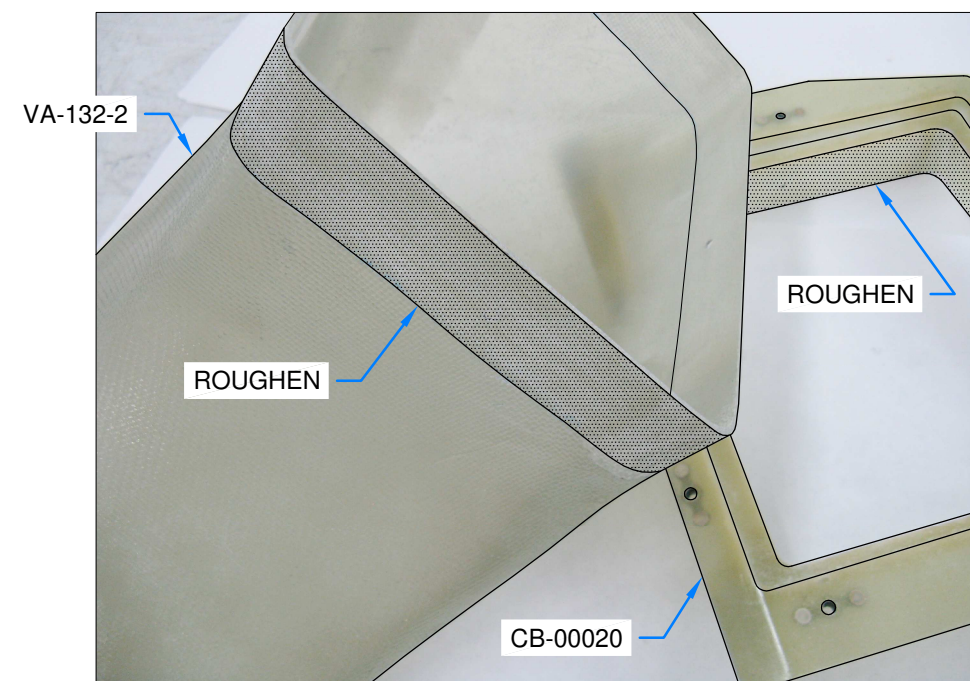
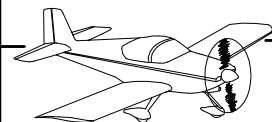


FIGURE 3: ROUGHEN CONTACT AREAS



NOTE: Steps 1 through 6 must be completed in a single work session.

NOTE: Put the epoxy/flox mixture into a heavy-gauge plastic bag. Cut a corner off of the bag to create a Ø3/32 in. [Ø2.4 mm] hole. Apply the epoxy/flox by squeezing the mixture through the hole (the way a cake decorator would put frosting on a cake).

Step 1: Mix cotton flox with epoxy resin per Section 5.18.

Step 2: Remove the clecos from one side of the CB-00020 Air Filter Frame.

Pry back the VA-132-2 Snorkel from the air filter frame and squeeze epoxy/flox into the space between the snorkel and air filter frame.

Coat the clecos with a release agent (e.g. Boelube, PVA, automotive wax, etc.) and re-cleco the snorkel to the air filter frame.

It is unnecessary to apply epoxy/flox to all of the contact area between the snorkel and the air filter frame: a line of epoxy/flox will suffice.

Step 3: Repeat the above step for the remaining three sides of the air filter frame.

Step 4: Squeeze epoxy/flox into any voids remaining around the upper edge of the snorkel so that an air-tight seal will be formed between the snorkel and the air filter frame. Pay special attention to the corners.

Step 5: Remove excess epoxy/flox from around both the air filter frame "ledge" and the lower edge of the air filter frame. See Figure 1.

Step 6: Allow the epoxy/flox mixture to fully cure.

Step 7: Uninstall the air filter frame/snorkel.

Step 8: Remove the Mylar packing tape from the fuel inlet and air inlet of the fuel injector servo.

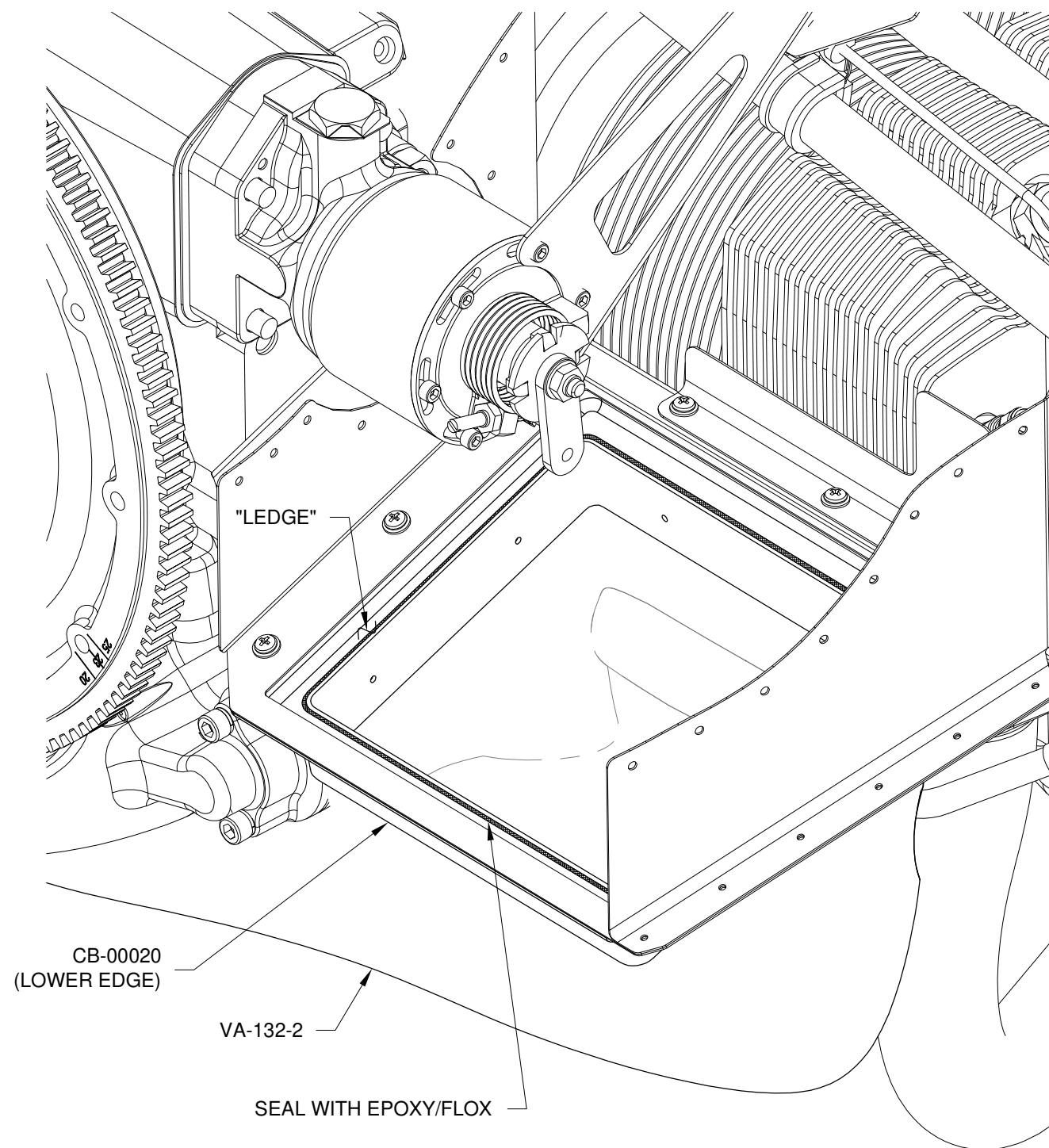


FIGURE 1: FLOX SNORKEL TO AIR FILTER FRAME



Step 1: Cut a hole for the VA-192A Alternate Air Inlet in the outboard face of the VA-132-2 Snorkel and CB-00020 Air Filter Frame as shown in Figure 1. Use the dimensions shown in Figure 2.

Step 2: Insert the alternate air inlet into the hole in the snorkel. Adjust the alternate air inlet until its flange lays flat on the snorkel surface.

Step 3: Adjust (rotate) the alternate air inlet until the center of the nutplate attach hole is 3 3/8 in. [85.7 mm] from the outer diameter of the number 2 cylinder oil return line (in the plane of the air inlet). See Figure 2.

Step 4: Remove the alternate air inlet and drill #40 the nutplate attach hole in the snorkel at the marked location.

Step 5: Insert the alternate air inlet into the hole in the snorkel. Adjust the alternate air inlet until its flange lays flat on the snorkel surface and the nutplate attach hole aligns with the #40 hole in the snorkel. See Figure 2.

Step 6: Match-Drill #30 the upper left hole in the alternate air inlet into the air filter frame and snorkel as shown in Figure 1.

Step 7: Match-Drill #19 the alternate air inlet nutplate attach hole into the snorkel as shown in Figure 1. **DO NOT** match-drill the two nutplate rivet holes.

Step 8: Remove the alternate air inlet.

Step 9: Final-Drill #40 the alternate air inlet nutplate rivet holes.

Step 10: Dimple the #30 and #40 holes in the alternate air inlet as shown in Figure 1.

Step 11: Rivet a nutplate to the alternate air inlet as shown in Figure 1.

Step 12: Attach the VA-192B Filter Bypass Door (in its closed position) to the alternate air inlet with a #8 screw in order to use the door as a bending form.

Bend the tab of the alternate air inlet over the filter bypass door. See Figure 1.

Remove the bypass door. Crimp the forward 1/4 in. [6.4mm] of the alternate air inlet tab to form a stop for the bypass door.

Step 13: Coat a #8 screw with release agent and thread it fully into the alternate air inlet nutplate.

Step 14: Machine countersink the upper left hole in the snorkel as shown in Figure 1.

Step 15: Final-Drill 1/4 the nutplate attach hole in the snorkel. This will allow the backside of the nutplate to fit into the snorkel.

Step 16: Roughen, then clean the outside surface of the snorkel around the hole for the alternate air inlet.

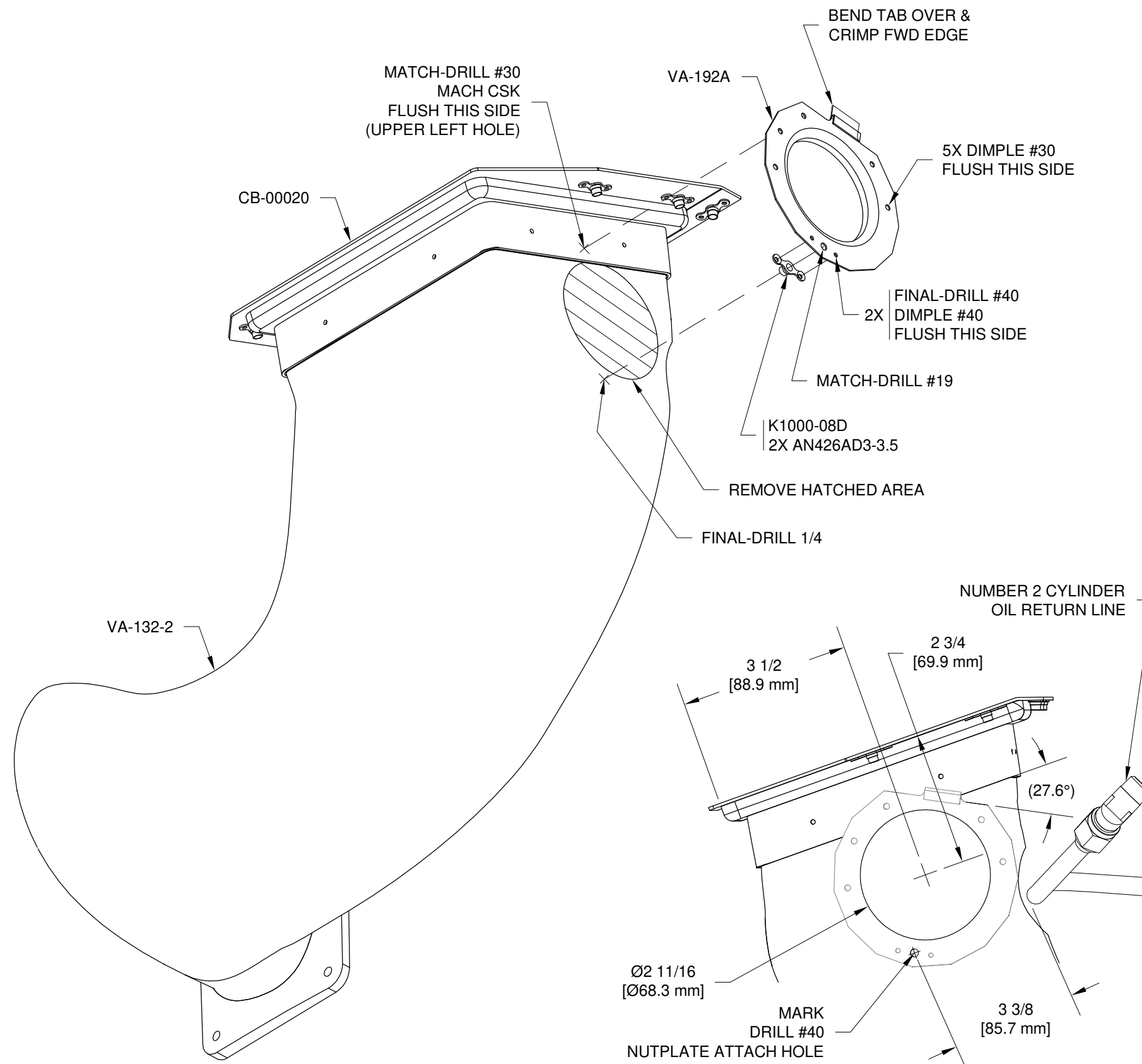


FIGURE 1: FIT ALT AIR INLET

FIGURE 2: ALT AIR HOLES



Step 1: Cover the cleco holes common to the CB-00020 Air Filter Frame and snorkel with Mylar packing tape. Apply the tape to the inside surface of the snorkel.

Step 2: Mix cotton floc with epoxy resin per Section 5.18.

Step 3: Apply the epoxy/floc mixture to the VA-132-2 Snorkel around the hole for the VA-192A Alternate Air Inlet.

Step 4: Fill the cleco holes common to the air filter frame/snorkel with epoxy/floc mixture.

Step 5: Coat a cleco with a release agent and cleco the alternate air inlet to the snorkel at the upper left hole. See Figure 1.

Verify that the alternate air inlet nutplate is aligned with the hole in the snorkel. See Figure 1.

Step 6: Shape/work the epoxy/floc mixture so that the gap between the alternate air inlet and the snorkel is filled.

Step 7: Allow the epoxy/floc mixture to fully cure. Remove the cleco and #8 screw from the alternate air inlet.

Step 8: Match-Drill #30 the holes in the alternate air inlet into the snorkel.

Remove excess cured epoxy/floc from the dimples in the alternate air inlet with a countersink tool.

Step 9: Rivet the alternate air inlet to the snorkel as shown.

Step 10: Machine countersink the VA-192B Filter Bypass Door as shown.

Step 11: Install the hardware on the filter bypass door as shown in Figure 1. Tighten the nuts as shown.

Step 12: Attach the filter bypass door to the snorkel as shown.

Verify that the filter bypass door rotates freely (do not over-tighten the screw).

Remove material from the bypass door if it interferes with the tab on the alternate air inlet. See Figure 1.

Verify that the filter bypass door does not prematurely catch the aft edge of the tab. Bend the aft edge of the tab as required.

Step 13: Drill #19 a drain hole at the lowest point in the snorkel as shown.

Step 14: Remove any debris from the inside of the snorkel.

Step 15: Install the snorkel on the fuel injector servo. See Page 47-17 for hardware callouts.

Step 16: Temporarily attach the snorkel to the baffle. See Page 47-09 for hardware callouts.

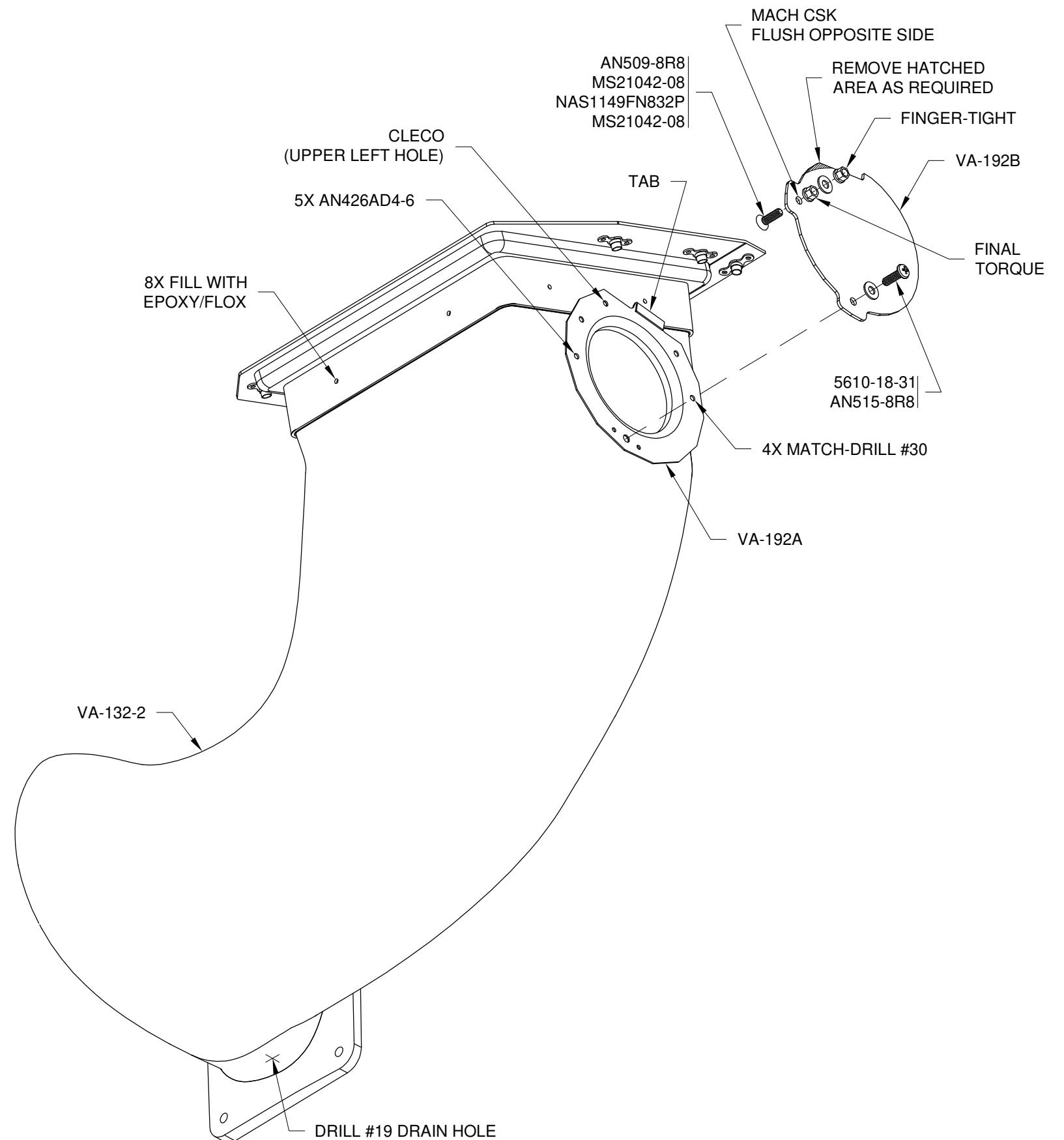
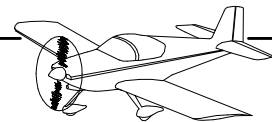


FIGURE 1: ATTACH ALT AIR INLET & DOOR



Step 1: Cut-out the right air ramp cone bending template shown in Figure 1 on Page 47-31.

Step 2: Deburr the CB-00034 Right Air Ramp Cone.

Step 3: Adhere the paper bending template to the cone using spray adhesive.

NOTE: When clamping parts for bending, vise jaws must have sharp upper edges and smooth faces. If required, use two pieces of scrap aluminum angle as jaw caps.

NOTE: Practice the following steps on a piece of .032 in. [0.8 mm]-thick scrap aluminum before bending the actual part.

Step 4: Clamp the right air ramp cone in a vise at the "1" bend line as shown in Figure 1. The template bend lines are numbered in the order in which the bends will be made.

Step 5: Bend the right air ramp cone approximately 10.0° along the entire length of the "1" bend line. The template should be on the outside of the bend.

Step 6: Loosen the vise, then clamp the cone at the next bend line in sequence and repeat the bending process.

Step 7: Continue bending until lines 1 to 6 have been bent, then flip the cone over in the vise and bend lines 7 to 10. See Figure 2.



FIGURE 1: BEND LINES 1 TO 6



FIGURE 2: BEND LINES 7 TO 10

Step 8: Cut-out the cone radii template shown in Figure 2 on Page 47-31.

Step 9: Use the radii template to check the right air ramp cone for proper shape as shown in Figure 3. Place the edge of the template along the forward edge of the cone and align the template lines with the upper and inboard edges of the cone.

Test-fit the cone to the aircraft at the corner between the CB-00003 Cylinder 1 Baffle and CB-00007 Right Air Ramp as shown in Figure 4.

Adjust/bend the cone by hand as required.

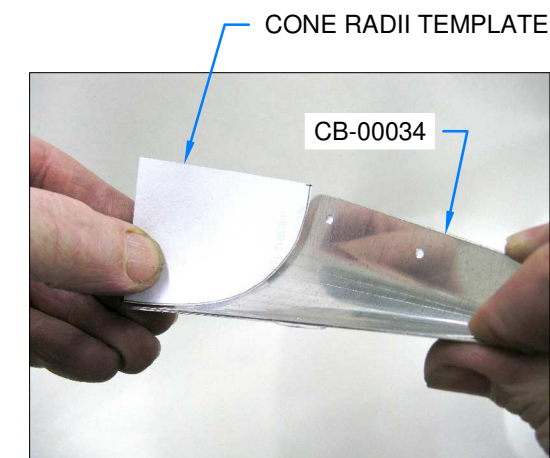


FIGURE 3: CHECK CONE SHAPE

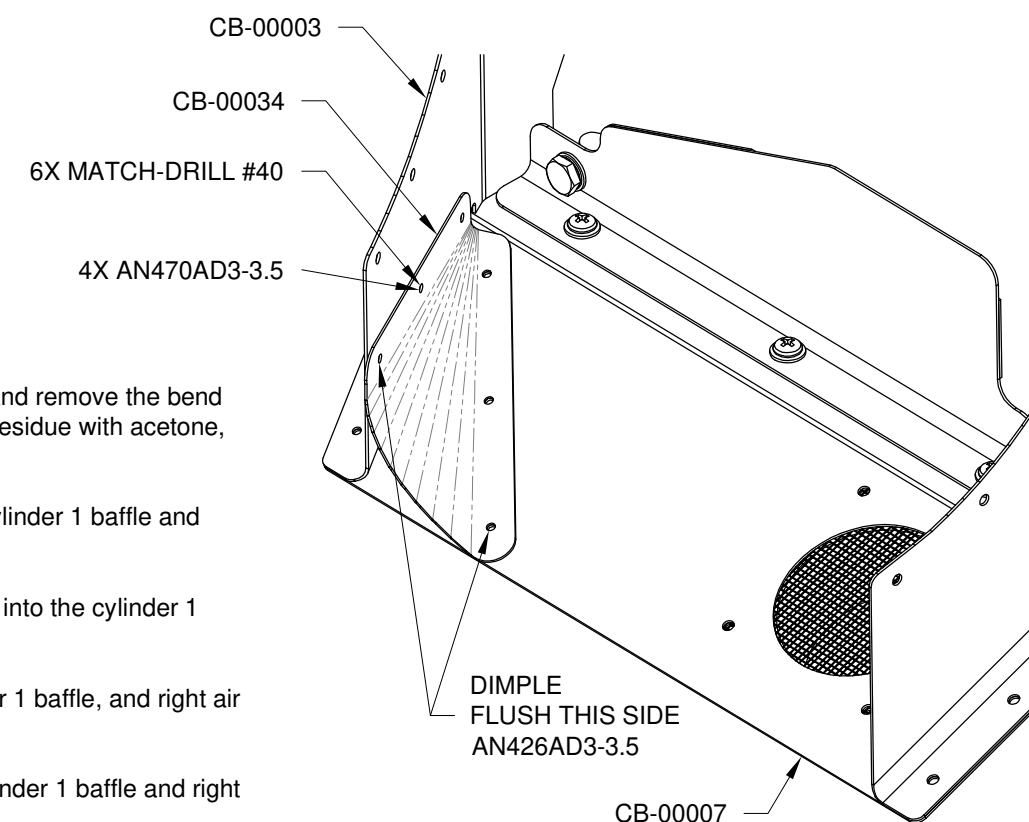


FIGURE 4: ATTACH RIGHT AIR RAMP CONE

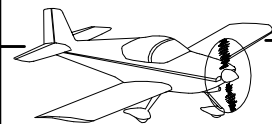
Step 10: Soak the cone in water and remove the bend template. Remove any adhesive residue with acetone, or equivalent.

Step 11: Clamp the cone to the cylinder 1 baffle and right air ramp. See Figure 4.

Step 12: Match-Drill #40 the cone into the cylinder 1 baffle and right air ramp.

Step 13: Dimple the cone, cylinder 1 baffle, and right air ramp as shown in Figure 4.

Step 14: Rivet the cone to the cylinder 1 baffle and right air ramp as shown in Figure 4.



Step 1: Cut-out the air filter frame cover bending template shown in Figure 3 on Page 47-31.

Step 2: Deburr the CB-00033 Air Filter Frame Cover.

Step 3: Adhere the paper bending template to the bottom of the cover using spray adhesive as shown in Figure 1.

NOTE: Practice the following steps on a piece of .032 in. [0.8 mm]-thick scrap aluminum before bending the actual part.

Step 4: Clamp the air filter frame cover in a vise at the "1" bend line as shown in Figure 2. The template bend lines are numbered in the order in which the bends will be made.

Step 5: Place the edge of a piece of approximately 5/16 in. [7.9 mm]-thick plywood against the cover at an angle roughly 10.0° greater than the angle indicated on the bend template. The larger angle will account for springback in the aluminum.

Step 6: Hit the plywood with a heavy soft-faced hammer to create the required bend along the entire length of the "1" bend line. The template should be on the outside of the bend. Re-hit the plywood as required. See Figure 3.

Step 7: Loosen the vise, then clamp the cover at the next bend line in sequence and repeat the bending process.

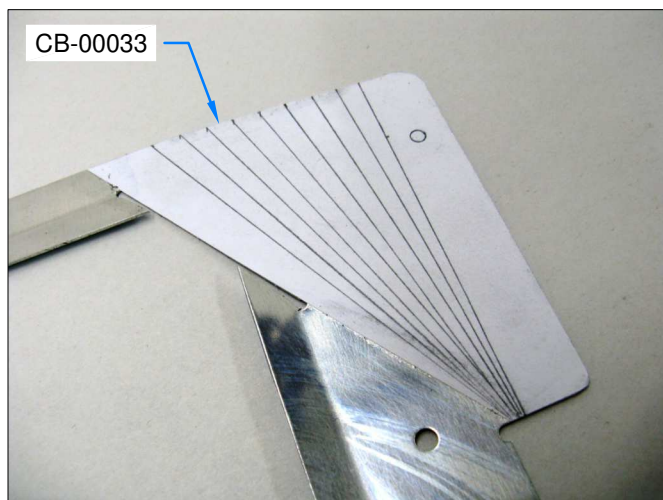


FIGURE 1: ADHERE BENDING TEMPLATE

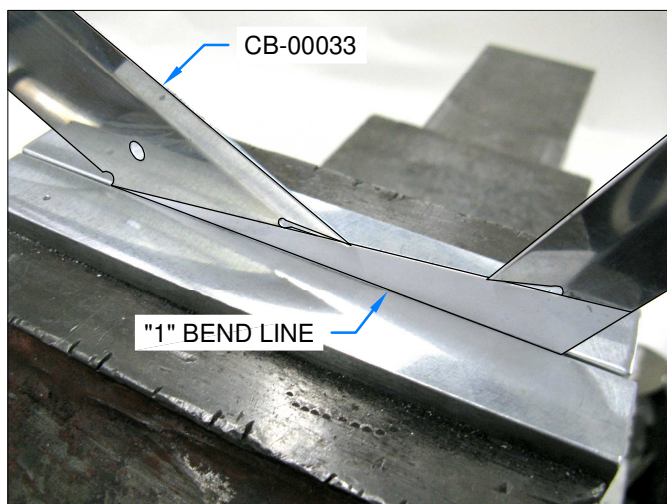


FIGURE 2: CLAMP COVER



FIGURE 3: HAMMER & PLYWOOD

Step 8: Use the radii template from the previous page to check the air filter frame cover for proper shape. Place the edge of the template along the forward edge of the cover and align the upper edge line on the template with the upper edge of the cover.

Test-fit the cover to the aircraft as shown in Figure 4.

Adjust/bend the cover by hand as required.

Step 9: Soak the cover in water and remove the bend template. Remove any adhesive residue with acetone, or equivalent.

Step 10: Install the E-33-2060 Air Filter into the CB-00020 Air Filter Frame.

Step 11: Attach the cover to the CB-00009 Left Air Ramp with screws. See Page 47-09 and Figure 4.

Step 12: Match-Drill #19 the hole in the cover into the CB-00001 Cylinder 2 Baffle as shown in Figure 4.

Step 13: Remove the cover and install a nutplate on the outside of the cylinder 2 baffle as shown in the detail view of Figure 4.

Step 14: Install the cover and CB-00006 Left Air Dam on the aircraft with screws.

Step 15: Fully tighten and safety wire the fuel injector attach bolts. See Page 47-17.

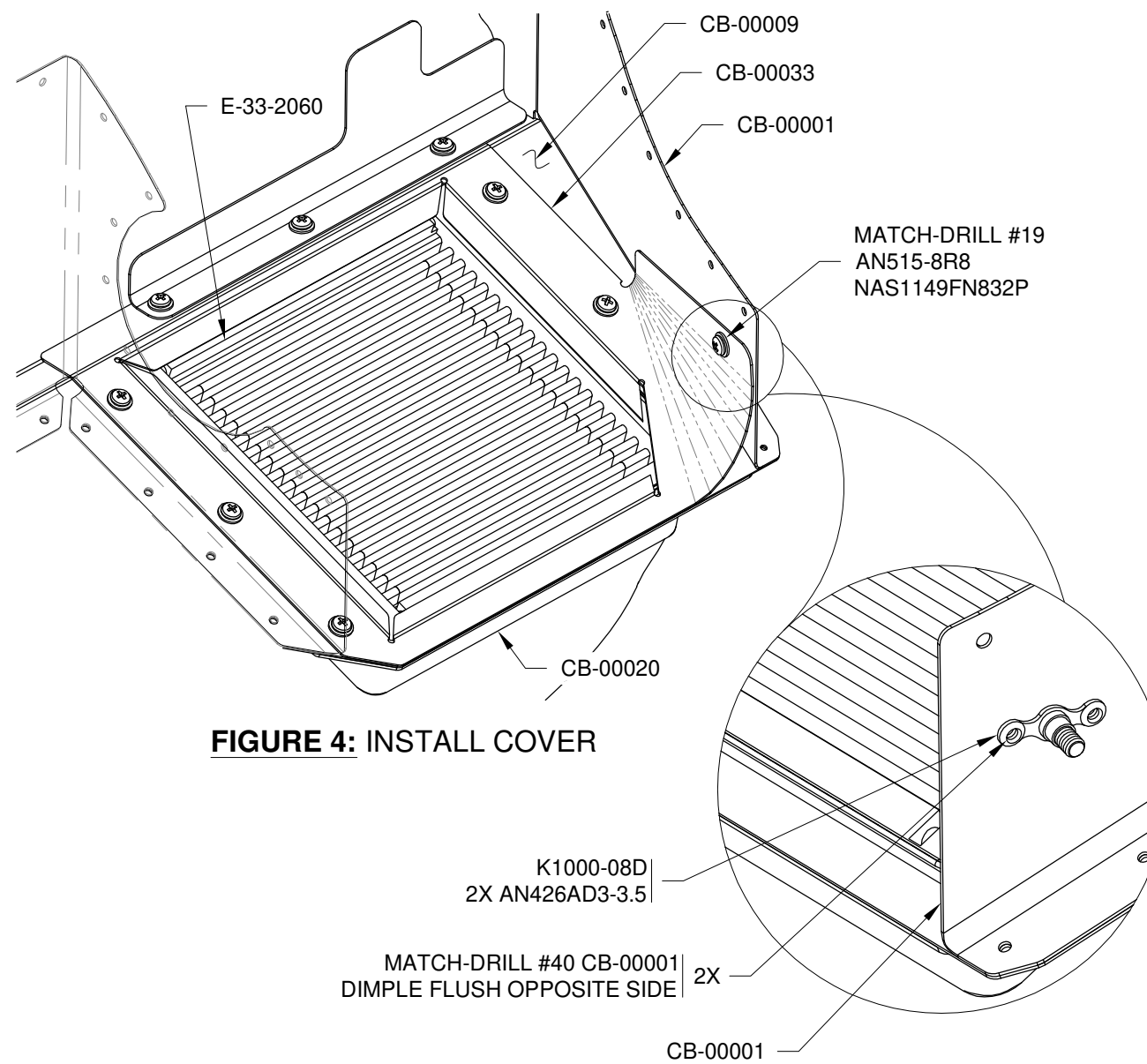
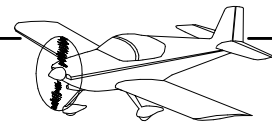


FIGURE 4: INSTALL COVER



NOTE: The CB-00032 Cowl Baffle Seals must curve inward (to the high pressure side of the baffle). The high pressure air inside the cowl baffle will hold the baffle seals against the cowl.

CAUTION: When installing the top cowl, ensure that the baffles seals (especially the two aft baffle seals) curve inward. If a baffle seal flips outward, it will likely flap against the cowl and cause a noticeable and potentially destructive vibration!

Step 1: Cleco, then rivet, the CB-00032 Cowl Baffle Seals to the inside surfaces of the forward and aft baffles as shown in Figure 1. Place a WASHER-00009 between the shop head of each rivet and the baffle seal. See Figure 2.

Install the baffle seals sequentially (A through M). Trim the baffle seals and WASHER-00009 as required to clear the forward cylinders. None of the rivet holes are shared between seals. Refer to Figure 3 for the baffle seal part numbers and orientation.

Step 2: Add a thin layer of epoxy resin to the inside surface of the top cowl where it contacts the baffle seals. This will reduce friction and help to prevent the seals and/or cowl from chafing.

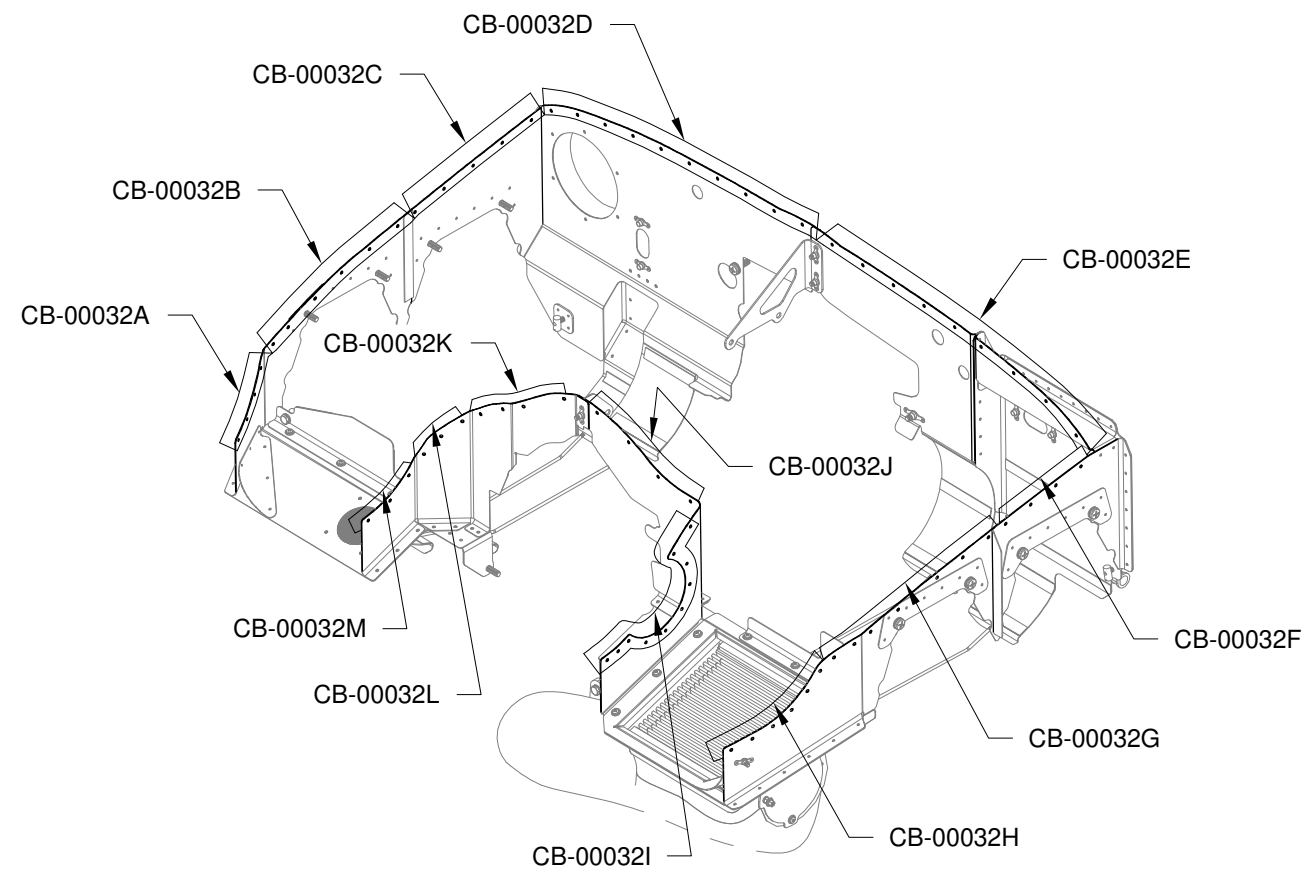


FIGURE 1: ATTACH BAFFLE SEALS

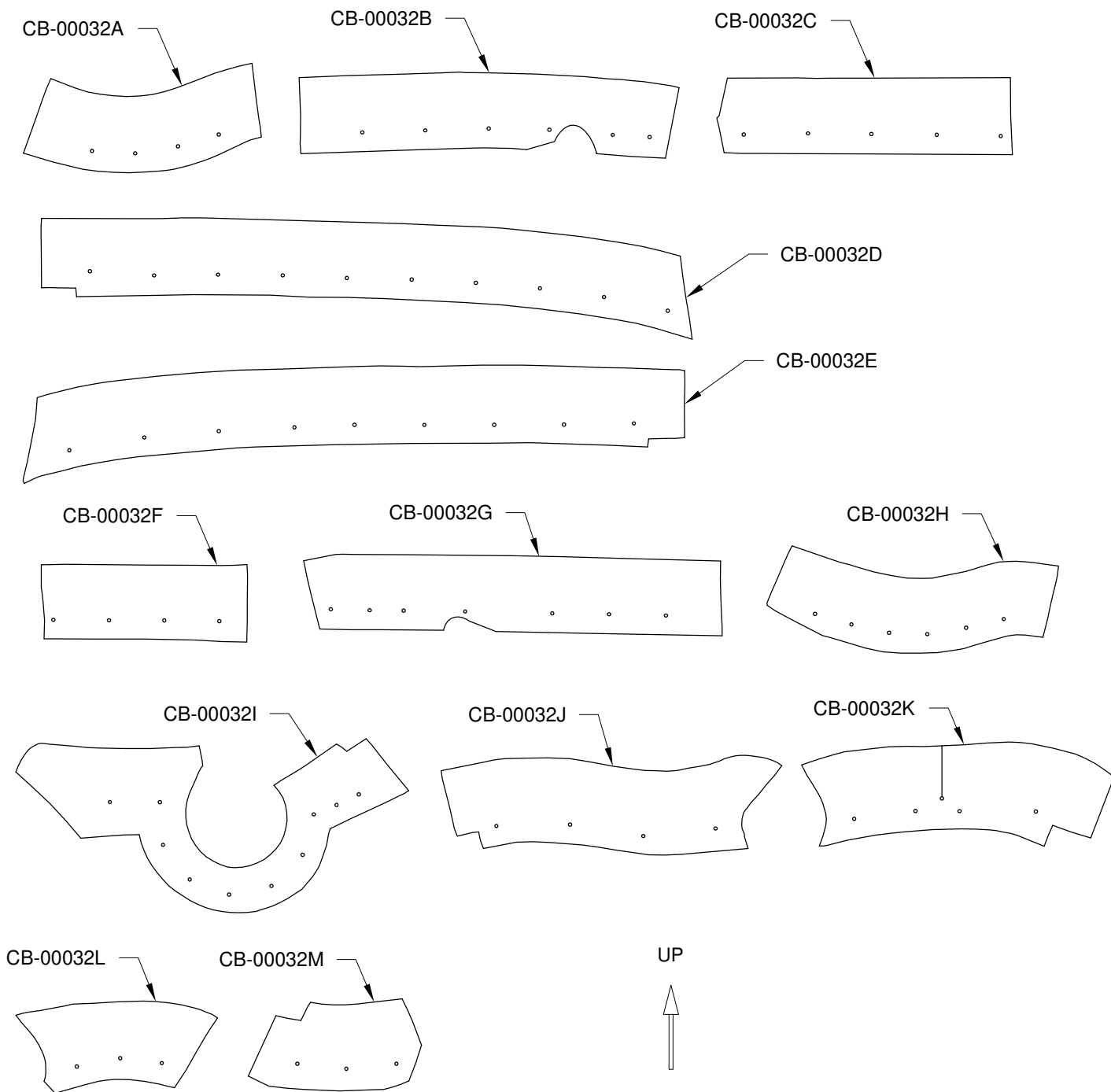
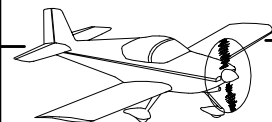


FIGURE 3: BAFFLE SEAL PART NUMBERS
(SIDE THAT CONTACTS BAFFLE SHOWN FACING UP)



FIGURE 2: BAFFLE SEAL HARDWARE



Step 1: Route the engine ignition wires through the holes in the CB-00018 Baffle Back Plate and CB-00015 Right Aft Baffle and install both ignition wire harness seals. See Figure 1.

Step 2: Fabricate the CB-00031 Magneto Cooling Tubes by cutting two 9 in. [228.6 mm] lengths of DUCT CBT-5/8 Cooling Blast Tube.

Step 3: Install the two magneto cooling tubes as shown in Figure 1.

Squeeze and twist the cooling tubes to insert them into the baffle holes. To prevent chafing and air leaks, apply RTV sealant around the cooling tubes where they contact the baffle holes.

Attach each cooling tube to the engine mount (and to the magneto bodies if possible) with a blob of RTV sealant. In order for the cooling tubes to be effective, the tube outlets must be positioned as close to the magneto bodies as possible.

Step 4: Seal all of the gaps between the cowl baffle and engine with RTV sealant. Small openings can add up to significant pressure losses which will adversely affect the cooling potential of the baffle system. For better access to the right aft baffle, temporarily remove the engine oil filler tube.

Step 5: Safety wire the engine oil filler tube to the crankcase.

Step 6: Verify that all of the fasteners installed throughout this section are fully tightened.

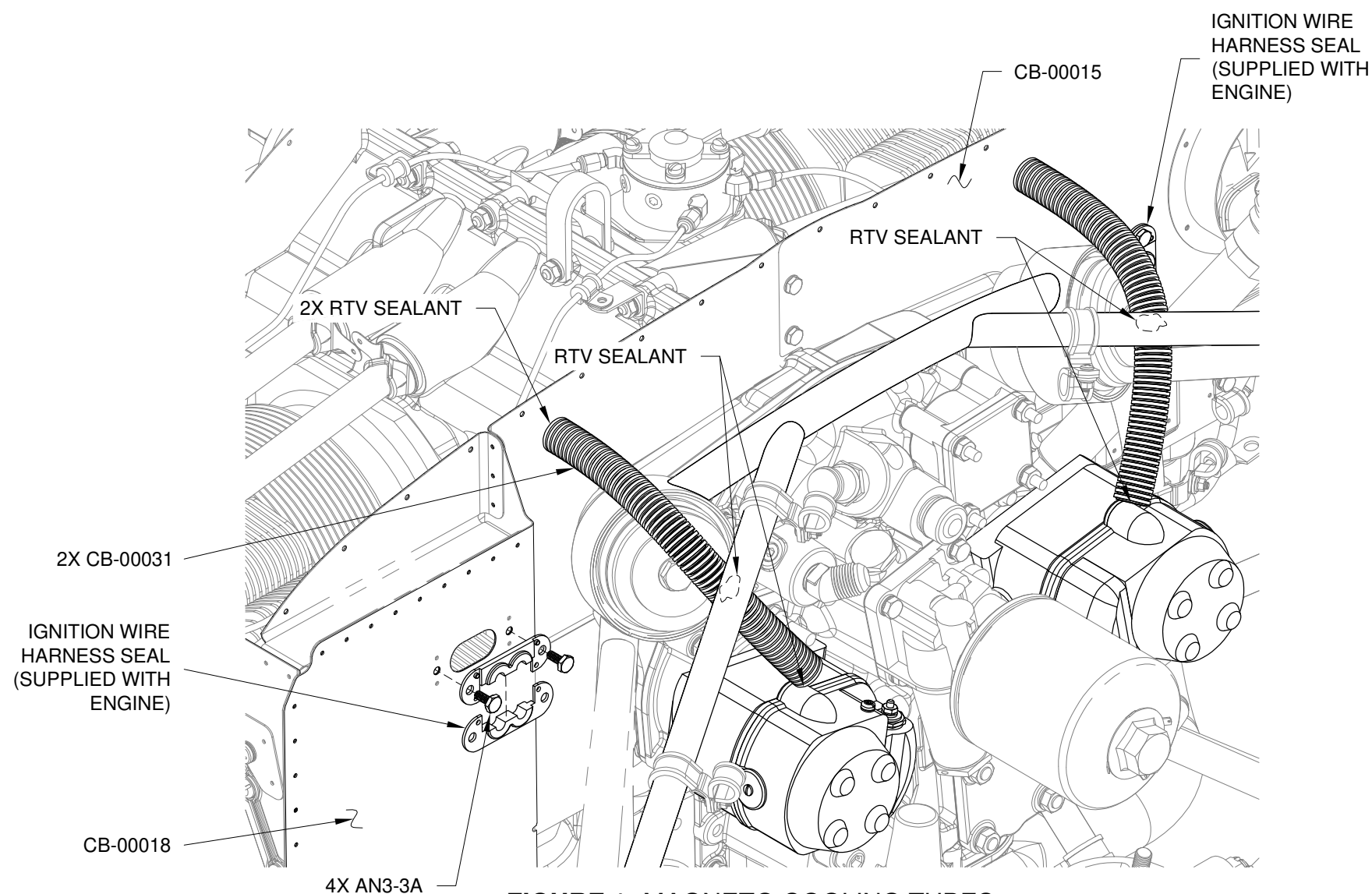
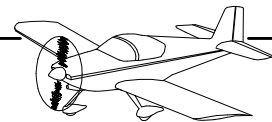


FIGURE 1: MAGNETO COOLING TUBES



Step 1: Install the COWL-00002 Bottom Cowl on the aircraft using the side hinge pins and bottom screws.

Step 2: Become familiar with the misalignment between the bottom cowl air inlets and the CB-00033 Air Filter Frame Cover, CB-00007 Right Air Ramp, and CB-00034 Right Air Ramp Cone. See Figure 1 and Figure 2.



FIGURE 1: MISALIGNMENT - LEFT

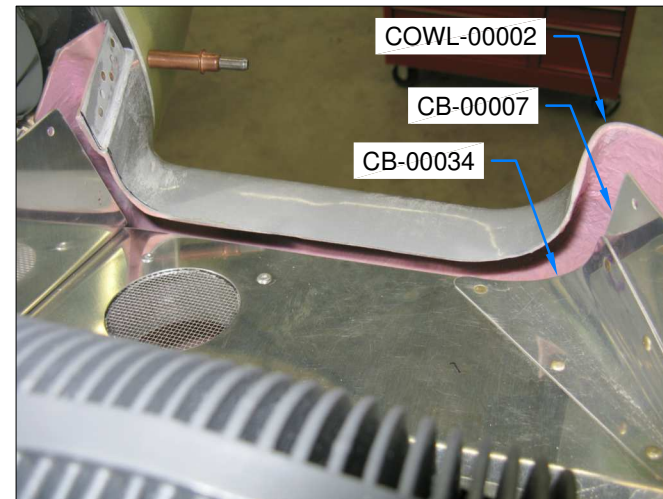


FIGURE 2: MISALIGNMENT - RIGHT

Step 3: Measure the distance between the bottom cowl inlets and the air filter frame cover and right air ramp at five equally-spaced points as shown in Figure 3. Mark each dimension on the bottom cowl.

Step 4: Remove the bottom cowl.

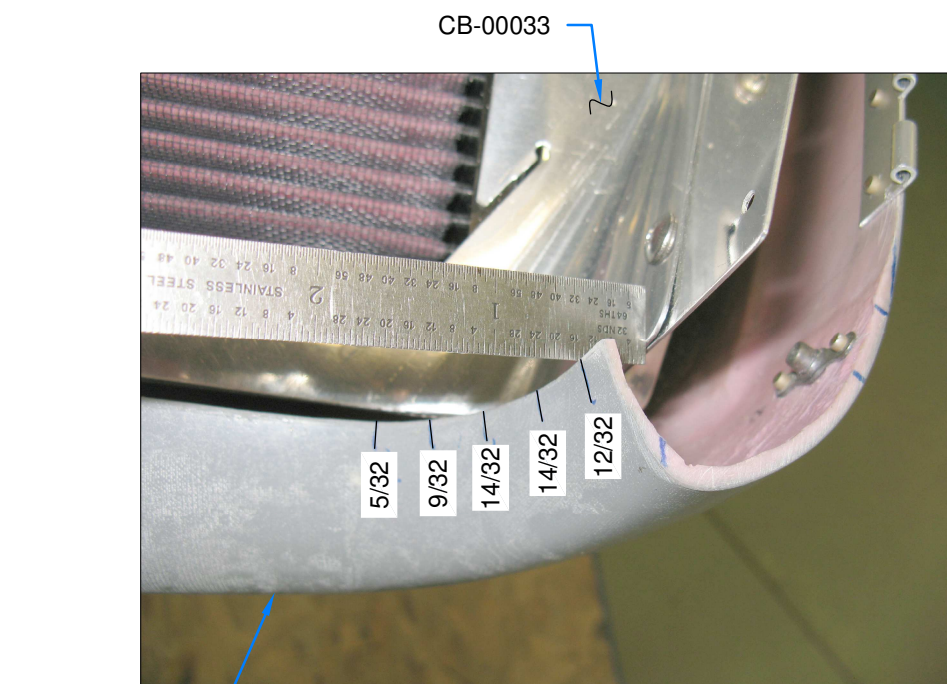


FIGURE 3: MEASURE GAP
(LEFT SIDE SHOWN, DIMENSIONS ARE EXAMPLE ONLY)

Step 5: Hand-form the CB-00036-L & -R Clamping Strips to match the shape of the bottom cowl inlets as shown in Figure 4, Figure 5, and Figure 6.

Leave a gap at the outboard end of each clamping strip that matches the dimensions marked on the cowl in Step 3 **minus** 3/32 in. [2.4 mm] to account for the thickness of the CB-00032N and CB-00032O Cowl Baffle Seals (not yet installed).

The aft edge of each clamping strip aligns with the aft edge of each inlet: twist the outboard ends as required.

Form each inboard bend with an approximate 3/16 in. [4.8 mm] bend radius.

Step 6: Sand smooth the inside surfaces of the bottom cowl that contact the clamping strips.

Step 7: Roughen, then clean, the inside surfaces of the bottom cowl where gaps exist between the cowl and the clamping strips. Use medium-grit sandpaper.

Step 8: Apply a release agent to the clamping strips.

Step 9: Clamp the clamping strips to the bottom cowl as shown in Figure 5 and Figure 6.

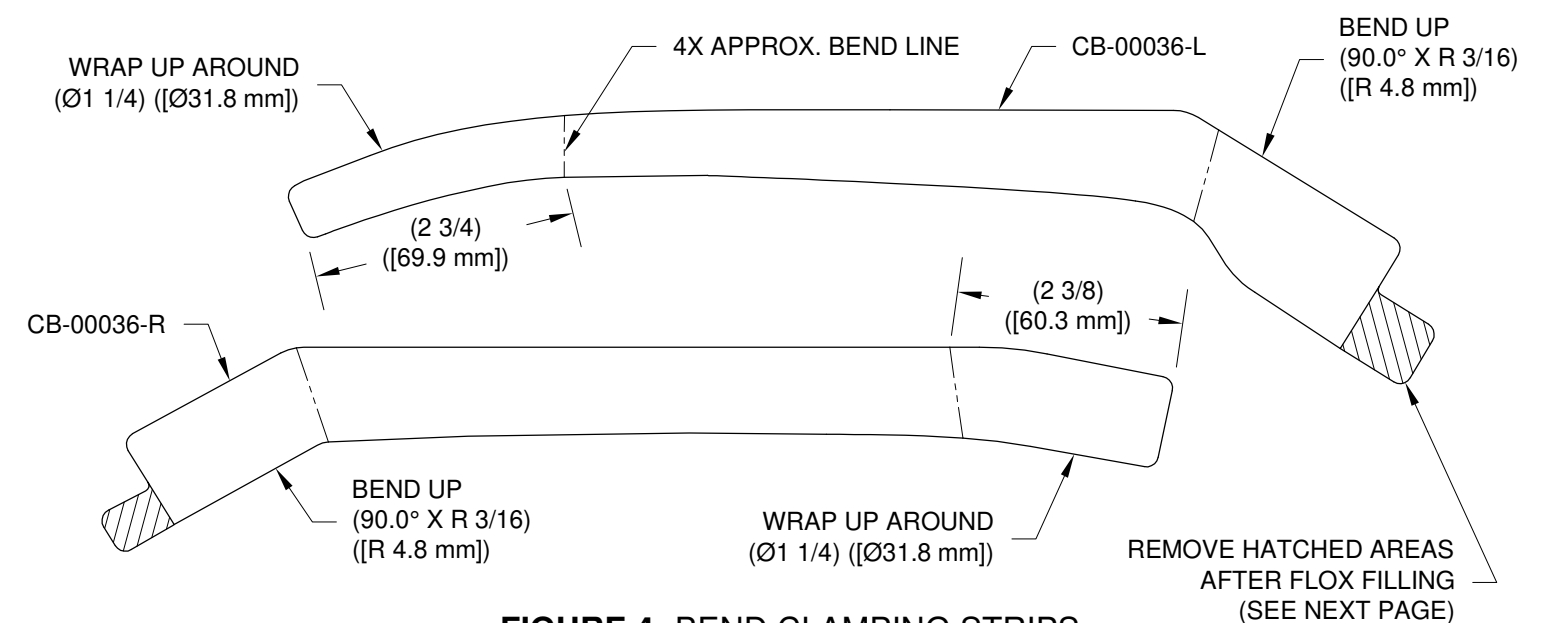


FIGURE 4: BEND CLAMPING STRIPS
(TOP SIDE LOOKING DOWN)

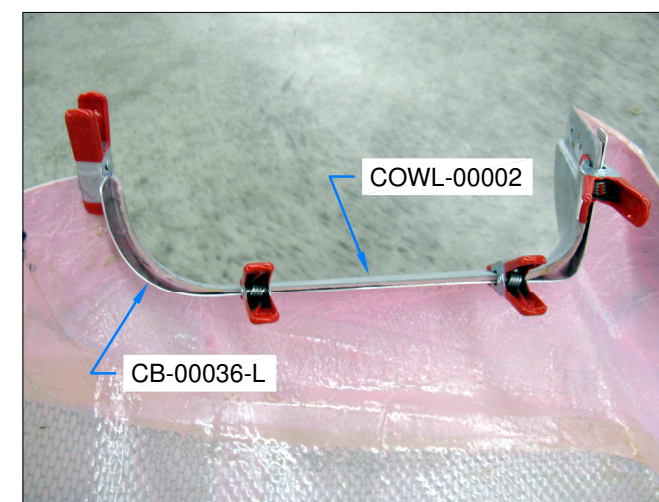


FIGURE 5: CLAMPING STRIP - LEFT
(AFT SIDE LOOKING FORWARD)



FIGURE 6: CLAMPING STRIP - RIGHT
(AFT SIDE LOOKING FORWARD)



Step 1: Position the COWL-00002 Bottom Cowl with the forward end pointing vertically downward.

Step 2: Mix cotton floc with epoxy resin per Section 5.18.

Step 3: Fill the gaps between the bottom cowl and the CB-00036-L & -R Clamping Strips with epoxy/flox mixture. Over-fill the gaps to ensure that any voids are eliminated. See Figure 1 and Figure 2.

Step 4: Allow the epoxy/flox mixture to fully cure.

Step 5: Remove the clamps and separate the clamping strips from the cured epoxy/flox.

Step 6: Trim off the clamping strip "tabs" as shown on the previous page.

Step 7: Sand away any epoxy/flox that projects beyond the aft edges of the bottom cowl air inlets as shown in Figure 3 and Figure 4.

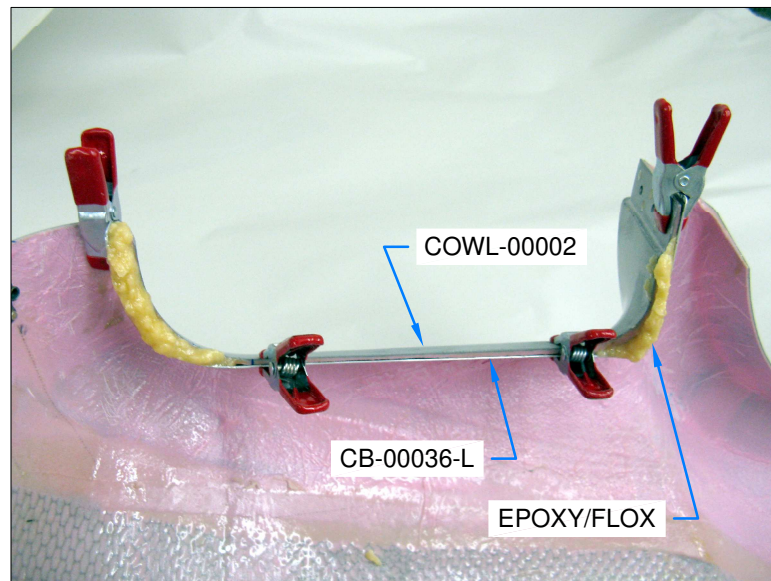


FIGURE 1: FILL GAPS - LEFT

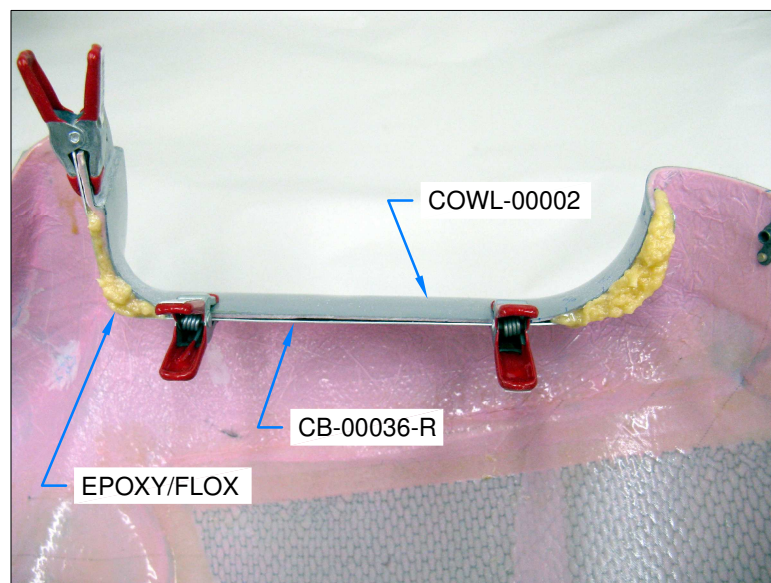


FIGURE 2: FILL GAPS - RIGHT

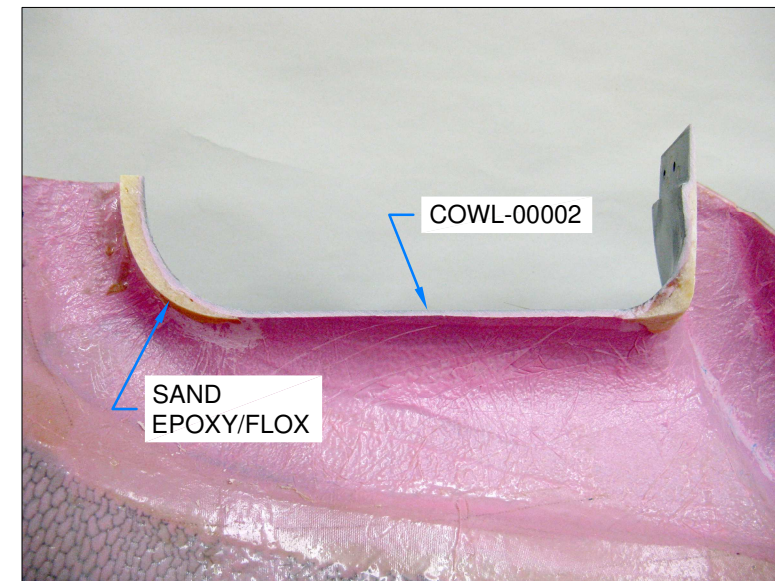


FIGURE 3: SAND FLUSH - LEFT

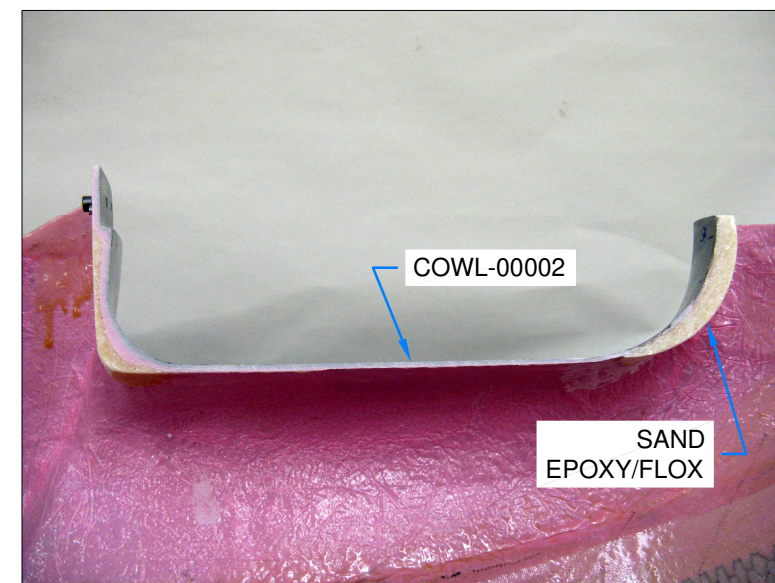
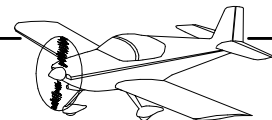


FIGURE 4: SAND FLUSH - RIGHT



Step 1: Grind/sand away the COWL-00002 Bottom Cowl and epoxy/flox at the inboard and outboard corners on the left and right sides to create smooth transitions (i.e. rounded surfaces with relatively sharp trailing edges) between the bottom cowl and the (soon-to-be-installed) CB-00032N and CB-00032O Cowl Baffle Seals. See Figure 1 and Figure 2.

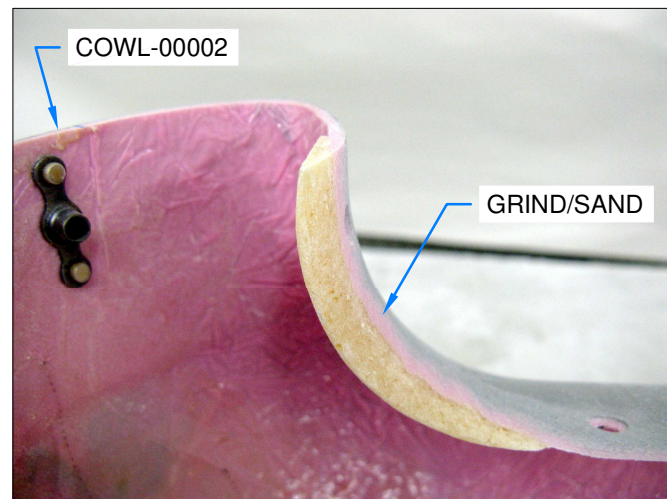


FIGURE 1: OUTBOARD TRANSITION - LEFT

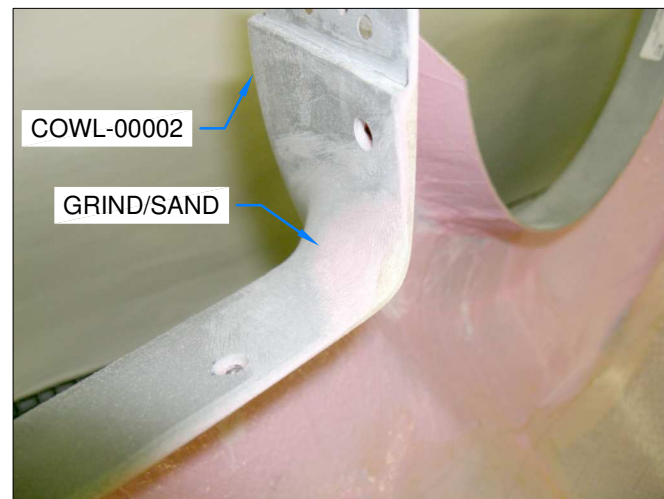


FIGURE 2: INBOARD TRANSITION - LEFT

Step 2: Join the COWL-00001 Top Cowl and bottom cowl together using the COWL HINGE PIN-LEFT and COWL HINGE PIN-RIGHT.

Step 3: Become familiar with the misalignment between the top cowl and bottom cowl at the outboard edges of the air inlets. Measure and record the offset between the top and bottom cowls. See Figure 3 and Figure 4.

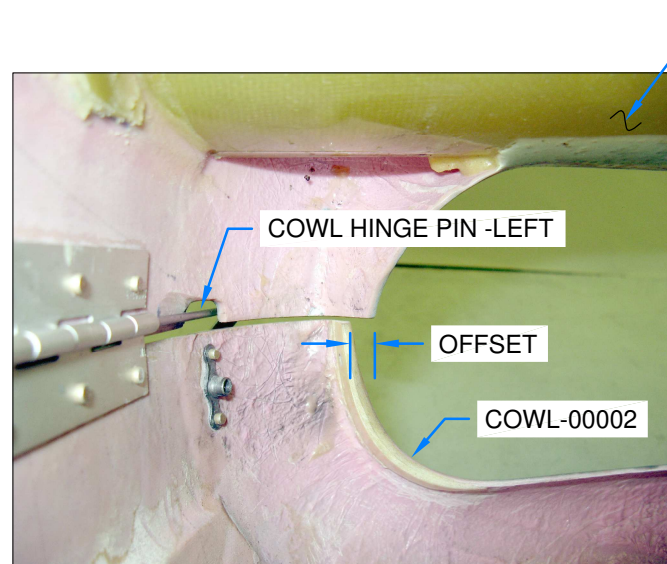


FIGURE 3: COWL MISALIGNMENT - LEFT

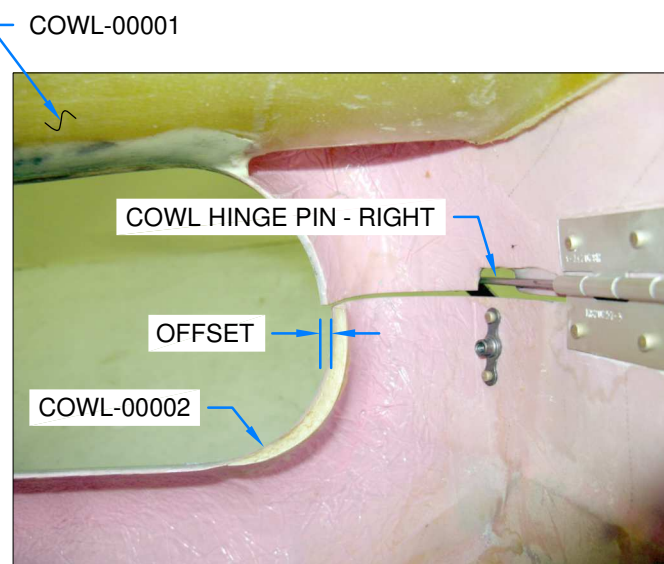


FIGURE 4: COWL MISALIGNMENT - RIGHT

Step 4: Separate the top and bottom cowls.

Step 5: Roughen the inside surfaces of the top cowl at the outboard edges of the air inlets where epoxy/flox will be applied. Use medium-grit sandpaper.

Step 6: Clean the sanded/roughened areas of the top cowl.

Step 7: Mix cotton floc with epoxy resin per Section 5.18.

Step 8: Apply a thick layer of epoxy/flox mixture to the roughened areas of the top cowl. Small pieces of peel ply can be used to keep the epoxy/flox in position. See Figure 5 and Figure 6.

Step 9: Allow the epoxy/flox mixture to fully cure.

Step 10: Remove the peel ply.

Step 11: Sand away any epoxy/flox that projects beyond the aft edges of the top cowl air inlets.

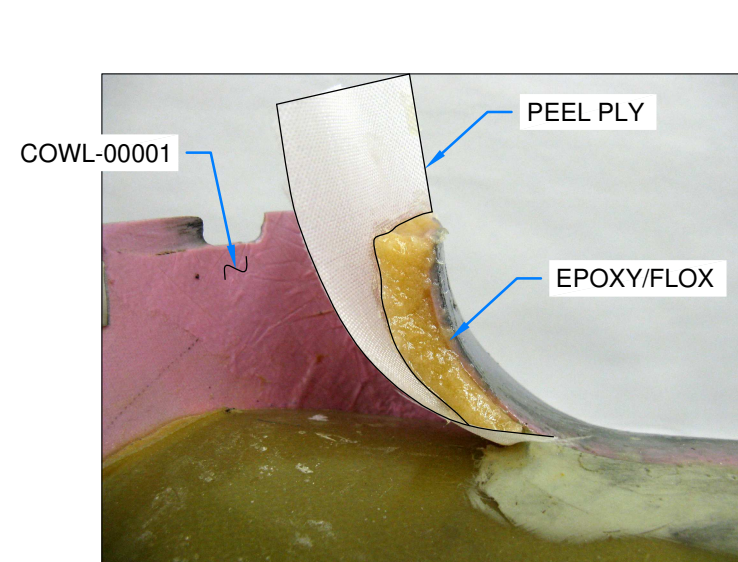


FIGURE 5: FLOX TOP COWL - RIGHT

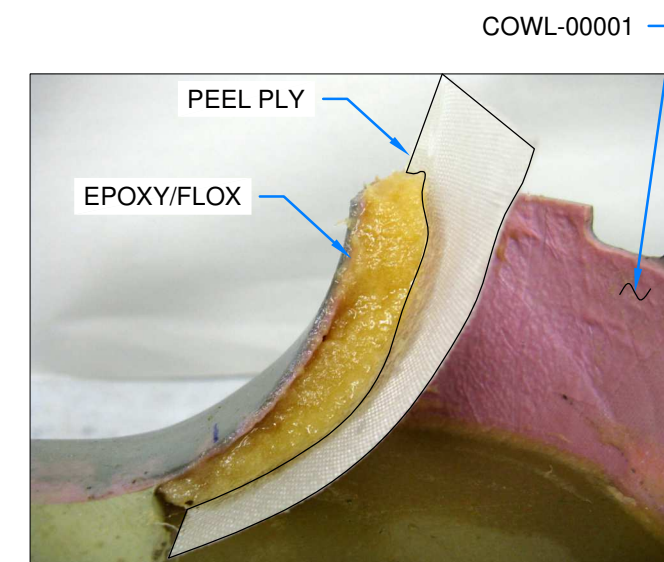


FIGURE 6: FLOX TOP COWL - LEFT



Step 1: Grind/sand away the COWL-00001 Top Cowl and epoxy/flox at the outboard corners to create smooth transitions (i.e. rounded surfaces) that match the curvature of the COWL-00002 Bottom Cowl. See Figure 1.

Step 2: Mark the locations of four screw holes around each bottom cowl air inlet using the approximate positions shown in Figure 2.

Step 3: Drill #27 the marked locations. Keep the drill bit perpendicular to the **inside** surface of the bottom cowl.

Step 4: Machine countersink the screw holes in the bottom cowl so that no part of the screw heads will sit above the cowl surface. Use a reduced-diameter #40 pilot countersink cutter.

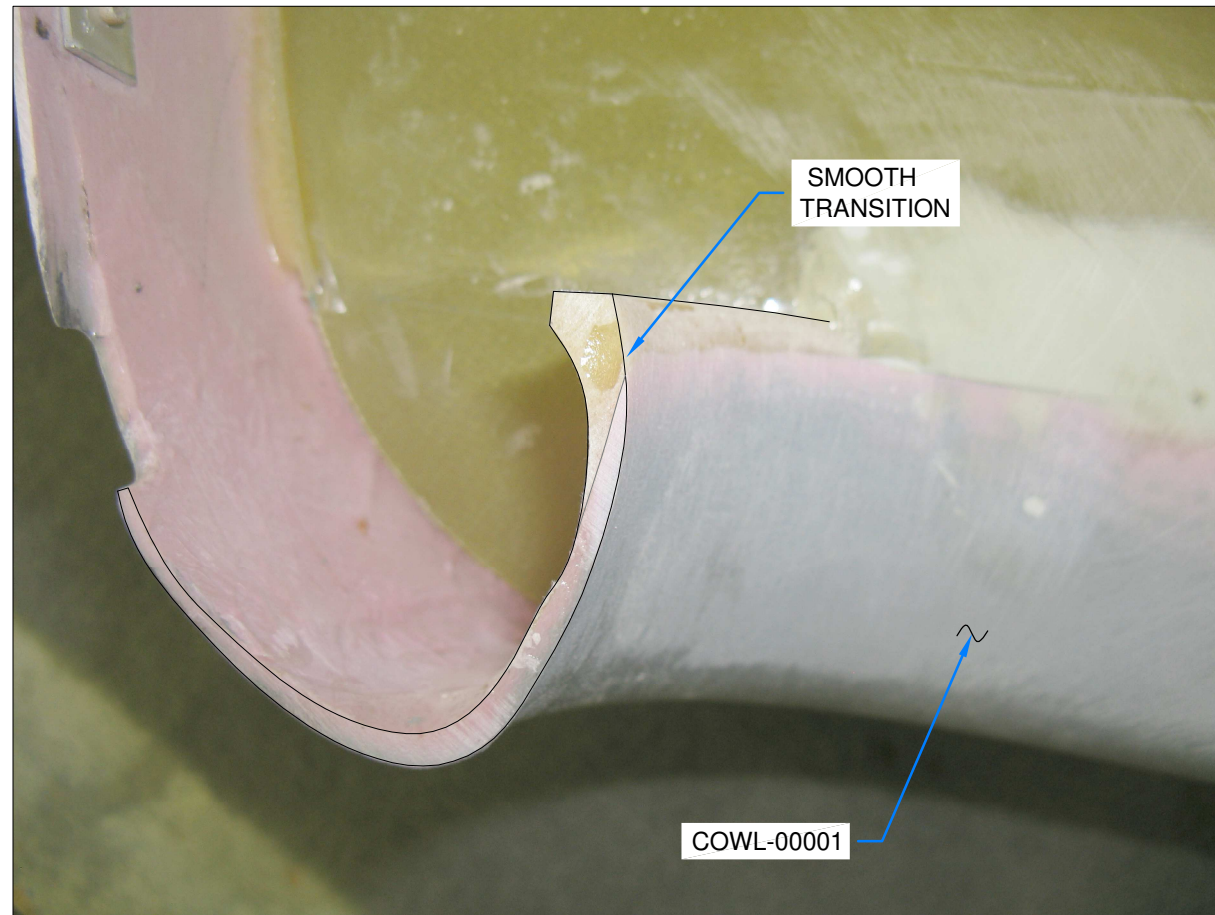


FIGURE 1: GRIND/SAND TOP COWL
(LEFT SIDE SHOWN)

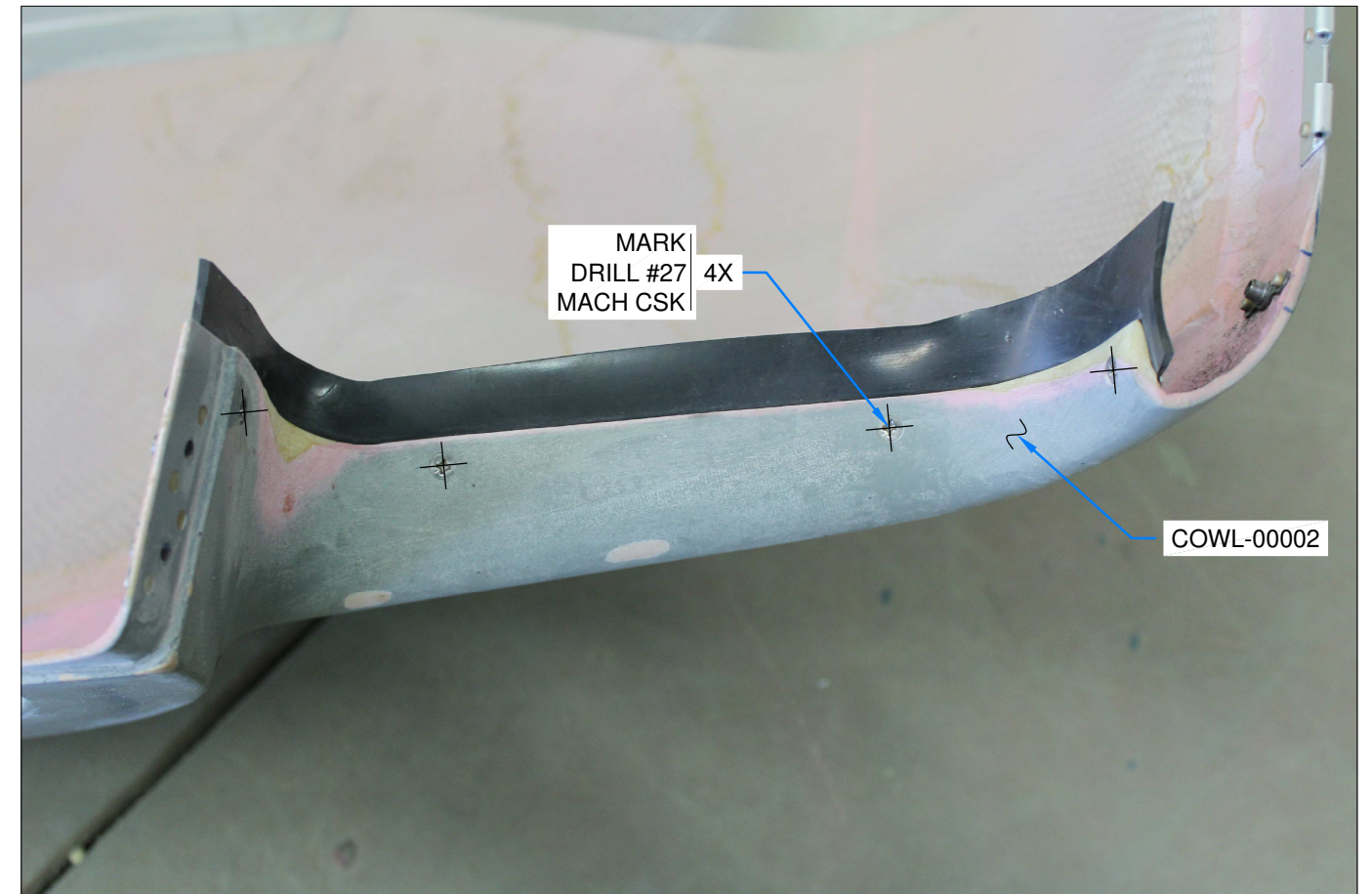
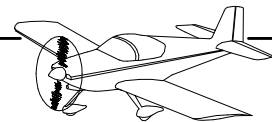


FIGURE 2: DRILL BOTTOM COWL
(LEFT SIDE SHOWN WITH SEAL INSTALLED)



Step 1: Clamp the CB-00032N and CB-00032O Cowl Baffle Seals between the COWL-00002 Bottom Cowl and the CB-00036-L & -R Clamping Strips. See Figure 1 and Figure 2.

Align the aft edge of each clamping strip with the aft edge of each bottom cowl air inlet. See Figure 1.

Approximately align the forward edge of each cowl baffle inlet seal with the forward edge of each clamping strip. See Figure 1.

Step 2: Match-Drill #27 the bottom cowl air inlet screw holes into the cowl baffle seals and clamping strips. Install hardware in each hole before drilling the next. See Figure 3.

Step 3: Remove the clamping strips and deburr the screw holes.

Step 4: Attach the cowl baffle seals to the bottom cowl using the clamping strips as shown in Figure 3. Tighten the screws to lightly compress the seals. **DO NOT** over-tighten the screws.

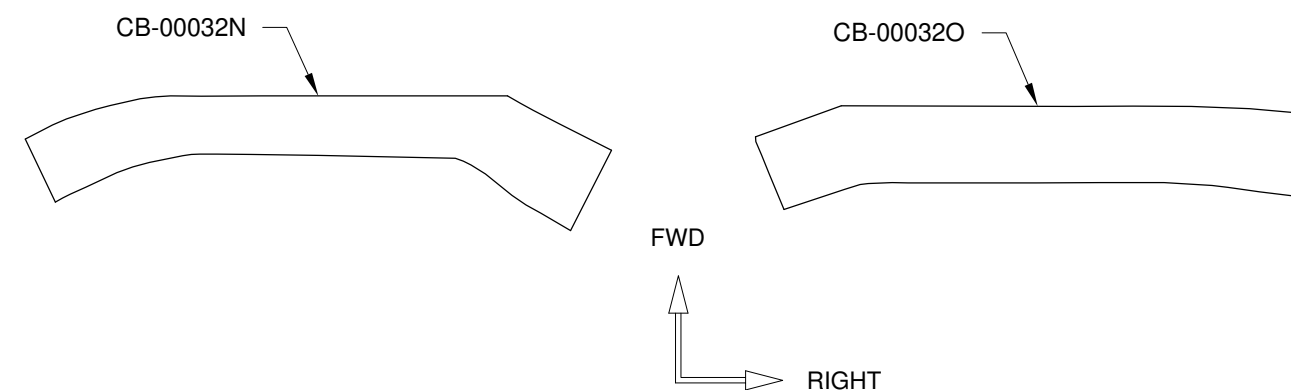


FIGURE 2: COWL BAFFLE INLET SEALS
(TOP SIDE LOOKING DOWN)

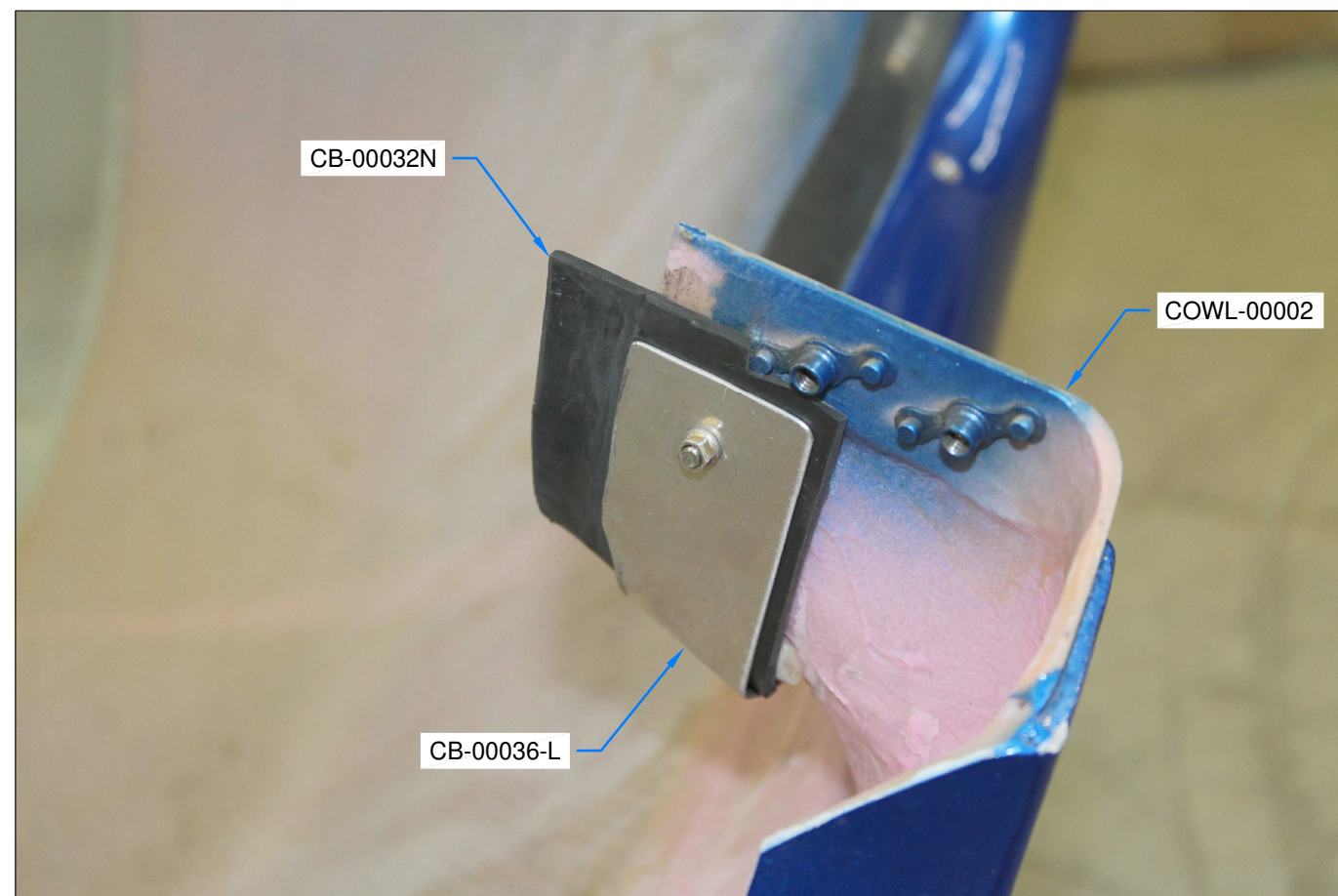


FIGURE 1: CLAMP INLET SEALS TO BOTTOM COWL
(LEFT SIDE SHOWN WITH HARDWARE INSTALLED)

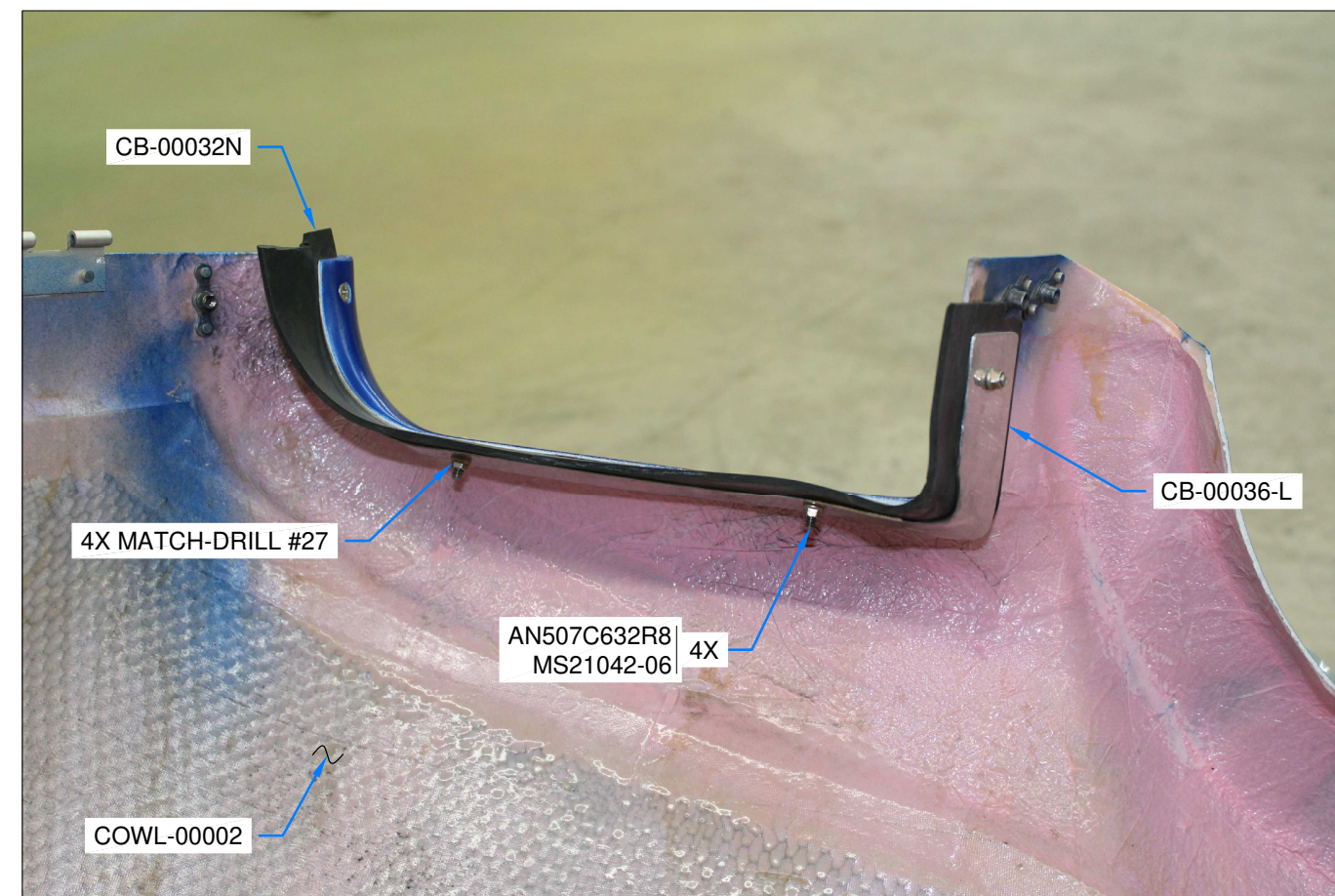
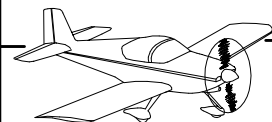


FIGURE 3: ATTACH INLET SEALS TO BOTTOM COWL
(LEFT SIDE SHOWN)



Step 1: Fabricate the inlet ramp / propeller governor seal from approximately 1 in. [25.4 mm]-thick closed-cell foam (not provided in kit) using the template provided in Figure 4 on Page 47-31. Avionics are often packed and shipped in a suitable foam. Closed-cell foam can be cut precisely using a band saw if you go slowly.

Step 2: Install the COWL-00001 Top Cowl on the aircraft.

Step 3: Apply tape to the left air ramp of the top cowl such that the inboard edge of the tape contacts the outboard edge of the baffle seal. See Figure 1.

Step 4: Remove the top cowl.

Step 5: Bond the foam seal to the top cowl with RTV silicone adhesive sealant such that the outboard edge of the foam slightly overlaps the inboard edge of the tape as shown in Figure 1.

Step 6: Remove the tape from the top cowl.

Step 7: Reinstall the propeller governor bracket assembly as described on Page 43-07. Fully tighten the aft three faceplate screws.

NOTE: A small number of builders with flying aircraft have reported that portions of their cowl baffle contact the COWL-00001 Top Cowl during engine startup and shutdown. This can cause damage to the top cowl as well as air leaks which can adversely affect the cooling potential of the baffle system.

To guard against this, inspect the inside of your top cowl within the first 50 hours of flight (e.g. at the end of Phase I flight testing). If damage is found, locate the corresponding area on the cowl baffle and remove no more than 3/32 in. [2.4 mm] from the upper edge of the baffle.

Measure the distance from the trimmed edge to the center of any nearby rivets/holes. If this distance is less than .200 in. [5.1 mm], add additional rivets on either side of the affected hole to secure the seal to the baffle. Space the new rivet holes halfway between the existing holes and at least .200 inch [5.1 mm] away from any edge (more if you think additional trimming will be necessary). See Page 47-23 for rivet type and installation.

If damage is still occurring and the baffle cannot be trimmed any further, the inner layer of fiberglass and the honeycomb core can be removed from the top cowl in the affected area. Apply two new layers of fiberglass to the affected area. Ensure the layers extend at least 2 in. [50.1 mm] beyond the affected area.

Note that conditions should only improve as the engine settles into its mounts during the first 100 hours of flight.

Periodically repeat the above inspection. Adding a layer of fresh paint to the inside of the top cowl can help to identify any new damage as it occurs.

If you do end up modifying your cowl baffle, please consider sending a description of the modification along with photos of the affected areas to support@vansaircraft.com.

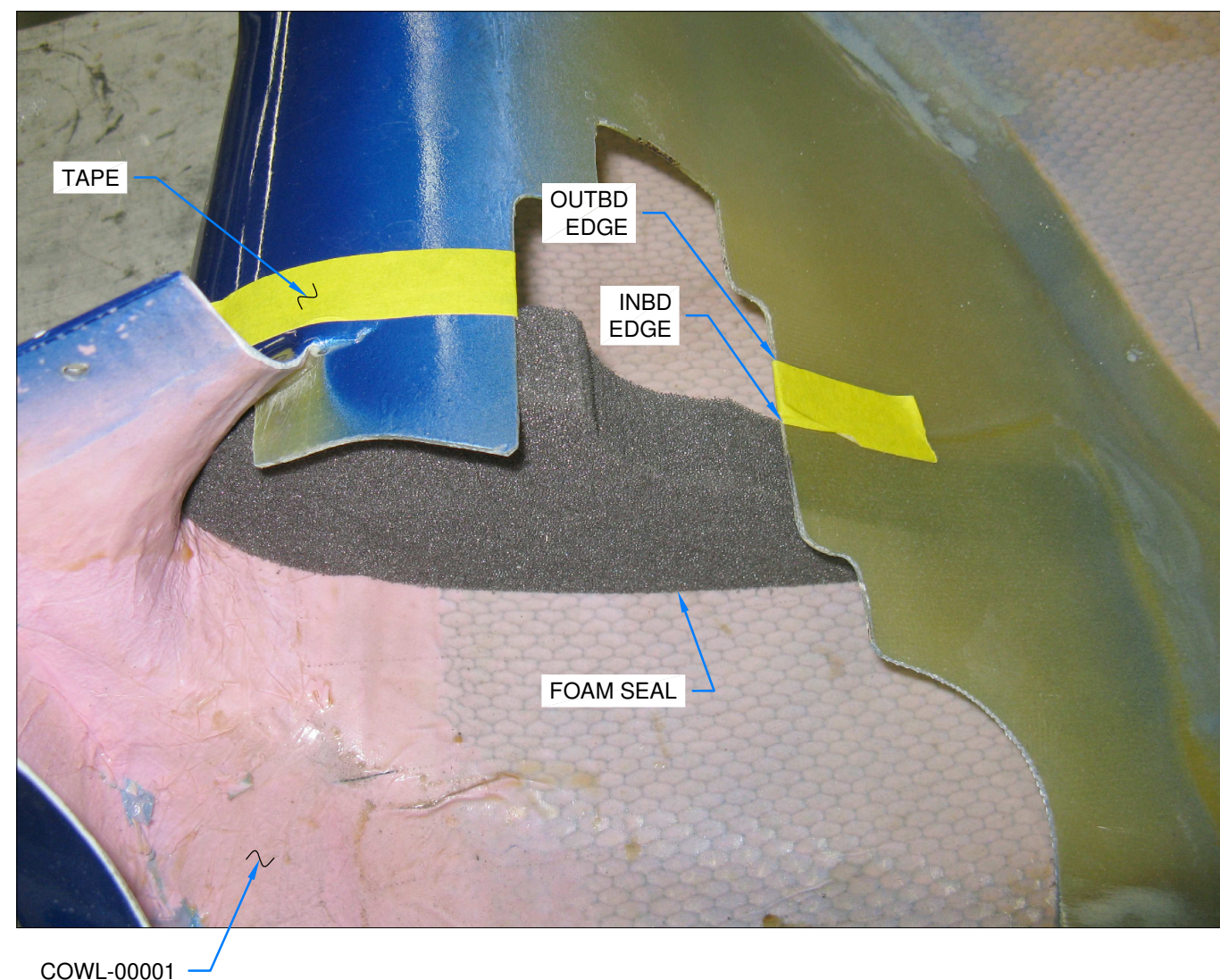
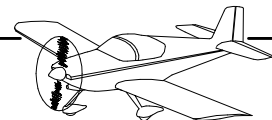


FIGURE 1: BOND FOAM SEAL TO TOP COWL



10 9/16
[268.3 mm]

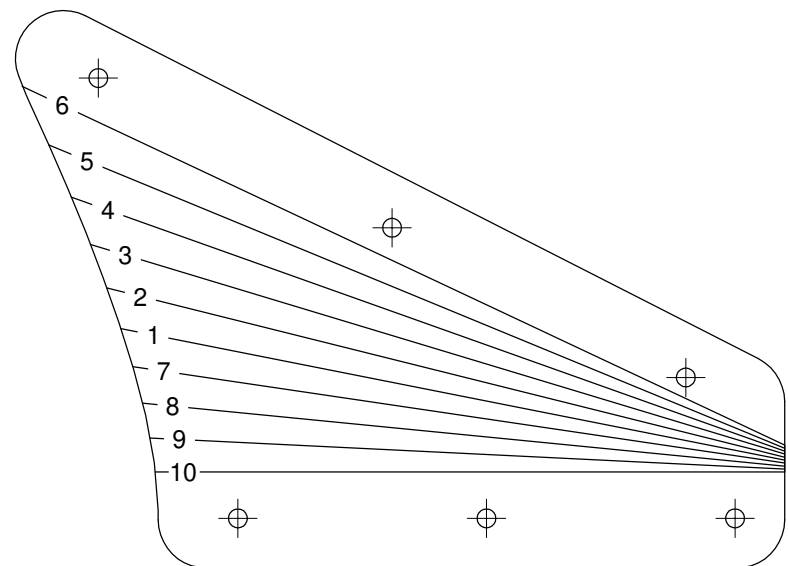


FIGURE 1: RIGHT AIR RAMP CONE BENDING TEMPLATE
(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!)

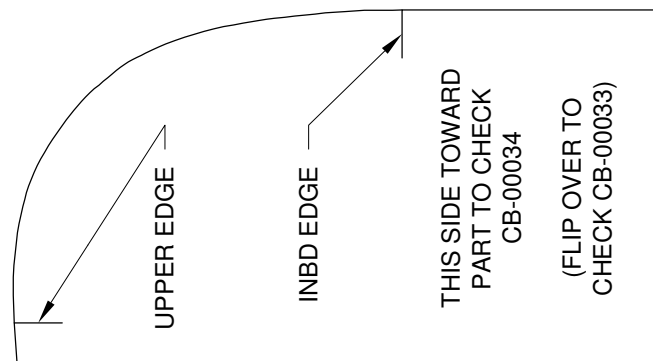


FIGURE 2: CONE RADII TEMPLATE
(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!)

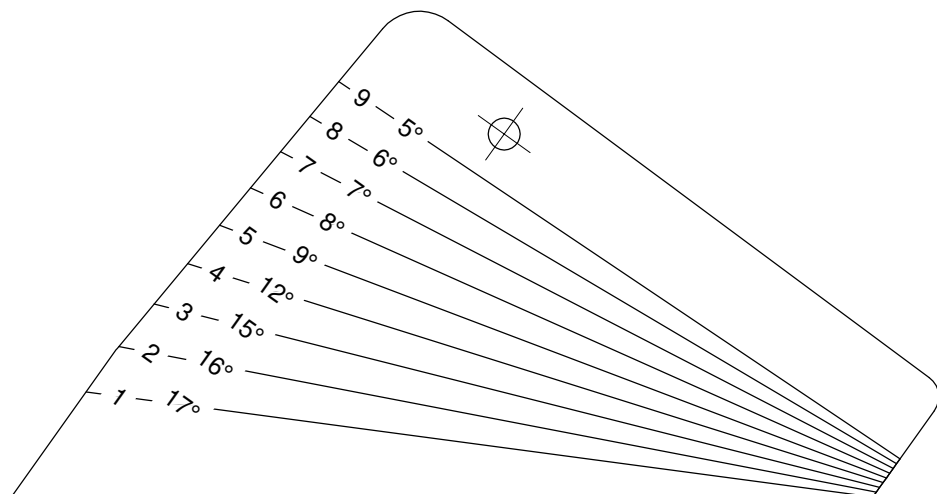


FIGURE 3: AIR FILTER FRAME COVER BENDING TEMPLATE
(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!)

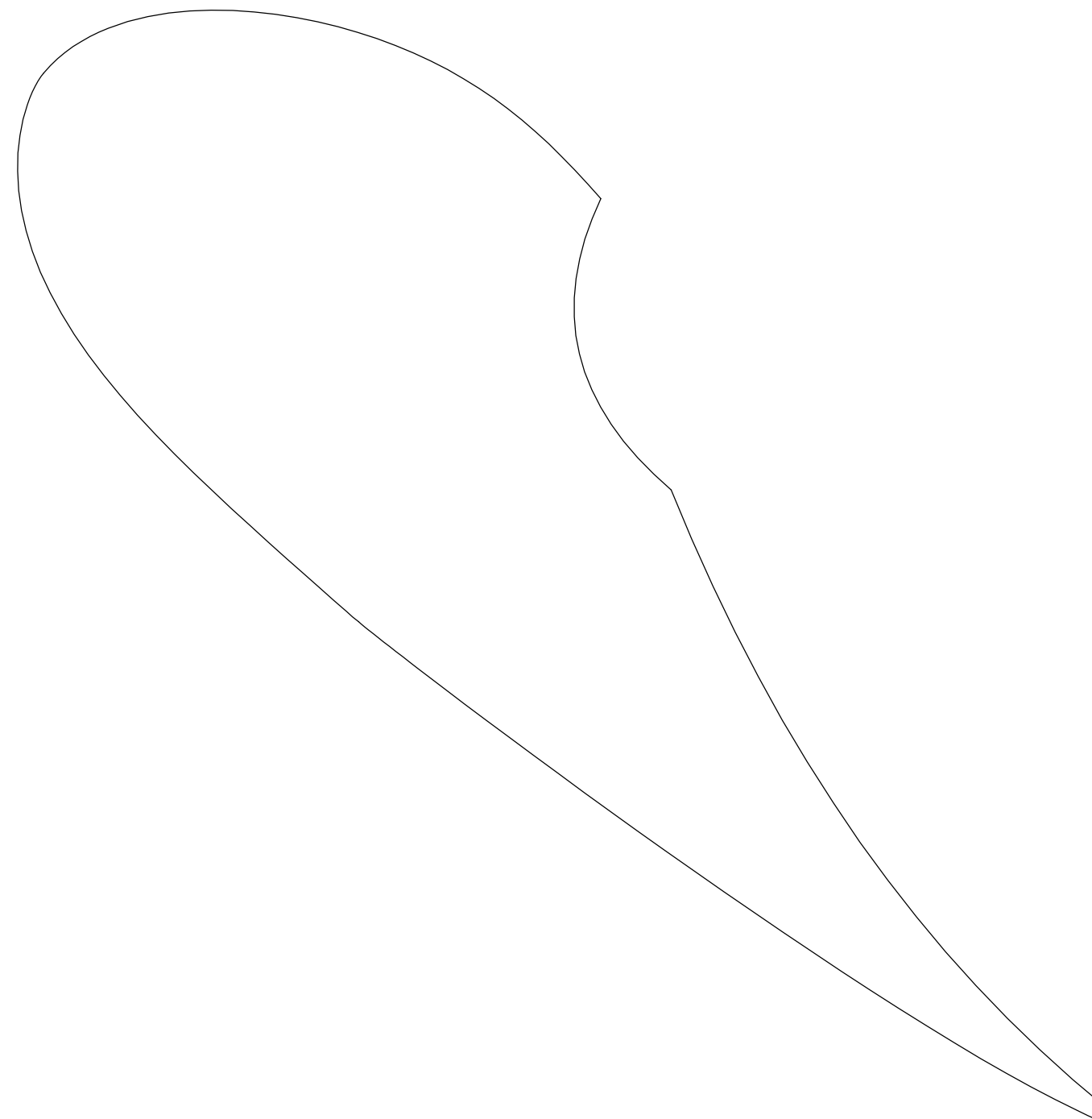


FIGURE 4: INLET RAMP / PROPELLER GOVERNOR FOAM SEAL TEMPLATE
(NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE!)

16
[406.4 mm]



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