

**TOTAL PERFORMANCE**  
**VAN'S AIRCRAFT**

14401 Keil Road NE, Aurora, Oregon, USA 97002  
PHONE 503-678-6545 • FAX 503-678-6560 • [www.vansaircraft.com](http://www.vansaircraft.com) • [info@vansaircraft.com](mailto:info@vansaircraft.com)  
Service Letters and Bulletins: [www.vansaircraft.com/public/service.htm](http://www.vansaircraft.com/public/service.htm)

## CHANGE NOTICE

Rev 7 07/06/16

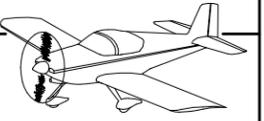
### ***REASON FOR REVISION:***

Add instruction for installation of F-1231G Canopy Catch.

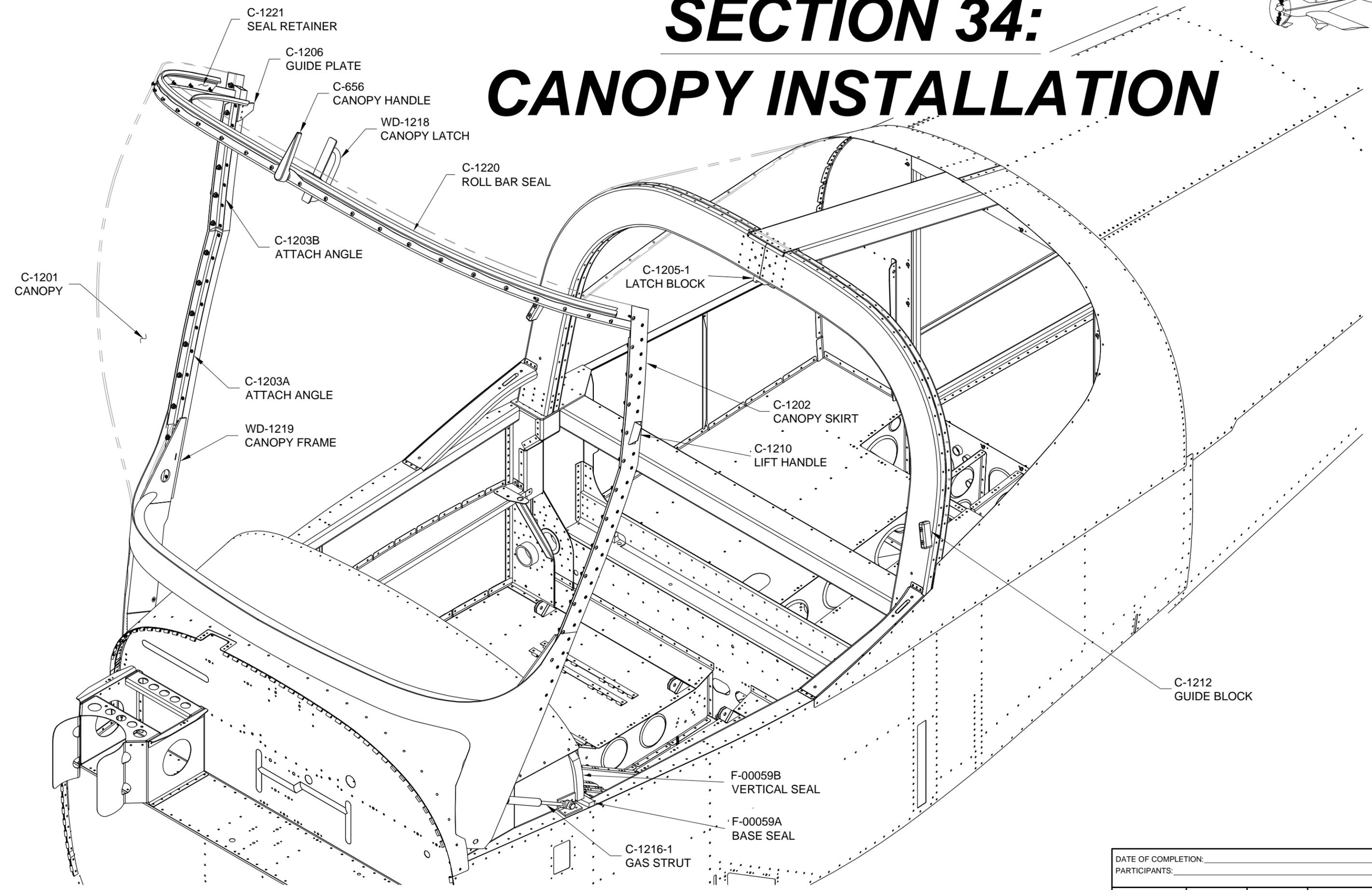
### ***REVISION DESCRIPTION:***

**Page 34-25 REV 0:** New Steps and Figures.

**Page 34-26 REV 0:** New page.

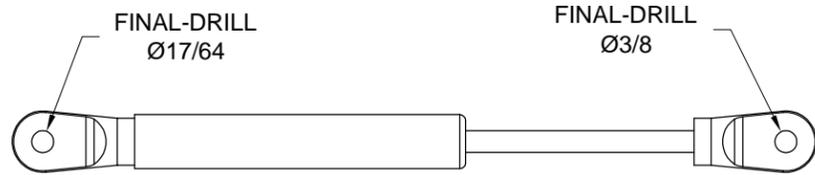


# SECTION 34: CANOPY INSTALLATION



DATE OF COMPLETION: \_\_\_\_\_  
 PARTICIPANTS: \_\_\_\_\_  
 DATE: 02/29/16 REVISION: 2 RV-12 PAGE 34-01

Step 1: Final-Drill both ends of the C-1216-1 Gas Struts as shown in Figure 1.



**FIGURE 1: FINAL-DRILL GAS STRUTS**

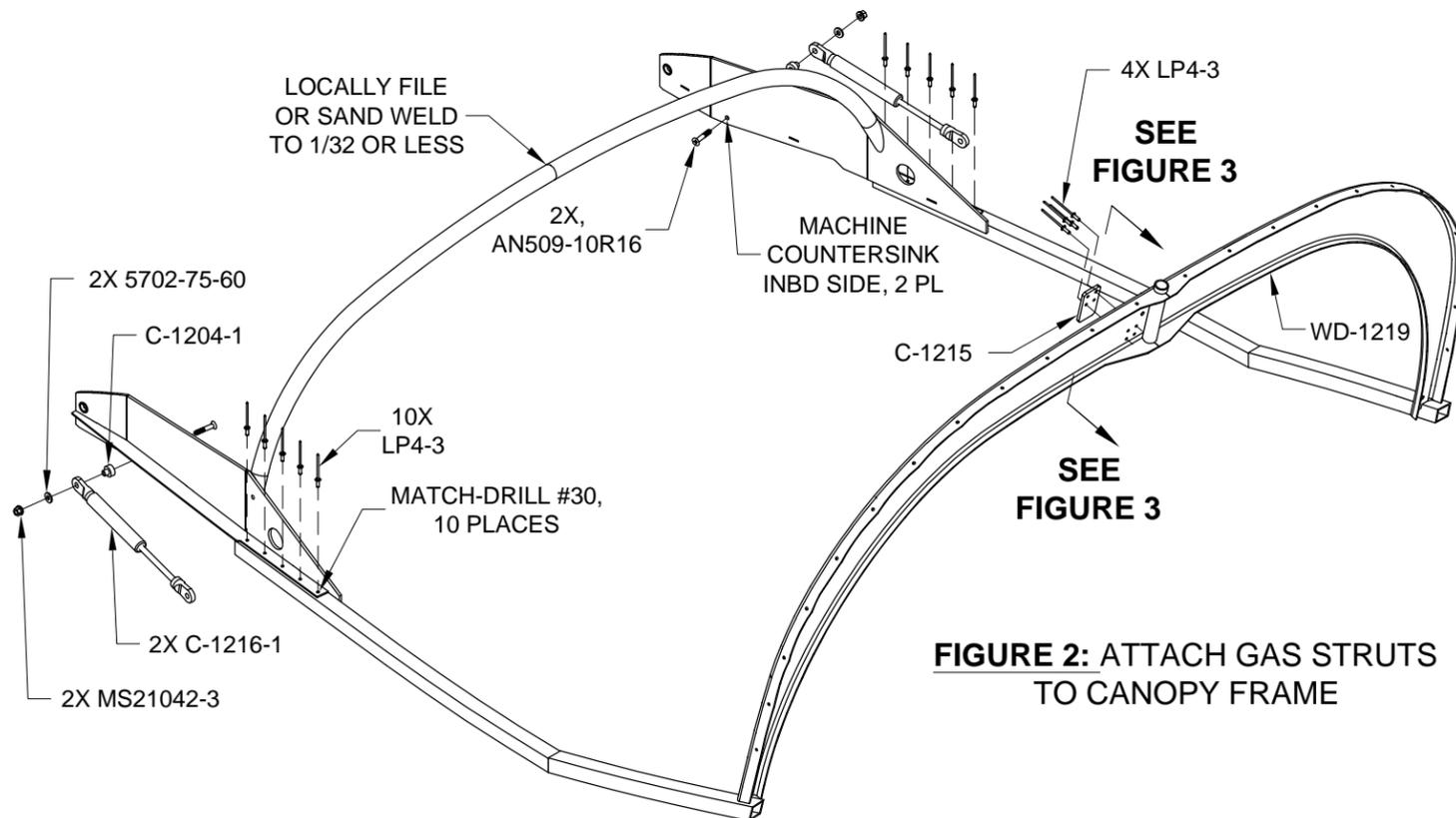
Step 2: Machine countersink the WD-1219 Canopy Frame two places to fit the head of a #10 flush head screw as shown in Figure 2. The depth of the countersink should be such that the screw head is flush to 1/32 protruding. A #30 pilot countersink can be used if you are very careful or you can buy/borrow a cutter with a #12 pilot.

Match-Drill the holes in the canopy frame as shown in Figure 2. Deburr the holes and install blind rivets called-out in Figure 2.

File or sand the weld in the center of the canopy frame front bow such that it protrudes not more than 1/32 above the basic tube. See Figure 2. This should be localized to only the place where the canopy will later make contact. See Page 34-05, Detail C for the location of the canopy to frame contact.

Attach the C-1216-1 Gas Struts to the canopy frame using the parts and hardware shown in Figure 2. For proper long-term operation of the gas struts, it is critical that they are oriented as shown in Figure 2.

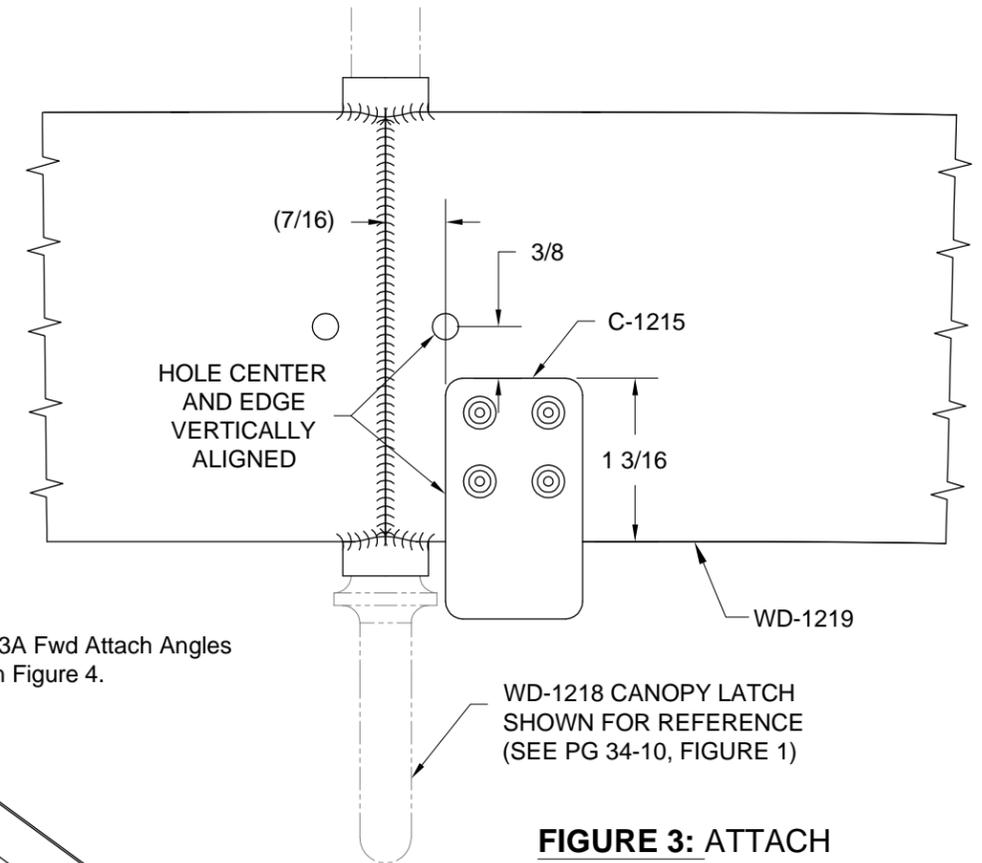
Trim the ends of the AN509 gas strut attach screws such that only 2 threads are protruding beyond the end of the nuts.



**FIGURE 2: ATTACH GAS STRUTS TO CANOPY FRAME**

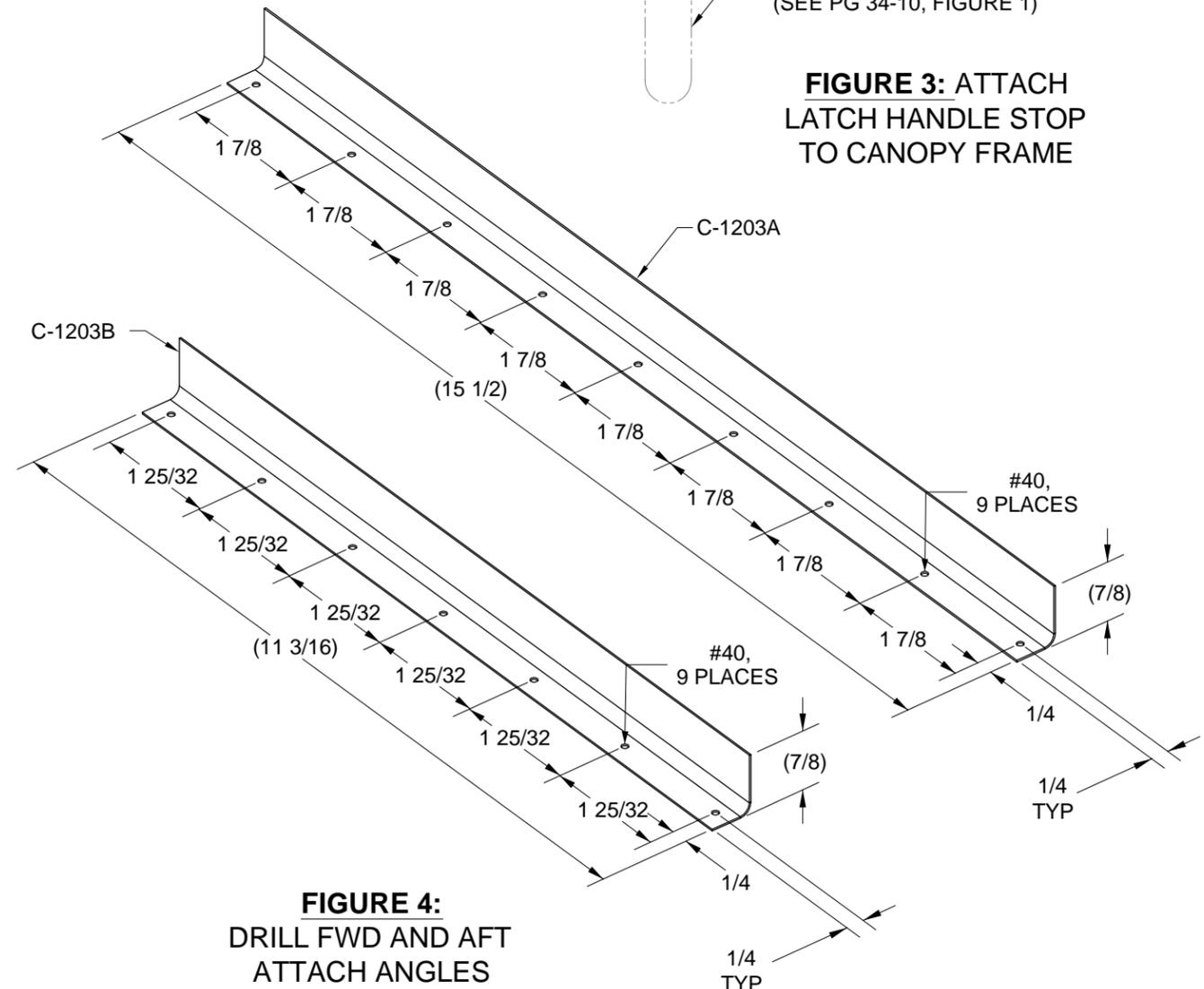
Step 3: Position the C-1215 Latch Handle Stop to the WD-1219 Canopy Frame as shown in Figure 2 and Figure 3 and match-drill #30 the latch handle stop to the canopy frame.

Deburr the holes in the canopy frame then attach the latch handle stop to the canopy frame using the hardware called-out in Figure 2.



**FIGURE 3: ATTACH LATCH HANDLE STOP TO CANOPY FRAME**

Step 4: Measure, mark, and drill the C-1203A Fwd Attach Angles and C-1203B Aft Attach Angles as shown in Figure 4.



**FIGURE 4: DRILL FWD AND AFT ATTACH ANGLES**



**Step 1:** Attach the WD-1219 Canopy Frame to the fuselage as shown in Figure 1.

Attach the C-1216-1 Gas Struts to the fuselage as shown in Figure 1.

**Step 2:** Trim pieces of 1/8 inch thick corrugated cardboard to match the longeron contour and tape to the F-1234-L/R Canopy Decks.

In addition to preventing the canopy frame from wearing on the heads of the canopy deck rivets, the corrugated cardboard will hold the bottom of the canopy frame the proper distance above the canopy deck as shown on Page 34-04, Section A-A, and Section B-B.

**Step 3:** Rotate the WD-1219 Canopy Frame down to the closed position.

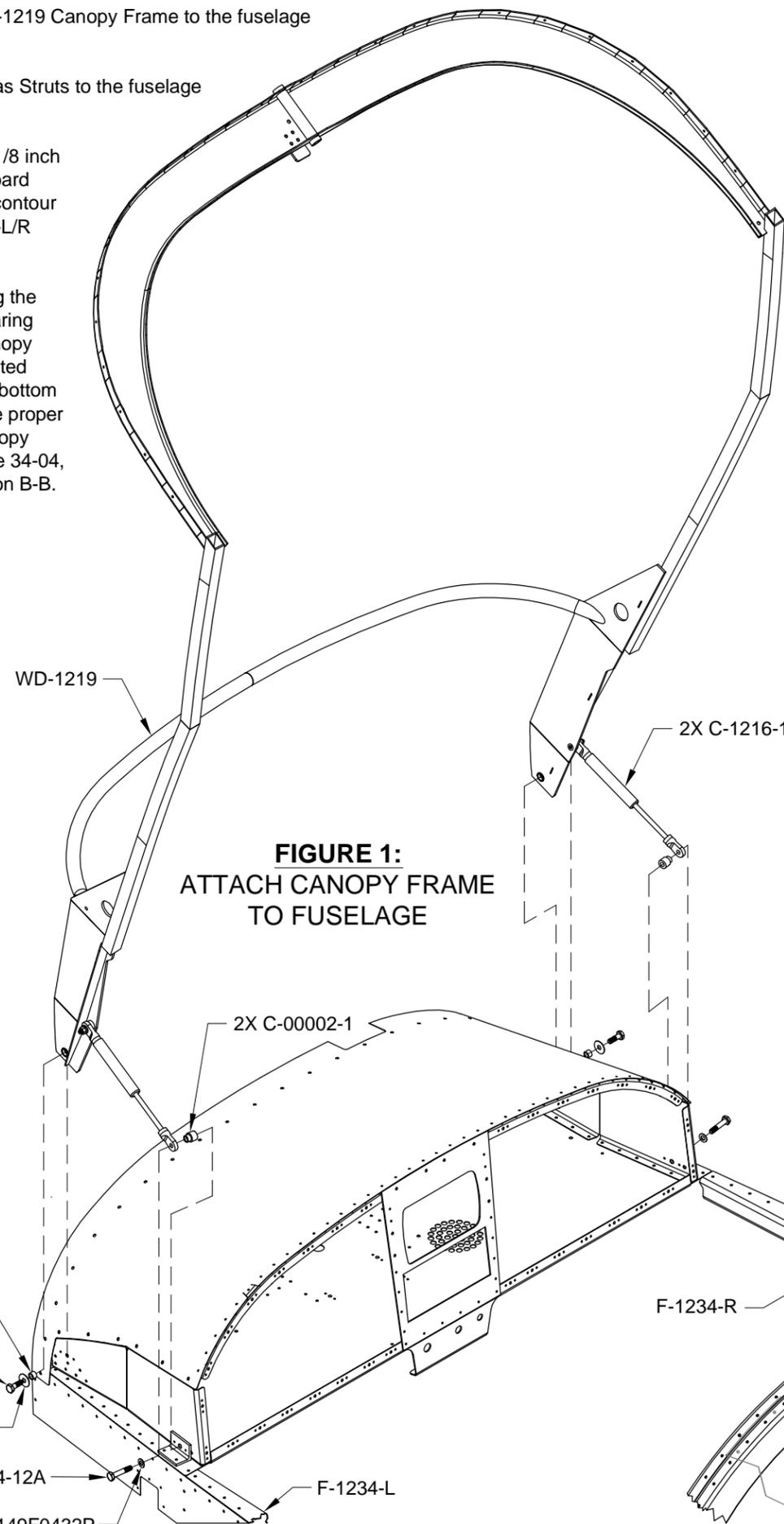
Because the canopy frame is unsupported/unreinforced at this time, it is necessary to apply force simultaneously to both sides while lowering or raising the canopy frame so as to keep the force of the C-1216-1 Gas Struts from distorting the canopy frame.

Check for proper position of the canopy frame forward bow relative to the instrument panel. See Figure 2. Carefully adjust/bend the canopy frame forward bow as required to achieve the proper position.

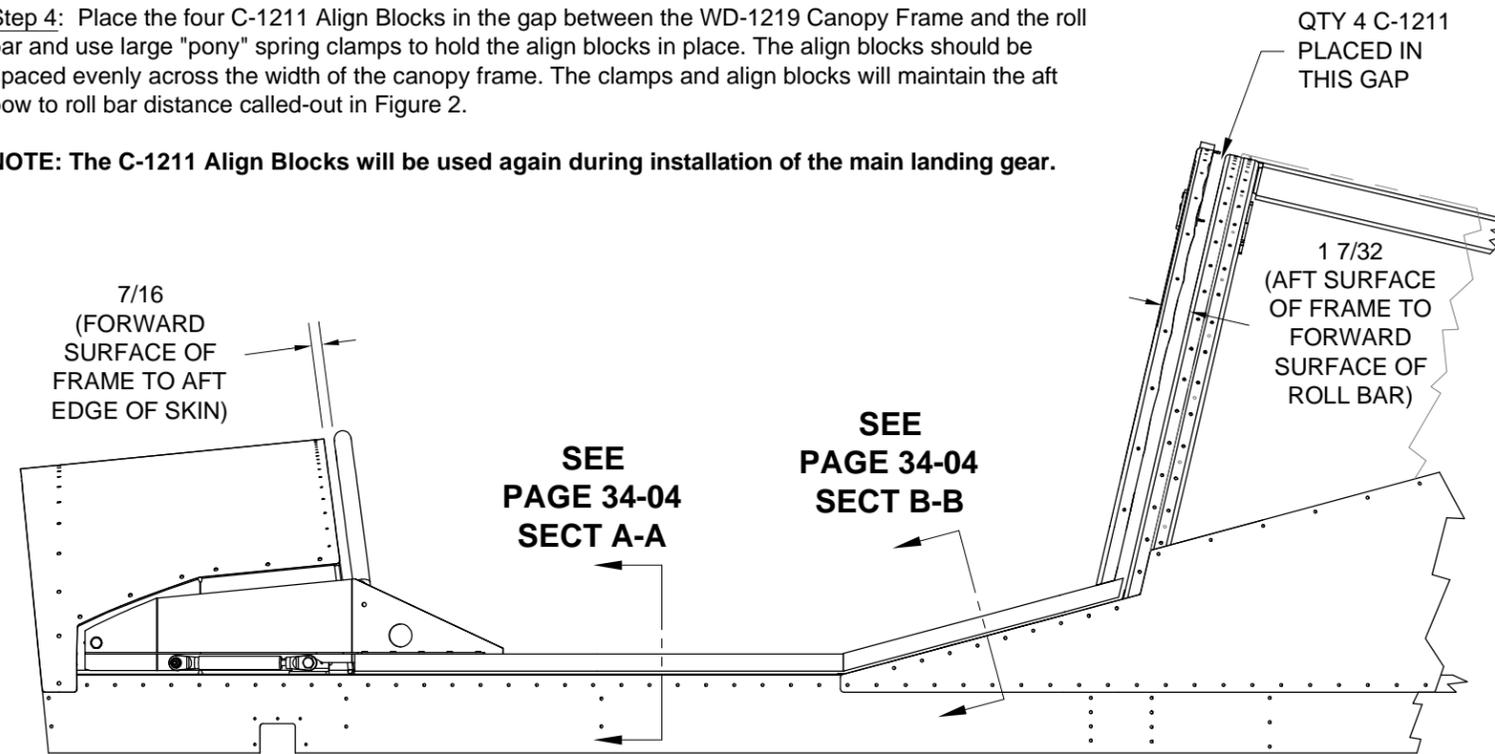
Verify that the forward arms of the canopy frame do not "catch" or interfere with the F-1240 Upper Forward Fuselage Skin by rotating the canopy frame up to the open position. If the canopy frame arm interferes then install a washer between the canopy frame and fuselage at the canopy pivot point.

**Step 4:** Place the four C-1211 Align Blocks in the gap between the WD-1219 Canopy Frame and the roll bar and use large "pony" spring clamps to hold the align blocks in place. The align blocks should be spaced evenly across the width of the canopy frame. The clamps and align blocks will maintain the aft bow to roll bar distance called-out in Figure 2.

**NOTE:** The C-1211 Align Blocks will be used again during installation of the main landing gear.



**FIGURE 1:**  
ATTACH CANOPY FRAME  
TO FUSELAGE



**FIGURE 2:**  
FIT CANOPY FRAME TO FUSELAGE

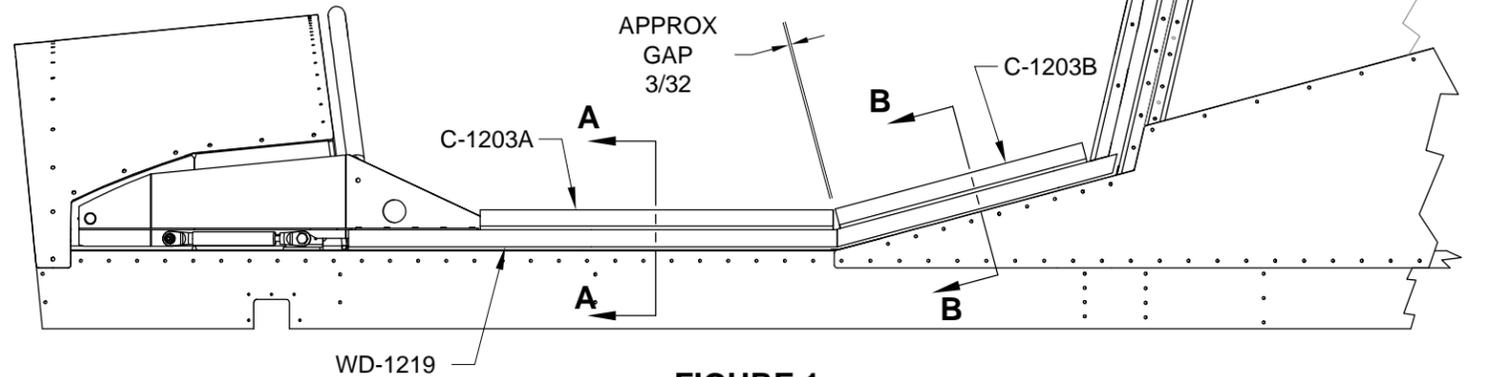


**Step 1:** Flute the C-1203A and C-1203B Attach Angles between pre-drilled holes to match the shape of the canopy frame sides. Be sure the flutes are formed upward, toward the inside of the angle, so that the attach angles mate flush to the top surfaces of the canopy frame as shown in Figures 1 and 2. Flute such that the inside edges of the attach angles are flush with the inside surface of the canopy frame sides as shown in Figure 1, Section A-A and Section B-B.

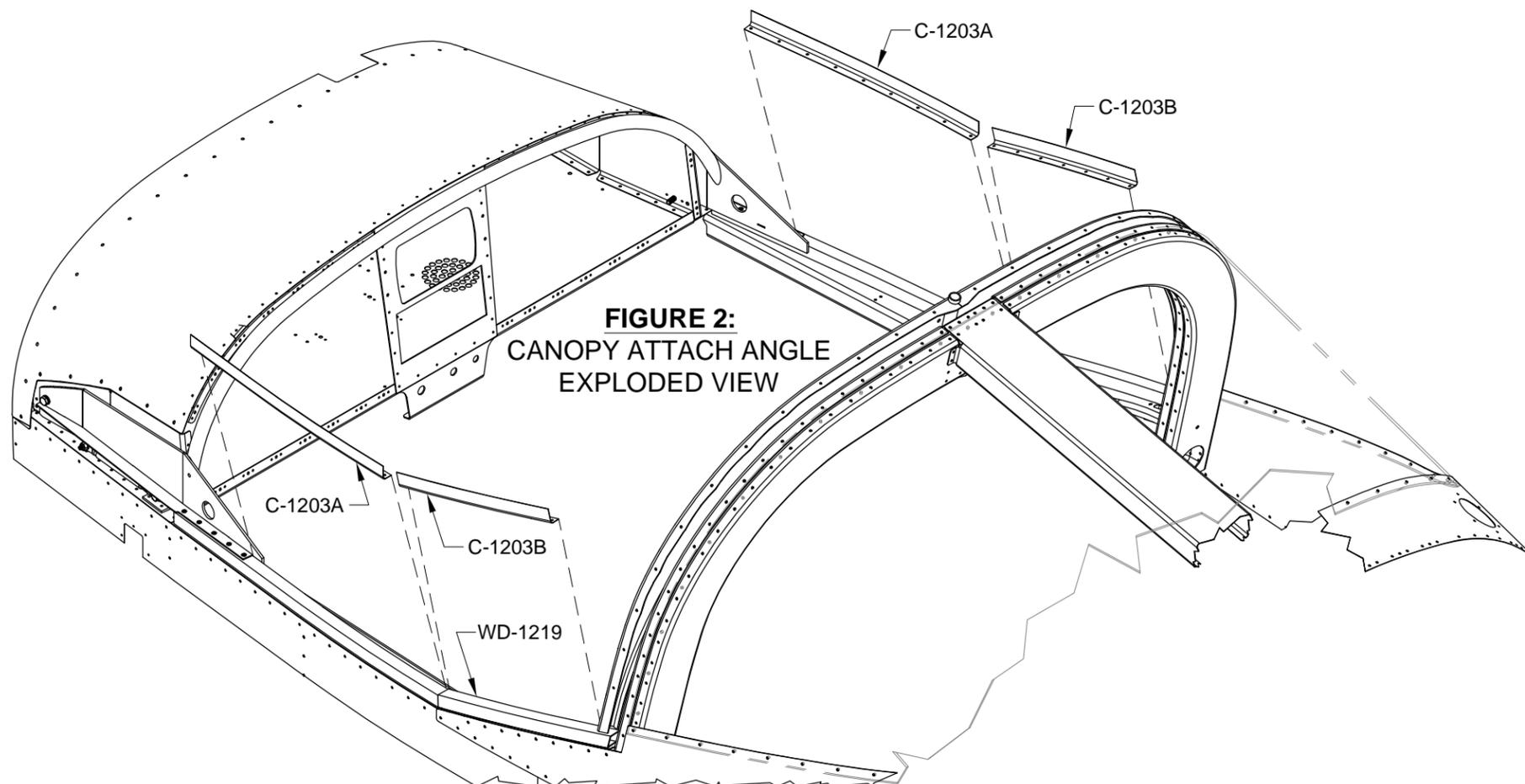
**Step 2:** With the inbd edge of the C-1203A Attach Angle held flush to the inside surface of the canopy frame side as shown in Section A-A and the fore/aft position as shown in Figure 1, match-drill #30 the attach angle to the canopy frame and cleco.

Work progressively from one end of the attach angle to the other. The flushness of the edge of the attach angle and canopy frame can be fine-tuned as match-drilling and clecoing progresses along the length of the attach angle.

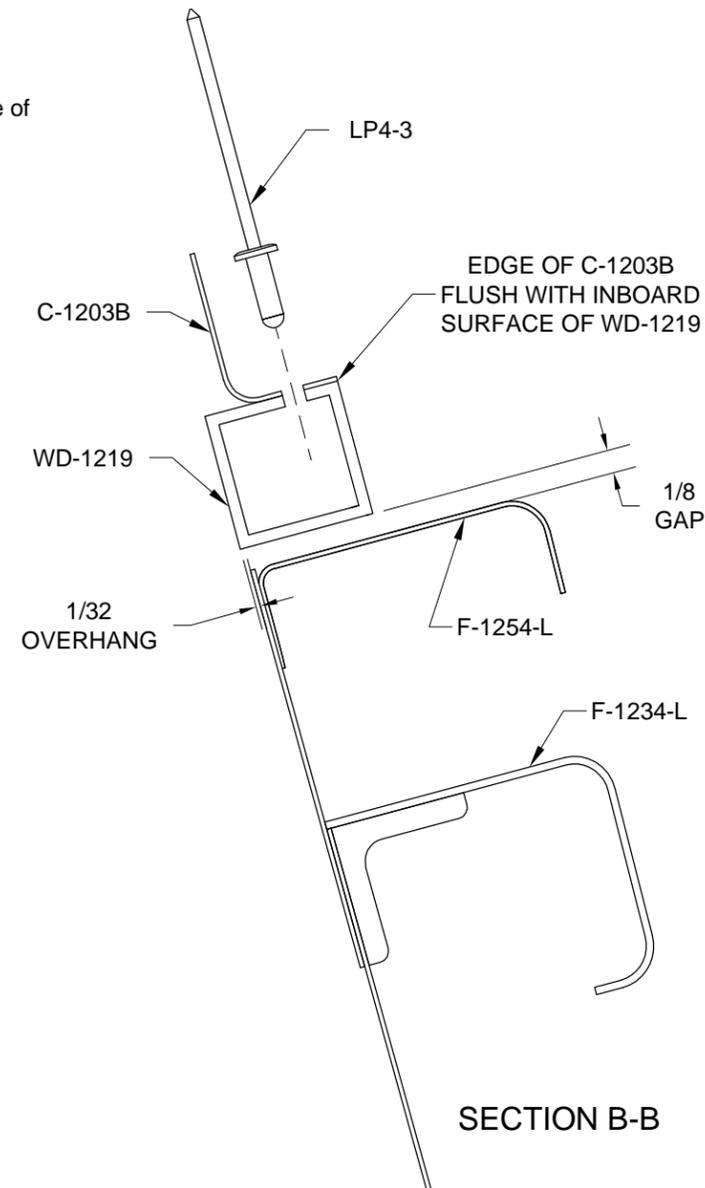
Match-Drill and cleco all C-1203A & B Attach Angles to the canopy frame.



**FIGURE 1:  
FITTING CANOPY ATTACH ANGLES**

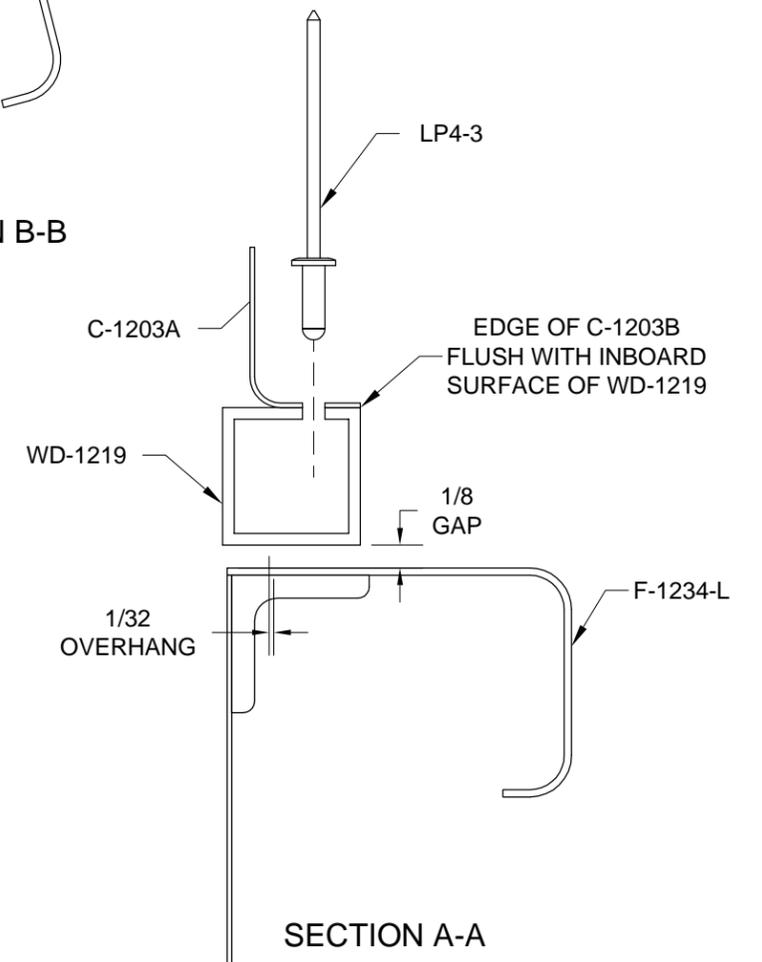


**FIGURE 2:  
CANOPY ATTACH ANGLE  
EXPLODED VIEW**



**SECTION B-B**

**Step 3:** Un-cleco the C-1203A and C-1203B Attach Angles from the WD-1219 Canopy Frame. Deburr all holes in the attach angles and canopy frame. Rivet all four attach angles to the canopy frame using the hardware called-out in Sections A-A and B-B.



**SECTION A-A**



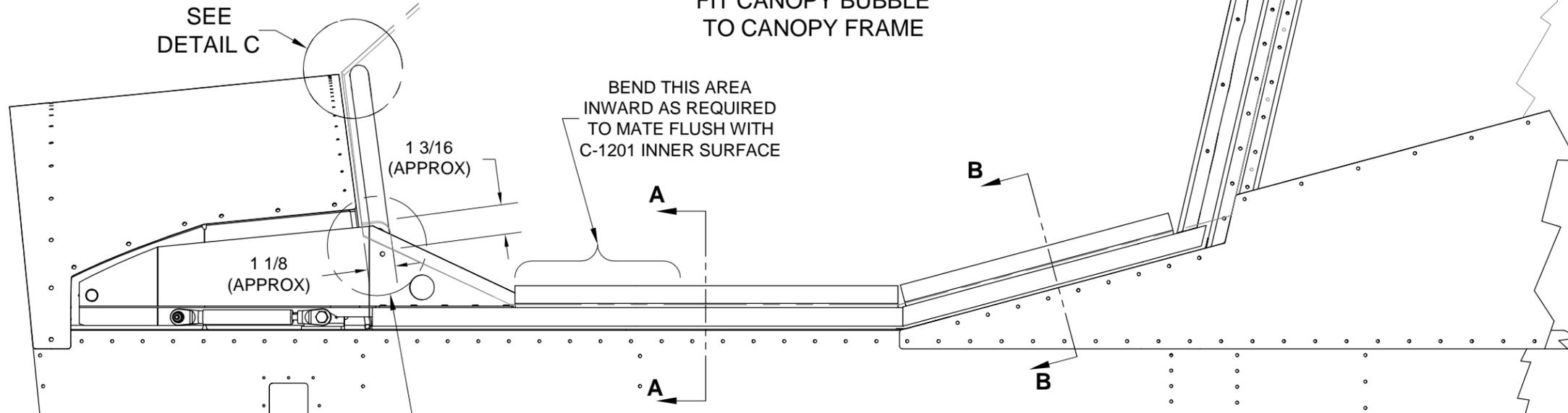
Step 1: Place strips of Low-Tack painters masking tape over the edges of the C-1203A and C-1203B Attach Angles and over the end of the latch handle tube in the center of the rear bow of the C-1219 Canopy Frame.

Carefully place a strip of tape along the full width of the canopy frame front bow, but leave the tape flat and do not press it down to conform to the shape of the front bow. Estimate angle of canopy and place tape in approximately this orientation. See Detail C.

The tape will protect the inside of the canopy bubble from being scratched while fitting and will show the tangent contact point of the canopy to the canopy frame front bow.

C-1201

**FIGURE 1:  
FIT CANOPY BUBBLE  
TO CANOPY FRAME**



NOTCH C-1201 FORWARD OUTBOARD CORNERS AS REQUIRED TO ALLOW FULL CONTACT WITH FRONT BOW OF WD-1219

**NOTE: See Section 5U for tips on working with the Plexiglass canopy. As supplied, the canopy is covered with plastic film, inside and out. So as to protect the canopy as much as possible during the assembly process, trim the plastic film, inside and out, so that the outer 3 inches (approximately) of canopy are exposed then run a strip of tape along the edge of the plastic film to keep it from peeling-up throughout the rest of the process. The film will, ideally, be left in place until the aircraft is complete and nearly ready to fly.**

Step 2: Place the C-1201 Canopy over the WD-1219 Canopy Frame and position the canopy both fore/aft and side-to-side such that the dimensions shown in Figure 1, Section A-A, Section B-B, and Detail C are achieved.

Using a "sharpie" pen, mark the canopy with the location of the center of the tube located at the middle of the canopy frame rear bow. Also mark on the canopy the amount of trim required at the forward outboard corners. See Figure 1.

Remove the canopy from the frame. Drill a 5/8 diameter hole for the latch tube using a step-drill. Deburr the edges of the hole.

Use a 1 inch diameter dowel wrapped with 40 or 60 grit sandpaper to trim the forward outboard corners. Smooth the trimmed edges with 220 grit sandpaper.

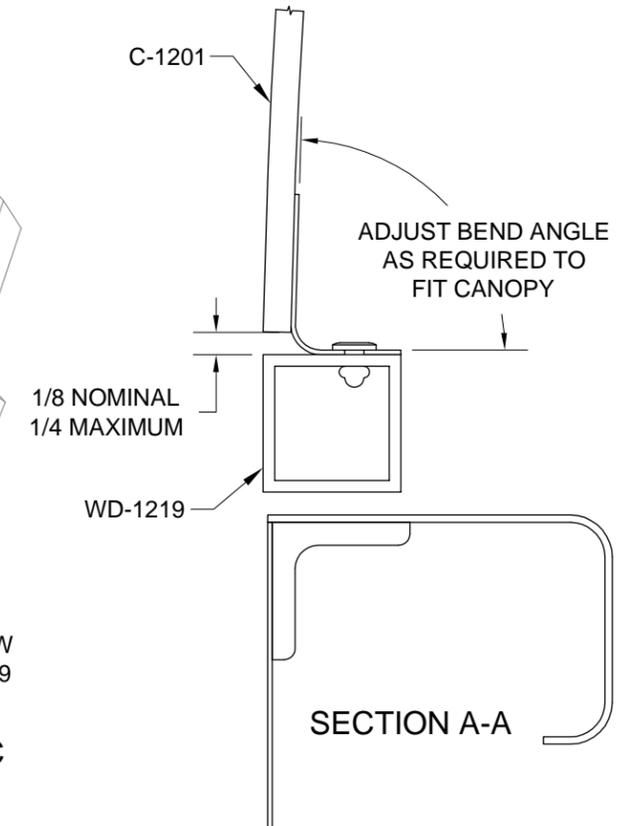
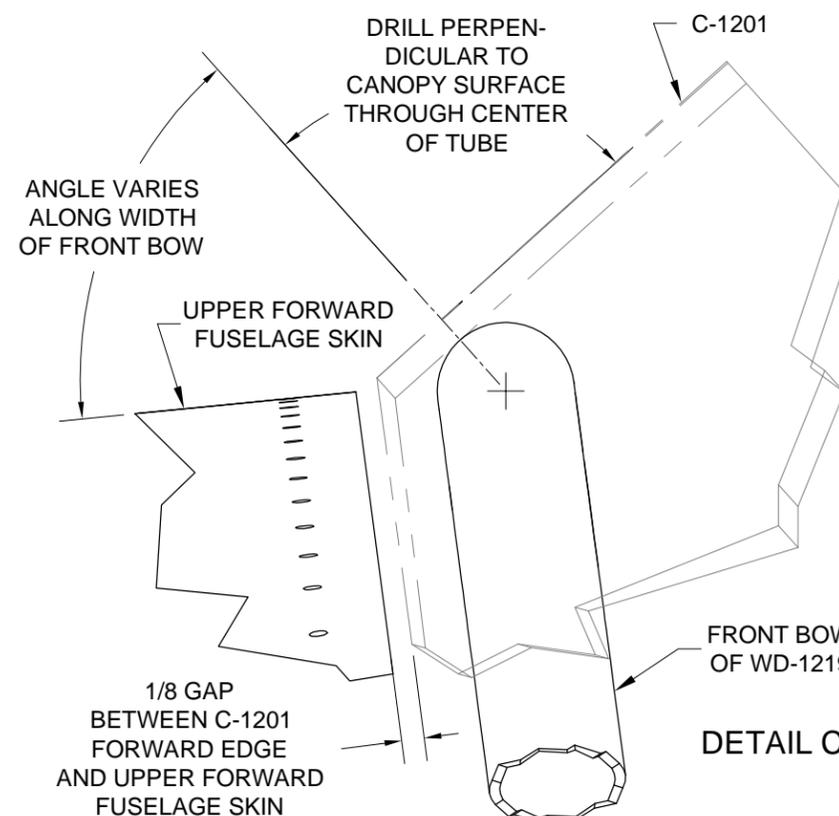
Step 3: Place the C-1201 Canopy back onto the WD-1219 Canopy Frame and engage the canopy frame tube in the hole in the canopy. Use strips of duct tape to help pull the sides of the canopy down and hold it in place.

Re-check the position of the canopy both fore/aft and side-to-side to verify that the dimensions shown in Figure 1, Section A-A, Section B-B, and Detail C are achieved. If the position of the canopy needs to be refined, the canopy latch tube hole may be carefully elongated by as much as 1/8 inch in any direction. Additionally, 80 to 100 grit sandpaper and a wood block can be used to remove material from the aft edge of the canopy if it interferes with the forward edge of F-1277A Aft Window.

Push-down the front edge of the canopy along the front bow. This will adhere the masking tape to the front bow but only along the line where the canopy contacts the front bow. This line of canopy-to-front bow contact is visible in the tape as a slightly darker color in the tape.

1/8 NOMINAL  
1/4 MAXIMUM

SECTION B-B

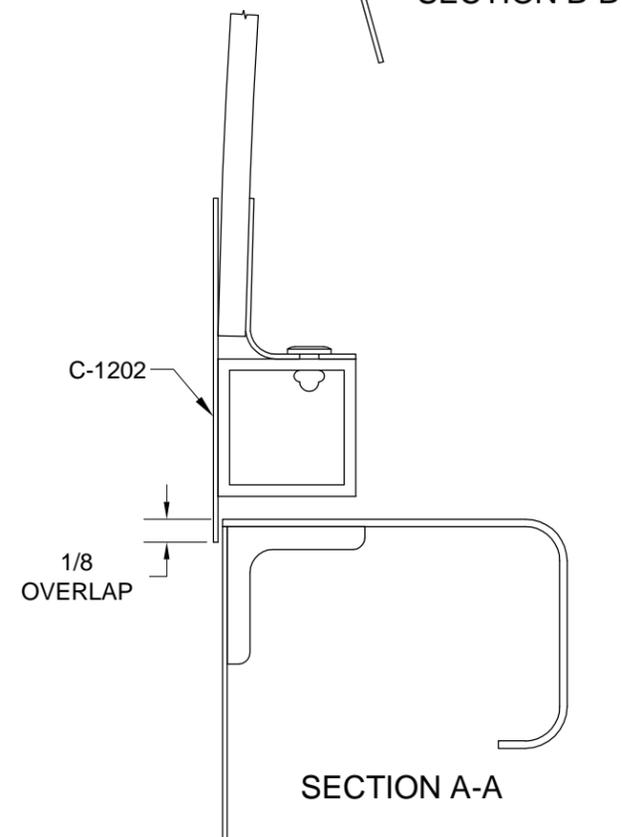
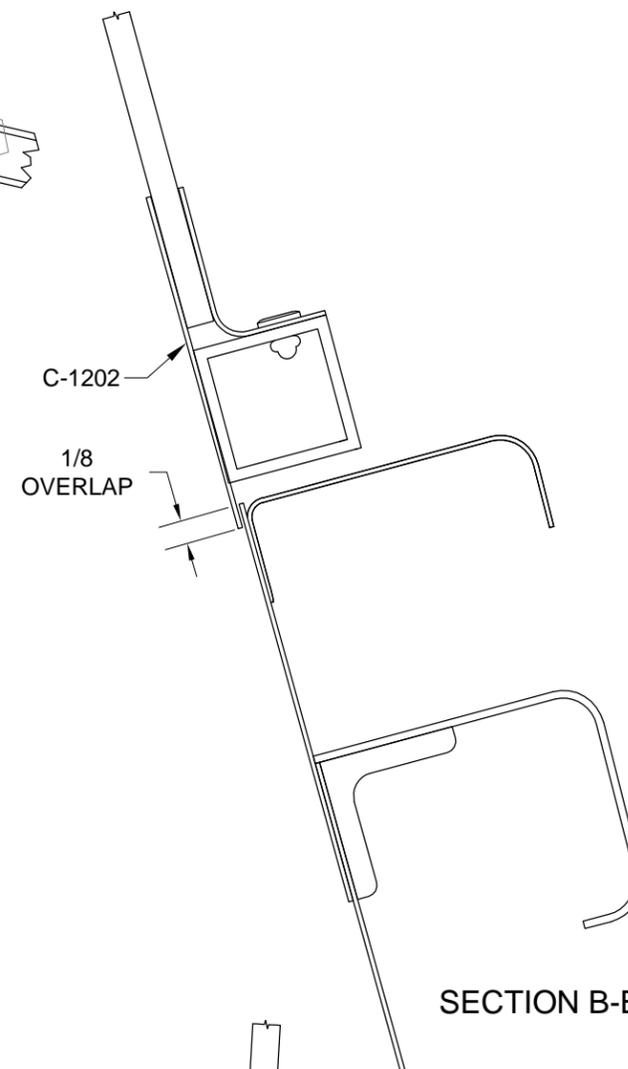
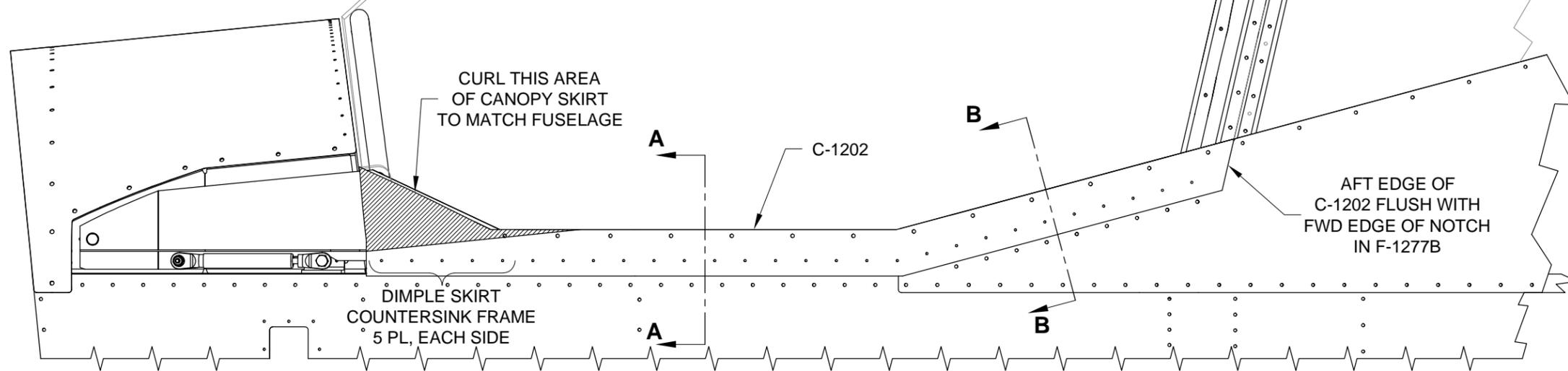




**Step 1:** Remove the C-1201 Canopy. Measure 2 inches each side of the weld joint at the middle of the WD-1219 Canopy Frame front bow and make a pen mark on the line of canopy to front bow contact. Then measure and mark every 2 inches on the line of contact both directions. Pre-drill #40 at each mark. Be sure to align the drill so that you are drilling through the center of the tube at each hole. See Page 34-05, Detail C.

**Step 2:** Place the C-1201 Canopy back on the WD-1219 Canopy Frame and use strips of duct tape to help pull the sides of the canopy down and hold it in place. Verify that the canopy is properly positioned fore/aft and side-to-side as shown in Page 34-05, Figure 1, Section A-A, Section B-B, and Detail C.

**FIGURE 1:  
ATTACH CANOPY SKIRTS**



**Step 3:** Beginning at one of the holes nearest the center of the front bow, drill with a #30 Plexiglass bit through the canopy and into the pre-drilled hole in the frame. Use the tape contact line to help you drill through the center of the tube and use the reflection of the drill bit in the canopy to help you drill perpendicular to the canopy surface. See Page 34-05, Detail C. Drill using full drill speed and light pressure. Cleco the hole after drilling.

Using a #30 Plexiglass bit, drill and cleco the canopy to the canopy frame rear bow at the hole nearest the top center of the rear bow. Clear any shavings from under the canopy before clecoing each drilled hole. Be sure that the canopy lays tightly against the canopy frame rear bow when it is clecoed. It is acceptable to loosen the spring clamps and allow the canopy frame to move upward even if the gap between the bottom of the canopy frame and deck becomes greater than 1/8 inch.

Re-verify that the strips of duct tape (installed in Step 2) are holding both sides of the canopy tight to the canopy frame front and rear bows and to the C-1203A & B Attach Angles.

Alternate drilling and clecoing between the front bow and rear bow working one hole outboard toward the left and right sides each time. Periodically check the position of the canopy on the frame to make sure that it is not migrating out of position as drilling progresses. Also, check to see that the canopy sides are not bulging-out as drilling progresses.

**Step 4:** Position the C-1202 Canopy Skirt to the outside surface of the canopy frame sides as shown in Figure 1, Section A-A and Section B-B. With the canopy skirt held or taped in place, match-drill #30 through the canopy skirt and into the canopy frame and cleco.

Repeat for the opposite side of the canopy.

**Step 5:** Remove the C-1202 Canopy Skirt and deburr the drilled holes. Dimple the most forward five rivet holes in the canopy skirt as called-out in Figure 1. Curl the forward upper corner of the canopy skirt to match the shape of the fuselage. The curl of the upper forward corner of the skirt should be such that the skirt lays tight against the canopy and frame when it is clecoed in place. Over curling is preferable to under bending so as to keep the curled skirt firmly in contact with the canopy and frame. The curl can be formed using hand pressure on the canopy skirt held against a cylindrical object.

This will require a few iterations of clecoing to the fuselage, noting required adjustments, removing, adjusting, and re-fitting. When nearly satisfied with the fit of the skirt to the fuselage, trim the aft end of the skirt so as to leave a 1/16 inch gap between the aft edge of the skirt and the fwd edge of the notch in the F-1277B skin.

**Step 6:** Remove the C-1201 Canopy from the WD-1219 Canopy Frame and deburr the holes in the canopy and canopy frame. Machine countersink the most forward five rivet holes in the canopy frame to fit the dimples in the C-1202 Canopy Skirt. See Figure 1.

Remove the clamps and spacers that were holding the canopy frame rear bow in position. Rotate the canopy frame up to the open position. Remove the corrugated cardboard spacers that were placed between the canopy frame and the cockpit sills.



**Step 1:** You will need to have a non-claustrophobic friend/spouse/child help you with this step. After having your helper climb into the cockpit, rotate the WD-1219 Canopy Frame back down to the closed position. Hand one of the wood spacers to your helper.

Place the C-1201 Canopy back into place on the canopy frame and re-cleco.

**Step 2:** Re-cleco both C-1202 Canopy Skirts to the canopy frame. Be sure that the canopy is clecoed along the full width of the front and rear bows. Use duct tape if/as required to pull the canopy sides down between the front and rear bows.

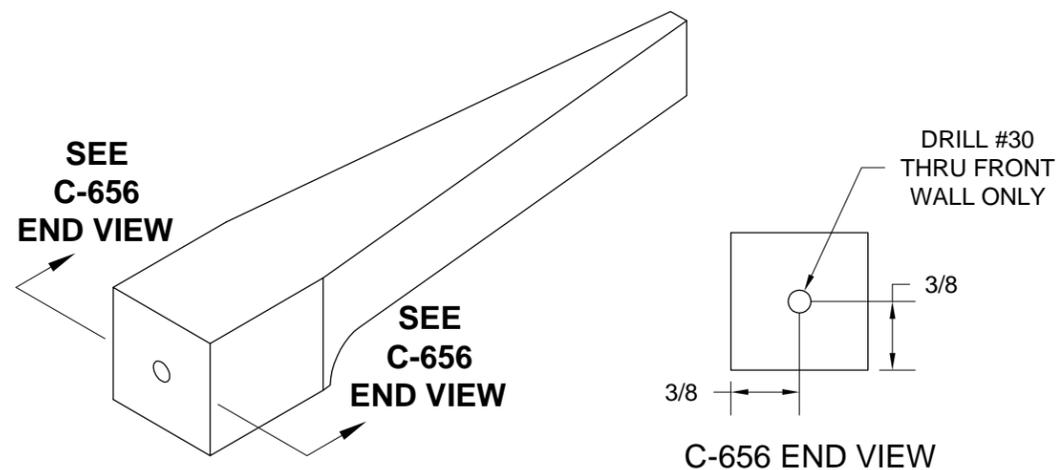
Match-drill using a #30 Plexiglass bit through the upper row of holes in the canopy skirt through the C-1201 Canopy and C-1203A and C-1203B Attach Angles. (The Plexiglass bit will easily cut through the thin aluminum attach angles.) Have your helper hold the wood spacer against the canopy attach angles to resist the drill pressure. Cleco each hole after drilling.

Repeat for the opposite side of the canopy.

**Step 3:** Remove the C-1201 Canopy from the fuselage and set it on your work table. Your helper can now be set free!

Final-Drill all holes in the canopy using a #27 Plexiglass bit. Deburr the drilled holes in the canopy.

Machine countersink the holes along the front edge of the canopy to fit the head of an AACQ4-4 blind rivet. Countersinks that are up to .015 too shallow are acceptable and are preferable to countersinks that are even slightly too deep.



**FIGURE 1:**  
PILOT-DRILL CANOPY HANDLE

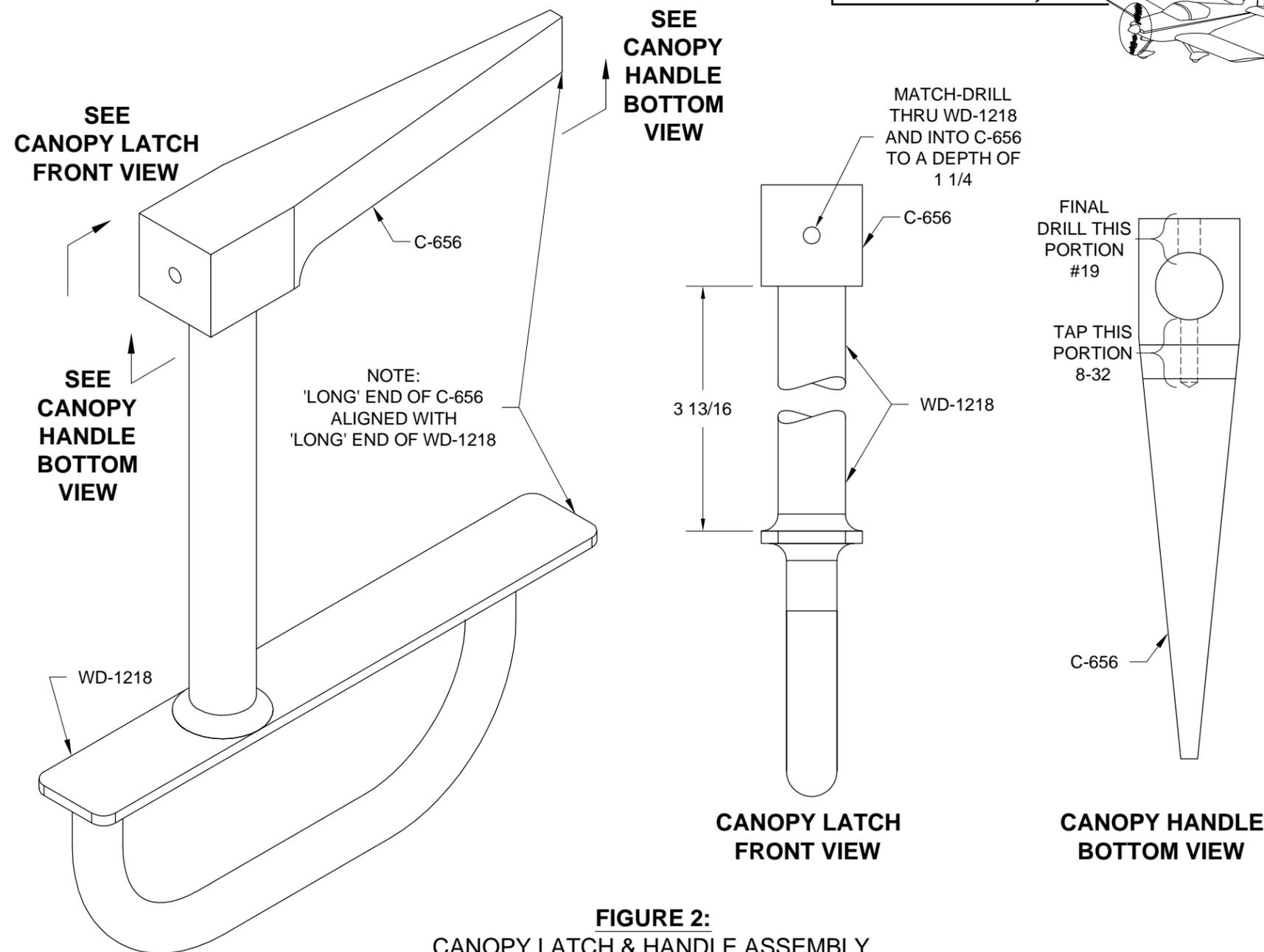
**Step 4:** Drill a pilot hole in the end of the C-656 Canopy Handle as shown in Figure 1.

Take the WD-1218 Canopy Latch and C-656 Canopy Handle and assemble them as shown in Figure 2. The tube end of the canopy latch may be shortened if/as required to achieve the dimension called-out in Figure 2.

Using the pilot hole in the canopy handle as a drill guide, match-drill #30 through both sides of the canopy latch tube and into the canopy handle to the depth called-out in Figure 2.

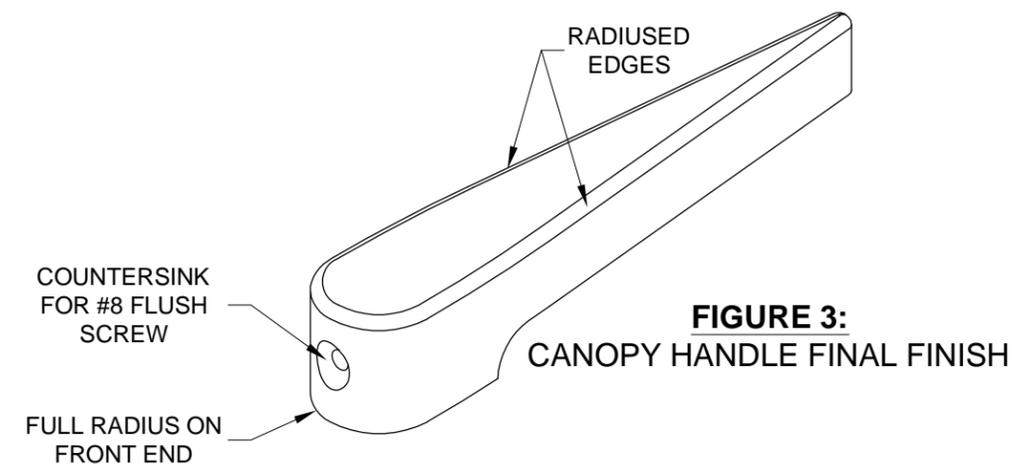
Disassemble the canopy latch and canopy handle. Final-Drill #19 through the front part of the canopy handle. Final-Drill #19 through the canopy latch. Deburr holes. Cut threads in the rear "tail" portion of the canopy handle using an 8-32 tap. Machine countersink the canopy handle to fit the head of a #8 flush screw.

The canopy handle edges and ends may be rounded if/as desired. See Figure 3 for an example of what the final shape might be.



**FIGURE 2:**  
CANOPY LATCH & HANDLE ASSEMBLY

**SEE CANOPY LATCH FRONT VIEW**



**FIGURE 3:**  
CANOPY HANDLE FINAL FINISH

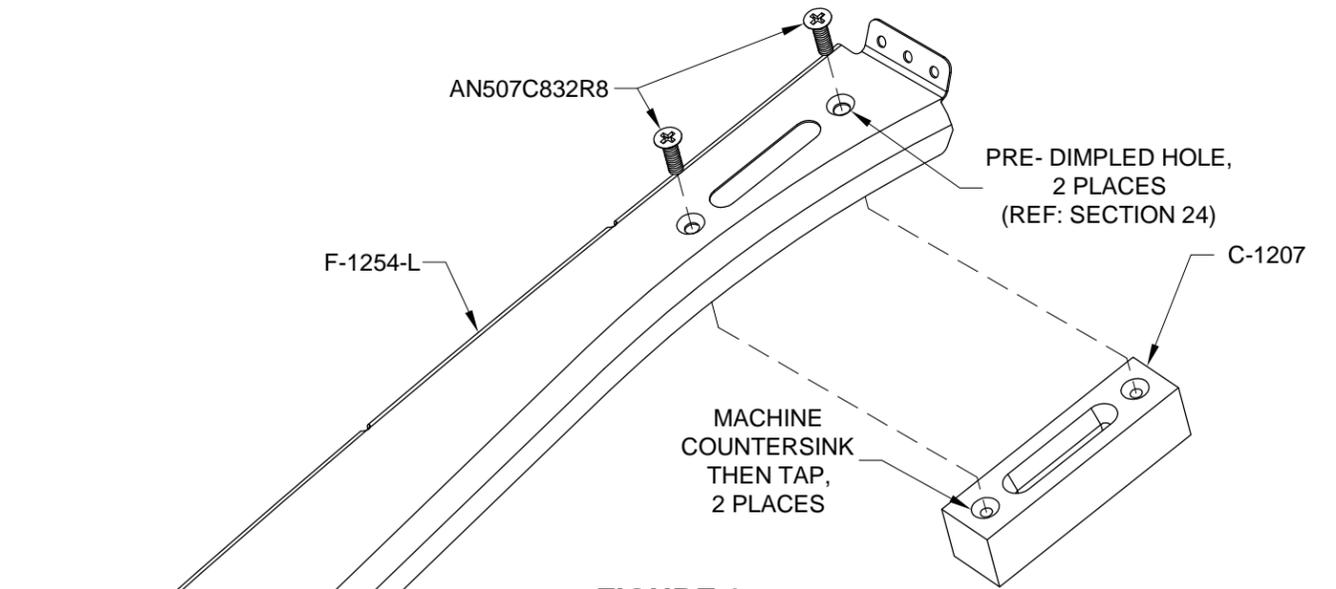
Step 1: Machine countersink the two holes in each C-1207 Guide Block to fit the head of a #8 flush screw. See Figure 1. Countersinks that are up to .015 too deep are acceptable and are preferable to countersinks that are too shallow. Tap 8-32 the two holes in each guide block.

Step 2: Install C-1207 Guide Blocks as shown in Figure 1.

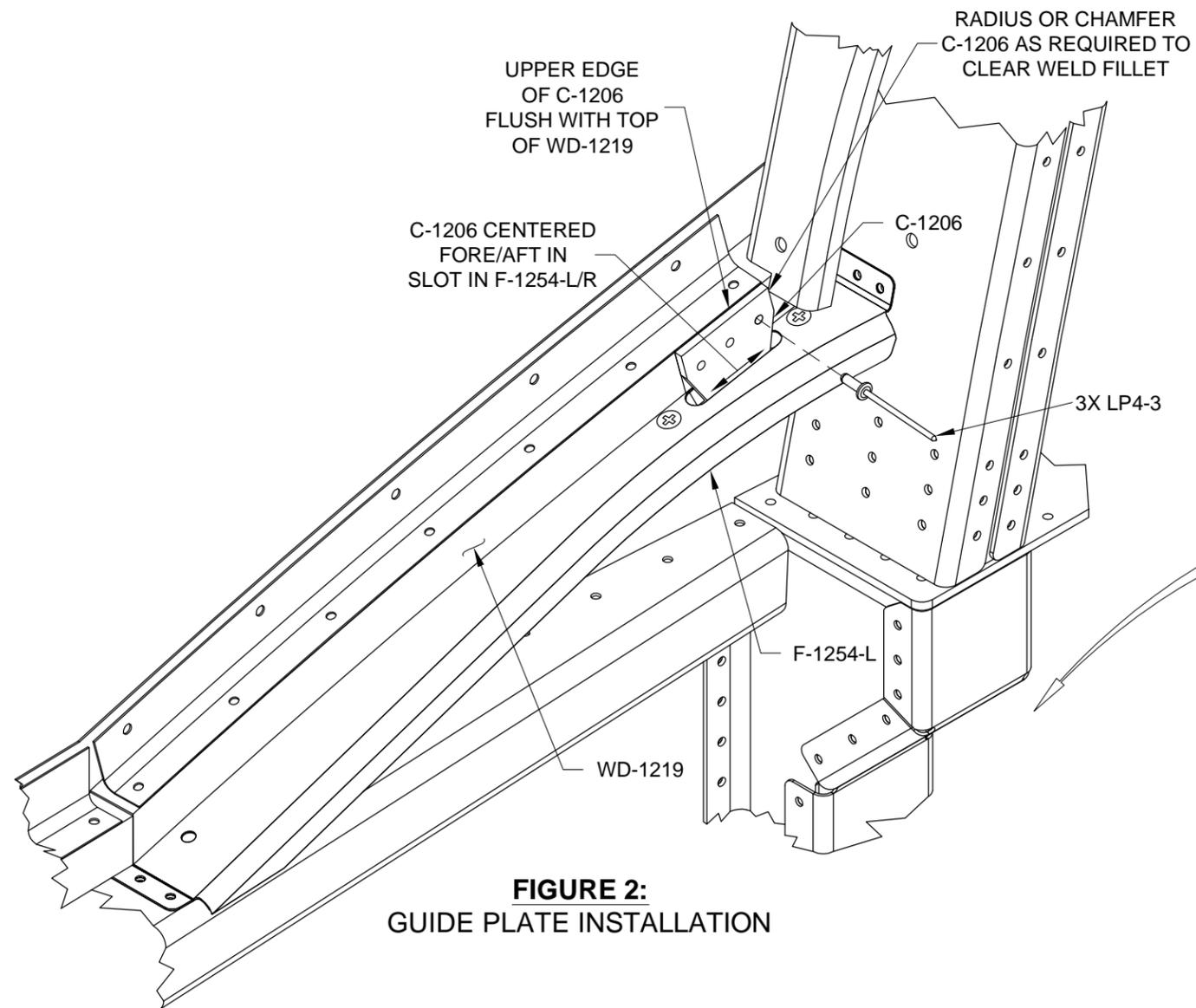
Step 3: Insert the C-1206 Guide Plate in the slot in the C-1207 Guide Block and position as called-out in Figure 2. Match-Drill the guide plate to the WD-1219 Canopy Frame using a #30 drill bit. Remove the guide plate and deburr holes. Rivet the guide plate to the canopy frame using the blind rivets called-out in Figure 2.

**NOTE:** This is a good time to paint the canopy frame, the 'D' Handle portion of the canopy latch, and inner surfaces of the canopy skirts to match the interior of the aircraft. Given that the canopy rear bow above the upper edges of the canopy skirts will be visible from the outside of the aircraft it may be more desirable to paint portions to match the aircraft exterior rather than interior. Consider also that when the canopy is in the open position certain parts of the canopy frame are exposed and it may be more desirable to paint to match the exterior rather than the interior.

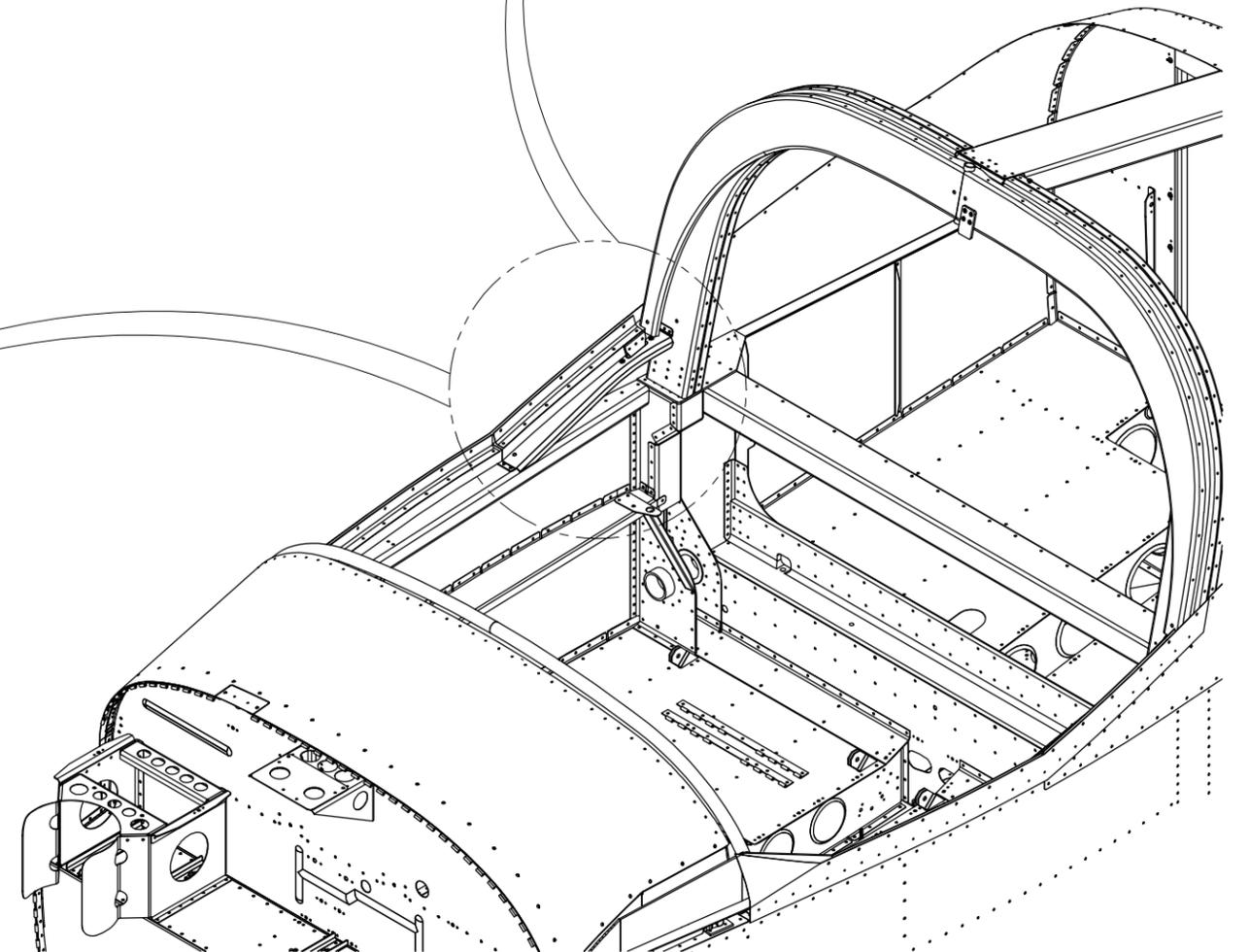
Leave the outer surfaces of the forward "arms" of the canopy frame bare in the area where the C-1208 Canopy Foam will be bonded. See Page 34-13.



**FIGURE 1:**  
GUIDE BLOCK INSTALLATION



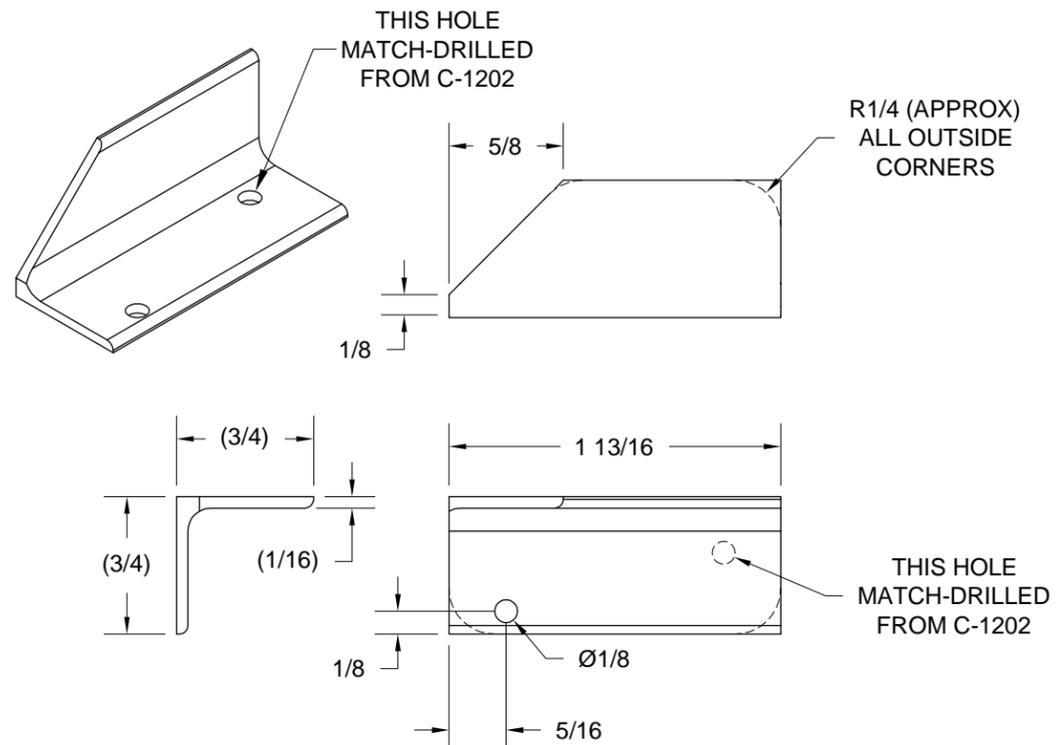
**FIGURE 2:**  
GUIDE PLATE INSTALLATION



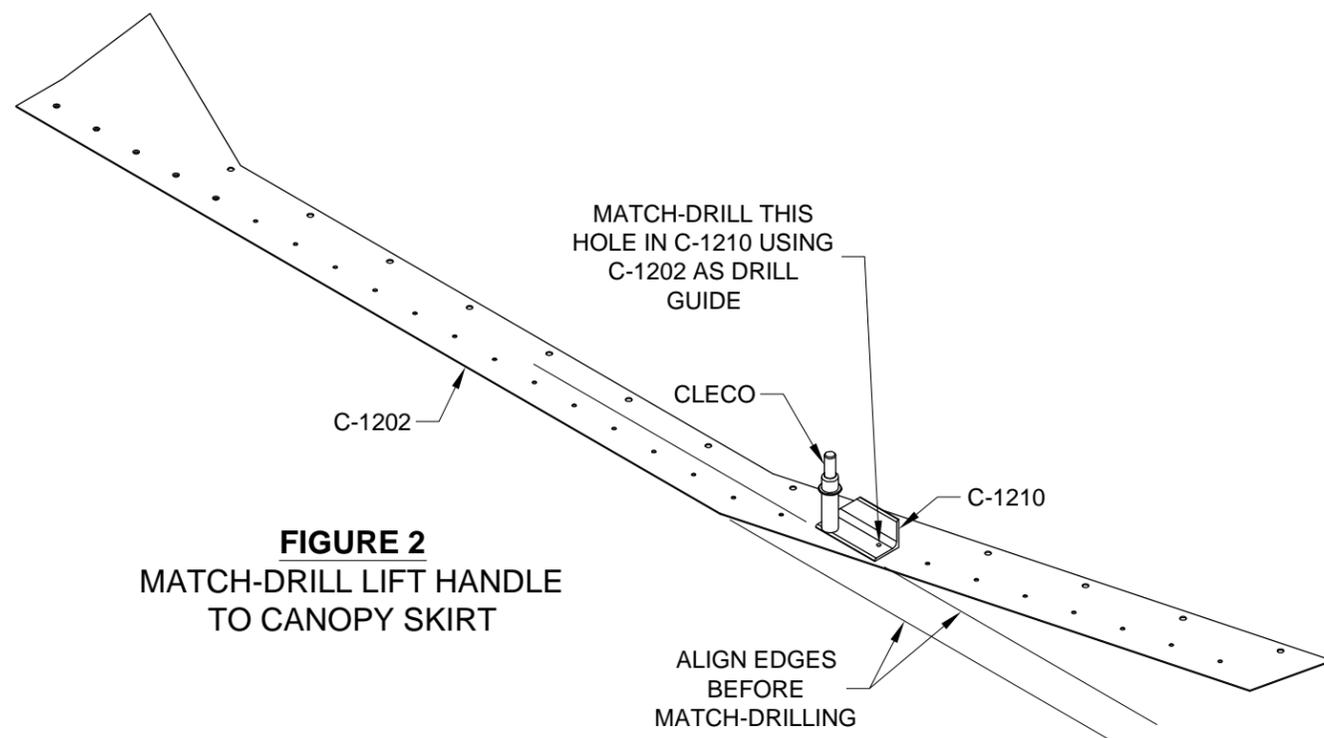


Step 1: Fabricate C-1210 Canopy Lift handles from 3/4 x 3/4 x .063 Aluminum Angle as shown in Figure 1. Make one "left" and one "right" lift handle.

Cleco the lift handle to the C-1202 Canopy Skirt as shown in Figure 2. Align the lift handle and match-drill the second hole in the lift handle using the hole in the canopy skirt as a drill guide.



**FIGURE 1**  
FABRICATE LIFT HANDLES



**FIGURE 2**  
MATCH-DRILL LIFT HANDLE TO CANOPY SKIRT

Step 2: Place the C-1201 Canopy on the WD-1219 Canopy Frame. Cleco the canopy to the canopy frame along the front bow.

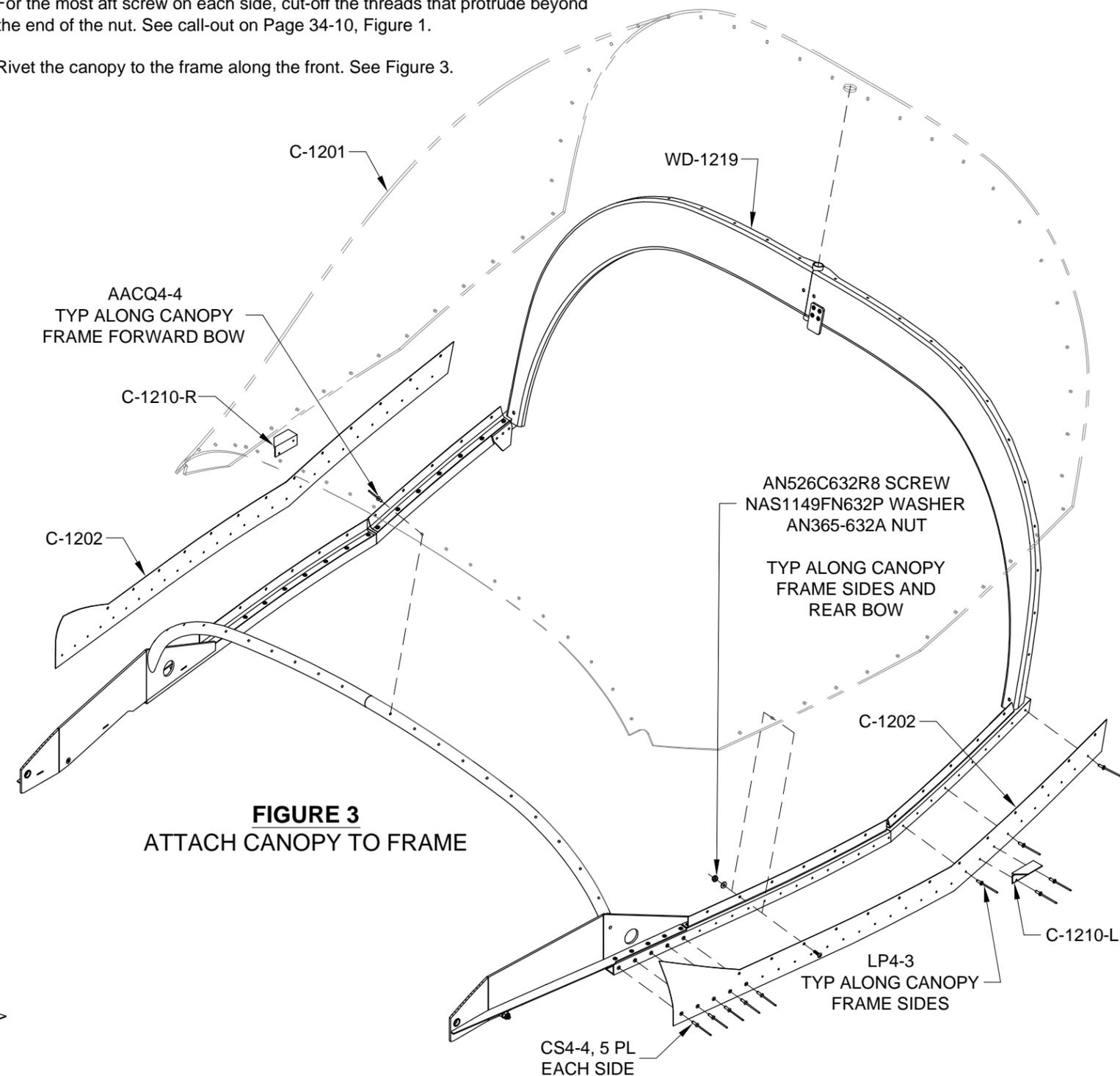
Screw the canopy to the frame along the rear bow using the hardware called-out in Figure 3. Do not over-tighten the screws. Tighten just enough so that the screws do not turn freely.

Step 3: Rivet the C-1202 Canopy Skirts and C-1210 Lift Handles to the WD-1219 Canopy Frame as shown in Figure 3.

Step 4: Screw the C-1201 Canopy to the frame along the sides. Once again, tighten only to the point that the screws do not turn freely.

For the most aft screw on each side, cut-off the threads that protrude beyond the end of the nut. See call-out on Page 34-10, Figure 1.

Rivet the canopy to the frame along the front. See Figure 3.



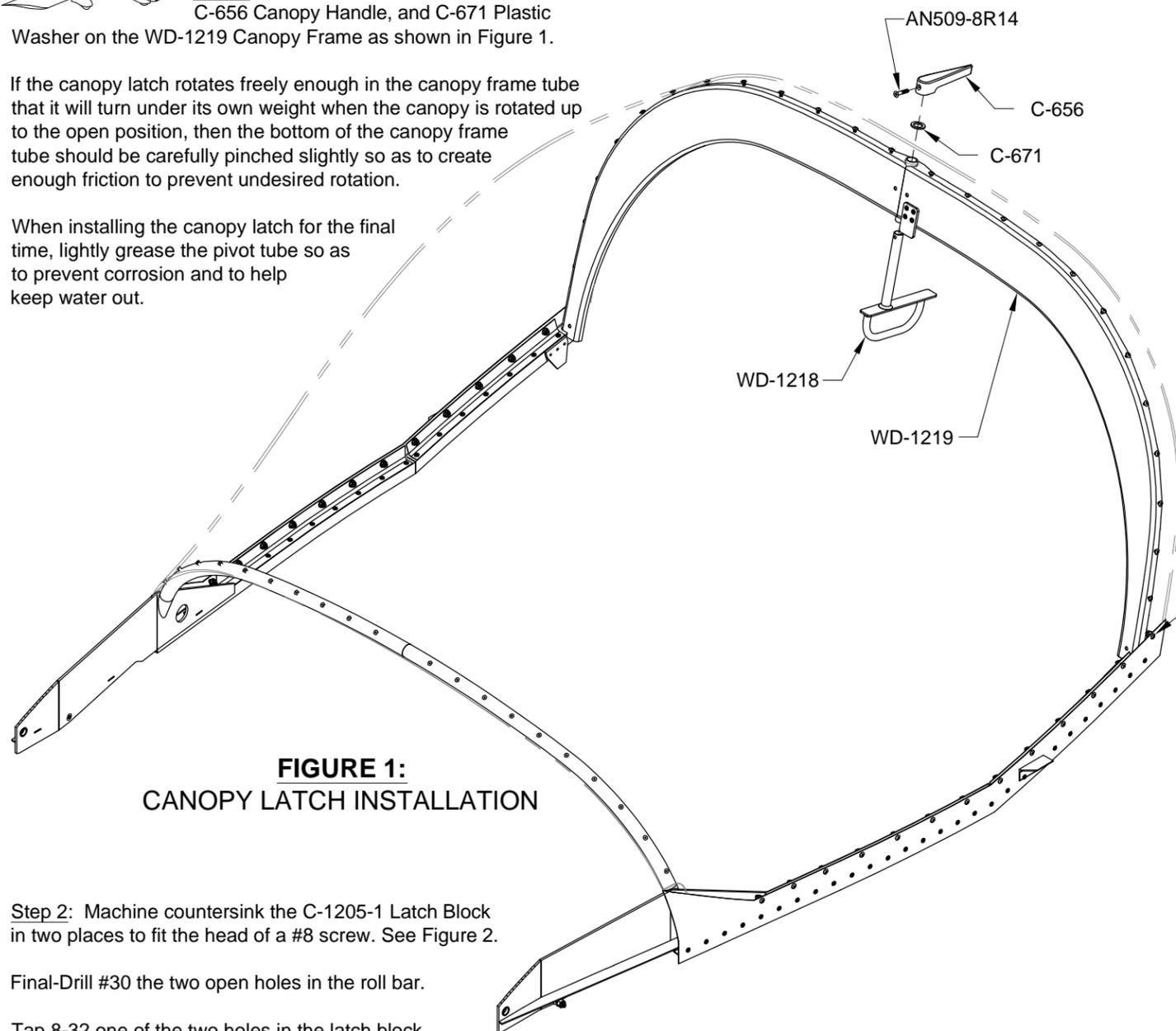
**FIGURE 3**  
ATTACH CANOPY TO FRAME



**Step 1:** Install the WD-1218 Canopy Latch, C-656 Canopy Handle, and C-671 Plastic Washer on the WD-1219 Canopy Frame as shown in Figure 1.

If the canopy latch rotates freely enough in the canopy frame tube that it will turn under its own weight when the canopy is rotated up to the open position, then the bottom of the canopy frame tube should be carefully pinched slightly so as to create enough friction to prevent undesired rotation.

When installing the canopy latch for the final time, lightly grease the pivot tube so as to prevent corrosion and to help keep water out.



**FIGURE 1:  
CANOPY LATCH INSTALLATION**

**Step 2:** Machine countersink the C-1205-1 Latch Block in two places to fit the head of a #8 screw. See Figure 2.

Final-Drill #30 the two open holes in the roll bar.

Tap 8-32 one of the two holes in the latch block.

Cleco the latch block to the bottom of the roll bar through the un-tapped hole.

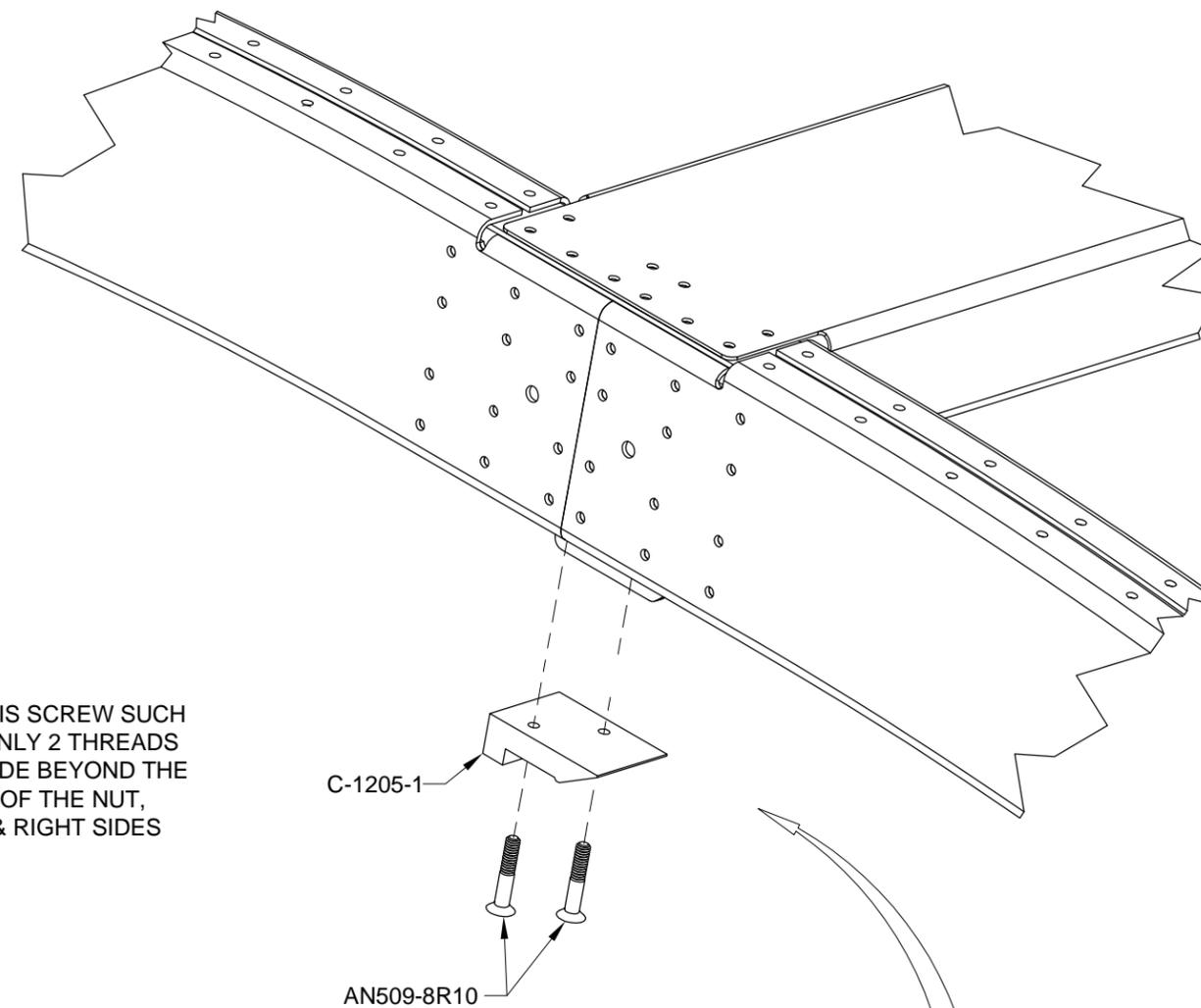
Start the 8-32 tap in the already tapped hole in the latch block and start the tap into the roll bar. The hole in the latch block will keep the tap properly aligned as it cuts threads into the roll bar. Remove the tap and uncleco the latch block.

Final-Drill #19 both holes in the latch block

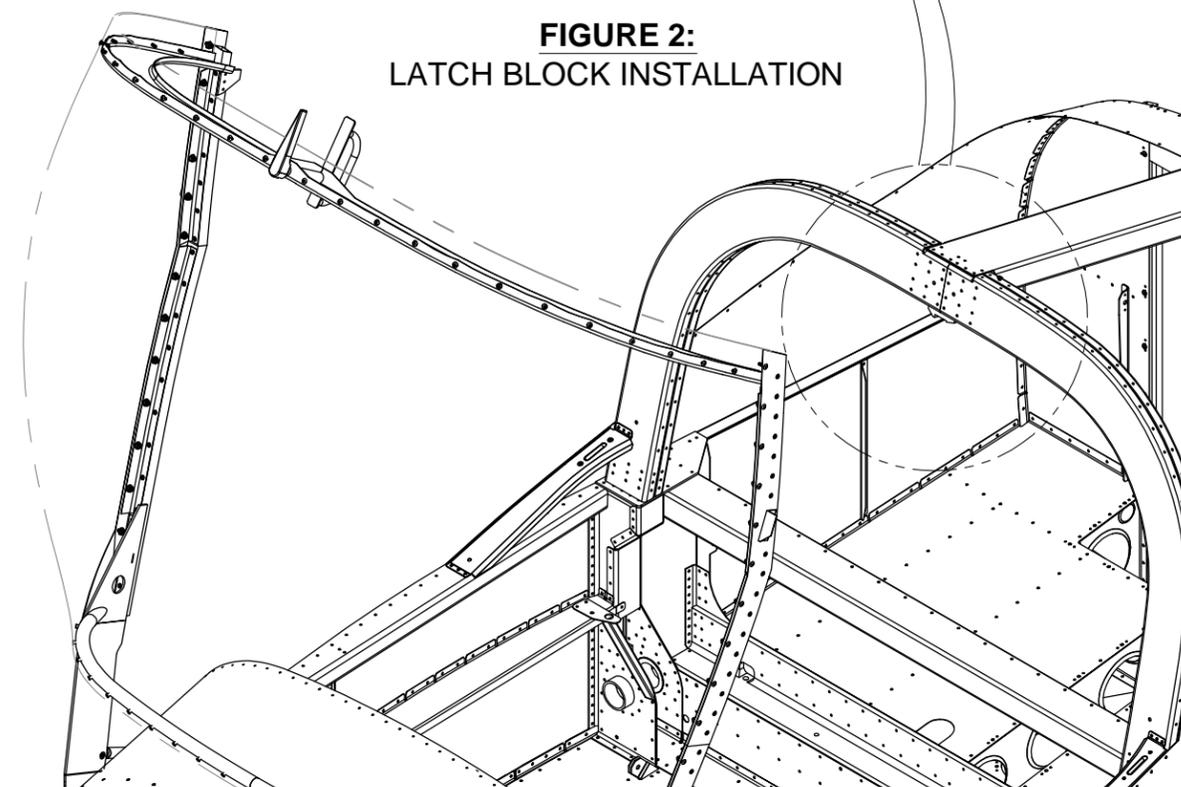
Screw the latch block to the roll bar using the tapped hole in the roll bar.

With the latch block in place, tap the remaining hole in the bottom of the roll bar.

Remove the latch block, clean away the metal chips, and re-install using both screws.



**FIGURE 2:  
LATCH BLOCK INSTALLATION**





**Step 1:** Close the canopy and latch it shut. The flat portion of the WD-1218 Canopy Latch should slide down the ramp of the C-1205-1 Latch Block. There should be little or no friction between the canopy latch and the F-1231F-1 Latch Plate arm. See Figure 1.

If excessive friction exists, a file may be used to remove a small amount of material (not more than .020) from the latch plate arm.

**Step 2:** Fabricate the C-1214 Latch Block from PS UHMW-125X1/2X2 by match-drilling three #30 holes using the F-1231F-1 Latch Plate arm as a drill guide. Countersink the leftmost hole so that the head of a CS4-4 Blind Rivet will be below flush. Trim the ends of the latch block to match the shape of the latch plate. Blind rivet the latch block to the latch plate as shown in Detail A in Figure 2.

The latch block may need to be chamfered to facilitate latching of the WD-1218 Canopy Latch. See Figure 2.

**Step 3:** Remove/cut the roller from the end of the ES E22-50K Micro Switch arm but leave the switch arm as long as possible. Install the ES E22-50K Micro Switch on the F-1231F-1 Latch Plate as shown in Figure 2. Insert the screws into the micro switch mounting holes and thread on the two lock nuts. Orient the lock nuts so that the flanges will contact the latch plate. **DO NOT** apply more than 3 in.-lb beyond prevailing torque to the two lock nuts against the switch.

While keeping the end of the lower screw in the kidney-shaped slot, thread the end of the upper screw into the tapped switch mounting hole in the latch plate until the lock nut flanges contact the latch plate. Loosely install the washer and lock nut on the lower screw.

**Step 4:** Close the canopy and latch it shut. Rotate the ES E22-50K Micro Switch about the upper screw. Align the micro switch so that the switch is only activated (indicated by a small clicking sound) when the WD-1218 Canopy Latch is fully latched.

Secure the micro switch by tightening the lock nut against the washer on the forward side of the F-1231F-1 Latch Plate. See Detail B in Figure 2.

**Step 5:** Fabricate the WH-W1115 (WHT) Canopy Latch Switch Ground Wire by cutting a piece of 22 gauge wire 5 inches long. Strip both ends of the ground wire. Crimp a female spade connector to one end of the ground wire. Crimp a ring terminal to the other end of the ground wire. See Figure 2.

**Step 6:** Detach the WH-W1114 (WHT) Canopy Latch Switch Terminal Wire from the roll bar assembly and strip the end. Crimp on a female spade connector. See Figure 2.

**Step 7:** Connect the spade connector end of the WH-W1114 (WHT) Canopy Latch Switch Terminal Wire to the N.O. (normally open) terminal of the ES E22-50K Micro Switch. See Figure 2 and Detail B.

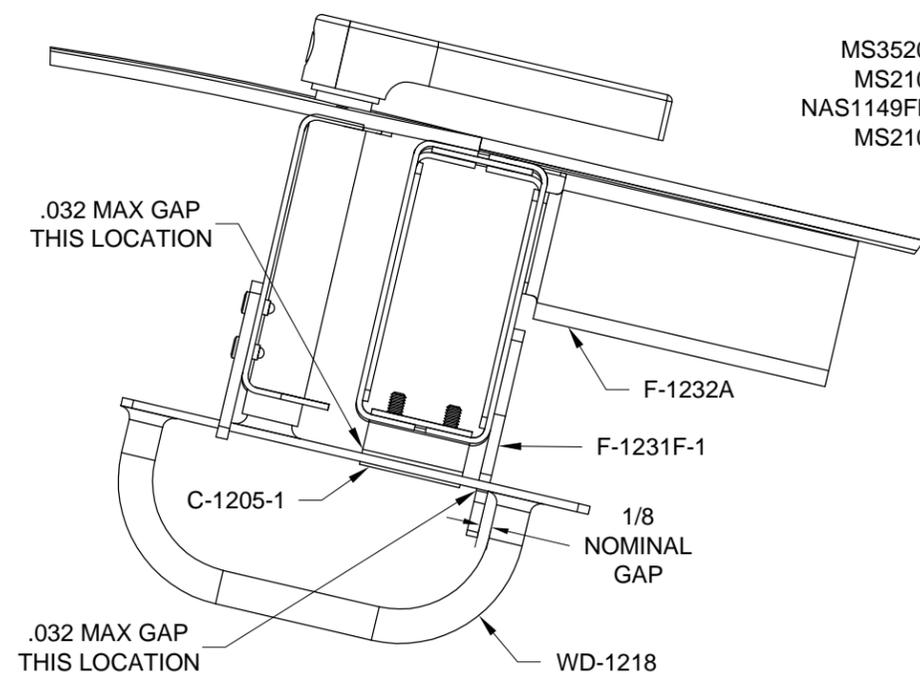
Connect the spade terminal end of the WH-W1115 (WHT) Canopy Latch Switch Ground Wire to the COM (common/ground) terminal of the micro switch. See Figure 2 and Detail B.

**Step 8:** Skip to Step 9 if the optional cockpit lighting package will be installed. Otherwise, cut two short lengths of heat shrink from the ES HST 3/16X1' Heat Shrink. Detach the WH-L435 (YEL/PRP) Cockpit Light Power Wire and WH-L436 (YEL/GRN) Cockpit Ground Wire from the roll bar assembly and cover the ends with the heat shrink.

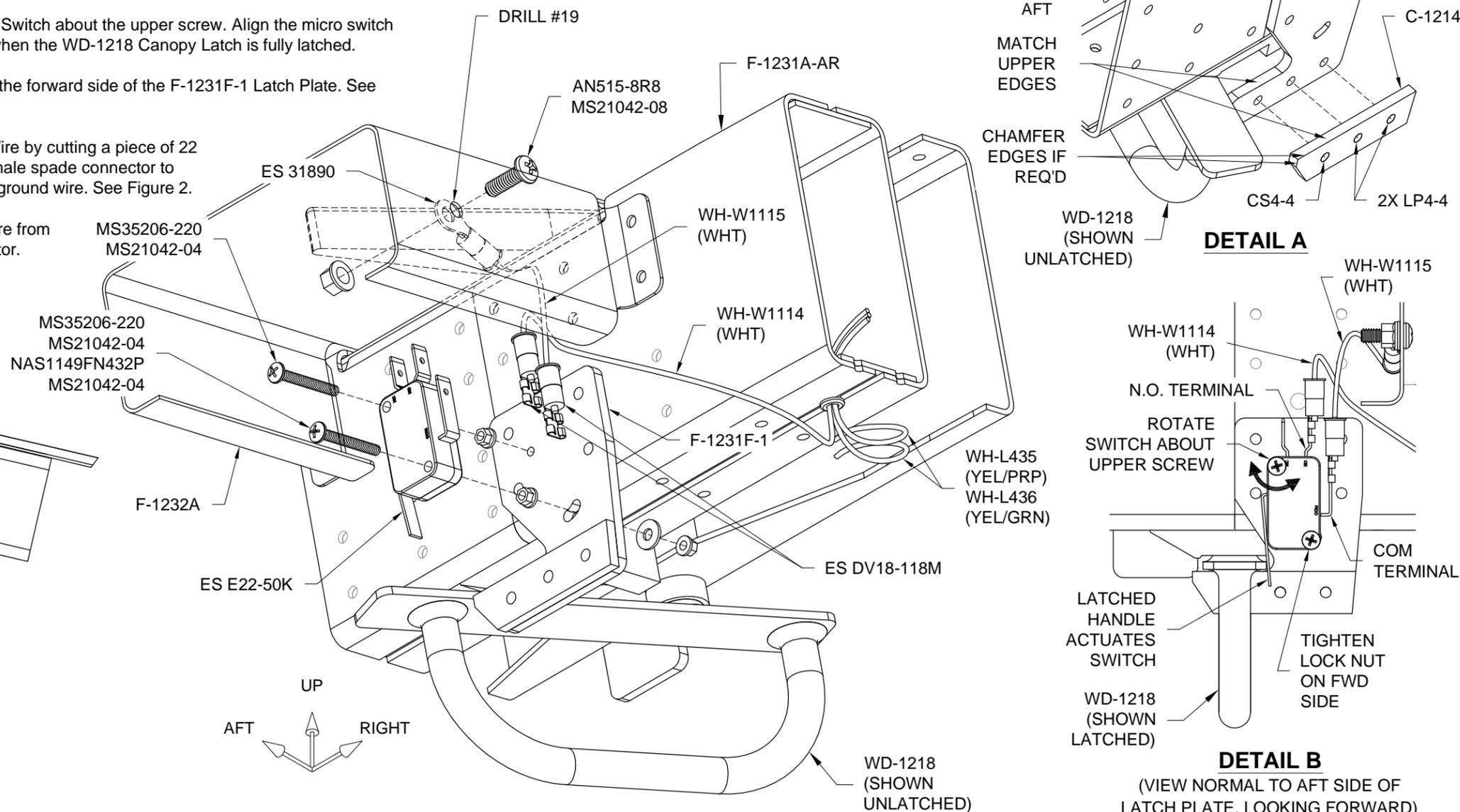
Tie-Wrap the cockpit light power wire and the cockpit ground wire to the WH-W1114 Canopy Latch Switch Terminal Wire.

**Step 9:** Drill #19 a hole in the side of the F-1232A Roll Bar Brace midway between the top and bottom of the brace and approximately 2.5 inches from the face of the F-1231A-AR Roll Bar Frame. Remove any paint from around the hole on the inboard side of the roll bar brace to ensure good conductivity with the ring terminal.

Install the ring terminal end of the WH-W1115 (WHT) Canopy Latch Switch Ground Wire on the inboard side of the roll bar brace as shown in Figure 2.



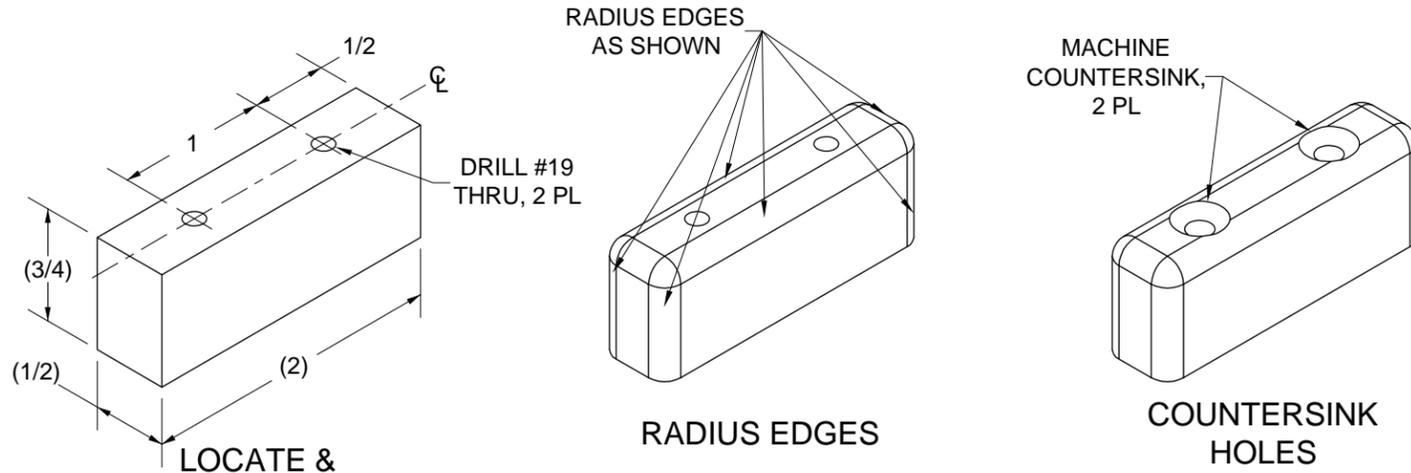
**FIGURE 1: CANOPY LATCHING DETAIL**  
(VIEW LEFT SIDE LOOKING RIGHT)



**FIGURE 2: INSTALL CANOPY LATCH SWITCH**



**Step 1:** Measure, mark, and drill each C-1212 Guide Block as shown in Figure 1, "LOCATE & DRILL HOLES".



**FIGURE 1:**  
GUIDE BLOCK HOLE LOCATIONS

**Step 2:** Radius the edges of each C-1212 Guide Block as shown in Figure 1, "RADIUS EDGES".

**Step 3:** Machine countersink the two holes in each C-1212 Guide Block to fit the head of a #8 flush screw. See Figure 1, "COUNTERSINK HOLES". Countersinks that are up to .015 too deep are acceptable and are preferable to countersinks that are too shallow.

**Step 4:** Unlatch the canopy and rotate it up to the open position.

Measure, mark, and drill holes in the F-1231A-FL and F-1231A-FR Roll Bar Frames as shown in Figure 2.

Hold one of the C-1212 Guide Blocks against the front of the roll bar frame and use one of the holes in the guide block to ensure that the tap remains aligned while cutting threads. Remove the guide block and clear away chips then temporarily attach the guide block to the roll bar frame using the same hole that was used to guide the tap. See Figure 2.

Select the remaining guide block and repeat the tap process for the opposite side.

**Step 5:** Rotate each of the C-1212 Guide Blocks on it's screw until the lower outboard corner is just tangent to the outside surface of the F-1231A-FL and F-1231A-FR Roll Bar Frames as shown in Figure 2.

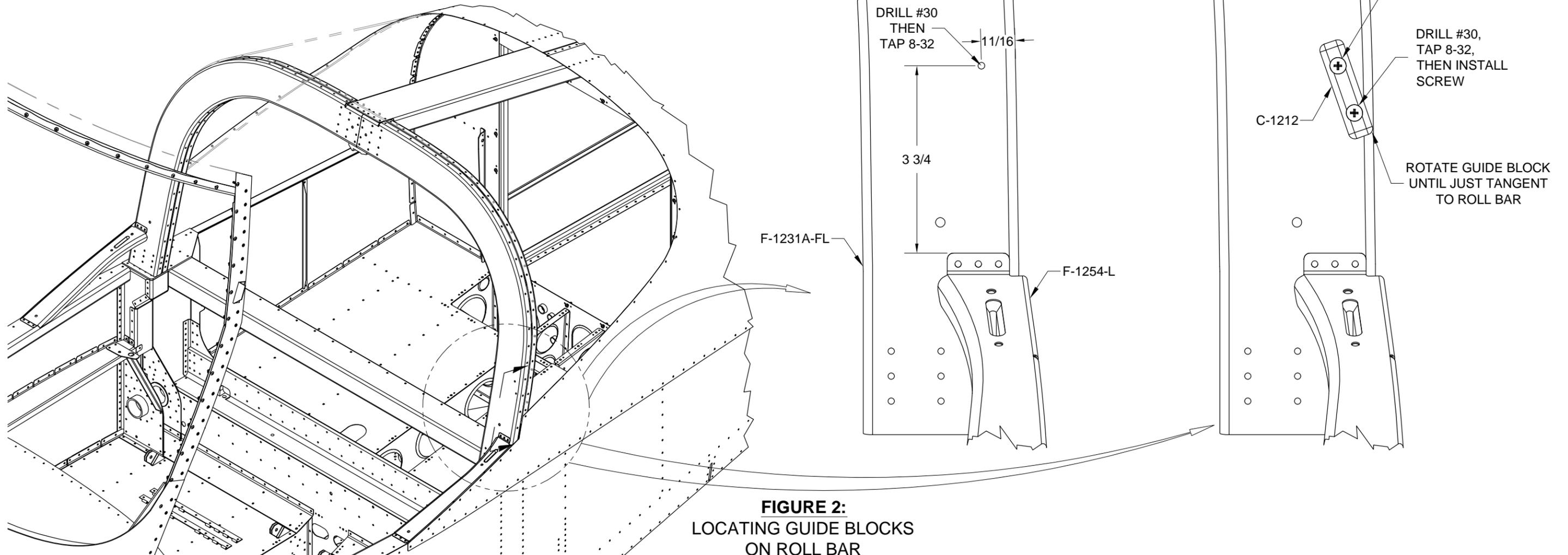
With the guide block held in proper position, run a #19 drill through the open hole in the guide block to make a mark on the roll bar frame. Repeat for the opposite side.

Rotate the guide block to expose the mark and drill #30 through the roll bar frame. Repeat for the opposite side.

Rotate the guide block back to it's proper position and tap using the hole in the guide block to hold the tap aligned while cutting threads. Repeat for the opposite side.

Clear away chips and final install both guide blocks as shown in Figure 2.

**Step 6:** Rotate the canopy down to the closed position. As the canopy nears the fully closed position, verify that there is no interference between any screws and the lower outboard corners of the C-1212 Guide Blocks. Chamfer the lower outboard corner of the guide block as required to eliminate interference.



**FIGURE 2:**  
LOCATING GUIDE BLOCKS  
ON ROLL BAR

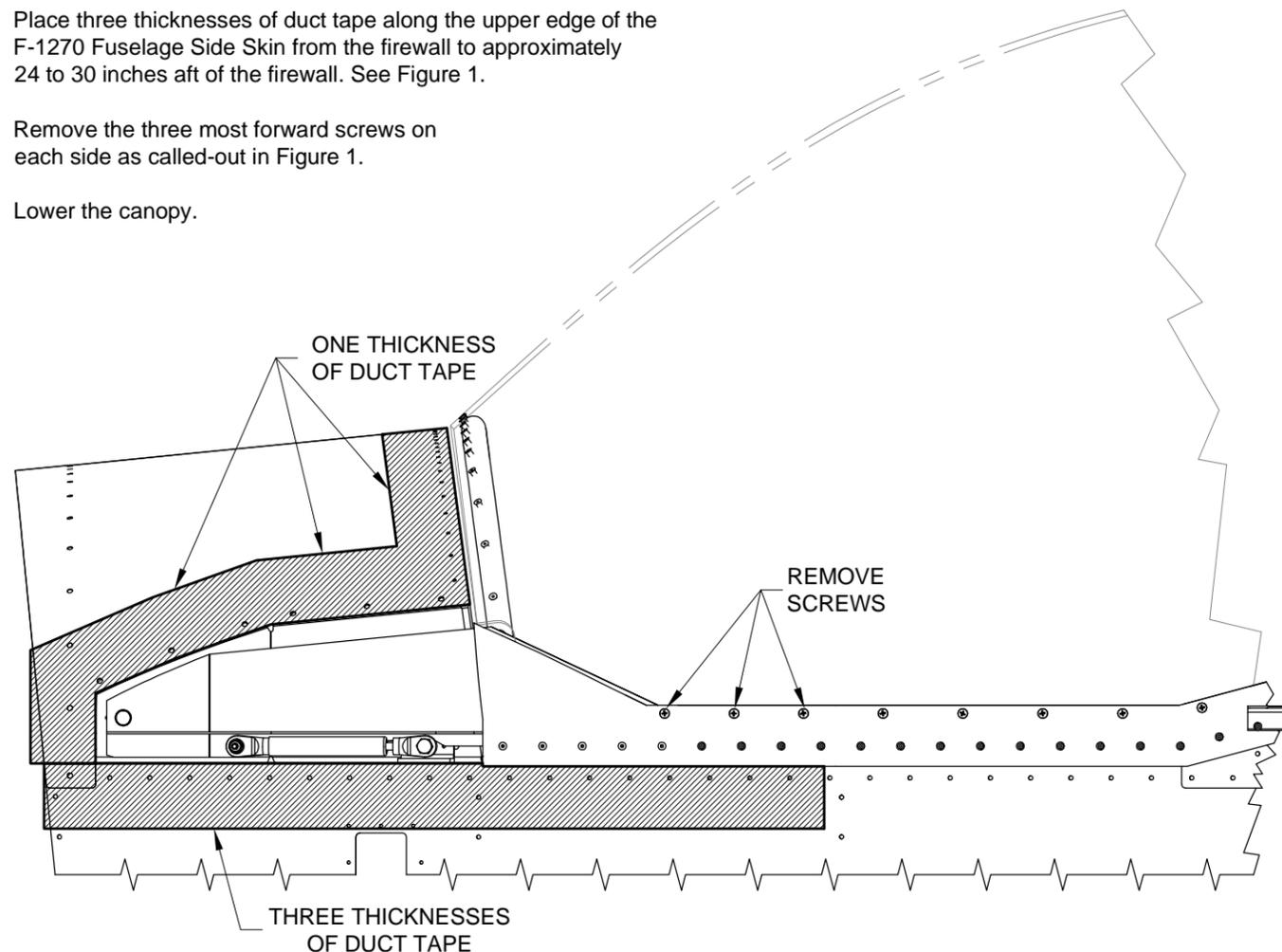


**Step 1:** Raise the canopy. Use masking tape and paper to cover the instrument panel and the coves where the canopy frame forward arms nest when the canopy is closed.

Place three thicknesses of duct tape along the upper edge of the F-1270 Fuselage Side Skin from the firewall to approximately 24 to 30 inches aft of the firewall. See Figure 1.

Remove the three most forward screws on each side as called-out in Figure 1.

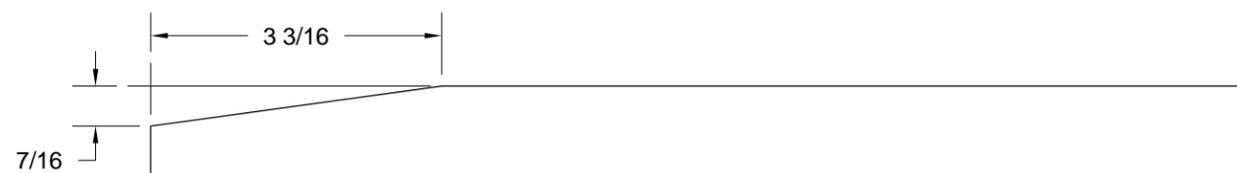
Lower the canopy.



**FIGURE 1:**  
PROTECTIVE TAPE PLACEMENT

**Step 2:** Place one thickness of duct tape to the edges of the F-1240 Upper Forward Fuselage Skin all the way around as shown in Figure 1. Mask-off the remaining area of the upper forward fuselage skin using masking tape and newsprint or butcher paper.

**Step 3:** Trim each C-1208 Canopy Foam as shown in Figure 2.



**FIGURE 2:**  
TRIM CANOPY FOAM

**Step 4:** Position the trimmed C-1208 Canopy Foam in place on the WD-1219 Canopy Frame as shown in Figure 3.

Push each canopy foam aft against the C-1202 Canopy Skirt so that the canopy skirt crushes the canopy foam to a depth of approximately 1/32 inch.

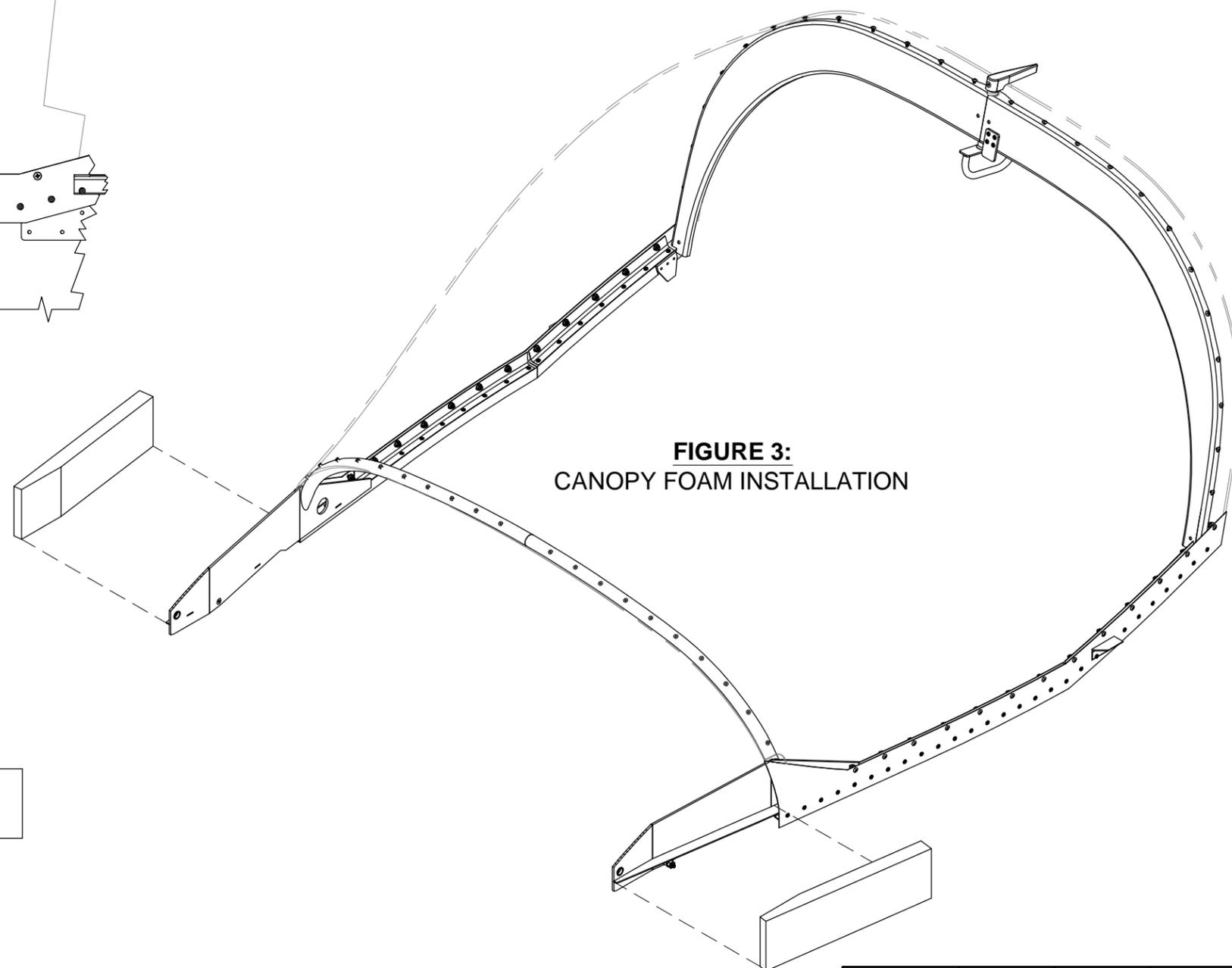
Push each canopy foam inboard against the head of the AN4 bolt that the canopy frame pivots on so that the bolt head crushes the canopy foam to a depth of approximately 1/32 inch.

Using a "sharpie" pen, trace the shape of the upper forward fuselage onto the inboard side of each canopy foam.

Remove the canopy foam and trim the upper edge to the sharpie mark. Use a hack-saw blade. Using a unibit, drill a 7/8 diameter hole through the canopy foam at the center of the mark made by the AN4 bolt head.

Use a piece of 80 to 100 grit sandpaper to scuff the surface of the canopy frame where the canopy foam will be in contact. Scuff so that the gloss is removed from the entire aluminum surface. Glue the canopy foam to the canopy frame using epoxy thickened with flox. Flox should be added to the resin until the mixture is just thick enough that it won't pour when the mixing cup is tipped.

Spread a thin (approx 1/16 inch) layer of thickened epoxy on the mating surface of the foam. Achieve a good bond between the canopy foam and canopy frame but use care so as not to get any epoxy/flox mixture on the pivot bolt or washers.



**FIGURE 3:**  
CANOPY FOAM INSTALLATION



**Step 1:** Using a 15 to 18 inch long by 3 inch wide sanding block with 80 grit sandpaper, shape the C-1208 Canopy Foam to match the contours of the forward fuselage. Use the sanding block held in an approximately fwd/aft direction guiding on the fuselage structure to achieve the desired shape.

**Step 2:** Cut-out the CANOPY MASKING GUIDE & GLASS FABRIC PLY TEMPLATES. (These are supplied full scale on a separate 24" X 36" drawing.) Using several small pieces of masking tape, align both left and right side templates to the canopy and tape in place.

**Step 3:** Place a strip of good quality electrical tape on the canopy closely following the edge of the paper templates. Use tape to bridge between the left and right templates following the line established by the templates. When bridging between right and left sides, project the line from the template on one side across the center of the canopy to match the line from the template on the other side.

Carefully remove the templates and set them aside to be used in the next step.

Place a second layer of electrical tape on top of the first layer. Mask-off the entire canopy above and aft of the double layer of electrical tape.

**Step 4:** Cut ten plies (two each of ply #1 through #5 as called-out on the CANOPY MASKING GUIDE & GLASS FABRIC PLY TEMPLATE) from 9 oz./square yard, plain weave E-Glass fabric. Use a rotary cutter on a smooth, relatively soft surface when cutting (the finished side of the crate your kit was delivered in makes a good surface for the rotary cutter). Cut the plies to the size/shape defined on the template. The templates will not be used again, so it is acceptable to cut the template down as you are cutting the plies.

Arrange the cut plies into two neat sequential stacks with ply #5 at the bottom of each.

**Step 5:** Sand the exposed canopy with 60 to 80 grit sandpaper. Sand the canopy skirt where glass fabric will be bonded. Use extra care to be sure that there are no shiny or glossy areas anywhere on the canopy or canopy skirts that will have glass fabric bonded to them. There must be **NO** visible shiny or glossy spots on any of the surfaces. Brush away (with a new paint brush) or gently blow away (using compressed air) all the sanding dust and other shop debris. Place mylar packaging tape over the duct tape strips that are protecting the F-1240 Upper Forward Fuselage Skin. Apply a light coating of wax to the surface of the mylar tape. Use great care to not get wax on any surface that the glass fabric bonds to.

**NOTE:** The remaining steps on this page should be completed in a single work session, so you will need to budget approximately four hours of uninterrupted work time before moving forward.

**Step 6:** Cut away the thin edges of the C-1208 Canopy Foam along the upper edge until there is a "shelf" approximately 1/8 inch wide. Mix epoxy and thicken with floc to create a paste and fill the just created gaps with the thickened resin mixture. See Figure 1 and Page 34-15, Figure 2.

**Step 7:** Place a piece (or pieces) of plastic food wrap on your work table. Place ply #1 on the plastic wrap and wet it out with epoxy. Use bondo squeegee to ensure that fabric is wetted with epoxy but not excessively so.

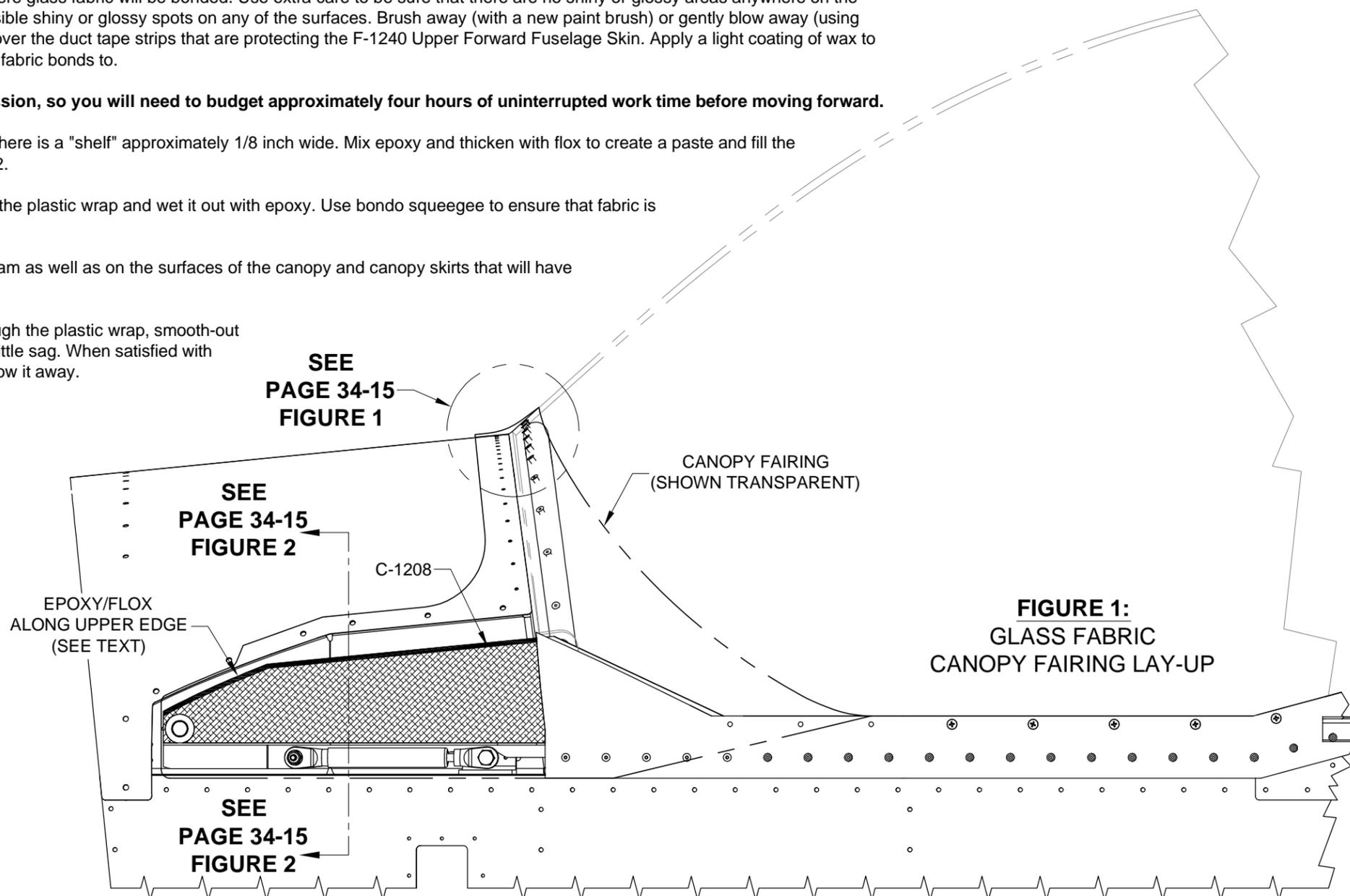
Brush a coat of epoxy on the porous outer surface of the final-shaped C-1208 Canopy Foam as well as on the surfaces of the canopy and canopy skirts that will have glass fabric bonded to them.

Pick up the plastic food wrap with ply #1 on it and position it on the canopy. Working through the plastic wrap, smooth-out the glass fabric and work the edges until they bridge across any unsupported areas with little sag. When satisfied with the placement of ply #1, carefully peel the plastic wrap away from the glass fabric and throw it away.

Repeat this process for ply #1 on the opposite side of the canopy.

**Step 8:** Allow resin to cure to the point that it is beginning to gel, but is still tacky. While the epoxy for ply #1 is still uncured, place ply #2 (dry) in place on the canopy and wet it out with epoxy resin. Use care while wetting-out the ply #2 fabric so as not to disturb the placement of ply #1. Place and wet-out ply #2 on the opposite side of the canopy.

Continue placing successive plies until ply #5 has been placed and wetted-out on both sides of the canopy. While still wet, cover the entire lay-up with peel ply (if desired) to minimize sanding before the next portion of the canopy fairing is layed-up. The peel ply should fully wet-out with resin when applied. It will easily pull-off after the resin is cured.



**FIGURE 1:**  
GLASS FABRIC  
CANOPY FAIRING LAY-UP



**Step 1:** Cut a series of strips of glass fabric that are 36 inches long with quantities and widths as listed below:

Width	Qty	Figure 1 Ply #
2 3/4	1	1
2 1/2	2	2 & 9
2 1/4	1	10
2	1	3
3/4	1	5
1/2	2	4 & 6
3/8	1	7
1/4	1	8

Use a rotary cutter along with a long straight edge when cutting these long skinny strips. Arrange the cut plies into a neat sequential stack with ply #10 at the bottom.

**NOTE:** The next step on this page should be completed in a single work session, so you will need to budget approximately three hours of uninterrupted work time before moving forward.

**Step 2:** Remove the peel ply (if used) from the previous lay-ups. If peel ply was not used, sand the most inboard three inches of the previous lay-up with 60 to 80 grit sandpaper. Use extra care to be sure that there are no un-sanded areas anywhere on the previous lay-up that will have glass fabric bonded to them. Brush away (with a new paint brush) or gently blow away (using compressed air) all the sanding dust and other shop debris.

**Step 3:** Place a piece of plastic food wrap on your work table. Place ply #1 on the plastic wrap and wet it out with epoxy. Use a bondo squeegee to ensure that the glass fabric is wetted with epoxy but not excessively so.

Brush a coat of epoxy on the surfaces of the canopy and previous lay-ups that will have glass fabric bonded to them.

Pick up the plastic food wrap with ply #1 on it and position it on the canopy. Place the edge of ply #1 against the edge of the electrical tape. Place the end of ply #1 such that it overlaps the previous lay-up by approximately 1/2 inch. Working through the plastic wrap, smooth-out the glass fabric and work the edges until they bridge across the unsupported areas with little sag. When satisfied with the placement of ply #1, carefully peel the plastic wrap away from the glass fabric and throw it away.

Work from one side across to the other and trim the ply to achieve 1/2 inch overlap "in-place" as the last few inches are laid down.

**Step 4:** Allow resin to cure to the point that it is beginning to gel, but is still tacky. With the epoxy for ply #1 still uncured, place ply #2 (dry) in place on the canopy and wet it out with epoxy resin. Place the edge of ply #2 1/8 inch below the edge of ply #1 as shown in Figure 1. Place the end of ply #2 such that it overlaps the end of ply #1 by approximately 1/2 inch. Use care while wetting-out the ply #2 fabric so as not to disturb the placement of ply #1. Trim the other end to achieve 1/2 inch overlap.

Continue placing successive plies until ply #10 has been placed and wetted-out. Place the edges of the plies as shown in Figure 1. Stagger the ends of the various plies so that the thickness of the new lay-up transitions smoothly into the previous lay-ups thus preventing "lumps" that make final finishing more difficult.

**Step 5:** Allow everything to cure for a day or so before beginning the finishing process. Start with 60 to 80 grit sandpaper on a flat sanding block for the sides and use a round (approximately 2 inch radius) sanding block for the center. This will get you quickly to the general shape, but be careful to not get into the electrical tape that is protecting the canopy. When you get down near the tape, switch to about 80 to 100 grit sandpaper and work very carefully until you are just contacting the tape and the canopy skirt metal on the edges of the lay-up. If you sand through the first layer of electrical tape, the second one should protect the canopy if you are watching carefully.

In areas where the edges of the lay-up don't bond onto the canopy or canopy skirt, it is only necessary to finish the surface to within approximately 1/4 inch of the edge of the lay-up.

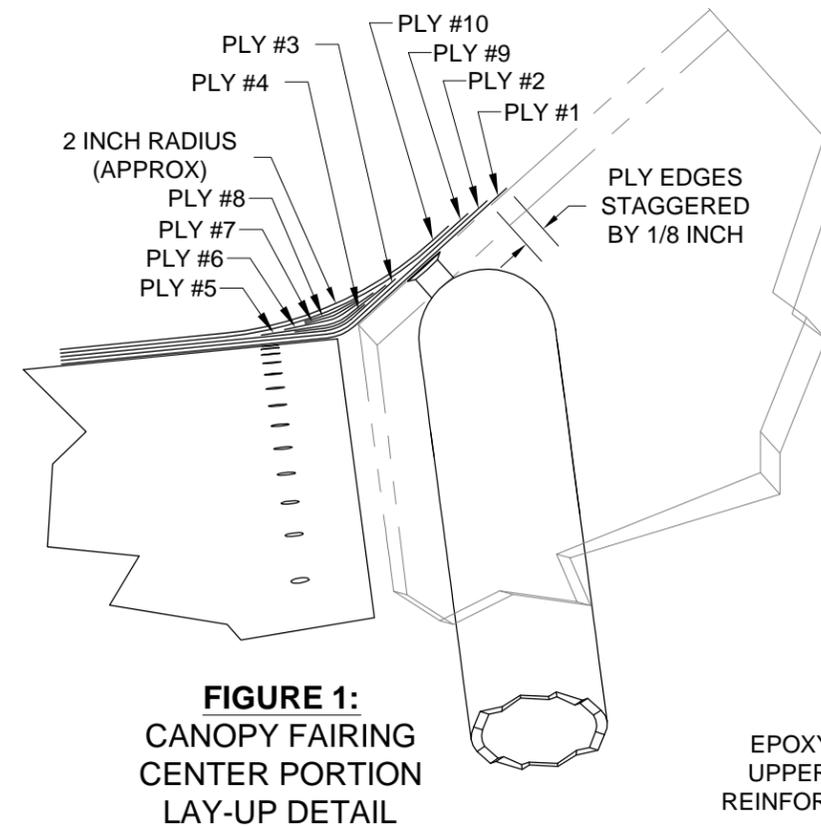
Remove the second layer of electrical tape (leaving only the first layer to protect the canopy) and sand carefully using 150 grit sandpaper until you just start to see sanding marks in the tape.

Brush on a heavy coat of epoxy overlapping the epoxy onto the tape and let harden.

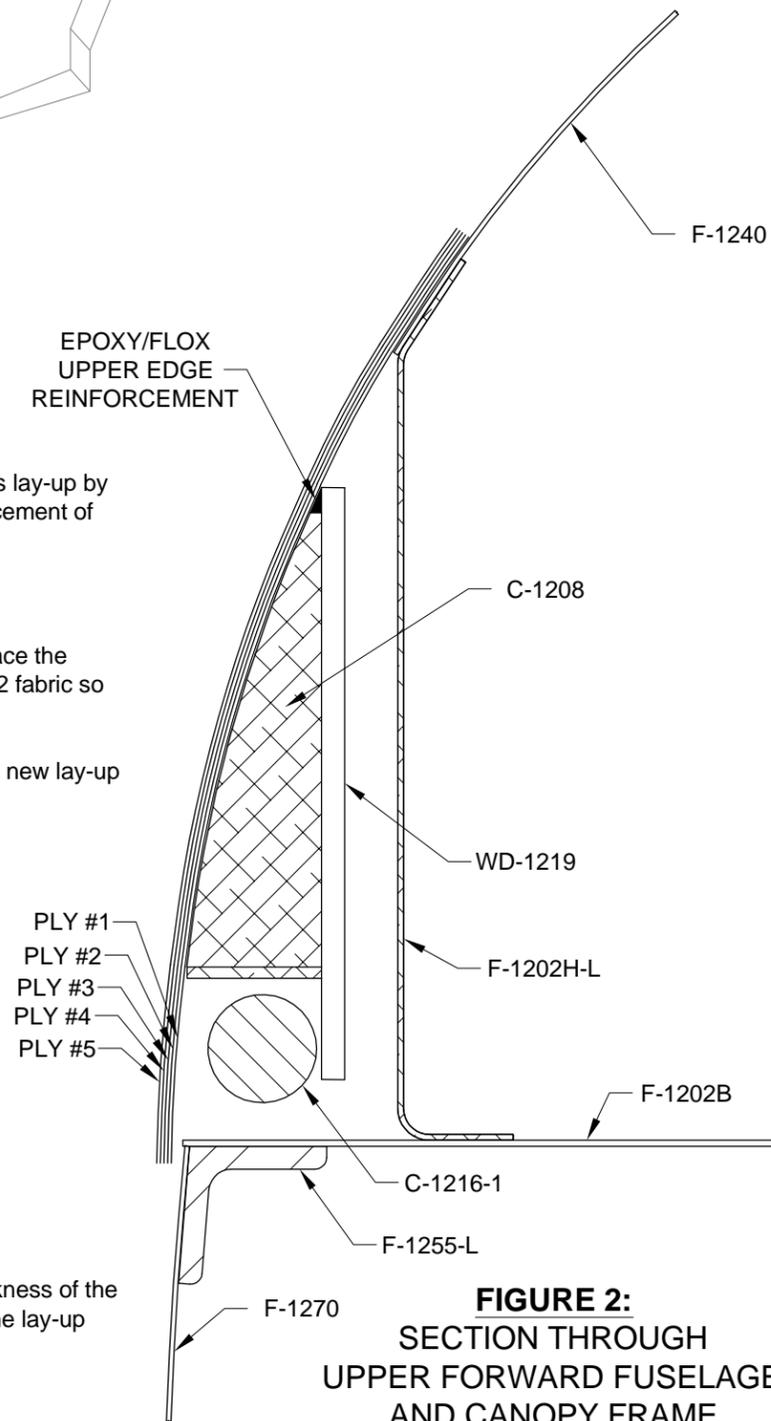
Sand again with 100 grit sandpaper then 150 grit sandpaper.

If there are any areas that need filling you can fill them now by scuffing with 60 grit sandpaper and filling with a dry mix of epoxy and microballoons.

The goal is to have a lay-up with the outer surface being a build-up of two or three coats of epoxy that has been finish sanded to final shape with the epoxy blending onto the canopy being the thickness of the electrical tape (or less). The epoxy/glass fabric lay-up that covers the forward portion of the C-1202 Canopy Skirts should blend to zero thickness seamlessly onto the metal. The final blending of the lay-up into the metal may require a couple of wet sanded applications of a filler primer to blend it out entirely.



**FIGURE 1:**  
CANOPY FAIRING  
CENTER PORTION  
LAY-UP DETAIL



**FIGURE 2:**  
SECTION THROUGH  
UPPER FORWARD FUSELAGE  
AND CANOPY FRAME



**Step 1:** Drill a 3/8 diameter hole through the glass fabric lay-up at the location of the canopy pivot bolt centers. Carefully enlarge the holes to 13/16 inch using a file or coarse sandpaper wrapped around a drill bit.

With the canopy pivot bolts now accessible, remove the bolts and then remove the canopy. Remove the tape protecting the upper forward fuselage and fuselage side skins.

**Step 2:** Re-drill the three holes where screws were removed and re-install screws/washers/nuts.

Trim the lower edges (the edges that slightly overlap the F-1270 Fuselage Side Skins. See Page 34-15, Figure 2) of the glass fabric lay-up to be parallel to the bottom edges of the C-1202 Canopy Skirts. Use a straight edge to project the canopy skirt lower edges forward onto the glass fabric lay-up.

**Step 3:** Cut-out the CANOPY LAY-UP TRIM TEMPLATE. (This is supplied full scale on a separate 24" X 36" drawing.) Using several small pieces of masking tape, align the template to the canopy and tape in place. Mark the trim line on the glass fabric lay-up using the template as a guide. (Page 34-14, Figure 1 also depicts the final-trim of the glass fabric lay-up.) Remove the template and use it to mark the opposite side of the canopy. Trim the glass fabric lay-up to the trim lines. Finish sand the trimmed edges.

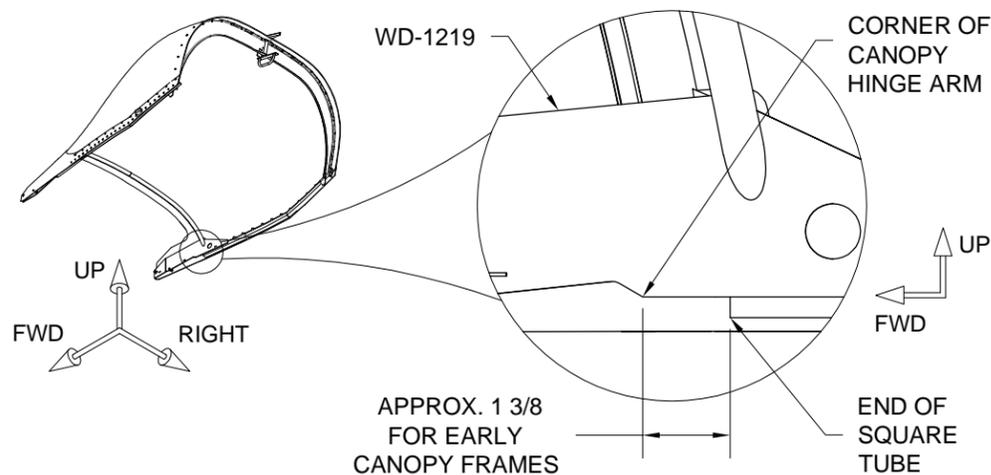
**Step 4:** Place the canopy back on the fuselage and re-install the pivot bolts. Carefully pivot the canopy up while observing the relationship of the forward edges of the glass fabric lay-up and the upper forward fuselage. If there is any impending interference, stop moving the canopy and mark where the glass fabric lay-up needs to be trimmed to clear the fuselage as it pivots up. Remove the canopy and trim as required. Repeat this process until the canopy can be fully opened without any interference between the glass fabric lay-up and the fuselage.

**Step 5:** Brush-coat with epoxy the exposed areas of the C-1208 Canopy Foam inside the pivot bolt cavities and along the front edge of the canopy foam where the glass fabric lay-up does not cover it. This will seal the foam and make it more durable. The epoxy may be thickened with floc if needed to fill gaps or cavities. Finish sand these areas as desired. Repetition of the brush coat may be necessary after finish sanding.



**NOTE:** Later production WD-1219 Canopy Frames have longer square tubes than the earlier version. The following steps describe identifying early production canopy frames and installing the C-1218 Extension these frames need in order to achieve an effective seal at the lower forward corners.

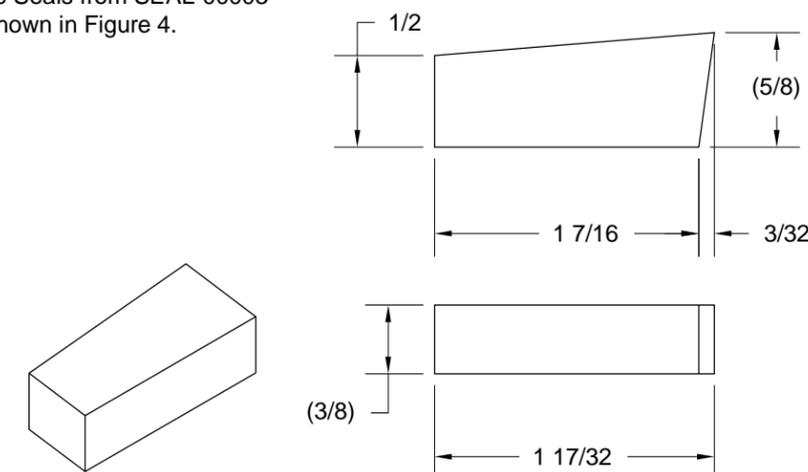
**Step 1:** Measure the distance between the end of the frame's square tube and the corner of the canopy hinge arm as shown in Figure 1. If the measurement matches the call-out the frame is an early production frame.



**FIGURE 1: DETERMINE FRAME TYPE**  
INNER RIGHT SIDE SHOWN

**NOTE:** The Seal is intended to be cut longer than necessary in order to provide something to hold on to when it is finally trimmed following installation.

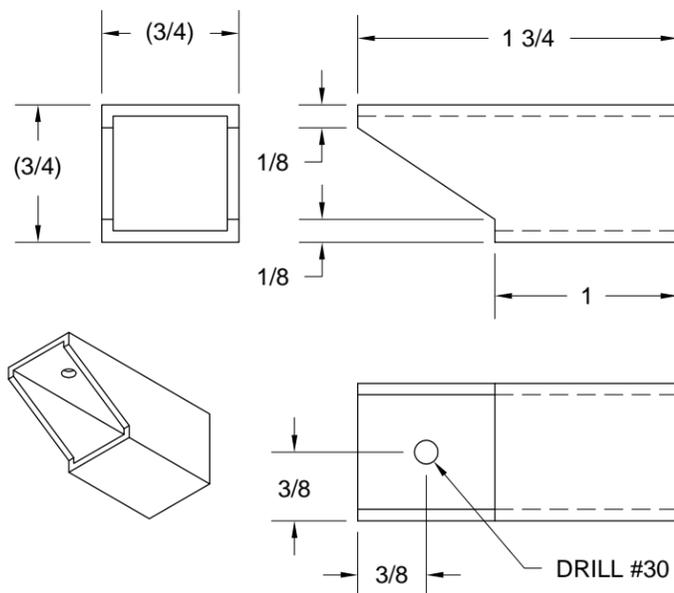
**Step 4:** Fabricate the F-00059A-L & -R Base Seals from SEAL-00003 Foam PVC .375X.625 per the dimensions shown in Figure 4.



**FIGURE 4: FABRICATE BASE SEAL**  
LEFT SHOWN - RIGHT OPPOSITE

**Step 2 (LATE PRODUCTION FRAME):** Skip to Step 4.

**Step 2 (EARLY PRODUCTION FRAME):** Fabricate C-1218 Extension from AT6-063X3/4X3/4 square tube as shown in Figure 2.



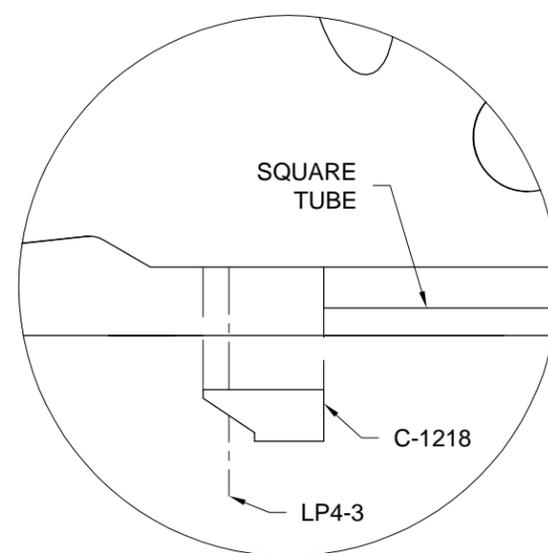
**FIGURE 2: FABRICATE EXTENSION**

**Step 3 (EARLY PRODUCTION FRAME):** Clamp the C-1218 Extension into position. See Figure 3.

Match-Drill #30 the canopy frame using the hole in the extension as a guide.

Remove extension, clear away chips, deburr and prime if desired.

Rivet the extension to the canopy frame using the hardware called out in Figure 3.



**FIGURE 3: INSTALL EXTENSION**

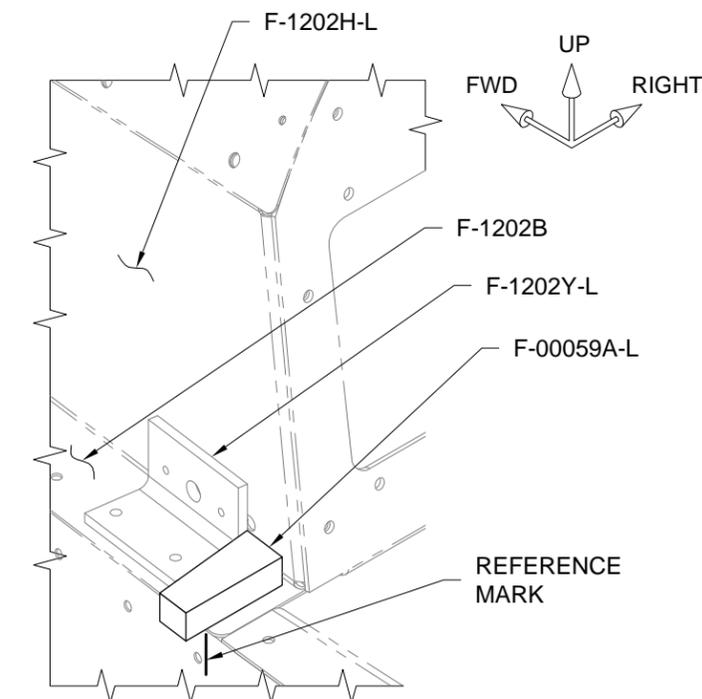
**NOTE:** Delay final installation of seals attached to painted surfaces until 5-7 days after painting is complete.

**Step 5:** Trim the lower inboard corner of the F-00059A-L Base Seal where it would interfere with the fillet of sealant at the bottom of the F-1202H-L Canopy Rib as shown on Page 34-21 Figure 1.

**Step 6:** Temporarily position the base seal onto the F-1202B Panel Base with the seal's fwd inboard corner contacting the aft end of the F-1202Y-L Strut Attach Angle and the inboard face of the seal butted up against the canopy rib. See Figure 5.

**Step 7:** Place a reference mark on the fuselage side skin as shown. Set aside the base seal for now.

**Step 8:** Repeat Steps 5-7 for the F-00059A-R Base Seal.



**FIGURE 5: ATTACH BASE SEAL**



**NOTE: Check for fit before priming or painting the C-1221 Seal Retainer.**

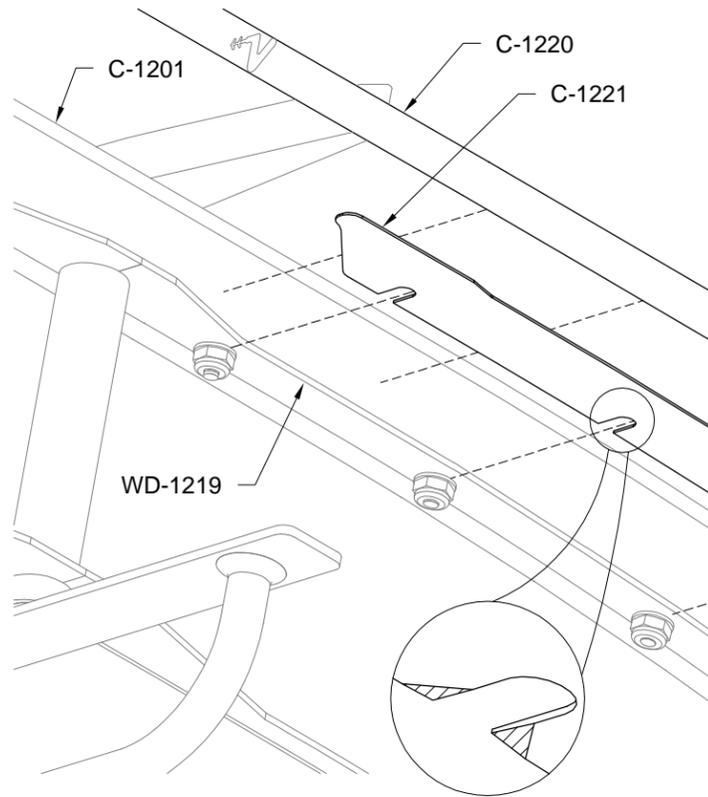
**Step 1:** Deburr the C-1221 Seal Retainer and bevel the edges at the screw slots as shown in Figure 1 to aid in sliding the retainer beneath the washers.

**Step 2:** Place the SEAL-00002 Leaf UR .375X.604, C-1221 Seal Retainers, 5/16 nut driver, Phillips screwdriver, straight-slot screwdriver with the end taped over, "Sharpie" pen, and C-1219 Foam Spacer (addressed in later steps) inside the cockpit and climb inside.

**Step 3:** Loosen the screws attaching the C-1201 Canopy to the WD-1219 Canopy Frame enough to allow the retainer to slide in between the canopy frame and washers.

Install the two retainers as shown in Figure 1 and Section B-B.

Tighten the screws just enough to hold the retainer in place to allow for later adjustment.



**FIGURE 1: RETAINER & SEAL INSTALLATION**

**Step 4:** Fabricate the C-1220 Roll Bar Seal from SEAL-00002 Leaf UR .375X.604 by first pushing the end of the material into the gap between the canopy and the C-1221 Seal Retainer starting at the lower end of one retainer. The end of the seal should coincide with the end of the retainer.

Push in the remainder of the seal until reaching the lower end of the other retainer.

Mark the seal where it extends past the retainer.

Pull out the last few inches of seal and cut with scissors at the mark. Reinstall seal. Verify the seal is fully seated along the entire length of both seal retainers. See Section B-B.

**Step 5:** Close and latch the canopy with an assistant stationed on the wing walk, Phillip's screwdriver in hand.

**NOTE: The assistant's job is to observe the seal gap from outside the canopy and tell the one on the inside which direction the seal retainer (and seal) should be moved and by how much.**

**Step 6:** Pry the seal retainer fwd or aft with the taped screwdriver to obtain the amount of seal to roll bar engagement per the Section B-B call-out.

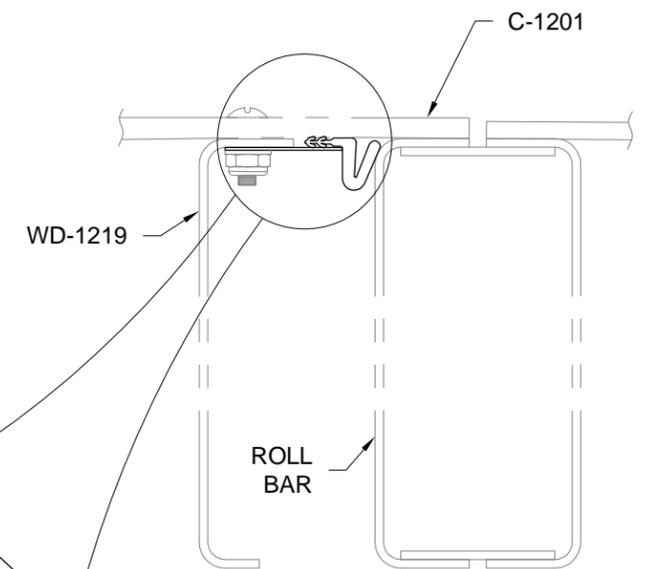
**NOTE: If the retainer is pushed fwd as far as it will go but the seal is tightly compressed, trim the aft edge of the retainer to relieve the seal. If the fwd edge of the retainer is riding the radius of the frame trim back the fwd edge of the retainer.**

**Step 7:** Mark the retainer before removal for precise reinstallation.

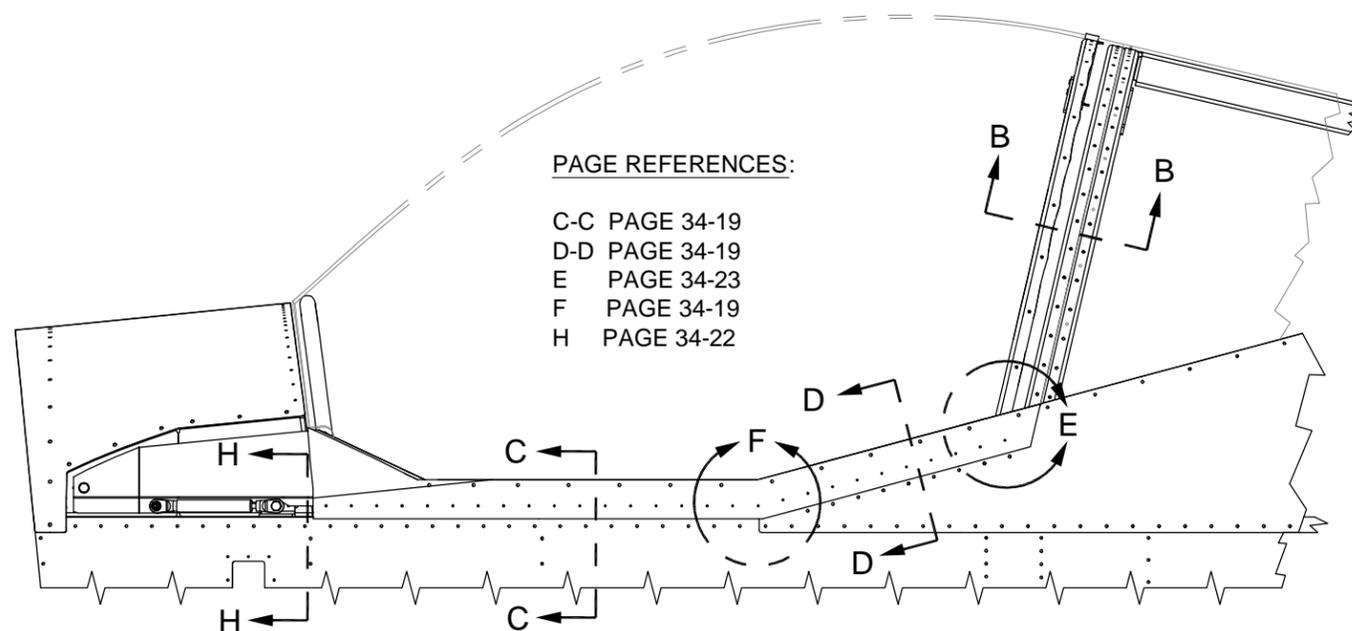
Trim retainer if necessary, deburr, prime and paint if desired.

**NOTE: Do not over-tighten canopy attach screws. Tighten just enough so that the screws do not turn freely.**

**Step 8:** Reinstall the retainers and the roll bar seal.



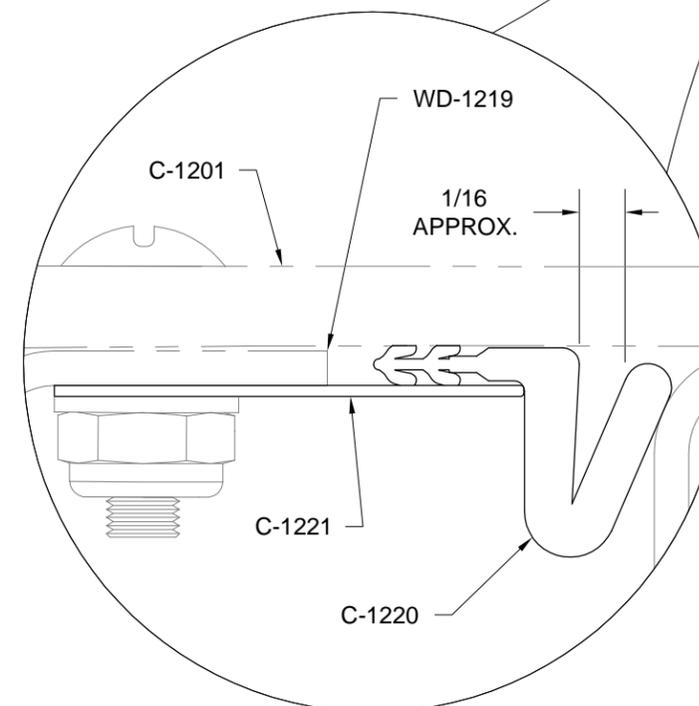
**SECTION B-B:  
(VIEW ROTATED CCW)**

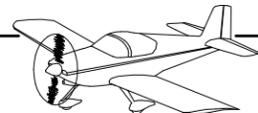


**PAGE REFERENCES:**

- C-C PAGE 34-19
- D-D PAGE 34-19
- E PAGE 34-23
- F PAGE 34-19
- H PAGE 34-22

**FIGURE 2: LEFT SIDE VIEW**





**NOTE:** Section C-C depicts the intended design gap between the WD-1219 Canopy Frame and the F-1234-L Canopy Deck.

In some cases this gap may exceed the capability of the side seal which is about 1/4 in. Compare Sections C-C and D-D.

If necessary reduce this gap using the C-1219 Foam Spacer wherever the gap is large enough to allow it to slide in easily.

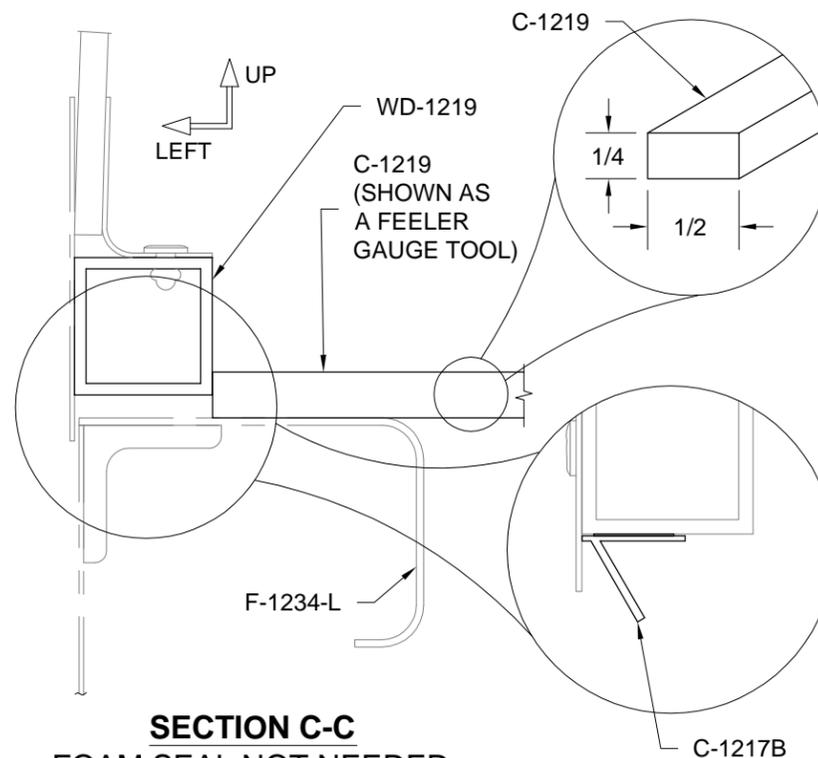
**Step 1:** Climb inside the cockpit, if not already there, then close and latch the canopy.

Attempt to slide the foam spacer into the gap between the WD-1219 Canopy Frame and F-1234-L Canopy Deck, keeping in mind that the C-1217B Side Seal will also be attached later.

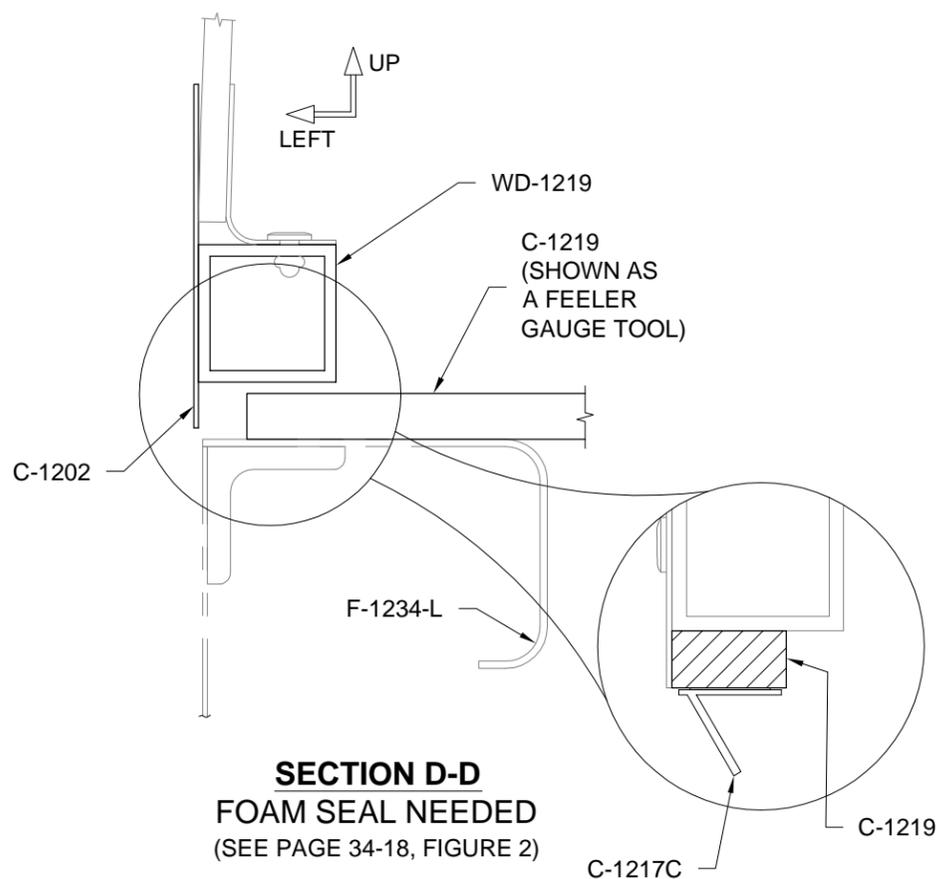
Mark the length of the canopy frame needing the foam spacer, if at all.

Repeat for the other side of the canopy before exiting.

**Step 2:** Clean the entire length of the underside of the square tubes.



**SECTION C-C**  
FOAM SEAL NOT NEEDED  
(SEE PAGE 34-18, FIGURE 2)

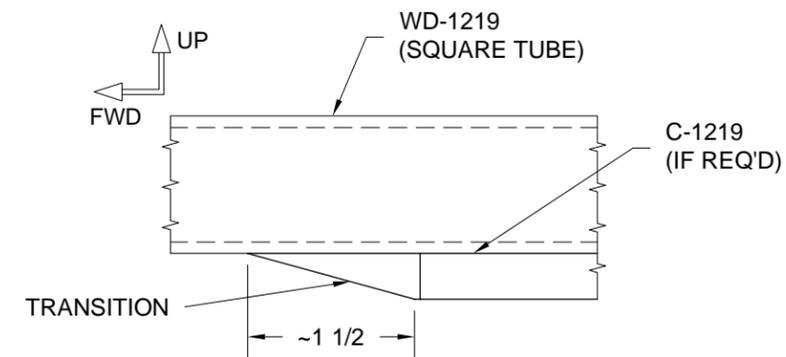


**SECTION D-D**  
FOAM SEAL NEEDED  
(SEE PAGE 34-18, FIGURE 2)

**Step 3 (FOAM SPACER NOT NEEDED):** Skip to Step 4.

**NOTE:** If needed taper the C-1219 Foam Spacer to provide a smoother transition for the side seal as it travels from the square tube to the surface of the spacer. See Figure 1.

**Step 3 (FOAM SPACER NEEDED):** Apply the C-1219 Foam Spacer to the bottom of the square tube per the marks made earlier and as shown in Section D-D.



**FIGURE 1: TRANSITION**  
(LEFT SIDE VIEW C-1202 NOT SHOWN)

**Step 4:** Determine the starting point (fwd end) of the C-1217B Side Seal by transferring the reference mark made on Page 34-17, Figure 5 to the outer surface of the C-1202 Canopy Skirt, then to the inner surface of the skirt, and finally to the bottom of the square tube.

**NOTE:** When a continuous length of side seal is applied around the corner joint in the square tube the seal collapses somewhat and may leak. To prevent this a two-piece seal is used to provide enough material for an overlapping joint.

**Step 5:** Fabricate the C-1217B and C-1217C Side Seals from SEAL-00001 Leaf SIL .313X.438.

Measure the side seal length beginning from the mark (see Step 4) near the fwd end and extending aft to the corner joint. Add 1/4 inch for the overlap. Refer to this piece as the C-1217B Side Seal. See Detail F.

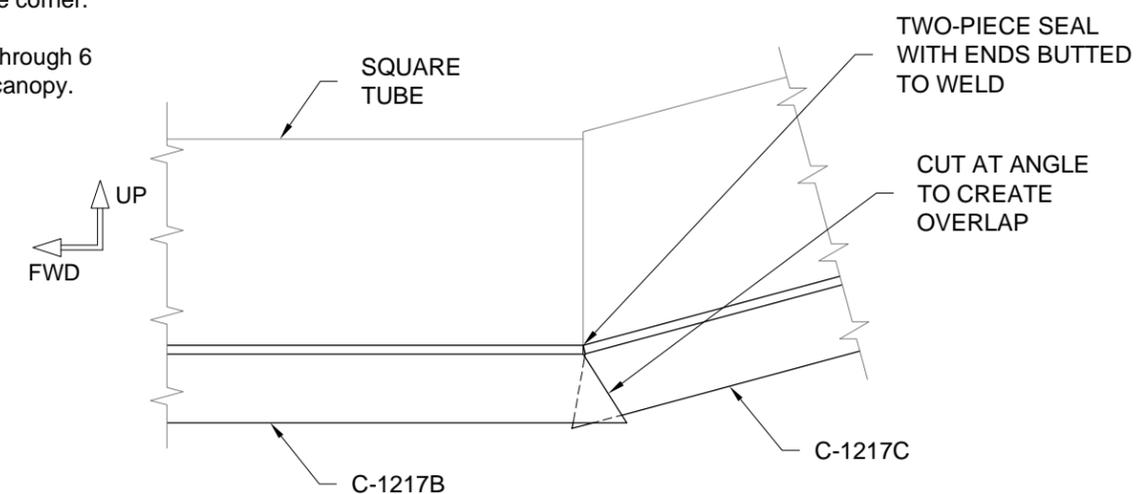
Attach the C-1217B Side Seal per the method described on Page 34-20, Steps 2-7.

Trim off only the C-1217B adhesive leg where it butts to the weld at the corner of the tube.

Trim the C-1217B's non-adhesive leg at the angle shown at the corner to fabricate the overlap.

**Step 6:** Repeat Step 5 for the C-1217C Side Seal, this time leaving 1/4 in. extra length forward of the tube corner.

**Step 7:** Repeat Steps 4 through 6 for the other side of the canopy.



**DETAIL F: OVERLAP AT SQUARE TUBE CORNER**  
(SOME PARTS OMITTED FOR CLARITY)

Step 1: Inspect the underside of the fiberglass layup where the C-1217A Fwd Seal will attach as shown in Section A-A. Remove any high spots that may prevent good adhesion.

**CAUTION: Mineral Spirits or other petroleum based cleaning products should NOT be used.**

Step 2: Clean the surface to which the fwd seal is to be attached with isopropyl (rubbing) alcohol. Let the surface dry completely.

**NOTE: The C-1217A Fwd Seal is intended to overlap the yet to be installed F-00059B Vertical Seal. See Figure 3 call-out.**

Step 3: Measure the cut length of the seal. See Figure 2 to locate seal end points. Pre-cut the seal with about one inch extra from SEAL-00001 Leaf SIL .313X.438 material before installing.

**NOTE: Apply when temperature is between 50°F and 100°F. Do NOT stretch fwd seal as it can retract or shrink. Use very firm pressure when applying.**

**Adhesion takes delayed set. Immediate removal and resetting can be done if an error occurs in the initial placement. DO NOT reset after one hour.**

Step 4: Remove approximately 12 in. of paper backing from the adhesive strip.

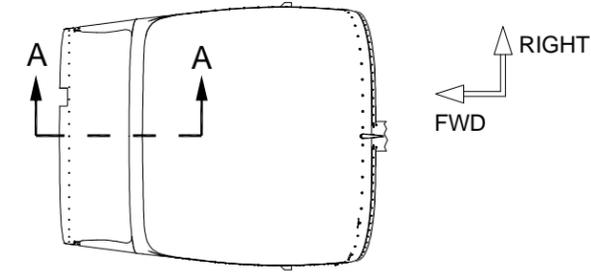
Step 5: Position the seal as shown in Section A-A and Figure 2, starting at one end and working toward the other.

Step 6: Remove the next 12 in. of backing and repeat until the entire length is installed. Trim the excess with a razor blade.

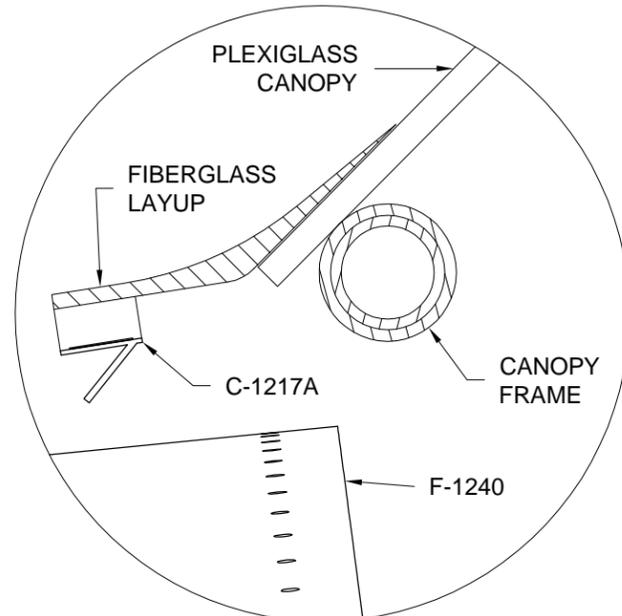
**NOTE: If available use a wallpaper seam roller or similar tool to reinforce adhesion after applying.**

Step 7: Once installed apply firm pressure along the entire surface of the seal to ensure proper adhesion.

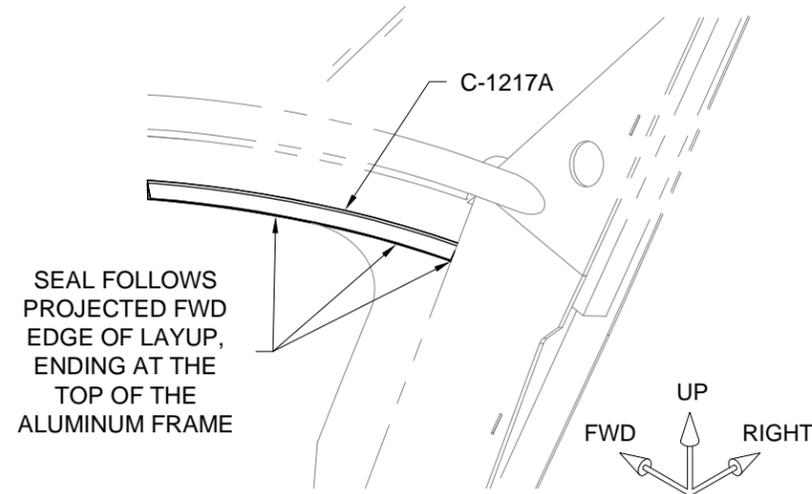
Double-check adhesion after 2-3 hours. Full set is reached in 24 hours.



**FIGURE 1: CANOPY/FWD FUSE**  
TOP VIEW



**SECTION A-A: SEAL POSITION**  
OPEN CANOPY SHOWN

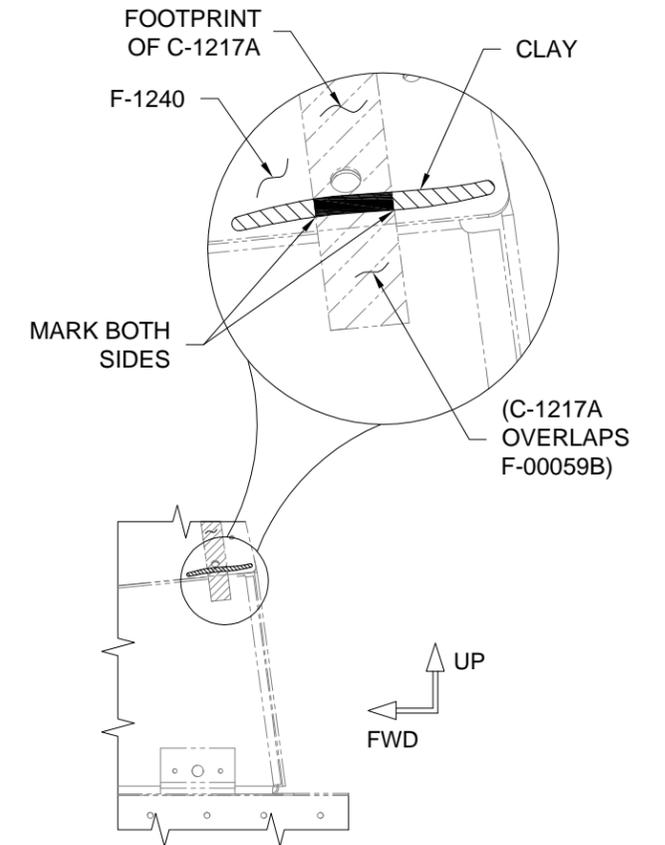


**FIGURE 2: SEAL LOCATION**  
OPEN CANOPY SHOWN

Step 8: Determine the location of the footprint of the C-1217A Fwd Seal on the F-1240 Upper Forward Fuselage Skin by placing about a 1/8 diameter, 1-2 in. roll of soft modeling clay parallel to the fore and aft edge of the skin and roughly beneath the seal as shown in Figure 3.

Close and reopen canopy.

Mark the footprint of the seal on the skin and remove the clay.

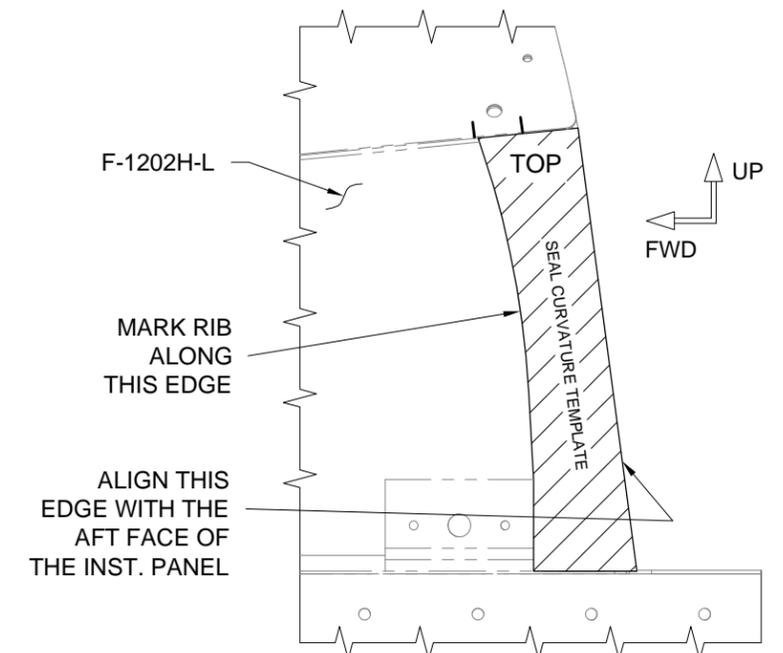


**FIGURE 3: LEFT SIDE VIEW**

**NOTE: Side load on the foam seal is minimized by following the canopy arc. The template provides this arc but is intended only as a guide for the seal's curvature and not primarily for locating the seal's top end. If use of the template does not result in the foam seal overlapping at least the aft two-thirds of the C-1217A Fwd Seal then reposition the top of the foam seal to achieve the overlap and just approximate the arc during installation.**

Step 9: Check the Seal Curvature Template at the end of the section for correct scale then cut out.

Step 10: Position the template as shown in Figure 4 and mark a reference line on the F-1202H-L & -R Canopy Ribs using the template as a guide.



**FIGURE 4: MARK RIB**



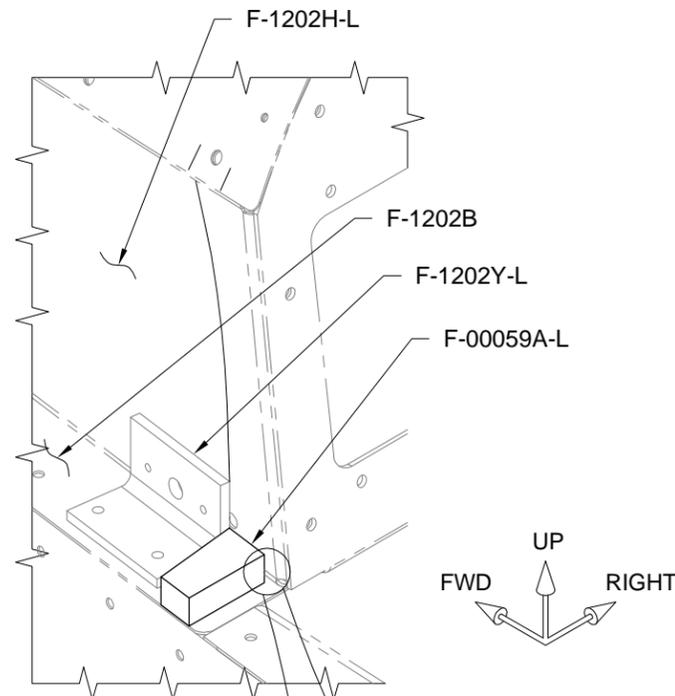
Step 1: Clean the painted surfaces where the foam seals will attach.

Step 2: Apply clear silicone adhesive per the call-out to the inboard end of the base seal and fill the gap at the inside corner.

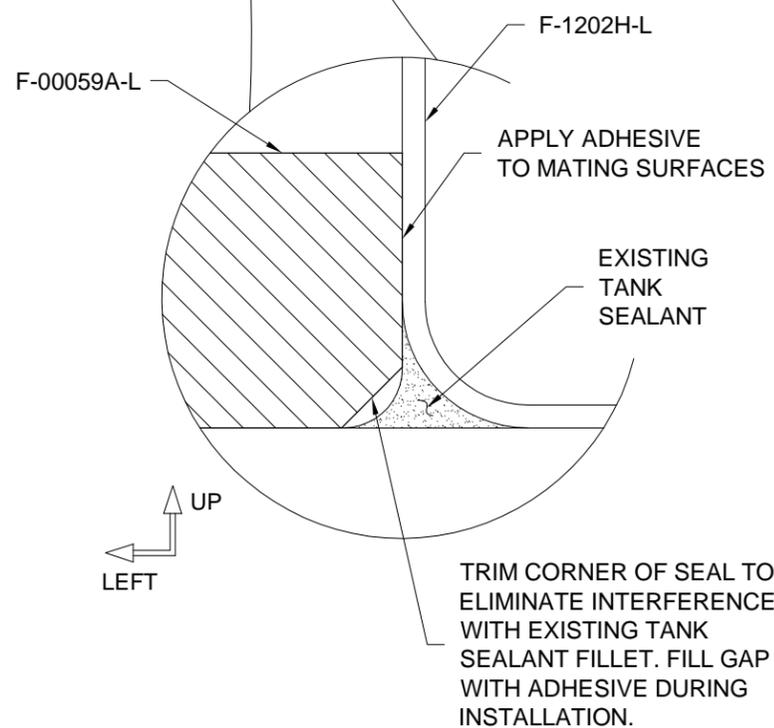
Step 3: Remove the base seal's paper backing and attach the seal to the F-1202B Panel Base. The seal's fwd inboard corner should contact the aft face of the F-1202Y-L Strut Attach Angle as shown.

Apply firm pressure in order to create a good bond.

Step 4: Repeat Steps 1-3 for the F-00059A-R Base Seal.



**FIGURE 1:**  
ATTACH BASE SEAL  
SEAL SHOWN TRIMMED



**NOTE:** For best results remove the foam's pressure sensitive adhesive (PSA) and use 3M Scotch-Weld Nitrile High Performance Plastic Adhesive 1099 Tan in a 5 oz. tube, and available through Amazon.com among others.

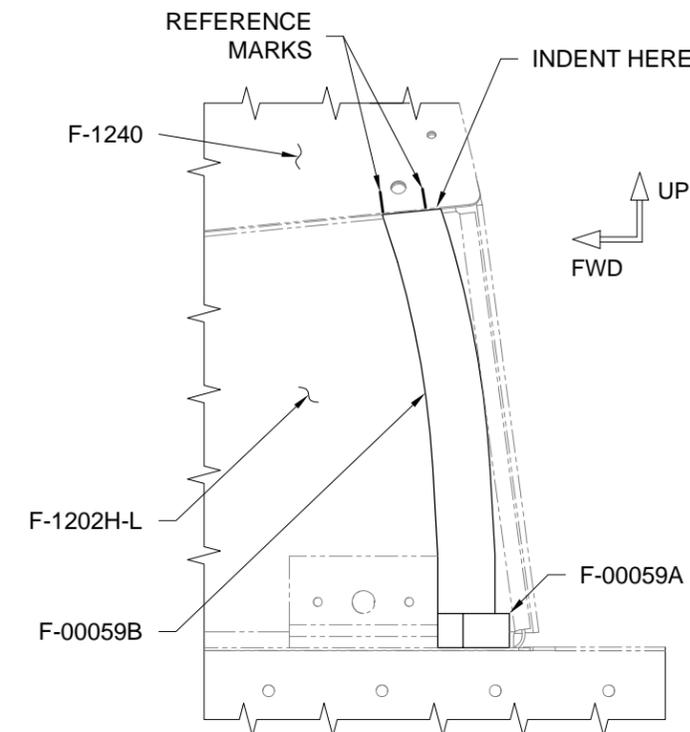
If the aircraft will not be flown regularly in rainy conditions, use the foam and PSA as provided. The foam may creep downward somewhat allowing a small amount of air into the cabin.

Step 5: Temporarily position the strip of SEAL-00003 Foam PVC .375X.625 material on top of the F-00059A Base Seal and against the F-1202H-L Canopy Rib. Remember to overlap the C-1217A Fwd Seal by using the reference marks made earlier. See Figure 2.

The seal will be able to follow the curve once the paper backing is removed.

Push on the seal where it coincides with the edge of the F-1240 Upper Forward Fuselage Skin to indent the paper backing.

Remove and cut the seal about 1/4 in. past the indentation. The seal will be cut to final length after installation. Hereafter the seal will be referred to as the F-00059B Vertical Seal.



**FIGURE 2:** LEFT SIDE VIEW  
SEAL SHOWN TRIMMED TO LENGTH

**Step 1 (USING FOAM AS-IS):** Apply a clear silicone adhesive to the lower end of the F-00059B Vertical Seal where the vertical seal will sit on top of the base seal.

Remove the paper backing from the vertical seal.

**NOTE:** The following steps describe cutting the foam away from the pressure sensitive adhesive for use with the 3M 1099 adhesive. Two of the three pieces of thin aluminum sheet act as spacers for the razor blade. Do not use the trimmed face of the seal when applying adhesive.

**Step 1 (USING 3M 1099):** Remove the PSA from the foam seal.

Cut the AS3-016X5X6 aluminum sheet provided into one 3X6 and two 1X6 inch strips.

Remove the paper backing from the F-00059B Vertical Seal and attach it lengthwise roughly down the middle of the 3X6 strip. See Figure 1.

Lay the two 1X6 strips on either side of the foam as spacers.

Hold down the spacers and cut the foam away from the adhesive with a sharp razor blade removing as little foam as possible. See Figure 2.

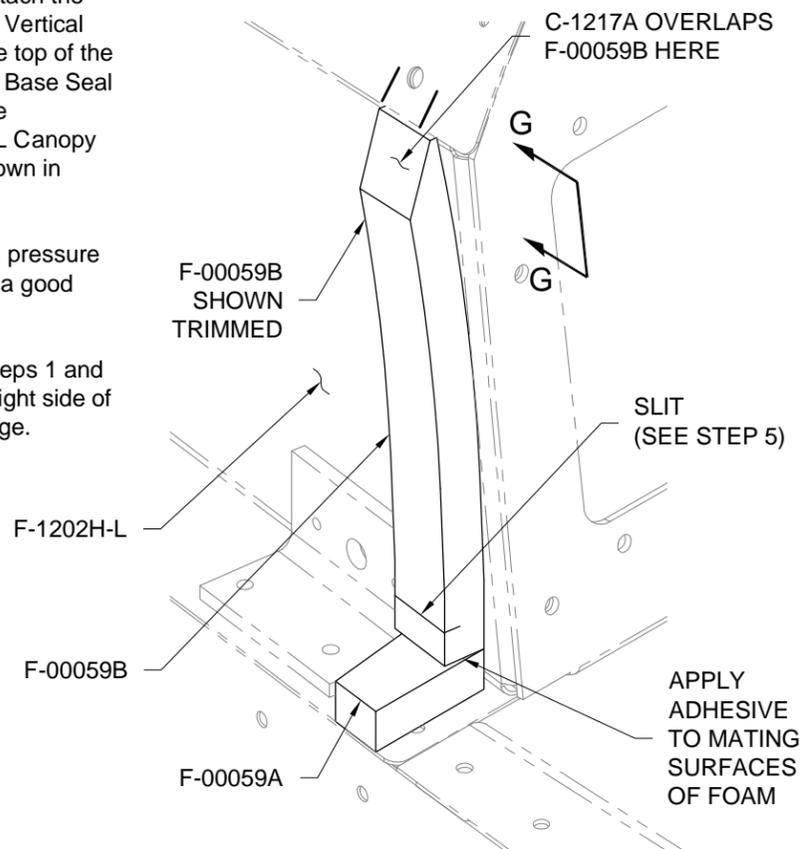
Mask all bonding areas since working with 3M 1099 can be messy.

Apply the 3M 1099 adhesive per the manufacturer's directions to the mating surfaces of the foam, the canopy rib and and to the top of the F-00059A Base Seal.

**Step 2:** Attach the F-00059B Vertical Seal to the top of the F-00059A Base Seal then to the F-1202H-L Canopy Rib as shown in Figure 3.

Apply firm pressure to ensure a good bond.

Repeat Steps 1 and 2 for the right side of the fuselage.

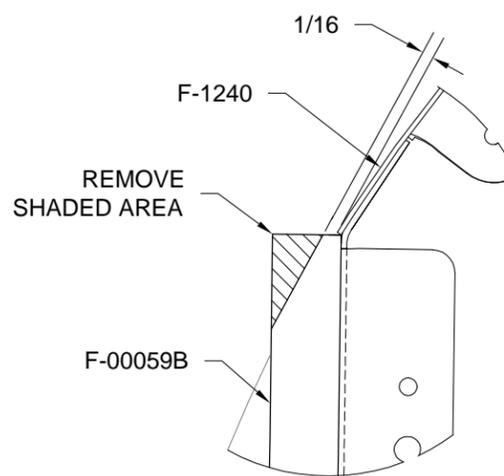


**FIGURE 3: ATTACH VERTICAL SEAL**

**Step 3:** Allow the foam seals and silicone adhesive to cure for 48 hours before trimming the seal or closing the canopy.

**Step 4:** After the sealant has had time to cure position a 1/16 spacer roughly tangent to the F-1240 Upper Forward Fuselage Skin surface. See View G-G.

Trim the upper end of the F-00059A Vertical Seal using a sharp razor blade atop the spacer.

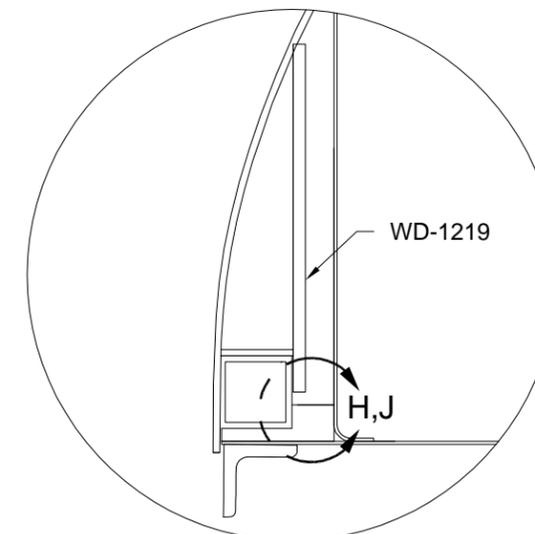


**VIEW G-G**

1/16 SPACER & INST. PANEL NOT SHOWN

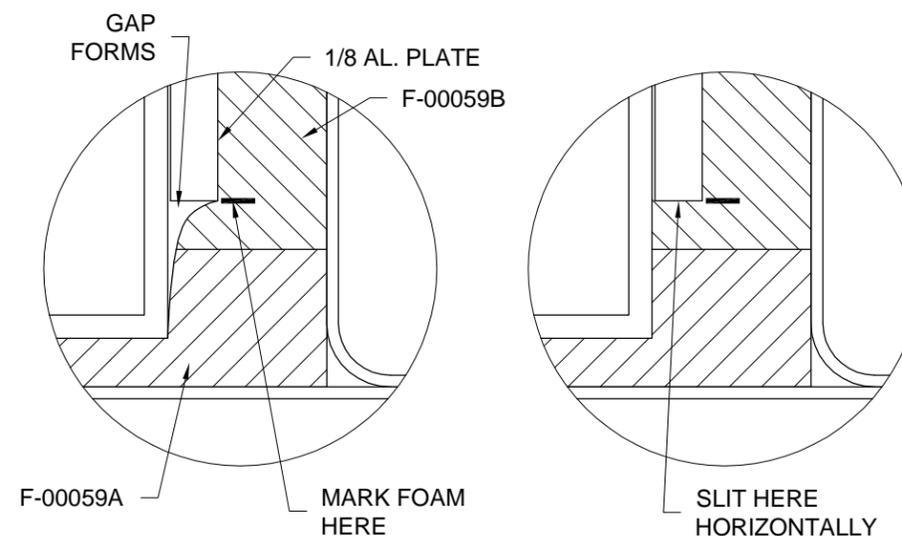
**Step 5:** Close the canopy (after seal adhesive has cured) and mark the foam adjacent to the bottom of the .125 thick aluminum plate which is part of the WD-1219 Canopy Frame as shown in Section H-H, Detail J.

Open the canopy and slit the F-00059B Vertical Seal horizontally at the mark approximately 1/8 inch deep to allow the bottom of the vertical seal to remain at full thickness thereby filling the gap. See Details J and K and Figure 3.



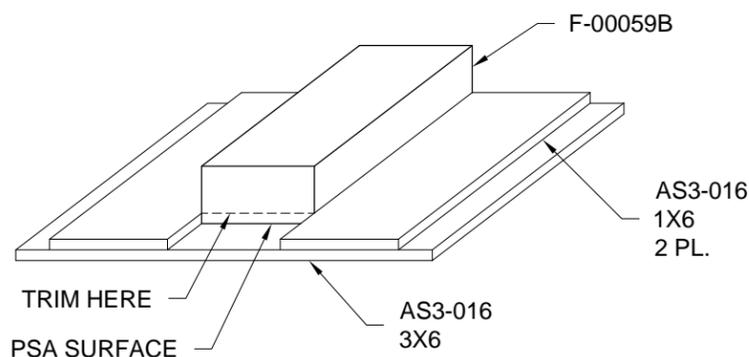
**SECTION H-H: SLIT FOAM SEAL**

(SEE FIGURE 2, PAGE 34-18)

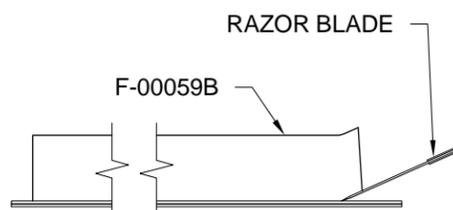


**DETAIL J: GAP IN FOAM SEAL**

**DETAIL K: GAP CLOSED**



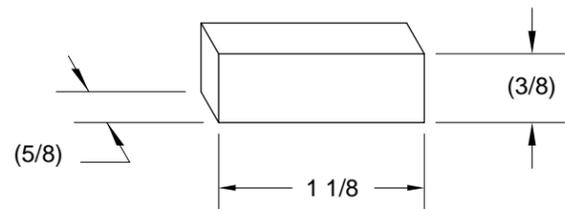
**FIGURE 1: ATTACH FOAM TO ALUMINUM STRIPS (NOT TO SCALE)**



**FIGURE 2: SIDE VIEW OF FOAM REMOVAL**



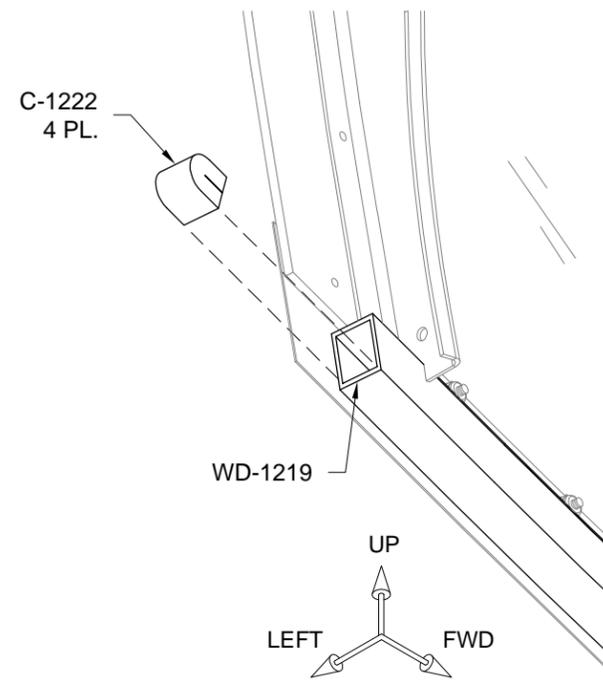
Step 1: Fabricate four C-1222 Foam Plugs from SEAL-00003 Foam PVC .375X.625 per the dimensions shown in Figure 1.



**FIGURE 1: FABRICATE FOAM PLUG**

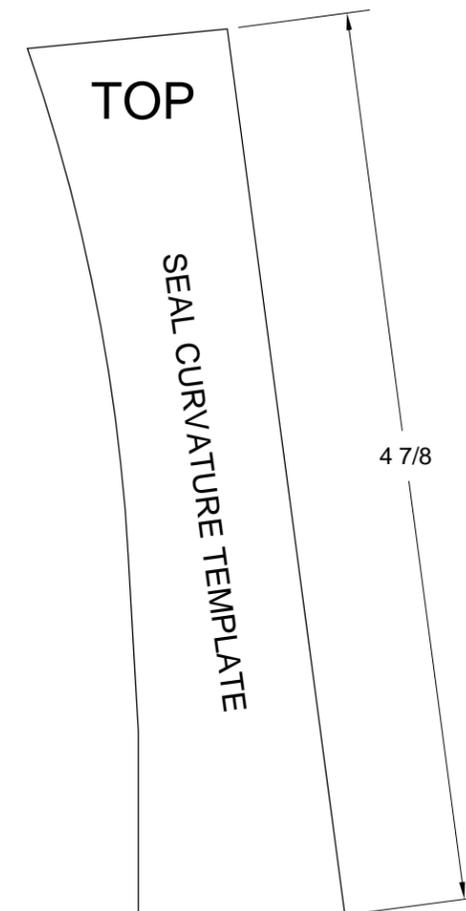
Step 2: Remove the adhesive backing from the C-1222 Foam Plug. Double up the foam strip with the adhesive contacting itself to form a plug as shown in Detail E.

Install one foam plug into each of the forward and aft open ends of the WD-1219 Canopy Frame square tubes. Additional adhesive is not required.



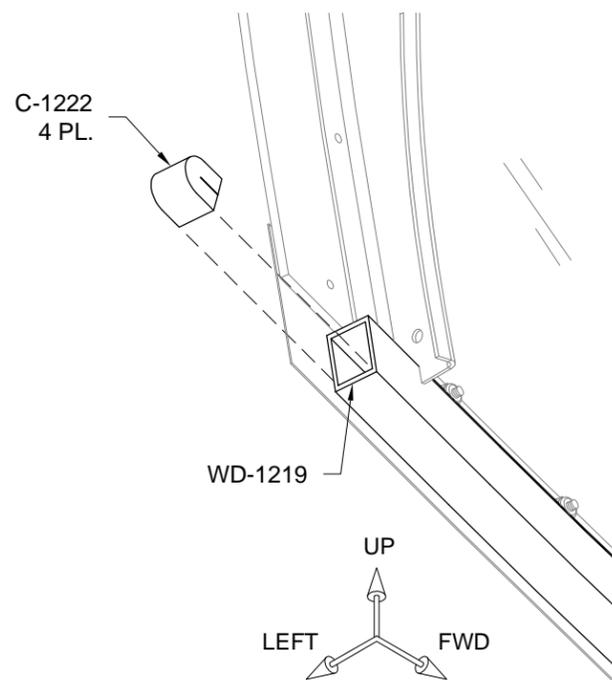
**DETAIL E: INSTALL FOAM PLUG**  
(SEE FIGURE 2, PAGE 34-18)

NOTE: CHECK PRINTED SCALE 1:1 PER SECTION 3 BEFORE USING THE TEMPLATE.



**FIGURE 2: TEMPLATE**

10 9/16





**THIS PAGE INTENTIONALLY LEFT BLANK**



**Step 1:** If installed, remove three rivets from the F-1231A-FR Roll Bar Frame as shown in Figure 1.

**Step 2:** Locate the F-1231G Canopy Catch and heavily deburr all edges in the area shown in Figure 4.

When satisfactorily deburred, prime and paint the canopy catch.

**Step 3:** Install the F-1231G Canopy Catch to the F-1231A-FR Roll Bar Frame with the rivets called out in Figure 2.

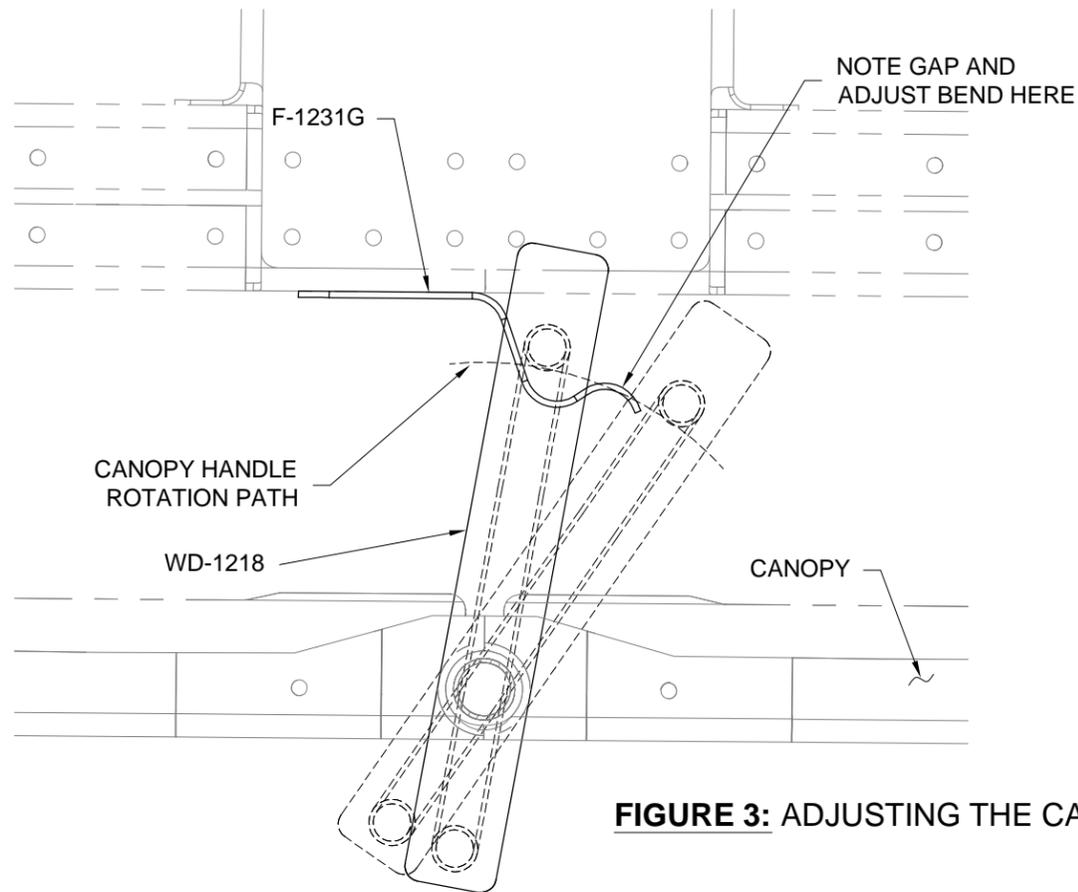
**Step 4:** While seated in the airplane, lower the canopy and rotate the WD-1218 Canopy Handle so that the canopy handle slides into the F-1231G Canopy Catch. See Figure 3.

When the canopy handle slides into the canopy catch, note the gap between the canopy handle and the bent tab on the canopy catch.

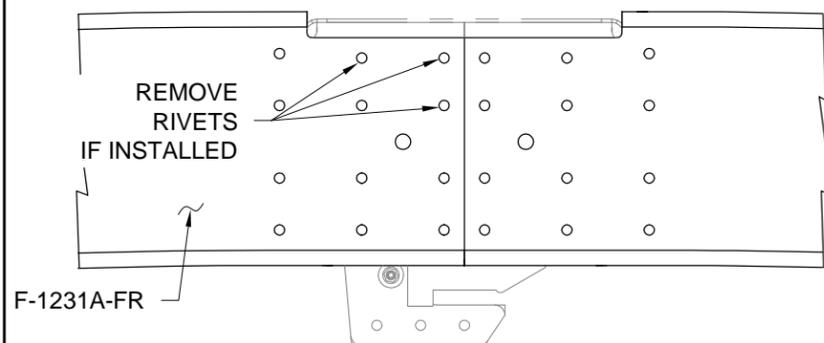
Adjust the gap by bending the bent tab on the canopy catch until the canopy handle just hits the bent tab when sliding into the canopy catch. The interference should create a positive latch so that a small amount of force is required to slide the canopy handle into and out of the canopy catch.

**Step 5:** Install the piece of provided UHMW tape to the canopy handle where the canopy handle contacts the canopy catch.

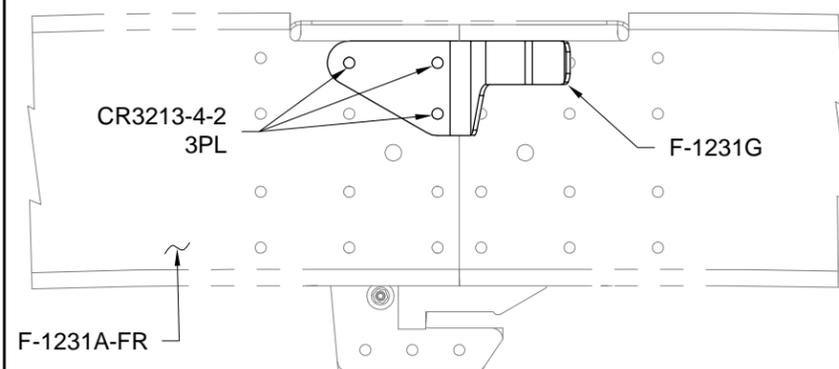
**WARNING:** The canopy catch is designed to restrain the canopy during ground operations only.



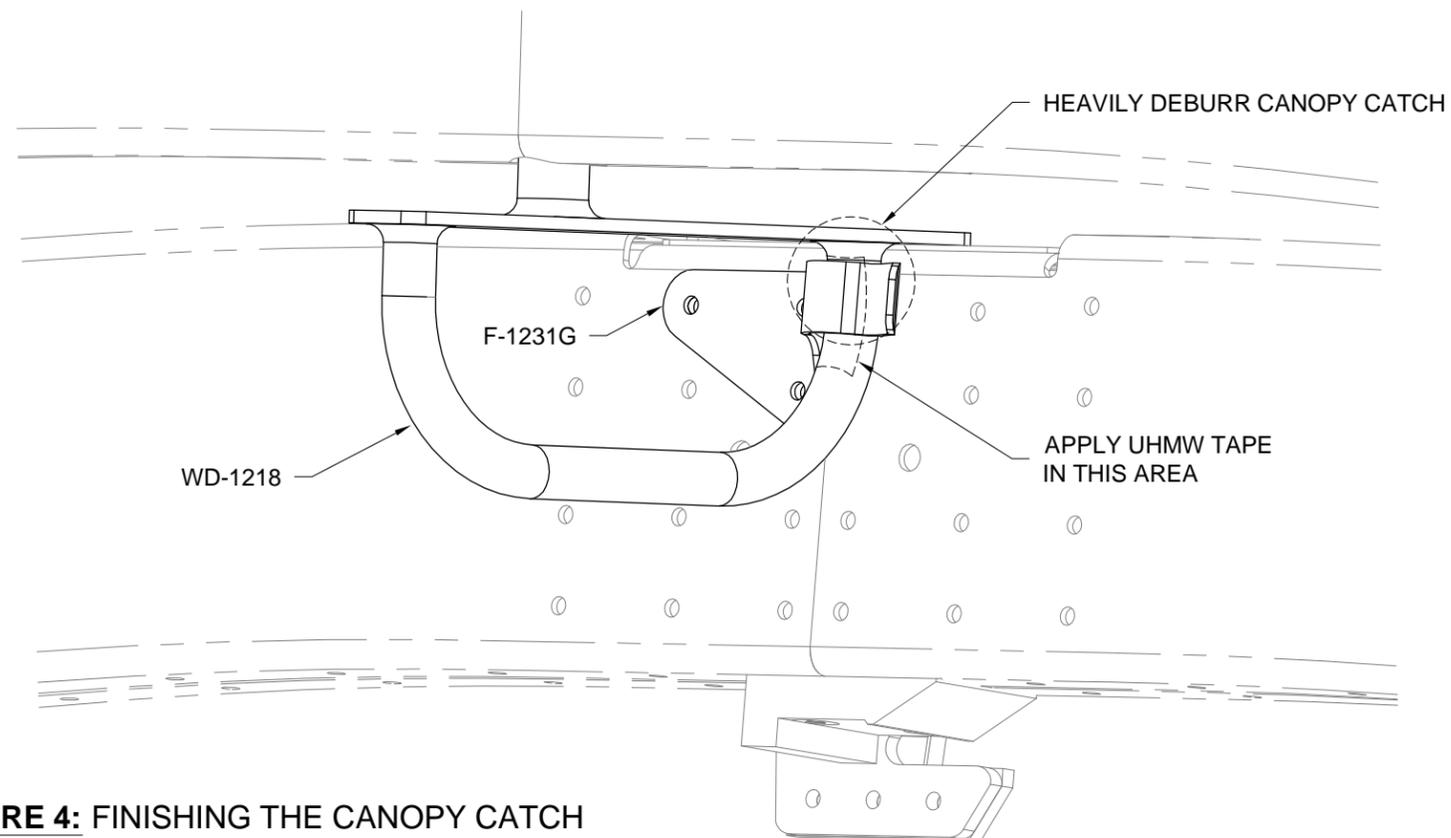
**FIGURE 3: ADJUSTING THE CANOPY CATCH**



**FIGURE 1: REMOVING RIVETS**



**FIGURE 2: INSTALLING THE CANOPY CATCH**



**FIGURE 4: FINISHING THE CANOPY CATCH**



**THIS PAGE INTENTIONALLY LEFT BLANK**