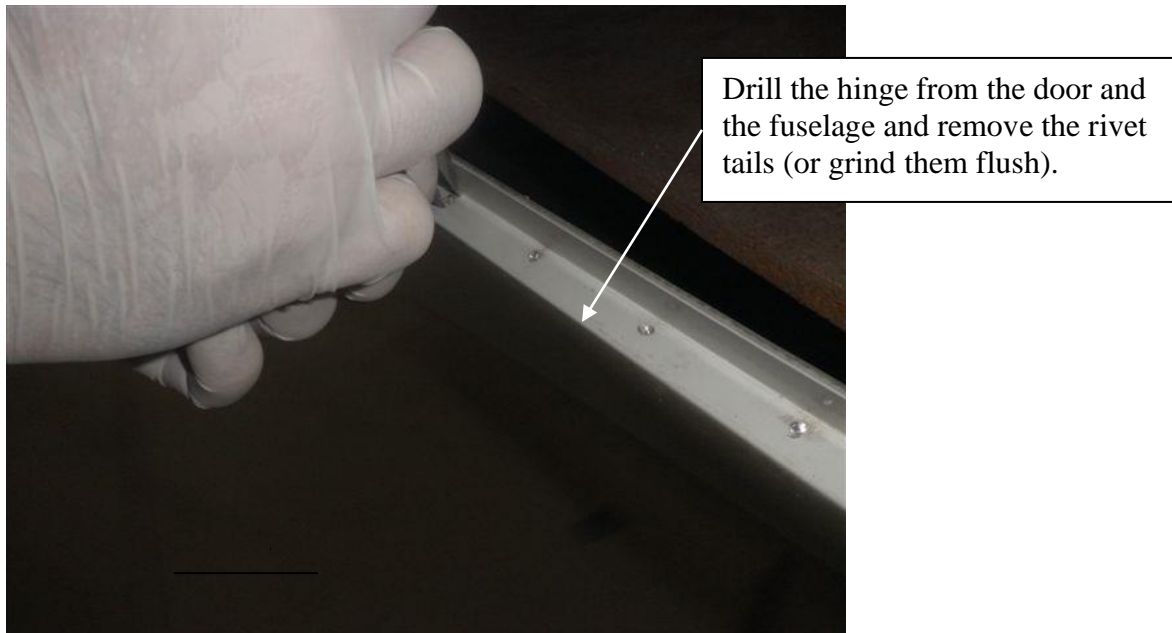


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## GlaStar Baggage Door Retrofit Instructions 11/20/2023

These instructions outline the procedures for installing a Sportsman-size baggage door to the GlaStar fuselage. Tooling for this baggage door was formed off of a finished GlaStar fuselage. Phase 1 will be to bond in the existing door. Phase 2 entails cutting out the opening for the larger door and installing the door seal. Phase 3 involves installing the new door and in Phase 4 the window will be installed followed by final cosmetic detailing.

### Step 1: Remove the existing baggage door



### Step 2: Remove the aft window

The aft window can be used in the new door if it can be successfully removed. If it was installed with Silpruf, push a piece of .020 safety wire beneath the window edge across the flange and grab the end with some needle nose pliers. Pull the wire along the flange cutting the Silpruf bond until the window comes free. If the window was bonded in with resin, carefully cut it out with a saber saw with fine teeth or a rotating type saw blade with a Dremel tool.

Note: the window will be smaller in size, so the edge portion that remains under the existing flange will not be used. If the window is cracked or damaged during removal, a new one can be ordered from Glasair Aviation, Part # 101-14003-01 or LP Aero Plastics 714-744-4448  
info@lpaero.com

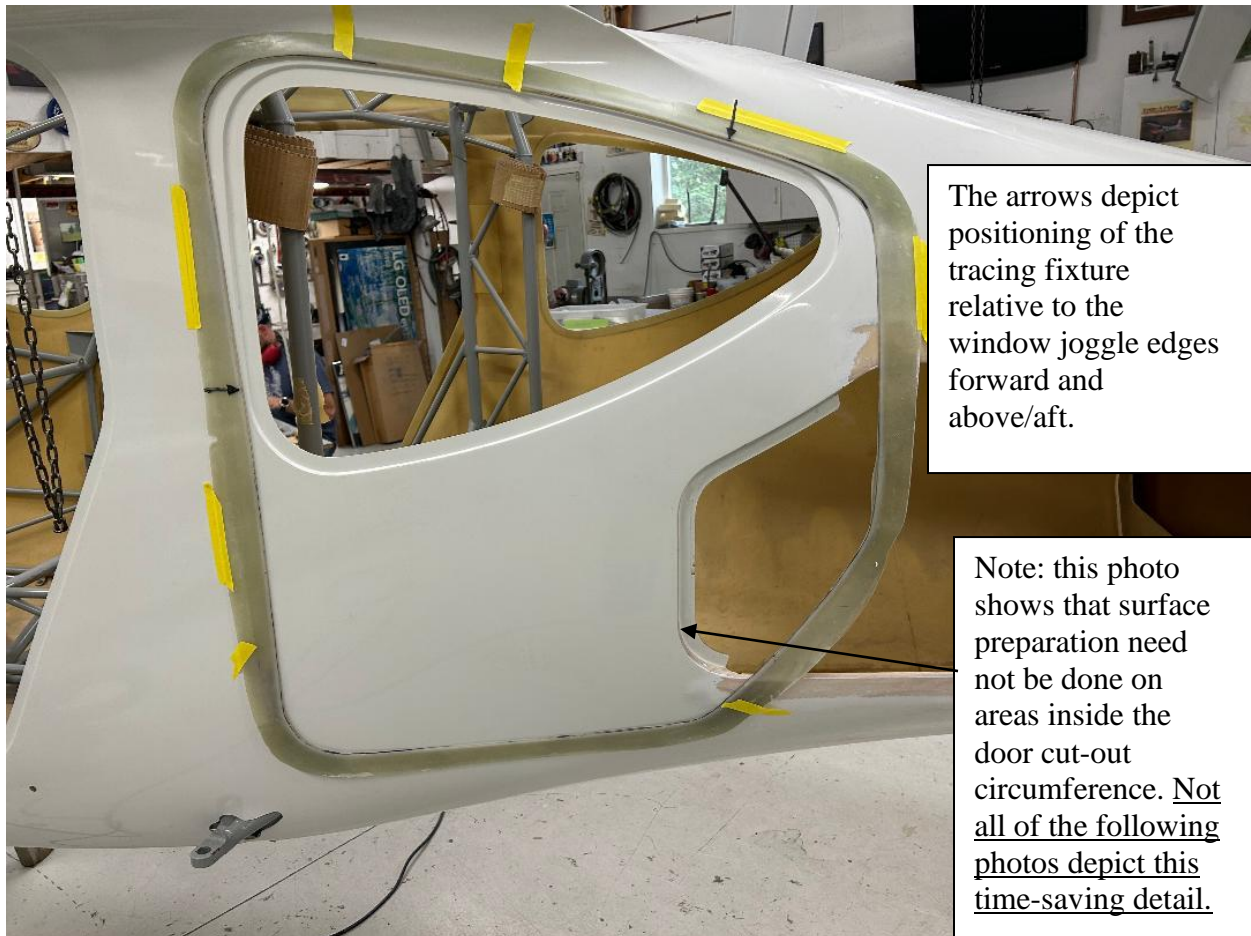
### Step 3: Tape off the interior



Tape off everything to prevent fiberglass dust contamination. The tail cone, sides and cockpit area. There will be a lot of grinding and sanding to do, so you'll be thankful you took this step in the end. If you have the insides all taped up and protected, it's time to get on to the next step. You'll need a pneumatic die-grinder and a vacuum cleaner.

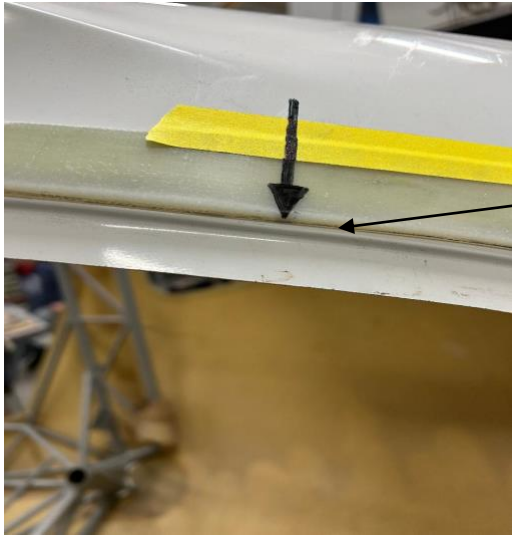
### Step 4: Trace the door opening on the fuselage

There is a fiberglass tracing fixture available. This photo shows the fixture before it was cut into (5) easily assembled pieces using hinges and pins so it will fit into a small box. (you pay USPS shipping) Contact Ted Setzer with address. Otherwise, follow the paper template instructions outlined in step 10 and trace the outline here/now.

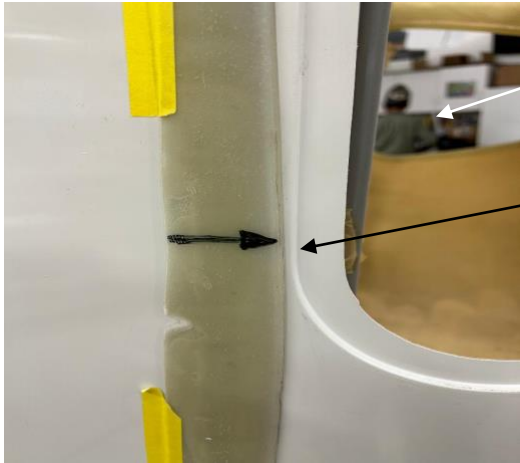


The arrows depict positioning of the tracing fixture relative to the window joggle edges forward and above/aft.

Note: this photo shows that surface preparation need not be done on areas inside the door cut-out circumference. Not all of the following photos depict this time-saving detail.



Upper/aft edge:  
Position just above  
window joggle edge.  
1/8" max



Forward edge:  
Position 1/8"  
forward of lower,  
fwd edge of  
window joggle.



Trace the door template inside edge.

**Step 4: Prepare the door opening for bonding**

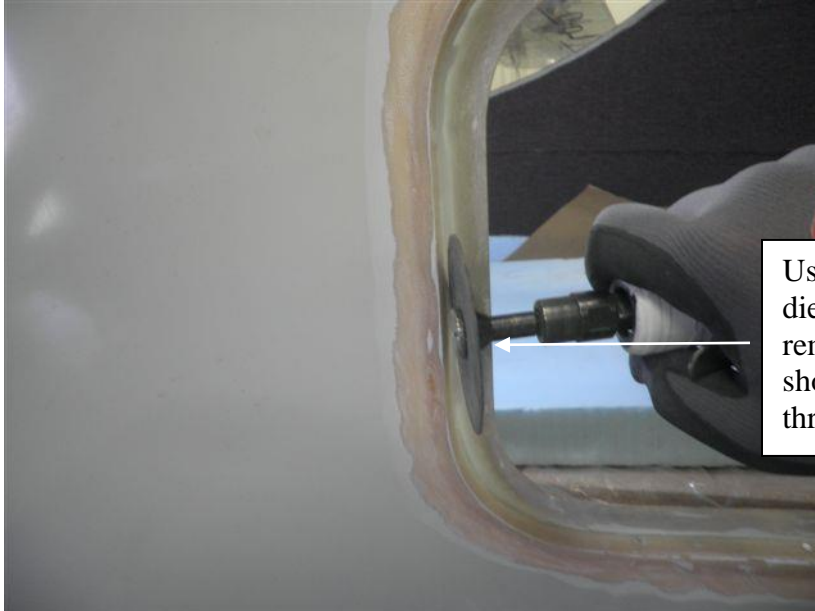


Use a drum sander to remove the paint or gelcoat from the joggle edge as shown here. Don't worry about the flange. It will be cut off in the next step.



Carefully remove the surface paint and gelcoat from the edge of the existing door opening with a disc sander using a fine-grit disc or a rough grit Scotch-Brite pad. Unless you are an expert with the tool, when it gets close to the surface of the fiberglass, finish the sanding by hand with 60-80 grit sandpaper.

Keep in mind the external fiberglass skin is only two plies thick. That's less than 0.030". Ideally, a taper ratio of 50:1 is desired, so  $50 \times .030" = 1.5"$  wide. The edge along the door opening should be sanded to nearly 0.030" full depth while the outside edge 1.5" away from the opening is tapered to nearly zero depth into the laminates.

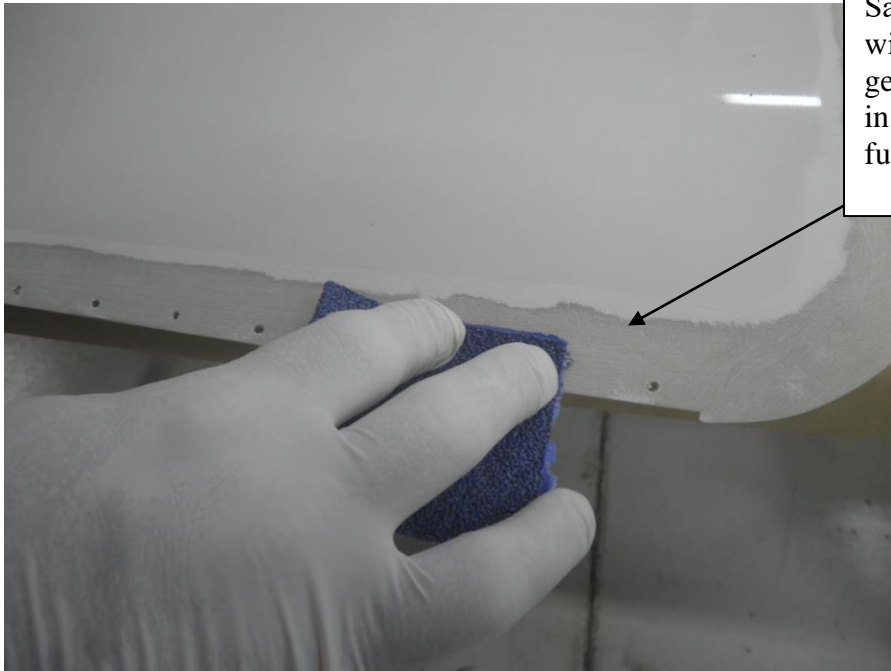


Use a cut-off disc on a pneumatic die-grinder or Dremel tool to remove the existing flange as shown. Remove the flange and throw it away.

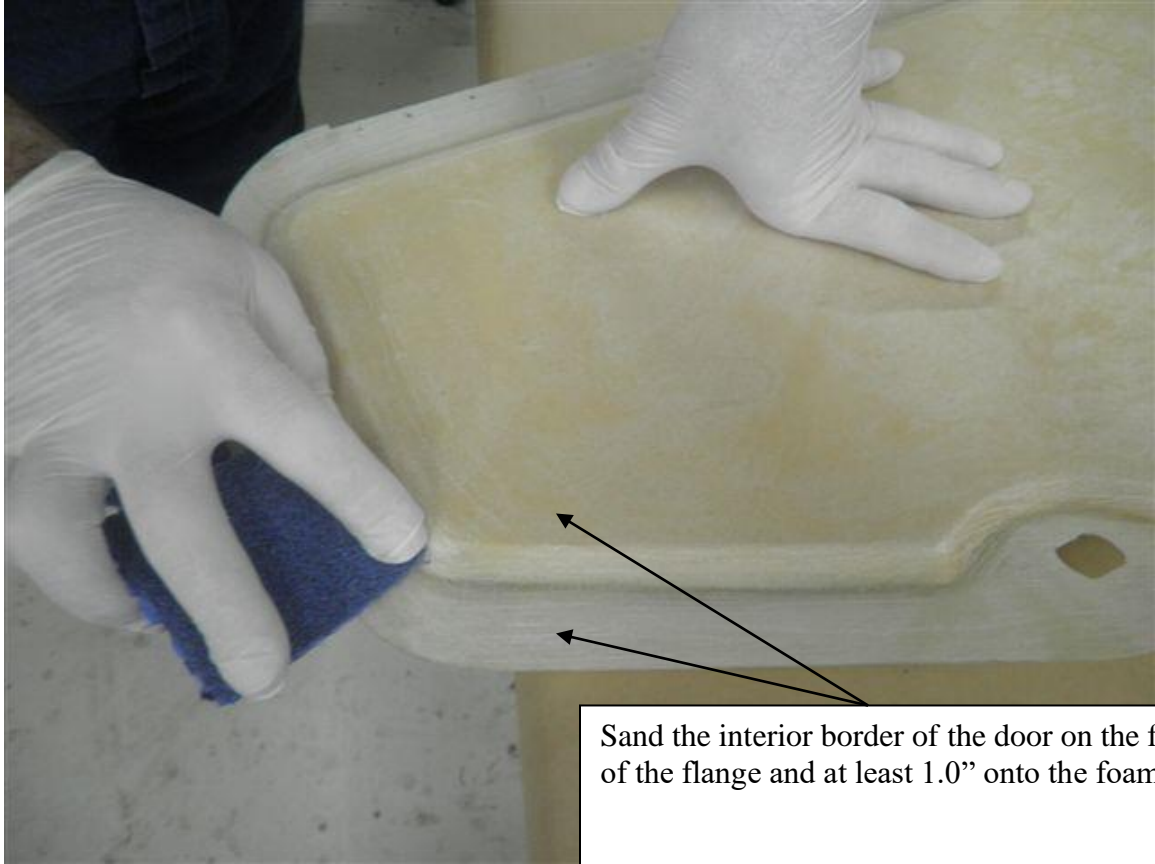


Scuff the interior fiberglass laminates in preparation for bonding the door in place. Be very careful not to sand using power tools. The interior plies are only one layer thick! To be safe, use 60-80 grit sand paper and sand by hand.

**Step 5: Prepare the existing door for bonding**



Sand the exterior border 1.5" wide to remove paint and gelcoat. Taper sand the border in the same manner that the fuselage exterior was sanded.



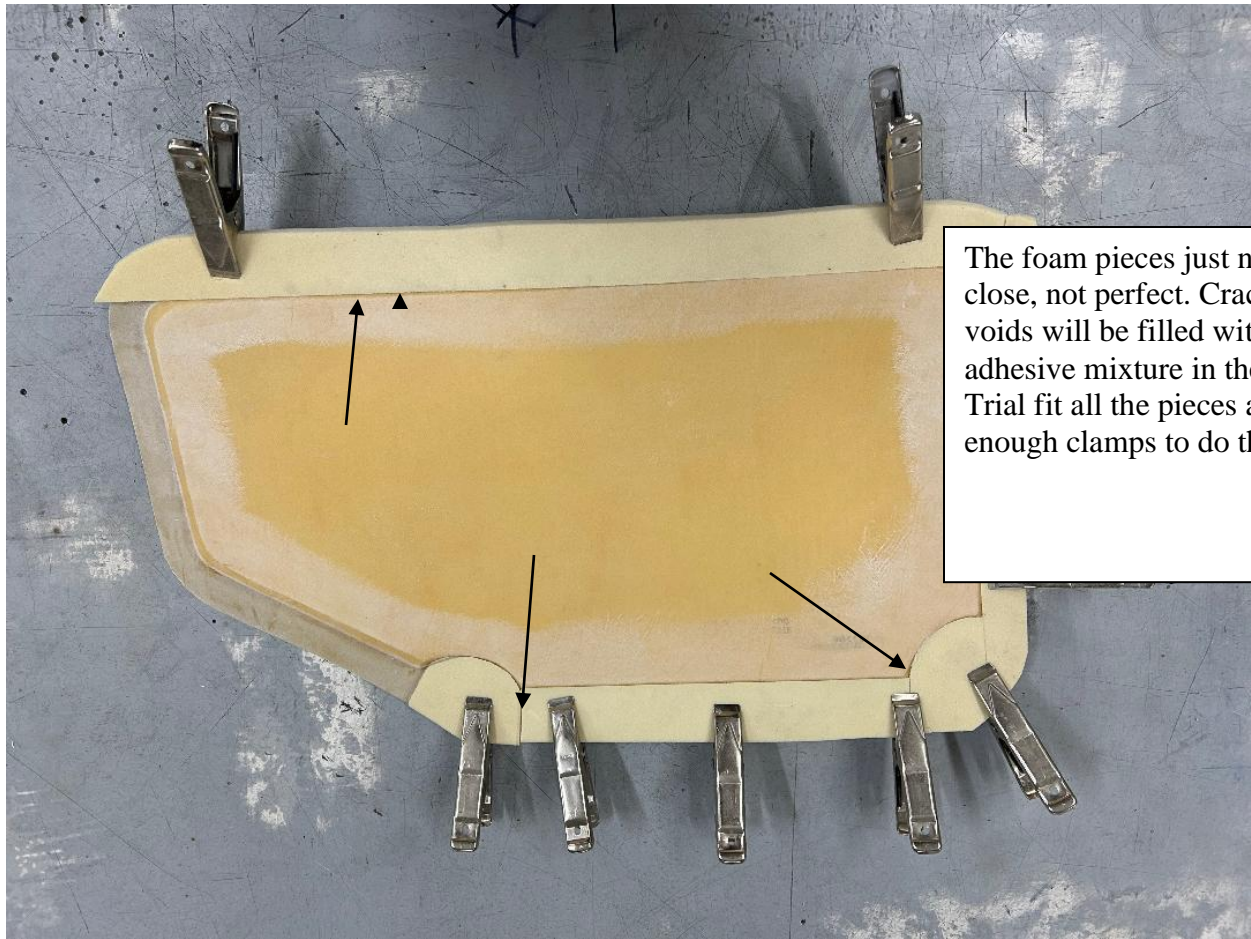
Sand the interior border of the door on the face of the flange and at least 1.0" onto the foam.



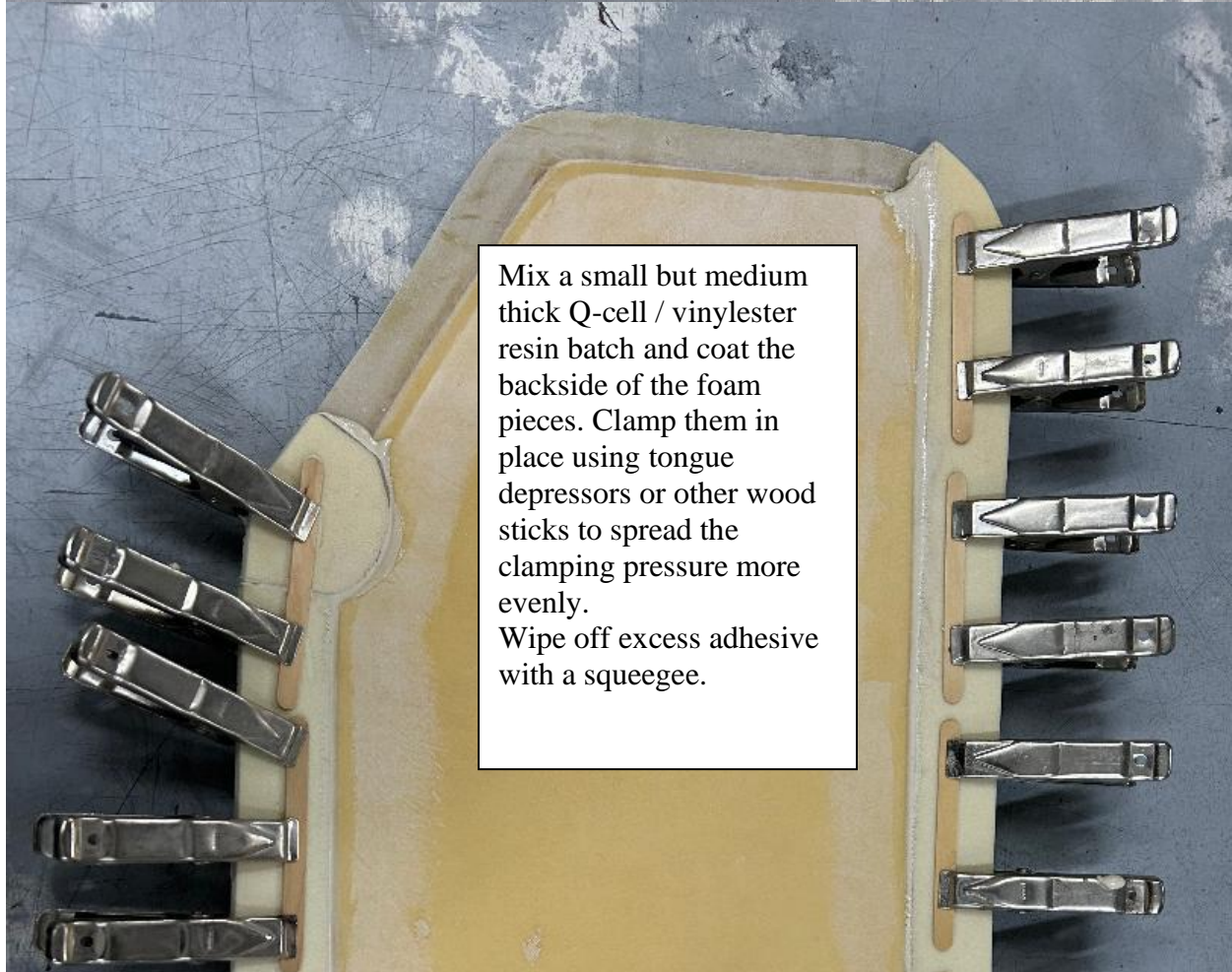
Cut pieces of supplied ¼" thick foam as a filler along the edges of the original door. Sand a bevel on the edges to match the bevel on the door







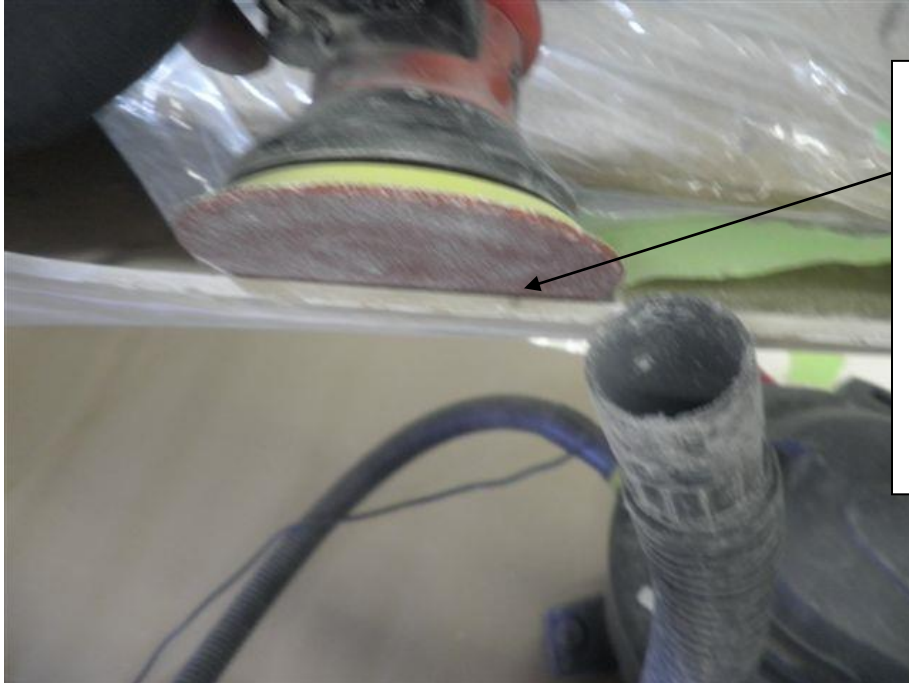
The foam pieces just need to fit close, not perfect. Cracks and voids will be filled with the Q-cell adhesive mixture in the next step. Trial fit all the pieces and round up enough clamps to do the job.



Mix a small but medium thick Q-cell / vinylester resin batch and coat the backside of the foam pieces. Clamp them in place using tongue depressors or other wood sticks to spread the clamping pressure more evenly. Wipe off excess adhesive with a squeegee.



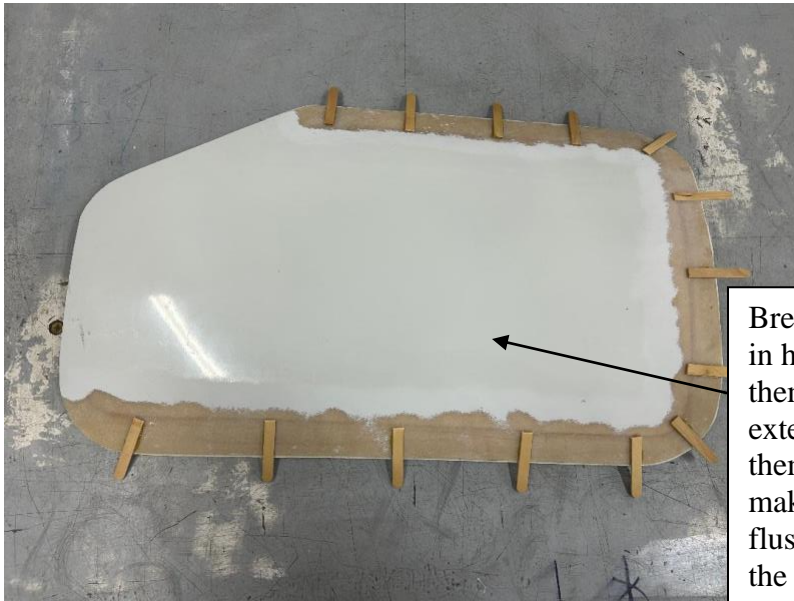
Once the adhesive cures, if needed, lightly block sand the inside of the door so the foam filler is flush and even with the inside surface.



Block sand or power sand the inside edge of the door opening flush with the interior laminates. The curved lip remnant from the seal flange needs to be eliminated.

Use of a vacuum when sanding will help keep the dust contained.

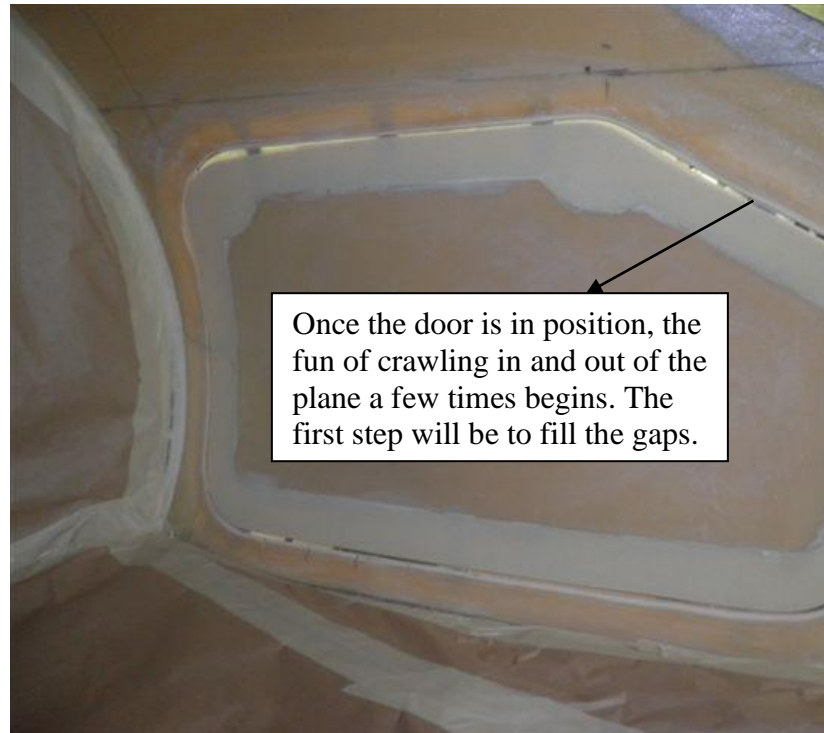
## Step 6: Bond in the baggage door



Break tongue depressors in half and hot-glue them flush to the door exterior surface. Press them firmly down to make sure the wood is flush against the edge of the door and not raised with glue.



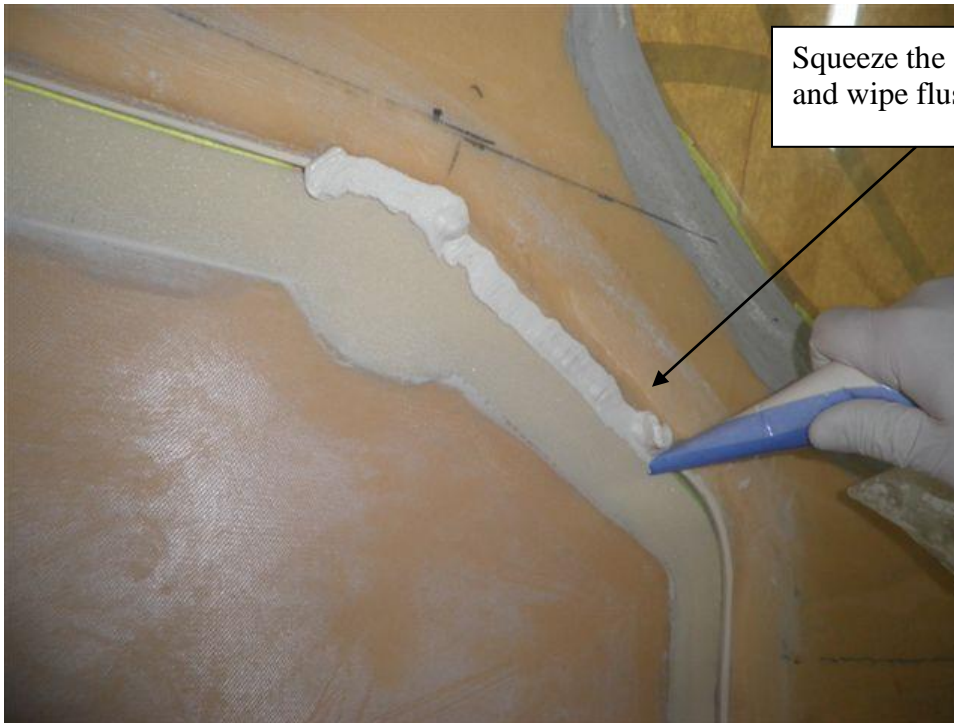
Center the door in the opening and cleco it in place making sure it is even and flush with the exterior sanded surface. The cleco holes will be covered with laminates



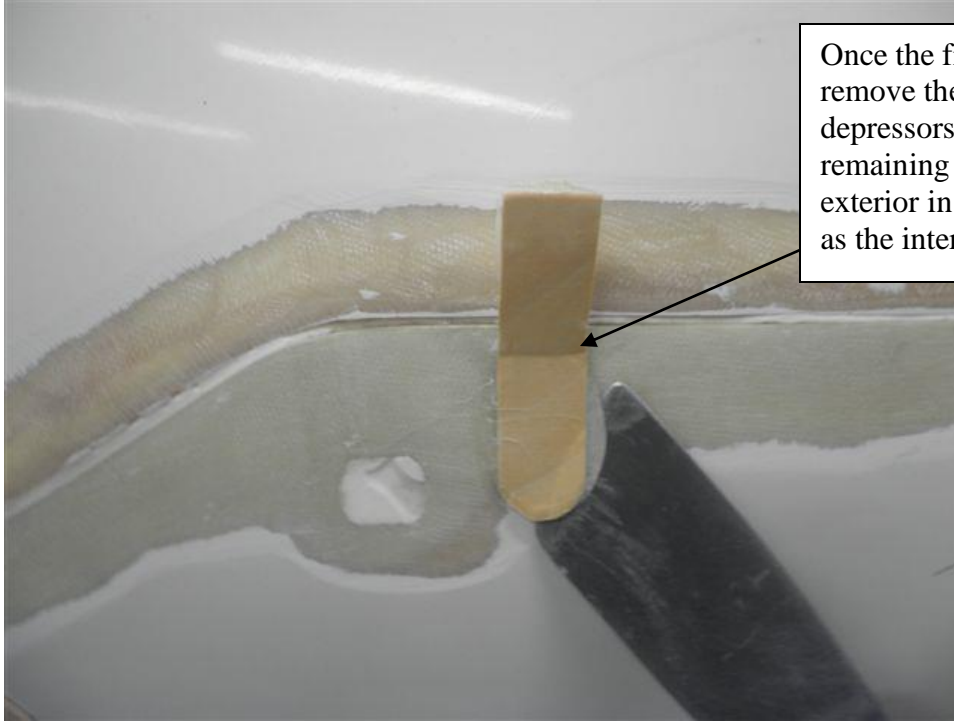
Once the door is in position, the fun of crawling in and out of the plane a few times begins. The first step will be to fill the gaps.



Make a cake decorators icing applicator with plastic film and tape, or just use a zip-lock sandwich bag.  
Mix up a thick (non-runny) batch of resin/Q-cell. Be sure to catalyze the resin prior to mixing in the Q-cell.  
Transfer the Q-Cell mixture into the bag and crawl inside the fuselage. Be sure to bring in a squeegee and extra cup to wipe up the excess!



Squeeze the Q-cell mixture into the gap and wipe flush with the squeegee.



Once the filler has cured, remove the tongue depressors and fill any remaining gaps on the exterior in the same manner as the interior.

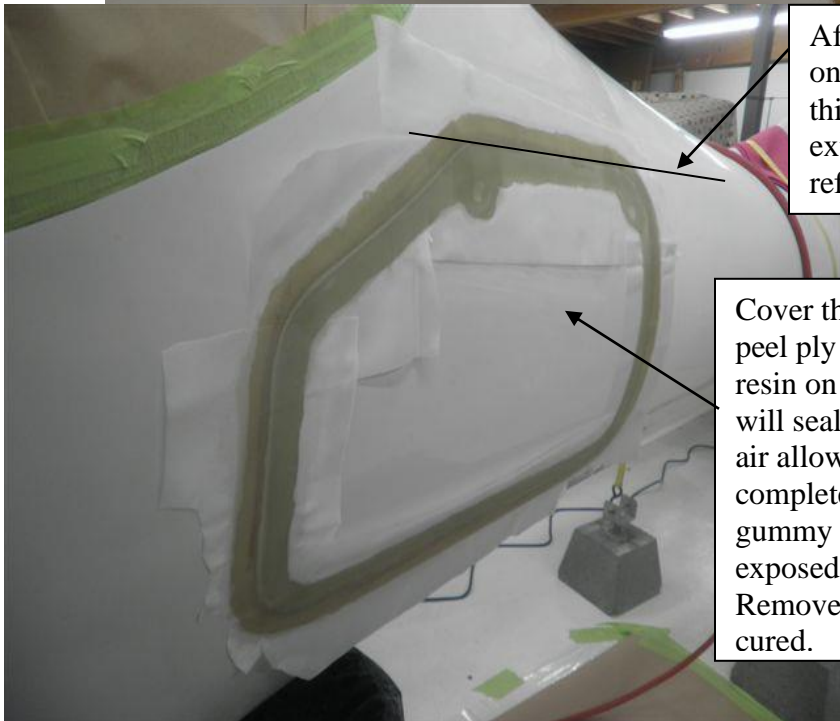
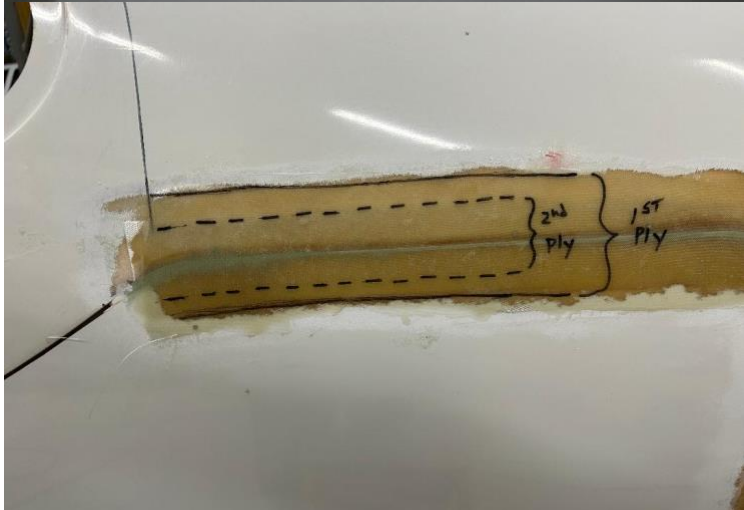


Cut two strips of 7781 fiberglass cloth on a 45 degree bias. The first layer will be full width of the sanded area and the second layer will be slightly narrower to avoid stacking thickness on the edges to be just sanded off later. The goal is for the laminates to fill the tapered trough without having to do a lot of sanding after cure, or adding a lot of filler material to blend them in if they are too high.

If necessary, do some more careful taper sanding of the external plies of both the fuselage and door now that they are together to form a trough.



Mix up a 100 gram batch of vinylester resin and saturate the external plies leaving no air bubbles. Overlap the corners or partially cut the “pleats” and lay them flat. For maximum strength, avoid cutting pleats in the top layer directly over underlying pleats.



After the resin cures, draw a line on the fuselage extending along this upper edge of the old door extending fore and aft for later reference in step 11.

Cover the external plies with peel ply without adding more resin on top of peel ply. This will seal off the laminates from air allowing it to cure completely and eliminate the gummy surface when resin is exposed to air while curing. Remove the peel ply after fully cured.

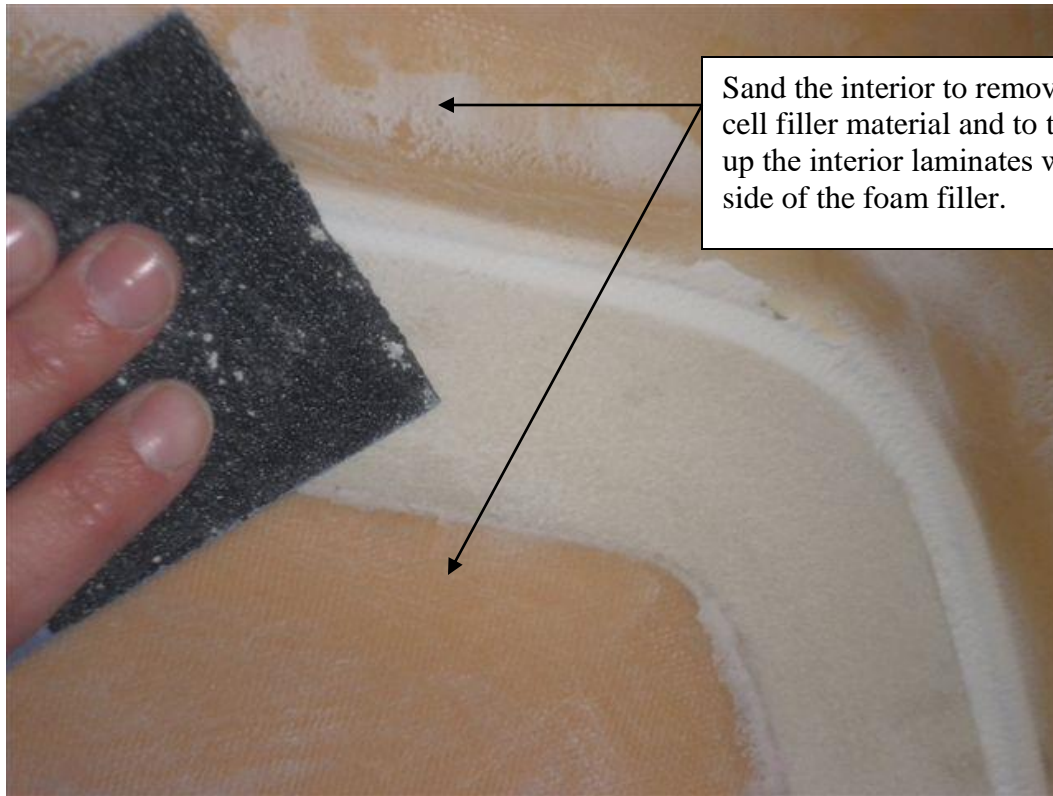


Use 60-80 grit sandpaper on a block and sand the exterior flush with the surrounding painted surfaces.

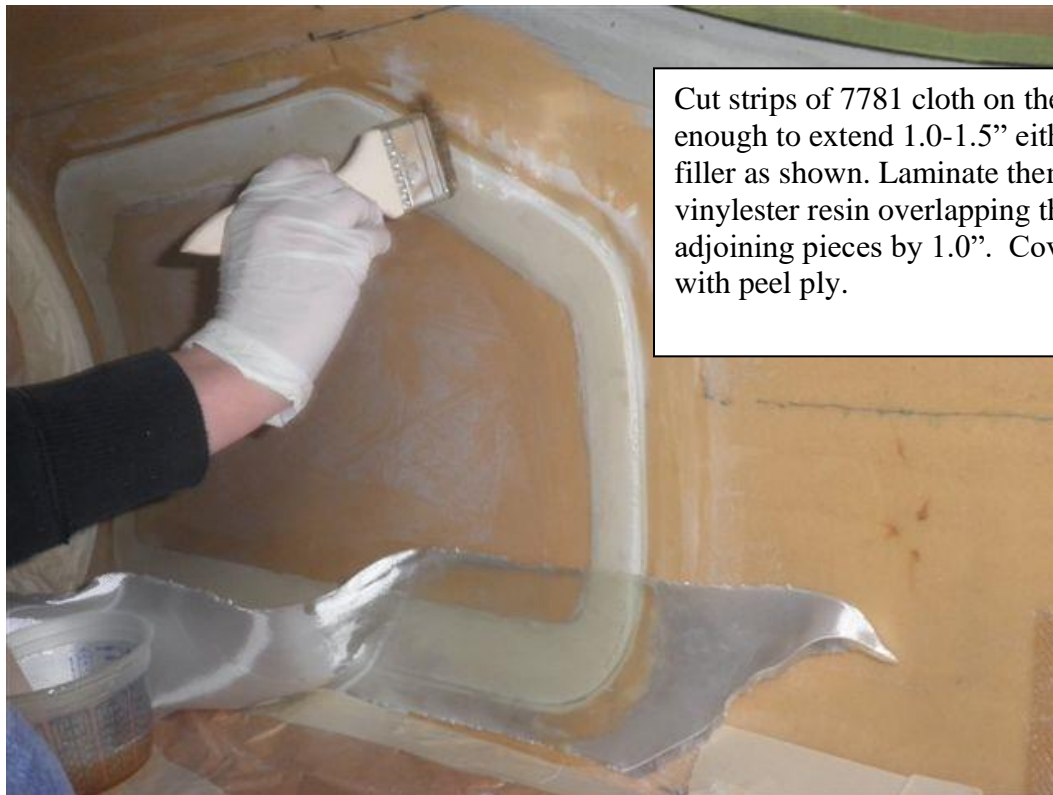
Observe that this sanding should be tapering or flattening the edges of the new laminates near the Gelcoat or paint edges. If it is sanding down the laminates in the center, the taper sanding was not done correctly and should be redone, or add body filler to blend in high spots.



**Step 7: laminate the interior.**



Sand the interior to remove any excess Q-cell filler material and to thoroughly rough up the interior laminates within 1.5" either side of the foam filler.



Cut strips of 7781 cloth on the 45 bias wide enough to extend 1.0-1.5" either side of the foam filler as shown. Laminate them in place with vinylester resin overlapping the edges of all adjoining pieces by 1.0". Cover the final layer with peel ply.



**Step 8: Body-work the exterior**



Obtain some lightweight body filler from a local auto paint store and apply over the exterior laminates. Be sure to remove exterior paint or rough-sand the gelcoat when blending body filler wider than previously sanded areas



Block sand to a smooth, blended surface.

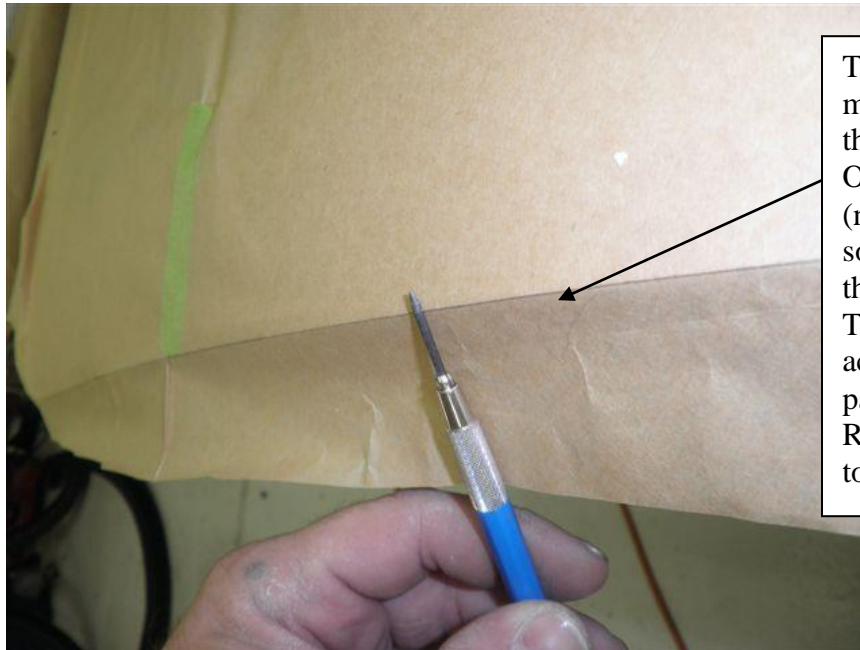
**Step 9: Fit the window into the new door**



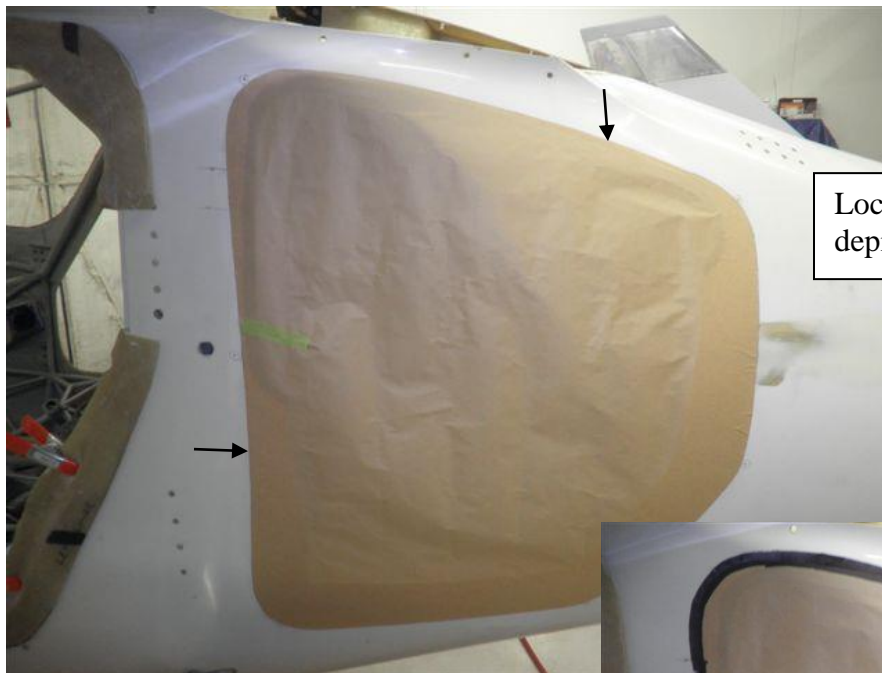
While waiting for laminates and body filler to cure, fit the old window into the new door joggle area, mark and trim it to obtain an even 1/8" gap around the circumference. Don't install the window until after the door has been hung on the hinges, for ease of reaching inside the fuselage.

**Congratulations! You are all the way back to "Square 1" as the saying goes, and ready to cut the fuselage open to receive the larger door.**

**Step 10: Cut the opening in the fuselage.**



To begin, a paper template must be made from the door and transferred to the fuselage.  
Obtain some craft or butcher paper (nothing stiff like cardboard). Cut some holes in the center and tape it to the door surface so it won't shift.  
Then take a pencil and make an accurate mark of the edges on the paper.  
Remove the paper and carefully cut to the marked line.



Locate the paper template as depicted in Step 4

Mark the fuselage all around the edges of the template with a sharpie pen and then remove the template.



**Note:** The following steps should be completed with both fuselage attach struts in place (Step 85, Section VIII, Fuselage Assembly). Without the struts in place, the aft fuselage can flex slightly, but enough to affect your carefully crafted gap between the door and the flange.



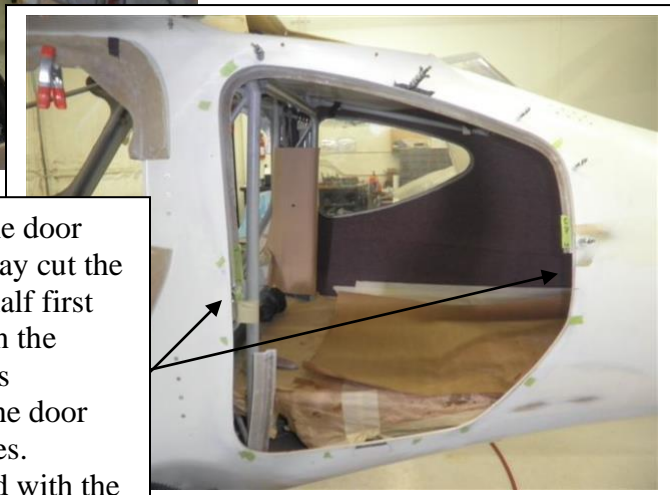
Cut the fuselage with a saber saw with a grit-edge blade or with a cut-off disc on a pneumatic die grinder.

**Be sure to initially cut it ¼" smaller than the template.** Place the door in the opening and trial fit it to obtain the best fit with the fuselage. It isn't a lot of wiggle room, but may help with fit some. Sand the opening a bit wider if necessary. If it fits the exterior contour better tilted one way or the other, re-trace the door edges and sand the opening to the new marks. Leave any gaps tight to begin with and open them to the final gap later, once the hinges have been installed. Sand to a final even gap of .060" min.- 0.010" max

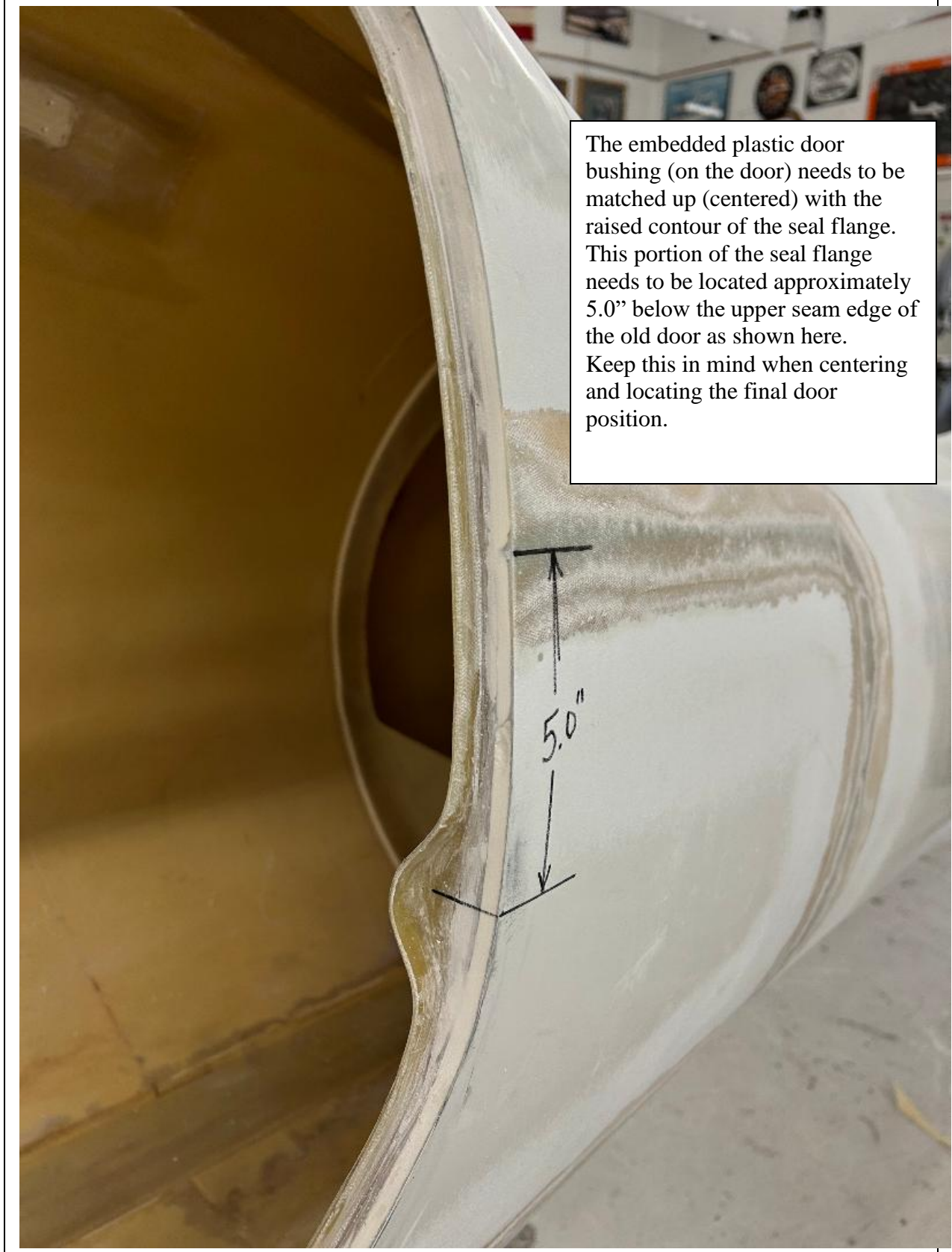
## Step 11: Install the door seal flange



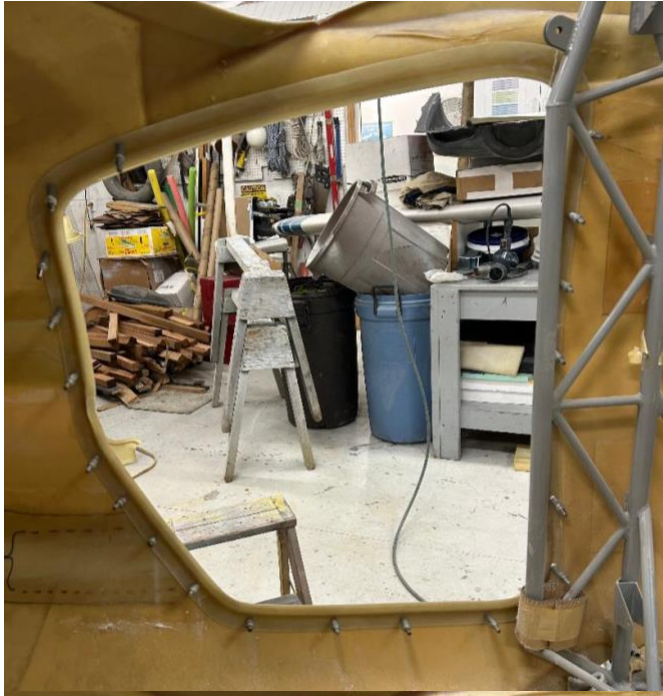
Rough sand the interior laminates surrounding the door opening with 60-80 grit approximately two inches from the edge.



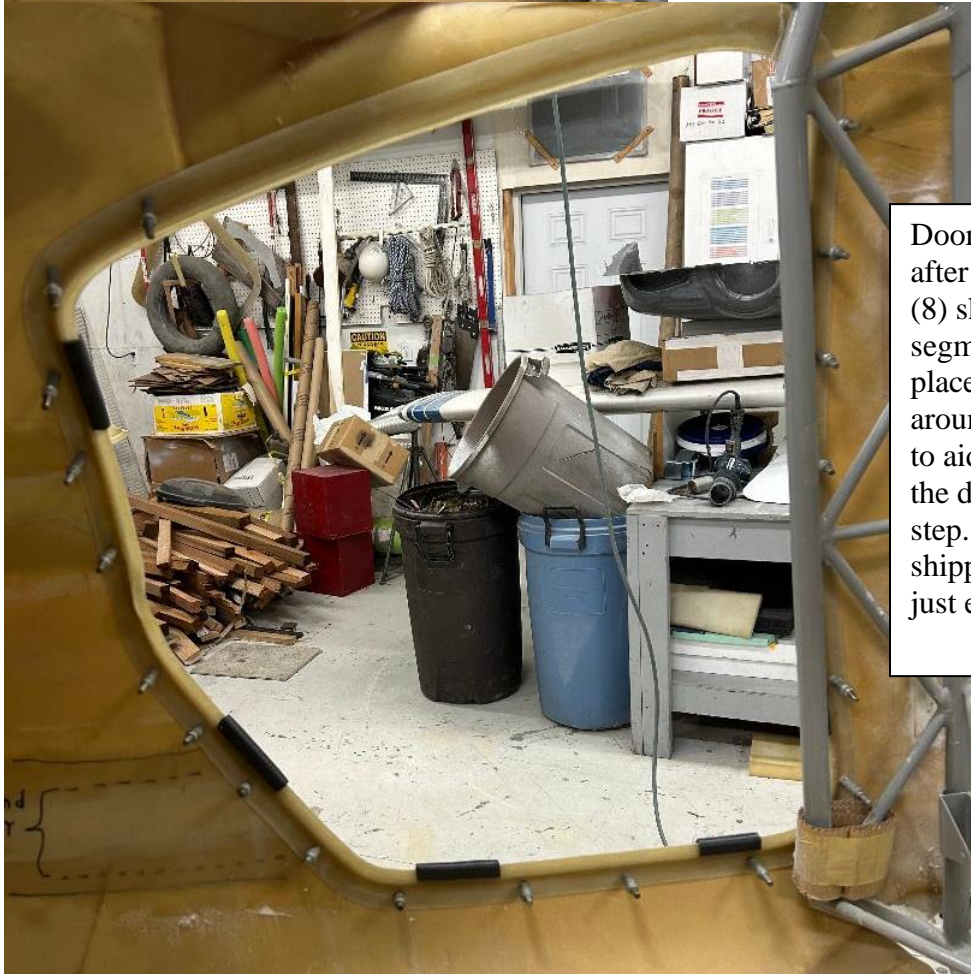
To obtain an even gap between the door seal flange and door foam, you may cut the flange in half and install the top half first followed with the bottom. Shorten the vertical legs until the flange gap is relatively even with the edge of the door opening along all corners and sides. Note: Early door kits were shipped with the seal flange cut in half. Later kits are shipped in a larger box with the flange in one piece. Read on through the entire procedure for installing the flange to determine if the flange would need to be cut and shortened.



The embedded plastic door bushing (on the door) needs to be matched up (centered) with the raised contour of the seal flange. This portion of the seal flange needs to be located approximately 5.0" below the upper seam edge of the old door as shown here. Keep this in mind when centering and locating the final door position.



Drill and cleco the flange to the fuselage using as many cleco's as necessary to keep the flange tight against the fuselage for bonding. Note that there are no clecos in the upper section of the flange. Just allow it to float 1/4" away from the fuselage since foam core isn't present here. It will be filled with Q-cell mixture later.

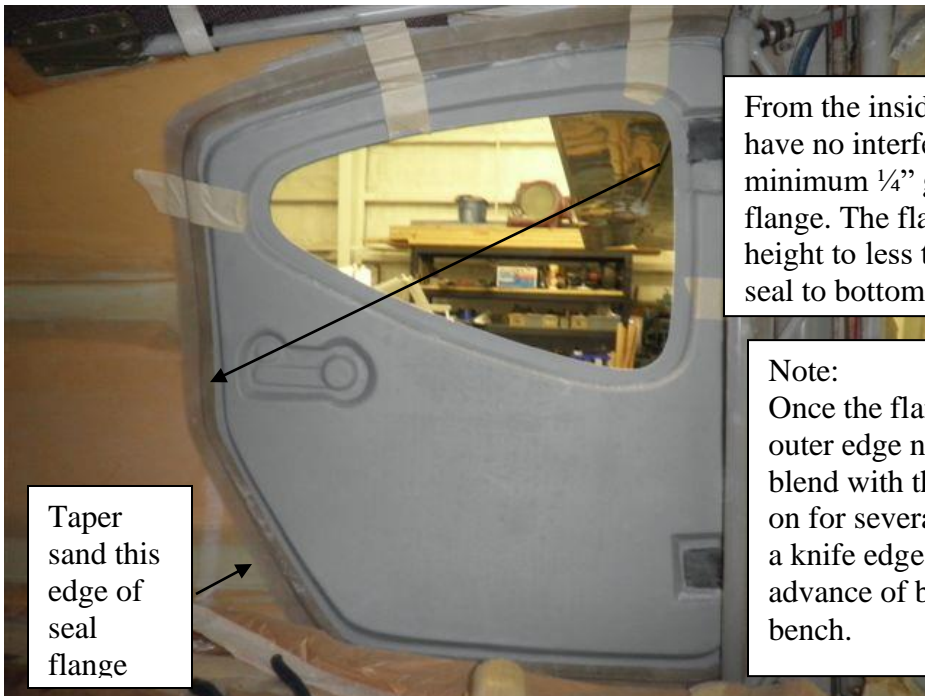


Door kits shipped after 10/2023 include (8) short seal segments to be placed on the flange around the opening to aid in centering the door. In the next step. If your kit was shipped prior to this, just eyeball the gap.





Temporarily install the door and check the fit on the outside to be sure the door edges cover the opening when the inside gap between the door inner surfaces and seal flange is relatively even. When satisfied with the door position, trace the exterior edge onto the fuselage for future reference when installing the hinges.



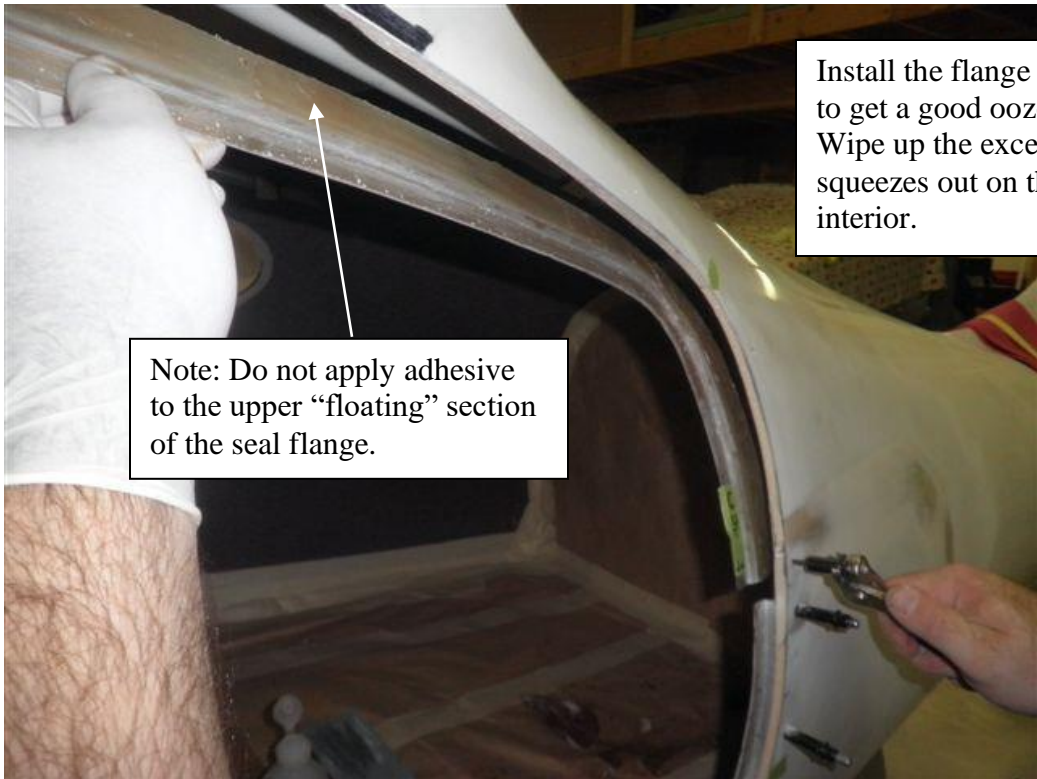
Taper sand this edge of seal flange

From the inside, verify that the door and flange have no interference points. There should be a minimum  $\frac{1}{4}$ " gap between the door and the flange. The flange can be slightly shortened in height to less than  $\frac{1}{2}$ " if necessary to allow the seal to bottom out.

Note:  
Once the flange is bonded in place, the outer edge needs to be taper sanded to blend with the interior laminates. (read on for several steps). Taper sanding it to a knife edge (outside the plane) in advance of bonding is easier to do on a bench.

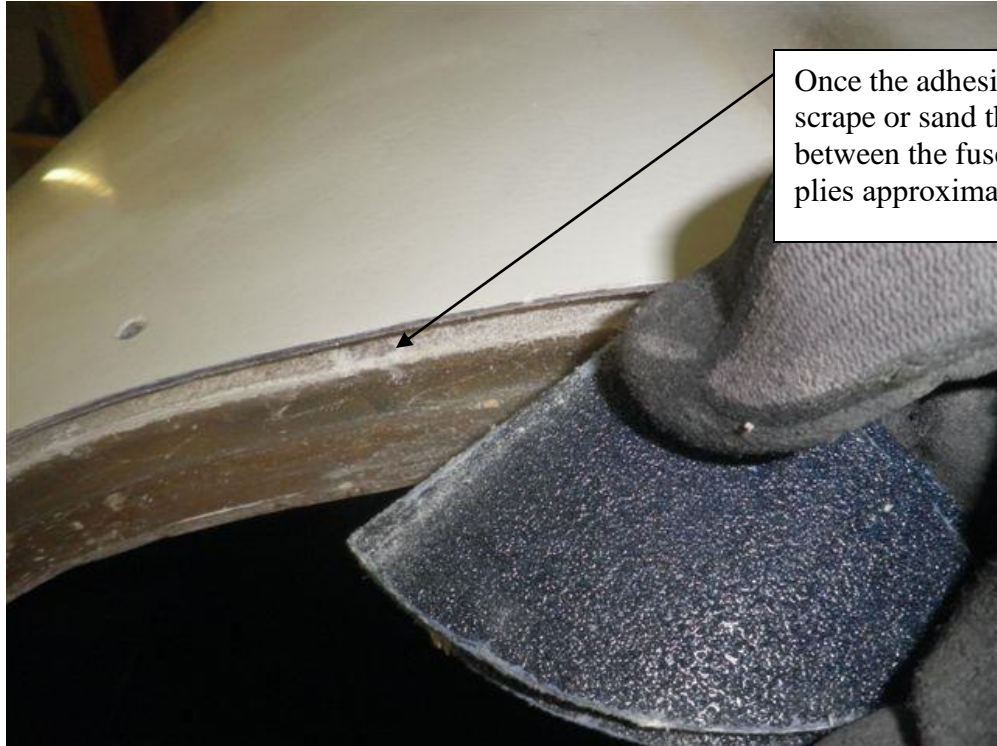


Mix up a “structural adhesive” mixture of resin, cabosil (for thickening) and milled fibers and apply it to the bonding edge of the door seal flange. Apply more than what is shown here. Excess squeeze out can easily be wiped up.



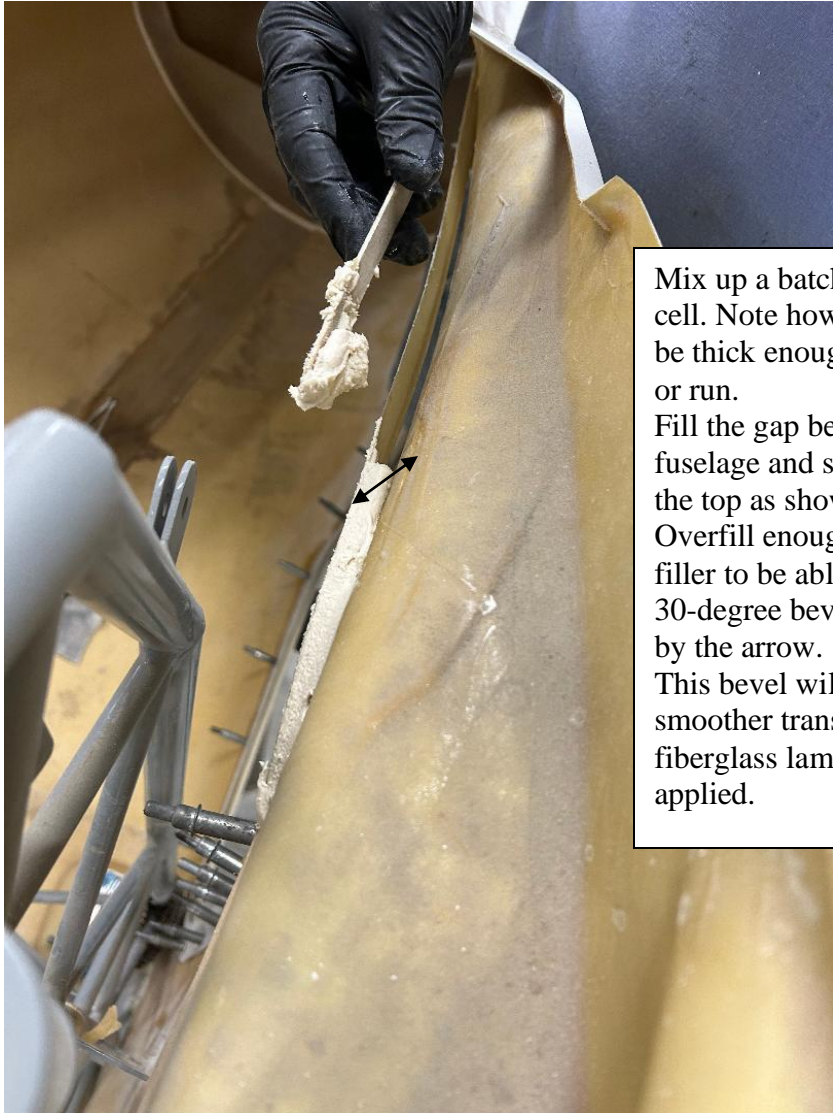
Install the flange with enough adhesive to get a good ooze-out from the edges. Wipe up the excess adhesive that squeezes out on the exterior and interior.

Note: Do not apply adhesive to the upper “floating” section of the seal flange.



Once the adhesive has cured, cut, scrape or sand the foam from between the fuselage outer and inner plies approximately 1/4" deep.





Mix up a batch of thick Q-cell. Note how it needs to be thick enough to not sag or run.

Fill the gap between the fuselage and seal flange at the top as shown.

Overfill enough of the filler to be able to sand a 30-degree bevel as shown by the arrow.

This bevel will allow for a smoother transition for the fiberglass laminates to be applied.

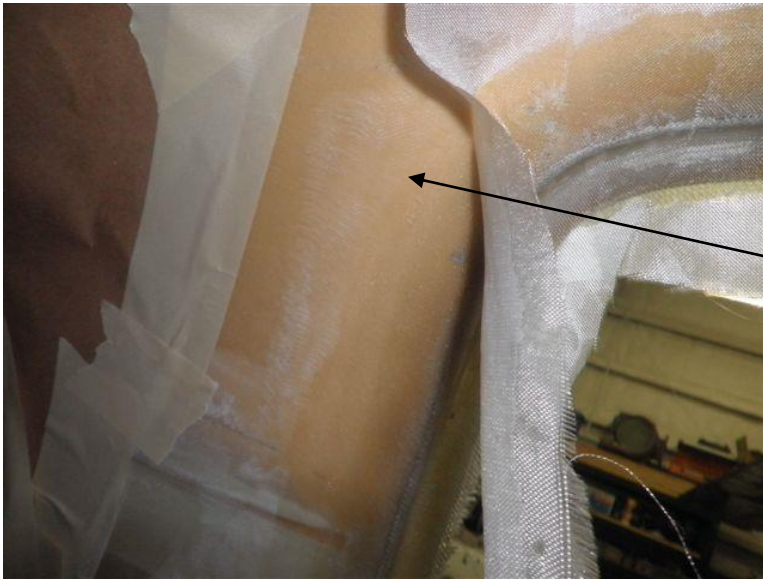


Use a disc sander to carefully taper the flange edge to the fuselage inner laminates. Be sure to wear a dust mask and use a vacuum to catch as much dust as possible.

Once again, do not use the power tool on the thin inner fuselage plies. Hand sand the final blending taper of the edge to the fuselage.



Cut two strips 7781 cloth on a 45 degree bias to bond the flange to the fuselage interior laminates. To minimize the amount of interior cosmetic sanding necessary, use peel ply over the laminates to get the ideal blending of the laminate edges with the fuselage interior



Notice how the peel ply does such a great job of blending the new laminates into the fuselage laminates. It makes the job of finishing the interior much easier.

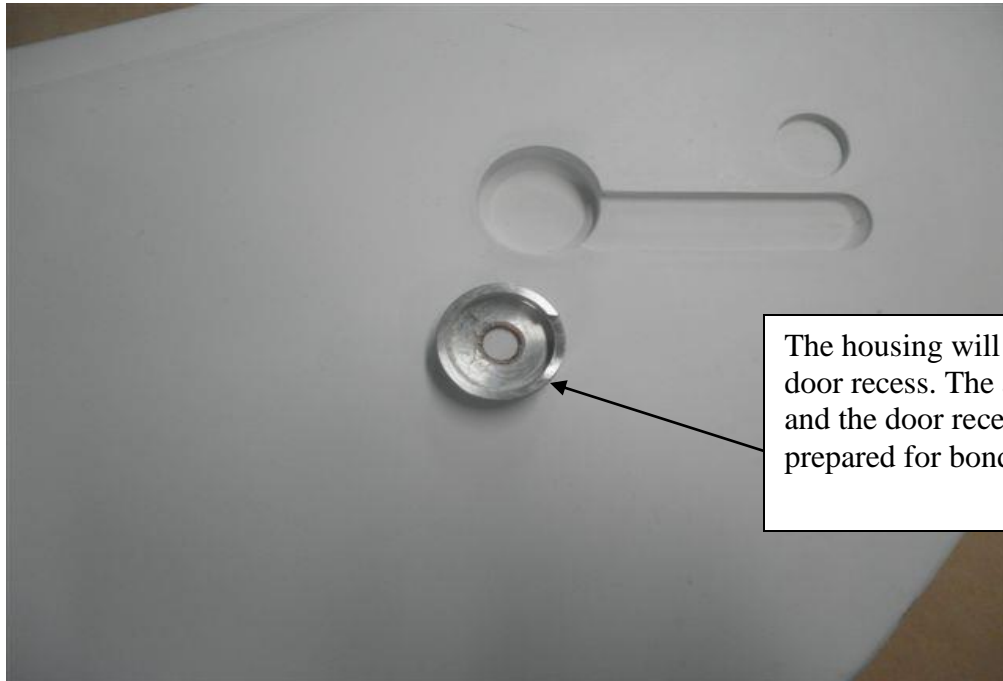


After the laminates have cured, use a drum or sanding block to sand the edges back to the original door seal flange depth. It should be a maximum 1/2" in height

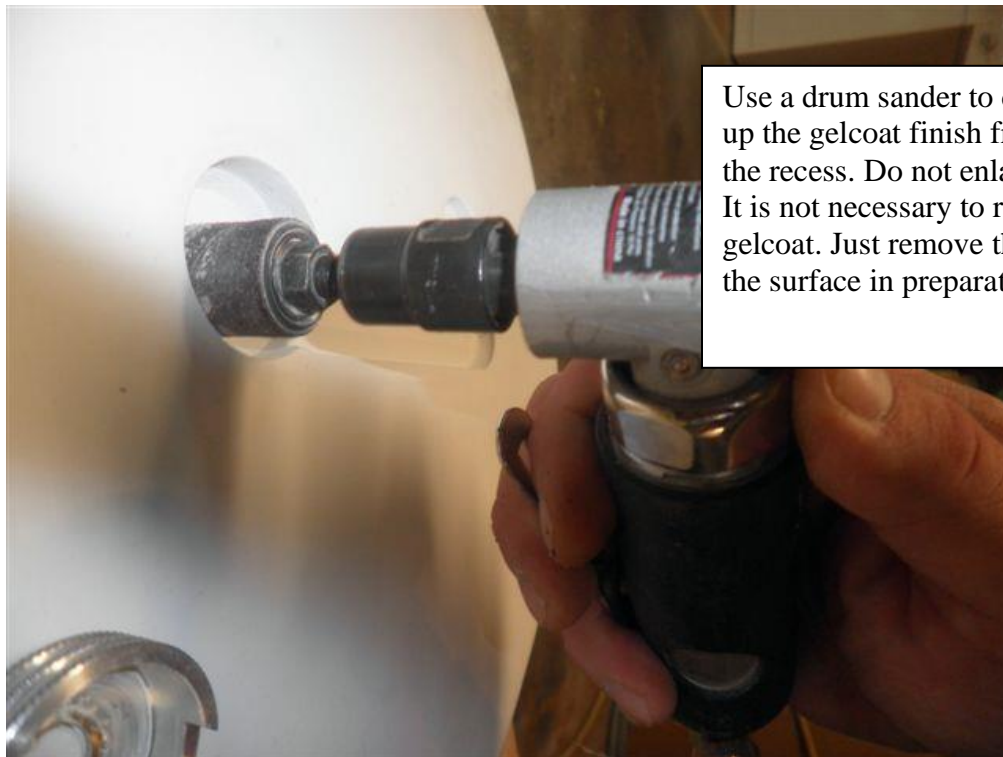


Phase 2 is now complete: the new door opening is finished and ready to begin installation of the new door. Any cleco holes and edges of the door opening will require cosmetically filling and sanding with body filler prior to application of gelcoat or paint in the final steps.

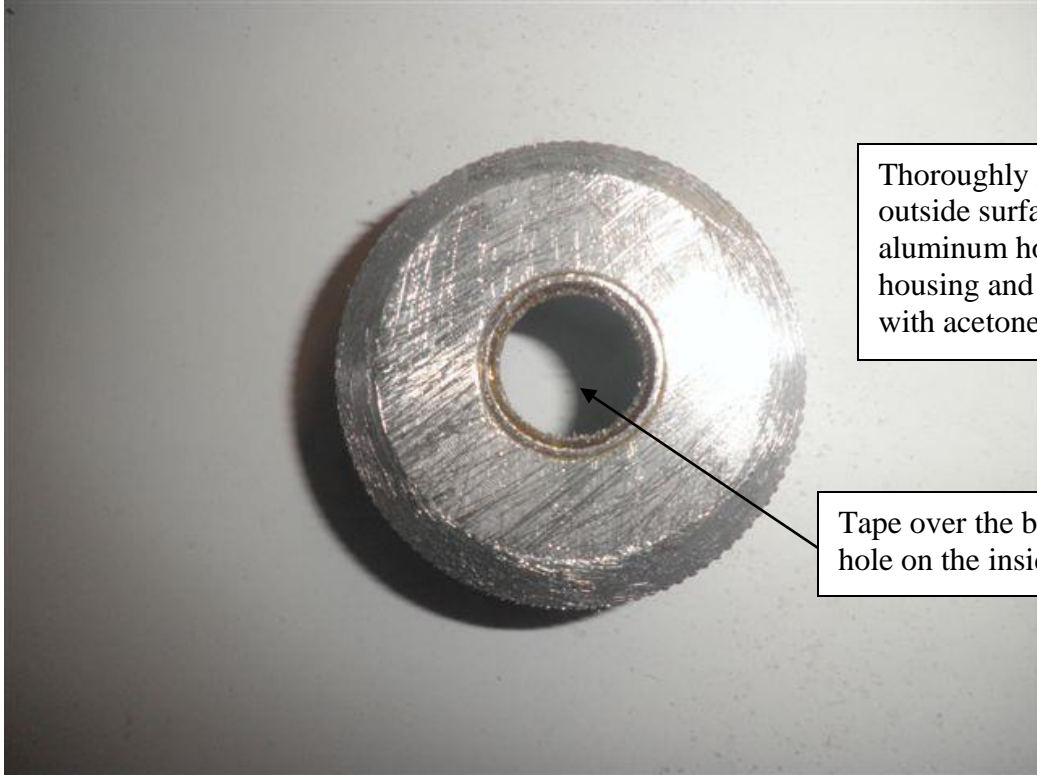
**Step 12: Installing the door handle and latch assembly.**



The housing will be bonded into the door recess. The aluminum housing and the door recess both need to be prepared for bonding



Use a drum sander to carefully rough up the gelcoat finish from the edges of the recess. Do not enlarge the recess. It is not necessary to remove the gelcoat. Just remove the smoothness of the surface in preparation for bonding.



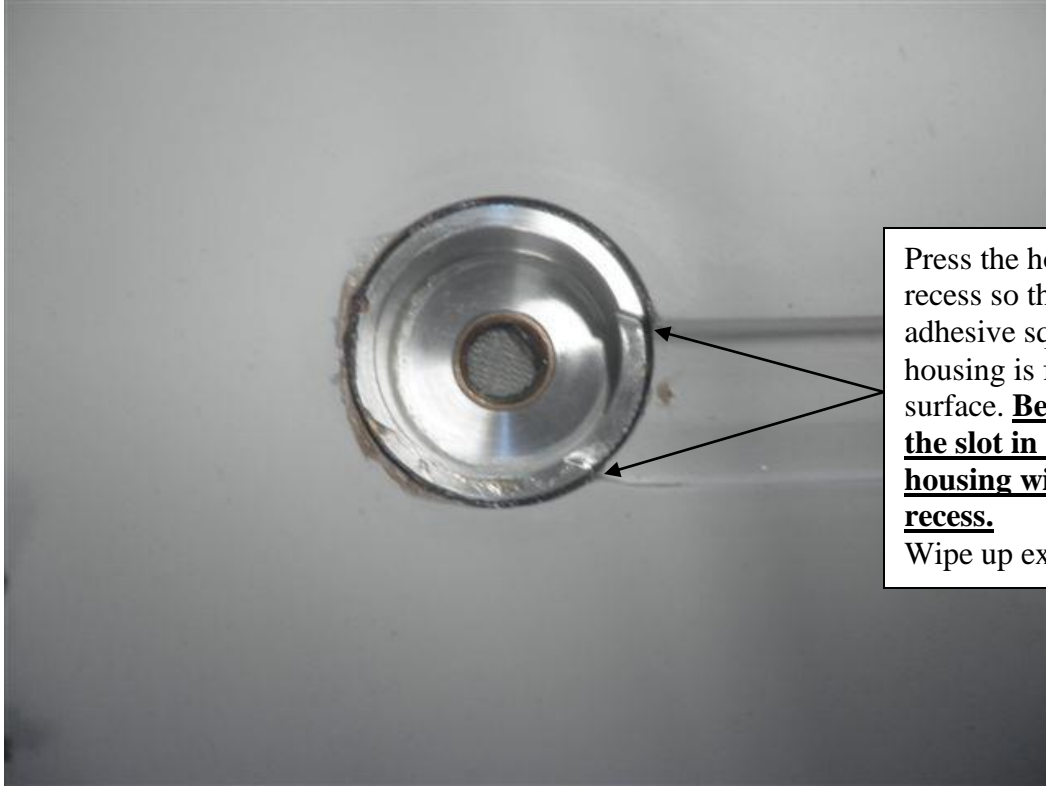
Thoroughly rough up the outside surfaces of the aluminum housing. Wipe the housing and the door recess with acetone.

Tape over the bushing hole on the inside.



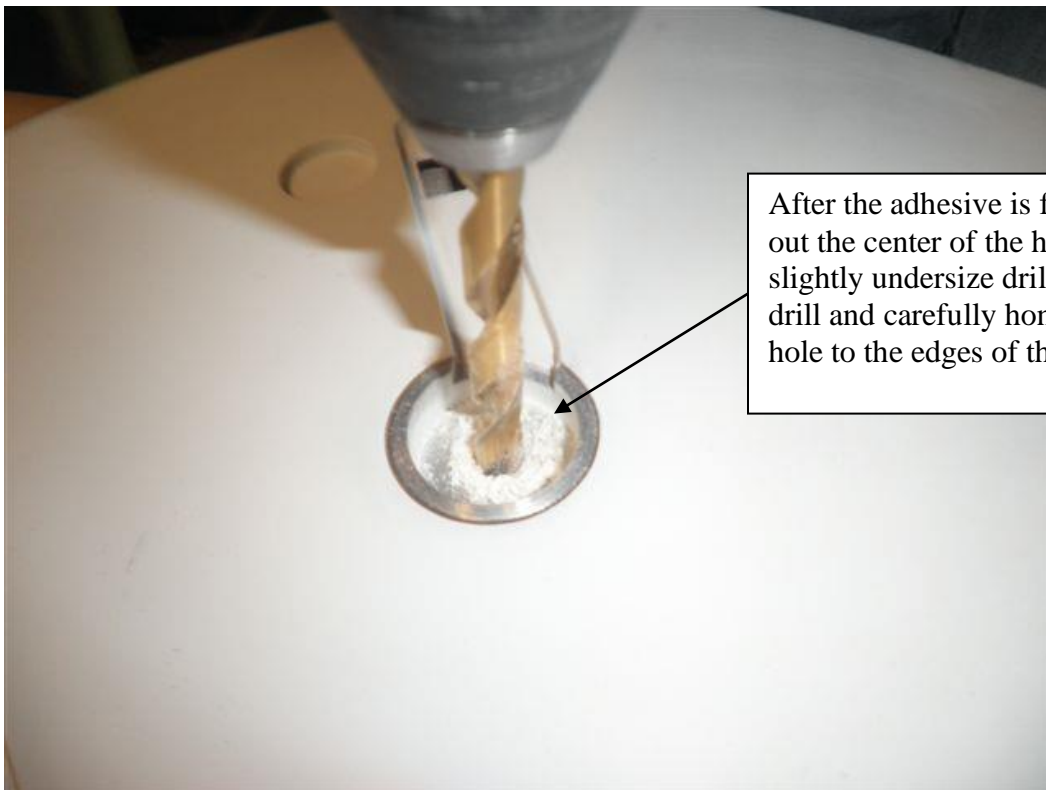
Mix up a small batch of resin, cabosil (to thicken) plus a little milled fiber as an adhesive mixture to bond in the housing.



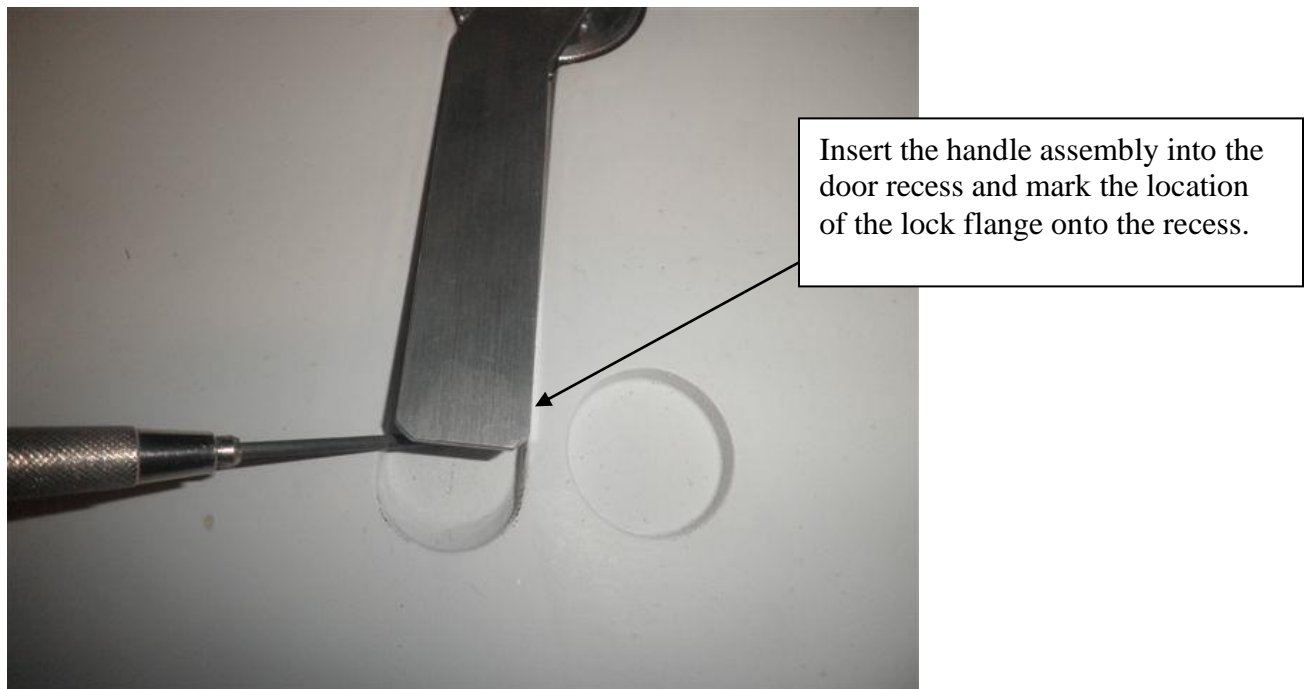
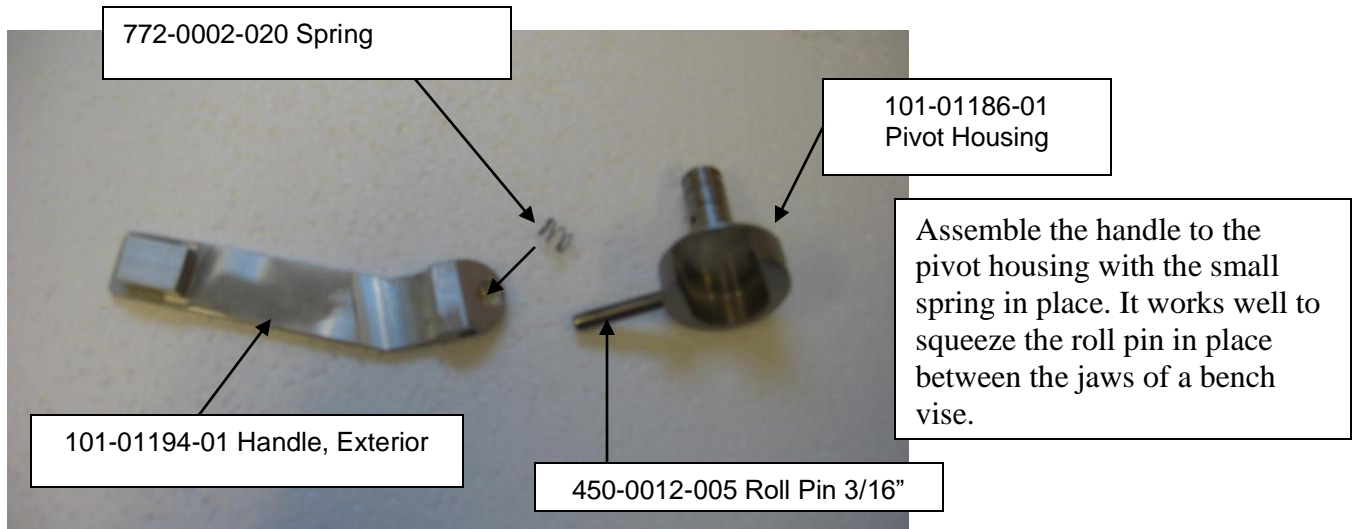


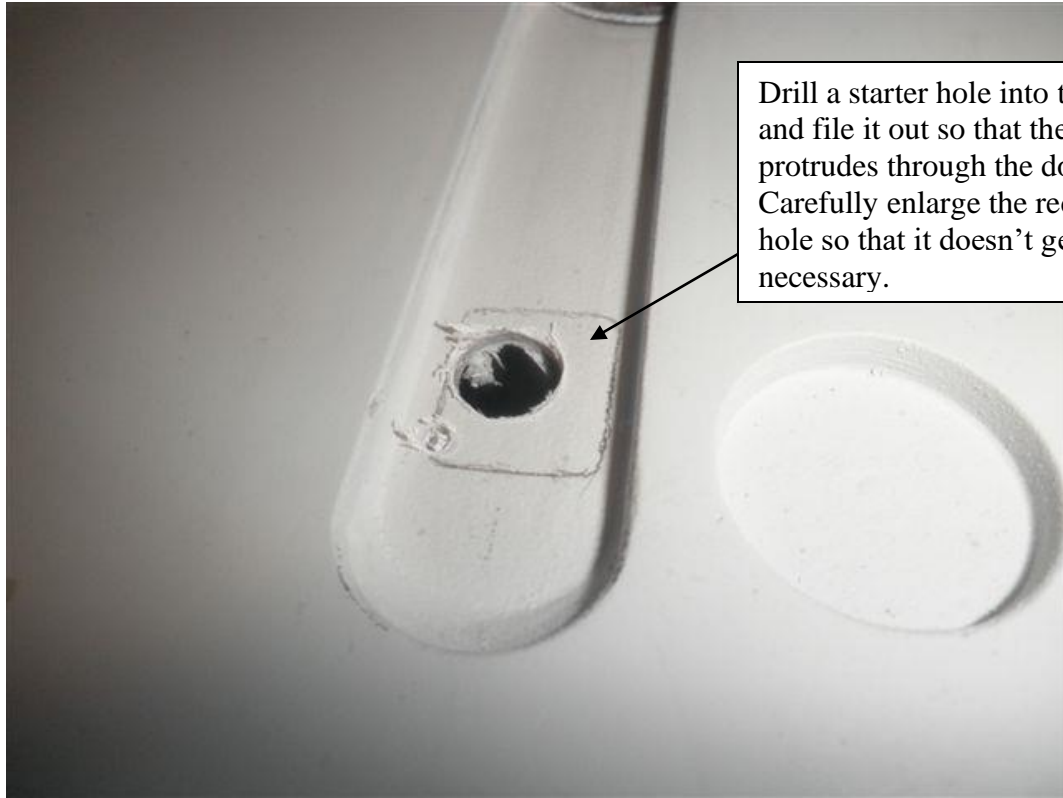
Press the housing into the recess so that an excess of adhesive squeezes out and the housing is flush with the door surface. **Be sure to line up the slot in the aluminum housing with the handle recess.**

Wipe up excess adhesive

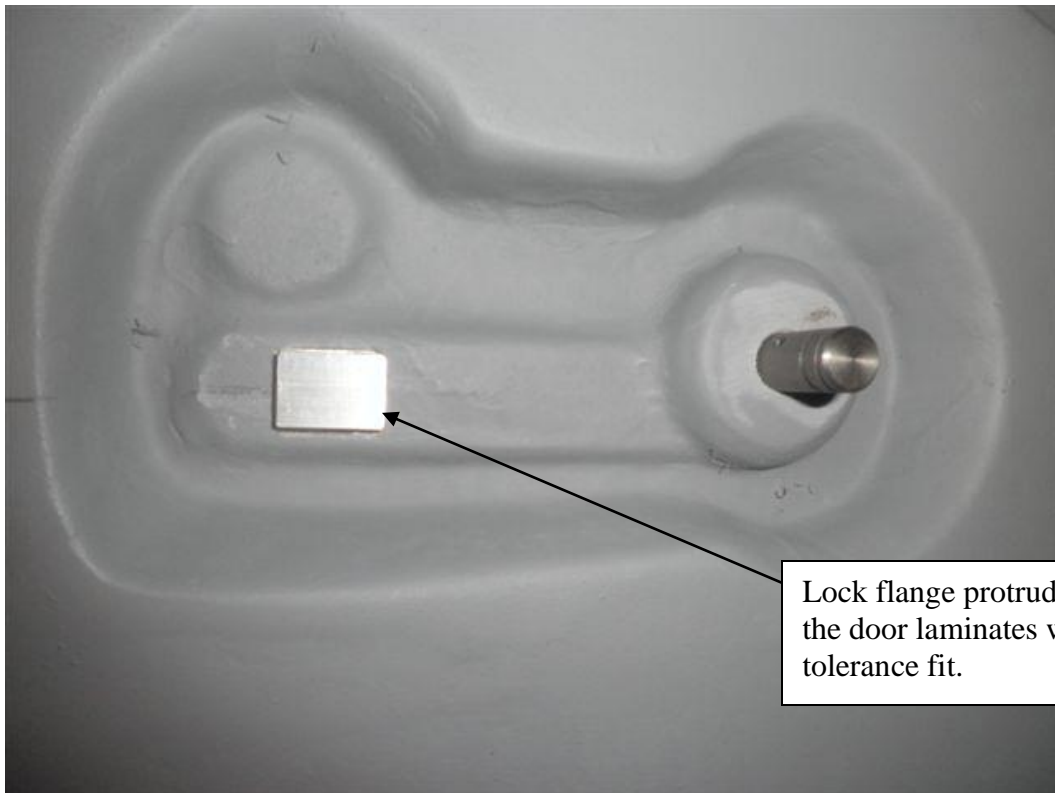


After the adhesive is fully cured, drill out the center of the housing with a slightly undersize drill bit or step-drill and carefully hone or file the hole to the edges of the bushing.



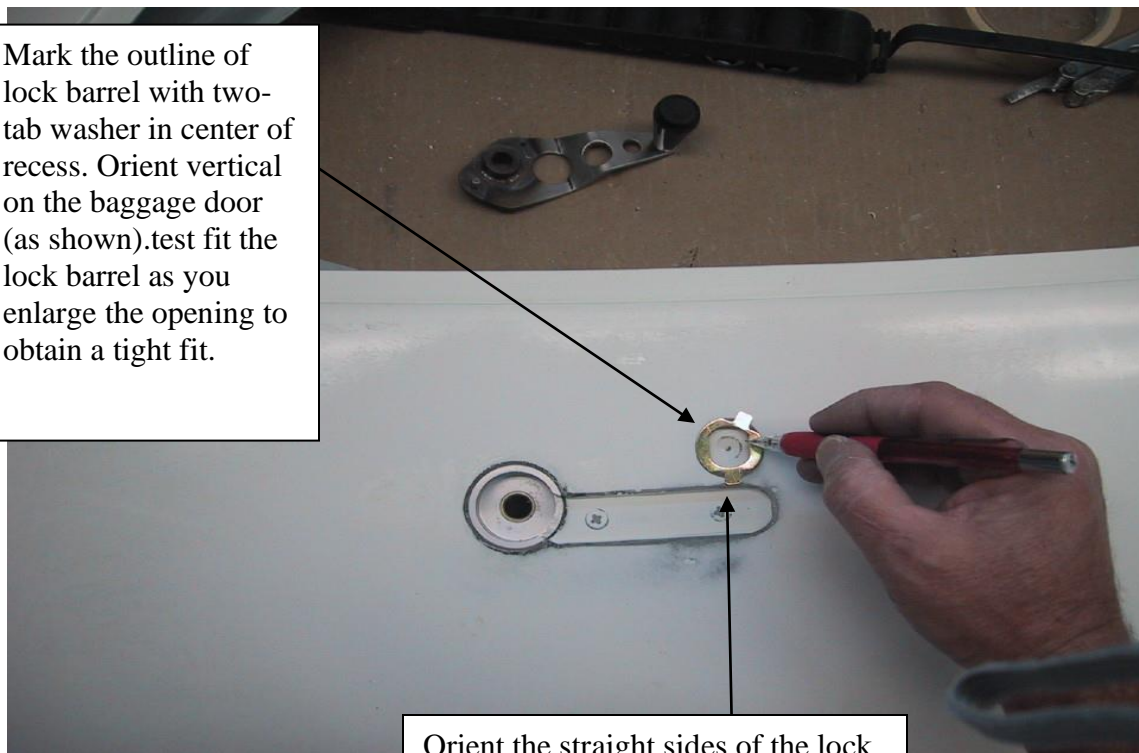


Drill a starter hole into the marked area and file it out so that the lock flange protrudes through the door laminates. Carefully enlarge the rectangular-shaped hole so that it doesn't get any bigger than necessary.



Lock flange protruding through the door laminates with close tolerance fit.

Mark the outline of lock barrel with two-tab washer in center of recess. Orient vertical on the baggage door (as shown).test fit the lock barrel as you enlarge the opening to obtain a tight fit.



Orient the straight sides of the lock barrel vertically.

Note: A lock set is not supplied in the baggage door kit. They are typically supplied with aircraft ignition switch kits sold by Aircraft Spruce and Specialty, or you might try obtaining a lock set from them. Hopefully you can use the ones on the original baggage door if the GlaStar was complete. If not, these lock sets are very commonly used as file cabinet and drawer locks and should be able to be obtained from a local locksmith.



101-01199-01 Lock Bar is included. In some cases it may need to be re-oriented 45 degrees. If so, use a small square file to re-orient the square hole



Install the external handle assembly into the housing with a light coat of grease on the shaft and aluminum housing.

Install (2) AN960-716 steel washers and a 450-0420-004 dowel pin.

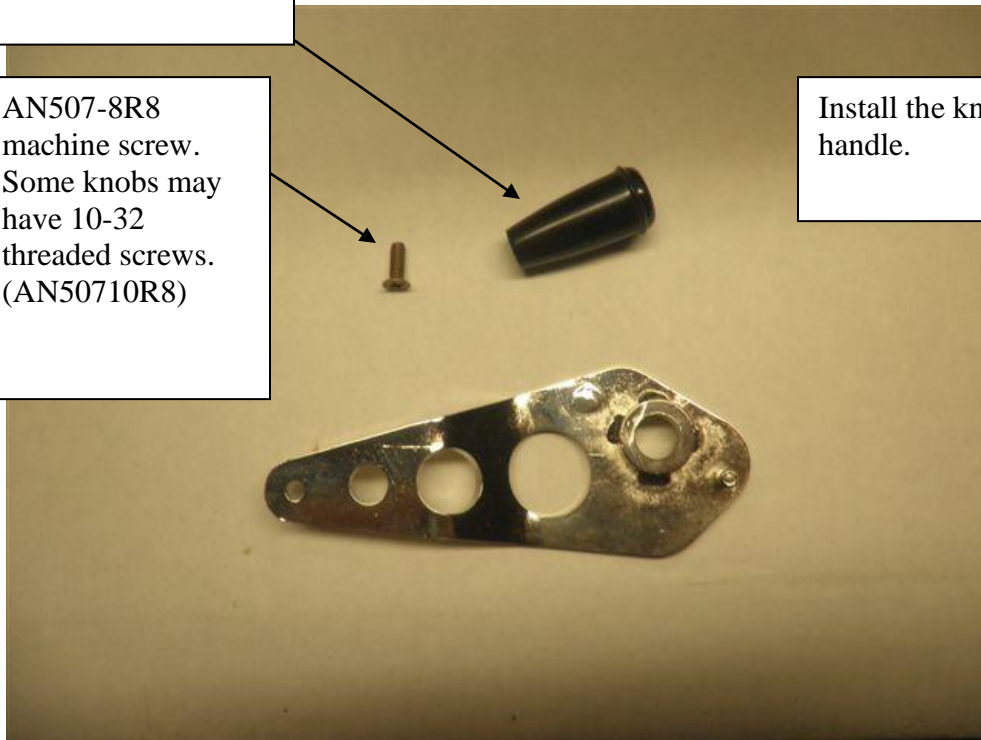
Washer stack-up may vary slightly.

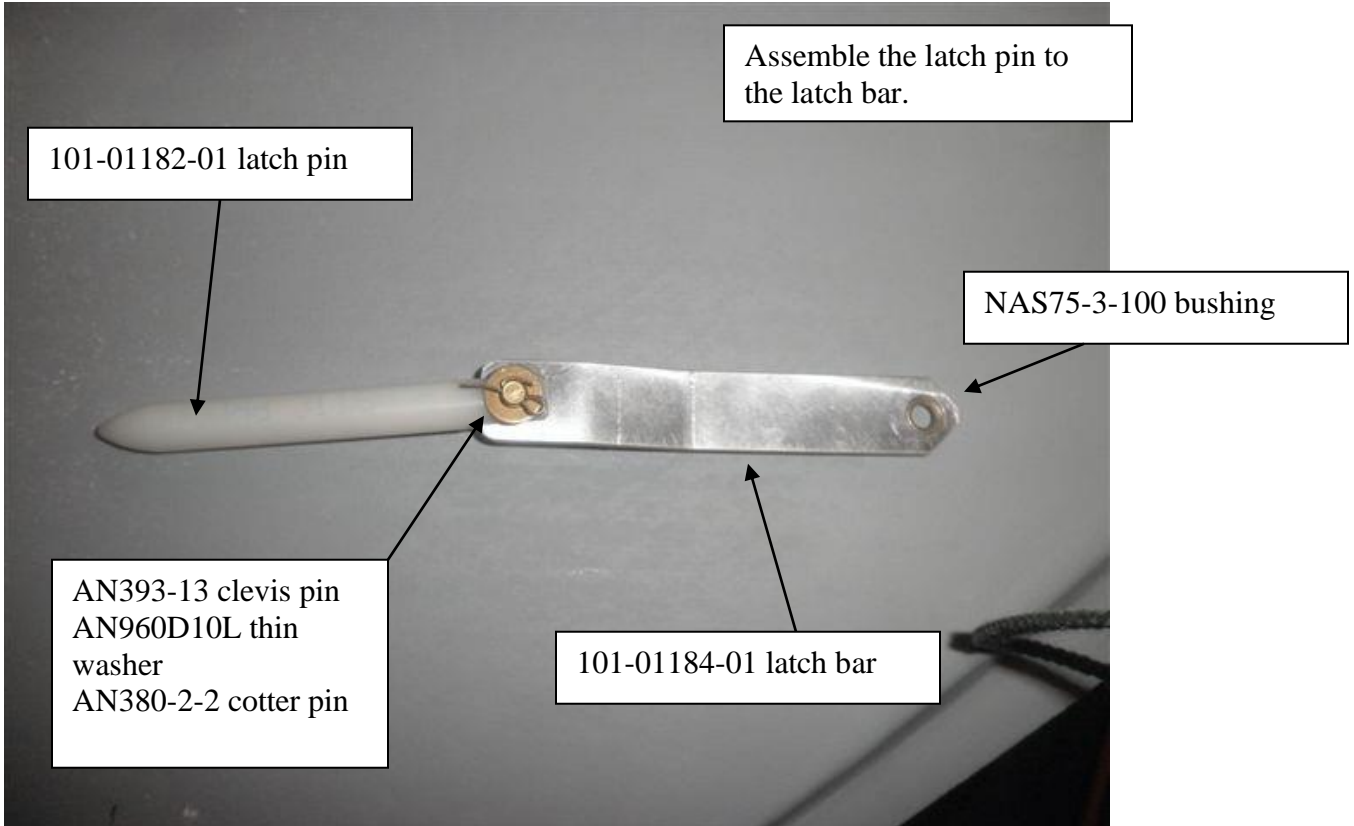
Use a stack up of thick/thin washers to eliminate end-play in the shaft.

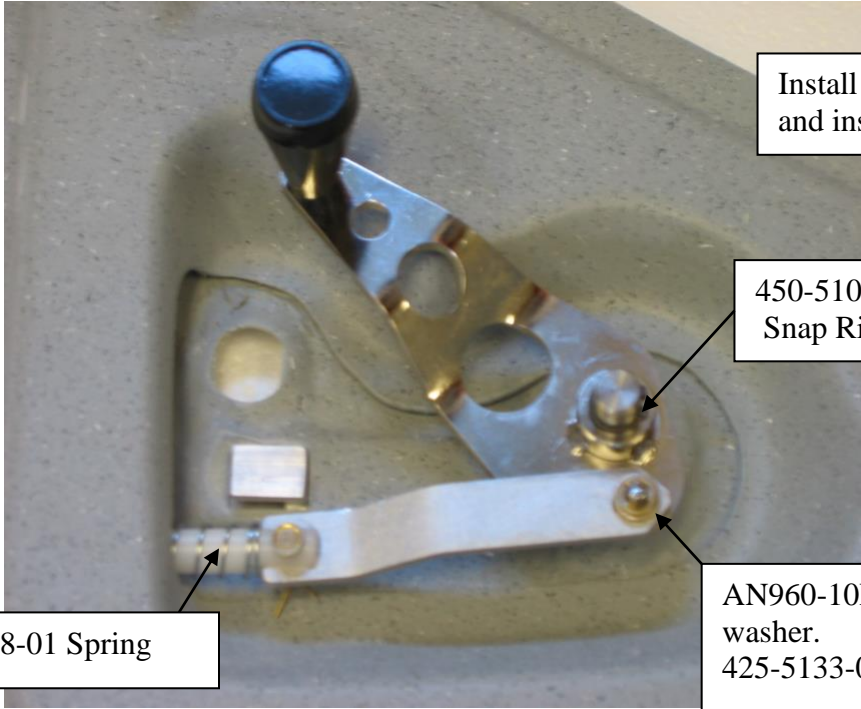
622-1050-001 knob

AN507-8R8 machine screw.  
Some knobs may have 10-32 threaded screws.  
(AN50710R8)

Install the knob onto the internal latch handle.







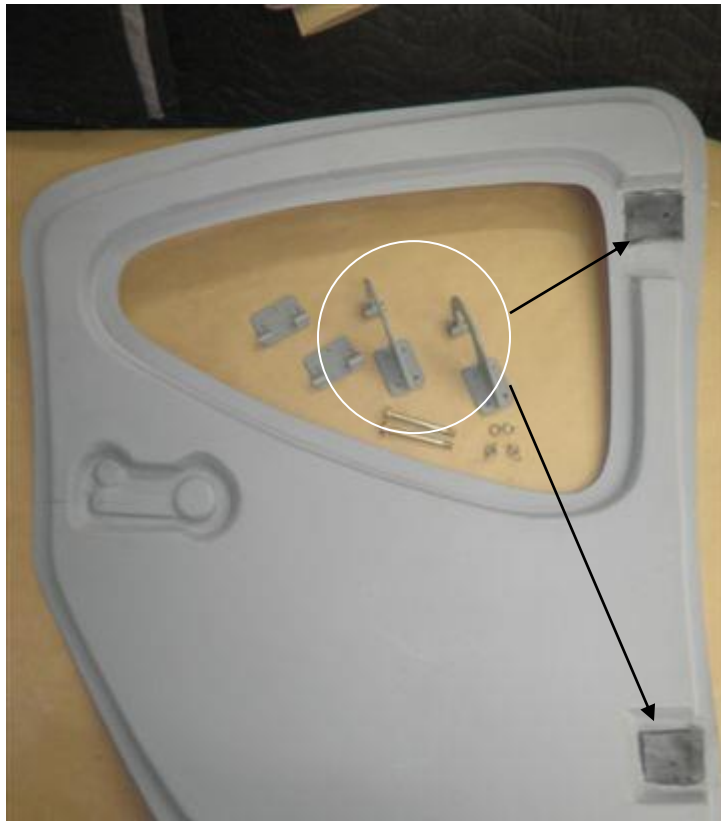
Install spring to Latch Pin and insert into Sleeve.

450-5101-043  
Snap Ring

101-01188-01 Spring

AN960-10L thin steel  
washer.  
425-5133-018 Snap Ring

**Step 13: Install the internal door hinges (see below for aluminum external hinges)**



Mount the curved door hinge-half to each pad on the door making sure the hinges are parallel to each other and the pin bushings are in alignment. Use a length of  $\frac{1}{4}$  diameter all-thread rod with nuts or some other means to be assured the hinge bolts will be in alignment with each other.

The hinges are fastened to the door with AN507 countersunk machine screws and AN364-1032A nuts. Use a #10 100-degree micro-stop countersink cutter to countersink the screw holes

***Note: be sure to place the hinge bases as far aft on the door pads as they will allow. This will assure the door will swing as far open as possible.***





Place the door flush with the exterior and centered in the opening (with door pin and seal flange bulge aligned as described in step 11) and temporarily hold it in position using hot glue and tongue depressors or masking tape.

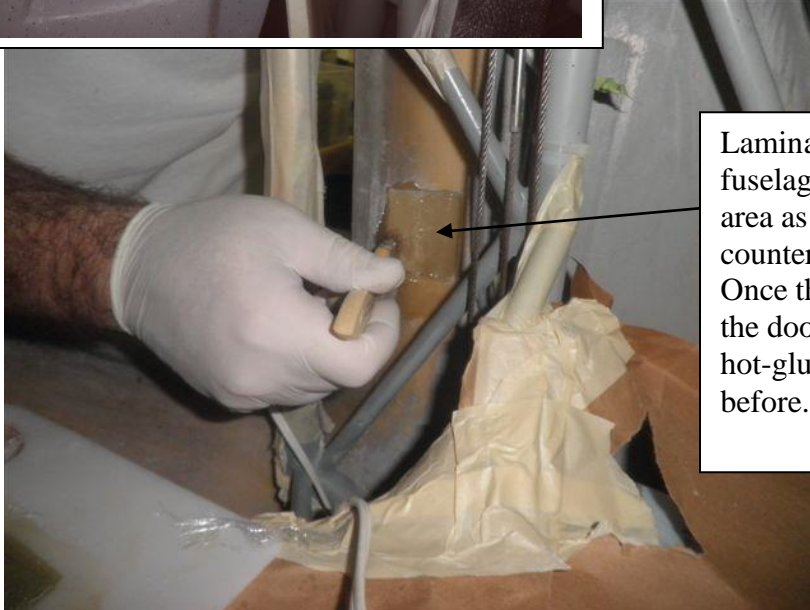
Mark the locations of the forward hinge-halves on the fuselage and remove the door.

Grind off the interior laminates and foam core in the vicinity of the hinge halves.

You can leave the foam core straight sided, or taper the foam core and inner laminates back to a smooth beveled edge. The goal is simply to make a secure mounting pad resulting in a clean cosmetic appearance when finished.



A small chance exists that the hinges may need to be relieved to clear the cage tubes. Don't worry about this until the hinges are completely installed.



Laminate 4 ply 7781 cloth against the fuselage exterior skin in the hinge-pad area as a means of adding countersinking depth for the fasteners. Once the laminates have cured, replace the door in the opening temporarily hot-glued in the centered location as before.

The final step of the hinge installation is to cure a 'wet shim' under the bases of the forward hinges. Cover the base of each hinge with Mylar tape (scotch tape will also work in a pinch).

Position the door centered in the opening and flush with the exterior once more.

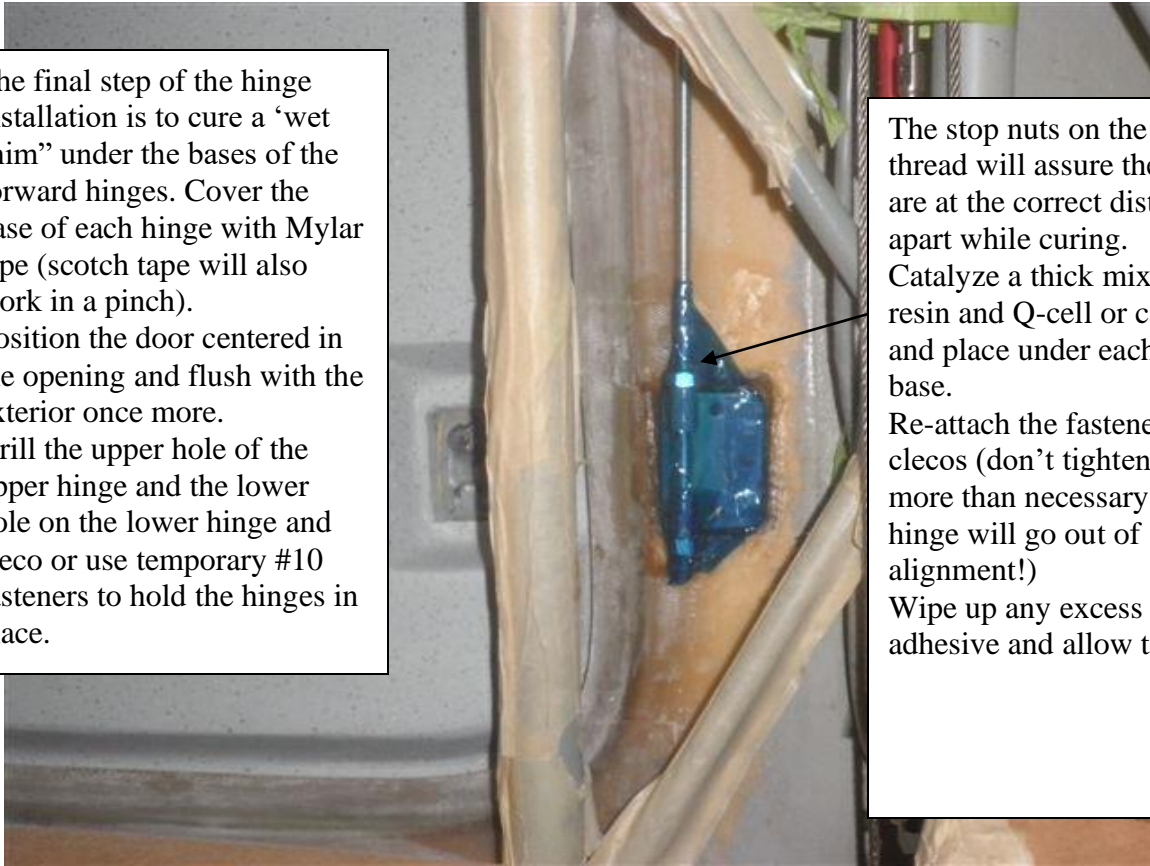
Drill the upper hole of the upper hinge and the lower hole on the lower hinge and cleco or use temporary #10 fasteners to hold the hinges in place.

The stop nuts on the all-thread will assure the hinges are at the correct distance apart while curing.

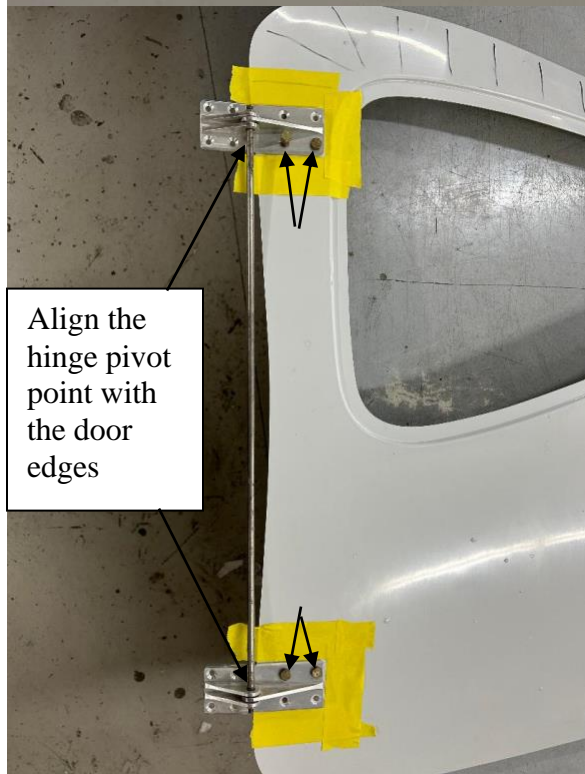
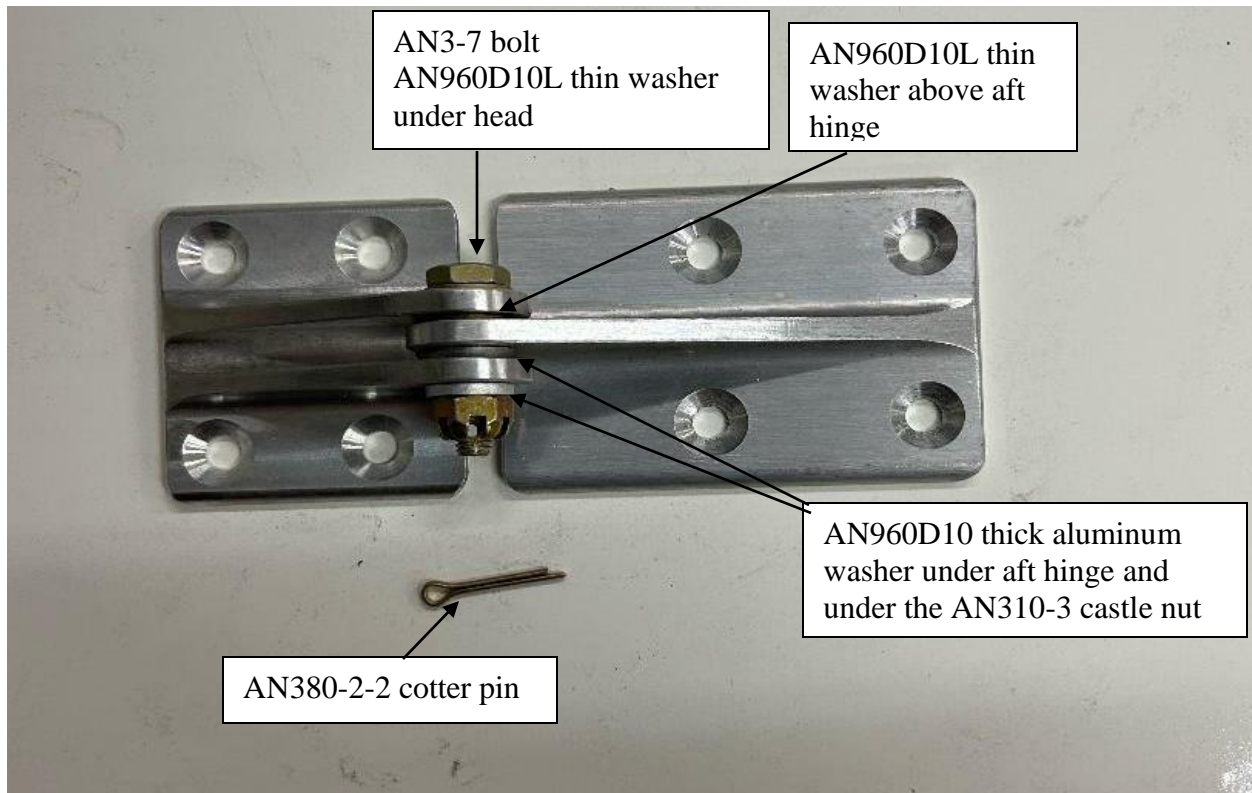
Catalyze a thick mixture of resin and Q-cell or cabosil and place under each hinge base.

Re-attach the fasteners or clecos (don't tighten any more than necessary or the hinge will go out of alignment!)

Wipe up any excess adhesive and allow to cure.

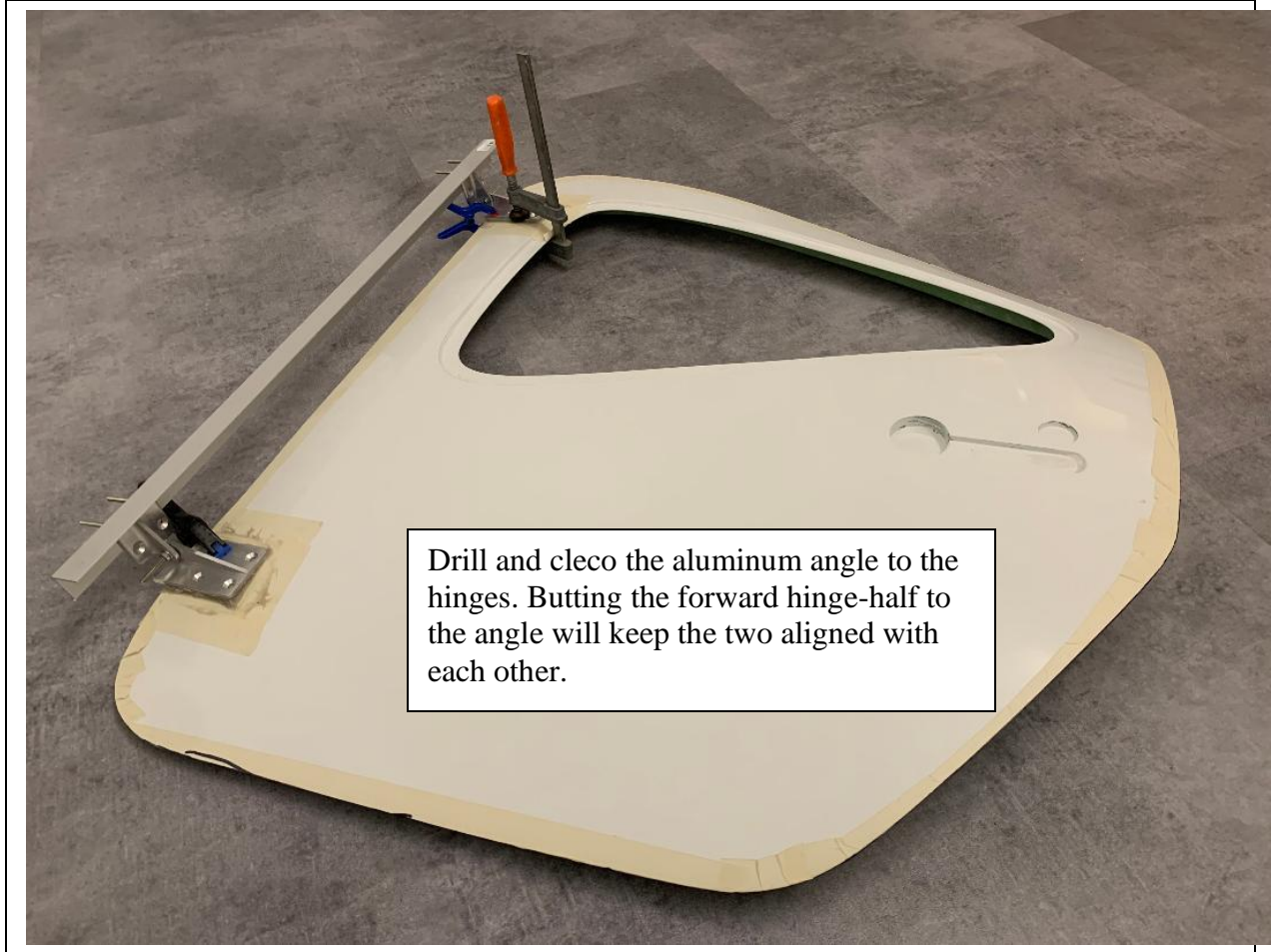


### Step 13A External machined aluminum hinge installation



Assemble the hinges as shown with a straight shaft in-between so that the hinges are located on the solid pad areas when viewed from the inside of the door. A piece of all-thread from the hardware store might be stiff enough. If not, slide a piece of metal tubing over the all thread. Drill only the holes shown by the arrows keeping the drill perpendicular to the hinge surface, not the curved door surface. Long-reach #10 clecos may be required. Lacking these, you could substitute AN3 bolts. Wax them well!

As an alternative (and simpler method) to a shaft aligning the hinges, use a straight piece of aluminum angle and clamp it to the forward hinge halves connecting them together.



Drill and cleco the aluminum angle to the hinges. Butting the forward hinge-half to the angle will keep the two aligned with each other.



Use mylar tape placed under the hinge to seal the holes and prevent the hinge from bonding the filler. Wax over the mylar as an extra precaution.

Cleco the hinges to the door at the contact side of the hinge only, then trace the hinge outline. Rough up the gelcoat for bonding, then mask off the door within 1/8" of the hinge edges to accommodate the adhesive radius. Mix up a batch of resin, cabosil and milled fiber to form a wedge filler under the hinge. Wipe up excess adhesive to form a smooth radius and allow to cure.



Place the door back in the position as traced back in step 11. Double check that the plastic door bushing on the door is centered vertically with the bulge on the seal flange.

Tape the door in position and drill # 10 holes through the forward hinges and through the fuselage keeping the drill perpendicular to the hinge surface, rather than the curved door surface.

**Don't drill the holes that are raised above the fuselage surface.** Only drill and cleco the ones that contact the fuselage as shown.



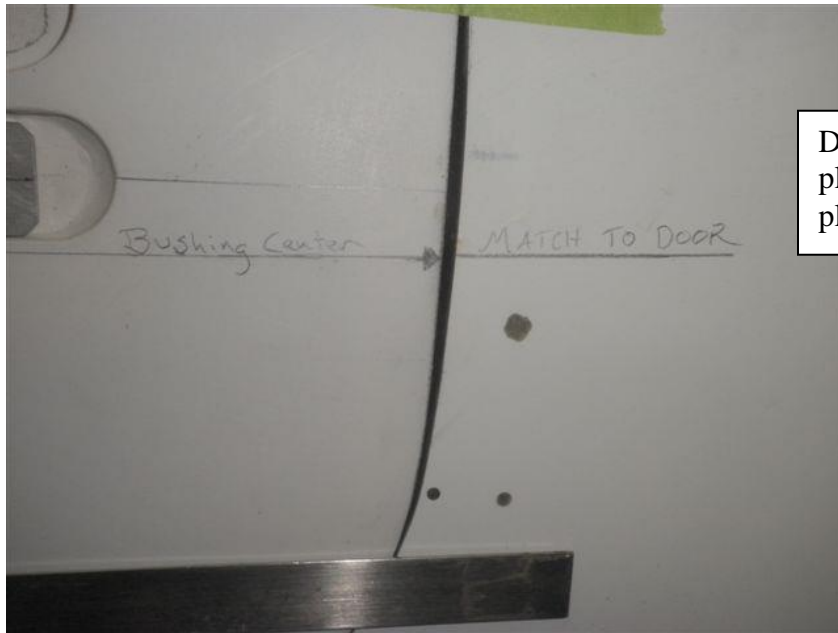
Now cover the hinges with mylar tape and wax and repeat the process of taping off the fuselage and filling under the forward hinge halves as previously described.



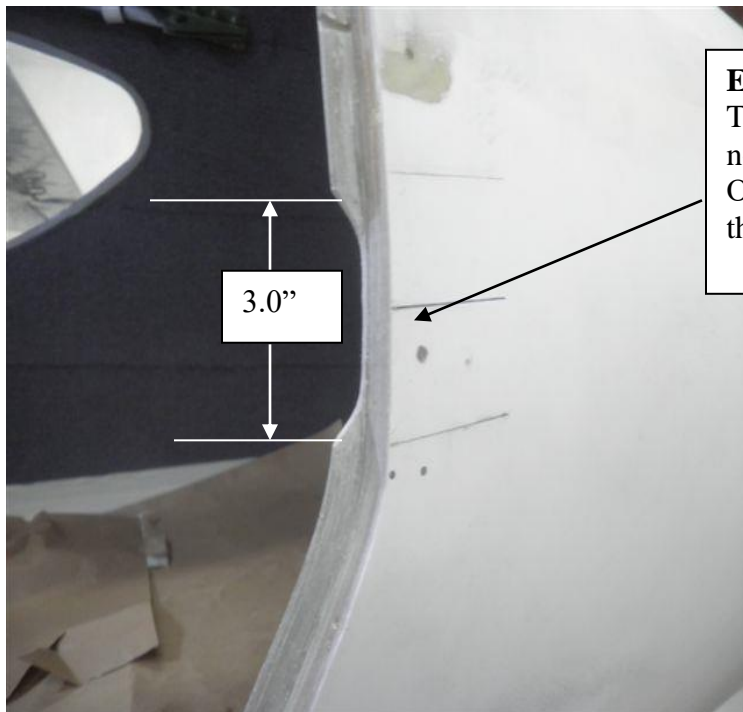
Once the filler adhesive mix has cured, drill the outer holes paying attention to keep the drill perpendicular to the hinge surface, not the curved door surface. This will allow the countersunk screw heads to be flush with the hinge surface.

Now is the time to swing the door open and closed and block sand the door edges to an even gap of 0.060" min to 0.010" maximum. If there are areas where the door edges are not flush with the fuselage, wait until they are corrected at the end of step 14 to sand the gap even.

**Step 14: Install the aft latch bushing in the fuselage**



Draw a line on the exterior of the plane matching the center line of the plastic latch pin.



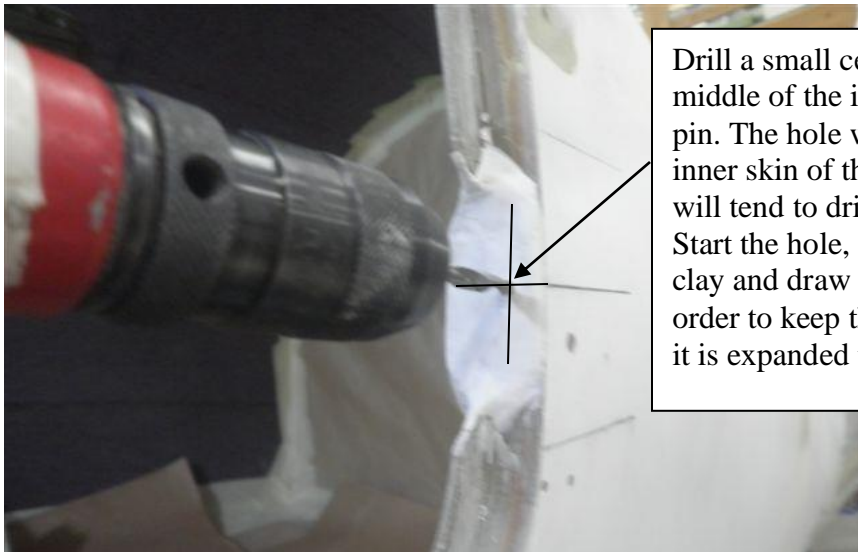
**Early door kits only:**

To get the door flush with the exterior, a notch was made in the door seal flange. Open the notch to 3" wide centered about the latch pin.

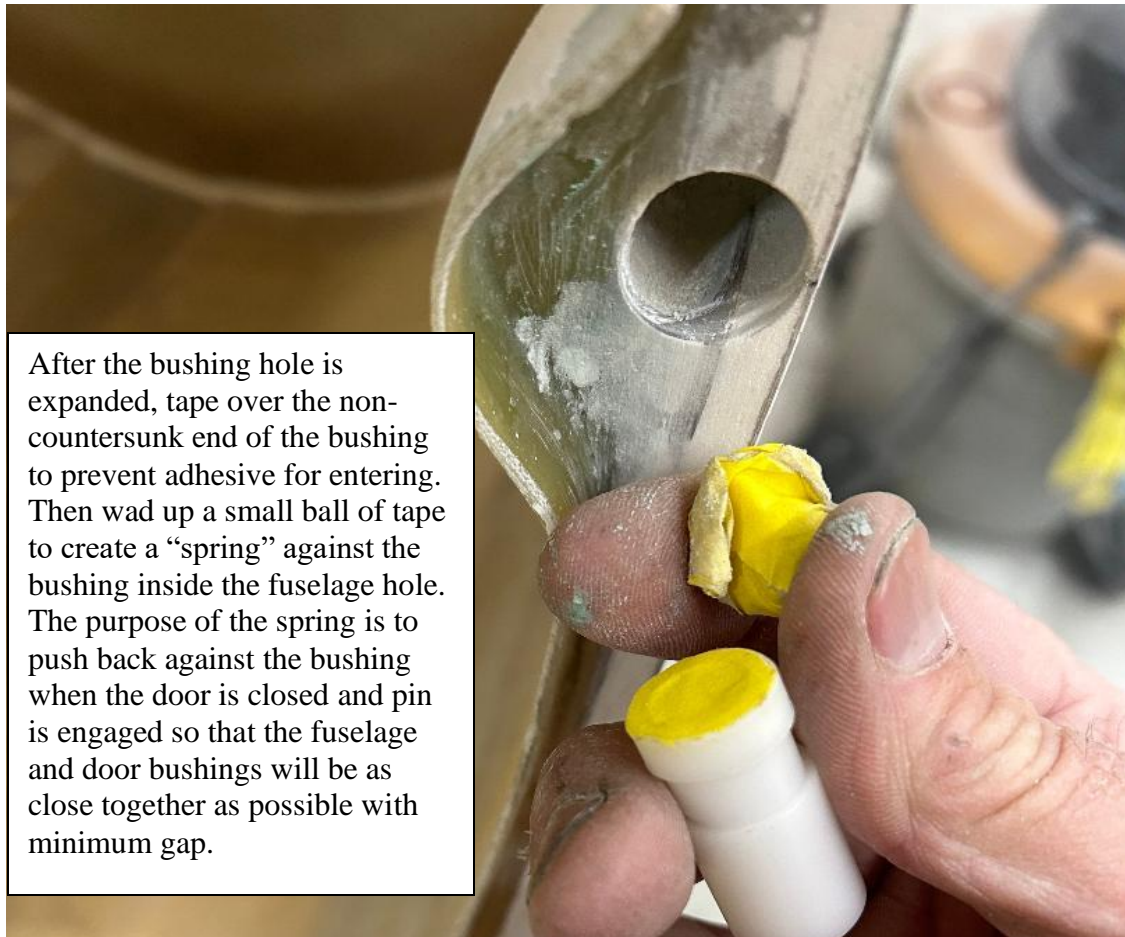




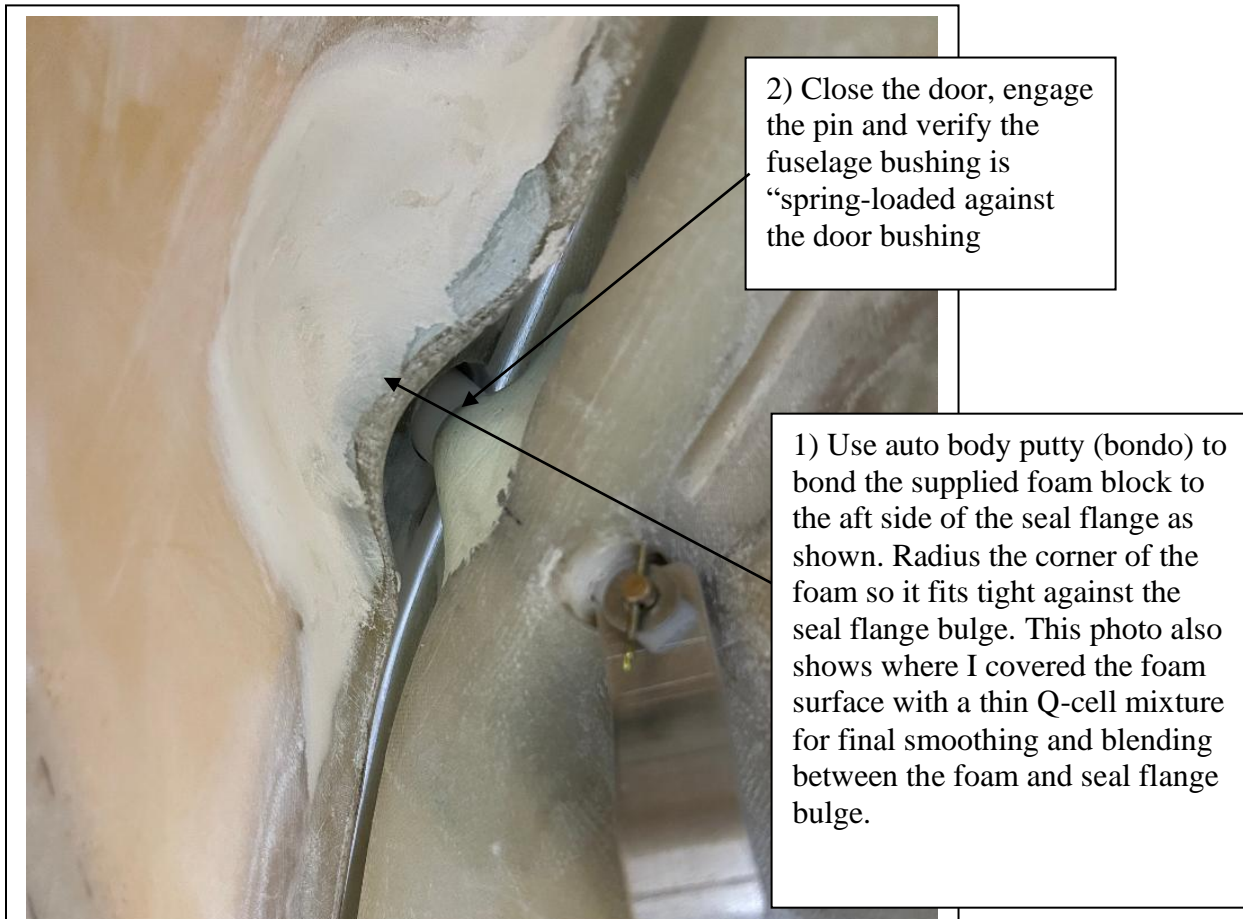
Pack some clay on the surface of the door opening as shown. **Position the door flush with the fuselage** and centered in the opening and push the handle until the pin contacts the clay and leaves a depression.



Drill a small centering hole in the middle of the indent left by the pin. The hole will be close to the inner skin of the fuselage which will tend to drift the hole. Start the hole, then remove the clay and draw a cross hair in order to keep the hole centered as it is expanded to a larger diameter

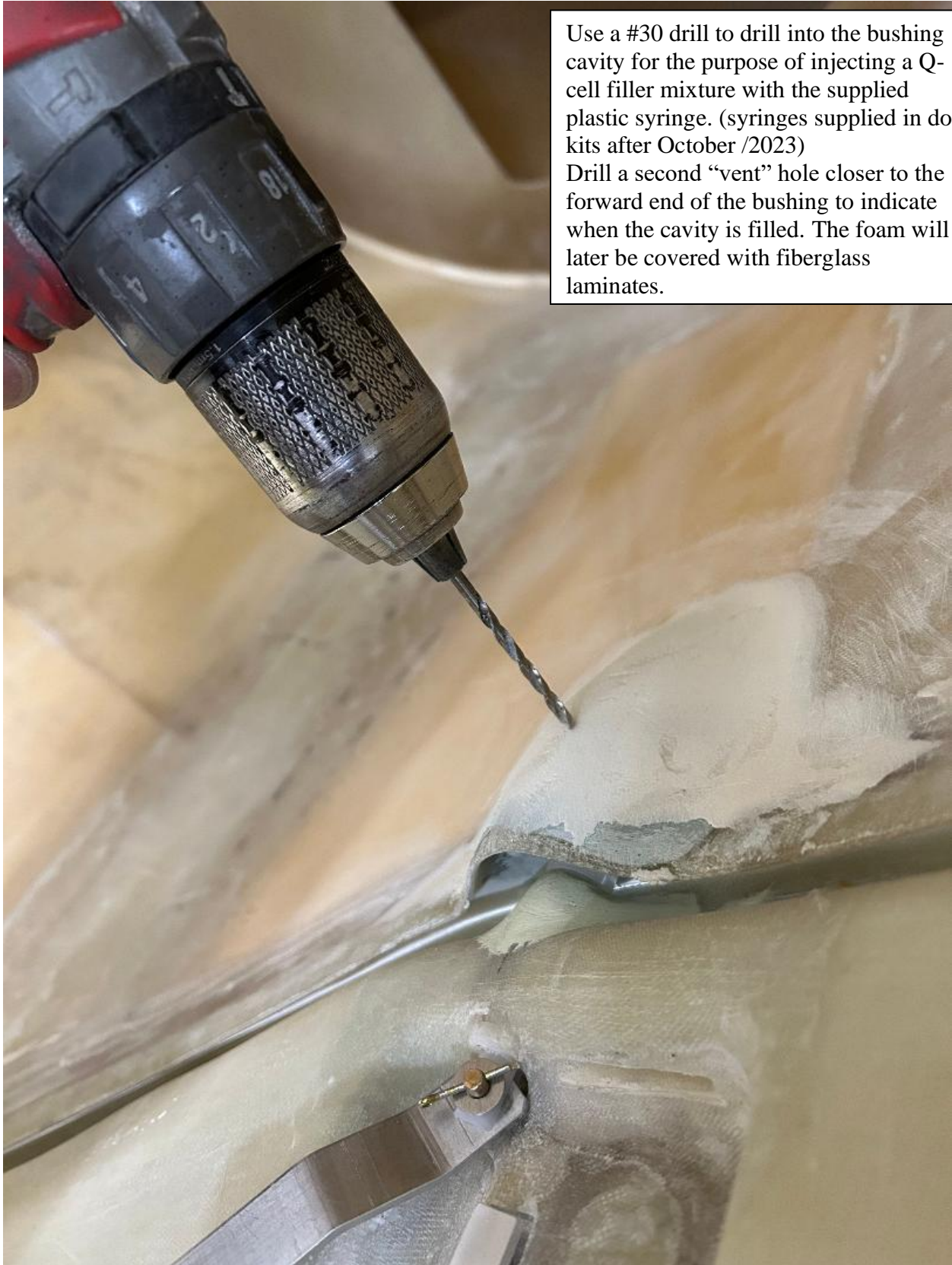


After the bushing hole is expanded, tape over the non-countersunk end of the bushing to prevent adhesive for entering. Then wad up a small ball of tape to create a “spring” against the bushing inside the fuselage hole. The purpose of the spring is to push back against the bushing when the door is closed and pin is engaged so that the fuselage and door bushings will be as close together as possible with minimum gap.



2) Close the door, engage the pin and verify the fuselage bushing is “spring-loaded against the door bushing

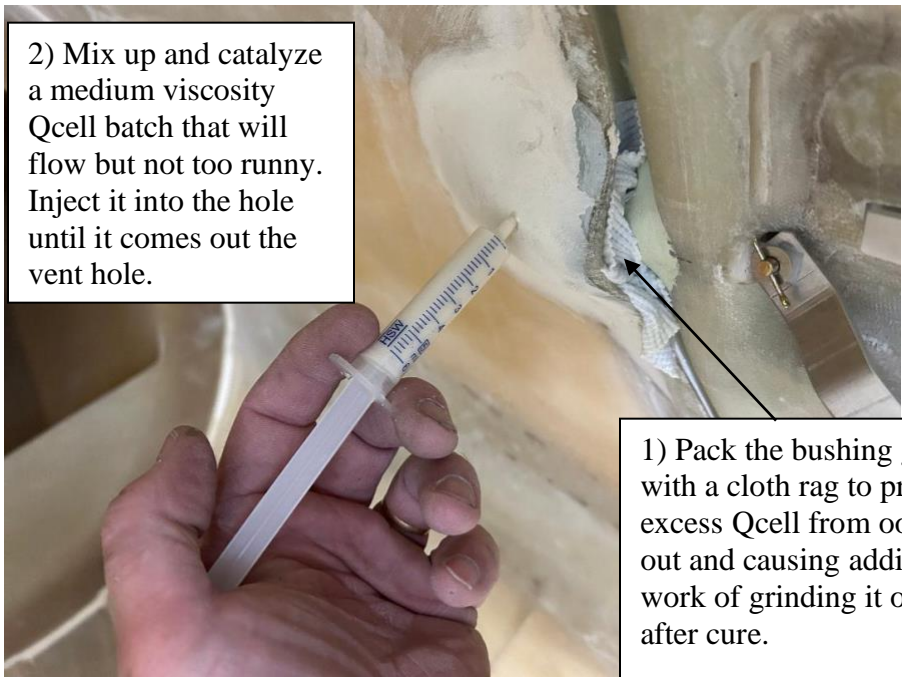
1) Use auto body putty (bondo) to bond the supplied foam block to the aft side of the seal flange as shown. Radius the corner of the foam so it fits tight against the seal flange bulge. This photo also shows where I covered the foam surface with a thin Q-cell mixture for final smoothing and blending between the foam and seal flange bulge.



Use a #30 drill to drill into the bushing cavity for the purpose of injecting a Q-cell filler mixture with the supplied plastic syringe. (syringes supplied in door kits after October /2023)  
Drill a second “vent” hole closer to the forward end of the bushing to indicate when the cavity is filled. The foam will later be covered with fiberglass laminates.

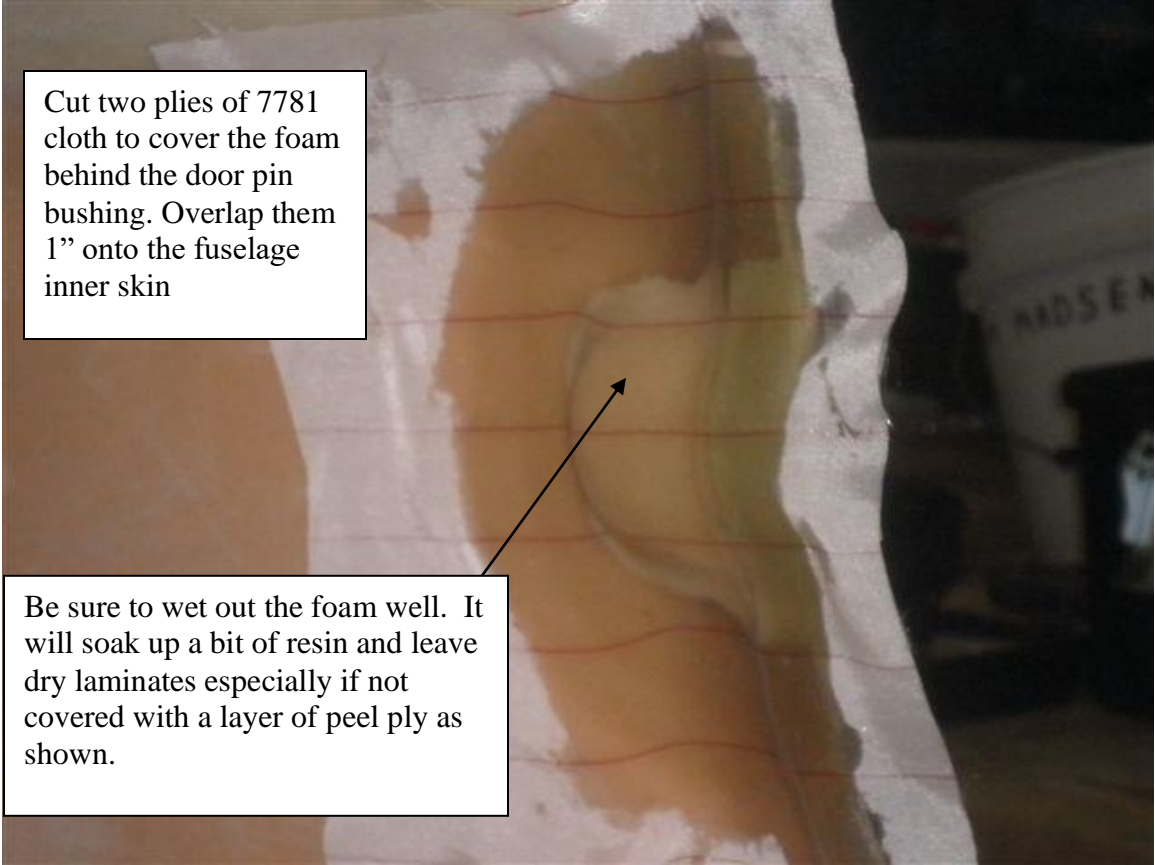


Once again, verify the door is flush with the fuselage with bushing in place and the pin engaged. Hot glue or cleco in place if necessary to hold it in position while the Qcell mixture cures.



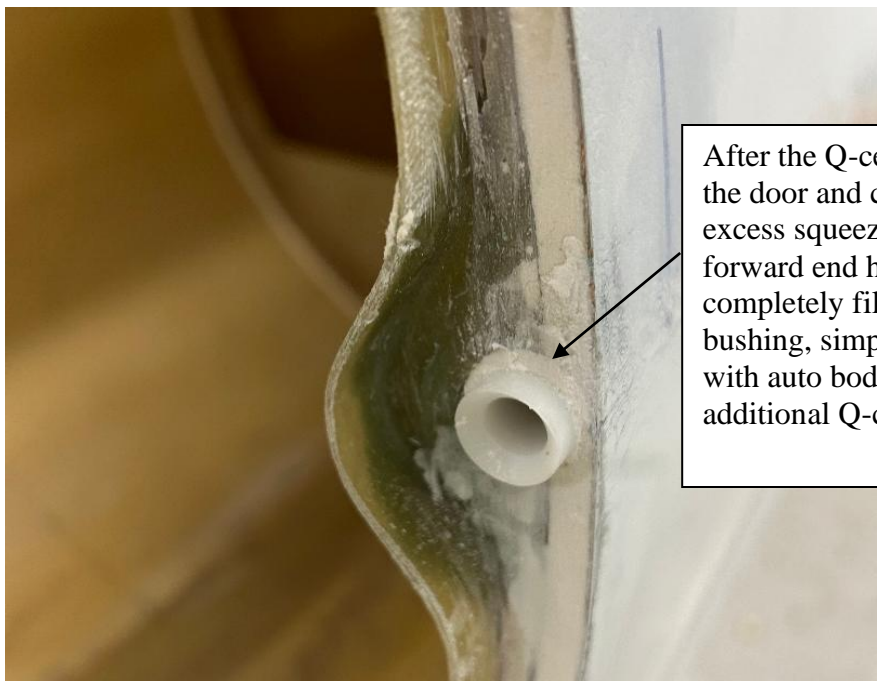
2) Mix up and catalyze a medium viscosity Qcell batch that will flow but not too runny. Inject it into the hole until it comes out the vent hole.

1) Pack the bushing gap with a cloth rag to prevent excess Qcell from oozing out and causing additional work of grinding it out after cure.



Cut two plies of 7781 cloth to cover the foam behind the door pin bushing. Overlap them 1" onto the fuselage inner skin

Be sure to wet out the foam well. It will soak up a bit of resin and leave dry laminates especially if not covered with a layer of peel ply as shown.



After the Q-cell is cured, open the door and clean up any excess squeezed out the forward end here. If not completely filled around the bushing, simply fill the gaps with auto body putty or additional Q-cell mixture.



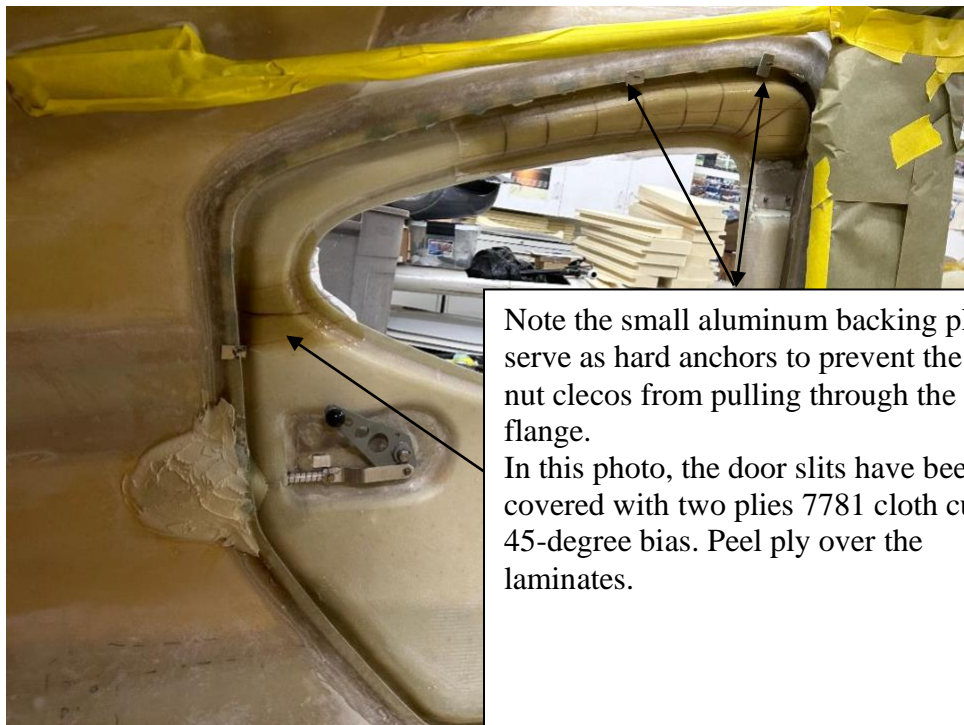
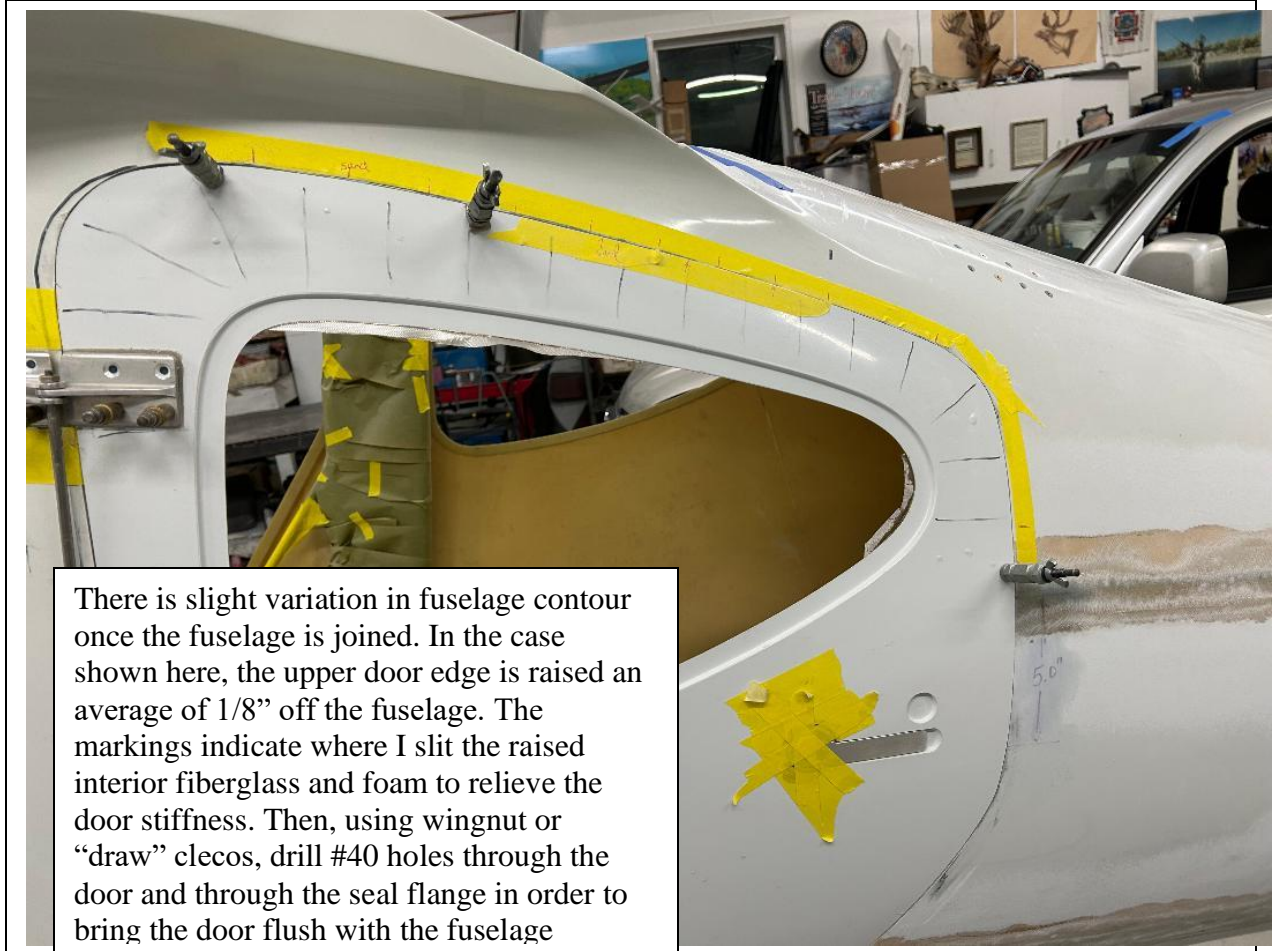
**Internal hinge note:**  
To get the door to swing open as far as possible, carefully cut some slots in the seal flange. If you do it slowly and carefully, you can use these slots as a stop for the door so it won't hit the fuselage side when fully opened.



For internal hinges, install the door seal in two pieces butting it against the hinges.

For external hinges, install the seal starting at the lower edge and continuing all the way around compressing it longitudinally as you go. When you get back to the beginning, cut the seal with tin snips at least  $\frac{1}{2}$ - $\frac{3}{4}$ " long. Then remove the seal nearly back to the start and install it again compressing it along the way. If you don't do it this way, you will end up with a gap. Does it shrink? Don't know, I can't explain why, but it always seems to happen. **Be forewarned: Use tin snips and always cut the seal a bit longer than necessary.** It seems to shrink! Make sure to push and compress the seal lengthwise as it gets pressed onto the flange.

**The remainder of the work is cosmetic in nature to finish the interior and exterior and sides of the door opening.**







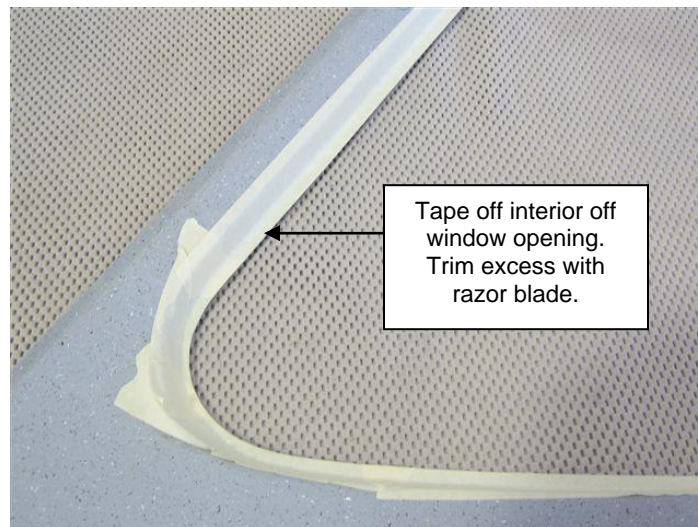
Sand, fill and paint the interior of the door to match the interior of the fuselage. A fiberglass cover is included in the kit with self-tapping screws. Position the cover so that the handle makes full travel open and closed. Drill and cleco #40 size holes through both the cover and the door inner skin. Then remove the door and upsize the cover holes to #20. The screws should tap into the door skin but not the cover. Do not over-tighten as the door skin is only 2-ply thick. The door kit includes a piece of black nylon strap to be used as an internal handle. Use a small, round soldering iron or a red-hot nail to melt holes in the strap ends and attach under the two screws depicted.



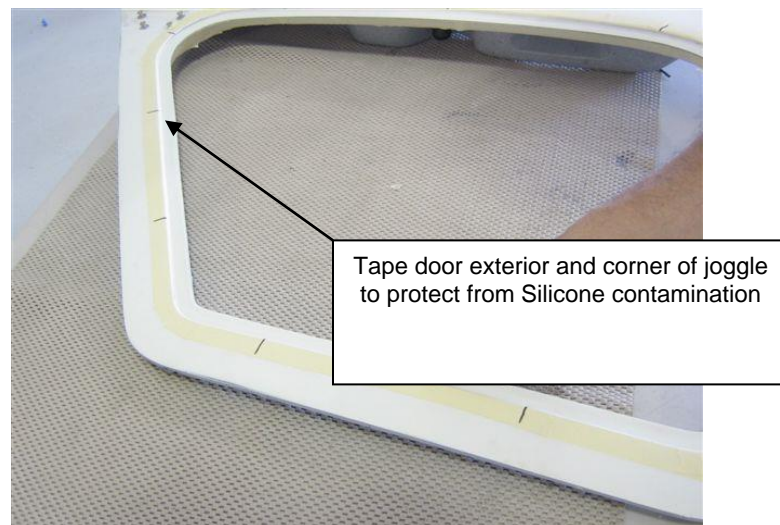
## Step 15: Window Installation

### *Tape Window Openings*

To protect the interior door surface from silicone contamination, tape off the inside surface of the window flange and cut the overhang off with a razor blade. One could also finish painting the door interior prior to installing the window to avoid silicone contamination.



Tape off the exterior to prevent silicon contamination of the outside surface. Sand the window flanges with 100 grit sandpaper to improve the bonding surface. Wipe clean with Acetone.

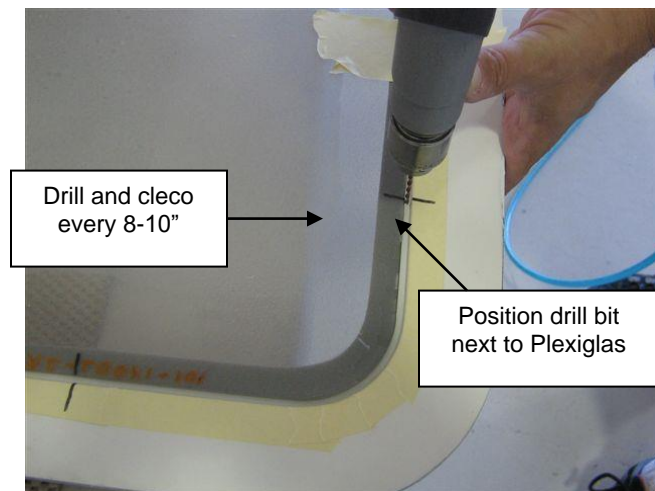


Note: Silicone contamination on the surface will result in "fish-eye" of the exterior paint. Either tape off all of the exterior in the vicinity of the windows or take great care in touching unprotected surfaces with your fingers!

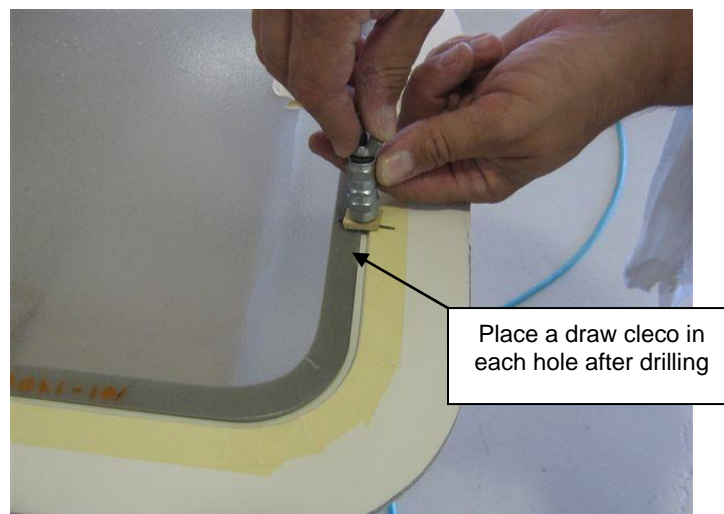
## *Position the Window and Drill the Cleco Holes*

Each window has a primered inner bonding surface and small, positioning tabs which serve to center the window with a 1/8-3/16" gap to the joggle. Sand the tabs slightly (if necessary) to improve the uniformity of the gap.

Position the window with even gaps around the circumference. Drill and cleco every 8-10" being mindful of areas that may need closer spacing if the window bows up.



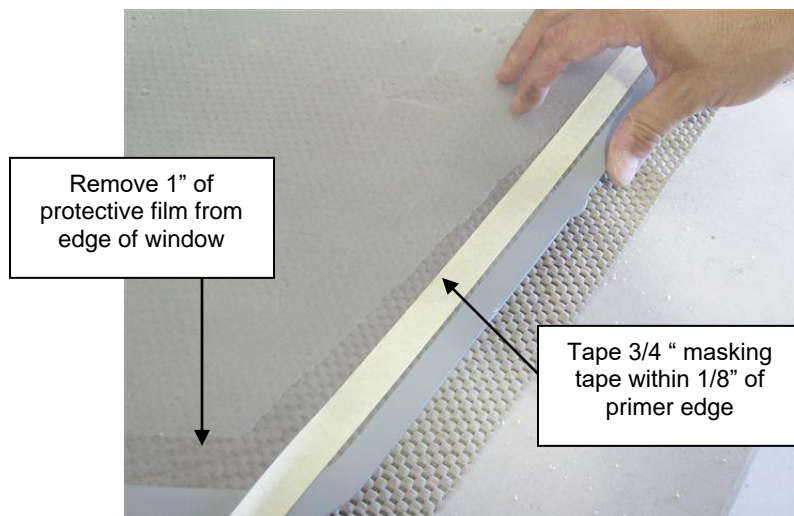
Note: Place the drill bit next to the Plexiglas to prevent any shifting of the windows.



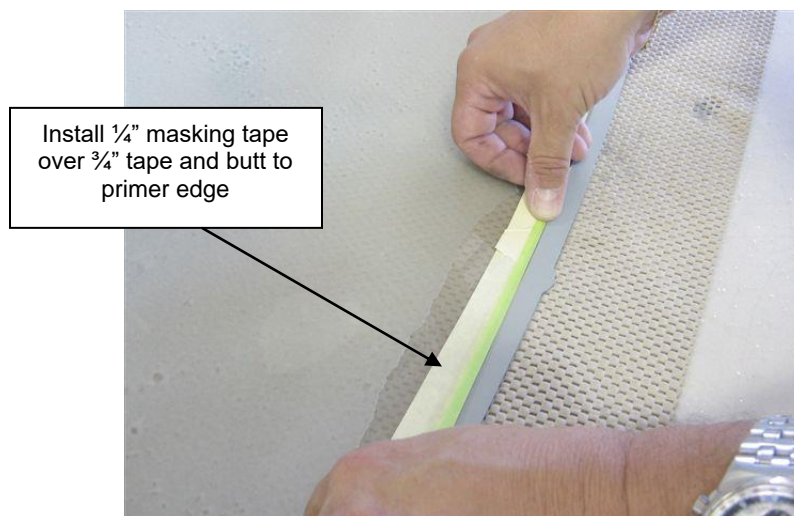
**Note: these window instructions describe installation of current Sportsman windows that come with a gray primered edge. See notes at the end of this section for preparation of the window edges without primer.**

## *Tape the Window Interior Surface*

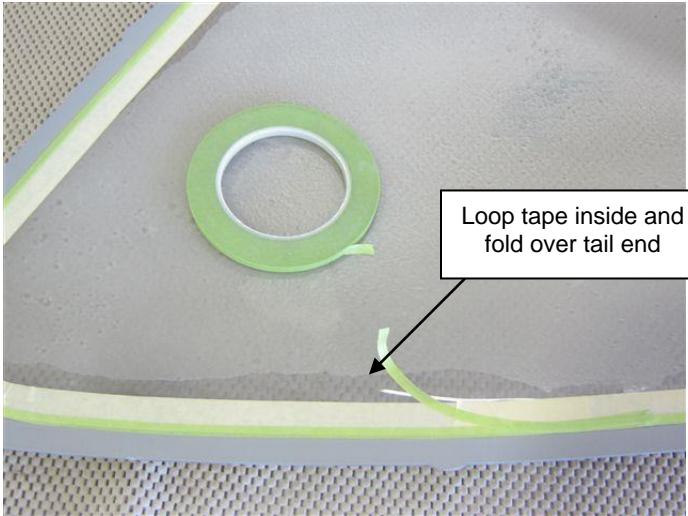
Remove 1" of the protective film from the window inside edge and place a layer of  $\frac{3}{4}$ " masking tape spaced approximately  $\frac{1}{8}$ " away from the primer edge.



Note: Use a high-quality masking tape (3M brand or equivalent). Cheaper masking tape tends to leave glue residue on the window making clean up more difficult. Do not leave masking tape on windows any longer than necessary as the glue can leave permanent marks.

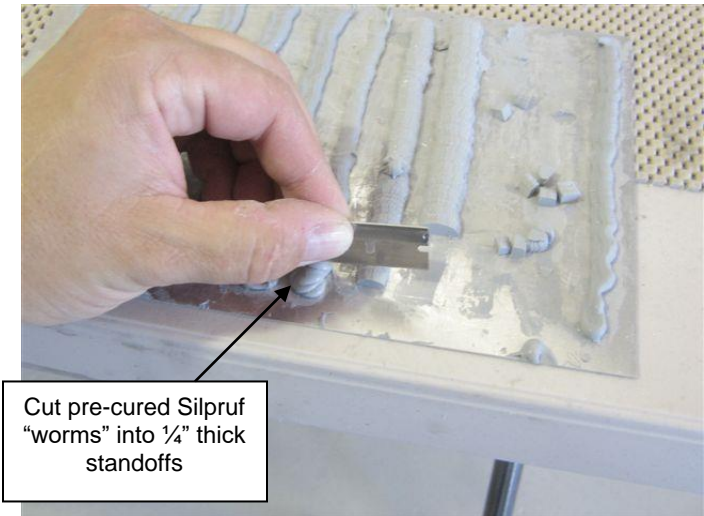


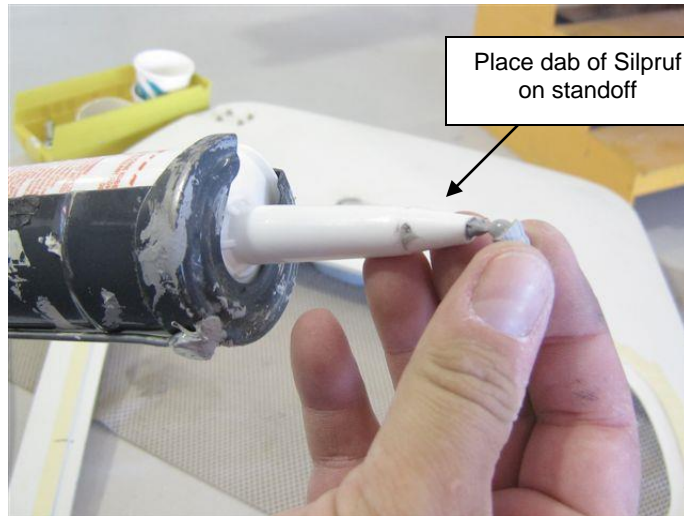
Keep the tape in one continuous piece and loop it inward after completing the circumference with the tail end folded over making it easy to grab and pull. Be sure the corners are tightly pressed in place, as the tension tends to pull them up.



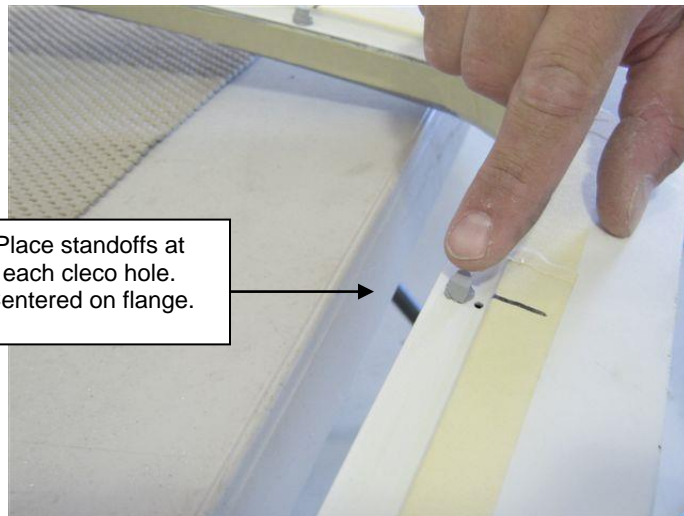
### *Install Window Standoffs*

To obtain a flush fit with the exterior, pre-cured Silpruf standoffs are glued to the center of the window joggle flange.





Place dab of Silpruf on standoff



Place standoffs at each cleco hole. Centered on flange.

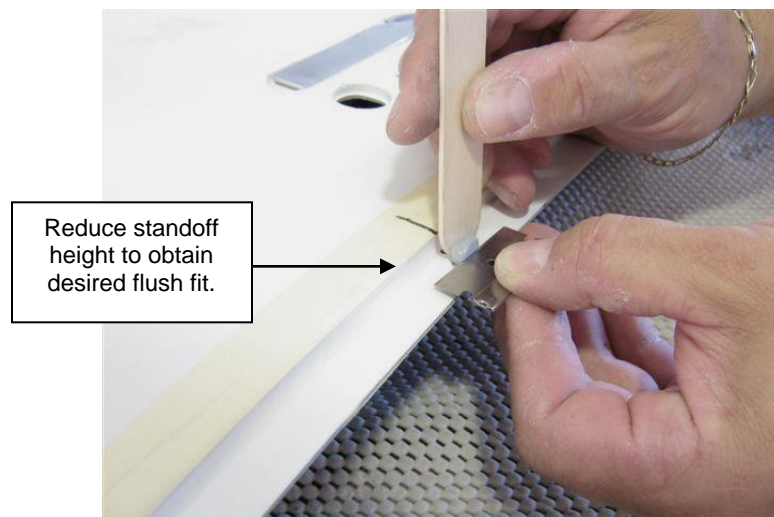
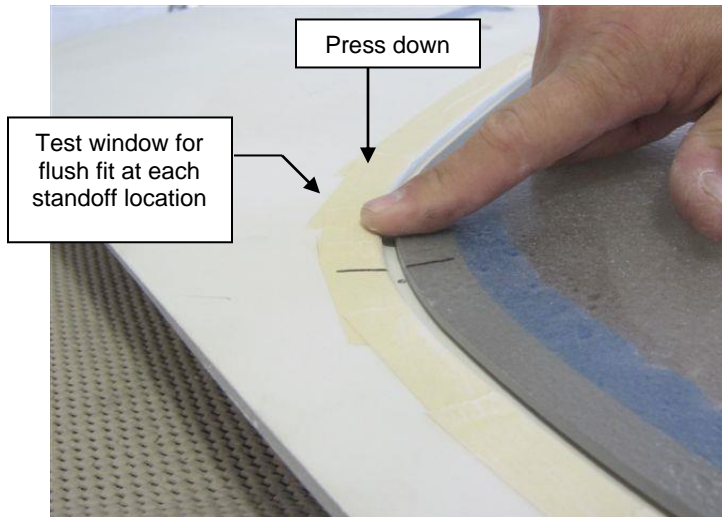


Closer standoff spacing needed at aft end of quarter windows

Note: All the standoffs to cure 24 hours prior to window installation.

## *Set the Window Depth*

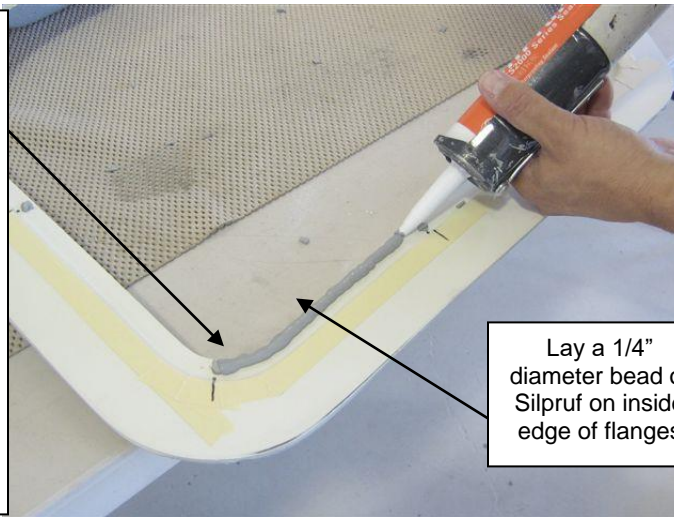
Place the window over the standoffs, and put slight finger pressure on the window at each cleco location.



## *Bond Window in Place*

Use a caulking gun to squeeze out a 1/4" diameter bead of Silpruf on the inside edge of window joggle flange.

It is very important not to get too large a bead of Silpruf on the flange. Ideally, you don't want any to squeeze out and fill the gap between the window edge and the door joggle. The gap will be filled at a later date after the door has been coated with exterior paint.



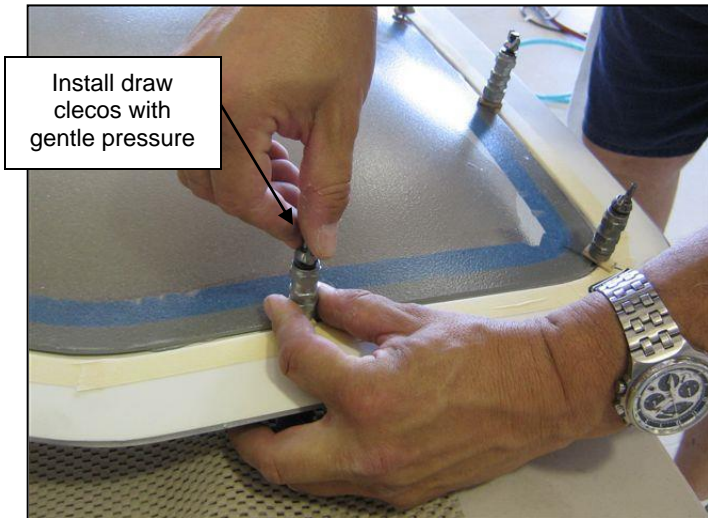
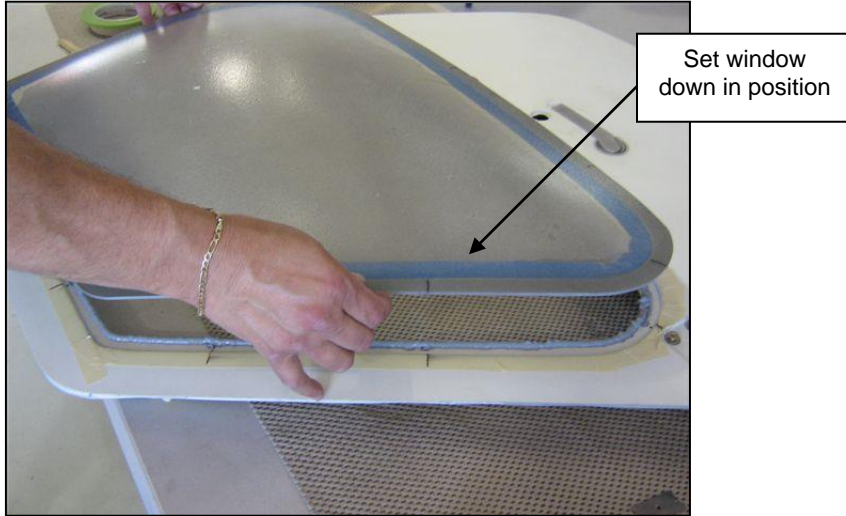
Lay a 1/4" diameter bead of Silpruf on inside edge of flanges



Baggage door window

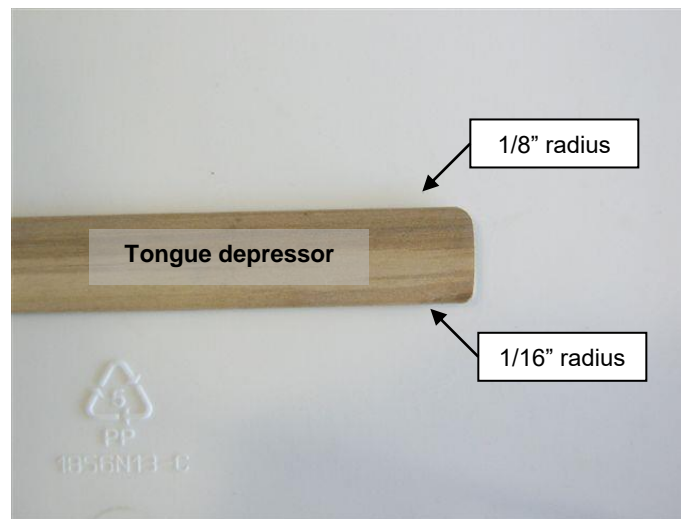


Carefully set the window in place and install the #40 draw clecos. Do not over tighten as they have a tendency to pull through the fiberglass much easier than aluminum. Do not wipe any excess Silpruf; squeeze out in the exterior trough (it will be cut out later after cure).

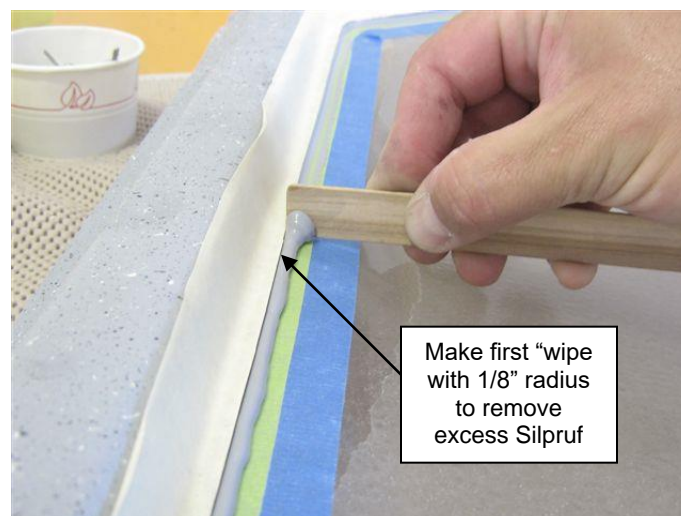


## *Wipe Excess Silpruf from Inside Edges*

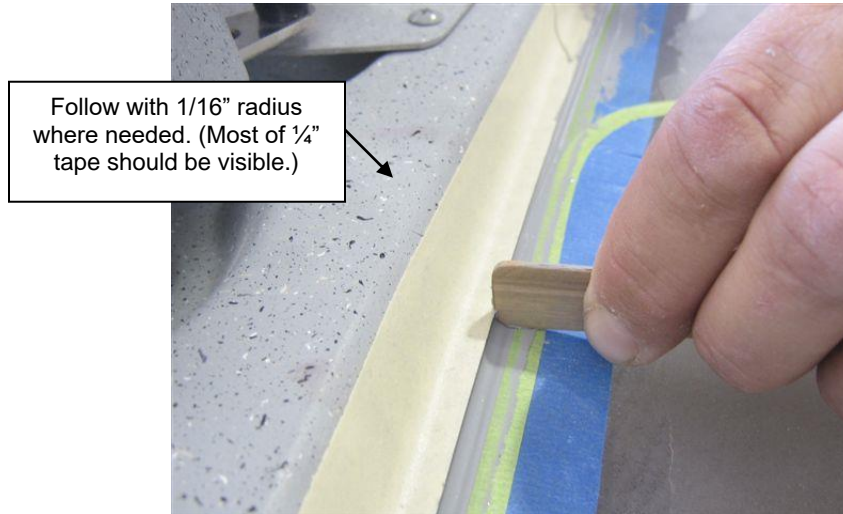
Square off one end of the tongue depressor and file or carefully grind a 1/16" radius on one corner and a 1/8" radius on the opposite corner.



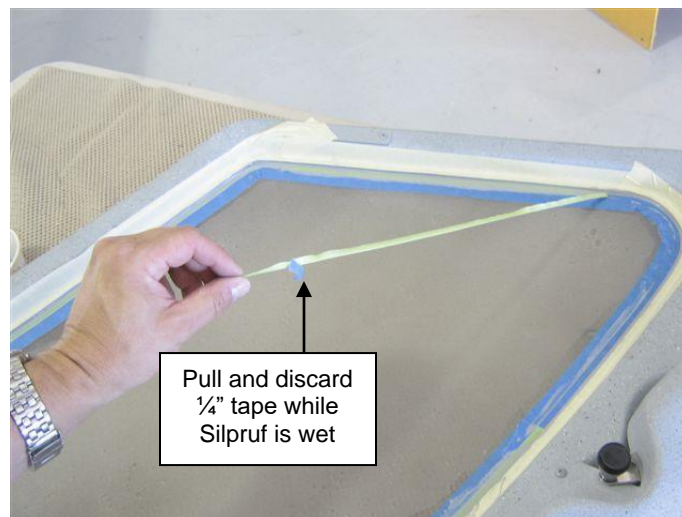
Use the larger, 1/8" radius to make the first wipe to remove excess Silpruf. Note any areas where the tape is closer to the flange edge and use the 1/16" radius to wipe these. To obtain the best cosmetic result, use a fingertip to make a final wipe around.



The tape must be pulled while the Silpruf is wet, but before pulling the tape, make sure that there is no excess build-up of Silpruf over the tape. If so, wipe again with tongue depressor and/or finger. The desired result should be a smooth, consistent corner radius of Silpruf.



Carefully pull that tape and discard.



Do not disturb the window for a minimum of 24 hours. The windows need a minimum of 48-hour cure time before removing the draw clecos. (Longer if temperature is less than 65°).

## *Remove Clecos and Fill Holes*

Remove the draw clecos and cosmetically fill the holes using a small syringe from the inside. Wipe the hole flush with a fingertip or rag without smearing much on the painted surface. (Silicone contamination will make any future pain touch up more difficult.)

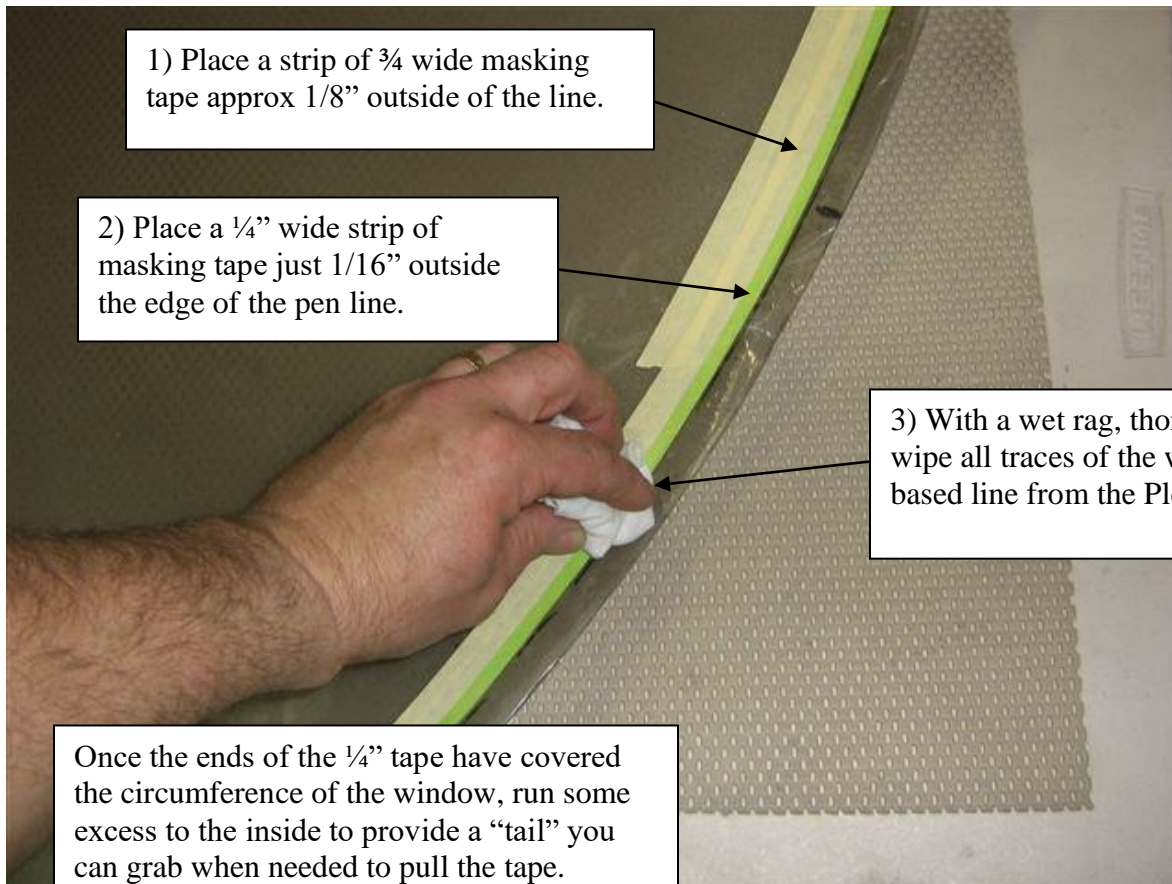


Note on Window Removal / Replacement: The advantage Silpruf offers is a soft, forgiving adhesive that allows for expansion of the fuselage and window without putting much stress on the window. Should a window ever need replacement, simply use a 16" length of .025 safety wire (with gloves on to protect fingers). Wiggle one end of the safety wire through the Silpruf from outside to inside and draw the wire along the flange, with tension. It will cut through the Silpruf and, if done carefully, not do any damage on the exterior or interior finish, although it may a good idea to tape off the exterior paint surrounding the window.

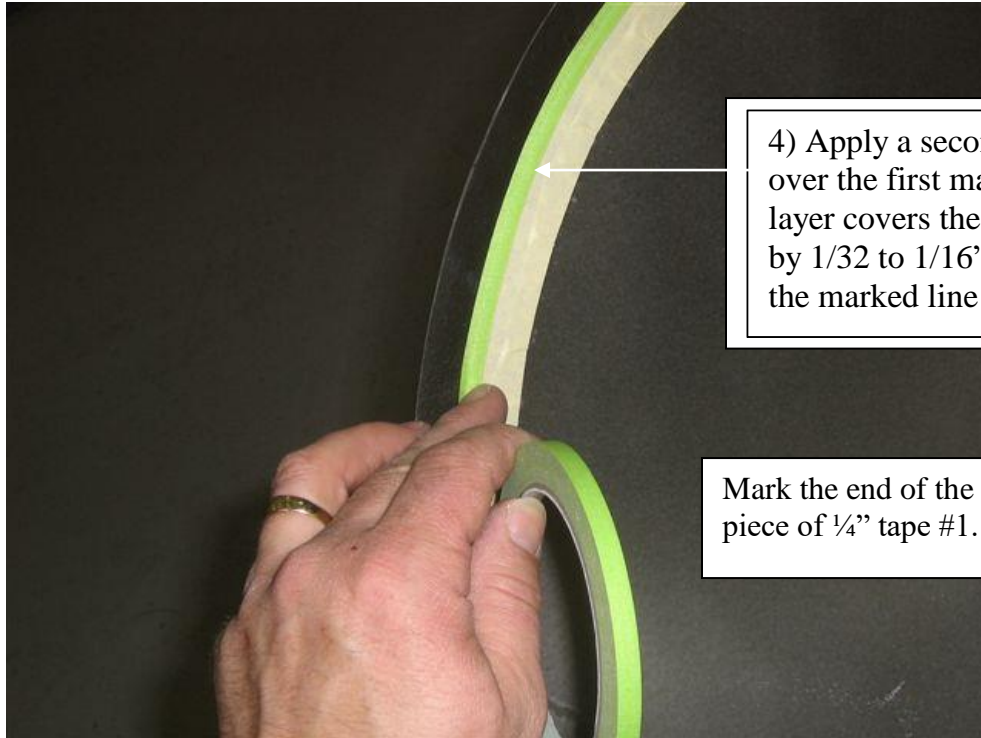
Once the window is removed, carefully cut the existing Silpruf residue from the flange with a utility knife and begin fitting the replacement window.

## Window edge treatment:

Window edges need a layer of primer or Silpruf to hide any irregularities or bubbles of trapped air that will show through the Plexiglas. **This is an important cosmetic step you don't want to skip!**

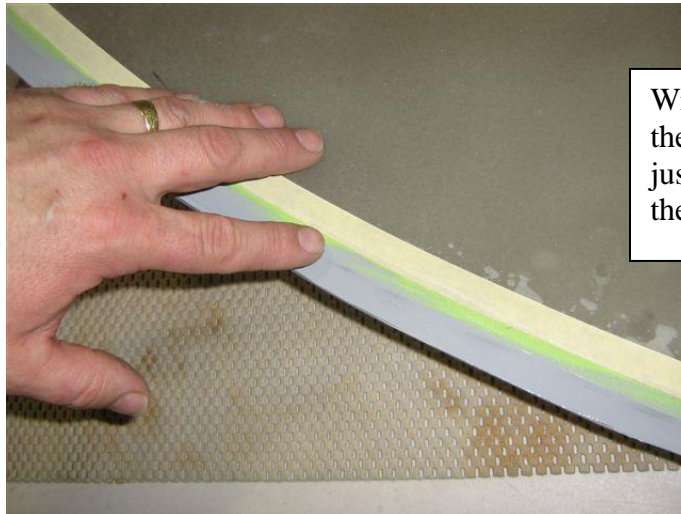


Mark the end of the first piece of tape #2 .



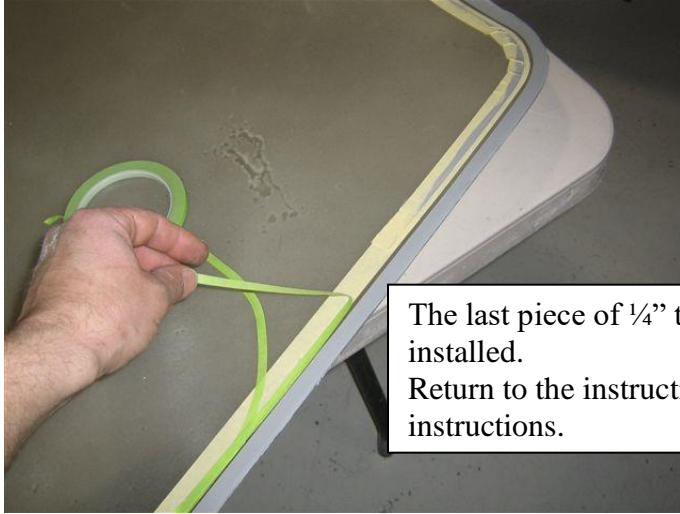
4) Apply a second layer of  $\frac{1}{4}$ " tape over the first making sure the second layer covers the edge of the first layer by  $\frac{1}{32}$  to  $\frac{1}{16}$ " (over the edge where the marked line used to be).

Mark the end of the second, overlapping piece of  $\frac{1}{4}$ " tape #1.



Wipe a thin layer of Silpruf over the bare edge of the window with your finger. Keep the thickness just enough to cover bare spots. Avoid allowing the Silpruf to be thick over the tape edge.

While the Silpruf is still wet, pull the tape marked #1 (which is the second piece applied). Allow the Silpruf to dry overnight in temps of 65 degrees or higher.



The last piece of ¼" tape will be removed after the window is installed.

Return to the instructions above for window installation instructions.