

9a. 20 gallon Fuel tank installation



Section objective: Installation of the removable 20 gallon fuel tanks, filler caps, close out ribs, vent system, sending units.

Required parts: Fuel tanks, fuel filler collar, collar receptacle. 1/4" fuel line, check valve, vent bulkhead fitting, sending unit, Aeropoxy resin/hardener, cotton flox, finger filter, required fuel fittings.

Required hardware: Hose clamps,

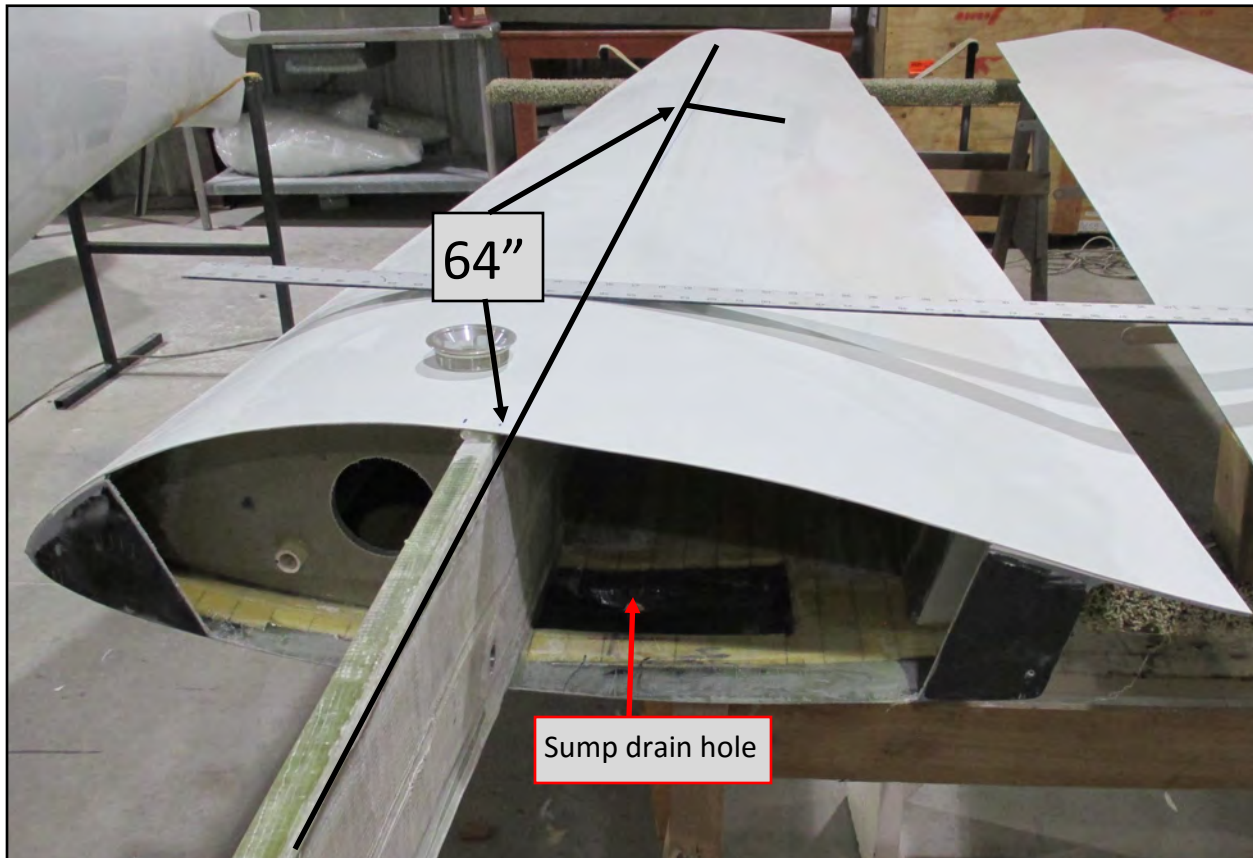
Required tools: Various fiberglass tools 2-3/8" hole saw, drill bits, hand tools. Long straight edge or chalk line.

Required conditions: N/A

Required skills or training: Ability to comprehend detailed instructions and complete the task, simple knowledge of hand tools and use.

Completed

1. Slide the right tank into the right wing fully. The tank will be inserted correctly when the 1/4"NPT boss in the bottom of the tank for the sump drain lines up with the hole in the bottom wing skin.



2. Use a straight edge or chalk line to transfer the location of the aft edge of the main spar to the top wing skin
3. Measure outboard from the root skin edge 64"

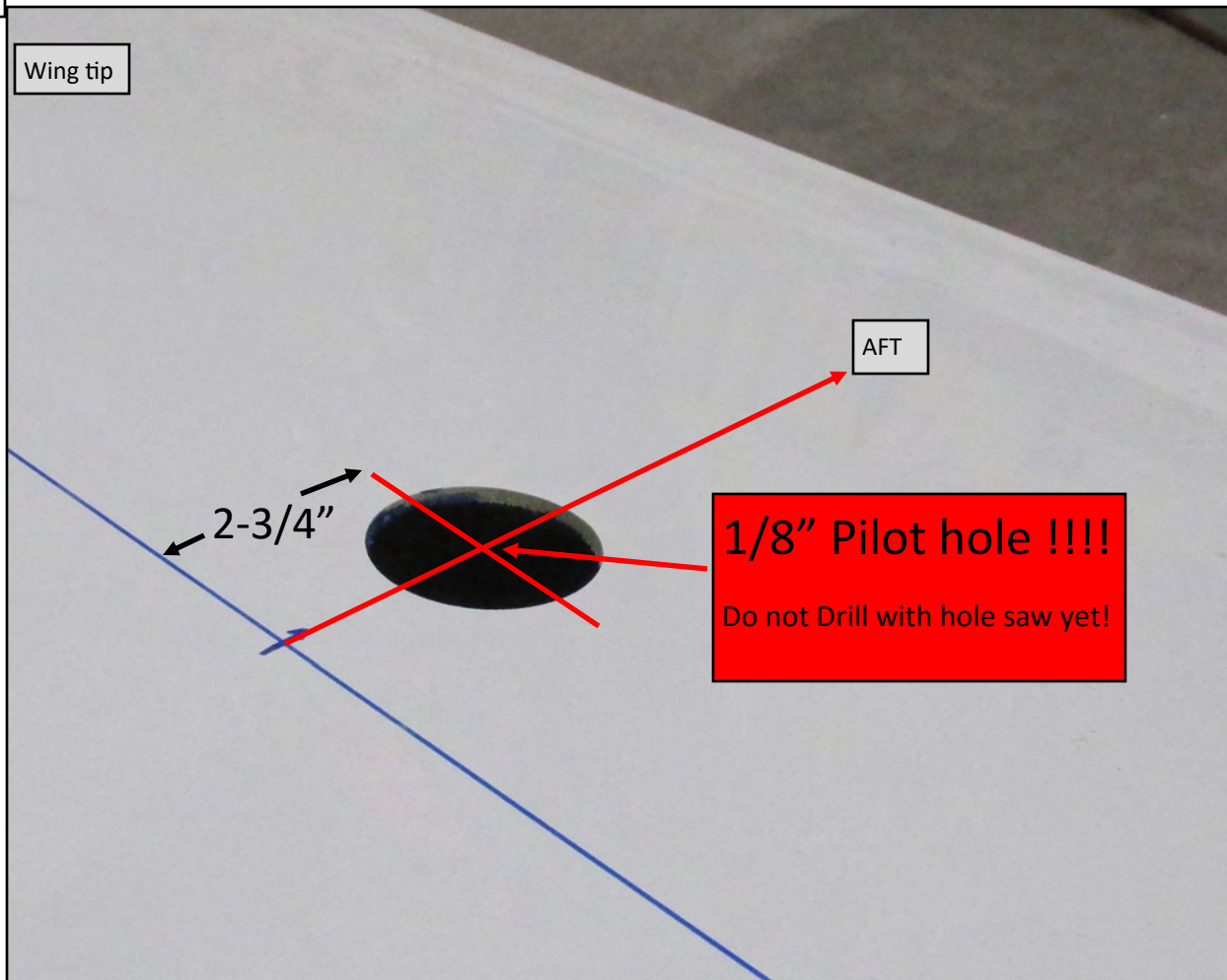
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Completed

4. Use a square to draw a line straight aft 90 degrees to the spar.
5. Measure back from the aft edge of the spar 2-3/4"
6. Drill a 1/8" pilot hole thru the wing skin and Tank. **DO NOT DRILL WITH A HOLE SAW YET ONLY A PILOT HOLE! THE RECEPTACLE IS SMALLER THAN THE FILLER COLLAR FLANGE!!**
7. Remove the fuel tank from the wing.

Wing tip



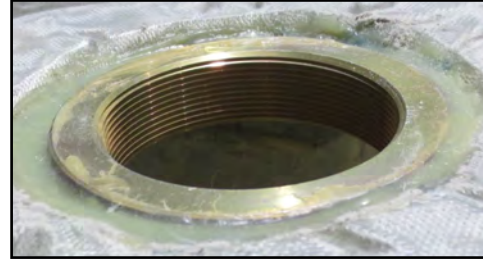
8. With the tank removed you can now drill a hole in the wing skin for the fuel filler flange.
9. Use a 2-3/8" hole saw at the pilot hole to punch a hole for the filler flange.
10. Repeat this process for the left wing. All dimensions are the same.
11. Measure the filler cap receptacle OD, and find a hole saw that is slightly smaller than that.
12. Use the hole saw to cut a hole in the top of the tank.
13. Carefully use a barrel sander or similar to slowly open up the hole in the tank to snugly fit the filler receptacle in.

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14. Sand the top of the tank around the opening by hand with no finer than 80 grit. If you use a tool it may polish the glass and not rough it up correctly.

15. Sand the under side of the fuel filler flange and collar which extends into the tank.



16. Mix up a small amount of epoxy and wet out the top of the tank and filler next.

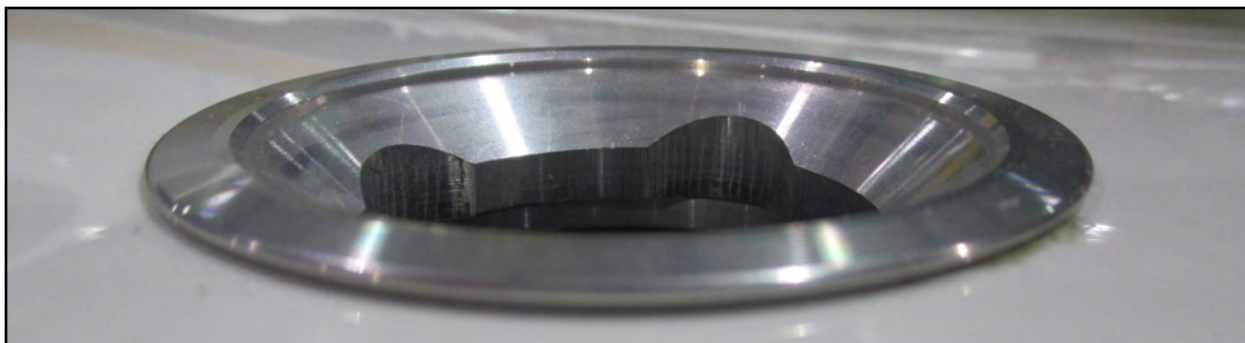
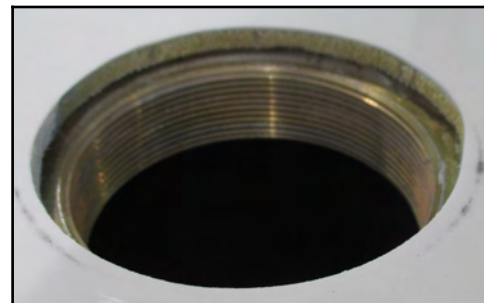
17. Add cotton floc and make a bonding paste to set the flange into the tank.

18. Apply a good amount of epoxy floc mix to the filler collar and set into the opening in the tank.

19. Slide the tank into the wing until fully seated.

20. The tank receptacle Collar should be nearly centered in the opening

21. Apply some grease to the fuel cap collar before screwing it in to prevent it from bonding in place.

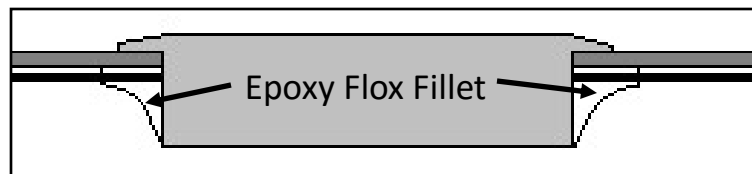


22. Carefully screw the Fuel cap collar into the receptacle. It may be necessary to hold the tank receptacle in place with a finger to keep it from rotating. The Cap Collar should be screwed down enough to become flush with the wing skin. **Let Cure for 24hrs.**

23. Remove the tank

24. Repeat process for other tank

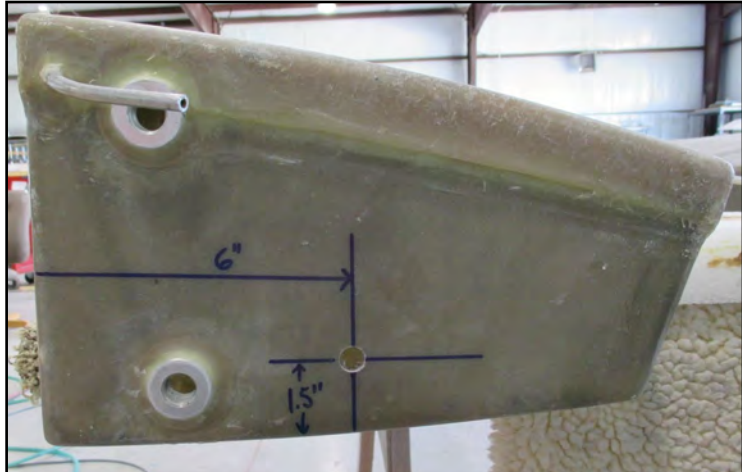
25. Mix up a small amount of 24hr epoxy and floc to make a fillet on the inside of the collars as shown in the drawing above. Inverting the tank to do so is the best position.



Completed

Fuel Probes

1. The Fuel probes are bonded to the inboard end of the fuel tanks
2. Locate the hole for the fuel probes by following the picture
This is the same for both fuel tanks
3. That location will be 6" aft of the front face of the tank., and 1.5" up from the bottom.



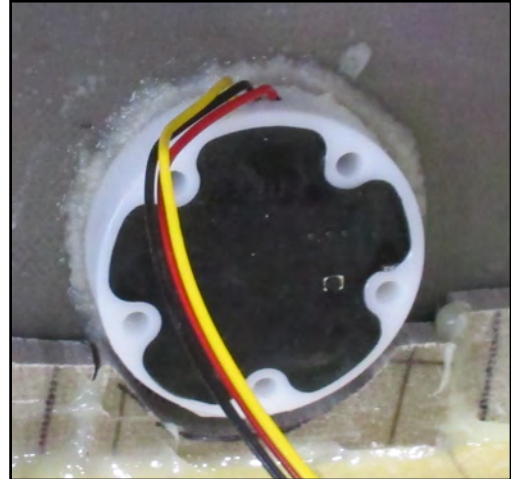
4. Drill a 1/2" hole at this point.
5. The Fuel probes must be bent to fit the tank. There is no set way to do this, except that the probe needs to go close to the bottom and close to the top of the tank.
6. Stand the tank on its aft edge so the front face is pointing at you. This will allow you to bend the probe using the tank as a guide. See the picture below.
7. The first 5" of the probe is bendable. This should be marked with a black line.
8. Bend the probes as shown below.
9. Insert the probe in to the tank and look thru the fuel pickup hole. This is when you can make fine adjustments to it. The probe must not touch the tank. Mark a left and right.



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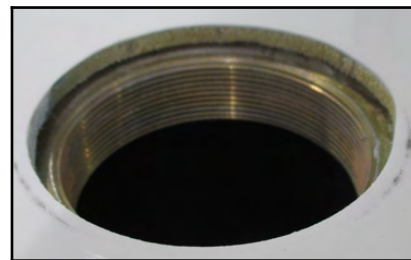
Completed

10. The probe will be bonded to the side of the fuel tank
11. Sand by hand the area which the tank will contact with 80grit or coarser paper. So not use a tool it may not roughen the surface correctly.
12. Sand the face of the puck as well by hand.
13. Clean both surfaces with acetone and let air dry.
14. Mix up a small batch of epoxy resin, 2oz total should be enough.
15. Brush a coat of resin on the tanks and the fuel probes.
16. Mix the remaining resin with cotton flox.
17. Apply a layer about 1/4" thick to the fuel probes.
18. Insert the probe to the tank and press against the tank, do not push all the way to the tank, a layer of fox mix about 1/8" should remain. The rest will push out.
19. Clean up around the fuel probe to create a fillet of glue.
20. Stand the tanks up on the opposite end against a wall or something sturdy to drive for 24hrs. This will keep the weight of the probe tube inside from separating the probe from the tank.



Final Tank installation

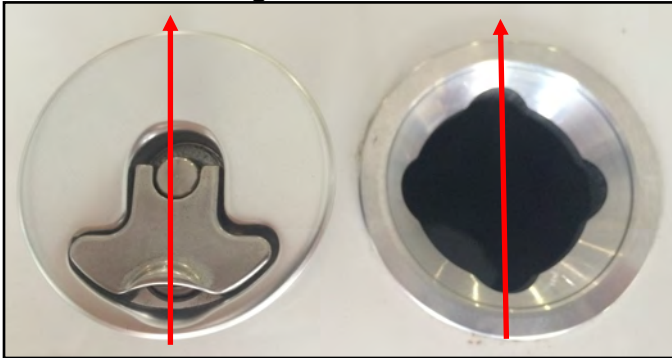
1. Insert each tank into the respective wing fully. Use the fuel collar receptacle bonded in earlier as a guide.
2. Try to moved the tank fore and aft using the collar.
3. If the tank does not move much then you are ready to install the fuel cap collar.
4. If the tank moves use a dense foam material behind the tank to push it against the spar.
5. Apply Loctite 567 to the treads of the fuel cap collar prior to installation.



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6. Thread the fuel cap collar into the tank. We have made a wood block which works well and does not damage the aluminum collar.



7. Thread the collar in fully until it becomes flush with the wing skin.

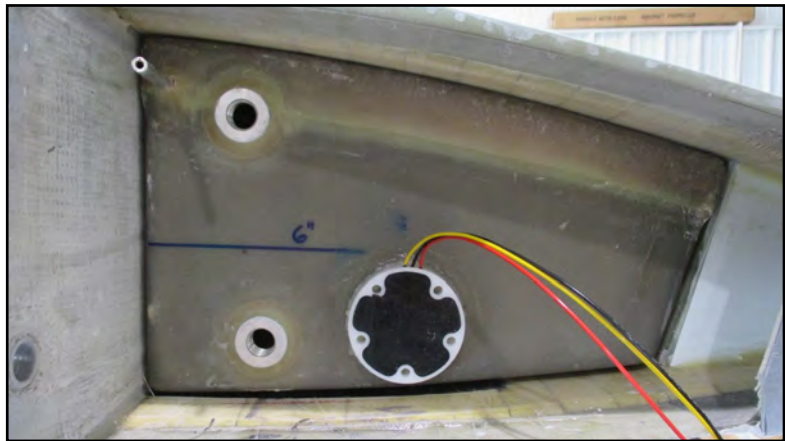
8. Note that the indents correspond to the cap and should be oriented correctly to keep the cap locking tab in trail.

9. It is not required but recommended to fill the gap around the tank at the root end with a pliable sealer.



10. We have found that DAP concrete sealer works well in this application. It is impervious to fuel, oils, and solvents.

11. Fill the void between the tank and wing.



12. Take care not to get any sealer on the inside of the wing which is inboard if the tank. This must remain clean fiberglass to bond the inboard rib to.



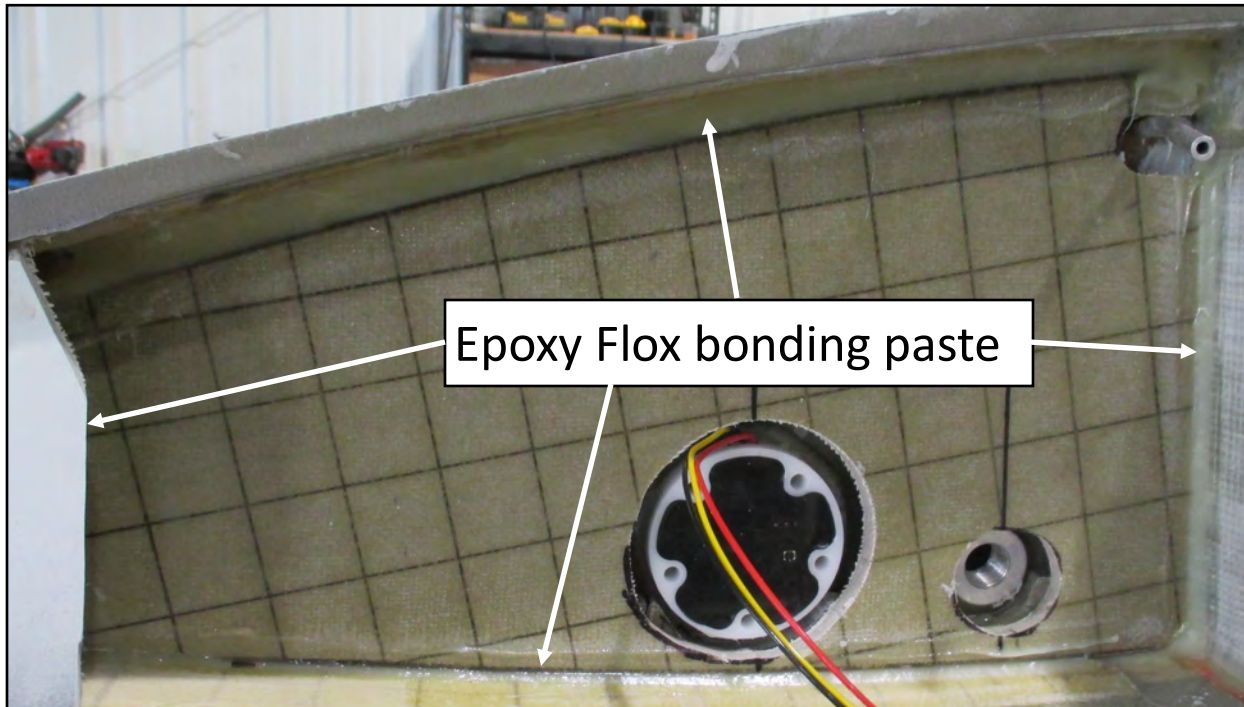
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13. The inboard rib must now be fitted.

14. No set measurements here. You must transfer the positions of the fuel pick up, sending unit, and vent from your installation to the rib.

15. Trim the rib as shown in the photo below. The rib does not need to fit tight around any of these components. It also does not need to fit tight to the wing, however no more than 1/8" gap should be allowed.



16. Verify all surfaces have been sanded and cleaned with solvent.

17. Mix up a batch of 24 hour epoxy resin. Apply resin to all matting surfaces.

18. Mix in cotton flox to make a bonding paste. Bond the rib in with epoxy flox mix. Fill any voids completely between the rib and wing. Complete for both tanks.

19. Locate the wing fuel system components.

20. Shown in the picture to the right: #1 fuel strainer, #2 vent fitting, #3 check valve, #4 3/8" line to 1/4" NPT brass fitting.



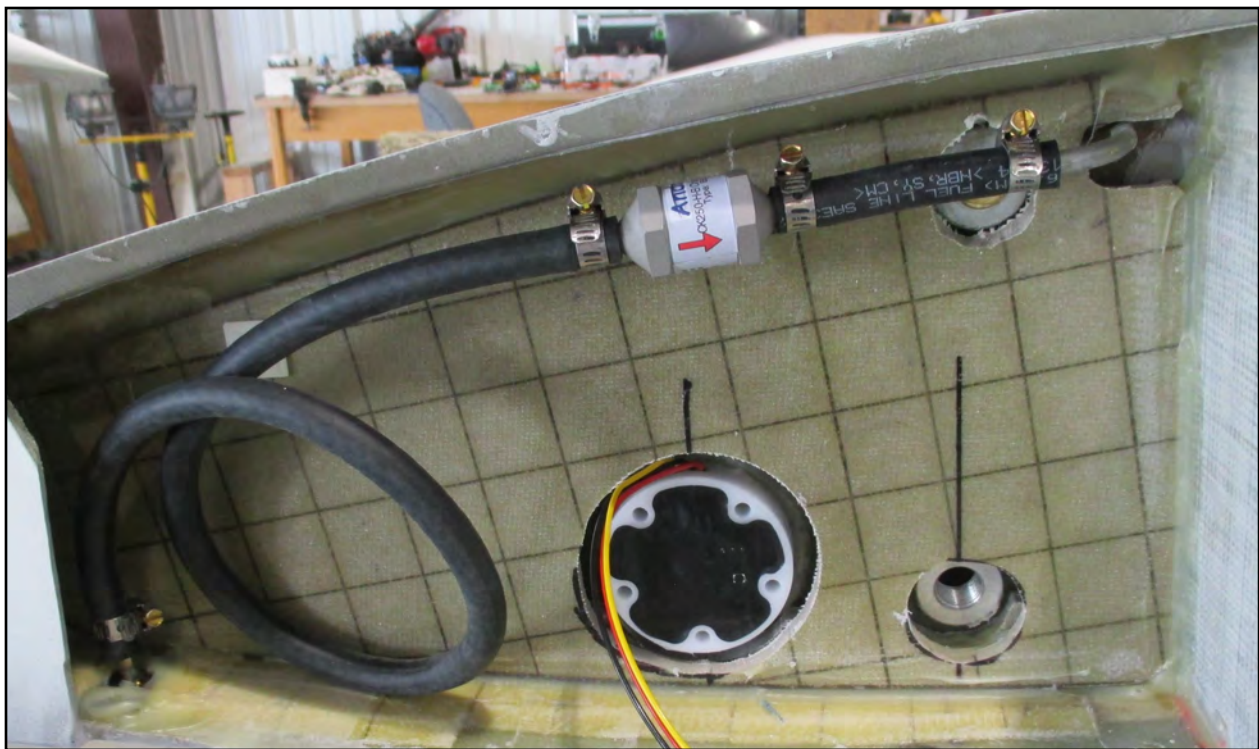
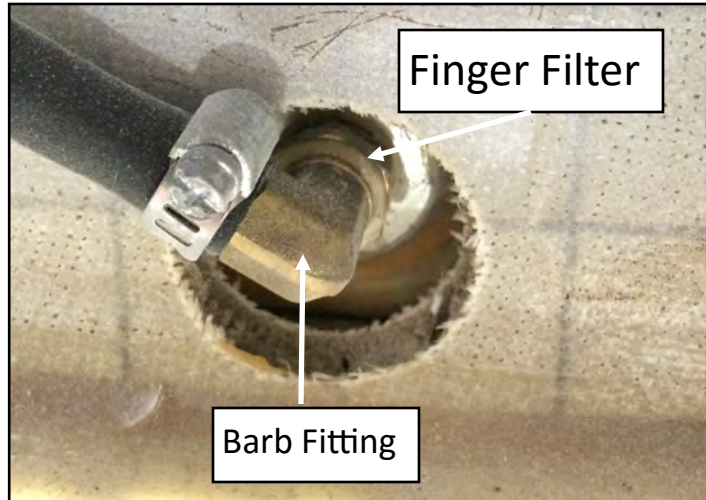
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21. Install the finger filter to the lower pick up boss, use Loctite 567 sealer.

22. Install the 90degree brass fitting into the finger filter and pointing up at a 45 degree angle to the rear. Use Loctite 567 sealer.

23. Install about 1.5' of 3/8" rubber fuel line on the fitting.



24. Install the tank vent fitting thru the aft lower skin. This should be placed just behind the rear hard point. Should the tank ever have to come out this needs to be clear of the tank.

25. Note the direction of the arrow in the check valve.

26. The 1/4" aluminum line from the tank is soft and can be bent aft with a light curve by hand.

27. Finish the vent system plumbing using the picture above using 1/4" rubber line.

28. Complete the other tank the same way.

29. Note tank sumps will be installed at a latter point.