

Air Tanks for that old Woodie By Darrell Sorensen

Have you been putting off installing air tanks for your wood Windmill. Here are step by step instructions on how I do it. To eliminate all the fitting around the thwarts, I simply cut them at the line of the air tank and reinstall them later. Don't worry, the boat isn't going loose its shape as it has been in this shape for about 40 years and it is not going to change. The plywood used for the tank sides is 4mm okoume 3 ply marine plywood, 2 - 4' x 8' sheets are required. It is attached to the Carlin (the strip of wood along the inside of the deck) by gluing a strip of plywood in the inside an inch wider and adding a strip of wood below it that takes up the thickness so the 4mm air tank plywood is just a little less than flush with the Carlin. The bottom of the air tanks are attached to a strip of 3/4" x 1" wood screwed up through the bottom with #6 screws at 6" centers & glued to the bottom with thickened epoxy. The angle of this strip has to line up with the bottom and the slope of the air tank. It is not the same for the full length of the boat, so it takes some hand planing. Also you will be going over a bottom batten near the front of the boat. In this area don't be afraid to use epoxy filler to plug any gaps. The tanks don't need to go all the way to the ends of the boat. You can make a plywood bulkhead 8" to 12" ahead of the transom for a small cubby. At the front make a bulkhead just aft of the rear of the deck breast plate.

Clamping the strip of plywood and wood spacer all at the same time.



Mark the thwarts where they are to be cut.
Windmill Class rules allow the air tanks to slope inward from vertical no more than 10 deg.



Cutting with a portable jig saw. I finished the cuts where the saw wouldn't reach with a Japanese pull saw.



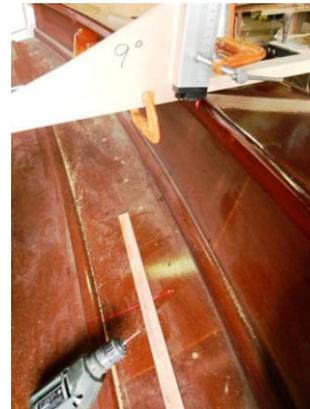
Rear thwarts cut off.



The hull with the thwarts cut and ready for the air tanks.



Using a laser to locate the bottom strip. The laser is set at 9 deg. to allow for any error so they won't go beyond the 10 deg. limit. Drill small pilot holes on 6" centers for the screws. Drill them 1/2" to the outside of the laser mark.



Grinding the paint off for the bottom strips.

I use square drive screws in my shop. Here I use #7 x 1" stainless steel trim head screws from McFeely's. To drive them I use an old fashioned brace. It gives you good control on how far the screw head sinks in on the plywood bottom. This works much better than any power driver.



Adding an attachment strip to the outside part of the thwarts where they will be anchored when put back in.



Tack on a temporary 4mm strip of plywood. This is so the thwarts can be fitted for installation after the air tanks are in.



Adding attachment strips to the center part of the thwarts.



Gluing & screwing



Make templates out of cheap material such as door skins. I make the tanks with three panels so the seams are mostly hidden by the front & rear thwarts.



Seal the back side of the tank walls with epoxy.

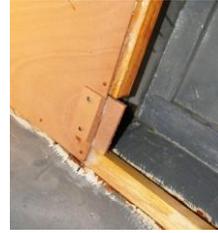


Getting ready to glue in the tank walls. Thicken the epoxy with silica thickener. You want it to fill gaps. This also shows the rear bulkhead forward of the transom.



There are several ways to fasten the tanks. Since the epoxy will seal and hold, nails screws or staples are just clamps. You can use 5/8" or 3/4" boat nails with 3" spacing and leave them in the boat. Another way is to use 1/4" crown staples (steel is OK) with a 4mm to 1/4" tack strip. After the epoxy has set the staples are removed, leaving only small holes to putty. The same can be done with #6 screws with 1/4" plywood pads under the screw head.

Where there is no solid backing behind a seam. Use a piece of plywood behind the butt joint. Screws with a pad under the head as clamps and removed after the epoxy has set.



Air tanks installed, ready for the thwarts to go back in. Make a 1/2" or 5/8" drain hole for each tank. I try to make it at the lowest point for draining if needed.



Make a small fillet with quartz micro spheres or micro balloons along the seam between the tank sides and bottom.

Testing the tanks for leaks. I use a small shop vac with about a 3/16" restrictor to blow air into the tank. Too much air can pop a seam. Brush on a mixture of soapy water. Any small leak will make large bubbles. If no large bubbles show up, be sure to check for any large leaks before you are done with the leak test. Large leaks won't blow bubbles.



Thwarts are back in, access plates are installed and tanks are painted. A good source for deck plates is Beckson Marine, go to their over-run section for the deals.



When storing your boat unscrew the deck plates so the air tanks will ventilate in case any moisture had gotten in to do any damage.

Air tanks should be tested for leaks before each sailing season.



Another good thing to do on a hot summer day when there is next no wind, go the lake with your boat and test for air tank leaks by capsizing your boat. You can also practice righting the boat and climbing back in. If you aren't as young as you use to be and can't get back in. Make a small rope ladder that fits in one of the rear cubbys to give you a leg up to get back into your boat.

Remember: *Windmill Sailing*  *Just Plane Fun*

