

This column is a forum for sharing the vast range of practical experience accumulated by our membership and not just my favorite boat maintenance topics. It is intended to be the place where you, the reader, can ask technical questions and either obtain direct answers in this column or direction to appropriate reference material.

Well "popular demand" struck again I'm happy to say, so we'll depart from the originally planned series of articles and respond to a request for some maintenance / repair advise. Before proceeding though, I have to admit that what you are about to read is based only on my limited experience. I am not a professional boat builder, nor am I in the boat repair business. But aside from the legal disclaimers, I have been messing around with boats for 35 years and during that time needed to repair a lot of different things myself (due primarily to lack of cash). If any of the pros that read this want to comment, please...please, let's hear from you!

So here it is springtime, a very rainy spring at that, and a reader asked a question about leaks in the cabin top, especially around the companionway hatch. Well as luck has it, two years ago this was my problem as well. It was discovered during a real downpour while sitting at our mooring. It was just a drip. Nothing to get excited about. Just one of those really annoying splat...splat...splat noises that overpowers your concentration when you are trying to read a really great sea story on a dark rainy night. The only good part of this leak was that it wasn't right over my berth.

So putting the book down, troubleshooting started! There wasn't much wind that night, so the water couldn't have been blown in past the baffles under the hatch. Further investigation revealed that pressing on the trim piece at the forward side of the hatch opening forced water to squeeze out. The only way the water could get there was to come in under the hatch rail. If that was the case, the water was also getting into the wood cabin top. I don't know how long it had been going on, but I suddenly saw my biodegradable boat rotting out from under (over?) me as I slept.

The construction of the cabin tops on our Friendships is as varied as the boats themselves. Wood (of course), laminated plywood, laminated plywood sheathed in fiberglass, solid fiberglass, and cored fiberglass (usually with balsa) are some of the construction methods that are used. Leaks in any type of construction require at least minimum inspection to see what the total extent of the damage or deterioration might be and locate the source of the leak. My boat's cabin top is fiberglass-sheathed plywood, but before we get into my story, let's review a selection of the initial actions that should or could occur.

1. Localize the source of the water intrusion as best you can. This step can be the hardest because water can migrate a considerable distance before it drips or runs down the headliner.
2. If it's a small leak get a thumbtack and piece of string. If the leak is larger, get a long towel or even a long section of

paper towel. Stick the thumbtack into the wood as close to the leak as possible, and put the end of the string or towel into a bucket. The water will run down the string or towel and quietly deposit itself in the bucket.

3. Now go back to sleep or reading your book. You have done all that you can do until daylight, and you won't have to listen to.... splat....splat....splat anymore.
4. Oh yes, remember where the bucket is so you don't step into it in the morning.

When daylight comes you have several alternatives. Which one you choose depends on several things; boat construction, size of the leak, size of your wallet, level of patience, etc. Going from complex (expensive but thorough) to easy (quick but hazardous to the long term health of your boat), here are the choices as I see them.

- A. Complete disassembly of the companionway trim and framing and inspection of the area for deterioration. Radical surgery!
- B. Localized disassembly of the structure in the leak area and a limited inspection. A measured approach.
- C. Caulk the area of the leak and hope there is no hidden damage. The ostrich approach.

Whatever the case, you should not ignore it. You may choose to have someone else fix it if the alternatives are either "A" or "B", but I would at least give it a good inspection.

The decisions you make are based on what you find during the inspection and many of the factors I joked about above, but I think the basis of the decision is driven by the construction of the cabin top and your basic skills.

With a solid fiberglass cabin top you can probably get away with choice "C" since fiberglass has a real high rot resistance. However, if the boat has wooden rails you may want to remove and re-bed them so the rails themselves don't rot. This repair should be well within anyone's capability.

At the opposite end of the spectrum, the cored fiberglass construction might require very detailed inspection that can only be accomplished if you disassemble all of the companionway trim so you can see what's behind it. If the folks who made the boat didn't seal the core completely when they were cutting the cabin top to fit the companionway, you have a problem. The reason for this radical surgery is the fact that any water that leaks into the sandwich is trapped. It soaks into the core material and if the material is wood, such as balsa, it rots. A rotten core significantly reduces the structural strength of sandwich construction. Fixing a large section of damaged cabin top that's made with cored construction is better left to a pro. It involves cutting out the interior surface and exposing the core so you can rip out the bad core material and laminate new material into the void.

Diagnosing the extent of the damage can be accomplished with a reasonable degree of accuracy. Obviously the primary diagnostic tool is your eyes. Visual inspection will usually give

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you many clues on where a leak is and the extent of the damage. Hidden damage requires a different troubleshooting method. I like to use sound, like sonar, to hear the differences in material density of the wood or whatever is under the fiberglass. Good solid wood sounds like ...well...good solid wood. When you hit it, it goes thump. No hollowness, no echo, just a deep base tone. Rot eats the lignin in the wood leaving voids in the wood's structure. When you hit it, it sounds hollow. Its' one of those things that when you hear it, you'll know! The best way to familiarize yourself with the sound is to start tapping on good wood and work your way toward a known rotten section. I used a small leather mallet because it won't damage the surface, but you can use almost anything. Just remember that the hammer may cause more damage than you want, so tap judiciously.

Another way you can locate the damage in a non-cored cabin top is to remove the headliner and do a visual inspection. If the damage is extensive, it will be obvious. You'll probably pull pieces of the wood or plywood off with the headliner. Less extensive damage can be difficult to locate. One of the telltales will be the stain that the water leaves on the surface of the wood. After repeated wet / dry cycles a residue that contains the breakdown byproducts forms on the surface. Probing the area with a small penknife or ice pick will usually show you where the weak / rotten areas are located. Plywood can be a little tricky. Because of its' layered construction, water and rot can migrate down one layer yet leave the other layers untouched. Tapping will usually work, but you may need to take core samples to really home in on the problem.

Since I had fiberglass-sheathed plywood, and very little external evidence of water intrusion, I used two methods to locate the extent of my problem; sounding with the leather mallet and drilled core samples. First I tapped....tapped....tapped on the fiberglass sheath on the outside of the top. Using the differences in the sound I outlined the suspect area which was about the size of an 8 ½ X 11 piece of paper. I marked the area off with a pencil. Then I took a thin-walled plug cutter and cut a hole into the underside of the top near the point where it was leaking. The hole was just deep enough to get a good wood sample but not deep enough the cut through the fiberglass. This first sample showed me that wood was not rotten, so I took three additional samples. One was about 6 in. from the first, and again showed no rot. The last two were taken in the center of the area I mapped and again about 6-in. apart. The conclusion of all this probing was that my problem was delamination, not rot. Evidently there was just enough flexing of the delaminated section so that when I walked on the cabin top the slight movement broke the seal of the bedding compound under the hatch rail allowing it to leak. It hadn't been leaking for long and there was no indication of moisture in the samples.

Now the issue was how to repair it. For this I went to the Gougeon Brothers "West System" epoxy repair book. In it they outline a procedure where you drill a pattern of small holes in

the top of the cabin, about an inch or two apart, that will accept the tip of a small syringe. But the first things that had to be fixed were the holes cut with the plug cutter on the inside of the cabin. Luckily the holes took the next plug size up, so armed with a little thickened epoxy they were set home and allowed to dry. Next, a thinned mix of epoxy was injected into each hole of the pattern that covered the area I had mapped while troubleshooting. The trick is to fit the tip of the syringe tightly into the lowest hole and inject enough epoxy so it oozes out of the holes above it or beside it. When it's full of epoxy, put a match stick or wood plug in the hole so the epoxy doesn't run out.

The epoxy was left over the next week to setup. Finishing the repair was fairly straightforward. The process of sanding, filling, fairing, sanding, filling, and final fairing; followed by priming and painting, and painting took the next two weekends. The job came out pretty good, in spite of my amateur status. The best part is that the leak hasn't returned. I could have had the boat yard do the job, but I always subscribe to the philosophy that if I pay someone else to do the job, I've lost twice; once when I paid them the money, and again because I lost the opportunity to learn something.