

Put Holes in Your Boat... The Right Way!

By Alex and Jack Wilken

As we move into late winter, it is pre-season project time for lots of us, and winter sailing season for others. Many, if not most, of boat projects may involve drilling holes in your beloved craft. Whether it is fine tuning the placement of our running rigging, installing new handrails, canvas snaps, instruments, or any number of other projects, putting holes in your boat is always an unsettling proposition. So, before you go firing up your favorite power tool, let us go over some of the questions you should ask yourself and the best practices. In past articles, we have gone over how to install thru hulls, winches, and mast hardware. This article is more broadly focused on how to deal with any hole you want to put in your boat.

A hole needs to be secure and sealed. What is the hole for? Where does it need to be? How to make it? How to make it secure? How to seal it? These are some of the most important considerations in the making of holes in your boat.

What is the hole for?

There are several reasons we want holes in our boats. One is to allow something to pass through them - like a wire, or a fitting for a ventilation hose. The other most common reason to drill into our boats is to anchor something

with a screw or bolt. The hole could also be larger to install something like an instrument display.

Where does the hole need to be?

The location of the hole is determined not only based on where it is most convenient on the outside, but also where it will work and be accessible on the inside of the boat. You may be running wires from your mast into the boat. Obviously, not running them all over the deck is preferable, but they must go through in a place that you can access on the inside, and thus complete the run to the desired location. You should plan the entire wire run, and even run wire inside from the hole to its end, before putting the hole in your boat to make sure you don't encounter a nasty surprise later.

If the hole is for a fastener, you normally need access to both sides, as well as space to accommodate washers or backing plates as required.

Additionally, you may need to consider that you're close enough to structural reinforcement as to give sufficient strength to the loads a fitting might be subjected to.

How to make the hole?

Depending on the hole you wish to make, you may use a drill, a saw, or both. The size and shape of hole and the material you are going through are the big determinants in this. Small (approximately up to six inches) round holes, are generally best made with a drill motor and the appropriate drill or hole saw. Bigger and non-round holes, will need some form of cutting device. On fiberglass and wood boats, a saber saw or jigsaw is often best.

Mark exactly where you want the hole. This

is as much a measure-twice-cut-once moment as there ever was! Drill a hole big enough to get the blade through at the edge, and then use the saber saw to finish the job (Figure 1). With holes that can't be drilled on metal boats, an angle grinder or cutting torch may be more appropriate.

How to make the hole secure?

The surface where you put the hole must be solid enough to take the loads that it may be subjected to. Cored fiberglass decks do not provide much material to fasten to. Coring is used to allow for a stiffer, lighter deck than fiberglass alone could achieve. As a result, the upper layer of fiberglass can be as little as 1/8" thick. If the core is foam, this will only provide enough holding power for the most minimal loads (Figure 2).

If more holding is needed, you can make a "hockey puck". To do this, remove the foam and replace it with thickened resin. First, drill a hole in the location about 1/4", or at least twice the diameter of the screw you will be using. Next, locate an allen wrench that is small enough to fit inside the hole you have drilled. Then, attach the long end of the allen wrench into a drill. Insert the short end into the hole you have drilled, and position the drill at 90 degrees to the surface of the fiberglass. Once you have the allen wrench inserted into the hole, trigger the drill so that the short end spins inside the foam behind the fiberglass. This effectively creates a "void" in the foam around the hole. Once you have created the void, the next step is to inject epoxy or resin into the void. Once the epoxy/resin has cured, you are left with a very solid anchoring point that you can drill and fasten your screw into. The best way to inject the epoxy is to use one of those non-needle syringes that you can get at any pharmacy; these also come with baby Tylenol and similar medicines for kids.

As long as the layup is polyester, you can use two-part epoxy or polyester resin material. Otherwise, epoxy resin is the only option. Mix the resin. Then, add high density thickener till it is still liquid enough to draw it into the syringe, but not too runny. About the consistency of Ketchup works. Draw it into the syringe, and

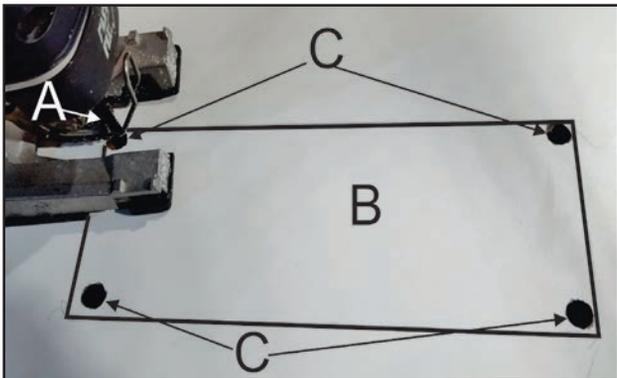


Figure 1: Drill the hole for the saw blade, "A", inside the desired hole dimension. For square a hole, "B", you can drill a hole in each corner, "C", and connect the dots.

inject it into the void until it is full. Once cured, this area is now ready to fasten to. Remember to drill a lead hole of appropriate size so as not to crack the fiberglass and ensure solid holding. If the core is plywood, then, in most situations where a wood or sheet metal screw would be an appropriate fastening, the plywood should provide sufficient holding power.

You must be very careful to make sure it stays sealed because if water gets into the layup, it will not always be immediately obvious and could be disastrous. If a cored deck is subjected to the loads that would require thru-bolting, it will leak and cause problems since the core is easily compressible. To prevent this and make the fastenings secure, the core must be removed and replaced with something solid. This is the most secure method for any hole needed in a cored deck or hull. We explained one way to do this in the article on winch installation from the April 2011 issue of *48° North*. For heavier loads, you will want to spread the load to prevent the bolt pulling through the deck. To spread the load, use large area fender washers or a

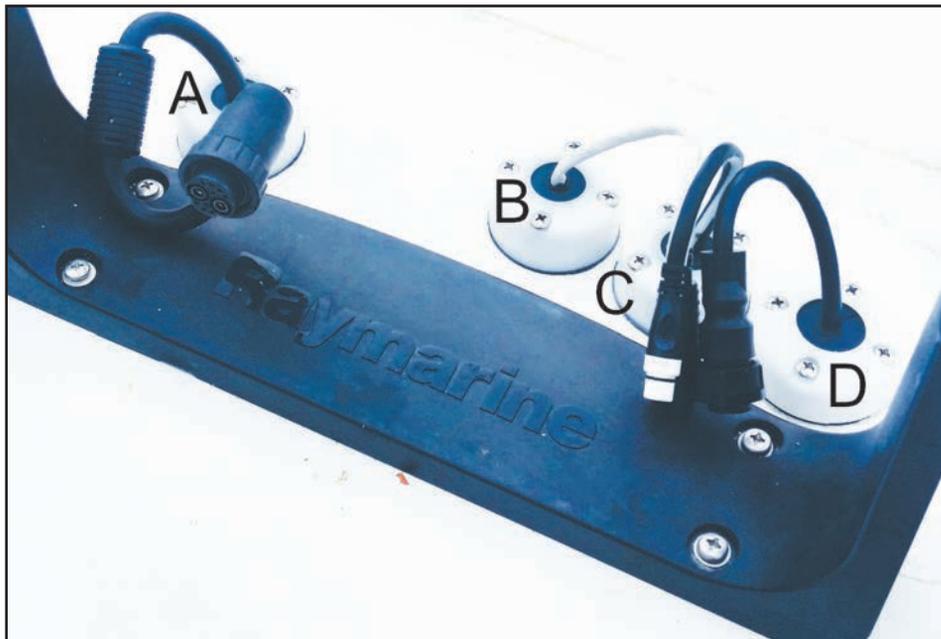


Figure 2: Watertight deck seal pass-thru fittings, "A-D". One for each wire. Because these fittings shouldn't have force put on them, you might be able to get away with sheet metal screws in a foam cored deck in a location where the cables are not stepped on.

backing plate, but we will ask that you refer to this previous article for the details of this process.

How to seal, short and long term?

You can simply drill a hole big

enough to run, for example, a wire, and squeeze some marine sealant into the hole and it may not leak for a while, but it would not be prudent to expect it to stay that way. One of the best ways to seal a wire is with a watertight fitting

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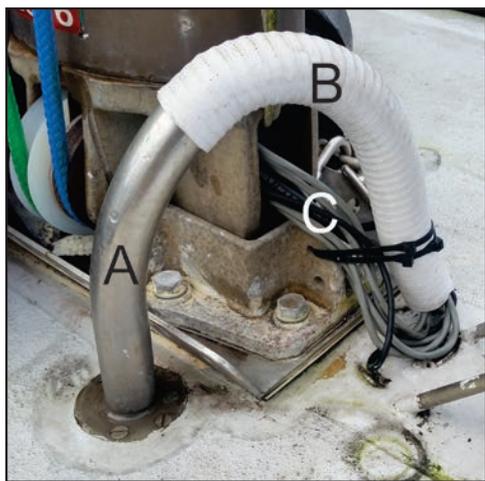


Figure 3: All the wires, "C", from this mast run up through the hose, "B", into the tube, "A", and into the boat. The end of the hose is filled with sealant around the wires to keep any water out.

(Figure 2). This doesn't work as well for multiple wires as each one wants its own fitting. A solution we have used is to have a flanged tube come up thru the deck, and then a hose is attached to it with the other end pointed at the deck. Then, run all the wires up into the hose and down through the deck, and

squeeze sealant in around the wires (Figure 3). With the wires secure, they have less room to work and displace the sealant, and, with the hose pointed down, the only water that tries to get in will be from a wave on deck.

All fittings that pass through the deck work in a similar way regarding water tightness. Once you have dry-fitted the fitting, tape it, and the deck around it. Then, remove the fitting and apply an even layer of sealant to its underside. Put it back in place and carefully tighten it down. Clean up the squeeze out, and only pull the tape once the sealant is entirely cleaned up. For thru-bolted hardware, the process is almost identical, with one addition: only tighten the bolts down till the hardware is touching the deck so that you do not squeeze out all the sealant. Then, leave it to fully cure for several days (more in cold temperatures), so that it forms a molded gasket. Now, tighten the bolts down making sure to only turn the nuts on the inside. If the bolt turns with the sealant dry, it will break the seal and water will find a way in. Even when the sealant is liquid, you should do everything you can not to let

the bolt turn as it can push the sealant out and cause a leak. With wood and sheet metal screws you have no choice but to turn them, so do so carefully, and make sure you do not over tighten them.

The fear we feel when we are about to make a new hole in our boat is good. It is the cue to make sure we can answer all the important questions about the hole before we begin. There are many words of caution, "Measure 3 times, cut once" and its variations comes to mind. "Plan your hole and follow your plan" might be more appropriate in this case. Bravery is not the absence of fear but doing it when you are scared anyway. Do not do something that you fear, blindly. Rather use the fear to focus your mind, to ensure that the cause of the fear is rendered moot. And once you have applied your focused mind to your desired project, you can enjoy the point of all this: Going sailing with peace of mind.

Jack and Alex Wilken are experienced boat builders and have cruised extensively. They hold USCG Captain's Licenses and are the owners of Seattle Boat Works.

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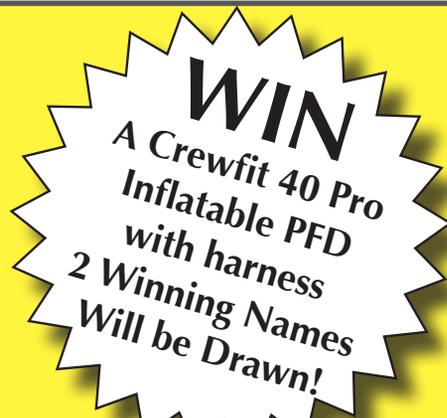
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