

Tabbing Bulkheads to the Hull and Deck

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There appears to be some interest as to the repair of loose tabbing of bulkheads to the hull or tabbing bulkheads to the underside of the deck/overhead. This document pertains to the tabbing, or repair of tabbing, of bulkheads to the hull and underside of the deck. The underside of the cabin is another issue left to a separate document.

Two references that I find to be very helpful on this subject are:

1. "The Fiberglass Boat Repair Manual" by Allan H. Vaitses
2. "Sailboat Hull and Deck Repair" by Don Casey

Both are published by International Marine, Camden, Maine, and still in print. The first is the better of the two books in my opinion.

For stiffing the deck see ref 1 pp 52-54 and ref 2 pp 90-91.
For tabbing bulkheads to the hull/deck, see ref. 1 pp 56-59 and ref.2 p 43.

My comments and descriptions follow.

A. Single skin vs. double skin.

This refers to the construction of the layup. A double skin is two skins separated by a core such as the decks and cabin tops of our boats. Single skin refers to a solid layup, regardless of thickness, such as our hulls.

B. Bulkhead print-thru

Bulkheads that are stood hard to a single-skin hull can print through or broadcast their positions. One can see this print-thru effect by looking along the length at the outside of the hull from the dock or dingy at an oblique angle. It helps to do this on a bright sunny day and the hull well waxed. One may see perhaps waviness due to fairing issues by the builder. Also one may see a vertical break in the reflection at the bulkhead positions running from the gunwale to the waterline. This line is the print-thru effect.

This effect is minimized at the deck or overhead by the core distributing the stress over a wider area. Remember that fiberglass does not like localized stress points.

The consequences of this condition can range from minimal to severe. Minimal is only the effect described above. Severe is when a crack appears in the gelcoat at the bulkhead position. If the severe condition is allowed to persist it can result in failure of the layup at this point.

If the print-thru is minimal and the tabbing has pulled away from only the bulkhead but is still intact re-tabbing the bulkhead to the hull is not necessary (see C. below). If the print-thru is severe, the tabbing has pulled away from the hull, or the tabbing has been compromised then re-tabbing is necessary (see D. below).

Since our boats are no longer in their molds, I suggest that any tabbing work be done with the boat in the water. It will then be completely supported. If the work is done on the hard, the boat could sag under its own weight pulling the hull away from the bulkhead. Then, when the boat is

returned to the water, the print-thru effect could be more prominent and the compression on the bulkhead more severe.

C. Repairing the bulkhead tabbing

If the print-thru is minimal and the tabbing has pulled away from only the bulkhead but is still intact all one has to do is to reattach the tabbing. This does not require re-fiberglassing the tab to the bulkhead.

Why? Because the failure was due to the swelling and shrinking of the wood as the humidity changed. This caused the fibers of the wood and/or glue joint in the ply to fail. Re-glassing will again fail at some point in the future.

Instead, using wooden wedges move the loose tab away from the bulkhead a little bit, being careful not to break it. Clean up behind the tab as best as possible, inject 3M's 5200 or similar caulk/adhesive, and screw the tab back to the bulkhead. Set the screws in a zigzag pattern along the bulkhead. While you're at it you may want to continue screwing the tabbing to the bulkhead all the way along its length even if it has not pulled away (for insurance). Cover the screw heads with filler to seal the fastener and repaint as needed.

D. Replacing the tabbing at the bulkhead to a single skin

However, if the print-thru is severe, the tabbing has pulled away from the hull, or the tabbing has been compromised then re-tabbing is necessary. This will require the replacement of the tabbing.

The acceptable technique today for attaching the bulkhead to the single skin hull calls for the bulkhead to be stood off the hull by a layer of closed-cell foam between the edge of the bulkhead and the hull. The foam can be 1/2 to 3/4 inch thick. The width is about three (3) times the thickness of the bulkhead and runs the entire length of the edge. The foam is centered on the bulkhead edge and the exposed foam on each side is tapered or feathered from the bulkhead to the hull. This relieves the sharp turn that would otherwise be required of the tabbing if the foam were not used. Also, the foam reduces or eliminates the print-thru or broadcasting of the bulkhead through the hull by softening the point of contact. While you are at it you might as well bring the installation up to today's standards. The small amount of work added to the task is well worth the result.

Now this gets messy. Take proper precautions as there will be a lot of fiberglass dust flying about. Remove the tabbing from the bulkhead and hull using a grinder (say 4 inch diameter). Cut away the edge of the bulkhead only enough to allow the foam to be inserted. Clean up the mess. Insert the foam and feather or taper the exposed foam to produce a good transition to the hull. One area to watch out for is the joint where the bulkhead, deck, and hull meet. I use canned foam available from a home supply store to fill this pocket. Sand it fair so that it resembles the foam along the bulkhead, then glass in the tab. Start the glassing with matt, then woven roving, then mat, then roving, and finally cloth for a nice finish. I suggest using epoxy. Each layer gets progressively wider, overlapping the one below. The width along the hull and bulkhead will end up being from 4 to 6 inches each (total 8 to 12 inches). Consider installing and countersinking flathead screws in a zigzag pattern down the length of the tab into the bulkhead for insurance against future delamination. Note that foam is not required where the deck meets the bulkhead. This is a double-skinned area. I will comment on this area below. See the West Epoxy or similar publications on how to use these materials. They should be available through your supplier.

E. Tabbing the bulkhead to the underside of the deck

This is a double-skin area and the use of a foam pad is not necessary. Also the length of the interface is fairly short and the sides of the cabin form a stiffener. The flex should be minimal. Make sure that the fiberglass has not pulled away from the core on the underside of the deck.

Remove any paint etc. from the bulkhead and deck overhead with a grinder for a distance of 4 to 6 inches each. Form a cove at the juncture of the bulkhead to the deck. The cove can be made from foam or wood bonded to the side of the bulkhead. This relieves the sharp turn that would otherwise be required of the tabbing if the cove were not used. Use the same prescription as in D. above for the layup.

I suggest that flathead screws be inserted through the tab and skin under the deck into the core in a zigzag pattern and countersunk. Because the interface between the inner skin and the core is an unknown, the screws are as an insurance against pulling this apart. Also, you may want to screw the tabbing to the bulkhead in a similar fashion as insurance against future delamination. Fill the heads of the screws with filler and then paint.

F. Tabbing the bulkhead to the overhead

This topic can get sticky. How one goes about this depends on the amount of flex in the overhead when under sail and its source. See a corresponding document on this topic.