

Tartan 37 Technical Resources

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Chapter 1: Hull and Deck Structure

Section 2: Replacing Balsa In a Cored Deck

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I've done this twice. The first time, I assisted a professional on my Morgan 43 several years ago. The second time, I did it solo on my Tartan 37. What led to this project was a soft flexible deck around the port chain plate.

How water penetrated the balsa core and how to prevent it.

The balsa core is sandwiched between two layers of fiberglass: the upper layer is the deck. When the balsa core becomes wet, it turns to mush. As a result, the deck becomes soft. One of the most common areas where this occurs is around the chain plates because we don't replace the caulking when it hardens. But it can happen around any fitting attached to the deck or where the deck cracks due to stress. This can allow water to slowly seep down the fitting and contaminates the balsa core. **TO PREVENT THIS, YOU SHOULD REGULARLY CHECK ALL THROUGH DECK FITTINGS AND RECAULK THEM IF THEY APPEAR TO BE LESS THAN WATERTIGHT.** Be mindful, that caulking becomes hard and brittle with the passage of time and that flexing of the deck can lead to this problem. I did not do this, therefore I paid the piper.

Accessing the contaminated balsa core.

The first decision is how to access the balsa, from above or below. I decided to repair the balsa core from below. Although immediate access to the balsa core is easier from above, repairing the non-skid so that it appears right is a real challenge. In the long run, going at it from below is the best option if access is possible.

In the Tartan 37 the main cabin and the head are separated by a bulkhead. As fate would have it, that is where the seepage occurred. Thus, I had to access the area from both locations. This required the removal of the port cabinets in the main cabin and the cabinet in the head. Removing the cabinets in the main cabin only took a few hours. Although I was able to loosen the cabinet in the head, I never was successful in removing it totally. However, I was able to loosen it, and by removing the shelving, and dropping it down a little, I was able to access the underside of the deck in that area.



Note the brown stain in the upper middle, a sign of the problem. This is the main cabin, port side, looking forward.

Next, I covered the entire area in plastic sheets to protect it from what was to follow. This included hanging a curtain around the work area in both the main cabin and the head to prevent the spread of air born particles of fiberglass. It is important to anchor the plastic with tape so that it won't move during the project.

Removing the contaminated balsa.

In a core deck, the balsa is located between two layers of fiberglass – the lower layer of fiberglass must be cut away to access the balsa. Here is what it looks like when it has been removed (the lower part is the bottom of the sandwich, what you see on top is a single sheet of fiberglass that holds the balsa core together when it was originally installed, IT IS NOT THE DECK):



I was not sure how thick the balsa core was, so I had to be careful about how deeply I cut into this lower layer of fiberglass - I did not want to accidentally cut through the core and the upper layer of fiberglass (the deck). As it turns out, the balsa core in my Tartan 37 is $\frac{1}{2}$ inch thick. To cut away the lower fiberglass layer, I used my trusty Dremel. When doing this, you want to wear a mask and throwaway clothing because the dust is fiberglass particles. There was no question of where the heart of the problem with the core was and I began my cut there. I extended it in small sections searching for uncontaminated balsa. This required several cuts until I reached solid balsa. Here is a photo of the area with the balsa removed.



Once you have removed the fiberglass, you can remove the contaminated balsa. Again, it will be wet and very soft. Once it is removed, you will want to scrape the underside of the deck to remove remnants of the bad balsa and the original adhesive. Next, allow the area to dry. I let it sit for the entire winter, and continued the job the following spring. When it is dry, you will gently and carefully sand the underside of the deck to prepare it for repair – it must be clean. Once it has been sanded, wipe it down with lacquer thinner to remove any contaminants. Now, you are ready to replace the core. At this point, you should clean the work area of debris and dust.

Replacing the balsa core.

If you wish to replace the bad balsa, that is your option. Many folks prefer it, but I selected a synthetic core because it would not break down if water ever penetrated it. I searched the Internet and found Divinycell H80 Grid Scored – I found it at Jamestown Distributors where you can see photos of the material. It is ½ inch thick. Also notice, that it is cut into one inch squares and light. This is very important because when you install it, you will be doing it in small pieces of various sizes. The important point is that when installed, there must be no air pockets between the core and the deck, or between various pieces of the installed core that can allow moisture to gather. Air pockets would allow moisture to accumulate.

Installing the new core is a 2-person task. One to mix the epoxy, dip the core and the other person to install it. Here is what you will need:

1. Epoxy
2. An adhesive filler
3. A plastic spreader;
4. Latex Gloves;
5. disposable paint brushes;
6. Mixing bowls (plastic ones that epoxy will not stick to);
7. Tongue depressors to stir the epoxy;
8. Whatever you feel you need to clean up a mess, since this is real messy.

I used the top of the icebox as a mixing and staging area. Again, this will be done in stages and you will be mixing epoxy throughout the process – you can't mix it all at one time since it will set before you complete the project.

The first step is to mix some epoxy (no filler) and brush it on the area where you will install the new core. When this coat of epoxy becomes sticky to the touch, you can begin to install the new core. The idea is that if it's sticky, the epoxy coated new core will stick to it. If it does harden then you must wash the area with water to remove the blemish, and recoat it with fresh thin epoxy.

Over the course of the project, you will probably mix several batches. The epoxy is to be thickened to the consistency of peanut butter with the filler. Take a small section of new core and dip it into the epoxy until it is totally covered, top, bottom and sides – don't brush it on, dip it so that it has a thick coating of epoxy. Once this is done, you will press it to the underside of the deck. You will be moving quickly because you don't want the epoxy to setup. As you press the new core in, make sure there are no air pockets. You will be constantly checking what you have done to prevent sagging. And, there will be drips coming down from the area. As I said above, it is a messy process. Use the spreader to constantly work the area you have done and make it as smooth as possible – filling any voids that appear between pieces of the new core. Cut the new core into small pieces that fit the area remaining to be filled. Once you have filled the entire area with the new core, work the spreader to make the area smooth and to assure that the new core is firmly pressed against the upper deck. Once the new core is stabilized, allow it to set for at least 12 or more hours.

(If for some reason, you don't complete this process in one setting, it is not the end of the world. However, before continuing, be sure to wash the hardened epoxy with water to remove the blemish that forms when it sets. Then apply a thin coat of epoxy to the remaining area, let it become sticky and continue the project.)

Once the new core is in place, you are going to lay 3 layers of fiberglass over the new core. Wash the newly applied epoxy with water to remove the blemish and allow it to dry. Cut the fiber glass cloth to fit the area. Coat the area with a thin layer of epoxy (no filler) and press the fiberglass cloth into it. Now apply new epoxy (no filler) with a brush to wet the cloth (it will become transparent), roll it flat to remove the air pockets,

apply the second and third layers of fiberglass cloth using the same technique. Once this is done, allow it to set.

In the mean time, you can clean up the mess, vacuum up the dust, etc. Next, it is time to reinstall the cabinetry, etc so that the interior is back to normal – failure to do this will result in getting “the look” from the first mate. And, you are done.

You have now paid the piper. To prevent this from happening again, go topside and check the caulking around the chain plate and anywhere else there is a fitting on the deck. Make sure these fitting (including screws) are watertight; if in doubt, remove the fitting, remove the old caulking and recaulk. I use 4200 because it remains pliable but others prefer 5200. To each their own. Good luck.