

1978 Catalina 30 Hull Number CTYN0987M78F Refit Preparation of Engine Compartment for Replacement of Engine

The Atomic 4 in this Catalina 30 will be replaced with a Moyer Marine Inc. exchange engine. There were two cracks in the fiberglass comprising the engine compartment surround, and there was crack in the supporting block on the starboard side under the engine access panel. It seems desirable to install many items on the engine compartment walls (heat exchanger, oil filter, gas filter, ...) and so I assumed it made sense to reinforce the engine compartment in preparation.

For some reason, the stringers had two slices cut out of them at an angle at the forward end; apparently to accommodate the flywheel and cover. The odd thing is that these cuts were not covered by fiberglass cloth. The lag screw brackets for three of the four motor mounts were quite solid; the starboard aft mount wood was "punky". This was excavated with an allen wrench in a drill; soaked with acetone and vacuumed out several times, and then filled with epoxy mixed with ground fiberglass. I thought I got both holes; apparently I missed the forward of the two holes: the lag screw would not tighten down after the engine was set.

Step 1: Reinforcing Material

I took ¼ inch plywood and layered on cloth, roving, cloth, roving, and cloth with epoxy. I made a "sandwich" material with the fiberglass layers outside and two layers of plywood inside. I laid up and placed sandbags on top (sitting on plastic sheets). I felt there would be no way water could attack the plywood once installed; the material is not intended to be installed where it would be constantly exposed to water anyhow. A small piece showing cross section:



Step 2: Preparation for Reinforcement

A household cleaner was used to remove as much filth as possible from the build and engine compartment surround. A right-angle grinder with a 36 grit sanding wheel was used to grind away all of the old fiberglass and gel coat down to the original hull glass layers. The area was then cleaned thoroughly with acetone.

The one keel bolt under the engine was cleaned thoroughly with a brass wire wheel and brass "toothbrush". The nut on this bolt was NOT torqued, primarily because I did not understand the need to do so. The keel exhibits no "smile" at the aft end.

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Step 3: Reinforcement of Bilge Area and Stringers

The area was painted with epoxy and a mixture of ground fiberglass and epoxy at a catsup-like consistency was spread over the area. Fillets of epoxy thickened with ground fiberglass were applied to the outer sides of the stringers to soften the curve. Eight layers of cloth were applied to the bilge area and over the stringers with the exception of the open wood cuts which received four layers (I was afraid to build that area too thick in case the engine would not sit properly). The area on which the motor mounts sit was then ground down the original fiberglass surface.

Step 4: Reinforcement of Engine Compartment Walls

Pieces of the reinforcement material were cut, sanded rough with 40 grit sandpaper, cleaned with acetone, and placed:

- Starboard forward corner
- Port forward area (where the compartment turns and becomes the port settee)
- Starboard side blocking under the access hatch
- Starboard aft corner
- Port aft wall (next to the aft access hatch on the port side)

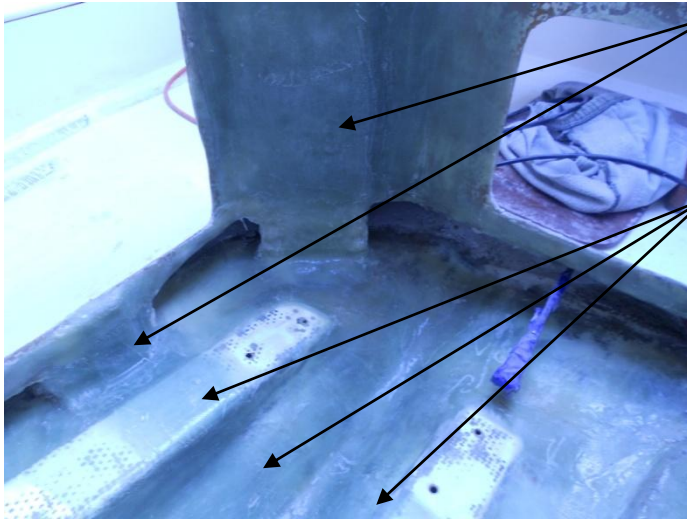
The engine compartment area was painted with epoxy and a mixture of ground fiberglass and epoxy at a catsup-like consistency was spread over the area. The reinforcing material(s) were then laid up against the walls into the thickened epoxy mixture. Fillets of epoxy thickened with ground fiberglass were applied to the outer sides of the reinforcing materials to soften the curve. Eight layers of cloth were applied over the reinforcing materials and engine compartment walls.

Step 5: Reinforcement of Upper Span

The Catalina 30 has a "span" across the engine compartment. This flexed quite a bit when I leaned on it, so I took three layers of reinforcing material cut into 1.5 inch widths and used epoxy and bolts to max one piece. A thick layer of chopped fiberglass, ground fiberglass, and epoxy was applied and this reinforcing "beam" was clamped to the underside of the "span". Another panel of reinforcing material was installed vertically from the hull to the "beam." A fillet of ground fiberglass and epoxy was used to soften the curve where the panel met the hull and eight layers of glass applied from the hull up onto the reinforcing panel. The vertical piece of the reinforcement material and the reinforcement "beam" were sanded rough with 40 grit sandpaper and cleaned with acetone prior to laying on the fiberglass cloth.

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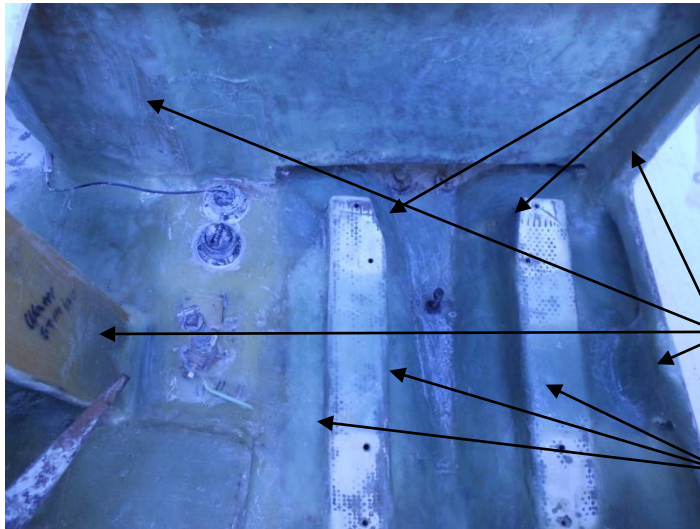
This is the aft starboard corner. The reinforcing layers of cloth on the stringers have been ground away where the motor mounts will sit.



Reinforcing material panels are glassed on here.

Layers of glass cloth cover the stringers here.

This is the forward engine compartment wall.



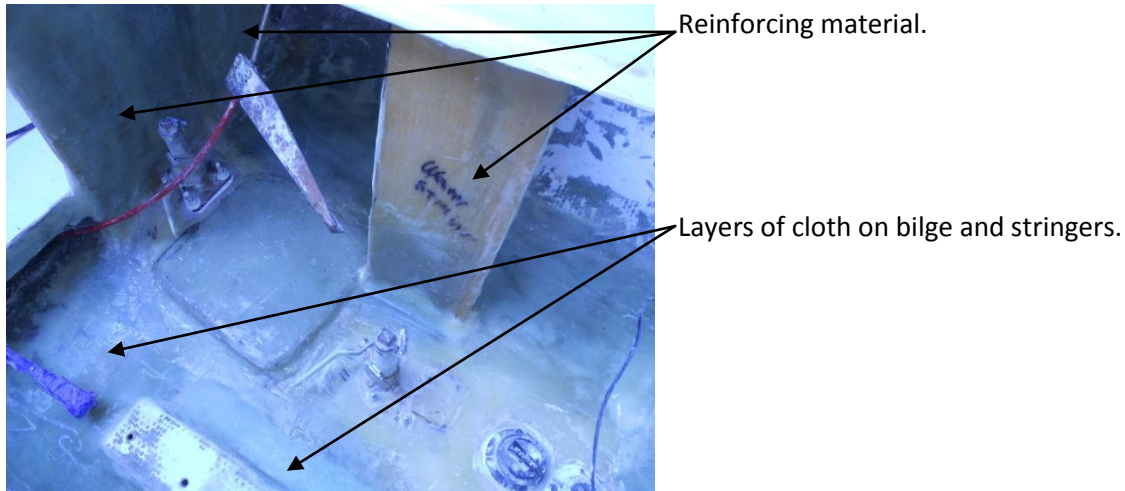
Cut faces of stringers covered with glass and cloth.

Reinforcing material.

Layers of cloth on stringers and bilge.

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This is the port aft engine compartment wall.



Step 6: Painting

The bilge and surrounding hull area as well as the engine compartment walls were painted with an epoxy coating paint. The color is light grey. I read later that white may have been a better choice; I had already purchased the coating and so I went ahead with the grey color. I learned that when the instructions say to mix a small batch and use quickly because a great deal of heat is generated when the epoxy “kicks” that you should believe it. I mixed too much up initially, it kicked, and burned my hand a little before I could set it down in my trash receptacle. So, always work in small batches.



This is the aft end of the engine compartment after painting.

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This is the forward end of the engine compartment after painting.

Step 7: Replacement Engine Set

The Moyer Marine Inc. new block replacement engine was then set; the motor mounts were replaced with new.



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New motor mounts:



The previous installation lasted 32 years; the goal is for this installation to last another 32 years.



This is the motor mount where I missed filling the forward "punky" hole – the forward lag screw does not hold anything and must be addressed (part of propeller shaft alignment).