



Where do Sea Ray 390's Leak? Let me count the ways starting from bow to stern:

How do I know where the leaks are? I did a 5 year hull up restoration of an 87 diesel 390EC.

What are the signs of leaks?

Water in the center hold where the water tank resides.

What are the consequences of the leaks?

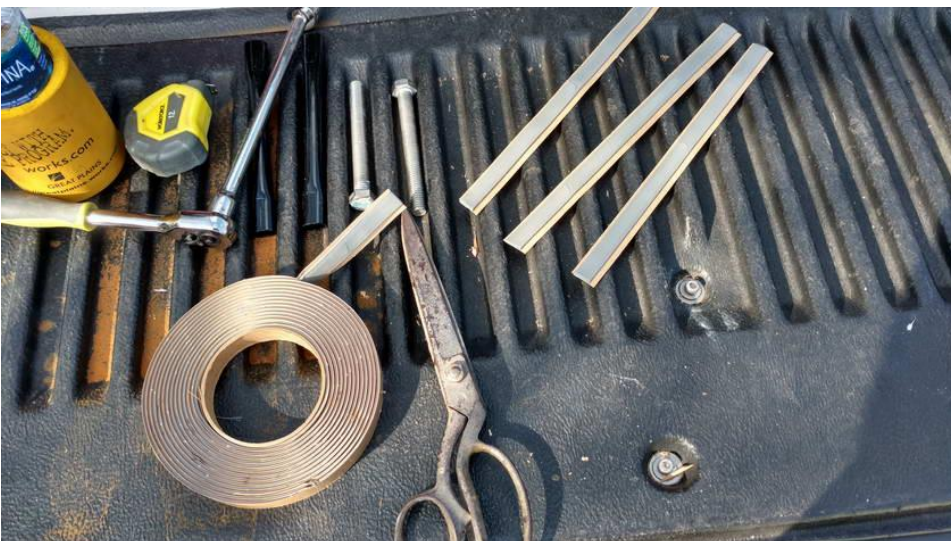
The water tank will eventually corrode on the bottom and start leaking. This will flood the compartment and eventually rot the stringers and saturate the foam below the water tank floor. This will rot the engine room bulkhead. How do I know? I had to replace the stringers, the lower floor, the water tank and repair a big rotted section in the bulkhead.

Remember there is NO WHERE FOR THE WATER TO GO once it enters the bilge forward of the engine room bulkhead.

Warning!!! DO NOT USE SILICONE RUBBER AS A SEALANT. Silicone rubber will only seal if mechanically held in compression like in an engine gasket. It will not stick to itself so you can never reseal. It is impossible to remove and nothing sticks to where it has been.

For windows and port lights use butyl rubber strips like used in window glazing. It remains flexible and will not dry out. It does not harden and is easily removed and replaced.

Figure 1 Butyl Rubber Caulk Strips



Use a polyurethane or polysulfide caulk for permanent seals that do not move much. 3M 5200 should ONLY be used for extreme structural repairs. 3M 4200 is preferred.

Where are the leaks?

Anchor rope locker:

The drain in the locker is very small and clogs easily. Water comes in from the hole where the rope/chain goes out. Also all the screw holes that attach the teak trim above will leak rotting out the plywood deck core under the windlass. Water will eventually rot the bulkhead between the vberth and locker allowing water to run in to the salon bilge through the storage compartment below the bed. It may bypass the compartment. There is a glass covered wood structural beam under the floor below the shower sump that will rot when wet.

Figure 2 Guess where the water leaks?



Figure 3 Totally rotted



Figure 4 Replaced with solid glass and epoxy 1.5" thick



Figure 5 Bulhead rotted

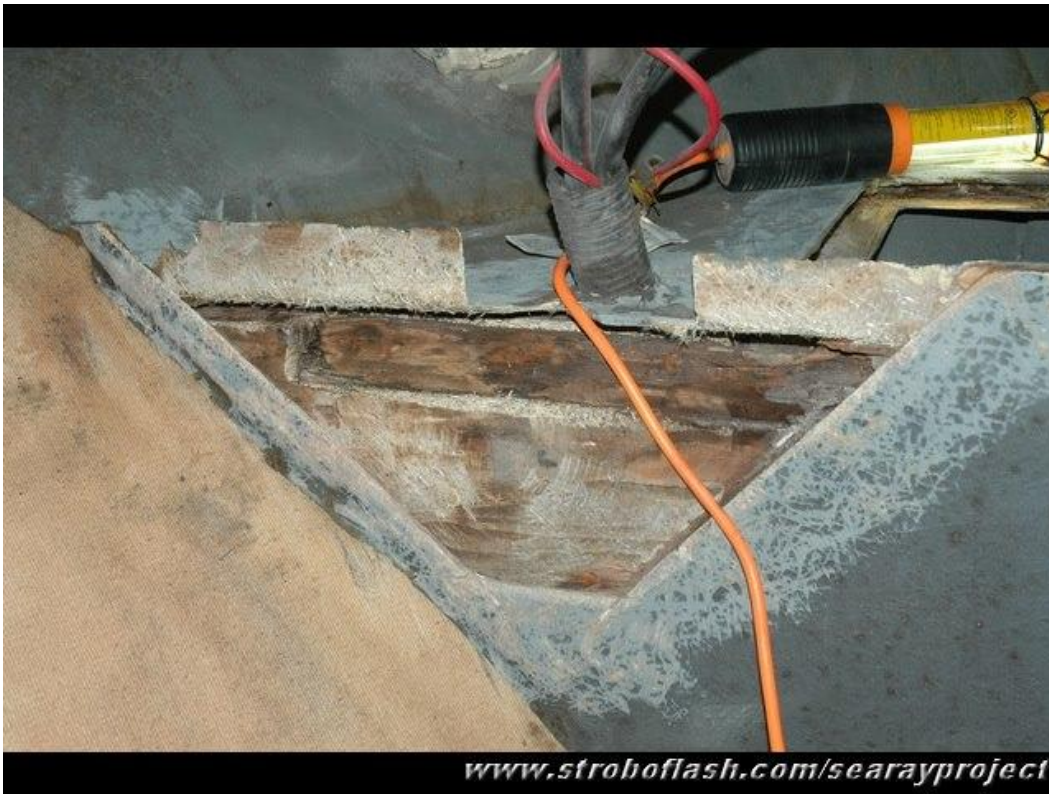


Figure 6 Water from above rotted out the bulkhead



V-berth port holes:

The port holes are plastic and originally sealed with silicone. If they are not cracked R&R with butyl tape. Seal the outside rings along the TOP half ONLY with silicone (one of the FEW places to use silicone) to allow any water to drain. You can purchase new ports and trim on EBAY.

Shower Drain and sump:

The shower drain is almost totally closed in and you may have to cut the floor in the head and then cut through a wall under the floor to get to it. It is poorly sealed with silicone and will eventually leak. You will probably not see the leak from the shower drain. It will leak in to the area behind the port stringer and eventually rot the stringer as it has no glass on the outboard side.

Figure 7 Shower Drain revealed



Shower Sump before rebuild



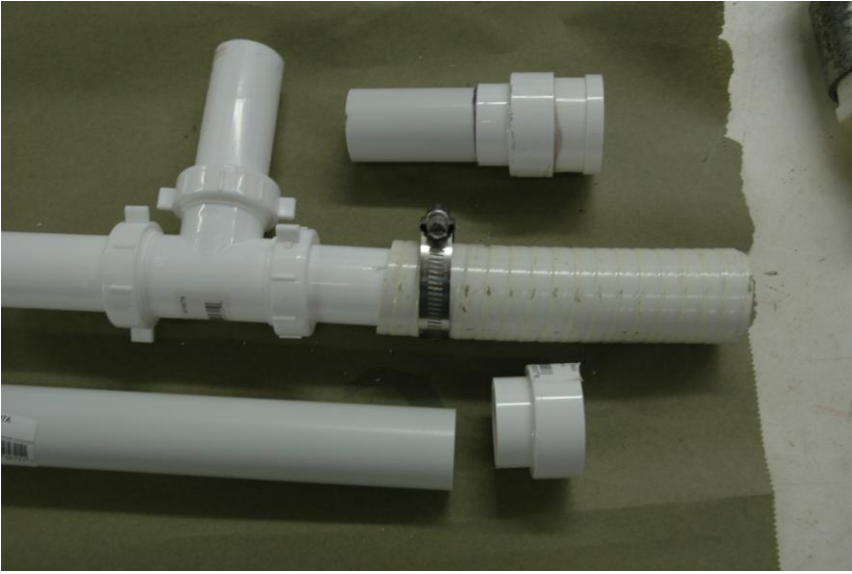
Figure 8 Shower Sump after rebuild



Sink Drains

Check all your sink drains. If they leak water will find its way under the water tank.

Hardware store polyethylene or PVC drain pipe is a perfect fit inside 1.5" marine quality flexible lines



Stanction Bases:

Everything was sealed with silicone and everything will leak. The stanction bases are no exception. When they leak the water goes in to the deck core and you have a big problem. Many of the base screws are behind cabinets and are very difficult to get to. If you can get to the nuts to remove the base then clean the area and caulk with 4200. Use three 1/8" spacers so you don't squeeze out all of the caulk. Tighten the screws after the caulk hardens. To fix a mushy core you have to remove the glass from below and fill with solid glass and epoxy.

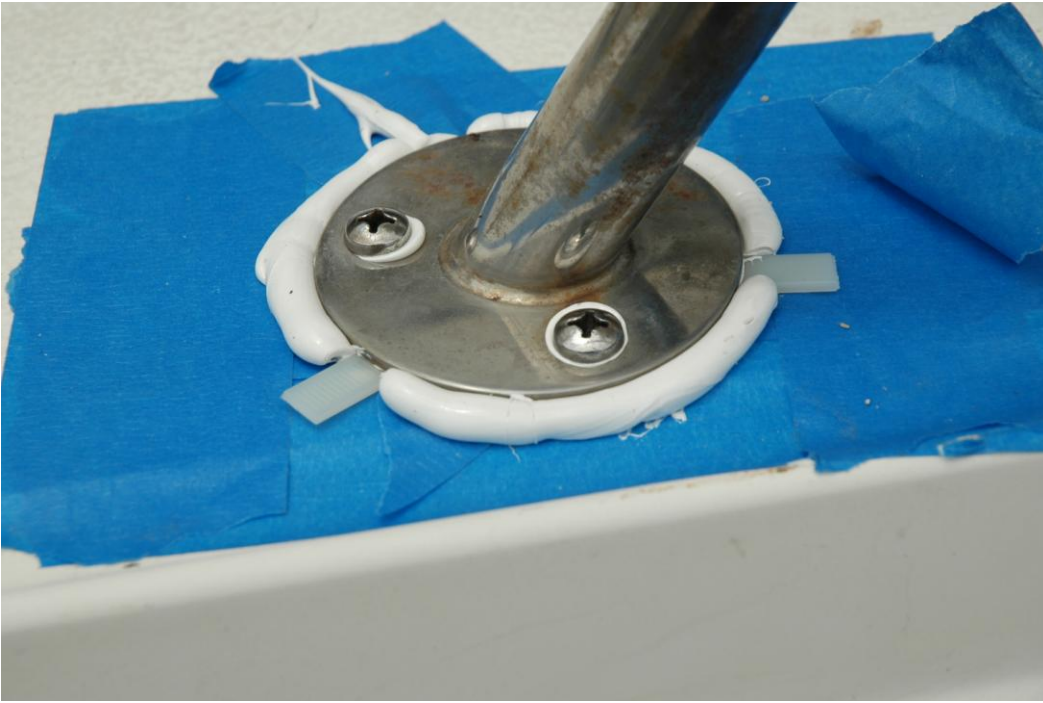
Figure 9 Dig out rotted core from below and fill with glass and epoxy.



Figure 10 Stanctions have backing plates and nuts and washers below.



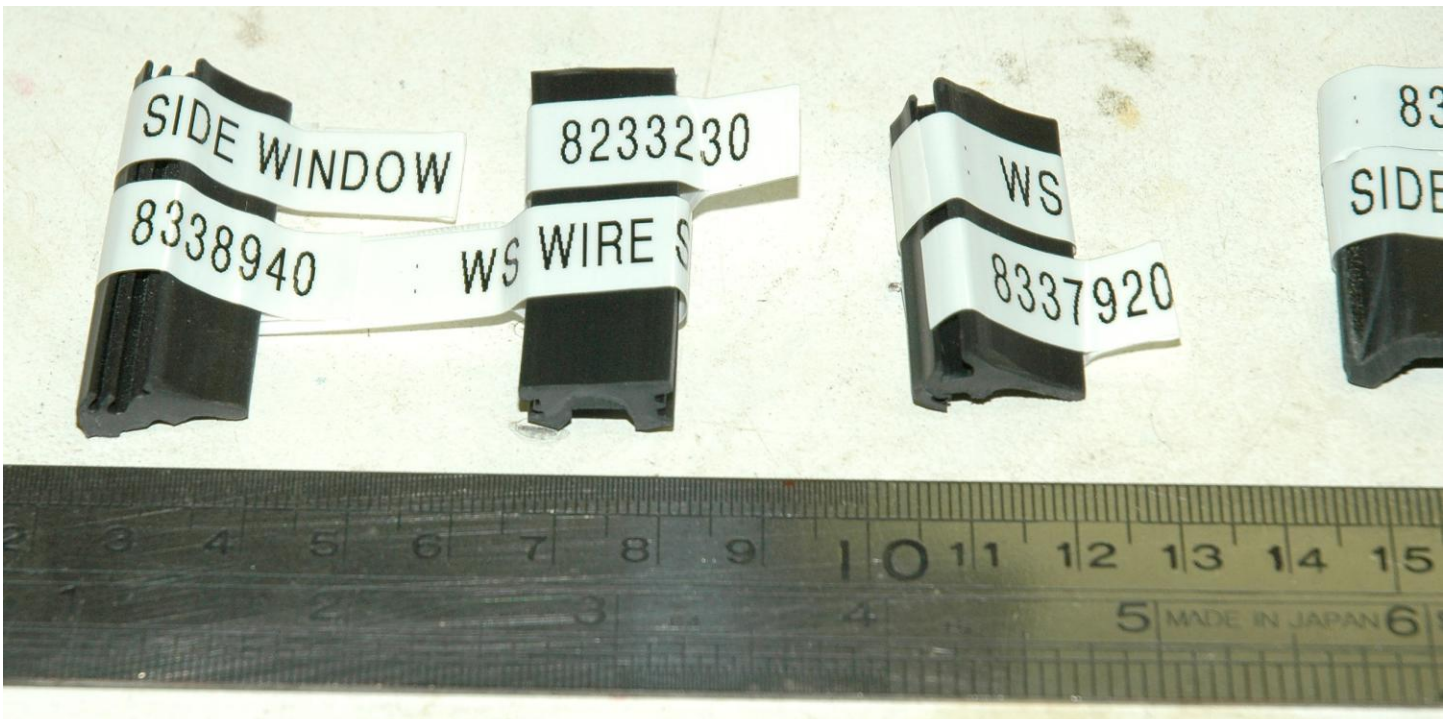
Figure 11 Let harden and trim excess. Pull the spacers. (they are only in 1/4")



Side Windows:

The bane of all Sea Ray owners. They leak because the acrylic window expands and contracts about ten times more than the aluminum frame thus breaking the double sided foam seals. I rebuilt the windows and used a high tech industrial rubber seal. It was very difficult and required great skill to install. I cannot recommend the system for the average owner. So I am now recommending black butyl tape that the window glazers use. (dkhardware.com) Two 1/8" strips to make a 1/4" thickness should do it and you will also have to get new rubber seals and trim from Sea Ray or Taylor Made. You may also have to pull the aluminum frames, clean off all the silicone rubber and reseal with 4200. Be prepared to inject rot stop epoxy in to some of the screw holes as the wood below may be rotted.

Figure 12 TrimLok.com industrial rubber seals. Not recommended for the average owner to install. New acrylic has to be cut and rubber has to be cut VERY accurately at extreme angle corners. Corners must be caulked prior to installing acrylic. Then I still had leaks after the rubber shrank after a couple of years.





Windsheid:

Once again the windshield frame is caulked in with silicone rubber and will leak. It is way too difficult to remove the frame however you can dig out as much caulk around the frame and then caulk with 4000UV. Also the screw heads under the trim strips need to be cleaned and sealed. After 25 years your windshield glass may have broken loose from the glazing sealant. The glass should be removed, frame and glass cleaned and new butyl rubber seal strips installed. This is not a job for the faint of heart but it can be done by an owner. You need a windshield seal breaker tool from an auto paint store, some suction cups from Harbor Freight and some glass stands made of 2x4s to hold the glass after removal. Butyl rubber glazing from dkhardware.com. If you can get a local glass company to do it you are better off. I did it myself but a helper is a real good idea.

Figure 13 With a few tools it is fairly easy to R&R glass.



Figure 14 Clean glass and suction cups are the only way to handle glass. Never pull sideways on the suction cups! NEVER NEVER FORCE GLASS TO MOVE. IF IT IS STUCK FIND OUT WHY!!!!



Figure 15 Glass is really big. NEVER lay flat! Always on edge!



Figure 16 While the glass is out it is a good time to paint the dash and console. Also seal the windshield wiper power wires at the lower starboard corner inside the windshield. It can also be sealed from below. See the next section.

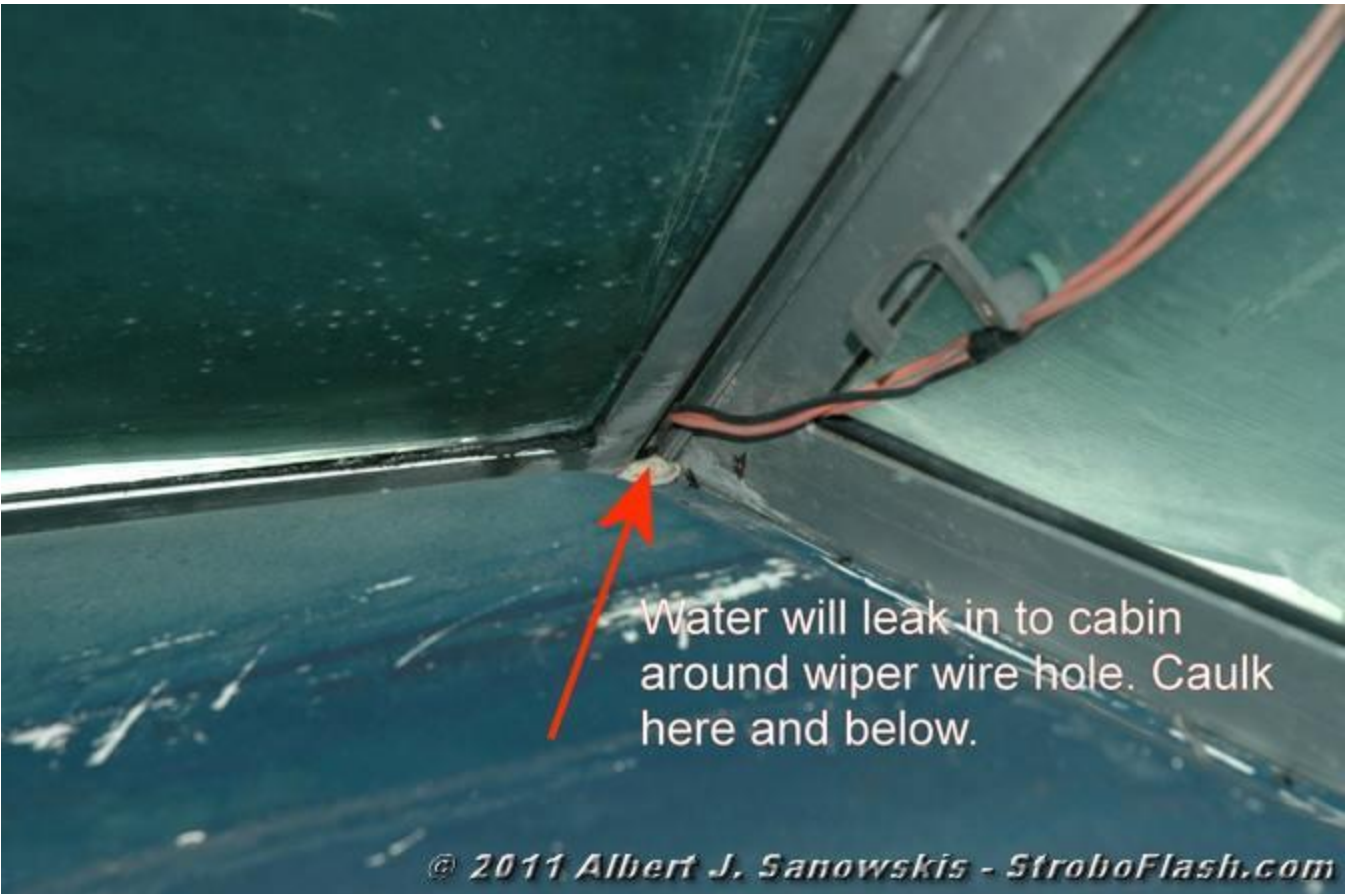


Figure 17 This is right above the stove. You have to pull some woodwork down to get to it but it leaks when water gets behind the windshield. See above photo.

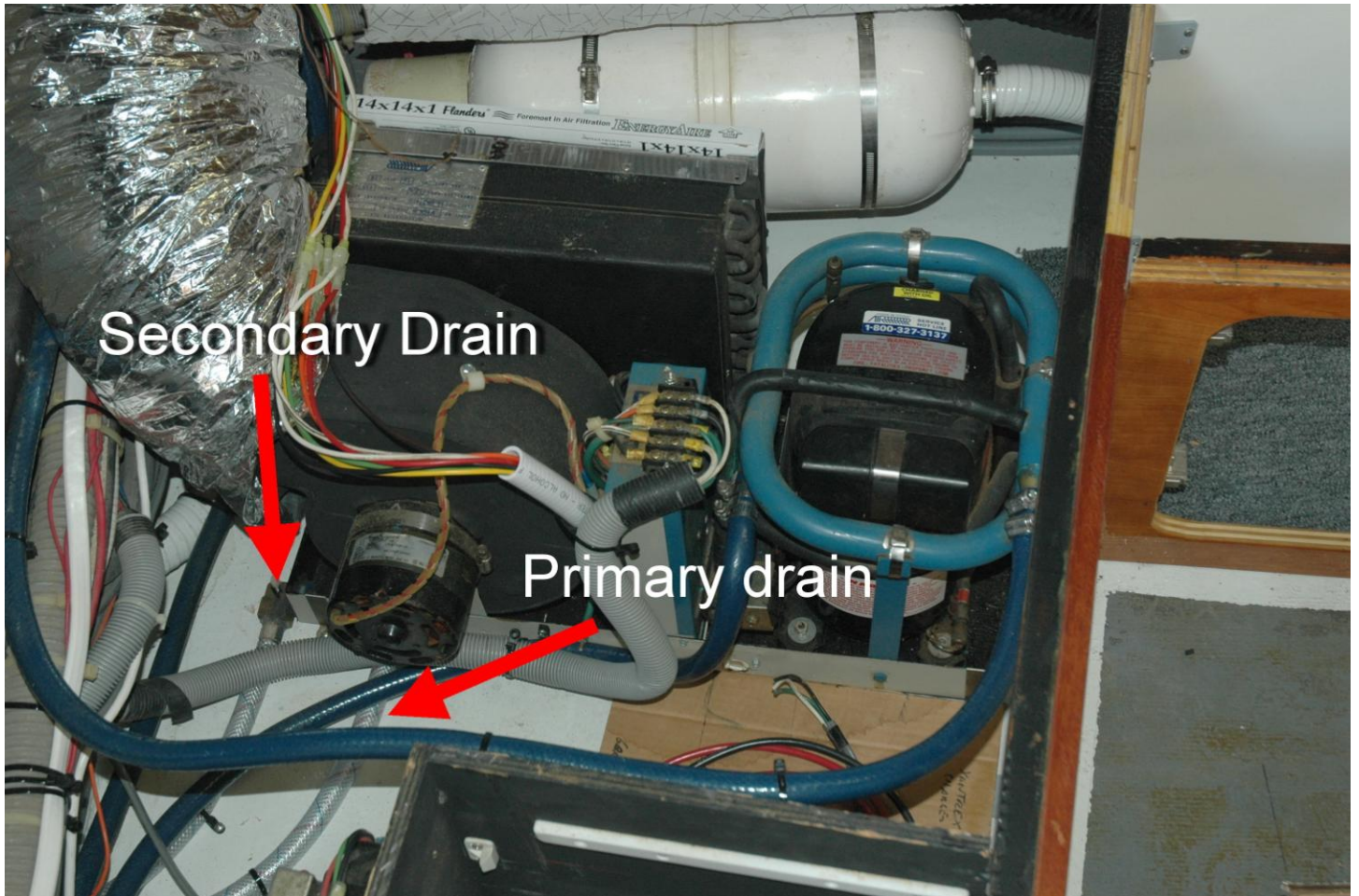


Figure 18 Might want to pull the hatch frames and seal them with 4200. They also leak. The crazing in the acrylic seems to be only cosmetic and only on the outside surface. Just looks bad.



Air Conditioners:

All air conditioners remove water from the air and have a primary and secondary condensate drain. The primary comes off the pan directly under the evaporator coils. This pan will corrode and leak thus dumping the condensate in to the larger pan under the entire unit. The secondary drain on the 390 is left open so if the primary pan fails all the water leaks in to the center bilge. I had to pull both units and build new primary pans out of stainless. The primary drain on the A/C under the bunk goes in to the shower sump. The secondary goes in to the bilge. The primary on the salon A/C under the couch goes through the engine room bulkhead and in to the forward sump. The secondary drains on to the floor and in to the center bilge. I added a new drain line to the secondary that also goes in to the engine room sump.



Water Tank Compartment

So here is where ALL the leaks wind up, at the lowest point of the mid-ships bilge.

Figure 19 This is what I found under the center hatch when I acquired the boat.



Figure 20 This is the wet mess I found under the water tank. The tank had a zillion holes in it from crevice corrosion. Google it.



Figure 21 I drilled a hole in the floor and found water under the floor that the tanks sits on. Bad news. That means the stringers are wet.



Figure 22 I pulled the floor under the tank and removed all the foam.



Figure 23 I drilled some holes in the stringers and found them to be wet and rotted.



Figure 24 Rotted stringer from leaking shower or side windows.



Figure 25 I cut out the stringers. They came out in handfulls of rotten wood



Figure 26 After a month in the bilge I have new stringers completely encapsulated in epoxy and glass.



Figure 27 When I put the floor back in I molded in a small sump. There is a permanent hose reaching to the bottom of the sump. I periodically blow in to the hose. If I hear bubbles I pump the water out with a small diaphragm pump. The only time I had water is after hurricane Matthew when the 80mph wind blew rain water through the sliding door frame. About 2 gallons.

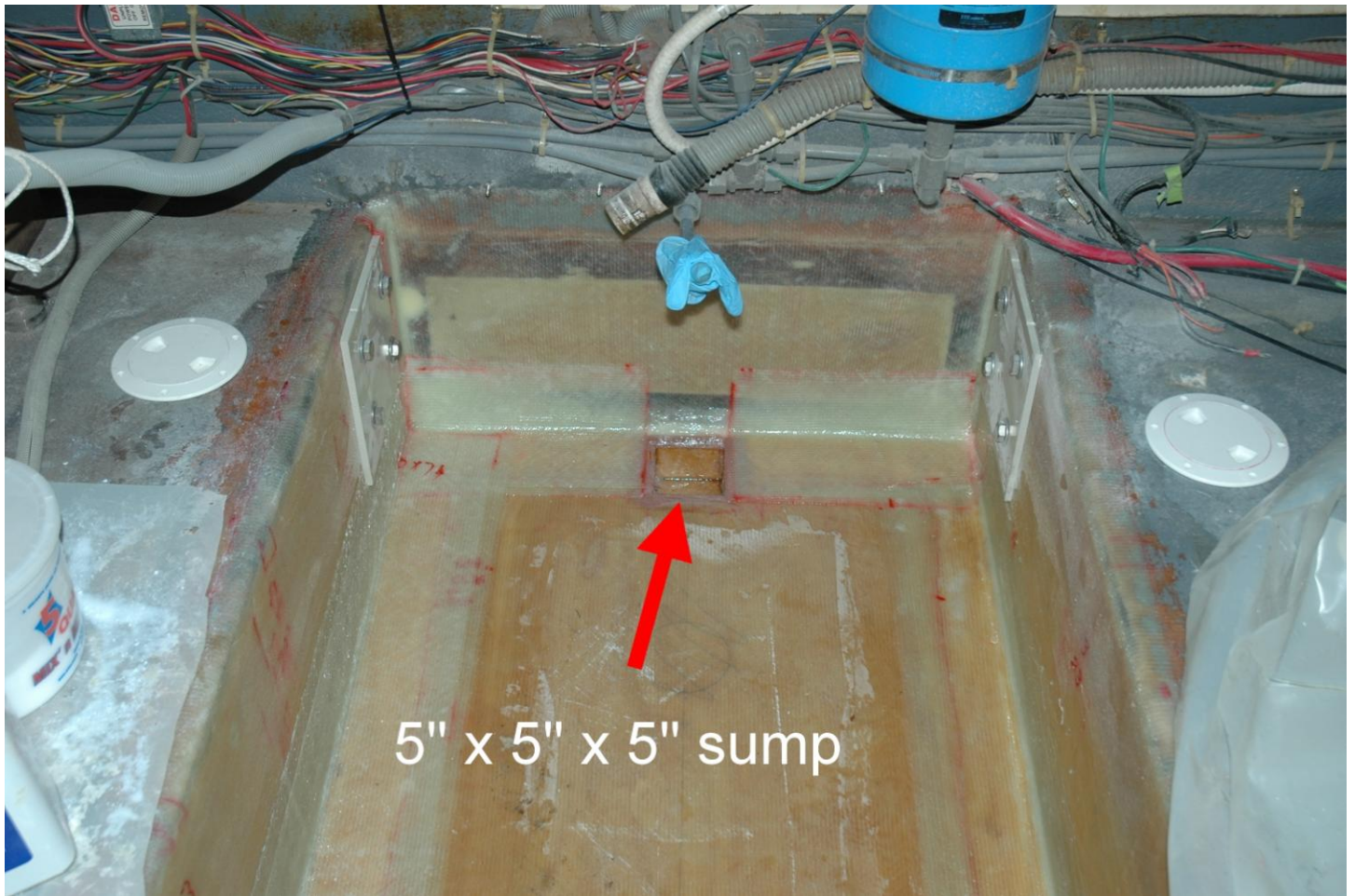


Figure 28 The new .125" wall 5052 aluminum water tank installed and resting on 1/4" rubber strips. The tank is coated with coal tar epoxy for maximum corrosion resistance.



Figure 29 I also installed a 6" inspection hatch so I can see inside the bilge under the water tank just incase any water might get in there. I can't see how but just in case.



Figure 30 Sorry I don't have a photo of the swiss cheese underside of the tank. I sold it for scrap.



Conclusion:

Any water that enters the boat forward of the engine room bulkhead has nowhere to go but under the water tank of behind the stringers in the foam. There is no way to get it out so it sits there and rots the wood and corrodes the tank finally resulting in the water tank releasing its contents in to the bilge. You should fix all the leaks which can be challenging. If you replace the water tank you should also glass/epoxy in a sump in front of the engine room bulkhead so you can pump water out of the bilge because you will probably NEVER fix all the leaks.

See my extensive web page and photo gallery of the entire 390EC restoration project

Web site:

<http://www.stroboflash.com/SearayProject>

Gallery

http://www.stroboflash.com/SearayProject/gallery/_Deck%20and%20Cabin%20Exterior/index.html

Contact me on Facebook in the “Sea Ray Classics And classic power boats” group. *I do not accept private messages or emails.* If you want to know something post in the group so all can benefit. Do not try to friend me. If I don't know you I will not accept.

Sources:

Window weather strips

Sea Ray Dealers

Taylor Made

Butyl rubber caulk, sliding door hardware, glazing supplies

Dkhardware.com

Epoxy and fiber glass

<http://Uscomposites.com>

<http://FGCI.com>