Protect Your Soling 1 Meter

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I have been sailing Soling 1 Meter boats for fifteen years. I have had two Victor Model Products boats (VMP) and now sail a 3DRC boat. During that time, I have identified and had to deal with several vulnerable areas of these boats. The purpose of this article is to help Soling 1 Meter owners avoid the problems I have encountered:

(1) The lateral hull areas just fore and aft of the main stiffener that is positioned under the mast step for both the VMP and 3DRC

(2) The radio board of the 3DRC with a removable keel

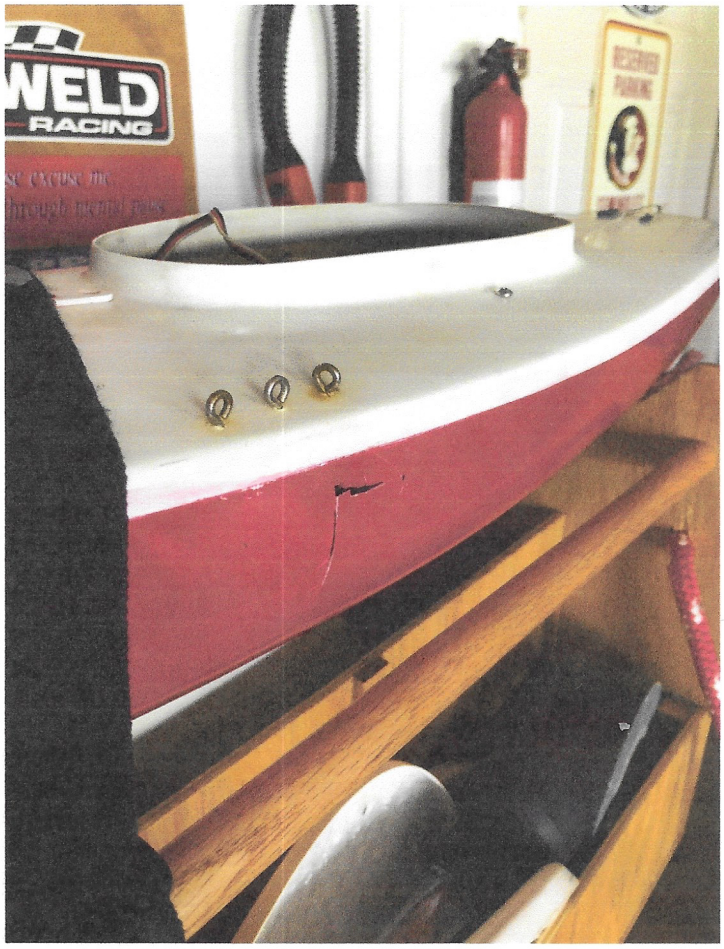
(3) The bow of the VMP and the 3DRC

The Lateral Hull Areas

This is the most likely problem to be encountered by a boat owner of VMP and 3DRC Solings built with an overlapping deck joint (most Soling 1 Meter boats). I have had four incidents of this type of damage caused by boat to boat collisions.

If another Soling hits your boat on the side of the bow or the side of the stern, it will most likely push your boat out of the way. If another Soling hits your boat amidships in line with the keel just forward and aft of the main stiffener, It will most likely pierce the hull. The hull areas fore and aft of the stiffener are soft and thin like eggshells. Boats built with a flush mount deck may not have this problem.

I have had three hull breaches aft of the stiffener and one forward of the stiffener all on the port side of the boat. Both areas are a nightmare to fix. The repair has to be made so the breach can be sealed up and the outside profile can be restored. This means doing an epoxy and glass cloth repair inside the boat with limited access. Every repair with heavy epoxy adds weight to the boat and makes the boat lopsided.



Breach in Soling side wall due to boat contact

When I bought my 3DRC, I wanted to prevent this problem from ever happening again.

Requiring a bow bumper might be a way to avoid boat to boat damage, but an article in Model Yachting magazine revealed that unless there is some give space in a bow bumper, it just results in a bigger hole in another boat. An added bow bumper will protect some one else's boat and not your own. If there is some give space, then the bow bumper will increase the length of the boat. The rules would have to be updated to allow bumpers and specify the size of the bumper otherwise there will be Soling 1.05 Meter boats.

I realized it must be up to the owner to have a feature added to the boat to prevent collision damage. Whether it is a brand new or an existing boat, the feature has to be simple, low cost, and lightweight (but very stiff) to

shore up the soft sides of the Soling 1 Meter. It also had to be compact enough so as not to interfere with the control arm action and wiring.

The answer to the problem was to use 1/4 inch polystyrene square tubing lengths. This clicked all the boxes for design requirements. The square tubing cross section is very stable, stiff in bending, compact without any edges to snag internal lines and virtually weightless. I cut (4) four inch long pieces of tubing. I glued the lengths horizontally to the inside wall of the boat, with one end positioned close to the stiffener, about 3/8 inch below the overlap of the deck on the hull. There should a piece of tubing fore and aft of the stiffener on both sides of the boat. I used CA (good quality super glue) or Testors orange label cement (like gel CA).

If your boat is going to be hit, it will be up high just under the deck overlap. I bought my 3DRC boat with everything inside set up by Doug Rieger except to leave the deck separate. This enabled me to have free access to make additions to the interior of the boat prior to bonding the deck to the

A look at the port side interior showing the fore and aft 1/4 inch square polystyrene tubing glued to the side wall

hull. Owners of existing boats also have access to these areas to make this addition. I found the 1/4 inch square tubing at the local Hobby Lobby but Amazon is another source.

An incident happened first time out in a race where another boat hit my boat amidships. There was no damage to my boat: there was only a paint chip at the point of contact. IT WORKED !!!

3DRC radio board with a removable keel

First off, I want to thank Doug Rieger for all his efforts in making the 3DRC Soling 1 Meter. This is the best Soling yet! The buying experience was easy. I was able to talk to Doug on the phone, give him the servo information and I had a new 3DRC order in two weeks. As I said before, I ordered the boat all built up but the deck was not attached. The boat is excellent and when ready to race, it came in a 2.5 ounces under the 10 pound minimum so I use a ballast weight to bring it up to spec.

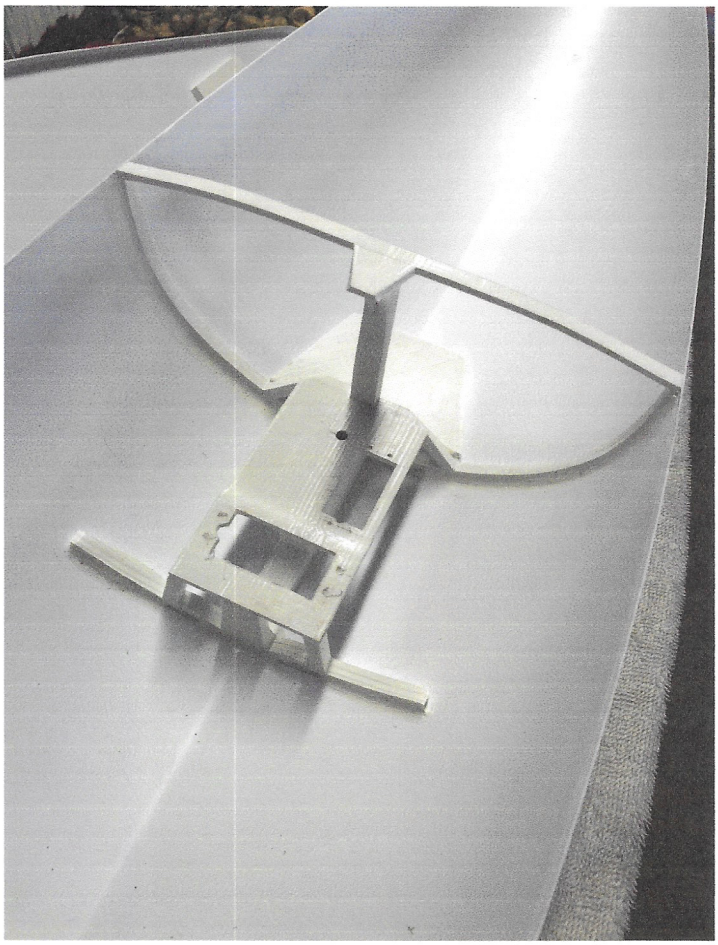
I inadvertently found the radio board was a vulnerable area. One thing I liked about the 3DRC is that I was able to use the three keels I had made for the VMP boat in the new 3DRC boat. I installed one of the keels in the boat and didn't remove it for nine months. During that time, the boat was always bone dry inside after racing…no leaks. At nine months, the keel was looking kind of scratched up and I decided to take out that keel and repaint it and put in a freshly painted keel. The new keel needed some upper surface shaping to match the profile of the 3DRC hull. I would repeatedly put the keel in the boat, fit check it and then remove it for more shaping. When I was satisfied with the fit I installed the keel into the boat with the rubber seal, stainless steel washer and the wing nut.

The next time I had the boat in the water, the rudder servo failed after being in the water for twenty minutes. The rudder locked over to one side and the boat started doing circles while the sail servo still worked. After about a half hour, the boat finally got to shore. At that time, the sail servo failed. I opened the hatch to discover the boat was filled with water like a bathtub. What happened? How did the boat that was bone dry after racing for nine months suddenly become a filled up bathtub. I knew it must have something to do with changing the keel but what?

I drained all the water out of the boat and took the boat home. I did repeated tests of the hull without the keel in the bathtub to find the leak. I thought maybe the keel had loosened the joint between the radio board and the keel box below it. After adding more glue on the rudder servo side, the tub test showed it was still leaking towards the rudder servo cut out in

the radio board. Several additions of glue followed by a tub test showed it still was leaking.

The problem was: Moving the keel in and out of the boat several times had made the stainless steel keel stud threads act like a rasp and abraded the inside of the hole in the radio board. Since the radio board was a 3D printed component, the keel threads grinding on the hole edge had made the layers of 3D printed material separate and the water was leaking from the hole between the layers of material over to the cut out for the rudder servo. The distance from the hole to the rudder servo cut out is only about a 1/4 inch. That explained why the rudder servo failed first because the leak was showering the rudder servo with water. The rest of the water leaked in during the half hour that the boat was continually doing circles in the lake.



Keel mount hole proximity to rudder servo cut out in radio board

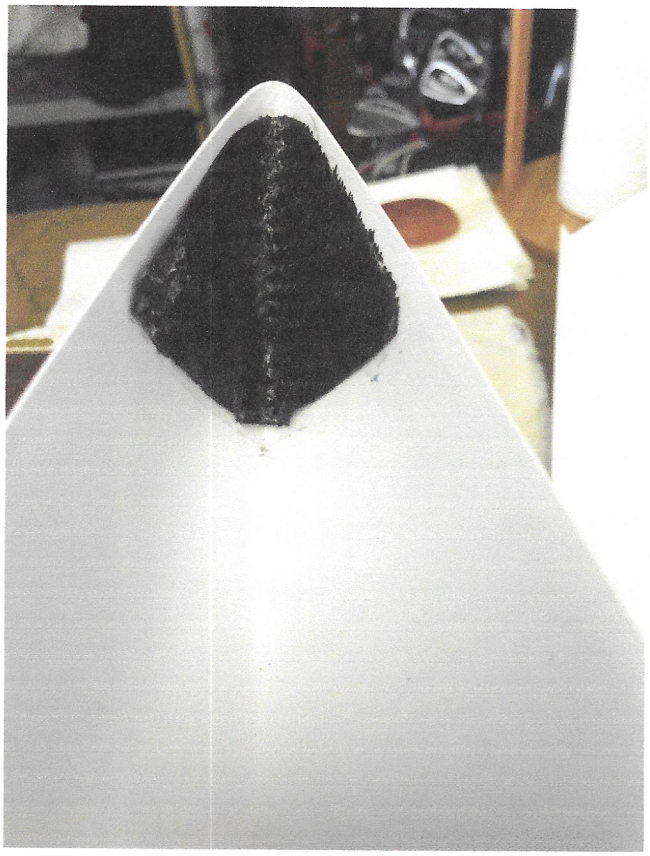
I found a fix for the damage and prevention for the future. Remove the keel, tape over the radio board hole for the keel mount on the inside of the boat. Turn the boat over and fill the hole in the radio board from inside the keel box with liquid CA. Leave the boat overnight until the CA gets good and hard. The very thin liquid CA initially wicks into and rebonds the 3D printed layers. Then the CA cures and dries solid.

After 24 hours, carefully redrill the keel mount hole. Apply some window sealant on the base of the keel stud and insert the keel into the radio board hole. Apply some more window sealant on the first few threads of the stud that protrude through the hole on the inside of the boat. Attach the rubber seal on the stud, then the stainless steel washer and finally screw on and tighten the wing nut. Leave all this to cure overnight. Aside from checking the tightness of the wing nut on the keel stud, leave it alone. Do not remove the keel. This will prevent any leakage from the radio board hole into the boat interior.

Once again, the boat was bone dry inside after racing. This procedure should be done anytime the keel is removed or replaced.

The Bow

I may be the only person I know that had this problem but I protect against it anyway. The first Soling I had was made by VMP. It was not well made and was always leaking out of glue joints that opened up. One day while racing, the boat went into a crowd of boats at a far mark and I lost sight of it. When I could see it again, the boat was missing the first inch and a half of the bow....hull and deck. It was like someone had put it on a band saw and removed the first inch and a half of the boat. I don't know if I hit another boat or another boat hit me. Trying to restore the bow was a continuing nightmare. When it came time to build a new boat, I reinforced the bow. I lined the inside of the bow with glass matte and epoxy or carbon fiber matte and liquid CA before the deck was attached. The glass or carbon fiber matte has to be very flexible to sit down tight against the very 3D profile inside the bow. It is not practical to do this with an existing boat but can be made while building a new boat.



Reinforcement of the bow

I want to thank my wife Margie (English Major and former real sailboat owner) for editing this article and encouraging my venture into RC racing.