



Tech Talk: Fiberglass Repair

by Bill Sangrey

At a Mid-Atlantic Chapter (MAC) Shippensburg, PA Tech Session in 2009, I demonstrated a procedure to repair broken fiberglass pieces such as midyear spare tire tubs. Dave Kitsch's (Tri-State Chapter) Restorer article described how to make a wooden mold to accomplish such repairs. This article and the process I demonstrated in Shippensburg, describe an approach for making the mold directly from the piece you want to repair. This process can be applied to virtually any shape; even complicated ones that would be very difficult to replicate in wood.

First A Few "Tricks of the Trade" Which Are Key to the Process:

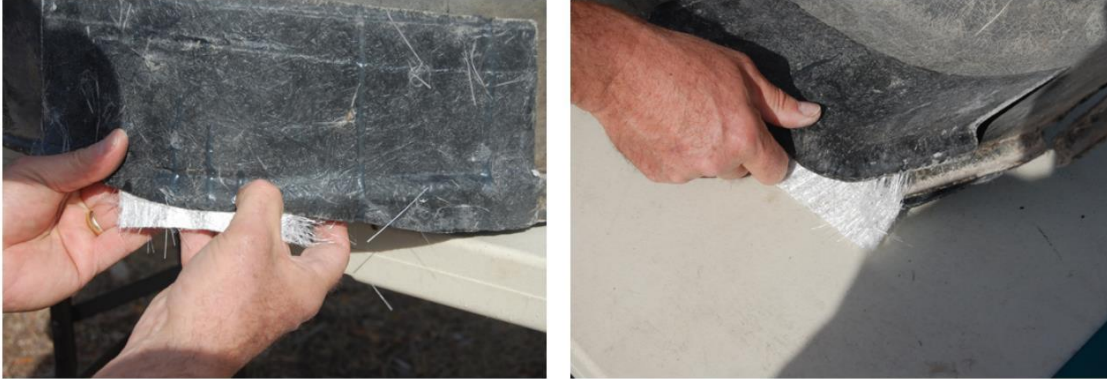
- Apply a mold release compound to the part. Nothing exotic – Maguire's Carnauba wax polish works just fine. You can use the exotic stuff (I have some now thanks to MAC member Frank Pascal, but you really do not need it. Just clean the surface of all grease and general junk, goo, and undercoat (which should not be there anyway – not from the factory).
- Cut up the fiber glass mat. Pull the double layer stuff apart.
- Dye the resin. Dyes are available in stores which sell fiberglass supplies. Not like the run of the mill auto parts store in Carlisle – they do not have the dye. Boat repair places are a better choice. You guys nearer the shore are closer to the source for the dye. I'm using some resin which Scott gave me.



Example of Parts Which Can Be Repaired:

- **Spare tire tubs and trays:** The front edges of these pieces are often (all the time?) banged up. They are at the lowest point right behind the differential and rear spring. Go over anything and they get smacked. The result: that lower edge is usually gone. But not on the sides.
- **Fan Shrouds:** Ever take one out? Hard to do without damaging it given the limited space and rusted bolts in "J" nuts simply clipped to the fiberglass. Maybe you have better luck. Me? I usually break something or find that a previous ham fist'd "mechanic" took it out with brute force – might call the removal process "blunt force trauma".

Late in '08 I had to start thinking about what I was going to do for a tech session in Shippensburg. Then I saw Scottie's legs in one of my car mags. Think it was Muscle Car magazine but I'm not sure and it is not important. Just a brief article but it showed the basic steps Scott uses to repair virtually all fiberglass parts such as tire tubs and fan shrouds. I called Scottie and we agreed to meet in Kissimmee during the January 2008 Winter Regional. He had a repaired tub and one he had to take home to Caledon, Ont. to repair. He explained and demoed the process to me without making the repair (he applied no resin) as I shot photos. I used those photos as a slide show during a February '09 tech session. Then I made a partial repair to a MAC member's broken tire tub.



Enough Prelude – Here Are the Steps:

- Inspect the area needing repair for its unique characteristics particularly the shape.
- Find an undamaged area which is shaped the same as the area needing repair. This will be your “mold creation” site.
- Thoroughly clean both the “to be repaired” and sample or “pattern or mold” areas. Start with soap and water (surprising how important this step is and how frequently we all rush to stronger stuff). Scrape any under coat and grease from both areas. Wash the areas with lacquer thinner. I do not use “Prep Sol”, mineral spirits or any similar solvent since they do evaporate relatively slowly and leave residues which will cause adhesion and contamination problems in both the molds and the repair.
- Remove all loose fiberglass strands and pieces from the damaged area. Grind, file or sand it. Use a face mask and long sleeves and pants. Unless you enjoy being “itchy” and damage to your lungs. To help control the fiberglass dust in my shop I run the shop-vac in the immediate to where I am grinding or sanding the damaged piece. You’ll want to bevel the repair edge rather significantly – more bonding surface for the new fiberglass is better. DO NOT leave a blunt edge for bonding.
- Prepare the fiberglass mat. Use “mat” only – do not use fiberglass cloth. Most fiberglass mat is double layer. Pull it apart. Cut the mat in pieces smaller than the repair area. You’ll be putting several layers of resin-soaked mat down – when making both the mold pieces and the repair itself.
- Polish the “mold” areas (inner and outer) several (3 or 4 times) with your Maguire’s (or other equivalent) wax (or mold release compound if you sprang for that). No need to use a lot of

wax and be sure to remove all excess wax. Also be sure to get wax on the edges of the “mold” area. Do a large enough mold piece to have reasonable coverage of the area you are repairing. But you do not have to make the mold so large as to cover the entire area being repaired. You can make the repair in more than one shot by simply moving the mold pieces to repeat the repair process.

- About the dye. You’ll want to experiment with this to get the color you need. You will need at least two different dye colors in to mix into the resin – black will be your basic color to start. I have no experience in this step as I used resin Scott gave to me.

The “Mold”:

- Make an inner mold and then a separate outer mold – one at a time.
- Lay up the molds with the resin-soaked fiberglass pieces. Use the separated and cut fiberglass pieces as the first layers. No need to use dyed resin when making the mold. Just plain resin here with hardener added is fine. You’ll want at least 4 layers of your cut & soaked fiberglass pieces. Your mold should be between 3/32nds to 1/8th inch thick. You can build thickness with the double thickness fiberglass mat. Be sure to get all bubbles out of the mold piece. Make sure that the resin and fiberglass lay down completely against the surface by dabbing it with the brush you use to spread the resin. You want to be sure of this step to get the right texture from the mold area and not have any voids.
- Once the resin has “set”, grind the “mold” piece to match the edges (e.g. of the tire tub) of the original part. Then, simply pry the mold off. It should just “pop” off. The unimportant edges of the mold will be tapered, thin, rough, and have strands of fiberglass sticking out. You’ll want to trim those rough edges for handling ease. Inspect the surface of the mold for any imperfections. Very minor ones can be repaired with more resin but if major flaws are present, “Do it again”.
- Then do the other side of the mold. You need both inner and outer molds.
- After you have cleaned up the rough edges of your molds, be sure to apply your “mold release” compound to all portions of the mold that may come in contact with fiberglass resin during the repair process. You do not want to make your mold part of the repair; you’ll just wreck the mold and have to do it all over again.



The “Repair”:

- Test fit your molds (inner and outer) to the area you took them from and to the area being repaired. Trim as needed. You’ll want to coat the surface of your original piece surrounding the molds with the “mold release” since the resin of the repair area will run out from under the mold as you complete the repair.
- Coat the roughed up and ground/sanded bonding surfaces of the repair area with the dyed resin, on both sides of the piece being repaired.
- As you did with the mold pieces lay up the cut mat you prepared previously on one side (e.g., the outside) of the repair area.
- Place the appropriate mold against the resin fiberglass (e.g. the outer mold piece). Use tape to hold the mold in place temporarily.
- Then lay up the resin soaked cut mat on the other (e.g., inside) side of the repair area. Be sure you have enough resin-soaked fiberglass to match the thickness of the original piece. You want more than enough. Clamping the mold pieces together will squeeze out the excess. Your objective is to put resin-soaked fiberglass only in the area needing repair. But you do want the resin-soaked fiberglass to extend past the finished edge of the original piece (e.g., the bottom edge of the tire tub. You’ll grind off the excess off as a final step.
- Place the matching (e.g. inner) mold piece in place and squeeze the two mold pieces together with clamps. Be sure the pressure is equal in all areas.
- Let it set. Walk away.
- Unclamp, remove the mold pieces off (hopefully), inspect for and flaws, spot repair as needed, and trim the excess hanging beyond the edge.

I hope this works for you. You may want to first experiment on a piece that is not critical to get a feel for the various steps before you commit to repairing that original part. Thanks to my Canadian friend Scottie Sinclair for showing me how!