

Avanti Fiberglass Repair: Nothing to Fear

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The outside of my Avanti looks pretty nice, but the hood is best left closed. Not until I had pulled my engine out to do some work did I have an opportunity to see the extent of the mess in there. I knew I'd regret the decision if I put all back together without cleaning things up. So I added this project to my list.

Now, before I bought my car, I already knew that the inner fender panel had been damaged in a prior-owner accident of some kind. But now with the engine out and the wiring removed I could finally see how sloppy the patchwork fiberglass repair was. Quick detective work indicated that at some point my Avanti had been involved in a traffic accident. The impact probably occurred directly from the side, at the center of the front left wheel, and breaking the outside of the fender badly enough that its outside skin was surgically and professionally replaced by a body shop.

But the inner fender did not fare so well. The energy of the collision had sent the heavy battery into motion, tearing it away from its moorings on the inner fender and ripping apart the inner fender from the midpoint to the center of the battery tray before things stopped flying. The under-hood repair was sloppy, distorted and obliterated any trace of the body contours. The area had been covered with fiberglass cloth to finish it, and the woven texture of the fabric was visible through the paint. The repair even bulged up in the middle, but probably the prior owner likely didn't complain and may not have even noticed. Perhaps understandably the owner did not want to pay a lot to fix this area that could only be seen with the hood raised, an area that even then was hidden behind the battery, the brake



booster and a bunch of wires. Even more likely, the body shop didn't even ask him if he wanted this area refinished like new, because addressing it properly might have been more trouble than it was worth to them.

But now, with the naked evidence staring at me, I surveyed the damage and wondered what to do. It was too bad to leave alone, but fixing it properly like it would require major surgery that was bound to be very expensive. Two options were

available: replace or repair. Luckily, the inner fender panel is available in reproduction. It costs around \$350 plus shipping, so I knew this was an option for me if I wanted to replace it. Aligning and splicing in the new panel would be a big job, but it would be possible to do. I decided to try to repair the damage

first, figuring I could always replace the entire panel in the end if it didn't work out to my liking. So I got busy.

There are dozens of books and articles written on fiberglass repair for boats and cars. I know because I found that many on the Internet without even looking too hard. You can thank Corvette enthusiasts for the wealth of material in the book store, on-line and in how-to videos on the Internet.



I started poking and pulling at the old repair to see how bad it was. Ouch. You can see in the picture here what my probing revealed... and it was not pretty. Here you can see most of the old repair cut out. I didn't cut it all out from the start, so I would still have something to which I could bond the makeshift forms I made that would shape the new repair. After this photo was taken, I cut more of this area away to remove more of the damage.

With so much of the original area removed, I found that it was difficult to remember or envision the shape of the repair in three dimensions like this. The panel has several angles and creases primarily to add stiffness to the thin fiberglass. I went onto the Internet, and with some searching I was able to find someone else's photo of their Avanti engine compartment empty of engine and freshly painted. I printed this photo and brought it to the garage, taping it to the windshield to use as a helpful reference point.

Now honestly, I hadn't worked with fiberglass in some time, actually since I was 18 and tried to bond a JC Whitney hood scoop to the hood of my hot rod Mustang. The result looked pretty shabby; even my same-age friends had laughed at me. This time I wanted to do it right. I went to YouTube on the internet (www.youtube.com) where people have filmed and posted nearly anything you can imagine of a how-to nature. I searched on "Fiberglass repair" and was able to watch several short videos of people using fiberglass to repair cars and boats. If you have never explored YouTube because you thought it was for silly stuff or just for kids, I urge you to go there and type in an automotive repair topic and see what you can find. The most helpful advice I gained was not to attempt to do all the surfaces at once. There is no reason to make life difficult, and if need be, the surface can be reconstructed one flat surface at a time. Fiberglass is a very forgiving material to work with, and new fiberglass sticks perfectly well to old fiberglass so long as it is clean.

I bought a gallon of resin and clear hardener at Home Depot, and ample fiberglass mat (not cloth) to cover the area with at least three layers. I also bought a bunch of cheap disposable 2" wide paint brushes, and a box of disposable latex gloves. You do not want to get this stuff on your hands, and cleanup is a breeze when all your mixing and application tools are disposable.

To ensure that my repair would stick, I used my small grinder attached to my compressor to remove any trace of undercoating from the back and scuff the surface at least three inches all the way around the edges. Fiberglass will not stick to very smooth or to oily surfaces, so this step is important. Always wear a long sleeved shirt, gloves and both eye and breathing protection when grinding this material. It can't be good for your lungs, and boy does it itch if you get the dust on your exposed skin. An experienced body man warned me to take a cool shower (not hot) after grinding the stuff, and be sure to wash the clothes in a separate load to avoid getting the itchy fibers in anything else, like your family's underwear.



The key is to work from the back, creating a mold on **top** of the damaged area and working to lay up the new fiberglass from the inside of the inside of the fender. I started with one single large flat surface, and created a mold using cardboard from a shoebox and used sheet metal screws to hold it in place.



I sandwiched a piece of clear plastic (from a file folder) between the cardboard and the fender to act as a smooth surface to build the repair against, one that would easily "release" from the resin once it had cured. Mixing a small quantity of resin and a few drops of hardener in a paper cup (don't use Styrofoam as it will dissolve the cup) I brushed it gently onto one side of the mat, from the center moving outwards. The point is to saturate the mat without either crumpling it up or causing it to shred apart.

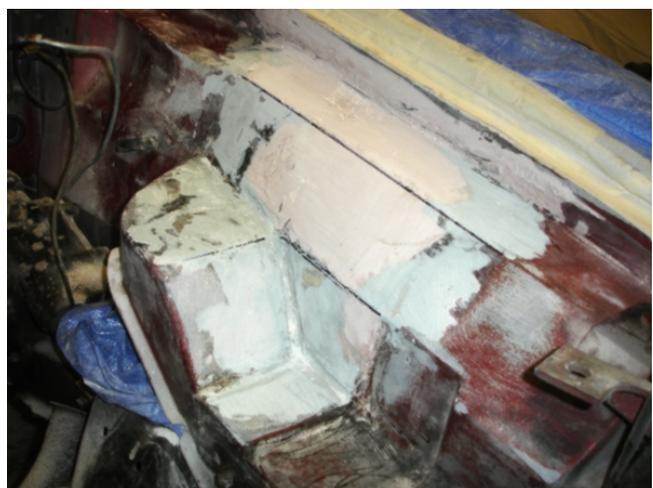
Applying the first layer from underneath is the most difficult, since we are working against gravity. Don't worry too much about neatness or getting it perfect: We are working from the back, and our goal is to get as much of the mat stuck to the face of the mold as possible. I used a clean stick to push the saturated mat into the corners the best I could. Once it has stuck I left it alone! I learned that too much poking and smoothing causes the sticky and saturated mat to want to come right back off and stick to my gloves rather than the smooth plastic surface of the mold. And once that starts happening it is next to impossible to spread it back out and get it re-stuck to the mold surface again, causing swearing, and for us to have to start over with a new piece of mat.

For the first layer I found that I needed to cut an additional piece of shoebox cardboard and plastic to use as a backer, screwing it over top of the wet repair from the inside of the fender to hold the wet mat in place.

(Top photo) Here is how the repair looked after two surfaces had been completed with a single layer each and the cardboard forms removed. Pretty rough, and from the back it looked like hell, but I was pleased at how smooth the exposed surface was when the release plastic was pulled away. I now had real hope that this was going to work!

One by one I created the original surfaces and creases, layering them from the back just like the first. Once the basic shape was in place work became much easier. Finished this part of the job by going back and covering the entire surface from the back with three layers of mat and resin. In between layers I used my little grinder to knock down any obviously high or misshapen lumps on the back of the repair, inside the wheel well. Each layer of cloth bonded to the old beautifully, and when dry it looked like one thick surface that sounded very solid when one knocked on it with a fist.

Using a high quality two-part plastic body filler (often called by its old name "Bondo") I



smoothed a thin layer over both the front and the back of the repair. It truly did not require much. The Bondo is not structural; here, it is only being used to fill the low spots.

Once it has begun to cure, knock down the high spots with a long coarse file. To make your work easier Don't wait until it has hardened completely to start this step; it is best performed within twenty minutes of application when it is still soft and grates off like parmesan cheese. If you wait too long it becomes harder to sand off. Again, always wear a dust mask when doing this type of work.

You can see that I have drawn lines with a straight edge and a black Sharpie pen along the creases and body lines. Using a sanding block, I sand diagonally towards the lines, stopping just short of the line. The goal is to create properly shaped surfaces with crisp defined edges.

When you are satisfied that you are "Close" to the proper shape and smoothness, coat the entire repair area with a mist of dark spray paint. Then using the longest sanding block you have (even a block of wood works) lightly sand the surfaces until the dark paint comes back off. You will be left with something that looks like the photo below. High spots will appear white, low spots are dark. Using a final thin skim coat of body filler address the low spots and repeat this exercise until you are satisfied.

Finally, sand the area with progressively finer paper. I went from 80 grit to 100 to 200 and was satisfied. In fact, I found that my repair area looked noticeably smoother than the factory original areas. Spray the entire area with primer-filler and sand the entire area smooth before applying the final coat of paint.

My Avanti is a relatively early model, and later versions added a stiffening brace under the battery bonded inside the wheel well. I ordered this part from Studebaker International, and returning to the back of the panel, inside the wheel well, I smoothed the area with my grinding wheel. This surface will be hidden with wrinkle undercoat.

I bonded and riveted it in place, using an acrylic construction bonding product (like "liquid nails") in the paint aisle at Home Depot, and used extra-long





headed rivets that are appropriate for joining two thicknesses of fiberglass together. This brace is much needed to stiffen the battery box, and since it also keeps the panel from flexing when the hood is opened to its limits.



All that remains is to paint the area. As we know, the Avanti's inner fender aprons are painted with body color paint, and this may prove vexing as finding a satisfactory match in a rattle can is unlikely. I have a compressor and a paint gun, but if you don't and can get a friend to help, this is a perfect place to practice your painting technique, in a place nearly hidden from sight. I removed the gas filler door (not an easy job, I found, requiring smaller hands than I possess) and brought it to my friendly auto paint dealer to have him mix me a quart of single stage urethane to spray the area. Two things are surprising about buying auto paint. One is the cost (the quart of paint and its associated hardener and thinner) cost be \$74; and the difficulty in finding a professional shop who will sell it to you. Federal regulations and insurance rules have apparently gotten tougher on these guys, and some may be unwilling to sell paint to a hobbyist. You may need to ask your friendly body shop to buy it for you.

Here is the inside fender freshly painted. With the addition of the stiffening brace the repair is stronger than new. I am happy with my work, even if I have to pop the hood to see it.



Degree of difficulty: 6 out of 10, only because it is rather messy and requires many steps it to get it all done. No one step is very difficult, however, and this can be attempted by a beginner.

Time to repair: lots of small steps with time in between for things to dry and cure. Total elapsed time two weeks of an hour spent here and there.

Total cost: Approximately \$150, of which half is the finish coat of paint.

Special tools: compressor and paint gun are the hardest to get around, most of the other body tools like files and sanding blocks are inexpensive. If you don't want to buy good ones you can use scraps of wood for sanding blocks.