GLASSWORK

Repairing and Restoring Fiberglass Sports Cars

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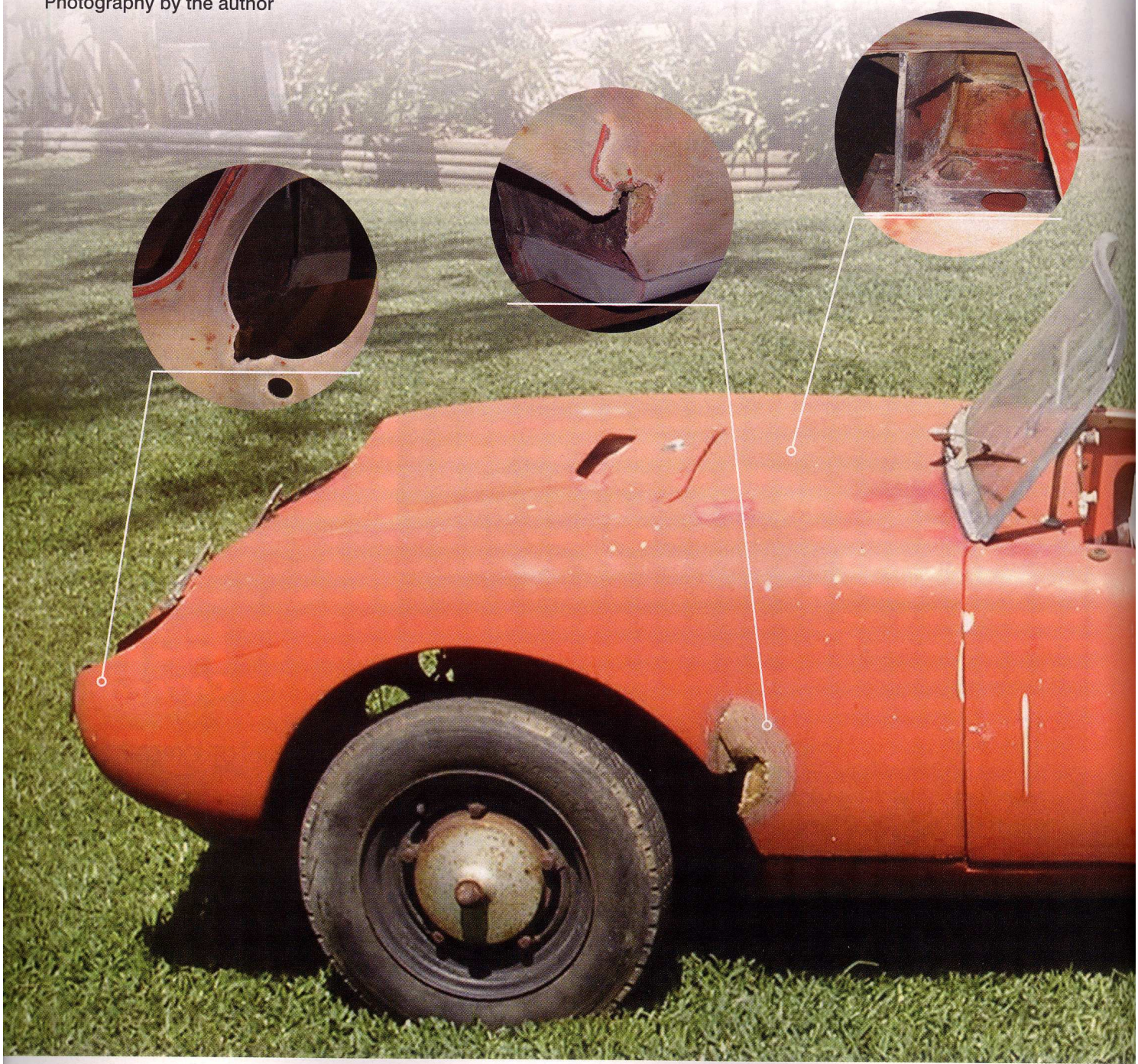
Photography by the author



It lurks in the darkness, creeping around corners and hiding in crevices, threatening to eat your classic alive and bleed your wallet dry. In our hobby, rust is the stuff of nightmares. However, some of our favorite machines—including the Lotus, Corvette and TVR—have been able to sleep a little more soundly. How? They're made of fiberglass.

When it comes to car construction, fiberglass has many advantages. Aside from being rustproof, this composite material is lightweight and well suited to small production runs. It can also be molded and formed in ways that steel just can't match.

While fiberglass itself is safe from road cancer, fiberglass-bodied cars are not immune to problems. Older bodies can be riddled with star cracks, accident damage and nicks. Old, unpainted bodies that have been left out in the sun can lose all or part of their gelcoat. Luckily, these issues can be fixed at home, and the material is easy to shape. We admit that the process can be messy, but unlike traditional metalwork, restoring fiberglass can be much less time-consuming.

Understanding What You Have

Even though fiberglass was invented more than 100 years ago, it didn't become commercially viable until around World War II. While the 1953 Corvette is widely credited with being the first fiberglass-bodied production car, Bill Tritt was using the material to build his Glasspar sports cars as early as 1949. Fiberglass helped give rise to a new industry of limited-production sports cars. Through the '50s and '60s, companies like Berkeley, TVR, Elva, Ginetta and others used fiberglass bodies to turn their dreams into reality.

So, how exactly are these kinds of bodies constructed? Where traditional metal car bodies are created by beating or pressing sheets of steel into a desired shape, fiberglass is more of an arts and crafts project.

The process usually starts by forming a buck into the desired shape of the final product. A mold is then taken from the buck. After the mold is coated with a release agent, a smooth, thick, paint-like layer called gelcoat is applied.

While fiberglass doesn't rust, it's not immune to the effects of aging. Chips, cracks and tears had taken their toll on our Berkeley's little body. Fortunately, the repair work is fairly straightforward.

ABOVE: The work starts with the removal of the old paint and gelcoat; a dual-action sander works well on the exterior surfaces. **RIGHT:** We used an Eastwood Soda blaster for the hidden areas. The soda blaster quickly strips the old topcoat, though it can leave a less-than-smooth finish.

Layers of fiberglass mat and resin are then laid over the gelcoat. This process can be done by hand or with something called a chopper gun. The chopper gun uses compressed air to spray a mix of chopped-up fiberglass mat and resin.

While the fiberglass can yield a slippery shape, it often lacks strength. Most of the time, additional reinforcements are required. Wood or metal is commonly used to bolster high-stress areas like body fastening points. Unfortunately, metal reinforcements are not immune to rusting, and wood can rot.

From the Top

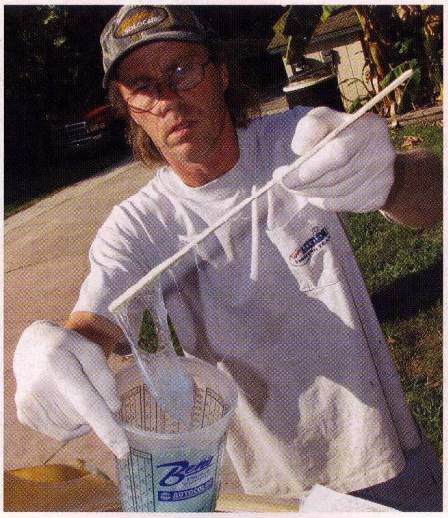
We recently restored a 1959 Berkeley microcar body that exhibited just about every kind of fiberglass problem known to humankind. From star cracks and extra holes drilled for no apparent reason to accident damage and rusted mounting plates, this project had it all. While these various issues require slightly different repairs, they all follow the same basic procedure.

Tim Manders, co-owner of The Body Werks, a high-end auto body shop in Holly Hill, Florida, helped with the project. Tim has been a fiberglass specialist for more than 30 years and has seen just about every kind of horror and injustice levied upon old fiberglass bodies.

As expected, our Berkeley's gelcoat was trashed. The only thing to do in this situation was remove the gelcoat entirely and get back to the raw fiberglass body.

While fairly straightforward, removing the gelcoat must be done carefully. We slowly and methodically sanded our entire car with 80-grit dry paper on a dual-action sander. This process takes less time than you might think, especially on a small car like a Berkeley.

From there, we used an Eastwood soda blaster to clean the wheel wells and and mounting ears. While a soda blaster can make quick work of



FAR LEFT: There's no hard-and-fast rule on how the fiberglass mat is used. It can be applied as strips or cut to fit into little holes and crevices. **NEAR LEFT:** The fiberglass mat has no strength until it's mixed with the resin and activator.

LEFT: Fiberglass is easy to cut. Damaged or unneeded sections can be quickly removed with an air-powered cutoff wheel.

removing old gelcoat, don't use one on the outside body panels. If not done very, very carefully, this method can be too aggressive for exterior panels.

Cut Out the Bad

Now we could attack the actual damage. Just like metalwork, the damaged areas of fiberglass bodies must be removed before the repair can be made.

We simply cut away any loose or fragmented bodywork, while the holes and star cracks were drilled out to reveal good material. A tapered grinding stone works well for fixing holes, as it leaves clean fiberglass.

To repair the rusted metal mounting plates, we first cut out the offending area. A cutting wheel or saber saw works well here, while a soda blaster can serve as a great cleaning tool. Before mixing up fiberglass for the repair, we fabricated and then painted a new plate.

Blend in the New

Making fiberglass is a three-part process, and the first two steps include whipping up some resin in addition to the fiberglass itself. The fiberglass material is made up of tiny strands of spun glass and has no strength without the resin. The resin is also very brittle until mixed

ABOVE LEFT: The replacement fiberglass needs to be shaped using some sort of form; aluminum ducting tape makes a great temporary mold for repairing small missing areas. Wooden paint sticks can also be used. **ABOVE RIGHT:** Once the mixed fiberglass is placed, remove the excess bubbles and resin with a squeegee. **LEFT:** Go in with a plan of attack. Since the resin will harden once mixed, it's easier to prepare multiple patches ahead of time and fix several problems at once.

What About Epoxy?

During the last 20 years, a lot of epoxies have been released with the intent of replacing fiberglass. Most industries—including the surfboard industry—have given these new materials a try, but they've usually gone back to simple, old-fashioned fiberglass.

While we have successfully made some small repairs with epoxies, these products usually don't hold up well in UV light. They also tend to get wonky with some types of paints. If you do face some minor repairs and want to try epoxies, Tim Manders of The Body Werks recommends a product from West System (westsystem.com).

There's one more thing to consider regarding epoxies: You can easily apply epoxy over traditional fiberglass, but the polyester resin used to make fiberglass cannot go over epoxy. As Tim explains, it doesn't adhere well and can make a heck of a mess.

Shop Smart

Just about every auto body repair store sells fiberglass repair materials, but Tim Manders recommends shopping at a real boat repair outlet. "You'll get the good stuff there," he notes. He recommends the Silmar brand, noting that the cheaper resins have inconsistent cure times that can make the job a nightmare, especially for novices.

Sources

The Body Werks
(386) 672-2125
Bodywork

Eastwood Company
(800) 343-9353
www.eastwoodco.com
Restoration supplies

Interplastic Corporation
(800) 736-5497
www.interplastic.com
Silmar fiberglass

ABOVE AND RIGHT: Repairing a large area? A top layer of tightly woven fiberglass cloth provides strength and a consistent surface texture. **LOWER RIGHT:** You're also allowed to modify techniques for specific needs. Since the channel behind the seats was doing little more than trapping dirt, we filled it in using a mixture of resin and chopped fiberglass. A paintbrush served as the perfect tool.

with the fiberglass mat. Together, they make one of the best repair materials ever invented.

An activator is the last material needed to make fiberglass; it's used to harden the resin. The weather will dictate the exact type and amount of activator needed, as the stuff is very much heat-dependent. Best results are achieved on days when the temperature is between 60 and 80 degrees Fahrenheit.

The next step is to prepare the body for the repair. Rough up the fiberglass that surrounds the repair and figure out your plan of attack—you'll most likely need to create some sort of a form or mold to support the fiberglass while it dries.

If it's a small hole, simply plug the backside with tape. Tim recommends metallic air conditioning repair tape, as standard duct tape will bleed into the repair and make a mess. For larger holes, cardboard can be used to shore up the repair.

Tim showed us some more advanced methods, such as forming body channels from wooden paint sticks. These methods are all rather makeshift, as the remains of the sticks, tape and cardboard can be ground away once the fiberglass is dry.

Depending on how the resin and actuator are mixed, you should have 15 to 30 minutes of shaping time. Once this time is up, the resin will begin to harden and you will no longer be able to work with it. In other words, you need to be prepared to make several repairs at once. Do your taping and molding in advance and then work on multiple repairs until the resin hardens.

Filling and Patching

The actual fiberglass comes in a variety of thicknesses and types, each suitable for different kinds of repairs. Fiberglass mat works well on

small areas, including channels and places where you need to bend the stuff around a bit. Fiberglass cloth is great for larger repairs and places that require more strength. We used middle-of-the-road No. 8 mat on the Berkeley.

Multiple layers of fiberglass mat will be needed for most repairs, so we started the process by laying several pieces of resin-soaked mat on some cardboard. We then applied the pieces to the body to fill in the damage.

Obviously, the goal is to roughly match the body's original thickness. Don't be too paranoid about this, though: If you make the repair too thick, you can easily grind back the fiberglass; if you make the repair a little too thin, you can add filler later.

As the mats are laid upon the body, press them into place with a cheap, resin-filled paint brush. The idea is to get the mat totally soaked

Molding in New Pieces

Need to replace a significant chunk of your vehicle's body, but don't have a parts car? You can still get the work done quite easily with fiberglass, although you will need to find a brave donor with the same make and model of car. This vehicle will serve as the buck for a new mold. While the process might sound a bit scary, you can usually make a plaster of paris mold without any damage to the donor car.

Many years back, we had a TVR Griffith whose rear fenders had been hacked out to fit large drag slicks. We found a fellow club member with the same car and made a mold off of his car's rear wheel wells.

We carefully taped up his wheel wells and then poured plaster of paris over the area. We added window screen and chicken wire to keep the mold from breaking upon removal.

Once we had a mold, we wiped in the release agent—any paste car wax will work. We then sprayed in some gelcoat and laid up some glass. Once everything dried, we had two perfect copies of a Griffith's wheel wells that we then glassed into place on our car.

in resin while also removing any air bubbles. A plastic filler spreader is useful for removing air bubbles from larger strips of cloth.

Once the repairs are dry and you are satisfied with the results, you can grind down the rough edges. At that point, you can go back and fill in any mistakes. Tim also likes to go over a larger repair area with cloth and more resin to build up strength.

This basic process can be slightly modified for specific repairs. For example, we cut up little strands of mat and mixed them directly with resin to fill in an unneeded channel. For minor repairs, we simply cut the mat into small squares and gooped them up with resin.

The process for piecing in a patch panel—like a quarter panel or part of a fender—isn't too different, assuming you have access to a good donor. First, cut the repair panel from the parts car. Then, cut the same area from the vehicle that's being restored.

The edges surrounding the repair must then be tapered. This step allows fresh materials to be placed between the two pieces, thus strengthening the repair. Clamp or tape the repair piece to the body and then fiberglass it in place.

Gary Hunter photo

ABOVE: Finally, a fresh gelcoat gives the fiberglass a smooth, even finish. Gelcoat is thick, so it's a little rough on the spray gun. Ideally you'd have a separate gun for spraying gelcoat, but in a pinch it can be thinned with acetone.

Applying the Gelcoat

Gelcoat is applied like paint or primer. The stuff is thicker than paint and requires a special gun, but any home enthusiast with access to compressed air and painting equipment should be able to gelcoat a body.

Here's a trick for applying gelcoat: Use a larger-than-normal tip for the gun and thin the gelcoat with acetone. This will encourage the gelcoat to move through your spray gun. Obviously, you should also use a mask, follow local ordinances, and safely dispose of any unused materials.

Clean Up and Wrap Up

While it's not difficult, working with fiberglass is very messy. You will need to wear rubber gloves, protect your work area with a drop cloth or old newspaper, and keep the stuff out of your eyes. Grinding fiberglass will also make you itch like crazy, so wear long sleeves, protect your skin, and don't breathe in fiberglass dust. Acetone, while harsh, will remove fiberglass resin from skin.

Once the fiberglass work is done, finishing the repair follows conventional methods. The gelcoat can then be filled, sanded and painted. Congratulations, mission accomplished. GM