

REPAIRING MAJOR PLASTIC DAMAGE WITHOUT MOLDS

Crash damaged body work, Triumph Trophy 1200



These are the damaged parts, removed from the wreck.

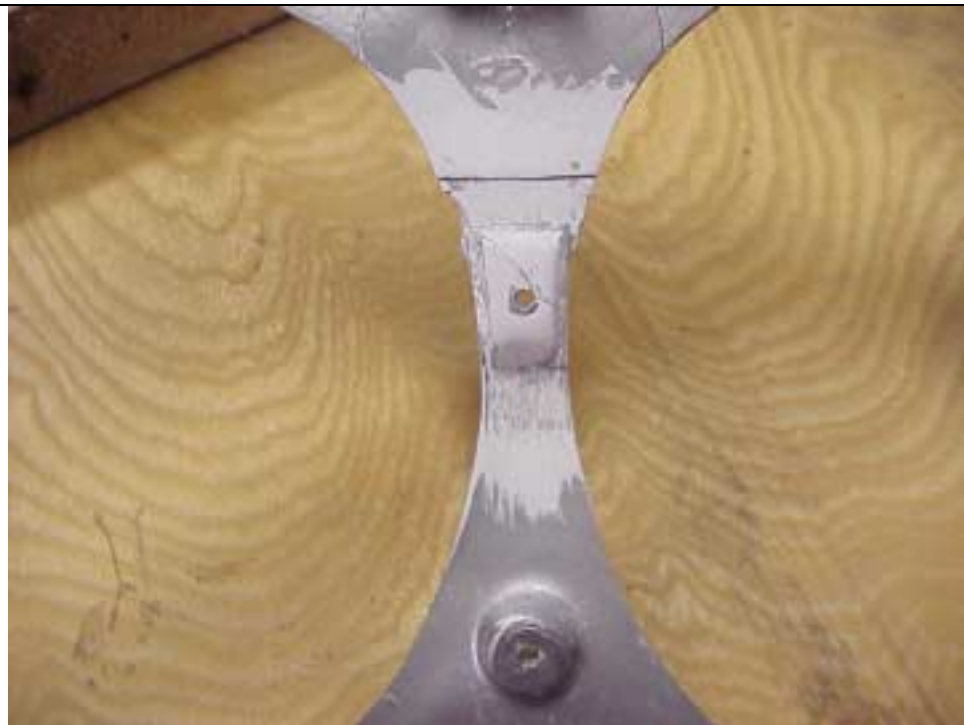
In addition to missing sections of plastic, internal mounting tabs are broken at most attachment points.

Broken tabs are reattached using long strands of fiberglass, as shown in my “How to repair broken fairing or side panel pins”.



Inside surfaces must be sanded with 120 grit sandpaper, to remove paint and provide a good grip for epoxy resin/glue.

I’ve used a pair of Vise Grips to hold correct alignment at the headlight flange.



Between the headlights, this support bar is broken in two.

With the headlamp flange clamped, this part can be glued, and reinforced.

All repairs must be made using epoxy glues and resins. Polyester resin (fiberglass resin) has poor holding characteristics and shrinks pretty dramatically as it cures. This shrinkage will pull your part out of shape.



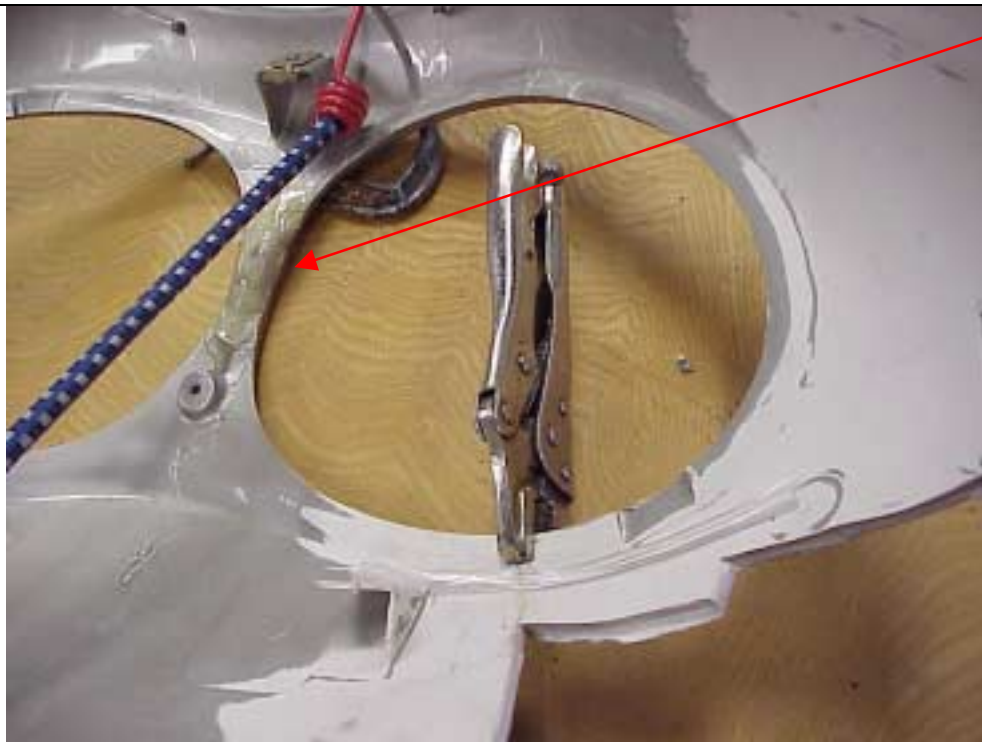
These are the fiberglass materials used for the repair.

On the left is 1" fiberglass tape, useful for rebuilding flanges or straight edges.

In the tray is $\frac{3}{4}$ ounce fiberglass cloth. This lightweight cloth is easy to mold, and wets out well with epoxy glues and resins.

On the right is 24 ounce cloth. I use this for heavy backing. Additionally, I pull long strands and cut them into pieces for reinforcing crack repairs.

NOTE: Never use "woven roving mat" with epoxy resins. The mat contains a binder (to keep it stiff before working) that only dissolves in polyester resin.



Look closely at the divider bar. I repaired it by placing many strands, of 24 ounce, lengthwise over (and beside) the crack.

Use "30 Minute" epoxy glue, and small wooden sticks to place the glue and the strands.

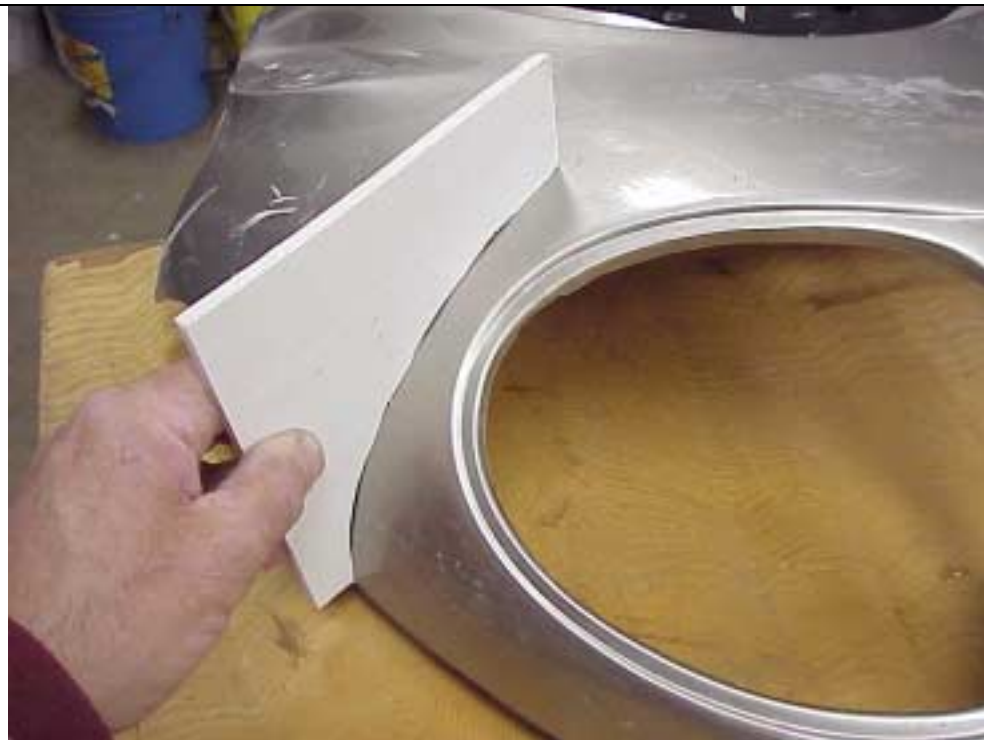
This repair is much stronger than the original part.

Note also, the crack at the headlamp flange was glued, prior to clamping. Now I'll build strands of 24 ounce across this crack.



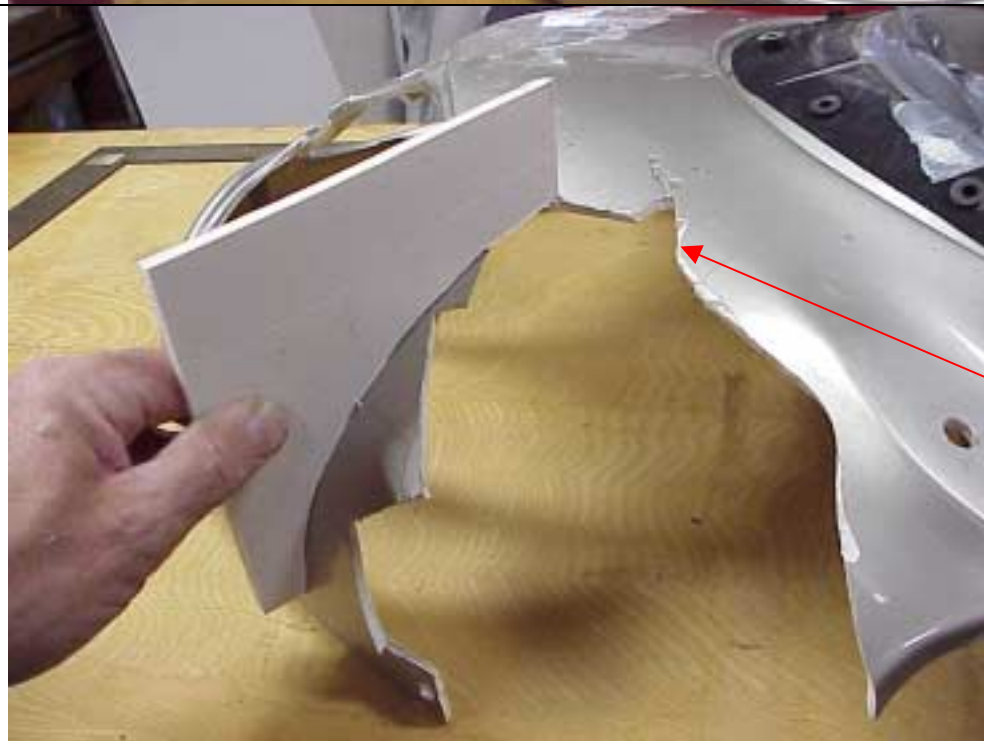
With the headlamp area stabilized, I leached "30 Minute" epoxy into other cracks. Use a heat gun to thin the epoxy, after it is applied.

Do not try this method with "5 Minute" or "fast set" epoxy.



In order to build a temporary external mold, it's necessary to duplicate shapes.

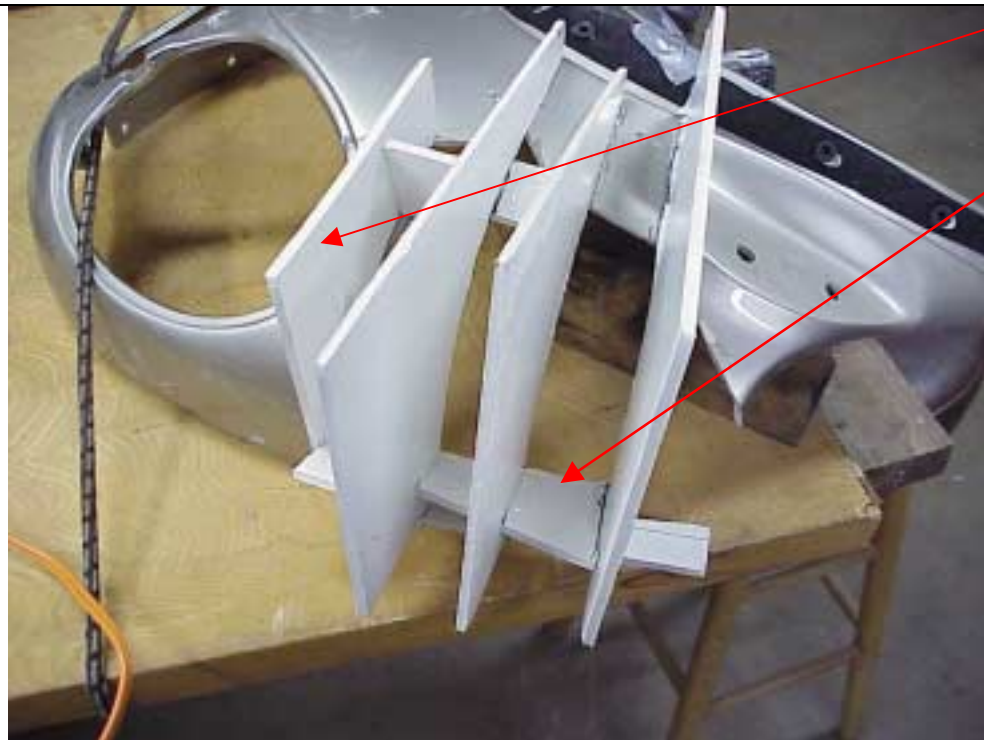
Use the less damaged side to make patterns from 1/4 " foam board. Scribe the shape with a compass, then cut out using a razor knife.



Begin the external mold by hot gluing each rib, on the damaged side. Be sure to flip your rib 180° when gluing it in place.

You can save yourself some work, by avoiding a mistake I made. Put duct tape around the edges of the broken area, sticky side in, with about 1/4-1/2" extending into the opening. You'll see this method a few pages on.

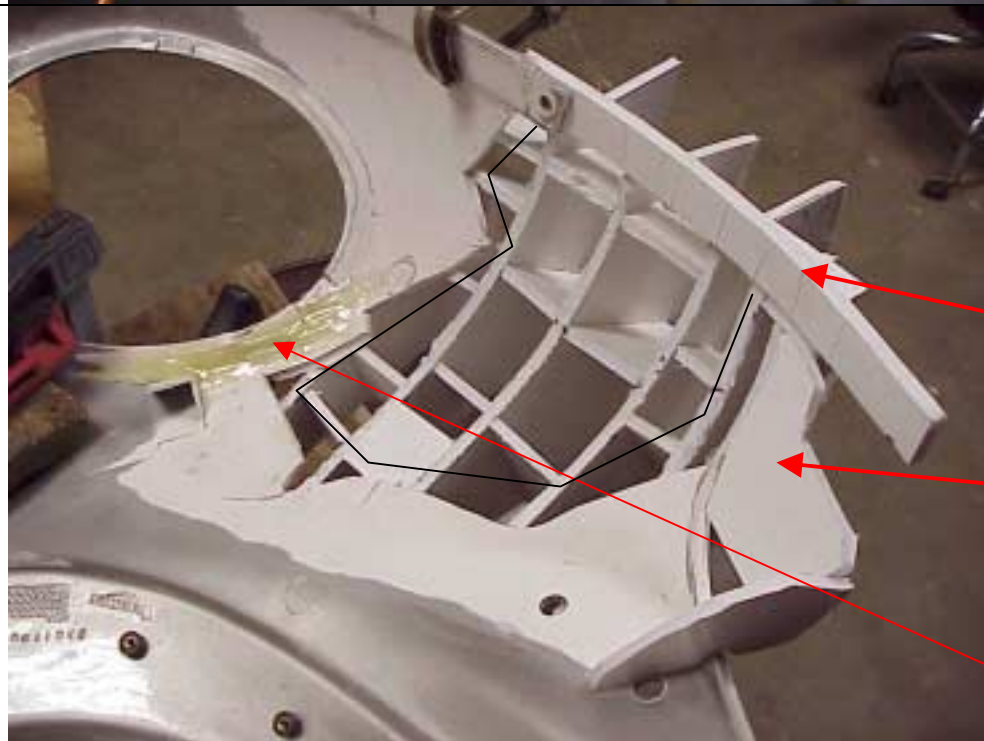
This technique will reduce the sanding, after removing the external mold (makes a prettier edge, also).



Continue the external mold build-up by shaping and cutting additional ribs.

Cut spacers, curved to match the other side, to stabilize the ribs.

Save the pieces you cut out, they can be used for patterns to make finish measuring templates.



Here's an inside view of the fully built external mold frame. Black line shows where outside duct tape should end (epoxy comes loose from the glue side with no problem.)

This curved piece will provide a positive location for the lower mounting flange.

I used a piece of foam board, cut to a curve and anchored with a brace, to form the rear edge mold.

Note the 24 ounce long strand crack repair.



Line the inside of the external frame with masking tape, or duct tape, and waxed paper. Use many layers of masking tape, to provide sufficient stiffness.

The epoxy resin will release from the glue side of tape.

This photo shows the first two layers of $\frac{3}{4}$ ounce cloth, laid up with epoxy resin.

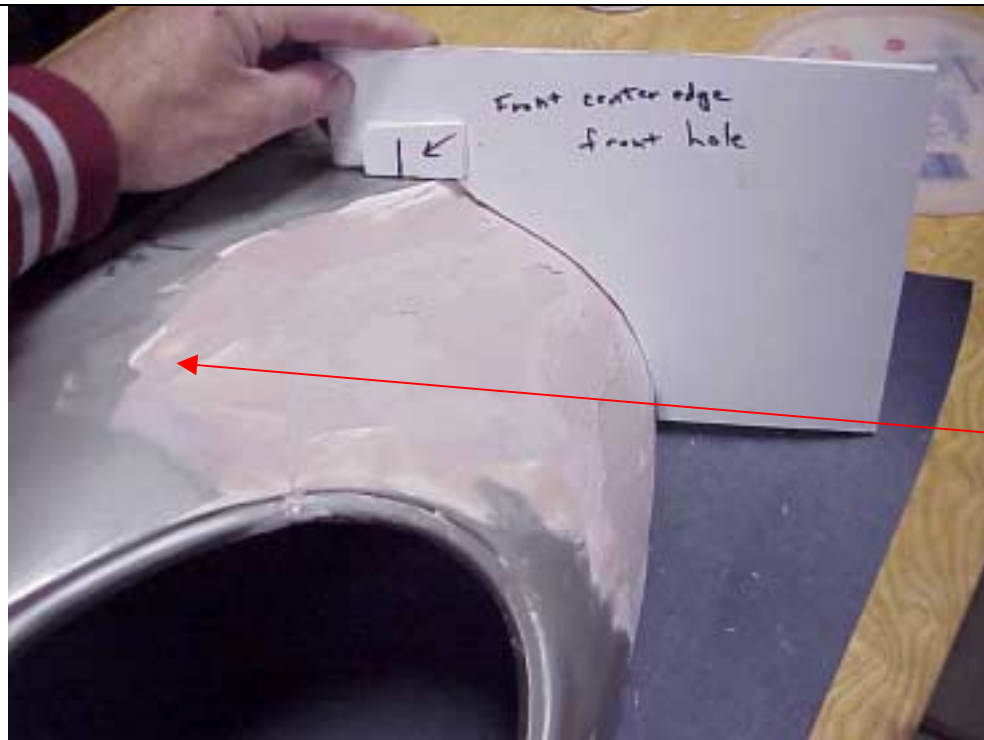


I added a layer of 24 ounce cloth, then four more layers of $\frac{3}{4}$ ounce cloth.

With the resin fully cured, the external mold can be removed and wax paper pulled away. The wrinkled finish is caused by the wax paper, which cannot stretch into a compound curve.

Note that I used enough masking tape to keep the epoxy/fiberglass below final finish level. This is important because:

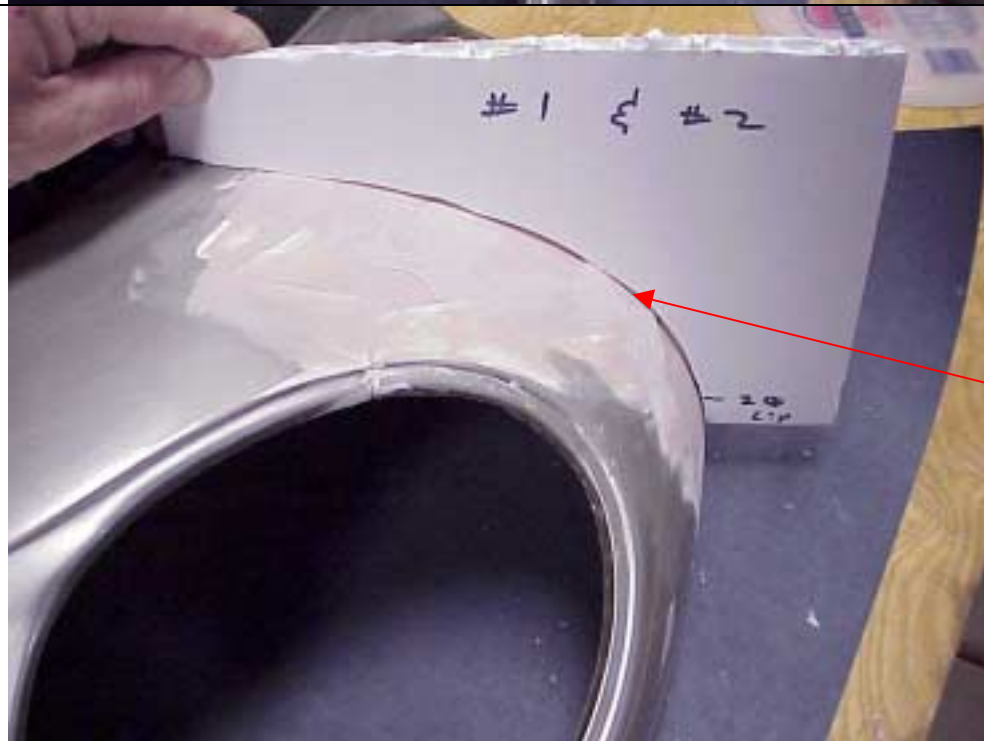
1. Epoxy is hard to sand down (much harder than body putty).
2. Paint sticks better to body putty.



I made new patterns, copied from the right side, to check build level of the body putty.

Each pattern must have locating marks, and position points measured, to duplicate right and left shape.

Note the wider areas of putty, in areas that had cracks. These cracks were “V’ed” out (using a round ball bit, on a Moto-Tool) to get sufficient bond. This method prevents putty popping loose due to insufficient contact area.



Here’s another pattern, copied from the right side. This one works for two areas, depending on how the marks are positioned.

Use a Sure-Form file, before the putty is completely hard, to rough in the shape.

Try to get an area “at height” to served as guide for additional applications of putty.



A “Sure Form” file works best for removing high spots, while the putty is still semi-flexible. When the putty can be peeled off your mixing plate, it’s ready to be worked with this file.



After rough sanding with 120 grit wet-or-dry (wet sand), I applied several coats of Spot Filler Primer.

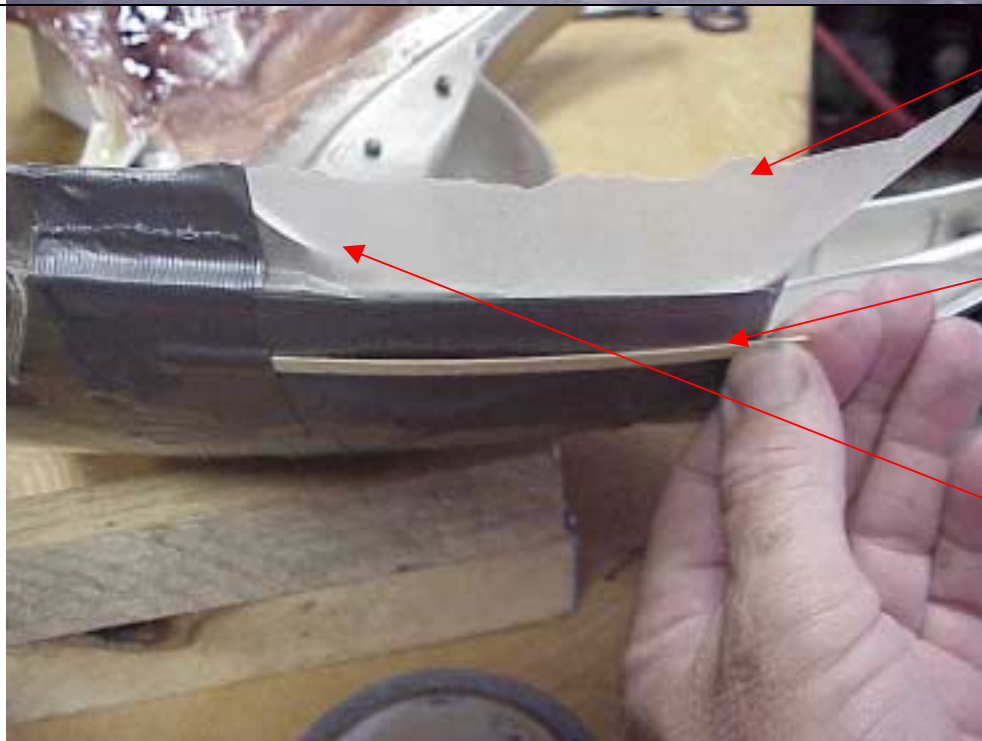
This paint fills the porosity in the body putty, and is easily sanded.

The repair is now fully faired, and fits the side panel perfectly.



Here is the repair, spot fill primed, on the right side of the upper fairing. This area was much easier to repair, using multiple layers of duct tape to “form” the outside shape.

I used fiberglass cloth with epoxy resin, cutting small sections of 1” fiberglass tape to build the lower flange.

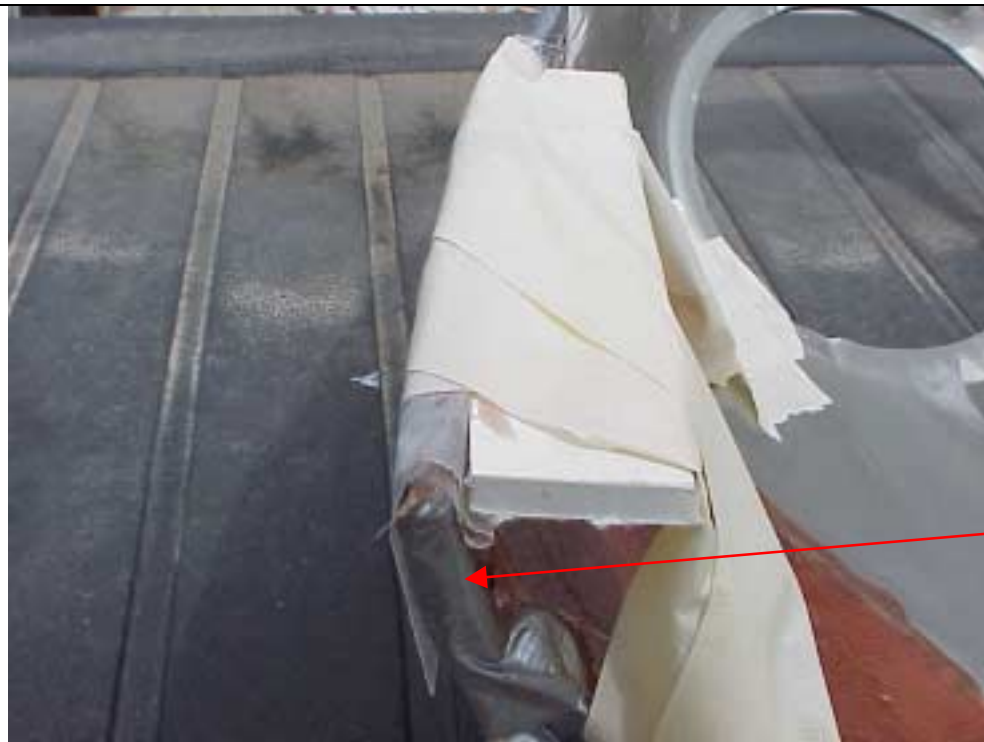


To repair smaller areas, place waxed paper over the outside surface, slightly larger than the hole.

Tape the waxed paper in place with duct tape. Use small wooden sticks or cardboard to put the right curve into your mold.

I'll use a piece of 1/4 " foam board, against the waxed paper, to mold the flange.

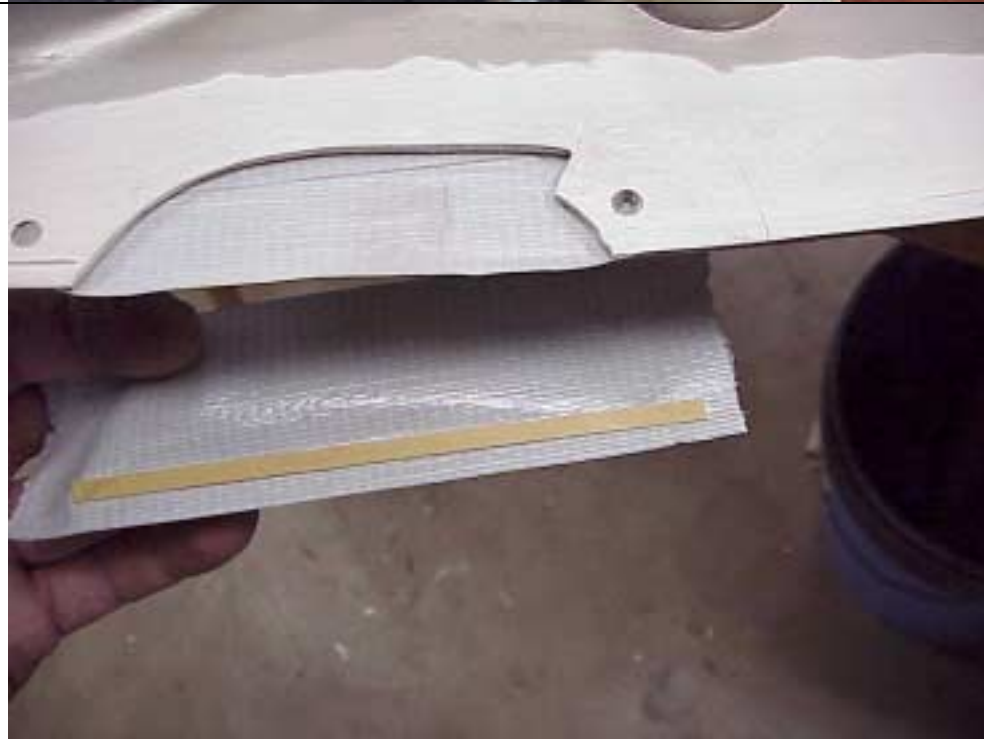
Lay up the inside with fiberglass cloth and epoxy.



After laying up the fiberglass, I folded more waxed paper over the flange area.

Use a piece of foam board, shaped to match the curve, taped against the waxed paper. This holds the flange area in correct position, during cure.

Here is the piece of foam board used to make the flange offset. The end is covered with duct tape, holding it in position.



One fairing side panel had a piece broken out of the upper edge. Using many layers of duct tape for support, I molded fiberglass into this area.

Use wooden sticks, or coffee stir sticks, to form a straight edge.

These small repairs are quick and easy. If you have any original parts, mount them with the duct tape, then build with epoxy and fiberglass cloth.