

G. R. P. REPAIRS - THE CORRECT WAY

by Andy Argyle of Berkeley Cars

A FEW LINES OF HELP and advice which may be of some use to owners of Berkeleys or for that matter any G.R.P. bodied special, who are starting out on their first restoration and/or rebuild etc.

STAR CRACKING (Crazing)

Star Cracking or crazing can occur for a variety of reasons and the most common are

- A. Impact damage
- B. Flexing on and around stress points
- C. Mould release damage.

There is, unfortunately, no quick and easy remedy for repairing Star Crazing. Simply grinding away large areas of cracked bodywork and applying large amounts of body filler or re-gelcoating will not usually cure the problem. Without identifying the cause of the cracking, this will only result in time and effort being wasted, and usually the cracks reappearing, soon after the car is back on the road — which can be quite demoralising, especially if the car has just been resprayed.

SO HOW CAN YOU PREVENT IT FROM RETURNING?

Well, the only sure way is to replace the affected panel or area with either a new or serviceable second-hand section. Areas which tend to suffer most in Berkeleys are around the bonnet and door hinge location points, suspension tops, scuttle, and around the rear suspension area. In cases where it is impractical to remove small sections of the body, then reinforcement of the underneath of the stressed areas will need to be done before repairing the star cracks. Fibreglass can be very dangerous, so there are precautions to take. Always wear a respirator and eye protection when sanding G.R.P. fibres.

PREPARING THE AREAS FOR REINFORCEMENT

- 1. Identify the perimeter of the area to be worked upon. Decide at this point whether it is to be cut out or repaired. If a new panel or section is required, the following steps will not be necessary as all of our Berkeley panels and sections come already reinforced in the required areas.
- 2. Clean up and de-grease thoroughly the area to be worked upon. I cannot stress enough the importance of the G.R.P. being contaminate free.
- 3. Rough up and key the area to be worked upon.
- 4. Reinforcement needs to be applied over a large part of the affected panel and not just to the local area of crack damage. Applying reinforcement to just a localised portion of cracking will not be sufficient to strengthen and stop the crazing. If possible, reinforce up to and around inner panels, bulkheads etc. on

the front and rear body mouldings. On the Berkeley three wheeler rear section it will be necessary to gain access through the seat and side holes. Usually between two to four layers of 2oz. chopped strand mat (C.S.M.) will be sufficient.

5. On large areas of crazing it may be easier to grind away the top surface to a depth suitable for one layer of G.R.P. tissue, which can then be covered with a normal car body filler. This is then profiled, sanded and painted etc. If the crazing is limited to only one or two surface cracks, then it may just require the following treatment:
 - Using a suitable small grinding attachment on your drill, grind a trough through each crack you wish to repair, down until you reach the fibreglass strands. This can be anywhere between a depth of 1/32" to 1/2". Be as thorough and careful as you can as this is a time-consuming and delicate operation. Continue this until you are completely satisfied you have accounted for as many of the cracks as you wish to repair.
 - Mix up a small amount of either Gelcoat or Lay-up resin and pour carefully into each crack, leaving enough room for a small amount of body filler. If possible fill the remaining troughs with body filler while the resin is still tacky. This will ensure a good bond.
 - Finally, apply further small amounts of body filler, until all the crazing has been covered, sand wet flat, prime and paint.

FURTHER RAMBLINGS ON THE PROBLEMS OF OSMOSIS

I have been a professional G.R.P. laminator for twenty years and I can say, 'This is a new one on me! It has been described to me as areas of blisters and depressions. This sounds as if the G.R.P. matting could be at fault in the affected area, because it had not been rolled sufficiently to expel all the air voids between the gel coat and the first layer of mat. What happens then is that as the temperature rises, the air in the voids expands and cracks. Moisture then enters, which subsequently freezes, and then the process repeats itself over again.

Unfortunately air voids are not normally visible until they are affected by temperature changes or when accidentally knocked out. These voids will need picking out, filling, sanding and painting. If you can manage to find them all in one go, then a repair of this type will be permanent. I do hope that the above information will be of some help to CSC members. Anyone wishing to discuss their own problems is welcome to call me at home on this number: 01533-640841. A new Berkeley brochure is now available, a copy of which could be sent out to you free Just give me a call on the above telephone number.

Note: Osmosis is often associated with fibreglass boat hulls so an internet check can give lots more information. *From a boat surveyor.* "Although often argued, all fibreglass hulls absorb water to some degree because the gel coat finish on the exterior, and the internal fibreglass reinforced plastic is porous. Even epoxies, the most waterproof resinous coatings available, are permeable. Since water is a solvent, it tends to react with the fibreglass, resulting in the water and solvents in the plastic mixing to create a weak solvent solution. Moisture continues to be absorbed through the gel coat and if resulting solutions are not able to escape by condensation on the interior, hydraulic pressure will be generated within the laminate, eventually leading to gel coat blistering." It might look bad but seems unlikely to result in serious structural degradation.

Link to Berkeley Owners Club webpage: <http://berkeleyclub.co.uk/index.htm>

Link for fibreglass info: <http://www.gibbs111.fsnet.co.uk/grp.htm>

NORMANS BITS

**HARD TOPS
FLEXIBLE BRAKE HOSES
FLEXIBLE OIL HOSES
GS GEARBOX TO 2CV DRIVESHAFT ADAPTORS ETC.
S.A.E. (A5 Size) for Illustrated List to -**

**N. Higgins
41, St Lawrence Avenue, Warwick, CV34 6AR
Phone: 0378 211810**

Load-spreading Washers for Fibreglass

From Nik François:

It isn't a very good idea to bolt straight to fibreglass. I use penny washers with Hyload pitch polymer damp proof course in between but rubber etc. will do just as well. To cut the 'rubber' washers, I've used short bits of water main steel pipe, with the edge machined to a chamfer. Best done with a lathe, but careful filing will produce something just as good. Whack it with a hammer using a piece of wood underneath, or squeeze it in the vice to produce the disc and then a smaller cutter for the hole in the middle - proprietary cutters are available for these smaller holes should you prefer. Tupperware-type tubs are very good if you want a white washer where it shows. Incidentally, abrasive flap wheels are a bit pricey, but are wonderful -for trimming fibreglass.

Further Info on Adhesives

From Alan Caunt:

I strongly recommend SIKAFLEX 221 for bonding GRP to GRP, metal, wood, glass etc. It is used by Quantum on their cars and can be obtained from Strand Glassfibre in standard mastic gun cartridges. It sticks, cures and seals ferociously —make sure you wipe off any surplus with petrol before it sets! In order to stop the contents of the nozzle setting solid, I keep it in the deep freeze (in a plastic hag) between uses. Incidentally, the deep freeze is also a handy place to keep mixed two— pot epoxies, resins etc., useable for a few days if you have mixed too much. There is a wide range of Sika products link is <http://www.sika.co.uk/uk-home.htm>

Cockpit Trim

From Richard Noble:

I was keen to copy the Lomax bun roll and wooden dash on my Lambda - first the bun roll. A visit to the local DIY superstore and fabric shop got me the following a) a sheet of 3ply plywood - easily jig-sawed, flexible and not too thick, b) 3 x 1 metre lengths of high density (grey) 15mm pipe insulation, c) small box of long rivets and d) 1.5 metres of vinyl 'cloth'. Total cost, about £14. The shape of the

cockpit border can easily be drawn round the woodwork, though I found it easier using paper templates. Cutting out lengths of vinyl, for contact glueing face down under the plywood and then riveting the ply shapes over the top was the easy bit. The insulation is cut in half lengthways and I used another slither to fill the void where the pipe should be! Aerosol carpet glue is good for the foam adhesion onto the wood. Stretching the warmed vinyl over the top, especially round the dash, is tiresome - contact glue is awkward and the spray is unsuitable for vinyl. Hot glue guns don't seem practical as they soften up in the summer sun. I found super-glue worked for me, carefully used. With at least one of our fellow members being an upholstery expert, I'm sure there are other suggestions available. As for the dash, a visit to the local wood yard produced a seasoned metre of American oak for £5, planed and sanded $\frac{3}{4}$ " thick. I drilled out the mounting holes on the fibreglass dashboard and circular cut outs for the dials, switches and glove compartment. Offering up the perimeter shaped wooden blank, all these holes, large and small, were marked from underneath. I wanted blind fixings on the back, so I carefully drilled out the rear fixing holes using a limited depth bench drill, just wide enough to allow countersunk screw heads to be embedded in Araldite. After the screws were glued in, they provided a good drying stand for the face-up wooden dash to be yacht varnished several times. When dry, it was mounted on the dash using wing nuts - easy removal for access and vinyl bun roll underlaying if necessary