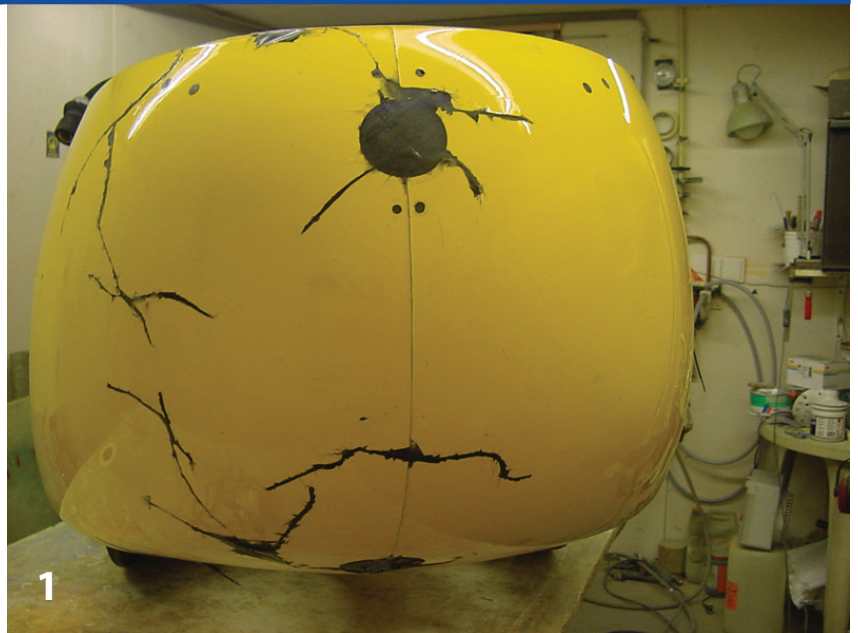


Filling the cracks

We have published a manual on how to repair the laminate before, now it's time to smoothen the outside of the repair.

This nose damage (picture 1) has been repaired from the inside. The owner of this velomobile would like to instal two headlights, therefore the single hole has been closed.

The black lines are big cracks (photo 1) that have been repaired with carbon. But the gelcoat layer is cracked too (photo 2) and lose in some places.

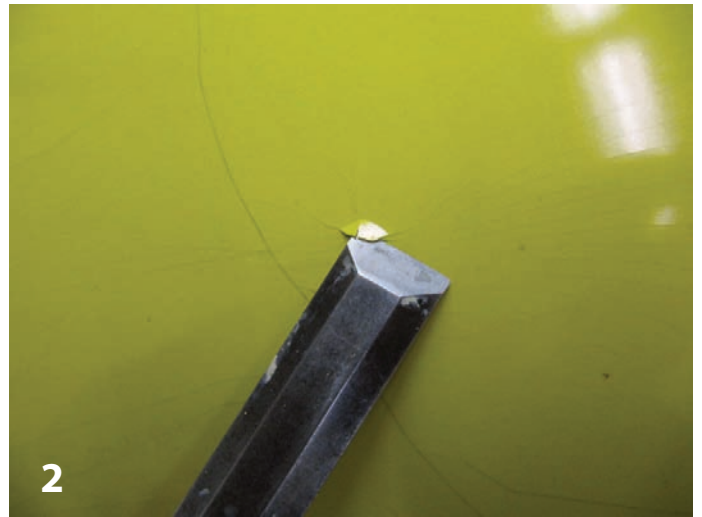
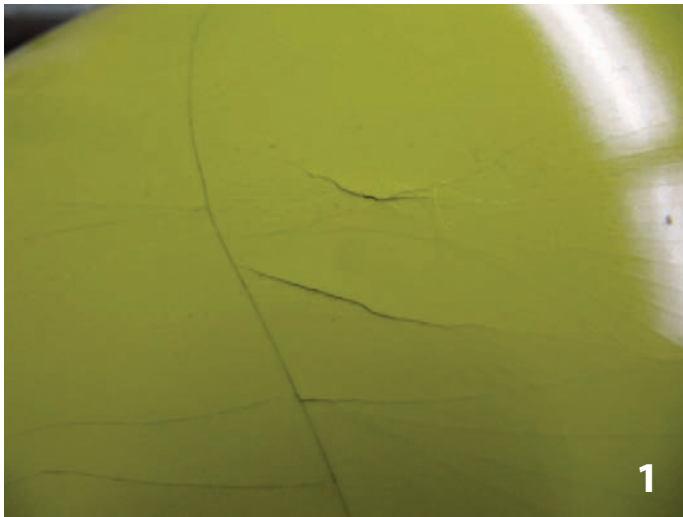


Grinding and sanding

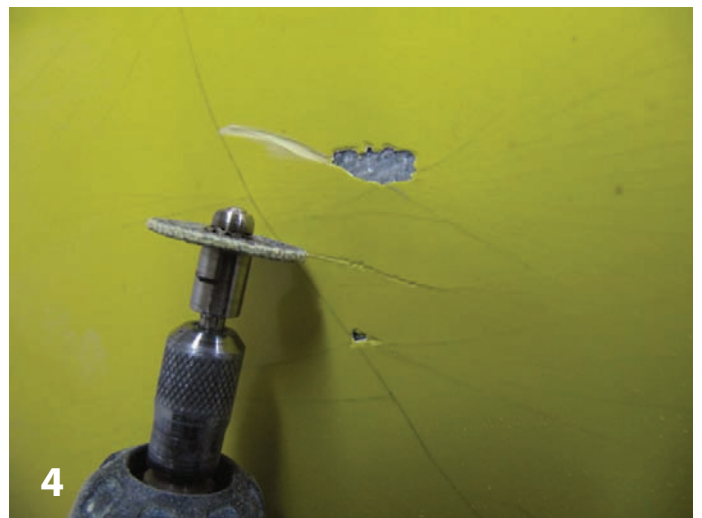
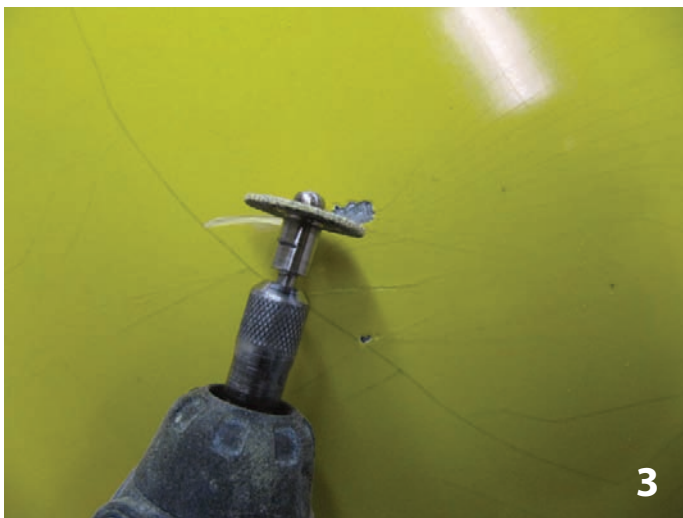


- sanding block / sanding machine
- dremel tool (disc or ball cutter)
- hearing protection
- dust mask and glasses
- vacuum cleaner
- chisel

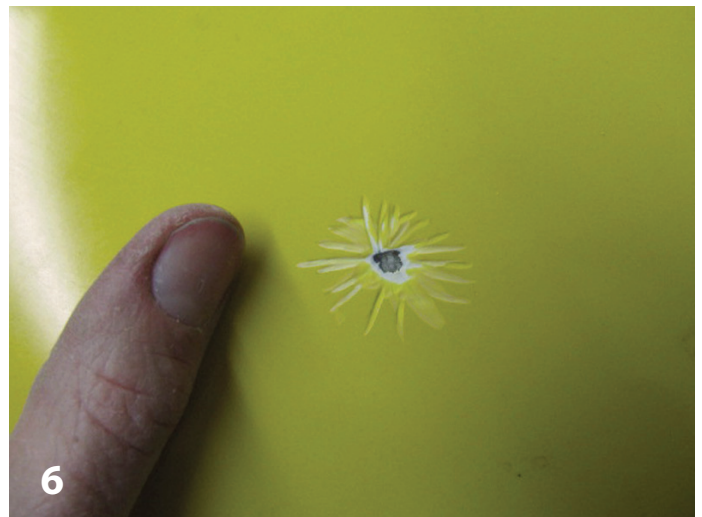
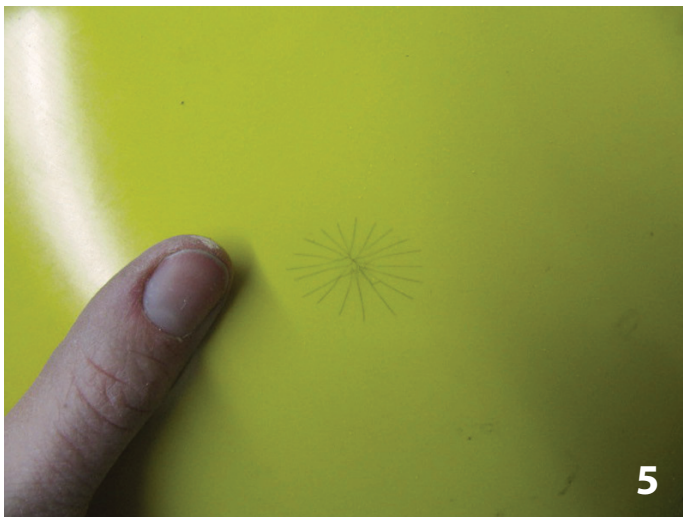




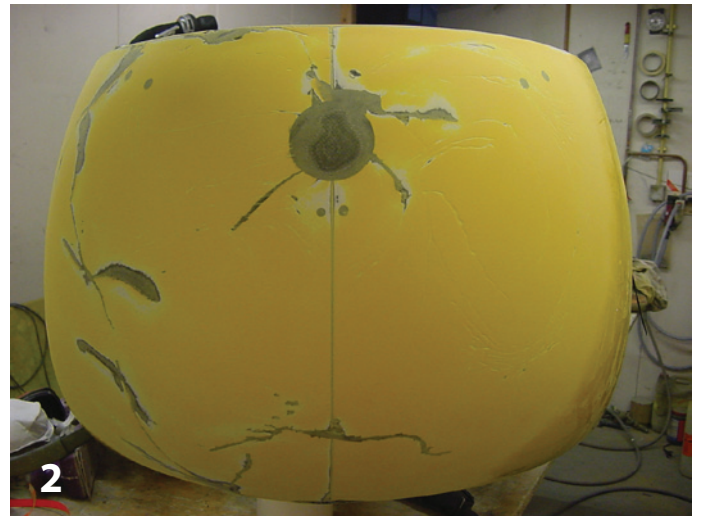
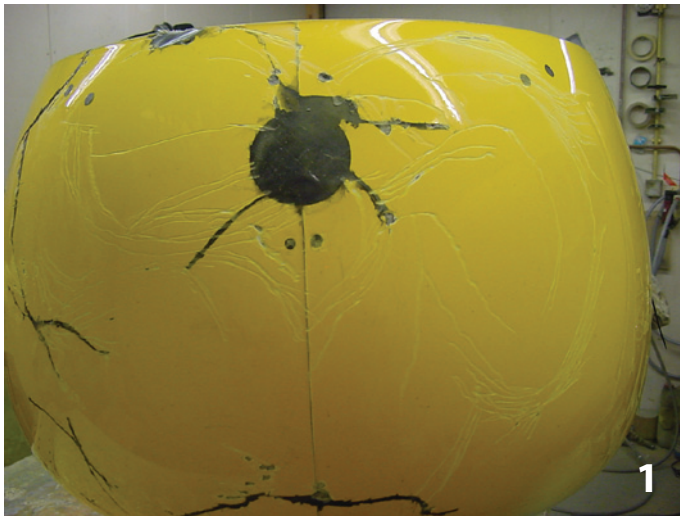
Start by removing loose pieces of gelcoat with the chisel (picture 1 and 2).



Grind out all the cracks in the gelcoat (picture 3 and 4) but do not grind into the laminate. You can hold the vacuum cleaner hose next to it to suck up the dust.



A small star shaped crack before (picture 5) and after (picture 6) grinding.



This is what the nose looks like after the grinding is finished.

The cracks that have been repaired with epoxy should be grind to be sure there are no air bubbles enclosed.

Grind the surface around the big cracks with sandpaper (P80-120)

Then grind the whole area where the filler will be applied with grain P400.

Putty



- polyester putty set
- board to mix the putty
- putty knife
- wide putty blade
- flexible ruler or cutting blade
- chisel



The workplace should be well ventilated and heated up to 20 degree C. You may use some hand cream before you start, it makes your hand easier to clean and working with gloves is not nice.



Mix some putty (mixing ratio should be on the package) don't mix more than you can apply in about 5 minutes. Use the putty knife to mix it, do not stir but smear it and then flip it over and smear some more till it has an even colour



Apply it to the body of the velomobile use a putty blade (picture 1) to divide it. The best result will be achieved by moving the blade from top to bottom and then left to right and diagonal. Apply it with a few moves don't use the blade till the putty runs dry and the surface gets rough.

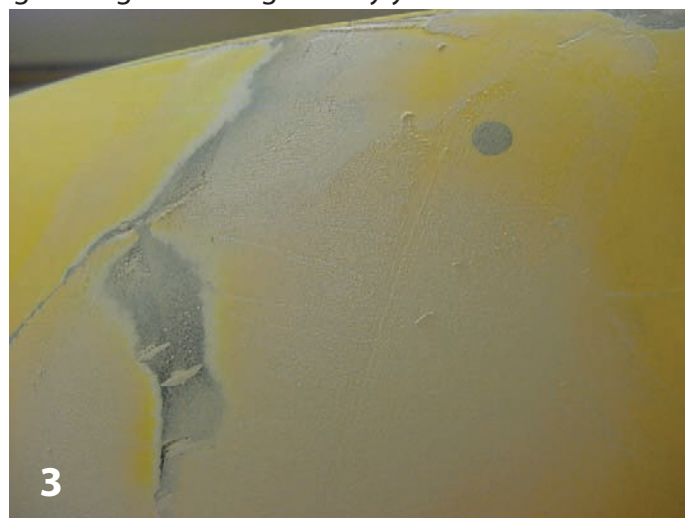
A putty blade works fine for the flat surfaces but for rounded shapes like the nose you best use a cutting blade (picture 2).

After you've applied the putty you can clean the tools with the putty knife. When the putty is leather like and not sticky anymore you can scrape it off. By waiting to long or starting to early you make it much harder.

Firmly push the putty into the cracks to make it stick and make sure there are no air bubbles in it. Apply the layers bottom to top, left to right and then diagonal. This way you should be able to smooth all the bumps.

Multiple thin layers give a better result than one or two thick layers.

Small bumps and irregularities can be cut away with the chisel when the putty is in a leathery state.



If you have applied to much you can sand it of. Wait until it has cured thoroughly, usually 30 minutes is enough depending on the amount of hardener, temperature and thickness of the layer.

Sanding



With the electric sanding machine you can easily smooth large surfaces. But mostly hand tools (picture 5) are sufficient and offer you more control especially on rounded surfaces like the nose.

Changing directions; vertical, horizontal, diagonal, is also important when sanding.





In the picture 1 three layers of putty have been smoothed. It is not a problem you can still see the laminate as long as it is smooth.

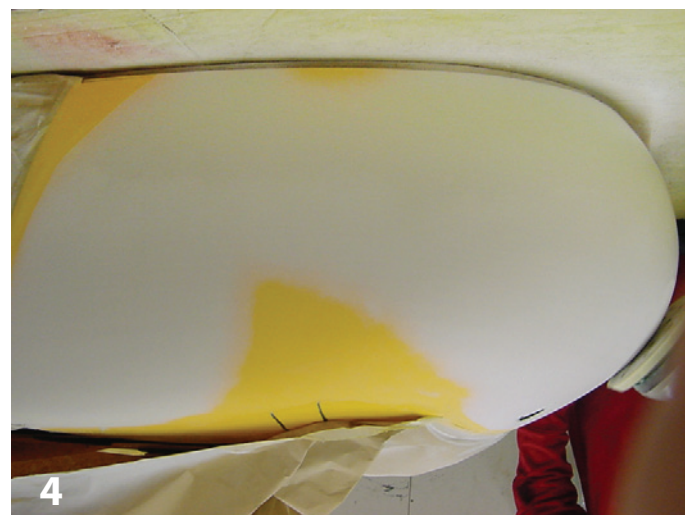
A thinner layer of putty is lighter.
Remove the dust after sanding.



In the picture 2 you can see small holes that may still be there even after three layers of putty. Bumps can be felt while stroking with the hand better than they can be seen. Using a lamp to make oblique light can help. Apply putty and sand until you get a good result.



Smoothed nose with putty (picture 3).



The same nose has now been covered with a spray-able filler to make it even smoother (picture 4). This also helps to cover the pinholes. They are very hard to see but will become very visible after the spray paint has been applied.

If you decide to spray-paint you will have to sand up to P400 at least.

Now it is ready for the paint job by spraying or using a roller. Or you may leave it to a professional car-painter.