

Cracked Windshield

By Pedro Bonilla

You're enjoying a drive on an open road.

There are a couple of vehicles in front of you when all of the sudden you hear a loud "WHACK!!!"

You stop the car, inspect it and find that there's a chip in your windshield.

What to do?

Do you have the whole windshield replaced?

Do you have the chip repaired?

Will the repair be good?

If you replace the windshield will you have leaks?

There are many things to consider in this case; all valid, but first let's learn a bit about automotive glass.

Its main function is for the protection of the passengers from the elements and debris.

Glass has been installed in vehicles since the very first cars.

Initially, windshields were made out of ordinary glass, but it didn't take but a few accidents and a couple of lawsuits to make manufacturers search for, and provide safer glass.

The first safety glass was tempered glass. It is produced by heating the pane of glass to over 1,100 °F and then rapidly cooling it (this is known as annealing). The result is that the outer surfaces of the glass become harder than the center and therefore it becomes stronger than regular glass of the same thickness. A good side effect of tempering is that when broken, tempered glass will break into very small, rounded pieces, which are much less dangerous than sharp and pointed glass shards from standard glass.

Tempered glass was installed in Ford automobiles as early as 1917, but it had the tendency to shatter from a simple stone chip. So, in 1919 Henry Ford solved the problem by applying a new French process of glass lamination. Laminated windshields, even today are made from two layers of glass with a bonding substrate in the center. The "sandwich" is subjected to high temperature making the inner substrate become crystal clear which bonds the glass. This inner layer will also hold the pieces of glass together if it fractures, making it much safer for the occupants in case of an accident.

Initially, Ford used a cellulose substrate as a laminating agent, now a day's PVB (Polyvinyl Butyrate) is used instead. PVB offers several additional advantages, such as blocking the harmful UV rays from the sun, adding a light tint to the glass, and reducing the amount of sound that comes through the windshield. Modern cars, including Porsche's still use both types of glass: tempered and laminated.

The side and rear windows are tempered while the windshield is laminated.

Nevertheless Porsche goes a bit further. Their tempered glass side windows get a highly efficient water repellent finish. By rapidly dispersing moisture and dirt, it ensures optimum visibility in the wet. For all of the glass surfaces, including the windshield, Porsche uses a special heat-insulating coating that helps prevent excessively high temperatures inside the vehicle.

Now, back to the chip. Repair or Replace?

In the old days, replacement was the only option and it was costly. So, the insurance companies started promoting windshield repair whenever possible in lieu of replacement.

The origins of windshield repair date back to 1971 when Minnesota Mining and Manufacturing (3M) first introduced a system they called "Scotch Weld". Prior to that date, the only improvement that could be done was purely cosmetic. Typically, an oil-based fluid was poured into the area to fill the damage and to "hide" the break. It has been said that some used car dealers did this to try to sell a vehicle without installing a new windshield. It should go without saying that this was not a permanent repair.

Today, windshield repair is a thriving business aside from the fact that the new adhesives and resins are excellent. Professional windshield repair companies use very sophisticated equipment to ensure a near-perfect repair. Their system can draw a vacuum to get any moisture out.

Their equipment can also "bend" the glass in order to spread apart the crack, then it will inject a series of special resins which will completely penetrate the cracks making them invisible. The final steps are curing the resin with UV light and shearing off any cured excess from the glass. This whole process will last around 30 minutes and in many cases they will come to your home or place of business.

Most insurance companies will give you the option of repairing your windshield at no cost to you or replacing it, but you're out your deductible.

The most common damages to windshields are: cracks, bulls-eye, star breaks and combinations of them. Cracks that are 6" in length or less are generally repairable and most chips can also be repaired.



The repair process consists of prepping the glass, and then injecting a special resin under pressure which fills in the crack, making it practically invisible. Finally the resin gets cured with a high intensity UV light which makes the glass bond.

Even though you can purchase a DIY glass repair kit, unless you have a minor chip with no cracks, it's generally best to have a professional do the work. It won't cost you any money, the work will be near perfect and you'll get a guarantee.



If the windshield is in good condition otherwise (no superficial pitting or scratches), it's generally better to have the chip or crack repaired because this way the windshield doesn't have to be removed and re-sealed which in some instances may cause air (sound) and water leaks into the vehicle's cabin. Also, modern cars' windshields are bonded to the frame which offers additional structural rigidity to the vehicle's chassis. According to National Statistics, 8 out of 10 windshield replacements fail to be installed properly. It is recommended to repair instead of replacing the windshield, whenever possible.

A word of caution, if your windshield suffers a crack or a chip, don't wait to get it repaired because the heat and or cold weather as well as any sudden added stress to the glass from driving the car on the road, may make the crack grow longer to the point where it is not repairable and the windshield must be replaced.

There are many professional glass repair facilities and services to choose from. in your area. Look them up whenever you need one.

Happy Porsche-ing,

Pedro