

YOU CAN CUT YOUR OWN GLASS

By M.H. Fox

ED. NOTE: Skinned Knuckles is pleased to reprint the following article, which originally appeared in the April 1984 issue.

You might ask yourself, "Why would a guy into restoring old cars want to learn to cut glass?" Go ahead, ask yourself. I won't tell anyone you talk to yourself. But I'll bet you have some welding gauges around with broken glass, or you accidentally poked that driveshaft through the garage window, or some of the car's instruments are without glass, or maybe your kid threw a rock through a window, or Even if heaven has never blessed you with one of the above, it's still a handy thing to know.

Many people feel that cutting glass is some sort of a black art, and those who can successfully cut glass must have a buddy somewhere in the Voodoo field. Actually nothing could be further from the truth. Like so many other things, cutting glass is a matter of learning a few tricks and having some faith: faith that the glass is actually going to break where you scored it. I'll attempt to show you the tricks in this article, but you will have to gain the faith yourself. No free lunch here; you will have to practice some. Fortunately it won't be very expensive.

First, a couple of things about glass. Glass is actually a liquid. A very viscous liquid.

The glass in many of the old cathedrals in Europe is actually thicker at the bottom than at the top. Many people attribute this to cold flow over the centuries. Another thing is that you don't actually cut glass (unless you have a diamond saw). Instead you score it and create a line of weakness, and it will easily break along that line. Glass likes to break in either straight lines or gentle curves. If you try to make it break along a sharp curve, it will keep going the way it was going.

No matter what old Joe down the block tells you, you can't cut tempered glass. It will shatter into a million pieces unless it is annealed. On newer cars, tempered glass is used on all windows except the windshield. The windshield is made of laminated plate glass, and it can be cut.

This brings me to a very important message. Don't ever use anything except safety glass for your car windows! If you survive the accident, you will be known as SCARFACE. Really, don't do it. Also for your own personal safety, wear eye protection whenever you cut glass. New eyes are mighty hard to come by.

If this hasn't already cured your insomnia, let's get started. Unless you have super strong fingernails, you will need some tools as follows:

- 1) Glass Cutter - The American made Fletcher brand seems to work best of all.
- 2) Breaking Pliers - These pliers close only at the tips (see Figure 1). You can make a pair by grinding down a pair of old Lineman's pliers, or use Parallel Jaw pliers. They work just as well.
- 3) Light Machine Oil - I use 3-in-1 oil. Take an old small jar, stuff some cotton into the bottom, and saturate it with the oil. Keep your cutter in the jar when not in use.
- 4) Some Practice Glass - Use single strength window glass. Sometimes your local glass store can completely fill your needs from their scrap pile.
- 5) Indoor/Outdoor Carpeting - Get a piece large enough for your glass cutting project to sit comfortably upon. Don't get the kind that has a foam backing. Get the cheap type. The foam has enough give to break the glass that you're trying to cut. Do your cutting on the carpeting and on a sturdy flat surface.

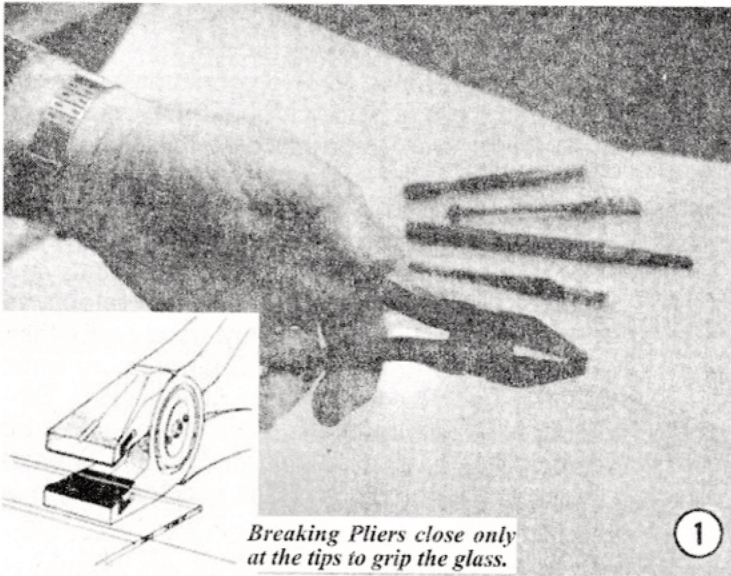


FIGURE 1 - Breaking Pliers - Figure 1 shows a pair of breaking pliers and some of the various glass cutters that I own.

Ed. Note: You can buy a glass cutter for as little as \$2, or you can spend \$50 for one. The difference is the quality of the cutting blade, replaceability of the cutting blade and the ergonomic feel of the cutter. A \$50 diamond blade is probably beyond the beginner's requirements, but a good blade - say in the \$8 to \$10 range will serve the purpose well.

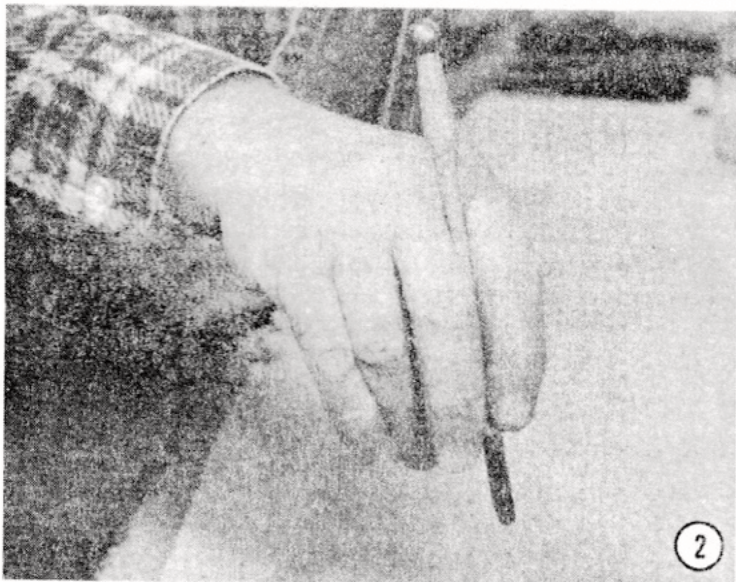


FIGURE 2 - The Right Way to Hold a Cutter - And now for some of those tricks. First, as previously mentioned, always keep your cutting wheel oiled. The easiest way to do this is to keep the cutter in the oil jar whenever it's not in use. Of course, when you're done cutting, you can close the jar and put them both away. Second, always start your cut about 1/16" from the edge of the glass and end it about the same distance from the other edge. This contradicts the instructions supplied with certain glass cutters, but then their job is to sell glass cutters. When you go over the edge, you nick the cutting wheel. The next time that you use the cutter, you will score a dotted line. A few more repeats of this and your cutter won't be worth a darn. You will have to buy a new one. Also don't go over a score line. That is the fastest way that I know of dulling a good cutter. Thirdly, to obtain consistently good results you must hold your cutter correctly. The cutting wheel must be reasonably perpendicular to the glass. If you hold the cutter as you would a pencil, it will wobble too much for a smooth cut. Figure 2 shows the right way to hold your cutter. Notice that it is held between the index and middle finger with the thumb supporting it on the bottom. This provides enough support for a smooth cut.

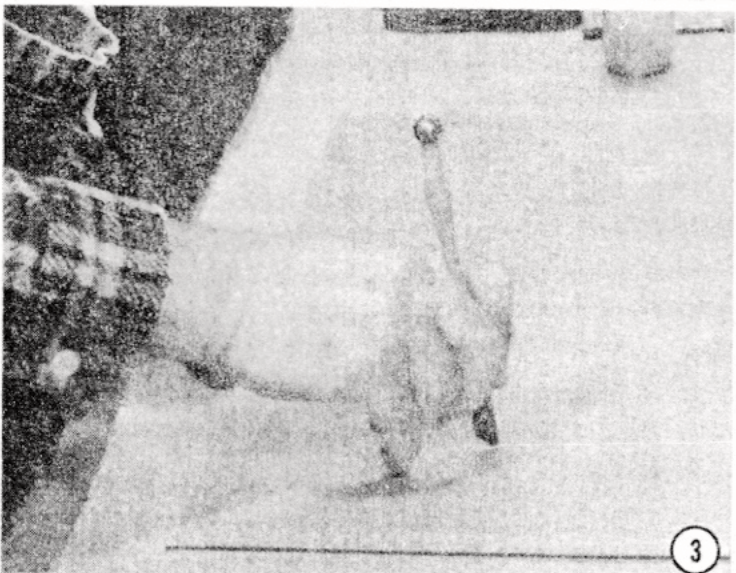
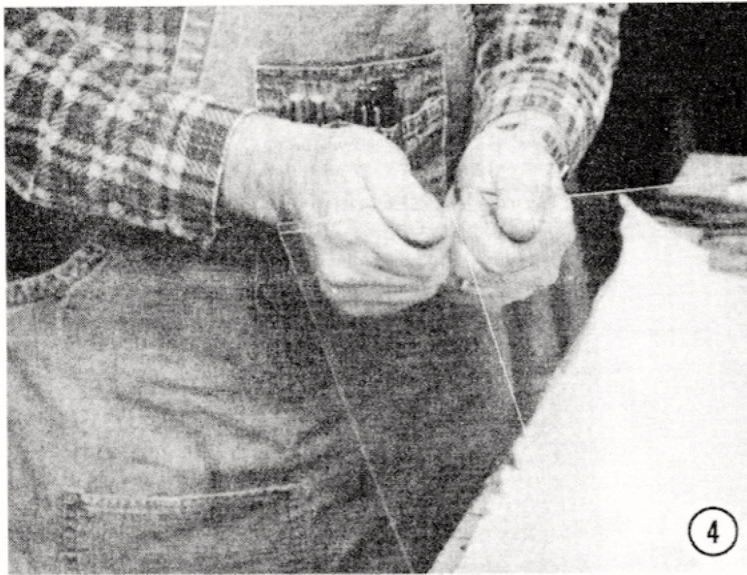
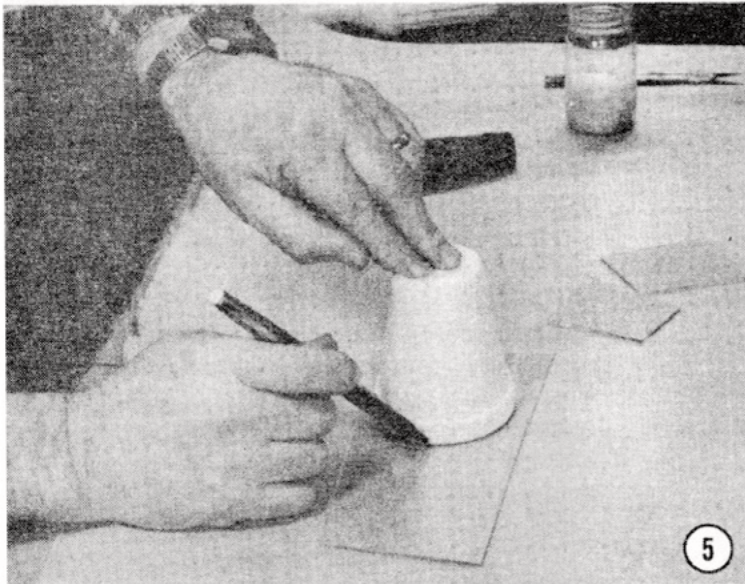


FIGURE 3 - The Scoring Process - Figure 3 illustrates the scoring process. It doesn't really matter if you push the cutter or draw it to you, as long as you press just firmly enough to get that zzzzzzt sound and to score the surface of the glass. I should mention here that old glass and new glass both cut about the same. In my experience I haven't noticed any difference.



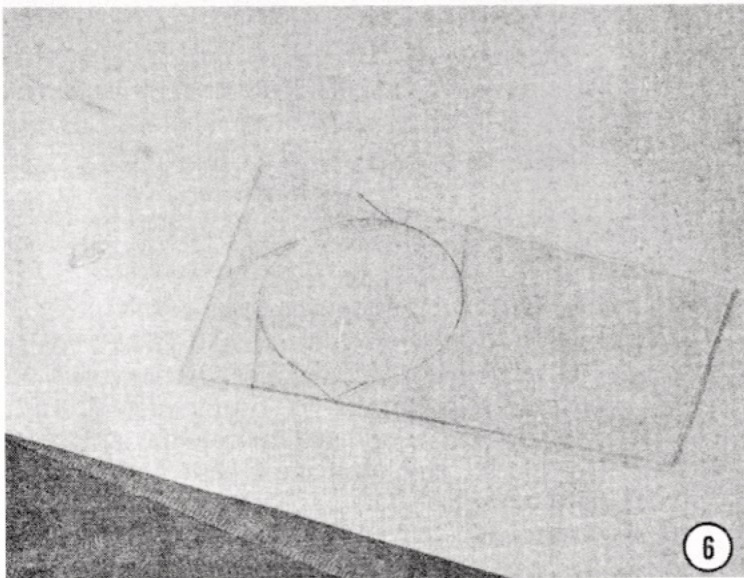
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FIGURE 4 - Breaking the Glass - Figure 4 shows the proper way to break glass. Notice that the glass is held with both hands between the thumb and forefinger on either side of the score line. The knuckles of the remaining fingers are pressed together. Holding it this way will prevent you from cutting yourself. To break the glass along the score line, briskly rotate your hands, using your knuckles as a pivot point, so that your thumbs move away from each other. Don't be timid, do it! It will work every time. Notice that you don't have to tap the glass. Tapping tends to produce a more jagged edge. So unless you have great rhythm, and are practicing to be a drummer, it isn't necessary for this type of cut.



5

FIGURE 5 - Drawing the Pattern - Since on the night of the class demonstration no one had any gauges or instruments that needed glass, a coffee cup was used as a pattern to cut a circle. Figure 5 illustrates this procedure. A standard felt-tipped pen works well on clean glass.



6

FIGURE 6 - The Completed Pattern- Figure 6 shows the completed pattern. Notice the lines radiating away from the circle. As previously mentioned, these lines provide a path for the glass to break without having to follow the sharp curve of the circle. The starting point for breaking is at the bottom of the photo where the lines converge.

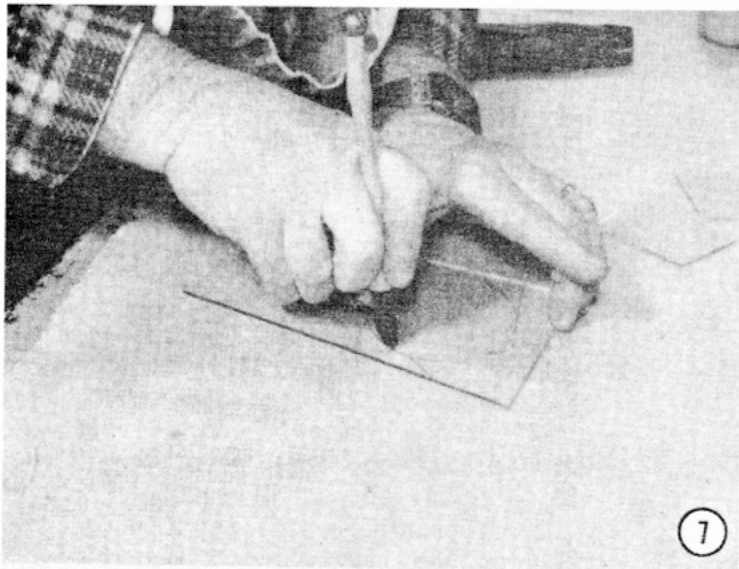


FIGURE 7 - Scoring the Circle - Figure 7 shows the scoring process. A couple of things to keep in mind are not to go over a previous score line and to keep things simple. As you progress around the circle to a point where your hands are in an awkward position, turn the glass as you progress while keeping the cutter in one spot. Start by cutting the circle first, and then score the radial break line from the circle outwards.

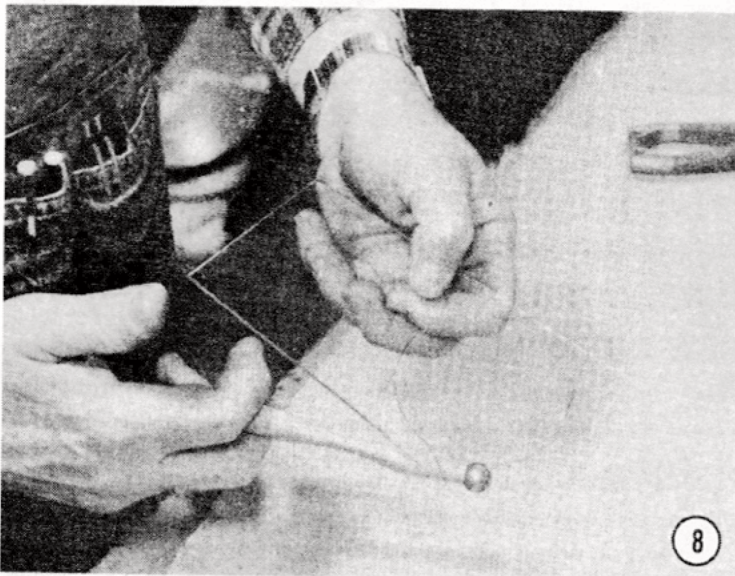


FIGURE 8 - Tapping Out the Circle- Although it wasn't really necessary in this case, Figure 8 illustrates the correct way to 'tap the glass. Always tap it on the opposite side of the glass from the score line. Strike the glass just hard enough to cause it to fracture under the score. Continue to tap beneath the front edge of the fracture all around the circle until you obtain a continuous fracture line.

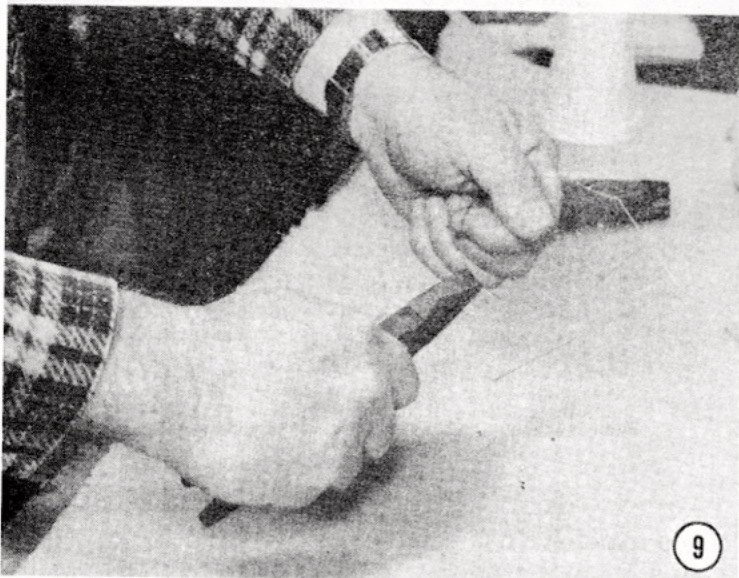


FIGURE 9 - Breaking Out the Circle- The use of breaking pliers is shown in Figure 9. The pliers are used here as there isn't enough room to grab the glass with the fingers. Always start at an edge and position the jaws close to, and parallel with, the score line. With the pliers in the correct position, bend the glass down (score side up) and the glass will break just as you planned it.

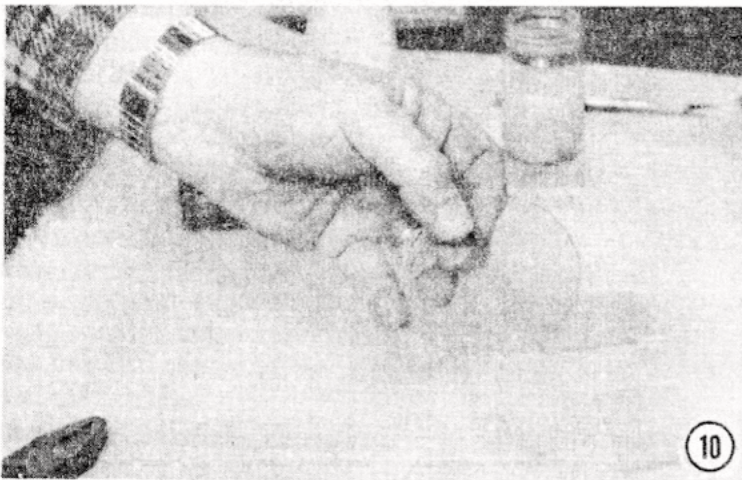


FIGURE 10 - The Finished Product- Figure 10 shows the completed product, a monocle for the Jolly Green Giant. Ho ho ho! The edges may be somewhat jagged, but they can be smoothed with sandpaper or on a sanding belt or disc.

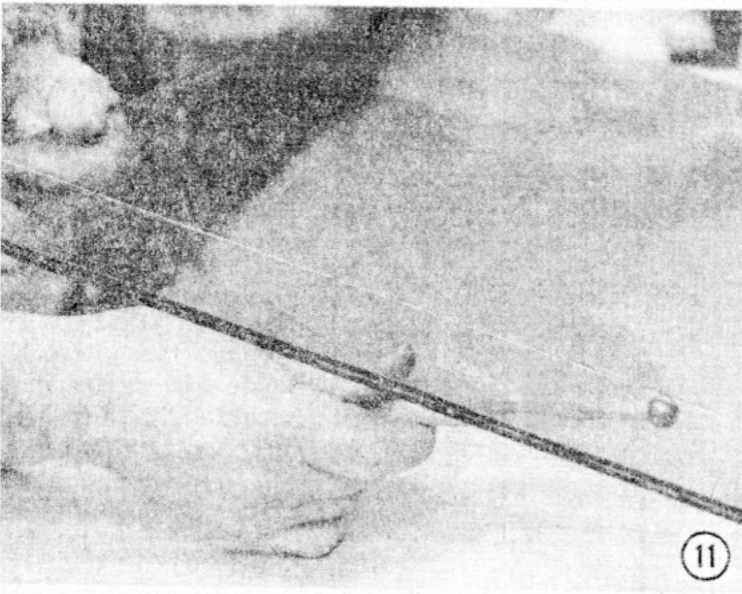


FIGURE 11 - Tapping Out Laminated Glass - Well now you have learned how to cut window glass. How about laminated safety (windshield) glass? That's a little more involved, but easy. Because laminated safety glass is really two pieces of plate glass sandwiched together with a piece of clear plastic between them, it has to be cut on both sides. Mark your pattern on one side and score it. Tap it out from the opposite side (see Figure 11). Turn it over and score it directly over the first score line on the other side. Tap it out from the side that you scored first. You should now have a piece of laminated glass fractured on both sides on your pattern line.

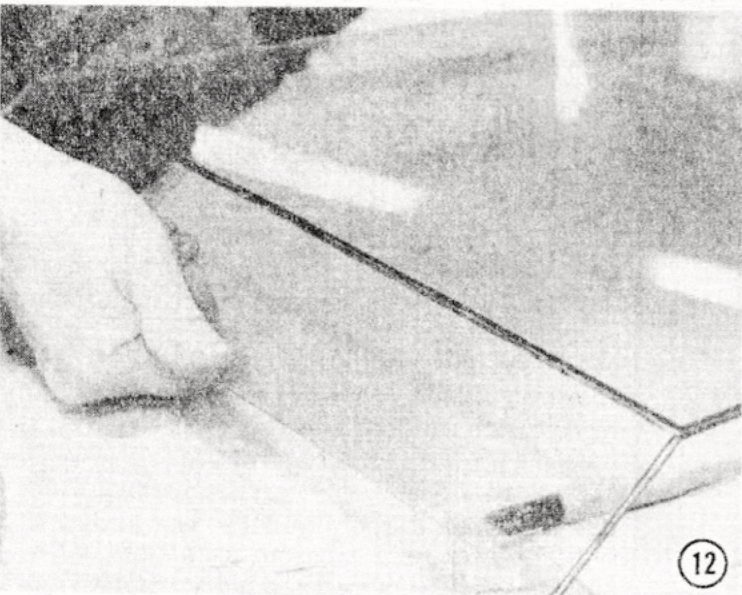


FIGURE 12 - Parting Laminated Glass - Bend the glass down (from either side of a flat piece). It will part as shown in Figure 12. The two pieces will still be attached by the sandwiched plastic. Bend it just far enough to allow you to slip in a knife or razor blade, and cut the plastic. There you are! Two pieces! Any rough edges may be dressed up, as before, with sandpaper. What, you might ask, can be done with curved laminated glass? Proceed as with flat glass, right up to where you have to bend the glass. At this time make sure that the curvature is facing upwards (it's free to rock). Then carefully bend the glass down as before and cut the plastic. If the part is large and the curvature is compound (it bends both ways), part it slightly and heat the plastic with a hair dryer, or take it outside to a safe place, pour in a small amount of alcohol, and set it on fire. Make sure that you can put the fire out if it gets out of hand. Either way will soften the plastic enough to allow you to part the glass sufficiently to allow you to insert your blade and cut the plastic.

Well there you have it! Remember to practice before you start on the real thing. I sure do hope that this has helped to dispel any fear that you may have had about glass cutting. It is really quite easy and useful. Buy good tools, and have fun with your hobby. S.K.