

Glass Cutter Impression Identification

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KEY WORDS: glass cutter, glass, impression, wheel, tracks, toolmark

Abstract

A case submitted for glass examination was found to contain only a glass cutter and control glass from the scene. One of the control pieces of glass had been scored by the cutter and not broken. The submitted glass cutter was identified as the source of the mark.

A burglary case submitted for glass examination contained only a "Red Devil" single wheel glass cutter and several shards of glass from the scene. The glass cutter having been found in the pocket of the suspect; only the cutter was seized, his clothing was not. The request for examination was to "compare glass found on the cutter with the glass from the scene." As expected, no glass was found on the cutter and it was too late to seize the clothing.

One of the shards had a line on it, presumably a cutter mark, that had not been broken. Examination of the glass directly, as you can imagine, proved unacceptable. Metal vapor coating was a possibility however, unavailable, so "Mikrosil" casts were made. This revealed that I was dealing with an impression, "a wee tire track". Test tracks were initially made in lead which were found unsuitable in that they were too deep and I lost the trees for the forest. Test tracks made on a microscope slide and cast with "Mikrosil." These were found suitable for comparison and ultimately - identification.

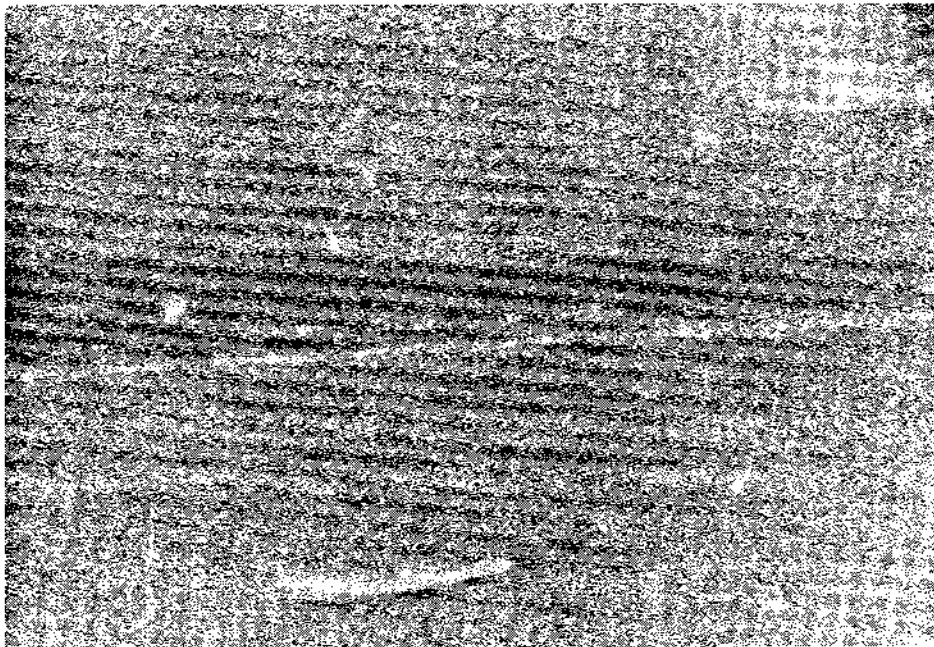
Comparison was done on a Leitz forensic comparison microscope with identification being made between tests and the question mark. The track, or mark, was also shown to repeat for each circumference and eliminations were demonstrated with seven other similar cutters which I had managed to round up. Although I was satisfied with the identification at this point, it was far from convincing (Photograph 1). The highest magnification (40-50X) was insufficient to adequately demonstrate the fine detail of this comparison.

Needing higher magnification, I went to a pair of "Leitz Ortho-Lux" microscopes with a bridge (the same as the equipment that makes up the forensic comparison) and "Ultrapac" objectives and condensers. I selected 12X objectives, yielding about 144X at the eye point.

and relief condensers for lighting. The relief condenser allows lighting at very shallow (nearly parallel) oblique angles to the surface being observed. This lighting technique allows for specular highlights and shadows to enhance surface relief-ideal for impression marks or this wee tire track. At this magnification (144X) the identification can be seen (Photograph 2). The two tracks, side by side - questioned and control, are clearly impression marks. The "tread pattern" of the wheel track, the identifiable marks, are the grind marks from manufacture and/or wear. Because of the nature of manufacture, namely grinding, each cutter wheel is unique and identifiable, and was shown to be so in this case.

The overall size of this mark is much the same as a single stria. Each numbered division of the scale (Photograph 3) is tenths of a millimeter, each division being hundredths. Using the scale as an indicator, the "tread width" is about three hundredths of a millimeter.

Typically, in these cases, the clothing is swept down and the particles of glass found are compared to the control glass submitted. The results of such comparison are at best only an indication of same source glass. In retrospect, an identification was made only because the clothing had not been seized. Had the customary evidence been submitted, the customary examination would have been done and this opportunity for identification would have been missed.

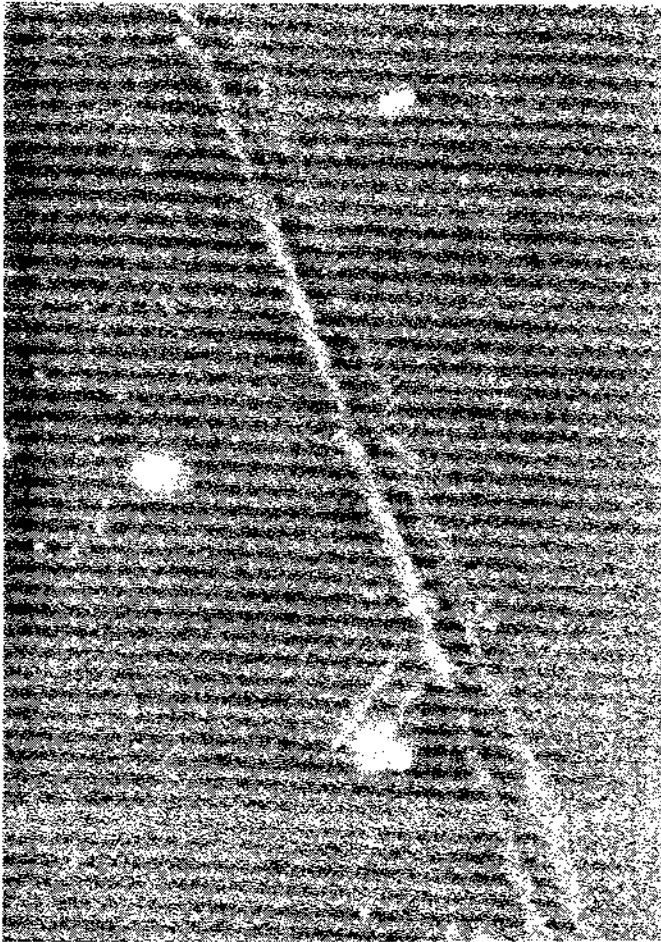


Photograph 1

40X-50X Magnified View of Question Track

Photograph 2

Left: Questioned Mark
Right: Known Test Mark



Photograph 3

Question Track. Each Division
in the Scale Equals 0.01 mm.

