

# RAVEN 25 AUTOMATIC PISTOL BREACH FACE TOOL MARKS

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The Raven Arms pistol has previously been described in this journal (Vol. 9, No.7). Prior to taking a tour of the Raven Arms plant, a Raven P-25 pistol (photo 1) was disassembled and examined. Of particular interest were the circular machining marks found on the breech face. The marks appeared to be concentric rings. To determine if the marks were in fact concentric, and not a spiral made by a pointed cutter like that normally used on a lathe, two Mikrosil casts of the breech face were made. The casts were compared on a comparison microscope. The machining marks transferred to the casts could be matched even when turned 180 degrees out of phase indicating concentric toolmarks (photos 2 and 3). Fired evidence cartridge cases from Raven pistols have been encountered in this laboratory and they have had impressions of the breechface on the primer. After the experience with concentric striations on Smith & Wesson firing pins (see previous article in this issue) the method of machining was of interest. Could concentric striations ever be considered individual and therefore useful in firearms identification? The individuality of the Raven breech face tool marks had to be established.

The breech face of the P-25, and its successor the MP-25, is a steel insert (photo 4) which is cast into the alloy slide. The steel insert, called a bolt, is subcontracted by Raven. As received by Raven the bolt is semi-finished with the firing pin hole drilled. The breech face is surfaced and two sides ground flat at Raven Arms prior to casting the bolt into the slide. A rotary surfacing of the breech face is the operation which forms the concentric rings. This is the final machining affecting the breech face toolmarks. The surfacing is done on a Bridgeport-type vertical mill. The mill operator places a semi-finished bolt on a post secured to the mill table. A spinning cutter (a two-flute end mill) comes straight down to surface the bolt and cut the recess for the cartridge head. The mill operator controls the cutter feed with a handle like that of a drill press. The bolts are manually placed on, and removed from the locating post. Approximately 700 bolts are surfaced per hour. The cutter is sharpened about every six months.

Six bolts were collected from the mill as they were surfaced. The first three were collected in sequence and marked. An hour later three more were collected. By this collection method the change in toolmarks over the period of

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an hour could be observed if there was insignificant variance from one bolt to the next. This seemed to be a prudent method of collection in light of the results from the S & W firing pin study, and the fact that the cutting tool rarely needed sharpening.

In the laboratory the first two bolts collected were compared on a comparison microscope. The machining striations on the two breech faces were quite different (photo 5). Intercomparison of other bolts collected gave like results. Each bolt had unique toolmarks. To check the concentricity of the toolmarks on these bolts, casts were made and two casts of any one bolt could be turned 180 degrees out of phase and matched.

George Jennings, owner of Raven, had a possible explanation for the radical change in striations from one bolt to the next. He has noticed a fine build-up of metal on the cutting edge of the tool. Apparently metal is micro-welded to the cutting edge and broken off, possibly numerous times, on each cut. An actual change in the edge of the tool does not occur in this case as evidenced by the long interval between sharpenings.

In view of the information derived from this study it is clear that breech face marks on cartridge cases fired in the Raven pistol may be used for identification purposes.

I would like to thank George Jennings for sharing his time and knowledge with the California Department of Justice and for allowing us to collect parts for laboratory examination.



photo 1

Raven Arms Model P-25  
•25 Automatic caliber

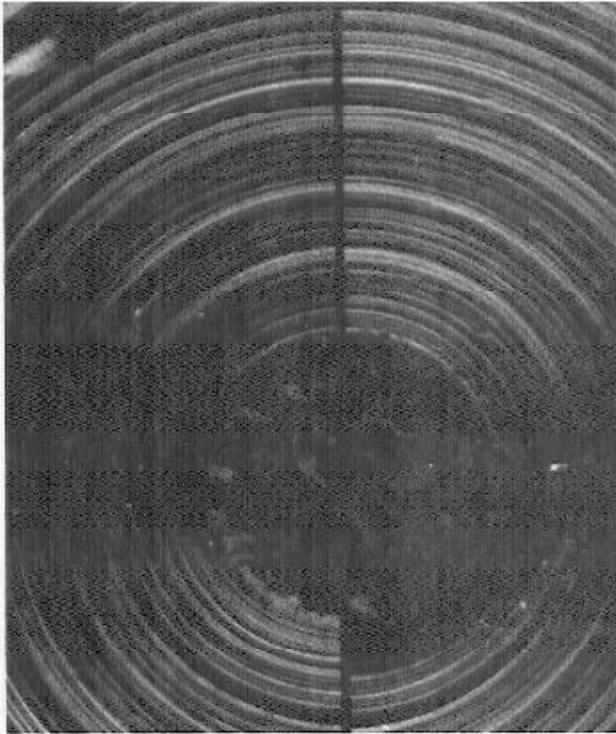


photo 2

Comparison of two Mikrosil casts.  
Both made from the same breech  
face and both in phase.

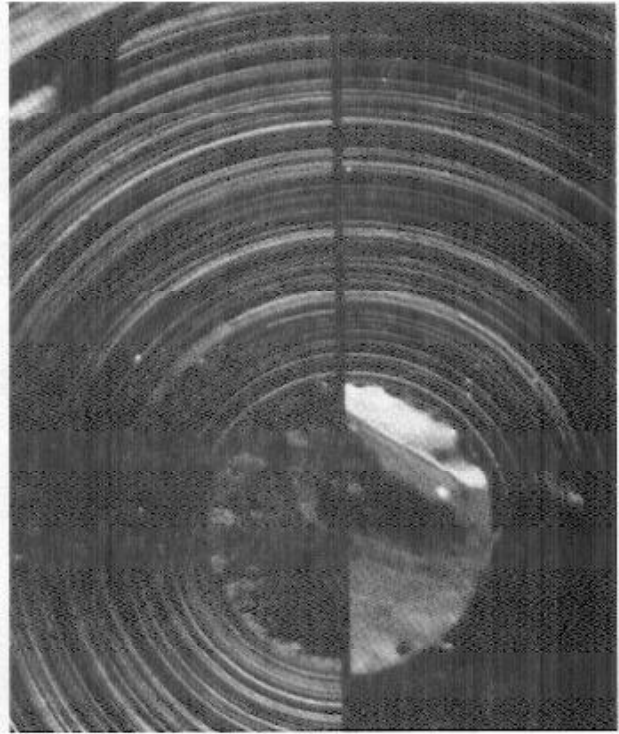


photo 3

Same as at left except that the  
right hand cast has been turned  
180 degrees out of phase.

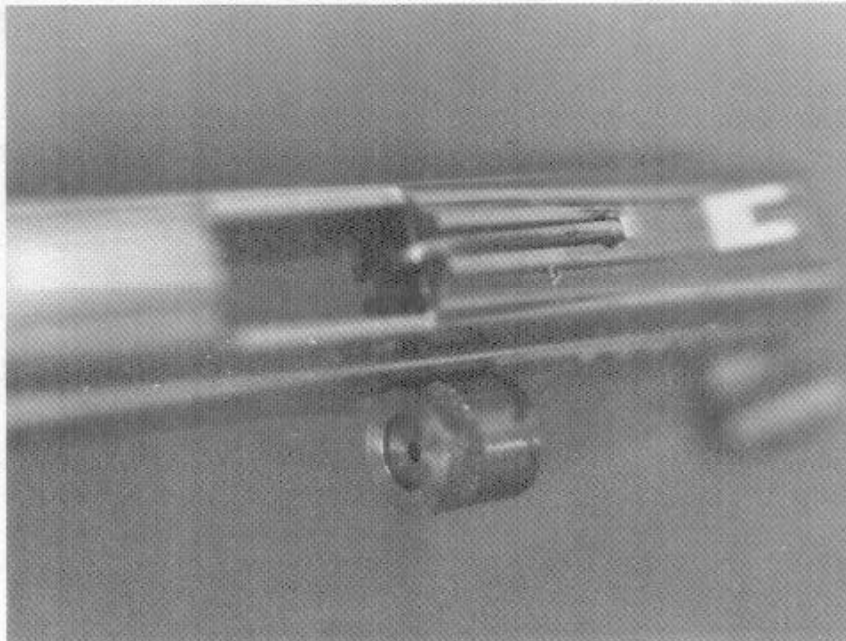


photo 4

Completed slide shown with milled bolt

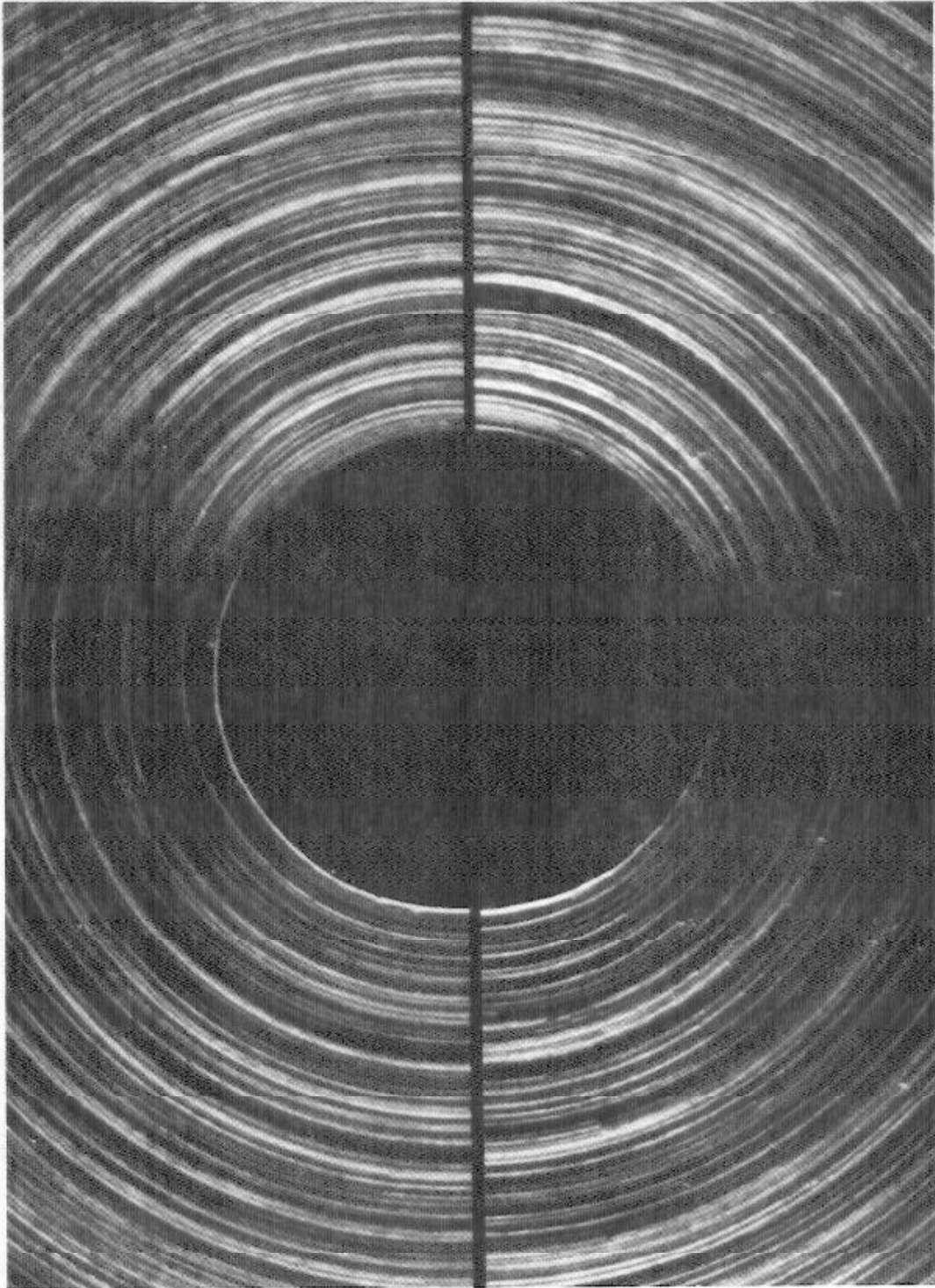


photo 5

Comparison of toolmarks on  
consecutively milled bolts  
#1 and #2