

HECKLER & KOCH POLYGONAL RIFLING

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Having noted that recent descriptions of Heckler and Koch firearms revealed a number of them to possess polygon rifling, a letter was sent to the factory in Oberndorf, W. Germany requesting certain information regarding manufacturing methods, rifling specifications, etc. In addition the loan of a P9s pistol was requested and most graciously provided by H/K's U.S. distributor in Arlington, Va. The following is a summary of the answers in their written reply, the examination of the weapon and of test fired bullets from the sample pistol.

The H/K P9S pistol

The pistol provided was in 9mm parabellum caliber; it is also available in .45ACP. Takedown is extremely simple and quickly reveals a number of interesting features in this pistol. The locking mechanism is of the delayed roller-locking type [see Figure I] and is reminiscent of the WW II MG 42. The thumb safety physically blocks the internal hammer from striking the firing pin; a slide hold-open device may be manually activated or comes into play in the usual fashion after the magazine is exhausted. A cock indicator protrudes from an aperture in the rear of the slide and the extractor also serves as a 'loaded' indicator in a similar manner to the P'08 (Luger). The breechface of the test pistol was devoid of visible tool marks and possessed a matte finish with a hemispherically shaped firing pin. A breechface diagram appears in Figure II.

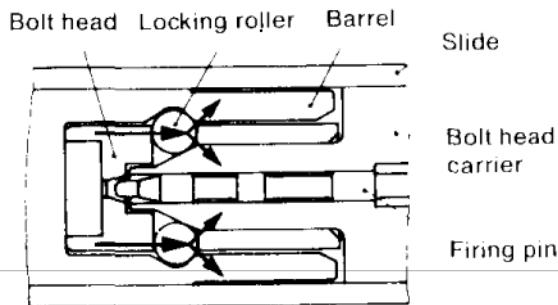


FIGURE I

extractor/load indicator

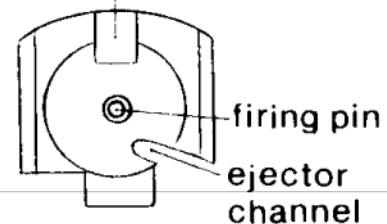
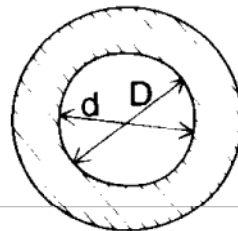


FIGURE II

Inspection of the bore offers a novel experience; a mirror-like bore is observed lacking grooves but reflecting a distinct out-of-roundness and obvious right-hand twist. Figure III provides an accurate representation of the four-sided profile presently used in the 9mmP version of the P9S pistol. A cerrolow cast taken at the muzzle gave .343 inches for d and .355 inches for D respectively.



D = maximum diameter

d = minimum diameter

FIGURE III

H&K 9mmP POLYGONAL PROFILE

Technical information provided by the manufacturer

All H/K barrels are hammer forged- a process that involves no cutting as the steel is compressed around the form.

Up until 1977 their pistol and SMG barrels were hammer forged in a long work piece then cut up into 2, 3 or 4 barrels. Consecutive barrels were not intentionally assembled into consecutive weapons. Their rifled barrels are individually formed.

For the P9 semi-automatic pistols in caliber 9mmP and .45ACP, the barrel profile and chamber are presently formed in one operating cycle i.e.- one blank is formed into one barrel.

Polygon barrels are presently manufactured in the following calibers: .22 Win. Mag. Rim Fire, 7x64mm, .308 Win., .30-'06, .300 Win. Mag.; 7.65mm Parabellum, 9mm Parabellum and .45ACP with 4 and 6 polygon profiles, all with right twists and with twist rates corresponding to those for barrels manufactured in the conventional way.

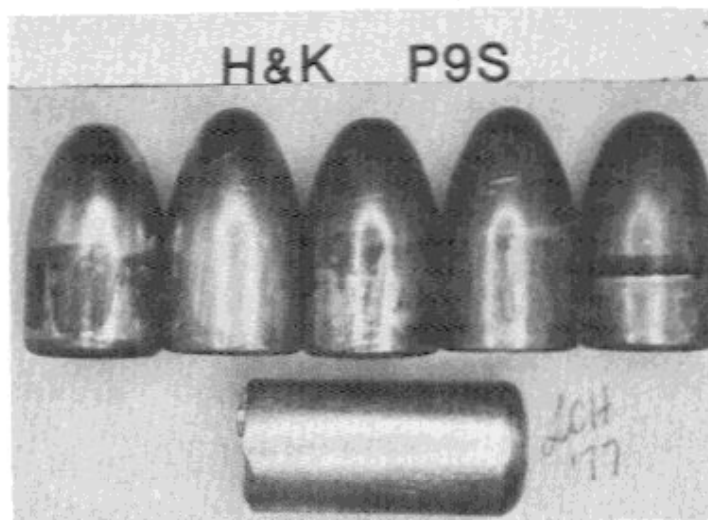
Early P9 barrels were 6-sided then changed to 4-sided some time ago [date or serial numbers not specified]. The P9S* in .45ACP has retained the 6-sided configuration; the other calibers of the P9S pistols have 4-sided profiles.

According to Heckler & Koch, they are presently supplying one other German firm (unnamed) with polygon barrels.

Examination of test fired bullets

Test firing of the P9S pistol was carried out with commercial ammunition (R-P, Federal and W-W loaded with fmj bullets) and with European military ball ammunition using a water recovery tank. An index mark was placed on each bullet and cartridge prior to firing to facilitate proper alignment of the projectiles under the comparison microscope.

Recovered bullets gave the initial impression of either having been fired through a completely shot-out bore or not fired at all. Closer inspection revealed that the responsible barrel was not rough or abrasive however; that it had a right twist and produced finely striated burnish marks where it had contacted the bullet. The 2X macrophotograph below shows five 9mmP bullets from different manufacturers all fired from the same P9S pistol. As can be seen, variations in the degree of barrel markings occur with differences in the brands of the ammunition. Beneath the bullets is a cerrolow bore cast taken



at the muzzle of the P9S pistol.

Microscopic examination of pairs of test fired bullets was carried out with an A/O forensic comparison microscope and fiber optic illumination. The index marks engraved on the bullets prior to firing were used to phase-orient them an expedite the initial search for matching striae (customary land and groove count and particularly land or groove width measurements cannot be effected in the usual manner with bullets from these weapons). Some matching of fine striae were found with some of the test fired bullets while others revealed no positive comparison. Additional techniques such as SEM that might extend one's capabilities were not explored at this time. AFTE members who wish to personally examine some of these bullets may obtain the loan of them by calling or writing the author.

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Notes and credits:

* The S added to the P9 designation denotes double action model.

Figures I and III were excerpted and modified in the case of Fig. III from the literature supplied by the manufacturer.

Special thanks and appreciation are extended to the Heckler and Koch firm for their kind assistance and prompt reply to my inquiries.

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OVERLAY YOUR TEST IMPRESSIONS

Detective Lieutenant John Versailles and Detective Sergeant James Berglund, Michigan State Police, Madison Heights Scientific Laboratory, Madison Heights, MI

This article is presented as an addendum to one entitled "COMPARATIVE MICROGRAPHY TECHNIQUES" written by Dennis L. McGuire, and Robert H. Kennington of Dade Co. Fla. and appearing in the AFTE Journal Volume 9 Number 1 March 1977. The article describes a method of obtaining footwear test impressions whereby the sole of the suspect shoe is lightly sprayed with oil, an impression rolled on card weight paper and dusted with black fingerprint powder to bring out the detail. We have used the technique and find it very helpful.

A variation of the technique substituting a transparent medium for card weight paper is extremely useful for quickly evaluating size and pattern similarities or differences. Any relatively stretch free transparent media such as clear X-ray film, clear plastic sheet protectors etc. will do. We are currently using clear acetate film .0015 in thickness, purchased in 20 inch by 100 foot rolls for around eleven dollars. It is available at most art supply stores.