

BULLET IDENTIFICATION FROM H&K USP POLYGONAL BARRELS

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ABSTRACT

The Heckler & Koch (H&K) Universal Self-Loading Pistol (USP) was initially equipped with cut-rifled barrels having a 6 groove, right twist.ⁱ A subsequent marketing change in 1994 replaced the cut-rifled barrels with the cold hammer-forged polygonal barrel also twisting 6 right.ⁱⁱ Because of the potential bullet identification problems associated with polygonal rifling, a study was undertaken to determine the feasibility of identifying fired bullets from an H&K USP caliber .40 S&W polygonal back to the barrel of origin.

After collecting and examining 30 sets of test fires, this examiner believes that even with the polygonal rifling now marketed in the H&K USP .40 S&W, identifying bullets to barrels of origin is no more difficult than in situations involving the more common cut-rifled barreling.

BACKGROUND:

Several years ago the Tucson Police Department initiated the H&K USP caliber .40 S&W pistol as the standard department issue sidearm. At that time the pistols had a cut-rifled barrel with a 6 right twist. While investigating an officer involved shooting in September of 1995, this examiner was disturbed to find that the officer's recently issued pistol had polygonal rifling, not the expected cut-rifling. Originally, H&K used cut-rifling in the USP barrels to conform to the American habit of using lead reloaded bullets when shooting. While certainly not endorsing this practice, H&K was marketing the USP as truly American and was anticipating American practices. However, it was realized that the American consumers associate H&K with polygonal rifling and in 1994 (at about S/N 22-30942), it was decided by the marketing division to return to the polygonal barrel.ⁱⁱⁱ

It was of some immediate relief to find test fired bullets from the officer's pistol (s/n: 22-32007) to have a great deal of heavy and fine stria that made sequencing and identification in this case routine. In the long term however, it was important to know if these unique striations were caused by an anomaly

or defect peculiar to this officer's pistol barrel or if the routine identification of a polygonal signature would be possible with the H&K USP.

STUDY:

There were 35 officer responses to a Lab request for test firing and collection of bullets and casings. Five of these were rifled barrels (s/n: 22-8924, 8946, 8894, 9239, 29363). This allowed 30 collections from polygonal rifled pistols to be examined. The collection consisted of at least five 180 grain bullets per pistol:

two Federal FMJ flat point (copper jacket)
two Winchester SXT Ranger (black finished)
one Remington FMJ flat point (copper jacket)

The bullets and casings were secured and all were placed separately in plastic containers and labeled accordingly.

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*(Continued from page 307)***RESULTS AND DISCUSSION:**

Of the 30 polygonal collections that were made, 28 of the copper jacketed collections were identified to others fired from the same barrel with little trouble. One of the non-identified copper jacketed collections had some stria that could be sequenced, but in this examiner's opinion lacked sufficient detail for an identification. This almost complete ability to identify these bullets was due to heavy patterned stria in both the land and groove engraved areas (see figures 1 and 2). The quality and quantity of the stria was excellent.

Experience from personal observation indicates copper jacketed bullets show the transfer of striations much better than do the black-finished bullets common to the Winchester "Black Talon" or "SXT Ranger" brands. That trait held true in this study in that only eight of the 30 SXT Ranger collections were identified to each other. It should be noted an additional 10 SXT Ranger collections had some stria that could be sequenced, but in this examiner's opinion lacked sufficient detail for an identification. Table #1 provides the pistol serial numbers, the approxi-

*(Continued on page 309)***TABLE #1**

Pistol S/N	App Rounds Through Barrel	ID of Copper Jacketed	ID of SXT Black Finish
1. 22-31178	200	yes	no
2. 22-31197	300	yes	yes
3. 22-31856	100	yes	no
4. 22-31871	1500	yes	yes
5. 22-31894	200	yes	no
6. 22-31900	350	yes	yes
7. 22-31994	1500	yes	yes
8. 22-32009	500	yes	no
9. 22-38992	100	no	no
10. 22-39002	300	yes	yes
11. 22-39156	500	yes	no
12. 22-39280	100	yes	yes
13. 22-39346	700	yes	no
14. 22-39347	100	yes	no
15. 22-39462	2500	yes	no
16. 22-39645	200	yes	no
17. 22-39647	200	yes	no
18. 22-39650	500	yes	no
19. 22-39665	1000	yes	yes
20. 22-39673	200	yes	no
21. 22-39795	500	yes	no
22. 22-39800	100	no	no
23. 22-39816	1000	yes	no
24. 22-39818	100	yes	no
25. 22-39820	200	yes	no
26. 22-39827	200	yes	no
27. 22-39837	500	yes	yes
28. 22-39846	300	yes	no
29. 22-39847	200	yes	no
30. 22-39895	100	yes	no

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mate number of rounds fired through the pistol barrel (gathered from officer interviews), result of copper jacketed bullet exam, and the result of black-finished bullet exam (these are examinations of like bullets fired from the same barrel).

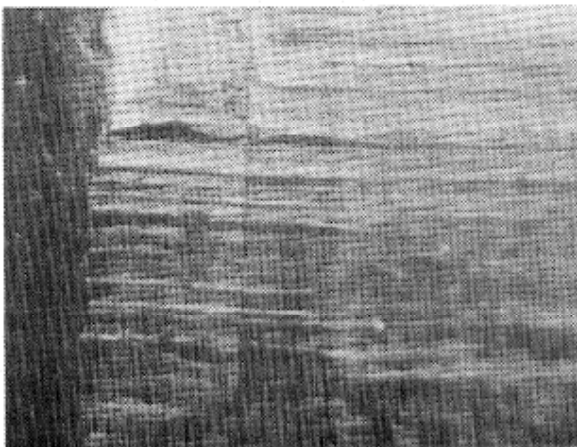


Figure 1: H&K USP LEA, S/N: 22-39605, 20X power, Copper Jacketed



Figure 2: H&K USP LEA, S/N: 22-39462, 20X power, Copper Jacketed

Several of these collections were compared to other collections in the study to determine the likeness of striated patterns on bullets fired from different barrels. The comparisons were based on the closeness of the serial numbers (which, as it

turns out, is not appropriate because the barrel serial numbers are stamped in a batch format, not sequentially stamped as manufactured)^{iv,v} as well as the use of the barrels. In no situation did this examiner see a correspondence of stria between the collections that appeared to be anything but accidental. The number and density of the striated patterns were unique enough to the respective barrels that a misidentification did not seem likely.

For purposes of comparative analysis these H&K USP .40 S&W polygonal barrels produce striated evidence on fired bullets of a quality that is as good as, if not better, than most cut-rifled produced stria this examiner has seen. Barrel molds (Mikrosil™) do not make clear the reasons for the heavy stria, but the consistency of them over a wide range of serial numbers indicate the source to be in the manufacturing process of the barrels and not a singular anomaly.

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ⁱLardizabal, P. "Cartridge Case Study of the Heckler & Koch USP" *AFTE Journal*; Vol. 27 #1, January 1995, pp 49-51

ⁱⁱBrassard, D. Personal Communication, Sept., 1996

ⁱⁱⁱBrassard, D. *ibid*

^{iv}Brassard, D. *ibid*

^vCusiter, D., H&K, Sterling Virginia, Personal Communication, Oct., 1996