

Ejection Port Marks: A Signature of Beretta

A Case Report By Nancy D. McCombs, California State Department of Justice, Fresno, CA

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ABSTRACT

A useful class characteristic was observed on cartridge cases fired from two .40 caliber Beretta pistols. In a recent case where traditional marks were found to be insufficient, identification was possible only through ejection port marks. These marks are generated as the cartridge case is ejected from the firearm's action and strikes the edge of the ejection port as it exits the firearm. Reproducible ejection port marks were observed on fired cartridge cases from numerous Beretta pistols of various models and caliber.

Background

During a high-speed chase, a man attempted to run down two police officers with his vehicle. The police officers fired a total of twenty-nine shots at the suspect whose vehicle was considered a deadly weapon. [1] As is common with officer-involved shootings, a request was made to establish the number of shots fired by each police officer and their position in relation to the suspect. Cartridge case ejection patterns often assist in determining the approximate position of the shooter(s).

Examination

Both pistols fired by the police officers were .40 caliber Berettas, model 96; and both were test fired in order to examine the cartridge cases. Comparison of the firing pin impressions, ejector marks, extractor marks, chamber marks and breechface marks did not assist in distinguishing them from one another. Further examination revealed ejection port marks on the walls of all test fired cartridge cases. The individual detail in these marks was sufficient to identify them back to their corresponding pistols, which in turn assisted in reconstructing the cartridge case ejection patterns.

Ejection port marks are commonly observed on fired cartridge cases, however, the quantity and quality of ejection port marks observed on cartridge cases fired from Beretta pistols was the focus of this study. Cartridge cases from 91 Beretta pistols were examined for the presence or absence of ejection port marks. If observed, test fires were compared with one another to determine if an identification were possible. The cartridge cases were fired from Beretta pistols of various models and caliber

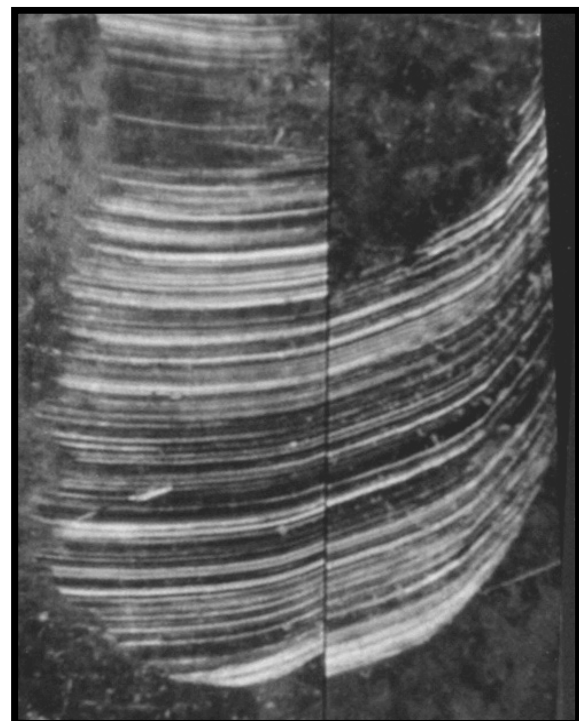
and were obtained from Laboratory test fires or test fires generated from Laboratory reference pistols.

As depicted in table 1, the existence of ejection port marks on test fired cartridge cases and the ability to identify them to one another is independent of caliber and model. With the exception of cartridge cases fired from .22 caliber Beretta pistols, ejection port marks were exhibited in excess of 50% for all remaining calibers. Interestingly, all .40 caliber Beretta pistols in this study displayed ejection port marks on their casings, with a successful identification rate between test fires of 75%.

Discussion

Ejection port marks are generated as the fired cartridge case strikes the edge of the ejection port as it is being ejected from the firearm. [1] Ejection port "dents" are more commonly observed on the walls of cartridge cases, especially on high-powered rifles and larger caliber pistols. [3, 4] The marks observed on the cartridge cases fired from the two police officers' Beretta pistols, as well as a majority of the cartridge cases examined in this study, were striated and not in the form of a dent. (Figure 1)

FIGURE 1



**Ejection Port Mark
Test Fire**

**Ejection Port Mark
Question**

The existence or absence of ejection port marks, as well as reproducibility and quality, depend on a number of

factors. Some possible variables including cartridge case composition, load, number of cartridge cases fired, condition of the firearm, make and model of firearm, how the cartridge is chambered and the position the firearm is held could influence results. It is important to note cycling cartridges through the firearm did not produce these marks, attributing their presence to the firing process.

Conclusion

Ejection port marks are commonly associated with Beretta pistols of various models and caliber. Over 50% of the Beretta pistols in this study displayed ejection port marks on their cartridge cases, with the greatest quantity and number of successful identifications between test fires appearing on cartridge cases from .40 caliber pistols. As Beretta pistols are routinely submitted to the crime lab, often related to officer-involved shootings,

References

- [1] Stokes, Doug, Personal Communication.
- [2] Haag, Lucien, "Firearms Evidence an Overview for the General Criminalist or Forensic Scientist", July 1991.
- [3] Kennington, Robert, The Matrix: 9mm Parabellum an Empirical Study of Type Determination and Personal Communication.
- [4] Kennington, Robert, The Matrix: 380 Auto A Technical Guide and Personal Communication.

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TABLE 1

#	CALIBER	MODEL	EJN PRT MARK	ID of Test
1	.22 SH	950	No	---
2	.22 SH	950B	No	---
3	.22 SH	950B	Yes	No
4	.22 SH	950B	No	--
5	.22 SH	950 BS	Inc.	No
6	.22 SH	1950	No	---
7	.22 SH	950B	No	---
8	.22 SH	950B	No	---
9	.22 LR	*	No	---
10	.22 LR	71	No	---
11	.22 LR	71	No	---
12	.22 LR	76	Yes	Yes
13	.22 LR	70S	No	---
14	.22 LR	*	Inc.	No
15	.22 LR	87BB	No	---
16	.22 LR	21A	Yes	Yes
17	.22 LR	21A	Yes	Inc.
18	.22 LR	948	Yes	Yes
19	.22 LR	948	No	---
20	.223 R	AR 70	Yes	No
21	.25	1954	Yes	Inc.
22	.25	950B	Yes	Inc.
23	.25	950BS	Yes	Yes
24	.25	950BS	Yes	No
25	.25	950BS	Yes	No
26	.25	950BS	No	---
27	.25	950BS	Yes	Yes
28	.25	950BS	Inc.	---
29	.25	950BS	Yes	No
30	.25	950BS	No	No
31	.25	1948	Inc.	No
32	.25	Brevetto 950	Yes	No
33	.25	Panther	No	---
34	.25	950 BS	No	---
35	.25	950B	Inc.	No
36	.25	20	Yes	Yes
37	.25	950 BS	Yes	No
38	.25	1934	Yes	No
39	.25	950 BS	No	---
40	.25	950BS	Yes	No
41	.25	950 BS	Inc.	No
42	.32	70	Yes	No
43	.32	Brevetto1915	Yes	No
44	.32	PSF-1953	Yes.	Inc.
45	.32	70	Yes	No

* Model not recorded by original examiner

#	CALIBER	MODEL	EJN PRT MARK	ID of Tests
46	.380	84B	Yes	No
47	.380	84	Yes	Yes
48	.380	84	Inc.	---
49	.380	84B	Yes	Yes
50	.380	84BB	Yes	Yes
51	.380	84F	Yes	No
52	.380	84F	Yes	Yes
53	.380	85BB	Yes	Yes
54	.380	85F	Yes	Yes
55	.380	*	No	No
56	.380	70S	Yes	Yes
57	.380	934	Yes	Yes
58	.380	85F	No	No
59	.380	1934	Yes	Yes
60	.380	1934	Yes	No
61	.380	1934	Inc.	---
62	.380	84	Inc.	---
63	.380	84	No	---
64	9mm	92	Yes	Yes
65	9mm	92FS	Yes	Yes
66	9mm	92FS	No	No
67	9mm	92FS comp.	Yes	Inc.
68	9mm	92F comp.	Inc.	---
69	9mm	92SB comp.	Yes	Yes
70	9mm	92F	No	---
71	9mm	92Fcomp.	Yes	Yes
72	9mm	1934	No	---
73	9mm	92F	No	---
74	9mm	92	Yes	Yes
75	.40	96	Yes	Inc.
76	.40	96	Yes	Yes
77	.40	96	Yes	Yes
78	.40	96	Yes	Yes
79	.40	96	Yes	No
80	.40	96	Yes	No
81	.40	96	Yes	Yes
82	.40	96	Yes	No
83	.40	96	Yes	Yes
84	.40	96	Yes	Yes
85	.40	96	Yes	Yes
86	.40	96	Yes	Yes
87	.40	96	Yes	Yes
88	.40	96	Yes	Yes
89	.40	96	Yes	Yes
90	.40	96	Yes	Yes
91	.40	96	Yes	Yes