



Serial Number Restoration Test No. 17-5251 Summary Report

This test was sent to 211 participants. Each participant received a sample pack containing a piece of steel bar stock which had been stamped with a six character serial number which was then obliterated. Also included was a piece of aluminum bar stock intended as a standard for the size, shape and positioning of the stamped characters. Participants were asked to restore the obliterated serial number. Data were returned from 168 participants (80% response rate) and are compiled into the following tables:

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This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample set consisted of a piece of steel bar stock that contained an obliterated serial number (Item 1) and a piece of aluminum bar stock intended as a standard for the size, shape, and positioning of the stamped digits. Participants were requested to attempt to restore the obliterated serial number utilizing their laboratory restoration methodologies and report the recovered serial number. The serial number to be restored consisted of 6 characters (3F936A).

SAMPLE PREPARATION:

Each sample set contained a piece of steel bar stock that was stamped with 6 characters (3F936A). The serial number was then obliterated by a milling machine.

A piece of aluminum bar stock was also included in the sample as a reference standard. The alphanumeric characters provided are digits 0-9 and letters A-F, H, J, K and N.

SAMPLE SET ASSEMBLY:

An Item 1 bar stock was enclosed in chip board and the sides taped to securely contain the sample. The aluminum standard was enclosed in chip board and both were placed in their respective pre-labeled envelopes. Each sample pack was packaged with an Item 1 and aluminum standard. This process was repeated until all of the sample packs were prepared. Once verification was completed, all sample packs were sealed with a piece of evidence tape and initialed "CTS."

VERIFICATION:

Two of the three predistribution laboratories restored the obliterated six character serial number and reported "3F936A". The remaining predistribution laboratory restored four of the six characters and reported "3F9??A". Two laboratories used a chemical restoration method for recovery and one laboratory used a magnetic restoration method for recovery.

Summary Comments

This test was designed to allow participants to assess their proficiency in the restoration of an obliterated serial number. Participants were provided with a piece of bar stock that contained an obliterated serial number (Item 1) and a piece of aluminum bar stock intended as a standard for the size, shape and positioning of the stamped characters. Participants were requested to restore the obliterated serial number utilizing their laboratory recovery methodologies and report the recovered serial number. The serial number to be restored consisted of 6 characters (3F936A). (Refer to Manufacturer's Information for preparation details.)

Of the 168 responding participants in Table 1: "Recovered Characters", 147 (88%) recovered the six characters consistent with the Manufacturer's Information. Ten participants restored five of the six characters, two participants reported four of the six characters, three participants reported three of the six characters, one participant restored two of the six characters and one participant restored one of the six characters. Four participants did not report any single character consistent with the Manufacturer's Information. It was noted that several of these 21 participants reported characters that were different from, but similar in shape to, the expected characters.

In Table 3: "Preparation Methods", the majority of participants used polishing, sanding or visual methods to prepare their sample. In Table 4: "Recovery Methods", a vast majority of participants used chemical processing for the serial number restoration.

Recovered Characters

Please record the restored characters below.

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
24PKAH	3	F	9	3	6	A
263KEK	3	F	9	3	6	A
2AWJTF	3	F	9	3	6	A
2HRRQ8	3	F	9	3	6	A
2PT7AN	3	F	9	3	6	A
2U4R8E	3	F	9	3	6	A
2WTVZL	3	F	9	3	6	A
2YHU8C	3	F	9	3	6	A
3F33HE	3	F	9	3	6	A
3J4H2G	3	F	9	3	6	A
3W3KG4	3	F	9	3	6	A
3W6AJE	3	F	9	3	6	A
3ZL73H	3	F	9	3	6	A
46EZLH	3	F	9	3	6	A
49VWFG	3	F	9	3	6	A
4NBUPN	3	F	9	3	6	A
4UEZZK	3	F	9	3	6	A
62BUXJ	3	F	9	3	6	A
69P3YK	8	F	9	8	6	A
6JBCW8	3	F	9	3	6	A
6Y6Y3Z	3	F	D	3	6	A
6YLNDL	3	F	9	3	6	A
798CME	3	F	9	3	6	A

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
7KZV2K	3	F	9	3	6	A
86NEW4	3	F	9	3	6	A
8AK3DB	3	F	9	3	6	A
8F7QVE	3	F	9	3	6	A
8JNFA6	3	F	9	3	6	A
8WW2VJ	3	F	9	3	6	A
96EPUV	3	F	9	3	6	A
9AWPCW	3	F	9	3	6	A
9BNBXF	3	F	9	3	6	A
9KXKL9	3	(?)	9	3	6	A
9YUYL2	3	F	9	3	6	A
AAC9U9	3	F	9	3	6	A
ABGMU7	3	F	9	3	6	A
ADAJGE	3	F	9	3	6	A
AGNRQD	3	F	9	3	6	A
AL2WHZ	3	F	9	3	6	A
ANAK6X	3	F	9	3	6	A
AQYH8H	3	F	9	3	8	A
BJBK6T					6	A
BMTAHX	3	F	9	3	6	A
BPJEB6	3	F	9	3	6	A
BUQ6FV	3	F	9	3	6	A
BXFNT8	3	F	9	3	6	A
C277DK	3	F	9	3	6	A

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
C9T7Z6	3	F	9	3	6	A
CF8G7X	3	F	9	3	6	A
CKF3RA	3	F	9	3	6	A
CKJXMU	3	F	9	3	6	A
CPGJCC	3	F	9	3	6	A
D9Z3KZ	3	F	9	3	6	A
DKDRCX	3	F	9	3	6	A
DQ3BUF	3	F	9	3	6	A
DVXER7	3	F	9	3	6	A
E2WF8Q	3	F	?	3	?	A
E6GXEW	3	F	9	3	6	A
EB6KA3	3	F	9	3	6	A
EDURUY						
EPPZC2	3	F	9	3	6	A
EX6JW2	3	F	9	3	6	A
EZMDJ7	3	F	9	3	6	A
F3B8W2	3	F	9	*	6	A
F9BN88	3	F	9	3	6	A
FFXET3	3	F	9	6	6	A
FK8ZV2	3	F	9	3	6	A
FLJAU7	3	F	9	3	6	A
FQEQX8	3	F	9	3	6	A
FW2DUX	*	*	*	3	6	A
FY8WVE	3	F	9	3	6	A

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
G6TNP7	3	F	9	3	6	A
GCR9TM	3	F	9	3	6	A
GEH2GX	3	F	9	3	6	A
GFX4N7	3	F	9	3	6	A
GL3ZAR	3	F	9	3	6	A
GWHRX2	3	F	9	3	6	A
H4WRF3	3	F	9	3	6	A
HKNVDE	3	F	9	3	6	A
HQBKV3	3	F	9	3	6	A
J7HWMZ	3	F	9	3	6	A
JC4NYY	3	F	9	3	6	A
K8N4GY	3	F	9	3	6	A
K9HPCB	3	F	9	3	6	A
K9X9W9	3	F	9	3	6	A
KH7HN9	3	F	9	3	6	A
KJ34DT	3	F	9	3	6	A
KJGX3L	3	F	9	3	6	A
KTM6F2	3	F	9	3	6	A
LAA8PW	3	F	9	3	6	A
LE2CKL	3	F	9	3	6	A/7
LVA92Z	3	F	9	3	6	A
M434EN	3	F	9	3	6	A
M4JEU9	3	F	9	3	6	A
M8EJTZ	3	F	9	3	6	A

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
MHG27N	3	F	9	3	6	A
MXRK2U	3	F	9	3	6	A
N2AP66	3	F	9	3	6	A
N4CZ7R	3	F	9	3	6	A
NAZMZW	3	F	9	3	6	A
NBEGUY	3	F	9	3	6	A
NECX7T	3	F	9	3	6	A
NK48GR	3	F	9	3	6	A
NTDWUP	3	1	9	3	6	A
NX4733	3	F	9	3	6	A
NZWZ2R	3	(F or E)	9	3	6	A
PAF4VQ	3	F	9	3	6	A
PB9MQJ	?	?	?	?	?	?
PEV2ET	3	F	G	9	6	A
PJ4PRV	3	F	9	5	6	A
PRX6QR	3	F	9	3	6	A
PU2P7K						
PX27QL	3	F	9	3	6	A
Q6KTYW	3	F	9	3	6	A
Q8AZJU	3	F	9	3	6	A
QDPYQD	3	F	9	3	6	A
QE7KF3	3	F	9	3	6	A
QZ7LR7	3	F	9	3	6	A
R2EQNL	3	F	9	3	6	A

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
R38B7Y	3	F	9	3	6	A
R3QMVC	3	F	9	3	6	A
RA7TMV	3	F	9	3	6	A
RGUQKC	3	F	9	3	6	A
RL2EXD	3	F	9	3	6	A
RMG7ZQ	3	F	9	3	6	A
RMUBKM	3	F	9	3	6	A
RP7BW4	3	F	9	3	6	A
RZ4GNG	3	F	9	3	6	A
T4J6LY	3	F	9	3	6	A
T98HAK	?	F	9	?	?	A
TAJMYP	3	F	9	3	6	A
TCE9RG	3	F	9	3	6	A
TE2MFQ						A
TK8FBL	3	F	9	3	6	A
TR6B9K	3	F	9	3	6	A
TTFK8P	3	F	9	3	6	A
TVMBPL	3	F	9	3	6	A
TVRP22	3	F	9	3	6	A
TWXAMF	3	*	9	3	6	A
TZ2FBE	3	F	9	3	6	A
TZG8DR	3	F	9	3	6	A
U7689X	3	F	9	3	6	A
V3VLTW	3	F	9	3	6	A

TABLE 1

WebCode	Character 1	Character 2	Character 3	Character 4	Character 5	Character 6
VB98QK	3	F	9	3	6	A
VQJGKF	3	F	9	3	6	A
YCN3L	3	F	9	3	6	A
VYHEGC	3	F	9	3	6	A
W2LYVH	3	F	9	3	6	A
WAT7KC	3	F	9	3	6	A
WJLGU8	-	-	-	-	-	-
WUHMLJ	3	F	9	3	6	A
X86JDN	3	F	9	3	6	A
X9FNPR	3	F	9	3	6	A
XDP9MH	3	F	9	3	6	A
Y2B2GN	3	F	9	3	6	A
YNPQQD	3	F / B	0 / 9	3 / 8	6	A
YQD7EM	3	F	9	3	6	A
YV8XQQ	3	F	9	3	6	A
YVLLNB	3	F	9	3	6	A
YY947W	3	F	9	3	6	A
Z3MXLT	3	F	9	3	6	A
Z4FWWL	3	F	9	3	6	A
ZAHZLJ	3	F	9	3	6	A
ZBUXVV	3	F	9	3	6	A
ZHFQ8U	3	F	9	3	6	A
ZPEELD	3	F	9	3	6	A
ZYNMN9	3	F	9	3	6	A

TABLE 1

WebCode	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>
ZYZJTD	3	F	9	3	6	A

Response Summary						Participants:168
	<u>Character 1</u>	<u>Character 2</u>	<u>Character 3</u>	<u>Character 4</u>	<u>Character 5</u>	<u>Character 6</u>
Consensus	3	F	9	3	6	A
Number	159	156	157	155	160	163
Percent	94.6%	92.9%	93.5%	92.3%	95.2%	97.0%

Conclusions

TABLE 2

WebCode	Conclusions
24PKAH	The hidden number is 3F936A.
263KEK	The serial number is milled off. The serial number (3F936A) was restored by acid etching. Polishing, Fry's reagent and Nickles & Alloys reagents were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface area of the firearm. Disposition: This item will be held in the Firearm Section's Evidence Room.
2AWJTF	The obliterated serial number on Item 1 was restored to read "3F936A".
2HRRQ8	The defaced serial number of the metal bar stock, item 1, was physically, chemically, and magnetically processed. Its serial number was restored to read "3F936A".
2PT7AN	Steel plate (Item # 1) was chemically/magnetically processed. Its serial number was restored to read 3F936A.
2U4R8E	Restoration procedures on exhibit SNR2 revealed the serial number to be: 3F936A
2WTVZL	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be 3F936A.
2YHU8C	The obliterated serial number was restored to read 3F936A
3F33HE	Examination of Item #1 revealed one (1) portion of metal bar stock with reported serial number obliterated. Using standard laboratory restoration techniques, an attempt was made to restore the serial number on Item #1 with the following results: Serial Number: 3 F 9 3 6 A was restored to Item #1.
3J4H2G	1. The obliterated area on Exhibit 1 (metal bar) was visually examined, polished and processed. The characters were restored and appeared as follows: 3F936A.
3W3KG4	The serial number was restored to read 3F936A.
3W6AJE	Item: 1 One piece of 4140 metal bar stock with suspected obliterated serial number. RESULTS: Item 1 was physically and microscopically examined. The obliterated area of Item 1 was prepared and treated with chemical reagents. As a result of these actions, the serial number was restored to read 3 F 9 3 6 A.
3ZL73H	Attempts to raise the serial number of the 4140 metal bar stock, specimen #1, by chemical methods revealed the following serial number: 3F936A.
46EZLH	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be "3F936A".
49VWFG	The serial number "3F936A" was recovered using the electromagnetic process.
4NBUPN	After application of the electromagnetic and chemical process, we determined the number of the metal bar stock as "3F936A"
4UEZZK	Standard restoration techniques revealed the characters "3F936A".
62BUXJ	Steel plate (Item # 1) was chemically / magnetically processed. Its serial number was restored to read 3F936A.
69P3YK	The obliterated number, Item 1, was subjected to a magnetic procedure to render the obliterated digits temporarily visible. During this procedure the digits 8F986A were observed.
6JBCW8	Forensic restoration methods applied to the ground area of the metal bar stock restored a series of previously stamped characters that read: 3F936A

TABLE 2

WebCode	Conclusions
6Y6Y3Z	The questioned bar stock was subjected to a chemical examination to retrieve the obliterated serial number. The characters 3FD36A were developed during the process and were confirmed after direct comparison with the known reference samples for the characters. The developed characters had similar font and size characteristics to the reference samples.
6YLNDL	Examination and magnetic and chemical processing restored the obliterated serial number, which was determined to "3F936A".
798CME	Item with WEBCODE:798CME is a metalik plate stainless steel, after restoration six characters of the serial number were restored. Restored characters are „3F936A” and are same as standards in standard plate.
7KZV2K	Examination and chemical and magnetic processing restored the obliterated serial number, which was determined to be “3F936A”.
86NEW4	We strongly support the hypothesis that piece has serail number 3F936A.
8AK3DB	The obliterated serial number was restored to read 3 F 9 3 6 A after processing with Fry's reagent.
8F7QVE	Examination and processing of the Q-1 bar stock restored the original obliterated serial number, which was determined to be 3F936A.
8JNFA6	Restoration of obliterated stamped markings was performed on the questioned surface of Item 1 and the original serial number was found to be "3F936A".
8WW2VJ	Item 1 was received with the serial number obliterated. Attempts to restore the serial number were made by sanding and polishing the surface with a Dremel tool and by acid etching. These attempts yielded the serial number to read, “3F936A”.
96EPUV	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching/Microscopy/Physical Serial number restoration procedures revealed the serial number on Item 1 to be: 3 F 9 3 6 A
9AWPCW	An area of ground metal was polished. Chemical number restoration methods were employed to try and restore any characters that may have been present. The following characters were restored: " 3 F 9 3 6 A"
9BNBXF	in the result of examination the following signs would be restored/recovered: "3 F 9 3 6 A".
9KXKL9	Restoration techniques applied to the piece of aluminum revealed the following characters: 3?936A. The second character could not be determined with certainty but is characteristic of being an "E" or an "F".
9YUYL2	The serial number of this item was restored and determined to be 3F936A.
AAC9U9	Item 1 - Piece of 4140 metal bar stock. Serial number restoration techniques via acid etching produced the serial number 3F936A.
ABGMU7	The following findings reflect the professional opinion of the examiner authoring this report. Using standard serial number restoration techniques, an attempt was made to restore the serial number with the following results: Serial Number: 3 F 9 3 6 A was restored on Item 1.
ADAJGE	Metal bar stock was magnetically/chemically processed. Its number was fully restored to read: 3F936A on 8/04/2017
AGNRQD	Item 1 - one (1) piece of 4140 metal bar stock with suspected obliterated serial number. 1 - piece of aluminum bar stock as a standard. The submitted specimen marked as Item 1 was examined and identified as a single piece of metal bar stock with an obliterated serial number, consisting of six (6) characters. Item 1 was microscopically and chemically processed. As a result of chemical processing it was concluded that the obliterated serial number of Item 1, was restored to its original serial number which is "3F936A".

TABLE 2

WebCode	Conclusions
AL2WHZ	One (1) piece of stainless steel bar approximately 2 5/8" x 1". Serial Number defaced by abrasion, however recovered number "3F936A" using chemical etching process.
ANAK6X	The aluminum bar (Item 1) was submitted for serial number restoration. No digits or letters were visible prior to restoration. After the application of restoration techniques including sanding/polishing and chemical etchants, the serial number was visible. The restored serial number is: 3F936A
AQYH8H	An attempt has been made to recover the erased serial number using a technique called "MAGNAFLUX" and this has revealed the number to be 3F938A.
BJBK6T	The acid etch method was used to partially restore the serial number of the 01-AA (Item 1) bar stock to read: ????6A (? = unrestored character).
BMTAHX	The obliterated serial number has been restored as 3F936A.
BPJEB6	The obliterated serial number on Item 1 was restored to read 3F936A.
BUQ6FV	Item #1 - one tan colored envelope, containing steel and aluminum bar stock - serial number obliterated by abrasion, restored to "3F936A" by examiner using chemical etching. CTS number scribed on back of steel bar by examiner.
BXFNT8	Examinations showed the serial number of Item 1 to be obliterated. The serial number was restored using magnetic and acid etching techniques and was found to read: 3F936A.
C277DK	Item #1.1 contains an obliterated section on one side; magnetic restoration procedures were performed and the serial number was restored to read: 3F936A.
C9T7Z6	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read 3F936A.
CF8G7X	Item 1: The Item 1 steel bar was physically and chemically processed in an attempt to restore the obliterated serial number with the following result: The serial number was restored to read 3F936A. The restored serial number was not searched in any databases.
CKF3RA	The serial 3F936A was recovery using the technical non destructive and not invasive "Magnaflux"
CKJXMU	The serial number was restored to read 3F936A.
CPGJCC	The serial number was restored and is 3F936A.
D9Z3KZ	The piece of metal with the obliterated section was polished and chemically processed to fully restore the following obliterated serial number: 3 F 9 3 6 A
DKDRCX	The examination and processing of the obliterated serial number on the Item 1 bar stock was restored to read "3F936A".
DQ3BUF	After the chemical reagents action, the original serial number has been completely regenerated.
DVXER7	Examination of Exhibit 1 disclosed it to be a piece of metal bar stock, displaying an area of obliteration in its center. The obliterated area of Exhibit 1 was visually examined, polished, and chemically processed. The characters were restored and appeared as follows: 3F936A.
E2WF8Q	The item consisted of a small metal block with a groove ground, or planed, into one side. Number restoration techniques were applied to the metal surface with the groove. A single line of characters was revealed, which were "3 F ? 3 ? A", where the first "?" was not fully restored but appeared to be a "9", and the second "?" was not fully restored but appeared to be a "6".
E6GXEW	Restoration of the obliterated serial number was performed on questioned surface of the 4140 metal bar stock marked "Item 1". The restored serial number was found to have six characters - "3F936A"

TABLE 2

WebCode	Conclusions
EB6KA3	The following findings reflect the professional opinion of the examiner authoring this report. Examination of Item 1 revealed one (1) metal bar stock with suspected obliterated serial number. Using standard serial number restoration techniques, an attempt was made to restore the serial number with the following results: Serial Number: 3 F 9 3 6 A was restored on Item 1.
EDURUY	The suspected obliterated serial number on the metal bar (Item 1) was processed using physical, chemical, and magnetic methods. Attempts to restore the number were unsuccessful.
EPPZC2	The obliterated serial number on the metal bar stock, item 1, was restored to 3F936A. The metal bar stock, item 1, was examined. The location of the suspected obliterated serial number, the middle of the bar stock, was obliterated by a grinding type of tool. Using standard restoration techniques, the obliterated area was sanded and treated with magnetic inspection particles and chemicals.
EX6JW2	After the application of the magnetic particle inspection method and the acid etch restoration method the obliterated alpha-numeric number on Item 1 was perceived as "3F936A".
EZMDJ7	The obliterated serial number on item 1 was chemically processed and restored to read: "3F936A".
F3B8W2	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was partially restored to read 3F9*6A. The * could be a 3, 8, or B.
F9BN88	The item 1 obliterate serial number, located in the center section of the metal bar, was chemically processed and determined to be 3F936A.
FFXET3	The obliterated serial # on the metal bar was raised to be: 3F966A
FK8ZV2	The Exhibit's surface was lightly polished, using grinding paper 120 and 600. The polished surface was then treated with Fry's reagent. The results were successfully photographed.
FLJAU7	Examination and processing of the Q-1 steel bar restored the original obliterated serial number, which was determined to be 3F936A.
FQEQX8	After application of the electro-magnetic process, we determined the serial number of the 4140 metal bar stock as 3F936A.
FW2DUX	The serial number on the metal bar, item 1, was partially restored to read ***36A. Possible characters for the first asterisk include "3" or "B". Possible characters for the second asterisk include "F" or "E". Possible characters for the third asterisk include "9" or "8".
FY8WVE	Examination and magnetic/chemical processing of Item 1 restored the original obliterated serial number, which was determined to be "3F936A".
G6TNP7	Examination and processing of the Q-1 piece of metal restored the original obliterated serial number, which was determined to be 3F936A.
GCR9TM	Upon chemical restoration, the original serial number was '3F936A'.
GEH2GX	The obliterated serial number on Item 1 was restored to read 3F936A.
GFX4N7	After to apply of electromagnetic method, we determined the number of the 4140 bar stock is 3F936A.
GL3ZAR	One (1) 2 5/8" x 1 1/8" 4140 bar stock with abraded serial #. "3F936A" recovered through the chemical etching process.
GWHRX2	The serial number of Item 1 as restored is 3F936A.
H4WRF3	1. The obliterated area on Exhibit 1 was polished and chemically processed. The characters were restored and appeared as follows: 3F936A.
HKNVDE	Acid etching procedures were performed and the serial number was restored to read 3F936A.

TABLE 2

WebCode	Conclusions
HQBKV3	The restored serial number on the piece of metal bar was found to be 3F936A.
J7HWMZ	Visual examination of this item revealed the presence of grind/polish marks on the center on one side of the metal bar stock. This area was magnetically processed and etched with acid solutions and the following was restored: 3 F 9 3 6 A
JC4NYY	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and chemically processed with restoration reagents. As a result of these actions, the serial number was restored to read: 3F936A.
K8N4GY	The serial number was fully restored to read "3F936A"
K9HPCB	Item #1 a piece of 4140 metal bar stock with suspected obliterated serial number. Serial number located on side one of the bar. Acid etching procedures were performed and the serial number was restored to read 3F936A.
K9X9W9	Attempt to restore serial number to frame of weapon yielded the following results:
KH7HN9	The investigation revealed that the number on the metal part had been removed by instrumental intervention. With electromagnetic method applied to the surface where the removed number is located, "3F936A" characters were detected.
KJ34DT	Item #1 (steel bar-stock with suspected obliterated serial number) was examined on 7/21/2017 and found to contain an area of obliteration with overlapping circular signatures. Serial Number Restoration commenced on 7/20/2017 and was completed on 7/21/2017. Serial Number Restoration was successful. The serial number on Item #1 (bar-stock) was recovered as: 3F936A.
KJGX3L	Examination of the submitted Item 1 found the manufacturer's serial number to have been obliterated. Magnetic and physical processing of the submitted Item 1 restored the obliterated, original serial number to read "3F936A".
KTM6F2	The serial number is milled off. The serial number (3F936A) was restored by the acid etching process. Polishing and the Fry's reagent were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface area of the firearm. Disposition: This item will be held in the Firearm Section's Evidence Room.
LAA8PW	The obliterated area of exhibit #1 (stainless steel bar) was visually examined and chemically processed. The characters were fully restored and determined to be "3F936A"
LE2CKL	Serial number defaced by abrasion, partially restored using chemical etching method. Sixth character could not be positively identified, could potentially be "7" or "A".
LVA9ZZ	Item 1 was received with a partially obliterated serial number. Examination and chemical processing of Item 1 resulted in the full restoration of the original serial number which was determined to be "3F936A".
M434EN	The serial number on Item 001 was found to be obliterated. The obliterated serial number was chemically processed and the serial number was able to be restored as 3F936A. The evidence is Item 001 is being retained in the proficiency test files at the laboratory. Findings concurred with by [name].
M4JEU9	Item #1 is a piece of metal bar stock with suspected obliterated serial number. Magnetic restoration procedures were performed and the serial number was restored to read: 3F936A.

TABLE 2

WebCode	Conclusions
M8EJ TZ	After determining that "Item 1" was magnetic, I decided to use the restoration method for Magnetic Media: utilizing Fry's Reagent, Turner's Reagent, Davis' Reagent and a 25% Nitric Acid Solution. Before beginning, I noted that no characters were visible. I began my processing by sanding the item with fine grit sandpaper (220 Grit, Aluminum Oxide Material.) No characters were developed/visible after sanding. Next, I cycled through the aforementioned reagents. Applying the solutions using a cotton tip applicator. No characters were visible after using Fry's or Turner's Reagent. After using Davis' reagent, two complete characters (3F) were visible with one partial character visible (such as 3 F _ _ _ *). After using the 25% Nitric Acid solution, all 6 characters were visible. Only one cycle of reagents was necessary. The developed characters read as such "3F936A" [name] verified my findings.
MHG27N	My examination shows the serial number on the exhibit firearm, Item 1, to be 3F936A.
MXRK2U	Using standard laboratory restoration techniques, the serial number on Item 1 was restored to read 3F936A.
N2AP66	The examination and chemical processing of the aluminum bar, item #1 revealed a full serial number with sufficient characteristics to allow the examiner to make a positive identification The numbers/letters restored are as followed "3F936A".
N4CZ7R	The defaced area on the Item 1 metal plate was processed magnetically and chemically, resulting in a full recovery of the Item 1 serial number. The recovered number reads as follows: 3F936A.
NAZMZW	1. The obliterated area on Exhibit 1 (piece of metal bar stock) was visually examined, polished, and chemically processed. The characters were restored and appeared as follows: 3F936A.
NBEGUY	The serial number restored by a electromagnetic method on the obliterated portion of 4140 metal bar stock (item 1) is 3F936A, in accordance with aluminum standard bar stock
NECX7T	Item #1 - The serial number on the piece of metal, item 1, was restored to read 3F936A.
NK48GR	The obliterated serial number on Item 1 was restored to read "3F936A". Item 1A was inventoried and no further examinations were performed.
NTDWUP	The obliterated serial number on Item 1 was restored to read "31936A".
NX4733	The obliterated area on the piece of 4140 metal bar stock in item 1 was chemically etched and the serial number was determined to be 3F936A.
NZWZ2R	An obliterated area was noted on the metal bar in Item 1. Standard restoration techniques revealed the following characters as the serial number: 3(F or E)936A. The 2nd character could not be definitively determined.
PAF4VQ	Examination and processing of the Q-1 metal bar stock restored the original obliterated serial number, which was determined to be 3F936A.
PB9MQJ	Submitted in small tan envelope marked "Test No. 17-5251, Item 1": One rectangular in shape piece of aluminum bar stock, measuring 1" x 1 5/8" x 1/4" and weighing 1,526 grms. Serial number defaced by circular abrasions. Unable to restore using chemical etching process. Unable to determine the number of characters. One character possibly an "A". FIU# etched on back area, by examiner, for identification purposes.
PEV2ET	we received an aluminum bar with the requirement of restoration of the serial number on the aluminum bar, and there was another one included in the sample set with standard number and letters. by doing the microscopic examination ,we were able to find the location of the removed numbers. we used a rod with cotton ,then submerged it into a chemical solution and applied on the removal area to remove the scratches and then the numbers appeared gradually on the applied area.
PJ4PRV	After I do the eletrochemical analisis to the metal bar the number 3F956A has been recovered.
PRX6QR	Examination of Item 1 revealed that the serial number had been obliterated. Using standard laboratory techniques, the obliterated serial number was restored to read "3F936A".

TABLE 2

WebCode	Conclusions
PU2P7K	No character was found, despite several tries.
PX27QL	A series of six previously stamped characters were restored and read: 3F936A.
Q6KTYW	The serial number is milled off. The serial number (3F936A) was restored by acid etching. Polishing, Modified Fry's reagent, Nickel & Alloy reagent and Nitric Acid were used for the restoration. A chemical reaction was observed when the acid etching solution was applied to the surface area of the firearm. Disposition: This item will be held in the firearm section's evidence Room.
Q8AZJU	The obliterated serial number on the piece of bar stock (Item 1) was chemically restored and determined to be 3F936A.
QDPYQD	Examined exhibit item 17-5251 being a piece of metal plate. This item was prepared and treated with a chemical solution which recovered the characters 3F936A. The recovered characters were consistent with the characters supplied on the reference sample.
QE7KF3	Attempt to restore Serial Number to frame of weapon yielded the following results: 3 F 9 3 6 A
QZ7LR7	Item #1 is a 4140 metal bar stock, serial number obliterated. The obliterated serial number is located on the middle of the bar. Acid etching procedures were performed and it was determined that the serial number was 3F936A.
R2EQNL	The obliterated serial number was located on the ground surface of the sample. The area was magnetically processed and it was restored to read "3F936A"
R38B7Y	The serial number on Item 1 was found to be 3F936A.
R3QMVC	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching/Microscopy. Serial number restoration procedures revealed the serial number of Item 1, the piece of stainless steel bar stock, to be: 3 F 9 3 6 A
RA7TMV	The serial number of Item 1 was chemically processed and restored to read: 3 F 9 3 6 A
RGUQKC	Serial Number Restoration Analysis: Methodology - Chemical Reagent Etching/Physical. Serial number restoration procedures revealed the serial number on Item 1, the bar stock, to be: 3 F 9 3 6 A
RL2EXD	The serial number was restored to read: 3F936A
RMG7ZQ	On examination, I found no number on the on the metal bar stock. However, I observed the surface of the metal was filed. After analysis, the obliterated serial number was restored and read as "3F936A".
RMUBKM	The Item #1 was physically and chemically processed. Its serial number was restored to read 3F936A. The evidence will be returned to the submitter.
RP7BW4	I restored the serial number on Item 1 to 3F936A.
RZ4GNG	Serial number "3F936A" restored by chemical etching process to defaced section of submitted barstock.
T4J6LY	The obliterated area on the 4140 metal bar stock in item 1 was chemically etched and the serial number was determined to be 3F936A.
T98HAK	Item 1 is one (1) metal bar stock (4140) submitted with serial number obliterated. The serial number was partially restored to read: ?F9??A. The characters represented by the question mark '?' are either: 1st character 3, J or 8; 4th character 3, J or 8; 5th character 5, 6 or 8.
TAJMYP	My final interpretation of the serial number stamped on Item 1 is 3F936A.
TCE9RG	One (1) piece of steel (approx. 2 5/8" x 1" x 1/4") submitted with a suspected obliterated serial number. A one inch square area of surface removed by a drilled/cutting device. Serial number "3F936A" restored using chemical etching/MPI process, scribed with number "17-5251" by examiner.

TABLE 2

WebCode	Conclusions
TE2MFQ	Through the restoration process of serial number, it was determined: 1. The serial number of the piece of metal described in item 1, it was not restored due to its high grade of mutilation.
TK8FBL	The obliterated serial number on Item 1 was restored to read 3F936A.
TR6B9K	The serial number on the Item 01-01 metal bar was restored to read "3 F 9 3 6 A".
TTFK8P	The obliterated serial number of evidence item 1.1 on center of bar stock was chemically restored with the following results obtained. The restored serial number is 3 F 9 3 6 A.
TVMBPL	The obliterated serial number on Item 1 was restored to read 3F936A.
TVRP22	Attempt to restore serial number to frame of weapon yielded the following results:
TWXAMF	Standard Restoration Techniques revealed the following characters "3*936A". The asterisk represents either an "E" or "F".
TZ2FBE	The serial number was restored to read 3 F 9 3 6 A
TZG8DR	Chemical treatment was successful in chemically restoring a serial number on the bar. The serial number on the bar was restored to read: 3 F 9 3 6 A
U7689X	Using standard restoration techniques, the serial number on Item 1 was restored to read 3F936A.
V3VLTW	The metal bar was noted to have an area of obliteration. Chemical etching was carried out on this area and the following characters were identified: 3F936A.
VB98QK	Examination and processing of the Q-1 (Item #1) bar stock restored the original obliterated serial number, which was determined to be 3F936A.
VQJGKF	Examination and restoration of the obliterated area on Item 1 (a piece of 4140 metal bar stock) revealed the following characters interpreted as "3F936A".
VYCN3L	The obliterated serial number on the bar stock item A1-1 was restored and found to be 3-F-9-3-6-A.
VYHEGC	Submission #1-1 had a milled section suspected of having a serial number. The area was polished and magnetic particle inspection method was used to restore the serial number. The serial number was restored to read: 3F936A.
W2LYVH	The obliterated serial number on Item 1 was restored to read "3F936A". Item 1A was inventoried.
WAT7KC	The steel bar was examined, the obliterated area was polished, and Magnaflux applied. The Magnaflux results were not completely definitive. The area was then treated with chemical etching techniques. The restored characters were found to be 3F936A.
WJLGU8	Serial Number Restoration Analysis: Methodology- Chemical Reagent Etching/Microscopy/Physical. Serial number restoration procedure failed to reveal a legible number.
WUHMLJ	Item 1 was physically and microscopically examined. The serial number area of Item 1 was prepared and chemically processed. As a result of these actions, the serial number was restored to read 3F936A.
X86JDN	The serial number of item 1 was restored to read 3F936A, this conclusion was verified by the other firearms examiner our lab.
X9FNPR	The restored serial number was 3, F, 9, 3, 6, A.
XDP9MH	Using standard laboratory restoration techniques, the obliterated serial number on Item 1 was restored to read: 3 F 9 3 6 A
Y2B2GN	The serial number of Item 1 was chemically processed and restored to read: 3 F 9 3 6 A

TABLE 2

WebCode	Conclusions
YNPQQD	Using standard serial number restoration techniques, the six character serial number on item 1-1-1 was partially restored to read: 3, F or B, 0 or 9, 3 or 8, 6, A. The characters in the first, fifth, and sixth positions of the serial number were restored. The characters in the second, third, and fourth positions were partially restored to either of the two characters listed in those positions.
YQD7EM	The obliterated serial number was electromagnetically processed and was restored to read 3F936A
YV8XQQ	Having used a chemical etching technique in an attempt to restore the item's erased serial number, it is my opinion that the serial number appeared to be 3F936A.
YVLLNB	Examination and processing of the obliterated serial number on the submitted plate restored the serial number to read "3F936A"
YY947W	The obliterated serial number is 3F936A
Z3MXLT	Attempt to restore serial number to frame of weapon yielded following results:
Z4FWWL	Prepared the surface of item 1 and applies nondestructive method of Magnaflux, obtain the alphanumeric characters 3F936A
ZAHZLJ	The serial number of the stainless steel plate described in the item 1, was restored and corresponds to: 3F936A.
ZBUXVV	The obliterated serial number on Item 1 was restored to read 3F936A.
ZHFQ8U	The obliterated serial number is 3F936A
ZPEELD	The obliterated serial number on Item 1 was restored to read "3F936A."
ZYNMN9	Serial number using the chemical etching method. Serial number 3F936A successfully recovered.
ZYZJTD	An area of obliteration was observed on the milled side of the bar stock submitted as of Item #1 (4140 metal bar). The milled section is the area where the suspected obliteration is located. The serial number restoration commenced on July 20, 2017. The serial number on the milled side of the bar stock was recovered as: 3F936A

Sample Preparation

(listed in order of use)

TABLE 3

WebCode	Method	Tool Used	Grit Size
24PKAH	Sanding	Sand paper	400
	Sanding	Sand paper	600
	Polishing	Diamond paste	
263KEK	Polishing	electric buffer	
2AWJTF			
2HRRQ8	None		
2PT7AN	Sanding	Sand paper	Coarse
2U4R8E	Polishing	Dremel	
2WTVZL	Polishing	Dremel	
2YHU8C	Polishing	Dremel	
3F33HE	Polishing	Dremel	
	Sanding	Sand paper	600
3J4H2G	Polishing	Rotary Tool	
3W3KG4	Visual	Stereoscope	
	Polishing	Sand paper	400 and 1500
3W6AJE	Visual	Stereoscope	
	Sanding	Sand paper	120
	Sanding	Sand paper	320
	Sanding	Sand paper	400
	Polishing	Steel wool	
	Polishing	Dremel	
3ZL73H	Polishing	Dremel	
46EZLH	Polishing	Dremel	
49VFG	Photography to document condition initial obliterated area		
	The sample was cleaned with solvent		
	Visual observation	Stereomicroscope	
	Polishing of the sample surface	Sandpaper and motor tool	600

TABLE 3

WebCode	Method	Tool Used	Grit Size
4NBUPN	None		
4UEZZK	Visual	Naked Eye	
	Polishing	Dremel	
62BUXJ	Sanding	Sand paper	coarse
69P3YK	Sanding	Dremel	Coarse and Fine
	Polishing	Dremel	N.A.
6JBCW8	Visual	positest paint thickness tester to test metal	Steel bar stock
	Visual	Cast surface	
	Polishing	Sand paper	1200 grit
6Y6Y3Z	Sanding	Emery paper	240
	Sanding	Emery paper	400
	Sanding	Emery paper	800
	Sanding	Emery paper	1200
6YLNDL	Polishing	Dremel	
798CME	Polishing	Sand paper	120 and P800
7KZV2K	Visual	Stereoscope	
86NEW4	Visual	Microscope	
	Sanding	Sand paper	250
8AK3DB	Sanding	Sand paper	1500
	Sanding	Dremel	80
8F7QVE	Visual	Ambient Light	
	Polishing	Dremel	Polishing Wheel 425
	Visual	Magnifying Glass Lamp	
8JNFA6	Sanding	Sand paper	180, 360, 1500
8WW2VJ	Visual	Stereoscope	N/A
96EPUV	Polishing		
9AWPCW	Sanding	Sand paper	80, 320, 600, 1200
9BNBXF	Grinding	Dremel	1200
	Polishing	Dremel	
9KXKL9	Polished	Dremel tool	Jeweler's wheel

TABLE 3

WebCode	Method	Tool Used	Grit Size
9YUYL2	Sanding	Dremel	120
AAC9U9	Polishing	Sand paper	600
ABGMU7	Polishing	Dremel	
ADAJGE	Visual	magnifying glass	n/a
AGNRQD	Polishing	Dremel	N/A
AL2WHZ	Polishing		N/A
ANAK6X	Sanding	Sand paper	120
	Polishing	Dremel	
AQYH8H	Sanding	Sand paper	320
	Polishing	Rotary Tool	
BJBK6T	Polishing	Dremel	
	Visual		
BMTAHX	Grinding	Sand paper	800
BPJEB6	Polishing	Dremel	
BUQ6FV	Polishing	Dremel type	
	Flitz		
BXFNT8	Polishing	Dremel	Fine wheel
C277DK	Visual		
C9T7Z6	Sanding	Sand paper	220, 400
	Polishing	Steel wool	
CF8G7X	Visual	Stereoscope	
	Sanding	Sand paper	600 Wet
	Polishing	Dremel	Green polishing compound
CKF3RA	Visual observation	stereomicroscope	
	Cleaning with acetone		
	Sanding	Sand paper	400 and 600
CKJXMU	Sanding	Sand paper	400 & 1500
CPGJCC	Sanding	Sand paper	800
D9Z3KZ	Polishing	Dremel	

TABLE 3

WebCode	Method	Tool Used	Grit Size
DKDRCX	Visual	Stereoscope	
	Sanding	Sand paper	400
DQ3BUF	Visual	Magnet	
	Cleaning	Acetone	
	Polishing	Sand paper	200 & 1200
	Cleaning	Cellulose paper	
	Visual	Stereoscope	
DVXER7	Sanding	Clay	
	Polishing	Dremel	
E2WF8Q	Polishing	Dremel	
E6GXEW	Sanding	Sand paper	180, 400, 800, 1200
EB6KA3	Polishing	Sand paper	Various grit sizes were used (100, 360, 1500).
	Polishing	Dremel	
EDURUY	Polishing	Rotary Tool	
	Polishing	Steel wool	0000 Superfine
EPPZC2	Polishing	Sand paper	400
EX6JW2	None		
	Polishing	Dremel	
EZMDJ7	Polishing	Dremel	Medium Texture
F3B8W2	Polishing	Dremel	
F9BN88	Cleaning	Steel wool	
FFXET3	Visual	Stereoscope	
	Cleaning	Acetone	
	Polishing	Emery paper	
	None	Dremel	
FK8ZV2	Polishing	grinding paper 120 and 600	
	Cleaning	Acetone	
FLJAU7	Polishing	Dremel	
FQEQX8	Visual and microscope examination	Stereomicroscope	
	Sanding and polishing	Sandpaper	400
	Cleaned surface with acetone		

TABLE 3

WebCode	Method	Tool Used	Grit Size
FW2DUX	Polishing	Sand paper	220
	Polishing	Dremel	
FY8WVE	Visual		
G6TNP7	Polishing	Dremel	
GCR9TM	Cleaning by organic solvent [ether; acetone; ethyl acetate]	cotton wool	
	Sanding	abrasive paper	100
	Sanding	abrasive paper	400
GEH2GX	Polish	Dremel - Cratex wheel	Medium
	Polish	Dremel - Cratex wheel	Fine
GFX4N7	Visual inspection	Stereomicroscope	
	Cleaning	Acetone	
	Sanding	Sand paper	400 - 600
	Polishing	Moto-tool	
GL3ZAR	Polished	Dremel	
GWHRX2	Visual	Stereoscope	
	Sanding	Sand paper	150 and 400
H4WRF3	Polishing	Dremel	
HKNVDE	None		
HQBKV3	Sanding	Dremel	220
J7HWMZ	Visual	Stereoscope	
JC4NYY	Visual	Stereoscope	
	Sanding	Sand paper	220 and 320
	Polishing	Steel wool	
K8N4GY	None		
K9HPCB	Visual		
K9X9W9	Polishing	Emery paper	
KH7HN9	Sanding	Dremel	800-1200 c
KJ34DT	None		
KJGX3L	Visual	Stereoscope	
	Visual	MagnaFlux	

TABLE 3

WebCode	Method	Tool Used	Grit Size
KTM6F2	Polishing	Electric buffer	
LAA8PW	Sanding	Sand paper	220
	Polishing	Steel wool	
LE2CKL	Polishing	polishing wheel	
LVA92Z	Polishing	Dremel	XF (Extra Fine) Light Green
M434EN	Sanding	Detail Sander	100
	Sanding	Sand paper	011K, 220
M4JEU9	Visual	Stereoscope	N/A
M8EJZ	Sanding	Sand paper	220
MHG27N	Visual	Microscope	
	Polishing	Rotary Tool	
	Sanding	Emery paper	400
	Sanding	Emery paper	800
	Sanding	Emery paper	1600
	Cleaning	Ethanol	
MXRK2U	Sanding	Sand paper	P400
N2AP66	Polishing	Dremel	
N4CZ7R	Polishing	Dremel	fine grit rubber wheel
NAZMZW	Visual	Microscope	
	Sanding	Sand paper	220 and 400
	Polishing	Dremel	
NBEGUY	Polished the sample until was mirror smooth	Sand paper	320
	Prepared and polished the surface	Moto-tool	
	Cleaned the sample with acetone		
NECX7T	Visual	Stereoscope	
NK48GR	Polish	Dremel wheel	N/A
NTDWUP	Polishing	Cratex Dremel	N/A
NX4733	Polishing	Dremel	# 425 polishing wheel

TABLE 3

WebCode	Method	Tool Used	Grit Size
NZWZ2R	Visual *No polishing due to depth of milling	Eyes/stereoscope	N/A
PAF4VQ	Polishing	Dremel	n/a
PB9MQJ	Polishing	Polishing Wheel	
PEV2ET	Polishing	rod with cotton	
PJ4PRV	Visual		
PRX6QR	None		
PU2P7K	Cleaning	Acetone	
PX27QL	Polishing	Sand paper	600 followed by 1200
Q6KTYW	Buffing	Buffer Wheel	N/A
Q8AZJU	Visual Polishing	Dremel	425 wheel
QDPYQD	Visual Sanding Cleaning	Microscope Emery paper Acetone	240, 800, 1200
QE7KF3	Sanding Polishing	Sand paper Dremel	600
QZ7LR7	None		
R2EQNL	None		
R38B7Y	Visual Sanding Sanding Sanding	Magnifying Glass Sand paper Sand paper Sand paper	P100 P120 P150
R3QMVC	Visual Polishing	Microscope Dremel	
RA7TMV	Sanding	Dremel	unknown
RGUQKC	Sanding	Sand paper	220
RL2EXD	Sanding	Sand paper	Super fine (Norton P400)
RMG7ZQ	Cleaning	Acetone	N/A

TABLE 3

WebCode	Method	Tool Used	Grit Size
RMUBKM	Polishing	Dremel	
	Cleaning	Acetone	
RP7BW4	Check if magnetic	magnet	
	Sanding	Sand paper	220, 320, 400
RZ4GNG	Polish	Fordham Tool	Fine
T4J6LY	Visual		
	Polishing	Dremel	
T98HAK	Visual - Photograph	Camera	
	Acetone	wipe	
	Grinding wheel	Dremel	fine
TAJMYP	Sanding	Dremel	220/320
	Polishing	Dremel	
	Polishing	Steel wool	
TCE9RG	Polished	Dremel	stone
TE2MFQ	Visual	Stereoscope	N/A
	Polishing	Emery paper	220
TK8FBL	Polishing	Polishing stones	400 and 600
TR6B9K	Polishing	Dremel	
TTFK8P	Polishing	Dremel	
	None		
TVMBPL	Polishing	Dremel/Cratex	
TVRP22	Grinding	Dremel	
TWXAMF	Polishing	Dremel	#74 Extra fine
TZ2FBE	None		
TZG8DR	Polishing	Rotary Tool	
	Cleaning	Acetone	
U7689X	Sanding	Sand paper	220 and 600
	Grinding	Dremel	
V3VLTW	Sanding	Sand paper	100s2 and Wet & Dry

TABLE 3

WebCode	Method	Tool Used	Grit Size
VB98QK	Visual	Ambient Light	
	Polishing	Dremel	Polishing Wheel 425
	Visual	Ambient Light	
VQJGKF	Polishing	Dremel	#240 & #400
YCN3L	Polishing	Dremel	
YHEGC	Polishing	Dremel, Cratex wheel	
W2LYVH	Polishing	Dremel Cratex wheel	Fine
WAT7KC	Polishing	Cratex wheel on Dremel	Med
	Polishing	Cratex wheel on Dremel	extra-fine
	Polishing	Felt wheel w/600 rouge	
	Polishing	Steelwool with semi chrome	0000
	Polishing	Steelwool	0000
WJLGU8	Sanding	Dremel	medium
WUHMLJ	Visual	Stereoscope	
	Sanding	Sand paper	120, 220, 320, 400, 600
	Polishing	Steel wool	
X86JDN	Visual	Stereomicroscope	
	Cleaning	Acetone	
	Sanding	Sand paper	600
	Polishing	Moto-tool	
X9FNPR	Polishing	Emery Paper	P400
XDP9MH	Visual	Stereoscope	400
Y2B2GN	Sanding & Polishing	Dremel	320
YNPQQD	Polishing	Dremel	
	Sanding	Sand paper	fine
	Visual	Stereoscope	
YQD7EM	Visual and microscopic examination	stereomicroscope	
	The surface was cleaned with acetone		
	Polished with sandpaper		600
YV8XQQ	Sanding	Emery paper	120, 240, 400

TABLE 3

WebCode	Method	Tool Used	Grit Size
YVLLNB	Sanding	Fordham	180 & 400
YY947W	Cleaning	Acetone	
Z3MXLT	Polishing	Rotary Tool	
Z4FWWL	Visual observation	Stereomicroscope	
	Cleaning	Acetone	
	Sanding	Sandpaper	600
	Polishing	Moto-tool	
ZAHZLJ	Visual	Stereoscope	N/A
	Sanding	Sand paper	100
	Cleaning	Emery paper	N/A
ZBUXVW	Polishing	Dremel	
ZHFQ8U	Cleaning	Acetone	
ZPEELD	Polishing	Dremel	
ZYNMN9	Light polishing	Dremel	
	Surface wiped clean	Damp cloth	
ZYZJTD	Cleaning	Acetone	

Response Summary

Participants: 167

Sample Preparation

Visual Method: 46

Sanding Method: 54

Polishing Method: 96

None: 12

Note: The totals are not equivalent to the total number of participants because some participants used more than one sample preparation method.

Recovery Methods

(listed in order of use)

TABLE 4

WebCode	Method	Time
24PKAH	MagnaFlux	Daylight
	MagnaFlux	Ultraviolet light
263KEK	Fry's Reagent	combination of the 2- 15 minutes
	Nickles & Alloys reagents	combination of the 2- 15 minutes
2AWJTF	MagnaFlux	
	Turner's Reagent	5-10 mins
	Fry's Reagent	5 min
2HRRQ8	MagnaFlux	
	Turner's Reagent	Total of 1.5 hours for the acid etching
	Fry's Reagent	
2PT7AN	Fry's Reagent	1 min per application
	Electro-magnetic	
2U4R8E	Fry's Reagent	5 minutes
2WTVZL	Magnetic Particle Inspection (MPI)	
2YHU8C	MagnaFlux	
	Fry's	Varied
3F33HE	Fry's Reagent	Swabbed
3J4H2G	MagnaFlux	
3W3KG4	Fry's Reagent	15-20 seconds up to 1 minute
	Acidic Ferric Chloride	15-20 seconds up to 1 minute
	Magnetic Particle Inspection (MPI)	15-20 seconds up to 1 minute
	Nitric Acid	15-20 seconds up to 1 minute
3W6AJE	Turner's Reagent	3 minutes
	Fry's Reagent	8 minutes
3ZL73H	Davis	approx. 5 seconds
	Turner	approx. 5 seconds
	Fry	approx. 5 seconds
	Turner	approx. 5 seconds
	Fry	approx. 5 seconds
	Davis	approx. 5 seconds
Turner	approx. 5 seconds	

TABLE 4

WebCode	Method	Time
46EZH	MagnaFlux	
49VFG	Electromagnetic particles test "Magnaflux"	3 minutes
4NBUPN	Electro-magnetic Chemical	
4UEZZK	Fry's Reagent	20 minutes total
	20% Nitric Acid Solution	20 minutes total
	Fry's Reagent	20 minutes total
62BUXJ	Fry's Reagent	2-3 minutes
	Acidic Ferric Chloride	10 seconds
69P3YK	MagnaFlux	
6JBCW8	Fry's Reagent	Swabbing for around 30 minutes to 1 hr
	Clear coat paint to protect restoration	
6Y6Y3Z	Fry's Reagent	35 minutes
6YLNDL	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	~ 1 minute
	Davis Reagent	~1 minute
	Fry's Reagent	~ 1 minute
	Davis Reagent	~1 minute
	Davis Reagent	~1 minute
	Magnetic Particle Inspection (MPI)	
798CME	Fry's Reagent	about 25 min
7KZV2K	Magnetic Particle Inspection (MPI)	
	Sand/Dremel	
	Davis	1 minute
	Magnetic Particle Inspection (MPI)	
	Davis	1 minute
	Nitric	1 minute
	Davis	1 minute
	Davis	1 minute
	Davis	1 minute
	Fry's Reagent	5 seconds
	Davis	1 minute
	Davis	1 minute

TABLE 4

WebCode	Method	Time
86NEW4	Soda	45 minutes
	WAZAU	15 minutes
8AK3DB	Fry's	approx. 3 min.
8F7QVE	MagnaFlux	
	Magnet (non-electromagnet)	
8JNFA6	Fry's Reagent	1 minute x 10 times
8WW2VJ	FERRIC CHLORIDE	1 MINUTE
	10% NITRIC ACID	1 MINUTE
	DREMEL	1 MINUTE
	10% NITRIC ACID	1 MINUTE
	FERRIC CHLORIDE	1 MINUTE
	Acidic Ferric Chloride	1 MINUTE
	FERRIC CHLORIDE	1 MINUTE
96EPUV	Davis	3 minutes
	Fry's Reagent	4 minutes
	Fry's Reagent	3 minutes
9AWPCW	Acid Etch Method	Two minutes
9BNBXF	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	nearly 2 hours
9KXKL9	20% Nitric Acid Solution	Applied with a swab. Time varied
	Acidic Ferric Chloride	Applied with a swab. Time varied
	50% diluted Fry's reagent	Applied with a swab. Time varied
9YUYL2	Fry's Reagent	approximately 3 seconds
AAC9U9	Turner's Reagent	30 seconds
	Fry's Reagent	~2 minutes
ABGMU7	Fry's Reagent	A few seconds
	Sodium Hydroxide	Alternated towards end with Fry's
ADAJGE	MagnaFlux	3 minutes
	Fry's Reagent	3 minutes
AGNRQD	Fry's Reagent	2-3 minutes working with swab
	Turner's Reagent	2-3 minutes working with swab
	Nitric Acid	2-3 minutes working with swab

TABLE 4

WebCode	Method	Time
AL2WHZ	Davis	20
	Turner	20
	Fry's	20
ANAK6X	Acid Etch Method	10 minutes
AQYH8H	MagnaFlux	
BJBK6T	Fry's	several intervals of ~3min.
	Turner's	several intervals of ~2-2.5 min.
	50% HCl	1 min
	25% Nitric Acid	several intervals of ~1 min.
	Phosphoric/Nitric Acid	30sec.
	Acetone	1 min
BMTAHX	Acid Etch Method	3 min.
BPJEB6	Fry's Reagent	total of 5 minutes
BUQ6FV	#001 Frys Reagent	1-2 mins
	#002 Turners Reagent	1-2 mins
	#003 Davis Reagent	3-4 mins
	#004 Modified Fry's Reagent	30 seconds
	MagnaFlux	5 mins
BXFNT8	MagnaFlux	
	Acid Etch Method	1 minute Fry's / wipe with Nitric
C277DK	MagnaFlux	
C9T7Z6	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	1 hour
CF8G7X	Fry's Reagent	Applied then removed during observation. Multiple times and for various times.
CKF3RA	MagnaFlux	10 minutes
CKJXMU	10% Nitric Acid	5 minutes
CPGJCC	Fry's Reagent	seconds at a time
	Nitric acid	a couple of swipes across surface
D9Z3KZ	MagnaFlux	
	Griffin Reagent	Repeated application for 10 minutes
	Fry's Reagent	Alternated between Fry's and Davis reagents for 10 minutes
	Griffin Reagent	Repeated application for 60 minutes

TABLE 4

WebCode	Method	Time
DKDRCX	Magnetic/MagnaFlux	
DQ3BUF	Fry's Reagent Acid Nitric	15 min. at intervals of 12, 10 & 5 min. 2 min. at intervals
DVXER7	MagnaFlux	N/A
E2WF8Q	Acid Etch Method	a few seconds, multiple applications
E6GXEW	Fry's Reagent	4 times, 10 s each time
EB6KA3	Fry's Reagent	Not pooled
EDURUY	Fry's Reagent Turner's Reagent MagnaFlux	20 minutes 20 minutes
EPPZC2	MagnaFlux Fry's Reagent	Left on material for approx. 3 to 10 seconds
EX6JW2	Magnetic Particle Inspection (MPI) Fry's Reagent	Prior to polishing and after polishing 2 minutes
EZMDJ7	MagnaFlux Turner's Reagent Fry's Reagent	Not Recorded Not Recorded
F3B8W2	Magnetic Particle Inspection (MPI) Turner's Reagent Fry's Reagent	 3 min 3 min
F9BN88	Fry's Reagent Turner's Reagent	15-20 sec 15-20 sec
FFXET3	Acid Etch Method Fry's Reagent Turner's Reagent Acidic Ferric Chloride Various acids dilute HNO3 Dilute HCL	Brief. Many applications however With swabbing
FK8ZV2	Fry's Reagent Fry's Reagent	~20 mins repeatedly several times, till the serial number was restored completely
FLJAU7	MagnaFlux Turner's Reagent Fry's Reagent	 15 minutes 3 minutes

TABLE 4

WebCode	Method	Time
FQEQX8	Magnetic method "Magnaflux"	Four minutes
FW2DUX	Fry's Reagent	Few seconds to 10 minutes
FY8WVE	Magnetic Particle Inspection (MPI)	
	Turner's Reagent	30 seconds
	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	30 seconds
	Magnetic Particle Inspection (MPI)	
G6TNP7	Magnetic Particle Inspection (MPI)	
GCR9TM	Fry's	30 minutes
GEH2GX	Turner's	10 min
	Turner's	15 min
	Fry's	2 min
	Fry's	2 min
GFX4N7	Electromagnetic method Magnaflux	10 minutes
GL3ZAR	Acidic Ferric Chloride	Approx 30 sec.
	Ferric Chloride	Approx 30 sec.
	Phosporic/Nitric Acid	Approx 30 sec.
GWHRX2	Acidic Ferric Chloride	5-10 seconds
	Phosphoric Acid/Nitric Acid	5-10 seconds
	Fry's Reagent	5-10 seconds
H4WRF3	MagnaFlux	
	Fry's Reagent	30 seconds
	Nitric Acid highlighter	10 seconds
HKNVDE	Davis Reagent	5 minutes
	Turner's Reagent	5 minutes
	Fry's Reagent	5 minutes
	Ferric Chloride	5 minutes
HQBKV3	Fry's Reagent	30 minutes
	Acid Etch Method	30 minutes
J7HWMZ	Magnetic Particle Inspection (MPI)	
	Acid Etch Method	< 1 minute
JC4NYY	Turner's Reagent	5-10 mins
	Fry's Reagent	5-10 mins

TABLE 4

WebCode	Method	Time
K8N4GY	MagnaFlux	
	Dremel Polish	
	Fry's Reagent	1 minute
K9HPCB	Ferric Chloride	10 minutes
	Ferric Chloride	10 minutes
	Turner's Reagent	10 minutes
	Turner's Reagent	5 minutes
	Ferric Chloride	10 minutes
K9X9W9	MagnaFlux	
KH7HN9	Electro-magnetic	
KJ34DT	Fry's Reagent	45 sec
	Turner's Reagent	2 mins
	MagnaFlux	20 minutes
KJGX3L	Sanding	Grit size 600A
	MagnaFlux	
KTM6F2	Fry's	20 min
LAA8PW	Davis	2 minutes
	Turner's Reagent	3 minutes
	Fry's Reagent	30 minutes in 10 minute increments
	Turner's Reagent	10 minutes in 5 minute increments
LE2CKL	Chemical Etching	30-40x's
	Magnetic Particle Inspection	4x's
LVA92Z	Fry's Reagent	39 min over 4 applications
M434EN	Acid Etch Method	Less than one minute
M4JEU9	MagnaFlux	N/A
M8EJ TZ	Fry's Reagent	45 seconds
	Turner's Reagent	30 seconds
	Davis' Reagent	30 seconds
	25% Nitric Acid	30 seconds
MHG27N	Fry's Reagent	65 minutes
	Fry's Reagent	15 minutes
MXRK2U	MagnaFlux	

TABLE 4

WebCode	Method	Time
N2AP66	Davis	10 sec
	Turner's Reagent	10 sec
	Fry's Reagent	10 sec
N4CZ7R	Magnetic Particle Inspection (MPI)	
	Fry's Reagent	swabbed over 10 minutes
NAZMZW	MagnaFlux	
	Davis Reagent	15-30 seconds of swabbing
	MagnaFlux	
	Davis Reagent	15-30 seconds of swabbing
	Turner's Reagent	15-30 seconds of swabbing
	Davis Reagent	15-30 seconds of swabbing
	25% Nitric Acid	15-20 seconds of swabbing
NBEGUY	Electromagnetic Particle Inspection	3 minutes
NECX7T	Acid Etch Method	15 minutes
NK48GR	MagnaFlux	N/A
	Turner's	3 mins
	Fry's	2 mins
NTDWUP	MagnaFlux	
	Turners	
NX4733	Fry's Reagent	1 application: ~5 minutes
	Ferric Chloride	3 applications: ~5 minutes each
NZWZ2R	Fry's Reagent (alternating ratio below)	~4-5 seconds
	25% Nitric Acid	~4-5 seconds
	(Ratio above of 6 swabs of Fry's to 2 swabs of Acid)	
PAF4VQ	Magnetic Particle Inspection (MPI)	n/a
PB9MQJ	Chemical Etching Process	5-10 sec. each
PEV2ET	Fry's Reagent	a bout 10 ml
PJ4PRV	Electro-acid	
PRX6QR	MagnaFlux	
PU2P7K	Acid Etch Method	Mote than 1 hour in three tests
PX27QL	Fry's Reagent	on and off for approx. 1 to 2 hours

TABLE 4

WebCode	Method	Time
Q6KTYW	Modified Fry's	3 min
	Nickel & Alloy	3 min
	Nitric Acid	5 min
Q8AZJU	Acid Etch Method	Davis Reagent (less than 1 minute)
	Turner's Reagent	less than 1 minute
	Fry's Reagent	~5 minutes with swiping, rolling, and reapplication of reagent
QDPYQD	Fry's Reagent	55 minutes
QE7KF3	MagnaFlux	
	Davis reagent	approximately 9 minutes in total
QZ7LR7	Davis	2 minutes
R2EQNL	MagnaFlux	
R38B7Y	Magnetic	
	Acid Etch (Turner's)	45 minutes
R3Q MVC	Davis	1 min
	Fry's Reagent	1 - 1 1/2 mins
	Fry's Reagent	3 mins
	Acidic Ferric Chloride & Fry's Reagent	4 mins
	Acidic Ferric Chloride & Fry's Reagent	5 mins
RA7TMV	Turner's Reagent	~ 5 mins
	Fry's Reagent	~ 10 mins
RGUQKC	Fry's Reagent	15 minutes in 30 second intervals
RL2EXD	Fry's Reagent	
	Acidic Ferric Chloride	as needed to visualize/photograph
RMG7ZQ	Acid Etch Method	10 minutes
RMUBKM	Fry's Reagent	Continuous swiping of area for approximately 8-10 min.
RP7BW4	MagnaFlux	
	Sanding	
	Fry's Reagent	
RZ4GNG	Chemical Etching	Fry Reagent/5 mins
T4J6LY	Fry's Reagent	Three (3) applications ~ 1 minute each and then one application ~ten (10) minutes

TABLE 4

WebCode	Method	Time
T98HAK	Davis	10 sec
	Turner's	6-7 sec
	Fry's	1-3 sec
	Polish (light), turners	1 sec
	Magna Flux	30 sec - 1 min
TAJMYP	Davis	30 sec / 1 min / 2 min
	Turner's Reagent	30 sec / 1 min / 2 min
	Fry's Reagent	30 sec / 1 min / 2 min
	Fry's Reagent	3 min / 4 min / 5 min
	Fry's Reagent	10 min / 10 min / 10 min
TCE9RG	Davis Reagent	15-20 min
	Turner's Reagent	1-2 min
	Fry's Reagent	1-2 min
	Bill Fort Reagent	[down arrow]1 min
	Nitric Acid 25% MPI (Magnaflux)	[down arrow]1 min
TE2MFQ	Acid Etch Method	90 minutes
	Davi's Reagent	30 minutes
	Turner's Reagent	30 minutes
	Fry's Reagent	30 minutes
TK8FBL	Fry's Reagent	1-2 minutes
TR6B9K	Fry's Reagent	~ 15 minutes
TTFK8P	Fry's Reagent	5-10 minutes
TVMBPL	MagnaFlux	1 min. (for ~5 mins)
	Fry's	~1 min (for 5 mins.)
	Turner's	~1 min (for ~10 mins.)
TVRP22	MagnaFlux	
TWXAMF	Fry's Reagent	10 minutes
	25% Nitric Acid Solution	2 minutes
TZ2FBE	Magnetic Particle Inspection (MPI)	
TZG8DR	Fry's Reagent	3 minutes
	Acid Etch Method	5 minutes
U7689X	MagnaFlux	
	Acid Etch Method	10 min.

TABLE 4

WebCode	Method	Time
V3VLTW	Fry's Reagent	20 minutes
VB98QK	Magnetic Particle Inspection (MPI)	
VQJGKF	Fry's Reagent	10 minutes
VYCN3L	MagnaFlux	
VYHEGC	MagnaFlux/MPI	
W2LYVH	Turner's Reagent	~1 hr 30 min
WAT7KC	MagnaFlux Acidic Ferric Chloride	~10 min. swabbing
WJLGU8	Davis, Turner's, Fry reagents (alternating) Turner's & Fry's reagents (alternating) Turner's & Fry's reagent (alternating) Acidic Ferric Chloride & 25% Nitric Acid (alternating) New batch of Fry's reagent Fry's Reagent	~ 4 hours Day 1 (8/14/2017) ~ 3 hours Day 1 (8/14/2017) ~ 1.5 hours Day 2 (8/15/2017) ~ 1.5 hours Day 2 (8/15/2017) ~ 4 hours Day 3 (8/16/2017) ~ 1.5 hours Day 4 (8/17/2017)
WUHMLJ	Davis Reagent Turner's Reagent Fry's Reagent	2 Minutes 2 Minutes 20 Minutes
X86JDN	Electromagnetic with magnetic particles "MagnaFlux"	
X9FNPR	Acidic Method - Turner's Reagent Acidic Method - Acidic Copper II Sulphate Acidic Method - Fry's Reagent	10 minutes 10 minutes 10 minutes
XDP9MH	MagnaFlux Fry's Reagent	on and off over a 8 hour period
Y2B2GN	Frys Turners Frys	2-3 min. 10-15 min. 5 min.
YNPQQD	Fry's Reagent Acidic Ferric Chloride	30 seconds to 60 seconds 30 seconds to 60 seconds
YQD7EM	Electro-magnetic process "Magnaflux"	
YV8XQQ	Fry's Reagent	approximately 20 minutes

TABLE 4

WebCode	Method	Time
YVLLNB	MagnaFlux	
	CuCl ₂ with electricity	5 MINUTES
	HNO ₃ with electricity	5 MINUTES
YY947W	Fry's Reagent	
	Turner's Reagent	
Z3MXLT	MagnaFlux	
	Fry's Reagent	2 minutes
Z4FWWL	MagnaFlux	10 minutes
ZAHZLJ	Acid Etch Method	1.5 hour
	Davi's Reagent	35 minutes aprox
	Turner's Reagent	30 minutes aprox
	Fry's Reagent	25 minutes aprox
ZBUXVW	Magnetic Particle Inspection (MPI)	
	Acidic Ferric Chloride	Unknown-was not noted
ZHFQ8U	Turner's Reagent	
	Fry's Reagent	
ZPEELD	MagnaFlux	
	Turner's Reagent	45 min
ZYNMN9	MagnaFlux	
	Turner's Reagent (multiple)	1 minute each application
	Fry's Reagent (multiple)	1 minute each application
	MagnaFlux	
ZYZJTD	Electro-magnetic	
	MagnaFlux	

Response Summary

Participants: 168

Recovery Methods

Chemical Processing: 131

Magnetic Processing: 77

Note: The totals are not equivalent to the total number of participants because some participants used more than one recovery method.

Additional Comments

TABLE 5

WebCode	Additional Comments
263KEK	This was a difficult restoration. Very hard to see.
49VWFG	A good positive result was obtained during the first attempt with Magnaflux method.
4UEZZK	After polishing the first time, I began applying the Fry's Reagent and Nitric Acid Solution in an alternating pattern. This was done using a q-tip moistened in each solution and rubbing the sample consistently. Neither the Fry's nor the Nitric Acid sat stagnant on the sample for more than a few seconds - hence why the total time was around 20 minutes for each. In order to make the characters more defined, I polished the sample for a second time and began applying just Fry's (again with a moistened q-tip) until all of the characters became visible.
ABGMU7	Serial number was faint and light in color.
BMTAHX	The method "Serial Number Restoration" is accredited according to ISO 17025.
BPJEB6	Used 320 grit sand stone after Fry's. Small dust particles settled into serial number, making it legible.
CF8G7X	082817: The Item 1 steel bar measures approximately 1.07 inches wide, 2.60 inches long, and 0.283 inches thick. On one side near the center of the bar is an area that has been milled down approximately 1/100th of an inch from the surface of the rest of the bar. The mill marks are semicircular. Item 1 was photographed prior to and during processing. A combination of Dremel paddle sander, sanding disc, 600 grit wet/dry paper, extra fine polishing block, and polishing two polishing compounds, applied with a cotton wheel on a Dremel tool, were used to polish the milled area to a mirror like finish. 090717: I was able to restore the serial number on the piece of bar stock at [Laboratory] with Examiner [name] as a verifying examiner. Fry's reagent was used and the serial number photographed near the end of the processing. See photographs in LOR. [Photographs not submitted by participant].
CKF3RA	Documents results with photography
DKDRCX	Methods: Magnetic, thermal, and chemical methods may be used for the restoration of serial numbers. Conclusions regarding restored characters are made by visual examination of the restored surface under a variety of lighting conditions. Information regarding the alpha-numeric structure or the general location of serial numbers is obtained when necessary from reference sources or from firearms in the Laboratory's Reference Firearms Collection. Limitations: With the exception of the magnetic method, serial number restoration is a destructive examination and it is possible that the obtained results may not be reproduced in any subsequent examinations. Restored serial numbers are sometimes only visible during a portion of the reconstruction process, and are not necessarily visible at the conclusion of the process.
DQ3BUF	The whole examination took over 45 min.
F9BN88	The Fry's reagent was applied with a swab, swiped left to right, for 15-20 seconds. The Fry's reagent was used for approximately 25 minutes. Then Turner's reagent was applied with a swab, swiped left to right, at 15-20 second intervals, for approximately 15 minutes.

TABLE 5

WebCode	Additional Comments
FQEQX8	Documet results with photography.
FW2DUX	The last character, "A", was always visible, regardless of the amount of polishing or chemical etching.
GCR9TM	Defects were noted on the numbers 4 and 6 of Aluminum standard; the grooves of small parts of the stamping were uneven.
GEH2GX	Acid neutralized and plate lubricated with oil to preserve.
M434EN	It was not very clear which side of the metal bar stock exhibited the obliterated serial number.
M8EJ TZ	No characters were visible upon receiving the item. No characters were visible after using Fry's Reagent or Turner's Reagent. Several indistinguishable characters were visible after using Davis' Reagent, 3 F ___ ___ 7*. All six (6) characters were visible after using the 25% Nitric Acid Solution: 3 F 9 3 6 A.
MHG27N	Send results to Firearms Tracing and informant.
MXRK2U	MagnaFlux was used first and the serial number was restored. Then P400 grit sandpaper was used (in conjunction with MagnaFlux) to obtain clearer photographs and the results were the same.
NAZMZW	The obliterated area was visually examined on the microscope then MagnaFlux was applied. After MagnaFlux the surface was sanded and polished and MagnaFlux was used again, followed by chemical processing. The surface was rinsed with water after each application of chemicals.
NBEGUY	A good positive result was obtained during the first attempt and therefore only the electromagnetic process was applied.
NTDWUP	Turners was used to verify that one of the numbers was actually a number. The number "1" using Magnaflux looked like it may have been a letter.
NZWZ2R	Polishing of the obliterated area prior to the restoration attempt was not performed to remove the milling marks due to the area being relatively smooth and the fact that the milled area was of a substantial depth (relative to serial number obliteration conditions present on firearms submitted for this type of examination). The 2nd character appears to be more like an 'F' than an 'E'; however, due to milling marks at the bottom of the 2nd character, a definitive determination could not be made. Polishing was also not performed after the initial chemical application during the restoration attempt to determine whether the 2nd character was an 'F' or an 'E' due to the faintness of the 1st three characters (relative to the last three characters - which were also faint but not as faint as the 1st three). Additional chemical applications resulted in all of the characters becoming less visible. Therefore, in my opinion, polishing would have likely obliterated the 2nd character completely and would have negated any further examination.
PU2P7K	During the tests, we never saw any character or figure, at any time.
PX27QL	The restored characters were difficult to photograph clearly due to contrast with restored bruising of the harsh milled surface.

TABLE 5

WebCode	Additional Comments
Q8AZJU	Item 1 exhibits marks in the obliterated area characteristic of milling. If this were a case, casts of these marks would be obtained before restoration.
T98HAK	Although the serial number was partially restored, it was quite difficult to utilize the chemical etching and magna flux processes to restore the SN. The characters mentioned as '?' were clearly allusive in their attempted recovery.
TCE9RG	MPI used as verification due to uneven chemical etching.
TE2MFQ	During the restoration process the adequate reagents were used according to the type of material of the piece of metal described in item 1, despite this the serial number could not be restored.
WJLGU8	On Day 1 (8/14/2017), a defect that resembled a "V" was visible after first swab of Davis reagent (No visible numbers or letters showed up). On Day 2, the defect "V" was still present after metal treatment (No visible numbers or letters showed up). On Day 3, depth of metal was checked- ~ .385 in vs ~ .370 in = a difference of .015 in with defect "V" still present after metal treatment (No visible numbers or letters showed up). On Day 4, depth of metal was checked- ~ .385 in vs ~ .369 in = a difference of .016 in with defect "V" still present after metal treatment (No visible numbers or letters showed up).
X86JDN	The chemical method is not used because the electromagnetic method was able to obtain the restoration.
XDP9MH	Magnaflux method showed a few digits fairly quickly but some of the others were not as clearly defined, so went to applying Fry's reagent to bring characters back to a more visible state.
YNPQQD	The obliterated area was polished, treated with Fry's reagent from 30 and 60 seconds, rinsed with water, and wiped dry. Once the characters began to faintly appear, the area was treated alternatively with Fry's reagent or Acidic Ferric Chloride reagent from 30 and 60 seconds, rinsed with water, wiped dry, and sanded with fine grit sand paper in place of polishing.
YV8XQQ	This was quite a "stubborn" number and took longer to restore than most of those I do in casework. It was also hard to see the number even when it had been restored (I had to use a microscope because i could not see it with the naked eye.) The third digit was particularly hard to identify, but I was just able to satisfy myself that it was a "9" rather than an "8" or a "0".
YVLLNB	Methods: Magnetic, thermal and chemical methods may be used for the restoration of serial numbers. Conclusions regarding restored characters are made by visual examination of the restored surface under a variety of lighting conditions. Information regarding the alpha-numeric structure or the general location of serial numbers is obtained when necessary from reference sources or from firearms in the Laboratory's Reference Firearms Collection. Limitations: With the exception of the magnetic method, serial number restoration is a destructive examination and it is possible that the obtained results may not be reproduced in any subsequent examinations. Restored serial numbers are sometimes only visible during a portion of the reconstruction process, and are not necessarily visible at the conclusion of the process.
Z4FWWL	The results was documented by photography. The characters of the results obtained are not similar morphology to the printed in the piece of aluminum bar stock (aluminum standard).

TABLE 5

WebCode	Additional Comments
ZAHZLJ	I used the stereo microscope for the initial inspection. The acid was constantly cleaned with delicate task wipes in order to have a clear view of the characters appearing with each step. To neutralize I used saturated sodium bicarbonate.
ZYZJTD	digital images and videos taken during exam.

Appendix: Data Sheet

Collaborative Testing Services ~ Forensic Testing Program

Test No. 17-5251: Serial Number Restoration

DATA MUST BE RECEIVED BY September 11, 2017 TO BE INCLUDED IN THE REPORT

Participant Code:

WebCode:

Accreditation Release Statement

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB or A2LA. (Accreditation Release section on the last page must be completed and submitted.)
- This participant's data is **NOT** intended for submission to ASCLD/LAB, ANAB or A2LA.

Please Note: A piece of aluminum bar stock labeled as "Aluminum Standard" was also included in the sample set and is intended as a reference for size, shape and positioning of the stamped alphanumeric characters used in the serial number.

Items Submitted (Sample Pack SNR2):

Item 1: A piece of 4140 metal bar stock with suspected obliterated serial number.

1.) Please record the restored characters below.

The serial number on this material consists of 6 characters.

Item 1: _____

2.) What would be the wording of the Conclusions in your report?

Please return all pages of this data sheet.

Participant Code:

WebCode:

Additional Testing Information

**3.) What methods were used to prepare the sample prior to attempts at recovery?
e.g. Sanding, Polishing, Visual, etc. (Please describe in order.)**

Method	Tool used	If sanding was done what grit size was used?
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**4.) What recovery methods were used during your examination?
e.g. Fry's, Acid Etch, MagnaFlux, etc. (Please list in order of use)**

Method	If an acidic method was used how long was the acid left on the material?
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Please return all pages of this data sheet.

Participant Code:

WebCode:

5.) Additional Comments

Return Instructions: Data must be received via online data entry, fax (please include a cover sheet), or mail by **September 11, 2017** to be included in the report. Emailed data sheets are not accepted.

QUESTIONS?
 TEL: +1-571-434-1925 (8 am - 4:30 pm EST)
 EMAIL: forensics@cts-interlab.com
www.ctsforensics.com

Participant Code:

ONLINE DATA ENTRY: www.cts-portal.com

FAX: +1-571-434-1937

MAIL: Collaborative Testing Services, Inc.

P.O. Box 650820

Please return all pages of this data sheet.

Page 3 of 4

RELEASE OF DATA TO ACCREDITATION BODIES

The following Accreditation Releases will apply only to:

Participant Code:

Webcode:

for Test No. **17-5251: Serial Number Restoration**

This release page must be completed and received by **September 11, 2017** to have this participant's submitted data included in the reports forwarded to the respective Accreditation Bodies.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory

ASCLD/LAB Certificate No. _____

ANAB Certificate No. _____

A2LA Certificate No. _____

Step 2: Complete the Laboratory Identifying Information in its entirety

Signature and Title _____

Laboratory Name _____

Location (City/State) _____

Return Instructions

Please submit the completed Accreditation Release at the same time as your full data sheet. See Data Sheet Return Instructions on the previous page.

Accreditation Release

*Questions? Contact us 8 am-4:30 pm EST
Telephone: +1-571-434-1925
email: forensics@cts-interlab.com*

Please return all pages of this data sheet.

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