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RESEARCH TEST and MEASUREMENT REPORT - Report No. 821304

M-788 SAFETY DETENT PLUNGER AND SPRING EVALUATION
(NEW BLACK OXIDE COMPONENTS)

Prepared by: Ron Williams

Date Prepared: 9-20-82

Proofread and Cleared By:

J.H. Hennings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

J. Hennings 9-24-82
Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Mater. & Mech. Analysis Lab

C.E. Ritchie 9-24-82
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 821304
REPORT TITLE: M-788 Safety Detent Plunger and Spring Evaluation
(New Black Oxide Components)
MODEL(S): 788
GAUGE OR CALIBER: 22-250 Rem., 243 Win., 308 Win.
DATE: 9-20-82
WORK ORDER NO.: C-1806-000
PART NAME: Trigger Assembly
DESIGNER/ENGINEER: R. Murphy

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 6

NO. OF ROUNDS PER GUN: 2,5000

TOTAL ROUNDS FIRED IN TEST: 15,000

AMMO TYPE: MAGS _____; TARGET: 22-250 Rem.

243 Win.
308 Win.
RIM FIRE _____ CENTER FIRE _____

September 20, 1982

TO: J. H. Hennings

FROM: R. Williams

REPORT TITLE: M-788 SAFETY DETENT PLUNGER AND SPRING EVALUATION
(NEW BLACK OXIDE COMPONENTS)

ABSTRACT

A total of 6 M-788 fire control assemblies with safety detent plunger and spring (black oxide colored) were delivered to the Test Lab by R. Murphy for testing. Production colored a batch of 788 plungers and springs to distinguish between the current 788 and the current 580 detent plunger and spring. Both dry cycle and live fire endurance test were used to test the assemblies.

SCOPE OF TEST

To determine if coloring the safety detent plunger and spring has any effect on the safety On/Off forces.

TEST RESULTS

No functional problems arose during testing. There was no significant change in the safe On/Off forces measured before, during and after testing on all the assemblies.

REPORT TEXT

The six (6) safety assemblies passed every check made on them throughout the test.

NOTE: The measurements recorded for the safe On/Off forces are questionable. There is no way to determine if they are within Remington Standards, because there are no standards written for these forces with this fire control assembly. The only Remington Standards written for safe On/Off forces pertain to the common fire control. That standard is:

4 - 8 lbs. - One sharp click, double click not allowed.

The Safe On/Off forces measured in this test range from 5.0 lbs. to 17.3 lbs. - a 12.3 lbs. difference. (Refer to Appendix "A", Data Sheets No. 1-6 for all Safe On/Off measurements.)

NOTE: The current New Design Safety Detent Plunger No. 92057 and Detent Spring No. 92058 replace the former Safety Detent Plunger No. 14497 and Detent Spring No. 14498. The former parts were used in the M-788 and also the M-580. The new parts were colored to help Production distinguish between the current and the former parts because the new current parts are not used in the M-580.

TEST PROCEDURE

A. Measurements

The following measurements were taken on the six (6) rifles used in this test:

- o Headspace
- o Firing Pin Indent
- o Trigger Pull
- o Sear Lift
- o Sear Engagement
- o Safe On/Off Forces

B. Test Conditions

1. All measurements were taken at start of test.
2. After 1,000 rds. of live fire all rifles were cleaned and remeasured. (Jack Shooting)
3. The rifles were then subjected to Safe On/Off dry cycling. Each rifle was cycled for 2,500 cycles, with Safe On/Off measurements taken every 500 cycles and Sear Lift and Engagement at the 2,500 cycle level.
4. The rifles were then live-fired to the 2,000 round level. (Jack Shooting) All measurements were taken at this level.
5. The rifles were then subjected to another Safe On/Off dry cycle test. They were brought to the 5,000 cycle level. (2,500 additional cycles) Safe On/Off measurements were taken every 500 cycles and Sear Lift and Engagement were measured at the 5,000 cycle level.

B. Test Conditions - continued

The same procedures were followed until live fire totaled 2,500 rounds per rifle and Safe On/Off dry cycle totaled 7,500 cycles per rifle.

C. Ammunition

Remington 22-250 55 grain Ptd. S.P. Index No. R22501

Remington 243 Win. 100 grain Ptd. S. P. Index No. R243W3

Remington 308 Win. 180 grain S.P. and Ptd. S.P. Index No. R308W2

" " R308W3

APPENDIX "A"

Plunger Report No. 821304
 M-788 Safety Detent and Spring Color Evaluation No. 1
 Sept. 22, 1982 (New Black oxide components) R. Williams

	1	2	3	4	5	6
M-788	22-250 B6130R2	HEADSPACE	EXTING	SAFE (lb)	TRIGGER	SEAR
Sample No. 1		BEN INDEPT	ON	OFF	PULL (lb)	SEAR
						ENGAGEMENT
1						
2	START OF TEST	Minut 001	0215	85	50	40
3						
4	LIVE FIRE					
5	after 1000 rds.	Minut 002	0220	66	49	41
6						
7	DRY CYCLE					
8	500 cye.			78	68	40
9	1000			80	60	40
10	1500			75	68	40
11	2000			65	60	40
12	2500			75	60	40
13						
14	LIVE FIRE					
15	after 2000 rds.	Minut 002	0231	72	58	41
16						
17	DRY CYCLE					
18	3000 cye.			83	58	40
19	3500			85	51	40
20	4000			86	56	40
21	4500			83	51	40
22	5000			88	50	40
23						
24	LIVE FIRE					
25	after 2500 rds.	Minut 002	0213	76	43	40
26						
27	DRY CYCLE					
28	5500 cye.			80	51	37
29	6000			80	51	37
30	6500			88	50	37
31	7000			91	45	37
32	7500			88	45	37
33						
34						
35	* THIS FIRE CONTROL HAS A PREVIOUS 10,000 DRY CYCLES					
36						
37						
38						
39						
40						

M-788 Safety Detent and Spring Color Evaluation
 Sept. 20, 1982 (New Black oxide components)

Report No. 821304

No. 2

R. Williams

	M-788	22-250 B&I 30846	HEADSPACE	FIRING R-N INDEANT	SAFE (lb)		TRIGGER Pull (lb)	SEAR	
					ON	OFF		LEFT	RIGHT
1									
2		START OF TEST	Min 002	.0208	8.5	5.5	4.6	.0075	.015
3									
4		LIVE FIRE							
5		after 1,000 rds.	Min 003	.0196	9.3	4.5	4.4	.016	.0175
6									
7		DRY CYCLE							
8		500 cye.			9.6	6.3	4.1		
9		1000			9.6	6.3	4.0		
10		1500			9.6	6.6	4.4		
11		2000			9.6	6.5	4.25		
12		2500			9.0	6.5	4.3	.017	.0175
13									
14		LIVE FIRE							
15		after 2000 rds.	Min 003	.0196	9.0	4.9	4.5	.0145	.019
16									
17		DRY CYCLE							
18		3000 cye.			9.8	6.1	4.5		
19		3500			9.3	6.0	4.75		
20		4000			9.5	6.1	4.6		
21		4500			11.5	6.0	4.6		
22		5000			12.6	5.5	4.5	.0165	.0185
23									
24		LIVE FIRE							
25		after 2500 rds.	Min 003	.0195	8.0	4.6	4.0	.0155	.014
26									
27		DRY CYCLE							
28		5500 cye.			12.6	5.5	4.5		
29		6000			11.6	5.8	4.5		
30		6500			11.6	5.8	4.5		
31		7000			12.3	6.0	4.4		
32		7500			11.3	6.3	4.4	.015	.018
33									
34									
35		* THIS FIRE CONTROL HAS A PREVIOUS 10,000 DRY CYCLES							
36									
37									
38									
39									
40									

Plunger Report No. 821304
M-788 Safety Detent and Spring Color Evaluation No. 3
Sept. 20, 1982 (New Black oxide components) R. Williams

1	2	3	4	5	6
M-788	243 #86134231	FIRING	SAFE (lbs)	TRIGGER	SEAR
	Sample No. 3	HEADSPACE	B-H INDENT	PULL (lbs)	SEAR
			ON OFF	LIFT	ENGAGEMENT
1					
2	START OF TEST	MINT 002	.020	6.3	5.3
3				5.5	.014
4	LIVE FIRE				
5	after 1,000 rds.	MINT 002	.020	13.1	5.3
6				5.25	.017
7	DRY CYCLE				
8	500 rds.			15.0	6.3
9	1000			13.3	6.6
10	1500			13.1	6.5
11	2000			13.1	6.0
12	2500			13.3	6.0
13				4.5	.0205
14	LIVE FIRE				
15	after 2000 rds.	MINT 003	.021	11.1	5.3
16				5.4	.0175
17	DRY CYCLE				
18	3000 rds.			14.6	5.5
19	3500			15.3	5.8
20	4000			16.0	6.1
21	4500			15.3	6.1
22	5000			15.3	5.5
23				4.5	.0205
24	LIVE FIRE				
25	after 2500 rds.	MINT 003	.020	11.3	4.8
26				4.8	.020
27	DRY CYCLE				
28	5500 rds.			14.0	5.8
29	6000			15.0	5.8
30	6500			15.6	5.8
31	7000			16.6	6.0
32	7500			15.6	5.1
33				4.4	.021
34					
35					
36					
37					
38					
39					
40					

Plunger Report No. 821304
 M-788 Safety Detent and Spring Color Evaluation No. 4
 Sept. 20, 1982 (New Black oxide components) R. Williams

	M-788	308 B6096793	HEADSPACE	FIRING PEN INDENT	SAFE (lbs)		TRIGGER Pull (lbs)	SEAR LIFT	SEAR ENGAGEMENT
					ON	OFF			
1									
2		START OF TEST	M.I.W.H. 001	.021	5.0	5.0	5.1	.018	.0205
3									
4		LIVE FIRE							
5		after 1,000 rds.	M.I.W.H. 002	.022	12.1	4.4	4.5	.019	.0185
6									
7		DRY CYCLE							
8		500 cye.			16.6	7.1	4.25		
9		1000			17.0	6.5	4.3		
10		1500			17.6	6.1	4.25		
11		2000			15.5	4.4	4.4		
12		2500			15.3	6.1	4.4	.0215	.0195
13									
14		LIVE FIRE							
15		after 2000 rds.	M.I.W.H. 004	.022	14.5	4.3	4.4	.0195	.0175
16									
17		DRY CYCLE							
18		3000 cye.			14.8	5.3	4.25		
19		3500			17.3	5.6	4.08		
20		4000			17.0	5.8	4.25		
21		4500			17.0	5.5	4.08		
22		5000			15.6	5.5	4.0	.020	.0195
23									
24		LIVE FIRE							
25		after 2500 rds.	M.I.W.H. 003	.022	14.8	4.6	4.9	.0135	.0195
26									
27		DRY CYCLE							
28		5500 cye.			15.1	5.1	4.0		
29		6000			15.3	5.0	4.0		
30		6500			15.3	5.0	4.1		
31		7000			15.6	4.8	4.3		
32		7500			15.3	5.3	4.0	.020	.020
33									
34									
35									
36									
37									
38									
39									
40									

M-788 Safety Detent and Spring Color Evaluation
 Sept. 20, 1982 (New Black oxide components)

Plunger

Report No. 221304

No. 5

R. Williams

	M-788	.308 B6096793	HEADSPACE	FIRING B.N. INDENT	SEAR (lb.)		TRIGGER PULL (lb.)	SEAR LIFT	SEAR ENGAGEMENT
					ON	OFF			
1		Sample No. 5							
2		START OF TEST	MINH+002	1021	8.6	5.3	4.4	.014	.019
3									
4		LIVE FIRE							
5		after 1000 rds.	MINH+001	1020	8.5	5.5	4.0	.013	.019
6									
7		DRY CYCLE							
8		500 cys.			9.8	6.5	4.0		
9		1000			9.5	5.5	3.8		
10		1500			9.3	5.8	3.9		
11		2000			9.6	5.8	3.8		
12		2500			9.3	5.6	3.75	.017	.020
13									
14		LIVE FIRE							
15		after 2000 rds.	MINH+003	1020	8.8	5.0	4.3	.016	.019
16									
17		DRY CYCLE							
18		3000 cys.			9.3	5.6	4.0		
19		3500			9.6	5.1	4.0		
20		4000			10.3	5.0	4.0		
21		4500			11.1	5.1	4.0		
22		5000			10.3	5.0	4.0	.0185	.0195
23									
24		LIVE FIRE							
25		after 2500 rds.	MINH+003	1020.5	9.5	4.4	4.25	.0155	.013
26									
27		DRY CYCLE							
28		5500 cys.			11.3	4.1	4.0		
29		6000			10.1	4.1	4.0		
30		6500			10.6	4.1	3.9		
31		7000			10.3	5.1	3.75		
32		7500			10.3	4.8	3.8	.018	.020
33									
34									
35									
36									
37									
38									
39									
40									

Plunger Report No. 821304
M-788 Safety Detent and Spring Color Evaluation No. 6
Sept. 20, 1982 (New Black oxide components) R. Williams

1	2	3	4	5	6
M-788	308 B6110920	FIRING	SAFE (lb.)	TRIGGER	SEAR
Sample No. 6	HEADSPACE	REN. INDENT	PULL (lb.)	LIFT	ENGAGEMENT
		ON	OFF		
1					
2	START OF TEST	MIN INCHES	0.19	10.8	5.6
3				44	.016
4	LIVE FIRE				
5	after 1,000 rds.	MIN INCHES	.020	9.5	5.75
6				13.8	.0135
7	DRY CYCLE				
8	500 cyc.		9.3	7.3	4.0
9	1000		8.6	8.0	3.75
10	1500		9.0	8.3	3.75
11	2000		10.0	7.1	4.0
12	2500		9.3	7.6	4.0
13					.015
14	LIVE FIRE				
15	after 2000 rds.	MIN INCHES	.020	10.0	4.6
16	*			44	.0155
17	DRY CYCLE				
18	3000 cyc.		9.5	4.6	3.6
19	3500		9.3	4.5	4.0
20	4000		9.3	5.0	4.1
21	4500		10.3	4.3	4.0
22	5000		10.3	4.5	4.0
23					.0165
24	LIVE FIRE				
25	after 2500 rds.	MIN INCHES	.020	9.3	4.0
26				4.6	.016
27	DRY CYCLE				
28	5500 cyc.		11.3	4.3	3.9
29	6000		11.3	4.3	3.9
30	6500		10.6	4.1	4.0
31	7000		11.3	4.3	4.0
32	7500		11.6	4.5	4.0
33					.0145
34					.0195
35	* NEW RECEIVER-B 6142469				
36	NEW BOLT				
37					
38					
39					
40					