

Remington
Rem-O-Gram

Quick Facts About REMINGTON PRODUCTS
--

cc: M. J. J.
 Paul
 Larry
 Bill
 Jim C. G. G.
 3-29-82

cc: House Force

Bridgeport, Connecticut
 March 22, 1982

TO THE FIELD FORCE

MODEL 700 "CLASSIC" - .375 H&H

RAMAC # 5848

There has been some confusion since an article appeared in the January 1982 American Rifleman, describing a prototype Model 700 made for the NRA. Remington was not consulted prior to publication. As a result, the article did not adequately cover the product or provide the correct order procedure.

There seems to be sufficient interest in this type of product to justify adding it to our line. Product specifications have been determined and estimated delivery information is now available.

The Model 700 "Classic" .375 H&H is a Custom Shop product that will be made on special order. They will not be inventoried in the Ilion warehouse.

The rifle is made up on the basic Model 700 Safari action with a smaller diameter barrel to reduce weight by approximately one pound. The stock is similar to the magnum "Classic" but has two internal steel reinforcement pins that are covered with inlaid rosewood caps. It has the solid magnum recoil pad.

In response to the American Rifleman article, we have received numerous inquiries from consumers, dealers, and distributors. We are in the process of answering these letters to advise them of the correct ordering procedure, pricing, and delivery. Details are as follow:

REMINGTON ARMS COMPANY, INC., BRIDGEPORT 2, CONN.

Form No. RD 451

Printed in U.S.A.

- Product - Model 700 "Classic" .375 H&H,
24" medium weight barrel, no
sights or sight holes.
- RAMAC - #5848
- Order Procedure - Orders accepted only from Remington
distributors. Order from Distribution
Services in Bridgeport, Connecticut.
- Pricing - Same as current Model 700 Safari:
Suggested Retail - \$719.95
Suggested Dealer - \$547.16
Distributor - \$445.94
- Delivery - Estimated six to nine months from
receipt of order.

E. J. Conroy

E. J. Conroy

WHF:b

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
REMINGTON

PETERS
PETERS

W
Distribution: C.B. Workman
C.E. Ritchie

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331

Lubricant Evaluation: M700 Cock and Fire Simulation

Prepared by: Fred Supry

Date Prepared: 3-22-82

Proofread and Cleared By:

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

James H. Hennings 4-14-82
Signature Date

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

C. E. Ritchie 4-14-82
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331
REPORT TITLE: Lubricant Evaluation: M700 Cock and Fire Simulation
MODEL(S): 700
GAUGE OR CALIBER: 30.06
DATE: 3-22-82
WORK ORDER NO.: C-1803-000
PART NAME:
DESIGNER/ENGINEER:

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: Static
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____
NO. OF ROUNDS PER GUN: _____
TOTAL ROUNDS FIRED IN TEST: _____
AMMO TYPE: MAGS _____; TARGET: _____
RIM FIRE _____ CENTER FIRE _____
10. DRY CYCLE - NO. OF SAMPLES TESTED 5 - each lubricant
MAX. NO. OF CYCLES 25000

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

April 13, 1982

TO: J.H. Hennings

FROM: F.L. Supry

REPORT TITLE: Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct a cock and fire evaluation on five spray lubricants.

1. Du Pont - Synthetic Diester
2. Krylon - Ten - 4
3. Sprayon - 711
4. CRC - 3-36
5. Houghton - HLP

These five lubricants were selected for evaluation from the results of a preliminary evaluation conducted by A.B. Hughes, Senior Consultant, ESD Maintenance Engineering Group, Du Pont. A copy of his evaluation for each of the five lubricants is located in Appendix "C".

Engineering Dept.

SCOPE OF TEST

To compare the five lubricants in a Model 700 cock and fire simulation test.

TEST RESULTS

In their order of finish, from the best performing lubricant to the poorest performing lubricant, the following results were obtained.

<u>LUBRICANT</u>	<u>AVERAGE CYCLE LIFE (5 Samples)</u>
1. Du Pont - Synthetic Diester	21,181 cys.
2. Sprayon - 711	17,646 cys.
3. CRC - 3-36	14,382 cys.
4. Houghton - HLP	8,333 cys.
5. Krylon - Ten-4	2,830 cys.

Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

Report No. 82 0331

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REPORT TEXT

- A. Trigger pull, sear lift, sear engagement, safe on, safe off, and bolt lift measurements were taken on each test vehicle at the start of the test, and at 5000 cycle intervals. Remington specifications for the M700 components used are:

• Trigger Pull	3½ lbs. - 6½ lbs.
• Sear Lift	.005" - .018"
• Sear Engagement	.015" - .020"
• Safe "On" - "Off"	None Established
• Bolt Lift	None Established

Refer to Appendix "A", data sheets No. 1 through No. 5, for individual results.

The Rc hardness was measured, at the cocking cam area, on each M700 bolt. Remington specifications Rc 37-46.

Refer to Appendix "A", data sheet No. 6, for individual hardness, lubricant used, simulator used and cycles completed.

A graphical analysis comparing the lubricants tested to their cycle life, and their cycle life to the simulator used is found in Appendix "B".

Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

Report No. 82 0331

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TEST PROCEDUREA. Measurements

1. Trigger Pull
Trigger Pull measurements were conducted using a Chatillon Model IN-10 pull scale.
2. Sear Lift and Sear Engagement
Sear lift and sear engagement measurements were conducted using a Model FC-14 optical comparator and measuring machine.
3. Safe "ON" and "OFF" Forces.
Safe On and Off forces were taken using a Chatillon Model DPP-25, push-pull scale.
4. Bolt Lift
Bolt lift forces, both cocked and fired, were taken utilizing a Chatillon Model 80D pull scale mounted on a machine designed to be used for bolt lift measurements.
5. Rc Hardness
The Rc hardness measurements were taken by George Catta, a production inspector, utilizing a Wilson Rockwell Hardness Tester.

B. Lubrication - (Pictorial presentation - Appendix "D")1. Lubrication Points

- a. Receiver: Locking lug area.
Track on receiver tang.
- b. Bolt: Cocking cam
Locking lugs
- c. Firing Pin: Threads
Striker radius and track.
- d. Trigger Assembly: Sear safety cam face.
Interior of trigger assembly, through sear inspection hole.

2. Lubrication procedure

- a. Components to be lubricated were completely degreased, using the solvent degreasing tanks located in our Heat Treat Department.
- b. The interior of the trigger assembly was lubricated by holding the spray can to direct the spray into the sear inspection hole. Duration of spray approximately 1 second.

NOTE: The two position nozzle on Du Pont aerosol can was more difficult to control for pin point application, than the standard plastic tubes on the other samples. (Pictorial example included.)

Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

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2. Lubrication Procedure - continued

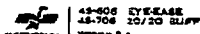
- c. All other lubrication points were lubricated by holding the aerosol can approximately six inches away from the area to be lubricated and covering the area until a thin layer of lubricant forms on the surface. Duration of spray; approximately 1 second.

C. Pictorial Presentation

1. Lubrication points and procedures.
2. Cocking cam, sear face, and striker radius and track areas were photographed at the start and completion of the test and are available on request.

A P P E N D I X A

(Data Sheets)



M 700 COCK FIRE SIMULATION

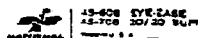
FLS

LUBRICANT EVALUATION

3-8-92

FIRST SAMPLE OF EACH LUBRICANT

		1	2	3	4	5	6
		TRIGGER PULL	SEAR LIFT	SEAR ENGAGEMENT	SAFE ON	SAFE OFF	BOLT - LIFT LOCKED FIRED
REM - SPECS		3 1/2 - 6 1/2 lbs	.005" - .008"	.015" - .020"	(lbs)	(lbs)	(lbs)
1	1 - DUPONT	(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
2	2 - 711						
3	3 - CRC						
4	4 - HLP						
5	5 - TEN 4						
6	1	6.25	.005	.020	7.5	6.50	3.00
7	2	6.50	.006	.015	6.75	4.25	2.00
8	cycles 3	5.50	.005	.016	5.25	4.25	3.00
9	4	6.00	.008	.017	7.00	5.75	3.00
10	5	6.50	.008	.016	6.75	4.50	4.50
11	1	6.00	.0055	.020	5.50	4.00	2.50
12	5000 2	6.00	.0065	.0175	6.00	5.50	2.50
13	cycles 3	6.00	.006	.020	6.00	4.50	2.00
14	4	5.75	.010	.017	7.50	5.00	3.00
15	* 5	6.50	.010	.020	7.25	5.50	5.00
16	1	5.75	.008	.020	5.75	4.0	2.25
17	10,000 * 2	5.75	.008	.018	5.25	3.75	2.50
18	cycles 3	5.25	.008	.022	4.50	3.75	2.0
19	4	6.25	.0095	.019	7.25	4.75	3.0
20	5	—	—	—	—	—	—
21	1	6.00	.009	.0205	6.00	4.00	2.00
22	15,000 2	—	—	—	—	—	—
23	cycles 3	5.50	.009	.024	5.00	5.50	2.00
24	* 4	6.00	.0105	.019	6.50	4.50	3.00
25	5	—	—	—	—	—	—
26	* 1	6.00	.0095	.021	6.00	4.00	2.00
27	20,000 2	—	—	—	—	—	—
28	cycles * 3	5.50	.0105	.027	4.50	4.00	2.00
29	4	—	—	—	—	—	—
30	5	—	—	—	—	—	—
31	1	—	—	—	—	—	—
32	25,000 2	—	—	—	—	—	—
33	cycles 3	—	—	—	—	—	—
34	4	—	—	—	—	—	—
35	5	—	—	—	—	—	—
36	* 1	FAILED	15.59	cycles			
37	* 2	FAILED	6.226	cycles			
38	* 3	FAILED	16.359	cycles			
39	* 4	FAILED	10.400	cycles			
40	* 5	FAILED	1990	cycles			
							DATA SHEET 1



M700

COCK & FIRE SIMULATION

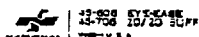
F.L.S.

LUBRICANT EVALUATION

3-8-82

SECOND SAMPLE OF EACH LUBRICANT

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT	LIFT
		PULL	LIFT	ENGAGEMENT	ON	OFF	COCKED	FIRED
	REM SPEEDS	3 1/2 - 6 1/2 lbs	.005" - .013"	.015" - .020"	(lbs)	(lbs)	(lbs)	(lbs)
1	1	DUPONT (AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)
2	2	711						
3	3	CRS						
4	4	HLP						
5	5	TEN 4						
6	1	6.00	.009	.0185	6.00	4.50	4.00	8.00
7	2	5.00	.006	.018	7.50	4.75	3.00	6.00
8	3	6.00	.012	.012	7.00	4.50	3.00	7.00
9	4	6.75	.0095	.016	7.50	6.75	2.50	7.00
10	5	5.50	.008	.016	7.50	5.50	3.50	7.00
11	5000	5.25	.0095	.0215	6.00	4.50	3.50	7.00
12	cycles	2	5.00	.0065	.019	5.75	4.00	3.50
13	3	5.75	.013	.020	5.00	4.00	3.00	8.00
14	4	6.25	.0095	.020	6.75	6.25	2.50	8.00
15	* 5	5.00	.009	.020	5.75	4.00	3.50	13.00
16	10,000	5.50	.011	.025	5.75	4.25	3.50	7.00
17	cycles	2	4.75	.0065	.019	5.25	4.00	2.50
18	* 3	6.00	.013	.023	6.25	3.75	3.00	15.00
19	* 4	6.00	.0095	.021	6.50	5.75	3.00	25.00
20	5	-	-	-	-	-	-	-
21	15,000	5.50	.011	.026	5.50	4.25	4.00	7.25
22	cycles	2	4.75	.0075	.019	5.00	4.00	3.00
23	3	-	-	-	-	-	-	-
24	4	-	-	-	-	-	-	-
25	5	-	-	-	-	-	-	-
26	20,000	5.50	.011	.0265	5.50	4.00	4.00	9.25
27	cycles	2	4.75	.009	.019	5.25	4.50	3.00
28	3	-	-	-	-	-	-	-
29	4	-	-	-	-	-	-	-
30	5	-	-	-	-	-	-	-
31	25,000	* 1	5.25	.011	.0285	5.50	3.75	4.00
32	cycles	* 2	4.50	.0095	.021	5.25	4.00	2.50
33	3	-	-	-	-	-	-	-
34	4	-	-	-	-	-	-	-
35	5	-	-	-	-	-	-	-
36	* 1	COMPLETED	25,000	cycles				
37	* 2	COMPLETED	25,000	cycles				
38	* 3	FAILED	8317	cycles				
39	* 4	FAILED	6115	cycles				
40	* 5	FAILED	2788	cycles				
							DATA SHEET 2	



M700 COCK & FIRE SIMULATION

F.L.S.

LUBRICANT EVALUATION

3-8-82

THIRD SAMPLE OF EACH LUBRICANT

		1		2		3		4		5		6	
		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT -		LIFT				
		PULL	LIFT	ENGAGEMENT	ON	OFF	COCKED	FIRED					
		9 1/2 - 6 1/2 lbs	.005"-.018"	.015"-.020"	(lbs)	(lbs)	(lbs)	(lbs)					
1	1	DUPONT	(AVG OF 3)		(AVG OF 3)	(AVG OF 3)	(AVG OF 3)	(AVG OF 3)					
2	2	TII											
3	3	CRC											
4	4	HLP											
5	5	TEN 4											
6	1	5.75	.007	.015	7.25	4.50	2.50	6.50					
7	2	6.00	.008	.015	7.50	7.50	2.50	8.25					
8	cycles	3	6.25	.008	.017	6.75	5.50	3.00	7.00				
9	4	5.75	.0125	.0195	8.00	5.50	3.00	7.00					
10	5	5.50	.008	.015	8.00	5.00	2.50	6.00					
11	5000	1	6.25	.009	.019	6.50	4.25	2.00	6.00				
12	cycles	2	5.25	.009	.021	5.25	7.50	3.50	6.50				
13	3	6.25	.0105	.0175	7.25	4.00	3.00	9.00					
14	4	5.75	.0125	.021	7.00	5.00	3.00	10.00					
15	* 5	5.50	.013	.021	6.00	3.75	2.50	18.00					
16	10000	1	6.00	.010	.020	6.00	3.75	2.00	5.50				
17	cycles	2	5.25	.009	.021	7.00	6.00	3.50	7.00				
18	3	6.00	.015	.0195	6.75	4.75	3.00	10.00					
19	* 4	5.75	.0125	.0225	6.50	4.50	3.50	57.00					
20	5	—	—	—	—	—	—	—					
21	15000	1	5.25	.0115	.020	5.75	4.00	2.00	6.50				
22	cycles	* 2	5.50	.0095	.022	6.50	5.50	4.00	14.00				
23	* 3	6.50	.015	.0195	6.75	4.00	3.00	15.00					
24	4	—	—	—	—	—	—	—					
25	5	—	—	—	—	—	—	—					
26	20000	1	5.75	.0115	.020	6.00	4.00	2.00	6.00				
27	cycles	2	—	—	—	—	—	—					
28	3	—	—	—	—	—	—	—					
29	4	—	—	—	—	—	—	—					
30	5	—	—	—	—	—	—	—					
31	25000	* 1	6.00	.0115	.021	6.25	3.75	2.00	12.00				
32	cycles	2	—	—	—	—	—	—					
33	3	—	—	—	—	—	—	—					
34	4	—	—	—	—	—	—	—					
35	5	—	—	—	—	—	—	—					
36	* 1	COMPLETED	25,000	cycles									
37	* 2	FAILED	15,140	cycles									
38	* 3	FAILED	10,110	cycles									
39	* 4	FAILED	6,788	cycles									
40	* 5	FAILED	2,484	cycles							DATA SHEET 3		

DATA SHEET 3

43-008 TYPE CASE
43-708 10/20 SUPP
NATIONAL

M700 COCK & FIRE SIMULATION

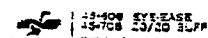
F.L.S.

LUBRICANT EVALUATION

3-8-92

FOURTH SAMPLE OF EACH LUBRICANT

		1		2		3		4		5		6	
		TRIGGER		SEAR		SAFE		SAFE		BOLT		LIFT	
		PULL		LIFT		ENGAGEMENT		ON		OFF		locked	
		34 - 6 1/2 lbs		.005" - .010"		.015" - .020"		(lbs)		(lbs)		(lbs)	
1	1 DuPont	(AVG. OF 3)						(AVG. OF 3)		(AVG. OF 3)		(AVG. OF 3)	
2	2 711												
3	3 CRC												
4	4 HLP												
5	5 TEN 4												
6	1	6.50	.0095	.019		6.75		4.25		4.00		8.00	
7	2	6.50	.008	.019		8.50		5.25		3.50		7.00	
8	3	5.50	.008	.016		7.25		4.75		3.00		9.00	
9	4	5.75	.009	.019		8.25		5.50		4.00		7.50	
10	5	5.50	.005	.017		9.00		6.75		3.00		7.50	
11	5000	1	6.25	.010	.023	6.25		3.25		3.00		8.00	
12	2	6.00	.011	.020		7.50		4.25		3.50		7.00	
13	3	5.50	.0085	.021		7.00		4.50		3.00		8.00	
14	4	6.00	.010	.019		7.25		5.00		4.00		10.00	
15	* 5	5.75	.010	.0185		7.00		4.75		3.00		16.00	
16	10000	1	5.75	.010	.023	5.75		3.50		4.00		8.00	
17	2	6.00	.012	.022		7.00		4.00		3.00		8.00	
18	3	5.50	.0095	.021		6.50		4.25		3.00		8.00	
19	* 4	6.00	.010	.021		7.00		5.25		4.00		29.00	
20	5	—	—	—		—		—		—		—	
21	15000	1	6.25	.0105	.024	5.25		3.00		3.50		9.00	
22	2	6.25	.013	.0225		7.50		4.00		3.50		9.00	
23	* 3	5.50	.0105	.0215		6.75		4.50		3.25		22.00	
24	4	—	—	—		—		—		—		—	
25	5	—	—	—		—		—		—		—	
26	20000	* 1	5.75	.0115	.024	5.75		3.00		3.00		24.00	
27	2	5.75	.0125	.024		6.50		4.00		4.00		24.00	
28	3	—	—	—		—		—		—		—	
29	4	—	—	—		—		—		—		—	
30	5	—	—	—		—		—		—		—	
31	25000	1	—	—	—	—		—		—		—	
32	2	—	—	—		—		—		—		—	
33	3	—	—	—		—		—		—		—	
34	4	—	—	—		—		—		—		—	
35	5	—	—	—		—		—		—		—	
36	* 1	FAILED		19520 cycles									
37	* 2	FAILED		16865 cycles									
38	* 3	FAILED		11830 cycles									
39	* 4	FAILED		8576 cycles									
40	* 5	FAILED		3467 cycles						DATA SHEET 4			



M 700 COCK & FIRE SIMULATION

F.L.S.

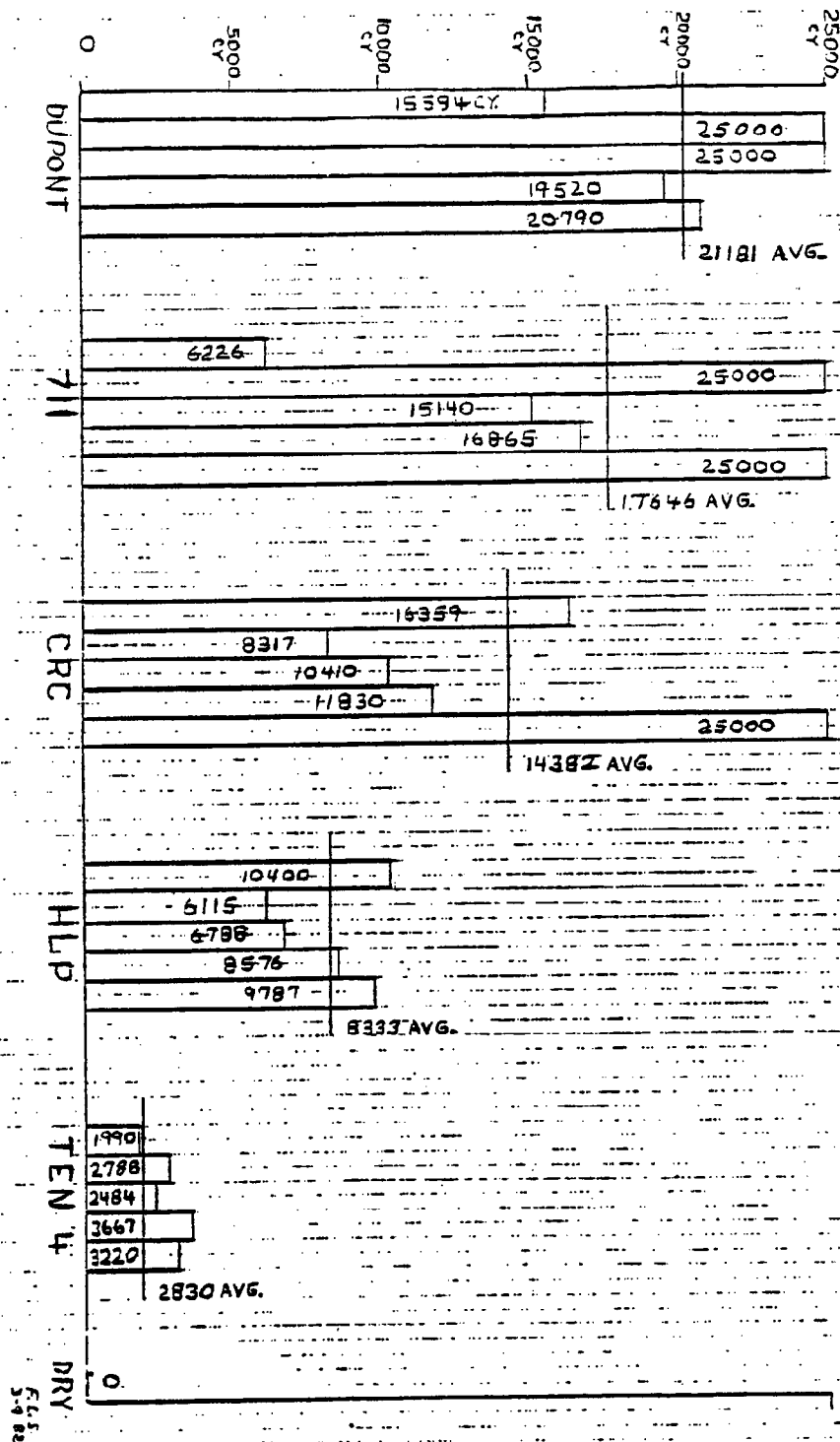
LUBRICANT EVALUATION

3-10-92

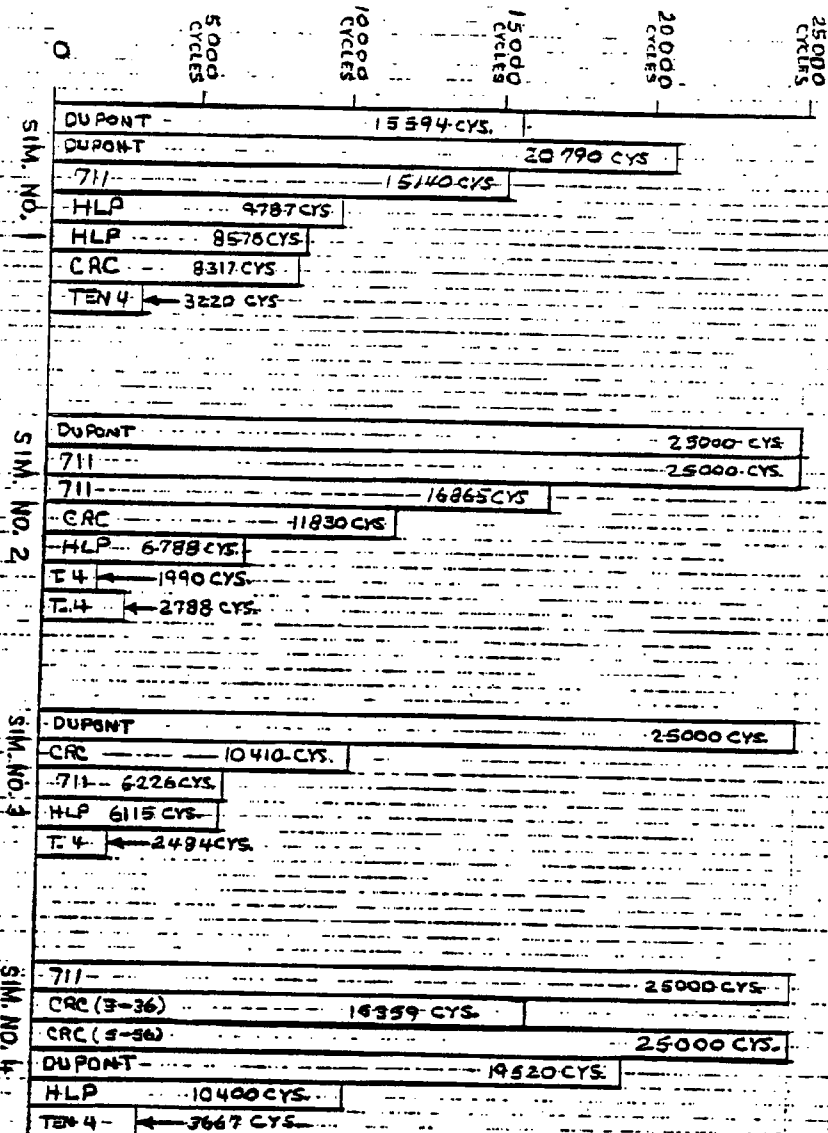
Rc HARDNESS: M700 BOLT COCKING CAM AREA

1	2	3	4	5	6
REM. SPECS.	Rc	LUBRICANT	SIMULATOR	CYCLES	
Rc 37-46	HARDNESS	USED	USED	COMPLETED	
↓ BOLT NO. ↓					
1					
2					
3	C1	39	DUPONT	1	15 594
4	C9	40	DUPONT	3	25 000
5	C12	40	DUPONT	2	25 000
6	C19	38	DUPONT	4	19 520
7	C20	37	DUPONT	1	20 790
8					
9					
10	C3	38	711	3	6 226
11	C7	39	711	2	25 000
12	C16	39	711	1	15 140
13	C27	38	711	2	16 865
14	C29	39	711	4	25 000
15					
16					
17	C4	39	CRC 3-36	4	16 359
18	C10	39	CRC 3-36	1	8 317
19	C17	40	CRC 3-36	3	10 410
20	C21	39	CRC 3-36	2	11 830
21	C25	39	CRC 5-56	4	25 000
22					
23					
24	C11	39	HLP	4	10 400
25	C18	39	HLP	3	6 115
26	C24	39	HLP	2	6 788
27	C26	39	HLP	1	8 576
28	C28	38	HLP	1	9 787
29					
30					
31	C2	38	TEN-4	2	1 990
32	C5	38	TEN-4	2	2 788
33	C6	39	TEN-4	3	2 484
34	C8	38	TEN-4	4	3 667
35	C13	39	TEN-4	1	3 220
36					
37					
38	C22	39	DRY		0
39					
40					
					DATA SHEET 6

APPENDIX B
(Graphic Presentation)



SPRAY LUBRICATION EVALUATION M700 COCK & FINE SIMULATION



5-4-88
F.L.S.

APPENDIX C

(Previous Evaluation)

Test # 20

Product: Du Pont - Synthetic Diester - 20%

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Synthetic chemical oily smell, not lasting
2. Feel: Light oily feel
3. Drying Rate: Slow drying
4. Penetration: Rapid penetration and spreading, clear color
5. Surface Wetting: Local wetting, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, no dissolving, good cleanup
7. Type Container: 4 oz aerosol, nozzle with straw
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Wet look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Excellent
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:
 Test 1 - 7
 Test 2 - 7
 Avg - 7.0
17. Reason for Elimination: Continue testing

Test # 14

Product: Sprayon #711 Penetrant/Lube/Moisturize

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Very oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Slow spreading, but continuous, clear color
5. Surface Wetting: Minimum spreading, removes oxidation, bright
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Very watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 6

Test 2 - 5

Avg - 5.5

17. Reason for Elimination: Continue testing

Test # 15

Product: CRC - 3-36

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Pleasant peppermint smell, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Medium penetrating and spreading, tan color
5. Surface Wetting: Slow spread, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, some dissolving, easy cleanup
7. Type Container: 1 oz aerosol, nozzle
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 4

Test 2 - 5

Avg - 4.5

17. Reason for Elimination: Continue testing

Test # 11

Product: E. F. Houghton - HLP All Purpose

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Fly spray smell, not lasting
2. Feel: Oily feel
3. Drying Rate: Rapid drying
4. Penetration: Rapid spreading, med. spreading, tan stain
5. Surface Wetting: Slow spreading, rapid dry to oily film, hard to clean
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Waxy, dark tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oil look, no rust within 24 hours
11. Rust Removal: No rust removal
12. Displace Moisture: Poor
13. Displace Solids: Fair
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:

Test 1 - 8

Test 2 - 5

Avg - 6.5

17. Reason for Elimination: Continue testing

Test # 13

Product: Krylon - Tan 4

Function: Multipurpose, prevents rust
Displaces moisture, gums, dirt and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Rapid absorption and spreading, dark tan stain
5. Surface Wetting: Slow spreading, oily appearance, good cleanup
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 11 oz aerosol, nozzle with straw
8. Liquid Appearance: Dark tan, watery
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Damp look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Good
13. Displace Solids: Good
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:
 - Test 1 - 8
 - Test 2 - 5
 - Avg - 6.5
17. Reason for Elimination: Continue testing

APPENDIX D

(Pictorial Presentation)

1. Lubrication procedures.
2. Individual components at the start and completion of test.
(Available upon request.)

REMINGTON ARMS COMPANY, INC.
INTERDEPARTMENTAL CORRESPONDENCE

Remington
4120

Detroy
422

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Distribution: C.B. Workman
C.E. Ritchie
J.P. Linde
J.W. Brooks
R.J. Pohl
Petroleum Lab
Chambers Works
A.B. Hughes
ESD-Louviers

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331

Lubricant Evaluation: M700 Cock and Fire Simulation

Prepared by: Fred Supry

Date Prepared: 3-22-82

Reviewed and Cleared By:

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

James H. Earnings 4-30-82
Signature Date

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

C.E. Ritchie 4/30/82
Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331
REPORT TITLE: Lubricant Evaluation: M700 Cock and Fire Simulation
MODEL(S): 700
GAUGE OR CALIBER: 30.06
DATE: 3-22-82
WORK ORDER NO.: C-1803-000
PART NAME:
DESIGNER/ENGINEER:

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: _____
NO. OF ROUNDS PER GUN: _____
TOTAL ROUNDS FIRED IN TEST: _____
AMMO TYPE: MAGS. _____; TARGET: _____
RIM FIRE _____ CENTER FIRE _____
10. DRY CYCLE - NO. OF SAMPLES TESTED 5
MAX. NO. OF CYCLES 25000

Report No. 82 0331

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

April 13, 1982

TO: J.H. Hennings
FROM: F.L. Supry
REPORT TITLE: Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct a cock and fire evaluation on five spray lubricants.

1. Du Pont - Synthetic Diester
2. Krylon - Ten - 4
3. Sprayon - 711
4. CRC - 3-36
5. Houghton - HLP

These five lubricants were selected for evaluation from the results of a preliminary evaluation conducted by A.B. Hughes, Senior Consultant, ESD Maintenance Engineering Group, Du Pont. A copy of his evaluation for each of the five lubricants is located in Appendix "C".

SCOPE OF TEST

To compare the five lubricants in a Model 700 cock and fire simulation test.

TEST RESULTS

In their order of finish, from the best performing lubricant to the poorest performing lubricant, the following results were obtained.

<u>LUBRICANT</u>	<u>AVERAGE CYCLE LIFE (5 Samples)</u>
1. Du Pont - Synthetic Diester	21,181 cya.
2. Sprayon - 711	17,646 cya.
3. CRC - 3-36	14,382 cya.
4. Houghton - HLP	8,333 cya.
5. Krylon - Ten-4	2,830 cya.

REPORT TEXT

- A. Trigger pull, sear lift, sear engagement, safe on, safe off, and bolt lift measurements were taken on each test vehicle at the start of the test, and at 5000 cycle intervals. Remington specifications for the M700 components used are:

• Trigger Pull	3½ lbs. - 6½ lbs.
• Sear Lift	.005" - .018"
• Sear Engagement	.015" - .020"
• Safe "On" - "Off"	None Established
• Bolt Lift	None Established

Refer to Appendix "A", data sheets No. 1 through No. 5, for individual results.

The Rc hardness was measured, at the cocking cam area, on each M700 bolt.

Refer to Appendix "A", data sheet No. 6, for individual hardness, lubricant used, simulator used and cycles completed.

A graphical analysis comparing the lubricants tested to their cycle life, and their cycle life to the simulator used is found in Appendix "B".

TEST PROCEDUREA. Measurements

1. Trigger Pull
Trigger Pull measurements were conducted using a Chatillon Model IN-10 pull scale.
2. Sear Lift and Sear Engagement
Sear lift and sear engagement measurements were conducted using a Model FC-14 optical comparator and measuring machine.
3. Safe "ON" and "OFF" Forces
Safe On and Off forces were taken using a Chatillon Model DPP-25, push-pull scale.
4. Bolt Lift
Bolt lift forces, both cocked and fired, were taken utilizing a Chatillon Model 80D pull scale mounted on a machine designed to be used for bolt lift measurements.
5. Rc Hardness
The Rc hardness measurements were taken by George Catia, a production inspector, utilizing a Wilson Rockwell Hardness Tester.

B. Lubrication - (Pictorial presentation - Appendix "D")1. Lubrication Points

- | | |
|----------------------|--|
| a. Receiver: | Locking lug area.
Track on receiver tang. |
| b. Bolt: | Cocking cam
Locking lugs |
| c. Firing Pin: | Threads
Striker radius and track. |
| d. Trigger Assembly: | Sear safety cam face.
Interior of trigger assembly, through sear inspection hole. |

2. Lubrication procedure

- a. Components to be lubricated were completely degreased, using the solvent degreasing tanks located in our Heat Treat Department.
- b. The interior of the trigger assembly was lubricated by holding the spray can to direct the spray into the sear inspection hole. Duration of spray approximately 1 second.

NOTE: The two position nozzle on Du Pont aerosol can was more difficult to control for pin point application, than the standard plastic tubes on the other samples. (Pictorial example included.)

2. Lubrication Procedure - continued

- c. All other lubrication points were lubricated by holding the aerosol can approximately six inches away from the area to be lubricated and covering the area until a thin layer of lubricant forms on the surface. Duration of spray; approximately 1 second.

C. Pictorial Presentation

1. Lubrication points and procedures.
2. Cocking cam, sear face, and striker radius and track areas were photographed at the start and completion of the test and are available on request.

APPENDIX A

(Data Sheets)

M 700 ROCK LIFE SIMULATION								
LUBRICANT EVALUATION								
FIRST SAMPLE OF EACH LUBRICANT								
		TRIGGER	SEAR	SEAR	SAFE	SAFE	30.5 - LIFT	
		PULL	LIFT	ENGAGEMENT	ON	OFF	ALZED	ERR
REM - SPDS		34.6 ± 1.6	.005 ± .001	.015 ± .020	(163)	(162)	(165)	(165)
1 - DUPONT	(Avg. 0.03)				(Avg. 0.03)	(Avg. 0.03)	(Avg. 0.03)	(Avg. 0.03)
2 - 711								
3 - CRC								
4 - HLP								
5 - Tex 4								
6		6.25	.005	.020	7.5	6.50	3.00	7.00
7	0	6.50	.006	.015	6.75	4.25	2.00	6.50
8	cycles	3	5.50	.005	.016	5.25	4.25	3.00
9		4	6.00	.008	.017	7.00	5.75	6.50
10		5	6.50	.008	.016	6.75	4.50	7.50
11		1	6.00	.0055	.020	5.50	4.00	2.50
12	5000	2	6.00	.0065	.0175	6.00	5.50	2.50
13	cycles	3	6.00	.006	.020	6.00	4.50	2.00
14		4	5.75	.010	.017	7.50	5.00	3.00
15	* 5	6.50	.010	.020	7.25	5.50	5.00	9.00
16		1	5.75	.008	.020	5.75	4.0	2.25
17	10,000	* 2	5.75	.008	.018	5.25	3.75	2.50
18	cycles	3	5.25	.008	.022	4.50	3.75	2.0
19		4	6.25	.0095	.029	7.25	4.75	3.0
20		5	—	—	—	—	—	—
21		1	6.00	.009	.0205	6.00	4.00	2.00
22	15,000	2	—	—	—	—	—	—
23	cycles	3	5.50	.009	.024	5.00	5.50	2.00
24	* 4	6.00	.0105	.019	6.50	4.50	3.00	18.00
25		5	—	—	—	—	—	—
26	* 1	6.00	.0095	.021	6.00	4.00	2.00	8.00
27	20,000	2	—	—	—	—	—	—
28	cycles	* 3	5.50	.0105	.027	4.50	4.00	2.00
29		4	—	—	—	—	—	—
30		5	—	—	—	—	—	—
31		1	—	—	—	—	—	—
32	25,000	2	—	—	—	—	—	—
33	cycles	3	—	—	—	—	—	—
34		4	—	—	—	—	—	—
35		5	—	—	—	—	—	—
36	* 1	FAILED	15,594	cycles				
37	* 2	FAILED	6,226	cycles				
38	* 3	FAILED	16,359	cycles				
39	* 4	FAILED	10,400	cycles				
40	* 5	FAILED	1,980	cycles				
DATA SHEET								

M-00		BACK + FIRE SIMULATION				F.I.C.	
LUBRICANT EVALUATION							
SECOND SAMPLE OF EACH LUBRICANT							
		1	2	3	4	5	6
	TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT-LIFT	
	PULL	LIST	ENGAGEMENT	ON	OFF	AMPS	FEET
REMINGTON	3.6215	.009	.015	.020	(105)	(165)	(165)
1	DUPONT (AVG. 6.0)			(AVG. 105)	(AVG. 165)	(AVG. 165)	(AVG. 165)
2	711						
3	ACE						
4	HLP						
5	FIN 4						
1	1	6.00	.009	.0185	61.00	41.50	41.00 8.00
2	2	5.00	.006	.018	71.50	41.75	31.00 6.00
3	3	6.00	.012	.012	71.00	41.50	31.00 7.00
4	4	6.75	.0095	.016	71.50	61.75	21.50 7.00
5	5	5.50	.008	.016	71.50	51.50	31.50 7.00
5000	1	5.25	.0095	.0215	61.00	41.50	31.50 7.00
2	2	5.00	.0065	.019	51.75	41.00	31.50 6.00
3	3	5.75	.013	.020	51.00	41.00	31.00 8.00
4	4	6.25	.0095	.020	61.75	61.25	21.50 8.00
* 5	5	5.00	.009	.020	51.75	41.00	31.50 13.00
10,000	1	5.50	.011	.025	51.75	41.25	31.50 7.00
2	2	4.75	.0065	.019	51.25	41.00	21.50 6.50
* 3	3	6.00	.013	.023	61.25	31.75	31.00 15.00
* 4	4	6.00	.0095	.021	61.50	51.75	31.00 25.00
5	5	-	-	-	-	-	-
15,000	1	5.50	.011	.026	51.50	41.25	41.00 7.25
2	2	4.75	.0075	.019	51.00	41.00	31.00 7.00
3	3	-	-	-	-	-	-
4	4	-	-	-	-	-	-
5	5	-	-	-	-	-	-
20,000	1	5.50	.011	.0265	51.50	41.00	41.00 9.25
2	2	4.75	.009	.019	51.25	41.50	31.00 6.50
3	3	-	-	-	-	-	-
4	4	-	-	-	-	-	-
5	5	-	-	-	-	-	-
25,000	* 1	5.25	.011	.0285	51.50	31.75	41.00 14.00
* 2	4.50	.0095	.021	51.25	41.00	21.50	7.00
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
* 1	COMPLETED	25,000	cycles				
* 2	COMPLETED	25,000	cycles				
* 3	FAILED	18,317	cycles				
* 4	FAILED	16,115	cycles				
* 5	FAILED	27,881	cycles				
DATA SHEET 2							

DATA SHEET 2

		M700 COCK & FIRE SIMULATION					F.L.S.	
		LUBRICANT EVALUATION					3-E-82	
		THIRD SAMPLE OF EACH LUBRICANT						

DATA SHEET 3

56		10000 CYCLES AFTER 24/30 RUN		M702 LOCK & FIRE SIMULATION		FLY									
				LUBRICANT EVALUATION		3-8-92									
				FOURTH SAMPLE OF EACH LUBRICANT											
		1		2		3		4		5					
		TRIGGER		SEAR		SEAR		SAFE		SAFE		BOLT - LIFT			
		PULL		LEFT		ENGAGEMENT		ON		OFF		LOCKED		FREE	
		4-6 1/2 lbs		1005-.028		025-.020		(lbs)		(lbs)		(lbs)		(lbs)	
1		1	On Point	(AVG. OF 3)				(AVG. OF 3)		(AVG. OF 3)		(AVG. OF 3)		(AVG. OF 3)	
2		2	711												
3		3	CRP												
4		4	HLP												
5		5	TEN 4												
6			1	6.50	.0095	.0119	6.75	4.25	4.00	8.00					
7			2	6.50	.0108	.0119	8.50	5.25	3.50	7.00					
8		cycles	3	5.50	.008	.016	7.25	4.75	3.00	9.00					
9			4	5.75	.009	.019	8.25	5.50	4.00	7.50					
10			5	5.50	.005	.017	9.00	6.75	3.00	7.50					
11		5000	1	6.25	.010	.023	6.25	3.25	3.00	8.00					
12		cycles	2	6.00	.0111	.020	7.50	4.25	3.50	7.00					
13			3	5.50	.0085	.021	7.00	4.50	3.00	8.00					
14			4	6.00	.010	.019	7.25	5.00	4.00	10.00					
15		*	5	5.75	.010	.0185	7.00	4.75	3.00	16.00					
16		10000	1	5.75	.010	.023	5.75	3.50	4.00	8.00					
17		cycles	2	6.00	.012	.022	7.00	4.00	3.00	8.00					
18			3	5.50	.0085	.021	6.50	4.25	3.00	8.00					
19			* 4	6.00	.010	.021	7.00	5.25	4.00	29.00					
20			5	—	—	—	—	—	—	—					
21		15000	1	6.25	.0105	.024	5.25	3.00	3.50	9.00					
22		cycles	2	6.25	.013	.0225	7.50	4.00	3.50	9.00					
23			* 3	5.50	.0105	.0215	6.75	4.50	3.25	22.00					
24			4	—	—	—	—	—	—	—					
25			5	—	—	—	—	—	—	—					
26		20000	* 1	5.75	.0115	.026	5.75	3.00	3.00	24.00					
27		cycles	* 2	5.75	.0125	.024	6.50	4.00	4.00	24.00					
28			3	—	—	—	—	—	—	—					
29			4	—	—	—	—	—	—	—					
30			5	—	—	—	—	—	—	—					
31		25000	1	—	—	—	—	—	—	—					
32		cycles	2	—	—	—	—	—	—	—					
33			3	—	—	—	—	—	—	—					
34			4	—	—	—	—	—	—	—					
35			5	—	—	—	—	—	—	—					
36			* 1	FAILED		19520 cycles									
37			* 2	FAILED		16865 cycles									
38			* 3	FAILED		11930 cycles									
39			* 4	FAILED		8576 cycles									
40			* 5	FAILED		3667 cycles						DATA SHEET 4			

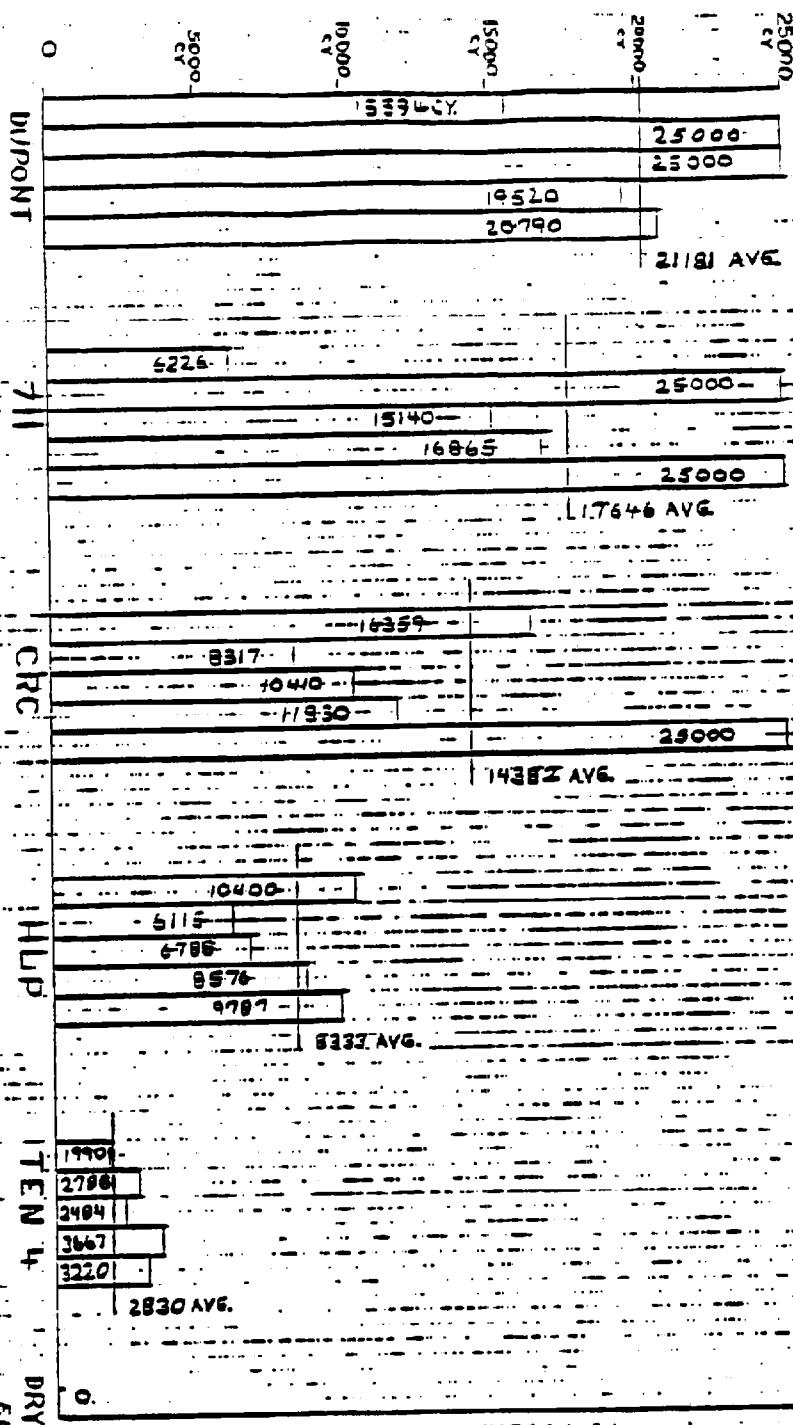
36	3-9-52	M700	LOCK & FIRE	SIMULATION	F.S.				
LUBRICANT EVALUATION					3-9-52				
FIFTH SAMPLE OF EACH LUBRICANT									
		TRIGGER	FEAR	FEAR	SAFE	SAFE	BOLT - LIST		
		PULL	LIFT	ENGAGEMENT	ON	OFF	COARSE	FINES	
		31-64/16"	.005"-.010"	.015"-.020"	(lbs)	(lbs)	(lbs)	(lbs)	
		(Avg of 3)			(Avg of 3)	(Avg of 3)	(Avg of 3)	(Avg of 3)	
1	DoPent								
2	711								
3	CRC								
4	HLF								
5	TEN 4								
	1	6.00	.0085	.0117	7.00	4.75	2.00	7.00	
	2	5.75	.0085	.0155	6.75	5.00	3.50	7.00	
	3	5.75	.0105	.0215	6.50	5.00	3.00	9.00	
	4	6.25	.012	.016	7.00	4.50	3.00	8.00	
	5	6.25	.008	.016	7.25	3.50	3.00	6.50	
	1	5.50	.0110	.0205	7.50	4.50	2.50	7.00	
	2	6.00	.0085	.016	5.75	4.00	4.00	8.00	
	3	5.75	.0105	.0215	5.50	4.25	3.00	9.00	
	4	6.25	.013	.019	6.50	4.25	4.00	7.50	
	*5	6.25	.010	.020	5.75	4.00	3.50	18.00	
	1	5.25	.0110	.021	7.50	4.00	3.00	8.00	
	2	5.50	.0110	.018	5.75	3.75	4.00	7.50	
	3	5.75	.0105	.0215	5.50	4.25	3.00	7.50	
	*4	6.25	.0135	.025	7.25	3.75	4.00	27.00	
	5	-	-	-	-	-	-	-	
	1	5.50	.0105	.021	6.50	4.00	3.00	8.00	
	2	5.75	.010	.018	5.75	4.00	3.50	7.50	
	3	6.00	.0105	.0215	5.50	4.50	3.00	7.00	
	4	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	1	5.50	.0105	.021	7.00	3.75	3.50	14.00	
	2	6.25	.010	.019	5.50	4.00	3.50	9.00	
	3	5.75	.0105	.022	5.50	4.25	3.00	11.00	
	4	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	*1	5.00	.011	.022	7.00	4.00	3.00	28.00	
	*2	5.75	.011	.020	5.75	3.75	4.00	12.00	
	*3	6.25	.017	.023	5.25	4.00	4.00	15.00	
	4	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	
	*1	FAILED	20790 cycles						
	*2	COMPLETED	25000 cycles						
	*3	COMPLETED	25000 cycles						
	*4	FAILED	9787 cycles						
	*5	FAILED	3220 cycles						
DATA SHEET 5									

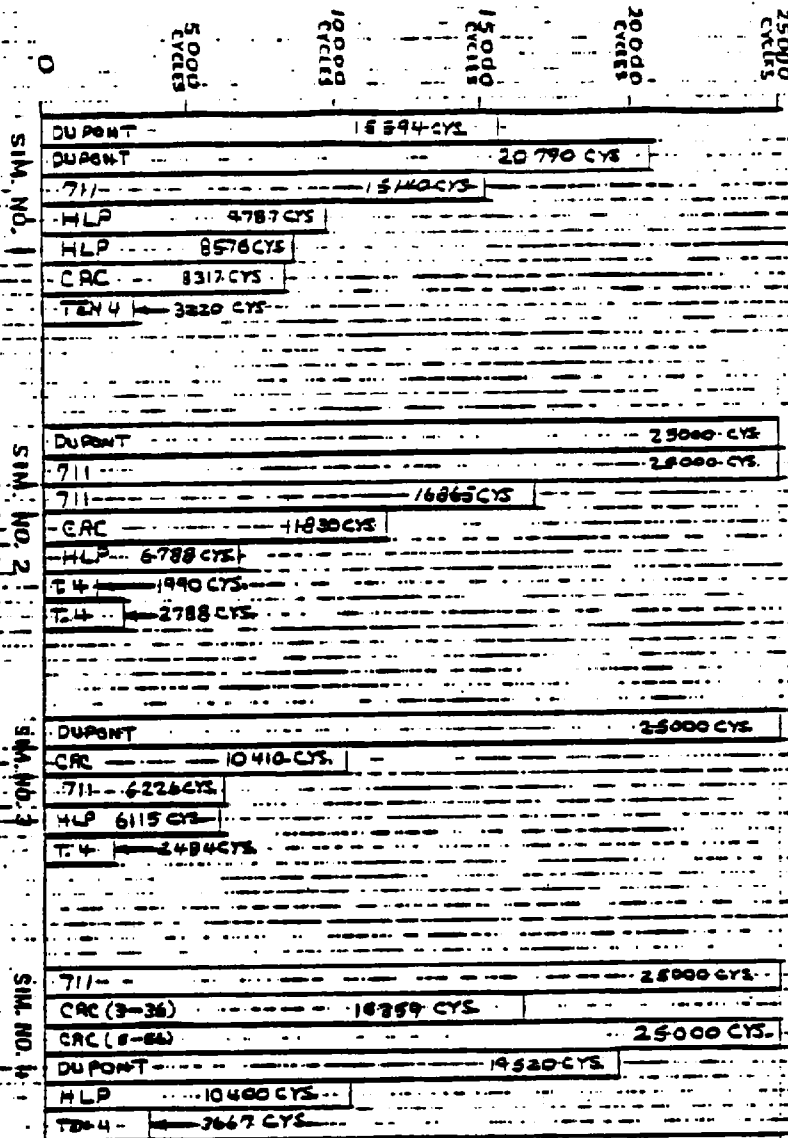
M 700 COCK & FIRE SIMULATION
 LUBRICANT - EVALUATION
 R- HARDNESS: M700 BOLT COCKING CAM AREA

REM SPEED	R-	LUBRICANT	SIMULATOR	CYCLES
R- 37-46	HARDNESS	USED	USED	COMPLETED
+ BOLT NO. +				
1				
2				
3	C1	39	DUPONT	1 15 554
4	C9	40	DUPONT	3 25 000
5	C12	40	DUPONT	2 25 000
6	C19	38	DUPONT	4 19 520
7	C20	37	DUPONT	1 20 790
8				
9				
10	C3	38	711	3 6 226
11	C7	39	711	2 25 000
12	C16	39	711	1 15 140
13	C27	38	711	2 16 845
14	C29	39	711	4 25 000
15				
16				
17	C4	39	CRC 336	4 16 359
18	C10	39	CRC 336	1 8 317
19	C17	40	CRC 336	3 10 410
20	C21	39	CRC 336	2 11 830
21	C25	39	CRC 558	4 25 000
22				
23				
24	C11	39	HLP	4 10 400
25	C18	39	HLP	3 6 115
26	C24	39	HLP	2 6 788
27	C26	39	HLP	1 8 576
28	C28	38	HLP	1 9 787
29				
30				
31	C2	38	TEN-4	2 1 990
32	C5	38	TEN-4	2 2 788
33	C6	39	TEN-4	3 2 484
34	C8	38	TEN-4	4 3 667
35	C13	39	TEN-4	1 3 220
36				
37				
38	C22	39	DRY	0
39				
40				DATA SHEET 6

APPENDIX B

(Graphic Presentation)





SPRAY LUBRICATION EVALUATION - M700 (CONT) FINE SIMULATION

APPENDIX C

(Previous Evaluation)

Test # 20

Product: De Pont - Synthetic Diastar - 204

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Synthetic chemical oily smell, not lasting
2. Feel: Light oily feel
3. Drying Rate: Slow drying
4. Penetration: Rapid penetration and spreading, clear color
5. Surface Wetting: Local wetting, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, no dissolving, good cleanup
7. Type Container: 4 oz aerosol, nozzle with straw
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Wet look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Excellent
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 7

Test 2 - 7

Avg - 7.0

17. Reason for Elimination: Continue testing

Test # 14

Product: Servover 4711 Penetrant/Lube/Demolitive

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Very oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Slow spreading, but continuous, clear color
5. Surface Wetting: Minimum spreading, removes oxidation, bright
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Very watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:
 Test 1 - 6
 Test 2 - 5
 Avg - 5.5
17. Reason for Elimination: Continue testing

Test # 13

Product: CAC - 3-16

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Pleasant peppermint smell, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Medium penetrating and spreading, tan color
5. Surface Wetting: Slow spread, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, some dissolving, easy cleanup
7. Type Container: 1 oz aerosol, nozzle
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:
Test 1 - 4
Test 2 - 5
Avg - 4.5
17. Reason for Elimination: Continue testing

Test # 11

Product: T. F. Souderton - ELP All Purpose

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Fly spray smell, not lasting
2. Feel: Oily feel
3. Drying Rate: Rapid drying
4. Penetration: Rapid spreading, med. spreading, can stain
5. Surface Wetting: Slow spreading, rapid dry to oily film, hard to clean
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Waxy, dark tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oil look, no rust within 24 hours
11. Rust Removal: No rust removal
12. Displace Moisture: Poor
13. Displace Solids: Fair
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:

Test 1 - 8

Test 2 - 5

Avg - 6.5

17. Reason for Elimination: Continuous testing

Test # 13

Product: Krylon - Tan 4

Function: Multipurpose, prevents rust
Displaces moisture, gums, dirt and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Rapid absorption and spreading, dark tan stain
5. Surface Wetting: Slow spreading, oily appearance, good cleanup
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 11 oz aerosol, nozzle with spray
8. Liquid Appearance: Dark tan, watery
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Damp look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Good
13. Displace Solids: Good
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:

Test 1 - 8

Test 2 - 5

Avg - 6.5

17. Reason for Elimination: Continue testing

APPENDIX D

(Pictorial Presentation)

1. Lubrication procedures.
2. Individual components at the start and completion of test.
(Available upon request.)