

REMINGTON ARMS COMPANY, INC.

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Remington

DEFERS

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"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

RESEARCH TEST and MEASUREMENT REPORT - Report No. 830941

M/SEVEN LWT. PENDULUM DROP TEST TO EVALUATE NEW TRIGGER DESIGN.

Prepared by: R. Howe

Date Prepared: 4-6-83

Processed and Cleared By:

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

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

Signature

Date

Signature

Date

PLAINTIFF'S
EXHIBIT

3038

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TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 830941

REPORT TITLE: M/Seven LWT. Pendulum Drop Test To Evaluate New Trigger Design

MODEL(S): M/Seven LWT.

GAUGE OR CALIBER: .243

DATE: 4-6-83

WORK ORDER NO.: C-1809-000

PART NAME: Trigger

DESIGNER/ENGINEER: D. Bullis

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 _____

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April 5, 1983

TO: C. E. RITCHIE
FROM: R. W. HOWE
REPORT TITLE: M/SEVEN LWT PENDULUM DROPTEST TO EVALUATE NEW DESIGN TRIGGER

ABSTRACT

On April 4, 1983, a request was received to test three (3) M/Seven LWT rifles. Two with New Style Trigger, one with the Old Style Trigger, and also one M/700 with old style trigger. D. Bullis, Current Firearms Design, requested the Test Lab to do a Pendulum Drop Test on these four rifles. To evaluate the Jar-Off resistance of the Fire Control Assembly.

SCOPE OF TEST

To evaluate and compare the Jar-Off resistance of the Fire Control Assembly at a 3' drop height against a hardwood back stop.

TEST RESULTS

Some Jar -Offs did occur in the top and bottom side modes at various heights as described in Result Sheet Appendix "A".

REPORT TEXT

1. Trigger Pull and Sear Engagement was preset at minimum present Remington Specs.

Present Remington Specs. are:

Trigger Pull Lbs.	3.0 to 5.0 lbs.
Trigger Sear Eng.	.015 to .020

2. The four rifles were drop tested at the 3' drop height against a hardwood backstop in the following modes:

Muzzle First W/Safe in "On" & "Off" positions
Butt First W/Safe in "On" & "Off" positions
Right Side W/Safe in "On" & "Off" positions
Left Side W/Safe in "On" & "Off" positions
Top Side W/Safe in "On" & "Off" positions
Bottom Side W/Safe in "On" & "Off" positions

Results in Appendix "A".

Note: During drop test, some Jar-Off did occur in the top and bottom side modes so it was decided to drop these guns at various other levels to determine what height the Jar-Off would occur. Other drop levels and results are recorded in Appendix "A".

3. After the first drop test was completed, all four (4) rifles were set at the minimum (3.0lb.) trigger pull and re-dropped in all test modes.

Also, one M/700 rifle from Test Report No. 820391 was added to this test. This rifle contained a new design trigger spring and screw as per Drawing Nos.:

Trigger Spring Dwg. No. SK A-3687

Trigger Screw Dwg. No. SK B-3688

Results in Appendix "A".

TEST PROCEDURE

A. Measurements

Trigger Pull was taken at the start of each test.

Sear Engagement was taken at the start of each test.

Test Conditions

1. Trigger pull forces were taken on all test guns using a Chatillon Model IN-10 Spring Pull Scale (See Appendix "A").
2. Sear Engagement was set on productions Optical Comparator in M/700 final assembly area. (See Appendix "A").
3. The Pendulum Drop Test was conducted on all test rifles at the 3' and the various other drop levels against a hardwood backstop from the muzzle, butt, both sides, top and bottom. (See Appendix "A").

Rifles Used in Test

M/Seven - Serial No. 7601285, Serial No. 7601292, Serial No. 7601289

M/700 - Serial No. A6351001, Serial No. B6341922

ALEXANDER K. SCH

APPENDIX "A"

M/7 NEW STYLE TRIGGER EVALUATION

DROP/JAR-OFF TEST ON
HARDWOOD SURFACE FROM
3' DROP EVALUATION

Serial #	TEST #1				TEST #2			
	M/7 New Style Trigger	M/7 New Style Trigger	M/7 Old Style Trigger	M/700 Old Style Trigger	M/7	M/7	M/7	M/700
	#7601285	#7601292	#7601289	#A6351001	#7601285	#7601292	#7601289	#A6351001
SAFE POSITION	On Off	On Off	On Off	On Off	On OFF	On OFF	On Off	On Off
TRIGGER PULL (Lbs.) Avg.	3.5 lbs.	3.16.	4.75lb.	5.75lb.	3.01b.	3.01b.	3.01b.	3.01b.
SEAR ENGAGEMENT	.015"	.015"	.015"	.015"	.015"	.015"	.015"	.015"
MUZZLE FIRST	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
BUIT FIRST	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
NIGHT SIDE	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
LEFT SIDE	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
BOTTOM SIDE	12"	- Ok	- Ok	- Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
	18"	- 3 J/O4	- 1 J/O4	- Ok	Ok Ok	Ok 3 J/O4	Ok 2 J/O4	Ok 4 J/O4
	24"	- 4 J/O4	- 2 J/O4	- 1 J/O4	Ok Ok	Ok 2 J/O4	Ok 4 J/O4	Ok 4 J/O4
	36"	Ok 4 J/O4	Ok 4 J/O4	Ok 2 J/O4	Ok Ok	Ok J/O	Ok J/O	Ok J/O
TOP SIDE	12"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
	18"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
	24"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
	36"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok J/O

NOTE: J/O means Jar Off (i.e. 3 J/O 4 means 3 Jar Offs out of 4 tries)

CERIFICATION: js
4/10/83

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Report No. 830941

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

☐ Developmental
☒ Design Acceptance
☐ Pre-Pilot
☐ Pilot
☐ Production Acceptance

☐ Safety Related
☐ Competitive Evaluation
☒ New Design
☐ Design Change
☐ Plant Assistance
☐ Ligation
☐ Warehouse Audit
☐ Cost Reduction
Stake _____
☐ Other _____

FIREARM STATS.

MODEL: 7 LWTCAL. or GAUGE: 243

BARREL TYPE: _____

PROOFED: YES ☒ NO ☐

REPORT REQ'D.

FORMAL ☒TEST
RESULTS
ONLY ☒DATE REQUESTED: 4-4-83DATE NEEDED BY: A.S.A.P.REQUESTED BY: BullisWORK ORDER NO: C-1809-000

TEST TYPE

☐ Strength Test
☐ Function Test
☐ Accuracy Test

☐ Ammunition Test
☐ Environmental Test
☐ Customer Complaint

☐ Dry Cycle Test
☐ Measurements
☐ Endurance Test

☐ Photo/Video
☒ Other DROP

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

DROP TEST 2 M/7 LWT 243 CAL. RIFLES.

• DROP 3 FEET

• DROP BUTT, MUZZLE, BOTH SIDES.

NEW STYLE TRIGGER - RELIEVED BOTH SIDES.

-GUNS REQUIRED:

#1 7601285 - Bull 3" engagement .015"

#2 7601292 - " 3" " .015"

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: _____

TEST COMPLETED BY: _____

REPORT DATE: _____

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(~~1ST~~ ^{2ND} SECOND TEST) (4.5-83)
(CONTROL GUNS)

M/7 LWT DROP TEST SAFE "OFF" ONLY. (HARD WOOD STOP)

(FOUR DROPS AT EACH LEVEL)

M/7 LWT GUN #13 - JARRED OFF 2 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

1	"	"	4	"	"	18"
0	"	"	4	"	"	12"

M/7 LWT GUN #14 - JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

3	"	"	4	"	"	18"
0	"	"	4	"	"	12"

(CONTROL GUN)
M/7 LWT GUN #12 JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

2	"	"	4	"	"	18"
0	"	"	4	"	"	12"

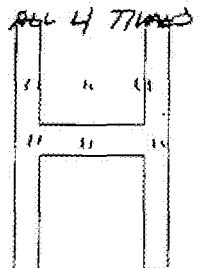
M/700 (CONTROL GUN) JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

4	"	"	4	"	"	18"
0	"	"	4	"	"	12"

NOTE:

M/700 CONTROL ALSO ~~TESTED~~ ^{DROPPED} ON TOP AT
12"-18" & 24" LEVELS 4 TIMES AT EACH LEVEL

RESULTS 24" OK
18" OK
12" OK



M/7LWT-NEW STYLE TRIGGER- 3' DROP TEST (HARD WOOD STOP ONLY)

	NEW STYLE TRIG.		NEW STYLE TRIG.		CONTROL GUN.		CONTROL GUN.		4-5-83
GUN+SER#	13 SER# 7601285		14 SER# 7601292		12 SER# 7601289		M/700 SER# 7635 1001		
SAFE POSITION	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
MUZZLE FIRST	OK	OK	OK	OK	OK	OK	OK	OK	
BUTT FIRST	OK	OK	OK	OK	OK	OK	OK	OK	
RIGHT SIDE	OK	OK	OK	OK	OK	OK	OK	OK	
LEFT SIDE	OK	OK	OK	OK	OK	OK	OK	OK	
TOP SIDE	OK	OK	OK	OK	OK	OK	OK	JARR'D OFF	
BOTTOM SIDE	OK	JARR'D OFF	OK	JARR'D OFF	OK	JARR'D OFF	OK	JARR'D OFF	
NOTE: ALL FOUR GUNS HAVE BEEN SET AT 3LB. TRIG PULL AND .015" ENGAGEMENT (SEAR)									

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MP 11 LWT - NEW STYLE 1000000 - 3. LKOP 1 EST (HARD ALONG STOP GIVE)

NEW STYLE TRIG.	NEW STYLE TRIG.	CONTROL GUN.	CONTROL GUN.	4-5-85
ION # Ser #	13 ser # 7601285	14 ser # 7601292	12 ser # 7601289	MP 100 Ser # 1635 1001
MP 10517041	ON	OFF	ON	OFF
Muzzle FIRST	OK	OK	OK	OK
Butt FIRST	OK	OK	OK	OK
RIGHT SIDE	OK	OK	OK	OK
LEFT SIDE	OK	OK	OK	OK
TOP SIDE	OK	OK	OK	OK
BOTTOM SIDE	OK	OK	OK	OK
ION # Ser #	13 ser # 7601285	14 ser # 7601292	12 ser # 7601289	MP 100 Ser # 1635 1001
MP 10517041	ON	OFF	ON	OFF
Muzzle FIRST	OK	OK	OK	OK
Butt FIRST	OK	OK	OK	OK
RIGHT SIDE	OK	OK	OK	OK
LEFT SIDE	OK	OK	OK	OK
TOP SIDE	OK	OK	OK	OK
BOTTOM SIDE	OK	OK	OK	OK

NOTE: All FOUR GUNS HAVE BEEN SET AT 3LB. TRIG Pull AND .015 ENGAGEMENT (SEAR)

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4-5-83

M/7 LWT DROP TEST SAFE "OFF" ONLY. (HARD WOOD STOP;
(FOUR DROPS AT EACH LEVEL)

M/7 LWT GUN #13 - JARRED OFF 2 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 1 " " 4 " " 18"
0 " " 4 " " 12"

M/7 LWT GUN #14 - JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 3 " " 4 " " 18"
0 " " 4 " " 12"

(CONTROL GUN)

M/7 LWT GUN #12 JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 2 " " 4 " " 18"
0 " " 4 " " 12"

M/700 (CONTROL GUN) JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 4 " " 4 " " 18"
0 " " 4 " " 12"

NOTE:

M/700 CONTROL ALSO ~~SHOT~~ DROPPED ON TOP AT
12"-18" & 24" LEVELS 4 TIMES AT EACH LEVEL

RESULTS 24" OK ALL 4 TIMES
18" OK
12" OK

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12/16

A (NEW STYLE TRIGGER) FIRST TEST 4/4/83
 M/S LWT 3' DROP TEST (HARD WOOD STOP ONLY)

GUN #	13 SER# 7601285	14 SER# 7601292
	SAFE ON	SAFE ON
	SAFE OFF	SAFE OFF
MUZZLE FIRST	OK	OK
BOTH FIRST	OK	OK
RIGHT SIDE	OK	OK
LEFT SIDE	OK	OK
TOP	OK	OK
BOTTOM	OK	OK

J.O. = JARRED OFF (FIRING PIN FEEL)

#13 TRIG PULL	3.25	3.25	3.50	AUG	3.5	2.85
#14	"	"	3-3-3	AUG	3.25	
CONTR	"	"	4.50-4.75-5.00	AUG	4.75	4.05
M/S	"	"	5.50	6.00	5.75	4.05

4-4-83

HARD WOOD STOP

A-SAFE OFF ONLY

A

LWT DROP TEST, B-BOTTOM ONLY
(4 DROPS AT EACH LEVEL BELOW)

#14 M/7 LWT GUN #14 JARRED OFF 2 TIMES IN 4 AT 24"
" " " " " 1 " " 4 AT 18"
" " " " " OK — 4 " " 4 AT 12"
#14 TRIG PULL AVG OF THREE = 3 LBS

#13 M/7 LWT GUN #13 JARRED OFF 4 TIMES IN 4 AT 24"
" " " " " 3 " " 4 AT 18"
" " " " " OK — 4 " " 4 AT 12"
#13 TRIG PULL AVG OF THREE 3.5 LBS

M/7 LWT CONTROL GUN JARRED OFF 2 TIMES IN 4 AT 36"
" " " " " 1 " " 4 AT 24"
" " " " " OK — 4 " " 4 AT 18"
" " " " " OK — 4 " " 4 AT 12"
CONTROL TRIG PULL AVG OF THREE 4.75 LBS

#1700 REG M/700 DID NOT JAR OFF UNTIL 4' DROP.
M/700 TRIG PULL AVG OF THREE 5.75 LBS.

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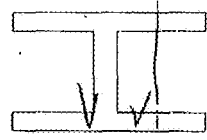
(NEW STYLE TRIGGER)

M/7 LWT 3' DROP TEST (HARD WOOD STOP ONLY)

GUN #	13 SER# 7601285	14 SER# 7601292
	SAFE ON	SAFE OFF
MUZZLE FIRST	OK	OK
BUTT FIRST	OK	OK
RIGHT SIDE	OK	OK
LEFT SIDE	OK	OK
TOP	OK	OK
BOTTOM	OK	OK

J.O. = TAPPED OFF (FIRING PIN FELL)

#13 TRIG PULL	3.25 325-350 AUG 3.5 LBS.
#14 " "	3-3-3 AUG. 3 LBS.
CENTER " "	4.75 475-500 AUG 4.75 LBS.
M/500 " "	5.50 600 575 AUG 5.75 LBS.



4-4-83

HARD WOOD STOP

A-SAFE OFF ONLY

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M/7 LWT DROP TEST, B-BOTTOM ONLY
(4 DROPS AT EACH LEVEL BELOW)

#14 M/7 LWT GUN #14 JARRED OFF 2 TIMES IN 4 AT 24"
 " " " " " " " " " " 4 AT 18"
 " " " " " " " " " " 4 AT 12"
 #14 TRIG PULL AVG OF THREE = 3 LBS

#13 M/7 LWT GUN #13 JARRED OFF 4 TIMES IN 4 AT 24"
 " " " " " " " " " " 4 AT 18"
 " " " " " " " " " " 4 AT 12"
 #13 TRIG PULL AVG OF THREE 3.5 LBS

#12 M/7 LWT CONTROL GUN JARRED OFF 2 TIMES IN 4 AT 36"
 " " " " " " " " " " 4 AT 24"
 " " " " " " " " " " 4 AT 18"
 " " " " " " " " " " 4 AT 12"
 CONTROL TRIG PULL AVG OF THREE 4.75 LBS

#1700 REG M/700 DID NOT JAR OFF UNTIL 4' DROP.
 M/700 TRIG PULL AVG OF THREE 5.75 LBS.

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