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SUPER

CC: W.H. Coleman, II
K.W. Soucy
D.J. Anderson
R.S. Murphy
J.W. Bower
J.R. Snedeker

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RESEARCH TEST AND MEASUREMENT REPORT
REPORT# 841401

MODEL SEVEN LWT. .308 CALIBER TRIAL AND PILOT EVALUATION

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MODEL SEVEN LWT. .308 CALIBER TRIAL AND PILOT EVALUATION

ABSTRACT:

Research and Development finds the Trial and Pilot Evaluation of the Model Seven Lwt. .308 caliber, assembled with the aluminum floor plate assembly, to be acceptable. However, although there were no malfunctions related to the new design floor plate assembly, the following should be investigated, by production:

1. During a Field Function Test on thirty (30) of the first Trial and Pilot rifles, ninety-nine (99) malfunctions occurred, for an overall malfunction rate of 2.4%. Seventy-two (72) malfunctions or 72.2% of the malfunctions, were "Don't Eject" malfunctions.
2. During a Field Function Test conducted on eight (8) of the second Trial and Pilot rifles, thirty-five (35) "Don't Eject" malfunctions occurred, for an overall malfunction rate of 3.2%. The "Don't Eject" malfunction accounted for 100% of the malfunctions occurring in the Field Test. Two (2) of the rifles, serial# 7603137 and serial# 7604294, had fifteen (15) and thirteen (13) malfunctions respectively. These two (2) rifles were turned over to PE & C. A note of explanation from PE & C is included in the appendix of this report.

Since the "Don't Eject" malfunction was so predominate during the evaluation, either greater care must be taken in production, to follow the established procedures or a change in the current procedures may be needed.

Prepared by: F.L. SUPRY
Date Prepared: 5/30/84

proofread and cleared by:

R.E. NIGHTINGALE, Foreman
Test, Measurement & Mech. Analysis Lab

J.R. SNEDEKER, Research Supervisor
Test, Measurement & Mech. Analysis Lab

W.H. COLEMAN, II
New Products Research Lab Director

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W.O.#81343-926

MODEL SEVEN LWT 308 CALIBER TRIAL AND PILOT EVALUATION

TO: R.E. NIGHTINGALE
FROM: F.L. SUPRY

INTRODUCTION:

On May 16, 1984 a request to conduct a Trial and Pilot evaluation on the Model 7 Lwt. 308 caliber rifle, assembled with the new design aluminum trigger guard assembly, was received by the Research Test Lab. A forty (40) rifle, production run sample was used.

Due to the favorable results of an extensive endurance, accuracy, preliminary measurements, and visual inspection completed on the last production run samples of the rifle this Trial and Pilot will be limited to Jack Function and Field Function.

The results of the testing done on Previous sample will be included in this report.

SCOPE OF TEST:

To determine if the production run samples meet Remington Specifications set by the Research Design Section.

TEST RESULTS: (Previous sample)

Thirty (30) rifles were subjected to a 135 round Field Function Test. Ninety-nine (99) malfunctions occurred, for an overall malfunction rate of 2.4%.

Fifteen (15) rifles were fired to 335 rounds, seven (7) rifles were fired to 1005 rounds, and three (3) rifles were fired to 2035 rounds. No breakages occurred. No floor plate openings occurred.

TEST RESULTS: (New sample)

The forty (40) rifle sample was found to meet the Remington Specifications set by the Research Design Section.

All forty (40) rifles were subjected to twenty (20) rounds of Remington ammunition, in a Jack Function test. No malfunctions occurred.

Eight of the rifles were subjected to a 135 round Field Function test. Thirty-five (35) "don't eject" malfunctions occurred, for an overall malfunction rate of 3.2%.

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REPORT TEXT:

1. VISUAL INSPECTION: (5 rifles) (Previous sample)

A. The visual inspection committee found no major items in the appearance of the rifles inspected.

B. The following general comments were made in overall reference to the rifles:

a. Several of the rifles had a dent on the top, rear of the stock, where the stock hit against the stop board of the gun truck.

b. The checkering over-runs were primarily located at the rear of the fore end pattern.

c. The rifles used in the visual inspection were:

7603926	7603156	7603161
7603441	7603126	

d. Comments recorded for each individual rifle are located in the appendix of this report.

2. PRELIMINARY MEASUREMENTS: (30 rifles)(Previous sample)

A. During the Preliminary Measurements, a burr was found on the tip of the firing pin of two of the rifles. The firing pins were replaced with firing pins from two of the rifles used in the visual inspection.

B. The following averages were established for the 30 rifles:

a. Floor Plate opening force: 3.0 pounds

b. Trigger Pull: 3.75 pounds

c. Firing Pin Indent: .024 inches

d. Headspace: .003 inches

C. Preliminary Measurement results per individual rifle are located in the appendix of this report.

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REPORT TEXT: (continued)

3. ACCURACY: (Previous sample)

A. Nineteen (19) rifles were tested for 100 yard accuracy and the following averages were established:

- a. Group Size: 2.37 inches
- b. Horizontal Spread: 2.24 inches
- c. Vertical Spread: 1.69 inches

B. Accuracy results per individual rifle are located in the appendix of this report.

4. FIELD FUNCTION: (Previous sample)

A. Thirty (30) rifles were subjected to a 135 round per rifle, Field Function Test and the following results were obtained:

- a. Twenty (20) rifles experienced no malfunctions.
- b. Ninety-nine malfunctions occurred, for an overall malfunction rate of 2.4%.
- c. Seventy-two (72) of the malfunctions were "Don't Eject" malfunctions.
- d. One rifle had a rough chamber. (Refer to report# 841021)

5. FIELD FUNCTION: (New sample)

A. All forty (40) rifles were subjected to the loading and firing of twenty (20) rounds of Remington, 180 grain soft point, ammunition, prior to the Field Function Test. There were no malfunctions on any of the rifles.

B. Eight of the 40 rifles were subjected to a 135 round per rifle, Field Function Test, and the following results were obtained:

- a. Two (2) of the rifles had no malfunctions.
- b. The overall malfunction rate was 3.2%.
- c. The malfunctions were all "don't eject" malfunctions. At each occurrence the plunger was found to be stuck down.
- d. Two (2) rifles, serial# 7603137 and serial# 7604294, accounted for twenty-eight (28) of the malfunctions. These two (2) rifles were turned over to J.B. Willoughby for examination. A note of explanation is included in the appendix of this report.

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REPORT TEXT: (continued)

6. ENDURANCE: (Previous sample)

A. Fifteen (15) rifles were subjected to an additional 200 round endurance test, and the following results were obtained:

- a. There were no floor plate openings.
- b. The overall malfunction rate for this portion of the endurance test was 0.76%.
- c. Twelve (12) of the rifles experienced no malfunctions.
- d. The three rifles that experienced malfunctions, experienced them as follows:
 - i. 7604807 - 5 stem low - (2.5% malfunction rate)
 - ii. 7603207 - 12 don't eject - (6.0% malfunction rate)
At each occurrence, the ejector was stuck down due to shaved brass.
 - iii. 7603389 - 2 stem high
- 4 follower tip down - (3.0% malfunction rate)

B. Seven (7) of the fifteen (15) rifles were subjected to an additional 700 round endurance test, and the following results were obtained:

- a. There were no floor plate openings.
- b. The overall malfunction rate for this portion of the endurance test was 0.8%.
- c. Five (5) of the rifles had no malfunctions.
- d. The two (2) rifles that experienced the malfunctions, experienced them as follows:
 - i. 7604098 - 4 stem high
2 stem right
1 bolt override - (1.0% malfunction rate)
 - ii. 7603389 - 8 don't eject
2 stem high
7 stem low
1 stem right
16 follower tip down - (4.8% malfunction rate)

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TEST RESULTS: (continued)

- C. Three (3) of the seven (7) rifles were subjected to an additional 1000 round endurance test, and the following results were obtained:
 - a. There were no floor plate openings.
 - b. The overall malfunction rate for this portion of the endurance test was 0.2%.
 - c. Two (2) of the rifles had no malfunctions.
 - d. The rifle that experienced the malfunctions, experienced them as follows:
 - i. 7603153 - 2 stem high
2 stem right
1 follower tip down
1 bolt override - (0.6% malfunction rate)

7. JACK FUNCTION: (New sample)

- A. Each of the forty rifles were subjected to twenty rounds of Remington ammunition, and no malfunctions occurred.
- B. There were no rough chambers in any of the sample rifles.

TEST PROCEDURE:

1. VISUAL INSPECTION: (Previous sample)

- A. The Visual Inspection Committee consisted of Z. Kowalski, B. Bosquet, (P.E. & C.); J. Snedeker, F. Supry, (Research); and J. Brooks, (consultant).
- B. Five (5) rifles were selected for the visual inspection, using random number tables, from a sample lot of 35 rifles.
- C. Each rifle was wiped down with a clean white Coyne towel, and examined by each member of the Visual Inspection Committee. All comments were recorded.

2. PRELIMINARY MEASUREMENTS: (Previous sample)

- A. Each rifle was checked for magnaflux and proof stamps.
- B. The headspace was checked on each rifle, using graduated headspace gauges.

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TEST PROCEDURE: (continued)

2. PRELIMINARY MEASUREMENTS: (continued)

- C. The floor plate opening force was checked, using a ten (10) pound push - pull gauge. Three readings were taken on each rifle and an average calculated.
- D. Trigger pull force measurements were taken, using a ten (10) pound spring scale. Three readings were taken on each rifle and an average calculated.
- E. Firing Pin Indent measurements were taken, using annealed copper crushers and a calibrated dial indicator. Three measurements were taken on each rifle and an average calculated.

3. ACCURACY: (Previous sample)

- A. The following nineteen (19) rifles were used in the 100 yard accuracy test:

7602999	7603374	7603110	7604374	7604807
7603362	7603323	7603340	7603609	7603482
7603389	7603003	7603153	7604098	7603155
7603357	7603342	7603326	7603430	

- B. The accuracy was shot by R. Williams, Research - Test Lab, at the R & D 100 yard range.
- C. Weaver mounts and rings were used in conjunction with a Lyman All American 20X 1/8 inch dot scope.
- D. Remington ammunition, index R308W2; code W09F D4501, 180 grain soft point, was used for the 100 yard accuracy test.
- E. Before shooting the 100 yard accuracy test, the bores on each rifle were brushed with Hoppe's No. 9 solvent and patched dry.
- F. A total of two (2), five (5) shot groups were shot with each rifle. The rifles were cooled between each group, and one (1) "warmer" shot was fired before the next group was shot.
- G. The patterns were analyzed for group size, horizontal spread, and vertical spread. The averages were calculated for each rifle.

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4. FIELD FUNCTION: (Previous sample)

A. Thirty (30) of the rifles were subjected to the loading and firing of 135 rounds of Remington and competitive ammunition. The round robin method of firing the rifles was used. Fifteen (15) rounds were fired; five (5) at a slow feeding cycle speed, five (5) at a medium feeding cycle speed, and five (5) at a fast feeding cycle speed. The rifles were then cooled before the firing of the next ammunition type.

B. The following ammunition was used in the field test:

a. Remington: R308W1 150-psp code# S22K D7069
R308W3 180-psp code# W17F D7743

b. Winchester: X3081 110-psp code# 79SE12 5Q
X3085 150-sp code# 24UE81
X3086 180-sp code# 68TC90 83
X3084 200-st code# 52TF80

c. Federal: 308A 150-psp code# 5A 1245
308B 180-psp code# 5B 1104
P308C 165-bt code# 32A 3118

C. All malfunctions were recorded; per rifle, per ammunition type, per feeding cycle speed, and per shooter. Individual and overall malfunction rates were calculated.

5. FIELD FUNCTION: (New sample)

A. The same procedure, that was used on the Previous sample, was followed to conduct a field function test on eight (8) rifles from the New sample.

6. APPENDIX:

A. Contents:

- a. Visual Inspection comments per individual rifle.
- b. Preliminary Measurement results per individual rifle.
- c. Accuracy results per individual rifle.
- d. A copy of the Lab Work Request.
- e. A copy of the note explaining the findings of the examination of the two rifles, serial# 7603137 and serial# 7604294.
- f. A copy of Report# 841021

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APPENDIX
MODEL 7 LWT. 308 CALIBER WITH ALUMINUM TRIGGER GUARD ASSEMBLY

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VISUAL INSPECTION:

GENERAL:

1. A slight mar was noticed on the top rear of the stocks, on each of the rifles, from the rifles hitting on the stop board of the gun truck.
2. The checkering over runs were primarily located at the rear of the patterns.

COMMENTS PER INDIVIDUAL RIFLE:

1. 7603926 - Some checkering over runs on all four points, at the rear of the fore end pattern.

The checkering in the grip area has slight over and under runs.

Bright spot on the rear of the trigger guard, from the head of the screw hitting the trigger guard.

The repaired crown appears rough.
3. 7603156 - Polish scratches on the floor plate cover.
4. 7603161 - White marks on the inside of the floor plate, on the side of the trigger bow.

Two dents on the left side of the stock, below the rear sight.

The repaired crown appears rough.
5. 7603126 - Dust in the finish.

Dent in the right side of the floor plate.

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PRELIMINARY MEASUREMENTS:

SERIAL#	HD SPACE (in)	FP INDENT (in)	TRIGGER PULL (lbs)	F PLATE OPENING (lbs)
7603160	.002	.023	4.00	3.00
7603374	.005	.0235	3.00	3.00
7603423	.005	.0235	3.50	3.00
7603323	.004	.0215	4.00	3.00
7603340	.001	.0235	4.00	3.00
7603207	.005	.024	3.25	3.25
7603110	.004	.024	3.50	3.00
7603616	.002	.0245	3.25	3.00
7603153	.001	.025	4.50	3.00
7603389	.004	.023	3.00	3.25
7604264	.006	.0225	3.25	2.75
7603882	.005	.021	3.75	3.00
7603326	.003	.0245	3.75	2.75
7603774	.003	.0225	3.25	2.75
7603342	.004	.024	4.00	3.00
7603003	.003	.023	3.25	3.00
7603357	.002	.025	3.50	3.00
7603155	.004	.023	3.75	3.25
7603453	.002	.023	3.75	3.25
7604374	.005	.024	4.25	3.00
7604098	.005	.0245	4.00	3.00
7604807	.001	.024	3.50	2.75
7603482	.004	.023	3.75	3.00
7603430	.005	.0255	4.25	3.00
7603609	.002	.024	4.50	3.00
7603362	.004	.025	4.75	2.75
7603262	.002	.023	3.00	3.00
7602999	.002	.0255	4.50	4.00
7604283	.005	.024	3.75	3.00
7603193	.002	.024	4.00	3.00
AVERAGE	.003	.024	3.75	3.00

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ACCURACY PER INDIVIDUAL RIFLE:

SERIAL#	GROUP SIZE (in.)	HORIZONTAL (in.)	VERTICAL (in.)
7603155	1.2	1.1	0.5
	1.5	1.2	1.3
average =	1.35	1.15	0.9
7604098	1.3	1.0	1.0
	2.5	1.9	2.4
average =	1.9	1.45	1.7
7603357	1.9	1.7	0.8
	2.5	2.4	1.6
average =	2.2	2.05	1.2
7603326	2.1	1.0	1.9
	3.1	2.8	2.1
average =	2.6	1.9	2.0
7603430	2.8	1.9	2.0
	2.3	2.0	2.3
average =	2.55	1.95	2.25
7603342	2.6	2.1	1.9
	2.6	1.6	2.2
average =	2.6	1.85	2.05
7603482	2.3	1.8	1.7
	3.3	3.1	1.5
average =	2.8	2.45	1.6
7603482	1.7	1.4	1.1
	2.0	1.4	1.9
average =	1.85	1.4	1.5
7603389	2.0	1.1	1.7
	3.2	3.2	2.3
average =	2.6	2.15	2.0

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ACCURACY PER INDIVIDUAL RIFLE: (continued)

SERIAL#	GROUP SIZE	HORIZONTAL	VERTICAL
7603003	2.1	2.0	1.2
	3.2	3.1	1.5
average -	2.65	2.55	1.35
7603153	2.3	2.1	1.1
	3.0	3.0	1.3
average -	2.65	2.55	1.2
7903323	2.2	1.9	1.9
	2.0	1.1	1.9
average -	2.1	2.0	1.9
7603362	2.9	2.8	1.4
	2.5	1.8	1.9
average -	2.7	2.3	1.65
7603340	2.8	2.6	1.1
	2.2	1.0	2.0
average -	2.5	1.8	1.55
7603110	2.3	2.3	1.1
	2.9	1.4	2.6
average -	2.6	1.85	1.85
7604374	1.6	1.4	1.3
	2.7	0.6	2.6
average -	2.15	1.0	1.95
7603374	2.3	1.6	2.1
	2.3	2.3	1.3
average -	2.3	1.95	1.7
7604807	1.9	1.7	1.0
	2.9	2.5	1.8
average -	2.4	2.1	1.4
7602999	2.8	1.9	2.4
	2.3	0.9	2.3
average -	2.55	1.4	2.35