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M/721 Pilot Line Test (30-06 Cal.)

9/8/47

Period: 7/28/47 to 8/28/47

Project: FD-721-1 W. O. #71106

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INTRODUCTION

This report covers the testing of M/721 Pilot Line rifles as follows:

- *1. Eight rifles tested for accuracy and functioning.
- **2. Endurance Test of one M/721 rifle following the Standard Endurance Test procedure - see Item A, Appendix.
- 3. Copies of Parts Lists, etc., as indicated in the Gun Test Request Form, Item C attached, are on file with the Test Group and may be had upon request.

OBJECTIVE

- 1. To determine the inherent (a) accuracy and (b) functional performance of M/721 rifles as of 7/28/47.
- 2. To determine the endurance characteristics of one M/721 rifle during a 6000 round breakdown test.

CONCLUSIONS

- ***1. That the inherent accuracy of M/721 rifles is as follows:
 - a. Average Extreme Spread (100 yds.) - 8 guns 3.15"
 - Average Min. Extreme Spread (100 yds.) - 8 guns 2.46"
 - Average Max. Extreme Spread (100 yds.) - 8 guns 4.11"
 - b. That the functional performance of Guns #20796 and #21101 was exceptionally poor. See "Experimental Details".
- 2. That the endurance of the M/721 tested was good with the exception of a Stock breakage (round 5300) and a Firing Pin Head breakage (round 2180).
- *Selected as a random sample of 65 guns stored in the warehouse.
- **Selected as an average gun of the eight tested.
- ***Rate of fire - 1 shot per minute. Water cool every 10 shots.
- Conditions: 3 shooters, 3 ten shot groups per shooter, range - 100 yd
20 power scope, bench rest, ammunition standardization -
1.00 E.S. at 100 yds.

WORK PROGRAM

The Routing Ticket on "Standard Endurance Test for Center Fire Rifles" dated 7/25/47 was used - copy attached (Item A, Appendix).

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RECOMMENDATIONS

It is recommended:

1. That the sharp edges on the rail of the magazine well be broken. Failure to feed in Guns #20796 and #21101 was caused by this condition.
2. That closer inspection be made of the proper seating of the Sear Spring.
3. That the Firing Pin hole in the face of the Bolt should not be chamfered. If this condition is allowed to exist, primers from fired rounds will mushroom into the chamfered crater.
4. That Stock breakages should be investigated and some means of preventing breakage be accomplished.
5. It is recommended that the inspectors marks from repeated inspections be placed on the bottom side of the barrel.
6. That periodic accuracy tests of M/721 rifles be made comparable to accuracy tests covered in this report.
7. That the accuracy of the M/721 be improved.
8. That the Trigger Guide Plate be made of a plastic material which will prevent freezing of the Trigger during extreme ice conditions.

SUMMARY OF RESULTS

Eight (8) Pilot Line M/721 rifles were fired 320 rounds with results as follows:

Accuracy

	<u>Extreme Spread (0 rounds)</u>			<u>Extreme Spread (rounds)</u>					
	<u>Average</u>	<u>Max.</u>	<u>Min.</u>	<u>1000</u>	<u>2000</u>	<u>3000</u>	<u>4000</u>	<u>5000</u>	<u>6000</u>
20584	2.85"	3.55"	2.20"						
20796	6.97	8.50	5.80						
20726*	2.94	3.10	1.70	2.92	2.90	2.74	2.9	3.2	4.2
21101	2.13	2.60	1.55						
20710	2.94	4.20	2.25						
20581	3.30	4.20	2.20						
20578	2.41	3.00	1.65						
20508	3.07	3.75	2.30						

*Endurance Gun accuracy shown at different periods of the endurance test.

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Functional Performance
of
Eight Test Guns (0-320 rounds only)

Gun Serial#	Overall Performance	Part Re- placements	Adjust- ments	Break- ages	Gun Failures	Remarks
20534	0 %					
20796	4.38%					Failures to feed
20726*	0 %					
21101	5.0 %					Failures to feed
20710	0 %					
20531	0 %					
20508	.625%					
20578	0 %					

Summary of
Functional Performance of
Endurance Gun #20726

Rounds Fired	Malfunctions					Remarks
	Un- locking	Feed- ing	Break- ages	Replace- ments	Gun Failures	
0-1000						
1001-2000					1	Failed Ice Test. See letter W. E. Leek to G. Pinckney. Appendix, Item B
2001-3000	1	2	1	1	1	Firing Pin Head (breakage) Hardness below specificati
3001-4000		2				
4001-5000		1			1	*Gun Failed, defective Ammunition Test.
5001-6000			1	1	1	Stock
Overall Performance		.10%				
Total Breakages		2				
Total Replacements		2				
Total Gun Failures		3				

*As compared with other standard Bolt Action rifles, the M/721 shows superior performance in handling defective ammunition and escaping breech gas.

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Summary of Measurements

<u>Rounds</u>	<u>Bore Dimensions</u>	<u>Av. Trigger Pull</u>	<u>Av. Firing Pin Indent</u>	<u>Av. Bolt Opening</u>	<u>Head Space</u>
0	.3096	5# 14.6 oz.	.0196"	9.7#	Min.
1000	.3096	7# 12 oz.	.019	10 #	Min.
2000	.310	6# 11.6 oz.	.019	9.9#	Min.
3000	.310	5# 14.4 oz.	.018	9.3#	Min.
4000	.310	6# 2.2 oz.	.020	9 #	Min.
5000	.310	7# 3 oz.	.020	8#8oz.	Max.
6000	.310	7# 4.8 oz.	.0198	8 #	Max.