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RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 900591
W.O.# 481152
JANUARY 3, 1991

MODEL 700, 7mm WEATHERBY MAGNUM, DESIGN ACCEPTANCE

Report# 900591

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Work Order# 481152

MODEL 700, 7mm WEATHERBY MAGNUM, DESIGN ACCEPTANCE

ABSTRACT:

Research and Development finds the Design Acceptance Evaluation of the Model 700 rifle in 7mm Weatherby Magnum caliber to be acceptable. The evaluation consisted of Accuracy, Field Function and High Pressure Strength.

Prepared by: D.R. Thomas
Date Prepared: January 3, 1991

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TO: J.R. Snedeker
FROM: D.R. Thomas

INTRODUCTION:

In July of 1990 the test lab started to conduct a Design Acceptance Evaluation of the Model 700 Rifle in 7mm Weatherby Magnum caliber. The test was not completed until mid December due to the unavailability of Remington 7mm Weatherby Magnum ammunition. The evaluation used five rifles and consisted of Accuracy, Field Function and High Pressure Strength.

SCOPE OF THE TEST:

To determine if the 7mm Weatherby Magnum caliber sample would meet the Remington Specifications for accuracy, field function and strength.

TEST RESULTS:
ACCURACY:

The Remington specification for group size for the 7mm Weatherby Magnum is 2.7 inches.

The average group size shot with Weatherby 175 gn. ammunition was 1.56 inches.

The average group size shot with Remington 175 gn. ammunition was 2.85 inches. The large discrepancy in results between the Weatherby and Remington ammunition is do to a problem with the Remington ammunition. This problem is being investigated at Lonoke. (See page 7)

FIELD FUNCTION:

Five rifles were each field tested with Remington and Weatherby ammunition. There were no malfunctions in the 500 rounds fired.

STRENGTH:

One rifle with a plugged bore was subjected to a high pressure round. The resulting damage was typical of all Model 700 rifles subjected to this test.

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REPORT TEXT:
GENERAL:

The following five rifles were used for the Design Acceptance Evaluation:

C6457706 C6464056 C6461248 C6460127 C6457960

ACCURACY:

All five rifles were used in the accuracy test.

Weatherby, 175 gn. Soft Point index no. 17035, lot# 01913 and Remington 175 gn. CLPSP index no. R7MWB2, lot# P08PC3023 were used for accuracy testing.

A Lyman "All American" 20X scope was used.

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

FIELD FUNCTION:

All five rifles were used in the Field Function Test. The rifles were fired 100 rounds each in the Field Function Test conducted at the Ilion Fish and Game Club.

The same ammunition types and codes that were used in the accuracy test were also used in the field function test.

STRENGTH:

Rifle C6457706 was used for the high pressure strength test. The high pressure load consisted of 65 gns. of 4227 powder and a 175 gn. Spitzer bullet.

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TEST PROCEDURE:
ACCURACY:

Three, five shot groups were shot with each ammunition type with each of the five rifles. The accuracy was shot by J.E. Selan and C. Stephens in the Research and Development 100 yard range located in building 52-1A.

Weatherby, 175 gn. Soft Point index no. 17035, lot# 01913 and Remington 175 gn. CLPSP index no. R7MWB2, lot# P08PC3023 were used for accuracy testing.

Standard long action Leupold bases and rings were used in conjunction with a 20X All-American Lyman scope.

The targets were analyzed for group size using the HP 9000 computer and digitizing tablet.

FIELD FUNCTION:

The rifles were subjected to the loading and firing of 50 rounds of each of the following ammunition types:

Weatherby # 17035 175 gn. Soft Point lot# 01913

Remington R7MWB2 175 gn. "Core-Lokt" Soft Point lot# P08PC3023

The field function test was conducted at the Ilion Fish and Game Club.

A round robin method of shooting, alternating shooters every ten rounds, was used throughout the field function testing.

The guns were allowed to air cool every 20 rounds.

STRENGTH:

Four bullets were lodged in the bore of rifle # C6457706.

A high pressure round was developed using the reloading and P&V facilities.

The high pressure round was fired in the "Iron Lung" in the measurement lab.

Estimated pressure for the destructive load fired in an unobstructed Barrel is 150,000 psi. Pressure generated in the plugged bore is much higher.

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APPENDIX

100 YARD ACCURACY RESULTS

SERIAL #	AMMO	GROUP 1 (in.)	GROUP 2 (in.)	GROUP 3 (in.)	AVERAGE (in.)	STD. DEV.
C6457960	Wby.	2.25	1.39	1.59	1.74	.450
	Rem.	2.10	2.64	3.64	2.79	.781
C6464056	Wby.	1.62	1.95	1.63	1.73	.188
	Rem.	1.27	3.19	3.60	2.69	1.244
C6457706	Wby.	1.66	1.59	1.15	1.47	.276
	Rem.	2.86	3.05	4.42	3.44	.851
C6461248	Wby.	1.82	1.51	1.88	1.74	.199
	Rem.	2.81	3.37	2.36	2.85	.506
C6460127	Wby.	1.60	1.19	1.06	1.28	.282
	Rem.	1.74	2.48	3.17	2.46	.715
Overall Average Group Size Weatherby Ammunition					1.56	
Overall Average Group Size Remington Ammunition					2.85	

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COMPARISON BY AMMO TYPE OF ALL FIVE RIFLES (USING ALL THREE GROUPS)

THE CHART BELOW SHOWS THAT THERE IS A SIGNIFICANT DIFFERENCE (@95% C.I.) BETWEEN THE AVERAGE GROUP SIZE FOR THE TWO TYPES OF AMMUNITION USED.

	N	MEAN	MEDIAN	TRMEAN	STDEV	SEMEAN
Wby	15	1.5927	1.6000	1.5831	0.3152	0.0814
Rem	15	2.847	2.860	2.847	0.797	0.206

	MIN	MAX	Q1	Q3
Wby	1.0600	2.2500	1.3900	1.8200
Rem	1.270	4.420	2.360	3.370

ANALYSIS OF VARIANCE

SOURCE	DF	SS	MS	F	p
FACTOR	1	11.794	11.794	32.11	0.000
ERROR	28	10.284	0.367		
TOTAL	29	22.078			

INDIVIDUAL 95 PCT CI'S FOR MEAN
BASED ON POOLED STDEV

LEVEL	N	MEAN	STDEV	
Wby	15	1.5927	0.3152	(-----*-----)
Rem	15	2.8467	0.7970	(-----*-----)
POOLED STDEV =		0.6060		
				1.80 2.40 3.00