

U.S. ARMY COMBAT SYSTEMS TEST ACTIVITY
ABERDEEN PROVING GROUND, MARYLAND 21005-5059
FIRING RECORD

23 June 1987

TECOM Project No. 2-WE-600-004-001,
Special Study; XM4 5.56-MM Carbine
Safety Qualification

Firing Record No.: S-51042
Dates of Test: May 1986 to May 1987
Authority: Letter, TECOM, AMSTE-TE-F,
17 December 1985

W.O. No. 330-32740-30

ar

ITEMS UNDER TEST

Carbine, Caliber 5.56-mm, XM4:

<u>SN</u>	<u>Test No.</u>	<u>SN</u>	<u>Test No.</u>
6153601	1	6153622	9
6153603	2	6153625	10
6153605	3	6153627	11
6153609	4	6153631	12
6153611	5	6153635	13
6153613	6	6153637	14
6153615	7	6153639	15
6153619	8	6153641	16

SUPPORTING FACILITIES AND MATERIALS

Ammunition:

Cartridge, 5.56-mm ball, M855, lot No. WCC85L030-039.
Cartridge, 5.56-mm tracer, M856, lot No. FNB84E003-011.
Cartridge, 5.56-mm ball, M193, lot No. LC83K002-212.
Cartridge, 5.56-mm, tracer, M196, lot No. LC81M010G-001.
Cartridge, 5.56-mm, blank, M200, lot No. LC81F021052.

The use of trade names in this firing record does not constitute an official endorsement or approval of the use of such commercial hardware or software. This firing record may not be cited for purposes of advertisement.

TABLE 11-2 (CONT'D)

- ^aNumber in () is assigned weapon number.
^bCrack in bolt at cam pin hole (see fig. 11-7). Not replaced.
^cBolt replaced to investigate cause of failure to eject problem with carbine No. 11. Replacement not charged as an operational mission failure.
^dCrack in bolt carrier at rear of firing pin hole (see fig. 11-8).
^eButt impacts during low temperature (-65 °F) and icing (+20 °F) tests caused severe fracture of the stock. The weapon completed firing tests without occurrence of stock telescoping when being fired (see fig. 11-5 and 11-6).

TABLE 11-3. REASSEMBLY CHARACTERISTICS OF THE XM4 CARBINE LOWER RECEIVER EXTENSION

Weapon Serial No.	ID ^a Test No.	Torque to Loosen		Required Realignment Torque ^c ,		40 ft-lb Torque Realignment Mismatch, in.
		Lock Nut, ft-lb	40 in.-lb Torque Realignment Mismatch, in. ^b	in.-lb	ft-lb	
6153601	2	30	- 0.12	200	12.5	+ 0.12
6153603	1	25	- .18	190	11.9	+ .12
6153605	10	20	- .18	180	11.2	+ .12
6153608	9	20	- .18	160	10.0	+ .18
6153611	8	25	- .18	190	11.9	+ .12
6153613	7	25	- .18	190	11.9	+ .12
6153615	6	20	- .12	140	8.8	+ .12
6153619	5	25	- .18	190	11.9	+ .12
6153622	4	25	- .18	190	11.9	+ .12
6153625	3	20	- .12	150	9.4	+ .12
6153627	11	25	- .12	160	10.0	+ .18
6153631	12	30	- .18	180	11.2	+ .12
6153635	13	25	- .18	170	10.6	+ .18
6153637	14	25	- .18	180	11.2	+ .18
6153639	15	20	- .12	130	8.1	+ .25
6153641	16	25	- .12	160	10.0	+ .12

- ^aThe lower receiver extension was not removed during the interchange test or during other subsequent firings. This part was only disassembled during final inspection.
^bThe lock ring torque requirement (from TM9-1005-320-24 + P) assembly of the lower receiver extension was 40 ± 2 in.-lb. The reassembly to align original staking fell short when the torque requirement was applied. 40-ft-lb torque requirement per Colt DWG 9390011 when applied, caused distortion of the lock ring spanner wrench holes and relocation of staking surfaces.
^cThe torque required to align the original staking of lock ring and alignment plate.

c. Final inspection of the 16 carbines included disassembly and reassembly of the lower receiver extension. An inconsistency was found in the torque requirement for the lock ring. The 40 ± 2 in.-lb specified in TM9-1005-320-24+P (ref 4) was incorrect. Colt drawing No. 9390011 called for 40 ± 2 ft-lb. The special spanner wrench adaptor for the torque wrench was found to cause deformation of the holes in the lock ring when 40 ft-lb was applied. The lock rings by-passed the original staking position when torqued to 40 ft-lb on all receivers. Durability of the spanner wrench adapter was poor. The pin broke after tightening only eight lock rings after removal of all 16 parts.

TABLE 11-4. FINAL INSPECTION MEASUREMENTS OF COMMON SPRING PART NO. 9349069 (NSN 5360-01-148-1751)

Weapon ID		Free Length Measurement, in. ^a		
Serial No.	Test No.	Windage Knob Spring	Sight Post Spring	Elevation Knob Spring
6153601	2	0.2800	0.2980	0.2835
6153603	1	.2780	.2975	.2990
6153605	10	.2795	.2805	.2985
6153608	9	.2790	.2795	.2990
6153611	8	.2740	.2980	.2985
6153613	7	.2785	.2990	.2815
6153615	6	.2785	.2975	.3010
6153619	5	.2785	.2990	.2990
6153622	4	.2770	.2935	.3010
6153625	3	.2770	.2970	^b .2780
6153627	11	.2780	.2990	.2990
6153631	12	.2810	.2990	.2960
6153635	13	.2820	.2990	.2990
6153637	14	.2840	.2785	.2995
6153639	15	.2775	.2990	.3010
6153641	16	.2805	.2960	.3005

^aDifference in free length caused by effects of compression when assembled. Reassembly of these springs adequately covered in TM 9-1005-320-24 + P (page 3-43).

^bSpring bent.

TABLE 11-5. 30-ROUND MAGAZINE USEAGE IN XM4 CARBINES FIRED FOR ENDURANCE^a

Mag No. Orig Rept	Tot Rd Fired	Tot No. Loadings	Tot No. Malfunctions ^b	Mag in Use at Test End	Weapon ID	
					Serial No.	Test No.
105	2,625	88	10	Yes	61 53601	2
106	2,538	85	1	Yes		
107	660	22	13	No		
(107) 141	1,902	64	5	Yes		
108	1,794	60	11	No		
(108) 144	774	26	6	Yes		
Total	10,293	345	46	-		
Avg	1,716	58	8	-		
101	2,925	98	2	Yes	61 53603	1
102	2,538	85	6	Yes		
103	1,263	42	8	No		
(103) 142	1,299	44	1	Yes		
104	2,568	86	4	Yes		
Total	10,593	355	21	-		
Avg	2,119	71	4	-		
117	2,625	88	12	Yes	61 53619	5
118	1,254	42	9	No		
(118) 143	1,284	43	2	Yes		
119	1,866	63	12	No		
(119) 145	696	24	8	Yes		
120	2,568	86	7	Yes		
Total	10,293	346	50	-		
Avg	1,716	58	8	-		
113	2,635	88	12	Yes	61 53622	4
114	2,538	85	9	Yes		
115	2,562	85	10	Yes		
116	2,568	86	10	Yes		
Total	10,303	344	41	-		
Avg	2,576	86	10	-		
109	2,625	88	5	Yes	61 53625	3
110	2,538	85	6	Yes		
111	2,562	86	0	Yes		
112	2,568	86	2	Yes		
Total	10,293	345	13	-		
Avg	2,573	86	3	-		

^aAll magazines were produced by OKAY industries.

^bMalfunctions associated with feeding-type stoppages.



Figure 11-1. Bolt broken during endurance test of gun 6153603 (1).



Figure 11-2. Extractor lip broken during endurance test of gun 6153625 (3).

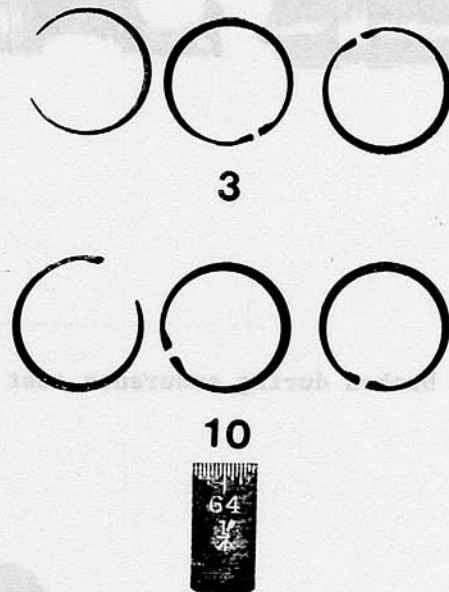


Figure 11-3. Gas seal rings worn and replaced in guns 6153625 (3) and 6153605 (10) during endurance and cookoff testing, respectively.

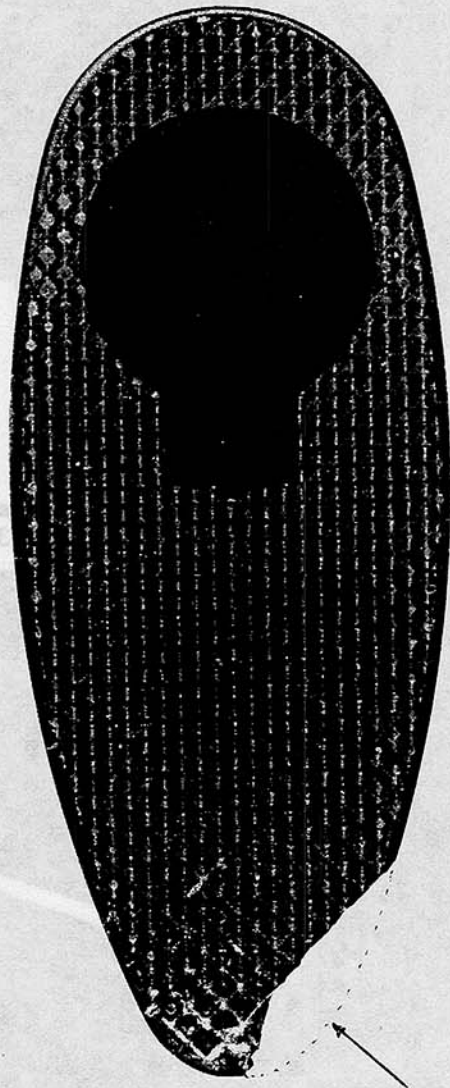


Figure 11-4. Showing break in toe of sliding buttstock assembly (arrow). Part from XM4 carbine SN 6153639 (15).

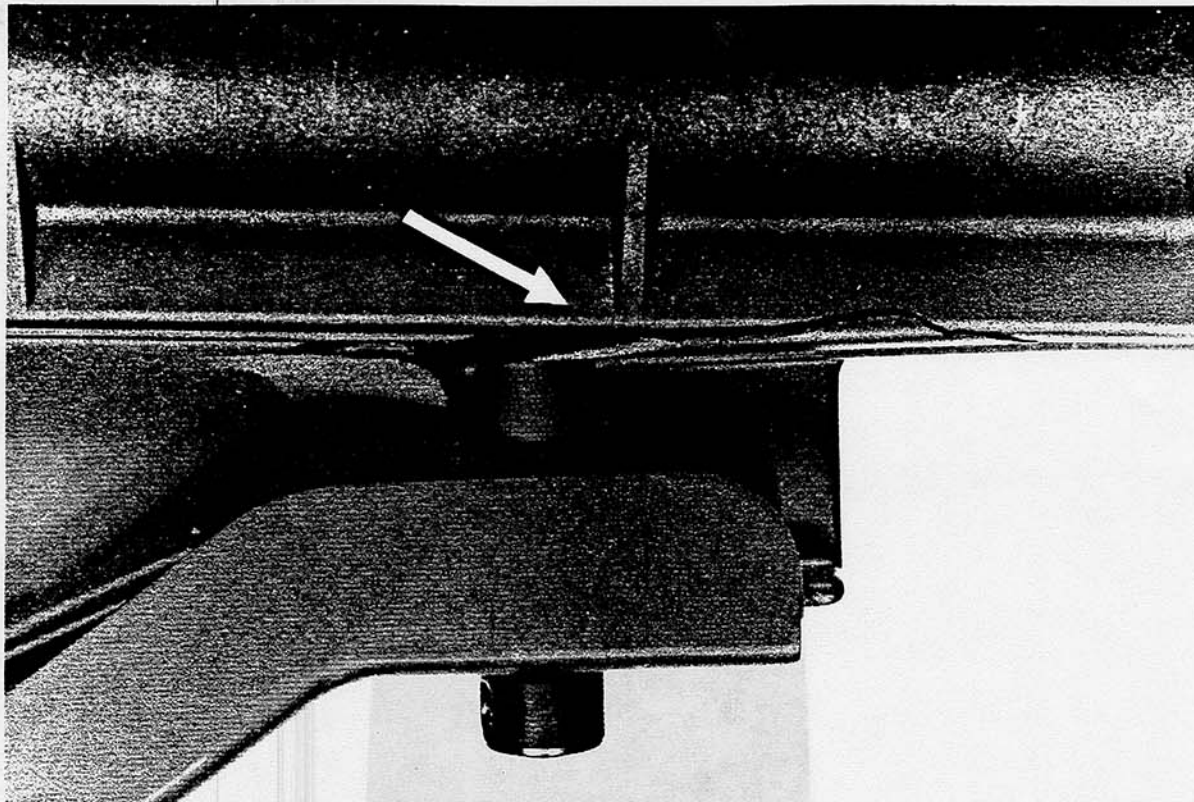


Figure 11-5. Right side view of sliding buttstock assembly showing fracture (arrow). Part from XM4 carbine SN 6153627 (11).

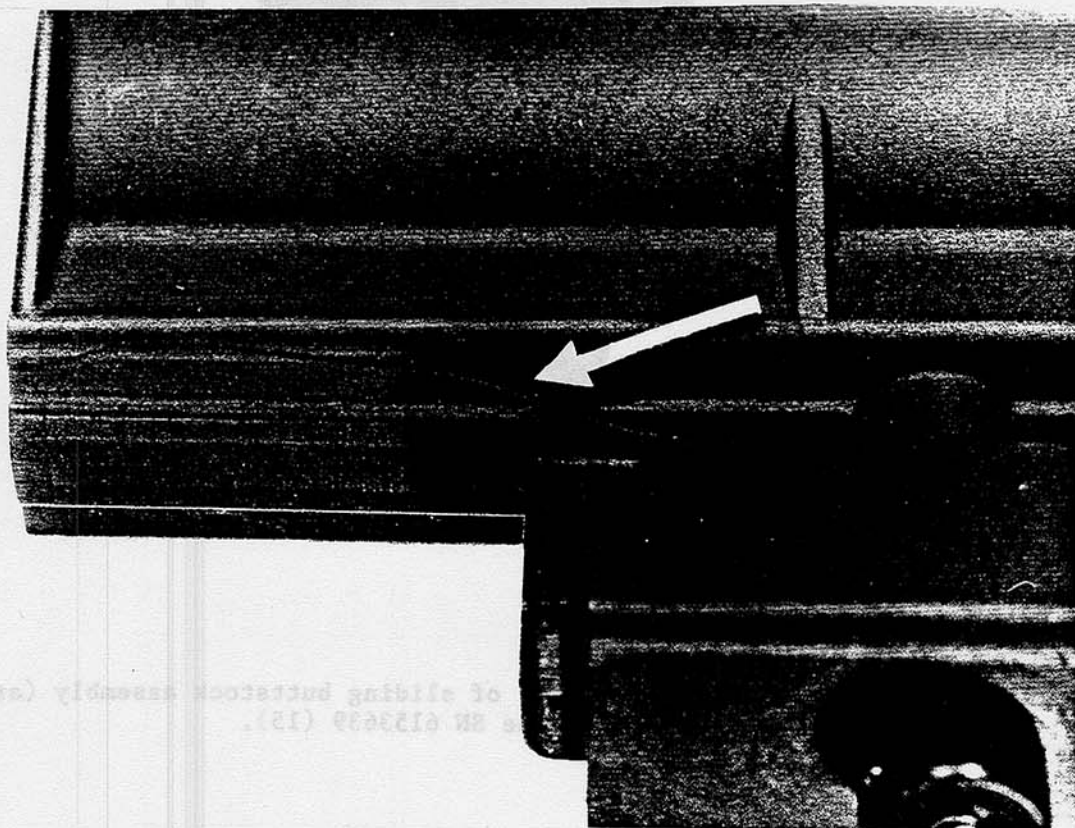


Figure 11-6. Left side 3/4 bottom view showing crack extending to front of sliding buttstock assembly (arrow). Part from XM4 carbine SN 6153627 (11).

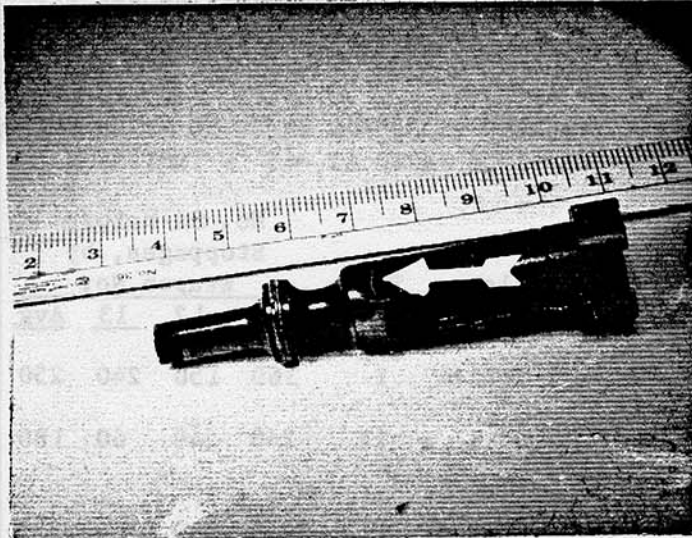


Figure 11-7. Magnetic particle crack pattern noted in bolt of rifle SN 6153603 (1).

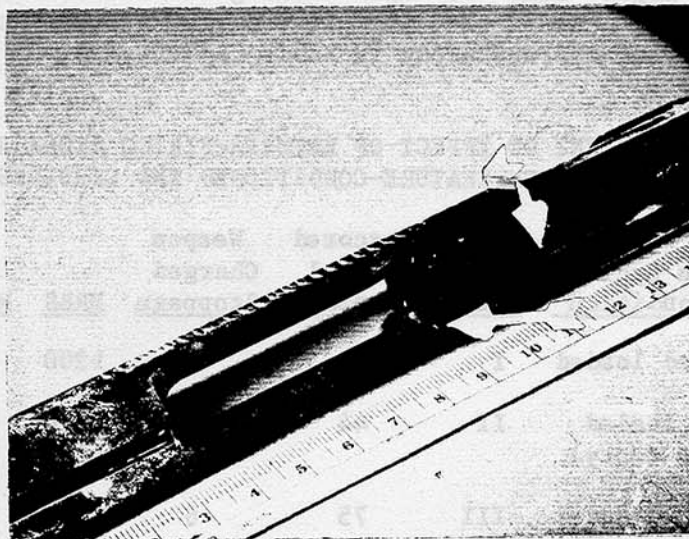


Figure 11-8. Magnetic particle crack pattern noted in bolt carrier of rifle SN 6153637 (14).

d. Use of the XM4 carbine at low temperature produces the same types of stoppages and maintenance requirements as experienced with M16A1 and M16A2 rifles. Testing of the carbine under different storage conditions showed similar characteristics relating to the occurrence of the first stoppage due to fouling. These data are presented in Table 11-6.

TABLE 11-6. NUMBER OF ROUNDS PRIOR TO FIRST STOPPAGE
FOR XM4 CARBINES FIRED AT -65 °F TEMPERATURE

<u>Between Cycle Storage Condition</u>	<u>Test Phase</u>	<u>No. Rd before Stoppages, by Weapon No.</u>			
		<u>11</u>	<u>12</u>	<u>13</u>	<u>Avg</u>
Bolt closed loaded	I	360	150	240	250
Bolt open loaded (chamber empty)	II	240	240	60	180
Bolt closed loaded (chamber empty)	III	240	360	30	210
Average all conditions		280	250	110	214

Although the data from Table 11-6 shows variability among weapons and test conditions which might tend to mask meaningful differences, review of the numbers of stoppages makes the differences in storage conditions become clearer. These differences are shown in Table 11-7.

TABLE 11-7. ASSESSMENT OF EFFECT OF BETWEEN-FIRING STORAGE CONDITIONS
FOR -65 °F TEMPERATURE-CONDITIONED XM4 CARBINES

<u>Between Cycle Storage Condition</u>	<u>Test Phase</u>	<u>Unscored Total Stoppage</u>	<u>Weapon Charged Stoppage</u>	<u>MRBS</u>	<u>MRBOMF</u>
Bolt closed loaded	I	34	3	1200	0
Bolt open loaded (chamber empty)	II	44	6	600	0
Bolt closed loaded (chamber empty)	III	75	6	600	0

Review of the occurrence of failures to fire is made in Table 11-8. Although the results are variable, the trend shows that storage of the weapon with bolt closed on an empty chamber produces more than double the number of failures to fire. This information, combined with the data from Table 11-9 show that storing the carbines fully loaded with a round chambered and ready to fire provides the best chance of initiating firing after cold storage over a 1200-round period. More important than the storage condition, however, is the demonstrated fact that frequent maintenance is mandatory to assure trouble-free operation. The XM4 carbine is generally trouble free for the first 240 rounds fired.

TABLE 11-8. FIRST FAILURE-TO-FIRE (FFR) STOPPAGE OCCURRENCE
FOR XM4 CARBINES FIRED AT -65 °F TEMPERATURE

<u>Between Cycle Storage Condition</u>	<u>Test Phase</u>	No. Rd before First Weapon Caused FFR Stoppages, by Weapon No.				Total No. FFR
		<u>11</u>	<u>12</u>	<u>13</u>	<u>Avg</u>	
Bolt closed loaded	I	360	840	240	480	12
Bolt open loaded (chamber empty)	II	720	360	720	600	7
Bolt closed loaded (chamber empty)	III	360	480	480	440	29
Overall Avg		480	560	480	507	-

TABLE 11-9. EFFECTS OF FOULING OF XM4 CARBINES AT -65 °F TEMPERATURE

<u>Test Phase</u>	<u>Between Cycle Storage Condition</u>	<u>Wpn No.</u>	<u>Rd Fired Before Cleaning^a</u>	<u>First Time Bolt Stuck^b</u>	<u>No. Butt Impacts^c</u>
I	Bolt closed loaded	11	1200	-	-
		12	1200	-	-
		13	1200	-	-
II	Bolt open loaded (chamber empty)	11	840	600	6
		12	840	600	4
		13	840	720	2
III	Bolt closed loaded (chamber empty)	11	840	480	6
		12	840	480	6
		13	840	480	6

TABLE 11-9 (CONT'D)

- ^a1200 rounds was the scheduled maintenance interval; less than that was unscheduled maintenance.
- ^bAll carbines which exhibited bolt sticking were restored to free movement after unscheduled maintenance except gun 11 (phase II) which had the problem continue after maintenance (rd 841). After firing of that cycle, no other sticking occurred with that weapon in phase II.
- ^cButt impacts (two per weapon, per cycle) in conjunction with releasing the stuck bolt of the carbines occurred at the start of each new firing cycle after the first occurrence until maintenance.

OBSERVATIONS AND REMARKS

1. The criterion references are based on the essential characteristics given in the ROC. These are listed below by their paragraph numbers as given by the ROC. Following these criteria, are those devised by the Test Agency and approved by TECOM in order to quantify the safety aspects of the tests.

Criteria referred in the ROC; those marked with an (*) were addressed in this test.

I. ESSENTIAL CHARACTERISTICS. The 5.56 carbine system shall consist of a weapon, ammunition, bayonet, magazines, sling and blank firing adapter (BFA). Upon fielding the weapon system must provide the following essential characteristics:

	Results ^a	Data Located in Encl No.
*a. Must be of 5.56 by 45 mm NATO caliber and optimized for firing the M855/M856 ammunition. It must be capable of firing the M193/M196 ammunition and the M200 blank.	Met.	1, 9
*b. Fire in both the semiautomatic and 3-round burst mode.	Met.	6
*c. The maximum parts commonality technically feasible between the 5.56-mm carbine and the M16A2, is required, to include but not limited to, lower receiver, upper receiver, sights, muzzle compensator, trigger group and bolt.	Met.	4
*d. Shot from a machine rest, the average extreme spread must not exceed 4-1/2 inches at 100 yd using M855 ammunition.	Not met ^b .	2, 4, 5, 6,

Data
Located
in

Results^a Encl No.

*e. Obtain a Mean Rounds Between Operation Mission Failure (MRBOMF) of 3800 rounds using M855 ammunition at ambient temperature. Met. 6, 8

f. Possess a sustained rate of fire per minute of from 12-15 rounds and a maximum rate of 45 rounds semiautomatic and 90 in 3-round bursts at ambient temperature. Not assessed.

g. Must be operable by the 5th through the 95th percentile of the user population. Not assessed.

*h. Must have a combat sling to allow portability during normal tasks and rapid engagements of targets. Met. 10

*i. Must be as light as technically feasible, not to exceed 6-1/2 pounds unloaded. Met. 1

*j. Must have a collapsible stock and not exceed 34 inches when extended. Met. 1

*k. Be NBC contamination/decontamination survivable. Met. 7

*l. Must be capable of being stored and operated in hot, basic, cold, and severe cold environments. Met. 7

*m. The weapons compatibility with existing night sights and M203 would be beneficial but is not essential. Partially met. 1

*o. Be able to use the M7 Bayonet of the M16A2. Met. 1

*II. RELIABILITY, AVAILABILITY AND MAINTAINABILITY (RAM). The weapon shall have, as a minimum, a Mean Round Between Stoppage (MRBS) of 600 and a Mean Round Before Operational Mission Failure of 3800 at ambient temperature. Barrel life shall be 10,000 rounds minimum. Weapon stoppages shall be able to be cleared by the operator within 15 sec. Met. 8

	Data Located in
<u>Results^a</u>	<u>Encl No.</u>

Criteria devised by Test Agency, approved by TECOM:

- | | | |
|---|------|---|
| a. The minimum no-cockoff level must be 150 rounds. | Met. | 9 |
| b. The peak noise and B duration of that noise must not exceed the single hearing protection requirement for the shooter as specified by MIL-STD-1474B: Table 5 and Figure 5. | Met. | 9 |

^aTest Agency assessment of the ability of the XM4 carbine to meet or exceed ROC essential characteristics and satisfy TECOM critical issues.

^bSee discussion in paragraphs 2 and 5.

2. The dispersion criterion of 4.5 inches is excessively stringent. The requirement for the M16A1 and M16A2 rifles is only 4.8 inches.

3. The effect of a change in feed ramp angle, while improving feeding at low temperature, may contribute to bolt-override stoppages in other environments. Although the overall impact on reliability is not significant, further study is required if any changes are proposed for the other M16 weapon types (i.e., M16A1, M16A2, and M231).

4. The frequency of failure-to-extract and eject stoppages in the XM4 carbine is symptomatic of high extraction velocity of the breeching components and possible (unknown) tolerance stack up of the bolt and extractor components. Although the adverse effect on reliability is not significant, these types of stoppages are not desirable. Further investigation should be made to assure that there is no incipient problem in this area of weapon design.

5. This is the final report on this task.

FUTURE RELATED WORK

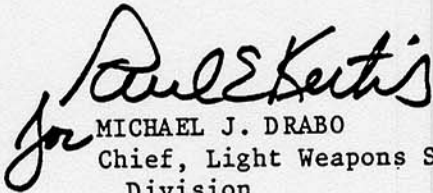
Initial production and inspection comparison tests of the XM4 carbine are required after USMC procurement action on the carbine is completed.

SUBMITTED:



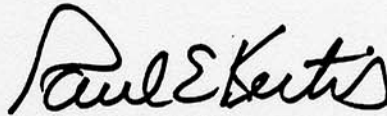
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FOR THE COMMANDER:



PAUL E. KERTIS
Director, Armament Systems
Directorate

14 Encl

1. Test Data, Initial Inspection
2. Initial Dispersion and Velocity Test
3. Test Data, Initial Function Check
4. Interchangeability
5. Test Data, Accuracy/Sight Calibration Test
6. Endurance
7. Test Data, Environmental/Adverse Conditions Test
8. Reliability
9. Safety and Health
10. Human Factors
11. Logistics Supportability
12. Definitions
13. References
14. Distribution List

TEST DATA, INITIAL INSPECTIONS

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INITIAL INSPECTION

TABLE 1.1. XM4 CARBINE INITIAL INSPECTION
WEIGHTS AND MEASUREMENTS

Weapon ID SN	Test No.	Weight, lb	Overall Length, in.	
			Stowed	Extended
61 53 601	1	6.03	30.1	33.4
61 53 603	2	6.01	30.1	33.4
61 53 605	3	6.02	30.1	33.4
61 53 608	4	6.02	30.2	33.4
61 53 611	5	6.03	30.2	33.4
61 53 613	6	6.02	30.2	33.4
61 53 615	7	6.02	30.2	33.4
61 53 619	8	6.02	30.2	33.4
61 53 622	9	6.02	30.1	33.4
61 53 625	10	6.03	30.1	33.4
61 53 627	11	6.03	30.2	33.4
61 53 631	12	6.04	30.1	33.4
61 53 635	13	6.04	30.1	33.4
61 53 637	14	6.02	30.2	33.4
61 53 639	15	6.03	30.2	33.4
61 53 641	16	6.00	30.1	33.4
Average	-	6.02	30.2	33.4
Criteria				
limits:				
Max		6.5	NA	34.0
Min		NA	NA	NA

TABLE 1.2. XM4 CARBINE INITIAL INSPECTION MEASUREMENTS

Weapon ID SN	Test No.	Spring Free	Rear Sight	
		Length, in. Action Spring	Adjustments 300 M	800 M
61 53 601	1	10.8	-1	+5
61 53 603	2	10.9	-1	+5
61 53 605	3	11.1	-1	+4
61 53 608	4	11.1	-1	+5
61 53 611	5	11.0	-2	+2
61 53 613	6	11.1	-1	+4
61 53 615	7	11.2	-1	+4
61 53 619	8	11.1	-1	+4
61 53 622	9	10.9	-1	+4
61 53 625	10	11.0	-1	+4
61 53 627	11	11.0	-1	+4
61 53 631	12	11.0	-1	+4
61 53 635	13	11.1	-1	+4
61 53 637	14	11.1	-1	+4
61 53 639	15	11.0	-1	+5
61 53 641	16	11.1	-1	+4
Average	-	11.0	-1	+4
Criterion		10.7 (min)		

TABLE 1.3. XM4 CARBINE INITIAL INSPECTION MEASUREMENTS

Weapon ID		Firing Pin		Air
Serial	Test	Protrusion,	Headspace,	Flow,
No.	No.	In.	In.	PSI
6153601	1	0.031	1.4646	3.1
6153603	2	.031	1.4656	3.1
6153605	3	.030	1.4646	3.0
6153608	4	.032	1.4656	3.0
6153611	5	.031	1.4646	3.1
6153613	6	.031	1.4656	3.1
6153615	7	.030	1.4646	3.1
6153619	8	.032	1.4646	3.1
6153622	9	.030	1.4646	3.3
6153625	10	.030	1.4646	3.1
6153627	11	.031	1.4646	3.0
6153631	12	.032	1.4646	3.2
6153635	13	.030	1.4656	3.1
6153637	14	.031	1.4646	3.1
6153639	15	.032	1.4646	3.1
6153641	16	.031	1.4646	3.3
Average	-	.031	1.4646	3.1
Criteria				
limits:				
	Min	.028	1.4646	a -
	Max	.036	1.4706	a -

^aNo criterion. Baseline measurement used to allow determination of gas tube fouling as a result of firing.

TABLE 1.4. XM4 CARBINE INITIAL INSPECTION MEASUREMENTS

Weapon ID		Trigger Pull, Pounds, by Selector Setting ^a							
Serial	Test	Semiautomatic				Controlled Burst			
		1	2	3	Avg	1	2	3	Avg
6153601	1	10.0	10.0	10.0	10.0	10.0	9.5	10.0	9.8
6153603	2	8.5	9.0	9.0	8.8	10.0	9.0	10.0	9.7
6153605	b 3	7.0	6.5	7.0	6.8	9.5	8.0	9.0	8.8
6153608	4	10.0	10.0	10.5	10.2	11.0	10.0	10.5	10.5
6153611	5	9.5	9.5	9.0	9.2	10.5	10.0	9.5	10.0
6153613	6	9.0	9.5	9.0	9.2	10.5	10.0	10.5	10.3
6153615	7	9.5	9.0	8.5	9.0	10.0	10.0	10.5	10.2
6153619	8	9.5	9.5	9.0	9.3	10.5	9.0	10.5	10.0
6153622	b 9	7.0	8.5	8.5	8.0	10.0	10.0	9.5	9.8
6153625	10	10.0	9.5	9.5	9.7	11.0	11.0	9.5	10.5
6153627	11	9.5	9.0	9.0	9.2	11.0	10.0	10.5	10.5
6153631	12	10.5	10.0	10.0	10.2	10.5	10.5	11.0	10.7
6153635	13	10.0	10.0	9.5	9.8	10.0	9.0	10.5	9.8
6153637	14	9.5	9.0	9.0	9.2	10.5	9.5	10.5	10.2

See footnotes at end of table.

TABLE 1.4 (CONT'D)

Serial No.	Test No.	Trigger Pull, Pounds, by Selector Setting ^a								
		Semiautomatic				Controlled Burst				
		1	2	3	Avg	1	2	3	Avg	
6153639	15	10.0	10.0	9.5	9.8	10.0	10.5	11.0	10.5	
6153641	16	10.0	9.5	9.5	9.7	10.5	11.0	10.0	10.5	
Average		-	-	-	9.3	-	-	-	10.1	
Criteria limits:										
Min						5.5				c -
Max						8.5				c -

^aThree trials taken per selector sitting.

^bMeets criterion limits. All other weapons fail.

^cRequirement specifies only semiautomatic mode selector setting.

TABLE 1.5. XM4 CARBINE INITIAL INSPECTION MEASUREMENTS

Weapon ID		Firing Pin Indent, Inches, by Fire Mode ^a			
Serial No.	Test No.	Semiautomatic		Controlled Burst	
		Inertia	Hammer	Inertia	Hammer
6153601	1	0.005	0.021	0.005	0.022
6153603	2	.006	.022	.005	.023
6153605	3	.005	.022	.005	.022
6153608	4	.006	.022	.006	.023
6153611	5	.006	.022	.006	.022
6153613	6	.006	.022	.005	.022
6153615	7	.005	.022	.006	.023
6153619	8	.004	.021	.005	.021
6153622	9	.005	.021	.005	.021
6153625	10	.006	.021	.006	.022
6153627	11	.005	.022	.005	.022
6153631	12	.005	.023	.005	.023
6153635	13	.006	.021	.006	.021
6153637	14	.006	.021	.005	.023
6153639	15	.005	.022	.005	.022
6153641	16	.005	.022	.005	.022
Average		.006	.022	.005	.022
Criteria limits:					
Min		NA	.020	NA	b -
Max		.008	NA	b -	NA

^aData shown are averages of three trials per condition.

^bCriterion does not specify, but implies use of the semiautomatic mode selector setting in establishing acceptability of performance.

TABLE 1.12

5.56 MM BARRELS

GAGE MEASUREMENTS INDICATED IN .0001 INCHES.

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

CASTING NUMBER	MANUFACTURER	MODEL	NUMBER OF ROUNDS	FIRING STATUS (CHECK ONE)	DATE OF GAUGING	Dist. (inches)						
						Ref. From Face of Flash Suppressor	LANDS .2190			GROOVES .2235		
							1-4	2-5	3-6	1-4	2-5	3-6
	F. MILLER	XM-4	0	X	24 MAY 86	1.35	+0.006	+0.003	+0.007	+0.005	+0.005	+0.006
2.00						0	3	0	4	4	4	
3.00						+0.004	5	+0.003	4	4	5	
4.00						6	6	7	5	5	5	
5.00						7	7	7	6	6	6	
6.00						7	7	8	7	7	6	
7.00						6	6	6	6	6	7	
8.00						+0.001 ^v *	7	5	7	7	4	
9.00						0 ^v	6	6	5	5	6	
10.00						+0.009 ^v	9	9	7	6	8 ^v	
11.00						7	8	8	6	4	6	
12.00						6	6	5	5	4	5	
12.60						5	5	5	5	4	4	
13.25						4	3	4	4	4	4	
13.50						3	2	4	+0.002	3	4	
13.75	+0.002	+0.002	+0.003	0	+0.001	+0.001						
* CASPORT Reading 8.10"												
LAND NO. 1 AT 12 O'CLOCK (MUZZLE)												
TWIST OF RIFLING:												
BORESCOPE REMARKS: Light circumferential tool marks on the chamber cylinder adjacent to the chamber front slope and on the chamber front slope. Light to moderate circumferential tool marks in the bore, located between the case clearance shoulder and the commencement of rifling. Intermittent light copper and carbon deposits throughout the bore. Intermittent light to moderate pitting throughout the bore. There is a small group of light to moderate tool chatter marks in the bore, located at the ten o'clock position and 10 of an inch aft of the muzzle end of the barrel. The gasport encompasses the full width of a land.												

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TABLE 1.19

5.56 MM BARRELS

GAGE MEASUREMENTS INDICATED IN .0001 INCHES.

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

DATE OF GAUGING	5.56 MM Barrel	FIRING STATUS (Check One) BEFORE <input checked="" type="checkbox"/> AFTER <input type="checkbox"/>	NUMBER OF ROUNDS 0	MODEL	MANUFACTURER	CASTING NUMBER	Dist. (inches) Ref. From Face of Flash Suppressor	GAGE MEASUREMENTS INDICATED IN .0001 INCHES.					
								LANDS .2190			GROOVES .2235		
								1-4	2-5	3-6	1-4	2-5	3-6
							1.35	+ .010	+ .011	+ .010	+ .009	+ .007	+ .008
							2.00	4	4	5	5	5	5
							3.00	4	5	6	7	7	6
							4.00	4	6	6	7	5	8
							5.00	7	7	8	8	8	8
							6.00	7	8	8	10	9	8
							7.00	7	7	7	9	9	8
							8.00	6	*+ .002	+ .005	8	5	9
							9.00	3	- .002	- .005	6	6	7
							10.00	4	+ .003	+ .008	8	8	7
							11.00	7	3	5	8	7	7
							12.00	3	7	5	8	7	8
							12.60	6	5	5	7	7	7
							13.25	5	5	5	6	7	5
							13.50	4	4	5	6	7	4
							13.75	+ .003	+ .002	+ .003	+ .005	+ .007	+ .004
							→ GAS PORT : READING TAKEN AT 8.10						
							LAND NO. 1 AT 12 O'CLOCK (MUZZLE)						
							TWIST OF RIFLING:						
							BORESCOPE REMARKS: Light circumferential tool marks on the chamber cylinder adjacent to the front slope, on the front slope and centering cylinder. Light to moderate circumferential tool marks in the bore, located between the case clearance shoulder and the commencement of rifling. Light to moderate carbon deposits throughout the bore. Light intermittent copper deposits on the lands throughout the bore. Light pitting throughout the bore. Light intermittent tool chatter marks in the bore, located between the one and three o'clock positions. Light gas erosion at the forward edge of the gas port. The gas port diameter encompasses the full width of a land. There is a nick or tool gouge mark in the land at the six o'clock position, located at the muzzle end of the barrel.						

PROOF OFFICER :
W.O. No. :

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TABLE 1.20

5.56 MM BARRELS

GAGE MEASUREMENTS INDICATED IN .0001 INCHES.

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

CASTING NUMBER	MANUFACTURER	PROOF OFFICER W.O. No. :	Dist. (inches) Ref. From Face of Flash Suppressor	LANDS .2190			GROOVES .2235		
				1-4	2-5	3-6	1-4	2-5	3-6
			1.35	+0.007	+0.006	+0.008	+0.004	+0.004	-0.002
			2.00	3	3	3	1	1	1
			3.00	4	5	4	3	3	2
			4.00	7	5	6	5	5	4
			5.00	7	6	7	5	5	5
			6.00	7	6	6	5	4	5
			7.00	6	6	6	5	5	4
			8.00	*+0.006	+0.002	+0.005	4	3	5
			9.00	0	0	-0.001	3	3	3
			10.00	+0.005	+0.005	+0.002	4	5	5
			11.00	4	6	4	4	5	4
			12.00	4	7	4	4	4	3
			12.60	5	5	4	4	3	5
			13.25	5	4	3	3	3	3
			13.50	4	3	3	3	+0.002	3
			13.75	+0.003	+0.001	+0.003	+0.002	0	+0.002
* GAS PORT: READING TAKEN AT 8.10									
LAND NO. 1 AT 12 O'CLOCK (MUZZLE)									
TWIST OF RIFLING:									
BORESCOPE REMARKS: Light to moderate circumferential tool marks on the chamber cylinder, located adjacent to the front slope. The chamber front slope has several small nicks at the ten o'clock position. Light circumferential tool marks on the chamber front slope and centering cylinder. Light to moderate circumferential tool marks in the bore, located between the case clearance shoulder and the commencement of rifling. There is a diagonal scratch on the centering cylinder located at the one o'clock position and just aft of the case clearance shoulder. Light to moderate pitting throughout the bore. Light to moderate carbon deposits throughout the bore. Light intermittent copper deposits throughout the bore. Intermittent light to moderate tool chatter marks in the bore, located between the one and four o'clock positions. Intermittent light longitudinal tool marks of varying lengths throughout the bore. The land at the nine o'clock position has two tool gouge marks, located 13.00 inches from the rear face of the barrel. The land at the two o'clock position is chipped or gouged on the driving edge, located at the muzzle end of the barrel. The gas port has light gas erosion at the forward edge. The gas port diameter encompasses the full width of a land.									
NUMBER	FIRING STATUS (Check One)	BEFORE							
		AFTER							
5.56 MM Barrel	DATE OF GAUGING								

STEAP-WT Form 326, 1 Jan 79

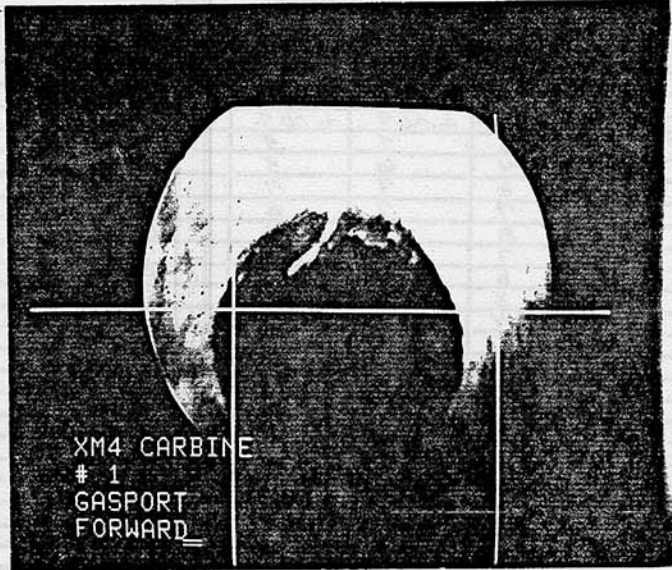
5.56 MM

XM 4 CARBINE

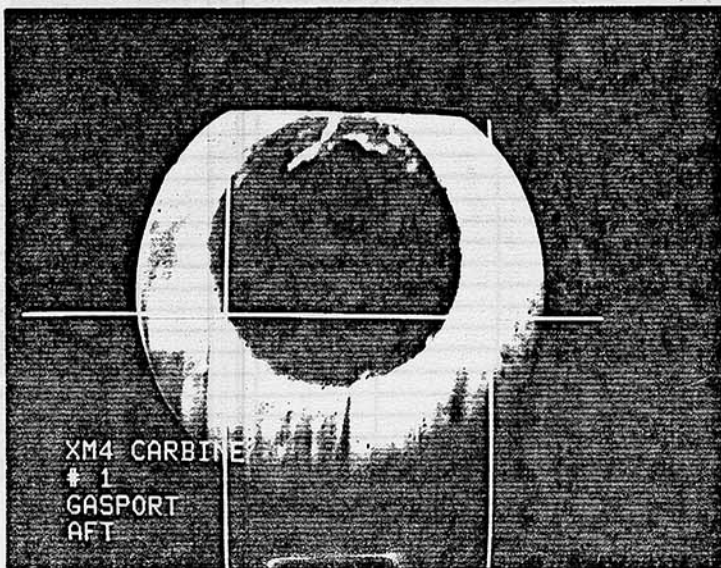
BARREL NO. 1

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.1

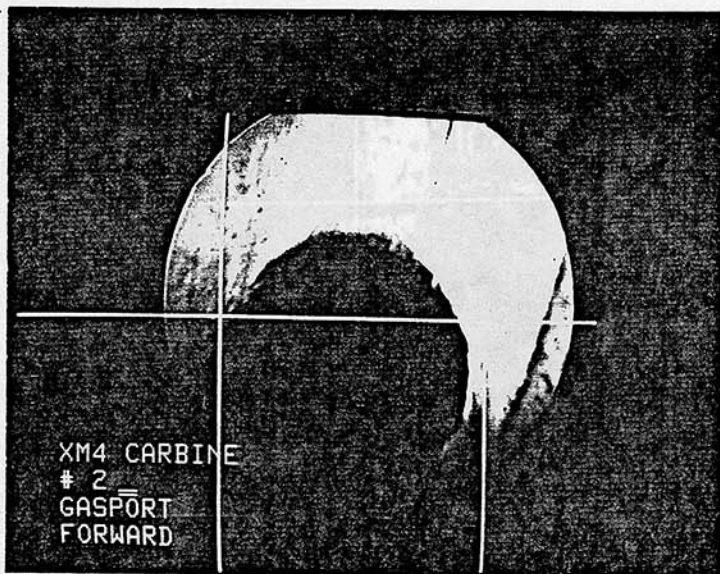
5.56 MM

XM 4 CARBINE

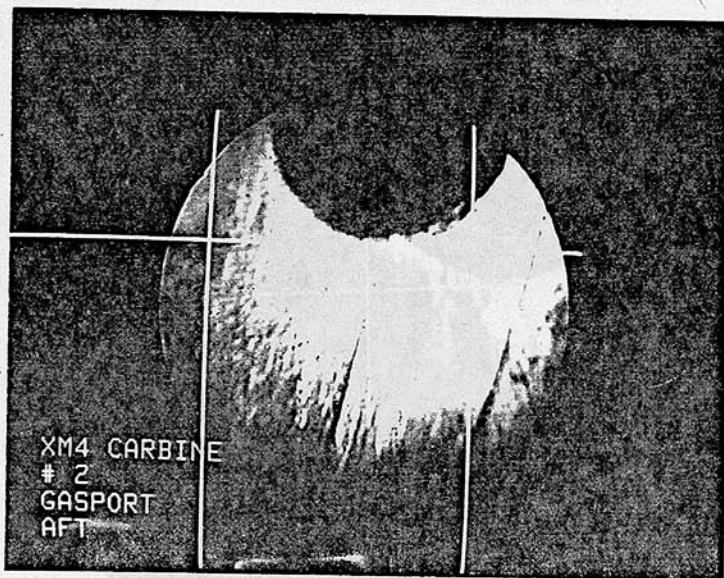
BARREL NO. 2

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.2

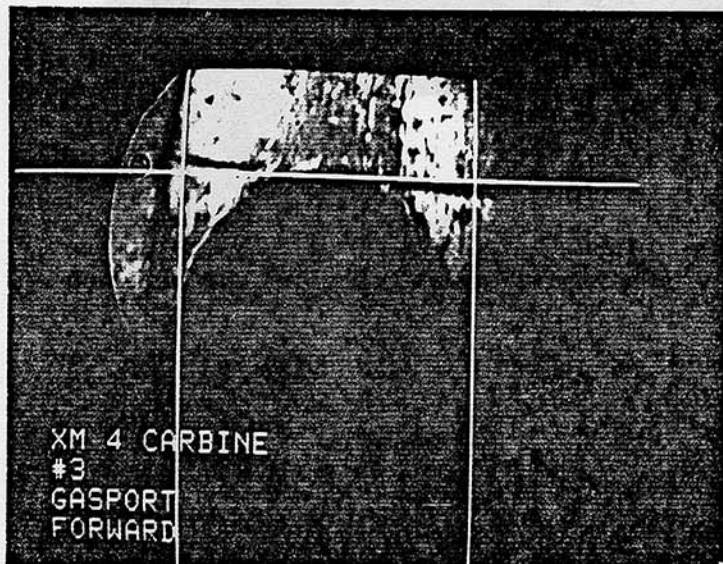
5.56 MM

XM 4 CARBINE

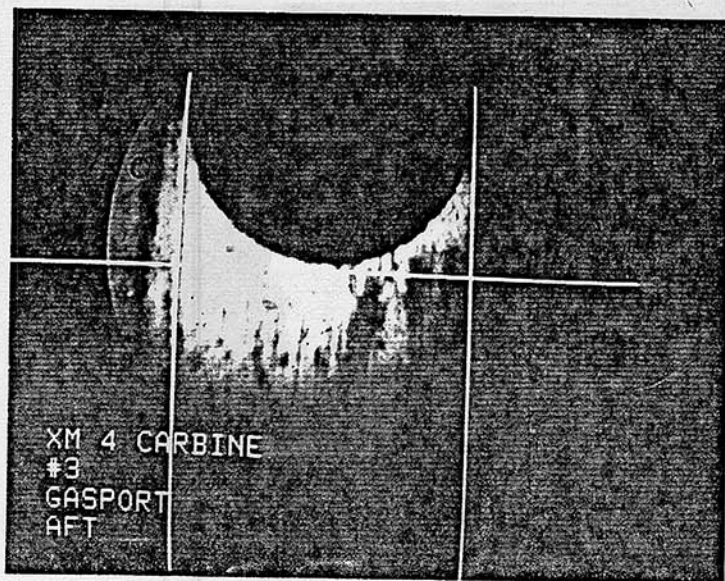
BARREL NO. 3

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.3

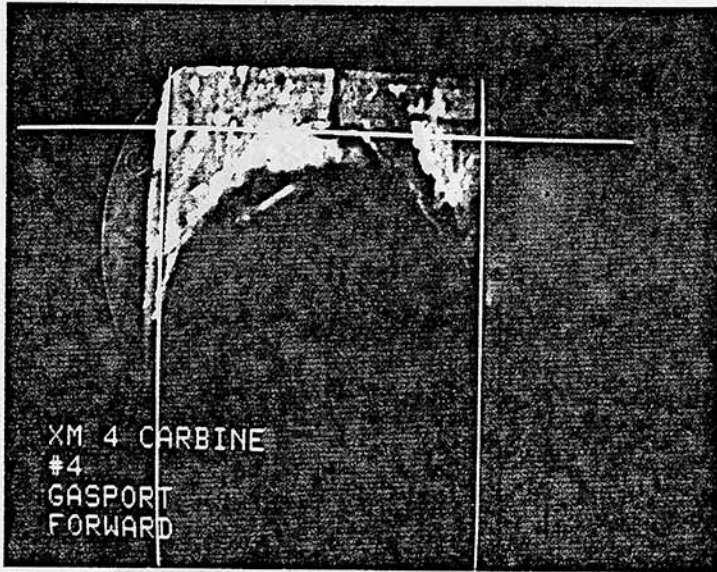
5.56 MM

XM 4 CARBINE

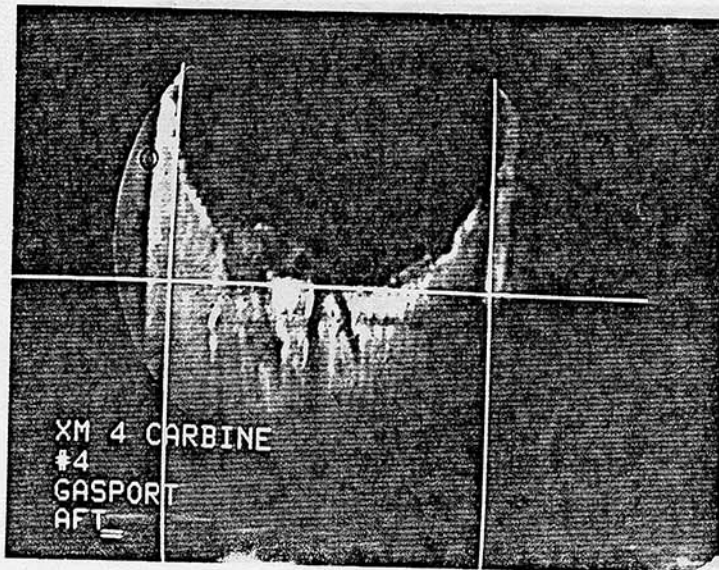
BARREL NO. 4

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



PORT - AFT

Figure 1.4

1

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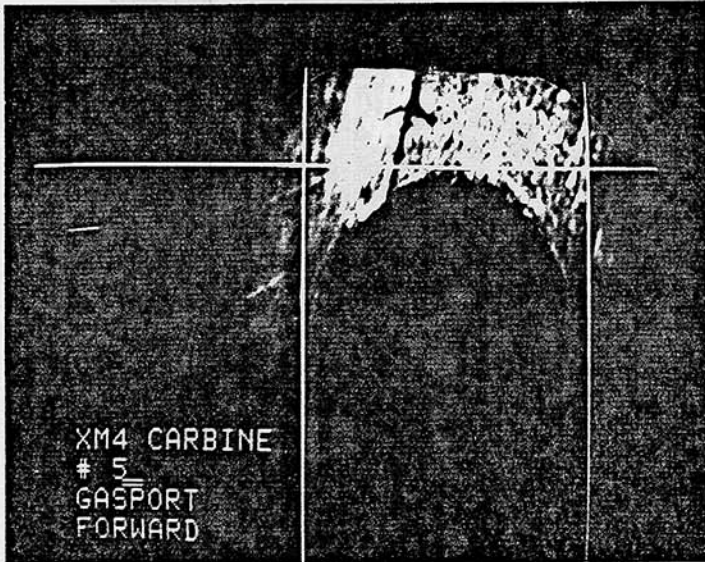
5.56 MM

XM 4 CARBINE

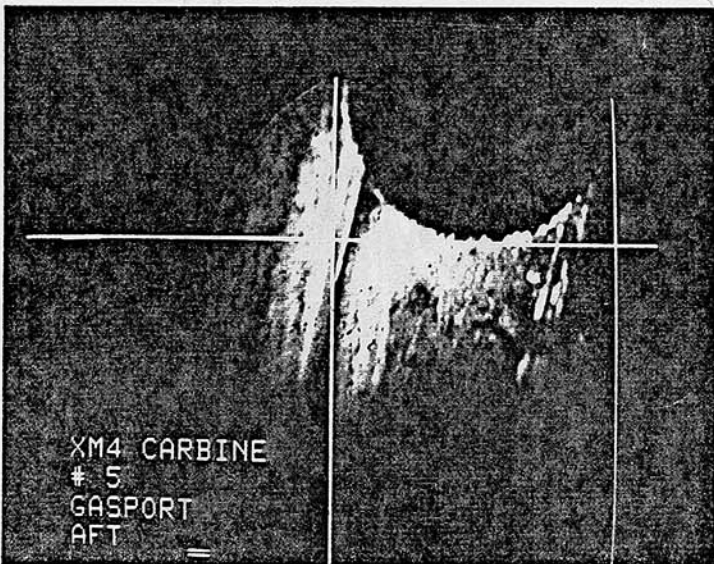
BARREL NO. 5

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.5

1

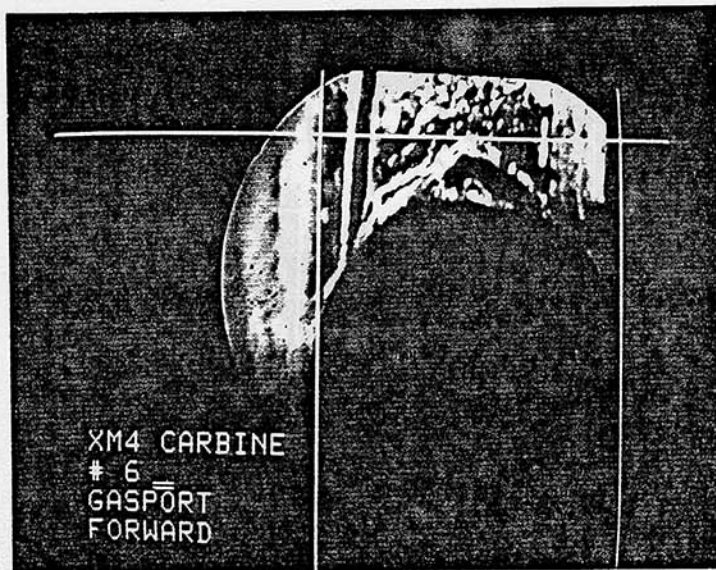
page 26

5.56 MM
XM 4 CARBINE

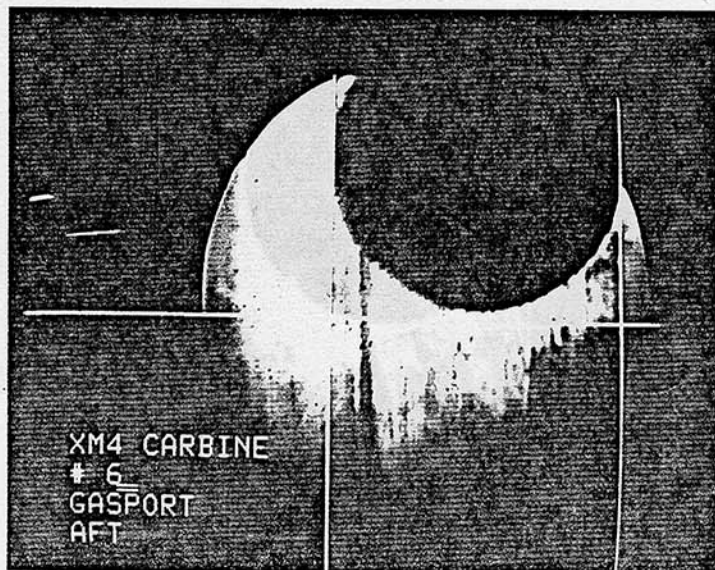
BARREL NO. 6

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



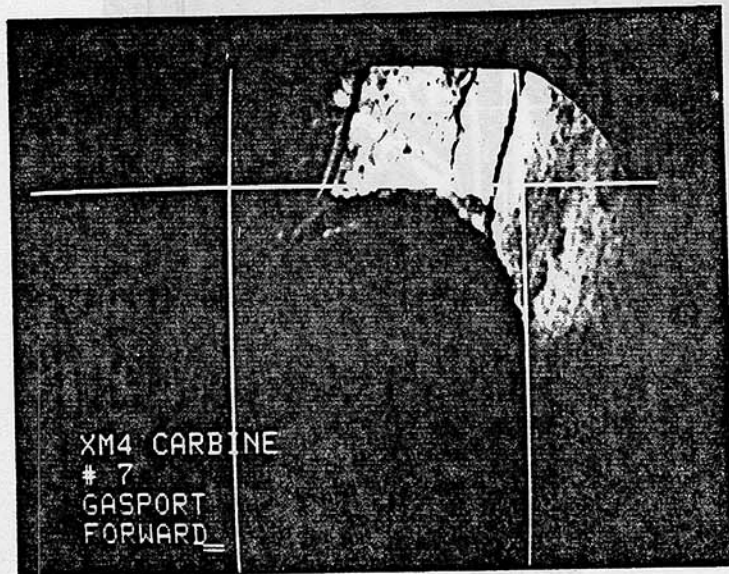
GAS PORT - AFT

Figure 1.6

5.56 MM

XM 4 CARBINE

GAS PORT PHOTOGRAPHS



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.7

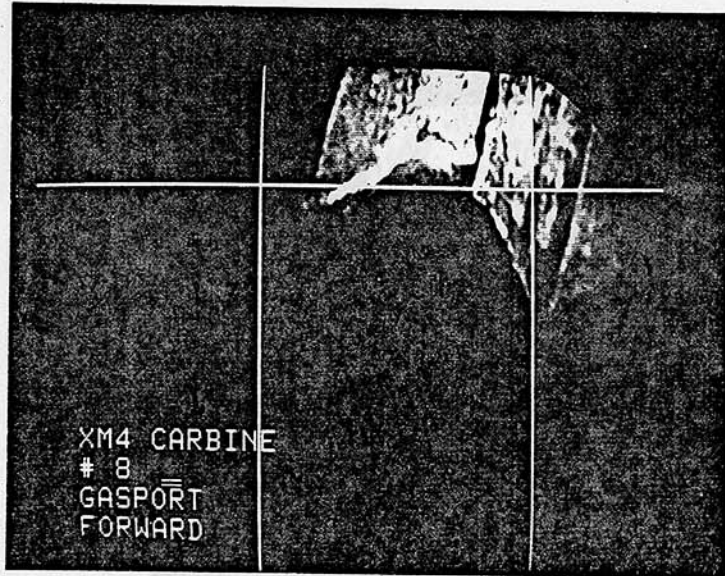
5.56 MM

XM 4 CARBINE

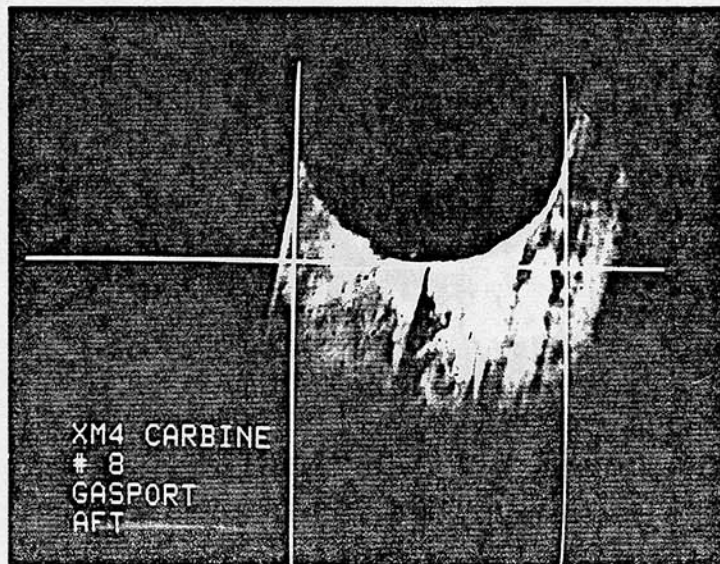
BARREL NO. 8

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



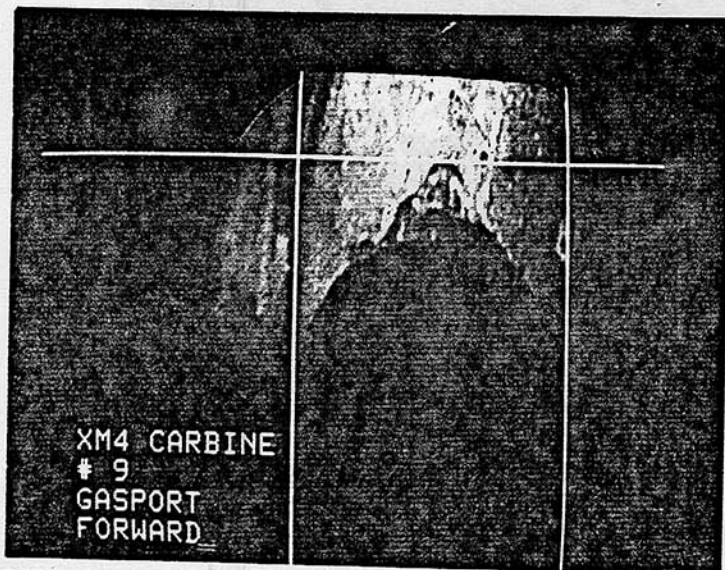
GAS PORT - AFT

5.56 MM
XM 4 CARBINE

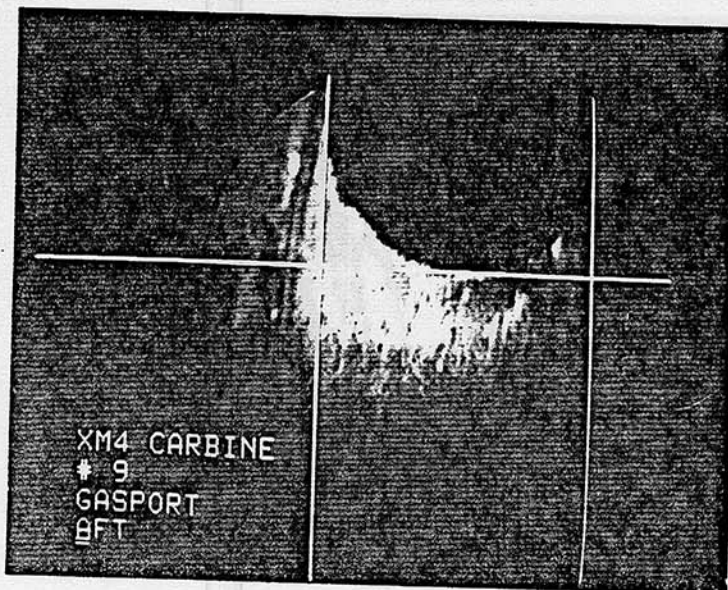
BARREL NO. 9

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.9

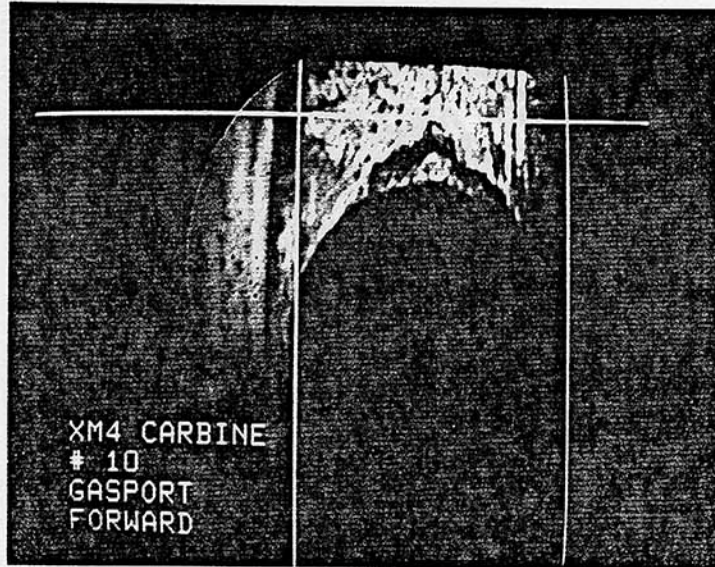
5.56 MM

XM 4 CARBINE

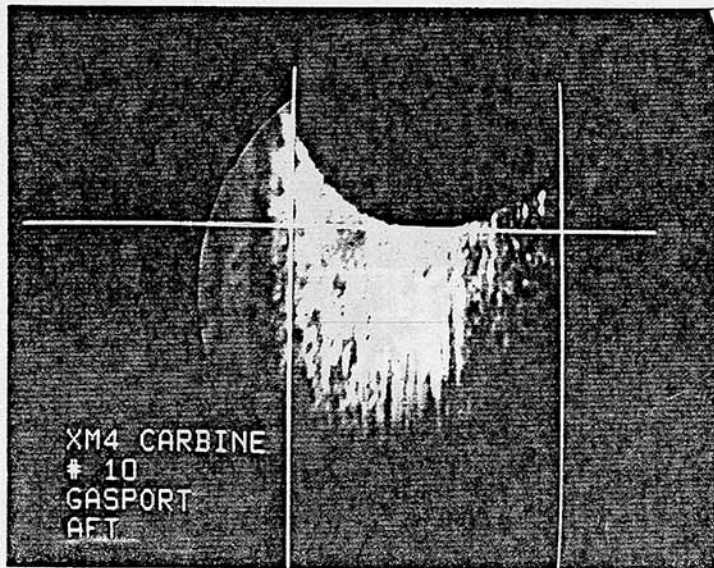
BARREL NO. 10

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.10

1

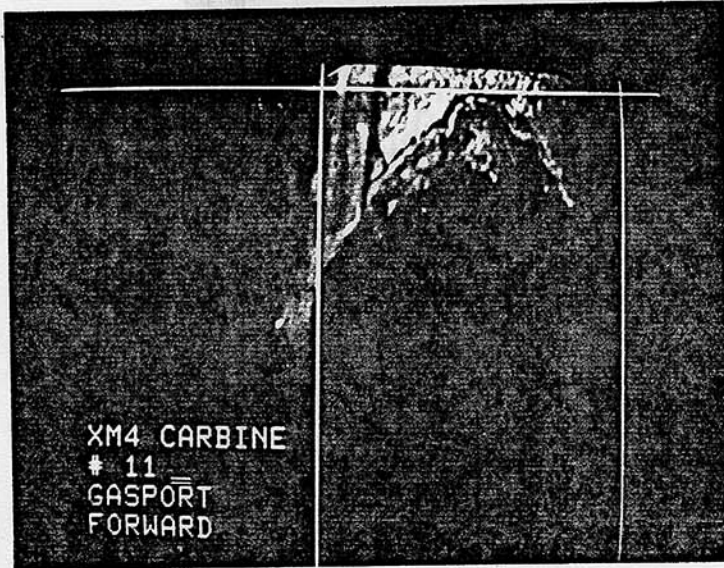
5.56 MM

XM 4 CARBINE

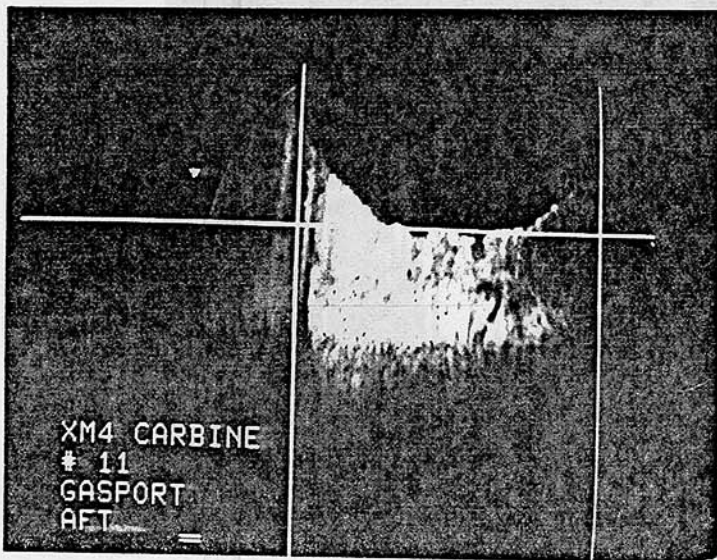
BARREL NO. 11

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.11

1

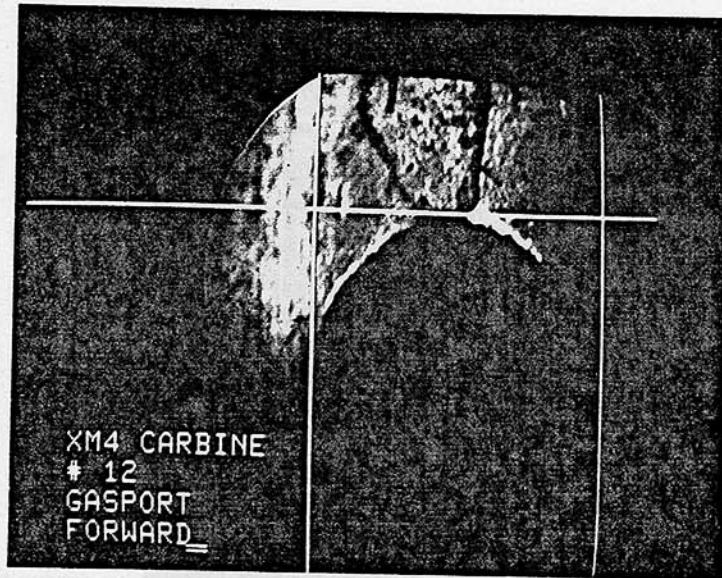
page 32

5.56 MM
XM 4 CARBINE

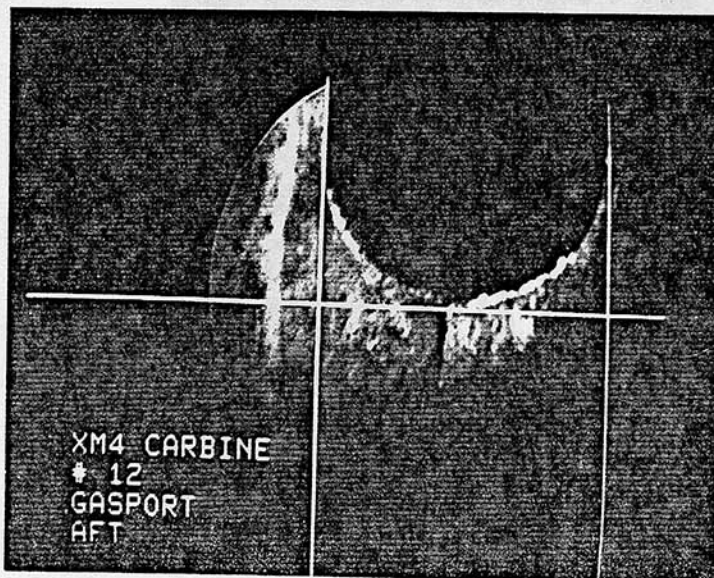
BARREL NO. 12

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

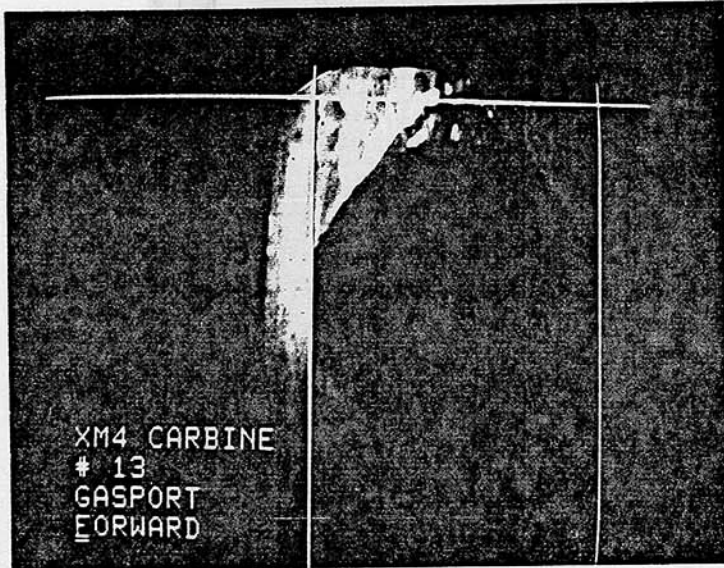
Figure 1.12

5.56 MM
XM 4 CARBINE

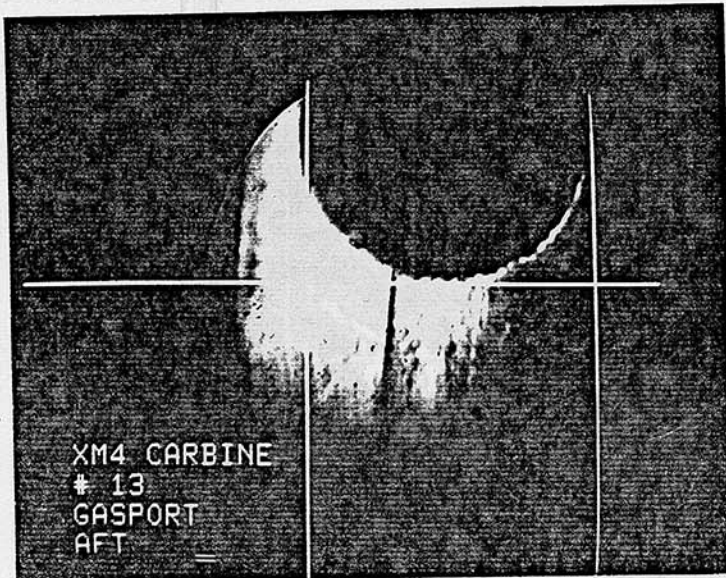
BARREL NO. 13

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.13

1

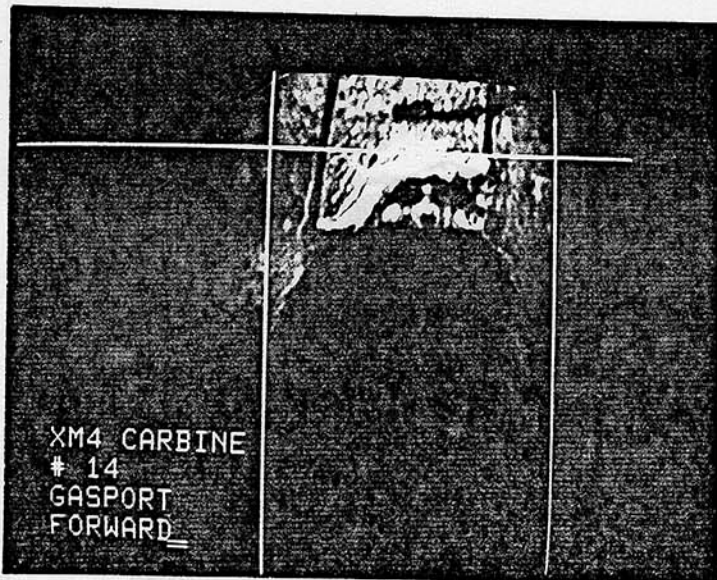
5.56 MM

XM 4 CARBINE

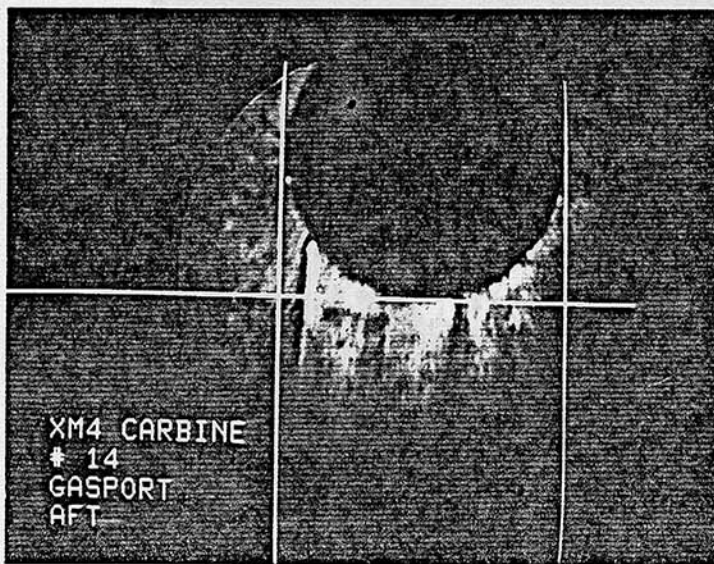
BARREL NO. 14

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.14

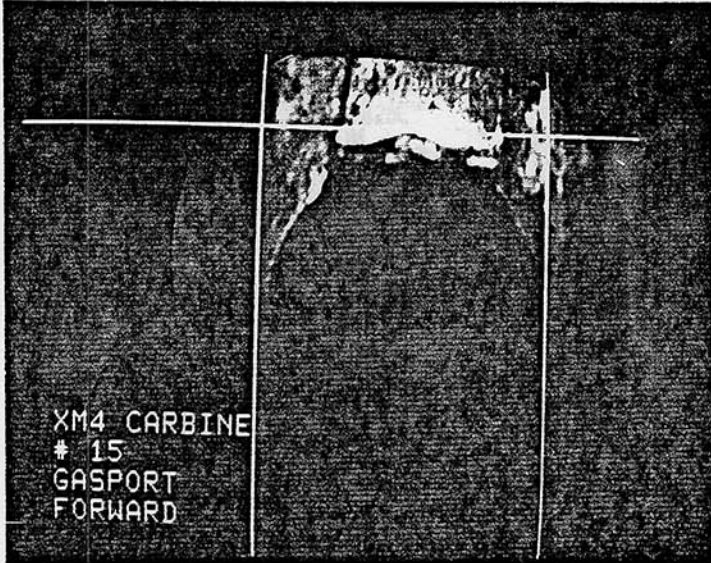
5.56 MM

XM 4 CARBINE

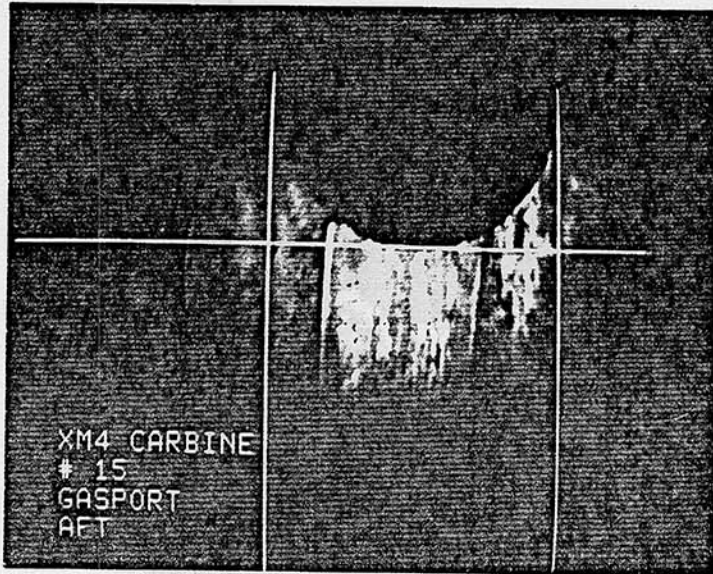
BARREL NO. 15

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.15

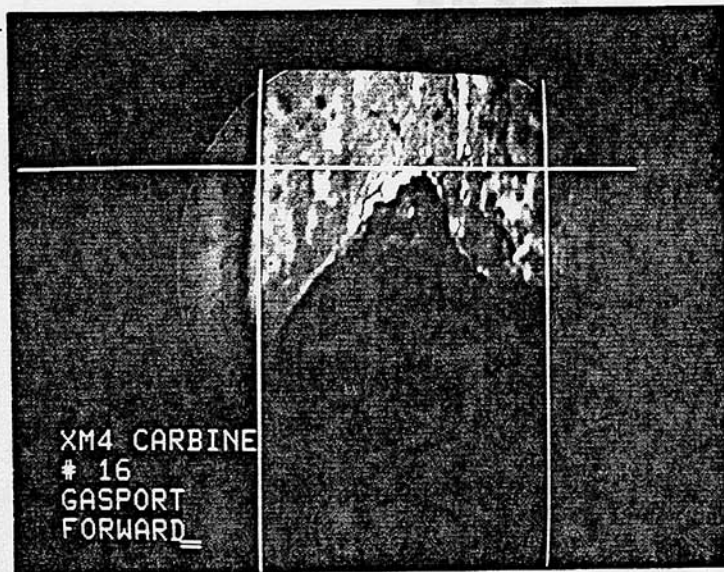
5.56 MM

XM 4 CARBINE

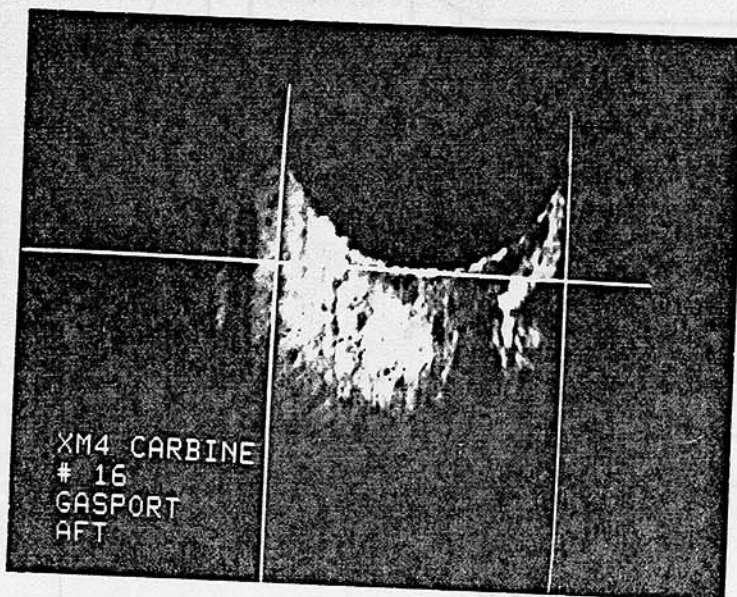
BARREL NO. 16

GAS PORT PHOTOGRAPHS

NO. OF ROUNDS 0



GAS PORT - FORWARD



GAS PORT - AFT

Figure 1.16

1

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5.56 MM CHAMBER CAST MEASUREMENTS

ALL MEASUREMENTS IN INCHES

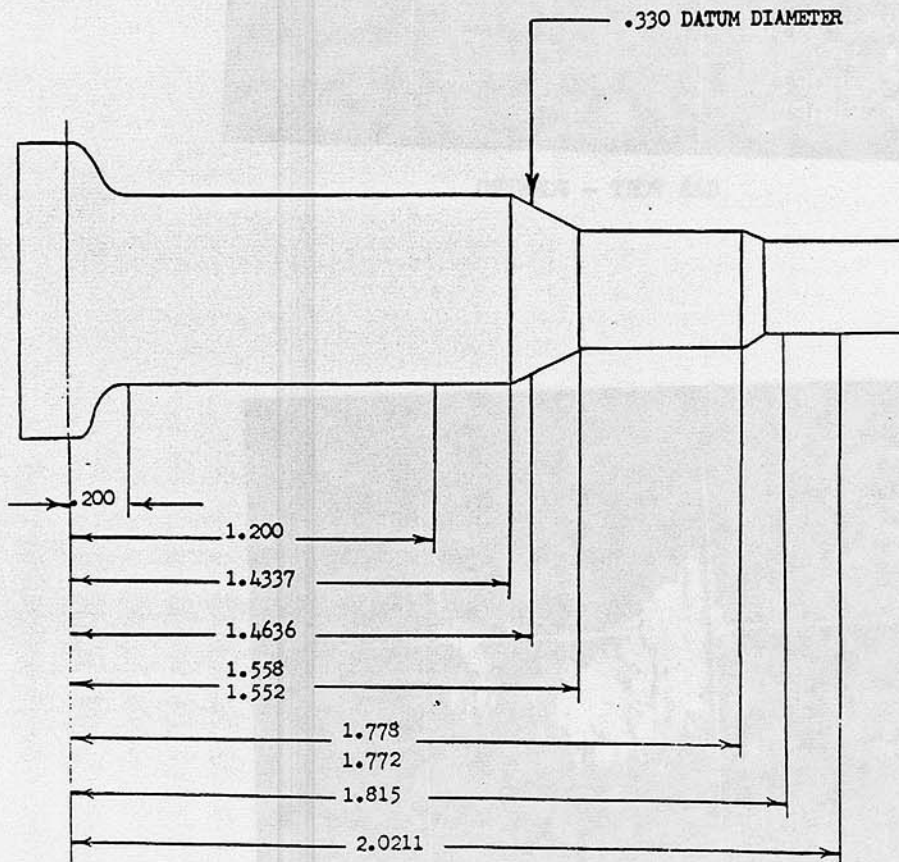


Figure 1.17

TABLE 1.22
5.56 MM
CHAMBER CAST MEASUREMENTS

*(ALL MEASUREMENTS IN INCHES FROM NOMINAL BREACH FACE)

DISTANCE	.200	1.200	1.4337	1.558	1.778	1.815	2.0211	.200 ACTUAL
	.3789	.3614	.3573	.257	.256	.2265	.220	
	.3769	.3594	.3553	.255	.254	.2246	.210	
BARREL# 1	.200	1.200	1.4361	1.5474	1.7742	1.815	2.0211	.220
	.3797	.3600	.3528	.2630	.2506	.2288	.2228	.3776
BARREL# 2	.200	1.200	1.4302	1.5509	1.7735	1.815	2.0211	.210
	.3797	.3595	.3539	.2606	.2506	.2272	.2221	.3784
BARREL# 3	.200	1.200	1.4310	1.5479	1.7706	1.815	2.0211	.220
	.3797	.3605	.3550	.2620	.2520	.2299	.2232	.3784
BARREL# 4	.200	1.200	1.4341	1.5471	1.7716	1.815	2.0211	.220
	.3798	.3591	.3530	.2631	.2521	.2307	.2213	.3774

* NOTE: The position of the nominal breach face was determined by locating the 0.330 inch datum diameter on the front slope, then measuring back 1.4636 inches. All other dimensions were then referenced from the nominal breach face.

TABLE 1.23

5.56 MM CHAMBER CAST MEASUREMENTS

* (ALL MEASUREMENTS IN INCHES FROM NOMINAL BREECH FACE)

DISTANCE	.200	1.200	1.4337	1.558	1.778	1.815	2.0211	.200 ACTUAL
SPECS.	.3789	.3614	.3573	.257	.256	.2265	.220	
	.3769	.3594	.3553	.255	.254	.2246	.210	
BARREL# 5	.200	1.200	1.4330	1.5480	1.7760	1.815	2.0211	.210
	.3791	.3602	.3546	.2622	.2493	.2296	.2239	.3788
BARREL# 6	.200	1.200	1.4378	1.5494	1.7690	1.815	2.0211	
	.3789	.3598	.3517	.2607	.2506	.2291	.2213	
BARREL# 7	.200	1.200	1.4309	1.5508	1.7746	1.815	2.0211	
	.3785	.3594	.3533	.2609	.2483	.2217	.2180	
BARREL# 8	.200	1.200	1.4346	1.5494	1.7760	1.815	2.0211	.210
	.3793	.3609	.3536	.2622	.2531	.2277	.2228	.3783

* NOTE: The position of the nominal breech face was determined by locating the 0.330 inch datum diameter on the front slope, then measuring back 1.4636 inches. All other dimensions were then referenced from the nominal breech face.

TABLE I.24
5.56 MM
CHAMBER CAST MEASUREMENTS

*(ALL MEASUREMENTS IN INCHES FROM NOMINAL BREECH FACE)

DISTANCE	.200	1.200	1.4337	1.558	1.778	1.815	2.0211	.200 ACTUAL
SPECS.	.3789 .3769	.3614 .3594	.3573 .3553	.257 .255	.256 .254	.2265 .2246	.220 .210	
BARREL# 9	.200	1.200	1.4337	1.5507	1.7721	1.815	2.0211	.220
				.2615	.2507	.2273	.2215	.3787
BARREL# 10	.200	1.200	1.4339	1.5488	1.7774	1.815	2.0211	
				.2617	.2474	.2242	.2189	
BARREL# 11	.200	1.200	1.4343	1.5505	1.7723	1.815	2.0211	.210
				.2605	.2524	.2291	.2227	.3787
BARREL# 12	.200	1.200	1.4305	1.5486	1.7760	1.815	2.0211	.220
				.2619	.2522	.2285	.2233	.3785

*NOTE: The position of the nominal breech face was determined by locating the 0.330 inch datum diameter on the front slope, then measuring back 1.4636 inches. All other dimensions were then referenced from the nominal breech face.

TABLE 1.25

5.56 MM CHAMBER CAST MEASUREMENTS

*(ALL MEASUREMENTS IN INCHES FROM NOMINAL BREECH FACE)

DISTANCE	.200	1.200	1.4337	1.558	1.778	1.815	2.0211	.200 ACTUAL
SPECS.	.3789	.3614	.3573	.257	.256	.2265	.220	
	.3769	.3594	.3553	.255	.254	.2246	.210	
BARREL# 13	.200	1.200	1.4324	1.5478	1.7766	1.815	2.0211	
	.3784	.3601	.3532	.2631	.2480	.2278	.2224	
BARREL# 14	.200	1.200	1.4350	1.5493	1.7773	1.815	2.0211	.230
	.3791	.3596	.3533	.2620	.2470	.2269	.2240	.3787
BARREL# 15	.200	1.200	1.4339	1.5476	1.7750	1.815	2.0211	.210
	.3799	.3602	.3528	.2616	.2514	.2302	.2236	.3789
BARREL# 16	.200	1.200	1.4356	1.5498	1.7762	1.815	2.0211	.210
	.3791	.3588	.3539	.2591	.2508	.2258	.2220	.3781

* NOTE: The position of the nominal breech face was determined by locating the 0.330 inch datum diameter on the front slope, then measuring back 1.4636 inches. All other dimensions were then referenced from the nominal breech face.

TABLE 1.26

5.56 MM

XM4 Carbine

Feed Ramp Angles (left & right)

BARREL NO. 1(2)
 RAMP - LEFT: 52° 0'
 RAMP - RIGHT: 51° 50'
 STEP DOWN - LEFT: 63° 16'
 STEP DOWN - RIGHT: 60° 5'

BARREL NO. 2(1)
 RAMP - LEFT: 53° 14'
 RAMP - RIGHT: 55° 33'
 STEP DOWN - LEFT: 60° 24'
 STEP DOWN - RIGHT: 60° 55'

BARREL NO. 3(10)
 RAMP - LEFT: 53° 50'
 RAMP - RIGHT: 52° 27'
 STEP DOWN - LEFT: 61° 7'
 STEP DOWN - RIGHT: 62° 0'

BARREL NO. 4(9)
 RAMP - LEFT: 52° 11'
 RAMP - RIGHT: 53° 02'
 STEP DOWN - LEFT: 62° 59'
 STEP DOWN - RIGHT: 61° 8'

BARREL NO. 5(8)
 RAMP - LEFT: 51° 31'
 RAMP - RIGHT: 52° 57'
 STEP DOWN - LEFT: 58° 33'
 STEP DOWN - RIGHT: 59° 15'

BARREL NO. 6(7)
 RAMP - LEFT: 52° 10'
 RAMP - RIGHT: 52° 12'
 STEP DOWN - LEFT: 59° 30'
 STEP DOWN - RIGHT: 60° 18'

BARREL NO. 7(6)
 RAMP - LEFT: 53° 31'
 RAMP - RIGHT: 52° 27'
 STEP DOWN - LEFT: 61° 33'
 STEP DOWN - RIGHT: 60° 58'

BARREL NO. 8(5)
 RAMP - LEFT: 52° 37'
 RAMP - RIGHT: 51° 49'
 STEP DOWN - LEFT: 59° 12'
 STEP DOWN - RIGHT: 61° 0'

BARREL NO. 9(4)
 RAMP - LEFT: 50° 56'
 RAMP - RIGHT: 51° 22'
 STEP DOWN - LEFT: 59° 11'
 STEP DOWN - RIGHT: 58° 57'

BARREL NO. 10(3)
 RAMP - LEFT: 52° 42'
 RAMP - RIGHT: 53° 30'
 STEP DOWN - LEFT: 63° 34'
 STEP DOWN - RIGHT: 62° 01'

BARREL NO. 11
 RAMP - LEFT: 51° 18'
 RAMP - RIGHT: 52° 27'
 STEP DOWN - LEFT: 61° 56'
 STEP DOWN - RIGHT: 60° 31'

BARREL NO. 12
 RAMP - LEFT: 54° 51'
 RAMP - RIGHT: 53° 24'
 STEP DOWN - LEFT: 64° 20'
 STEP DOWN - RIGHT: 64° 58'

BARREL NO. 13
 RAMP - LEFT: 51° 21'
 RAMP - RIGHT: 52° 28'
 STEP DOWN - LEFT: 60° 31'
 STEP DOWN - RIGHT: 59° 28'

BARREL NO. 14
 RAMP - LEFT: 51° 0'
 RAMP - RIGHT: 50° 18'
 STEP DOWN - LEFT: 60° 19'
 STEP DOWN - RIGHT: 59° 44'

BARREL NO. 15
 RAMP - LEFT: 50° 39'
 RAMP - RIGHT: 62° 36'
 STEP DOWN - LEFT: 59° 4'
 STEP DOWN - RIGHT: 61° 41'

BARREL NO. 16
 RAMP - LEFT: 52° 10'
 RAMP - RIGHT: 53° 38'
 STEP DOWN - LEFT: 36° 0'
 STEP DOWN - RIGHT: 34° 16'

Note: Number in () is barrel number assigned after interchange test.

TABLE 1.27. PARTIAL LIST OF XM4 CARBINE DRAWINGS

Drawing Title	Drawing No.
Carbine, 5.56 mm XM4	93 90000
Upper receiver and barrel assembly	93 90001
Cap, handguard	93 90002
Handguard assembly	93 90003
Handguard	93 90004
Liner, outer, handguard	93 90005
Liner, inner, handguard	93 90006
Replacement barrel and front sight assembly	93 90007
Sight and gas tube assembly	93 90008
Barrel and barrel extension assembly	93 90009
Lower receiver assembly	93 90011
Sliding buttstock assembly	93 90012
Buttstock, sliding	93 90013
Lever, release	93 90014
Marking, lower receiver Model XM4	93 90015
Gas tube assembly	93 90016
Gas tube and plug assembly	93 90017
Tube, gas	93 90018
Extension, receiver	93 90019
Nut, receiver extension	93 90020
Plate, receiver end	93 90021
Spring, action	93 90022
Buffer assembly	93 90023
Body, buffer	93 90024
Pin, lock (next assy. dwg No. 93 90012)	93 90025
Nut, lock pin (next assy. dwg No. 93 90012)	93 90026
Spring, locking (next assy. dwg No. 93 90012)	93 90027
Receiver, upper	93 90028
Upper receiver assembly	93 90029
Extension, barrel	93 90030
Cam, burst (3-shot)	93 90031
Hammer assembly	93 90031

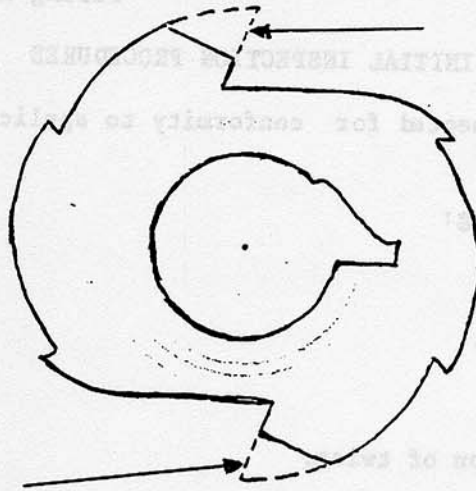


Figure 1.18. Showing 3-shot burst cam (PN-9390031) modification from M16A2 rifle design (PN-9349108). Arrows indicate area removed. (Drawing not to ~~1:1~~ scale.)

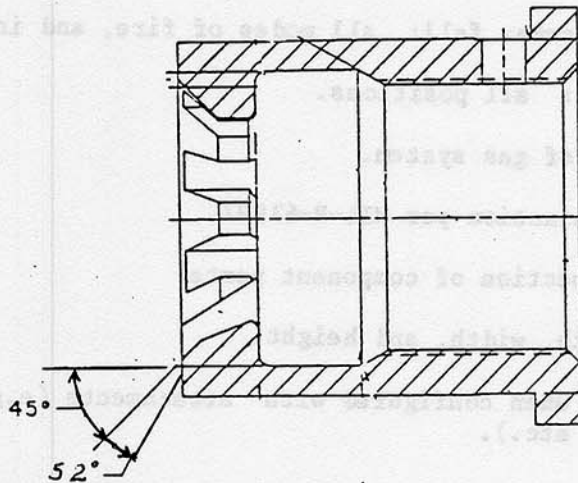


Figure 1.19. Showing feed ramp angle modification of XM4 carbine barrel extension (PN-9390030) has an angle of 52 degrees. M16A2 rifle component (PN-8448550) has an angle of 45 degrees. (Drawing not to scale.)

TABLE 1.28. INITIAL INSPECTION PROCEDURES

a. All weapons were inspected for conformity to applicable drawings and specifications.

Included were the following:

- (1) Bore measurements.
- (2) Chamber measurements.
- (3) Bore length.
- (4) Rifling rate/direction of twist.
- (5) Weapon weight (unloaded, without magazine or attachments and maintenance equipment).
- (6) Trigger pull force - all modes of fire.
- (7) Headspace.
- (8) Firing pin protrusion.
- (9) Firing pin indent (hammer fall: all modes of fire, and inertia).
- (10) Stock length of pull: all positions.
- (11) Airflow measurement of gas system.
- (12) Visual/physical examination per MIL-R-63997.
- (13) Magnaflux/zyglo inspection of component parts.
- (14) Overall weapon length, width, and height.
- (15) Weight of weapon when configured with attachments (e.g., bayonet, M203 grenade launcher, MILES, etc.).
- (16) Dispersion data.
- (17) Attachment compatiability into M15A2 BFA, M7 bayonet, M203 grenade launcher, MILES.

b. Analysis (ref criterion Ic, Ii, Ij, Im, Io). The data pertaining to each criterion are reviewed for compliance with the criterion on a point estimate pass/fail basis.

INITIAL DISPERSION AND VELOCITY TEST

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INITIAL DISPERSION AND VELOCITY

TABLE 2.1A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#1 T1	3.9	2.9	12.2	9.1	12.5	10
XM4#1 T2	5.0	4.5	17.3	14.7	19.4	10
XM4#1 T3	3.6	2.1	11.9	6.1	12.1	10
XM4#1 T4	4.3	2.5	12.4	8.6	14.7	10
XM4#1 T5	3.8	4.3	13.7	16.8	16.8	10
MEAN	4.1	3.2	13.5	11.1	15.1	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#1 T1	3.1	2.2	4.2	4.9	2.1	10
XM4#1 T2	3.5	3.3	5.4	6.7	-10.1	10
XM4#1 T3	2.7	1.7	3.6	4.2	-1.3	10
XM4#1 T4	3.6	1.7	4.1	5.0	-6.7	10
XM4#1 T5	2.8	2.9	4.5	5.7	0.3	10
MEAN	3.1	2.4	4.4	5.3	-3.1	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#1 T1	1.54	1.14	4.80	3.60	4.92	10
XM4#1 T2	1.96	1.76	6.80	5.80	7.65	10
XM4#1 T3	1.42	0.83	4.70	2.40	4.77	10
XM4#1 T4	1.71	0.99	4.90	3.40	5.80	10
XM4#1 T5	1.48	1.67	5.40	6.60	6.62	10
MEAN	1.62	1.28	5.32	4.36	5.95	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#1 T1	1.21	0.88	1.66	1.91	0.32	10
XM4#1 T2	1.38	1.31	2.14	2.63	-1.57	10
XM4#1 T3	1.07	0.67	1.42	1.64	-0.20	10
XM4#1 T4	1.40	0.68	1.63	1.98	-1.03	10
XM4#1 T5	1.10	1.13	1.78	2.24	0.05	10
MEAN	1.23	0.93	1.73	2.08	-0.49	

* Covariance in square in.

TABLE 2.1B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 1-T1	XM4 1-T2	XM4 1-T3	XM4 1-T4	XM4 1-T5
	Instrumental Velocity, fps				
1	2769	2715			
2	2769	2745			
3	2780	2774			
4	2723	2705			
5	2743	2793			
6	2775	2757			
7	-	2778			
8	2752	2750			
9	2711	2753			
10	2717	2760			
Avg	2749	2753	-	-	-

TABLE 2.2A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#2 T1	4.0	3.4	10.2	9.4	13.3	10
XM4#2 T2	3.3	2.6	10.4	7.9	12.5	10
XM4#2 T3	4.3	3.0	13.2	10.2	14.2	10
XM4#2 T4	3.7	3.6	11.7	10.7	11.8	10
XM4#2 T5	2.8	3.7	8.1	11.9	13.0	10
MEAN	3.6	3.3	10.7	10.0	13.0	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#2 T1	3.2	2.9	4.6	5.2	-8.3	10
XM4#2 T2	2.7	2.1	3.7	4.2	2.4	10
XM4#2 T3	3.4	2.4	4.6	5.2	2.8	10
XM4#2 T4	2.9	3.0	4.7	5.2	-1.9	10
XM4#2 T5	2.2	3.0	4.1	4.7	-4.0	10
MEAN	2.9	2.7	4.3	4.9	-1.8	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#2 T1	1.57	1.33	4.00	3.70	5.23	10
XM4#2 T2	1.29	1.03	4.10	3.10	4.91	10
XM4#2 T3	1.69	1.19	5.20	4.00	5.61	10
XM4#2 T4	1.46	1.44	4.60	4.20	4.65	10
XM4#2 T5	1.11	1.47	3.20	4.70	5.11	10
MEAN	1.42	1.29	4.22	3.94	5.10	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#2 T1	1.28	1.13	1.82	2.06	-1.28	10
XM4#2 T2	1.08	0.82	1.45	1.65	0.37	10
XM4#2 T3	1.34	0.94	1.81	2.06	0.43	10
XM4#2 T4	1.16	1.17	1.83	2.05	-0.30	10
XM4#2 T5	0.88	1.19	1.61	1.84	-0.62	10
MEAN	1.15	1.05	1.70	1.93	-0.28	

* Covariance in square in.

TABLE 2.2B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 2-T1	XM4 2-T2	XM4 2-T3	XM4 2-T4	XM4 2-T5
	Instrumental Velocity, fps				
1	2730	2779	2816	2814	2806
2	2795	2731	2770	2778	2810
3	2778	2833	2751	2796	2713
4	2790	2778	2760	2770	2806
5	2719	2812	2779	2758	2773
6	2745	2789	2780	2731	2699
7	2778	2764	2804	2762	2731
8	2787	2797	2774	2758	2822
9	2777	2772	2827	2804	2834
10	2717	2728	2788	2791	2809
Avg	2762	2778	2785	2776	2780

TABLE 2.3A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#3 T1	4.1	3.6	11.4	10.2	12.4	10
XM4#3 T2	5.1	2.2	16.0	6.9	16.3	10
XM4#3 T3	3.9	2.7	11.2	8.6	11.5	10
XM4#3 T 4	4.3	3.1	11.2	10.2	11.4	10
XM4#3 T5	4.8	2.3	14.7	7.4	14.7	10
MEAN	4.4	2.8	12.9	8.6	13.3	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#3 T1	3.5	3.0	4.9	5.4	-4.8	10
XM4#3 T2	4.2	1.8	4.7	5.6	2.2	10
XM4#3 T3	3.4	2.1	4.4	4.8	-0.8	10
XM4#3 T 4	3.7	2.4	4.9	5.3	0.8	10
XM4#3 T5	4.1	1.7	4.7	5.4	0.1	10
MEAN	3.8	2.2	4.7	5.3	-0.5	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#3 T1	1.60	1.40	4.50	4.00	4.88	10
XM4#3 T2	2.01	0.87	6.30	2.70	6.43	10
XM4#3 T3	1.54	1.07	4.40	3.40	4.53	10
XM4#3 T 4	1.69	1.23	4.40	4.00	4.49	10
XM4#3 T5	1.90	0.92	5.80	2.90	5.80	10
MEAN	1.75	1.10	5.08	3.40	5.23	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#3 T1	1.38	1.16	1.91	2.13	-0.74	10
XM4#3 T2	1.66	0.69	1.86	2.19	0.34	10
XM4#3 T3	1.34	0.82	1.71	1.88	-0.12	10
XM4#3 T 4	1.44	0.96	1.94	2.09	0.13	10
XM4#3 T5	1.61	0.67	1.85	2.11	0.01	10
MEAN	1.49	0.86	1.86	2.08	-0.08	

* Covariance in square in.

TABLE 2.3B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 3-T1	XM4 3-T2	XM4 3-T3	XM4 3-T4	XM4 3-T5
	Instrumental Velocity, fps				
1	2783	2772	2814	2844	2826
2	2768	2832	2800	2782	2751
3	2779	2786	2778	2787	2788
4	2777	2756	2781	2809	2815
5	2760	2795	2788	2793	2813
6	2775	2842	2796	2778	2786
7	2780	2747	2768	2813	2788
8	2787	2750	2798	2816	2740
9	2818	2801	2821	2700	2823
10	2783	2748	2797	2813	2830
Avg	2781	2783	2794	2793	2796

TABLE 2.4A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#4 T1	5.2	2.6	16.5	7.4	16.7	10
XM4#4 T2	3.9	2.8	14.7	8.6	14.8	10
XM4#4 T3	4.0	4.2	11.9	11.4	16.5	10
XM4#4 T4	6.1	5.9	21.3	17.8	27.8	10
XM4#4 T5	4.4	2.9	13.2	10.2	13.7	10
MEAN	4.7	3.7	15.5	11.1	17.9	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#4 T1	4.2	2.2	5.0	5.8	-8.7	10
XM4#4 T2	2.7	2.1	3.9	4.8	1.3	10
XM4#4 T3	3.2	3.5	4.8	5.8	-15.0	10
XM4#4 T4	3.7	4.5	6.3	8.4	-27.9	10
XM4#4 T5	3.4	2.2	4.3	5.3	6.2	10
MEAN	3.4	2.9	4.9	6.0	-8.8	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#4 T1	2.06	1.01	6.50	2.90	6.59	10
XM4#4 T2	1.54	1.11	5.80	3.40	5.82	10
XM4#4 T3	1.58	1.66	4.70	4.50	6.51	10
XM4#4 T4	2.38	2.32	8.40	7.00	10.93	10
XM4#4 T5	1.72	1.16	5.20	4.00	5.41	10
MEAN	1.86	1.45	6.12	4.36	7.05	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#4 T1	1.65	0.86	1.97	2.30	-1.34	10
XM4#4 T2	1.06	0.84	1.54	1.90	0.20	10
XM4#4 T3	1.27	1.36	1.89	2.29	-2.32	10
XM4#4 T4	1.47	1.78	2.47	3.33	-4.32	10
XM4#4 T5	1.34	0.87	1.71	2.07	0.97	10
MEAN	1.36	1.14	1.92	2.38	-1.36	

* Covariance in square in.

TABLE 2.4B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers					TARGET
	XM4 4-T1	XM4 4-T2	XM4 4-T3	XM4 4-T4	XM4 4-T5	
	Instrumental Velocity, fps					
1	- 1	2805	2773	2842	2873	XM44 T1
2	2774	2794	2789	2762	2773	XM44 T2
3	2779	2771	2861	2833	2773	XM44 T3
4	2773	2786	2807	2767	2781	XM44 T4
5	2757	2780	2784	2780	2800	XM44 T5
6	2780	2736	2769	2784	2777	
7	2787	2802	2807	2765	2790	MEAN
8	2809	2786	2788	2779	2805	
9	2758	2787	2849	2727	2780	TARGET
10	2779	2813	2806	2800	2835	
Avg	2777	2786	2803	2784	2799	

TARGET STATISTICS IN INCHES

	MEAN	STDEV	MIN	MAX	TARGET
10	1.75	0.16	1.58	1.92	XM44 T5
10	1.38	0.08	1.30	1.46	XM44 T4
10	1.38	0.08	1.30	1.46	XM44 T3
10	1.24	0.11	1.13	1.35	XM44 T2
10	1.81	0.18	1.63	2.00	XM44 T1
	1.88	0.12	1.76	2.00	MEAN
10	1.81	0.18	1.63	2.00	XM44 T5
10	1.47	0.07	1.40	1.54	XM44 T4
10	1.47	0.07	1.40	1.54	XM44 T3
10	1.81	0.18	1.63	2.00	XM44 T2
10	1.81	0.18	1.63	2.00	XM44 T1
	1.88	0.12	1.76	2.00	MEAN

TABLE 2.5A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
<i>XM4#5 T1</i>	4.8	3.3	16.3	8.4	17.1	10
<i>T2</i>	4.4	2.5	13.0	7.1	13.4	10
<i>T3</i>	2.3	3.7	6.4	12.2	13.3	10
<i>T4</i>	2.5	3.8	7.9	13.5	14.5	10
<i>T5</i>	2.1	3.5	6.4	11.4	11.6	10
MEAN	3.2	3.3	10.0	10.5	14.0	

TARGET	MHD	MVD	MR	RSD	COV*	N
	3.4	2.9	4.8	5.8	0.8	10
	3.6	2.0	4.4	5.0	2.3	10
	1.9	2.9	3.7	4.4	-3.8	10
	2.1	2.7	3.7	4.5	-5.1	10
	1.7	2.8	3.6	4.1	0.6	10
MEAN	2.5	2.7	4.0	4.8	-1.0	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
<i>XM4#5 T1</i>	1.89	1.28	6.40	3.30	6.74	10
<i>T2</i>	1.73	0.98	5.10	2.80	5.26	10
<i>T3</i>	0.91	1.47	2.50	4.80	5.24	10
<i>T4</i>	0.98	1.48	3.10	5.30	5.70	10
<i>T5</i>	0.84	1.37	2.50	4.50	4.57	10
MEAN	1.27	1.32	3.92	4.14	5.50	

TARGET	MHD	MVD	MR	RSD	COV*	N
	1.32	1.13	1.91	2.28	0.13	10
	1.42	0.79	1.74	1.99	0.36	10
	0.73	1.14	1.47	1.73	-0.59	10
	0.81	1.06	1.44	1.78	-0.80	10
	0.68	1.10	1.42	1.61	0.10	10
MEAN	0.99	1.04	1.59	1.88	-0.16	

* Covariance in square in.

TABLE 2.5B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 5-T1	XM4 5-T2	XM4 5-T3	XM4 5-T4	XM4 5-T5
	Instrumental Velocity, fps				
1	2776	2843	2804	2820	2834
2	2814	2756	2798	2775	-
3	2763	2805	2757	2805	2815
4	2731	2789	2811	2829	2780
5	2815	2814	2784	2814	2813
6	2800	2844	2798	2818	2799
7	2773	2803	2816	2784	2823
8	2770	2751	2804	2804	2762
9	2815	2813	2776	2772	2846
10	2745	2801	2791	2769	2786
Avg	2780	2802	2794	2799	2806

TABLE 2.6A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#6 T1	2.6	1.7	8.4	6.1	9.9	10
XM4#6 T2	2.3	2.3	6.9	7.4	7.4	10
XM4#6 T3	1.9	1.6	5.6	5.1	6.3	10
XM4#6 T4	1.7	1.2	6.1	3.8	6.1	10
XM4#6 T5	2.2	2.9	6.6	9.1	10.2	10
MEAN	2.1	1.9	6.7	6.3	8.0	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#6 T1	1.9	1.2	2.3	3.1	3.7	10
XM4#6 T2	1.8	1.7	2.9	3.3	-0.0	10
XM4#6 T3	1.5	1.2	2.2	2.5	-0.7	10
XM4#6 T4	1.3	0.9	1.8	2.1	0.5	10
XM4#6 T5	1.9	2.2	3.1	3.6	2.4	10
MEAN	1.7	1.4	2.5	2.9	1.2	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#6 T1	1.00	0.69	3.30	2.40	3.91	10
XM4#6 T2	0.90	0.92	2.70	2.90	2.93	10
XM4#6 T3	0.77	0.63	2.20	2.00	2.48	10
XM4#6 T4	0.69	0.46	2.40	1.50	2.40	10
XM4#6 T5	0.88	1.12	2.60	3.60	4.02	10
MEAN	0.85	0.77	2.64	2.48	3.15	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#6 T1	0.74	0.47	0.92	1.22	0.58	10
XM4#6 T2	0.72	0.67	1.15	1.28	-0.01	10
XM4#6 T3	0.60	0.48	0.86	0.99	-0.10	10
XM4#6 T4	0.51	0.36	0.70	0.83	0.08	10
XM4#6 T5	0.74	0.85	1.21	1.43	0.37	10
MEAN	0.67	0.57	0.97	1.15	0.19	

* Covariance in square in.

TABLE 2.6B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers					TARGET
	XM4 6-T1	XM4 6-T2	XM4 6-T3	XM4 6-T4	XM4 6-T5	
	Instrumental Velocity, fps					
1			2836	2808	2820	
2			2737	2786	2789	
3			2799	2753	2804	
4			2806	2831	2837	
5			2755	2811	2790	
6			2787	2802	2776	
7			2762	2781	2791	
8			2807	2803	2828	
9			2799	2778	2780	
10			2782	2781	2801	
Avg	-	-	2787	2794	2802	

TARGET STATISTICS IN INCHES

Rd	HT	VR	HR	VR	HT	TARGET
10	0.00	0.00	0.00	0.00	0.00	
9	0.00	0.00	0.00	0.00	0.00	
8	0.00	0.00	0.00	0.00	0.00	
7	0.00	0.00	0.00	0.00	0.00	
6	0.00	0.00	0.00	0.00	0.00	
5	0.00	0.00	0.00	0.00	0.00	
4	0.00	0.00	0.00	0.00	0.00	
3	0.00	0.00	0.00	0.00	0.00	
2	0.00	0.00	0.00	0.00	0.00	
1	0.00	0.00	0.00	0.00	0.00	
Avg	0.00	0.00	0.00	0.00	0.00	

TABLE 2.7A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#7 T1	4.8	3.2	14.5	11.7	15.1	10
XM4#7 T2	2.2	1.5	6.9	4.3	6.9	10
XM4#7 T3	1.8	2.6	5.3	8.4	9.0	10
XM4#7 T4	2.7	3.0	7.9	11.4	12.0	10
XM4#7 T5	3.0	3.1	9.9	8.6	9.9	10
MEAN	2.9	2.7	8.9	8.9	10.6	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#7 T1	3.9	2.3	4.7	5.8	0.5	10
XM4#7 T2	1.7	1.2	2.4	2.7	-0.4	10
XM4#7 T3	1.4	2.1	2.8	3.1	0.5	10
XM4#7 T4	2.2	1.7	3.1	4.0	2.1	10
XM4#7 T5	2.4	2.4	4.0	4.3	1.0	10
MEAN	2.3	2.0	3.4	4.0	0.7	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#7 T1	1.89	1.28	5.70	4.60	5.95	10
XM4#7 T2	0.89	0.59	2.70	1.70	2.71	10
XM4#7 T3	0.69	1.02	2.10	3.30	3.55	10
XM4#7 T4	1.05	1.19	3.10	4.50	4.74	10
XM4#7 T5	1.19	1.20	3.90	3.40	3.90	10
MEAN	1.14	1.06	3.50	3.50	4.17	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#7 T1	1.55	0.92	1.83	2.28	0.08	10
XM4#7 T2	0.66	0.49	0.93	1.06	-0.06	10
XM4#7 T3	0.54	0.82	1.09	1.24	0.07	10
XM4#7 T4	0.86	0.66	1.23	1.59	0.33	10
XM4#7 T5	0.94	0.96	1.56	1.69	0.16	10
MEAN	0.91	0.77	1.33	1.57	0.11	

* Covariance in square in.

TABLE 2.7B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 7-T1	XM4 7-T2	XM4 7-T3	XM4 7-T4	XM4 7-T5
	Instrumental Velocity, fps				
1	2780	2789	2758	2811	2806
2	2768	2760	2794	2754	2761
3	2775	2781	2747	2787	2762
4	2757	2793	2799	2781	2716
5	2795	2756	2755	2792	2755
6	2766	2815	2762	2792	2735
7	2697	2730	2775	2813	2821
8	2746	2801	2783	2758	2769
9	2778	2779	2765	2753	2834
10	2720	2837	2789	2799	2773
Avg	2758	2784	2773	2784	2773

TABLE 2.8A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#8 T1	3.5	1.6	13.2	4.3	13.4	10
XM4#8 T2	2.4	2.3	7.4	7.1	8.1	10
XM4#8 T3	1.9	3.4	5.6	9.7	9.8	10
XM4#8 T4	2.9	2.9	9.9	11.2	11.2	10
XM4#8 T5	2.3	2.8	6.6	8.9	9.1	10
MEAN	2.6	2.6	8.5	8.2	10.3	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#8 T1	2.4	1.4	3.1	3.9	0.2	10
XM4#8 T2	2.0	1.8	2.9	3.3	-2.4	10
XM4#8 T3	1.5	2.8	3.4	3.9	1.6	10
XM4#8 T4	2.2	1.8	3.4	4.1	0.3	10
XM4#8 T5	1.9	2.1	3.3	3.6	0.1	10
MEAN	2.0	2.0	3.2	3.8	-0.0	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#8 T1	1.38	0.62	5.20	1.70	5.28	10
XM4#8 T2	0.94	0.90	2.90	2.80	3.18	10
XM4#8 T3	0.74	1.34	2.20	3.80	3.86	10
XM4#8 T4	1.15	1.13	3.90	4.40	4.40	10
XM4#8 T5	0.89	1.10	2.60	3.50	3.59	10
MEAN	1.02	1.02	3.36	3.24	4.06	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#8 T1	0.96	0.54	1.20	1.52	0.04	10
XM4#8 T2	0.79	0.71	1.15	1.30	-0.37	10
XM4#8 T3	0.58	1.09	1.33	1.53	0.25	10
XM4#8 T4	0.85	0.69	1.35	1.61	0.05	10
XM4#8 T5	0.76	0.82	1.29	1.42	0.02	10
MEAN	0.79	0.77	1.27	1.48	-0.00	

* Covariance in square in.

TABLE 2.8B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 8-T1	XM4 8-T2	XM4 8-T3	XM4 8-T4	XM4 8-T5
	Instrumental Velocity, fps				
1	2765	2806	2786	2772	2774
2	2777	2772	2760	2861	2728
3	2753	2792	2772	2819	2790
4	2794	2780	2775	2788	2804
5	2798	2748	2815	2806	2705
6	2758	2812	2823	2790	2808
7	2764	2786	2772	2783	2748
8	2742	2835	2831	2790	2753
9	2799	2783	2803	2780	2787
10	2790	2794	2749	2766	2800
Avg	2744	2791	2789	2795	2770

TABLE 2.9A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#9 T1	2.8	3.9	9.7	12.4	13.3	10
XM4#9 T2	2.6	3.4	8.1	13.5	14.1	10
XM4#9 T3	3.6	5.3	11.7	17.8	18.4	10
XM4#9 T4	2.6	4.1	8.6	12.7	14.7	10
XM4#9 T5	5.8	3.4	20.6	8.9	20.7	10
MEAN	3.5	4.0	11.7	13.1	16.2	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#9 T1	2.1	3.0	4.1	4.8	-3.4	10
XM4#9 T2	2.0	2.0	3.4	4.3	-4.6	10
XM4#9 T3	2.9	3.9	5.5	6.4	-2.4	10
XM4#9 T4	2.0	3.3	4.0	4.9	6.6	10
XM4#9 T5	4.0	2.9	5.6	6.7	-4.8	10
MEAN	2.6	3.0	4.5	5.4	-1.7	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#9 T1	1.09	1.55	3.80	4.90	5.22	10
XM4#9 T2	1.01	1.34	3.20	5.30	5.54	10
XM4#9 T3	1.41	2.09	4.60	7.00	7.25	10
XM4#9 T4	1.04	1.63	3.40	5.00	5.78	10
XM4#9 T5	2.27	1.35	8.10	3.50	8.13	10
MEAN	1.37	1.59	4.62	5.14	6.38	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#9 T1	0.82	1.17	1.63	1.89	-0.53	10
XM4#9 T2	0.80	0.79	1.33	1.68	-0.71	10
XM4#9 T3	1.13	1.53	2.18	2.52	-0.37	10
XM4#9 T4	0.78	1.28	1.58	1.94	1.02	10
XM4#9 T5	1.57	1.14	2.19	2.64	-0.75	10
MEAN	1.02	1.18	1.78	2.13	-0.27	

* Covariance in square in.

TABLE 2.9B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers				
	XM4 9-T1	XM4 9-T2	XM4 9-T3	XM4 9-T4	XM4 9-T5
	Instrumental Velocity, fps				
1	2754	2790	2793	2817	2765
2	2789	2750	2761	2790	2757
3	2778	2760	2759	2755	2769
4	2727	2773	2734	2769	2731
5	2776	2742	2777	2773	2743
6	2777	2719	2765	2748	2766
7	2767	2742	2774	2775	2755
8	2749	2814	2785	2762	2760
9	2753	2779	2793	2786	2762
10	2779	2710	2810	2783	2752
Avg	2756	2758	2775	2776	2756

TABLE 2.10A. TARGET DATA BEFORE INTERCHANGE

TARGET STATISTICS IN CENTIMETERS

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#10T1	2.0	1.2	5.3	3.6	5.8	10
XM4#10T2	2.8	2.8	9.4	8.4	11.3	10
XM4#10T3	2.3	2.2	7.1	6.6	7.6	10
XM4#10T4	1.6	2.6	5.3	7.6	7.7	10
XM4#10T5	2.2	2.2	6.6	7.6	9.0	10
MEAN	2.2	2.2	6.8	6.8	8.3	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#10T1	1.8	0.9	2.1	2.3	1.9	10
XM4#10T2	2.0	2.3	3.2	4.0	-3.0	10
XM4#10T3	1.9	1.7	2.8	3.2	0.2	10
XM4#10T4	1.2	2.2	2.8	3.1	1.7	10
XM4#10T5	1.8	1.7	2.7	3.1	-2.2	10
MEAN	1.7	1.8	2.7	3.1	-0.3	

* Covariance in square cm.

TARGET STATISTICS IN INCHES

TARGET	HSD	VSD	EHS	EVS	ES	N
XM4#10T1	0.80	0.46	2.10	1.40	2.30	10
XM4#10T2	1.09	1.12	3.70	3.30	4.46	10
XM4#10T3	0.89	0.87	2.80	2.60	2.97	10
XM4#10T4	0.65	1.04	2.10	3.00	3.04	10
XM4#10T5	0.85	0.86	2.60	3.00	3.55	10
MEAN	0.86	0.87	2.66	2.66	3.26	

TARGET	MHD	MVD	MR	RSD	COV*	N
XM4#10T1	0.71	0.37	0.82	0.92	0.29	10
XM4#10T2	0.77	0.90	1.28	1.56	-0.46	10
XM4#10T3	0.74	0.66	1.09	1.24	0.02	10
XM4#10T4	0.48	0.88	1.09	1.22	0.26	10
XM4#10T5	0.70	0.68	1.05	1.21	-0.34	10
MEAN	0.68	0.70	1.07	1.23	-0.04	

* Covariance in square in.

TABLE 2.10B. VELOCITY DATA BEFORE INTERCHANGE

Rd No.	Weapon Target Numbers					TARGET
	XM4 10-T1	XM4 10-T2	XM4 10-T3	XM4 10-T4	XM4 10-T5	
	Instrumental Velocity, fps					
1	2747	2817	2763	2774	2803	
2	2800	2789	2823	2760	2785	
3	2727	2755	2735	2784	2812	
4	2776	2746	2743	2774	2797	
5	2751	2753	2801	2731	2777	
6	2744	2733	2805	2810	2801	
7	2757	2759	2778	2792	2796	
8	2759	2777	2799	2755	2789	
9	2799	2783	2815	2780	2811	
10	2818	2760	2789	2793	2799	
Avg	2768	2767	2785	2775	2797	