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COMPARISON TEST OF

RIFLE, 5.56-MM, M16A1

FINAL REPORT

BY

ERIC KEELE

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ABERDEEN PROVING GROUND

ABERDEEN PROVING GROUND, MARYLAND

19 JAN 1972

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SUBJECT: Comparison Test Report of Rifle, 5.56-MM, M16A1, TECOM Project No. 8-ME-600-016-015

Commanding General
US Army Weapons Command
ATTN: AMSWE-QA
Rock Island, Illinois 61201

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FOR THE COMMANDER:

R. P. WITT
Associate Director
Materiel Testing Directorate

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ABSTRACT

The purpose of this test was to evaluate the performance of M16A1 rifles to detect any deterioration of product quality during production. Testing was conducted at Aberdeen Proving Ground by the Materiel Testing Directorate from 28 October to 30 November 1971. Sixteen rifles were inspected for compliance with the military specification for the M16A1 rifle. Six of the rifles were fired for accuracy and nine for reliability. Two of the rifles fired for reliability failed to meet requirements, one because of excessive failures to feed from the magazine and a second because of a broken firing-pin-retaining pin. The part failure and the occurrence of excessive malfunctioning were classified as shortcomings. It was concluded that with the exception of the two rifles which failed the reliability test, all rifles met inspection, accuracy, and reliability requirements. It was also concluded that the quality of the extractor springs in the rifles in this test was superior to the quality of those used in the rifles in the last comparison test.

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FOREWORD

The Quality Assurance Branch, US Army Weapons Command, was responsible for preparing the test plan. The Materiel Testing Directorate was responsible for conducting the test and preparing the final test report.

Acknowledgement is made to Mr. Walter Eller for his technical assistance in the conduct of the various phases of this test.

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ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND 21005

TECOM PROJECT NO. 8-WE-600-016-015

FINAL REPORT ON COMPARISON TEST OF RIFLE, 5.56-MM, M16A1

28 OCTOBER TO 30 NOVEMBER 1971

SECTION 1. SUMMARY

1.1 BACKGROUND

Production samples of items are subjected to comparison tests in accordance with a continuing program under the jurisdiction of WECOM to assure the quality of production items. The tests reported herein were conducted to evaluate the quality of a sample of production M16A1 rifles.

The authority for the test is shown as Reference 1.

1.2 DESCRIPTION OF MATERIEL

The M16A1 rifle is a lightweight, air-cooled, gas-operated weapon capable of either semiautomatic or automatic fire. The rifle employs a 20-round magazine and fires 5.56-mm ball (M193) and tracer (M196) cartridges. More detailed information is contained in TM 9-1005-249-12 (Reference 2). Right and left side views of the M16A1 rifle are shown in Figure 1.2-1.

Applicable serial numbers are shown in Table 2.2-I.

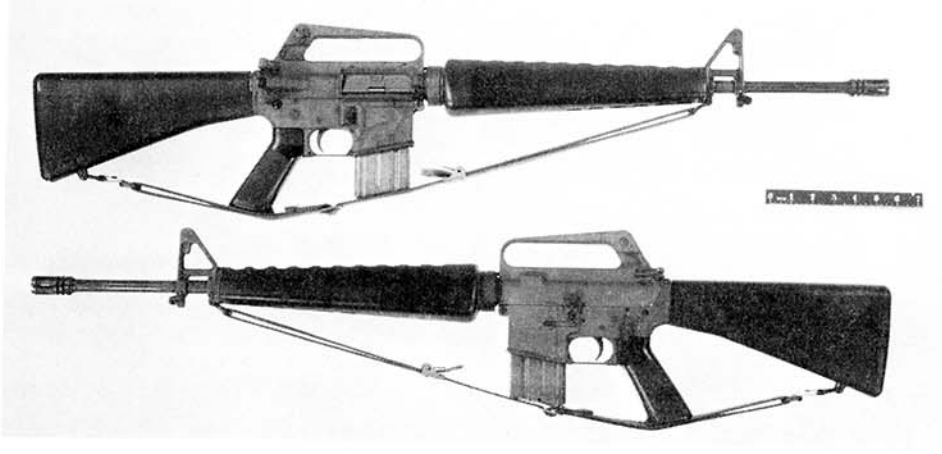

Figure 1.2-1: Right and Left Side Views of an M16A1 Rifle.

1.3 TEST OBJECTIVES

a. To detect any degradation of product quality during production.

b. To assure that the rifles conform to the technical requirements of the military specifications for the M16A1 rifle.

c. To provide data to AMSWE-QA for an independent reliability, maintainability, and availability assessment per AR 705-50.

1.4 SCOPE

Testing was conducted by the Materiel Testing Directorate at APG during the period from 28 October to 30 November 1971. The rifles were inspected and fired for accuracy and endurance. In accordance with the test plan (Reference 5), function and maintenance data were recorded throughout the test for use by WECOM in performance of a reliability - maintainability assessment. The data are contained in Table III of Appendix I. Statistical analysis was not used for evaluation of the performance of the M16A1 rifle because no criteria were provided which required this type of evaluation.

1.5 SUMMARY OF RESULTS

1.5.1 Subtest Findings

1.5.1.1 Inspection. There was no damage to the packing and crating or to the weapons and accessories. The 16 rifles received were clean and the markings were legible. The rifles met the inspection requirements and standards of the military specification for the M16A1 rifle (Reference 4).

1.5.1.2 Accuracy Test. The dispersion data from the accuracy targets show the performance of the six rifles fired for accuracy to be well within the permitted 4.8-inch extreme-spread limit. Also, with the sights adjusted within the allowable limits, the projectile impacts were all within the specified rectangular outline.

1.5.1.3 Endurance Test. Nine rifles were fired 6000 rounds each. Four broken extractor springs, one broken ejector spring, and one broken firing-pin-retaining pin occurred. With the exception of the firing-pin-retaining pin, the number of failures of the other components were within the permitted quantities stated in the military specification. Failure of a firing-pin-retaining pin is not permitted prior to 6000 rounds.

Nineteen failures to feed from the magazine occurred with one rifle. The military specification establishes an allowable number of four with a single rifle or nine with four rifles combined. The number of malfunctions with eight of the nine rifles was within the permitted limit.

During the last comparison test none of the rifles from the same producer as the rifles in this test failed to meet requirements because of excessive malfunctions, however, three of the seven rifles tested failed because of broken extractor springs. A total of 12 broken extractor springs occurred with the seven rifles, of which five of the springs failed before 2000 rounds of firing (2000-round minimum life prescribed).

1.5.2 Deficiencies and Shortcomings

1.5.2.1 Deficiencies. None.

1.5.2.2 Shortcomings. One rifle fired for endurance exceeded the permitted number of failures to feed from the magazine in a 6000-round test and a broken firing-pin-retaining pin occurred in another rifle at 3301 rounds (6000-round minimum life prescribed).

1.6 CONCLUSIONS

It was concluded that:

a. With the exception of two rifles which failed to meet reliability requirements, all the rifles tested met the inspection, accuracy, and reliability requirements of the military specification for the M16A1 rifle (para 2.2, 2.3, and 2.4).

b. The quality of the extractor springs in these rifles was superior to those used in the rifles in the last comparison test (para 2.4).

c. On an over-all basis the quality and performance of the rifles in this test were equal to those in the last comparison test (para 2.2, 2.3, and 2.4).

1.7 RECOMMENDATIONS

Not applicable.

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SECTION 2. DETAILS OF TEST

2.1 INTRODUCTION

2.1.1 General

All subtests were conducted in accordance with the test plan (Reference 5) which was prepared by WECOM.

Sixteen M16A1 rifles were received for test. To aid in programming in the various subtests the rifles were designated individually No. 1 through 16. Rifle serial numbers are identified with these designations outlined in Table 2.2-I. The subtests to which the rifles were subjected are outlined in Table 2.1-I.

Table 2.1-I. Subtests to Which the Individual Rifles Were Subjected

Subtest No.	Title	Rifle No.
2.2	Inspection	All
2.3	Accuracy	3, 4, 5, 10, 11, and 15
2.4	Endurance	1, 2, 6, 7, 8, 9, 12, 13, and 16
-	Spare rifle	14

2.1.2 Maintenance

With the exception of initial inspection, during which the rifles were disassembled, inspected, and maintained following the instructions in TM 9-1005-249-34 (Reference 3), maintenance throughout the subtests was performed per TM 9-1005-249-12 (Reference 2). The rifles were lubricated with MIL-L-46000A (LSA) semifluid lubricating oil during the accuracy and endurance tests.

2.1.3 Malfunction Data

The abbreviations used in this report to identify malfunctions are listed in Appendix VI. All malfunctions were identified by round number on the rifle and round number within a magazine. The failure of the bolt to remain to the rear malfunction always occurred after round 20 from the magazine. All other malfunctions are counted as occurring on whatever round number was being fired at the time of the malfunction.

2.2 INSPECTION TEST

2.2.1 Objectives

a. To determine that the test items and support materiel had been received in proper condition for test and were free from damage.

b. To inspect and to measure certain physical characteristics, and to test fire each rifle.

2.2.2 Criteria

a. The test items shall be adequately and clearly marked and undamaged (para 7.1.1 and 7.1.2 of Reference 5).

b. Trigger-pull force shall be 5.5 to 8.5 pounds and free of creep (para 3.3.7 of Reference 4).

c. Headspace shall be 1.4646 to 1.4706 inches (para 3.3.5 of Reference 4).

d. Firing-pin indent from inertia force shall not exceed 0.008 inch and shall not be less than 0.020 inch as a result of normal hammer fall. The indent shall not be off center more than one-half the diameter of the firing-pin point (para 3.3.6 of Reference 4).

e. Firing-pin protrusion shall be 0.028 to 0.036 inch (para 3.3.4.2 of Reference 4).

f. The average cyclic rate of fire for a 20-round continuous burst shall be 700 to 900 spm (para 3.3.9 of Reference 4).

g. The rifles shall meet the examination requirements of paragraph 4.6.2.2.2 of Reference 4.

2.2.3 Method

A thorough disassembly, inspection, and maintenance operation (per TM 9-1005-249-34) was performed on each rifle and physical characteristics were obtained as follows:

a. Trigger pull was determined by averaging five dry-firing trials as measured by a hand-held spring scale.

b. Headspace was determined by employing a graduated set of headspace gages (1.4646 to 1.4706 inch) to determine the longest gage which could be accepted in the rifle chamber with the bolt closed and locked. Also, the headspace was checked with the gage provided by AMSWE-QA.

c. Firing-pin protrusion was measured with a dial-indicator gage.

d. Bore measurements were obtained with the use of an air gage.

e. Firing-pin indent was measured employing copper-compression cylinders and a holding fixture inserted in the rifle chamber. The firing-pin indent test was conducted in two trials, first by measuring the depth of indent as a result of normal hammer fall against the firing pin, and then by measuring indent caused by inertia motion of the firing pin when the bolt carrier was freely released from the bolt catch position.

f. The rifle bolts were subjected to a magnetic-particle inspection for cracks, seams, or other discontinuities.

Each rifle was then fired 40 rounds (20 rounds in 3- to 5-round bursts immediately followed by a continuous 20-round burst) from a benchrest position. The cyclic rate of fire for each rifle was recorded during the continuous 20-round burst.

At the conclusion of firing the endurance test, the rifles were again inspected and headspace, firing-pin protrusion, trigger pull, firing-pin indent, and barrel bores were measured. After-test measurements were not recorded on the rifles fired in the accuracy test; these rifles were fired very few rounds (approximately 100).

2.2.4 Results

The rifles were packaged two per fiberboard carton; within the cartons they were individually contained in a sealed bag, type MIL-B-131E, classes 1 and 2. There was no damage to the packing, the crating, or the rifles and accessories. The items received with each rifle were seven magazines and one each of the following items: cleaning rod, chamber brush, bore brush, sling, plastic 5-ounce bottle, general-purpose cleaning brush, small-arms accessories case, and a maintenance manual (DA Pam 750-30). The rifles and accessories were clean and the markings were legible.

The trigger-pull, headspace, firing-pin protrusion, and indent measurements, as well as cyclic rates of fire recorded on the rifles during inspection, are all given in Table 2.2-I.

Table 2.2-I. Physical Measurements

APG No.	Mfr Serial No.	Measurements[a]										Cyclic Rate of Fire, spm
		Trigger Pull, lb		Headspace, in.		Firing-Pin Protrusion, in.		Firing-Pin Indent, in.				
								Inertia		Hammer Fall		
		Before	After	Before	After	Before	After	Before	After	Before	After	
1	4573468	7.4	7.9	1.4646	1.4646	0.033	0.033	0.005	0.005	0.023	0.024	831
2	4573626	7.2	7.6	1.4656	1.4656	.032	.033	.004	.005	.023	.023	853
3	4574806	6.8	-	1.4656	-	.033	-	.005	-	.023	-	851
4	4574883	7.1	-	1.4646	-	.033	-	.005	-	.023	-	883
5	4577777	7.2	-	1.4646	-	.032	-	.005	-	.023	-	840
6	4578490	7.6	7.1	1.4656	1.4656	.033	.034	.005	.006	.022	.023	883
7	4578608	7.6	8.6	1.4646	1.4656	.033	.034	.005	.004	.022	.023	827
8	4578674	7.3	7.0	1.4656	1.4656	.032	.032	.004	.003	.023	.023	783
9	4579219	7.5	[b] -	1.4646	[b] -	.034	[b] -	.005	[b] -	.023	[b] -	804
10	4580933	7.3	-	1.4646	-	.033	-	.006	-	.024	-	842
11	4582168	7.9	-	1.4646	-	.033	-	.005	-	.023	-	887
12	4582634	7.8	7.6	1.4656	1.4666	.033	.034	.005	.004	.024	.023	853
13	4583112	7.8	7.2	1.4646	1.4656	.033	.033	.005	.003	.023	.021	844
14	4585111	7.7	-	1.4646	-	.033	-	.005	-	.024	-	863
15	4585226	7.3	-	1.4656	-	.033	-	.005	-	.023	-	831
16	4585542	7.4	7.4	1.4666	1.4666	.032	.033	.005	.004	.024	.024	877

[a]The measurements are designated as before or after test, except for cyclic rate of fire, which was recorded during the firing of the second 20-round magazine (rounds 21 through 40) on all rifles. No after-test measurements were recorded on the rifles fired for accuracy.

[b]Excessive FF/BOB type malfunctions occurred with this rifle. Per request of AMSWE-QA the rifle was shipped to WECOM for determination of compliance with drawing requirements; after-test measurements were not recorded.

2.2.5 Analysis

All rifles met the criteria requirements as outlined in paragraph 2.2.2.

2.3 ACCURACY TEST

2.3.1 Objective

The objective was to determine the accuracy and dispersion characteristics of the test rifles.

2.3.2 Criteria

a. The extreme spread of a 10-shot group shall not exceed 4.8 inches at a range of 100 yards (para 3.3.10 of Reference 4).

b. All impacts of each 10-shot group at 100 yards shall be within the rectangular outline of the targeting and accuracy diagram (17.6 inches vertical by 11.6 inches horizontal) as specified in Figure 1 of Reference 4.

c. Sight adjustments may be made in order to place the 10-shot group within the rectangular outline cited above but the sight adjustments shall not exceed the following (para 3.3.10 of Reference 4):

   1) The front sight shall be no higher than flush, nor below flush by more than 0.030 inch.

   2) The rear sight shall be within two clicks right or left of mechanical zero.

2.3.3 Method

Six rifles were fired employing M193 ammunition which was quality-certified to group within a mean radius of 1.2 to 1.4 inches at 200 yards as measured in accordance with MIL-C-9963.

Prior to the first record target, three sighting shots were fired with the sights centrally located (rear sight at mechanical zero, front sight at a point 0.015 inch below flush position). The sights were then adjusted, if necessary, within the limits cited in paragraph 2.3.2c. This setting of the sights was used throughout the remainder of the accuracy test.

Five 10-shot targets were then fired semiautomatically with each rifle from a benchrest position in a closed range. All targets were fired by a rifleman holding a current NRA Master classification. The targets were fired no faster than 10 to 30 spm; the rifles were cooled to ambient range temperature between each set of five targets.

2.3.4 Results

The target data are summarized in Table 2.3-I. The individual target data are contained in Table I of Appendix I.

Table 2.3-I. Summary of Accuracy Firings[a]

Rifle No.	CI from AP[b], in. H	CI from AP[b], in. V	Extreme Spread, in.	Mean Radius, in.	No. of Rds Outside Rectangular Outline	No. of Fliers[c]
Range: 100 yards. Ammunition: Cartridge, ball, 5.56-mm, M193, lot TW-1-145. Condition: Benchrest.						
3	+0.8	-3.5	2.9	0.9	0	0
4	+0.6	+3.3	2.2	0.8	0	0
5	+1.0	+2.7	2.7	0.8	0	0
10	+1.9	-0.4	2.7	0.8	0	0
11	-2.0	-2.7	3.1	1.0	0	0
15	-0.9	-1.9	3.5	1.1	0	0

[a]The target measurements are in inches and the data are the average of five 10-round targets for each rifle.
[b]Center of impact from aiming point; the aiming point was at the 6 o'clock position on an 8-inch black bull's-eye which was located midway vertically and horizontally within a rectangular outline measuring 17.6 inches vertically by 11.6 inches horizontally.
[c]A flier is defined as a shot hole which is a greater distance from the nearest shot hole than the extreme spread of the other nine holes.

At the completion of the accuracy test each of the six rifles had been fired approximately 100 rounds and two BEC type malfunctions had been experienced. Both malfunctions occurred while firing a 20-round burst for the recording of the cyclic rate during the initial inspection. No similar malfunctions occurred with the nine rifles fired for endurance.

2.3.5 Analysis

The dispersion data show the performance of all six rifles to be well within the 4.8-inch extreme-spread limit permitted in MIL-R-45587 (Reference 4). Also, with the sights adjusted within the limits cited in paragraph 2.3.2c., the projectile impacts were all within the specified rectangular outline.

2.4 ENDURANCE TEST (6000-ROUND)

2.4.1 Objective

The objective was to determine the reliability and durability of the test weapons.

2.4.2 Criteria

a. The cyclic rate of fire for each rifle shall be within 700 to 940 spm as measured at the beginning of the test and at 1000-round intervals thereafter (para 3.3.12 of Reference 4).

b. The reliability and durability of the test weapons during 6000 rounds of firing shall not exceed the limits cited in Table I of Reference 4. (The reliability and durability standard has been extracted from MIL-R-45587 and is contained in Table II of Appendix I.)

2.4.3 Method

Seven rifles were each fired 6000 rounds of M193 ball ammunition. For round-count purposes, the 40 rounds fired for functioning and cyclic rate during the initial inspection were included in the 6000-round total for the test. With the exception of the first cycle, which consisted of 60 rounds, to maintain 100-round increments on the rifles the rifles were fired in 100-round cycles and were air-cooled after each cycle. All firing was accomplished from a benchrest position. The 100-round cycles were fired as follows:

a. Twenty rounds in bursts of approximately five rounds each.

b. Twenty rounds in a single continuous burst (record cyclic rate).

c. Twenty rounds semiautomatically.

d. Twenty rounds in bursts of approximately five rounds each.

e. Twenty rounds semiautomatically.

Maintenance (per TM 9-1005-249-12) was performed following each 1000 rounds of firing. The rifle bolts were magnetic-particle inspected initially (subtest 2.2) and after 6000 rounds. An inspection, which included trigger pull, firing-pin protrusion, firing-pin indent, head-space, and barrel-bore measurements, was conducted initially and at the conclusion of the test.

Fifteen magazines were used with each rifle. The magazines were numbered consecutively 1 through 15 and were employed in rotation throughout the test.

2.4.4 Results

The endurance test was initially fired with seven rifles, however, due to the failure of one of the rifles to meet reliability requirements because of excessive failures to feed from the magazine, two additional rifles were fired 6000 rounds per request of AMSWE-QA.

The reliability and durability data are summarized from the performance data contained in Appendix I and are presented in Table 2.4-I. The cyclic-rate-of-fire data recorded throughout the test are summarized for each 1000-round cycle and are presented in Table 2.4-II. One lot of ball M193 ammunition, TW-1-145, was fired throughout the test.

Table 2.4-I. Summary of Endurance and Reliability Data

Rifle No.	Malfunctions				Total Rifle Malfunctions	Defective, Damaged or Broken Parts[a]
	FF/BOB	FBL	FJ	FBR		
1			1		1	Two extractor springs (3000 each); one firing-pin-retaining pin (3301)[b]
2					0	
6					0	
[c] 7					0	One extractor spring (5000); one ejector spring (6000)
8		1		1	[d] 2	One extractor spring (6000)
9	19				[e] 19	
12				1	1	
[c] 13					0	
16					0	

[a] The numbers appearing in parenthesis indicate the life of the broken part in rounds fired.

[b] One leg broke from the firing-pin-retaining pin and lodged between the bolt carrier and upper receiver, thus preventing full recoil travel and causing a failure to eject.

[c] Rifles 7 and 13 were the two rifles fired for additional endurance and reliability data.

[d] The screws that assemble the key to the bolt carrier were loose during the 3000-round scheduled maintenance period. The screws were tightened and restaked.

[e] This rifle failed to meet reliability requirements because of an excessive number of FF/BOB type malfunctions.

Table 2.4-II. Summary of Cyclic-Rate-of-Fire Data during Endurance Test

Rifle No.	Remarks	Cyclic Rate of Fire, spm, 1000-Round Cycle No. 1	2	3	4	5	6
1	Max	831	865	875	875	906	902
	Min	756	822	823	844	838	869
	Ex var	75	43	52	31	68	33
	Avg	787	837	843	860	859	884
2	Max	879	921	937	928	937	915
	Min	809	861	867	877	838	865
	Ex var	70	60	70	51	99	50
	Avg	843	877	887	890	886	886
6	Max	883	926	904	917	921	908
	Min	822	859	861	863	857	883
	Ex var	61	67	43	54	64	25
	Avg	846	874	876	877	876	894
7	Max	879	895	921	895	915	904
	Min	827	887	885	847	861	859
	Ex var	52	08	36	48	54	45
	Avg	856	891	894	875	884	878
8	Max	829	851	879	924	921	919
	Min	764	808	822	869	867	877
	Ex var	65	43	57	55	54	42
	Avg	797	830	844	887	883	887
9	Max	857	924	889	908	921	897
	Min	752	845	827	829	853	838
	Ex var	105	79	62	79	68	59
	Avg	802	875	854	856	875	862
12	Max	853	912	933	937	924	910
	Min	762	844	851	861	859	879
	Ex var	91	68	82	76	65	31
	Avg	805	863	878	885	876	892

Table 2.4-II (Cont'd)

Rifle No.	Remarks	Cyclic Rate of Fire, spm 1000-Round Cycle No. 1	2	3	4	5	6
13	Max	893	883	926	908	912	897
	Min	844	859	871	834	831	825
	Ex var	49	24	55	74	81	72
	Avg	864	872	883	869	850	851
16	Max	906	910	930	926	933	933
	Min	842	867	887	895	883	900
	Ex var	64	43	43	31	50	33
	Avg	866	892	902	907	901	911

The before- and after-test measurements on trigger pull, headspace, firing-pin protrusion, and firing-pin indent are given in Table 2.2-I (subtest 2.2). The before- and after-test barrel-bore measurements are contained in the APG library file copy of this report. Magnetic-particle inspection of the bolts before test showed patterns on the bolts from two of the nine rifles which indicated some sort of discontinuities. The phosphate coating was not removed for further investigation. The magnetic-particle patterns on the two bolts were as follows:

a. Bolt for Rifle No. 4582634 (APG 12).

   1) A 1/16-inch pattern extended rearward from the top edge of the hole for the ejector retaining pin.

   2) A 1/32-inch pattern was present in the right fillet of the extractor slot. The pattern extended onto the face of the bolt 1/64 inch.

   3) A 1/32-inch pattern was present in the left fillet of the extractor slot beginning at the forward edge and extending rearward.

b. Bolt for Rifle No. 4578490 (APG 6). A 3/64-inch pattern was present in the fillet at the rear end of the extractor slot. It appeared to extend into the cam pin hole.

After completion of the endurance test the bolts in the rifles were again subjected to magnetic-particle inspection. The inspection showed small magnetic patterns on all bolts across the rear fillet of the lug adjacent to the right side of the extractor slot. Three of the bolts showed small patterns in the fillet of the extractor slot. The after-test

inspection showed the patterns disclosed on two of the bolts (rifles 6 and 12) prior to test had not enlarged. The occurrence of the discontinuities in the bolts was judged to be very minor in nature. Because no problems were experienced and no unsafe conditions resulted the discontinuities were not classified as a shortcoming.

2.4.5 Analysis

The military specification for the M16A1 rifle (MIL-R-45587) establishes an allowable number of malfunctions and parts breakage for a 6000-round endurance test. This reliability and durability standard has been extracted and is contained in Table II of Appendix I. The performance of the nine M16A1 rifles were assessed against these requirements and the assessment is given in Table 2.4-III.

Table 2.4-III. Rifle Performance Data Assessed against Military Specification Requirements

APG No.	MIL-R-45587 Requirement Met	MIL-R-45587 Requirement Failed	Reason for Failure
1		X	A broken firing-pin-retaining pin occurred[a].
2	X		
6	X		
7	X		
8	X		
9		X	Nineteen failure-to-feed type malfunctions from the magazine occurred[b].
12	X		
13	X		
16	X		

[a]One leg broke from the firing-pin-retaining pin and caused a failure to eject. This was readily clearable and did not put the rifle out of operation nor cause an unsafe condition. The component is considered critical and failure prior to 6000 rounds is not permitted.

[b]A total of four failures to feed from the magazine with a single rifle or nine with four rifles combined is allowed.

The cause of the FF/BOB malfunctions with rifle No. 9 was not determined. This type of malfunction occurred during both semiautomatic and automatic fire with various magazines, however, occurrence was predominantly on the eighteenth and nineteenth rounds from the magazine. Preliminary measurements on the bolt and receiver disclosed no discrepancies relative to drawing requirements. The interchange of component parts from a second rifle indicated that the cause of the malfunctions was probably attributable to a build-up of tolerances in the lower receiver of the

rifle. Per request of AMSWE-QA, the rifle and magazines were shipped to WECOM for physical measurements and investigation.

During the last comparison test (Reference 6) none of the rifles produced by Colt's Firearms failed to meet requirements because of excessive failure-to-feed type malfunctions, however, three of seven rifles tested failed because of broken extractor springs. A total of 12 broken extractor springs occurred with the seven rifles, of which five of the springs broke before 2000 rounds of firing.

During this comparison test four broken extractor springs occurred in testing nine rifles; the earliest failure occurred at 3000 rounds, thus demonstrating a definite superiority over the extractor springs used in the rifles in the previous comparison test.

SECTION 3. APPENDICES

APPENDIX I - TEST DATA

Index for Target Data

1. The target number identifies the rifle number and the target number, e.g.:

   3-1 = Rifle No. 3 and target No. 1.

2. The target data were recorded relative to the aiming point (the six o'clock position on the bull's-eye).

Table I-I. Target Data, inches

TGT NO.	EVD	MVD	VSD	EHD	MHD	HSD	ES	MR	CI H	CI V
3-1	2.6	0.6	0.8	1.7	0.5	0.6	3.0	0.9	0.6	-3.9
3-2	1.4	0.3	0.5	1.9	0.4	0.6	2.1	0.6	0.9	-3.8
3-3	4.2	0.9	1.2	3.0	0.7	1.0	4.2	1.3	1.5	-3.3
3-4	2.3	0.6	0.8	2.0	0.5	0.6	2.7	0.8	0.6	-3.4
3-5	2.2	0.6	0.7	1.7	0.4	0.6	2.7	0.7	0.4	-3.1
Mean	2.5	0.6	0.8	2.1	0.5	0.7	2.9	0.9	0.8	-3.5
4-1	2.7	0.7	0.9	2.1	0.5	0.7	2.7	1.0	0.5	3.6
4-2	1.6	0.5	0.6	1.9	0.5	0.7	2.1	0.8	0.8	2.8
4-3	1.8	0.6	0.7	1.5	0.3	0.4	1.8	0.7	0.8	2.5
4-4	2.4	0.6	0.7	1.3	0.3	0.4	2.4	0.8	0.7	4.3
4-5	1.7	0.3	0.5	1.4	0.3	0.4	1.7	0.6	0.2	3.2
Mean	2.0	0.5	0.7	1.6	0.4	0.5	2.2	0.8	0.6	3.3
5-1	2.1	0.6	0.7	1.0	0.3	0.4	2.1	0.7	0.4	3.6
5-2	1.9	0.5	0.6	2.3	0.6	0.7	2.3	0.8	0.7	3.3
5-3	3.4	0.9	1.0	2.0	0.3	0.5	3.4	1.0	1.2	2.4
5-4	2.2	0.4	0.6	2.3	0.4	0.7	2.6	0.7	1.2	2.0
5-5	2.2	0.6	0.7	2.6	0.6	0.8	3.3	0.8	1.5	2.4
Mean	2.4	0.6	0.7	2.0	0.4	0.6	2.7	0.8	1.0	2.7
10-1	2.2	0.8	0.9	1.0	0.3	0.3	2.2	0.8	1.7	0.1
10-2	2.9	0.6	0.8	2.5	0.5	0.7	3.1	0.8	2.2	-0.9
10-3	2.9	0.8	1.0	1.3	0.5	0.5	3.0	1.0	1.9	-0.8
10-4	2.5	0.5	0.7	1.9	0.5	0.6	2.5	0.8	2.2	0.0
10-5	2.4	0.6	0.8	1.7	0.4	0.5	2.6	0.8	1.5	-0.5
Mean	2.6	0.6	0.8	1.7	0.4	0.5	2.7	0.8	1.9	-0.4
11-1	3.5	0.8	1.1	2.7	0.7	0.9	3.6	1.3	-2.4	-2.4
11-2	2.2	0.6	0.7	2.1	0.7	0.8	2.6	0.9	-1.6	-2.3
11-3	2.8	0.6	0.8	2.0	0.5	0.7	3.0	0.8	-2.6	-3.1
11-4	1.7	0.4	0.5	1.9	0.5	0.6	2.2	0.7	-1.5	-3.1
11-5	4.1	0.8	1.2	1.3	0.5	0.5	4.1	1.0	-1.8	-2.6
Mean	2.9	0.6	0.9	2.0	0.6	0.7	3.1	1.0	-2.0	-2.7
15-1	3.1	0.7	0.9	1.2	0.3	0.4	3.1	0.8	0.0	-1.9
15-2	3.6	0.9	1.1	2.8	0.6	0.8	3.7	1.1	-0.6	-1.8
15-3	4.4	1.3	1.6	1.5	0.5	0.6	4.6	1.4	-0.9	-1.2
15-4	3.4	0.9	1.1	2.3	0.7	0.9	3.5	1.3	-1.3	-2.3
15-5	1.8	0.5	0.6	2.7	0.6	0.8	2.7	0.9	-1.9	-2.3
Mean	3.3	0.9	1.1	2.1	0.5	0.7	3.5	1.1	-0.9	-1.9

Table I-II. Malfunctions and Unserviceable Parts Permitted in 6000-Round Endurance Test (Extracted from Reference 4)

Malfunctions[1]	Single Rifle	Four Rifles
Failure of bolt to lock[2]	2	4
Failure to fire	2	4
Failure to feed (from magazine)	4	9
Failure to eject	2	4
Failure to chamber	3	7
Failure to extract	1	2
Bolt fails/hold rear	3	8
All other malfunctions[4]	0	0
Total - above malfunctions combined	9	22

Unserviceable Parts[1]	Minimum Life[5] Rounds	Four Rifles[6] Combined
Magazine assembly	250	2
Ejector spring	3,000	2
Extractor spring	2,000	4
Other parts (see note 3)	3,000	1
Total unserviceable parts - above unserviceable parts combined		4

[1]When malfunctions are traceable to particular parts it is permissible to replace such parts and record them as unserviceable, subject to the limitations of Table I. When verified by the Government representative that previously recorded malfunctions are attributable to an unserviceable part, such malfunctions shall not be counted against the rifle being tested, provided that they occurred not more than 200 rounds prior to replacement of the unserviceable part. These 200 rounds shall have been fired with the unserviceable part. However, such malfunctions shall remain recorded and properly identified. Malfunctions attributable solely to ammunition defects shall not be counted against the rifle; however, such malfunctions shall be recorded. (All malfunctions which are not counted against the rifle (i.e., attributable to an unserviceable part, Government furnished equipment, ammunition, etc.) shall be verified by Government Representative that the malfunction was caused by a defective condition of an unserviceable part, Government furnished equipment, ammunition, etc.) See Appendix III for definitions of malfunctions, unserviceable parts, etc.

[2]In the event of any failure of bolt to lock malfunction, the forward assist assembly shall be operated (M16A1 only). Failure of the forward assist assembly to remain engaged with the bolt carrier assembly during manual attempt to lock bolt shall be considered an additional malfunction in the category of "other malfunctions".

[3]Other parts shall be limited to trigger spring, disconnect spring, hammer spring, extractor pin and extractor.

[4]Other malfunctions include, but are not limited to: occurrence of doubling (two shots fired with a single trigger pull) during semi-automatic firing; failure to immediately stop firing when the trigger is released (uncontroled fire) during burst firing; and failure of forward bolt assist assembly to remain engaged with bolt carrier assembly during manual attempt to lock the bolt, etc.

[5]Minimum life rounds is defined as the minimum service life of an individual part, whether it is the original part or a replacement part, expressed in the number of weapon rounds fired with the part assembled in the weapon. For example, an extractor spring failing prior to firing 2000 rounds on a new rifle, has not met the minimum life rounds. The failure shall be recorded and shall be cause for test failure.

[6]The allowable number of unserviceable parts shown for 4 rifles combined applies only to parts failing after the minimum life rounds have been fired on the weapon. For example, ejector springs failing at 3500 rounds on one rifle and at 4100 rounds on a second weapon fall within the allowable limits of 2 on 4 rifles combined; however, failure of an ejector spring on a third rifle after firing 3000 rounds, exceeds the allowance and shall be cause for test failure.

MAINT. Type	MAINT. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS Mag. Rd No.	Mag. Code No	Mode of Fire	Type	Class	UNSERVICEABLE PARTS Part Name	Rd on Part at Replac	REMARKS
Ammunition: M193 ball, lot TW-1-145 (all rifles and all subtests)													
Rifle: Serial No. 45734468 (APG-1)													
Subtest: Initial Inspection													
S	DS	1.00	1.00	0									
				21 to 40	831		1-2						
Subtest: Endurance													
				121 to 140	756		1-7						
				221 to 240	788		1-12						
				321 to 340	762		1-2						
				421 to 440	806		1-7						
				521 to 540	770		1-12						
				621 to 640	827		1-2						
				721 to 740	762		1-7						
				821 to 840	778		1-12						
				921 to 940	791		1-2						
S	C	0.83	0.83	1000									
				1021 to 1040	865		1-7						
				1121 to 1140	840		1-12						

MAINT.		Maint.	Active Maint.	Rifle	Cyclic	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Time	Rd No	Rate (spm)	Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				1221 to 1240	829		1-2						
				1321 to 1340	822		1-7						
				1421 to 1440	838		1-12						
				1521 to 1540	840		1-2						
				1621 to 1640	844		1-7						
				1721 to 1740	831		1-12						
				1821 to 1840	823		1-2						
				1921 to 1940	834		1-7						
S	C	0.75	0.75	2000									
				2021 to 2040	875		1-12						
				2121 to 2140	851		1-2						
				2221 to 2240	831		1-7						
				2321 to 2340	829		1-12						
				2421 to 2440	823		1-2						
				2521 to 2540	844		1-7						
				2621 to 2640	838		1-12						
				2721 to 2740	847		1-2						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				2821 to 2840	847		1-7						
				2921 to 2940	847		1-12						
S	O	0.83	0.83	3000							Extractor spring	3000	Broken
				3021 to 3040	875		1-2						
				3121 to 3141	851		1-7						
				3221 to 3240	844		1-12						
P	O	0.16	0.16	3301		1	1-1	Burst	FJ	I	Firing pin retaining pin	3301	One leg broken
				3321 to 3340	849		1-2						
				3421 to 3440	861		1-7						
				3521 to 3540	857		1-12						
				3621 to 3640	875		1-2						
				3721 to 3740	861		1-7						
				3821 to 3840	855		1-12						
				3921 to 3940	871		1-2						
S	C	0.75	0.75	4000									
				4021 to 4040	906		1-7						
				4121 to 4140	875		1-12						
				4221 to 4240	838		1-2						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				4321 to 4340	849		1-7						
				4421 to 4440	859		1-12						
				4521 to 4540	847		1-2						
				4621 to 4640	840		1-7						
				4721 to 4740	853		1-12						
				4821 to 4840	859		1-2						
				4921 to 4940	865		1-7						
S	C	0.72	0.72	5000									
				5021 to 5040	902		1-12						
				5121 to 5140	887		1-2						
				5221 to 5240	879		1-7						
				5321 to 5340	873		1-12						
				5421 to 5440	902		1-2						
				5521 to 5540	877		1-7						
				5621 to 5640	883		1-12						
				5721 to 5740	885		1-2						
				5821 to 5840	883		1-7						
	I			5921 to 5940	869		1-12						
S	O+DS	0.92	0.92	6000 End of Test							Extractor spring	6000	Broken

MAINT.		Maint.	Active Maint.	Rifle	Cyclic	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Time	Rd No	Rate (spm)	Mag. Rd No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
Rifle: Serial No. 4573				626	(APG-2)								
Subtest: Initial Inspection													
S	DS	1.08	1.08	0									
				21 to 40	853		2-2						
Subtest: Endurance													
				121 to 140	818		2-7						
				221 to 240	840		2-12						
				321 to 340	847		2-2						
				421 to 440	863		2-7						
				521 to 540	809		2-12						
				621 to 640	879		2-2						
				721 to 740	838		2-7						
				821 to 840	847		2-12						
				921 to 940	832		2-2						
S	C	0.58	0.58	1000									
				1021 to 1040	921		2-7						
				1121 to 1140	881		2-12						
				1221 to 1240	863		2-2						
				1321 to 1340	869		2-7						
				1421 to 1440	857		2-12						

MAINT.		Maint.	Active	Rifle	Cyclic	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Maint. Time	Rd No	Rate (spm)	Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	NH on Part at Replac	
				1521 to 1540	877		2-2						
				1621 to 1640	871		2-7						
				1721 to 1740	861		2-12						
				1821 to 1840	877		2-2						
				1921 to 1940	885		2-7						
S	C	0.67	0.67	2000									
				2021 to 2040	937		2-12						
				2121 to 2140	887		2-2						
				2221 to 2240	867		2-7						
				2321 to 2340	881		2-12						
				2421 to 2440	883		2-2						
				2521 to 2540	875		2-7						
				2621 to 2640	879		2-12						
				2721 to 2740	893		2-2						
				2821 to 2840	869		2-7						
				2921 to 2940	895		2-12						
S	C	0.73	0.73	3000									
				3021 to 3040	928		2-2						
				3121 to 3140	879		2-7						
				3221 to 3240	877		2-12						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				3321 to 3340	887		2-2						
				3421 to 3440	877		2-7						
				3521 to 3540	881		2-12						
				3621 to 3640	904		2-2						
				3721 to 3740	889		2-7						
				3821 to 3840	885		2-12						
				3921 to 3940	893		2-2						
S	C	0.70	0.70	4000									
				4021 to 4040	937		2-7						
				4121 to 4140	897		2-12						
				4221 to 4240	883		2-2						
				4321 to 4340	838		2-7						
				4421 to 4440	883		2-12						
				4521 to 4540	879		2-2						
				4621 to 4640	879		2-7						
				4721 to 4740	887		2-12						
				4821 to 4840	887		2-2						
				4921 to 4940	887		2-7						
S	C	0.67	0.67	5000									

MAINT. Type	MAINT. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (rpm)	MALFUNCTIONS Mag Rd No.	MALFUNCTIONS Mag. Code No	MALFUNCTIONS Mode of Fire	MALFUNCTIONS Type	MALFUNCTIONS Class	UNSERVICEABLE PARTS Part Name	UNSERVICEABLE PARTS Rd on Part at Replac	REMARKS
				5021 to 5040	915		2-12						
				5121 to 5140	877		2-2						
				5221 to 5240	865		2-7						
				5321 to 5340	869		2-12						
				5421 to 5440	891		2-2						
				5521 to 5540	885		2-7						
				5621 to 5640	879		2-12						
				5721 to 5740	897		2-2						
				5821 to 5840	891		2-7						
				5921 to 5940	893		2-12						
S	O+DS	1.00	1.00	6000									
			End	of Test									
Rifle: Serial No 4574				806	(APG-3)								
Subtest: Initial Inspection													
S	DS	1.16	1.16	0									
				21 to 40	851								
Subtest: Accuracy													
S	C	0.57	0.57	93									Targets 3-1 thru 3-5
				End of Test									

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
Rifle: Serial No. 4574883 (APG-4)													
Subtest: Initial Inspection													
S	DS	1.22	1.22	0									
				21 to 40	883								
Subtest: Accuracy													
S	O	0.62	0.62	113									Targets 4-1 thru 4-5
				End of Test									
Rifle: Serial No 4577777 (APG-5)													
Subtest: Initial Inspection													
S	DS	1.17	1.17	0									
				21 to 40	840								
Subtest: Accuracy													
S	O	0.73	0.73	103									Targets 5-1 thru 5-5
				End of Test									

MAINT. Type	MAINT. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	UNSERVICEABLE PARTS Part Name	Rd on Part at Replac	REMARKS
Rifle: Serial No 457849 (APG-6)													
Subtest: Initial Inspection													
S	DS	1.15	1.15	0									
				21 to 40	883		6-2						
Subtest: Endurance													
				121 to 140	844		6-7						
				221 to 240	853		6-12						
				321 to 340	822		6-2						
				421 to 440	857		6-7						
				521 to 540	827		6-12						
				621 to 640	859		6-2						
				721 to 740	832		6-7						
				821 to 840	857		6-12						
				921 to 940	829		6-2						
S	C	0.67	0.67	1000									
				1021 to 1040	926		6-7						
				1121 to 1140	879		6-12						
				1221 to 1240	867		6-2						

MAINT.		Maint.	Active Maint.	Rifle	Cyclic	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Time	Rd No	Rate (spm)	Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				1321 to 1340	873		6-7						
				1421 to 1440	869		6-12						
				1521 to 1540	863		6-2						
				1621 to 1640	859		6-7						
				1721 to 1740	867		6-12						
				1821 to 1840	867		6-2						
				1921 to 1940	869		6-7						
S	C	0.77	0.77	1941 to 2000									
				2021 to 2040	904		6-12						
				2121 to 2140	881		6-2						
				2221 to 2240	873		6-7						
				2321 to 2340	861		6-12						
				2421 to 2440	873		6-2						
				2521 to 2540	869		6-7						
				2621 to 2640	869		6-12						
				2721 to 2740	877		6-2						
				2821 to 2840	867		6-7						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				2921 to 2940	887		6-12						
S	C	0.70	0.70	3000									
				3021 to 3040	917		6-2						
				3121 to 3140	885		6-7						
				3221 to 3240	873		6-12						
				3321 to 3340	879		6-2						
				3421 to 3440	867		6-7						
				3521 to 3540	867		6-12						
				3621 to 3640	871		6-2						
				3721 to 3740	863		6-7						
				3821 to 3840	873		6-12						
				3921 to 3940	879		6-2						
S	C	0.73	0.73	4000									
				4021 to 4040	921		6-7						
				4121 to 4140	881		6-12						
				4221 to 4240	869		6-2						
				4321 to 4340	857		6-7						
				4421 to 4440	867		6-12						

MAINT.		Maint.	Active Maint.	Rifle	Cyclic Rate	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Time	Rd No	(spm)	Mag. Nd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Nd on Part at Replac	
				4521 to 4540	867		6-2						
				4621 to 4640	863		6-7						
				4721 to 4740	873		6-12						
				4821 to 4840	875		6-2						
				4921 to 4940	889		6-7						
S	C	0.68	0.68	5000									
				5021 to 5040	908		6-12						
				5121 to 5140	891		6-2						
				5221 to 5240	887		6-7						
				5321 to 5340	883		6-12						
				5421 to 5440	900		6-2						
				5521 to 5540	897		6-7						
				5621 to 5640	877		6-12						
				5721 to 5740	904		6-2						
				5821 to 5840	902		6-7						
				5921 to 5940	887		6-12						
S	O+DS	0.95	0.95	6000									
			End	of	Test								

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	No on Part at Replac	
Rifle Serial No 4578608 (APG-7)													
Subtest Initial Inspection													
S	DS	1.13	1.13	0									
				21 to 40	827		7-2						
Subtest: Endurance													
				121 to 140	829		7-7						
				221 to 240	838		7-12						
				321 to 340	857		7-2						
				421 to 440	842		7-7						
				521 to 540	873		7-12						
				621 to 640	867		7-2						
				721 to 740	869		7-7						
				821 to 840	879		7-12						
				921 to 940	877		7-2						
S	C	0.53	0.53	1000									
				1021 to 1040	895		7-7						
				1121 to 1140	895		7-12						
				1221 to 1240	883		7-2						
				1321 to 1340	889		7-7						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				1421 to 1440	889		7-12						
				1521 to 1540	891		7-2						
				1621 to 1640	889		7-7						
				1721 to 1740	897		7-12						
				1821 to 1840	893		7-2						
				1921 to 1940	887		7-7						
S	C	0.50	0.50	2000									
				2021 to 2040	921		7-12						
				2121 to 2140	887		7-2						
				2221 to 2240	879		7-7						
				2321 to 2340	885		7-12						
				2421 to 2440	906		7-2						
				2521 to 2540	893		7-7						
				2621 to 2640	887		7-12						
				2721 to 2740	889		7-2						
				2821 to 2840	895		7-7						
				2921 to 2940	877		7-12						
S	C	0.55	0.55	3000									

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Nl on Part at Replac	
				3021 to 3040	895		7-2						
				3121 to 3140	887		7-7						
				3221 to 3240	881		7-12						
				3321 to 3340	863		7-2						
				3421 to 3440	885		7-7						
				3521 to 3540	879		7-12						
				3621 to 3640	881		7-2						
				3721 to 3740	867		7-7						
				3821 to 3840	867		7-12						
				3921 to 3940	847		7-2						
S	C	0.53	0.53	4000									
				4021 to 4040	915		7-7						
				4121 to 4140	906		7-12						
				4221 to 4240	891		7-2						
				4321 to 4340	887		7-7						
				4421 to 4440	879		7-12						
				4521 to 4540	887		7-2						
				4621 to 4640	877		7-7						
				4721 to 4740	873		7-12						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag Rd No.	Mag Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				4821 to 4840	865		7-2						
				4921 to 4940	861		7-7						
S	O	0.50	0.50	5000							Extractor spring	5000	Broken
				5021 to 5040	904		7-12						
				5121 to 5140	897		7-2						
				5221 to 5240	875		7-7						
				5321 to 5340	873		7-12						
				5421 to 5440	883		7-2						
				5521 to 5540	859		7-7						
				5621 to 5640	873		7-12						
				5721 to 5740	873		7-2						
				5821 to 5840	865		7-7						
				5921 to 5940	873		7-12						
S	O tps	0.77	0.77 End	6000 of Test							Ejector spring	6000	Broken

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
Rifle: Serial No. 45786 74 (APG-8)													
Subtest: Initial Inspection													
S	DS	1.02	1.02	0									
				21 to 40	783		8-2						
Subtest: Endurance													
				121 to 140	764		8-7						
				221 to 240	829		8-12						
				321 to 340	772		8-2						
				421 to 440	818		8-7						
				521 to 540	801		8-12						
				621 to 640	829		8-2						
				721 to 740	788		8-7						
				821 to 840	809		8-12						
				921 to 940	776		8-2						
S	C	0.73	0.73	1000									
				1021 to 1040	851		8-7						
				1121 to 1140	845		8-12						
				1221 to 1240	8[illegible]		8-2						
				1321 to 1340	7[illegible]		8-7						

FIRE. Type	FIRE. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (rpm)	MALFUNCTIONS Msg No.	MALFUNCTIONS Msg Code No	MALFUNCTIONS Mode of Fire	MALFUNCTIONS Type	MALFUNCTIONS Class	UNSERVICEABLE Part Name	UNSERVICEABLE Rd on Part at Replac	REMARKS
				1421 to 1440	831		8-12						
				1521 to 1540	823		8-2						
				1621 to 1640	808		8-7						
				1721 to 1740	808		8-12						
				1821 to 1840	815		8-2						
				1921 to 1940	811		8-7						
S	C	0.72	0.72	2000									
				2021 to 2040	879		8-12						
				2121 to 2140	840		8-2						
				2221 to 2240	840		8-7						
				2321 to 2340	842		8-12						
				2421 to 2440	838		8-2						
				2521 to 2540	857		8-7						
				2621 to 2640	849		8-12						
				2721 to 2740	840		8-2						
				2821 to 2840	831		8-7						
				2921 to 2940	822		8-12						
S	DS	0.67	0.67	3000									Bolt carrier. Key loose. The screws were tightened and restaked.
				2063		3	8-4	Burst	FBL	I			CH/M. The round was damaged during feeding.

MAINT. Type	MAINT. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS Mag Rd No	Mag. Code No	Mode of Fire	Type	Class	UNSERVICEABLE PARTS Part Name	UNSERVICEABLE PARTS Rd on Part at Replac	REMARKS
				3021 to 3040	924		8-2						
				3121 to 3140	891		8-7						
				3221 to 3240	875		8-12						
				3321 to 3340	869		8-2						
				3421 to 3440	885		8-7						
				3521 to 3540	887		8-12						
				3621 to 3640	881		8-2						
				3721 to 3740	889		8-7						
				3821 to 3840	877		8-12						
				3921 to 3940	895		8-2						
S	C	0.62	0.62	4000									
				4021 to 4040	921		8-7						
				4121 to 4140	906		8-12						
				4221 to 4240	869		8-2						
				4321 to 4340	871		8-7						
				4421 to 4440	879		8-12						
				4521 to 4540	867		8-2						
				4621 to 4640	867		8-7						
				4700		20	8-5	Semi	FBR	I			CH
				4721 to 4740	908		8-12						

M.E.T.		Maint.	Active Maint.	Rifle	Cyclic Rate	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Time	Rd No	(spm)	Mag No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				4821 to 4840	867		8-2						
				4921 to 4940	879		8-7						
S	C	0.65	0.65	5000									
				5021 to 5040	919		8-12						
				5121 to 5140	881		8-2						
				5221 to 5240	877		8-7						
				5321 to 5340	881		8-12						
				5421 to 5440	883		8-2						
				5521 to 5540	893		8-7						
				5621 to 5640	883		8-12						
				5721 to 5740	893		8-2						
				5821 to 5840	895		8-7						
				5921 to 5940	883		8-12						
S	O+DS	0.88	0.88	6000									
			End of	Test							Extractor Spring	6000	Broken

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag Rd No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
Rifle: Serial No. 457921 (APG-9)													
Subtest: Initial Inspection													
S	DS	1.12	1.12	0									
				39		19	9-2	Auto	FF/BOB	I			CH
				21 to 39	804		9-2						
				121 to 140	759		9-7						
				221 to 240	809		9-12						
				278		18	9-14	Burst	FF/BOB	I			CH/BA
				339		19	9-2	Auto	FF/BOB	I			CH
				321 to 339	767		9-2						
				399		19	9-5	Semi	FF/BOB	I			CH
				421 to 440	820		9-7						
				459		19	9-8	Semi	FF/BOB	I			CH/BA
				519		19	9-11	Burst	FF/BOB	I			CH
				521 to 540	765		9-12						
				639		19	9-2	Auto					
				621 to 640	857		9-2						
				659		19		Semi	FF/BOB	I			CH
				721 to 740	802		9-7						

MAINT. Type	MAINT. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS Mag. Mf. No.	Mag. Code No	Mode of Fire	Type	Class	UNSERVICEABLE PARTS Part Name	Nl on Part at Replac	REMARKS
				821 to 840	831		9-12						
				939		19	9-2	Auto	FF/808	I			CH
				921 to 939	811		9-2						
S	C	0.58	0.58	1000									
At this time, per request of AMSWE-QA, the lower receiver from a rifle No 4585111 (a spare rifle - APG-14) was assembled to the upper receiver of rifle No 4579219 (APG-9).													
				1021 to 1040	924		9-7						
				1121 to 1140	873		9-12						
				1221 to 1240	885		9-2						
				1321 to 1340	842		9-7						
				1421 to 1440	863		9-12						
				1521 to 1540	845		9-2						
				1621 to 1640	867		9-7						
				1721 to 1740	881		9-12						
				1821 to 1840	915		9-2						
				1921 to 1940	857		9-7						
S	C	0.75	0.75	2000									
At this time the original upper and lower receivers for rifle 4579219 (APG-4) were reassembled.													

MAINT.		Maint.	Active	Rifle	Cyclic	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Maint. Time	Rd No	Rate (spm)	Mag Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	NI on Part at Replac	
				2021 to 2040	879		9-12						
				2121 to 2140	889		9-2						
				2221 to 2240	849		9-7						
				2321 to 2340	867		9-12						
				2421 to 2440	851		9-2						
				2459		19	9-3	Semi	FF/BOB	I			CH
				2521 to 2540	838		9-7						
				2559		19	9-8	Semi	FF/BOB	I			CH
				2579		19	9-9	Burst	FF/BOB	I			CH
				2621 to 2640	827		9-12						
				2739		19	9-2	Auto	FF/BOB	I			CH
				2721 to 2739	844		9-2						
				2821 to 2840	851		9-7						
				2859		19	9-8	Semi	FF/BOB	I			CH
				2921 to 2940	842		9-12						
S	C+DS	0.73	0.73	3000									

At this time, per request of AMSWE-QA, the bolt catch, spring, plunger and roll pin from rifle No 4585111 (APG-14) were installed in the lower receiver of rifle No 4579219 (APG-9). The original upper receiver was still being used.

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag Rd No.	Mag Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				3021 to 3040	908		9-2						
				3121 to 3140	865		9-7						
				3221 to 3240	834		9-12						
				3321 to 3340	842		9-2						
				3421 to 3440	859		9-7						
				3521 to 3540	853		9-12						
				3621 to 3640	867		9-2						
				3721 to 3740	829		9-7						
				3821 to 3840	847		9-12						
				3879		19	9-14	Burst	FF/BOB	I			CH
				3921 to 3940	857		9-2						
S	C	0.65	0.65	4000									
				4021 to 4040	921		9-7						
				4121 to 4140	904		9-12						
				4159		19	9-13	Semi	FF/BOB	I			CH
				4221 to 4240	871		9-2						
				4321 to 4340	857		9-7						
				4421 to 4440	863		9-12						
				4539		19	9-2	Auto	FF/BOB	I			CH

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				4521 to 4539	879		9-2						
				4639		19	9-7	Auto	FF/BOB	I			CH
				4621 to 4640	861		9-7						
				4721 to 4740	871		9-12						
				4821 to 4840	867		9-2						
				4921 to 4940	853		9-7						
S	C&DS	0.68	0.68	5000									
At this time the original bolt catch, spring, plunger and roll pin were reassembled in rifle No 4579219 (APG-9) and the upper receiver from rifle No. 4585111 (APG-14) was assembled.													
				5021 to 5040	895		9-12						
				5121 to 5140	897		9-2						
				5221 to 5240	865		9-7						
				5321 to 5340	859		9-12						
				5421 to 5440	851		9-2						
				5462		2	9-4	Burst	FF/BOB	I			CH
				5521 to 5540	861		9-7						
				5621 to 5640	845		9-12						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				5721 to 5740	857		9-2						
				5821 to 5840	838		9-7						
				5921 to 5940	857		9-12						
S	O+DS	0.90	0.90	6000 End of	Test								
Rifle: Serial No. 4580933 (APG-10)													
Subtest: Initial Inspection													
S	DS	1.20	1.20	0									
				39		19	10-2	Auto	BEC	I			CH
				40 to 59	842		10-2						
Subtest: Accuracy													
S	O	0.83	0.83	112									Tgts 10-1 thru 10-5
				End of	Test								
Rifle: Serial No. 4582168 (APG-11)													
Subtest: Initial Inspection													
S	DS	1.25	1.25	0									
				21 to 40	887		11-2						
Subtest: Accuracy													
S	O	0.73	0.73	93									Tgts 11-1 thru 11-5
				End of	Test								

M.T.M.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag Mf. No	Mag Code No	Mode of Fire	Type	Class	Part Name	NI on Part at Replac	
Rifle : Serial No.			45826	34	(APG-12)								
Subtest : Initial Inspection													
S	DS	1.15	1.15	0									
				21 to 40	853		12-2						
Subtest : Endurance													
				121 to 140	826		12-7						
				221 to 240	811		12-12						
				321 to 340	788		12-2						
				421 to 440	809		12-7						
				521 to 540	783		12-12						
				621 to 640	838		12-2						
				721 to 740	762		12-7						
				821 to 840	796		12-12						
				921 to 940	786		12-2						
S	C	0.58	0.58	1000									
				1021 to 1040	912		12-7						
				1121 to 1140	847		12-12						
				1221 to 1240	849		12-2						
				1321 to 1340	844		12-7						

M.O.S.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				1131 to 1140	857		12-12						
				1521 to 1540	865		12-2						
				1621 to 1640	859		12-7						
				1721 to 1740	863		12-12						
				1821 to 1840	863		12-2						
				1921 to 1940	875		12-7						
5	C	0.68	0.68	2000 2021 to 2040	933		12-12						
				2121 to 2140	863		12-2						
				2221 to 2240	851		12-7						
				2321 to 2340	867		12-12						
				2421 to 2440	863		12-2						
				2521 to 2540	883		12-7						
				2621 to 2640	879		12-12						
				2721 to 2740	879		12-2						
				2821 to 2840	879		12-7						
				2921 to 2940	879		12-12						
5	C	0.63	0.63	3000 3060		20	12-3	Semi	FBR	I			CH

M.O.S.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (rpm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Nr on Part at Replac	
				3021 to 3040	937		12-2						
				3121 to 3140	897		12-7						
				3221 to 3240	881		12-12						
				3321 to 3340	883		12-2						
				3421 to 3440	879		12-7						
				3521 to 3540	887		12-12						
				3621 to 3640	877		12-2						
				3721 to 3740	879		12-7						
				3821 to 3840	861		12-12						
				3921 to 3940	865		12-2						
S	C	0.67	0.67	11000									
				4021 to 4040	924		12-7						
				4121 to 4140	887		12-12						
				4221 to 4240	859		12-2						
				4321 to 4340	867		12-7						
				4421 to 4440	869		12-12						
				4521 to 4540	877		12-2						
				4621 to 4640	869		12-7						
				4721 to 4740	865		12-12						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Mt. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				4821 to 4840	873		12-2						
				4921 to 4940	863		12-7						
S	C	0.50	0.50	5000									
				5021 to 5040	910		12-12						
				5121 to 5140	889		12-2						
				5221 to 5240	887		12-7						
				5321 to 5340	885		12-12						
				5421 to 5440	879		12-2						
				5521 to 5540	889		12-7						
				5621 to 5640	897		12-12						
				5721 to 5740	897		12-2						
				5821 to 5840	897		12-7						
				5921 to 5940	889		12-12						
S	O+DS	0.97	0.97	6000									
				End of	Test								

ITEM		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE Parts		REMARKS
Type	Level					Mag Rd No	Mag Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
Rifle, Serial No 4583112 (APG-13)													
Subtest: Initial Inspection													
S	DS	1.12	1.12	0									
				21 to 40	844		13-2						
Subtest: Endurance													
				121 to 140	859		13-7						
				221 to 240	847		13-12						
				321 to 340	847		13-2						
				421 to 440	859		13-7						
				521 to 540	871		13-12						
				621 to 640	879		13-2						
				721 to 740	871		13-7						
				821 to 840	893		13-12						
				921 to 940	873		13-2						
S	C	0.52	0.52	1000									
				1021 to 1040	879		13-7						
				1121 to 1140	867		13-12						
				1221 to 1240	883		13-2						
				1321 to 1340	879		13-7						

M.E.T.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	INSTRUCTIONS					UNSERVICEABLE Radio		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rl on Part at Replac	
				1421 to 1440	869		13-12						
				1521 to 1540	869		13-2						
				1621 to 1640	873		13-7						
				1721 to 1740	859		13-12						
				1821 to 1840	869		13-2						
				1921 to 1940	871		13-7						
S	C	0.57	0.57	2000									
				2021 to 2040	926		13-12						
				2121 to 2140	879		13-2						
				2221 to 2240	873		13-7						
				2321 to 2340	879		13-12						
				2421 to 2440	879		13-2						
				2521 to 2540	875		13-7						
				2621 to 2640	879		13-12						
				2721 to 2740	875		13-2						
				2821 to 2840	897		13-7						
				2921 to 2940	871		13-12						
S	C	0.57	0.57	3000									

M.T.E.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Rd. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				3321 to 3040	908		13-2						
				3321 to 3140	900		13-7						
				3221 to 3240	879		13-12						
				3321 to 3340	867		13-2						
				3421 to 3440	867		13-7						
				3521 to 3540	863		13-12						
				3621 to 3640	865		13-2						
				3721 to 3740	863		13-7						
				3821 to 3840	847		13-12						
				3921 to 3940	834		13-2						
S	C	0.52	0.52	4000									
				4021 to 4040	912		13-7						
				4121 to 4140	889		13-12						
				4221 to 4240	847		13-2						
				4321 to 4340	844		13-7						
				4421 to 4440	831		13-12						
				4521 to 4540	832		13-2						
				4621 to 4640	836		13-7						
				4721 to 4740	834		13-12						

M.I.T.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag. Mf. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				4821 to 4840	832		13-2						
				4921 to 4940	838		13-7						
S	C	0.52	0.52	5000									
				5021 to 5040	897		13-12						
				5121 to 5140	863		13-2						
				5221 to 5240	859		13-7						
				5321 to 5340	857		13-12						
				5421 to 5440	847		13-2						
				5521 to 5540	844		13-7						
				5621 to 5640	834		13-12						
				5721 to 5740	840		13-2						
				5821 to 5840	840		13-7						
				5921 to 5940	825		13-12						
S	O+DS	0.75	0.75	6000									
			End	of	Test								

MAINT. Type	MAINT. Level	Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS Mag Rd No.	Mag. Code No	Mode of Fire	Type	Class	UNSERVICEABLE PARTS Part Name	UNSERVICEABLE PARTS Rd on Part at Replac	REMARKS
Rifle: Serial No. 4585				5111	(APG-14)								
Subtest: Initial Inspection													
S	DS	1.33	1.33	0									
				21 to 40	863		14-2						
S	O	0.63	0.63	End of test, except for utilization of component parts as described during test with rifle No 45792		19	(APG-9),						
Rifle: Serial No. 4585				226	(APG-15)								
Subtest: Initial Inspection													
S	DS	1.25	1.25	0									CH
				39		19	15-2	Auto	BEC	I			
				40 to 59	831		15-2						
Subtest: Accuracy													
S	O	0.68	0.68	112									Tgts 14-1 thru 14-5
				End of Test									

M.E.W.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Msg Rd No	Msg. Code No	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
RdSet: Serial No. 4585				542	(APG-16)								
Subtest: Initial Inspection													
S	DS	1.22	1.22	0									
				21 to 40	877		16-2						
Subtest: Endurance													
				121 to 140	842		16-7						
				221 to 240	867		16-12						
				321 to 340	845		16-2						
				421 to 440	869		16-7						
				521 to 540	855		16-12						
				621 to 640	906		16-2						
				721 to 740	847		16-7						
				821 to 840	887		16-12						
				921 to 940	867		16-2						
S	C	0.83	0.83	1000									
				1021 to 1040	910		16-7						
				1121 to 1140	893		16-12						
				1221 to 1240	895		16-2						
				1321 to 1340	887		16-7						

MAINT.		Maint. Man Hrs	Active Maint. Time	Rifle Rd No	Cyclic Rate (spm)	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level					Mag Rd. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Rd on Part at Replac	
				1421 to 1440	902		16-12						
				1521 to 1540	897		16-2						
				1621 to 1640	895		16-7						
				1721 to 1740	867		16-12						
				1821 to 1840	881		16-2						
				1921 to 1940	897		16-7						
S	C	0.70	0.70	2000									
				2021 to 2040	930		16-12						
				2121 to 2140	902		16-2						
				2221 to 2240	897		16-7						
				2321 to 2340	897		16-12						
				2421 to 2440	897		16-2						
				2521 to 2540	902		16-7						
				2621 to 2640	897		16-12						
				2721 to 2740	906		16-2						
				2821 to 2840	887		16-7						
				2921 to 2940	912		16-12						
S	C	0.68	0.68	3000									

MAINT.		Maint.	Active Maint.	Rifle	Cyclic Rate	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Time	Rd No	(spm)	Mag. Nr. No.	Mag. CodeNo	Mode of Fire	Type	Class	Part Name	Nr on Part at Replac	
				3021 to 3040	926		16-2						
				3121 to 3140	908		16-7						
				3221 to 3240	908		16-12						
				3321 to 3340	915		16-2						
				3421 to 3440	900		16-7						
				3521 to 3540	902		16-12						
				3621 to 3640	900		16-2						
				3721 to 3740	910		16-7						
				3821 to 3840	895		16-12						
				3921 to 3940	902		16-2						
S	C	0.57	0.57	4000									
				4021 to 4040	933		16-7						
				4121 to 4140	921		16-12						
				4221 to 4240	887		16-2						
				4321 to 4340	902		16-7						
				4421 to 4440	889		16-12						
				4521 to 4540	893		16-2						
				4621 to 4640	883		16-7						
				4721 to 4740	900		16-12						

MAINT.		Maint.	Active	Rifle	Cyclic	MALFUNCTIONS					UNSERVICEABLE PARTS		REMARKS
Type	Level	Man Hrs	Maint. Time	Rd No	Rate (spm)	Mag Nr. No.	Mag. Code No	Mode of Fire	Type	Class	Part Name	NI on Part at Replac	
				4821 to 4840	902		16-2						
				4921 to 4940	902		16-7						
S	C	0.60	0.60	5000									
				5021 to 5040	933		16-12						
				5121 to 5140	910		16-2						
				5221 to 5240	906		16-7						
				5321 to 5340	900		16-12						
				5421 to 5440	904		16-2						
				5521 to 5540	919		16-7						
				5621 to 5640	910		16-12						
				5721 to 5740	906		16-2						
				5821 to 5840	919		16-7						
				5921 to 5940	902		16-12						
S	O+DS	0.97	0.97 End	6000 of	Test								

APPENDIX II - TEST FINDINGS

Not used.

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APPENDIX III - DEFICIENCIES AND SHORTCOMINGS

1. Deficiencies

None.

2. Shortcomings

Shortcoming	Suggested Corrective Action	Remarks
2.1 One of the nine rifles fired 6000 rounds for reliability failed to meet the malfunction requirements of the military specification (Reference 4) because of an excessive number of failures to feed from the magazine (para 1.5.2.2).		None.
2.2 One of the nine rifles fired 6000 rounds for reliability experienced a broken firing-pin-retaining pin. In accordance with the military specification (Reference 4), breakage of this part is not permitted in the firing of 6000 rounds (para 1.5.2.2).		None.

3. Corrected Deficiencies and Shortcomings

None.

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APPENDIX IV - MAINTENANCE EVALUATION

Not used.

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APPENDIX V - REFERENCES

1. Letter, TECOM, AMSTE-BC, Test Directive for Customer Test/Support Directive. TECOM Project/Test No. 8-WE-600-016-015, Comparison Test of Rifle, 5.56-MM M16A1, 25 August 1971.

2. TM 9-1005-249-12, Operator and Organizational Manual for the M16 and M16A1 Rifles, August 1968.

3. TM 9-1005-249-34, Direct and General Support Maintenance Manual for the M16 and M16A1 Rifles, August 1968.

4. Military Specification MIL-R-45587 for Rifles, 5.56-MM, M16 and M16A1, 15 December 1969.

5. Test Plan, Comparison for Rifle, 5.56-MM, M16A1, US Army Weapons Command, AMSWE-QAS, 3 August 1971.

6. Keele, Eric, Final Report on Comparison Test of Rifle, 5.56-MM, M16A1. TECOM Project No. 8-WE-600-016-012. Aberdeen Proving Ground. Report No. APG-MT-3883, July 1971. (Distribution Controlled by US Army Weapons Command, ATTN: AMSWE-QA.)

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APPENDIX VI - ABBREVIATIONS AND DEFINITIONS

1. Malfunction Abbreviations and Definitions. These include:

   a. BEC. Bolt catch engaged and stopped the bolt or the bolt carrier during firing instead of after the last round in the magazine was fired.

   b. FFM. A feeding malfunction which occurs during firing with the rifle bolt positioned behind the base of the cartridge and the round has not been stripped from the magazine. The abbreviation may be followed with a number which indicates the round in the magazine (i.e., FFM-1 is a failure to feed of the first round from the magazine).

   c. FF/BOB. A feeding malfunction which occurs during firing when the bolt has overridden the base of the cartridge in the magazine and fails to strip the round from the magazine.

   d. FBL. Failure of the bolt to lock, brass not visible.

   e. FBR. Failure of the bolt to be engaged and held open in a rearward position by the bolt catch after the last round in the magazine is fired.

   f. FJ. Failure of a fired case to be completely ejected from the rifle. Usually, this malfunction is indicative of a broken extractor spring.

2. Malfunction Clearing Actions. In most instances in the recording of firing-performance data in the various subtests as well as Appendix I, the clearing action that was required to overcome malfunctions was recorded. The abbreviations which were used to identify the action are as follows:

   a. BA. The use of the bolt assist device cleared the stoppage.

   b. CH. Only the charging handle was used to clear the stoppage.

   c. M. It was necessary to remove the magazine in order to clear the stoppage; the abbreviation CH/M is listed, indicating that the charging handle had to be held to the rear with one hand while the magazine was removed with the other.

3. Malfunction Classifications. These include:

   a. Class I. Immediately clearable (clearable by gunner through operation of charging handle, removal of magazine or manually removing round without aid of tools or equipment).

b. Class II. Clearable by gunner with available equipment (basic issue items).

c. Class III. Not clearable by gunner.

4. Maintenance Designations. These include:

a. Type:

1) P, preventative.

2) S, scheduled.

3) U, unscheduled.

b. Level Performing Action:

1) C, operator or crew.

2) O, organizational maintenance.

3) DS, direct support.

5. Definitions. These include:

a. Active Maintenance Time. This is the increment of the time during which the maintenance action is actually being performed (i.e., excluding all inactive downtime such as supply, administrative, and stand-by). This is stated in multiples of calendar hours or the elapsed maintenance times, i.e., not to be confused with maintenance man-hours.

b. Maintenance Man-Hours. Maintenance man-hours include that amount of time accumulated by all personnel performing the maintenance task. Two men work on an item simultaneously for 2 hours, one stops at this point and the second continues on the item for an additional 3 hours. This indicates that the active maintenance time is 5 hours and the maintenance man-hours are 7.

c. Malfunction. A malfunction is a faulty action of the ammunition, weapon, or support equipment. Malfunctions are of two types; those that cause unintended interruptions of firing and those that do not.

d. Shortcoming. An imperfection or malfunction occurring during the life cycle of equipment, which should be reported and which must be corrected to increase efficiency and to render the equipment completely serviceable. It will not cause an immediate breakdown, jeopardize safe operation, or materially reduce the

usability of the materiel or end product. If occurring during test phases, the shortcoming should be corrected if it can be done without unduly complicating the item or inducing another undesirable characteristic such as increased cost, weight, etc.

e. Unserviceable Part. A part that causes malfunctioning of the rifle or impairs the safety of the user.

6. General Abbreviations:

a. Auto, the rifle was fired a 20-round burst.

b. Burst, the rifle was fired in 3- to 5-round bursts.

c. CI, center of impact with respect to aiming point.

d. Ex var, extreme variation.

e. H, horizontal.

f. Semi, the rifle was fired semiautomatically.

g. Spm, shots per minute.

h. V, vertical.

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APPENDIX VII - DISTRIBUTION LIST

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13. ABSTRACT

The purpose of this test was to evaluate the performance of M16A1 rifles to detect any deterioration of product quality during production. Testing was conducted at Aberdeen Proving Ground by the Materiel Testing Directorate from 28 October to 30 November 1971. Sixteen rifles were inspected for compliance with the military specification for the M16A1 rifle. Six of the rifles were fired for accuracy and nine for reliability. Two of the rifles fired for reliability failed to meet requirements, one because of excessive failures to feed from the magazine and a second because of a broken firing-pin-retaining pin. The part failure and the occurrence of excessive malfunctioning were classified as shortcomings. It was concluded that with the exception of the two rifles which failed the reliability test, all rifles met inspection, accuracy, and reliability requirements. It was also concluded that the quality of the extractor springs in the rifles in this test was superior to the quality of those used in the rifles in the last comparison test.

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	ROLE	WT	ROLE	WT	ROLE	WT
Rifle, 5.56-mm M16A1 Accuracy, 5.56-mm rifle Endurance (6000-rounds), M16A1 rifle Failures to feed, M16A1 rifle						