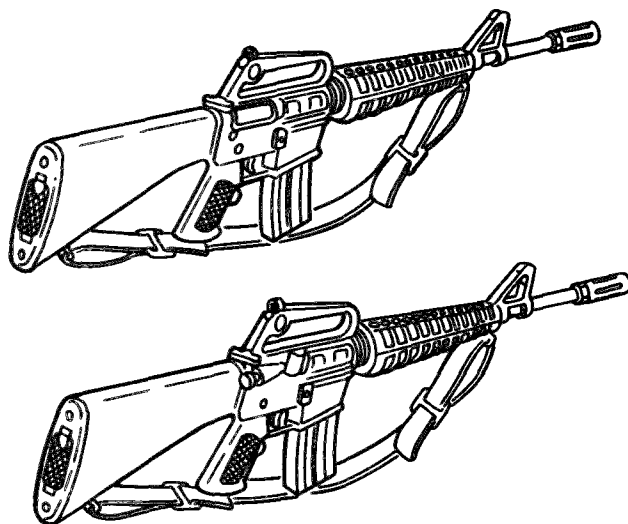


**ARMY TM 9-1005-249-23&P
AIR FORCE TO 11W3-5-5-24
COAST GUARD COMDTINST M8370.9**

Supersedes Copy Dated November 1983

TECHNICAL MANUAL

**UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
RIFLE, 5.56MM, M16 (1005-00-856-6885) (EIC:4F7)
RIFLE, 5.56 MM, M16A1 (1005-00-073-9421) (EIC:4FC)**



DISTRIBUTION STATEMENT. Approved for public release; distribution is unlimited.

**HEADQUARTERS, DEPARTMENTS OF THE ARMY AND
AIR FORCE, COMMANDANT, COAST GUARD**

INTRODUCTION	1-1
UNIT MAINTENANCE INSTRUCTIONS	2-1
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS	3-1
MAINTENANCE AUXILIARY EQUIPMENT	4-1
REFERENCES	A-1
MAINTENANCE ALLOCATION CHART	B-1
REPAIR PARTS AND SPECIAL TOOLS LIST	C-1
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST	D-1
ILLUSTRATED LIST OF MANUFACTURED ITEMS	E-1
TORQUE LIMITS	F-1
ALPHABETICAL INDEX	INDEX-1

JUNE 1991

METRIC CHART

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

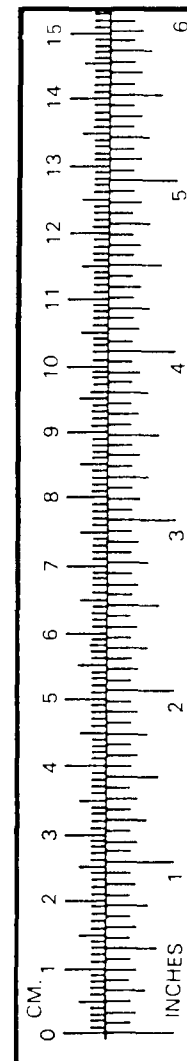
TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



WARNING

RADIATION HAZARD



TRITIUM (H3)

- A. **RULES AND REGULATIONS:** Copies of the following rules and regulations are maintained at HQ, AMCCOM, Rock Island, IL 61299-6000. Copies may be requested, or information pertinent to these rules and regulations obtained, by contacting the AMCCOM Radiological Protection Officer (RPO), AUTOVON 793-2964/2965/2966 Commercial (309) 782-2964/2965/2966.
- (1) 10CFR Part 19 - Notices, Instructions, and Reports to Workers; Inspections.
 - (2) 10CFR Part 20 - Standards for Protection Against Radiation.
 - (3) NRC license, license conditions, and license application.
- B. **SAFETY PRECAUTIONS.** The radioactive material used in this rifle is tritium gas (H3) sealed in a glass tube. It poses no significant hazard to the repairman when intact. The source illuminates the front sight for night operations. Tampering with or removal of the source in the field is prohibited by Federal law. In the event there is no illumination, notify the local Radiological Protection Officer. Do not attempt to repair or replace the sight in the field! If skin contact is made with any area contaminated with tritium, immediately wash with nonabrasive soap and water.
- C. **IDENTIFICATION:** The radioactive self-luminous source is identified by means of a radioactive warning label (as above). This label should not be defaced or removed, and should be replaced immediately when necessary. Refer to the local RPO or the AMCCOM RPO for instructions on handling, storage, or disposal.
- D. **STORAGE AND SHIPPING:** All radioactively illuminated instruments or modules which are defective will be evacuated to a depot maintenance activity. These items must be placed in a plastic bag and packaged in the shipping container from which the replacement was taken, before evacuation to a higher echelon is made. Spare equipment must be stored in the shipping container, as received, until installed on the weapon. Storage of these items is recommended to be in an outdoor shed type storage or unoccupied building.

WARNING

Read this manual carefully before performing required maintenance. This manual will be referred to for Inspection/Maintenance and Repair procedures.

Before starting an inspection, be sure to clear the rifle. Do not actuate the trigger until the rifle has been cleared. Inspect the chamber to ensure that it is empty and no ammunition is in position to be chambered. Do not keep live ammunition near work area.

To avoid injury to your eye, use care when removing and installing spring-loaded parts.

All Active Army M161/M16A1 rifles must be inspected and gaged at least once annually for safety. All Army Reserve and Army National Guard M16/M16A1 rifles must be inspected and gaged at least once every two years, after the initial inspection/gaging procedures have been accomplished. This two year interval may be maintained unless preventive maintenance checks and services (PMCS), or other physical evidence indicates that an individual unit's M16/M16A1 rifles require inspection at a more frequent interval. If it is determined that a yearly inspection is necessary for an individual unit, only that unit will be affected. This will not affect other units in regard to the interval of inspection.

Air Force users refer to inspection requirements in AFR 50-36, Volume 1.

WARNING (cont)

Below Direct Support Maintenance, DO NOT interchange bolt assemblies from one weapon to another. Doing so may result in injury to, or death of, personnel.

Bolt cam pin must be installed or weapon will blow up while firing the first round. If the bolt cam pin is not installed, injury to, or death of, personnel may result.

Dry cleaning solvent is flammable and toxic and should be used in a well-ventilated area. The use of rubber gloves is necessary to protect the skin when washing rifle parts.

When using solid film lubricant or dichloromethane, be sure the area is well ventilated

When using P-C-111, avoid skin contact. If it comes in contact with the skin, wash off thoroughly with running water. Using a good lanolin base cream after exposure to compound is helpful. Gloves and protective equipment are recommended.

For further information on safety, care, and handling of ammunition: Army and Air Force users refer to M16/M16A1 Operator's Manual TM 9-1005-249-10/TO 11A13-10-7; Coast Guard users refer to OP4 or OP5.

For additional first aid data, see FM 21-11

HEADQUARTERS, DEPARTMENTS OF THE ARMY
AND AIR FORCE
COMMANDANT, COAST GUARD
Washington, DC 19 June 1991

Unit and Direct Support Maintenance Manual
(Including Repair Parts and Special Tools List)
RIFLE, 5.56MM, M16
(1005-00-856-6885)
RIFLE, 5.56MM, M16AI
(1005-00-073-9421)

Current as of 7 January 1991

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know.

Army users mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual direct to: Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAS, Rock Island, IL 61299-6000.

Air Force users submit AFTO Form 22, Technical Order System Publications Improvement Report and Reply to: WR-ALC/MMDET, Robins AFB, GA 31098-5609.

Coast Guard users submit Publications Correction/Change Report form CG 4394 to: Commandant, U.S. Coast Guard (G-ODO-2), Washington, DC 20593-0001.

A reply will be furnished to you.

	Page
HOW TO USE THIS MANUAL	iii
CHAPTER 1 INTRODUCTION.....	1-1
Chapter Overview	1-1
Section I General information	1-1
Section II Equipment Description and Data	1-2
Section III Principles of Operation	1-4
CHAPTER 2 UNIT MAINTENANCE INSTRUCTIONS	2-1
Chapter Overview	2-1
Section I Repair Parts, Special Tools, TMDE, and Support Equipment	2-1
Section II Service Upon Receipt	2-1
Section III Preventive Maintenance Checks and Services (PMCS)	2-3
Section IV Troubleshooting	2-12
Section V Decontamination of Rifles and Arms Rooms	2-21
Section VI Maintenance Procedures	2-21

*This manual supersedes TM 9-1005-249-24&P, dated 25 November 1983, including all changes and TO 11W3-5-5-24 dated 10 February 1972.

		Page	Illus Figure
CHAPTER	3 DIRECT SUPPORT MAINTENANCE INSTRUCTIONS	3 - 1	
	Chapter Overview	3 - 1	
Section	I Repair Parts, Special Tools, TMDE, and Support Equipment	3 - 1	
Section	II Service Upon Receipt	3 - 1	
Section	III Troubleshooting	3 - 2	
Section	IV Decontamination of Rifles Shop Area	3 - 9	
Section	V Maintenance Procedures for the M16 and M16A1 Rifle	3-10	
Section	VI Preembarkation Inspection of Materiel in Units Alerted for Overseas Movement	3-73	
CHAPTER	4 MAINTENANCE OF AUXILIARY EQUIPMENT	4-1	
	Chapter Overview	4-1	
Section	I Unit Auxiliary Equipment	4-1	
Section	II Preparation for Storage or Shipment	4-13	
APPENDIX	A REFERENCES	A-1	
APPENDIX	B MAINTENANCE ALLOCATION CHART	B-1	
APPENDIX	C REPAIR PARTS AND SPECIAL TOOLS LIST	C-1	
Section	I Introduction	C-1	
Section	II Repair Parts List	C-1-1	
Group	00 5.56MM Rifle M16,8448600 and M16A1, 8448500	C-1-1	C - 2
Group	01 Bolt carrier assembly 8448501	C-2-1	C - 2
	0101 Bolt Assembly 8448509	C-3-1	C - 3
	0102 Key and bolt carrier assembly 8448505	C-4-1	C - 4
Group	02 Charging handle assembly 8448517	C-5-1	C - 5
Group	03 Upper receiver and barrel assembly 8448601 (M16) and 8448522 (M16A1)	C-6-1	C - 6
	0301 Rifle barrel assembly 8448663	C-7-1	C - 7
	0302 Upper receiver assembly 8448602 (M16) and 8448523 (M16A1)	C-8-1	C - 8
	030201 Forward assist assembly 9349 086(M16AI)	C-9-1	C - 9
Group	04 Lower receiver and extension assembly 8448604 (M16) and 8448578 (M16A1)	C-10-1	C - 10
	0401 Buttstock assembly 9349119	C-11-1	C - 11
	0402 Hammer assembly 8448610	C-12-1	C - 12
	0403 Trigger assembly 8448591	C-13-1	C - 13
	0404 Lower receiver and extension subassembly 8448605 (M16) and 8448579 (M16A1)	C-14-1	C - 14
Section	III Special Tools List	C-15-1	C - 15
Section	IV National Stock Number and Part Number Index	I-1	
APPENDIX	D EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST	D-1	
APPENDIX	E ILLUSTRATED LIST OF MANUFACTURED ITEMS	E-1	
APPENDIX	F TORQUE LIMITS	F-1	
	ALPHABETICAL INDEX	Index-1	

HOW TO USE THIS MANUAL

Read this manual carefully before performing required maintenance. This manual will be referred to for Inspection/Maintenance and Repair procedures.

GENERAL

There are several things you need to know to use this manual efficiently.

1. All references in the manual are to pages only. Reference to maintenance procedures is to the page where the respective initial setup appears.
2. Illustrations for the maintenance procedures show only those parts affected by the operation being performed.
3. Whenever the male gender is mentioned in the manual (i.e., crewman, repairman), it also pertains to females.
4. When the term "evacuate to support maintenance" is used, the entire rifle must be evacuated.

INDEXES

This manual is organized to help you find the information you need quickly. There are several useful indexes.

1. Front Cover Index. Lists the most important areas of the manual. It is keyed to areas with bleed-to-edge indicators.
2. Table of Contents. Lists in order all chapters, sections, and appendixes. Gives page references.
3. Nomenclature Cross-References List.
4. Chapter Overviews. Summarize material covered in the chapter. Are located at the beginning of each chapter.
5. Symptom Index. Located just before the troubleshooting table in each maintenance chapter. Lists, in alphabetical order, parts of the rifle with possible malfunctions. References pages of the troubleshooting table.
6. Alphabetical Index. Located at the end of the manual. An extensive subject index for everything in the manual. Gives page references.

MAINTENANCE PROCEDURES

There are two maintenance chapters:

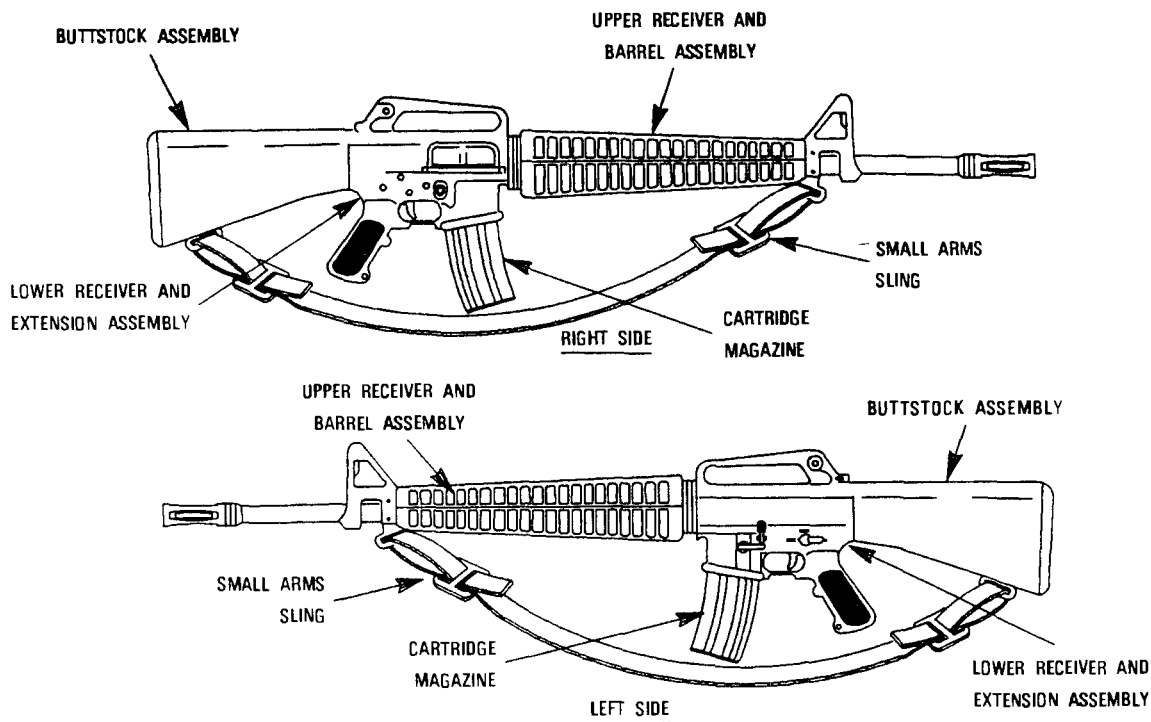
Army personnel use chapter two for unit maintenance procedures and chapter three for direct support maintenance procedures.

Air Force personnel: Only Air Force Specialty Code 753XX Combat Arms Training and Maintenance (CATM) specialists, technicians, and gunsmiths are authorized to perform maintenance procedures contained in this manual.

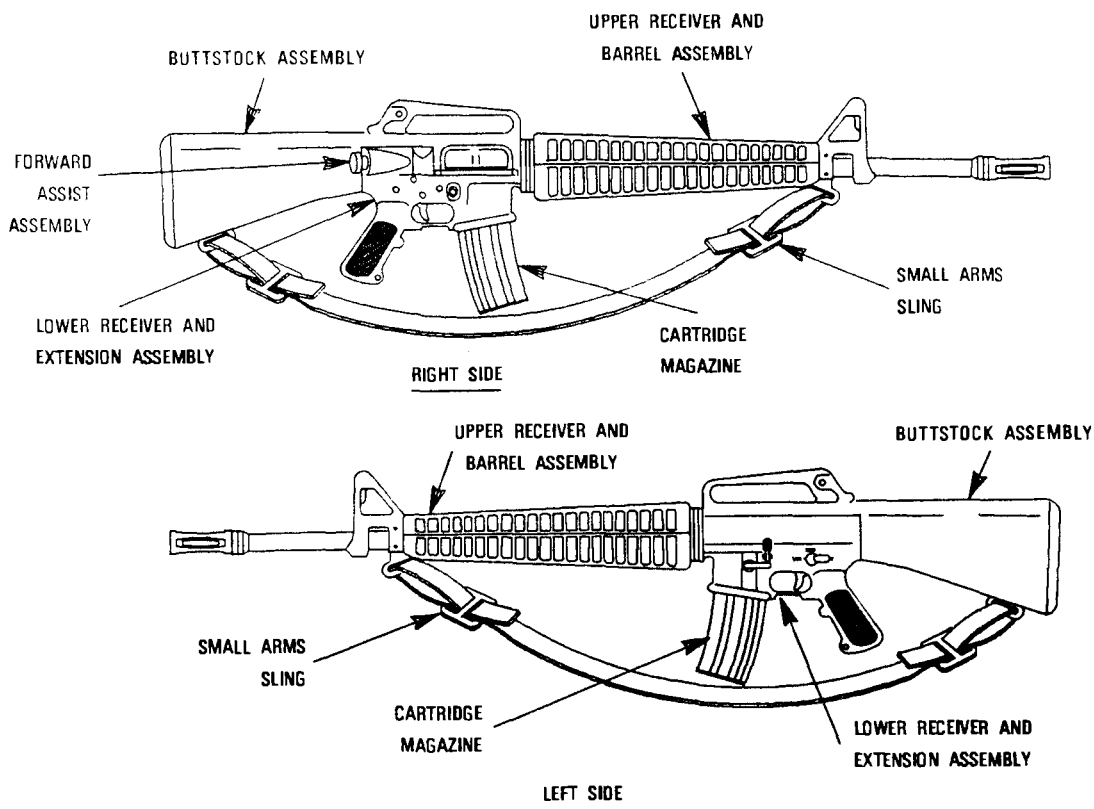
Each maintenance task has an initial setup containing a list of the following things you will need in order to do your maintenance task:

1. Tools and Special Tools. For standard and special tools, see appendixes B and C. Army uses the Tool Set, Gage Set and/or Shop Set listed in the initial setup.
2. Materials/Parts. Lists expendable materials and 100 percent replaceable parts. Each material or part is followed by a part number or appendix reference.
3. References. Lists other publications containing necessary information.
4. Equipment Condition. Lists conditions to be met before starting the procedure. The reference on the left of the condition is a page reference to instructions for setting up the condition.
5. General Safety Instructions. Lists safety instructions to follow before performing maintenance procedures.

EXTERNAL VIEW OF 5.56MM RIFLE M16



EXTERNAL VIEW OF 5.56MM RIFLE M16A1



CHAPTER 1
 INTRODUCTION

CHAPTER OVERVIEW

This chapter contains general information equipment description and data and principles of operation for your weapon.

Section I. GENERAL INFORMATION

1-1. SCOPE.

- a. **Type of Manual:** Unit and Direct Support Maintenance.
- b. **Model Number and Equipment Name:** 5.56mm Rifle M 16 and M16A1.
- c. **Purpose of Equipment.** Provides personnel an offensive/defensive capability to engage targets for field use.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System.

Air Force users refer to TO 11 W 1-10 for applicable forms and records.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. See TM 750-244-7.

1-4. PREPARATION FOR STORAGE OR SHIPMENT. Refer to chapter 4, paragraph 4-7. Air Force users refer to Special Packaging Instructions (SPI) 00-856-6885.

1-5. OFFICIAL NOMENCLATURE, NAMES AND DESIGNATIONS.

NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Nomenclature
Action Spring	Helical Compression Spring (8448629)
Bolt Catch Spring	Helical Compression Spring (8448633)
Carrier	Key and Bolt Carrier Assembly (8448505)
Disconnecter Spring	Helical Compression Spring (8448594)
Ejector Spring	Helical Spring (8448516)
Extractor Spring Assembly	Spring Assembly (8448755)
Hammer Spring	Helical Torsion Spring (8448611)
Magazine Catch Spring	Helical Compression Spring (8448637)
Pistol Grip	Rifle Grip (9349127)
Pivot Pin Detent	Takedown Detent (8448585)
Trigger Spring	Helical Torsion Spring (8448593)
Weapon	5.56mm Rifle M 16 (8448600) or M 16A1 (8448500)

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your rifle needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on SF 368 (Product Quality Deficiency Report). Mail it to us at Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAD-1, Rock Island, IL 61299-6000. We'll send you a reply.

Air Force users submit Materiel Deficiency Report (MDR) to: DIR MAT MGT ROBINS AFB GA//MMIBTC// and Product Quality Deficiency Report to: DIR MAT MGT ROBINS AFB GA//MMQA// IAW Technical Order 00-35D-54.

Coast Guard users submit PQDRs (SF 368) in accordance with COMDTINST M4855.1 to: Commandant, U.S. Coast Guard (G-ODO-2), Washington, DC 20593-0001.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. Characteristics.

- (1) Lightweight
- (2) Air-cooled
- (3) Gas-operated
- (4) Magazine-fed
- (5) Semi or automatic fire

b. Capabilities. Provides personnel an offensive/defensive capability to engage targets while in the field role.

c. Features.

(1) Receivers are made of light-weight aluminum alloys; however, the safety, durability, and function of the rifles are in no way reduced. The portability and logistical values are greatly increased, particularly when air transport is used.

(2) The bolt locking action is one of the mechanical features of the weapon. The bolt and barrel extension contains locking lugs which engage and lock the bolt firmly in the barrel extension. The initial force of the explosion of the cartridge propellant is absorbed by the barrel, barrel extension, and bolt.

(3) The trigger guard is easily adaptable to winter operations. A spring-loaded retaining pin is depressed to allow ready access to the trigger when wearing arctic mittens.

(4) The ejection port cover prevents dirt or sand from getting into the ejection port. The cover must be closed during periods when firing is not anticipated. It opens automatically by the forward or rearward movement of the bolt carrier.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

- (A) **CHARGING HANDLE ASSEMBLY.** Provides a means of charging the weapon.
- (B) **BOLT CARRIER ASSEMBLY.** Carries bolt to chamber and fires the weapon. Contains the firing pin, extractor, bolt, ejector, and cam pin.
- (C) **UPPER RECEIVER AND BARREL ASSEMBLY.** Rifle barrel assembly is air-cooled, contains flash suppressor and front sight assembly, and holds the two hand guards and the sling swivel. Upper receiver contains rear sight, ejection port and cover, and a housing for the bolt carrier and bolt assembly. A forward assist assembly is used on the M16A1 weapon.
- (D) **LOWER RECEIVER AND EXTENSION ASSEMBLY.** Lower receiver contains the trigger assembly, sear hammer assembly, selector lever, rifle grip, bolt catch, and buttstock assembly. The buttstock assembly houses the action spring, buffer assembly, and extension assembly.
- (E) **CARTRIDGE MAGAZINE.** 30 round cartridge capacity.
- (F) **SMALL ARMS SLING.** The small arms sling is adjustable and provides a means to carry the weapon.

