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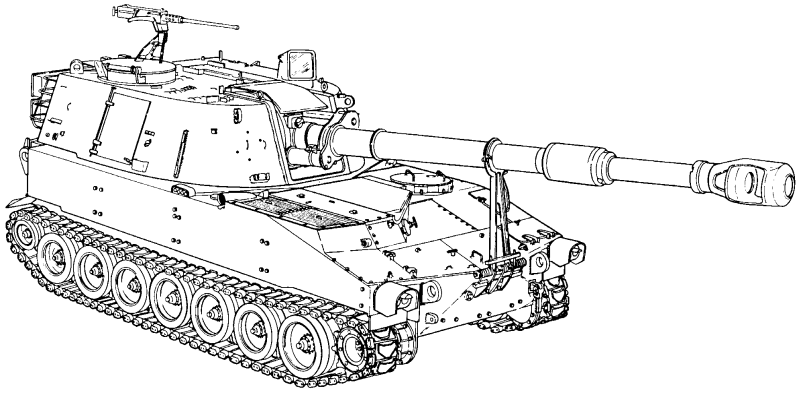
DEPARTMENT OF THE ARMY
TECHNICAL MANUAL

OPERATOR'S MANUAL FOR

HOWITZER, MEDIUM, SELF-PROPELLED, 155MM

M109A2 (2350–01–031–0586)(EIC:3EZ)
M109A3 (2350–01–031–8851)(EIC:3E2)
M109A4 (2350–01–277–5770)(EIC:3E8)
M109A5 (2350–01–281–1719)(EIC:3E7)



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HEADQUARTERS, DEPARTMENT OF THE ARMY

TECHNICAL MANUAL
No. 9–2350–311–10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 23 November 1994

OPERATOR'S MANUAL
FOR
HOWITZER, MEDIUM, SELF-PROPELLED, 155MM
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M109A5 (2350–01–281–1719) (EIC: 3E7)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028–2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or email your letter, DA Form 2028, or DA Form 2028–2 direct to: Commander, U.S. Army Tank–automotive and Armaments Command, ATTN: AMSTA–LC–CIP–WT, Rock Island, IL 61299–7630. The email address is amsta–ac–nml@ria.army.mil. The fax number is DSN 793–0726 or Commercial (309) 782–0726.

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HOW TO USE THIS MANUAL

This manual consists of:

1. Instructions for use by the crew in operating and maintaining the M109A2/M109A3/M109A4/M109A5, 155MM, Self-Propelled, Medium, Howitzer.

2. Location, description, and basic operation characteristics of the M109A2/M109A3/M109A4/M109A5 howitzer major components.

3. Procedures to:

   a. Operate the M109A2/M109A3/M109A4/M109A5 howitzer and components.

   b. Perform for firing.

   c. Perform preventive maintenance on systems/components.

   d. Perform troubleshooting of malfunctioning systems/components (isolation of malfunction causes).

   e. Remove, repair, and install cab system/components.

4. Appendixes for detailed listings of:

   Appendix A. References applicable to M109A2/M109A3/M109A4/M109A5 howitzer, including supply manuals, forms, and other M109A2/M109A3/M109A4/M109A5 publications.

   Appendix B. List of components and support items that are supplied with the vehicle for operational maintenance.

   Appendix C. List of items required to support vehicle during operation.

   Appendix D. List of expendable and durable items needed to operate and maintain this vehicle.

   Appendix E. Illustrates stowage and sign guides which mark the place where equipment should be stowed when not in use.

   Appendix F. Provides information for loading on-vehicle equipment.

   Appendix G. Instructs crew on lubrication, including correct intervals and lubricants.

HOW TO USE THIS MANUAL — CONTINUED

Indexing

Five major indexing procedures are used in this manual to help operators locate information rapidly.

1. Cover Index: Lists sections of text and page number. Includes index mark which lines up with index marks on the actual page of reference.

   Example: Description and Use of Operator's Controls and Indicators 2–2

2. Table of Contents.

3. Chapter and section indexes listing data/information covered within the chapter and section.

4. Malfunction Index identifies system malfunction and provides paragraph references for specific troubleshooting procedures or maintenance action.

5. Index: Alphabetical listing of information.

Operation/Maintenance Text and Illustrations (Chapters 2 through 6)

1. Procedures are to be performed in the sequence shown in the text and illustrations. Step 1 must be performed before Step 2. Procedure A must be performed before Procedure B, and so on.

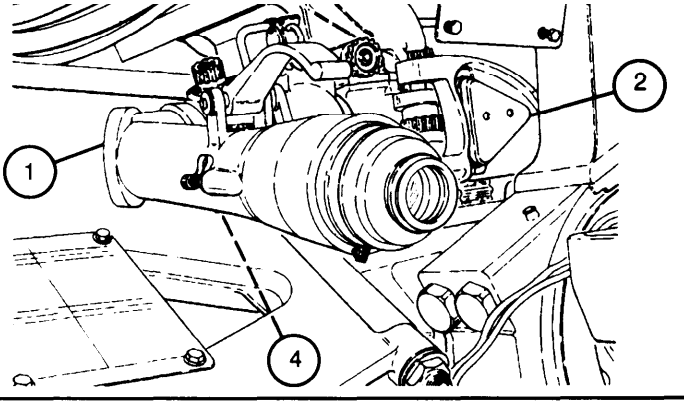
2. Parts of the system/components are identified in text by callout numbers in parentheses.

   Example: Remove two cap screws (1) and two Iockwashers (2).

3. Parts/components are identified on illustrations with callout numbers keyed to the callouts in the text. Visible parts are identified by a solid line from the callout to the illustration. Hidden parts are indicated by a dashed line. See Sample A below.

SAMPLE A

3 Connect cable assembly receptacle (4) on M146 telescope mount (2) to underside of M118A2/M118A3 elbow telescope (1)



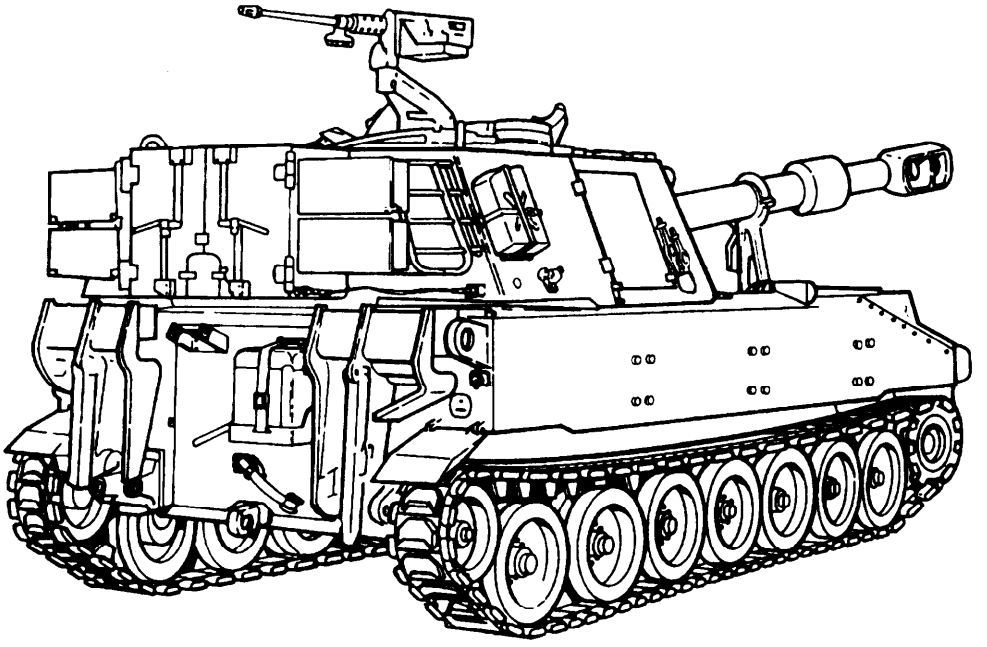
4. Throughout this manual the words WARNING and CAUTION will appear. There is a reason for every one of them.

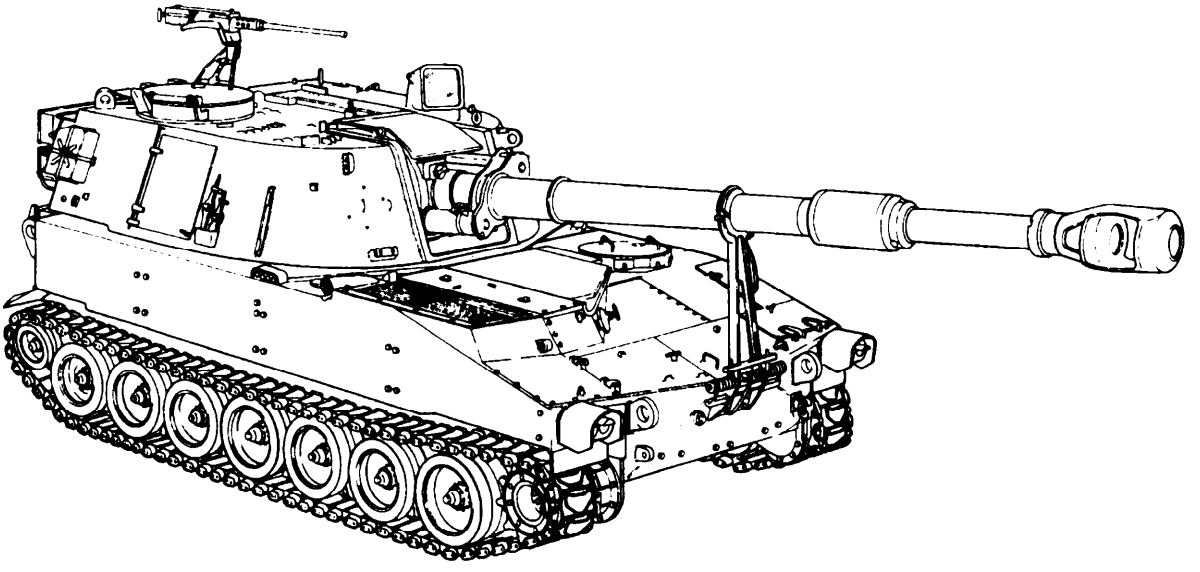
A warning is used to alert the user of hazardous operating and maintenance procedures, practices, conditions, statements, etc., that may result in injury or death of personnel if not strictly observed. Warnings are preceded by the following symbol:

WARNING

A caution is used to alert the user of hazardous operating or maintenance procedures, practices, conditions, statements, etc., that may result in damage to or destruction of equipment or mission effectiveness if not strictly observed. Cautions are preceded by the following symbol:

CAUTION





M109A2/M109A3/M109A4/M109A5

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1 SCOPE

a. Type of Manual: Operator's

b. Model Number and Equipment Name: M109A2/M109A3/M109A4/M109A5 Howitzer, Medium, Self-Propelled, 155MM.

c. Purpose of Equipment: The howitzer is a vehicle that provides armored combat support. It allows firing through its primary armament, M185 or M284 155MM cannon assembly, and its secondary armament, M2 heavy barrel caliber 50 machine gun.

d. Special Inclusions in the Manual: Section IV. of Chapter 1 outlines section drill procedures to be practiced for performance improvement. Appendix F provides on-vehicle loading plans.

1-2 MAINTENANCE FORMS AND PROCEDURES

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in the Maintenance Management Update.

1-3 AMMUNITION

1-3.1 Injury/Damage

Accidents involving injury to personnel or damage to material will be reported in accordance with AR 385-40. Explosives and ammunition malfunctions will be reported in accordance with AR 75-1.

1-3.2 Safety, Care, and Handling

For safety, care, and handling of ammunition, refer to paragraph 2-15 and to Chapters 5 and 6.

1-4 CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with the howitzer be reported so that the problem can be corrected and improvements can be made to prevent the problem in the future.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of keywords such as “corrosion,” “rust,” “deterioration,” or “cracking,” will ensure that the information is identified as a CPC problem.

The form should be submitted to:

Commander
U.S. Army Armament Research, Development and Engineering Center
ATTN: AMSTA-AR-QAW-A (R)/Customer Feedback Center
Rock Island, IL 61299-7300

1-5 DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-6 for procedures on how to destroy the M109 self-propelled howitzer. You will find procedures for destruction of munitions in TM 43-0002-33 (improved conventional munitions). Procedures for destruction of chemical munitions are outlined in TM 3-250.

Below are some general guidelines to follow in destruction of equipment to prevent enemy use.

Destruction of the vehicle, armament, and equipment when subject to capture or abandonment in a combat zone, will be undertaken only when the unit commander decides such action is necessary in accordance with orders of, or policy established by, the Army commander.

In general, destruction of essential parts, followed by burning, will usually be sufficient to render the vehicle, armaments, and equipment useless. Time is usually critical.

Materiel must be damaged so that it cannot be restored to usable condition by either repair or cannibalization. If a lack of time or personnel prevents destruction of all parts, give priority to destruction of parts hardest to replace. It is important that the same parts be destroyed on all units to prevent construction of one complete unit from several damaged ones.

All items of sighting and fire control instruments and equipment, especially telescopes, gunner’s quadrants, and binoculars, are costly and difficult to replace. They should be conserved whenever possible. If you cannot carry them with you, destroy them by smashing with your sledgehammer, pick, or mattock. Throw the pieces in all directions.

When time is short, a method of destroying the equipment with materiels at hand is as follows:

Retrieve or smash sighting and fire control equipment.

1-5 DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE - CONTINUED

Load cannon with projectile and full powder charge. Attach a 50 foot (15.2 m) or longer lanyard to firing mechanism. Disconnect recoil cylinder lines and fire the weapon.

Take a sledgehammer and bend the end of the counter recoil buffer rod.

A second method is to close the breechblock and toss several thermite grenades down the cannon tube. Elevate the cannon tube so that the grenades will fall against the breechblock. This will melt the breech and the powder chamber, causing them to fuse together.

1-6 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATION (EIR)

If your howitzer 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 or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, U.S. Army Armament Research, Development and Engineering Center, ATTN: AMSTA-AR-QAW-A (R)/Customer Feedback Center, Rock Island, IL 61299-7300. We will send you a reply.

1-7 WARRANTY INFORMATION

The M109 howitzer series is no longer warranted.

1-8 NOMENCLATURE CROSS-REFERENCE LIST

Nomenclature in this manual was chosen in accordance with the terms used for provisioning as they appear in the Repair Parts and Special Tools Lists (RPSTL). A few tools and cab components however are referred to by names more common than those in the RPSTL. In many cases the more common name is a shorter name for the same component.

Manual Nomenclature	Official Nomenclature
Cab ammunition rack assembly	Projectile stowage rack assembly
Canister rack propellant	Bracket assembly
Cannon tube	Tube assembly
Combat override switch	Override switch assembly
Dipstick	Gage rod
Hex key	Socket head screw key
Howitzer	155MM, medium, self-propelled howitzer, M109A2/M109A3/M109A4/M109A5
Lockwire	Safety wire, nonelectrical wire
M1A1 collimator	Infinity aiming reference collimator M1A1