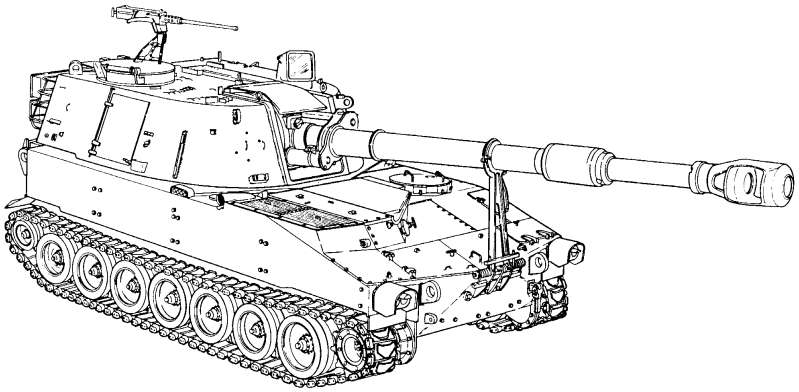
DEPARTMENT OF THE ARMY
TECHNICAL MANUAL

UNIT MAINTENANCE MANUAL
FOR

CAB, ARMAMENT, SIGHTING AND FIRE CONTROL, ELEVATING AND TRAVERSING SYSTEMS AND ASSOCIATED COMPONENTS 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. 9–2350–311–20–2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 24 December 1993

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REPORTING OF 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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*This manual supersedes the following manual: TM 9–2350–311–20–2, June 1986, and all changes.

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HOW TO USE THIS MANUAL

This manual consists of:

1. Instructions for unit maintenance on the M109A2/M109A3/M109A4/M109A5, 155MM, Self-Propelled, Medium, Howitzer cab systems and components.

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

3. Cab systems/components maintenance procedures to:

   a. Prepare the M109A2/M109A3/M109A4/M109A5 howitzer for service upon receipt.

   b. Perform operational checks for systems/components.

   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. Maintenance policy, definition of terms. Maintenance Allocation Chart (MAC).

   Appendix C. Reference to applicable Repair Parts and Special Tools List (RPSTL).

   Appendix D. Expendable and durable items list.

   Appendix E. Illustrated list of manufactured items.

   Appendix F. Torque limits.

   Appendix G. Mandatory replacement parts list.

   Appendix H. Tool identification list.

   Appendix I. Schematic Symbols.

   Appendix J. Recoil Exerciser Instruction

   Index

   Foldouts (FOs): Electrical and hydraulic schematics.

HOW TO USE THIS MANUAL – CONTINUED

Indexing

Five major indexing procedures are used in this manual to help mechanics 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: Troubleshooting 3–1

2. Table of Contents.

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

4. Quick Guide to Troubleshooting identifies system malfunction and provides paragraph references for specific troubleshooting procedures or maintenance action.

5. Index: Alphabetical listing of information.

Maintenance Text and Illustrations (Chapters 4 through 19)

1. Maintenance 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. Equipment illustrations use numbers to identify parts of the system/components.

   Example: Remove two cap screws (7) and two lockwashers (8).

3. This manual is written to include all parts authorized to be used or repaired at the unit level using Repair Parts and Special Tools List (RPSTL) (TM 9–2350–311–24P–2) as a guide. All parts with SMR code maintenance levels “O” are mentioned in the order of functional group codes whenever possible, to enable location in the RPSTL.

CHAPTER 1
INTRODUCTION

GENERAL

This chapter provides a general introduction to the purposes, safe use, and capabilities of the howitzer. Section I describes procedures for destroying equipment to prevent enemy use, references to other technical manuals, and forms to recommend improvements. Sections II and Ill familiarize the mechanic with equipment data and operating principles of the howitzer's systems.

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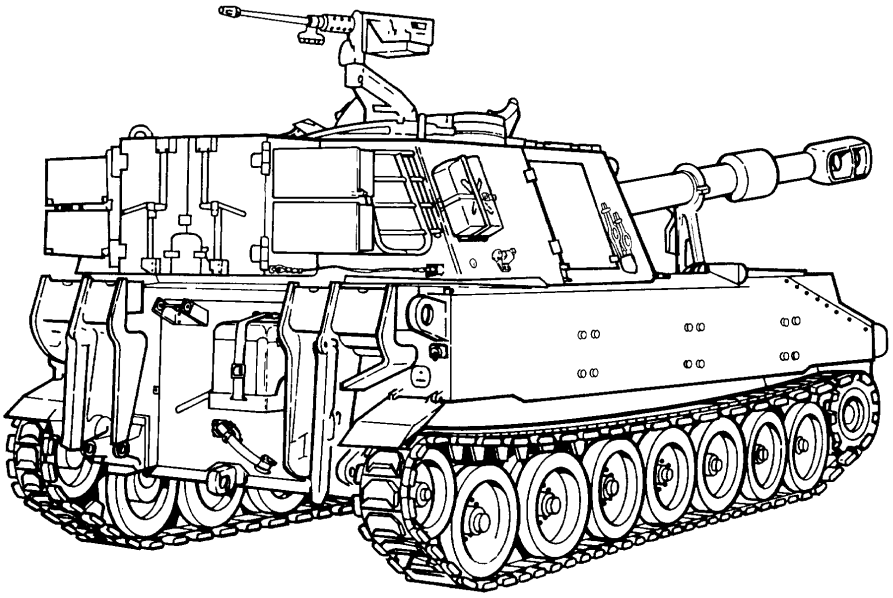

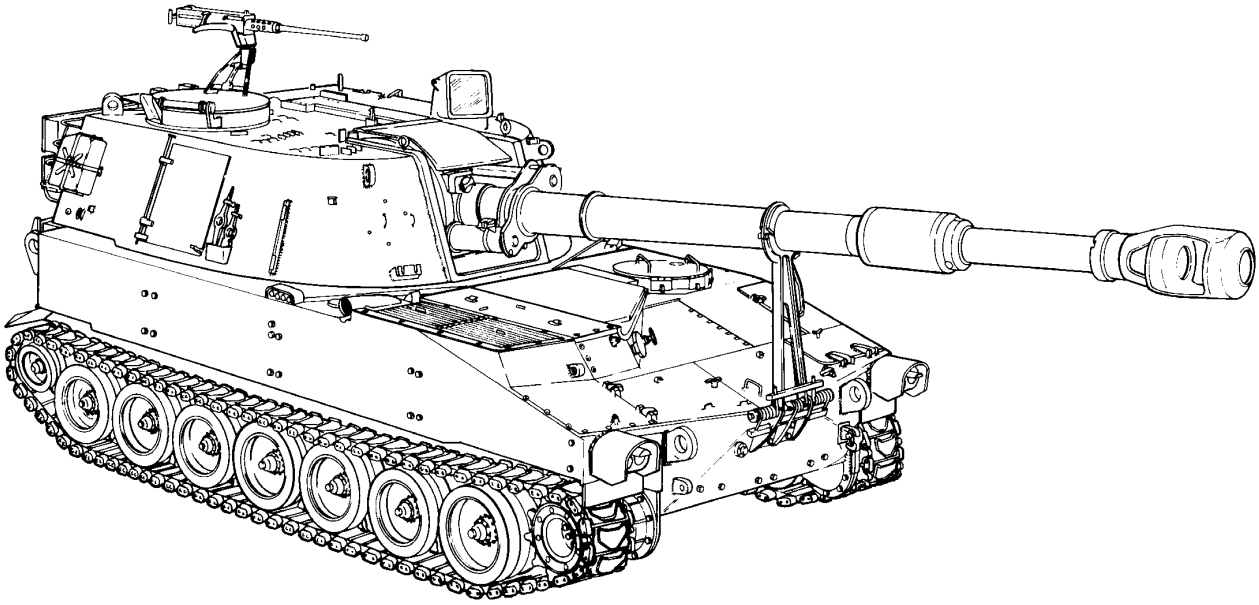

M109A2/M109A3/M109A4/M109A5

Section I. GENERAL INFORMATION

1–1 SCOPE

a. Type of Manual: Unit maintenance.

b. Model Number and Equipment Name: M109A2/M109A3/M109A4/M109A5 Howitzer, Medium, Self-Propelled, 155MM. This manual deals with maintenance for the cab and associated components. TM 9–2350–311–20–1 deals with maintenance of the hull and associated components.

c. Purpose of Equipment: The howitzer cab, containing the M185 or M284 155MM cannon and secondary armament M2 heavy barrel caliber 50 machine gun, provides the firepower for the howitzer. The cab components also provide the fire control for the 155MM cannon.

1–2 MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 738–750, The Army Maintenance Management System; DA PAM 738–751, Functional Users Manual for the Army Maintenance Management System–Aviation (TAMMS–A); or AR 700–138, Army Logistics Readiness and Sustainability.

b. Accidents involving injury to personnel or damage to materiel will be reported on DA Form 285 (Accident Report) in accordance with AR 385–40. Explosives and ammunition malfunctions will be reported in accordance with AR 75–1.

1–3 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, armament, 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.

1–3 DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE — CONTINUED

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.

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.

1–4 PREPARATION FOR STORAGE OR SHIPMENT

Instructions on proper storage and shipment of the M109 self-propelled howitzer series are covered in Chapter 2, General Cab Maintenance, of this manual.

1–5 QUALITY ASSURANCE (QA)

No particular quality assurance manual pertains specifically to the M109 howitzer series.

Defective material received through the supply system should be reported on Product Quality Deficiency Report (QDR) SF 368. Instructions for preparing QDRs are provided in AR 702–7, Reporting of Quality Deficiency Data. QDRs should be mailed directly 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.

1–6 OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS

Nomenclature in this manual was chosen in accordance with the terms used for provisioning as they appear in the Repair Parts and Special Tools List (TM 9–2350–311–24P–2) and Maintenance Allocation Chart, Appendix B. 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.