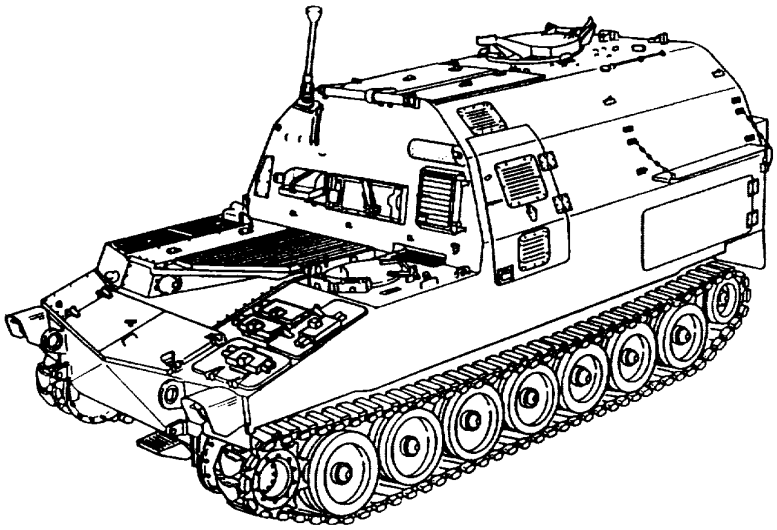
**TECHNICAL MANUAL**



# UNIT MAINTENANCE MANUAL FOR

# CARRIER, AMMUNITION, TRACKED M992A1 (NSN 2350-01-352-3021)

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**HEADQUARTERS, DEPARTMENT OF THE ARMY**
**OCTOBER 1993**

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TECHNICAL MANUAL

NO. 9-2350-287-20-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 22 OCTOBER 1993

# UNIT MAINTENANCE MANUAL
# FOR
# CARRIER, AMMUNITION, TRACKED
# M992A1
# (NSN 2350-01-352-3201)
# EIC:AE6

**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. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-IM-OPIT, Warren, MI 48397-5000. A reply will be furnished to you.

You may also provide DA Form 2028-2 information to TACOM via datafax or e-mail:
- TACOM's fax number is DSN 786-6323 or Commercial (810) 574-6323
- TACOM's e-mail address is tacom-tech-pubs@cc.tacom.army.mil

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# HOW TO USE THIS MANUAL

## SCOPE.

This technical manual contains Unit maintenance procedures for the M992A1 Carrier, Ammunition, Tracked. Chapter 1 contains general information; Chapter 2 contains information on general maintenance procedures and describes and illustrates troubleshooting procedures; and Chapters 3 through 22 describe and illustrate maintenance procedures for various systems and components. Ten appendixes and a subject index are also included in this manual.

## INDEXING.

Four indexing procedures are used to help you locate information quickly:

- Cover index. Lists chapter titles and important parts of the manual, with corresponding page numbers. Each chapter or part listed is boxed in, with a black outeredge that is in line with the first page of that chapter or part.
- Table of contents. The table of contents follows the Safety Summary. The table of contents lists all chapters numerically, with corresponding page numbers.
- Chapter indexes. Each chapter starts with a numerical listing of all paragraphs in that chapter.
- Alphabetical index. The alphabetically arranged subject index starts on page Index 1.

## MAINTENANCE TEXT AND ILLUSTRATIONS (CHAPTERS 3 THROUGH 22).

Each chapter begins with a numerical listing of all paragraphs. The first paragraph in each chapter is titled "General" and describes the system(s) to be covered. General repair and inspection procedures may also be given.

Each paragraph contains the following information, as appropriate:

- The common or specials tools and test equipment required to perform the procedures are listed under the heading "Tools/Test Equipment." Common and special tools are listed in Appendix I.
- Materials and mandatory replacement parts that will be discarded during the procedure are listed under the heading "Materials/Parts." A Materials/Parts list does not contain items that may be replaced if found defective during inspection. Also, the list does not contain the item named in the paragraph title. Materials may be found in Appendix D. Mandatory replacement parts may be found in Appendix H. Refer to TM 9-2350-287-24P for information on other parts that may have to be replaced.
- If more than one person is required to perform the procedure, the number is specified under the heading Personnel Required."
- Technical manuals, technical bulletins, field manuals, or other reference material that may be required to perform the procedure are listed under the heading "References." Note that the titles of all publications and forms referenced in the manual are listed in Appendix A.
- Procedures that must be performed on the vehicle prior to the maintenance procedure are listed under the heading "Equipment Conditions."

## TEXT AND ILLUSTRATIONS.

Maintenance procedures are to be performed in the sequence given in the text and illustrations.

Illustrations are numbered clockwise, beginning at the 11 o'clock position. Because an illustration is keyed to the text, parts that are removed sequentially may not have sequential numbers. For example:

1. Remove screw (4), lockwasher (6), washer (7), and bracket (5) from transmission.

## IMPORTANT.

Be sure to read the entire paragraph before beginning a maintenance procedure. Also, read the general information in Chapter 1 before beginning a procedure.

Warnings and cautions appear immediately preceding the step to which they pertain. It is important to read and thoroughly understand the warnings and/or cautions before beginning maintenance.

Notes may precede or follow the steps to which they pertain, depending on what makes the most sense. Notes highlight essential operating or maintenance procedures, conditions, or statements.

## PROBLEM SOLVING.

The best way for you to fulfill your responsibility for maintaining the equipment covered in this manual is to make maximum use of your maintenance manual. The following three sample problems illustrate ways to use the manual efficiently:

1. How do I replace the roadwheel hub?

   - Look in the subject index for "roadwheel hub replacement" and turn to the appropriate page.

2. An equipment condition for replacing surge tank hoses (para 6-4) is, "Powerpack removed (para 3-2)." How do I find out what page paragraph 3-2 begins on?

   - Look in the chapter index for Chapter 3 until you find paragraph 3-2, Powerpack Replacement; then turn to the appropriate page.

3. The auxiliary power unit (APU) engine won't start. How do I find out what's wrong?

   - Turn to the Quick Guide to Troubleshooting (para 2-18). Find the name of the item that doesn't work (APU).
   - Find the problem (ENGINE CRANKS BUT FAILS TO START) in the listing for APU.
   - Turn to the paragraph in the Troubleshooting Chart (para 2-19) that is referenced-in this case, paragraph 2-19u(1).

# CHAPTER 1
# INTRODUCTION

## Section I. GENERAL INFORMATION


| Paragraph Number | Paragraph Title | Page Number |
|---|---|---|
| 1-1 | Scope | 1-1 |
| 1-2 | Maintenance Forms, Records, and Reports | 1-1 |
| 1-3 | Destruction of Army Materiel To Prevent Enemy Use | 1-1 |
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| 1-8 | Warranty Information | 1-2 |
| 1-9 | Safety, Care, and Handling | 1-3 |
| 1-10 | Corrosion Prevention and Control (CPC) | 1-3 |


## 1-1. SCOPE.

a. **Type of manual:** Unit maintenance.
b. **Model number and equipment name:** M992A1 Carrier, Ammunition, Tracked.
c. **Purpose of equipment:** Provide overland transport of 155-millimeter projectiles and propelling charges from ammunition supply points to self-propelled howitzers in the field.

## 1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS.

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 for the Army Maintenance Management System-Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.

## 1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Refer to TM 750-244-6 for procedures on destruction of military vehicles. Destruction of munitions is covered in TM 750-244-5-1 (conventional ammunition) and TM 43-0002-33 (improved conventional munitions).

## 1-4. PREPARATION FOR STORAGE OR SHIPMENT.

Refer to para 2-36 of this manual for procedures on preparation of the M992A1 for storage or shipment.

## 1-5. QUALITY ASSURANCE.

No specific quality assurance manual pertains to the M992A1.

Defective material received through the supply system should be reported on an SF Form 388, Product Quality Deficiency Report, Instructions for preparing the reports are provided in AR 702-7, Reporting of Quality Deficiency Data. Mail your completed form directly to:

Commander
U.S. Army Tank-Automotive Command
ATTN: AMSTA-QRT
Warren, MI 48397-5000

## 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 (RPSTL) and maintenance allocation chart (MAC) for Unit maintenance on the M992A1 .

A few tools and hull components are, however, referred to by names more common that those in the RPSTL. In many cases, the more common name is a shorter name for the same component.

Nomenclature Cross-Reference

| Manual Nomenclature | Official Nomenclature |
|---|---|
| Adapter | Straight pipe adapter |
| Bracket | Rotating eye bracket |
| Front hull slope plate | Armor plate |
| Hook | Strap fastener loop |
| Hose or hose assembly | Hose assembly, nonmetallic |
| Lockwire | Nonelectrical wire |
| Master relay | Relay and housing assembly |
| Side hull slope plate | Door support plate |
| Spring | Adjustable door spring |
| Tube | Metallic bent tube |
| Wiring harness | Branched wiring harness |

## 1-7. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).

If your M992A1 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 Form 368 (Product Quality Deficiency Report). Mail it to the address specified in DA Pam 738-750.

## 1-8. WARRANTY INFORMATION.

The M992A1 is not warranted.

## 1-9. SAFETY, CARE, AND HANDLING.

For information on general safety precautions and regulations, review the warning summary at the front of this manual and the safety summary that follows the table of contents. Observe all warnings and cautions that appear in the maintenance procedures.

## 1-10. 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 this item be reported so the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with the 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 an SF Form 368. Use of key words such as "corrosion," "rust," "deterioration," and "cracking" will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA Pam 738-750.

## Section II. EQUIPMENT DESCRIPTION AND DATA


| Paragraph Number | Paragraph Title | Page Number |
|---|---|---|
| 1-11 | Equipment Characteristics, Capabilities, and Features | 1-4 |
| 1-12 | Location and Description of Major Components | 1-5 |
| 1-13 | Differences Between Models | 1-11 |
| 1-14 | Equipment Data | 1-13 |
| 1-15 | Equipment Configuration | 1-16 |


**[Text Deleted]**

### 1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

#### Purpose

The M992A1 is a field artillery ammunition support vehicle comparable in speed, mobility, and survivability to current field artillery weapons (M109A6 self-propelled howitzer class).

#### Capabilities

This full-tracked, self-propelled, diesel-powered vehicle is highly mobile and maneuverable. It is capable of long-range, high-speed operation on improved roads and is well suited to rough terrain, muddy or marshy ground, sand, snow, or ice. The M992A1 can also ford waterways where maximum depth is 42 inches.

#### Features

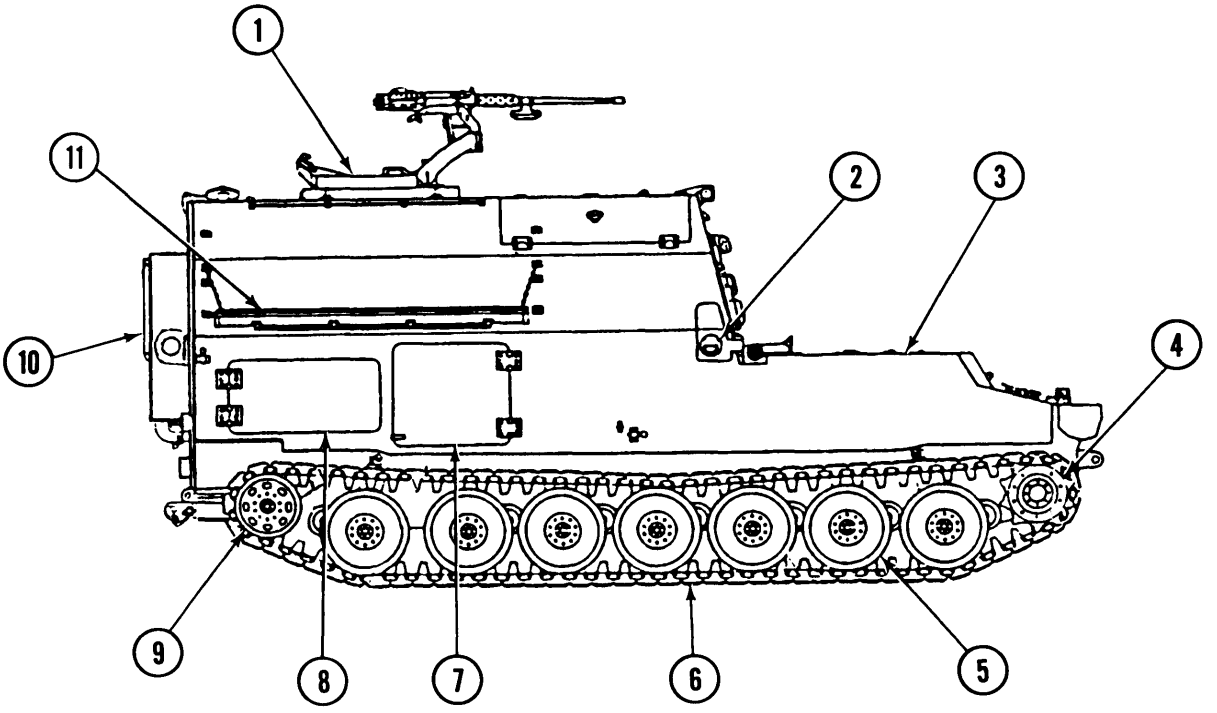
- Ammunition-handling equipment that includes a hydraulically operated conveyor assembly, two projectile rack assemblies, canister stowage compartments, and related components.
- Remote start, diesel-powered auxiliary power unit (APU) for continuous operation of electrical and hydraulic systems without use of the main engine.

**[Text Deleted]**

- Upper rear door that, when opened, provides overhead ballistic protection between M992A1 and supported howitzer. Two small doors in upper rear door allow operation of conveyor with upper rear door closed.
- Side doors, on both sides of vehicle, that provide access for personnel and for the loading of propellant-charge canisters and copperhead projectiles into canister compartments.
- On-board nuclear, biological, and chemical (NBC) agent detection and protection system.
- Crew seating for three, plus driver's seat and commander's seat.
- Simplified test equipment for the internal combustion engine (STE/ICE).

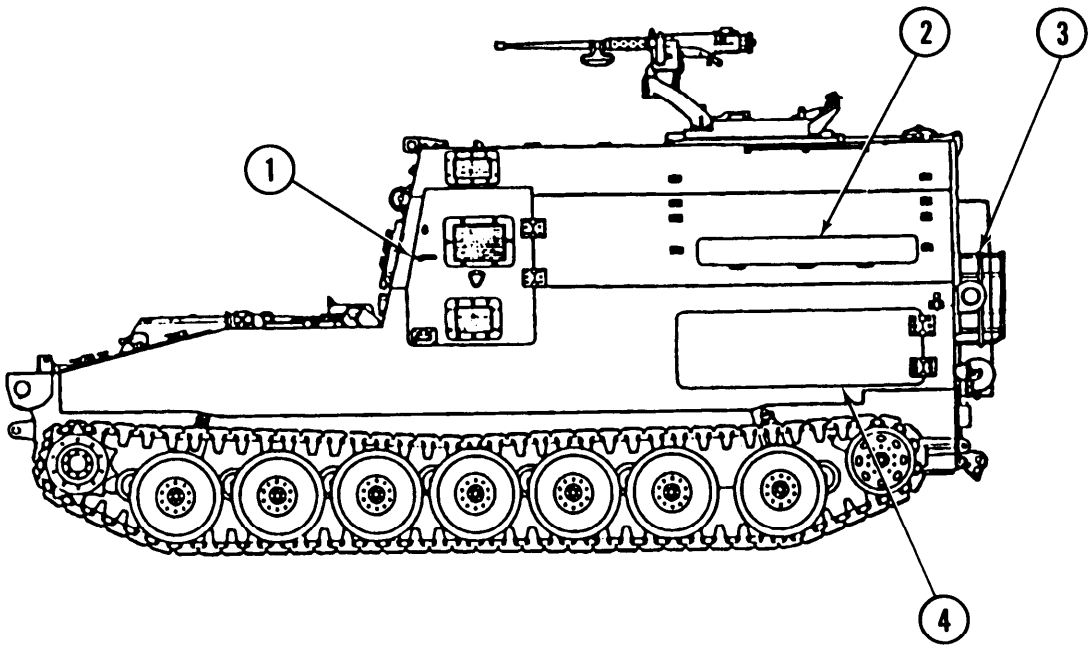
## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

1. Commanders cupola
2. Fuel fill access door
3. Hull
4. Drive sprocket (one on each side)
5. Roadwheel (seven sets of two on each side)
6. Track (one on each side)
7. Personnel side door
8. Canister side door
9. Idler wheel
10. Crew automatic fire extinguishing system (AFES) fire extinguisher box assembly
11. Duffle bag stowage rack



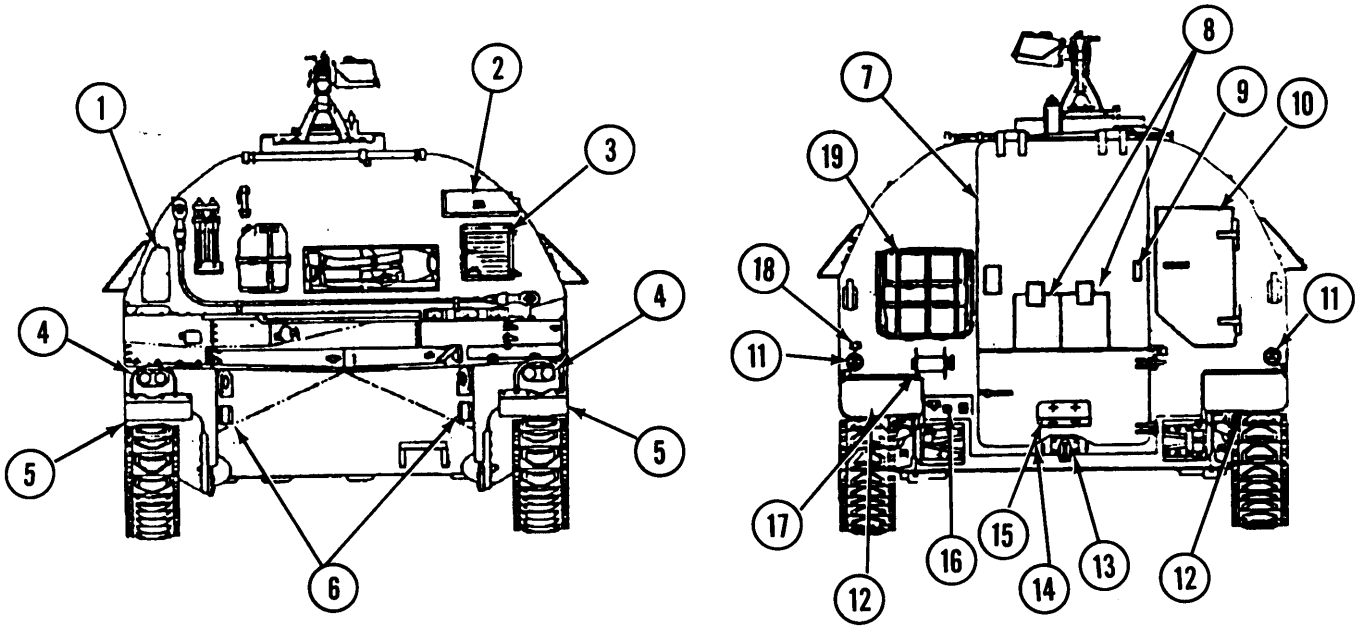
## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (continued).

1. APU door
2. Duffle bag stowage rack
3. Stowage rack
4. Canister door/copperhead projectiles



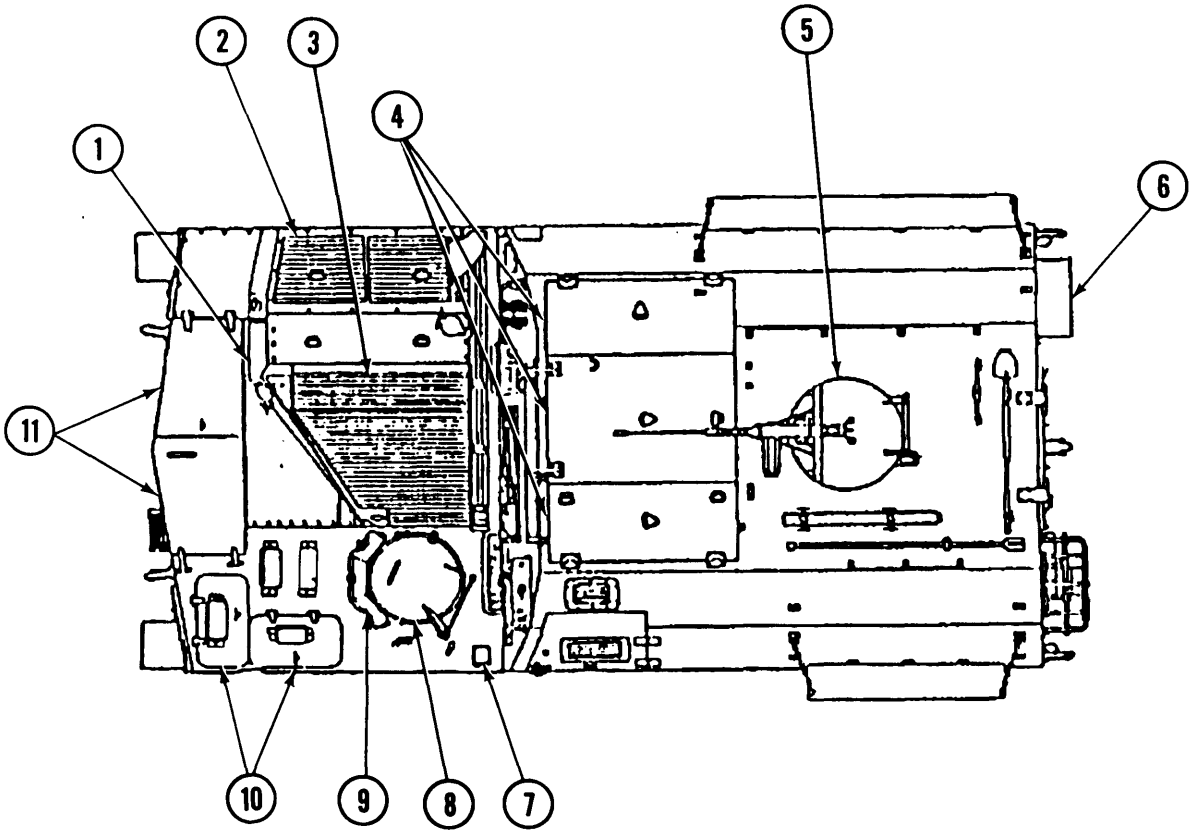
## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (continued).

1. Fuel fill filter access plate
2. APU muffler
3. APU air inlet door
4. Headlights
5. Fenders
6. Towing lugs
7. Upper rear door
8. Upper rear door small doors
9. Small door latches
10. Crew AFES fire extinguisher box assembly
11. Taillights
12. Fenders
13. Tow pintle
14. Lower rear door
15. Ml 3 Decontamination Apparatus
16. NBC terminals, NATO intervehicle slave connector, and trailer receptacle
17. Telephone handreel
18. Telephone terminals
19. Stowage rack

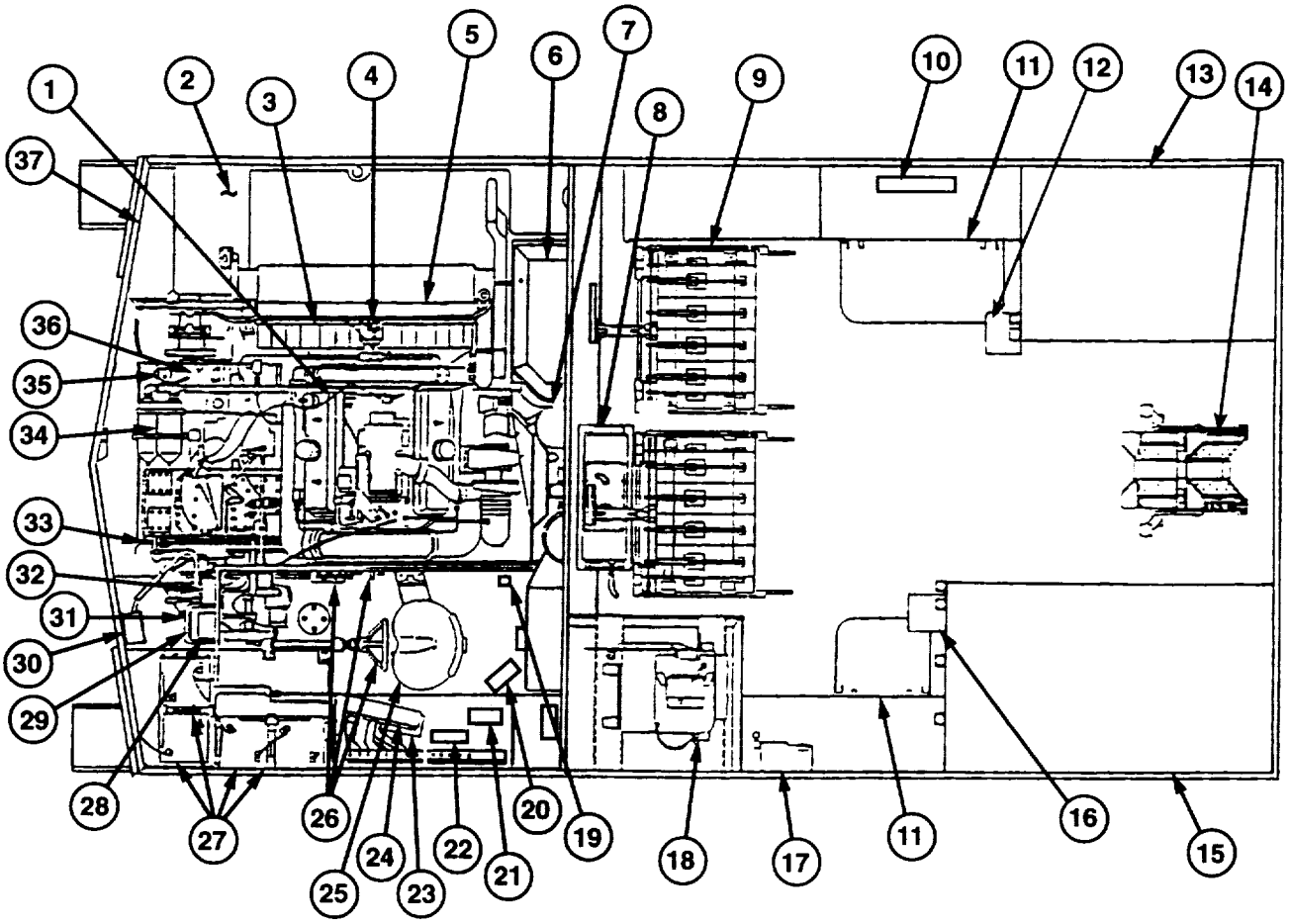


## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (continued).

1. Engine deck access plates
2. Engine access cover
3. Air intake grille
4. Tcp doors
5. Commanders cupola
6. Crew AFES fire extinguisher box assembly
7. AFES manual discharge system (AFES/MDS) lanyard cable pull handle
8. Driver's hatch
9. Driver's periscope assembly
10. Battery access covers
11. Transmission access covers



## 1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (continued).




1. Engine
2. Fuel tanks and pumps
3. Radiator
4. Generator
5. Fan assembly
6. Air cleaner
7. Personnel heater
8. Hydraulic fluid reservoir
9. Projectile rack assemblies
10. Crew AFES test and alarm (T/A) panel
11. Crew seats
12. Precision lightweight global positioning system (GPS) receiver (PLGR)
13. Right canister compartment shelf assembly
14. Conveyor assembly
15. Left canister compartment shelf assembly
16. Mounted water ration heater (MWRH)
17. Hydraulic control panel
18. APU
19. Air cleaner restriction indicator
20. Personnel heater control box
21. AFES/MDS actuator assembly
22. Engine AFES T/A panel
23. Driver's compartment NATO slave receptacle
24. Main and portable instrument panels
25. Drivers seat
26. Drivers controls
27. Batteries
28. Voltage regulator
29. Bilge pump relay
30. Rectifier
31. Starter relay
32. Master relay
33. Secondary fuel filter
34. Engine oil filters
35. Primary fuel filter
36. Transmission
37. Coolant surge tank