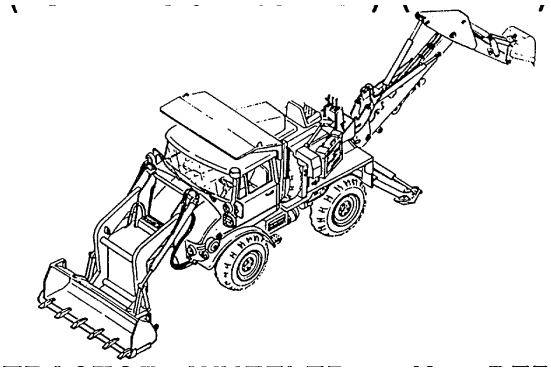
TECHNICAL MANUAL
OPERATOR'S MANUAL

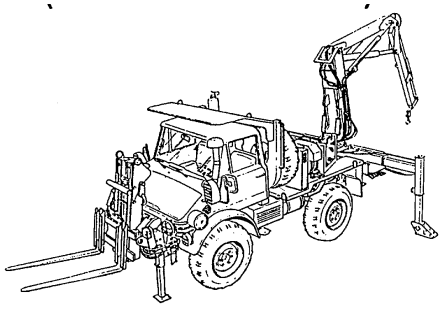
FOR
TRACTOR, WHEELED, 4 X 4 DED
SMALL EMPLACEMENT EXCAVATOR

(SEE)
(NSN 2420-01-160-2754) (EIC:EDL)



TRACTOR, WHEELED, 4 X 4 DED
HIGH MOBILITY MATERIAL HANDLER

(HMMH)
(NSN 2420-01-205-8636)



HEADQUARTERS, DEPARTMENT OF THE ARMY JULY 1993
This manual supersedes TM 5-2420-224-10 dated December 1989

TECHNICAL MANUAL
No. 5-2420-224-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., *28 July 1993*

OPERATOR'S MANUAL

FOR

TRACTOR, WHEELED, 4 X 4 DED
SMALL EMPLACEMENT EXCAVATOR (SEE)
(NSN 2420-01-160-2754) (EIC:EDL)

AND

TRACTOR, WHEELED, 4 X 4 DED
HIGH MOBILITY MATERIAL HANDLER (HMMH)
(NSN 2420-01-205-8636)

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 (Recommended Changes to Publications and Blank Forms), 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 E-mail your letter or DA Form 2028 direct to: AMSTA-LC-CI Tech Pubs, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The E-mail address is TACOM-TECH-PUBS @ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

HOW TO USE THIS MANUAL

This single volume manual is divided into chapters, sections, and paragraphs. For a specific chapter, section, or paragraph, refer to the Table of Contents (page i).

The Table of Contents lists the title of each chapter and section and the page number where each can be found. The Table of Contents also lists the Appendices and Index for this manual.

Chapter 1 introduces and describes the Small Emplacement Excavator (SEE) and the High Mobility Material Handler (HMMH). It also provides General Information, Equipment Description, and Technical Principles of Operation.

Chapter 2 provides Operating Instructions for the SEE/HMMH in the following sections:

Description and Use of Operator's Controls and Indicators
Preventive Maintenance Checks and Services (PMCS)
Lubrication Instructions
Operation Under Usual Conditions
Operation Under Unusual Conditions

Chapter 3 provides Maintenance Instructions for the SEE/HMMH in the following sections:

General Lubrication Instructions
Troubleshooting
Maintenance Procedures

A feature of the Troubleshooting Section is the Symptom Index. This index provides an easy way to find the troubleshooting procedure needed by looking up the symptom.

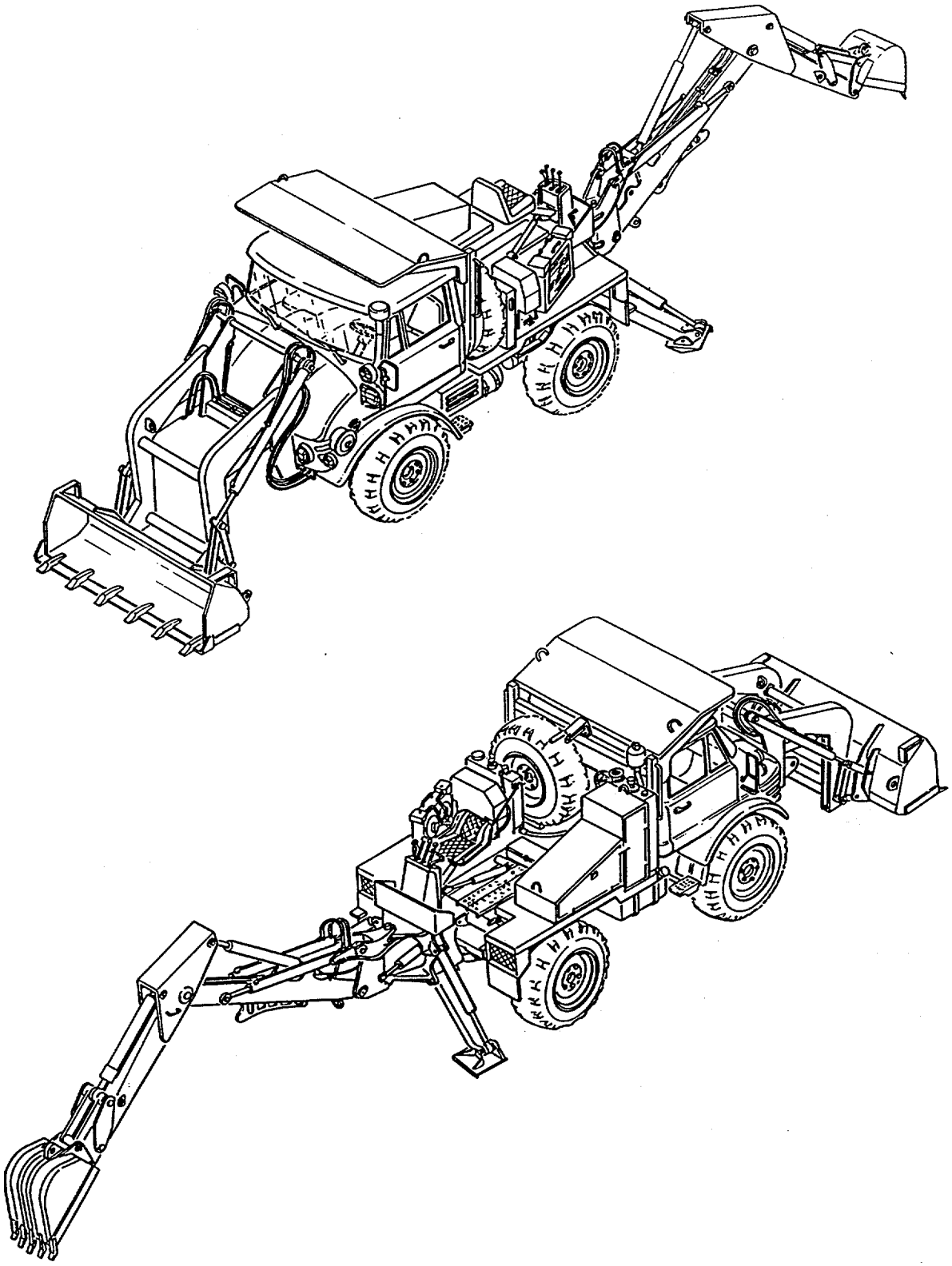
Appendices are located at the back of this manual to provide information on equipment, tools, and supplies needed to keep the SEE/HMMH fully operational.

Before operating any part of the SEE/HMMH, always do the following:

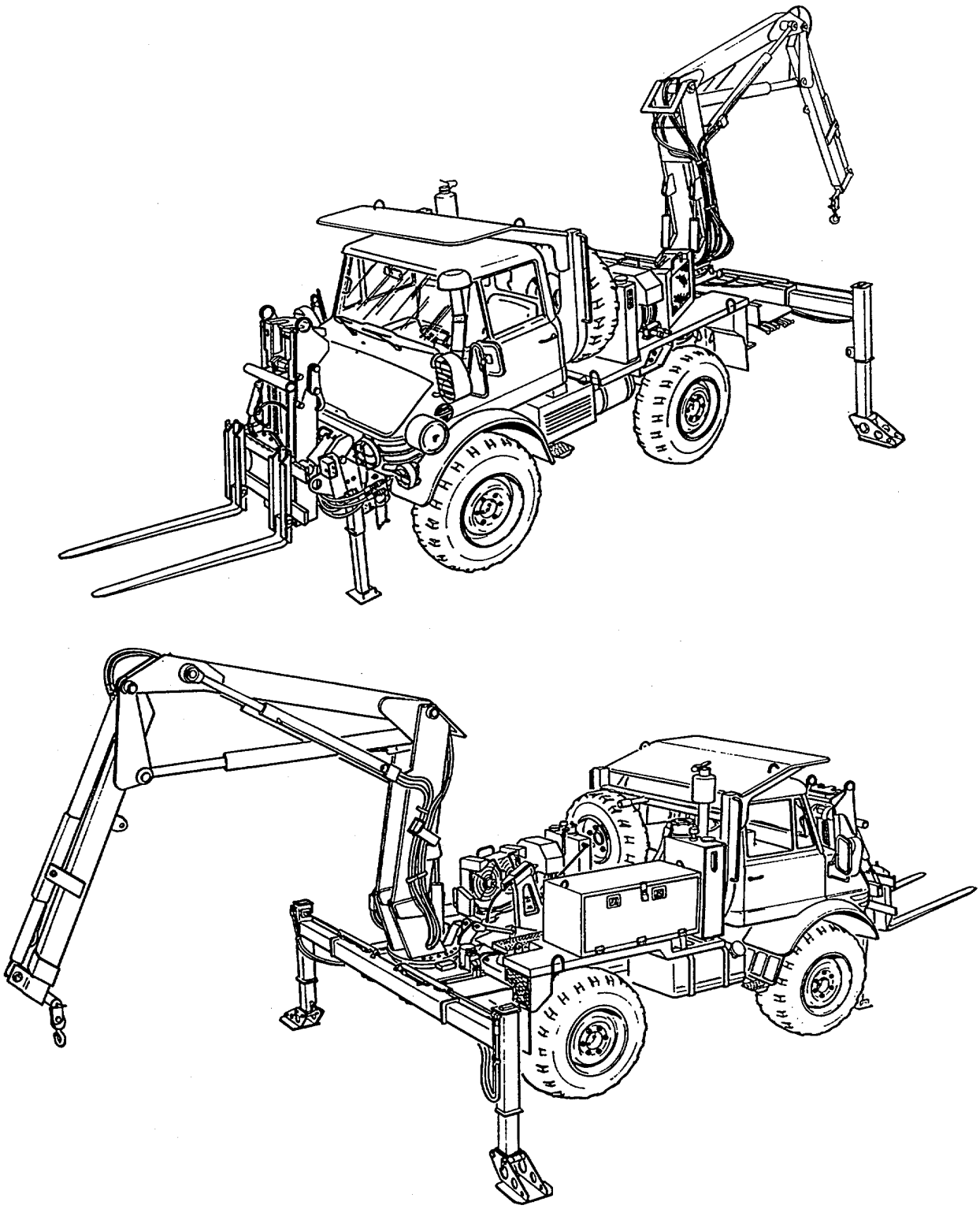
Read and follow all WARNINGS inside the front cover.

Read the Equipment Description and Technical Principles of Operation located in Chapter 1.

Read completely through the Operating Instructions to familiarize yourself with the equipment before using it.



Small Emplacement Excavator (SEE)



High Mobility Material Handler (HMMH)

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

WARNING

Read operating instructions and safety rules carefully in this manual. Important information is emphasized in each respective section. Failure to do so could result in personal injury.

CAUTION

To ensure long service life and reliable operation of engine and drivetrain in a new vehicle, do not operate at full load during first 50 hours [621 miles (1000 km)]. After this period, increase slowly to full speed of tractor. Failure to do so could result in equipment damage.

1-1. SCOPE

a. **Type of Manua**l. This manual is designed to help you operate and maintain both the Small Emplacement Excavator (SEE) and the High Mobility Material Handler (HMMH).

- Chapter 1 contains general information, description, and data on the SEE/HMMH.
- Chapter 2 depicts and describes the controls and indicators, Preventive Maintenance Checks and Services (PMCS), and operation of the SEE/HMMH.
- Chapter 3 contains lubrication instructions, troubleshooting, and maintenance procedures.
- Appendices A through D list references, Components of End Item (COEI), Basic Issue Items (BII), Additional Authorization List (AAL), and Expendable Supplies and Materials List.

b. **Model Numbers and Equipment Names**.

(1) Model No. FLU419 Tractor, Wheeled, 4 x 4 DED Small Emplacement Excavator (SEE) with attachments, NSN 2420-01-160-2754.

(2) Model No. FLU10344 Tractor, Wheeled, 4 x 4 DED High Mobility Material Handler (HMMH) with attachments, NSN 2420-01-205-8636.

c. **Purpose of Equipment.**

(1) The SEE is used for excavating, loading, lifting, and grading on various types of terrain with its front loader and backhoe. The vehicle is equipped with a chain saw, pavement breaker, and hammer drill. It is capable of rapid deployment for constructing protective positions.

(2) The HMMH is equipped with a forklift and crane for material handling. The vehicle is equipped with an impact wrench to assist in maintenance of other equipment and is capable of rapid deployment.

d. **Measurements and Dimensions.** The equipment described herein is both metric and standard and requires both metric and standard tools. Instructions are provided in both units of measure.

1-2. MAINTENANCE FORMS AND RECORDS

Every mission begins and ends with paperwork. There isn't much of it, but you have to keep it up. The forms and records you will fill out have several uses. They are a permanent record of the services, repairs, and modifications made on your vehicle. They are reports to unit maintenance and your commander; and they are a checklist for you when you want to know what was wrong with the vehicle after its last use, and whether those faults have been repaired. 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 (TAMMS).

1-3. HAND RECEIPT (-HR) MANUAL

This manual has a companion document with a TM number followed by "-HR". The TM 5-2420-224-10-HR consists of pre-printed hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, BII, and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in Chapter 12, AR 25-30:

The U.S. Army Adjutant General Publications Center
ATTN: AGLD-QRA
St. Louis, MO 63114

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

If your vehicle 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 (QDR) and mail it to us at:

U.S. Tank-automotive and Armaments Command
ATTN: AMSTA-TR-E/PQDR MS 267
6501 E. 11 Mile Road
Warren, MI 48397-5000

We' ll send you a reply.

1-5. WARRANTY INFORMATION

The vehicles are warranted by Freightliner Corporation in accordance with TB 5-2420-224-14. Warranty starts on the date found in block 23, DA Form 2408-9 in the logbook. Report all defects in material or workmanship to your supervisor, who will take appropriate action through your unit maintenance shop.

1-6. NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Nomenclature
Engine coolant	Antifreeze, ethylene-glycol mixture
Cold start system	Ether quick-start system
Gladhand	Quick-disconnect coupling
Suspension lockout system	Suspension lockout system

1-7. LIST OF ABBREVIATIONS

Abbreviation	Definition
AAL	Additional Authorization List
BII	Basic Issue Items
C	Centigrade or Celsius
cm	centimeter
COEI	Components of End Item
F	Fahrenheit
FOPS	Falling Objects Protective Structure
kg	kilogram
km	kilometer
km/h	kilometers per hour
kPa	kilopascal
kW	kilowatt
l	liter

m ..... meter
MPT ..... Multiple Purpose Tires
N.m ..... Newton meter
PMCS ..... Preventive Maintenance Checks and Services
PTO ..... Power Take-Off
QDR ..... Quality Deficiency Report
ROPS .....Roll-Over Protective Structure

Section II. EQUIPMENT DESCRIPTION

1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

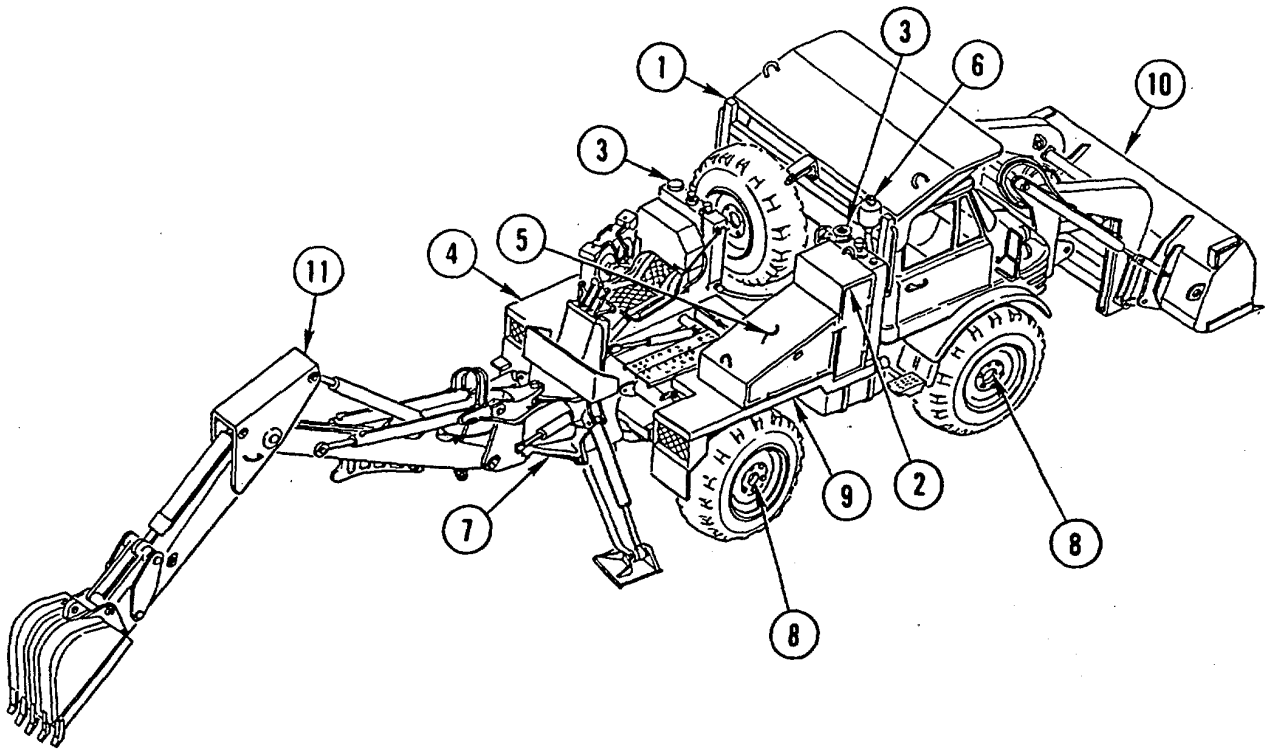
a. **Characteristics.**

- Low center of gravity for stability
- Capable of convoy speed
- Small turning radius
- High ground clearance under axles and frame
- Rapid deployment
- Multiple attachment versatility

b. **Capabilities and Features**.

- Broader range of angles of approach and departure
- Four-wheel drive and differential locks on both axles can be engaged and disengaged while moving
- High mounted air intake and vertical exhaust
- Power assisted disc brakes on all four wheels
- Power steering
- All steel cab
- Roll-Over Protective Structure (ROPS)
- Falling Objects Protective Structure (FOPS)
- Trailer towing equipment with electrical trailer connection
- Backhoe or crane and hydraulic tools can be operated simultaneously

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS



ROLL-OVER PROTECTIVE STRUCTURE (ROPS) (1). Protects cab if vehicle roll-over occurs.

STOWAGE (2). Hydraulic tools and equipment.

HYDRAULIC SYSTEM (3). Belt driven front system and Power Take-Off (PTO) driven rear system, rated to power heavy implements and tools.

UTILITY PLATFORM (4). Solid base, access backhoe operations.

BASIC ISSUE ITEMS (BII) TOOLS (5). Stored behind cab in hydraulic accessory box.

VERTICAL EXHAUST (6). Mounted behind cab.

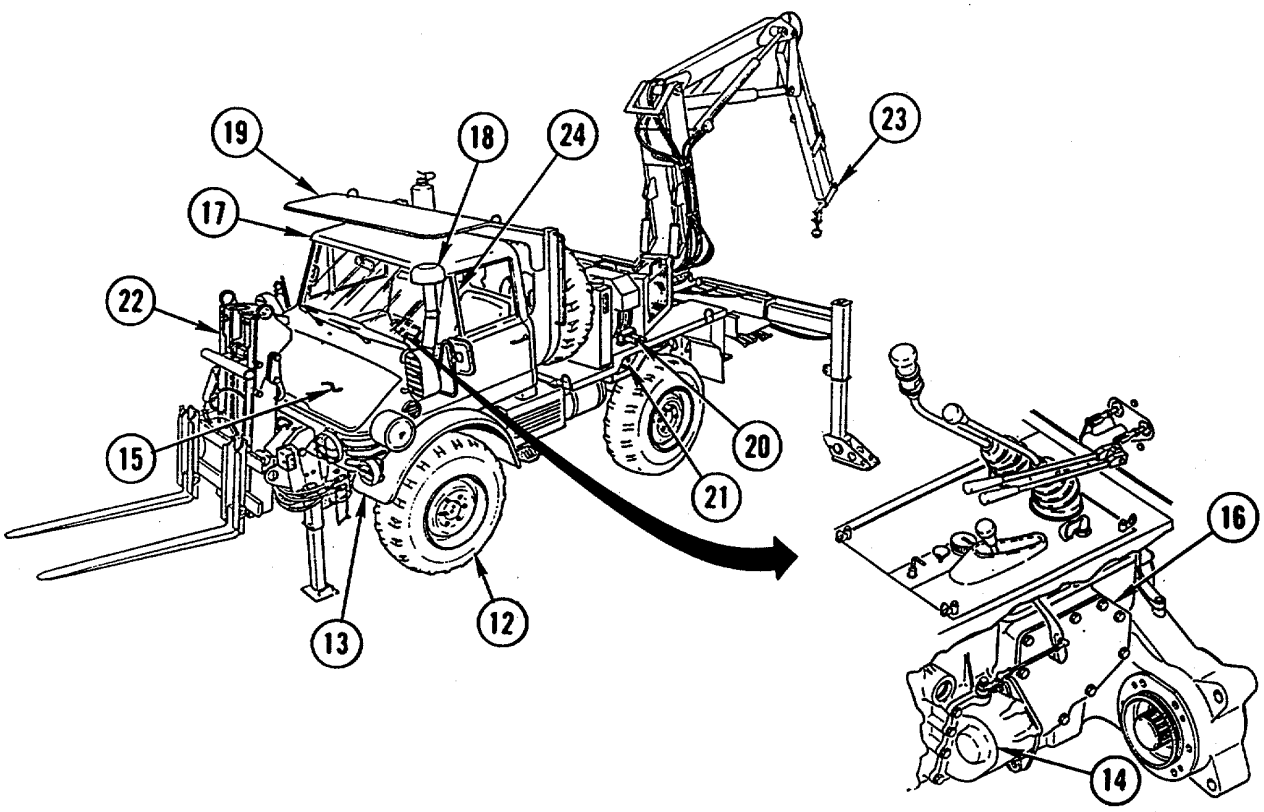
TRAILER TOWING EQUIPMENT (7). Tow pintle with air brake and electrical connections.

FOUR-WHEEL DRIVE (8). Four-wheel drive with differential lock, front and rear axles.

CHASSIS FRAME (9). Flexible, ladder-type, high-strength steel.

FRONT LOADER (10). Used for excavating and filling excavations.

BACKHOE (11). Digs excavations and trenches.



MULTIPLE PURPOSE TIRES (MPT) (12). Low-pressure high-traction radial ply with mounted spare.

SUSPENSION (13). Coil springs, shock absorbers, and suspension lockout cylinders on the HMMH.

POWER TAKE-OFF (PTO) (14). Supplies power to the rear hydraulic pump.

ENGINE (15). Four-stroke, six-cylinder diesel.

TRANSMISSION (16). Fully synchronized 16 forward, 8 reverse, and pneumatic preselect shift mechanism.

CAB (17). Two-person, all steel construction.

HIGH MOUNTED AIR INTAKE (18). Mounted on left front corner of cab.

FALLING OBJECTS PROTECTIVE STRUCTURE (FOPS) (19). Protects cab from falling objects.

HYDRAULIC TOOL COUPLINGS (20). Quick-disconnect type.

LEFT PLATFORM CONTROL PANEL (21). One-person operation.

FORKLIFT (22). Loads and unloads palletized material.

CRANE (23). Lifts material for maintenance and supply operations.

FIRE EXTINGUISHER (24). Mounted between seats.