

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR
CARRIER, PERSONNEL, FULL TRACKED, ARMORED M113A3
2350-01-219-7577 (EIC AEY)

CARRIER, COMMAND POST, LIGHT TRACKED M577A3
2350-01-369-6085 (EIC AE7)

CARRIER, ANTI-TANK (TOW), FULL TRACKED, ARMORED M901A3
2350-01-369-7253 (EIC AFD)

CARRIER, FIRE SUPPORT PERSONNEL, FULL TRACKED, ARMORED
M981A3
2350-01-369-6079 (EIC AFB)

CARRIER, SMOKE GENERATOR, FULL TRACKED M1059A3
2350-01-369-6083 (EIC AFA)

CARRIER, MORTAR, 120-MM M121, SELF-PROPELLED M1064A3
2350-01-369-6082 (EIC AE8)

CARRIER, STANDARDIZED INTEGRATED COMMAND POST SYSTEM
(SICPS) M1068A3
2350-01-369-6086 (EIC AFC)

CARRIER, MECHANIZED SMOKE OBSCURANT M58
2350-01-418-6654 (EIC 5CG)

SUPERSEDURE NOTICE — This manual supersedes TM 9-2350-277-34 dated 24 July 1994, including all changes.

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HEADQUARTERS, DEPARTMENT OF THE ARMY

2 January 2001

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DEPARTMENT OF THE ARMY
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TECHNICAL MANUAL**DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL**

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(EIC 5CG)

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://aeeps.ria.army.mil>. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA 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, DA Form 2028 or DA Form 2028-2 direct to: Technical Publication Information Office, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309)782-0726.

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

This manual tells you how to perform direct and general support maintenance for the M113A3, M577A3, M901A3, M981A3, M1059A3, M1064A3, M1068A3, and M58 Carriers.

Before starting a task or procedure, read HOW TO USE THIS MANUAL and CHAPTER 3, GENERAL MAINTENANCE PROCEDURES.

WHAT'S IN THE MANUAL — FRONT TO BACK

This TM supplement is divided into front and rear matter and Work Packages (WPs) for ease of use.

The WARNING SUMMARY section provides safety and first aid information. This section includes general warnings not found in the TM text and a list of the most important detailed warnings extracted from the WPs. All of these warnings cover hazards that could kill or injure personnel.

The TABLE OF CONTENTS lists the WPs.

CHAPTER 1 covers general introductory information with theory of operation. The Equipment Description WP gives a brief description of major parts and features of the carriers. The Theory of Operation WP provides information that will help you understand how the carrier components work.

CHAPTER 2 covers troubleshooting procedures authorized at the DS/GS maintenance level.

CHAPTER 3 includes general maintenance procedures for service upon receipt, PMCS, general maintenance instructions, and maintenance WPs for the engine system.

CHAPTER 4 contains maintenance WPs for the fuel system.

CHAPTER 5 contains maintenance WPs for the cooling system.

CHAPTER 6 contains maintenance WPs for the electrical system.

CHAPTER 7 contains maintenance WPs for the transmission.

CHAPTER 8 contains maintenance WPs for the wheels and tracks.

CHAPTER 9 contains maintenance WPs for steering.

CHAPTER 10 contains maintenance WPs for the shock absorbers.

CHAPTER 11 contains maintenance WPs for the hull.

CHAPTER 12 contains maintenance WPs for the hull accessory items.

CHAPTER 13 contains maintenance WPs for the hydraulic system.

CHAPTER 14 contains maintenance WPs for tools and test equipment.

CHAPTER 15 contains maintenance WPs for the auxiliary generator.

CHAPTER 16 contains maintenance WPs for special purpose kits.

CHAPTER 17 contains maintenance WPs for sighting material.

CHAPTER 18 contains maintenance WPs for electrical equipment (M1068A3 only).

CHAPTER 19 contains maintenance WPs for precision instruments and systems.

CHAPTER 20 contains maintenance WPs for fire fighting equipment.

CHAPTER 21 contains maintenance WPs for the shipping closure and frame.

CHAPTER 22 contains general support maintenance WPs.

CHAPTER 23 provides supporting information for the TM. It includes the following WPs:

The REFERENCES WP lists references to be used by personnel in operating and maintaining the carrier.

The COMMON TOOLS and SUPPLEMENTS and SPECIAL TOOLS/FIXTURES WP lists the tools used in the initial setup.

The EXPENDABLE/DURABLE SUPPLIES and MATERIALS lists the expendable supplies and materials used to maintain or repair the carrier.

HOW TO USE THIS MANUAL (cont)

The FABRICATED TOOLS WP lists instructions for making tools authorized to be fabricated at DS or GS maintenance levels.

The INDEX is an alphabetical listing of all the tasks in the WPs of this TM. Each entry is cross-referenced to the WP number and page number.

DA FORM 2028-2 is used to report errors and to recommend improvements for procedures in this manual. Three blank DA Forms 2028-2 are in the back of this manual. A sample is provided to show you how to fill out the DA Form 2028-2.

The back cover includes a METRIC CONVERSION CHART that can be used to convert U.S. customary measurements to their metric equivalents. Measurements in this manual are given in U.S. customary unit with metric units in parentheses.

HOW TO USE THE WORK PACKAGES

How to find the WP you need

Pick a key word from the carrier part or system to be used during the WP. Look in the INDEX for this key word or the name of the action you will perform. Turn to the page indicated.

How to read the WP

Be sure to read all **warnings, cautions** and **notes**. These are in all types of WPs. They help you avoid harm to yourself, other personnel and equipment. They also tell you things you should know about the WP.

Before starting, get all tools, supplies, and personnel, listed on the setup page needed to do the WP. Be sure to read the WP before performing the maintenance. If any other WPs are referenced, you must go to the setup page for each of those WPs to find out what tools, parts, and materials will be needed.

Start with step 1 and do each step in given order.

Look at the drawings. These show you what to look for when reading a maintenance WP.

Maintenance Instructions WPs

Doing maintenance WPs will keep the carrier in shape to operate. Maintenance WPs are used to present maintenance instructions. Each maintenance WP details steps which you need to perform. If the carrier and parts need maintenance that is not included in any WP in the manual, report this to your supervisor.

Read the INITIAL SETUP section carefully before you start a WP. Get the tools and supplies listed and the personnel needed to perform the WP. Be sure that the equipment is in the condition required.

DEFINITION OF WP TERMS

WARNINGS, CAUTIONS, AND NOTES

Be sure to read all warnings and cautions in the WP. Ignoring a warning could cause death or injury to yourself or other personnel. Ignoring a caution could cause damage to equipment. Notes contain facts to make the WP easier. Warnings, cautions, and notes always appear just above the WP step to which they apply.

WARNINGS

Call attention to things that could kill or injure personnel. Warnings are also listed in the Warning Summary section (page a).

CAUTIONS

Call attention to actions or materials that could damage equipment.

NOTES

Contain important facts to make the procedure easier.

HELPER

Helpers are needed for WPs that require more than one person such as lifting heavy objects or acting as an observer.

HOW TO USE THIS MANUAL (cont)

If a helper is needed to perform a procedure, the INITIAL SETUP will list “Helper” under the PERSONNEL REQUIRED heading.

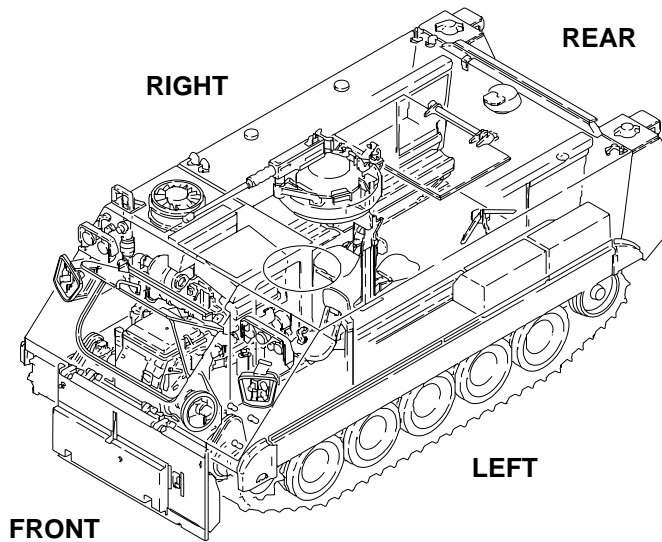
If helper assists with a step, the step will include: “Have helper assist”.

If a helper performs the action alone, the step will start with “HELPER”.

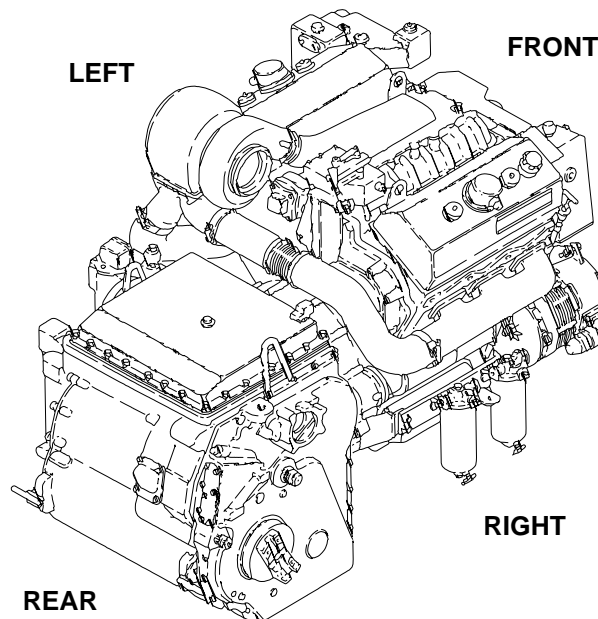
Locational Terms

The terms “front”, “rear”, “left”, and “right” are used to indicate where items are located. The POINT OF REFERENCE FOR THESE TERMS IS DIFFERENT FOR CARRIER ITEMS AND POWER UNIT ITEMS. (Carrier items are items which are not on the power unit. Power unit items are items on the engine or transmission).

If you are working with carrier items, use this point of reference. Think of the location as if you were sitting in the driver’s seat looking out the hatch.



If you are working with power unit items, use this point of reference. Think of the locations as if you were standing at the transmission end of the power unit and facing the flywheel. This rule applies whether the power unit is IN or OUT of the carrier.



HOW TO USE THIS MANUAL (cont)

REFERENCES

References within a WP refer to a different manual or to another WP in the same manual. A step in one WP may be a complete WP someplace else. Below is an example of a reference step from the WP: INSTALL ENGINE COOLANT HEATER KIT.

Example: Lower power plant grill (see your -20).

The tools needed to do the task will be listed in that task.

MATERIALS/PARTS

For all WPs, the following comments apply:

Parts which are listed on the setup page will be referred to as “new” in the WP setup when installed.

Examples are: “locknuts”, “lockwashers”, “cotter pins”, and some “gaskets”.

These and other new parts are listed under MATERIAL/PARTS in the initial set up.

GENERAL MAINTENANCE

Cleaning, inspecting, checking for leaks, and similar procedures which apply to most WPs are found in CHAPTER 3, GENERAL MAINTENANCE PROCEDURES. Use these steps to clean and inspect any part being removed, repaired, or installed. Special cleaning will be covered in the WP step.

HOW TO USE THE REPAIR PARTS AND SPECIAL TOOLS LISTS (RPSTL) WITH THIS MANUAL

The RPSTL TM 9-2350-277-24P gives the National Stock Number (NSN) required to order parts use in the maintenance WPs. To use the RPSTL to identify and order a part, do the following:

In this manual, turn to the first page of the WP to be performed.

Find Materials/Parts under INITIAL SETUP, and read the part(s) that need replacement. If required, find the illustrated part in the WP steps.

Go to the RPSTL and find the same illustrated part. That part will have an item number assigned to it. Look this item number up in the listing for that figure. The NSN can be found in the National Stock Number and Part Number Index in the back of the RPSTL.

If you inspect an item and find that it is damaged, go to the RPSTL and find the SMR code for the item. If the SMR code does not authorize you to repair the item, reassemble it and send it to the authorized level of maintenance.

CHAPTER 1

GENERAL SUPPORT INTRODUCTORY INFORMATION WITH THEORY OF OPERATION

WORK PACKAGE INDEX

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EQUIPMENT DESCRIPTION.....	.0002 00
THEORY OF OPERATION.....	.0003 00
REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.....	.0004 00

GENERAL INFORMATION

0001 00**SCOPE**

Type of Manual: Direct and General Support Maintenance

Equipment Model Number, Name, and Purpose:

M113A3 – Armored Full Tracked Personnel Carrier

Purpose: Transportation and positioning combat troops and supplies.

M577A3 – Light Tracked Command Post Carrier

Purpose: Provides protection and mobility for field commanders in a tactical environment.

M901A3 – Armored Full Tracked Anti-Tank (TOW) Carrier

Purpose: Provides mobility for heavy anti-tank weapon designed and built to attack and defeat armored vehicles and other targets such as field fortifications.

Other Applicable Manuals: See TM 9-2350-259-34, and TM 9-2350-259-24P for DS and GS maintenance, and repair parts for the turret and related parts.

M981A3 – Armored Full Tracked Fire Support Personnel Carrier

Purpose: Provides mobile operating base for target location, designation, and communication by a Fire Support Team in support of a maneuver company.

Other Applicable Manuals: See TM 9-2350-266-34-1 &-2, and TM 9-2350-266-24P for DS and GS maintenance, and repair parts for the turret and related parts.

M1059A3 – Full Tracked Smoke Generator Carrier

Purpose: Designed to generate a smoke screen in the battlefield environment.

Other Applicable Manuals: See TM 3-1040-283-20&P for Operator's instructions, Unit maintenance, and repair parts for Smoke Generator Set M157A2.

M1064A3 – Self-propelled 120-mm M121 Mortar Carrier

Purpose: Provides mobility for the 4.7-inch (120-mm) Mortar M121 or M120. The M121 can be fired from a turntable mounted in the carrier. The M120 can be fired from a portable mount off the carrier.

Other Applicable Manuals: See TM 9-1015-250-23 and TM 9-1015-250-23P for Unit and DS maintenance and repair parts for the 4.7-inch (120-mm) Mortar M121 or M120.

M1068A3 – Standardized Integrated Command Post System (SICPS) Carrier

Purpose: Designed as a command post and field office to support the various configurations and installation layouts of the Army Tactical Command and Control System (ATCCS) and provide protection for field commanders in a tactical environment.

Other Applicable Manuals: See TM 11-7010-256-12&P for Operator's instructions, Unit maintenance, and repair parts for SICPS Equipment.

See TM 10-5410-229-13&P for Operator's instructions, Unit and DS maintenance, and repair parts for the Modular Command Post System (MCPS) tent and related parts.

M58—Mechanized Smoke Obscurant Chassis

Purpose: Designed to provide large area smoke screens in support of various tactical situations. Smoke can be generated in a static position or on the move.

Other Applicable Manuals: See TM 3-1040-285-10 for Operator's instructions for the Mechanized Smoke Obscurant System Smoke Generator.

See TM 3-1040-285-20 for Unit Maintenance for the Mechanized Smoke Obscurant System Smoke Generator.

See TM 3-1040-285-30 for Direct Support Maintenance for the Mechanized Smoke Obscurant System Smoke Generator.

See TM 3-1040-285-23P for repair parts for the Mechanized Smoke Obscurant System Smoke Generator.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pamphlet 738-750, The Army Maintenance Management System (TAMMS).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your carrier 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 an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-QRT, Warren, MI 48397-5000. A reply will be sent to you.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

See the following technical manuals for information on destruction of Army materiel:

TM 750-244-2 Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.

TM 750-244-5-1 Procedures for Destruction of Conventional Ammunition and Improved Conventional Munitions to Prevent Enemy Use.

TM 750-244-6 Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use.

TM 750-244-7 Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1520, 2530, 5590, 5595 to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

For information about administrative storage or shipment, see the following documents:

Preparation for Storage or Shipment

<u>Specification</u>	<u>Applicable Carriers</u>
MIL-C-45360G(AT)	M113A3, M1059A3, M1064A3
MIL-C-46746E(AT)	M577A3 & M1068A3
MIL-C-62327B(AT)	M901A3 (Less TOW Weapon) & M981A3

NOMENCLATURE CROSS-REFERENCE

This listing includes nomenclature cross references used in this manual.

COMMON NAME

Locknut	Self-locking nut
Lockscrew	Self-locking bolt
Lockwasher	Self-locking washer

METRIC EQUIVALENTS

Metric equivalents are used throughout this manual. Metric symbols and units are:

Metric Equivalents

<u>SYMBOL</u>	<u>UNIT</u>
C	Celsius
cc	cubic centimeter
cm	centimeter
j	joule
kg	kilogram
kg/min	kilogram per minute
km	kilometer
km/h	kilometer per hour
kPa	kilopascal
kW	kilowatt
l	liter
m	meter
mm	millimeter
N·m	Newton-meters

SAFETY, CARE, AND HANDLING

See Warning Summary in front of manual.

EQUIPMENT DESCRIPTION

0002 00**EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

For equipment characteristics, capabilities, and features, see your -10.

LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS**ENGINE**

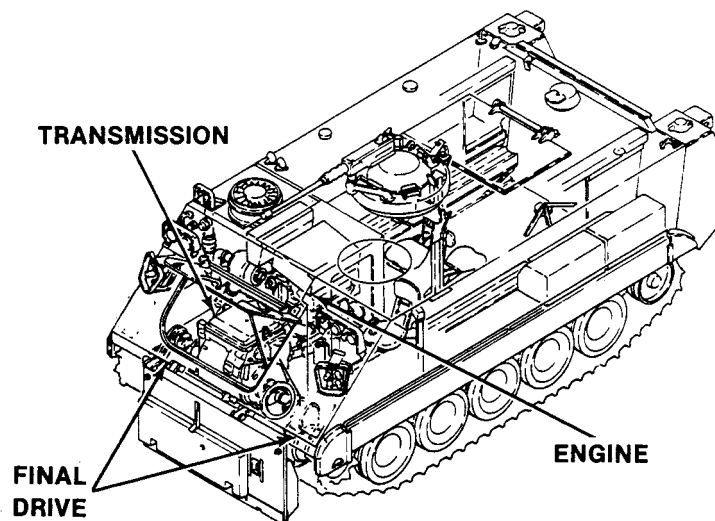
A turbocharged diesel engine is located in the power plant compartment.

TRANSMISSION

An automotive transmission connects to the engine and powers the final drives.

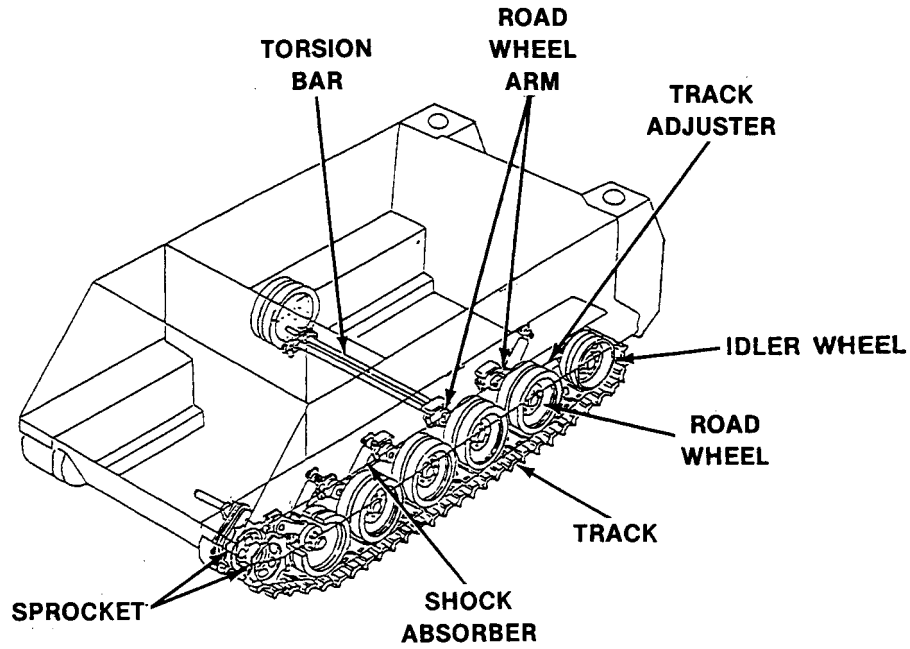
FINAL DRIVES

Final drives attach to the transmission by propeller shafts. They deliver power to drive sprockets at the front of the carrier.



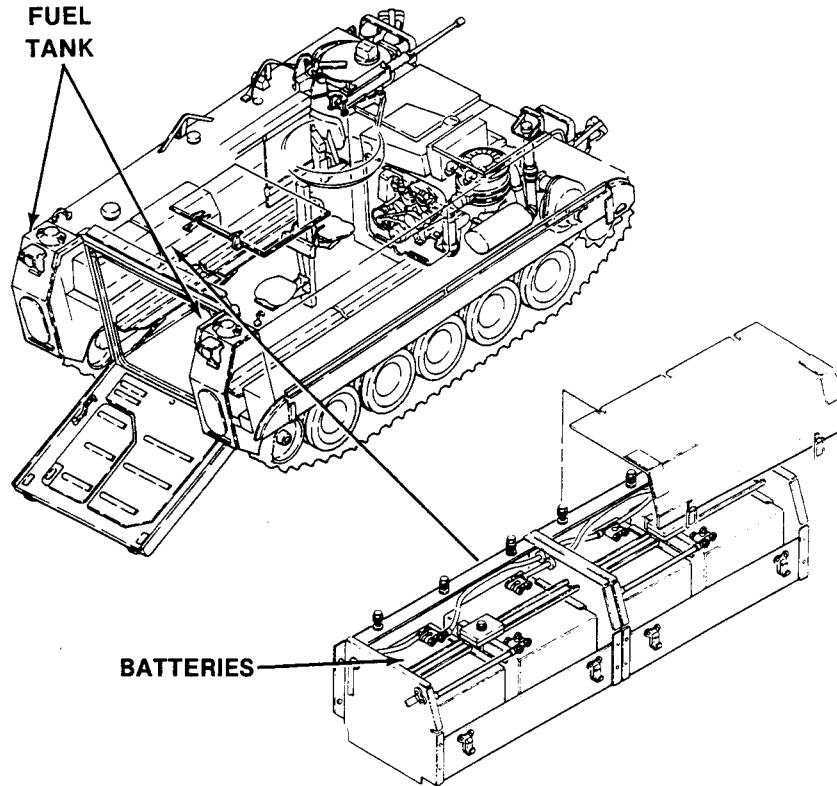
TRACKS AND SUSPENSION

Drive sprockets are at the front of the carrier drive track. Torsion bars and shock absorbers attach to road wheels and provide suspension.



ELECTRICAL

Four batteries connected in a parallel-series arrangement supply electricity through the distribution box to the carrier. On the M113A3, M901A3, M981A3, M1059A3, and M58 carriers, the four batteries are located on the left sponson. On the M577A3 and M1068A3 carriers, the four batteries are located on the right sponson next to the personnel heater. On the M1064A3 carrier, two batteries are located in a drawer on the left sponson behind the driver and two batteries are located under the right personnel seat.

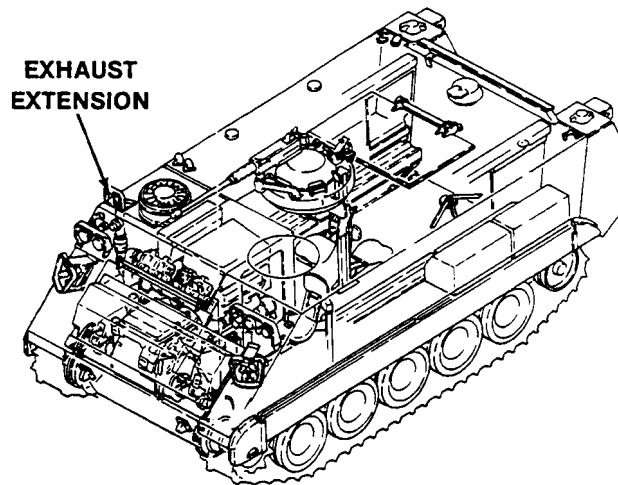
**M113A3, M901A3, AND M1059A3 SHOWN**

FUEL SYSTEM

The M113A3, M901A3, M981A3, M1059A3, M1064A3, and M58 carriers have two external fuel tanks located at the rear of the carrier on each side of the ramp. Total capacity is 95 gallons. The M577A3 and M1068A3 carriers have two internal fuel tanks located on the rear left and right sponsons. Total capacity is 120 gallons.

EXHAUST SYSTEM

The exhaust system drives the turbocharger and carries exhaust gases through manifolds and the muffler.

**DIFFERENCES BETWEEN CARRIERS**

This manual covers seven different carriers. For a list of differences between carriers, see the DIFFERENCES chart in your -20.

EQUIPMENT DATA

For equipment data, see your -10.