* This publication supersedes M44A2 series data published in TM 9-2320-209-20-1; TM 9-2320-209-20-2-1; TM 9-2320-209-20-2-2; TM 9-2320-209-20-3-1; TM 9-2320-209-20-3-2; TM 9-2320-209-20-3-3; TM 9-2320-209-20-3-4, 27 May 1981. Retain all TM 9-2320-209-20 publications for reference pertaining to M44 and M44A1 series trucks.

TECHNICAL MANUAL

UNIT MAINTENANCE

FOR

2-1/2-TON, 6X6, M44A2 SERIES TRUCKS (MULTIFUEL)

Model		NSN Without Winch	NSN With Winch
Truck, Cargo	M35A2	2320-00-077-1616	2320-00-077-1617
	M35A2C	2320-00-926-0873	2320-00-926-0875
	M36A2	2320-00-077-1618	2320-00-077-1619
Truck, Tank, Fuel	M49A2C	2320-00-077-1631	2320-00-077-1632
Truck, Tank, Water	M50A2	2320-00-077-1633	2320-00-077-1634
	M50A3	2320-00-937-4036	2320-00-937-5264
Truck, Van, Shop	M109A3	2320-00-077-1636	2320-00-077-1637
Truck, Instrument Repair Shop	M185A3	4940-00-077-1638	4940-00-077-1639
Truck, Tractor	M275A2	2320-00-077-1640	2320-00-077-1641
Truck, Dump	M342A2	2320-00-077-1643	2320-00-077-1644
Truck, Maintenance, Pipeline Construction	M756A2		2320-00-904-3277
Truck, Maintenance, Earth Boring and Polesetting	M764		2320-00-937-5980

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DEPARTMENT OF THE ARMY
Washington D. C., *25 October 1991*

TECHNICAL MANUAL
FOR
UNIT MAINTENANCE
2-1/2-Ton, 6X6, M44A2 SERIES TRUCKS
(MULTIFUEL)

Model		NSN Without Winch	NSN With Winch
Truck, Cargo	M35A2	2320-00-077-1616	2320-00-077-1617
	M35A2C	2320-00-926-0873	2320-00-926-0875
	M36A2	2320-00-077-1618	2320-00-077-1619
Truck, Tank, Fuel	M49A2C	2320-00-077-1631	2320-00-077-1632
Truck, Tank, Water	M50A2	2320-00-077-1633	2320-00-077-1634
	M50A3	2320-00-937-4036	2320-00-937-5264
Truck, Van, Shop	M109A3	2320-00-077-1636	2320-00-077-1637
Truck, Instrument Repair Shop	M185A3	4940-00-077-1638	4940-00-077-1639
Truck, Tractor	M275A2	2320-00-077-1640	2320-00-077-1641
Truck, Dump	M342A2	2320-00-077-1643	2320-00-077-1644
Truck, Maintenance, Pipeline Construction	M756A2		2320-00-904-3277
Truck, Maintenance, Earth Boring and Polesetting	M764		2320-00-937-5980

* This publication supersedes M44A2 series vehicle data published in TM 9-2320-209-20-1; TM 9-2320-209-20-2-1; TM 9-2320-209-20-2-2; TM 9-2320-209-20-3-1; TM 9-2320-209-20-3-2; TM 9-2320-209-20-3-3; TM 9-2320-209-20-3-4, 27 May 1981. Retain all TM 9-2320-209-20 publications for reference pertaining to M44 and M44A1 series trucks.

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REPORTING OF ERRORS

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 back of this manual direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, Michigan 48397-5000. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

ABOUT YOUR MANUAL

Spend some time looking through this manual. You'll find that it has a new look, different than most of the TM's you've been using.

New features added to improve the convenience of this manual and increase your efficiency are:

a. **Accessing Information** – These include features such as the bleed-to-edge locators on the cover and edge of the manual. Extensive troubleshooting guides for specific systems lead directly to step-by-step directions for problem solving and maintenance tasks.

b. **Illustrations** – A variety of methods are used to make locating and fixing components much easier. Locator illustrations with keyed text, exploded views, and cut-away diagrams make the information in this manual easier to understand and follow.

c. **Modification or Special Purpose Kits** – M44A2 series vehicles can be updated with modification kits or equipped with special purpose kits. They allow the vehicle to operate more efficiently or perform a special function. Sometimes the vehicle being worked on doesn't exactly match the maintenance procedure in this manual because the proper kit has not been installed. Refer to troubleshooting sections in chapter 2 to find troubleshooting instructions or a reference to kit installation instructions.

d. **Keying Text With Illustrations** - Illustration and text are located on facing pages that show the specific task you are working on. In some cases, the task steps and illustrations are located side by side. Continue reading for an example of modular text and illustrations.

e. **General Features** - Your TM is the best source available for providing information and data critical to vehicle operation and maintenance:

- Safety summary (warning pages a, b, c, and d)
- General information, equipment description, and data (chapter 1, sections I and II)
- Principles of operation (chapter 1, section III)
- Preventive Maintenance Checks and Services - PMCS (chapter 2, section III)
- Systems Troubleshooting (chapter 2, sections IV, V, VI, and VII)
- Detailed maintenance procedures (chapters 3 through 14)
- Shipment and limited storage (chapter 15, sections I, II, and III)
- References (appendix A)
- Maintenance Allocation Chart – MAC (appendix B)
- Expendable/durable supplies and materials list (appendix C)
- Torque limits (appendix D)
- Schematic and Wiring Diagrams (appendix E)

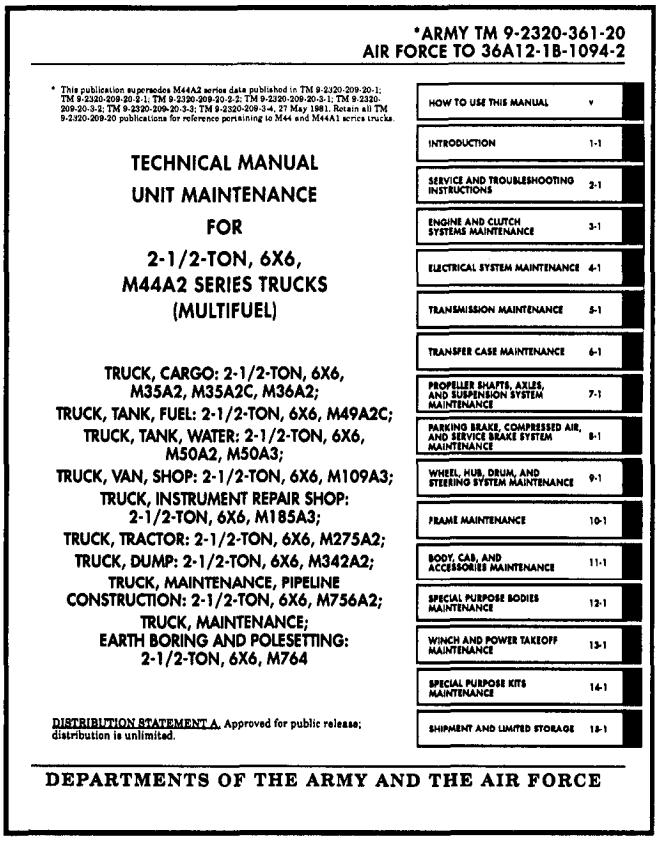
A typical example of how to use this manual is provided on the following pages.

USING YOUR MANUAL: AN EXAMPLE

TASK: The operator of an M44A2 series vehicle, model number M35A2C, has complained of excessive exhaust noise and exhaust fumes entering the cab of his vehicle. The vehicle has been assigned to you for repair.

TROUBLESHOOTING STEPS:

1. Look at the cover of this manual. You'll see chapter/section titles listed from top to bottom on the right-hand side.
2. Look at the right-edge of the manual. On some of the pages you'll see edge indicators (black bars) that are alined with the chapter/section bars on the cover. These are the locations of the chapters/sections in the text.
3. Look for "SERVICE AND TROUBLE-SHOOTING INSTRUCTIONS" in the chapter list on the cover. This is where the troubleshooting information is located.
4. Turn to those pages with the edge indicator matching the black bar for service and troubleshooting instructions. Page numbers are also listed next to chapter/section titles.
5. Chapter 2 is divided into seven sections:
   - Section I - Repair Parts, Special Tools, TMDE, and Support Equipment
   - Section II - Service Upon Receipt
   - Section III - Preventive Maintenance Checks and Services (PMCS)
   - Section IV - Mechanical Systems Troubleshooting
   - Section V - Compressed Air and Brake System Troubleshooting
   - Section VI - Electrical Systems Troubleshooting
   - Section VII - STE/ICE Troubleshooting
6. Turn to section IV, "MECHANICAL SYSTEMS TROUBLESHOOTING" (page 2-24). This troubleshooting section is system-oriented and is broken down into 25 major vehicle systems.
7. One of the first pages of this section is the "MECHANICAL TROUBLESHOOTING SYMPTOM INDEX" (turn to page 2-25).
8. Look down the list until you find "EXHAUST SYSTEM." Beneath that heading you will find the symptoms noted by the vehicle operator: "Excessive exhaust noise" and "Exhaust fumes in cab."
9. Turn to the page indicated: 2-33.



*ARMY TM 9-2320-361-20
AIR FORCE TO 36A12-1B-1094-2

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TECHNICAL MANUAL
UNIT MAINTENANCE
FOR
2-1/2-TON, 6X6,
M44A2 SERIES TRUCKS
(MULTIFUEL)

TRUCK, CARGO: 2-1/2-TON, 6X6, M35A2, M35A2C, M36A2;
TRUCK, TANK, FUEL: 2-1/2-TON, 6X6, M49A2C;
TRUCK, TANK, WATER: 2-1/2-TON, 6X6, M50A2, M50A3;
TRUCK, VAN, SHOP: 2-1/2-TON, 6X6, M109A3;
TRUCK, INSTRUMENT REPAIR SHOP: 2-1/2-TON, 6X6, M185A3;
TRUCK, TRACTOR: 2-1/2-TON, 6X6, M275A2;
TRUCK, DUMP: 2-1/2-TON, 6X6, M342A2;
TRUCK, MAINTENANCE, PIPELINE CONSTRUCTION: 2-1/2-TON, 6X6, M756A2;
TRUCK, MAINTENANCE; EARTH BORING AND POLESETTING: 2-1/2-TON, 6X6, M764

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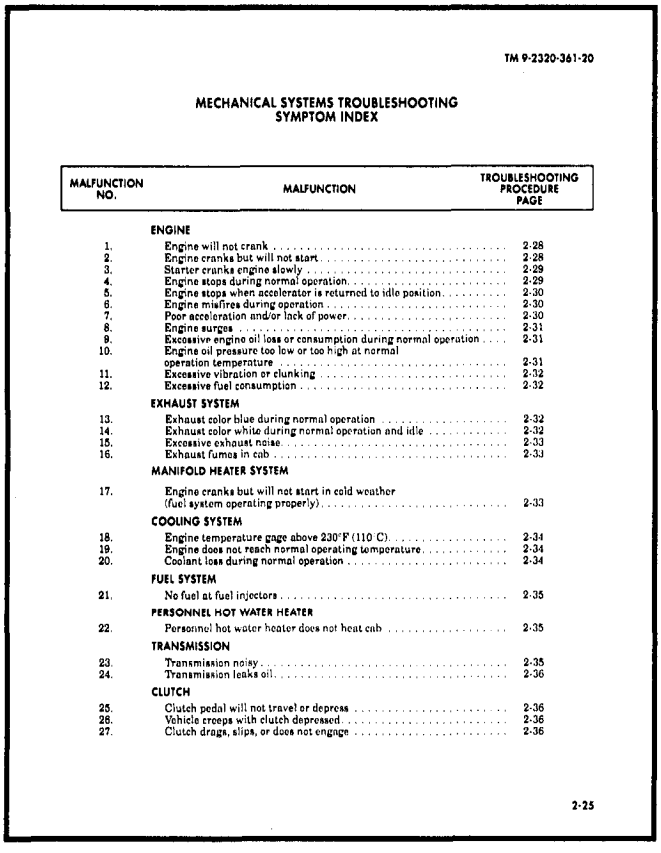
DEPARTMENTS OF THE ARMY AND THE AIR FORCE



TM 9-2320-361-20

MECHANICAL SYSTEMS TROUBLESHOOTING
SYMPTOM INDEX

MALFUNCTION NO.	MALFUNCTION	TROUBLESHOOTING PROCEDURE PAGE
	ENGINE	
1.	Engine will not crank	2-28
2.	Engine cranks but will not start	2-28
3.	Starter cranks engine slowly	2-29
4.	Engine stops during normal operation	2-29
5.	Engine stops when accelerator is returned to idle position	2-30
6.	Engine misfires during operation	2-30
7.	Poor acceleration and/or lack of power	2-30
8.	Engine surges	2-31
9.	Excessive engine oil loss or consumption during normal operation	2-31
10.	Engine oil pressure too low or too high at normal operating temperature	2-31
11.	Excessive vibration or clunking	2-32
12.	Excessive fuel consumption	2-32
	EXHAUST SYSTEM	
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14.	Exhaust color white during normal operation and idle	2-32
15.	Excessive exhaust noise	2-33
16.	Exhaust fumes in cab	2-33
	MANIFOLD HEATER SYSTEM	
17.	Engine cranks but will not start in cold weather (fuel system operating properly)	2-33
	COOLING SYSTEM	
18.	Engine temperature gage above 230°F (110°C)	2-34
19.	Engine does not reach normal operating temperature	2-34
20.	Coolant loss during normal operation	2-34
	FUEL SYSTEM	
21.	No fuel at fuel injectors	2-35
	PERSONNEL HOT WATER HEATER	
22.	Personnel hot water heater does not heat cab	2-35
	TRANSMISSION	
23.	Transmission noisy	2-35
24.	Transmission leaks oil	2-36
	CLUTCH	
25.	Clutch pedal will not travel or depress	2-36
26.	Vehicle creeps with clutch depressed	2-36
27.	Clutch drags, slips, or does not engage	2-36

2-25

10. On page 2-33, step/test relating to resolving the problem of "Excessive exhaust noise" is listed:

    Step 1. During your inspection, you discover that an exhaust pipe is cracked and rusted. The part must be replaced. Chapter 3, section VIII is referenced.

11. Turn to the "TABLE OF CONTENTS" and find the chapter dealing with the engine. You find it as "CHAPTER 3, ENGINE AND CLUTCH SYSTEMS MAINTENANCE." Furthermore, you note that the chapter is divided into nine sections; you are interested in "Section VIII. Exhaust System Maintenance."

NOTE: Before attempting to repair or replace the exhaust system, as a Unit mechanic, you must:

a. Determine the maintenance responsibility of repair or replacement of the component.

b. If the task is at your echelon of maintenance responsibility, you must identify the tools needed and the replacement parts required.

Refer to the Maintenance Allocation Chart - MAC (appendix B) to determine not only the maintenance responsibility of the item, but also to obtain an estimate of the time required to perform the task, tools needed, and any special notes/requirements necessary.

Refer to TM 9-2320-361-20P, Unit Maintenance Repair Parts and Special Tools List for M44A2 Series Vehicles, for requisition data concerning replacement parts for this task.

12. Turn to chapter 3, section VIII, which covers "EXHAUST SYSTEM MAINTENANCE." In the maintenance index we find that there are two paragraphs listed, para. 3-37 and 3-38.

13. Paragraph 3-38 is a task for replacing the exhaust system used only on model M50A2 and M50A3 vehicles. All other M44A2 series vehicles will follow para. 3-37 for replacement of the exhaust system. Notice that, in this case, it starts on the same page, 3-82.

14. The first two pages shown have procedures and illustrations for performing the removal steps for components of the exhaust system.

Table 2-2. Mechanical Troubleshooting (Contd).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
15. EXCESSIVE EXHAUST NOISE
Step 1. Inspect turbocharger for secure mounting and exhaust leaks. If turbocharger mountings are loose, tighten 23-27 lb-ft (31-37 N·m).
Step 2. Inspect exhaust pipes for secure connections, cracks, breaks, and excessive rust. Replace damaged parts (chapter 3, section VIII).
Step 3. Inspect exhaust stack for secure connections, cracks, and breaks. Replace damaged parts (chapter 3, section VIII).
Step 4. If excessive exhaust noise still exists, it may be necessary to install exhaust insulator kit 12300664.
END OF TESTING!
16. EXHAUST FUMES IN CAB
Step 1. Inspect exhaust manifold, turbocharger, exhaust pipes, and connections for leaks. Replace damaged parts (chapter 3, section VIII).
Step 2. Inspect exhaust manifold and turbocharger for leaks. If leaking, notify supervisor.
END OF TESTING!
MANIFOLD HEATER SYSTEM
17. ENGINE CRANKS BUT WILL NOT START IN COLD WEATHER (FUEL SYSTEM OPERATING PROPERLY)
Step 1. Check manifold heater system electrical circuit (table 2-4, malfunction 39).
Step 2. Check fuel pump supply lines and filter for leaks, bends, kinks, and restrictions. If vehicle is equipped with alcohol evaporator, check for proper operation as required (TM 9-2320-361-10).
WARNING Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.
NOTE • Have drainage container ready to catch fuel. • During steps 3 and 4, do not confuse in-tank fuel pump pressure with manifold heater pump pressure.
Step 3. Disconnect fuel line at fuel nozzle, energize manifold heater circuit and check to see if fuel is discharged. If fuel is not discharged, replace manifold heater fuel pump (para. 3-30 or 3-31).
Step 4. Check fuel nozzle for proper operation. Remove fuel return lines (para. 3-27). Energize circuit and check to see if fuel is discharged. If fuel is not discharged, notify supervisor.
END OF TESTING!

2-33

Section VIII. EXHAUST SYSTEM MAINTENANCE

3-36. EXHAUST SYSTEM MAINTENANCE INDEX

PARA. NO.	TITLE	PAGE NO.
3-37.	Exhaust System Replacement	3-82
3-38.	Exhaust System (M50A2 and M50A3) Replacement	3-86

3-37. EXHAUST SYSTEM REPLACEMENT

This task covers:
a. Removal
b. Installation

INITIAL SETUP:

APPLICABLE MODELS
All except M50A2, M50A3

MATERIALS/PARTS
Four gaskets
Ten locknuts
Two lockwashers

REFERENCES (TM)
TM 9-2320-361-10
TM 9-2320-361-20P

EQUIPMENT CONDITION
Air cleaner element removed (para. 3-14).

GENERAL SAFETY INSTRUCTIONS
Do not touch hot exhaust system components with bare hands.

WARNING
Do not touch hot exhaust system components with bare hands. Severe injury to personnel will result.

a. Removal

1. Remove locknut (13) and screw (7) from coupling (14). Discard locknut (13).
2. Disconnect elbow (9) from flex tube (15), and remove coupling (14) and gasket (8) from elbow (9). Discard gasket (8).
3. Loosen clamp (11) and remove elbow (9), clamp (11), and gasket (10) from turbocharger (12). Discard gasket (10).
4. Remove locknut (22) and screw (21) from coupling (23), and remove flex tube (15), coupling (23), and gasket (24) from exhaust pipe (29). Discard gasket (24) and locknut (22).
5. Remove locknut (2) and screw (38) from coupling (39). Discard locknut (2).
6. Remove stack pipe (1), coupling (39), and gasket (40) from exhaust pipe (29). Discard gasket (40).
7. Remove four locknuts (4), screws (36), two clamps (3), and exhaust shield (35) from exhaust pipe (29). Discard locknuts (4).
8. Remove two locknuts (30), washers (31), screws (34), washers (33), and cover plates (18) from fender (32). Discard locknuts (30).

3-82

DETAILED MAINTENANCE PROCEDURES:

15. Detailed procedures: Include everything you must do to accomplish a basic maintenance task.

    a. Before beginning the maintenance task, look through the procedure. You must familiarize yourself with the entire maintenance procedure before beginning the maintenance task. The entire procedure of paragraph 3-37: "EXHAUST SYSTEM REPLACEMENT" includes: a. Removal and b. Installation.

    b. The eight basic headings listed under "INITIAL SETUP" outline special tools, materials, personnel requirements, and special conditions. Headings will not be listed if there are no entries. The headings are:

        - **APPLICABLE MODELS** Any models that require that particular maintenance task.
        - **TEST EQUIPMENT** Test equipment needed to complete a task.
        - **SPECIAL TOOLS** Those special tools needed to complete a task. Common tools are not listed.
        - **MATERIALS/PARTS** All parts or materials needed to complete a task.
        - **PERSONNEL REQUIRED** The number of personnel needed to perform a task. If only one mechanic is needed, this heading will not be used. If you think that you need more help to correctly or safely complete a task (perhaps as the result of unusual conditions, etc.), alert your supervisor and ask for help.
        - **REFERENCES (TM)** Those additional manuals needed to complete a task.
        - **EQUIPMENT CONDITION** Notes the conditions that must exist before starting the task. For exhaust system replacement, the vehicle must have the parking brake set and the air cleaner element removed.
        - **GENERAL SAFETY INSTRUCTIONS** Summarizes all safety warnings for the maintenance task.

    c. A step-by-step maintenance procedure follows the "INITIAL SETUP" and gives detailed instructions for the procedure. These instructions give part name and action performed. The numbers in parentheses correspond to the part's callout number in the accompanying illustration. Warnings, cautions, and notes give additional information.

        - **WARNINGS** - Indicate conditions, practices, or procedures which must be observed to avoid personnel injury, loss of life, or long-term health hazard.
        - **CAUTIONS** - Indicate conditions, practices, or procedures which must be observed to avoid damage to equipment or destruction of equipment.
        - **NOTES** - Include essential information of special importance, interest, or aid in job performance.

    d. At the end of a procedure, "FOLLOW-ON TASKS" will list those additional tasks that must be performed to complete the procedure.

16. You can also use the Table of Contents (page ii) to find more information about the vehicle. For example: Principles of Operation in chapter 1.

17. Unit PMCS are presented in table 2-1 starting on page 2-4.

18. Chapter 2, section VII, STE/ICE Troubleshooting, can be used if STE/ICE is available for troubleshooting or PMCS.

19. Refer to TM 9-2320-361-20P, Unit Maintenance Repair Parts and Special Tools List for Truck, 2-1/2-Ton, 6x6, M44A2 Series, when requisitioning parts, special tools, and equipment for unit maintenance.

20. Your manual is easier to use once you understand its design. We hope it will encourage you to use it more often as an aid to maintenance support for M44A2 series vehicles.

CHAPTER 1
INTRODUCTION

Section I. General Information (page 1-1)
Section II. Equipment Description and Data (page 1-3)
Section III. Principles of Operation (page 1-37)

Section I. GENERAL INFORMATION

1-1. SCOPE

a. This technical manual contains instructions for unit maintenance of 2-1/2-ton, 6x6, multifuel, M44A2 series vehicles.

b. The vehicle model numbers and equipment names are:

(1) M35A2 Cargo Truck, WO/W and W/W
(2) M35A2C Cargo Truck With Dropsides, WO/W and W/W
(3) M36A2 Cargo Truck With Extra Long Wheelbase, WO/W and W/W
(4) M49A2C Fuel Tank Truck, WO/W and W/W
(5) M50A2 Water Tank Truck (400- and 600-Gallon Tanks), WO/W and W/W
(6) M50A3 Water Tank Truck (Two 500-Gallon Tanks), WO/W and W/W
(7) M109A3 Shop Van Truck, WO/W and W/W
(8) M185A3 Instrument Repair Shop Truck, WO/W and W/W
(9) M275A2 Tractor Truck, WO/W and W/W
(10) M342A2 Dump Truck, WO/W and W/W
(11) M756A2 Pipeline Construction Maintenance Truck, W/W
(12) M764 Earth Boring and Polesetting Maintenance Truck, W/W

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

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. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Procedures for destruction of Army materiel to prevent enemy use can be found in TM 750-244-6.

1-4. PREPARATION FOR STORAGE OR SHIPMENT

Storage and shipment instructions are in Chapter 15, Shipment and Limited Storage, of this manual and TM 746-10, Marking, Packaging and Shipment of Supplies and Equipment: General Packaging Instructions for Field Use.

1-5. REPORTING QUALITY DEFICIENCIES, IDEAS, AND EQUIPMENT IMPROVEMENT RECOMMENDATIONS

If your 2-1/2-ton, M44A2 series 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. Put it on an SF 368 (Quality Deficiency Report). Mail in accordance with DA PAM 738-750.

1-6. EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-39 series is compiled from some of the Equipment Improvement Reports that you prepared on the vehicles covered in this manual. Many of these articles resulted from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements minor alterations, proposed Modification Work Orders (MWO's), warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also refer to DA Pam 25-30, Consolidated Index of Army Publications and Blank Forms, and Appendix A of this manual.

1-7. WARRANTY INFORMATION

The transfer, transmission, transmission shaft, front axle assembly, rear axle assembly, differential carrier, air hydraulic cylinder, steering gear, cargo body, winch, power takeoff assembly, and delivery pump are warranted in accordance with TB 9-2320-209-14 for the M35A2 and M35A2C cargo trucks, M49A2C fuel tank truck, M50A3 water tank truck, and M275A2 tractor truck. The 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.