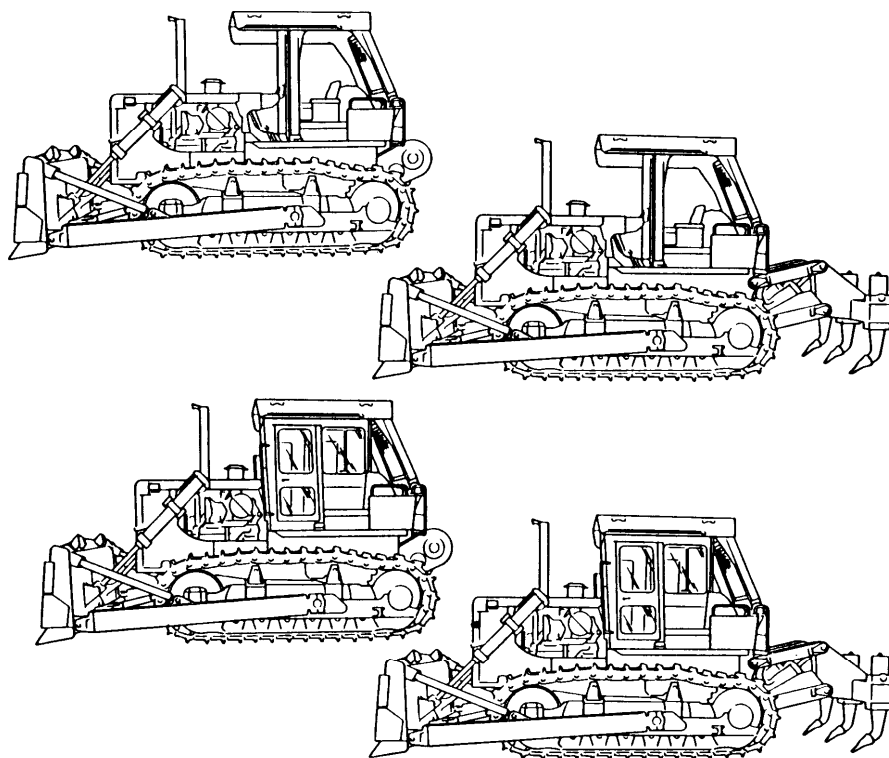


## TECHNICAL MANUAL

### DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE FOR

## TRACTOR, FULL TRACKED, LOW SPEED: DED, MEDIUM DRAWBAR PULL, SSN M061



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**TRACTOR WITH RIPPER AND WINTERIZED CAB,  
NSN 2410-01-253-2118  
TRACTOR WITH WINCH AND WINTERIZED CAB,  
NSN 2410-01-253-2117**

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 MARCH 1993

Approved for public release; distribution is unlimited.

**\* TECHNICAL MANUAL  
NO. 5-2410-237-34**

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington D.C., 30 March 1993

**Direct Support and General Support  
Maintenance Manual  
for**

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**TRACTOR WITH WINCH AND WINTERIZED CAB,  
NSN 2410-01-253-2117**

## **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, US Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be furnished to you.

**Approved For Public Release; Distribution is Unlimited**

**\*This publication along with TM5-2410-237-20 supersedes TM5-2410-237-24**

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## HOW TO USE THIS MANUAL

## 1. ABOUT YOUR MANUAL

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

New features added to make this manual easier for you to use are:

- a. Finding Information - These include entry features such as the thumb indexing indicators 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 - Many methods are used to make finding and fixing parts 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. Keying Text With Illustrations - Instructions/text are located together with figures that illustrate the specific task you are working on. In most cases, the task steps and figures are located side by side.

This TM is organized so that the information and procedures, needed to perform maintenance tasks, are easily located. Take a few minutes to read through this How To Use part of the manual to learn how it is put together and how to find the information you need.

## 2. BEFORE YOU START

- a. Read and understand all WARNING, SAFETY AND FIRST AID DATA in the front of this manual. This data contains general shop safety practices not included in maintenance tasks.
- b. Read Chapter 1 to learn more about the tractor and its purpose, capabilities and features.

## 3. CONTENTS OF MANUAL

- a. This TM contains maintenance instructions at the direct support and general support levels for the D7G Tractor. Included are principles of operation, fault isolation troubleshooting, and corrective maintenance tasks as authorized by the Maintenance Allocation Chart (MAC).

- b. This TM is made up of:

(1) Chapters. There are 14 chapters.

- (a) Chapter 1, Introduction. This chapter contains general tractor information of interest to direct support and general support maintenance technicians.
- (b) Chapter 2, Direct Support and General Support Maintenance Instructions. This chapter contains instructions of interest to direct support and general support level maintenance technicians on tools, equipment, and troubleshooting.

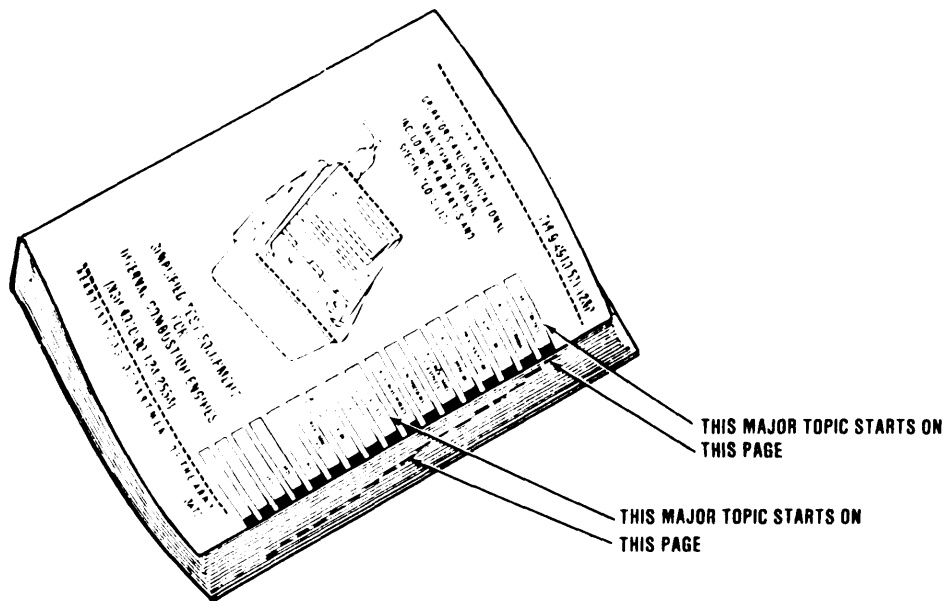
## HOW TO USE THIS MANUAL (Cont'd)

- (c) Chapter 3, Engine Maintenance. This chapter contains maintenance of engine components.
  - (d) Chapter 4, Fuel System Maintenance. This chapter contains maintenance of fuel system components.
  - (e) Chapter 5, Cooling System Maintenance. This chapter contains maintenance of cooling system components.
  - (f) Chapter 6, Electrical System Maintenance. This chapter contains maintenance of electrical system components.
  - (g) Chapter 7, Transmission Maintenance. This chapter contains maintenance of transmission components.
  - (h) Chapter 8, Transfer and Final Drive Maintenance. This chapter contains maintenance of transfer and final drive components.
  - (i) Chapter 9, Track Maintenance. This chapter contains maintenance of track and carrier components.
  - (j) Chapter 10, Steering and Brake Maintenance. This chapter contains maintenance of steering, brake and clutch components.
  - (k) Chapter 11, Frame, Body, Cab, Hood, and Hull Maintenance. This chapter contains maintenance of frame components.
  - (l) Chapter 12, Winch Maintenance. This chapter contains maintenance of winch components.
  - (m) Chapter 13, Hydraulic System Maintenance. This chapter contains maintenance of hydraulic components and controls.
  - (n) Chapter 14, Earth Moving Equipment Maintenance. This chapter contains maintenance of blade and ripper components.
- (2) Sections. Some chapters are further subdivided into sections. Sections allow for easier break-up of material. They are:
- (a) Chapter 1 has two sections: General Information and Equipment Description.
  - (b) Chapter 2 has three sections: Repair Parts, Special Tools, TMDE and Support Equipment; Troubleshooting Procedures; and Pre-embarkation of Material for Overseas Movement.
- (3) Paragraphs. Paragraphs make up chapters. The paragraphs have the information needed to do the job properly. Each paragraph is the start of a major topic within the chapter.
- (4) Pages. Pages are numbered consecutively within each chapter. The first part is the chapter number followed by a dash and the consecutive page number. For example, page 3 of Chapter 2 is numbered 2-3.

## HOW TO USE THIS MANUAL (Cont'd)

- (5) Appendices. Appendices are found in the back of the manual.
  - (a) Appendix A, References. This appendix contains references to other information you may need to do your job.
  - (b) Appendix B, Expendable Supplies and Materials List. This appendix contains procurement information on expendable items you need for maintenance.
  - (c) Appendix C, Illustrated List of Manufactured Items. This appendix contains information you need to make parts that are not procured.
  - (d) Appendix D, Torque Limits. This appendix contains torquing information for normal hardware on components without specific torques.
- (6) Glossary. The glossary is located in the back of the manual. It contains a listing of unusual terms and abbreviations used in this manual and their explanation.
- (7) Index. The index is located in the back of the manual. It lists topics in alphabetical order and references the paragraph numbers where information on the topic can be found.

### 4. HOW TO FIND INFORMATION QUICKLY



- a. Using the Front Cover. The front cover of the manual has boxed titles for major topics you use the most. At the right side of each box is a blackened area. The blackened area matches black markings on the first page of that major topic in the manual. Fan the outer edge of the manual with your thumb to find the topic material marked.

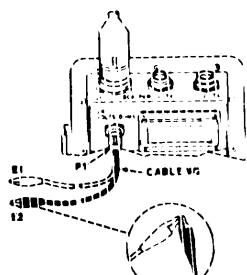
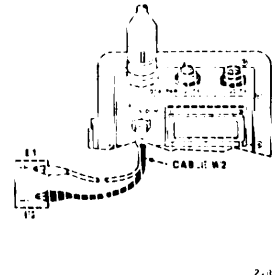
## HOW TO USE THIS MANUAL (Cont'd)

- b. Using the Table of Contents. The table of contents lists all chapters, appendices, sections and other important information in this manual and the page number where each starts.

## CHAPTER NUMBER

## PARAGRAPH NUMBER

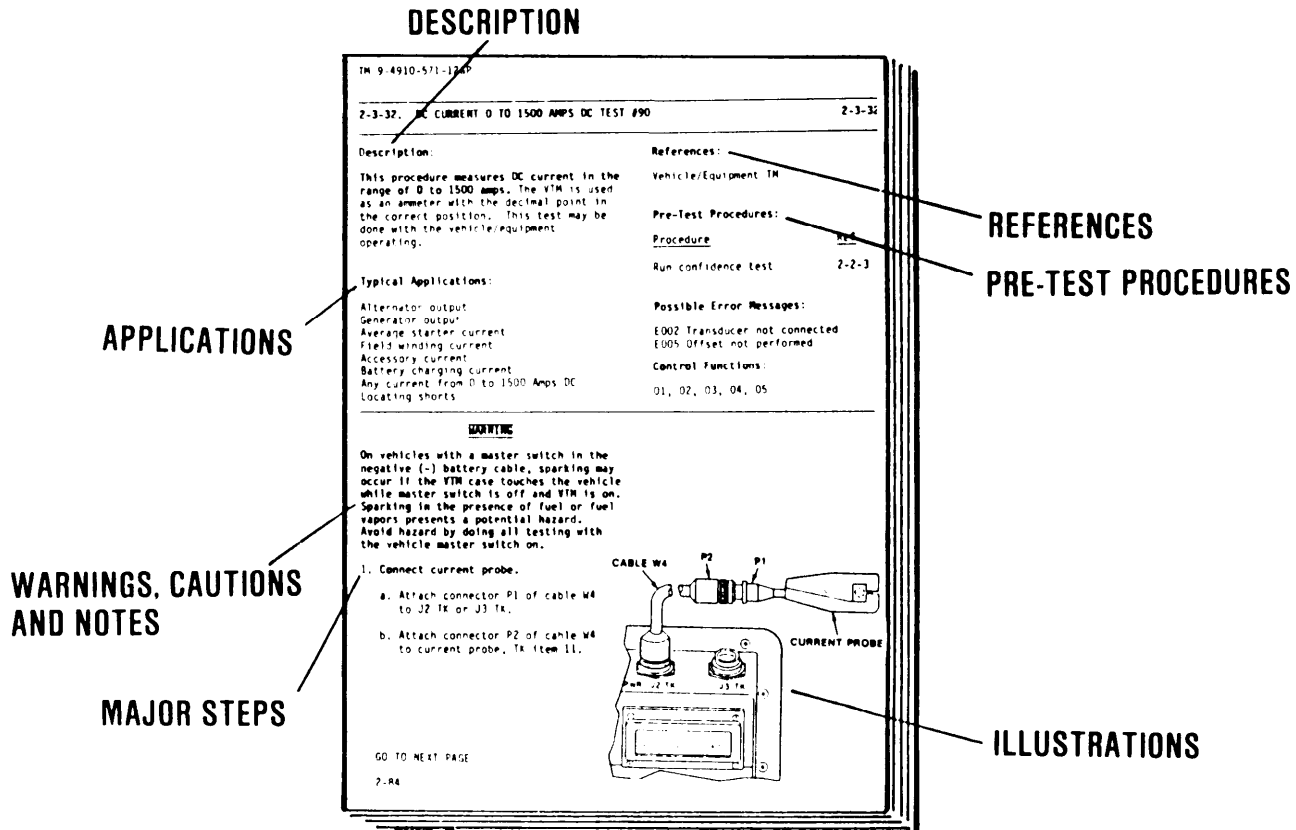
## PARAGRAPH TITLE CONTINUED

| CHAPTER NUMBER                                                                                                                                                                                                                                                                                                                 |                                        | PARAGRAPH NUMBER                                                                                                                                                                                      |                                               | PARAGRAPH TITLE CONTINUED                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TM 9-4910-571-128P                                                                                                                                                                                                                                                                                                             | 2-3-31. DC VOLTAGE 0 TO 45 VDC TEST RM | 2-3-31                                                                                                                                                                                                | 2-3-31. DC VOLTAGE 0 TO 45 VDC TEST RM (cont) | 2-3-31                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b><br>This procedure measures voltage in the range of +45 to +65 volts. The VM is used as a DC voltmeter with the scales printed in the correct position. This test must be done with the component being tested turned on.                                                                                    |                                        | <b>References</b><br>Vehicle/Equipment TM<br><b>Pre-Test Procedures</b><br>Procedure Ref<br>Amperage test 2-3-3                                                                                       |                                               | <b>1. Set TEST SELECT switch to 15.</b><br><b>2. Press and hold TEST button until EOL appears on display.</b><br><b>3. Release TEST button and wait for offset value to appear on display. If offset is within +0.6 to +6.1, proceed to step 3. If offset is more than +6.5 to +6.9, refer to Offset Fault Isolation paragraph 2-3-32.</b> |
| <b>Typical Applications:</b><br>Battery Coil Primary<br>Fuel Solenoid Starter Motor<br>Starter Solenoid Starter Cable Strap<br>Interior Output<br>Alternator Negative Cable Plug<br>Any DC voltage within +0.5 to +45                                                                                                          |                                        | <b>Possible Error Messages:</b><br>EOL Offset not performing                                                                                                                                          |                                               | <b>CAUTION:</b><br>Electrical shock hazard. Ensure circuit is off before attaching leads. Failure to heed warning could cause shock, injury or death. If electrical shock occurs, administer first aid and seek medical assistance immediately.                                                                                            |
| <b>ROUTINE</b><br>On vehicles with a master switch or the negative (-) battery cable, sparking may occur if the VM case touches the vehicle while master switch is off and VM is on. Sparking in the presence of fuel or fuel vapors presents a hazard. Avoid sparking by doing a 1 testing with the vehicle master switch on. |                                        | <b>Control Functions:</b><br>C1, C2, J1, D1, O5                                                                                                                                                       |                                               | <b>NOTE:</b><br>Always attach red clip E1 to positive (+) side and black clip E2 to negative (-) side of item being measured, or a negative number may be displayed.                                                                                                                                                                       |
| <b>1. Connect test probe cable W2. Attach connector PL of cable W2 to VM/TS/IMS J6.</b><br><b>2. Do offset test.</b><br>a. Attach red clip E1 to black clip E2.                                                                                                                                                                |                                        |                                                                                                                     |                                               | <b>3. Connect leads. Attach clips E1 and E2 across circuit where voltage is to be measured.</b><br><b>4. Measure voltage.</b><br>a. Turn on circuit to be tested.<br>b. Press TEST button.                                                                                                                                                 |
| GO TO NEXT PAGE<br>2-3-32                                                                                                                                                                                                                                                                                                      |                                        | <b>NOTE:</b><br>If +0.6 to +6.1 is displayed, voltage is not within +45 to +65 volts. The circuit to be measured on VM is negative (-) number is displayed when a negative voltage is being measured. |                                               |                                                                                                                                                                                                                                                        |

## PAGE NUMBER

- c. Using Chapter Indexes. On the first page of each chapter is an alphabetical summary listing of all paragraphs in that chapter and the page number where each can be found. In cases where the chapter has been divided into sections, a table of contents is located at the beginning of each section. If you are still having trouble finding a task, refer to the manual index at the end of the manual.
- d. Using Paragraph Numbers and Titles. Paragraph numbers include the chapter number. The paragraph number appears before the title of the paragraph title line. Paragraphs that are longer than one page will have the paragraph number and title continued at the top of each following page.

## HOW TO USE THIS MANUAL (Cont'd)



## 5. HOW TO USE THE TROUBLESHOOTING CHARTS

Troubleshooting is divided into two parts, electrical and mechanical. At the start of the section is an alphabetical summary listing of the paragraphs in that section and the page number where each can be found. Two of the paragraphs contain a symptom index, one for electrical and one for mechanical.

The symptom index lists common problems that you may have with the tractor and the page number where each can be found.

Each problem is followed by several tests or inspections that may indicate the cause of the problem. The tests or inspections are arranged from the most likely (1) to the least likely.

Each test or inspection is followed by step-by-step instructions needed to find the problem and the page number needed in the maintenance chapter to correct the problem.

## 6. HOW TO USE A PROCEDURE

Each procedure consists of two parts, an initial setup table and a task section. You must familiarize yourself with the entire maintenance procedures before beginning the maintenance task.

## HOW TO USE THIS MANUAL (Cont'd)

The initial setup table contains the following parts:

Description - Describes the procedure.

Applications - Gives examples of how/where the procedure is used.

References - Shows where reference material can be found.

Equipment Conditions - Refers to procedures that must be done before attempting this procedure.

## CHAPTER 1

## INTRODUCTION

## Section I. GENERAL INFORMATION

## 1-1. SCOPE

- a. Type of Manual. This manual contains maintenance instructions, at the direct support and general support levels, for the D7G Tractor.
- b. Model Numbers and Equipment Names. D7G Tractor, Full Tracked, Low speed: Diesel Engine-Driven, Medium-Drawbar Pull. Equipped with rollover protective structure (ROPS) and Semi-U (straight) tilt type blade. Available in four versions:
  - Tractor with rear-mounted ripper
  - Tractor with rear-mounted winch
  - Tractor with rear-mounted ripper and winterized cab
  - Tractor with rear-mounted winch and winterized cab
- c. Purpose of Equipment.  
and for clearing land of small trees and brush.
  - (1) Tractors equipped with ripper are designed for dozing and also for ripping soil, rocks, asphalt, and concrete.
  - (2) Tractors equipped with winch are designed for dozing and also for all types of winching operations.

## 1-2. MAINTENANCE FORMS AND RECORDS

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. EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable 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 result 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 Forms 2028-2 (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, References of this manual.

#### 1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Demolition of materiel to prevent enemy use shall be in accordance with the requirement of TM 750-244-3 (procedures for Destruction of Equipment to Prevent Enemy Use for U.S. Army).

#### 1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMENDATIONS (EIR'S)

If your D7G tractor 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 (Quality Deficiency Report). Mail it to: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-QRD, Warren, MI 48397-5000. We'll send you a reply.

#### 1-6. WARRANTY INFORMATION

Refer to warranty TB, Technical Bulletin 5-2410-237-1.

### Section II. EQUIPMENT DESCRIPTION AND DATA

#### 1-7. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

Detailed descriptions of the D7G Tractor can be found in TM5-2410-237-20.

#### 1-8. EQUIPMENT DATA

TM5-2410-237-20 contains the tabulated data for the D7G Tractor.