

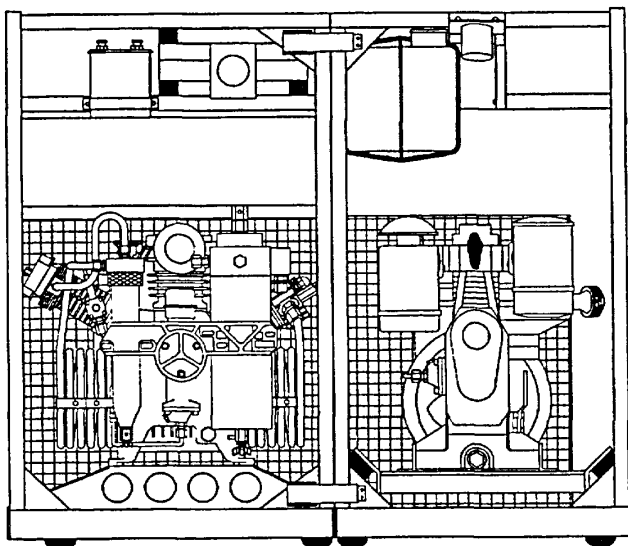
TECHNICAL MANUAL

**OPERATOR, UNIT, DIRECT SUPPORT
AND GENERAL SUPPORT**

MAINTENANCE MANUAL

FOR

**COMPRESSOR UNIT,
RECIPROCATING
5.0 CFM, MODEL CAPITANO-PD
(NSN 4310-01-107-8006)**



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**HEADQUARTERS, DEPARTMENT OF THE ARMY
MARCH 1999**

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DEPARTMENT OF THE ARMY
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MAINTENANCE MANUAL
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5.0 CFM, MODEL CAPITANO-PD
(NSN 4310-001-107-8006)

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: Director, Armament and Chemical Acquisition and Logistic Activity (ACALA), ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630 (E-mail amsta-ac-nml@ria.army.mil).

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HOW TO USE THIS MANUAL

In this manual, primary chapters and sections appear in upper case/capital letters; paragraphs are presented in numeric sequence with the chapter number listed first, e.g., 4-19, and the title is all upper case/capital letters; subordinate paragraphs are presented in alpha sequence, e.g., (a); the next paragraphs are presented in numeric sequence with the number presented in parenthesis, e.g., (1). The location of additional material that must be referenced is clearly marked. Figures supporting maintenance procedures/test are located as close as possible to their references.

CHAPTER 1 - INTRODUCTION. Chapter 1 contains general information, equipment description and technical principles of operation

CHAPTER 2 - OPERATING INSTRUCTIONS. Chapter 2 contains a description of the end item and each control and indicator is described. Operating procedures include Preventive Maintenance Checks and Services (PMCS), and operation under usual and unusual conditions.

CHAPTER 3 - OPERATOR MAINTENANCE INSTRUCTIONS. Chapter 3 contains lubrication instructions, troubleshooting procedures used to recognize malfunctions/symptom, probable cause and corrective action, and maintenance procedures authorized at operator level

CHAPTER 4 - UNIT MAINTENANCE INSTRUCTIONS. Chapter 4 lists lubrication instructions, troubleshooting procedures used to recognize/symptom, probable cause and corrective action, and maintenance procedures authorized at unit level

CHAPTER 5 - DIRECT SUPPORT MAINTENANCE INSTRUCTIONS Chapter 5 contains information for direct support maintenance on the CAPITANO-PD Reciprocating Compressor Unit

CHAPTER 6 - GENERAL SUPPORT MAINTENANCE INSTRUCTIONS. Chapter 6 contains information for general support maintenance on the CAPITANO-PD Reciprocating Compressor Unit

APPENDIX A - REFERENCES. This appendix lists all the publications referenced in this manual.

APPENDIX B - MAINTENANCE ALLOCATION CHART (MAC) This appendix provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

APPENDIX C - COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEM (BII) LIST. This appendix lists components of the end item and basic issue items to help you inventory the items for safe and efficient operation of the equipment

APPENDIX D - ADDITIONAL AUTHORIZATION LIST. This list identifies Items that do not have to accompany the CAPITANO-PD and that do not have to be turned in.

APPENDIX E -EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST. This appendix lists expendable/durable supplies and materials that you will need to operate and maintain the end item. This listing is for information only and is not the authority to requisition the listed items

APPENDIX F - ILLUSTRATED LIST OF MANUFACTURED ITEMS. This appendix includes complete instructions for making items authorized to be manufactured or fabricated at organizational, direct support, and general support maintenance.

APPENDIX G - TORQUE LIMITS. This appendix lists applicable torque values expressed in standard and metric values.

ALPHABETICAL INDEX. The index contains key technical manual subjects arranged in alphabetical order. If you require information on a certain subject (i.e., cleaning), but you are not sure where to look, use the index to locate the specific page.

CHAPTER 1 INTRODUCTION

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Section I. GENERAL INFORMATION

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1-1. SCOPE.

This technical manual contains descriptive data, operation instructions, setup and storage procedures, and maintenance instructions for a 5.0 CFM, Reciprocating Compressor Unit. The manufacturer's part number for the reciprocating compressor unit is CAPITANO-PD.

NOTE

Where possible, all dimensional values are given in the English system and Metric system. The metric values will appear in parenthesis following the English system value.

1-2. PURPOSE.

The purpose of the reciprocating compressor unit is to provide purified high pressure breathing air.

1-3. 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).

1-4. CORROSION PROTECTION.

a. Corrosion Prevention and Control (CPC) of Army material is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements made to prevent the problem in future items.

b. While corrosion is typically associated with 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.

c. If a corrosion problem is identified, it can be reported using Standard Form SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure the information is identified as a CPC problem.

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

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your model CAPITANO-PD compressor unit 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 our equipment. Let us know why you don't like the design or performance. Put it on a SF-368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank Automotive and Armaments Command (TACOM) ATTN, AMSTA-AC-NML Rockland, IL 61299-7630. A reply will be furnished to you.

1-6. LIST OF ABBREVIATIONS.

cfm	Cubic feet per minute
lpm	Liters per minute
rpm	Revolutions per minute
psi	Pounds per square inch
hp	Horsepower
cc	Cubic centimeter
qt	Quart
in	Inch
lbs	Pounds
bar	Bar
Nm	Newton-meter
lb-ft	Pound-foot
CO	Carbon monoxide
CO ₂	Carbon dioxide
cu ft	Cubic foot
cu in	Cubic inch
cu m	Cubic meter
gal	Gallon
PMCS	Preventive Maintenance Checks and Services
MAC	Maintenance Allocation Chart
PMV	Pressure Maintaining Valve
cm	Centimeter
mm	Millimeter
TDC	Top Dead Center

1-7. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

The procedures for destroying Army material to prevent enemy use are listed in TM 750-2443.

Section II. EQUIPMENT DESCRIPTION AND DATA

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1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

Equipment characteristics, capabilities and features of the model CAPITANO-PD reciprocating compressor unit consist of a high pressure compressor driven by a one cylinder diesel engine through a V-belt (Figure 1-1 and 1-2). The unit includes gauges, hourmeters, fuel tank, purification system and a two part portable frame. The model CAPITANO-PD is capable of providing 5.0 cubic feet per minute of free air compressed to 3200 psi. The unit can be operated in temperatures ranging from 0° F to 110° F (-17.8° C to 43° C).

a. Compressor The compressor will deliver 5.0 cfm of breathing air compressed to 3200 psi. The cylinders are arranged in a "W" configuration. The first stage is in the center, with the second stage on the left and the Compressor. The compressor is a three cylinder, three stage reciprocating piston, air-cooled third stage on the right when facing the impeller/pulley. Lubrication of the third stage is provided by a high-pressure oil pump. The first and second stages are splash lubricated. The cylinders of the compressor, the intercoolers and the aftercoolers are air-cooled. Cooling air is drawn across the compressor by an axial fan impeller/pulley driven by the diesel engine. An intermediate filter is installed between the 2nd and 3rd stages. It includes a centrifugal plate to remove entrained air and oil and a sintered metal filter element to remove solid particles.

b. Diesel Engine. The air-cooled, four-cycle, one cylinder diesel engine develops 6 hp at 3600 rpm. An axial fan impeller cools the engine. The engine is started by use of a hand crank.

c. Fuel Tank. The fuel tank is mounted above the engine, and is attached to the engine unit frame (Figure 1-1). It has a 2.38 gal (9 l) capacity with no reserves.

d. Purification System. The purification system consists of an oil/water separator and a dryer/purifier. The oil/water separator after the third stage includes a coalescing element for removal of oil and water aerosols. The dryer/purifier contains a replaceable cartridge for removal of oil and water vapors and conversion of CO to CO₂. The design of the dryer/purifier requires that a cartridge filter be properly installed in order to maintain pressure on the system. This ensures that only treated air will be available for filling delivery.

e. Frame. The frame consists of two sections, one section provides mounting for the reciprocating compressor, while the other provides mounting for the diesel engine. Each section is a welded fabrication of square steel tubing and angles. The sections are separately portable as four man carries. Alignment studs are provided on the compressor frame, located at the top and bottom corners. These studs fit snugly into the corresponding open receptacles incorporated into the engine frame. For assembly of the two sections, the alignment studs of the compressor frame are inserted into the engine frame until the frames are tight together. Adjustable draw latches are provided for securing the two sections together in alignment for operation.

f. Drive. After the frame sections are secured together, a V-belt is installed over the pulleys of the engine and compressor and belt guards are bolted on, completing the assembly of the unit and providing drive capability for the compressor by the diesel engine.

g. Intercoolers and Aftercoolers. Intercoolers are provided between stages 1 and 2, and between stages 2 and 3. An aftercooler is situated between stage 3 and the final oil/water separator. Compressed air is cooled as it advances between stages and before final delivery.