*TM 55-1905-223-24-8

TECHNICAL MANUAL

FIELD AND SUSTAINMENT MAINTENANCE MANUAL

FOR

AIR COMPRESSOR MODEL D340 QR-25 LANDING CRAFT UTILITY (LCU) NSN 1905-01-154-1191



*Supersedes TM 55-1905-223-24-8, 17 January 1989, including all changes.

DISTRIBUTION STATEMENT A. Approved for public release: distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

FEBRUARY 2010

WARNING SUMMARY

First aid procedures for soldiers are contained in FM 4-25.11, First Aid.

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within the technical manual.

Unauthorized modifications, alterations or installations of or to this equipment are prohibited and are in violation of AR 750-10. Any such unauthorized modifications, alterations or installations could result in death, injury or damage to the equipment.

EXPLANATION OF SAFETY WARNING ICONS



ELECTRICAL - Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.



MOVING PARTS - Hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.



EYE PROTECTION - Person with goggles shows that the material will injure the eyes.



HEARING PROTECTION - Headphone over ears show that noise level will harm ears.



HEAVY PARTS - heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.

EXPLANATION OF SAFETY WARNING ICONS - continued



HEAVY PARTS - foot with heavy object on top shows that heavy parts can crush and harm.



HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.



HELMET PROTECTION - arrow bouncing off head with helmet shows that falling parts present a danger.



SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.



HOT SURFACES - hand over object radiating heat shows that part is hot and can burn.

GENERAL SAFETY WARNINGS DESCRIPTION



Always ensure affected circuits have been secured, locked out and tagged out. Performing maintenance with circuits energized presents a shock hazard and may result in death or injury to personnel or equipment damage.

Under no circumstances should repair or adjustment of energized equipment be attempted alone. The immediate presence of someone capable of rendering aid is required. Before making adjustments, be sure to protect against grounding. If possible, adjustments should be made with one hand, with the other hand free and clear of equipment. Even when power has been removed from equipment circuits, dangerous potentials may still exist due to retention of charges by capacitors. Circuits must be grounded and all capacitors discharged prior to attempting repairs. Failure to follow these warnings may result in injury or death to personnel.

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.





Always ensure affected systems have been secured, locked out and tagged out to prevent accidental energizing of equipment that can result in the entanglement of limbs and clothing in moving parts.

When manually rotating machinery, ensure personnel are clear of rotating parts to prevent entanglement of limbs and clothing. Failure to follow these warnings may result in injury or death to personnel.

GENERAL SAFETY WARNINGS DESCRIPTION - continued

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

WARNING



Air compressor may be hot. Allow the air compressor to cool before performing maintenance. Failure to follow this warning may result in injury or death to personnel.

WARNING



Compressed air systems are under high pressure. Bleed compressed air from system prior to performing any maintenance. Do not direct compressed air against skin or clothing. Particles blown by compressed air are hazardous to eyes and escaping air volume can damage hearing. Wear Personal Protective Equipment (PPE) including hearing and protective goggles. Failure to follow this warning may result in injury or death to personnel.

WARNING



All personnel in the vicinity of the lifting operations should wear appropriate safety equipment including gloves, hard hat, and safety shoes.

Heavy loads can crush. Do not allow any body parts to come under the load or between the load and a stationary object. Failure to follow these warnings may result in injury or death to personnel.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Supersedes TM 55-1905-223-24-8, 17 January 1989. Zero in the "Change No." column indicates an original page or work package.

Date of issue for the original manual:

Original 01 February 2010

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HEADQUARTERS DEPARTMENT OF THE ARMY WASHINGTON, D.C., 01 February 2010

TECHNICAL MANUAL

FIELD AND SUSTAINMENT MAINTENANCE MANUAL

for AIR COMPRESSOR

MODEL D340 QR-25

LANDING CRAFT UTILITY (LCU) NSN 1905-01-154-1191

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to 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 https://aeps.ria.army.mil. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. 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, email, or fax your comments or DA Form 2028 directly to the U.S. Army TACOM Life Cycle Management Command. The postal mail address is U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-MPP / TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is tacomlcmc.daform2028@us.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

*Ssupersedes TM 55-1905-223-24-8, 17 January 1989, including all changes.

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

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HOW TO USE THIS MANUAL

This manual contains certain features to improve the convenience of using this manual and increase the user's efficiency. These features include:

a. Accessing Information

Information is accessed by referring to the Table of Contents, located in the front of this manual, or by looking in the Alphabetical Index, located in the back of this manual.

b. Illustrations

Various methods are used to locate and repair components. Locator illustrations in Controls and Indicator tables, PMCS tables, exploded views and cut-away diagrams make the information in the manual easier to understand and follow.

c. Using This Manual

When using this manual, read and understand the entire maintenance action before performing the task. Also, read and understand all warnings, cautions and notes that apply to the task to be performed. The warning summary will inform personnel of hazards associated with the equipment to be worked on. However, the summary is not all inclusive and personnel should be aware at all times of hazardous conditions that may arise.

Prior to starting the procedures in this manual, the initial setup requirements are located directly above each procedure. The information is given to ensure all materials, expendables, tools and any other equipment necessary are readily available for use. The initial setup will be accomplished prior to starting the actual steps of each maintenance procedure.

LOCATING MAJOR COMPONENTS

Obtain the manual for the system to be worked on. Open to the Table of Contents located in the front of this manual. Find Chapter 1, *General Information, Equipment Description and Theory of Operation*. Under the chapter title you will find the work package titled *Equipment Description and Data*. Turn to the work package indicated. Within this work package you will find a description of the major component(s) and an illustration of what the component(s) looks like.

The Alphabetical Index, located in the back of this manual, contains an alphabetical list of all sections of this manual. *Location and Description of Major Components* is found in section L. The work package is found on the right side of the title where the *Location and Description of Major Components* is located. Turn to the work package indicated to find the description and location of each component.

TROUBLESHOOTING PROCEDURES

The Table of Contents or Alphabetical Index may be used to locate sections within this manual. To locate a particular troubleshooting procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 2, *Troubleshooting Procedures.* Under this section, find a work package titled *Troubleshooting Symptom Index.* Turn to the work package indicated, which lists all of the troubleshooting procedures. Look down the list until you find the appropriate work package for the problem you are trying to solve. To the right side of the procedure will be a work package number. Turn to the work package indicated and follow the steps to complete the troubleshooting procedure. The procedures list the symptom/malfunction, possible cause and the corrective action. The corrective action will indicate which maintenance procedure to go to for the repair of the symptom or what level of maintenance is capable of repair of the problem. Follow the procedures indicated to complete the task. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

Test Equipment: Lists all test equipment (standard or special) required to troubleshoot, test and inspect the equipment covered in this manual. The test equipment is identified with an item number and work package number from the *Tools and Test Equipment List* located in Chapter 6, *Supporting Information*.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Tools and Test Equipment List* located in Chapter 6, *Supporting Information*.

Personnel Required: Unless another MOS is specified in the initial setup of a work package, all tasks are to be performed by a Watercraft Engineer, MOS 88L.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the TM number.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package *References* in Chapter 6, *Supporting Information*.

MAINTENANCE INSTRUCTIONS

To locate a maintenance procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 4, *Maintenance Instructions,* look down the list and find the maintenance procedure to be accomplished. On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated. Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Tools and Test Equipment List* located in Chapter 6, *Supporting Information*.

Materials/Parts: Lists all expendable items and support materials, mandatory replacement parts, and bulk items necessary to perform the task. Expendable and durables are identified with an item number and work package number from the *Expendable and Durable Supplies and Materials List* located in Chapter 6, *Supporting Information*.

Personnel Required: Unless another MOS is specified in the initial setup of a work package, all tasks are to be performed by a Watercraft Engineer, MOS 88L.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package *References* in Chapter 6, *Supporting Information*.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the TM number.

Test Equipment: Lists all test equipment (standard or special) required to troubleshoot, test and inspect the equipment covered in this manual. The test equipment is identified with an item number and work package number from the *Tools and Test Equipment List* located in Chapter 6, *Supporting Information*.

REPAIR PARTS AND SPECIAL TOOLS LIST

Refer to TM 55-1905-223-24P when requisitioning parts, special tools and equipment.

Identify the mandatory repair parts required to perform this task listed at the top of the work package in the INITIAL SETUP. Using the part number provided, refer to the part number index work package in TM 55-1905-223-24P. Look up the part number in the part number column and identify the figure and item number where the part is located. Turn to the figure and locate the item number listed. Verify that the item is correct.

CHAPTER 1

FIELD AND SUSTAINMENT MAINTENANCE FOR AIR COMPRESSOR

GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

FIELD AND SUSTAINMENT MAINTENANCE FOR AIR COMPRESSOR GENERAL INFORMATION

SCOPE

The scope of this manual is as follows:

Type of Manual; Field and Sustainment maintenance manual.

Model Number and Equipment Name; Model D340 QR-25, Air Compressor Unit. Components of the air compressor are:

Air Compressor Unit. Air Compressor Dehydration Piping Group.

Purpose of Equipment:

Air Compressor Unit; To supply compressed air to the air receiver tank. Used for starting engines; also provides low pressure air to run pneumatic tools.

Air Compressor Dehydration Piping Group; Dries, cools and cleans the compressed air from the air compressor unit.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance are those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your Air Compressor 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. If you have internet access, the easiest and fastest way to report problems or suggestions is to go to https://aeps.ria.army.mil/aepspublic.cfm (scroll down and choose the "Submit Quality Deficiency Report" bar). The Internet form lets you choose to submit an Equipment Improvement Recommendation (EIR), a Product Quality Deficiency Report (PQDR or a Warranty Claim Action (WCA). You may also submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of Army materiel 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 can be made to prevent the problem in future items. Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking. Plastics, composites, and rubber material can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking. SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Refer to TM 750-244-6 for instructions covering the destruction of Army Materiel to prevent enemy use.

PREPARATION FOR STORAGE OR SHIPMENT

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the Preventive Maintenance Checks and Services (PMCS) charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness.

LIST OF ABBREVIATIONS

Abbreviation/Acronym	Name
AMP BDC BX CN DA PAM EA EIR ft-lbs hp in-lbs kgm MAC MTOE Nm PG PMCS psi RO rpm RPSTL SAE TAMMS TDC TM TMDE TU	Amperes Bottom Dead Center Box Can Department of Army Pamphlet Each Equipment Improvement Recommendations Foot Pounds Horsepower Inch Pounds Kilogram Maintenance Allocation Chart Modified Table of Organization and Equipment Newton Meter Package Preventive Maintenance Checks and Services Pounds Per Square Inch Roll Revolutions Per Minute Repair Parts and Special Tools List Society of Automotive Engineers The Army Maintenance Management System Top Dead Center Technical Manual Test Measurement and Diagnostic Equipment Tube
WP	Work Package

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this Field and Sustainment maintenance manual. If quality of material requirements are not stated in this Field and Sustainment maintenance manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SAFETY, CARE AND HANDLING

Safety precautions must be observed at all times while performing maintenance. General WARNINGS and First Aid data appear in the front of this manual. Review all safety information before starting any task. Carefully read through an entire maintenance procedure before performing any maintenance function. Make sure the task can be done safely. All WARNINGS, CAUTIONS, and NOTES are of great importance to your personal safety and the safety of the equipment.

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools; test, measurement, and diagnostic equipment; and support equipment requirements are listed and illustrated in the Repair Parts and Special Tools List (RPSTL), TM 55-1905-223-24P. These items are also listed in the Maintenance Allocation Chart (MAC), WP 0058 of this manual.

REPAIR PARTS

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (RPSTL), TM 55-1905-223-24P.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE FOR AIR COMPRESSOR EQUIPMENT DESCRIPTION AND DATA

CHARACTERISTICS, CAPABILITIES AND FEATURES

- 1. Characteristics
 - a. Single-acting, two-stage, belt-driven, two cylinder, electric-driven.
 - b. Air cooled.
 - c. Controlled at the pilothouse or engine room console.
- 2. Capabilities and Features
 - a. Capable of delivering required air pressure (200 psi) at lower temperatures than a single-stage air compressor.
 - b. The pulley is finned to also act as a fan and move air over the intercooler to lower output air temperature.
 - c. Lubricated by means of a positive displacement rotary type oil pump.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Refer to Figure 1. The QR-25, Model 340 air compressor is a single-acting, two-stage, belt-driven, two cylinder, air cooled unit. The compressor is mounted on a separate base that includes the air compressor and electric motor. The motor drives two V-belts, which in turn drive a pulley attached to the compressor crankshaft. The air compressor unit includes a base, an electric motor, V-belts, belt guard, intercooler, hydraulic unloader, and the air compressor.

- a. Air Compressor (Figure 1). Crankcase, cylinder block and head, containing crankcase, connecting rods, and pistons to generate air pressure.
- b. Bearing Case (Figure 1, Item 14). Contains the crankshaft bearing ring and oil pump.
- c. Hydraulic Unloader (Figure 1, Item 10). Allows excessive pressure to be unloaded.
- d. Intercooler (Figure 1, Item 9). Cools air between compressor stages.
- e. Electric Motor (Figure 1, Item 7). Provides the drive power.
- f. V-belt (Figure 1, Item 6). Provides belt drive.
- g. Pulley (Figure 1, Item 15). Rotates crankshaft and cools the intercooler.
- h. Air System Supply Thermometer (Figure 2, Item 1). Displays air temperature prior to entering air system.
- i. Aftercooler (Figure 2, Item 2). Cools air between compressors and air system.
- j. 1 and 0.01 Micron Prefilters (Figure 2, Item 3). Filters condensate and particles from compressed air prior to entering air system.
- k. Water Separator (Figure 2, Item 4). Removes condensate from compressed air prior to prefilters.
- I. Separator and prefilter solenoid valves (Figure 2, Item 5). Timed automatic drain of condensate from prefilters and water separator.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - continued

- m. Air Filter Automatic Valve Controller (Figure 2, Item 6). Push on/Pull off controller for the separator and prefilter solenoid valves.
- n. Membrane Dryers (Figure 2, Item 7). Filters condensate and particles from compressed air prior to entering air system.

EQUIPMENT DATA

Characteristics and reference data for the air compressor is given in Table 1. Also see the equipment data given in the operator's manual, TM 55-1905-223-10.

Characteristics	Reference Data	
Air Compressor	Model 340, two stage, belt driven	
Hydraulic Unloader	0-350 psi	
Electric Motor	10 hp, 60 Hz, 240/460 Vac	

Table 1. Equipment Data.



Figure 1. Air Compressor Assembly (External View).



Figure 2. Air Compressor Dehydration Piping Group.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE FOR AIR COMPRESSOR THEORY OF OPERATION

GENERAL

There are two QR-25, Model D340 air compressors, which are intended to supply air to the storage tanks. The two air compressors are mounted one over the other on the port side aft end of the engine room. The air pressure from each compressor is controlled by an individual pressure switch mounted near each compressor which is set to cut out at 200 psi (±5 psi). The bottom air compressor is set to start and operate at a minimum of 180 psi (±5 psi) and the top air compressor is set to start and operate at a minimum of 160 psi (±5 psi). The system pressure relief valves are set at 240 psi (±5 psi). The air compressors are controlled by a local start-stop switch located at the air compressor in the engine room. An emergency run switch is located at the motor controller located on the forward bulkhead of the engine room. The pilot house and engine room control consoles each have an air pressure gauge which displays system air pressure.

Air Compressor. The following is a brief summary of the QR-25, Model D340 air compressor assembly and the drive system, and a description of controls that are separate from the compressor assembly and drive system. Refer to Figure 1.

- a. Air Cooling System. Refer to Figure 2.
 - (1) Drive Sheave (Pulley). The drive sheave (pulley) has cast iron fan blades that direct a blast of air across a finned intercooler, then across the finned cylinders and heads.
 - (2) Intercooler. The intercooler is an integral design of the air-cooled two-stage compressor. The intercooler consists of finned tubes connecting the first stage and the second stage. The tubes cool and condense the air.
- b. Lubricating System. The crankcase rotating and reciprocating parts are lubricated by a positive displacement rotary gear type oil pump. Refer to Figure 3. Oil is drawn up from the crankcase oil sump through an oil strainer to the oil pump. The pump forces oil, under pressure, through the crankshaft and connecting rods to lubricate the crankpin journals, the main journals, the wrist pin bearings, and the cylinder walls.
 - (1) Oil Pump. The oil pump is an integral gear type pump with an adjustable pressure relief valve. Refer to Figure 4. It is flange-mounted, piloted to the oil pump housing, and direct driven by the crankshaft.
 - (2) Oil Pressure Gauge. Normal oil pressure is between 18 and 20 psi.
- c. Drive Power. A motor pulley diameter is selected to obtain the pressure and air delivery without overloading the motor or operating the compressor beyond or below the designed speed range. The motor pulley is coupled to the compressor sheave using V-belts. Refer to Figure 5.
- d. Hydraulic Unloader Valve. The hydraulic unloader valve permits the driving unit and compressor to attain full rated speed, and assures that oil pressure has been established before the compression of air begins. The hydraulic unloader valve is considered an integral part of the air compressor. Refer to Figure 6.
- e. Mode of Control. Receiver or plant air system pressure is controlled within limits by automatically stopping and starting the compressor as the air pressure reaches a maximum preset pressure and then drops to a minimum preset pressure.

GENERAL - continued

f. Air Compressor Dehydration Piping Group. The air compressor dehydration piping group is an external component of the air compressor. Refer to Figure 7. The air compressor dehydration piping group provides three main functions; cools the compressed air leaving the air compressor, removes moisture from the cooled compressed air and filters out foreign matter that may cause damage within the compressed air system.



Figure 1. Air Compressor.



Figure 2. Air Cooling System.

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Figure 3. Lubricating System.



Figure 4. Crankcase Oil Pump Assembly.



Figure 6. Hydraulic Unloader Valve.





END OF WORK PACKAGE

CHAPTER 2

FIELD MAINTENANCE FOR AIR COMPRESSOR

TROUBLESHOOTING PROCEDURES

FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR TROUBLESHOOTING SYMPTOM INDEX

TROUBLESHOOTING

Both a symptom index and a troubleshooting table are provided. The symptom index will help you locate the information you need for troubleshooting.

SYMPTOM INDEX				
Malfun	ction/Symptom	Troubleshooting Procedure Page		
AIR CC	DMPRESSOR			
1 9 2 3 4 5 6 7 8 10 11 12	Air receiver pressure excessive Compressor fails to start Compressor knocks Compressor loads and unloads excessively (RPM fluctuate) Compressor overheats Excessive belt wear Excessive belt wear Excessive current draw Excessive oil consumption Excessive vibration Low discharge pressure and air delivery. Low oil pressure Motor stalls	WP 0005-1 WP 0005-4 WP 0005-2 WP 0005-2 WP 0005-2 WP 0005-2 WP 0005-3 WP 0005-3 WP 0005-3 WP 0005-3 WP 0005-3 WP 0005-5 WP 0005-5		
AIR COMPRESSOR DEHYDRATION PIPING GROUP				
1 2 4 3 5	Excessive moisture in air system Excessive vibration in aftercooler High air supply inlet temperature High differential pressure in prefilters Water in the moisture separator			

WP 0005 and 0006 lists the common fault conditions that may be found during operation or maintenance of the equipment. Look for causes and do corrective actions in the order listed. This manual cannot list every symptom that may show up, and it cannot list all the possible causes and corrective actions. If a symptom is not listed, or if it keeps up after you have performed the corrective actions, notify your supervisor.

END OF WORK PACKAGE
FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools	WP 0021
	WP 0022
Tool Kit, General Mechanic's	WP 0025
(WP 0058 Item 1)	WP 0027
Ohmmeter (WP 0058, Item 7)	WP 0029
	WP 0031
Matorials/Parts	WP 0033
Waterials/Faits	WP 0034
	WP 0036
Lubricating Oil, Air Compressor	WP 0038
(WP 0059, Item 7)	WP 0039
	WP 0040
References	WP 0041
	WP 0042
WP 0012	WP 0043
WP 0014	WP 0044
WP 0015	TM 55-1905-223-10
WP 0017	TM 55-1905-223-24-18
WP 0018	LO 55-1905-223-12
WP 0020	

Table 1. Air Compressor Unit Troubleshooting Procedures.

SYMPTOM/MALFUNCTION	POSSIBLE CAUSE	CORRECTIVE ACTION
		WARNING
	Always ensure affected syste tagged out to prevent accide in the entanglement of limbs maintenance with systems en to personnel or equipment da result in injury or death to per	ems have been secured, locked out and ntal energizing of equipment that can result and clothing in moving parts. Performing nergized may result in death or serious injury amage. Failure to follow this warning may rsonnel.
 Air receiver pressure excessive. 	 Check for inaccurate air pressure gauge (TM 55-1905-223-24-18). 	Replace gauge (TM 55-1905-223-24-18).
	2. Check for defective pressure switch.	Replace switch (TM 55-1905-223-24-18).

0005

SYMPTOM/MALFUNCTION POSSIBLE CAUSE		CORRECTIVE ACTION	
2. Compressor knocks.	 Check for loose suction or discharge valve. 	Tighten valves; suction (WP 0025), discharge (WP 0027).	
	2. Check for a loose pulley.	Tighten pulley bolts.	
	3. Check for inadequate crankcase lubrication.	Add oil if needed (LO 55-1905-223-12).	
	 Check for worn connecting rod bearings. 	Replace connecting rod bearings; low pressure (WP 0033), high pressure (WP 0038).	
	 Check for worn crankshaft bearings. 	Replace bearings (WP 0043).	
	 Check for worn piston pin bushing. 	Replace piston pin bushing; low pressure (WP 0033), high pressure (WP 0038).	
3. Compressor loads and unloads excessively (RPMs fluctuate)	 Incorrect speed due to belt slipping. 	Tighten V-belt as required (WP 0012).	
	2. Check for excessive system air leakage from fittings, piping, or air tank.	Locate air leaks and correct as required.	
	 Check for defective unloaders. 	Repair or replace unloaders (WP 0018 or WP 0017).	
4. Compressor overheats.	 Check for excessive system leakage. 	Tighten all fittings and connections.	
	2. Check for inadequate lubrication.	Add oil (LO 55-1905-223-12).	
	 Check for inadequate ventilation. 	Remove any ventilation obstructions.	
	 Check for defective discharge valves. 	Replace discharge valves (WP 0027).	
	5. Check for clogged intercooler.	Replace intercooler (WP 0021).	
5. Excessive belt wear.	 Check for motor pulley and compressor pulley misalignment. 	Align pulleys (WP 0012).	
	2. Check belt tension.	Adjust V-belts (WP 0012).	

Table 1. Air Compressor Troubleshooting Procedures - continued.

SYMPTOM/MALFUNCTION	POSSIBLE CAUSE	CORRECTIVE ACTION
5. Excessive belt wear - Cont.	 Check to see if compressor pulley is wobbling. 	Tighten or replace compressor pulley (WP 0044).
	 Check for damaged or rough pulley groove. 	Replace pulley (WP 0044).
6. Excessive current draw.	 Check for loose electrical connections. 	Tighten all connections.
	 Check for low input voltage (less than 216 volts). 	Troubleshoot switchboard and distribution circuits (TM 55-1905-223-24-18).
	3. Check for low oil pressure.	Check oil level gauge and add oil if needed (LO 55-1905-223-12).
	 Check for binding internal components. 	Replace pistons and crankshaft as needed (WP 0029, WP 0034, and WP 0042).
	5. Check for defective motor.	 Use multimeter and check motor windings for an open or short condition.
		 Replace motor if either condition exists (WP 0014).
7. Excessive oil consumption.	1. Check for overheating of compressor due to inadequate lubrication or	 Shut down and allow to cool (TM 55-1905- 223-10).
	loss of lubrication.	 Check for oil leaks and correct as required. Lubricate compressor (LO 55- 1905-223-12).
	2. Check for restricted air intake.	Clear air intake.
	 Check oil for proper viscosity. 	Change oil using the correct viscosity (LO 55-1905-223-12).
	4. Check for worn piston rings.	Repair piston; low pressure (WP 0031), high pressure (WP 0036).
	5. Check for bent or twisted connecting rod.	Repair connecting rod; low pressure (WP 0033), high pressure (WP 0038).
8. Excessive vibration.	1. Check belt tension.	Adjust V-belts (WP 0012).
	2. Check for loose compressor or motor.	Tighten all mounting bolts.
	3. Check for loose pulley.	Tighten pulley (WP 0044).

Table 1.	Air Compressor	Troubleshooting	Procedures -	continued.
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SYMPTOM/M	IALFUNCTION	POSSIBLE CAUSE	CORRECTIVE ACTION
8. Excessive Cont.	vibration -	 Check for excessive discharge pressure. 	Adjust pressure switch to maintain to 180-200 psi or replace valves.
		 Check for faulty compressor valves. 	Replace valves; suction (WP 0025), discharge (WP 0027).
9. Compresso	or fails to start.	1. Check to see if power is on.	Turn on power.
		2. Check for loose or broken power wire.	Connect or replace wire (TM 55-1905-223-24-18).
		 Check if thermal overload is tripped. 	Reset thermal overload.
		 Check for correct power at motor. 	Restore correct power (TM 55-1905-223-24-18).
		5. Check for defective motor (WP 0014).	Replace motor (WP 0015).
10. Low discha and air deliv	rge pressure very.	 Check for open drain valve. 	Close valve.
		Check for leaks in the plant air system.	Secure all fittings and connections.
		 Check for leaking safety valve. 	Replace valve.
		4. Check for slipping V-belts.	Adjust V-belts (WP 0012).
		5. Check for restricted air inlet filter or suction line.	Remove restriction from inlet filter or suction line.
		Check for defective pressure gauges.	Replace pressure gauges (TM 55-1905-223-24-18).
		 Check for leaking head gasket. 	Replace head gasket (WP 0020).
		 Check for loose or defective suction or discharge valve. 	Replace valves; suction (WP 0025), discharge (WP 0027).
		 Check for defective unloader. 	Replace hydraulic unloader (WP 0017) or Unloader valve (WP 0022).
		10. Check for worn piston rings or loose pistons.	Repair piston; low pressure (WP 0031), high pressure (WP 0036).
		11. Check for clogged intercooler.	Replace intercooler (WP 0021).

Table 1. Air Compressor Troubleshooting Procedures - continued.

SYMPTOM/MALFUNCTION	POSSIBLE CAUSE	CORRECTIVE ACTION
11. Low oil pressure.	 Check for low oil level in crankcase. 	Add oil to the proper level (LO 55-1905-223-12).
	2. Check for oil leaks.	Repair leaking components.
	 Check for plugged oil sump strainer. 	Remove bearing carrier group (WP 0039), clean sump strainer and change oil (LO 55-1905-223-12).
	 Check for defective oil pressure gauge. 	Replace gauge (WP 0041).
	5. Check oil viscosity.	Change oil (LO 55-1905-223-12).
	 Incorrect assembly of bearing carrier. 	Remove bearing carrier and reassemble (WP 0039 and 0040).
		 Verify correct placement of gasket (WP 0039).
		2. Repair bearing carrier (WP 0040)
12. Motor stalls.	 Check for proper voltage to the motor with a multimeter. 	If low voltage is found, check voltage at motor controller (TM 55-1905-223-24-18).
	 Check for defective motor (WP 0014). 	Replace motor (WP 0015).

Table T. All Complessor Houseshooling Procedules - continued	Table 1	I. Air	[·] Compressor	Troubleshooting	Procedures -	continued.
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FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR DEHYDRATION PIPING GROUP TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1)

References

WP 0008 WP 0049 WP 0050 WP 0051 WP 0052 Drawing LCU2K-99-551-01 TM 55-1905-223-10 TM 55-1905-24-18

SYMPTOM/MALFUNCTION	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Excessive moisture in the air system.	1. Defective solenoid valves.	 Reduce "OFF" time of solenoid valve (WP 0051).
		2. Replace solenoid valves (WP 0052).
	2. Water separator clogged.	1. Clean and dry water separator.
		 Reduce "OFF" time of solenoid valve (WP 0051).
	3. Prefilters contain	1. Clean prefilter (WP 0050).
	moisture.	2. Reduce "OFF" time of solenoid valve (TM 55-1905-223-10).
	4. Membrane dryers contain moisture.	Dry membrane dryer with liquid free low pressure air.
	5. Membrane dryer contains oil.	 Remove vent plug, inspect fibers for oil residue.
		2. Replace membrane dryers (WP 0048).
2. Excessive vibration in	1. Loose components.	Tighten loose components.
	 Fan blades damaged or misshapen. 	Replace aftercooler (WP 0049).

SYMPTOM/MALFUNCTION		POSSIBLE CAUSE	CORRECTIVE ACTION	
3.	High differential pressure in prefilters.	Filter elements contain moisture or debris.	Repair prefilters (WP 0050).	
4.	High air supply inlet temperature.	1. Aftercooler coils air flow restricted.	Sevice aftercooler (WP 0008).	
		2. Aftercooler fan not operating properly.	Repair aftercooler (WP 0049).	
5.	Water in the moisture separator.	 Solenoid valve not operating properly. 	 Test and adjust water separator solenoid valve (WP 0051). 	
			 Reduce "OFF" time of solenoid valve (WP 0051). 	
			3. Replace solenoid valve (WP 0052).	
		2. Water separator contains moisture and debris.	Clean and dry water separator.	

Table 1. Air Compressor Dehydration Piping Group Troubleshooting Procedures - continued.

CHAPTER 3

FIELD MAINTENANCE FOR AIR COMPRESSOR

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) MAINTENANCE INSTRUCTIONS

FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) PROCEDURES INTRODUCTION

GENERAL

PMCS is designed to keep the equipment in good working condition. This is accomplished by performing certain tests, inspections, and services. WP 0008, Table 1, lists items to be serviced and the procedures needed to accomplish the PMCS. If needed, PMCS may be performed more frequently than the indicated interval.

EXPLANATION OF PMCS TABLE

1. **Item Number (Item No.) Column**. Numbers is this column are for reference. If your equipment does not perform as required, refer to WP 0005 or WP 0006, Troubleshooting. Report any malfunctions or failures on a DA Form 2404/5988E, Equipment Inspection and Maintenance Worksheet. In the "Item Number" column on DA Form 2404/5988E, record the appropriate item number from the PMCS Table (WP 0008).

- 2. Interval Column. The "Interval" column tells you when to perform a check or service.
 - a. *Daily* procedures must be accomplished daily prior to use.
 - b. *Weekly* procedures must be accomplished one a week.
 - c. *Monthly* procedures must be accomplished once a month.
 - d. *Quarterly* procedures must be accomplished once every three months.
 - e. *Semiannually* procedures must be accomplished once every six months.
 - f. *Annually* procedures must be accomplished once every twelve months.

3. **Items To Be Checked/Serviced.** The "Items To Be Checked/Serviced" column provides the assembly or subassembly to be checked or serviced.

NOTE

The WARNINGS and CAUTIONS appearing in your PMCS table shall always be observed. WARNINGS and CAUTIONS appear before applicable procedures. You must observe these WARNINGS to prevent injury or death to personnel, and CAUTIONS to prevent your equipment from being damaged.

4. **Procedures**. The "Procedures" column tells you how to perform the required checks and services.

5. **Equipment not Ready/Available if.** Information in this column tells you what faults will keep your equipment from being capable of performing it primary mission. If you perform check/service procedures that show faults listed in this column, the equipment is not mission-capable. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

CLEANING AND LUBRICATION

CAUTION

Follow all cleaning and lubrication instructions carefully. Failure to do so can result in damage to equipment. Failure to follow this caution may result in damage to equipment.

Proper cleaning and lubrication can aid in avoiding possible problems or trouble, so make it a habit to do the following:

- 1. Thoroughly wash all equipment exposed to salt spray with clean, fresh water.
- 2. Clean grease fittings before lubrication.
- 3. Lubricate all equipment at conclusion of the operation before equipment storage. Always use the PMCS lubrication instructions as a guide.
- 4. Never use too much lubricant.
- 5. Never use the wrong type or grade of lubricant.
- 6. Lubricate more during constant use and less during inactive periods.
- 7. Use the correct grade of lubricant for seasonal temperature expected.

FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Lubricating Gun, Hand (WP 0058, Item 5)

Materials/Parts

Gloves, Rubber, Industrial (WP 0059, Item 4) Rag, Wiping (WP 0059, Item 8) Tag, Danger (WP 0059, Item 10)

References

WP 0049 TM 55-1905-223-10 LO 55-1905-223-12

ITEM NO	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
		AIR COMPRESSOR ASSEMBLY		
1	Daily	Air Compressor Oil Level	CAUTION	
			Do not overfill crankcase. Failure to follow this caution may result in damage to equipment.	
			Check that oil level is between high and low level marks on liquid level gauge.	
			Inspect oil for contamination and change if necessary (LO 55-1905-223-12).	
2	Daily	Air Compressor Oil Pressure	Check oil pressure when hot. Pressure should read 18 to 20 PSI on the oil pressure gauge.	Oil pressure below 16 psi.
3	Daily	Air Distribution System	Drain moisture from air receivers, separator and traps. If excessive moisture is present adjust separator and prefilter solenoid valves (WP 0051).	
4	Weekly	Air Compressor Air Intake Filter	Inspect filter. Clean or replace	
5	Monthly	V-belts and Pulley	Check V-belt tension. If greater than 3/8 in. deflection, adjust V- belts (WP 0012).	V-belt tension cannot be adjusted.
			Check pulley and pulley clamp bolts. Tighten if loose.	
6	Monthly	Intercooler	Clean coils with low pressure air or mild detergent and water.	
7	Monthly	Aftercooler	Clean coils with low pressure air or mild detergent and water.	
8	Quarterly	Separator and Prefilter Solenoid Valves	Test and adjust solenoid valves (WP 0051).	

Table 1. Preventive Maintenance Checks and Services

ITEM NO	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
9	Quarterly	Pressure Switch	Check that pressure switches are adjusted to 180-200 psi.	Cannot maintain minimum 180 psi.
10	Quarterly	Motor	Lubricate motor bearings (LO 55-1905-223-12).	
11	Quarterly or 500 Operating Hours	Air Compressor	Change oil and oil filter (LO 55-1905-223-12).	

Table 1. Preventive Maintenance Checks and Services - continued

CHAPTER 4

FIELD MAINTENANCE FOR AIR COMPRESSOR

MAINTENANCE INSTRUCTIONS

FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR MAINTENANCE INSTRUCTIONS INTRODUCTION

GENERAL

This chapter provides field maintenance for the air compressor units and air compressor dehydration piping group. The tasks are for inspection, test, service, adjustment, removal, repair and replacement of subassembly components. These tasks are addressed in the following work packages.

FIELD MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR SERVICE UPON RECEIPT

CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage in accordance with the instructions of DA PAM 750-8.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 750-8.

Check to see whether the equipment has been modified.

Remove and replace protective caps, plugs, inserts, wrappings, and tape when inspection/inventory is completed. Inspect piping openings for damage. Wipe off dirt, grease, or protective films at time of installation.

Remove chocks from resilient mounted components.

DEPROCESSING UNPACKED EQUIPMENT

After receipt and inspection of unpacked equipment, make sure that all packing materials, temporary braces, masking tape, etc., are removed from the material before installation.

INITIAL SETUP PROCEDURE

Includes operational checks and inspections that are not performed for a routine startup. Field and sustainment maintenance personnel will perform initial setup in accordance with the operator's manual, TM 55-1905-223-10.

NORMAL STARTUP

Refer to operator's manual, TM 55-1905-223-10.

SHUTDOWN PROCEDURE (USUAL OR UNUSUAL)

Refer to operator's manual, TM 55-1905-223-10.

PRELIMINARY SERVICING AND ADJUSTMENT

It is important that careful preparations and inspection be made before the air compressors are put in use.

Pre-Start Checks

Before initial start of compressors, make the following inspection:

- 1. Check all connections to motor and starting pushbuttons with wiring diagram. Check voltage, phase and frequency on motor nameplate with live circuit.
- 2. Check piping and pressure gauges for proper operation.
- 3. Check lubrication and piping.

PRELIMINARY SERVICING AND ADJUSTMENT - continued

- 4. Check alternating current motor lubrication.
- 5. Ensure that all valves are properly set and operational, with the discharge valve closed.
- 6. Check rotation. Be sure that the driver operates in the direction indicated by the arrow on the motor casing as serious damage can result if the compressor is operated with the incorrect rotation. Check rotation each time the motor leads have been disconnected.
- 7. Check air compressor dehydration piping group prefilters, water separator, solenoid valves and air filter automatic valve controller for proper operation.

FIELD MAINTENANCE AIR COMPRESSOR ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Sling, Endless (WP 0058, Item 2) Hoist, Chain (WP 0058, Item 3)

Materials/Parts

Tags, Danger (WP 0059, Item 10) Flange gasket Lockwashers

Personnel Required

Two

References

WP 0012 WP 0013 WP 0024 TM 55-1905-223-10

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

WARNING



Compressed air systems are under high pressure. Bleed compressed air from system prior to performing any maintenance. Do not direct compressed air against skin or clothing. Particles blown by compressed air are hazardous to eyes and escaping air volume can damage hearing. Wear Personal Protective Equipment (PPE) including hearing and protective goggles. Failure to follow this warning may result in injury or death to personnel.

- 1. Remove V-belts (WP 0013).
- 2. If system is pressurized, bleed off air pressure using test (WP 0024).
- 3. Scribe foundation indicating compressor base location.
- 4. Remove bolts at discharge flange (Figure 1, Item 1) on air compressor (Figure 1, Item 2).
- 5. Disconnect discharge flange (Figure 1, Item 1) and discard gasket.
- 6. Remove compressor mounting bolts (Figure 1, Item 7) nuts (Figure 1, Item 4) lockwashers (Figure 1, Item 5) and flat washers (Figure 1, Item 6) from foundation (Figure 1, Item 3).

WARNING



All personnel in the vicinity of the lifting operations should wear appropriate safety equipment including gloves, hard hat, and safety shoes.

Heavy loads can crush. Do not allow any body parts to come under the load or between the load and a stationary object. Failure to follow these warnings may result in injury or death to personnel.

7. Use a lifting sling and remove compressor (Figure 1, Item 2) to a level working surface.

END OF TASK

INSTALLATION

WARNING



All personnel in the vicinity of the lifting operations should wear appropriate safety equipment including gloves, hard hat, and safety shoes.

Heavy loads can crush. Do not allow any body parts to come under the load or between the load and a stationary object. Failure to follow these warnings may result in injury or death to personnel.

- 1. Using a lifting sling, swing compressor (Figure 1, Item 2) into place on compressor foundation (Figure 1, Item 3) use scribe marks as a position reference.
- 2. Install bolts (Figure 1, Item 7) flat washers (Figure 1, Item 6) lockwasher (Figure 1, Item 5) and nuts (Figure 1, Item 4).
- 3. Verify alignment of compressor on foundation (Figure 1, Item 3) and drive pulleys. Torque all hex head bolts.
- 4. Install new gasket on discharge flange (Figure 1, Item 1) to compressor (Figure 1, Item 2).



Figure 1. Air Compressor

INSTALLATION - continued

- 5. Install V-belts (WP 0013).
- 6. Adjust V-belts (WP 0012).

END OF TASK

FIELD MAINTENANCE V-BELT ADJUSTMENT ADJUST

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Bar, Wrecking (WP 0058, Item 4)

Materials/Parts

Tags, Danger (WP 0059, Item 10)

Personnel Required

Two

References

TM 55-1905-223-10

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

ADJUST

- 1. Remove bolts (Figure 1, Items 1 and 3) from upper half of belt guard (Figure 1 Item 2).
- 2. Remove upper half of guard (Figure 1, Item 2).
- 3. Loosen alternating current motor (Figure 1, Item 5) mounting bolts just enough to allow movement of the motor (Slight tension).
- 4. Place a pry bar into mounting base (Figure 1, Item 4) and move alternating current motor (Figure 1, Item 5) away from the compressor.
- 5. Tighten mounting bolts.

WARNING



When manually rotating machinery, ensure personnel are clear of rotating parts to prevent entanglement of limbs and clothing. Failure to follow this warning may result in injury or death to personnel.

6. Rotate compressor pulley by hand to check pulley alignment.

NOTE

Belt deflection is measured at the center point of the drive belts as shown in detail A. Approximately 3/8 of an inch is sufficient. Adjust slightly tighter for new V-belts.

- 7. Check for the proper belt deflection. Repeat steps 3-5 to achieve correct deflection.
- 8. Install upper half of belt guard (Figure 1, Item 2).
- 9. Install bolts (Figure 1, Items 1 and 3) into belt guard.
- 10. Clear tags, start system and verify proper operation (TM 55-1905-223-10).





DETAIL A



END OF TASK

FIELD MAINTENANCE V-BELTS REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
	References
Materials/Parts	WP 0012
Tag, Danger (WP 0059, Item 10)	
LOCKNUTS	Equipment Condition
	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

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NOTE

Replacement of V-belts is completed as a set of two belts.

REMOVAL

- 1. Remove bolts (Figure 1, Items 1 and 3) upper half of belt guard (Figure 1, Item 2).
- 2. Remove bolts and locknuts (Figure 1, Items 4 and 9) from lower half of belt guard (Figure 1, Item 10). Discard locknuts.
- 3. Loosen alternating current motor mounting bolts (Figure 1, Item 8).
- 4. Slide alternating current motor (Figure 1, Item 6) toward compressor to slack V-belts.
- 5. Remove V-belts (Figure 1, Item 5).

END OF TASK

INSTALLATION

- 1. Install new V-belts (Figure 1, Item 5).
- 2. Slide alternating current motor back into position and hand tighten mounting bolts (Figure 1, Item 8).
- 3. Correct any misalignment of drive pulleys.
- 4. Install lower half of belt guard (Figure 1, Item 10).
- 5. Install bolts and new locknuts (Figure 1, Items 4 and 9).



Figure 1. V-belt.

6. Adjust V-belts (WP 0012).

END OF TASK

FIELD MAINTENANCE ALTERNATING CURRENT MOTOR TEST

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Tool Kit, Electrical Repair (WP 0058, Item 6) Ohmmeter (Insulation Tester) (WP 0058, Item 7)

Materials/Parts

Tag, Danger (WP 0059, Item 10) Tag, Blank (WP 0059, Item 11) Gasket

Personnel Required

Two

References

WP 0015 TM 55-1905-223-10

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

WARNING



Always ensure affected circuits have been secured, locked out and tagged out. Performing maintenance with circuits energized presents a shock hazard and may result in death or injury to personnel or equipment damage.

Under no circumstances should repair or adjustment of energized equipment be attempted alone. The immediate presence of someone capable of rendering aid is required. Before making adjustments, be sure to protect against grounding. If possible, adjustments should be made with one hand, with the other hand free and clear of equipment. Even when power has been removed from equipment circuits, dangerous potentials may still exist due to retention of charges by capacitors. Circuits must be grounded and all capacitors discharged prior to attempting repairs. Failure to follow these warnings may result in injury or death to personnel.

TEST

- 1. Remove cover screws, cover and gasket from electrical motor conduit box (Figure 1, Item 5). Discard gasket.
- 2. Using a multi-meter, verify no electrical power at motor connections.
- 3. Disconnect and label electrical conductors from motor.
- 4. Using a multi-meter set to the ohms scale, test continuity of the motor windings by performing the following:
 - a. Measure continuity between conductors (Figure 1, Items 2 and 3); value should be less than 10 ohms.
 - b. Measure continuity between conductors (Figure 1, Items 3 and 4); value should be less than 10 ohms.
 - c. Measure continuity between conductors (Figure 1, Items 2 and 4); value should be less than 10 ohms.
 - d. If values are greater than 10 ohms, replace motor (WP 0015).
- 5. Using an ohmmeter (insulation tester), check for insulation breakdown to ground by performing the following:
 - a. Measure resistance between conductor (Figure 1, Item 2) and motor casing; value should be greater than 1 MegOhm.
 - b. Measure resistance between conductor (Figure 1, Item 3) and motor casing; value should be greater than 1 MegOhm.
 - c. Measure resistance between conductor (Figure 1, Item 4) and motor casing; value should be greater than 1 MegOhm.
 - d. If all values are not equal or if values are less than 1 MegOmh, replace motor (WP 0015).
TEST - continued

- 6. Connect electrical conductors to motor leads according to labels.
- 7. Install new gasket, cover, and cover screws onto electrical motor conduit box (Figure 1, Item 5).
- 8. Clear tags, start system and verify proper operation (TM 55-1905-223-10).



Figure 1. Alternating Current Motor.

END OF TASK

FIELD MAINTENANCE ALTERNATING CURRENT MOTOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Tool Kit, Electrical Repair (WP 0058, Item 6) Puller, Mechanical (WP 0058, Item 8)	References
Materials/Parts	WP 0013
Cleaning Compound, Solvent-Detergent	Equipment Condition
(WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3) Tag, Danger (WP 0059, Item 10) Tag, Blank (WP 0059, Item 11) Gasket Lockwashers	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove electrical conduit box cover (Figure 1, Item 7).
- 3. Using multi-meter, verify no electrical power at motor connections.
- 4. Disconnect and label electrical connections.
- 5. Remove motor bolts (Figure 1, Item 2) flat washers (Figure 1, Item 3) lockwashers (Figure 1, Item 4) and nuts (Figure 1, Item 5). Discard lockwashers.
- 6. Remove motor (Figure 1, Item 1) from mounting platform (Figure 1, Item 6) to a level working surface.
- 7. Remove set screw from pulley on motor shaft.
- 8. Using a mechanical puller, remove drive pulley.
- 9. Remove machine key.

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean motor shaft and key way with cleaning solvent and dry with lint free rags.
- 2. Place machine key into motor shaft key way.
- 3. Align key ways and slide drive pulley onto motor shaft. Hand tighten set screw.
- 4. Move motor to compressor bed (Figure 1, Item 6) and install mount bolts (Figure 1, Item 2), flat washers (Figure 1, Item 3), new lockwashers (Figure 1, Item 4) and nuts (Figure 1, Item 5) hand tight.
- 5. Align drive pulley to compressor pulley using a straight edge. Tighten set screw.
- 6. Connect electrical connections as indicated by the labels.
- 7. Install electrical conduit box cover.

INSTALLATION - continued



Figure 1. Alternating Current Motor.

8. Install V-belts (WP 0013).

END OF TASK

FIELD MAINTENANCE ALTERNATING CURRENT MOTOR REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Tool Kit, Electrical Repair (WP 0058, Item 6) Puller, Mechanical (WP 0058, Item 8)	References
Materials/Parts	WP 0015
Cleaning Compound, Solvent-Detergent	Equipment Condition
(WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3) Grease, Ball and Roller (WP 0059, Item 5) Tag, Danger (WP 0059, Item 10) Washer, Spring Tension	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove alternating current motor (WP 0015).
- 2. Remove nuts (Figure 1, Item 16).
- 3. Remove fan shroud (Figure 1, Item 1).
- 4. Loosen set screw and remove fan (Figure 1, Item 2).
- 5. Remove deflector (Figure 1, Item 3).
- 6. Remove fan side end bell (Figure 1, Item 4).
- 7. Remove spring tension washer (Figure 1, Item 5). Discard washer.
- 8. Remove grease fitting (Figure 1, Item 13) from drive side end bell (Figure 1, Item 12).
- 9. Remove nuts (Figure 1, Item 15) from drive side end bell (Figure 1, Item 12).
- 10. Remove deflector (Figure 1, Item 14) and drive side end bell (Figure 1, Item 12).
- 11. Carefully remove rotor (Figure 1, Item 9).
- 12. Secure rotor (Figure 1, Item 9) on a level work surface.
- 13. Using mechanical puller, remove bearing (Figure 1, Item 6) and bearing (Figure 1, Item 11).

END OF TASK

REPAIR

Repair of the motor is by replacement of worn or damaged parts and the following:

- a. Deflector, dirt (Figure 1, Item 3).
- b. Washer, spring (Figure 1, Item 5).
- c. Bearing, ball (Figure 1, Item 6).
- d. Bearing, ball (Figure 1, Item 11).
- e. Deflector, dirt (Figure 1, Item 14).

END OF TASK

ASSEMBLY

1. Clean and inspect rotor (Figure 1, Item 9).

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 2. Clean old grease from end bells (Figure 1, Items 4 and 12).
- 3. Install bearings (Figure 1, Items 6 and 11) onto shaft of rotor (Figure 1, Item 9).
- 4. Carefully install rotor (Figure 1, Item 9) into stator housing (Figure 1, Item 7).
- 5. Install drive side end bell (Figure 1, Item 12) and secure with nuts (Figure 1, Item 15).





ASSEMBLY - continued

- 6. Install deflector (Figure 1, Item 14).
- 7. Install new spring tension washer (Figure 1, Item 5).
- 8. Install fan side end bell (Figure 1, Item 4) and deflector (Figure 1, Item 3).
- 9. Install fan (Figure 1, Item 2) and secure set screw.
- 10. Rotate rotor (Figure 1, Item 9) to check clearance of fan (Figure 1, Item 2) to end bell (Figure 1, Item 4).
- 11. Install fan shroud (Figure 1, Item 1) and secure with nuts (Figure 1, Item 16).
- 12. Install alternating current motor (WP 0015).

END OF TASK

FIELD MAINTENANCE HYDRAULIC UNLOADER ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Matariala/Parta	References
	TM 55-1905-223-10
Tag, Danger (WP 0059, Item 10) Tape, Antiseizing (WP 0059, Item 12)	Equipment Condition
	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Disconnect outlet air tube (Figure 1, Item 1) from elbow (Figure 1, Item 5).
- 2. Disconnect inlet air tube (Figure 1, Item 2) from elbow (Figure 1, Item 5).
- 3. Remove hydraulic unloader assembly (Figure 1, Item 3) from oil pump housing (Figure 1, Item 4).

NOTE

Note orientation of elbow outlets for installation.

4. Remove elbows (Figure 1, Item 5) from hydraulic unloader (Figure 1, Item 3).

END OF TASK

INSTALLATION

- 1. Clean and inspect elbows (Figure 1, Item 5). Remove all sealant from threads.
- 2. Apply antiseizing tape to threads on elbows (Figure 1, Item 5).
- 3. Install elbows (Figure 1, Item 5) into hydraulic unloader (Figure 1, Item 3) in the same position as removed.
- 4. Apply antiseizing tape to threads on hydraulic unloader (Figure 1, Item 3).
- 5. Install hydraulic unloader (Figure 1, Item 3) onto oil pump housing (Figure 1, Item 4).
- 6. Attach air outlet (Figure 1, Item 1) and air inlet (Figure 1, Item 2) to hydraulic unloader (Figure 1, Item 3).
- 7. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

INSTALLATION - continued



Figure 1. Hydraulic Unloader.

END OF TASK

FIELD MAINTENANCE HYDRAULIC UNLOADER ASSEMBLY REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
	Reference
Materials/Parts	
	WP 0017
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1)	Equipment Condition
Cloth, Cleaning (WP 0059, Item 3)	
(WP 0059. Item 7)	Air compressor, valves, and controllers locked out and
Tag, Danger (WP 0059, Item 10)	lagged out (FM 4-01.502)
Parts Kit, Compressor	

DISASSEMBLY

- 1. Remove hydraulic unloader (WP 0017).
- 2. Remove filter (Figure 1, Item 8) from filter housing (Figure 1, Item 7).
- 3. Unscrew filter housing (Figure 1, Item 7) from unloader body (Figure 1, Item 4).
- 4. Remove spring (Figure 1, Item 6) and stem (Figure 1, Item 5) from unloader body (Figure 1, Item 4).
- 5. Unscrew cap (Figure 1, Item 1) from unloader body (Figure 1, Item 4).
- 6. Remove diaphragm (Figure 1, Item 2) and stem button (Figure 1, Item 3).

END OF TASK

REPAIR

Repair of the hydraulic unloader is by replacement of worn or damaged parts and the parts contained in the compressor parts kit.

END OF TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all hydraulic unloader parts with cleaning solvent and dry with lint free rags.
- 2. Inspect hydraulic unloader body (Figure 1, Item 4) bore for damage.
- 3. Place stem button (Figure 1, Item 3) and diaphragm (Figure 1, Item 2) into unloader body (Figure 1, Item 4).
- 4. Screw cap (Figure 1, Item 1) onto unloader body (Figure 1, Item 4).
- 5. Apply compressor lubricating oil to O-rings on stem (Figure 1, Item 5). Insert into unloader body (Figure 1, Item 4).
- 6. Ensure stem (Figure 1, Item 5) moves freely in unloader body (Figure 1, Item 4).
- 7. Insert spring (Figure 1, Item 6) into unloader body (Figure 1, Item 4). Hold in place and screw filter housing (Figure 1, Item 7) into unloader body.

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8. Insert filter (Figure 1, Item 8) into filter housing (Figure 1, Item 7).





9. Install hydraulic unloader (WP 0017).

END OF TASK

FIELD MAINTENANCE CYLNDER BLOCK REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Wrench, Torque (WP 0058, Item 9)	References
Materials/Parts	WP 0011
	WP 0013
Cleaning Compound, Solvent-Detergent	WP 0020
(WP 0059, Item 1)	WP 0021
Cloth, Abrasive (WP 0059, Item 2)	WP 0029
Cloth, Cleaning (WP 0059, Item 3)	WP 0034
Tag, Danger (WP 0059, Item 10)	WP 0044
Gasket	
Lockwashers	Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).
- 7. Remove connecting rod and high pressure piston assembly (WP 0034).
- 8. Remove bolts (Figure 1, Item 2) and lockwashers (Figure 1, Item 3) from cylinder block (Figure 1, Item 1). Discard lockwashers.
- 9. Remove cylinder block (Figure 1, Item 1) from crankcase (Figure 1, Item 5).
- 10. Remove and discard gasket (Figure 1, Item 4).

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean cylinder block using cleaning solvent and dry with lint free rags.
- 2. Clean gasket surface on crankcase (Figure 1, Item 5).

INSTALLATION - continued

- 3. Insert two alignment studs in threaded holes at opposite corners of the crankcase (Figure 1, Item 5).
- 4. Place new gasket (Figure 1, Item 4) onto crankcase (Figure 1, Item 5).
- 5. Position cylinder block (Figure 1, Item 1) onto crankcase (Figure 1, Item 5).
- 6. Install bolts (Figure 1, Item 2) and new lockwashers (Figure 1, Item 3) into crankcase hand tight. Remove alignment studs and and install remaining bolts and new lockwashers.
- 7. Torque bolts in a cross match pattern in two steps, step one 35 ft-lbs and final torque 70 ft-lbs.



Figure 1. Cylinder Block.

- 8. Install connecting rod and low pressure piston assembly (WP 0029).
- 9. Install connecting rod and high pressure piston assembly (WP 0034).
- 10. Install cylinder head assembly (WP 0020).

INSTALLATION - continued

- 11. Install intercooler (WP 0021).
- 12. Install compressor pulley (WP 0044).
- 13. Install air compressor (WP 0011).
- 14. Install V-belts (WP 0013).

END OF TASK

FIELD MAINTENANCE CYLINDER HEAD ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Gasket, Flange Lockwashers

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Wrench, Torque (WP 0058, Item 9)	References
Materials/Parts	WP 0013 WP 0021
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1)	WP 0044
Cloth, Abrasive (WP 0059, Item 2) Cloth, Cleaning (WP 0059, Item 3)	Equipment Condition
Tag, Danger (WP 0059, Item 10) Gasket, Head	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

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REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove compressor pulley (WP 0044).
- 3. Remove intercooler (WP 0021).
- 4. Remove five screws (Figure 1, Item 2) and lockwashers (Figure 1, Item 3) from cylinder head (Figure 1, Item 1). Discard lockwashers.
- 5. Remove seven screws (Figure 1, Item 10) and lockwashers (Figure 1, Item 9) from cylinder block (Figure 1, Item 8). Discard lockwashers.
- 6. Remove head (Figure 1, Item 1) and gasket (Figure 1, Item 7). Discard gasket.
- 7. Remove screws (Figure 1, Item 4), flange (Figure 1, Item 5) and flange gasket (Figure 1, Item 6) from cylinder head (Figure 1, Item 1). Discard flange gasket.



Figure 1. Cylinder Head Assembly.

END OF TASK

IINSTALLATION

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel.

Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow these warnings may result in injury or death to personnel.

- 1. Clean all gasket surfaces with cleaning solvent and wipe dry with lint free rags.
- 2. Install new flange gasket (Figure , Item 6) flange plate (Figure 1, Item 5) and secure with screws (Figure 1, Item 4).
- 3. Place new head gasket (Figure 1, Item 7) on top of cylinder block (Figure 1, Item 8).
- 4. Mount head assembly (Figure 1, Item 1) on top of cylinder block (Figure 1, Item 8).
- 5. Install five screws (Figure 1, Item 2) and new lockwashers (Figure 1, Item 3) into the top of head assembly (Figure 1, Item 1). Hand tighten.
- 6. Install seven screws (Figure 1, Item 10) and new lockwashers (Figure 1, Item 9) into cylinder block (Figure 1, Item 8). Hand tighten.

INSTALLATION - continued

7. Using torque sequence (Figure 2), torque screws to 65 ft-lbs.



Figure 2. Torque Sequence.

- 8. Install intercooler (WP 0021).
- 9. Install compressor pulley (WP 0044).

END OF TASK

FIELD MAINTENANCE INTERCOOLER REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Wrench, Torque (WP 0058, Item 9)

Materials/Parts

Cloth, Abrasive (WP 0059, Item 2) Tag, Danger (WP 0059, Item 10) Gasket (2) Lockwashers

Personnel Required

Two

References

WP 0013 WP 0044

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove compressor pulley (WP 0044).

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

- 3. Remove screws (Figure 1, Item 1) and lockwashers (Figure 1, Item 2) from intercooler (Figure 1, Item 3). Discard lockwashers.
- 4. Remove intercooler (Figure 1, Item 3) and two gaskets (Figure 1, Item 4) from head assembly (Figure 1, Item 5). Discard gaskets.

END TASK

INSTALLATION

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean gasket surfaces on head assembly (Figure 1, Item 5) with abrasive cloth.
- 2. Install two gaskets (Figure 1, Item 4) and intercooler (Figure 1, Item 3). Secure with screws (Figure 1, Item 1) and new lockwashers (Figure 1, Item 2).

INSTALLATION - continued





- 3. Install compressor pulley (WP 0044).
- 4. Install V-belts (WP 0013).

END OF TASK

FIELD MAINTENANCE UNLOADER VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
	References
Materials/Parts	TH 55 1005 000 10
Cloth Cleaning (WP 0059 Item 3)	IM 55-1905-223-10
Tag, Danger (WP 0059, Item 10) Gasket	Equipment Condition
	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

NOTE

Valve body removals are identical with the exception of air inlet supply. One valve is a single supply and the other has a second connection to balance between the high and low side.

REMOVAL

- 1. Disconnect air inlet supply line (Figure 1, Items, 2, 3, or 4) from unloader body (Figure 1, Item 9).
- 2. Remove screws (Figure 1, Item 5) from unloader body (Figure 1, Item 9).
- 3. Remove diaphragm (Figure 1, Item 7) and diaphragm disc (Figure 1, Item 8) from unloader body (Figure 1, Item 9).
- 4. Unscrew unloader body (Figure 1, Item 9) from cylinder head (Figure 1, Item 12).
- 5. Remove unloader piston (Figure 1, Item 10) and gasket (Figure 1, Item 11). Discard gasket.

END OF TASK

INSTALLATION

- 1. Inspect gasket surfaces and wipe with a clean lint free rag.
- 2. Install new gasket (Figure 1, Item 11) and unloader piston (Figure 1, Item 10). Ensure piston moves freely.
- 3. Install new underloader body (Figure 1, Item 9).
- 4. Install diaphragm disc (Figure 1, Item 8) and diaphragm (Figure 1, Item 7).
- 5. Install valve cover (Figure 1, Item 6) and secure with screws (Figure 1, Item 5).
- 6. Connect air supply line (Figure 1, Items, 2, 3, or 4) to unloader body (Figure 1, Item 9).

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Figure 1. Unloader Valve.

7. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK

FIELD MAINTENANCE UNLOADER VALVE REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
	References
Materials/Parts	
	WP 0022
Cloth, Cleaning (WP 0059, Item 3)	
Tag, Danger (WP 0059, Item 10)	Equipment Condition
Diaphragm Diaphragm Diag	
Ring, Spacer	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove unloader valve (WP 0022).
- 2. Remove self locking screw (Figure 1, Item 11) and spacer ring (Figure 1, Item 12) Discard ring.
- 3. Clean and inspect all parts for damage. If unloader piston (Figure 1, Item 10) is damaged, replace unloader (WP 0022). If unloader piston (Figure 1, Item 10) is not damaged, continue on with this WP.

END OF TASK

REPAIR

Repair of the unloader valve is by replacement of following:

- a. Diaphragm (Figure 1, Item 1 or 7).
- b. Diaphragm disc (Figure 1, Item 4 or 8).
- c. Spacer ring (Figure 1, Item 12).

END OF TASK

ASSEMBLY

- 1. Install self-locking screw (Figure 1, Item 11) and new spacer ring (Figure 1, Item 12).
- 2. Install unloader valve (WP 0022).

ASSEMBLY - continued



Figure 1. Unloader Valve.

END OF TASK

FIELD MAINTENANCE RELIEF VALVE REPLACEMENT TEST, REMOVAL, INSTALLATION

INITIAL SETUP

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1)

Materials/Parts

Sealing Compound (WP 0059, Item 9) Tag, Danger (WP 0059, Item 10)

TEST

Personnel Required

Two

References

TM 55-1905-223-10 FM 4-01.502

WARNING



Compressed air systems are under high pressure. Bleed compressed air from system prior to performing any maintenance. Do not direct compressed air against skin or clothing. Particles blown by compressed air are hazardous to eyes and escaping air volume can damage hearing. Wear Personal Protective Equipment (PPE) including hearing and protective goggles. Failure to follow this warning may result in injury or death to personnel.

WARNING



Air compressor may be hot. Allow the air compressor to cool before performing maintenance. Failure to follow this warning may result in injury or death to personnel.

- 1. Relieve system pressure by pulling the ring on the pressure relief valve (Figure 1, Item 1), Detail A, located on compressor head (Figure 1, Item 2).
- 2. Release ring on pressure relief valve (Figure 1, Item 1), Detail A. Air flow should stop.
- 3. If relief valve continues to purge air repeat steps 1 and 2. If air flow continues replace relief valve (Figure 1, Item 1).

TEST - continued





END OF TASK

REMOVAL

WARNING



Compressed air systems are under high pressure. Bleed compressed air from system prior to performing any maintenance. Do not direct compressed air against skin or clothing. Particles blown by compressed air are hazardous to eyes and escaping air volume can damage hearing. Wear Personal Protective Equipment (PPE) including hearing and protective goggles. Failure to follow this warning may result in injury or death to personnel.

1. Lock out, tag out air compressor valves and controller IAW FM 4-01.502.

WARNING



Air compressor may be hot. Allow the air compressor to cool before performing maintenance. Failure to follow this warning may result in injury or death to personnel.

- 2. Remove pressure relief valve (Figure 1, Item 1) by un-screwing valve from compressor head (Figure 1, Item 2).
- 3. Inspect threaded hole in compressor head (Figure 1, Item 2) for any thread sealing compound, remove any compound.

END OF TASK

INSTALLATION

CAUTION

Apply thread sealing compound on threads sparingly. Care must be taken to avoid sealant entering air system. Failure to follow this caution may result in damage to relief valve.

- 1. Apply thread sealing compound to pressure relief valve (Figure 1, Item 1).
- 2. Install relief valve (Figure 1, Item 1) into compressor head (Figure 1, Item 2).
- 3. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK
FIELD MAINTENANCE SUCTION VALVE ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Materials/Parts	References
	WP 0022
Cloth, Cleaning (WP 0059, Item 3) Tag, Danger (WP 0059, Item 10) Gasket, Double	Equipment Condition
Gasket Ring, Spacer Spring, Helical	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

NOTE

Removal of the suction valves is identical with the exception of the cover plates and gasket.

REMOVAL

- 1. Remove unloader valve (WP 0022).
- 2. Remove self locking screw (Figure 1, Item 2).
- 3. Remove screws (Figure 1, Item 3).
- 4. Remove plate (Figure 1, Item 1 or 5) and gasket (Figure 1, Item 6 or 14). Discard gasket.
- 5. Remove retainer (Figure 1, Item 7), pin (Figure 1, Item 8), and platform (Figure 1, Item 9).
- 6. Remove pins (Figure 1, Item 13) and helical springs (Figure 1, Item 12). Discard springs.
- 7. Remove suction valve (Figure 1, Item 10).

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

8. Remove spacer ring (Figure 1, Item 11). Discard ring.

END OF TASK

INSTALLATION

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean and inspect valve pocket. Wipe clean with a lint free rag.
- 2. Install new spacer ring (Figure 1, Item 11).

INSTALLATION - continued



Figure 1. Suction Valve.

- 3. Insert suction valve (Figure 1, Item 10) into head (Figure 1, Item 4).
- 4. Insert new helical springs (Figure 1, Item 12) and pins (Figure 1, Item 13) into suction valve (Figure 1, Item 10).
- 5. Install platform (Figure 1, Item 9), pin (Figure 1, Item 8) and retainer (Figure 1, Item 7).
- 6. Install new gasket (Figure 1, Item 6 or 14) and plate (Figure 1, Item 1 or 5) and secure with screws (Figure 1, Item 3).
- 7. Install self locking screw (Figure 1, Item 2).
- 8. Install unloader valve (WP 0022).

END OF TASK

FIELD MAINTENANCE SUCTION VALVE REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
	References
Materials/Parts	
	WP 0022
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1)	WP 0025
Clothing, Cleaning (WP 0059, Item 3) Tag, Danger (WP 0059, Item 10)	Equipment Condition
Spring, Helical	Air compressor, valves, and controllers locked out and

tagged out (FM 4-01.502)

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NOTE

Repair of the suction valves are identical.

DISASSEMBLY

- 1. Remove unloader valve (WP 0022).
- 2. Remove suction valve assembly (WP 0025).
- 3. Remove valve seat (Figure 1, Item 5), helical spring (Figure 1, Item 4), bearing washer (Figure 1, Item 3) and stud (Figure 1, Item 2) from suction valve (Figure 1 Item 1). Discard spring.

END OF TASK

REPAIR

Repair of the suction valves is by replacement of worn or damaged parts and the following:

- a. Helical spring (Figure 1, Item 4).
- b. Bearing washer (Figure 1, Item 3).

END OF TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all components with cleaning solvent and wipe dry with a lint free rag.
- 2. Install stud (Figure 1, Item 2) into suction valve (Figure 1, Item 1).
- 3. Install bearing washer (Figure 1, Item 3), new helical spring (Figure 1, Item 4) and valve seat (Figure 1, Item 5) into suction valve (Figure 1, Item 1).

ASSEMBLY - continued



Figure 1. Suction Valve.

- 4. Install suction valve assembly (WP 0025).
- 5. Install unloader valve (WP 0022).

END OF TASK

FIELD MAINTENANCE DISCHARGE VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
	References
Materials/Parts	TM 55-1905-223-10
Cloth, Cleaning (WP 0059, Item 3)	
Tag, Danger (WP 0059, Item 10) Gasket, Double	Equipment Condition
Gasket Ring, Spacer	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

NOTE

Removal of discharge valves is identical with the exception of the cover plates and gaskets.

REMOVAL

- 1. Remove nut cap (Figure 1, Item 2) and screw (Figure 1, Item 1) from plate (Figure 1, Item 4 or 12).
- 2. Remove screws (Figure 1, Item 3).
- 3. Remove plate (Figure 1, Item 4 or 12) and gasket (Figure 1, Item 5 or 11). Discard gasket.
- 4. Remove valve spacer (Figure 1, Item 6).
- Grasp bolt (Figure 1, Item 7) and remove discharge valve (Figure 1, Item 8) from valve pocket (Figure 1, Item 10)

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

6. Remove spacer ring (Figure 1, Item 9). Discard ring.

END OF TASK

INSTALLATION

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

- 1. Inspect valve pocket (Figure 1, Item 10). Wipe clean with a lint free rag.
- 2. Install new spacer ring (Figure 1, Item 9).
- 3. Install discharge valve (Figure 1, Item 8).

INSTALLATION - continued

- 4. Install valve spacer (Figure 1, Item 6).
- 5. Install new gasket (Figure 1, Item 5 or 11) and cover plate (Figure 1, Item 4 or 12).
- 6. Secure cover plate screws (Figure 1, Item 3).
- 7. Install screw (Figure 1, Item 1) and nut cap (Figure 1, Item 2).
- 8. Clear tags, start system and verify proper operation (TM 55-1905-223-10).



Figure 1. Discharge Valve.

END OF TASK

FIELD MAINTENANCE DISCHARGE VALVE REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
	References
Materials/Parts	
	WP 0027
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3)	Equipment Condition
Tag, Danger (WP 0059, Item 10) Spring, Helical	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

NOTE

Discharge spring coils are marked with white paint on each end coil.

DISASSEMBLY

- 1. Remove discharge valve assembly (WP 0027).
- 2. Remove bolt (Figure 1, Item 1).
- 3. Remove valve seat (Figure 1, Item 5) bearing washer (Figure 1, Item 4) and helical spring (Figure 1, Item 3). Discard spring.

END OF TASK

REPAIR

Repair of the discharge valves is by replacement of worn or damaged parts and the following:

- a. Helical spring (Figure 1, Item 3).
- b. Bearing washer (Figure 1, Item 4).
- c. Valve seat (Figure 1, Item 5).



Figure 1. Discharge Valve.

END OF TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all components with cleaning solvent and wipe dry with a lint free rag.
- 2. Install new helical spring (Figure 1, Item 3) bearing washer (Figure 1, Item 4) and valve seat (Figure 1, Item 5) into discharge valve (Figure 1, Item 2).
- 3. Install bolt (Figure 1, Item 1).
- 4. Install discharge valve assembly (WP 0027).

END OF TASK

FIELD MAINTENANCE CONNECTING ROD AND LOW PRESSURE PISTON ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Wrench, Torque (WP 0058, Item 9) Compressor, Piston Ring	References
(WP 0058, Item 10)	WP 0011 WP 0013
Materials/Parts	WP 0019 WP 0020
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1)	WP 0021 WP 0044
Cloth, Cleaning (WP 0059, Item 3)	
(WP 0059, Item 6)	Equipment Condition
Tag, Danger (WP 0059, Item 10) Lubricating Oil, Air Compressor (WP 0059, Item 7)	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)
Gaskets	
Locknuts	
Lockwashers	

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).

REMOVAL - continued

6. Remove screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), covers (Figure 1, Item 4) and gaskets (Figure 1, Item 3) from both sides of crankcase (Figure 1, Item 2). Discards gaskets.



Figure 1. Crankcase Access Cover.

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

NOTE

The low pressure piston is the largest diameter piston in the compressor. This can be observed once the cylinder head is removed.

7. On one side of assembly, place marks (Figure 2, Item 9) on connecting rod (Figure 2, Item 10) and connecting rod cap (Figure 2, Item 8) to assist in reassembly.

REMOVAL - continued

- 8. Remove locknuts (Figure 2, Item 6) and lockwashers (Figure 2, Item 7) from bolts (Figure 2, Item 2). Discard locknuts and lockwashers.
- 9. Remove bolts (Figure 2, Item 2). If bolts appear to be stuck use a steel bar (flat stock). Slide through crankcase openings (Figure 2, Item 4) and under bolt. Rest edge of flat stock on bolt. Place strap wrench over end of crankshaft and briskly rotate crankshaft downward until bolts are loosened.
- 10. Remove connecting rod cap (Figure 2, Item 8) and bearing sleeve from crankshaft.
- 11. Check for a wear ridge at TDC of cylinder (Figure 2, Item 3), if ridge cannot be removed, replace cylinder block (WP 0019).

CAUTION

Exercise care while removing connecting rod and piston from cylinder. Avoid contacting cylinder wall and crankshaft rod journals with connecting rod bolts. Failure to follow this caution may result in damage to equipment.

12. Carefully push connecting rod and low pressure piston assembly (Figure 2, Item 1) up and out of compressor cylinder.



Figure 2. Connecting Rod and Low Pressure Piston Assembly.

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and wipe dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive and remove if present.
- 3. Insert bolts (Figure 3, Item 15) into connecting rod (Figure 3, Item 16).
- 4. Thoroughly lubricate all surfaces of connecting rod and low pressure piston assembly (Figure 3, Item 1) with oil.
- 5. Rotate crankshaft so that crankshaft journal (Figure 3, Item 9) is at BDC. Apply lubriplate to journal.
- 6. Stagger piston ring end gaps 180 degrees from each other. Install piston ring compressor (Figure 3, Item 5) onto piston (Figure 3, Item 2).
- Align bolts (Figure 3, Item 15) to crankshaft journal (Figure 3, Item 9) and insert piston assembly into cylinder (Figure 3, Item 7). Stop when piston ring compressor (Figure 3, Item 5) is flush with top of cylinder (Figure 3, Item 7).
- 8. Observe location of bolts through the crankcase openings; make adjustments to ensure proper alignment.

NOTE

One inch clearance is required between crankshaft journal and connecting rod to allow for bearing installation.

9. Observe bolt location. Use tool handle (Figure 3, Item 3) to push piston slowly into place. Leave a one inch clearance between crankshaft journal (Figure 3, Item 9) and connecting rod (Figure 3, Item 16).

CAUTION

The lubrication hole in the upper bearing sleeve must line up with the drilled oil passage in the connecting rod. Failure to follow this caution may result in damage to equipment.

- Place upper bearing sleeve (Figure 3, Item 14) onto crankshaft journal (Figure 3, Item 9). Push piston assembly remaining distance to seat connecting rod (Figure 3, Item 16) onto upper bearing sleeve (Figure 3, Item 14).
- 11. Place lower bearing sleeve (Figure 3, Item 13) into connecting rod cap (Figure 3, Item 12).

INSTALLATION - continued



Figure 3. Connecting Rod and Low Pressure Piston Assembly.

- 12. Align marks on connecting rod (Figure 3, Item 16) and connecting rod cap (Figure 3, Item 12). Install new lockwashers (Figure 3, Item 11) and new locknuts (Figure 3, Item 10). Torque to 40 ft-lbs
- 13. Rotate crankshaft to ensure it moves freely.
- 14. Inspect crankcase to ensure that it is clear of foreign objects, wipe with lint free rags.

INSTALLATION - continued



Figure 4. Crankcase Access Cover.

- 15. Install new crankcase gasket (Figure 4, Item 3) and cover (Figure 4, Item 4). Secure with bolts (Figure 4, Item 5) and new lockwashers (Figure 4, Item 6).
- 16. Install cylinder head assembly (WP 0020).
- 17. Install intercooler (WP 0021).
- 18. Install compressor pulley (WP 0044).
- 19. Install air compressor (WP 0011).
- 20. Install V-belts (WP 0013).

END OF TASK

FIELD MAINTENANCE LOW PRESSURE PISTON ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:	Personnel Required
Tools and Special Tools	Two
Tool Kit, General Mechanic's (WP 0058, Item 1)	References
Expander, Piston Ring (WP 0058, Item 11)	WP 0011
Pliers, Retaining Ring (WP 0058, Item 12)	WP 0013
	WP 0020
Materials/Parts	WP 0021
	WP 0029
Cleaning Compound, Solvent-Detergent	WP 0044
Cloth, Cleaning (WP 0059, Item 3) Lubricating Oil, Air Compressor (WP 0059, Item 7)	Equipment Condition
Tags, Danger (WP 0059, Item 10) Ring, Retaining	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).

REMOVAL - continued

- 7. Remove retaining ring (Figure 1, Item 7) and push piston pin (Figure 1, Item 8) out of piston (Figure 1, Item 9). Discard retaining ring.
- 8. Remove low pressure piston (Figure 1, Item 9).

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with lint free rag.
- 2. Inspect all parts for corrosion preventive compound and remove if present.
- 3. Insert new retaining ring (Figure 1, Item 11) into pin bore of piston (Figure 1, Item 9).
- 4. Lubricate piston pin (Figure 1, Item 8) and pin bore of piston (Figure 1, Item 9) with oil.
- 5. Position piston (Figure 1, Item 9) onto connecting rod (Figure 1, Item 1) and insert piston pin (Figure 1, Item 8) until firmly seated against retaining ring (Figure 1, Item 11).
- 6. Install new retaining ring (Figure 1, Item 7) into pin bore of piston (Figure 1, Item 9).

NOTE

Make sure that beveled edges of piston ring face direction shown in Figure 1. Install bottom piston ring first and next set of rings as shown in Figure 1.

- 7. Using a piston ring expander, install piston ring (Figure 1, Item 10) into bottom groove of piston (Figure 1, Item 9).
- 8. Using a piston ring expander, install piston ring (Figure 1, Item 2) into the third groove of piston (Figure 1, Item 9).
- 9. Install ring expander (Figure 1, Item 5) into second groove of piston (Figure 1, Item 9).
- 10. Using a piston ring expander, install piston ring (Figure 1, Item 6) into second groove of piston (Figure 1, Item 9).

INSTALLATION - continued

- 11. Install ring expander (Figure 1, Item 4) into top groove of piston (Figure 1, Item 9).
- 12. Using a piston ring expander, install piston ring (Figure 1, Item 3) into top groove of piston (Figure 1, Item 9).



Figure 1. Low Pressure Piston Assembly.

INSTALLATION - continued

13. Install conecting rod and low pressure piston assembly (WP 0029).

END OF TASK

FIELD MAINTENANCE LOW PRESSURE PISTON ASSEMBLY REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Expander, Piston Ring (WP 0058, Item 11) Pliers, Retaining Ring (WP 0058, Item 12)	References
	WP 0011
Materials/Parts	WP 0013
	WP 0020
Cleaning Compound, Solvent-Detergent	WP 0021
(WP 0059, Item 1)	WP 0029
Cloth, Cleaning (WP 0059, Item 3)	WP 0044
Tags, Danger (WP 0059, Item 10)	
	Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).

DISASSEMBLY - continued

- 7. Using a piston ring expander, remove piston rings (Figure 1, Items 1, 2, 5, and 7).
- 8. Remove ring expanders (Figure 1, Items 3 and 4).

END TASK

REPAIR

Repair of the low pressure piston is by replacement of worn or damaged parts and the following:

- a. Piston ring set (Figure 1, Items 2 and 5).
- b. Piston rings (Figure 1, Items 1 and 7).
- c. Ring expanders (Figure 1, Items 3 and 4).

END TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.

NOTE

Make sure that beveled edges of piston ring face direction shown in Figure 1. Install bottom piston ring first and next set of rings as shown in Figure 1.

- 3. Using a piston ring expander, install piston ring (Figure 1, Item 7) into bottom groove of piston (Figure 1, Item 6).
- 4. Using a piston ring expander, install piston ring (Figure 1, Item 1) into third groove of piston (Figure 1, Item 6).
- 5. Install ring expander (Figure 1, Item 4) into second groove of piston (Figure 1, Item 6).
- 6. Using a piston ring expander, install piston ring (Figure 1, Item 5) into second groove of piston (Figure 1, Item 6).

ASSEMBLY - continued

- 7. Install ring expander (Figure 1, Item 3) into top groove of piston (Figure 1, Item 6).
- 8. Using a piston ring expander, install piston ring (Figure 1, Item 2) into top groove of piston (Figure 1, Item 6).



Figure 1. Low Pressure Piston Assembly.

ASSEMBLY - continued

9. Install conecting rod and low pressure piston assembly (WP 0029).

END OF TASK

FIELD MAINTENANCE CONNECTING ROD LOW PRESSURE ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Pliers, Retaining Ring (WP 0058, Item 12)	References
Materials/Parts	WP 0011 WP 0013
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1)	WP 0020 WP 0021
Cloth, Cleaning (WP 0059, Item 3) Lubricating Oil, Air Compressor (WP 0059, Item 7) Tags Danger (WP 0059, Item 10)	WP 0029 WP 0044
Ring, Retaining	Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).

REMOVAL - continued

- 7. Remove retaining ring (Figure 1, Item 7) from piston (Figure 1, Item 4). Discard retaining ring.
- 8. Push piston pin (Figure 1, Item 6) out of piston (Figure 1, Item 4).
- 9. Pull piston (Figure 1, Item 4) off connecting rod (Figure 1, Item 1).





END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and wipe dry with lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Install bushing (Figure 1, Item 2) into connecting rod (Figure 1, Item 1).
- 4. Lubricate piston pin (Figure 1, Item 6) and piston bore (Figure 1, Item 5) with lubricating oil.
- 5. Insert connecting rod (Figure 1, Item 1) into piston (Figure 1, Item 4). Insert piston pin (Figure 1, Item 6) until firmly seated against retaining ring (Figure 1, Item 10).
- 6. Install new retaining ring (Figure 1, Item 7).
- 7. Install conecting rod and low pressure piston assembly (WP 0029).

END OF TASK

FIELD MAINTENANCE CONNECTING ROD LOW PRESSURE ASSEMBLY REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Pliers, Retaining Ring (WP 0058, Item 12)	References
Materials/Parts	WP 0011
	WP 0013
Cleaning Compound, Solvent-Detergent	WP 0020
(WP 0059, Item 1)	WP 0021
Cloth, Cleaning (WP 0059, Item 3)	WP 0029
Lubricating Oil, Air Compressor (WP 0059, Item 7)	WP 0044
Tags, Danger (WP 0059, Item 10) Locknut	Equipment Condition
Ring, Retaining Washer, Flat	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).

DISASSEMBLY - continued

- 7. Remove retaining ring (Figure 1, Item 7). Discard ring.
- 8. Push piston pin (Figure 1, Item 6) out of piston (Figure 1, Item 4).
- 9. Pull piston (Figure 1, Item 4) off connecting rod (Figure 1, Item 1).
- 10. Remove bushing (Figure 1, Item 2).

END OF TASK

REPAIR

Repair of the low pressure connecting rod assembly consists of replacement of any worn or damaged parts and the following:

- a. Retaining ring (Figure 1, Item 7).
- b. Bearing sleeve (Figure 1, Item 12).
- c. Sleeve bushing (Figure 1, Item 2).
- d. Machine bolt (Figure 1, Item 3).
- e. Washer (Figure1, Item 9).
- f. Nut (Figure 1, Item 8).

END OF TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and wipe dry with lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Install bushing (Figure 1, Item 2) into connecting rod (Figure 1. Item 1).
- 4. Lubricate piston pin (Figure 1, Item 6) and piston bore (Figure 1, Item 5) with oil.
- 5. Insert connecting rod (Figure 1, Item 1) into piston (Figure 1, Item 4). Insert piston pin (Figure 1, Item 6) until firmly seated against retaining ring (Figure 1, Item 10).
- 6. Install new retaining ring (Figure 1, Item 7).


Figure 1. Connecting Rod Low Pressure Assembly.

7. Install conecting rod and low pressure piston assembly (WP 0029).

END OF TASK

FIELD MAINTENANCE CONNECTING ROD AND HIGH PRESSURE PISTON ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Wrench, Torque (WP 0058, Item 9) Compressor, Piston Ring (WP 0058, Item 10)

Materials/Parts

Cleaning Compound, Solvent-Detergent (WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3) Grease, General Purpose (Lubriplate) (WP 0059, Item 6) Lubricating Oil, Air Compressor (WP 0059, Item 7) Tags, Danger (WP 0059, Item 10) Gasket Locknuts Lockwashers

Personnel Required

Two

References

WP 0011 WP 0013 WP 0019 WP 0020 WP 0021 WP 0044

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).

REMOVAL - continued

6. Remove screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), covers (Figure 1, Item 4) and gaskets (Figure 1, Item 3) from both sides of crankcase (Figure 1, Item 2). Discard gaskets and lockwashers.



Figure 1. Crankcase Inspection Cover.

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

NOTE

The high pressure piston is the smallest diameter piston in the compressor. This can be observed once the cylinder head is removed.

- 7. On one side of assembly, place marks (Figure 2, Item 9) on connecting rod (Figure 2, Item 1) and connecting rod cap (Figure 2, Item 8).
- 8. Remove locknuts (Figure 2, Item 6) and lockwashers (Figure 2, Item 7) from bolts (Figure 2, Item 2). Discard locknuts and lockwashers.

REMOVAL - continued

- Remove bolts (Figure 2, Item 2). If bolts appear to be stuck use a steel bar (flat stock). Slide through crankcase openings (Figure 2, Item 4) and under bolt. Rest edge of flat stock on bolt. Place strap wrench over end of crankshaft and briskly rotate crankshaft downward until bolts are loosened.
- 10. Remove connecting rod cap (Figure 2, Item 8) and bearing sleeve from crankshaft.
- 11. Check for a wear ridge at TDC of the cylinder (Figure 2, Item 3). If ridge cannot be removed, replace cylinder block (WP 0019).

CAUTION

Exercise care while removing connecting rod and piston from cylinder avoid contacting cylinder wall and crankshaft rod journals with connecting rod bolts. Failure to follow this caution may result in damage to equipment.

12. Carefully push connecting rod (Figure 2, Item 10) and high pressure piston assembly (Figure 2, Item 1) up and out of compressor cylinder.



Figure 2. Connecting Rod and High Pressure Piston Assembly.

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and wipe dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive compound and remove if present.
- 3. Insert bolts (Figure 3, Item 15) into connecting rod (Figure 3, Item 16).
- 4. Thoroughly lubricate all surfaces of connecting rod and high pressure piston assembly (Figure 3, Item 1) with oil.
- 5. Rotate crankshaft so that crankshaft journal (Figure 3, Item 9) is at BDC. Apply Lubriplate to journal.
- 6. Stagger piston ring end gaps 180 degrees from each other. Install piston ring compressor (Figure 3, Item 5) onto piston (Figure 3, Item 2).
- Align bolts (Figure 3, Item 15) to crankshaft journal (Figure 3, Item 9) and insert piston assembly into cylinder (Figure 3, Item 7). Stop when piston ring compressor (Figure 3, Item 5) is flush with top of cylinder (Figure 3, Item 7).
- 8. Observe location of bolts through crankcase openings. Make adjustments to ensure proper alignment.

NOTE

One inch clearance is required between crankshaft journal and connecting rod to allow for bearing installation.

9. Observe bolt location. Use tool handle (Figure 3, Item 3) to push piston slowly into place. Leave one inch clearance between crankshaft journal (Figure 3, Item 9) and connecting rod (Figure 3, Item 16).

CAUTION

The lubrication hole in the upper bearing sleeve must line up with the drilled oil passage in the connecting rod. Failure to follow this caution may result in equipment damage.

- Place upper bearing sleeve (Figure 3, Item 14) onto crankshaft journal (Figure 3, Item 9). Push piston assembly the remaining distance to seat connecting rod (Figure 3, Item 16) onto upper bearing sleeve (Figure 3, Item 14).
- 11. Place lower connecting rod bearing sleeve (Figure 3, Item 13) into connecting rod cap (Figure 3, Item 12).
- 12. Align marks on conneting rod (Figure 3, Item 16) and connnecting rod cap (Figure 3, Item 12). Install new lockwashers (Figure 3, Item 11) and new locknuts (Figure 3, Item 10). Torque to 40 ft-lbs.



Figure 3. Connecting Rod and High Pressure Piston Assembly.

INSTALLATION - continued

- 13. Rotate crankshaft to ensure it moves freely.
- 14. Inspect crankcase to ensure that it is clear of foreign objects, wipe with lint free rags.
- 15. Install new crankcase gasket (Figure 4, Item 3) and crankcase cover (Figure 4, Item 4). Secure with bolts (Figure 4, Item 5) and new lockwashers (Figure 4, Item 6).



Figure 4. Crankcase Access Cover.

- 16. Install cylinder head assembly (WP 0020).
- 17. Install intercooler (WP 0021).
- 18. Install compressor pulley (WP 0044).
- 19. Install air compressor (WP 0011).

END OF TASK

FIELD MAINTENANCE HIGH PRESSURE PISTON ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Expander, Piston Ring (WP 0058, Item 11) Pliers, Retaining Ring (WP 0058, Item 12)	References
	WP 0011
Materials/Parts	WP 0013
	WP 0020
Cleaning Compound, Solvent-Detergent	WP 0021
(WP 0059, Item 1)	WP 0034
Cloth, Cleaning (WP 0059, Item 3)	WP 0044
Lubricating Oil, Air Compressor	
(WP 0059, Item 7)	Equipment Condition
Tags, Danger (WP 0059, Item 10)	
Ring, Retaining	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and high pressure piston assembly (WP 0034).

REMOVAL - continued

- 7. Remove retaining rings (Figure 1, Item 6) and push piston pin (Figure 1, Item 7) out of piston (Figure 1, Item 8). Discard retaining ring.
- 8. Remove high pressure piston (Figure 1, Item 8).

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Insert new retaining ring (Figure 1, Item 9) into pin bore of piston (Figure 1, Item 8).
- 4. Lubricate piston pin (Figure 1, Item 7) and pin bore of piston (Figure 1, Item 8) with oil.
- 5. Position piston (Figure 1, Item 8) onto connecting rod (Figure 1, Item 1) and insert piston pin (Figure 1, Item 7) until firmly seated against retaining ring (Figure 1, Item 9).
- 6. Install new retaining ring (Figure 1, Item 6) into pin bore of piston (Figure 1, Item 8).

NOTE

Make sure that beveled edges of piston ring face direction shown in Figure 1. Install bottom piston ring first and the next set of rings as shown in Figure 1.

- 7. Install ring expander (Figure 1, Item 11) into bottom groove of piston (Figure 1, Item 8).
- 8. Using a piston ring expander, install piston rings (Figure 1, Item 10 and 12) into bottom groove of piston (Figure 1, Item 8).
- 9. Using a piston ring expander, install piston ring (Figure 1, Item 13) into third groove of piston (Figure 1, Item 8).
- 10. Install ring expander (Figure 1, Item 3) into second groove of piston (Figure 1, Item 8).
- 11. Using a piston ring expander, install piston ring (Figure 1, Item 2) into second groove of piston (Figure 1, Item 8).
- 12. Install ring expander (Figure 1, Item 4) into top groove of piston (Figure 1, Item 8).

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INSTALLATION - continued

13. Using a piston ring expander, install piston ring (Figure 1, Item 5) into top groove of piston (Figure 1, Item 8).



Figure 1. High Pressure Piston Assembly.

INSTALLATION - continued

14. Install connecting rod and high pressure piston assembly (WP 0034).

END OF TASK

FIELD MAINTENANCE HIGH PRESSURE PISTON ASSEMBLY REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Expander, Piston Ring (WP 0058, Item 11) Pliers, Retaining Ring (WP 0058, Item 12)	References
Materials/Parts	WP 0011 WP 0013 WP 0020
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1)	WP 0021 WP 0034
Tags, Danger (WP 0059, Item 3)	Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and high pressure piston assembly (WP 0034).

DISASSEMBLY continued

- 7. Using a piston ring expander, remove piston rings (Figure 1, Items 1, 4, 6, 8, and 9).
- 8. Remove ring expanders (Figure 1, Items 2, 3, and 7).

END TASK

REPAIR

Repair of the high pressure piston is by replacement of worn or damaged parts and the following:

- a. Ring expander (Figure 1, Item 7).
- b. Ring expander set (Figure 1, Items 2 and 3).
- c. Piston ring set (Figure 1, Items 6 and 8).
- d. Piston ring (Figure 1, Item 4).
- e. Piston ring (Figure 1, Item 1).
- d. Piston ring (Figure 1, Item 9).

END TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.

NOTE

Make sure that beveled edges of piston ring face direction shown in Figure 1. Install bottom piston first and next set of rings as shown in Figure 1.

- 3. Install ring expander (Figure 1, Item 7) into bottom groove of piston (Figure 1, Item 5).
- 4. Using a piston ring expander install piston rings (Figure 1, Item 6 and 8) into bottom groove of piston (Figure 1, Item 5).
- 5. Using a piston ring expander, install piston ring (Figure 1, Item 9) into third groove of piston (Figure 1, Item 5).
- 6. Install ring expander (Figure 1, Item 2) into second groove of piston (Figure 1, Item 5).

ASSEMBLY - continued

- 7. Using a piston ring expander, install piston ring (Figure 1, Item 1) into second groove of piston (Figure 1, Item 5).
- 8. Install ring expander (Figure 1, Item 3) into top groove of piston (Figure 1, Item 5).
- 9. Using a piston ring expander, install piston ring (Figure 1, Item 4) into top groove of piston (Figure 1, Item 5).



Figure 1. High Pressure Piston Assembly.

ASSEMBLY - continued

10. Install connecting rod and high pressure piston assembly (WP 0034).

END OF TASK

FIELD MAINTENANCE CONNECTING ROD HIGH PRESSURE ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Pliers, Retaining Ring (WP 0058, Item 12)	References
Materials/Parts	WP 0011
	WP 0013
Cloth, Cleaning (WP 0059, Item 3)	WP 0020
Cleaning Compound, Solvent-Detergent	WP 0021
(WP 0059, Item 1)	WP 0034
Lubricating Oil, Air Compressor (WP 0059, Item 7) Tags, Danger (WP 0059, Item 10)	WP 0044
Ring, Retaining	Equipment Condition
	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and high pressure piston assembly (WP 0034).

REMOVAL - continued

- 7. Remove retaining ring (Figure 1, Item 7) from piston (Figure 1, Item 4).
- 8. Push piston pin (Figure 1, Item 6) out of piston (Figure 1, Item 4).
- 9. Pull piston (Figure 1, Item 4) off connecting rod (Figure 1, Item 1).



Figure 1. Connecting Rod High Pressure Assembly.

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Install bushing (Figure 1, Item 2) into connecting rod (Figure 1, Item 1).
- 4. Lubricate piston pin (Figure 1, Item 6) and piston bore (Figure 1, Item 5) with oil.
- 5. Insert connecting rod (Figure 1, Item 1) into piston (Figure 1, Item 4). Insert piston pin (Figure 1, Item 6) until firmly seated against retaining ring (Figure 1, Item 10).
- 6. Install new retaining ring (Figure 1, Item 7).
- 7. Install connecting rod and high pressure piston assembly (WP 0034).

END OF TASK

FIELD MAINTENANCE CONNECTING ROD HIGH PRESSURE ASSEMBLY REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Pliers, Retaining Ring (WP 0058, Item 12)	References
Materials/Parts	WP 0011
	WP 0013
Cloth, Cleaning (WP 0059, Item 3)	WP 0020
Cleaning Compound, Solvent-Detergent	WP 0021
(WP 0059, Item 1)	WP 0034
Lubricating Oil, Air Compressor (WP 0059, Item 7) Tags, Danger (WP 0059, Item 10)	WP 0044
Locknut Ring, Retaining	Equipment Condition
washer, Flat	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and high pressure piston assembly (WP 0034).

DISASSEMBLY - continued

- 7. Remove retaining ring (Figure 1, Item 7). Discard ring.
- 8. Push piston pin (Figure 1, Item 6) out of piston (Figure 1, Item 4).
- 9. Pull piston (Figure 1, Item 4) off connecting rod (Figure 1, Item 1).
- 10. Remove bushing (Figure 1, Item 2).



Figure 1. Connecting Rod High Pressure Assembly.

END OF TASK

REPAIR

- 1. Repair of the high pressure connecting rod assembly consists of replacement of any worn or damaged parts and the following:
 - a. Ring, retaining (Figure 1, Item 7).
 - b. Bearing sleeve (Figure 1, Item 12).
 - c. Bushing, sleeve (Figure 1, Item 2).
 - d. Bolt machine (Figure1, Item 3).
 - e. Washer (Figure1, Item 9).
 - f. Nut (Figure 1, Item 8).

END OF TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Install bushing (Figure 1, Item 2) into connecting rod (Figure 1, Item 1).
- 4. Lubricate piston pin (Figure 1, Item 6) and piston bore (Figure 1, Item 5) with oil.
- 5. Insert connecting rod (Figure 1, Item 1) into piston (Figure 1, Item 4). Insert piston pin (Figure 1, Item 6) until firmly seated against retaining ring (Figure 1, Item 10).
- 6. Install new retaining ring (Figure 1, Item 7).
- 7. Install connecting rod and high pressure piston assembly (WP 0034).

END OF TASK

FIELD MAINTENANCE BEARING CARRIER ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Wrench, Torque (WP 0058, Item 9)

Materials/Parts

Cloth, Cleaning (WP 0059, Item 3) Tag, Danger (WP 0059, Item 10) Gasket, Bearing Carrier Gasket, Oil Pick Up Tube Lockwasher

Personnel Required

Two

References

WP 0017 WP 0041 TM 55-1905-223-10 LO 55-1905-223-12

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502) Crank oil drained (LO 55-1905-223-12)

REMOVAL

- 1. Remove oil pressure gauge (WP 0041).
- 2. Remove hydraulic unloader assembly (WP 0017).

REMOVAL - continued

- 3. Remove filter element (Figure 1, Item 9).
- 4. Scribe bearing carrier (Figure 1, Item 1) to crank case to reference location for reassembly.
- 5. Remove bolts (Figure 1, Item 8) from bearing carrier (Figure 1, Item 1).

NOTE

Bearing sleeve will remain in bearing carrier group.

- 6. Pull bearing carrier (Figure 1, Item 1) out and then upward to clear the oil pickup tube (Figure 1, Item 6). Remove bearing carrier gasket (Figure 1, Item 2). Discard gasket.
- 7. Remove screws (Figure 1, Item 5) and lockwashers (Figure 1, Item 4) to remove oil pickup tube (Figure 1, Item 6) and gasket (Figure 1, Item 7). Discard lockwashers and gasket.





END OF TASK

INSTALLATION

- 1. Ensure bearing sleeve (Figure 1, Item 3) is set in bearing carrier (Figure 1, Item 1).
- 2. Install new gasket (Figure 1, Item 7), oil pickup tube (Figure 1, Item 6) on bearing carrier (Figure 1, Item 1) with new lockwashers (Figure 1, Item 4) and screws (Figure 1, Item 5). Torque to 25 ft-lbs.
- 3. Slide new bearing carrier gasket (Figure 1, Item 2) over oil pickup tube (Figure 1, Item 6).
- 4. Insert oil pickup tube (Figure 1, Item 6) into crankcase and fit bearing carrier (Figure 1, Item 1) on pump drive.

CAUTION

Ensure oil holes on bearing carrier gasket are aligned with holes on bearing carrier. Failure to follow this caution may result in damage to equipment.

NOTE

Use scribe marks on crankcase and bearing carrier to aid in assembly.

- 5. Align bearing carrier gasket (Figure 1, Item 2) and install bolts (Figure 1, Item 8). Torque to 15 ft-lbs.
- 6. Install oil pressure gauge (WP 0041).
- 7. Install hydraulic unloader assembly (WP 0017).
- 8. Install filter element (Figure 1, Item 9). Fill crankcase with oil (LO 55-1905-223-12).
- 9. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK

FIELD MAINTENANCE BEARING CARRIER ASSEMBLY REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Wrench, Torque (WP 0058, Item 9)

Materials/Parts

Cleaning Compound, Solvent-Detergent (WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3) Lubricating Oil, Air Compressor (WP 0059, Item 7) Tag, Danger (WP 0059, Item 10) O-ring, Bearing Carrier O-ring, Shouldered Shaft O-ring Ring, Retaining Spring, Helical

Personnel Required

Two

References

WP 0017 WP 0039 WP 0041

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove oil pressure gauge (WP 0041).
- 2. Remove hydraulic unloader assembly (WP 0017).
- 3. Remove bearing carrier assembly (WP 0039).
- 4. Scribe oil pump housing (Figure 1, Item 13) and bearing carrier (Figure 1, Item 6) to reference location for reassembly.
- 5. Remove bolts (Figure 1, Item 14) from oil pump housing (Figure 1, Item 13).
- 6. Pull oil pump housing (Figure 1, Item 13) off bearing carrier (Figure 1, Item 6).
- 7. Remove retaining ring (Figure 1, Item 12) and pull gear rotor set (Figure 1, Item 11) from shouldered shaft (Figure 1, Item 9). Discard retaining ring.
- 8. Remove wear ring (Figure 1, Item 10) and shouldered shaft (Figure 1, Item 9) from bearing carrier (Figure 1, Item 6).
- 9. Remove O-ring (Figure 1, Item 8) from shouldered shaft (Figure 1, Item 9). Discard O-ring.
- 10. Remove O-ring (Figure 1, Item 7) from bearing carrier (Figure 1, Item 6). Discard O-ring .

DISASSEMBLY - continued

NOTE

Count and record the number of turns it takes to remove screw. The same number of turns must be used when installing the screw.

- 11. Remove screw (Figure 1, Item 1) from bearing carrier (Figure 1, Item 6).
- 12. Remove nut (Figure 1, Item 3) and O-ring (Figure 1, Item 2) from screw (Figure, Item 1). Discard O-ring.
- 13. Remove helical spring (Figure 1, Item 4) and ball bearing (Figure 1, Item 5) from bearing carrier (Figure 1, Item 6). Discard spring.

END OF TASK

REPAIR

Repair of the bearing carrier is by replacement of worn and damaged parts and the parts contained in oil pump repair kit with the following:

- a. Ball bearing (Figure 1, Item 5).
- b. Spring helical (Figure 1, Item 4).

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean all parts with cleaning solvent and dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Install ball bearing (Figure 1, Item 5), and new helical spring (Figure 1, Item 4) into bearing carrier (Figure 1, Item 6).
- 4. Install new O-ring (Figure 1, Item 2) onto screw (Figure 1, Item 1).
- 5. Screw nut (Figure 1, Item 3) onto screw (Figure 1, Item 1).

NOTE

Install screw with the same number of turns noted during removal.

6. Install screw (Figure 1, Item 1) into bearing carrier (Figure 1, Item 6).

ASSEMBLY - continued

- 7. Hold screw (Figure 1, Item 1) in place and tighten nut (Figure 1, Item 3).
- 8. Insert new O-ring (Figure 1, Item 7) into bearing carrier (Figure 1, Item 6).
- 9. Install new O-ring (Figure 1, Item 8) on shouldered shaft (Figure 1, Item 9).
- 10. Install wear ring (Figure 1, Item 10) onto shouldered shaft (Figure 1, Item 9).
- 11. Insert shouldered shaft (Figure 1, Item 9) into bearing carrier (Figure 1, Item 6).
- 12. Lubricate gear rotor set (Figure 1, Item 11) with oil and install onto shouldered shaft (Figure 1, Item 9).
- 13. Install new retaining ring (Figure 1, Item 12) on shouldered shaft (Figure 1, Item 9).
- 14. Align scribe marks on oil pump housing (Figure 1, Item 13) and bearing carrier (Figure 1, Item 6). Install bolts and torque to 30ft-lbs.



Figure 1. Bearing Carrier Assembly.

ASSEMBLY - continued

15. Install bearing carrier assembly (WP 0039).

END OF TASK

FIELD MAINTENANCE OIL PRESSURE GAUGE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1)

Materials/Parts

Tag, Danger (WP 0059, Item 10) Tape, Antiseizing (WP 0059, Item 12)

Personnel Required

Two

References

TM 55-1905-223-10

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

Remove pressure gauge (Figure 1, Item 1) from oil pump housing (Figure 1, Item 2).

END OF TASK

INSTALLATION

- 1. Clean pipe threads of gauge port on oil pump housing (Figure 1, Item 2).
- 2. Wrap antiseizing tape onto new pressure gauge threads.
- 3. Install pressure gauge (Figure 1, Item 1) onto oil pump housing (Figure 1, Item 2).
- 4. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

INSTALLATION - continued



Figure 1. Oil Pressure Gauge.

END OF TASK

FIELD MAINTENANCE **CRANKSHAFT GROUP REPLACEMENT REMOVAL, INSTALLATION**

INITIAL SETUP:

Tools and Special Tools Personnel Required Tool Kit, General Mechanic's Two (WP 0058, Item 1) References Materials/Parts WP 0011 Cleaning Compound, Solvent-Detergent WP 0013 (WP 0059, Item 1) WP 0020 Cloth, Cleaning (WP 0059, Item 3) WP 0021 Grease, Ball and Roller Bearing (WP 0059, Item 5) WP 0029 Tag, Danger (WP 0059, Item 10) WP 0034 WP 0039 WP 0044 WP 0045

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod low pressure piston assembly (WP 0029).
- 7. Remove connecting rod and high pressure assembly (WP 0034).
- 8. Remove bearing carrier assembly (WP 0039).

REMOVAL - continued

- 9. Remove screws (Figure 1, Item 1) and bearing plate (Figure 1, Item 11).
- 10. Remove shim (Figure 1, Item 10) spacer plate (Figure 1, Item 9) and shims (Figure 1, Items 7 and 8).
- 11. Remove bearing cup (Figure 1, Item 6).

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

12. Remove crankshaft (Figure 1, Item 2) from crankcase (Figure 1, Item 5).



Figure 1. Crankshaft Group.

END OF TASK
INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean roller bearings with cleaning solvent and dry with a lint free rag.
- 2. Inspect all parts for corrosion preventive compounds and remove if present.
- 3. Apply a thin coat of grease and press bearings (Figure 1, Items 3 and 4) on crankshaft (Figure 1, Item 2).

WARNING



Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow this warning may result in injury or death to personnel.

- 4. Insert crankshaft (Figure1, Item 2) into crankcase (Figure1, Item 5).
- 5. Install bearing cup (Figure 1, Item 6) until properly seated onto bearing (Figure 1, Item 3).
- 6. Install shims (Figure 1, Items 7 and 8) spacer plate (Figure 1, Item 9) and shim (Figure 1, Item 10).
- 7. Install bearing plate (Figure 1, Item 11) and secure with screws (Figure 1, Item 1). Handtight.
- 8. Install bearing carrier assembly (WP 0039).
- 9. Adjust crankcase assembly (WP 0045).
- 10. Install connecting rod and high pressure piston assembly (WP 0034).
- 11. Install connecting rod and low pressure piston assembly (WP 0029).

INSTALLATION- continued

- 12. Install cylinder head assembly (WP 0020).
- 13. Install intercooler (WP 0021).
- 14. Install air compressor (WP 0011).
- 15. Install compressor pulley (WP 0044).

END OF TASK

FIELD MAINTENANCE CRANKSHAFT GROUP REPAIR DISASSEMBLY, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Puller, Mechanical (WP 0058, Item 8)	References
Materials/Parts	WP 0011
	WP 0013
Cleaning Compound, Solvent-Detergent	WP 0020
(WP 0059, Item 1)	WP 0021
Cloth, Cleaning (WP 0059, Item 3)	WP 0029
Grease, Ball and Roller Bearing (WP 0059, Item 5)	WP 0034
Tag, Danger (WP 0059, Item 10)	WP 0039
	WP 0042
	WP 0044

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).
- 7. Remove connecting rod and high pressure assembly (WP 0034).
- 8. Remove bearing carrier assembly (WP 0039).
- 9. Remove crankshaft group (WP 0042).

DISASSEMBLY - continued

- 10. Using mechanical puller, remove bearing (Figure 1, Item 1) from crankshaft (Figure 1, Item 2).
- 11. Using mechanical puller, remove bearing (Figure 1, Item 3) from crankshaft (Figure 1, Item 2).





END OF TASK

ASSEMBLY

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

- 1. Clean roller bearings with cleaning solvent and dry with a lint free rag.
- 2. Inspect bearings for corrosion preventive compound and remove if present.

ASSEMBLY - continued

- 3. Apply a thin coat of grease and press new bearings (Figure 1, Items 1 and 3) onto crankshaft (Figure 1, Item 2).
- 4. Install crankshaft group (WP 0042).

END OF TASK

FIELD MAINTENANCE COMPRESSOR PULLEY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Two
Wrench, Torque (WP 0058, Item 9) Puller, Mechanical (WP 0058, Item 8)	References
Materials/Parts	WP 0013
Cloth, Cleaning (WP 0059, Item 3) Tag, Danger (WP 0059, Item 10)	Equipment Condition
	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Scribe crankshaft (Figure 1, Item 3) to indicate location of pulley for installation.
- 3. Remove bolts (Figure 1, Item 1) and nuts (Figure 1, Item 5) from pulley (Figure 1, Item 4).

NOTE

It may be necessary to wedge open the spilt in the pulley to facilitate removal.

- 4. Using mechanical puller, remove pulley (Figure 1, Item 4) from crankshaft (Figure 1, Item 3).
- 5. Remove machine key (Figure 1, Item 2) from crankshaft (Figure 1, Item 3).

END OF TASK

INSTALLATION

- 1. Clean and inspect machine key (Figure 1, Item 2) and keyway for wear.
- 2. Install machine key (Figure 1, Item 2) into keyway on crankshaft (Figure 1, Item 3).
- 3. Align keyway on pulley (Figure 1, Item 4) to machine key (Figure 1, Item 2). Slide pulley onto crankshaft (Figure 1, Item 3) up to scribe mark.
- 4. Install bolts (Figure 1, Item 1) and nuts (Figure 1, Item 5) onto pulley (Figure 1, Item 4).
- 5. Tighten hex head bolts and nuts equally maintaining equal space on the pulley hub. Torque to 90 ft-lbs.

INSTALLATION - continued



Figure 1. Compressor Pulley.

6. Install V-belts (WP 0013).

END OF TASK

FIELD MAINTENANCE CRANKCASE ASSEMBLY ADJUSTMENT REMOVAL, ADJUST

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Indicator, Dial (WP 0058, Item 13)

Materials/Parts

Shim (0.002) Shim (0.005) Shim (0.007)

Personnel Required

Two

References

WP 0013 WP 0042 WP 0044

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove compressor pulley (WP 0044).

END OF TASK

ADJUST

- 1. Firmly seat crankshaft into bearing carrier by rotating crankshaft and tapping with a plastic faced hammer.
- 2. Tighten screws (Figure 1, Item 4) on bearign plate (Figure 1, Item 3) in a cross match pattern. Torque to 30 ftlbs.

NOTE

Repeat steps 3 through 7 to obtain the proper clearance.

- 3. Attach dial indicator (Figure 1, Item 1) to crankcase as shown in Figure 1.
- 4. Push in on crankshaft (Figure 1, Item 2) and pull out to check for needle deflection on dial indicator (Figure 1, Item 1).
- 5. Push in on crankshaft (Figure 1, Item 2) and hold. Set dial indicator to zero.



Figure 1. Crankcase Assembly Adjustment.

- 6. Pull crankshaft outward and record reading. End play reading should be 0.0015 0.003.
- If dial indicator reading is not between 0.0015 0.003, add or remove shims to obtain proper clearance (WP 0042).
- 8. Install compressor pulley (WP 0044).

END OF TASK

FIELD MAINTENANCE CRANKCASE ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	References
Tool Kit, General Mechanic's (WP 0058, Item 1)	WP 0011 WP 0013
Materials/Parts	WP 0019 WP 0020 WP 0021
Cleaning Compound, Solvent-Detergent (WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3)	WP 0029 WP 0034 WP 0039 WP 0042 WP 0044

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

- 1. Remove V-belts (WP 0013).
- 2. Remove air compressor (WP 0011).
- 3. Remove compressor pulley (WP 0044).
- 4. Remove intercooler (WP 0021).
- 5. Remove cylinder head assembly (WP 0020).
- 6. Remove connecting rod and low pressure piston assembly (WP 0029).
- 7. Remove connecting rod and high pressure assembly (WP 0034).
- 8. Remove cylinder block (WP 0019).
- 9. Remove bearing carrier assembly (WP 0039).
- 10. Remove crankshaft group (WP 0042).

REMOVAL - continued

- 11. Remove pin (Figure 1, Item 4).
- 12. Remove ball bearing (Figure 1, Item 1).
- 13. Remove plug (Figure 1, Item 3) from crankcase (Figure 1, Item 2).

END OF TASK

INSTALLATION

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds.

Air Compressor assembly casing edges are machined and may contain sharp edges or burrs. Wear protective gloves to eliminate the risk of injury to personnel. Failure to follow these warnings may result in injury or death to personnel.

1. Clean new crankcase with cleaning solvent and dry with lint free rags.

NOTE

Before installation, inspect new crankcase for defects. Ensure all machined and threaded holes are clear and located in same location as the crankcase being replaced.

- 2. Install ball bearing (Figure 1, Item 1) into crankcase (Figure 1, Item 2).
- 3. Install pin (Figure 1, Item 4) into crankcase (Figure 1, Item 2).
- 4. Wrap antiseizing tape onto plug (Figure 1, Item 3). Install plug.

INSTALLATION - continued



Figure 1. Crankcase Assembly.

- 5. Install cylinder block (WP 0019).
- 6. Install crankshaft group (WP 0042).

END OF TASK

FIELD MAINTENANCE CRANKCASE ASSEMBLY REPAIR DISASSEMBLY, ASSEMBLY

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1)

Materials/Parts

Cleaning Compound, Solvent-Detergent (WP 0059, Item 1) Cloth, Cleaning (WP 0059, Item 3) Lubricating Oil, Air Compressor (WP 0059, Item 7) Tag, Danger (WP 0059, Item 10) Gasket (2) Lockwashers

Personnel Required

Two

References

TM 55-1905-223-10

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

DISASSEMBLY

- 1. Crankcase (Figure 1, Item 4):
 - a. Remove screws (Figure 1, Item 8) and lockwashers (Figure 1, Item 7). Discard lockwashers.
 - b. Remove cover (Figure 1, Item 6 or 9) and gasket (Figure 1, Item 5). Discard gasket.
- 2. Gauge Rod (Figure 1, Item 2):
 - a. Remove gauge rod (Figure 1, Item 2) from crankcase (Figure 1, Item 4).
 - b. Remove O-rings (Figure 1, Item 3) from gauge rod cap (Figure 1, Item 1).

END OF TASK

WARNING



Cleaning solvent-detergent compounds can cause irritation and/or damage to eyes. Use protective goggles when handling cleaning compounds. Failure to follow this warning may result in injury or death to personnel.

ASSEMBLY

- 1. Crankcase (Figure 1, Item 4):
 - a. Clean gasket surface with cleaning solvent and dry with lint free rag.
 - b. Inspect crankcase (Figure 1, Item 4) to ensure it is clear of foreign objects.
 - c. Install new gasket (Figure 1, Item 5) and cover (Figure 1, Item 6 or 9). Secure with new lockwashers (Figure 1, Item 7) and screws (Figure 1, Item 8) Torque to 12 ft-lbs.
- 2. Gauge Rod (Figure 1, Item 2):
 - a. Apply a thin coat of oil to O-rings (Figure 1, Item 3).

NOTE

Care must be taken not to twist the O-ring.

- b. Slide new O-rings (Figure 1, Item 3) into grooves on gauge rod cap (Figure 1, Item 1).
- c. Install gauge rod (Figure 1, Item 2).
- 3. Clear tags, start system and verify proper operation (TM 55-1905-223-10).



Figure 1. Crankcase Assembly.

END OF TASK

FIELD MAINTENANCE AIR COMPRESSOR DEHYDRATION PIPING GROUP REPAIR REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Wrench, Pipe (WP 0058, Item 14)

Materials/Parts

Tape, Antiseizing (WP 0059, Item 12) Tag, Danger (WP 0059, Item 10) References

TM 55-1905-223-10 WP 0049 WP 0050 WP 0052 WP 0053

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

CAUTION

Do not use any oil or petroleum based products on any component or assembly of the water separator. Doing so will cause premature failure of the membrane dryers. Failure to follow this caution may result in damage to equipment.

REPAIR

Repair of the air compressor dehydration piping group is by replacement or repair of the following:

- a. Aftercooler (Figure 1, Item 3) (WP 0049).
- b. Prefilters (Figure 1, Items 4 and 5) (WP 0050).
- c. Separator Prefilter Solenoid Valves (Figure 1, Items 6 and 16) (WP 0052).
- d. Air Filter Drain Valve Controller (Figure1, Item 7) (WP 0053).

- e. Thermometer (Figure 1, Item 1).
 - (1) Close gate valves (Figure 1, Items 12 and 13) to isolate dehydration piping group.

WARNING



Compressed air systems are under high pressure. Bleed compressed air from system prior to performing any maintenance. Do not direct compressed air against skin or clothing. Particles blown by compressed air are hazardous to eyes and escaping air volume can damage hearing. Wear Personal Protective Equipment (PPE) including hearing and protective goggles. Failure to follow this warning may result in injury or death to personnel.

- (2) Open drain valve (Figure 1, Item 10) to de-pressurize dehydration piping group.
- (3) Close gate valves (Figure 1, Item 2) to isolate thermometer (Figure 1, Item 1).
- (4) Remove thermometer (Figure 1, Item 1) from piping group.
- (5) Clean pipe nipple and threads of all antiseizing tape.
- (6) Wrap antiseizing tape onto threads of thermometer (Figure 1, Item 1).
- (7) Install thermometer (Figure 1, Item 1) into piping group.
- (8) Close drain valve (Figure 1, Item 10).
- (9) Open gate valves (Figure 1, Item 2).
- (10) Open gate valve (Figure 1, Item 12).
- (11) Clear tags, start system and verify proper operation (TM 55-1905-223-10).



Figure 1. Air Compressor Dehydration Piping Group.

f. Membrane dryers (Figure 1, Item 9).

WARNING



Compressed air systems are under high pressure. Bleed compressed air from system prior to performing any maintenance. Do not direct compressed air against skin or clothing. Particles blown by compressed air are hazardous to eyes and escaping air volume can damage hearing. Wear Personal Protective Equipment (PPE) including hearing and protective goggles. Failure to follow this warning may result in injury or death to personnel.

- (1) Close gate valves (Figure 1, Items 12 and 13) to isolate the dehydration piping group.
- (2) Open drain valve (Figure 1, Item 10) to de-pressurize dehydration piping group.
- (3) Remove mounting hardware (Figure 1, Item 11). Retain hardware for installation.

CAUTION

Care must be taken not to place any strain on piping group. Failure to follow this caution may result in damage to equipment.

- (4) Using two wrenches, loosen and remove both union couplings (Figure 1, Items 8 and 14) and membrane dryers (Figure 1, Item 9).
- (5) Secure membrane dryer (Figure 1, Item 9) in bench vise and remove pipe adapters (Figure 1, Item 15).
- (6) Remove membrane dryer (Figure 1, Item 9) from bench vise. Gently secure new membrane dryer in bench vise.
- (7) Clean pipe threads of all antiseizing tape.
- (8) Wrap antiseizing tape onto threads of pipe adapters (Figure 1, Item 15) and thread into new membrane dryer (Figure 1, Item 9).
- (9) Remove new membrane dryer from bench vise.
- (10) Install membrane dryer (Figure 1, Item 9). Secure with union couplings (Figure 1, Items 8 and 14).

- (11) Install mounting hardware (Figure 1, Item 11).
- (12) Close drain valve (Figure 1, Item 10).
- (13) Open gate valve (Figure 1, Item 12).
- (14) Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK

FIELD MAINTENANCE AFTERCOOLER REPAIR REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0058, Item 1)	Тwo
Tool Kit, electrical repair (WP 0058, Item 6)	References
Materials/Parts	TM 55-1905-223-10
Tag, Danger (WP 0059, Item 10) Tag, Blank (WP 0059, Item 11) Lockwashers	Equipment Condition
	Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

REMOVAL

CAUTION

Do not use any oil or petroleum based products on any component or assembly of the aftercooler. Doing so will cause premature failure of the membrane dryers.

Care must be taken not to place any strain on piping group. Failure to do so will result in damage to piping group. Failure to follow these cautions may result in damage to equipment.

1. Using two wrenches, loosen and remove two unions (Figure 1, Item 1) from piping group.

WARNING



Always ensure affected circuits have been secured, locked out and tagged out. Performing maintenance with circuits energized presents a shock hazard and may result in death or injury to personnel or equipment damage. Failure to follow this warning may result in injury or death to personnel.

- 2. Remove screws from conduit box (Figure 1, Item 2) and remove cover.
- 3. Label and remove electrical wires.



Figure 1. Aftercooler.

REMOVAL - continued

- 4. Remove aftercooler mounting bolts (Figure 1, Item 7), washers (Figure 1, Item 6), lockwashers (Figure 1, Item 4) and nuts (Figure 1, Items 5). Discard lockwashers.
- 5. Remove aftercooler (Figure 1, Item 3) and move to a clean, level work station.

END OF TASK

DISASSEMBLY

- 1. Remove bolts (Figure 2, Item 3) and washers (Figure 2, Item 4) from aftercooler core (Figure 2, Item 8).
- 2. Remove motor (Figure 2, Item 1) with fan (Figure 2, Item 5) and fan guard (Figure 2, Item 2) still attached to motor (Figure 2, Item 1).



Figure 2. Motor, Fan and Fan Guard.

- 3. Mark facing of fan (Figure 2, Item 5) for proper installation. Loosen set screw (Figure 2, Item 7) from fan (Figure 2, Item 5) and remove fan from motor shaft (Figure 2, Item 6).
- 4. Remove bolts (Figure 2, Item 10) and washers (Figure 2, Item 9). Remove fan guard (Figure 2, Item 2) from motor (Figure 2, Item 1).

END OF TASK

REPAIR

Repair of aftercooler is by replacement of motor.

END OF TASK

ASSEMBLY

1. Install fan guard (Figure 3, Item 2) onto motor (Figure 3, Item 1) with bolts (Figure 3, Item 4) and washers (Figure 3, Item 3).



Figure 3. Fan Guard and Fan.

- 2. Install fan (Figure 3, Item 6) onto motor shaft (Figure 3, Item 5) as identified by marking made during disassembly. Secure with set screw (Figure 3, Item 7).
- 3. Spin fan by hand to ensure it moves freely. Adjust fan on motor shaft if fan comes into contact with fan guard.
- 4. Install motor (Figure 4, Item 1) with onto aftercooler core (Figure 4, Item 6). Secure with bolts (Figure 4, Item 3) and washers (Figure 4, Item 4).



Figure 4. Motor.

END OF TASK

INSTALLATION

- 1. Install aftercooler (Figure 5, Item 1). Secure with mounting bolts (Figure 5, Item 5), washers (Figure 5, Item 4), new lockwashers (Figure 5, Item 2) and nuts (Figure 5, Item 3).
- 2. Connect electrical wires as labeled and remove tags.
- 3. Install cover onto the conduit box (Figure 5, Item 7). Secure with screws.

CAUTION

Care must be taken not to place any strain on piping group. Failure to do so will result in damage to piping group. Failure to follow this caution may result in damage to equipment.

- 4. Connect two unions (Figure 5, Item 6) to piping group. Tighten using two wrenches.
- 5. Clear tags, start system and verify proper operation (TM 55-1905-223-10).



Figure 5. Aftercooler.

END OF TASK

FIELD MAINTENANCE PREFILTERS REPAIR DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

References
TM 55-1905-223-10
Equipment Condition
Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

CAUTION

Do not use any oil or petroleum based products on any component or assembly of the prefilters. Doing so will cause premature failure of membrane dryers. Failure to follow this caution may result in damage to equipment.

NOTE

Repair procedures for both the prefilters are the same.

DISASSEMBLY

CAUTION

Care must be taken not to place any strain on piping group. Failure to do so will result in damage to piping group. Failure to follow this caution may result in damage to equipment.

- 1. Using two wrenches, disconnect union (Figure 1, Item 1) from pipe adapter (Figure 1, Item 2).
- 2. Using two wrenches, loosen union (Figure 1, Item 3) on gate valve (Figure 1, Item 4) enough to allow free movement of pipe. Swing piping (Figure 1, Item 5) out and away from prefilter (Figure 1 Item 6).



Figure 1. Disconnection of Piping.

CAUTION

The two prefilters are identical except for the micron rating of the element. One contains a 1.0 micron element (Figure 2, Item 2), and the other prefilter contains a 0.01 micron element (Figure 2, Item 1). Care must be taken to ensure the correct element is installed in the corresponding prefilter during repair. Failure to do so will significantly shorten the life of the element.

- 3. Unscrew lower housing (Figure 2, Item 3) from upper housing (Figure 2, Item 4) and remove.
- 4. Remove O-ring (Figure 3, Item 2).
- 5. Remove element (Figure 3, Item 3) from lower housing (Figure 3, Item 1).

DISASSEMBLY - continued







Figure 3. Disassembly of Lower Housing.

6. Use a clean, lint-free rag to wipe out the lower housing.

END OF TASK

REPAIR

Repair of prefilter is by replacement of housing O-ring and element.

END OF TASK

0050-3

ASSEMBLY

- 1. Insert element (Figure 4, Item 1) into lower housing (Figure 4, Item 4) and push element firmly into position.
- 2. Install O-ring (Figure 4, Item 3) into upper housing (Figure 4, Item 2).



Figure 4. Repair of Lower Housing.



Figure 5. Installation of Lower Housing.

CAUTION

The two prefilters are identical except for the micron rating of the element. One contains a 1.0 micron element (Figure 5, Item 2), and the other prefilter contains a 0.01 micron element (Figure 5, Item 1). Care must be taken to ensure the correct element is installed in the corresponding prefilter during repair. Failure to do so will significantly shorten the life of the element.

3. Screw lower housing (Figure 5, Item 3) into upper housing (Figure 5, Item 4). The lower housing (Figure 5, Item 3) is installed correctly when raised arrow symbol and raised lock symbol (Figure 5, Item 5) are aligned.

CAUTION

Care must be taken not to place any strain on piping group. Failure to follow this caution may result in damage to equipment.

- 4. Swing piping (Figure 6, Item 1) back into position, aligning union (Figure 6, Item 5) to pipe adapter (Figure 6, Item 2). Using two wrenches, tighten union (Figure 6, Item 5) to pipe adapter (Figure 6, Item 2).
- 5. Using two wrenches, tighten union (Figure 6, Item 4) onto gate valve (Figure 6, Item 3).



Figure 6. Connection of Piping.

6. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK
FIELD MAINTENANCE SEPARATOR AND PREFILTER SOLENOID VALVES TEST AND ADJUSTMENT TEST, ADJUST

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1)

NOTE

Test procedures for both dual solenoid valve and single solenoid valve are the same.

TEST

1. Secure power on air filter automatic valve controller (Figure 1, Item 1) by pushing switch (Figure 1, Item 2).



Figure 1. Air Filter Automatic Valve Controller.

TEST - continued

- 2. Set ON TIME control knob (Figure 2, Item 4) on solenoid valves (Figure 2, Items 1 and 2) to 15 seconds.
- 3. Set OFF TIME control knob (Figure 2, Item 3) on solenoid valves (Figure 2, Item 1 and 2) to TEST position.



Figure 2. Dual and Single Solenoid Valves.

- 4. Restore power on air filter automatic valve controller (Figure 1, Item 1) by pulling out switch (Figure 1, Item 2).
- 5. Verify solenoid valve opens for 15 seconds and closes for 5 seconds.
- 6. Adjust solenoid valve.

END OF TASK

ADJUST

- 1. Secure power on air filter automatic valve controller (Figure 1, Item 1) by pushing switch (Figure 1, Item 2).
- 2. Set ON TIME control knob (Figure 2, Item 4) on solenoid valve (Figure 2, Items 1 and 2) to 5 seconds or desired length of time for solenoid valve to open (measured between 1-15 seconds).
- 3. Set OFF TIME control knob (Figure 2, Item 3) on solenoid valve (Figure 2 Item 1 and 2) to 15 minutes or desired length of time for solenoid valve to remain closed (measured between 1-50 minutes).
- 4. Restore power on air filter automatic valve controller (Figure 1, Item 1) by pulling out switch (Figure 1, Item 2).

END OF TASK

END OF WORK PACKAGE

0051

FIELD MAINTENANCE SEPARATOR AND PREFILTER SOLENOID VALVES REPLACEMENT REPLACE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Tool Kit, Electrical Repair (WP 0058, Item 6)

References

TM 55-1905-223-10

Equipment Condition

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502)

Materials/Parts

Tag, Danger (WP 0059, Item 10) Tag, Blank (WP 0059, Item 11) Tape, Antiseizing (WP 0059, Item 12)

NOTE

Replacement procedures for both separator solenoid valve and prefilter solenoid valve are the same.

REMOVAL

1. Remove screws (Figure 1, Item 2) on solenoid valve (Figure 1, Item 1 or 6) and remove cover.



Figure 1. Separator and Prefilter Solenoid Valves.

- 2. Label and remove electrical wires from solenoid valve (Figure 1, Item 1 or 6).
- 3. Loosen stuffing tube nut (Figure 1, Item 3) and remove cable (Figure 1, Item 4) from solenoid valve (Figure 1, Item 1 or 6).

CAUTION

Care must be taken not to place any strain on piping group. Failure to follow this caution may result in damage to equipment.

- 4. Using two wrenches, loosen and disconnect unions (Figure 1, Item 5) from gate valve and piping.
- 5. Remove solenoid valve (Figure 1, Item 1 or 6) and move to a clean level work station.
- 6. Remove piping from solenoid valve (Figure 1, Item 1 or 6).
- 7. Clean pipe nipple and threads of all antiseizing tape.

END OF TASK

INSTALLATION

1. Wrap antiseizing tape onto pipe threads. Install pipe into solenoid valve (Figure 1, Item 1 or 6) and tighten. Pipe should be perpendicular to solenoid valve (Figure 1, Item 1 or 6).

CAUTION

Care must be taken not to place any strain on piping group. Failure to follow this caution may result in damage to equipment.

- 2. Connect unions (Figure 1, Item 5) to gate valve and piping. Tighten using two wrenches.
- 3. Feed cable (Figure 1, Item 4) through stuffing tube and tighten stuffing tube nut (Figure 1, Item 3).
- 4. Connect electrical wires as identified by labels. Remove labels.
- 5. Install cover onto solenoid valve (Figure 1, Item 1 or 6) and secure with screws (Figure 1, Item 2).
- 6. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK

FIELD MAINTENANCE AIR FILTER AUTOMATIC VALVE CONTROLLER REPAIR

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0058, Item 1) Tool Kit, Electrical Repair (WP 0058, Item 6)

Materials/Parts

Tag, Danger (WP 0059, Item 10) 1 Amp Fuse 15 Amp Fuse **Personnel Required**

Two

References

Air compressor, valves, and controllers locked out and tagged out (FM 4-01.502) TM 55-1905-223-10

REPAIR

Repair of air filter automatic valve controller is by replacement of fuses.

WARNING



Under no circumstances should testing of energized equipment be attempted alone. The immediate presence of someone capable of rendering aid is required. Before testing equipment, be sure to protect against grounding. If possible, testing should be made with one hand, with the other hand free and clear of equipment. Failure to do so may result in serious injury or death. Failure to follow this warning may result in injury or death to personnel.

1. Using a multimeter set to voltage scale, place test leads on each side of fuse. If there is no voltage observed, fuse is serviceable. If voltage is observed, fuse is unserviceable.

REPAIR - continued

WARNING



Always ensure affected circuits have been secured, locked out and tagged out. Performing maintenance with circuits energized presents a shock hazard and may result in death or injury to personnel or equipment damage. Failure to follow this warning may result in injury or death to personnel.

2. De-energize, lockout and tag out Air Filter Automatic Valve Controller (FM 4-01.502).



Figure 1. Removal and Installation of Fuses.

- 3. Using fuse puller, remove unserviceable fuse (Figure 1, Item 1) from fuse holder (Figure 1, Item 2).
- 4. Install new fuse (Figure 1, Item 1) into fuse holder (Figure 1, Item 2).
- 5. Clear tags, start system and verify proper operation (TM 55-1905-223-10).

END OF TASK

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR TORQUE VALUES

SCOPE

SAE capscrews are graded according to the strength of the capscrew. They are marked on the head so the correct strength and torque value are known. The tables in this appendix will list the capscrew markings with correct torque values as well as values for pipe plugs and metric bolts.

CAUTION

When replacing capscrews, always use a capscrew of the same measurement and strength as the capscrew being replaced. Using incorrect capscrews can result in equipment damage. Bolts threaded into aluminum require much less torque. Failure to follow this caution may result in damage to equipment.

NOTE

Always use torque values listed in the tables when specific torque values are unknown. The torque values listed in the tables are based on the use of lubricated threads.

Capacity Body		SAE Grade # 5			SAE Grade # 6 or # 7			SAE Grade #8			
Size		Cast Iron or Steel			Cast Iron or Steel			Cast Iron or Steel			
Inches-	Thread		TORQU	E		TORQUE			TORQL	JE	
		Ft-lb	kgm	Nm	Ft-lb	kgm	Nm	Ft-lb	kgm	Nm	
1/4	-20	8	1.1064	10.8465	10	1.3630	13.5582	12	1.6596	16.2698	
	-28	10	1.3830	13.5582				14	1.9362	18.9815	
	-18	17	2.3511	23.0489	19	2.6277	25.7605	24	3.3192	32.5396	
5/16	-24	19	2.6277	25.7605				27	3.7341	36.6071	
3/8	-16	31	4.2873	42.0304	34	4.7022	46.0978	44	6.0852	59.6560	
	-24	35	4.8405	47.4536				49	6.7767	66.4351	
7/16	-14	49	6.7767	66.4351	55	7.6065	74.5700	70	9.6810	94.9073	
	-20	55	7.6065	74.5700				78	10.7874	105.753	
1/2	-13	75	10.3725	101.6863	85	11.7555	115.2445	105	14.5215	142.3609	
	-20	85	11.7555	115.2445				120	16.5860	162.6960	
9/16	-12	110	15.2130	149.1380	120	16.5960	162.6960	155	21.4365	210.1490	
	-18	120	16.5960	162.6960				170	23.5110	230.4860	
5/8	-11	150	20.7450	203.3700	167	23.0961	226.4186	210	29.0430	284.7180	
	-18	170	23.5110	230.4860				240	33.1920	325.3920	
3/4	-10	270	37.3410	366.0660	280	38.7240	379.6240	375	51.825	508.4250	
	-16	295	40.7985	399.9610				420	58.0860	568.4360	
7/8	9	395	54.6285	535.5410	440	60.8520	596.5520	605	83.6715	820.2590	
	-14	435	60.1605	589.7730				675	93.3525	915.1650	

Table 1. Capscrew Markings and Torque Values.

Capacity Body Size		SAE Grade # 5 Cast Iron or Steel			SAE Grade # 6 or # 7 Cast Iron or Steel			SAE Grade #8 Cast Iron or Steel		
Inches-	Thread	TORQUE			TORQUE			TORQUE		
		Ft-lb	kgm	Nm	Ft-lb	kgm	Nm	Ft-lb	kgm	Nm
1.0	-8	590	81.5970	799.9220	660	91.2780	894.8280	910	125.8530	1233.7780
	-14	660	91.2780	849.8280				990	136.9170	1342.2420
Capso Marki	crew H a d ngs		and		OR			OR	Ì	

Table 2. Pipe Plug Torque Values

	Size				In Cast I	ron or	
Thread	Actual	Thread O.D	In Aluminum	Components	Steel Components		
			То	rque	Torque		
in	Nm	(in)	Nm	(ft-lbs)	Nm	(ft-lbs)	
1/16	8.1	(0.32)	5	(45 in-lbs)	15	(10)	
1/8	10.4	(0.41)	15	(10)	20	(15)	
1/4	13.7	(0.54)	20	(15)	25	(20)	
3/8	17.3	(0.68)	25	(20)	35	(25)	
1/2	21.6	(0.85)	35	(25)	55	(40)	
3/4	26.7	(1.05)	45	(35)	75	(55)	
1	33.5	(1.32)	60	(45)	95	(70)	
1-1/4	42.2	(1.66)	75	(55)	115	(85)	
1-1/2	48.3	(1.90)	85	(65)	135	(100)	

Table 3. Metric Bolt Torque Values

		Cast Iron	or Steel			
Thread For General	Head	Mark 4	Head Mark 7			
Purposes	Tor	que	Torque			
(size x pitch (mm)	ft-lb.	(Nm)	ft-lb.	(Nm)		
6 x 1.0	2.2 to 2.9	(3.0 to 3.9)	3.6 to 5.8	(4.9 to 7.8)		
8 x 1.25	5.8 to 8.7	(7.9 to 12)	9.4 to 14	(13 to 19)		
10 x 1.25	12 to 17	(16 to 23)	20 to 29	(27 to 39)		
12 x 1.25	21 to 32	(29 to 43)	35 to 53	(47 to 72)		
14 x 1.5	35 to 52	(48 to 70)	57 to 85	(77 to 110)		
16 x 1.5	51 to 77	(67 to 100)	90 to 120	(130 to 160)		
18 x 1.5	74 to 110	(100 to 150)	130 to 170	(180 to 230)		
20 x 1.5	110 to 140	(150 to 190)	190 to 240	(160 to 320)		
22 x 1.5	150 to 190	(200 to 260)	250 to 320	(340 to 430)		
24 x 1.5	190 to 240	(260 to 320)	310 to 410	(420 to 550)		

Table 4.	Air Com	pressor To	orque Values
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Air Compressor Fastener	Torque - ft-lbs
Connecting Rod Bolt	40
Bearing Carrier Mounting Bolt	30
Adjustment Plate Bolt	30
Inspection Plate Bolt	12
Crankcase to Cylinder Bolt	75
Cylinder to Head Bolt	65
Valve Cover Plate Bolt	50
Valve Clamp Screw	60
Valve Clamp Screw Locknut	50
Unloader Diaphragm Cap Screw	8
Compressor Pulley Bolts	90
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CHAPTER 5

SUSTAINMENT MAINTENANCE FOR AIR COMPRESSOR

MAINTENANCE INSTRUCTIONS

SUSTAINMENT MAINTENANCE INSTRUCTIONS FOR AIR COMPRESSOR MAINTENANCE INSTRUCTIONS INTRODUCTION

GENERAL

Sustainment maintenance task is limited to overhaul of the air compressor. Overhaul of the air compressor will be performed on-condition or during On-Condition Cyclic Maintenance (OCCM) as coordinated or determined by the Sustainment Maintenance proponent. Overhaul shall consist of replacing all necessary components to return the air compressor to a completely serviceable/operational condition. These tasks are addressed in the following work packages:

WP 0019 WP 0025 WP 0027 WP 0029 WP 0034 WP 0039 WP 0042

CHAPTER 6

FIELD AND SUSTAINMENT MAINTENANCE FOR AIR COMPRESSOR

SUPPORTING INFORMATION

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR REFERENCES

SCOPE

This work package lists all manuals, forms, military specifications, technical bulletins, technical manuals and miscellaneous publications referenced in this manual or required for maintenance activities.

FIELD MANUALS

FM 4-01.502	Army Watercraft Safety
FM 4-25.11	First Aid
FM 31-70	Basic Cold Weather Manual
FM 55-501	Marine Crewman's Handbook

FORMS

DA Form 2028 DA Form 2404/5988E DA Form 2407 SF Form 368	Recommended Changes to Publications and Blank Forms Equipment Inspection and Maintenance Worksheet Maintenance Request Product Quality Deficiency Report
MILITARY SPECIFICATIONS	
MIL-PRF-16173 MIL-PRF-21260	Corrosion Preventive Compound, Solvent Cutback, Cold-Application Lubricating Oil, Internal Combustion Engine, Preservative Break-In

Painting of Watercraft

Welding on Watercraft

Preservation of Vessels for Storage

TECHNICAL BULLETINS

TB 43-0144 TB 55-1900-204-24 TB 55-1900-207-24 TB 740-97-4

TECHNICAL MANUALS

LO 55-1905-223-12 TM 38-740 TM 43-0139 TM 55-1905-223-10 TM 55-1905-223-24-18 TM 55-1905-223-24P TM 750-244-6 Lubrication Order for Landing Craft, Utility (LCU-2000 Class) Storage and Maintenance of Army Prepositioned Stock Materiel Painting Instructions for Army Material Operator's Manual for Landing Craft, Utility (LCU-2000 Class) LCU 2000 Class Basic Craft Maintenance Manual Repair Parts and Special Tools List for the LCU 2000 Class Watercraft Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use

Treatment of Cooling Water in Marine Diesel Engines

MISCELLANEOUS PUBLICATIONS

DA PAM 750-8

The Army Maintenance Management System (TAMMS) Users Manual

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

MAINTENANCE ALLOCATION CHART (MAC)

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field - includes two subcolumns, Crew (C) and Maintainer (F). Sustainment - includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

- Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the SMR code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
- 2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.
- 3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
- 4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC. The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance function.

INTRODUCTION - continued

Maintenance Functions

Maintenance functions are limited to and defined as follows:

- 1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gaugings and evaluation of cannon tubes.
- 2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
- 3. Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
 - a. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.
 - b. Repack. To return item to packing box after service and other maintenance operations.
 - c. Clean. To rid the item of contamination.
 - d. Touch up. To spot paint scratched or blistered surfaces.
 - e. Mark. To restore obliterated identification.
- 4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
- 5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.
- 6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
- 7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
- 8. Paint (ammunition only). To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
- 9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

INTRODUCTION - continued

 Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

- 11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
- 12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above).

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating

INTRODUCTION - continued

conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

- C Crew maintenance
- F Maintainer maintenance

Sustainment:

- L Specialized Repair Activity (SRA)
- H Below depot maintenance
- D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) - Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

- Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.
- Column (3) Nomenclature. Name or identification of the tool or test equipment.
- Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.
- Column (5) Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) - Remarks Code. The code recorded in column (6) of the MAC.

Column (2) - Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR MAINTENANCE ALLOCATION CHART (MAC)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL				(5)	(6)
			CREW	FIELD MAINTAINER	SUSTAI BELOW	NMENT DEPOT	TOOLS AND	
GROUP	COMPONENT	MAINTENANCE		F	DEPOT H	D	EQUIPMENT REFERENCE	REMARKS
NUMBER	ASSEMBLY	FUNCTION		•		D	CODE	CODE
08	AIR COMPRESSOR ASSEMBLY	INSPECT SERVICE REPAIR OVERHAUL	0.3 0.2	0.3 1.3 3.0			1, 2, 3	A I
0801	COMPRESSOR V-BELTS	INSPECT ADJUST REPLACE		0.8 1.0 1.0			1, 4 1	B C
0802	MOTOR, ALTERNATING CURRENT	SERVICE TEST REPLACE REPAIR		0.1 1.1 1.0 2.0			5 1, 6, 7 1, 6, 8 1, 6, 8	
0803	HYDRAULIC UNLOADER ASSEMBLY	REPLACE REPAIR		1.0 0.5			1 1	
0804	CYLINDER BLOCK	REPLACE		1.0			1, 9	D
0805	CYLINDER HEAD ASSEMBLY	REPLACE		0.8			1, 9	
080501	INTERCOOLER	SERVICE REPLACE		0.3 0.4			1,9	E
080502	UNLOADER VALVE	REPLACE REPAIR		1.0 0.5			1 1	
080503	RELIEF VALVE	TEST REPLACE		0.1 0.5			1	
080504	SUCTION VALVE	REPLACE REPAIR		0.7 0.5			1 1	
080505	DISCHARGE VALVE	REPLACE REPAIR		1.3 0.5			1 1	
0806	LOW PRESSURE CONNECTING ROD AND PISTON ASSEMBLY	REPLACE		1.0			1, 9, 10	
080601	LOW PRESSURE PISTON ASSEMBLY	REPLACE REPAIR		0.5 0.5			1, 11, 12 1, 11, 12	
		1						

Table 1. MAC For Air Compressor Assembly.

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR MAINTENANCE ALLOCATION CHART (MAC)

(1)	(2)	(3)		(4) MAINTENAN	(5)	(6)		
				FIELD	SUSTAI	NMENT		
			CREW	MAINTAINER	DEPOT	DEPOT	EQUIPMENT	
GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	С	F	н	D	REFERENCE CODE	REMARKS CODE
080602	LOW PRESSURE CONNECTING ROD ASSEMBLY	REPLACE REPAIR		0.2 0.2			12 12	
0807	HIGH PRESSURE CONNECTING ROD AND PISTON ASSEMBLY	REPLACE		1.0			1, 9, 10	
080701	HIGH PRESSURE PISTON ASSEMBLY	REPLACE REPAIR		0.5 0.5			1, 11, 12 1, 11, 12	
080702	HIGH PRESSURE CONNECTING ROD ASSEMBLY	REPLACE REPAIR		0.2 0.2			12 12	
0808	BEARING CARRIER GROUP	REPLACE REPAIR		1.5 1.0			1, 9 1, 9	
080801	OIL PRESSURE GAUGE	REPLACE		0.7			1	
0809	CRANKSHAFT GROUP	REPLACE REPAIR		1.0 1.0			1 1, 8	
080901	COMPRESSOR PULLEY	INSPECT REPLACE		0.7 0.6			1, 8, 9	
0810	CRANKCASE ASSEMBLY	ADJUST REPLACE REPAIR		0.6 0.3 1.0			1, 13 1 1	F
0811	AIR COMPRESSOR DEHYDRATION PIPING GROUP	INSECT REPAIR	0.2	0.7			1, 14	
080901	AFTERCOOLER	SERVICE REPAIR		0.5 2.5			1, 6	E G

Table 1. MAC For Air Compressor Assembly.

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR MAINTENANCE ALLOCATION CHART (MAC)

(1)	(2)	(3)		(4) MAINTENAN) ICE I EVEL		(5)	(6)
				FIELD	SUSTAINMENT		1	
			CREW	MAINTAINER	BELOW DEPOT	DEPOT	TOOLS AND EQUIPMENT	
GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	С	F	н	D	REFERENCE CODE	REMARKS CODE
081102	PREFILTERS	INSPECT REPAIR	0.1	1.0			1	
081103	SEPARATOR AND PREFILTER SOLENOID VALVES	INSPECT TEST ADJUST REPLACE	0.1	0.1 0.2 1.5			1 1, 6	
081104	AIR FILTER AUTOMATIC VALVE CONTROLLER	REPAIR		0.5			1, 6	н

Table 1. MAC For Air Compressor Assembly.

Tools or Test Equipment Ref	Maintenance	Nomenclature	National Stock	Tool Number
	LCVCI	Tiomenciature	Number	
1	F	Tool Kit, General Mechanic's	5180-00-629-9783	SC-5180-90-CL- N55 (50980)
2	F	Sling, Endless	3940-01-183-9412	3375958 (15434)
3	F	Hoist, Chain	3950-00-235-4235	M1LH904CLASS1 TYPEHSTYLE1 (81349)
4	F	Bar, Wrecking	120-00-293-0665	0658 (9756)
5	F	Lubricating Gun, Hand	4930-00-253-2478	MIL-G-3859 (81349)
6	F	Tool Kit, Electical Repair	5180-00-391-1087	5180-00-391-1087 (80244)
7	F	Ohmmeter (Insulation Tester)	6625-01-223-2980	212159 (07239)
8	F	Puller, Mechanical	5120-00-499-1489	ST-647 (15434)
9	F	Wrench, Torque	5120-01-125-5190	B107.14 (05047)
10	F	Compressor, Piston Ring	5120-00-116-7676	ST-755 (15434)
11	F	Expander, Piston Ring	5120-00-150-7486	ST-763 (15434)
12	F	Pliers, Retaining Ring	5120-00-595-9551	G404P-NP (20705)
13	F	Indicator, Dial	5210-01-157-2291	3376050 (15434)
14	F	Wrench, Pipe	5120-00-277-1461	07062203 (Z8X80)

Table 2. Tools and Test Equipment for Air Compressor.

0058

Remark Code	Remarks
A	Repair of air compressor assembly is limited to replacement of air compressor.
В	This procedure maybe required multiple times to obtain proper deflection.
С	V-belts must be replaced as a set.
D	Cylinder block honing is not authorized. If honing is required replace cylinder block.
Е	Servicing is limited to cleaning the coils.
F	This procedure may be required multiple times to obtain the correct clearance.
G	Repair of aftercooler is limited to replacement of motor.
н	Repair of the filter automatic valve controller is by replacement of fuses.
I	Depot Level Maintenance will be accomplished through the use of commercial activities on as needed basis or through the On-Condition Cyclic Maintenance (OCCM) Program in accordance with AR 750-1, Para 6-16.

Table 3. Remarks for Air Compressor.

FIELD AND SUSTAINMENT MAINTENANCE AIR COMPRESSOR EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

SCOPE

This work package lists expendable and durable items that you will need to operate and maintain the fire pump subsystem. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use cleaning cloth (WP 0059, Item 3).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item (F = Maintainer or ASB).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

(1)	(2)	(3)	(4)	(5)
ITEM	LEVEL	STOCK		
NUMBER	STOCK	NUMBER	DESCRIPTION	U/I
1	F	7930-01-330-0187	Cleaning Compound, Solvent-Detergent PF 32 (66724)	ВХ
2	F	5350-00-221-0872	Cloth, Abrasive ANSI B74.18 (80204)	PG
3	F	7920-01-454-1147	Cloth, Cleaning NIB1998ALRAG5LB015 (83421)	BX
4	F	8415-00-266-8677	Gloves, Rubber, Industrial MIL-DTL-32066 (81349)	PR
5	F	9150-01-117-2928	Grease, Ball and Roller Bearing DOD-G-24508 (81349)	CN
6	F	9150-00-392-1670	Grease, General Purpose (Lubriplate) B105 (73219)	TU
7	F	9150-01-158-2881	Lubricating Oil, Air Compressor GST OIL 100 (96004)	CN
8	F	7920-00-205-1711	Rag, Wiping DDD-R-30 (81348)	EA
9	F	8030-00-999-6313	Sealing Compound 10001 (08589)	TU
10	F		Tag, Danger	вх
11	F	8135-00-292-2351	Tag, Blank (Electrical Wire) A-A-900 (58536)	MX
12	F	8030-00-889-3535	Tape, Antiseizing A-A-58092 (58536)	RO

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Warning Summary

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By Order of the Secretary of the Army:

GEORGE W. CASEY, JR. General, United States Army Chief of Staff

Official: Joupe E. Morrow

JOYCE E. MORROW Administrative Assistant to the Secretary of the Army 0819305

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch

1 decimeter = 10 centimeters = 3.94 inches 1 meter = 10 decimeters = 39.37 inches

- 1 dekameter = 10 meters = 32.8 feet
- 1 hectometer = 10 dekameters = 328.08 feet
- 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

- 1 centigram = 10 milligrams = .15 grain 1 decigram = 10 centigrams = 1.54 grains1 gram = 10 decigram = .035 ounce 1 dekagram = 10 grams = .35 ounce 1 hectogram = 10 dekagrams = 3.52 ounces1 kilogram = 10 hectograms = 2.2 pounds1 quintal = 100 kilograms = 220.46 pounds
- 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce 1 deciliter = 10 centiliters = 3.38 fl. ounces 1 liter = 10 deciliters = 33.81 fl. ounces 1 dekaliter = 10 liters = 2.64 gallons 1 hectoliter = 10 dekaliters = 26.42 gallons 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

- 1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
- 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
- 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet 1 sq. dekameter (are) = 100 sq. meters 1.076.4 sq. feet
- 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
- 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches

1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	То	Multiply by	To change	То	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.983	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton meters	.11296			

Temperature (Exact)

°F	Fahrenheit	5/9 (after	Celsius °C	
	temperature	subtracting 32)	temperature	

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