

TECHNICAL MANUAL
UNIT, INTERMEDIATE DIRECT
SUPPORT
AND INTERMEDIATE GENERAL
SUPPORT
MAINTENANCE INSTRUCTIONS

FIRE PUMP
SUBSYSTEM

FOR
LANDING CRAFT UTILITY (LCU)

NSN 1905-01-154-1191

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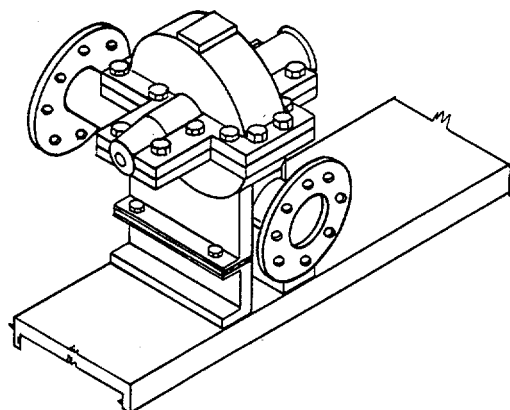
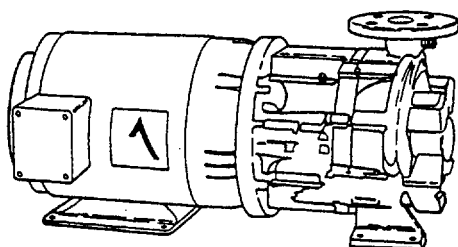
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HEADQUARTERS, DEPARTMENT OF THE ARMY

17 JANUARY 1989

TECHNICAL MANUAL
No. 55-1905-223-24-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 January 1989

**UNIT, INTERMEDIATE DIRECT SUPPORT
AND INTERMEDIATE GENERAL SUPPORT
MAINTENANCE INSTRUCTIONS**

**FIRE PUMP SUBSYSTEM
FOR
LANDING CRAFT UTILITY (LCU)
NSN 1905-01-154-1191**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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CHAPTER 1

INTRODUCTION

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Section I. GENERAL INFORMATION

1-1. **Scope.** The scope of this manual is as follows:

a. Type of Manual. Unit, intermediate direct support, and intermediate general support maintenance manual.

b. Name of Equipment. The equipment covered by this manual is the fire pump subsystem that is installed aboard the LCU 2000 Class watercraft. See FIGURE 1-1. Operation of the fire pump subsystem is covered in TM 55-1905-223-10. Components of the fire pump subsystem are:

(1) Auxiliary Fire Pump Assembly.

(2) Centrifugal Pump Unit.

c. Purpose of Equipment. The fire pump subsystem pumps seawater into firemain piping for onboard or off-vessel firefighting.

1-2. **Maintenance Forms, Records and Reports.** Department of the Army forms and procedures used for equipment maintenance are prescribed by DA Pam 738-750, The Army Maintenance Management System.

1-3. **Destruction of Army Materiel to Prevent Enemy Use.** Refer to TM 750-244-3 for instructions covering the destruction of Army Materiel to prevent enemy use.

1-4. **Reporting Errors and Recommending Improvements.** If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be sent directly to you.

1-5. **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. Disassembly, and repacking of equipment for shipment or short term storage, are covered in paragraphs 2-25, 3-17 and 4-16.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-6. **General Description.** The fire pump subsystem consists of three pump assemblies, associated piping, valves, manifolds, and gauges. The pumps provide water to the system from a sea chest in the vessel's hull bottom. Designated valves in the firemain system must be open to allow the system to be pressurized. FIGURE 1-1 shows the electric driven and diesel driven fire pump subassemblies.

1-7. **Characteristics, Capabilities and Features.** A very broad view of the fire pump subsystem is as follows:

a. Characteristics

- (1) Two electric driven pumps
- (2) One diesel driven pump
- (3) Each can be controlled at the pump, in the pilot house, and in the EOS (engine operating station).

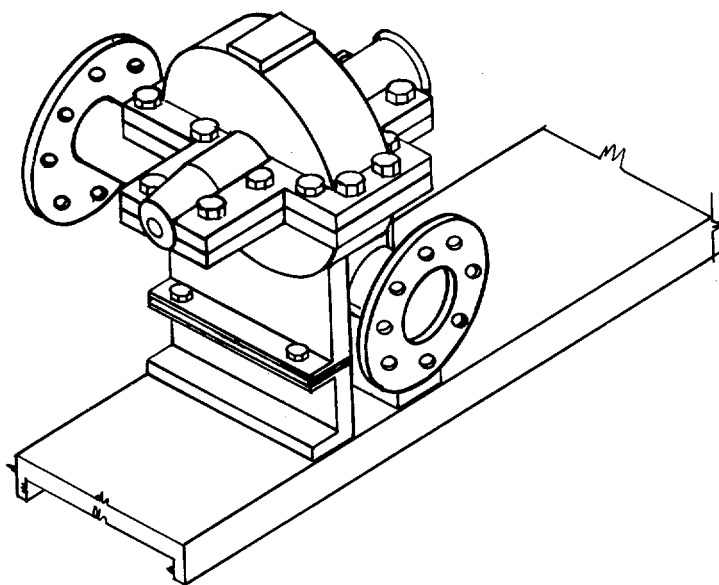
b. Capabilities and Features

- (1) Provides emergency ballasting/deballasting
- (2) Provides additional firemain pressure
- (3) Diesel-driven pump can be used when vessel has lost electrical power.

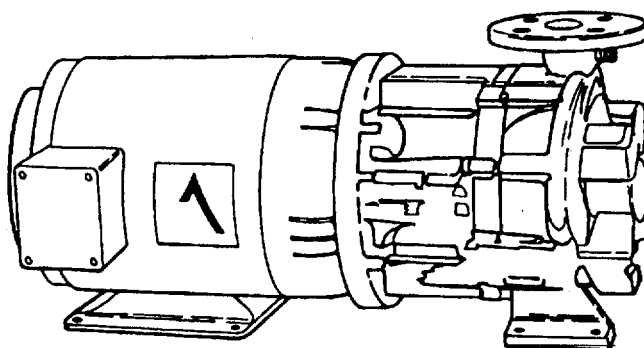
1-8. **Location and Description of Major Components.** Two electric driven, centrifugal fire pumps are located in the engine room, each with a rating of 250 GPM at 125 psi. Both of these pumps are connected directly to the ballast system to provide a water source if the vessel is unable to attain seawater suction, or if emergency ballasting or deballasting is required. The auxiliary fire pump is located in the bow thruster machinery space and is mounted direct drive to the bow thruster diesel engine. It has a rating of 500 GPM at 125 psi. This pump is used if the vessel loses electrical capabilities, or if additional firemain pressure is required. Start and stop controls for all pumps are located on or near each pump, with remote controls in the pilothouse.

1-9. **Equipment Data.** Reference data for the firepumps subsystem is given in Table 1-1. Also see the equipment data given in the operator's manual, TM 55-1905-223-10.

1-10. **Warranty Information.** The main fire pumps are warranted by the Allis-Chalmers Company for 12 months. Warranty begins on the date found on the DA Form 2410 or DA Form 2408-16 in the log book. Report all defects in material and workmanship to your supervisor; who will take the appropriate action. The auxiliary fire pump is warranted by the Peerless Pump Company for 1 year from date of shipment. For additional information pertaining to the warranty refer to TB 55-1905-223-12.



AUXILIARY PUMP ASSEMBLY



MAIN PUMP ASSEMBLY

FIGURE 1-1. Fire Pump Subsystem.

Table 1-1. Equipment Data Characteristics

Characteristics	Reference Data
ELECTRIC DRIVEN PUMP DATA	
Type	2000
Manufacturer	Allis-Chalmers
Size	3 X 2 X 9 inches
rpm	3500
hp	30
Mounting	Vertical
Rate	250 gpm @ 125 psi
Liquid	Raw Seawater
Seal	Mechanical
Driver Source	30 hp electric motor
Motor	D.P. vertical
Enclosure	3525
rpm	40F76Y5E
SPEC	NP0012/CD0005
Nameplate	1.15
SERV. FAC	F
Code	88.0
P.F.	284JP-4036M
Frame	70°F (21°C)
Operating Temperature	230/460
Volts	60
Hertz	70/35
amps	3
Phase	B
INS. CL.	B
Design	104°F (40°C) - CONT
Rating	90.2
FL. EFF.	
DIESEL DRIVEN PUMP	
Type	4-A.D.
Manufacturer	Peerless
Size	4 X 4 X 18.5 inch impeller
rpm	1750
hp	300
Mounting	Horizontal
Rate	500 gpm @ 125 psi
Liquid	Raw Seawater
Seal	Mechanical
Coupling	Falk Steel Flex
Driver Source	300 hp Diesel Engine

1-11. **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.

Overview The Principles of Operation section will tell you basic information about how the fire pump subsystem works.

Section III. PRINCIPLES OF OPERATION

1-12. **General.** The firemain system is pressurized by two primary fire pumps and one auxiliary fire pump, with associated piping, valves, and manifolds. Each fire pump will take suction from a sea chest and discharge water into the system. The system is controlled by valve alignments. Each pump is controlled locally at the pump and remotely in the pilothouse. Each control station has a control panel that contains motor Start/Stop buttons (except for auxiliary pump), indicator lights, and a power switch. The indicator lights will indicate the operational status of the pumps. The auxiliary fire pump is driven by the bow thruster diesel engine (reference TM 55-1905-223-24-5) and is started or stopped by means of a hand lever on the side of the diesel engine clutch assembly. The RPM of this pump is controlled by the RPM of the diesel engine. These pumps provide a total capacity of 1,000 GPM for onboard or off-vessel firefighting. Refer to the operator's manual, TM 55-1905-223-10, for more information on firepump subsystem control.

CHAPTER 2

UNIT MAINTENANCE INSTRUCTIONS

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Section I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TRDE); AND SUPPORT EQUIPMENT

2-1. **Common Tools and Equipment.** For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your organization.

2-2. **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), Appendix B of this manual.

2-3. **Repair Parts.** Repair parts are listed and illustrated in the Repair Parts and Special Tools List (RPSTL), TM 55-1905-223-24P.

Section II. SERVICE UPON RECEIPT

2-4. **Checking Unpacked Equipment.**

- a. 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 738-750.
- b. 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 738-750.
- c. Check to see whether the equipment has been modified.

- d. 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.
- e. Remove chocks from resilient mounted components.

2-5. **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.

2-6. **Preliminary Servicing and Adjustment.** It is important that careful preparations and inspection be made before the fire pumps are put in use.

a. Pre-Start Checks, Electric Driven Pumps. Before initial start of pumps, make the following inspection:

- (1) Check alignment between pump and motor (driver).
- (2) Check all connections to motor and starting pushbuttons with wiring diagram. Check voltage, phase and frequency on motor nameplate with live circuit.
- (3) Check suction and discharge piping and pressure gauges for proper operation.
- (4) Turn rotating element by hand to ensure that it rotates freely.
- (5) Check stuffing box adjustment, lubrication, and piping.
- (6) Check driver lubrication.
- (7) Ensure that pump is primed and all valves are properly set and operational, with the discharge valve closed, and the suction valve open.
- (8) Check rotation. Be sure that the driver operates in the direction indicated by the arrow on the pump casing as serious damage can result if the pump is operated with the incorrect rotation. Check rotation each time the motor leads have been disconnected.

b. Pre-Start Checks, Diesel Driven Pump. Before initial start of pump, make the following inspection:

- (1) Perform steps 2-6a(1), (3), (4), (5) and (6).
- (2) Refer to TM 55-1905-223-24-5, Bow Thruster Diesel Engine, for pre-checks prior to engaging clutch to start pump.

CAUTION

Ensure both bow thruster clutch and fire pump clutch are disengaged prior to starting prime mover.