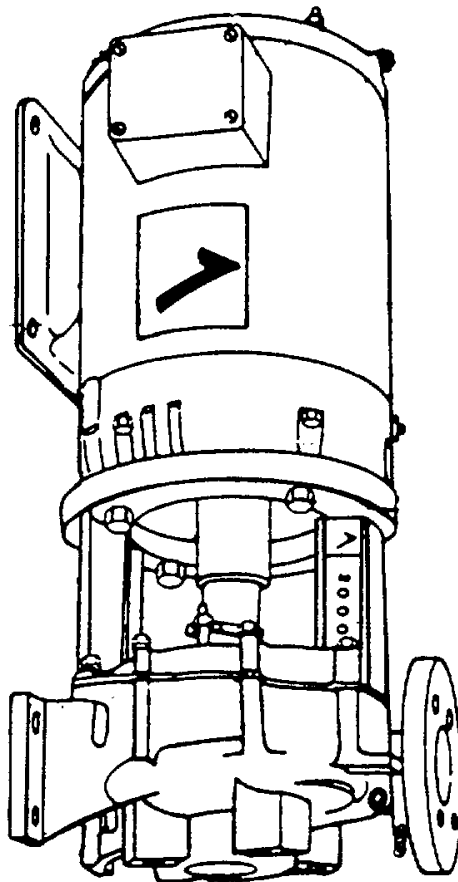


TECHNICAL MANUAL

UNIT, INTERMEDIATE DIRECT SUPPORT AND INTERMEDIATE GENERAL SUPPORT MAINTENANCE INSTRUCTIONS BILGE / BALLAST PUMP FOR LANDING CRAFT UTILITY (LCU) NSN 1905-01-154-1191



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

BILGE/BALLAST PUMP
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

Section I	General Information	1-1
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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. Model Number and Equipment Name. Bilge/Ballast Pump: Model 600, Type 2000. Motor: Type 213T-445T.
- c. Purpose of Equipment. To provide water to the system from the sea chest in the vessel's hull bottom for the function of bilge drainage and ballast for vessel stability.

1-2. **Maintenance Forms, Records, and Reports.** Department of the Army forms and procedures used for equipment maintenance are those 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 Equipment Improvement Recommendations** (EIR). 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, Missouri 63120-1798. We'll send you a reply.

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 paragraph 2-15.

SECTION II. EQUIPMENT DESCRIPTION AND DATA

1-6. **Characteristics, Capabilities, and Features.** A very broad view of the bilge/ballast pump subsystem is as follows:

a. Characteristics.

- (1) Motor driven, electric - 40 hp.
- (2) Pump, centrifugal - 750 gpm.

b. Capabilities and Features.

- (1) Can operate from one of two pump assemblies.
- (2) Controlled from the pump or engineering control center.
- (3) Transfers water to seven ballast tanks to provide vessel stability.
- (4) Provides for bilge drainage.

1-7. **Location and Description of Major Components.** The bilge/ballast subsystem consists of a primary pump and an auxiliary pump assembly, associated tanks, piping, valves, manifolds, indicators, alarms, and gauges. The pump provides water to the system from the sea chest in the vessel's hull bottom and transfers it through the piping to the seven ballast tanks as controlled by valve alignment. There are three ballast tanks forward in the vessel, two midships, and two aft. The bilge/ballast subsystem provides two functions: bilge drainage, and vessel stability. Start and stop controls for the pump are located on or near the pump and in the engineering control center. (Reference TM 55-1905-223-10.) The major components of the bilge/ballast pump subsystem are the pump, motor, and motor adapter. The pump is rated for 750 gpm at 150 ft TDH (total discharge head). Reference FIGURE 1-1 for major components of the primary bilge/ballast pump. See TM 55-1905-223-24-12, for information on the Fire Pump Subsystem.

1-8. **Equipment Data.** Characteristics and reference data are provided in Table 1-1. Also see the equipment data given in the operator's manual, TM 55-1905-223-10.

Table 1-1. Equipment Data

Characteristics	Reference Data
Bilge/Ballast Pump Pump output	Model 600, Type 2000 750 gpm at 150 ft TDH
Pump Motor Rated HP Voltage/phase Frequency Current rating	Drip-proof vertical enclosure 40 hp at 3550 rpm 240/460 Vac - 3 phase 60 Hz 95.6/47.8 amps

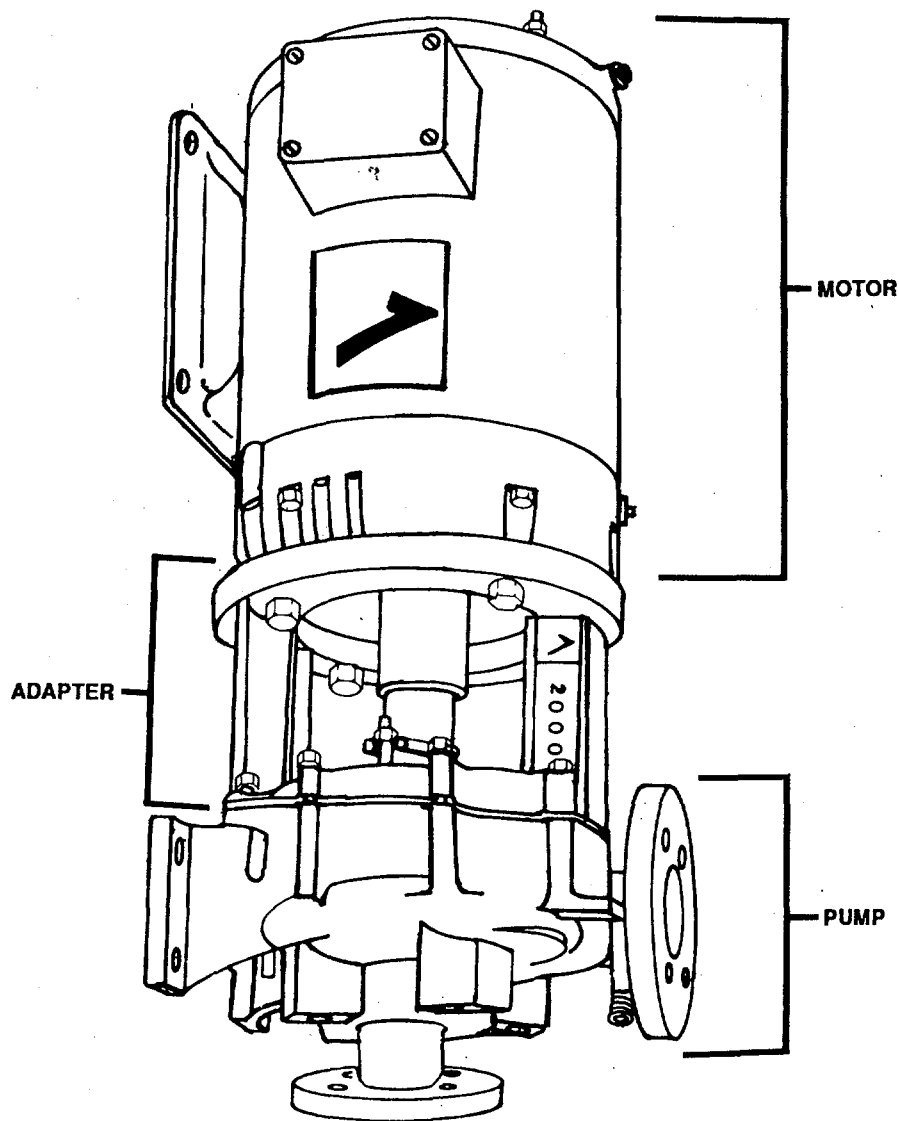


FIGURE 1-1. Bilge/Ballast Pump Assembly.

1-9. **Safety, Care, and Handling.** Safety precautions must be observed at all times while performing maintenance. General WARNINGS and first-aid data appear in 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 safety and the safety of the equipment.

SECTION III. PRINCIPLES OF OPERATION

Overview of bilge/ballast pump assembly.

The Principles of Operation section will tell you basic information about how this assembly works.

1-10. **General.** The bilge/ballast system is pressurized by a close coupled electric pump with associated piping, valves, indicator gauges, and manifolds. With valve alignment arranged for ballasting, the pump will take suction from the sea chest and discharge water through the piping into each of the seven ballast tanks until filled to the desired capacity. With the valve alignment arranged for trimming the vessel, the pump will move water through the system to strategic tanks or discharge the water directly overboard until the vessel has reached the desired trim. With valve alignment arranged to pump bilges, the pump will take suction through a pipe-mounted strainer located in the lowest accessible point in the bilges of the engine room, auxiliary machinery room, bow thruster machinery room, and tunnel. Water will discharge directly overboard. (Reference TM 55- 1905-223-24-18, Basic Craft Hull and Outfitting.)

a. Bilge/Ballast Pump Assembly. The bilge/ballast pump is controlled locally on or near the pump and in the engine room control booth. Pressing the START pushbutton energizes the electric motor, which is close coupled to the pump. The shaft in turn drives the pump, which takes a suction from the sea chest, bilge strainer, or ballast tank according to desired service.

b. Auxiliary Bilge/Ballast Fire Pump Assembly. One of two fire pumps serves as an auxiliary bilge/ballast pump. See TM 55-1905-223-24-12, Fire Pump Subsystem.

CHAPTER 2

UNIT MAINTENANCE INSTRUCTIONS

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SECTION I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); 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 shipment 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. **Initial Setup Procedure.** Includes operational checks and inspections that are not performed for a routine startup. Direct support maintenance personnel will perform initial setup in accordance with the operator's manual, TM 55-1905-223-10.

2-6. **Normal Startup.** Refer to operator's manual, TM 55-1905-223-10.

2-7. **Shutdown Procedure** (Usual or Unusual). Refer to operator's manual, TM 55-1905-223-10.

2-8. **Preliminary Servicing and Adjustment.** It is important that careful preparations and inspection be made before the bilge/ballast pumps are put in use. Before initial start of the pump, make the following inspection:

- a. Inspect alignment between pump and piping.
- b. Inspect all connections to motor and starting device; check voltage and frequency on motor nameplate with line circuit.
- c. Inspect suction and discharge piping and pressure gauges for proper operation.
- d. Turn rotating element by hand to ensure that it rotates freely.
- e. Inspect lubrication and piping.
- f. Inspect driver lubrication.
- g. Ensure that pump is full of liquid for priming and all valves are properly set and operational, with the discharge valve closed, and the suction valve open.
- h. Inspect rotation. Be sure that the driver operates in the direction indicated by the arrow on the pump casing. Serious damage can result if the pump is operated with the incorrect rotation. Inspect rotation each time the motor leads have been disconnected.

SECTION III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-9. **Explanation of PMCS Table.** PMCS is designed to keep the equipment in good working condition. This is accomplished by performing certain tests, inspections, and services. Table 2-1 lists items to be serviced and the procedures needed to accomplish the PMCS. The "Interval" column tells you when to perform a check or service. If needed, PMCS may be performed more frequently than the indicated interval. The "Procedures" column tells you how to perform the required checks and services. If your equipment does not perform as required, see Table 2-2, Troubleshooting. Report any malfunctions or failures on DA Form 2404. In the Item Number column on DA Form 2404, record the appropriate Item Number from the PMCS table.

Table 2-1. Unit Preventive Maintenance Checks and Services (PMCS)

Item No.	Interval			Items To Be Inspected	Procedures
	A	Q	S		
1	•			Pump and Motor	Check pump and motor alignment with suction and discharge piping. Shim up units as required. Inspect suction and discharge piping for strain or misalignment. Inspect all piping supports for soundness and effective support of loading.
2			•	Shaft and shaft sleeve	Check for scoring.
3			•	Stuffing	Clean coolant piping and remove any deposits or scaling.
4	•			Valves	Inspect foot valves and check valves for leakage.
5		•		Motor Bearings	Grease in accordance with LO 55-1905-223-12.