

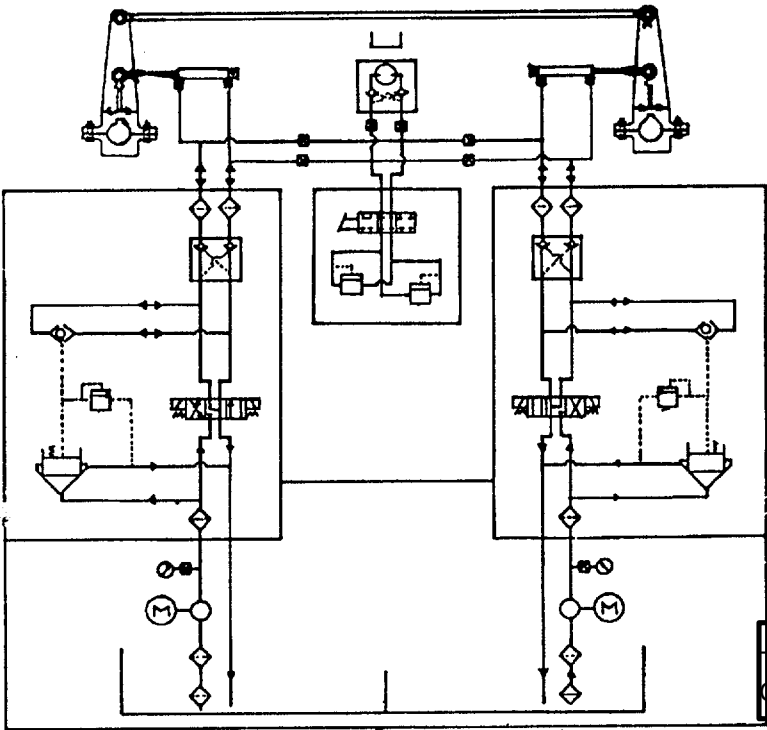
TECHNICAL MANUAL

UNIT, INTERMEDIATE DIRECT
SUPPORT
AND INTERMEDIATE GENERAL
SUPPORT
MAINTENANCE INSTRUCTIONS
STEERING GEAR
SYSTEM
FOR

LANDING CRAFT UTILITY (LCU)

NSN 1905-01-154-1191

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HEADQUARTERS, DEPARTMENT OF THE ARMY
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HEADQUARTERS
DEPARTMENT OF THE ARMY
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**UNIT, INTERMEDIATE DIRECT SUPPORT,
AND INTERMEDIATE GENERAL SUPPORT
MAINTENANCE INSTRUCTIONS**

**STEERING GEAR SYSTEM
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. **Name of Equipment.** The equipment covered by this manual is the steering gear system that is installed aboard the LCU 2000 Class Watercraft. This manual is limited in scope to the hydraulic portion of the steering gear system. See FIGURES 1-1 and 1-2. The steering control system is covered in TM 55-1905-223-10. Hydraulic components are as follows:

- (1) Twin pumpset, Model TA30D.
- (2) Crossover relief valve used on hulls 2008 and subsequent.
- (3) Double acting relief/bypass/shutoff (DARBS) valve.
- (4) Pair of twin hydraulic cylinders, Model L 100-650.
- (5) Emergency manual helm pump Model 83.
- (6) Emergency hand pump used on hulls 2008 and subsequent.
- (7) 2 Gallon header tank used on hulls 2008 and subsequent.
- (8) Two-litre (1/2 U.S. Gallon) header tanks.

c. **Purpose of Equipment.** The steering gear system electrohydraulic equipment causes the watercraft rudders to move on command, which controls the direction of vessel travel.

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.** 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-MEQ; 4300 Goodfellow Blvd.; St. Louis, I 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. Repacking of equipment for shipment or short term storage, is covered in paragraph 2-27.

Hulls 2008 and subsequent

Change 1 1-1

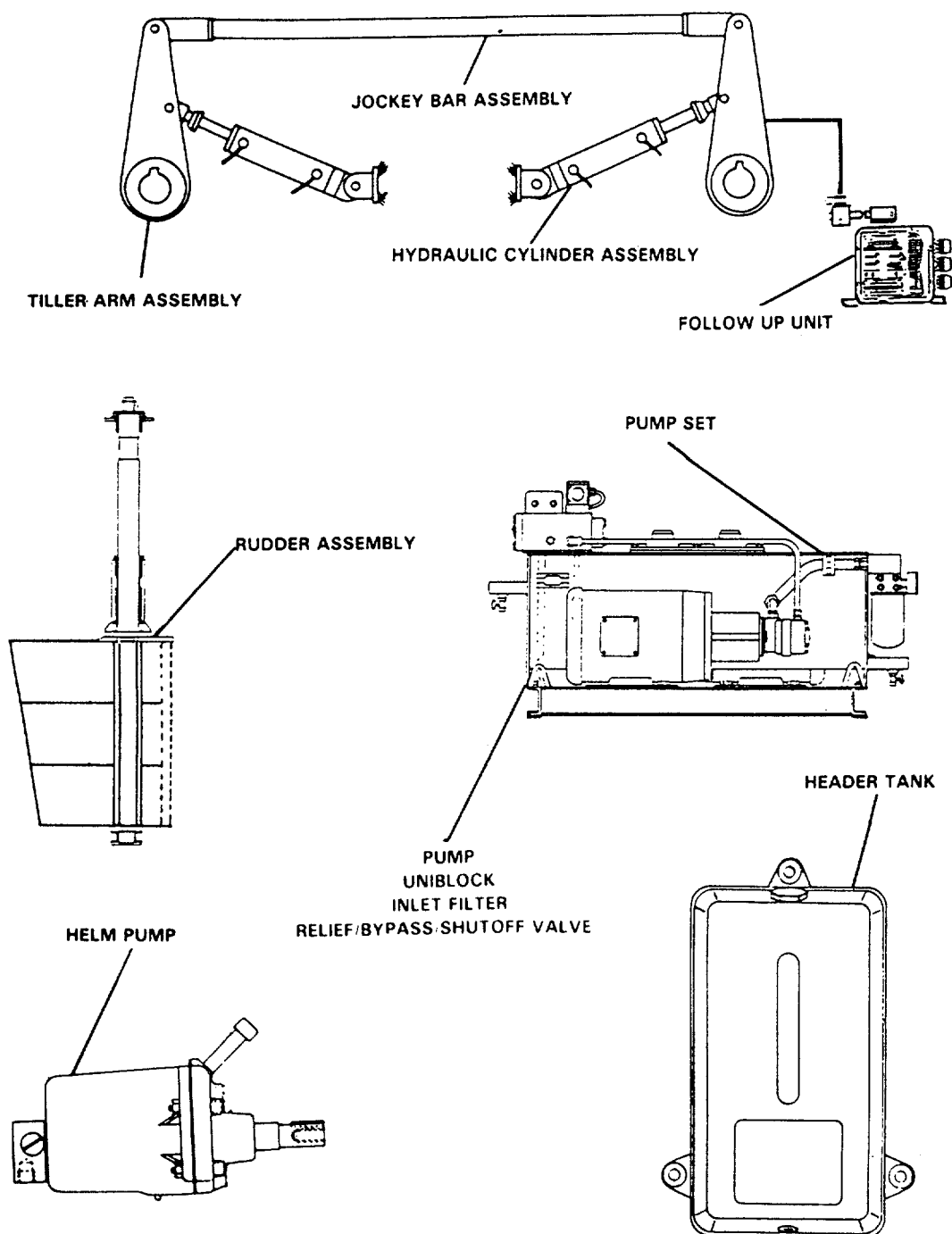


FIGURE 1-1. Electrohydraulic Steering Gear.

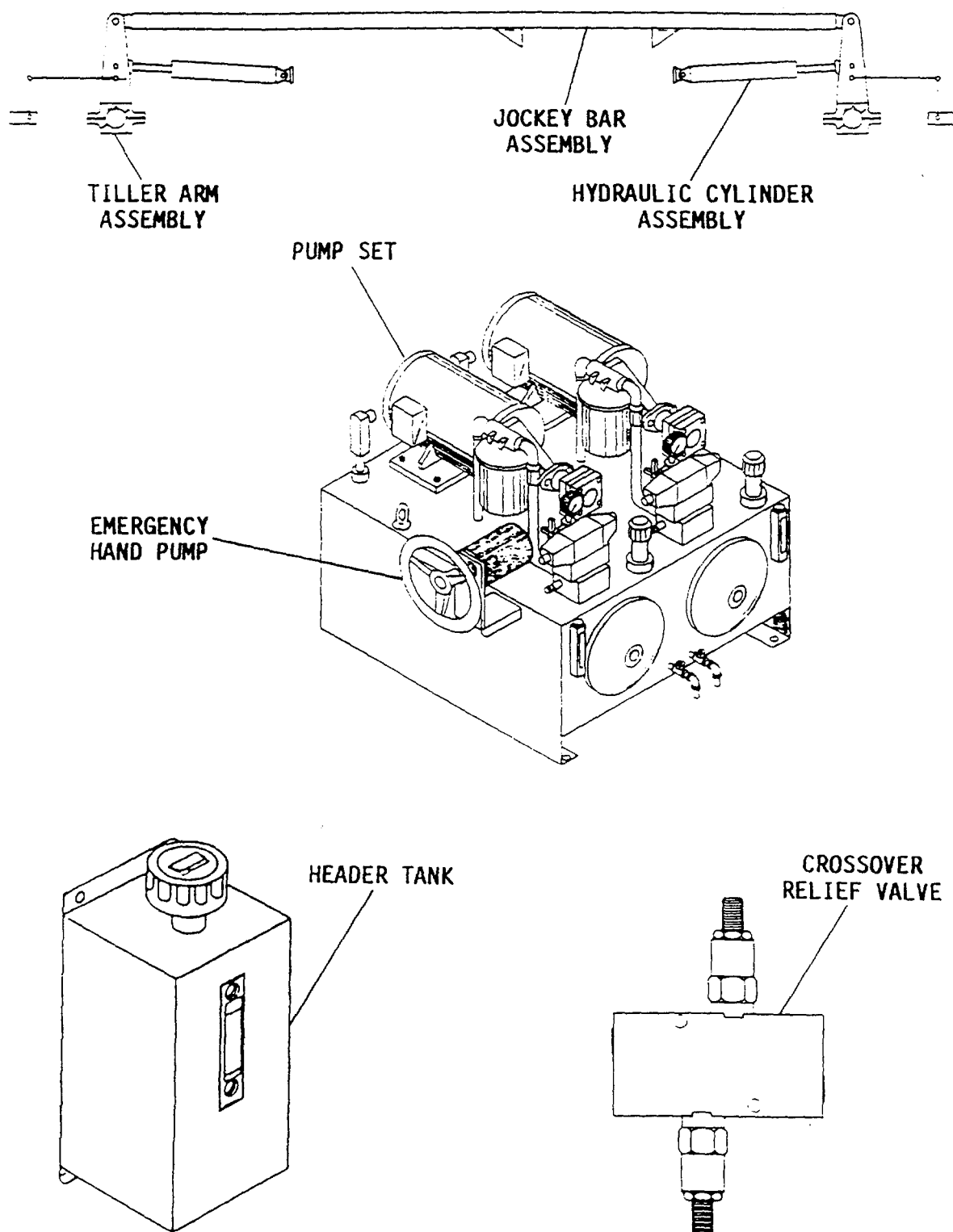


Figure 1-2. Electrohydraulic Steering Gear

Hulls 2008 and subsequent

Section II. EQUIPMENT DESCRIPTION AND DATA

1-6. **General Description.** The LCU 2000 Class Watercraft is equipped with twin propellers and rudders. The electrohydraulic system develops a total rudder torque of 1 3L ton-ft and is capable of rotating the rudders from 35 degrees right of center to 35 degrees left of center in 15 seconds. Steering gear hydraulic equipment includes a dual pumpset to generate hydraulic power, piping and hoses to transmit pressurized fluid, hydraulic cylinders to convert fluid energy into mechanical work, and valves to control and direct fluid flow. The system also includes filters and strainers for fluid conditioning, relief valves for overload protection, and reservoirs for fluid supply and heat dissipation. When steering signals from the pilothouse are interrupted, the steering gear room takes control by using one of the two local control units near the pumpsets. In the event of a power loss to the pumpset, an emergency hand pump is used for emergency steering. The steering gear equipment is shown in FIGURES 1-1 and 1-2.

1-7. **Characteristics, Capabilities and Features.** A very broad view of the steering gear hydraulic system is as follows:

a. Characteristics

- (1) Controls direction of vessel travel.
- (2) Provides hydraulic power for the rudder movement.
- (3) Controlled from pilothouse and/or steering gear room.

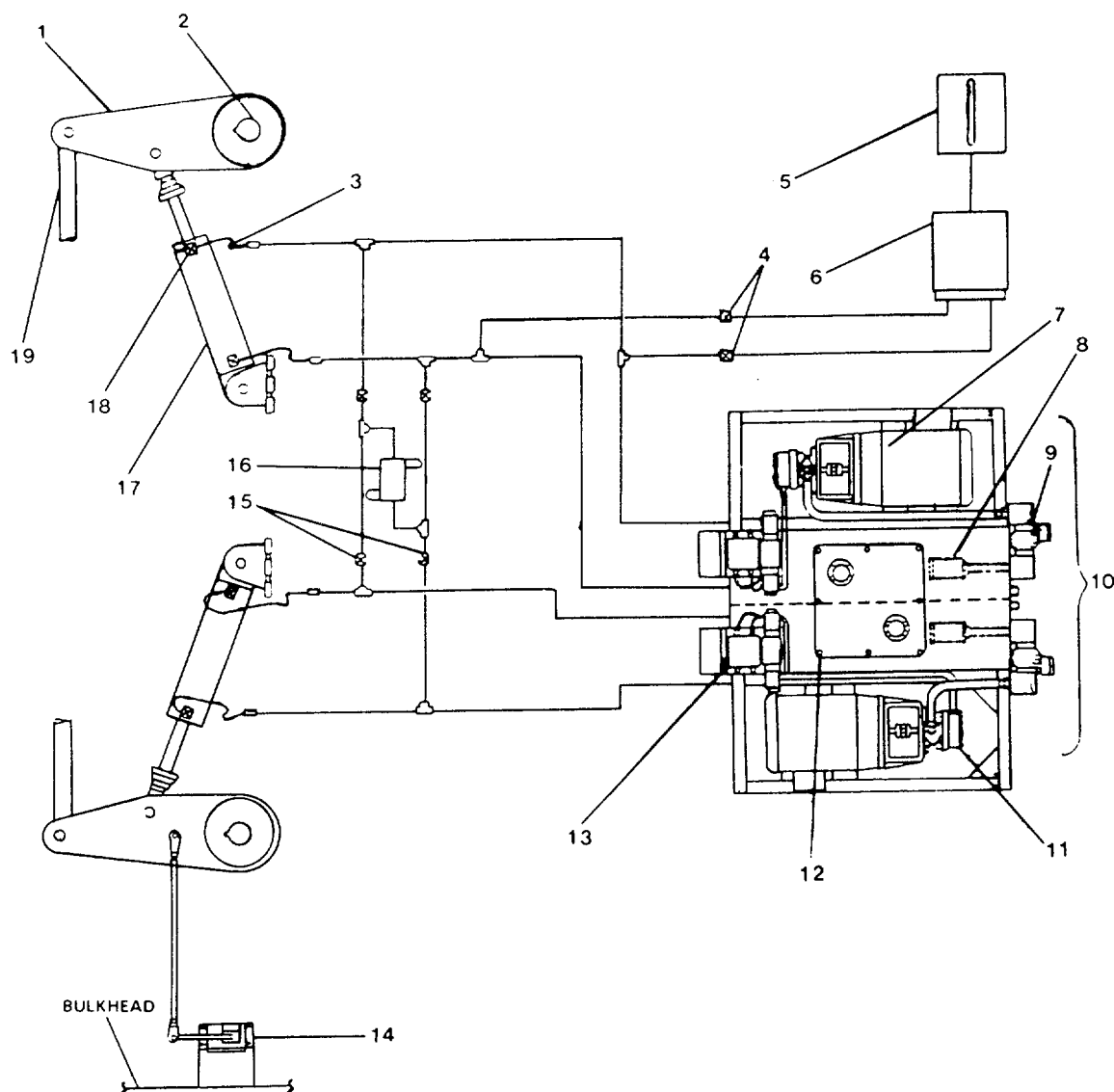
b. Capabilities and Features

- (1) Can operate with only one cylinder.
- (2) Emergency hand pump can replace twin pumpsets in emergency.
- (3) Relief valve setting lets rudder move if it hits something.

1-8. **Location and Description of Major Components.** The steering gear room houses the primary mechanical and electrohydraulic components that make up the steering gear. At the heart of the system is the twin pumpset, plus port and starboard hydraulic cylinders. The pumpset is secured to a deck foundation on the port side of the steering gear room aft of the rudder stocks. The hydraulic cylinders are installed inboard of each tiller arm. Steering gear controls are located in the pilothouse. See TM 55-1905-223-10 for more information on the steering gear controls. Components described in the following paragraphs are illustrated in FIGURES 1-3 and 1-4 except where noted.

a. Reservoir. The rectangular enclosure under the twin pumpset is the hydraulic fluid reservoir. This 60-gallon tank is internally divided into two separate 30-gallon tanks with separate but identical fill openings, 1 sight gauges, internal suction strainers, low level sensors (used on Hulls 2008 and subsequent).

b. Reservoir. The rectangular enclosure in the center of the twin pumpset is the hydraulic fluid reservoir. This 30-gallon tank is internally divided into two separate 15-gallon tanks with separate but identical fill openings, sight gauges, internal suction strainers, low level sensors, and porting blocks. The porting blocks include inlets, outlets, and drains. The quantity of oil for normal operations is 11 gallons in each tank. The sight gauges register FULL for these quantities. The unused tank space allows for air/oil expansion and pitch and roll slosh. The tank partition is fluid tight, but is not built to the full height of the tank.



LEGEND

- | | |
|-------------------------------------|---|
| 1. TILLER ARM | 11. VANE PUMP |
| 2. RUDDER POST | 12. RESERVOIR |
| 3. HYDRAULIC HOSE | 13. UNIBLOCK 2A MANIFOLD |
| 4. SHUTOFF VALVE | 14. FOLLOWUP TRANSMITTER |
| 5. HEADER TANK | 15. SHUTOFF VALVE |
| 6. HELM PUMP | 16. DOUBLE ACTING RELIEF/
BYPASS/SHUTOFF VALVE |
| 7. ELECTRIC MOTOR | 17. HYDRAULIC CYLINDER |
| 8. RESERVOIR INLET LINE
STRAINER | 18. SHUTOFF VALVE |
| 9. INLET FILTER | 19. JOCKEY BAR |
| 10. DUAL PUMPSET | |

Figure 1-3. Steering Gear (Hydraulic Piping) System.