

TECHNICAL MANUAL

UNIT, INTERMEDIATE DIRECT
SUPPORT
AND INTERMEDIATE GENERAL
SUPPORT
MAINTENANCE INSTRUCTIONSREVERSE OSMOSIS
WATERMAKER

FOR

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

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UNIT MAINTENANCE
INSTRUCTIONS

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INTERMEDIATE DIRECT SUPPORT
MAINTENANCE INSTRUCTIONS

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INTERMEDIATE GENERAL SUPPORT
MAINTENANCE INSTRUCTIONS

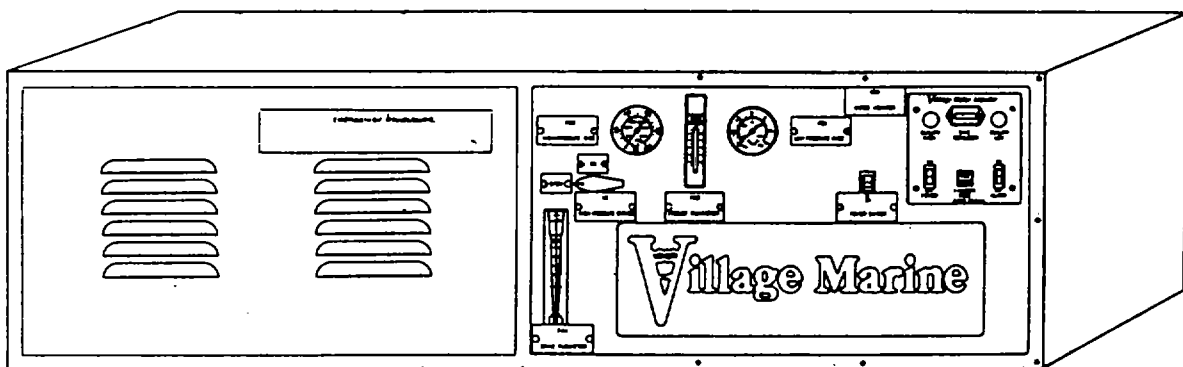
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HEADQUARTERS, DEPARTMENT OF THE ARMY

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 January 1989UNIT, INTERMEDIATE DIRECT SUPPORT, AND INTERMEDIATE GENERAL SUPPORT
MAINTENANCE INSTRUCTIONSREVERSE OSMOSIS WATERMAKER
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. Number and Equipment Name. The equipment covered by this manual is the Reverse Osmosis Watermaker Model PW800, installed aboard the LCU 2000 Class watercraft. See FIGURE 1-1 .
- c. Purpose of Equipment. The reverse osmosis desalinators convert seawater into drinking water.

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.** 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. Repacking of equipment for shipment or short term storage is covered in paragraph 2-30.

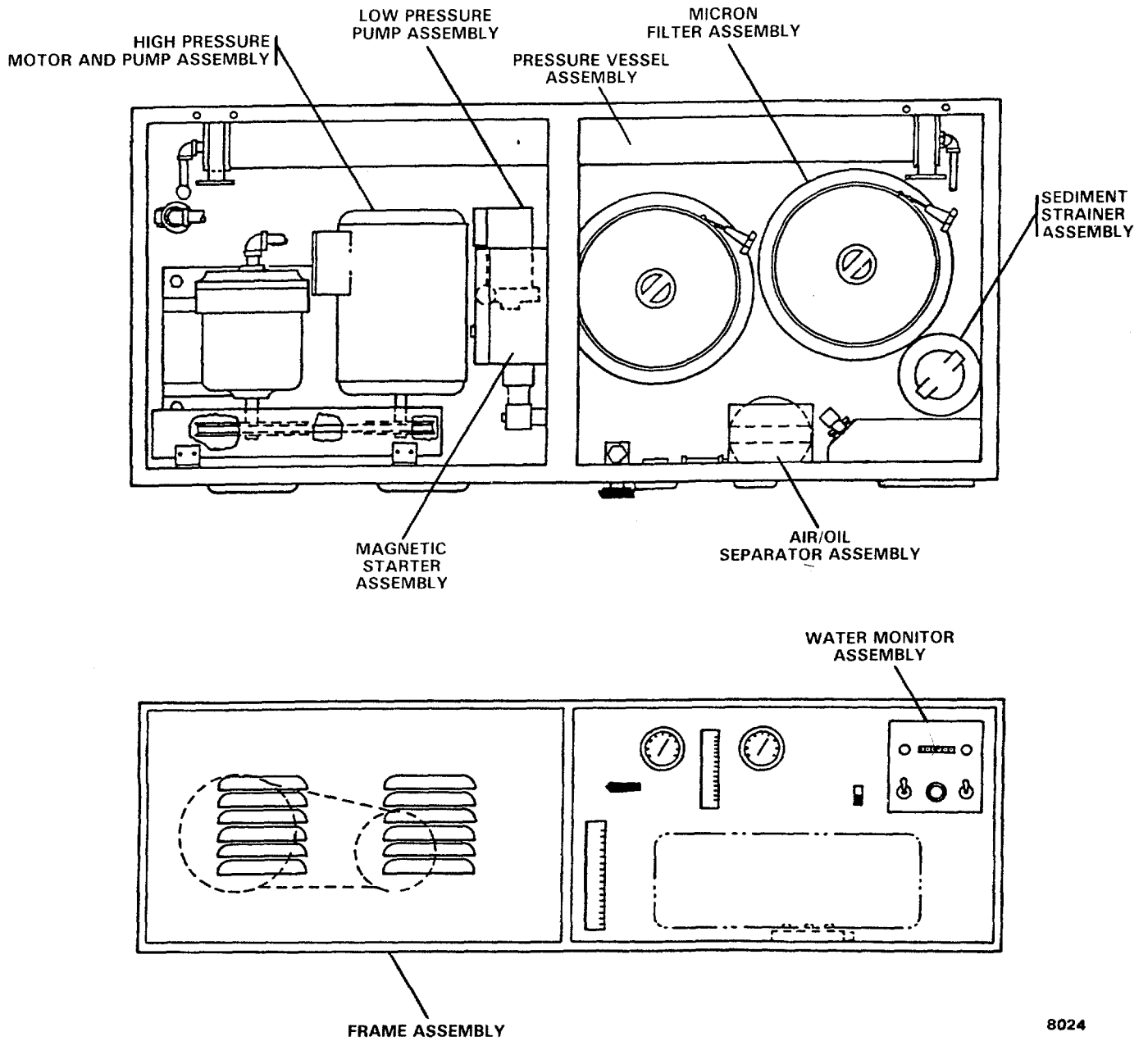


FIGURE 1-1. *Reverse Osmosis Watermaker - Model PW800.*

SECTION II. EQUIPMENT DESCRIPTION AND DATA

1-6. **General Description.** The Model PW800 Reverse Osmosis Watermaker (also referred to as the watermaker and the RO desalinator) is a single pass seawater purification system that operates on the principle of reverse osmosis to remove salt from seawater so that you may drink it. Fresh water produced by the watermaker is distributed to the following areas and systems: two storage tanks, sinks, wash basins, showers, galley, drinking fountains, washing machines, and water heater .

1-7. Characteristics, Capabilities, and Features.

a. Characteristics.

- (1) Removes salt from seawater.
- (2) Operates on the principle of reverse osmosis.

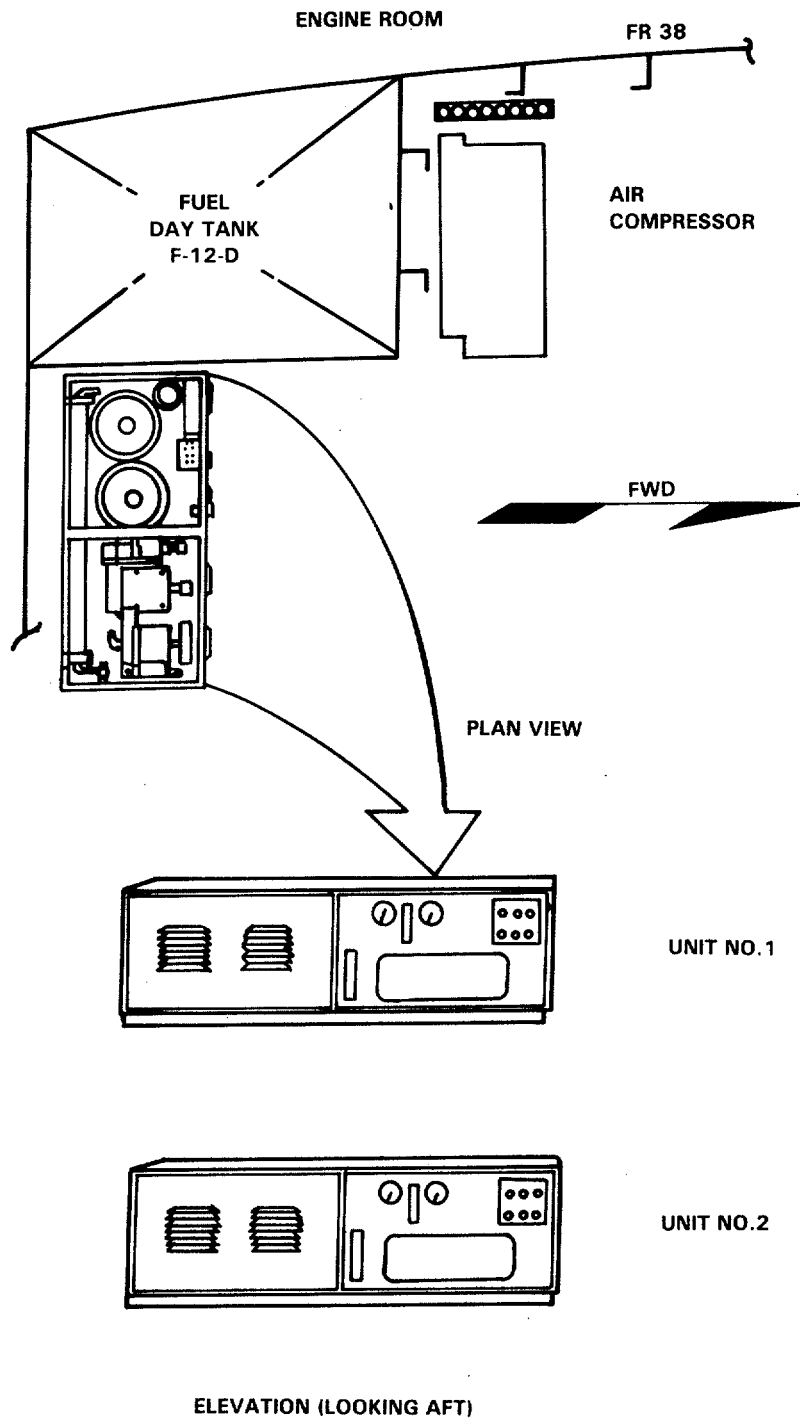
b. Capabilities and Features.

- (1) Can produce up to 800 gallons of fresh water per day
- (2) Rejects 98.6% of the salt in seawater.

1-8. **Location and Description of Major Components.** Two identical watermakers are located one over the other in the engine room on the port side aft (FIGURE 1-2). Piping systems provide seawater supply, overboard drainage for the brine output line, and fresh water piping for the transfer of the purified water output into the fresh water storage tanks located port and starboard just forward of the engine room. Nominal output of each single pass unit is 600 to 800 gallons per day. The RO desalinator consists of filters, pressure pumps, RO modules, interconnecting piping, and monitoring and control components. Component interconnections are shown in FIGURE 1-3. The filters remove air, oil, and foreign particles from the feedwater. Pressure pumps develop optimum pressures for filtration and desalination processing. Monitoring and control components test the salinity of the purified water and energize or deenergize the diverter valve to save or dump the water as appropriate. Other control components include on-off controls, valves, flow meters, and pressure gauges. Components are illustrated in FIGURE 1-4 and described in the following subparagraphs.

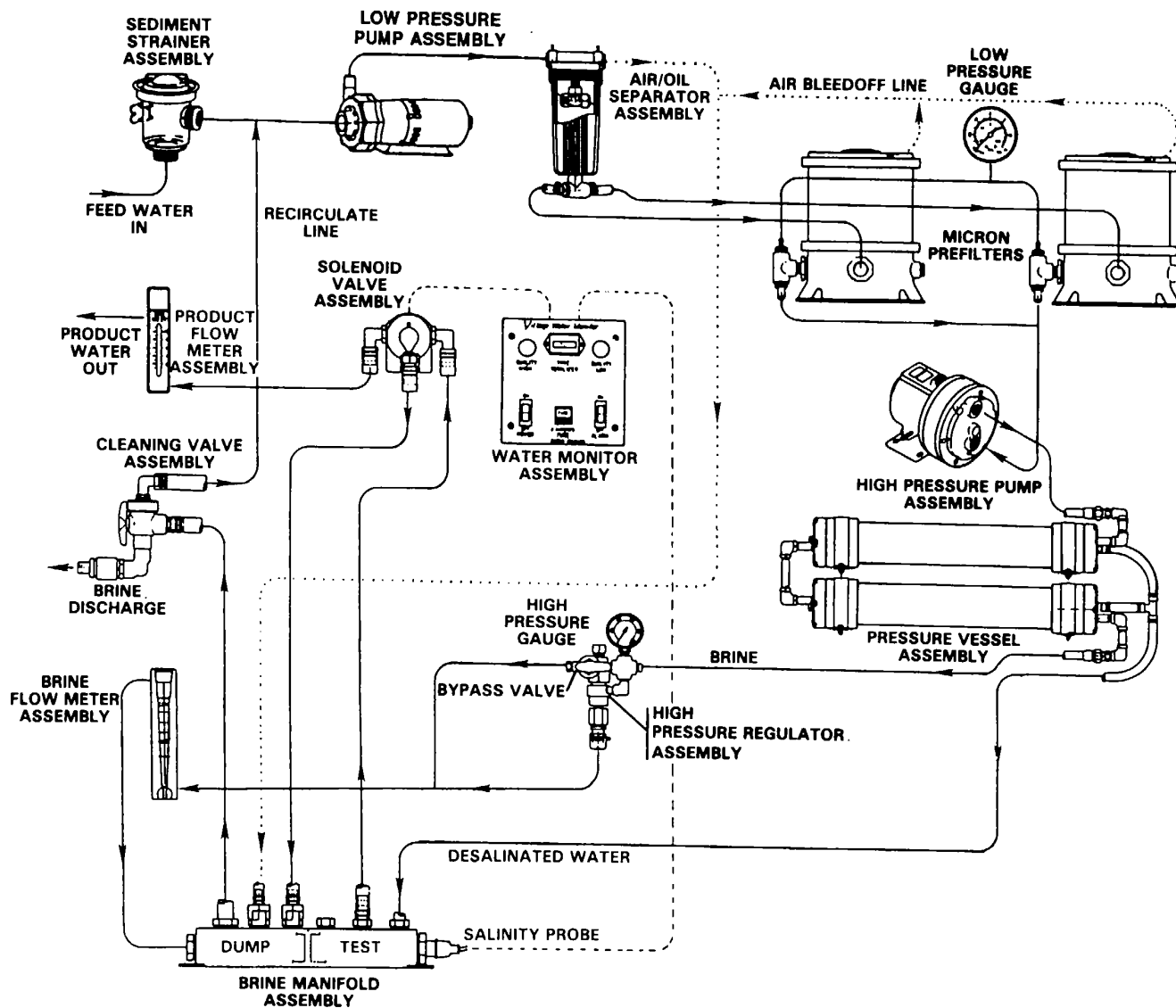
a. Cleaning Valve Assembly. The cleaning valve (1, FIGURE 1-4, Sheet 1) is a hand operated valve installed near the lower left end of the watermaker. The valve handle turns 180 degrees from OPERATE (down) to CLEAN (up). In the OPERATE position, input to the valve from the brine manifold goes into an overboard drain. In the CLEAN position, this input is recirculated through the watermaker.

b. Pressure Vessel Assembly. Mounted on a vertical rack just inside the back frame of the watermaker are two interconnected RO modules (2, FIGURE 1-4, Sheet 1). Each module consists of the pressure vessel and the internal seawater membrane element (FIGURE 1-5). The pressure vessel is a length of fiberglass reinforced tube strengthened at each end by a collar of increased diameter and fitted with bolted end plugs which incorporate inlet and outlet fittings and preformed packing seals. Inside the tube is the replaceable spiral-wound RO membrane element.



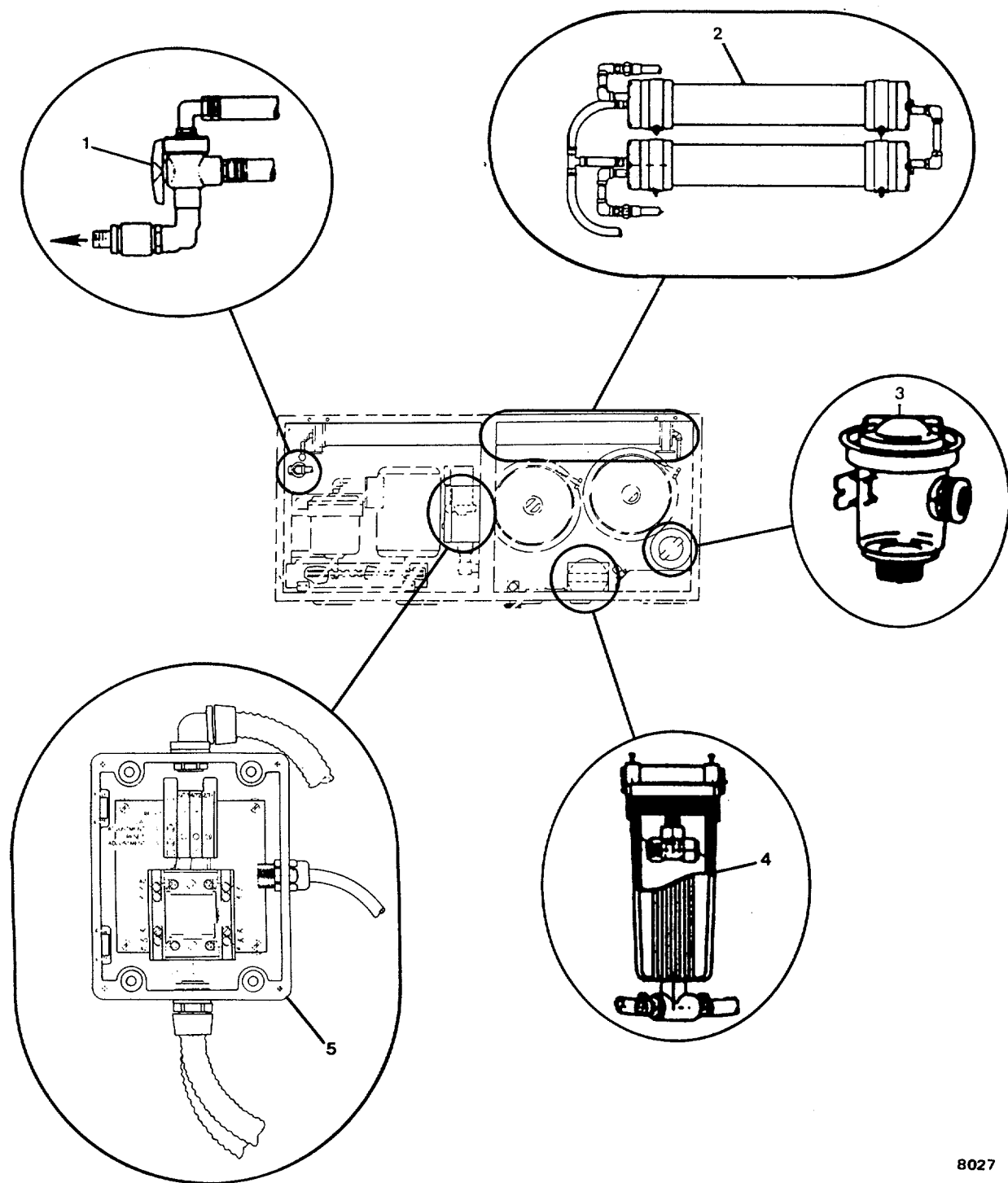
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FIGURE 1-2. Reverse Osmosis Watermaker System Location.



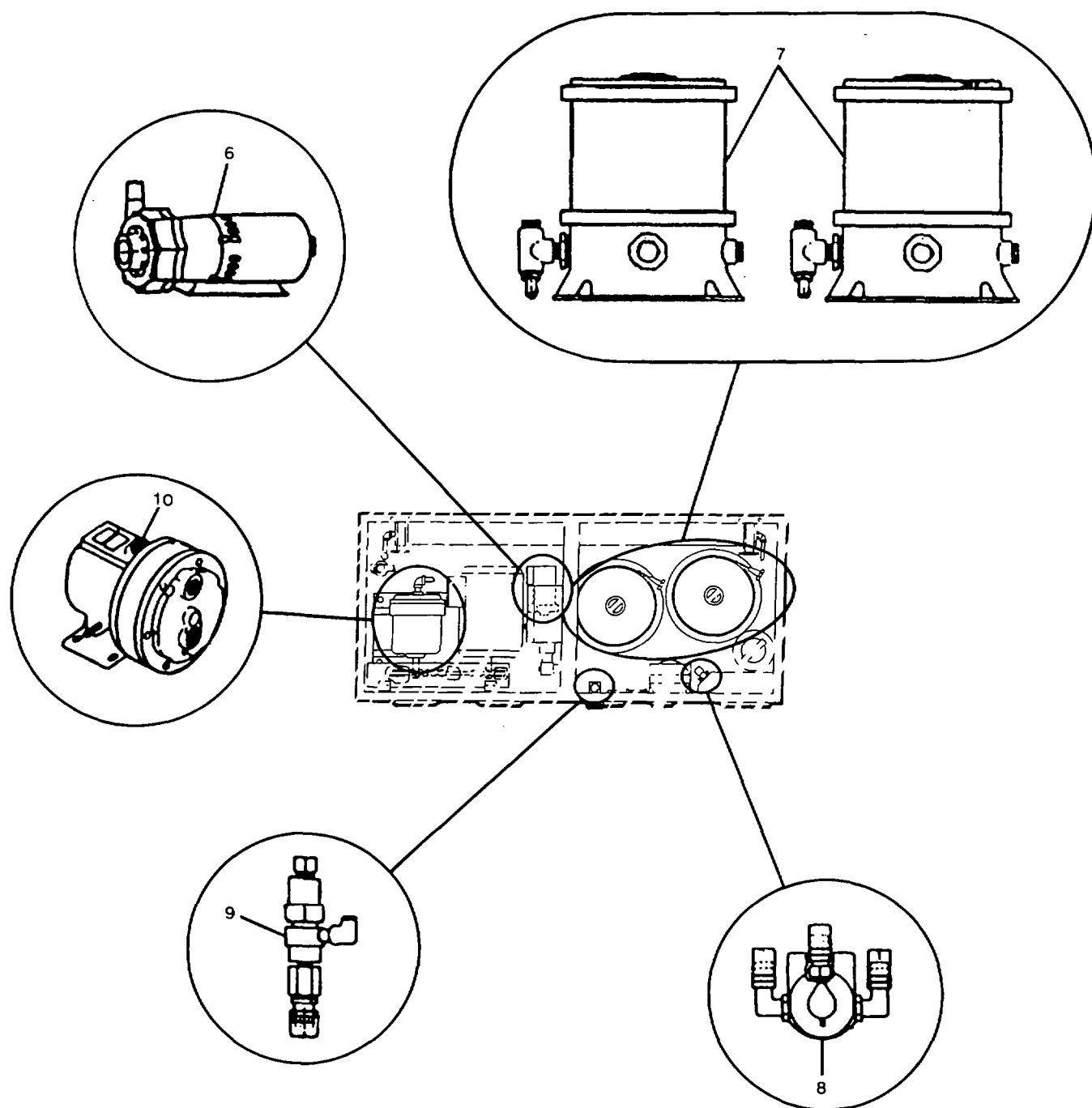
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FIGURE 1-3. RO Desalinator Flow Diagram.



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FIGURE 1-4. *Internal Components (Sheet 1 of 2).*



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FIGURE 1-4. *Internal Components (Sheet 2 of 2).*