

TECHNICAL MANUAL

OPERATOR'S AND UNIT
MAINTENANCE MANUAL

WATER PURIFICATION UNIT,
REVERSE OSMOSIS, 3,000 GPH
TRAILER MOUNTED, FLATBED CARGO,
22-1/2 TON 8 WHEEL TANDEM
MODEL NO. WTA-060
NSN 4610-01-219-8707

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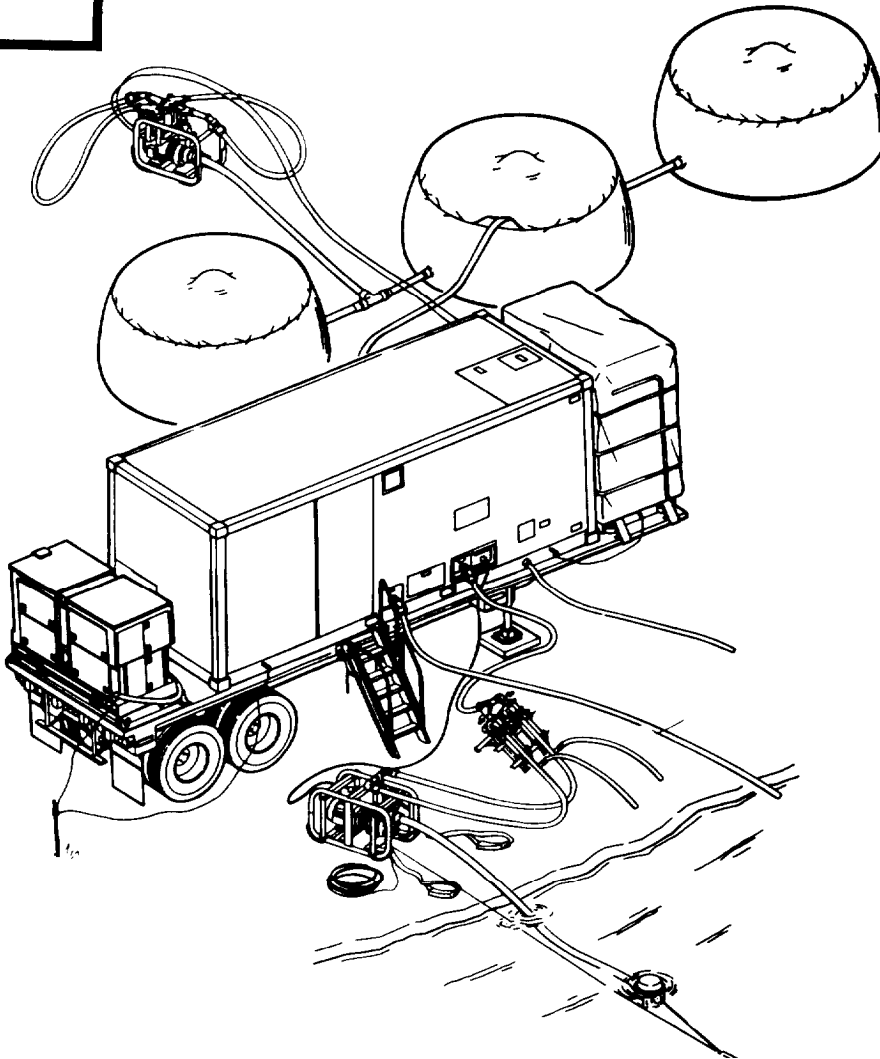


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HEADQUARTERS, DEPARTMENT OF THE ARMY
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22-1/2 TON 8 WHEEL TANDEM
MODEL NUMBER WTA-060, NSN 4610-01-219-8707
MODEL NUMBER ROWPU-1, NSN 4610-01-371-1790**

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CHAPTER 1. INTRODUCTION

SECTION I. GENERAL INFORMATION.

1-1. SCOPE.

- a. *Type of Manual.* Operator and Unit Maintenance Manual.
- b. *Model Number and Equipment Name.* Reverse Osmosis Water Purification Unit, referred to from now on in this manual as the ROWPU. Two models are covered by this manual; Model WTA-060 as manufactured by Aqua-Chem., Inc., and Model ROWPU-1 as manufactured by Keco Industries, Inc. When any portion of this manual refers to only one of these models, the statement "(MODEL WTA-060 ONLY)" OR "(MODEL ROWPU-1 ONLY) " will be placed immediately after the applicable sentence. If no reference is made to only one model, then that portion of the manual applies to both models.
- c. *Purpose of the Equipment.* Purifies water from many different sources to make potable (drinkable) water. Can purify:
 - (1) Dirty fresh water.
 - (2) Brackish water (dirty and a little salty).
 - (3) Sea water (very salty).
 - (4) Fresh water containing nuclear, biological, or chemical (NBC) agents.
- d. *Special Limitations on Equipment*
 - (1) Operates in temperatures between -25°F and 110°F (-32°C and 43°C).
 - (2) Winterization kit must be used if operating temperature is below 32°F (0°C).
 - (3) RO elements may be ruined if they are allowed to freeze.
 - (4) Temperatures of the source water cannot be greater than 110°F (43°C).
 - (5) The amount of water produced depends on the temperature of water being purified.
 - (6) Must be hauled by M818 or M932 tractors.
 - (7) Side-to-side slope of the ROWPU cannot be more than 2 degrees, end-to-end slope cannot be greater than 5 degrees. Greater slopes could cause unit to tip over.

1-2. MAINTENANCE FORMS AND RECORDS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs). If your ROWPU needs improvement let us know. Send us an EIR. You, the user, are the only one who can tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it directly to Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP-WT, Rock Island, IL 61299-7630. We'll send a reply. ■

1-4. WARRANTY INFORMATION. Refer to TB 10-4610-232-24 for the warranty on Model ROWPU-1. Report all defects in material or workmanship to your supervisor.

1-5. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. Command decisions, according to tactical decision, will decide when destruction of the ROWPU will take place. A destruction plan will be prepared by the using organization, unless one has been prepared by higher authority. For general destruction procedures for this equipment, refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

1-6. PREPARATION FOR STORAGE OR SHIPMENT. Refer to Chapter 4, Section VI of this manual for preparation for storage or shipment instructions.

1-7. QUALITY ASSURANCE/QUALITY CONTROL. Refer to quality assurance/quality control specification MIL-9858A for quality assurance/quality control information.

1-8. SAFETY, CARE AND HANDLING. Always keep in mind the general CAUTIONS and WARNINGS, listed on the warning page at the front of this manual and the specific CAUTIONS and WARNINGS given with procedures throughout this manual and as data plates and decals on the ROWPU.

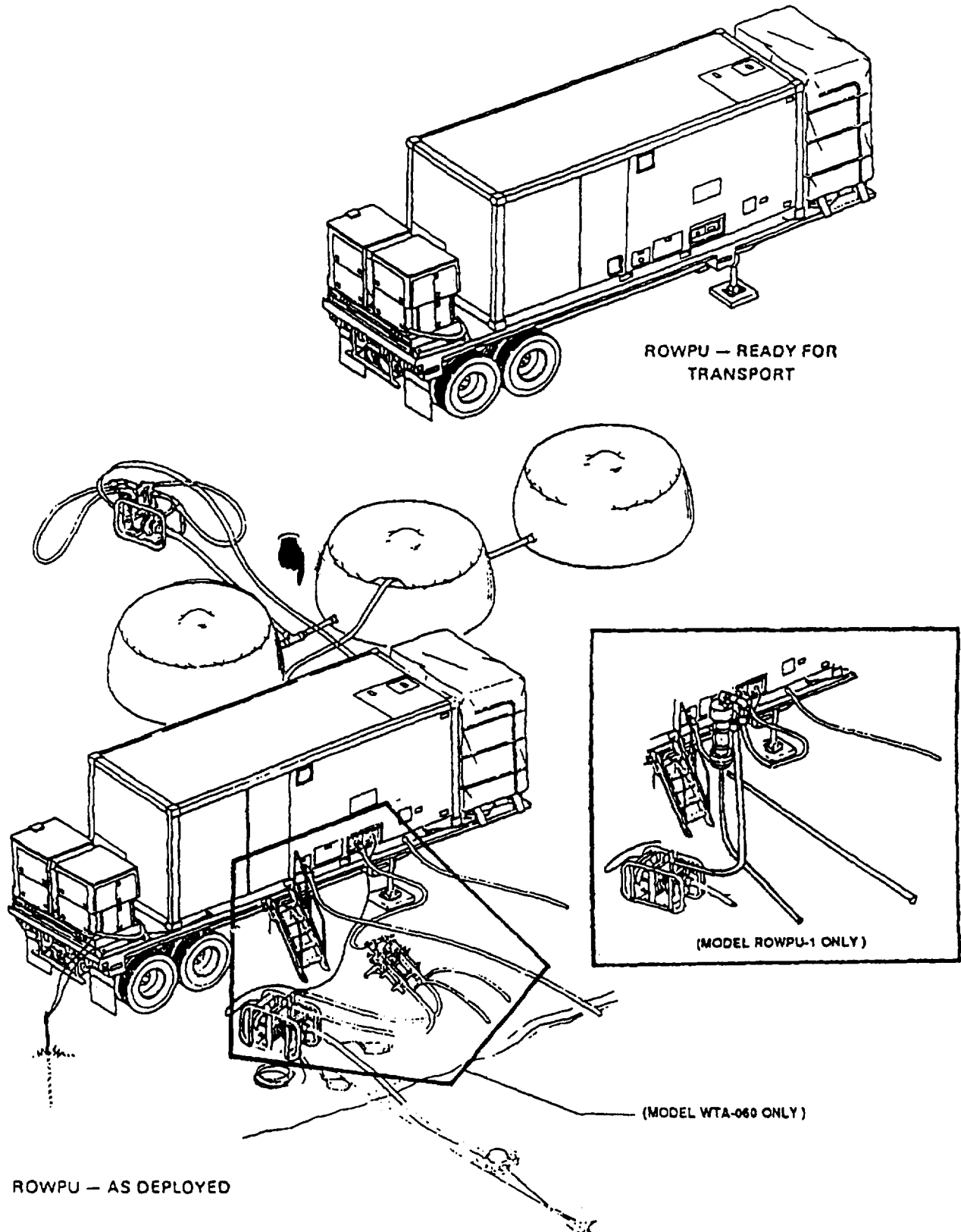


Figure 1-1. 3000 Gallons Per Hour Reverse Osmosis Water Purification Unit

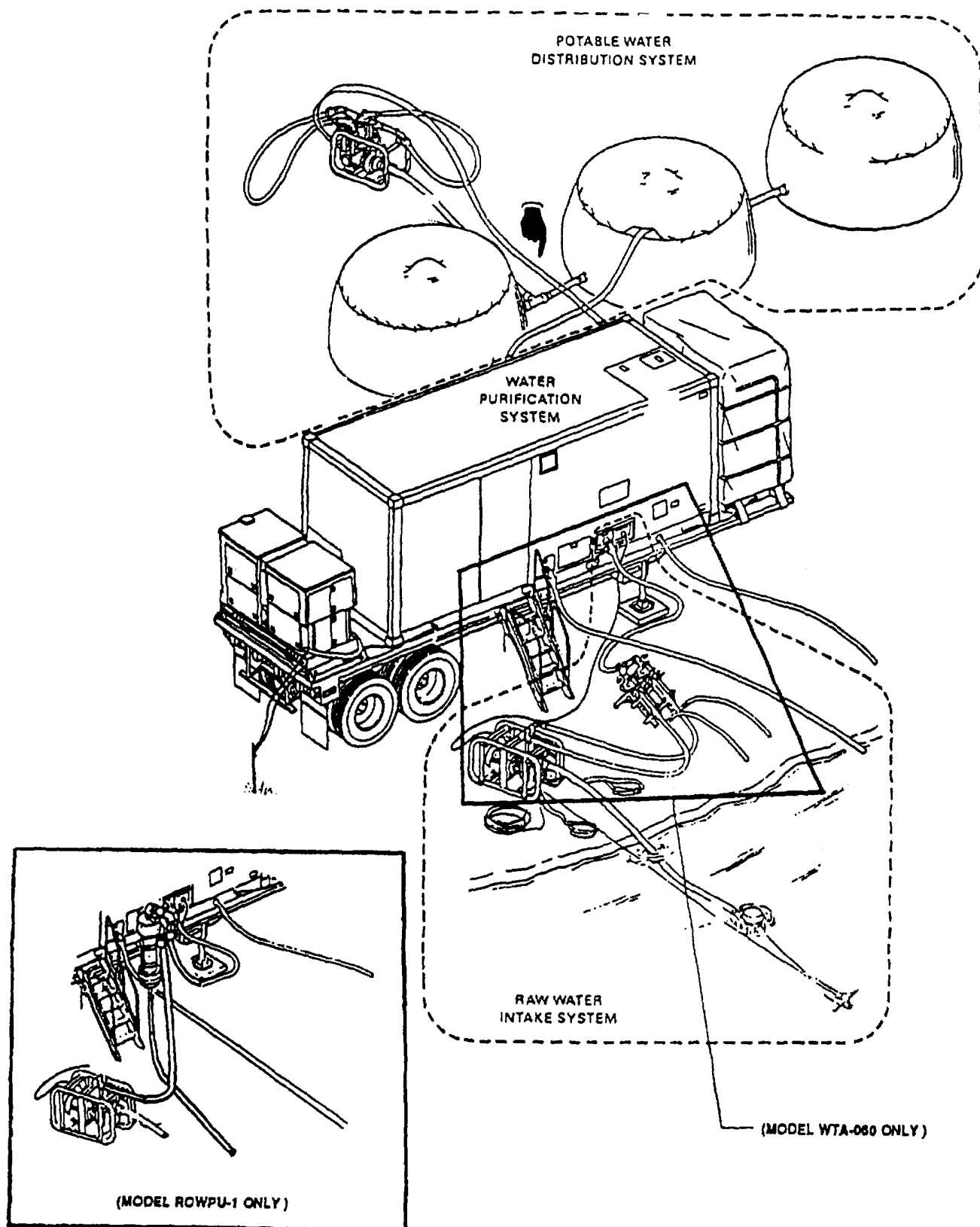


Figure 1-2. Major Systems of the ROWPU

SECTION II. EQUIPMENT DESCRIPTION.

1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES.

a. *Characteristics.*

- (1) Contained in a special 8 x 8 x 20 ft (2.4 x 2.4 x 6.1 m) ISO (International Standards Organization) container with skid mounted external components.
- (2) The ROWPU can be shipped by military aircraft.
- (3) The ROWPU is mounted on a standard 30 ft (9.5 m) M871 military trailer so it can be moved to where it is needed.
- (4) The ROWPU is powered by a 60 KW utility diesel generator.

b. *Capabilities and Features.*

- (1) The ROWPU can supply 60,000 gallons daily from fresh waters or brackish waters 75°F (24°C) and over. Less water is produced from colder water sources.
- (2) The ROWPU can supply 40,000 gallons daily from sea water 75°F (24°C) and over.
- (3) The ROWPU can supply 60,000 gallons daily from NBC contaminated fresh waters 75°F (24°C) and over.
- (4) The ROWPU produces potable water to long term consumption standards of purity.
- (5) It can handle raw water turbidity to 150 NTU.
- (6) On an NBC decontamination mission, raw water containing up to 10 ppm CW agent, or one million microorganism colonies per 100 ml, or 100,000 pCi/l (picoCuries per liter) radioactivity can all be made potable.
- (7) Raw water can be taken from wells, lakes, seas, lagoons, rivers, or through an ice hole. The raw water pump can lift water about 15 feet (4.5 m) and discharge up to a height of 30 feet (9 m) at 110 gpm (416 lpm).
- (8) The winter kit allows the unit to be operated at a water point where air temperatures are between -25 and 32°F (-32 and 0°C) and water temperatures are above 32°F (0°C).
- (9) The ROWPU is set up and operated by a 3 person crew (one of whom is an NCO). Operation is semi-automatic.

1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. The ROWPU is made up of three main systems as shown in Figure 1-2. The major components of each system are described in the following paragraphs.

NOTE

The electrical power source for operation of the ROWPU is provided by a 60 KW utility Diesel Generator. See TM 5-6115-545-12 for information about the generator. If equipped with tactical quiet generator, see TM 9-6115-645-10.

a. *Raw Water Intake System (Figure 1-3).* The Raw Water Intake System supplies feed water to the ROWPU and consists of the following major components.

- (1) *Intake Strainer.* A floating intake strainer holds the raw water intake hose off the bottom of the water source and screens out leaves, sticks, fish, and other large objects. It is connected by sections of rigid suction hose to the raw water pump. A non-floating strainer (part of winterization kit) is used for ice hole operation.
- (2) *Anchor.* Used to deploy the intake strainer and hold it in place.
- (3) *Raw Water Pump.* Draws water through the intake strainer and discharges the water to the cyclone separators. A hand priming pump is used to assist initial prime to the water pump.
- (4) *Cyclone Separators.* Remove sand and heavy dirt by centrifugal water flow action. Raw water discharge hose sections deliver the water from separators to the water purification system at the feed water booster pump inlet.
- (5) *Priming Assist Pump.* This hand operated pump is used to help draw water up to the raw water pump. It is disconnected from raw water pump after priming is completed.

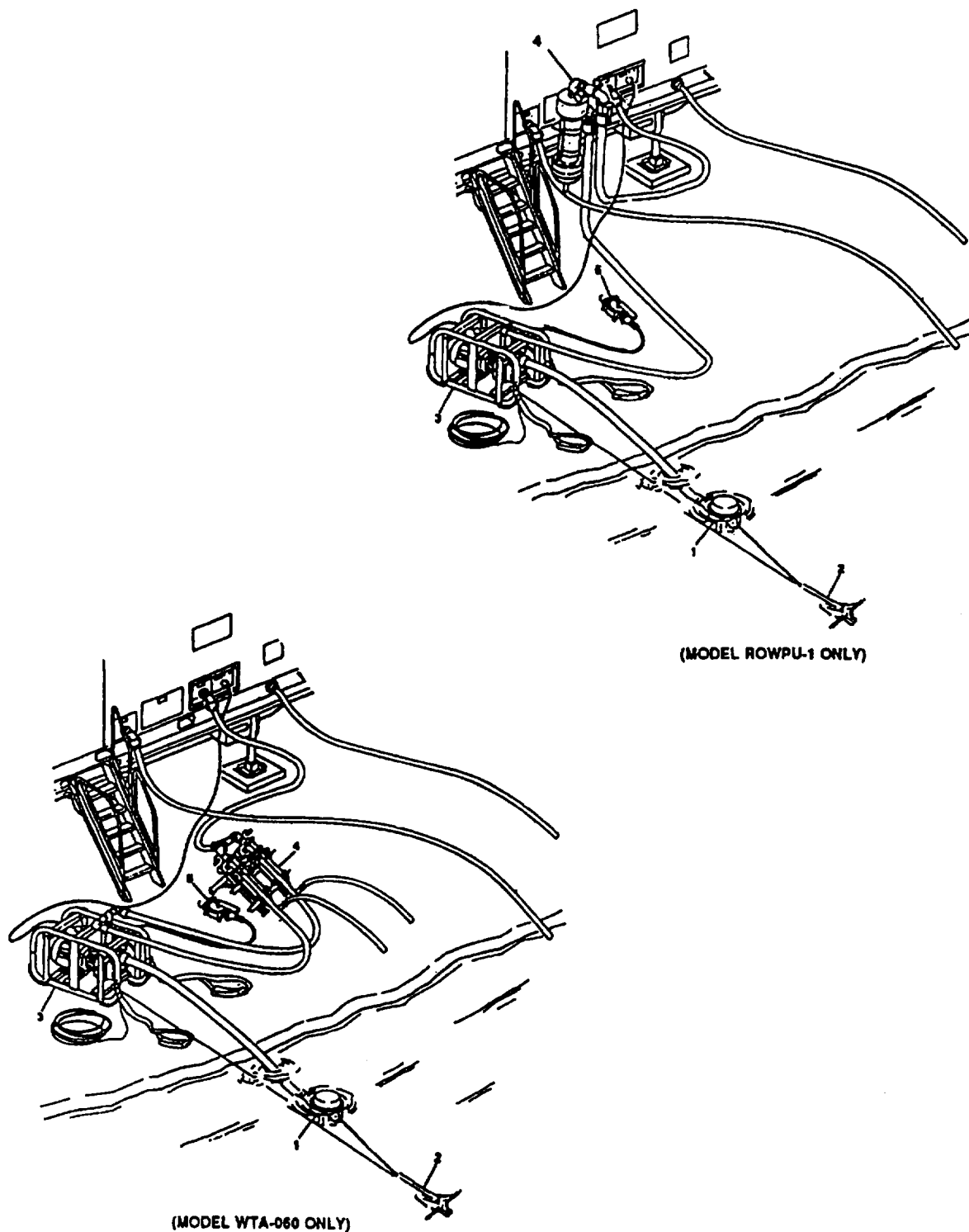


Figure 1-3. Major Components of the Raw Water Intake System

b. *Water Purification System (Figure 1-4).* This system purifies the raw water to make potable water suitable for drinking.

- (1) The components of the Water Purification System are contained in the ISO container (van) (1) and the separate high pressure pump assembly (2).
- (2) The Water Purification System consists of the following major components and appropriate piping and valves, monitoring devices, and semi-automatic controls.
 - (a) *Feed Water Booster Pump (3).* Pressurizes water from the raw water system as needed for the filtration processes. It is a 115 gpm (435 lpm) pump and requires 35-40 psig (241-276 kPa) to operate.
 - (b) *Basket Strainer (4).* Removes remaining large particles in the water to prevent clogging of the internal distributors of the media filter.

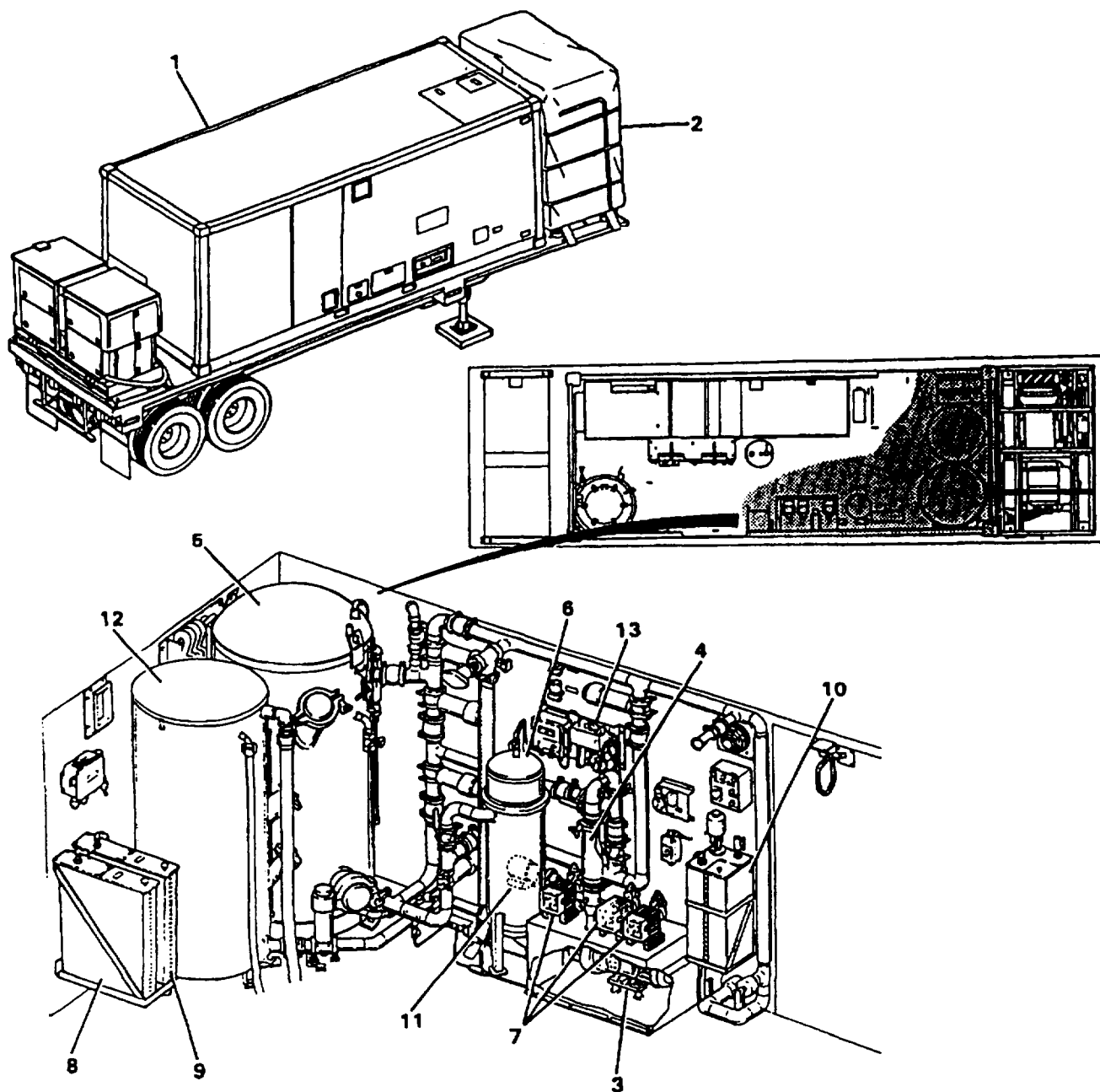


Figure 1-4. Major Components of the Water Purification System (Sheet 1 of 4)
(MODEL WTA-060 ONLY)