DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL

MAINTENANCE MANUAL

WATER PRETREATMENT,

DECONTAMINATION SET

FSN 4610-880-0288

This copy Is a reprint which Includes current pages from Changes 1 through 3.

HEADQUARTERS, DEPARTMENT OF THE ARMY
MARCH 1972

WARNING

DANGEROUS CHEMICALS

See that chemicals are available and protective clothing and mask are worn. Keep chemical containers tightly closed and covered with a tarpaulin if in an exposed location

Do not mix dry calcium hypochlorite and activated carbon together. They react violently with possible fire or explosion.

WARNING

CHEMICAL AND BIOLOGICAL CONTAMINATES

Do not drink or smell suspected contaminated water. Avoid wetting skin with contaminated water to prevent possible absorption of chemical and biological materials through the skin.

Waste sludge and diatomite filter backwash slurry could contain chemical and biological warfare agents in concentrated form. Discharge these wastes away from operating area. Under peacetime controlled conditions waste concentrate should be buried or drummed and hauled to an approved disposal facility. Under warfare conditions waste concentrate can be lagooned or directed downstream to obtain dilution.

All water initially contaminated with Lewisite should be recycled as described in paragraph 2-4 *d.* When the distribution pump and hose line are used to recycle water that is not approved for drinking, the next tank or approved water should be pumped to waste for two minutes to flush pump and hose line before being distributed for drinking water.

After operation, decontamination of the Water Pretreatment Decontamination Set is accomplished as follows: Obtain 300 gallons of finished water from the Water Purification Unit. Add 3 3/4 pounds of calcium hypochlorite (100 ppm available chlorine) to the finished water. Circulate this water through the equipment including pumps, hoses, and tank for a period of one hour. Drain all equipment.

Change No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC. *25 April 1974*

Operator and Organizational Maintenance Manual

WATER PRETREATMENT DECONTAMINATION SET

(C & B AGENTS, TRAILER MOUNTED)

FSN 4610-880-0278

TM 5-4610-207-12, 24 March 1972, is changed as follows:
The title is changed as shown above:

Warning Page. Fourth line from bottom of Warning, "300-gallons" is changed to read "3000-gallons"
Page 15. Figure 1-3 is superseded.

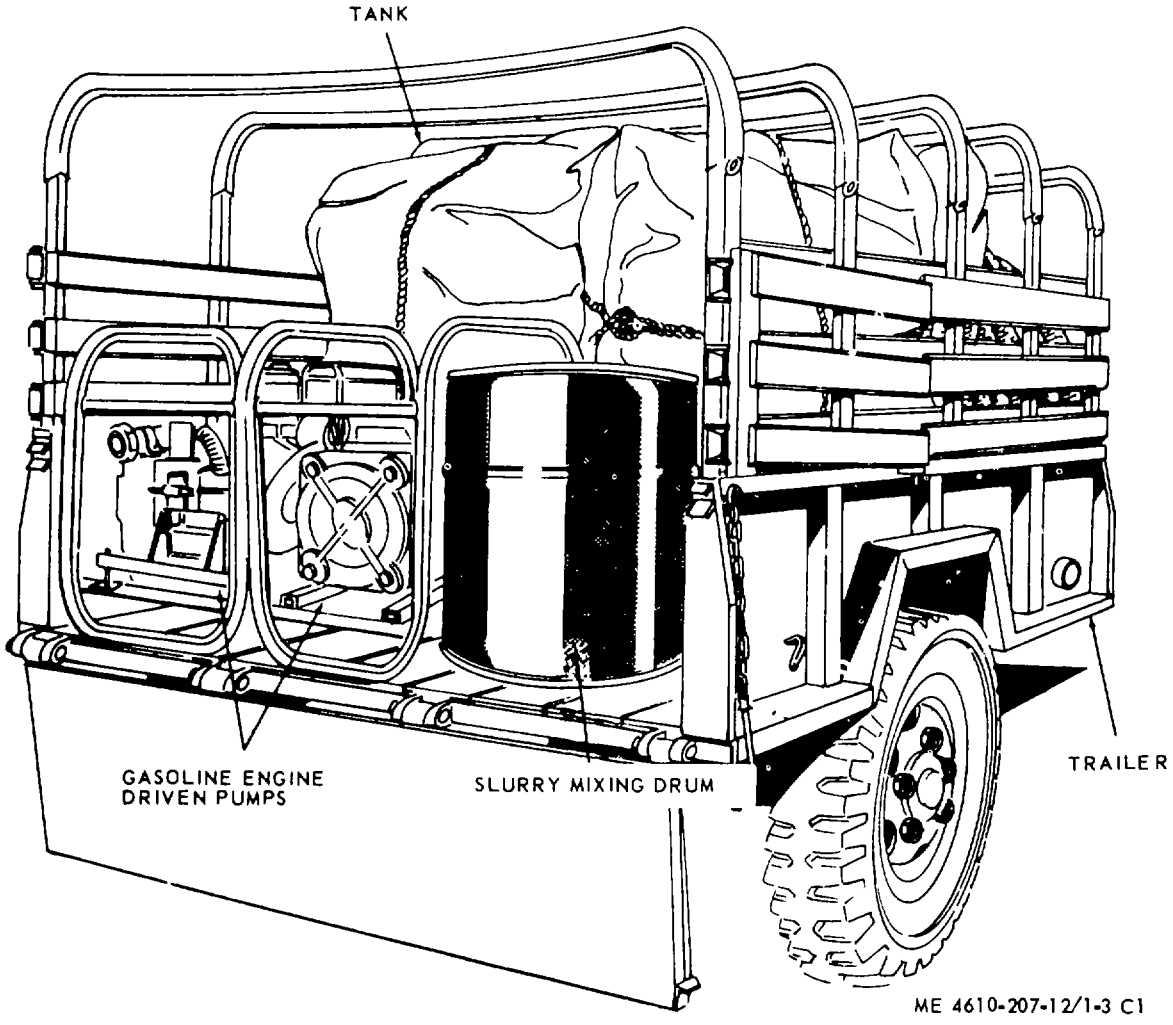
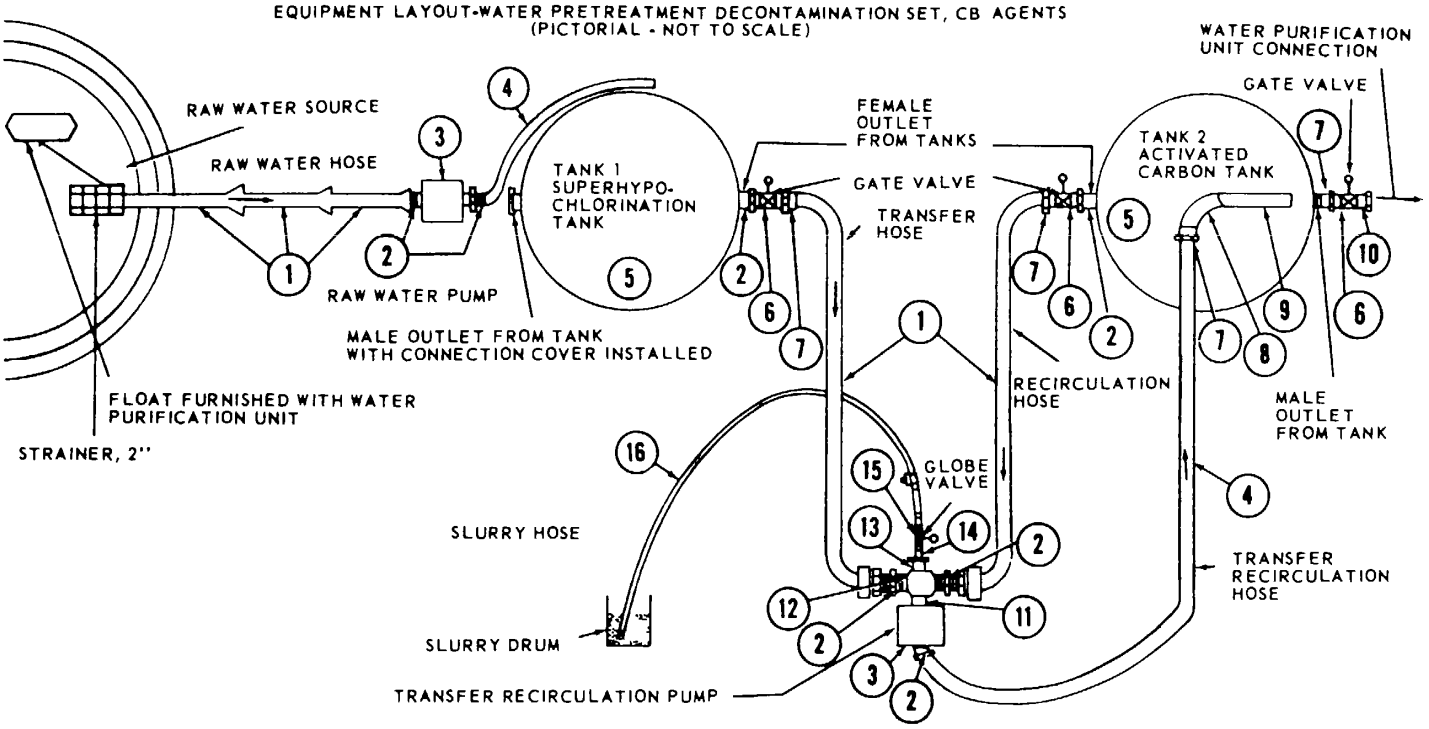


Figure 1.3. Trailer, rear, loaded (without cover)

Page 1.5. Paragraph 1-6d, line 6 is changed to read "for a detailed list of special chemical materials".

Page 2-2. Figure 2-1 is superseded.



1. HOSE, 2-INCH, RUBBER, 10 FT LONG
2. ADAPTER, 2-INCH, MALE HOSE TO MALE PIPE
3. PUMP, 100 GPM, GED
4. HOSE, 2-INCH, COTTON, 25 FT LONG
5. TANK, 3000 GALLON
6. VALVE, GATE, 2-INCH
7. ADAPTER, 2-INCH, FEMALE HOSE TO MALE PIPE
8. ELBOW, 2-INCH
9. PIPE, 2-INCH, 5 FOOT LENGTH
10. ADAPTER, 2-INCH MALE PIPE TO 1-1/2-INCH FEMALE HOSE
11. NIPPLE, 2-INCH, 4 INCHES LONG
12. CROSS, 2-INCH
13. BUSHING, REDUCING, 2-INCH TO 1/4 INCH
14. NIPPLE, 1/4 INCH, 2-INCH LONG
15. VALVE, GLOBE, 1/4 INCH
16. HOSE, PLASTIC, 1/2 INCH ID, 6 FT LONG, WITH HOSE CLAMP

Figure 2-1. Control valve schematic.

Page 2-3. Paragraph 2-3c(11), lines 3 and 4 are changed to read "slurry enters the process stream at a reasonable uniform rate during the transfer. Close slurry valve when mixing drum is empty.
Page 2-5. Paragraph 2-3c(16), line 4, correct spelling of "continued" to "continue".
Page 3-1. Table 3-1, item 2, line 2, add: "Tighten leaking valves and fittings and replace leaking hoses with serviceable ones."
Page 3-2. Table 3-3, Item 1, step 2, line 2 add: "(para 42(10))".
Table 3.3, item 1, step 3, line 2, add: " (para 4-2(11))".
Table 3-3, item 3, step 1, line 2, add: "(para 4-2)".
Page 3-3. Table 3-4, add the following set components. FSN 5120-223-7397; PLIERS, SLIP-JOINT; STRAIGHT NOSE, W/CUTTERS, 8 IN. LG; EA; 1. FSN 5120-234-8910; SCREWDRIVER, FLAT TIP; 6 IN LG.; EA, 1 FSN 6135-050-3280; BATTERY, DRY, SINGLE VOLTAGE, TYPE BR-200/U; EA; 1.
Page 4-3 Paragraph 4-2c(6) is superseded:

(6) Assemble the upper and lower support tubes by sliding the smaller (inner) tubes inside the larger (outer) tubes (fig. 4-2).

Page 4-5 Paragraph 4-2c(9)(*c*) and (*d*) are superseded:

(c) Screw a 5-foot length of 2-inch outlet pipe to the elbow.

(d) Attach elbow to center of upper support with hose clamp and position the tube on tank 2 with 2-inch outlet pipe in down position.
Page 4-8. Paragraph 4-2*c*(12), line 1, insert figure reference "(fig. 4-5)" after the word "float". Delete figure reference from line 4.
Page 4-10. Paragraph 4-2*c*(20), line 1, add figure reference "(fig. 2-2)" after the word "adapter".
Paragraph 4-2c(24), line 3, add figure reference "(6 and 7, fig. 2-1)" at end of sentence.
Paragraph 4-2c(25)(a), line 3, add figure reference "(10, fig. 2-1)" after the words "tank 2".
Paragraph 4-2c(26), line 1, add figure reference "(fig. 4-7)" after the word "cover".
Page 4-11. Figure 4-8, in the legend, item 9, "ACCESSORY MIXING DRUM" is changed to read "SLURRY MIXING DRUM"
Page A-1. Paragraph A7, line item 3, "TM 740-97-1" is changed to read "TM 740-90-1" Administrative Storage of Equipment.
Page B-2. Section 2, column 2, the heading is changed from "Functional Group" to read" Assembly Group"

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United State Army
The Adjutant Genera

Distribution:

To be distributed in accordance with DA Form 18, (qty rqr block No. 510) Organizational maintenance requirement for Decontamination Equipment.

Changes In Force: C 1 and C 2

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGITON, D.C, *28 November 1974*

Operator's and Organizational Maintenance Manual

WATER PRETREATMENT DECONTAMINATION SET
(C & B AGENTS, TRAILER MOUNTED)
FSN 46104880-0278

TM 5-4610-207-12, 24 March 1974, is changed as follows:

Inside Front Cover. Add the following to the list of safety precautions:

CAUTION
WATER PURIFICATION EQUIPMINT SET TURN-IN

Opened or broken packages of chemicals (i.e, ferric-chloride and calcium hypochlorite) are highly caustic and can have deleterious effect, during extended periods of storage, on the interior surface of the van body and its components.

When turning in a Water Purification Equipment Set as unserviceable or excess, the following actions will be taken.:

All partially consumed or opened chemicals will be utilized and/or destroyed locally.

All unopened chemicals will be individually packaged and will not be stored for shipment inside of the water purification unit van body.

By Order of the Secretary of the Army:

FRED C WEYAND
General United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25A (qty rqr block No. 177) Operator's maintenance requirements for Water Purification.

Change, In force: C 1, C 2 and C 3

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *29 August 1975*

Operator and Organizautonal Maintenance Manual
WATER PRETREATMENT DECONTAMINATION SET
(C & B AGENTS, TRAILER MOUNTED)
NSN 4610-0880278

TM -4610-207-12, 24 March 1972, is changed as follows:

The title is changed as shown above.

NOTE

All "Federal Stock Numbers" appearing in this publication should be corrected to the new "National Stock Numbers" before using. This can be done by inserting 00- after the Federal Stock Class. For example, Federal Stock Number 6115-937-0929 will be corrected to the following National Stock Number: 6115-00-937-0929. Whenever the words "Federal Stock Number" appear throughout the publication, correct to read "National Stock Number."

Page 2 of cover. Add the following warnings:

WARNING

Operation of this equipment presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Wear ear muffs or ear plugs which were fitted by a trained professional.

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Use in a well-ventilated area as the fumes are dangerous if inhaled. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 F.-138F. (38 C.-59 C.).

Page 1-1. Paragraph 1-3 is superseded as follows:

1-3. Reporting of Errors

You can improve this manual by recommending improvements using DA Form 2028 (Recommended Changes to Publications and Blank Forms), and DA Form 20282 (Recommended Changes to Equipment Technical Manuals) located in the back of the manual and mail, the forms direct to Commander: US Army Troop Support Command, ATTN: AMSTSMPP, 4300 Goodfellow Boulevard, St. Louis, Missouri 63120. A reply will be furnished direct to you.

Page 2-3. paragraph 23*c*(1). Add the following warning:

WARNING
Dangerous Chemicals

Do not mix dry calcium hypochlorite and activated carbon together. They react violently with possible fire or explosion.

Paragraph 23*c*(11) is superseded as follows:

(11) As the transfer is being made, open 1/4 inch slurry valve (fig. 2-2) so that all the carbon slurry enters the process stream at a reasonable uniform rate during the transfer. Close slurry valve when mixing drum is empty. Close the slurry valve when the tank is empty.

Page 3-3, table 3-4, line 3A. Add the following:

6135040503280	BATTERY, DRY Single Voltage, MILB-18/34 Type BA-200/V	EA	1

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

VERNE L BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25A, (qty rqr block No. 509) Operator maintenance requirements for Decontamination Equipment.

TECHNICAL MANUAL 1
No. 5-4610-207-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *24 March 1972*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

WATER PRETREATMENT, DECONTAMINATION SET

FSN 4610-880-0278

LIST OF ILLUSTRATIONS

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual is for your use in operating and maintaining the water pretreatment decontamination set It provides information on the operation and maintenance of the equipment.

b. Appendix A contains a list of publications applicable to this manual. Appendix B contains the Maintenance Allocation Chart.

1-2. Maintenance Forms and Records

Maintenance forms and records that you are required to use are explained in TM 38-750.

1-3. Reporting of Errors

You can improve this manual by calling attention to errors and by recommending improvements, using DA Form 2028 (Recommended Changes to Publications) or by a letter, and mail directly to Commanding General, U.S. Army Mobility Equipment Command, ATTN: AMSME-MPP, St. Louis, Mo. 63120.

1-4. Equipment Serviceability Criteria IESC)

This equipment is not covered by an ESC.

1-5. Destruction of Army Material to Prevent Enemy Use

a. General

(1) When capture or abandonment of the water pretreatment decontamination set is imminent, the responsible unit commander must make the decision either to destroy the equipment or render it inoperative. Based on this decision, (orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy all vital parts of the equipment and all corresponding repair parts

(2) Refer to TM 750-244-3 for information covering the destruction of Army material to prevent enemy use.

b. *Demolition by Mechanical Means.* Cut the water tanks and hoses in many places. Smash the valves and strainer.

c. Scattering and Concealment. Remove the valves from the hose lines Scatter these parts through dense foliage, bury them in dirt or sand, or throw them into a lake, stream, well, or other body of water

d. Burning. Disconnect hoses and stack around the tanks. Pack rags, clothing, or canvas around the tank Saturate this packing with gasoline, oil, or diesel fuel and Ignite.

e. Submersion. Submerge valves, fittings, and tank supports in body of water to provide water damage and concealment. Salt water does greater damage to metal parts than fresh water

f. Training. All operators should receive thorough training in the destruction of the water pretreatment decontamination set. Simulated destruction, using all the above listed methods, should be included in the operator training program. It must be emphasized in training that demolition operations are usually necessitated by critical situations when time available for destruction is limited. For this reason, it is necessary that the operators be thoroughly familiar with all methods of destruction and be able to carry out demolition instructions without reference to this or any other manual.

Section II. DESCRIPTION AND DATA

1-6. Description

a. Standard water purification unit, sizes 420, 600, 1500, and 3000 gph (gallons per hour) are for purification of ordinary water. This is accomplished by coagulation with ferric chloride and limestone, disinfection with calcium hypochlorite and filtration through diatomite. These units are effective against most known biological materials used in connection with germ warfare. An example of an exception may be bacterial spores. The water purification process is not designed or intended for the removal or destruction of chemical agents, although small amounts of certain agents would be removed It is essential, therefore, that CW-BW (chemical warfare-biological warfare) agents be destroyed by

a pretreatment process before the water is put through the water purification unit.

b. The water pretreatment decontamination set (fig. 1-1, 1-2, and 1-3), hereafter referred to as the water decontamination set, is used ahead of the water purification units for the destruction or removal of agents associated with chemical-biological warfare. It consists of two 3000 gallon collapsible, synthetic rubber coated, nylon tanks. two 125 gpm (gallons per minute) gasoline engine driven water pumps, mixing drum and paddle, rubber pail, hoses, fittings, valves and chemicals.

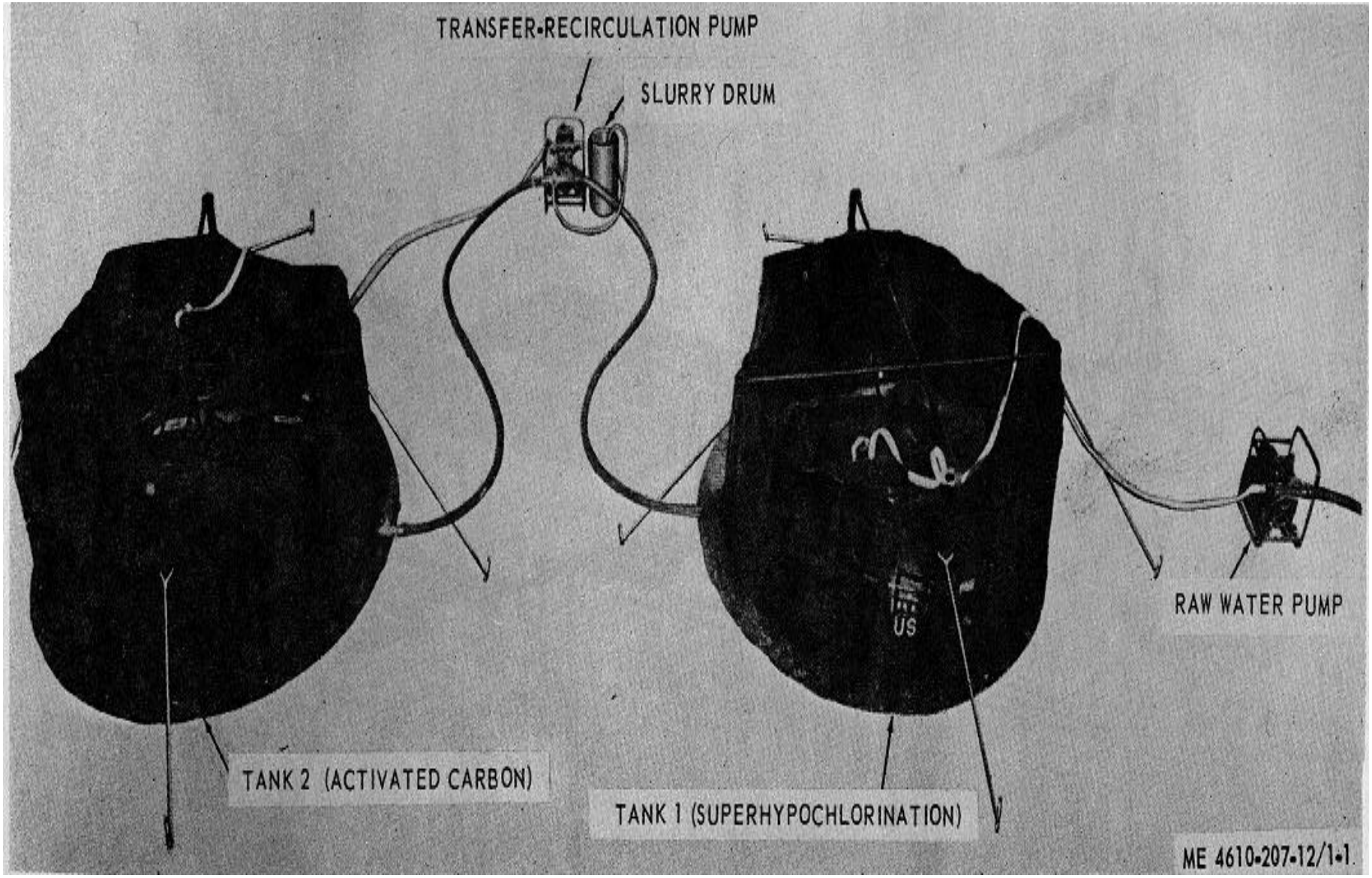


Figure 1-1. Tanks, hoses, and pumps, physical arrangement

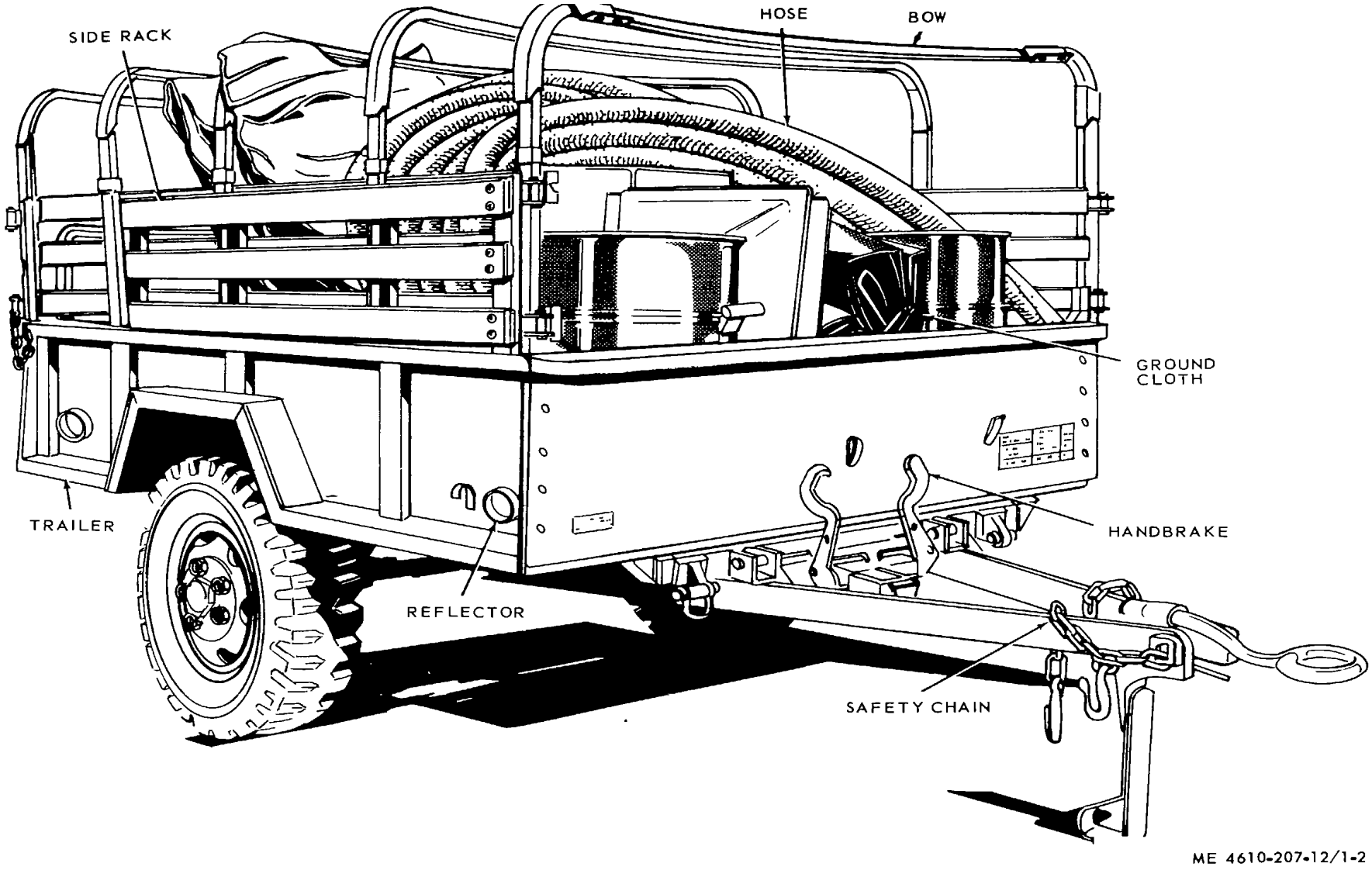


Figure 1-2. Trailer, front loaded (without cover)

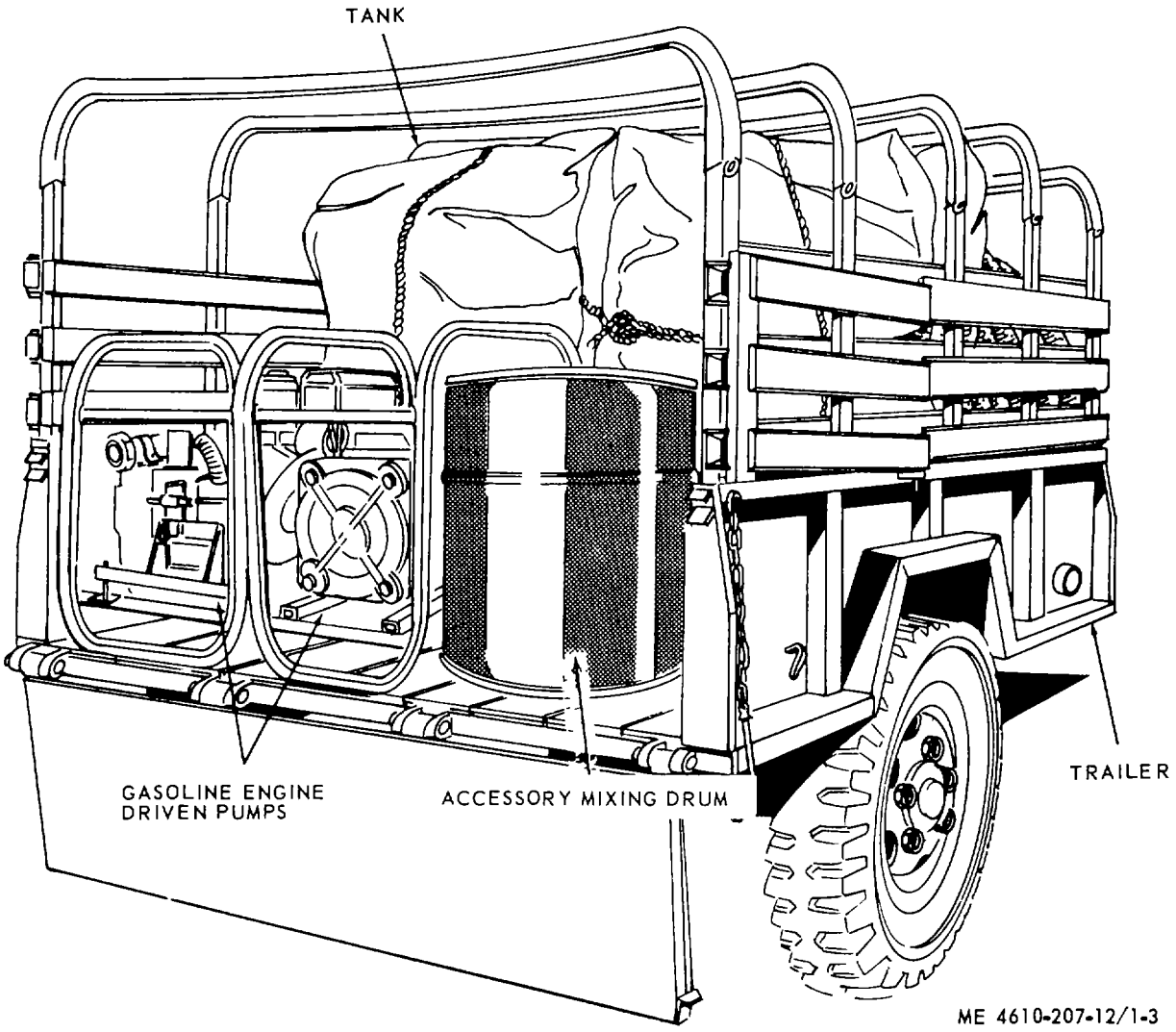


Figure 1-3. Trailer, rear, loaded (without cover).

c. The use of the water decontamination set is determined only by higher authority when intelligence reports indicate the suspected use of chemical warfare. Water analysis testing and screening kits AN-M2 and ABC-M30-A1 are used for determining if chemical contaminants are present in the raw water supply.

d. Nerve agents, arsenicals, blood agents, toxins, incapacitating agent and biological, including exceptional chlorine-resistant types, are the agents employed that contaminate water and for which this type of equipment is required. Refer to table 1-1 for a detailed list of special biological materials that are employed for this type of warfare.

Table 1-1. Significant CW Agent Water Contaminants

Group	Symbol	Agent
Nerve Agents	GA	Tabum
	GB	Sarin
	GD	Soman
	VX	
Arsenical	L	Lewisite
Blood Gases	AC	Hydrogen Cyanide
	CK	Cyanogen Chloride
Incapacitating Agent	BZ	

e. The cater decontamination set is transported in a 3/4 ton, 2 wheel trailer that has rough terrain ,and air transport mobility. Under normal conditions it can le manually unloaded from the

trailer and erected by two men in approximately one hour, and can be disassembled and loaded in approximately one hour.

f. Individual components that make up the set are items currently in the military supply system.

1-7. Tabulated Data

There are identification plates on three components of the water decontamination set. The pump data plate is located on the frame beneath the pump. The engine data plate is located on the engine flywheel cover, and a combination name plate is located on the front panel of the trailer. Refer to table 1-2 for data on these plates.

Table 1-2. Tabulated Data

Tanks, Fabric, Collapsible	
Manufacturer	Military Standard
Capacity	3000 gallons
Diameter	135 inches
Height	54 inches
Model number	T-14398
Federal stock number	5430-355-4486
Pump, Centrifugal	
Manufacturer	Military Standard
Capacity	125 gpm at 50 ft. head
Connections	2 in threaded inlet and outlet
Model number	P-52109, Class 1
Federal stock number	4320-542-3347
Engine, Gasoline	
Manufacturer	Military Standard
Horsepower	3 at 3600 rpm
Cycle	4
Model number	2A016-I and 2A016-II
Trailer Cargo, Army Model M1A1	
Manufacturer	Military Standard
Capacity	3/4 ton
Inside dimensions	66 in wide, 18 in high
Model number	T-10579, Type I
Federal stock number	2330-898-6779

CHAPTER 2
OPERATING INSTRUCTIONS

WARNING

If equipment fails to operate, refer to troubleshooting procedures in Chapter 3.

Section I. OPERATING PROCEDURES

2-1. General

a. The instructions in this section are published for the information and guidance of personnel responsible for operation of the water pretreatment decontamination set.

b. The operator must know how to perform every operation of which the set is capable. This section gives instructions on starting and stopping the set, and on coordinating the basic motions to perform the specific tasks for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

c. Operation of the water purification unit is normal except as noted below.

(1) When the water decontamination set is used ahead of the water purification unit, the water containing 600 ppm (parts per million) of carbon is easier to coagulate than raw water carbon. The activated carbon is a coagulant aid and the normal ferric chloride dosage can be reduced. Satisfactory coagulation can frequently be obtained with ferric chloride dosages of 10 ppm.

(2) Calcium hypochlorite is added to the water in the storage tank in the amount required to provide the free chlorine residual prescribed by the area surgeon. The storage tank must be clean and free from activated carbon to permit effective post chlorination.

d. The processing steps for handling CW-BW contaminated raw water is as follows:

(1) Pretreatment.

(a) Superhypochlorination with 100 ppm calcium hypochlorite.

b Activated carbon treatment with 600 ppm activated carbon.

(2) Water purification treatment.

(a) Coagulation with ferric chloride and limestone.

(b) Diatomite filtration.

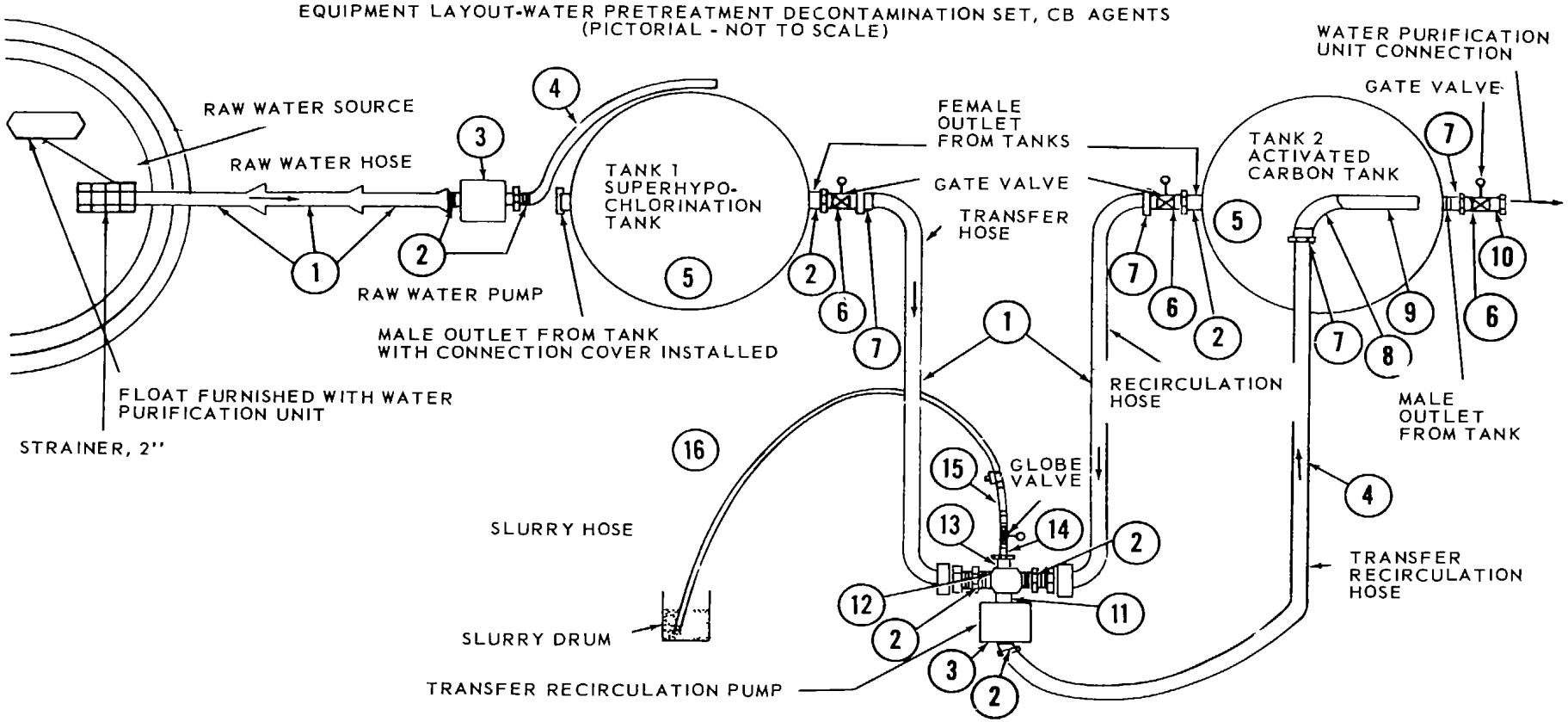
(c) Post chlorination.

(3) Check finished water from water purification unit for residual CW agents with test kits AN-M2 and ABC-M30-A1. If contamination is above tolerance the water must be recirculated and the entire procedure repeated. Acceptable water is clear and contains the free chlorine residual prescribed by the area surgeon.

2-2. Controls and Instruments

a. General. This paragraph provides the operator/crew with sufficient information on the various controls to insure proper operation of the water decontamination set.

b. Manual Control Valves. The control valves and their location are illustrated in figure 2-1.



1. HOSE, 2-INCH, RUBBER, 10 FT LONG
2. ADAPTER, 2-INCH, MALE HOSE TO MALE PIPE
3. PUMP, 100 GPM, GED
4. HOSE, 2-INCH, COTTON, 25 FT LONG
5. TANK, 3000 GALLON
6. VALVE, GATE, 2-INCH
7. ADAPTER, 2-INCH, FEMALE HOSE TO MALE PIPE
8. ELBOW, 2-INCH
9. PIPE, 2-INCH, 5 FOOT LENGTH
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14. NIPPLE, 1/4 INCH, 2-INCH LONG
15. VALVE, GLOBE, 1/4 INCH
16. HOSE, PLASTIC, 1/2 INCH ID, 6 FT LONG, WITH HOSE CLAMP

ME 4610-207-12/2-1

Figure 2-1. Control valves, schematic.

2-3. Starting and Operating.

a. General. Two men are required to operate the water point. One to operate the decontamination set and the other to operate the water purification unit.

WARNING

In a chemical-biological warfare situation (which is the only time this equipment is used) both operators must wear protective clothing consisting of fatigues, M17A1 mask, protective hood, protective boots and rubber gloves.

b. Preparation for Starting.

(1) Refer to TM 5-4320-208-12 and perform the before operation checks and services to the engine and pump.

(2) Lubricate engine as specified in current lubrication order.

c. Starting and Operating.

(1) Close outlet valve of tank I (fig. 2-1), and check tightness of the male outlet connection cover opposite this valve.

(2) Sprinkle 3 3/4 pounds (one entire plastic bottle) of calcium hypochlorite over bottom of tank 1.

(3) Prime raw water pump as follows:

(a) Remove priming plug.

(b) Fill pump with raw water.

(c) Replace plug.

(4) Start raw water pump as follows:

(a) Fill gasoline tank.

( ) Close choke.

(c) Open fuel valve.

(d) Wind starting rope on flange and pull rope to start engine.

(e) Slowly open choke as engine warms.

(5) Fill tank I with raw water. This requires 30 minutes pumping at the rate of 100 gpm.

(6) Open the gate valve on tank 1 and make certain that both valves of tank 2 (fig. 2-1) are closed.

(7) Prepare the activated carbon as follows-

(a) Open drum and set lid aside.

(b) Remove one of the three bags, each contain 15 pounds of carbon.

(c) Open bag and pour into empty mixing drum.

(d) Pour 21 gallons of water into the drum using the rubberized pail as a measure.

(e) Stir with paddle until carbon is wetted.

(8) Refer to paragraph 2-3c(3) and prime transfer-recirculation pump (fig. 2-1).

(9) Refer to paragraph 2-3 c (4 and start engine.

(10) Pump entire 3000 gallons of superhypochlorinated water from tank 1 to tank 2.

(11) As the transfer is being made, open 1/4 inch slurry valve (fig. 2-2) so that all the carbon slurry enters the process stream at a reasonable rate during the 30 minute transfer.

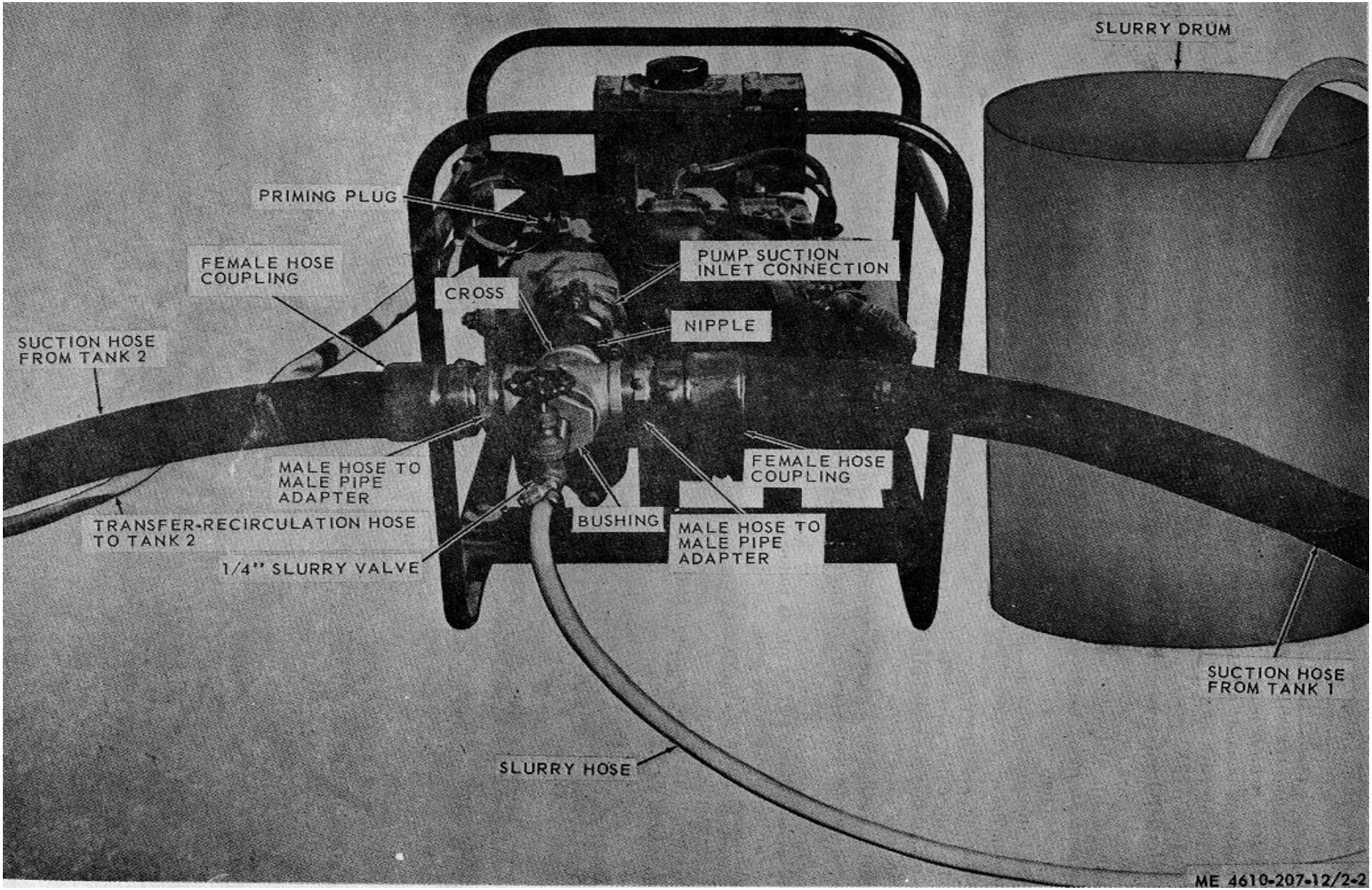


Figure 2-2. Transfer-recirculation pump details

(12) When tank 1 is empty, refer to figure 2-1 and adjust valves to recirculate as follows:

(a) Open valve on female outlet of tank 2.

(b) Close outlet valve on tank 1 and transfer-recirculation pump will recirculate contents of tank 2.

NOTE

Recirculation is necessary to maintain carbon in suspension so it will be effective.

NOTE

Transfer-recirculation pump operates continuously it is either transferring water from tank 1 or recirculating the water of tank 2.

(13) Refer to figure 2-1 and open tank 2 outlet valve (water purification unit connection) and allow water purification unit to pump carbon laden water from tank 2 at the rated capacity of the water purification unit in use.

(14) Refer to paragraph 2-3 c(11 and (2) and recharge tank I as soon as it is empty.

(15) Pump raw water into tank 1.

(16) Rated capacity of the water purification unit must be considered for subsequent transfer of superhypochlorinated water from tank 1 to tank 2. Refer to table 2-1 and continued with above sequence for continuous production of potable water at water purification unit rated capacity.

Table 2-1. Superhypochlorinated Water Transfer Points

Water purification unit rated capacity	Transfer point (tank 1 to tank 2)
3000 gph	When tank 2 is 1/2 full (25 inches deep)
1500	When tank is 1/4 full (12 1/2 inches deep.)
600	When tank 2 is 1/10 full (5 inches deep)
420	When tank 2 is .07 full (3 1/2 inches deep)

NOTE

Always recharge tank 1 when It becomes empty.

NOTE

Check finished water from water purification unit for residual C-W agent and chlorine residual. Presence of visible activated carbon in the treated water will make maintenance of a chlorine residual extremely difficult

2-4. Recycling

a. Testing. Each tankfull of treated water from the water purification unit will be tested before distribution. Testing will insure that the free chlorine residual prescribed by the area surgeon is present.

b. Test Equipment.

(1) Perform the C-W agent test with Water Testing and Screening Kit AN-M2 and Refill Kit, Chemical Agent Detector VG Components ABC- M30-A1.

CAUTION

All water initially contaminated with LEWISITE should be recycled as described in paragraph 2-4d.

(2) When using the AN-M2 Test Kit to detect the presence of arsenic above tolerance levels, change the directions for the arsenic test (para B-1 (a) of the directions for use of the Water Testing Kit, Chemical Agents AN-M2), to require filling the bottle P to top mark on the bottle labeled 25 ml.

(3) If G or V agents were Initially present in the contaminated water, use only the ABC-M30-A 1 Refill Kit for analysts. If the water is contaminated with mustard gases, obtain sample of water from purification unit before chlorine is added.

c. Storage Tank Connection. Normally the storage tanks, provided with standard water purification units, are interconnected with suction hoses to obtain the effect of a single large storage tank. When the water decontamination set is used, storage tanks will not be interconnected, but will be filled individually with treated water and each full tank tested If test is satisfactory, pump water to consumer using distribution pump and hose.

d. Recycling Procedures.

WARNING

When the distribution pump and hose line are used to recycle water that is not approved for drinking, the next tank of approved water should be pumped to waste for two minutes to flush pump and hose line before being distributed for drinking water.

(1) For C-W agent contamination of treated water. Recycle water back to hypochlorination tank (tank 1) if test indicates that contamination Is above permissable limits. Water is again treated with calcium hypochlorite, activated carbon, and processed through water purification unit a second time. Use distribution pump and hose to pump water back for second treatment.

(2) For activated carbon contamination of treated water Recycle water back to water purification unit only, by-passing water decontamination set. Insure that diatomite filter has been freshly backwashed and precoated prior to recycling.

e. Recirculation Diagram

(1) Refer to figure 2-3 for recycling schematic of C-W agent contaminated water.

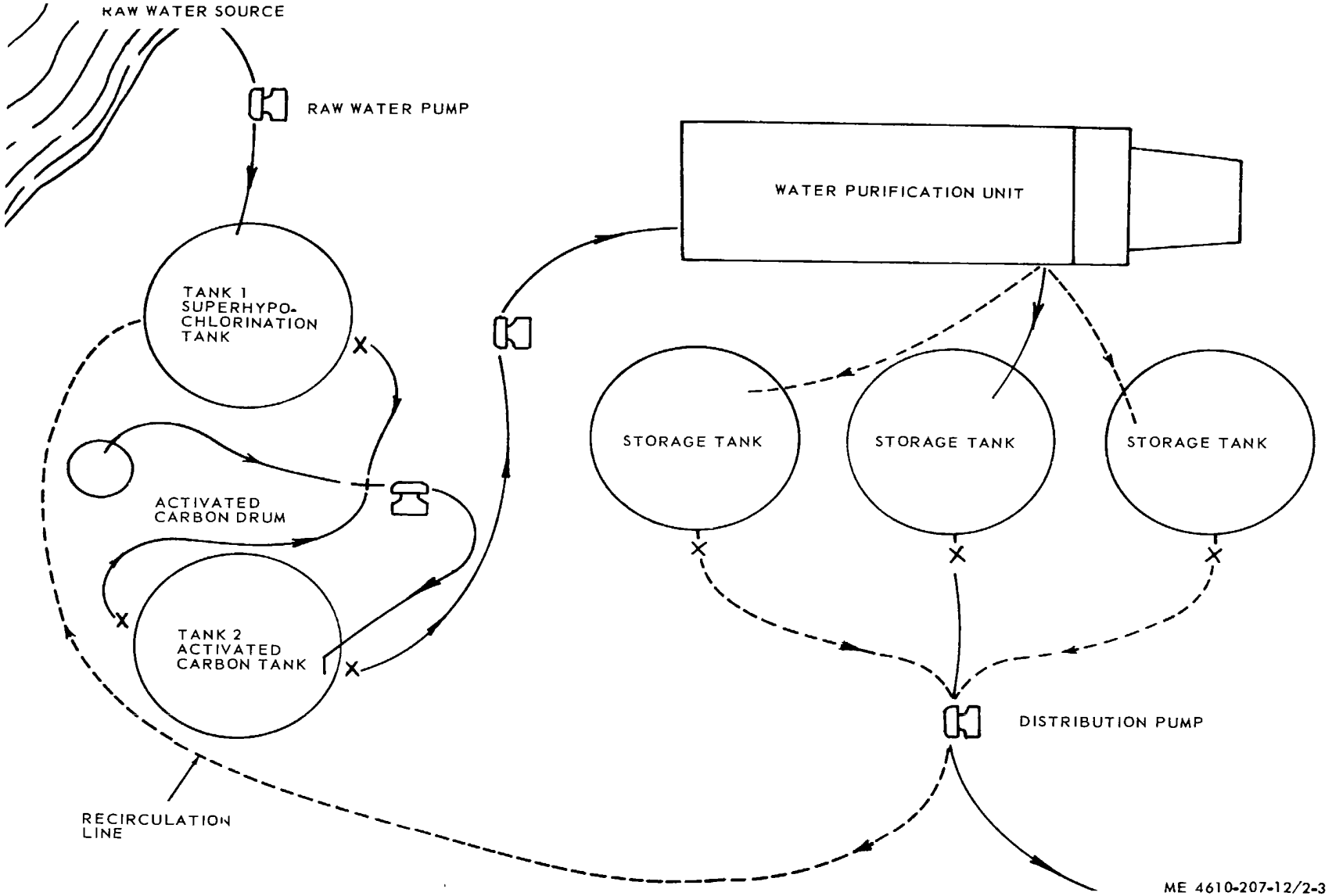


Figure 2-3. Recycling schematic of CW contaminated treated water

(2) Refer to figure 2-4 for recycling schematic of activated carbon contaminated water.

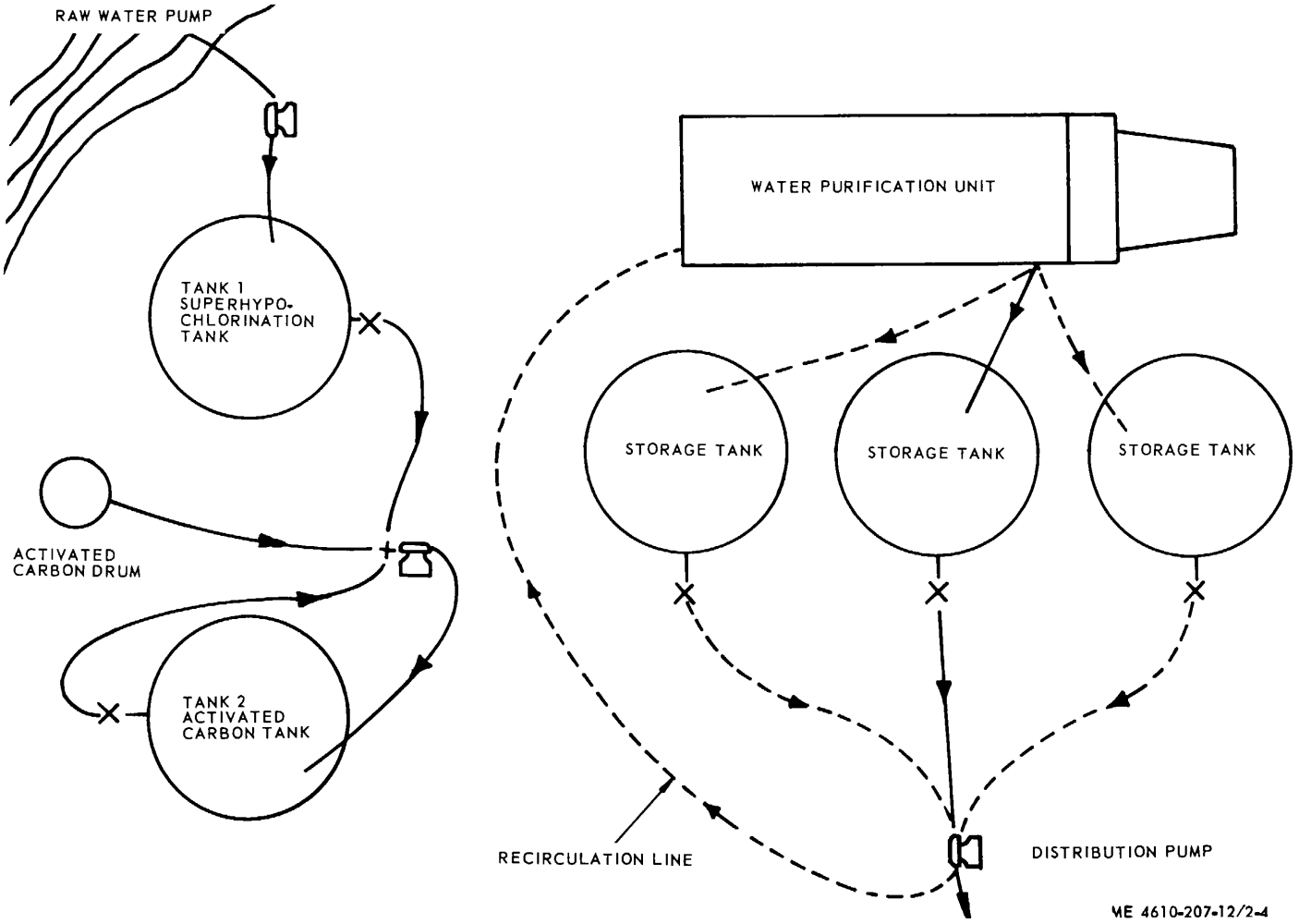


Figure 2-4. Recycling schematic of activated carbon contaminated treated water.

Section II. OPERATION OF AUXILIARY EQUIPMENT

2-5. General

This section contains information on the operation of auxiliary equipment which is part of the water decontamination set.

2-6. Water Pumps

a Two 125,gpm gasoline engine (driven water pumps are supplied for operation of the equipment.

b Refer to TM 5-432(t-208-12 for information on the operation of the water pumps.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-7. General

This section contains instructions for operating the water decontamination set under unusual conditions. Included are instructions for operation of the equipment in extreme cold, extreme heat, and under rainy or humid condition

2-8. Operation in Extreme Cold

a. Operation of the Equipment in extreme cold temperatures creates special problems which require careful inspection and maintenance. If at all possible ,provide a windbreak around the equipment and erect tenting shelter for protection. If the equipment is to be out of operation for any period during freezing temperatures, drain all pumps ,lines and tanks

b. During freezing temperatures allow the circulating pumps to maintain a flow of about 35 gpm. The discharge hose of the raw water pump can be permitted to flow back to the supply source at the same rate

c. Fuel ,coal, or wood burning heaters can be installed inside shelters to protect the equipment. 2-9. Operation in Extreme Heat Cooling-Keep the centrifugal pump clean and free of dust. If the pump is operated indoors ,allow sufficient room around the unit for air circulation.

2-10. Operation Under Rainy or Humid conditions

a General If the pumps are outside and not operating, cover the pumps with canvas or other waterproof material during bad weather Remove the cover during dry periods and allow the unit to dry out.

b. Fuel Keep the fuel tank full at all times to present condensation Drain and service the fuel filter frequently.

c *Electrical.* Humid conditions can cause corrosion and deterioration of electrical components. Keep electrical components and wiring clean and dry

d Lubrication Lubricate the engine in accordance with the current lubrication order and 'IM 5-2805-257-14.

e. chemicals Keep chemical containers tightly closed and covered with a tarpaulin if in an exposed location.

CHAPTER 3

OPERATOR/ CREW MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. General

This section contains information for the lubrication of the water decontamination set. Refer to paragraph 3-2 c for information on the components requiring lubrication.

3-2. Detailed Lubrication Information

a. Care of Lubricants. Keep all lubricants (grease and oil) in closed containers and store in a clean, dry place away from heat. Allow no dirt, dust, water or foreign matter to mix with the lubricants. Keep all lubrications equipment clean and ready for use at all times

b. Cleaning Clean lubricants from application points with a clean cloth. Old or hardened lubricants may easily be removed by using an , proved cleaning solvent. Keep all external parts not requiring lubrication free of lubricants

c. lubrication

(1) Lubricate the gasoline engines in accordance with the current lubrication order and TM 5-2805-257-14.

(2) Lubricate the trailer in accordance with the current lubrication order and TM 9-2330-202-14

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-3. General

To insure that the water decontamination set is ready for operation at all times ,it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraph 3-4. Defects discovered during operation of the unit shall be noted for future correction to he made as soon as operation has ceased. Stop operation immediately if a deficiency is .noted during operation which would damage the equipment or cause injury to personnel if operation were continued. All deficiencies and short comings will be recorded together with the corrective action taken on D A Form 2404 at the earliest possible opportunity

3-4. Preventive Maintenance Checks and Services

a Tables 3-1 and 3-2 contain tabulated lists of preventive checks and services which must be performed by the operator.

b. the item numbers indicate the sequence of minimum inspection requirements. The interval column designates the required service interval. A quarterly interval is equal to 3 calendar months or 2.51) hours of operation ,whichever occurs first.

C Refer to tables 3-1 and 3-2 for the preventive maintenance checks and services

Table 3-1. Operator/Crew prevention Maintenance Checks and Services

B-Before Operation Time reqmired1 3 | D-During Operation Time required: 1,3 | A-After Operation 'Time required1 3

Interval and Sequence No			Item to be inspected Procedure	Work Time (M H)
B	D	**A**		
1	3	5	COLLAI'SIBILE 'I'ANK Check for leaks or any damage to fabric	0 8
2	4	6	VALVES,HOISES ANI)IT"'IN Check for leaks and damage	0 5

Table 3-2. Operator/Crew Preventive Maintenance Checks and Services
D-Daily W-Weekly

Interval and Sequence No		Item to be Inspected Procedure	**Work Time** (M **,/H)**
D	W		
1		CENTRIFUGAL PUMPS Refer to TM 5-4320-208-12	
2	1	CARGO TRAILER Refer to TM 9-2330-202-14	

Section III. TROUBLESHOOTING

3-5. General

a This section contains troubleshooting information for locating most of the operating troubles which may develop in the water decontamination set Each malfunction for an individual component ,unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/ inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

3-6. Operator Maintenance Troubleshooting

Refer to table 3-3 for operator troubleshooting.

NOTE

Before you use this table, be sure you have performed all applicable operating checks

Table 3-3. Operator Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1 INSUFFICIENT RAW WATER SUPPLY
Step 1 Check proper operation of raw water pump Refer to TM 5-4320-208-12
Step 2 Check for clogged strainer Clean or replace defective strainer
Step 3 Check for cracked or broken raw water hose Replace defective hose
2 INSUFFICIENT WATER SUPPLY TO TANK NO 2
Step 1 Check proper operation of transfer pump. Refer to TM 5-4320-208-12
Step 2 Check tanks for cracks or cuts Refer to organizational maintenance
Step 3 Check for defective hoses ,valves and fittings Replace defective component
3. INSUFFICIENT WATER SUPPLY TO WATER PURIFICATION UNIT
Step I Check for defective hose, valve and fittings Replace defective component

Section IV. MAINTENANCE PROCEDURES

3-7. General

a This section contains information pertaining to the maintenance functions which the operator/ crew can perform.

b Maintenance functions which can be performed by the operator/ crew are limited to the replacement of components.

3-8. Set Component List

a. The included list describes those components, and their respective quantities, which make up the water decontamination set. Prior to requisitioning replacement parts or components, refer to the current edition of the Reference Supply Catalog, SC4 1 0-97-CL-E I 1.

b Refer to table 3-4 for the components which make up the water decontamination set.

Table 3-4. Set Component List

Federal stock number	Description	Unit of meas.	Qty in set
4730-277-6845	ADAPTER, S'TRAIGHTI,PIIPE TO HOSE copper alloy,2-11 ½ NP'T external thd on pipe end.,2-11½ NPSH external the on hose end (81349) C-52404, type XVI, Class C	EA	7
4730-278-8268	ADAPTER,STRAIGHT,PIPE TO HOSE copper alloy,2-11½ NPT external thd on pipe end ,1½ 11 ½ NPSH Internal ,the on hose end 181:34o) C-52404,type XVI, Class B	EA	1
4730-278-8269	Adapter ,STRAIGHT,PIPE TO HOSE copper alloy,2-11 /2 NPT external the on pipe end,2-1 [1/2 NPSH internal thd on hose end 181.341) C-52404,type XVI, Class B	EA	R
8430-820-6299	BOOT'',IMIERMEABLE,AGENT,PROTECTIVE. M2A1,size 11PR-	EA	2
8413-820-6300	B()'I'T. IMI'ERMEABLE,AGENT,PROTECTIVEM2AI,size 10PR2	EA	2
473-277-2231	BUSHING. PIPE brass or bronze,2-111/2 NPT external thd,/4-111/2 NPT the internal 181348) WW-P-471,type I	EA	1
811-242-4770	CALCIUM, HYIOCIHLORITE,TECHNICAL33/4 lb plastic bottle 181348)1C-I 14,type II	BT	48
6810-40-1-3708	ARCOAL. AC'TIVATED, 'TECHNICAL power,15 lb bags,3 per drum 181:34()1 C-506	DR	4
473-202-8072	CLAMP,1lOSE cres,0 500 In to O 1069 In id, thumb screw type 181.348) W-W-C-440. type II. style-1	EA	1
473-135,-948	CLAMP',HOSEcres,4 In to 5 In d	EA	1
	47-3(0-254-6366CGRI()OSS. PIPE brass or bronze,2 in 181 348) 'W-W-P-46(0 Class A	EA	1
8110-8-11-728I	DRUM . Slipping ANI) STORAGE enameled Interior and exterior, removable top, 30 gallon	EA	1
471-249-.1381	EIBOW'. PIPE Grass or bronze. 2 in 90 degree 181.348) W-W-P-460,Class	EA	1
8415-75.3-52	GLOVES TO()XICOLOGICAL AGENTS. PROTECTIVE 181.3491 G-12223.,type II, except wtPR2		
5120-110- 118	HAMMER. HAND sledge ,blacksmiths double face,2%12 lb head (813481 GGG-H-81. type X. Class furnished with fiberglass handle	EA	1
4240-926-4201	HOOD mask ,field protective 1214501) M6A2	EA	2
4720-28-6103	HOSE COTTON. RUBBER , IN EI) double jacket. synthetic . 350 psi test pressure. rm(ker lg., rigid external the and swivel internal the, brass, expansion couplings. 2-I 11/ N l'SEIt. FEI) SP'EC W'W'-C-62 1. 2 nl id,25 ft lg excel couplings 1811;481 ZZ-H-451	EA	2
4720-227-220	HOSE ASSEMBIBLY. R UBBEI/R %ater % rapped. suction. wire reinforced,100 psi test preschooler. grass (opining each end. Fed Spec W-W-C-646,Type B. expansion ring. rocker frigid external told on one end and swivel internal tiled on other end. 2-1 1 Nl''1t. 2 in idt lg excel couplings 181.3481 ZZ-ii-5-)(type I. Grade B	EA	7
6665-909-3647	KIT REFILL. CIIEMNICAL AGENT DETECTOR VG COMI)ONEN'I'S ABC-M 31)-A I	EA	1
6665-171-947	kilt. WA'I'ER 'I'ES'I'INGANI) SCREENINGAN-M2	EA	1
6230-501-1523	LANTERN ELEC'TRIC 6 volt. battery powered,8 In o/a lg. 31/ In o/a 6 in i, , a II. adjustable beam 181.3481 W'-L-2)()0. type I	EA	1
4241-926-4201	NIMASK. C('protective field. ABC. Ml , AI	EA	2
4730-116-1172	NIPPL.E brass. I/I in 181 1481 WW-N-351. type I	EA	2
4730-16-2033	nipple. PIPE 2,.5 in lg 181348) WW-N-15l,tipe I	EA	1
2040-268-9261	PADDLE, ,BOA'T'	EA	1
7240-246-1097	PAIL, RUBBER steel handle, rubber coated,3 gallon 18134t)1 P'-52415,Grade B	EA	2
47110-240-9236	PIPE. steel, galvanized. ' In ,I) 1 54 im wall. 2 3.75 In Od max. Threaded one end, ft lg required, fabricate from FSN 4710-)-277-, 466 181:34)81 WW-P-4014. Grade A	FT	1

Table 3-4 Con't)

Federal stock number	Description	unit of meas	Qty in set
4320-542-3347	PUMP,CENTRIFUGAL: fresh water, gasoline engine driven; frame mtd,2 m inlet, 2 in outlet,125 gpm at 50 ft head,		
	(81349) P-52109,Class 1	EA	2
5120-293-3336	SHOVEL,HAND D handle, rd point; open back; commercialsize2; 11 hto 12½2 in lg,91h to 101/4 in w blade		
	(81348) GGG-S-326,type IV, Class A, style I	EA	1
4730-202-9174	STRAINER,SUCTION HOSE: brass bbl,2-11 ½ NPSH internal thd,6-7 in lg; hex or octagon wrenching feature, No 35 inside cut, V-slots		
	(813491 S-12165,type 11	EA	
1			
5430-355-4486	TANK,FABRIC,COLLAPSIBLE- nylon, water; 3, 000 gallon,11 ft3 in dia 54 in deep, w / staves, guy ropes, cover and ground cloth; synthetic rubber coated, both sides		
	181349) T-14398	EA	
2			
5210-541-3324	TAPE,MEASURING6 ft lg	EA	
1			
2330-898-6779	TRAILER,CARGO: 3/4 Ton, Army Model MI01A1,body steel, with lattice type side extensions, tailgate, top bows and tarpaulin; inside dimension 96 in ig,66 in w,18 In h		
	(81349) T-10579,type I	EA	1
4710-563-4689	TUBING,PLASTIC polyvinyl chloride,1h in id; fabricate from FSN 4710-709- (1441,6 ft required		
	(813481 ZZ-T-831,Grade PFT6		
4820-595-1847	VALVE, GATE bronze; 2-1 1] NPT internal the, rising system; 125 psi		
	(813481 W-W-V-54,type II, Class A	EA	3
4820-227-0168	VALVE,GLOBE brass or bronze,/4-18 NPT internal the		
	(813481 W-W-V-51,type I, Class A	EA	2
5120-277-1479	WRENCH,PIPE adjustable jaw, aluminum alloy; 1 to 2 in ips; 18 lg		
	(813481 GGG-W-651,type II, Class CEA2		
5120-293-1602	WRENCH,SPANNER universal hose coupling, for 1 to 3 in. hose couplings,11 in. lg		
	181348) GGG-W-665-type V	EA	2
7520-559-9618	CASE,MAINTENANCE AND OPERATIONAL MANUALS: cotton duck, water repellent, mildew resistant MIL-B-11743-B (over packed with equipment, to be mounted where required)	EA	1

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPTOF MATERIAL

4-1. Inspecting and Servicing the Equipment

a. Inspect the tanks and hoses for damage caused by sharp objects cutting the fabric ,and for broken or missing parts.

b Service the engine and pump in accordance with TM 5-4320-208-12.

4-2. Installation

a. General. The water decontamination set is packed and shipped to the installation site as components, and must be assembled in sequence to make a complete usable unit. *b. Components* Refer to table 3-4 for the individual components that make up the water decontamination set.

C. Installation.

(1) Refer to figure 1-1 and arrange the equipment approximately as illustrated.

(2) Locate the two 3000 gallon tanks at a maximum distance of 10 feet between them

NOTE

Orient tanks so that female outlet connections on bottom of tanks (fig 4-1) face each other

(3) Spread ground cloths (fig 4-1) without wrinkles, and place tanks on ground cloths.

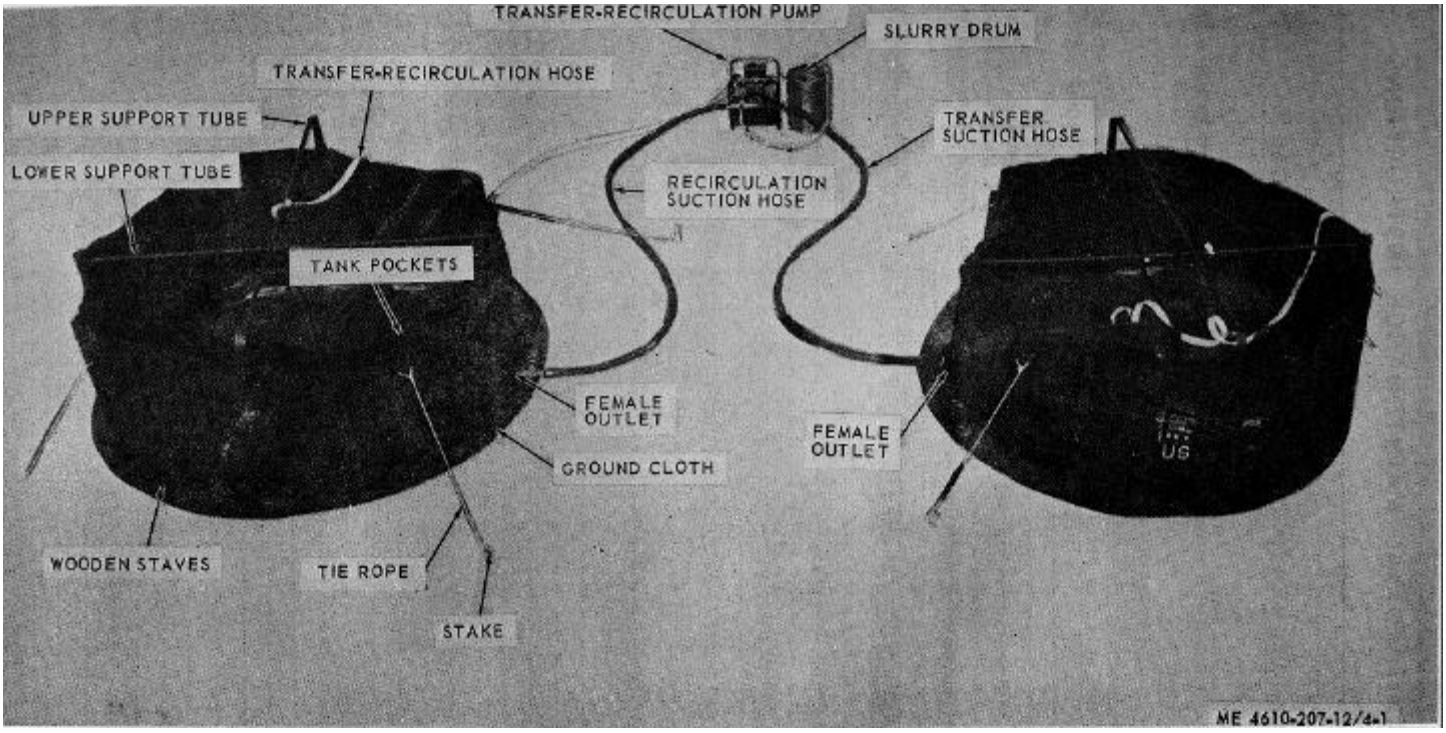


Figure 4-1. Tank detail.

(4) Insert wooden staves (fig. 4-1) in tank pockets. making certain the staves opposite each other have rope rings Tie ropes to stave rings. (5) Drive stakes fig. 4-1) into ground. Pull ropes to errect tanks in a standing position and tie ropes to ground stakes

(6) Assemble upper and lower support tubes (figr. 4-2) for both tanks.

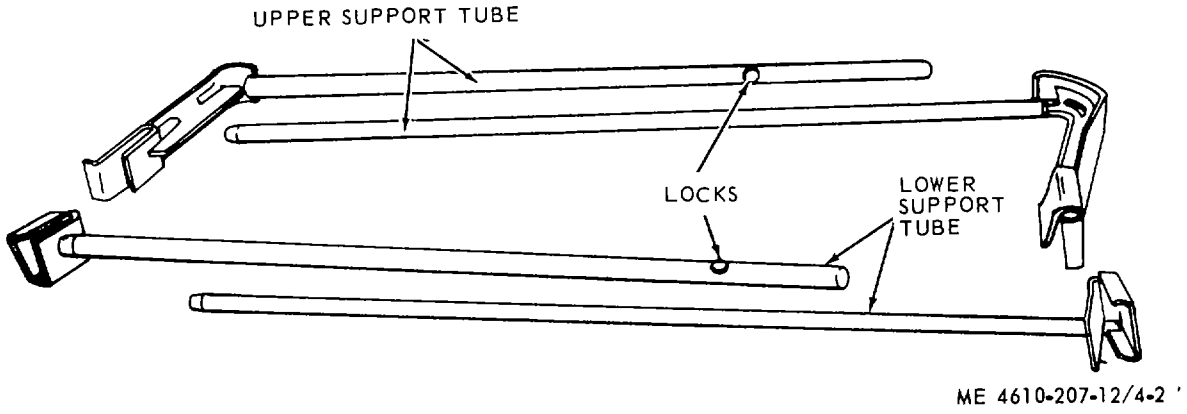


Figure 4-2. Support tubes.

(7) Place support tube for tank1. Super hypochlorination tank ,fig. 1-1) in position.

(8) Install lower support tube on tank 2 (activated carbon tank, fig. 4-1).

NOTE

Mark or identify tank 1 and tank 2 in appropriate manner.

(19) Refer to figures 4-3 and 4-4 and assemble recirculation hose as follows:

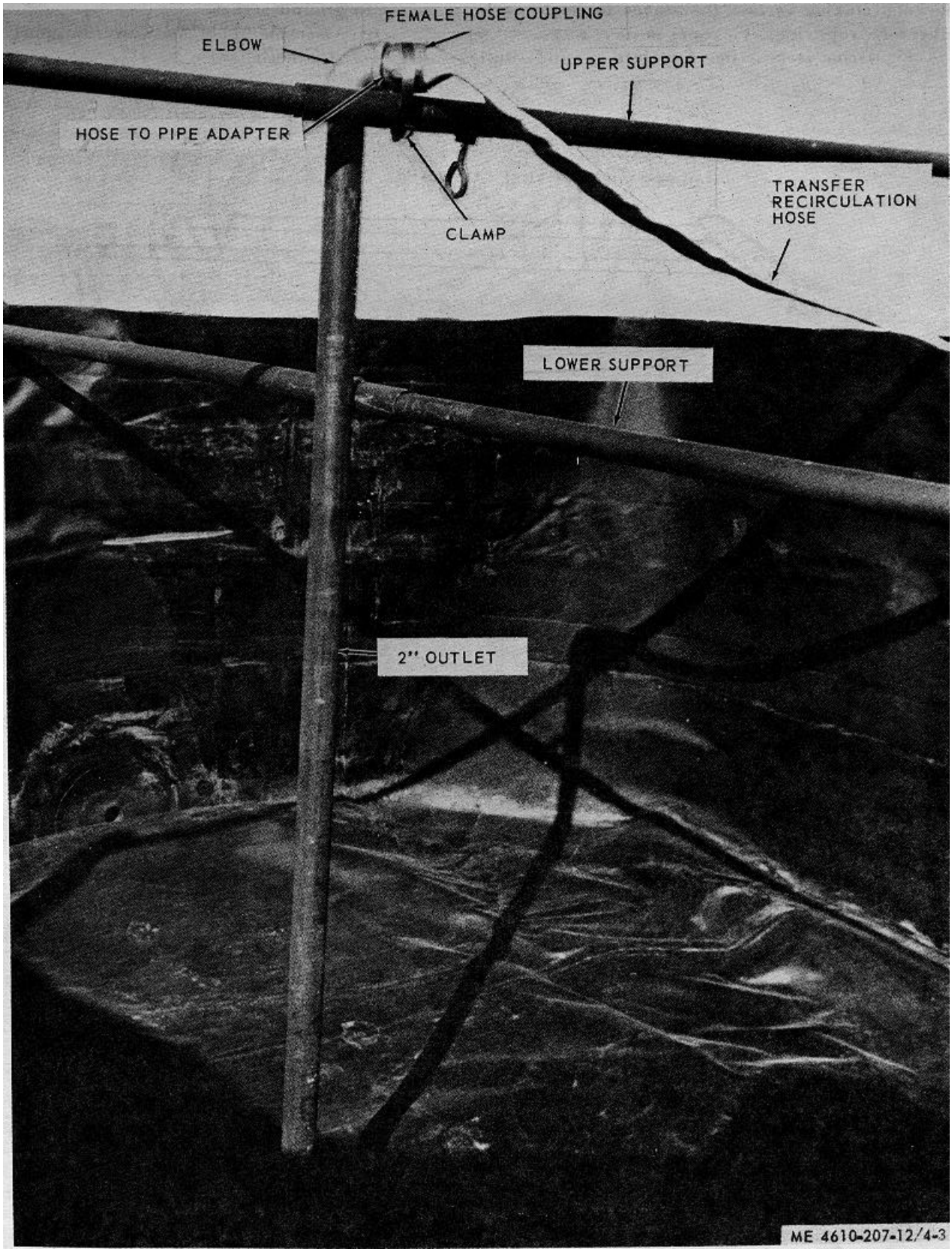


Figure 4-3. Transfer-recirculation hose, installation and removal

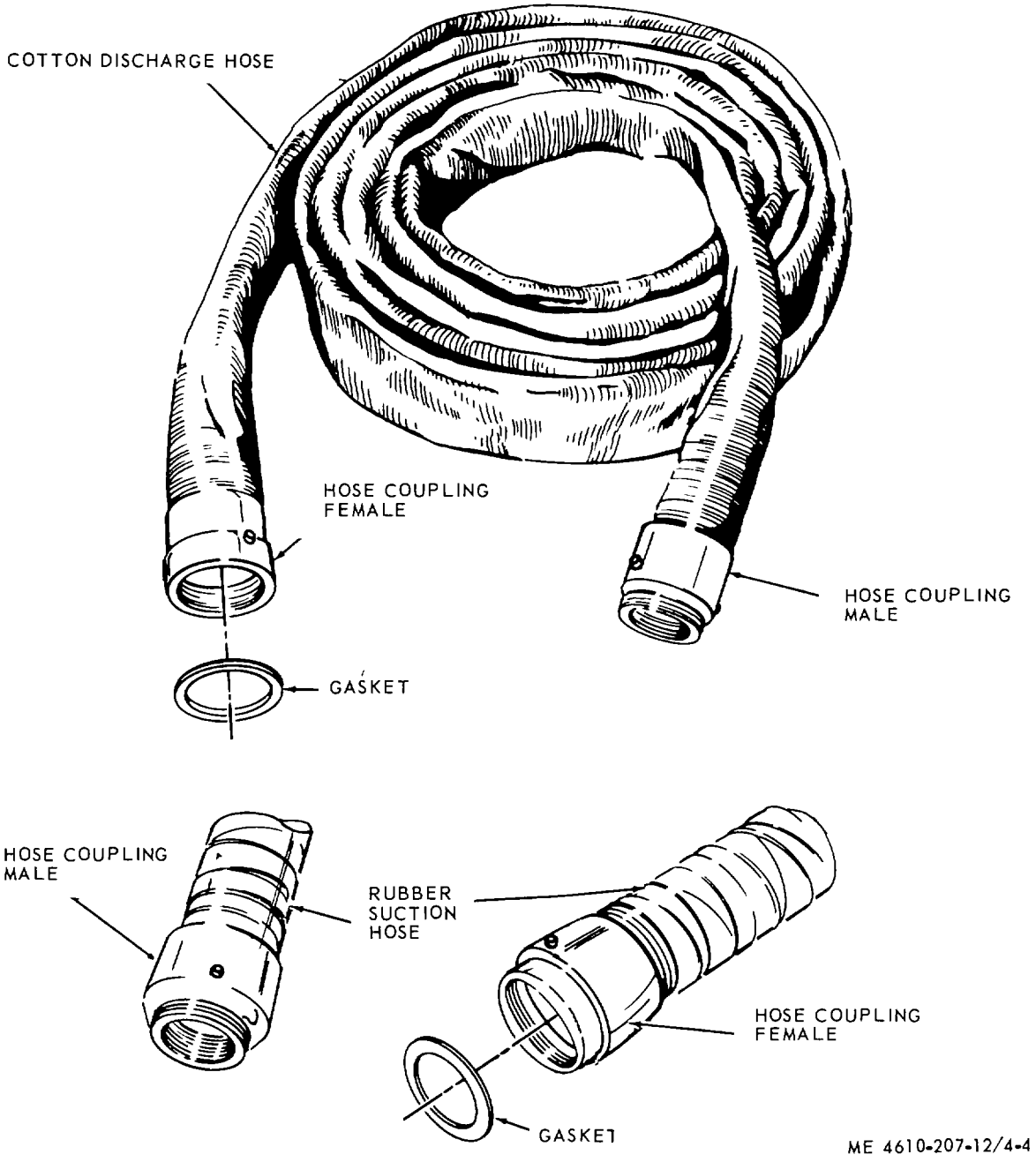


Figure 4-4. Hose and fitting details.

(a) Connect 2 inch male to female adapter to male end of a 25 foot length of cotton hose.

(b) Screw a 2 inch 90 degree elbow on the adapter

(c) Screw a 5 foot length of pipe to the elbow.

(d) Attach elbow to center of the upper support tube with hose clamp and position the tube on tank 2 with pipe in down position.

(10) Attach strainer to suction hose, figure 4-5

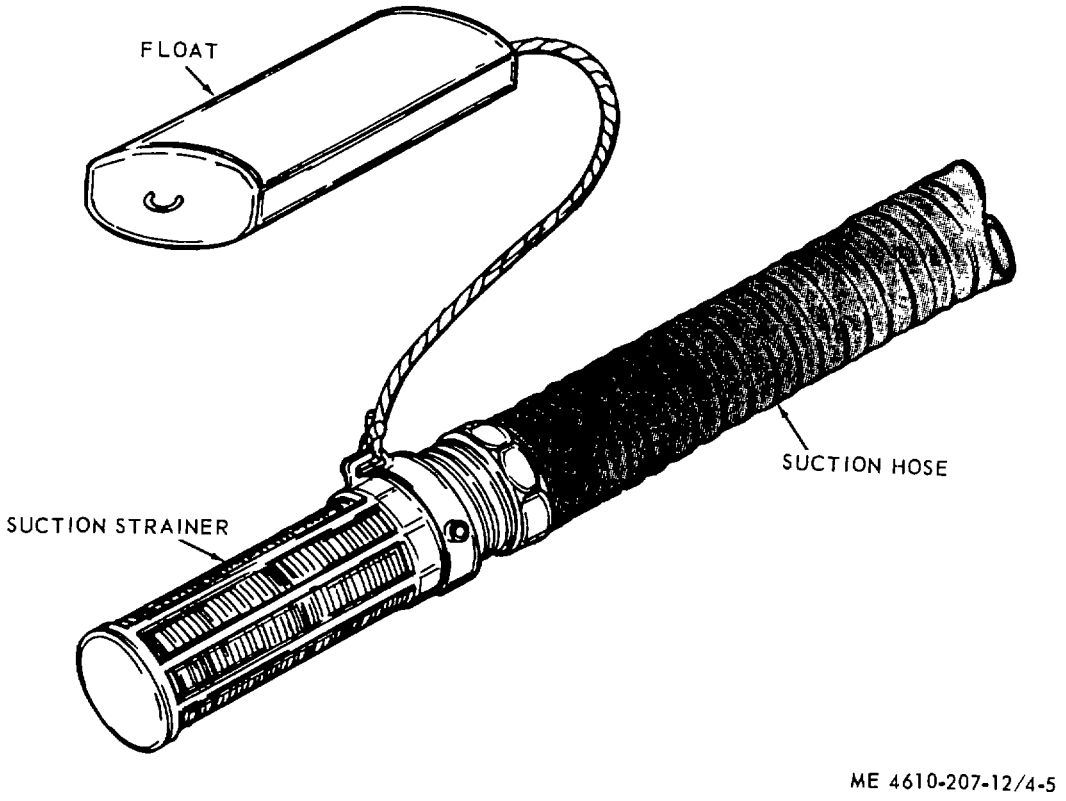


Figure 4-5. Raw water strainer and float.

(11) Attach 2 inch rubber hose lengths (up to 5 lengths) to suction side of the raw water pump with 2 inch male-male adapter,figure 4-6.

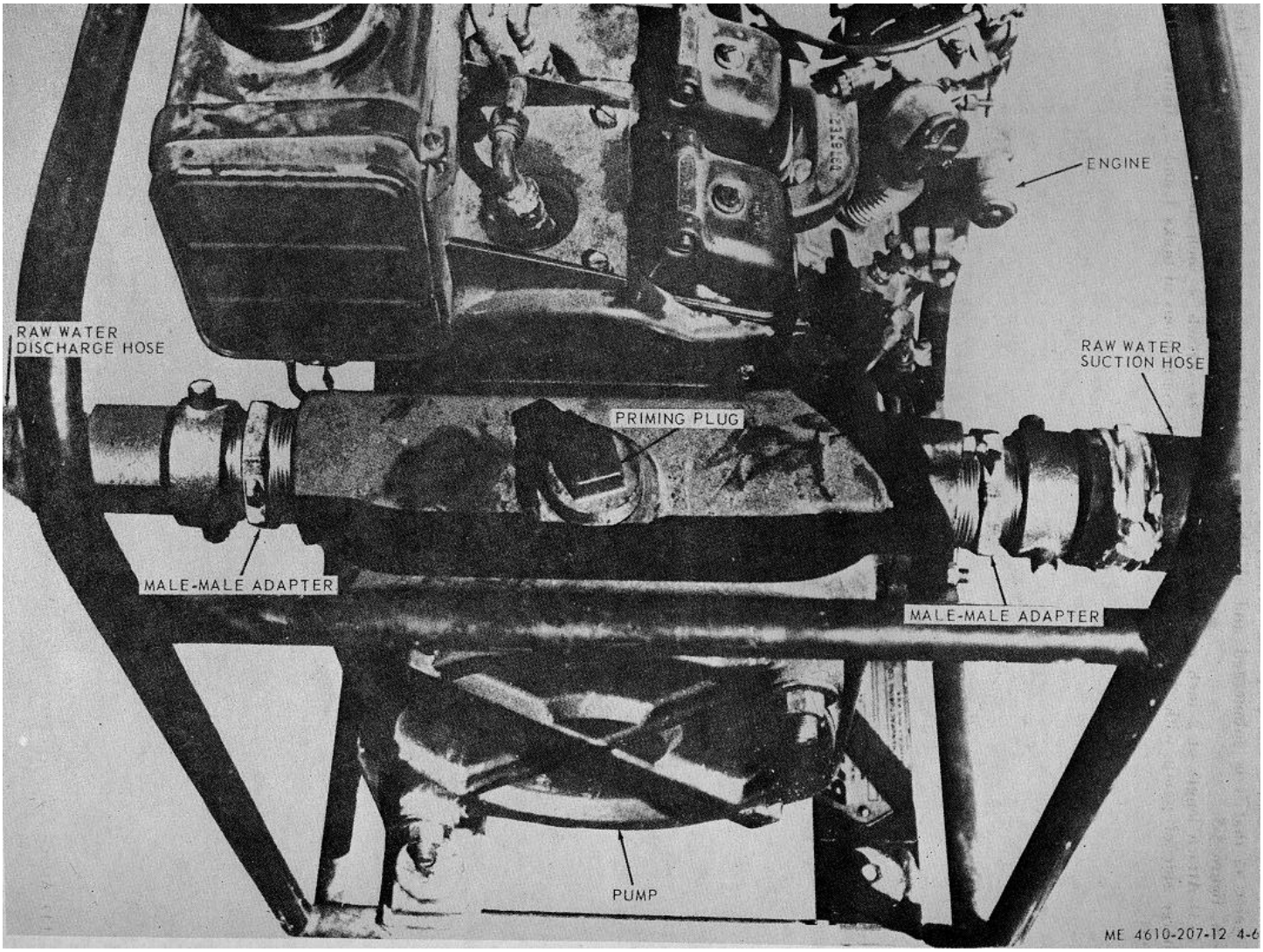


Figure 4-6. Raw water pump details.

(12) Attach the raw water strainer float to the raw water hose strainer and place the strainer in raw water so that it is submerged and off the bottom, figure 4-5.

(13) Attach length of 2 inch cotton hose to discharge side of pump with 2 inch male-male adapter.

(14) Place discharge end of cotton hose in tank 1.

(15) Connections and hose assemblies for tank I and tank 2 are as follows:

(a) Attach 2 inch male-male adapter to female connections of tanks 1 and 2,figure 4-7.

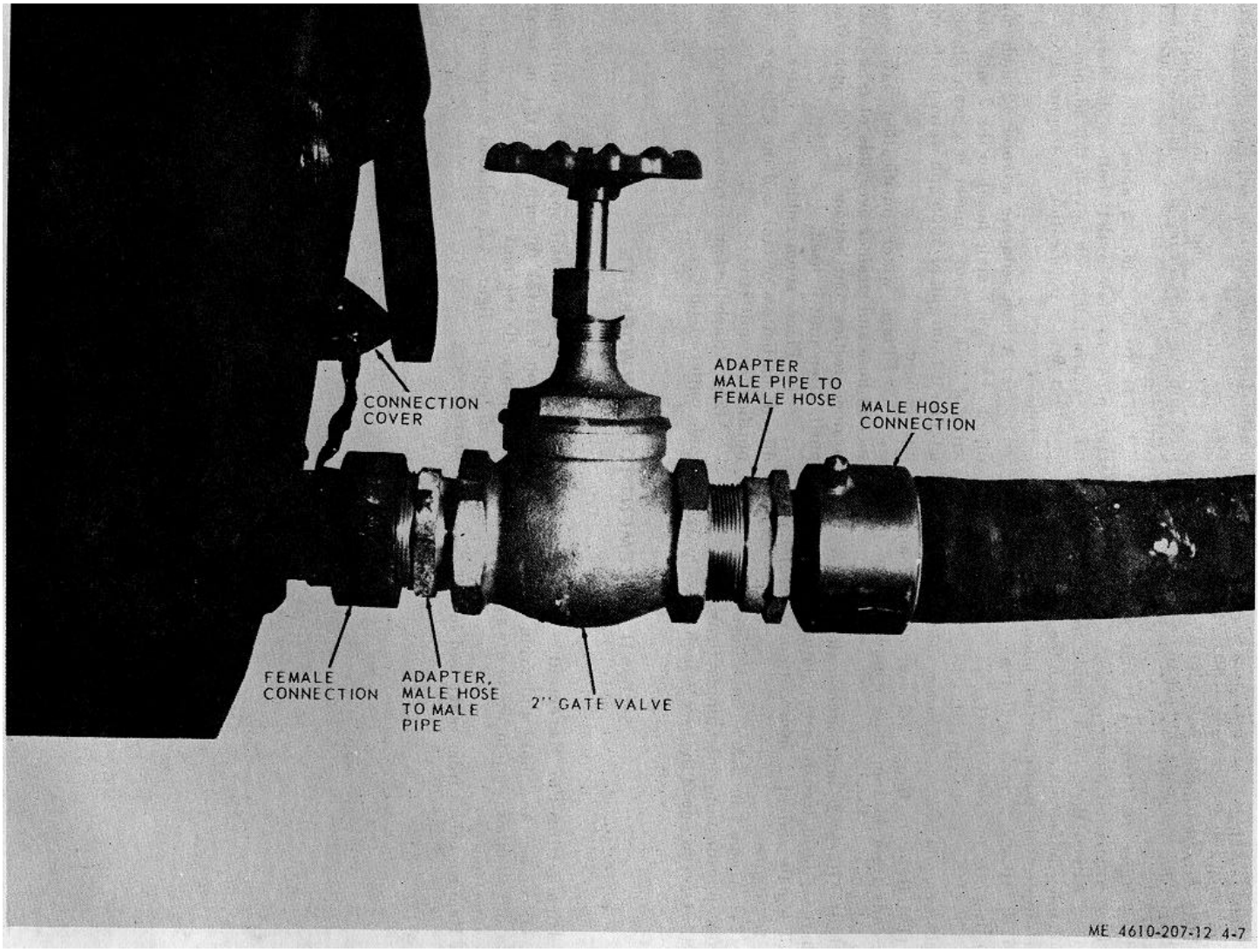


Figure 4-7. Tank connection details

(b) Install 2 inch valve to adapters.

(c) Attach a 2 inch male-female adapter to each tank valve (male pipe end to valve, female hose end away).

(d) Install a length of 2 inch rubber hose with male end of hose to female adapter. Each tank now has female hose ends that are to be attached to the cross, figure 2-2

(16) Refer to figure 1-1 and set up the transfer-recirculation pump.

(17**)** Attach the 2 inch nipple to the pump suction inlet connection, and attach the 2 inch cross to the nipple of the pump suction inlet ,figure 2-2.

(18) Attach 2 inch male-male adapters to opposite ports of cross, figure 2-2

NOTE

Port opposite nipple is for carbon addition

(19) Refer to figure 2-2 and attach female hose ends from bottom tank connections to the male adapters.

(20) Attach 2 inch male-male adapter to discharge side of transfer-recirculation pump and install female end of 2 inch cotton recirculation hose to adapter.

(21) Attach 2 inch X 1/4 inch bushing to port of cross opposite pump inlet nipple,figure 2-2.

(22) Screw one of the two 1/4 inch pipe nipples into bushing and install l/4 inch globe valve on nipple. Screw remaining /4 inch pipe nipple into open end of l/4 inch globe valve and attach /2 inch plastic slurry hose to nipple with hose clamp, figure 2-2.

(23) Lead free end of 1/2 inch plastic slurry hose into the slurry drum and secure with tape or cord, figure 2-2.

(24) Attach 2 inch adapter (female hose to male pipe) to male outlet (bottom discharge) of tank 2 and Install 2 inch valve to this adapter.

(25) Water purification unit connections are as follows-

(a) Attach reducing adapter (2 inch male pipe to 1 ½/2 inch female hose) to the 2 inch outlet valve of tank 2,and connect raw water hose to adapter if 1500 gph or 3000 gph water purification unit is used.

(b) Place water purification raw water suction hose and strainer over side of tank 2 with strainer resting on bottom if 600 gph water purification unit is used.

(c) Place submersible raw water pump directly on bottom of tank 2 if the 420 gph water purification unit is used.

(26) Attach the female connection cover to the male outlet of tank 1.

Section II. MOVEMENTTOA NEW WORKSITE

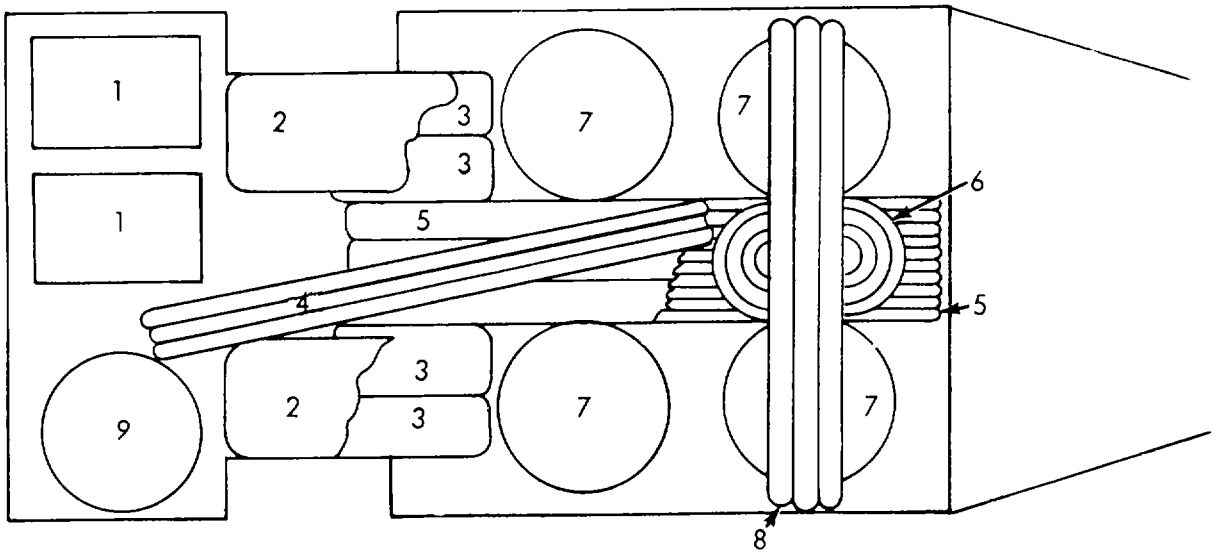
4-3. Dismantling For Movement

a. Disconnect hose lines and drain water from tanks and all other components to a waste ditch or raw water source.

b Remove valves from tanks and install caps.

c. Follow order and manner of instructions, paragraph 4-2c(3) through 4-2 c (8) in reverse, and dismantle the tanks.

d. Refer to figure 4-8 and load components on trailer



1. PUMP, CENTRIFUGAL, GED. (2 REQ)
2. TANK, 3,000 GAL CAPACITY (2 REQ)
3. CARTONS, CALCIUM-HYPOCHLORITE (4 REQ)
4. SUPPORT, TANK-COVER & PADDLES (10 REQ)
5. STAVES FOR 3000 GAL TANKS (40 REQ)
6. HOSE, 2-INCH, DISCHARGE, 25-FT LENGTH (4 REQ)
7. DRUM, ACTIVATED-CARBON (4 REQ)
8. HOSE, RUBBER 2-INCH, 10-FT LENGTH (7 REQ)
9. ACCESSORY MIXING DRUM

ME 4610-207-12/4-8

Figure 4-8. Trailer loading plan

4-4. Reinstallation After Movement
Refer to paragraph 4-2 and install the water decontamination set.

Section III. REPAIR PARTS,SPECIAL TOOLS,AND EQUIPMENT

4-5. Tools and Equipment
Basic issue tools and repair parts issued with or authorized for the water decontamination set are listed in table 3-4.

4-6. Special Tools and Equipment
No special tools or equipment are required by organizational maintenance personnel for the maintenance of the water decontamination set. 4-7. Maintenance Repair Parts
Repair parts and equipment are listed in table 3-4 of this manual.

Section IV. LUBRICATION INSTRUCTIONS

4-8. General
This section contains information for the lubrication of components of the water decontamination set.

4-9. Lubrication
Certain components of the water decontamination set require lubrication. Documents covering lubrication are referenced in paragraph 3-2 c

Section V. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-10. General
Systematic inspection of the water decontamination set is required so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services to be performed are listed and described in paragraph 4-11. Defects discovered during operation shall be noted for future correction as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment or cause injury to personnel if operation were continued. All deficiencies and short comings will be recorded together with the corrective action taken on DA Form 2404 at the earliest possible opportunity.

4-11. Preventive Maintenance Checks and Services

a. Table 4-1 contains a tabulated list of preventive checks and services which must be performed by organizational maintenance personnel

b. The item numbers indicate the sequence of minimum inspection requirements. The interval column designates the required service interval A quarterly interval is equal to 3 calendar months or 250 hours of operation, whichever occurs first.

c Refer to table 4-1 for the preventive maintenance checks and services

Section VI. TROUBLSHOOTING

4-12. General

a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the water decontamination set. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you determine probable causes and corrective actions to take. You should perform the tests/ inspections and corrective actions in the order listed. b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 4-1. Organizational Preventive Maintenance Checks and Services

Q-Quarterly

Sequence number	Item to be inspected procedure	Work time (M / H)
1.	CENTRIFUGAL PUMPS Refer to TM 5-4320-208-12	
2	CARGO TRAILER Refer to TM 9-2330-202-14	

4-13. Organizational Troubleshooting — Maintenance — Refer to table 4-2 for organizational maintenance troubleshooting

Section VII. RADIO INTERFERENCE SUPPRESSION

4-14. General Methods Used to Attain Proper Suppression

Essentially, suppression is attained by providing a low resistance path to ground for stray currents. The methods used include shielding the ignition and high-frequency wires, grounding the frame with bonding straps, and using capacitors and resistors.

4-15. Interference Suppression Components

a. Primary Suppression Components. The primary suppression components are those whose primary function is to suppress radio interference. These components are described and located in TM 5-2805-257-14.

b. Secondary Suppression Components These components have radio interference suppression functions which are incidental or secondary to their primary function.

4-16. **Replacement of Suppression Components**

Refer to TM 5-2805-257-14 for replacement of defective radio interference suppression components.

Table 4-2. Organizational Maintenance Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. NO RAW WATER SUPPLY Step 1. Check operation of raw water pump Refer to TM 5-4320-208-12
2 NO WATER SUPPLY TO TANK NO 2 Step I Check operation transfer pump Refer to TM 5-4320-208-12 Step 2 Check tank for leaks Repair tanks para 4-181

Section VIII. MAINTENANCE OF COLLAPSIBLE TANKS

4-17. General

Two 3000 gallon collapsible fabric tanks are furnished as components of the water decontamination set. Tank I is used as the superhypochlorination tank and tank 2 is used for the activated carbon tank.

4-18. Tank Repair

In the event cuts or wounds occur in a tank, permanent repairs can be accomplished by utilization of the repair kit and instructions furnished with each tank.

CHAPTER 5

ADMINISTRATIVE STORAGE

5-1. Preparation of Equipment for Shipment Within Zone of Interior

a General. Detailed instructions for the preparation of the Water Decontamination Set for domestic shipment are outlined below. Preservation will be accomplished in sequence that will not require operation of previously preserved components

b Inspection. Equipment will be inspected for any unusual condition such as damage, rusting, accumulation of water ,and pilferage. All deficiencies will be recorded on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

c Cleaning and Drying Thorough cleaning and drying by an approved method is the first essential procedure in any effective preservation process. Approved methods of application are described in TM 38-230.

d Painting Paint all surfaces when the paint has been removed or damaged. Refer to TM 9-213 for detailed painting instructions. *e. Exterior Surfaces.* Coat exposed, machined, ferrous metal surfaces with preservative conforming to Specification MIL-C-11796,class 3 (type P-6l. If preservative is not available automotive and artillery grease (GAA) as specified in the lubrication order may be used. Coat exposed, noncritical, ferrous metal surfaces with preservative conforming to MIL-C-16173,grade I or 4 (type P- I or P-4)

f Air Reservoir Remove the fitting from tanks and spray the tank interior with type P-1 0,grade 2, engine preservative oil conforming to Specification MIL-L-21260,and reinstall fitting. Open drain cock to allow excess preservative oil to drain. Leave drain-cock open to aitow condensation to drain.

g Depreservation Guide. A properly annotated depreservation guide(DAForm2258, Preservation and Depreservation Guide for Vehicles and Equipment) will be completed concurrently with the preservation of each item of mechanical equipment with any peculiar requirements outlined in spaces 28 through 33. The completed depreservation guide will be placed in a waterproof envelope, marked "Depreservation Guide" and fastened in a conspicuous location on the trailer

h. Marking. Shall conform to MIL-STD-129.

5-2. Loading of Equipment for Shipment

a Use a lifting device of sufficient capacity and hoist the water decontamination set on the carrier.

b For over the road shipment, determine the road and bridge li, notations and display warning flags.

5-3. Preparation of Equipment for Limited Storage

a. General. Detailed instructions for preserving and maintaining the Water Decontamination Set in limited storage are outlined in this paragraph. Limited storage is defined as storage not to exceed 6 months.

b. Inspection. Refer to paragraph 5-1 b.

c. Cleaning and Drying. Refer to paragraph 5-1 c.

d. Painting. Refer to paragraph 5-1 *d.*

e. Exterior Surfaces Refer to paragraph 5-1 e.

f. Air Reservoir. Refer to paragraph 5-1 *f.*

g Depreservation Guide. Refer to paragraph 5- *1g*

h. Pneumatic Tires. Pneumatic tires will be inflated to operating pressure.

i. Weatherproofing. When suitable shelter is not available, select a firm, level, well-drained storage location protected from prevailing winds. Position the equipment on heavy planking or other solid surfaces. Cover the equipment with a tarpaulin or other suitable waterproof covering and tie down securely.

5-4. Inspection and Maintenance of Equipment in Storage

a. Inspection. When equipment has been placed in storage, all scheduled preventive maintenance services ,including inspection ,will be suspended and preventive maintenance inspection shall be every 90 days as outlined in paragraph 5-1. Refer to TM 740-90-1.

b Worksheet and Preventive Maintenance. Applicable forms listed in TM 38-750 will be prepared for each major item of equipment when initially placed in limited storage and every 90 days thereafter. Perform required maintenance promptly to make sure equipment is mechanically sound and ready for use.

APPENDIX A

REFERENCES

A-1. Destruction To Prevent Enemy Use

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

A-2. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers Approved for Army Users

A-3. Lubrication

C9100-IL	Identification List for Fuels ,Lubricants, Oils and Waxes

A-4. Maintenance

SC4610-97-CL-E11	Reference Supply Catalog
TM 5-2805-257-14	Operator ,Organizational ,Direct Support and General Support Maintenance Manual; Engine, Gasoline,3 HI' Military Standard Models: (Model 2A1O 6-1,FSN 2805-601-5127),(Model 2A016-2,FSN 2805-714-8553),(Model 2A016-3,FSN 2805-072-4871)
TM 5-4320-208-12	Operator and Organizational Maintenance Manual, Pump, Centrifugal, Gasoline Driven, Frame Mounted,2 in. 125 GPM,50 ft. Head, Military Model 2-125-50-G,Less MIL-STD Engine, FSN 4320-542-3347
TM 9-2330-202-14	Operator ,Organizational, Direct Support and General Support Maintenance Manual; Trailer, Cargo,1/ Ton,2 Wheel, MIOI (FSN 2330-738-9509) and MIOIA (FSN 2330-898-6779); Chassis,Trailer,4 Ton,2 Wheel,M 116 (FSN 2330-542-5987) and MII(AI (FSN 2330-898-6780)
TM 10-500-13	Airdrop of Supplies and Equipment Rigging for the M 101,Yt Ton Cargo Trailer
TM 10-500-17	Rigging, CW-B Water Pretreatment Decontamination Set
TM 38-750	The Army Maintenance Management System

A-5. Painting

TM 9-213	Painting Instructions for Field Use

A-6. Radio Interference Suppression

TM 11-483	Radio Interference Suppression

A-7. Shipment and Storage

TB 740-97-2	Preservation of USAME COM Mechanical Equipment for Shipment and Storage
TM 38-230	Preservation, Packaging and Packing of Military Supplies and Equipment
TM 740-97-1	Administrative Storage of Equipment

A-8. Water Supply

TM 5-700		Field Water Supply
TM 5-813-1		Water Supply, General Consideration
TM 5-813-2		Water Supply, Sources
TM 5-813-3		Water Supply, Treatment
TM	5-813-4	Water Supply, Storage

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions. (Section III lists the special tools and test equipment required for each maintenance function as referenced from section II

B-2. Explanation of Columns in Section II

a *Group Number, Column (1).* The assembly group number is a numerical group assigned to each assembly. The assembly groups are listed on the MAC in disassembly sequence beginning with the first assembly removed in a top down disassembly sequence

b. Assembly Group. Column (2). This column contains a brief description of the components of each assembly group.

c. Maintenance Functions, Column (3). This column lists the various maintenance functions (A through K . The upper case letter placed in the appropriate column indicates the lowest maintenance level authorized to perform these functions. The active repair time required to perform the maintenance function is included directly below the symbol identifying the category of maintenance. The symbol designations for the various maintenance levels are as follows:

C-Operator or crew
O-Organizational maintenance
F- direct support maintenance
H-General support maintenance
D-Depot maintenance

The maintenance functions are defined as follows:

A- Inspect To determine serviceability of an item by comparing its physical, mechanical, anti electrical characteristics with established standards.

B- 'Test To verify serviceability and to detect electrical or mechanical failure by use of test equipment t

C- Service. To clean ,to preserve, to charge, and to add fuel, lubricants, cooling agents, and air (If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed).

D- Adjust. To rectify to the extent necessary to bring into proper operating range.

E-- Align To adjust specified variable elements of an item to bring to optimum performance.

F'- Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy ,to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

G- Install. To set up for use in an operational environment such as an emplacement, site, or vehicle.

H- Replace. To replace unserviceable items with serviceable like items.

I- Repair Those maintenance operations necessary to restore an item to serviceable condition through correction of material damage or a specific failure. Repair may be accomplished at each level of maintenance

J- Overhaul Normally, the highest degree of maintenance performed by the Army in order to minimize time work is in process consistent with quality and economy of operation It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition

K- Rebuild. The highest degree of materiel maintenance It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards .Rebuild is performed only when required by

operational considerations or other paramount factors and then only at the depot maintenance level. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

d. Tools and Equipment ,Column (4) This column is provided for referencing by code the special tools and test equipment (sec. III),required to perform the maintenance functions (sec. II).

e. Remarks. Column (5). This column is provided for referencing by code the remarks pertinent to the maintenance functions.

b-3. Explanation of Columns in Section III

a. Reference Code. This column consists of a number and a letter separated by a (lash The number references the T&TE requirements listed in section II. The letter represents the specific maintenance function the Item is to be used "if in columns A through K of section II.

b. Maintenance Level This column shows the lowest level of maintenance authorized to use the special tool or test equipment.

d. *Nomenclature.* This column lists the name or identification of the tool or test equipment. T*ool Number* This column lists the manufacturer's code and part number, or Federal stock number of tool or test equipment.

Section II. MAINTENANCE ALLOCATION CHART

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functional Group	(3) Maintenance functions											(4) Tools and equipment	(5) Remarks
		A Inspect	B Test	C Service	D Adjust	E Align	F Calibrate	G Install	H Replace	I Repair	J Overhaul	K Rebuild		
?1	Pump, Centrifugal ...(See TM 5-4320-208-121													
02	Tank ,Fabric, Collapsible	C							C	O				
		08							15	480				
03	Valves, Hoses and Fittings	C							C					
		05							10					
04	Trailer, Cargo ...(See TM 9-2330-202-14)													
05	Water Testing Equipment													
	Testing Kit	C							C					
		0 5							0.5					1
	Refill Kit	C							C					
		05							0.5					2

Section III. SPECIAL TOOL AND SPECIAL TEST EQUIPMENT REQUIREMENTS

Reference code	Maintenance Category	Nomenclature	Total number
I-A	C	Water Testing Kit, Chemical Agents	AN-M2 6665-171-9747
2-A	C	Refill Kit, Chemical Agent Detector VG Components	ABC-M30-AI 6665-909-3647

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