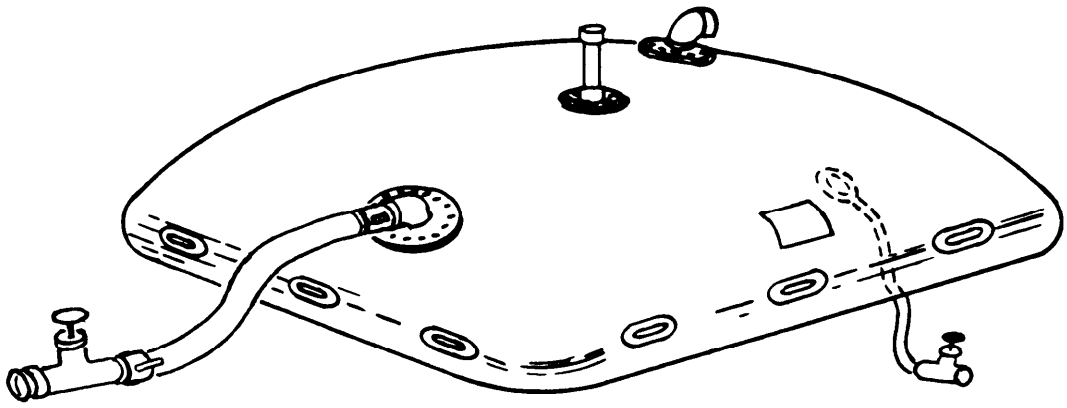
TM 5-5430-216-13&P

OPERATOR AND ORGANIZATION
MAINTENANCE INSTRUCTION
REPAIR PARTS AND SPECIAL TOOLS LIST
FOR
TANK, FABRIC, COLLAPSIBLE 20,000 GALLON WATER
NSN 5430-01-106-9678



HEADQUARTERS, DEPARTMENT OF THE ARMY

29 JANUARY 1987

CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C., 18 SEPTEMBER 1992

Operator and Organization Maintenance Instruction
Repair Parts and Special Tools List
for

TANK, FABRIC, COLLAPSIBLE, 20,000 GALLON WATER
MODEL 53029A-20, NSN 5430-01-106-9678
MODEL 53029B-20, NSN 5430-01-351-7813

Approved for public release; Distribution is unlimited

TM 5-5430-216-13&P, 29 January 1987 is changed as follows:

1. The title has been changed as shown above.

2. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i through iv	i through iv
1-1 through 1-6	1-1 through 1-6
2-5 and 2-8	2-5 and 2-8
4-11 through 4-14	4-11 through 4-14
4-17 and 4-18	4-17 and 4-18
- - - -	4-18.1 and 4-18.2
4-19 through 4-22	4-19 through 4-22
C-5 and C-6	C-5 and C-6
- - - -	C-6.1 and C-6.2
C-7 and C-8	C-7 and C-8
- - - -	C-8.1/(C-8.2 blank)
C-9 and C-10	C-9 and C-10
- - - -	C-10.1/(C-10.2 blank)
C-11 through C-14	C-11 through C-14
- - - -	C-14.1 and C-14.2
C-17 and C-18	C-17 and C-18
- - - -	E-1/(E-2 blank)
- - - -	F-1 and F-2

3. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
02811

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25-E, block no. 3827, requirements for TM 5-5430-216-13&P.

OPERATOR AND ORGANIZATION

MAINTENANCE INSTRUCTION

REPAIR PARTS AND SPECIAL TOOLS LIST

FOR

TANK, FABRIC, COLLAPSIBLE, 20,000 GALLON WATER
MODEL 53029A-20, NSN 5430-01-106-9678
MODEL 53029B-20, NSN 5430-01-351-7813

LIST OF IILUSTRATIONS

LIST OF ILLUSTRATIONS

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 the procedures, please let us know. Mail your letterer 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 Troop Support Command, ATTN: AMSTR-MMTS, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

CHAPTER 1. INTRODUCTION

Section I. GENERAL INFORMATION

1-1. PURPOSE AND FUNCTION. The 20,000 gallon water tank is a collapsible fabric container designed to store potable water. The collapsible tank is intended for use as a water storage container when large capacity quick storage facilities are needed, and where permanent water storage facilities are not available. It will store water that is off loaded from shipping tankers or pumped from wells, lakes or other water sources. Water is then dispensed to support operations. The tank is primarily used in quick-response deployment operations.

1-2. CAPABILITIES. The tank has a capacity of 20,000 gallons (75.71 kiloliters). The tank is compatible with all standard military water storage and handling equipment. The tank can be quickly deployed on flat ground with a minimum of surface preparation.

1-3. PERFORMANCE CHARACTERISTICS. The tank is composed of a single ply nylon cloth coated on both sides with an elastomer. Four fittings are bonded into the tank for attaching one vent assembly, two filler/discharge assemblies, and one drain assembly. The tank and components are suitable for operational use at ambient temperatures from plus 125°F (51.7°C) to plus 32°F (0.O°C). The tank materials are designed to resist exposure effects from extreme temperatures, rain, snow, ice, fungi growth and high humidity conditions. Access to the inside of the tank can be made through either filler/discharge fitting. The tank is self-supporting and does not require earth-embankment support.

1-4. DIMENSIONS, WEIGHT, VOLUME.

a. The following dimensions are for the tank when empty and folded prior to deployment.

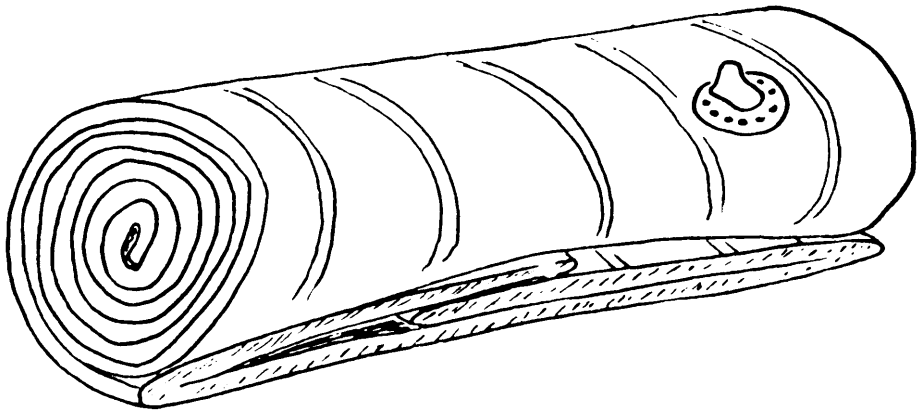


Figure 1-1. Tank Empty and Folded
Model 53029A-20

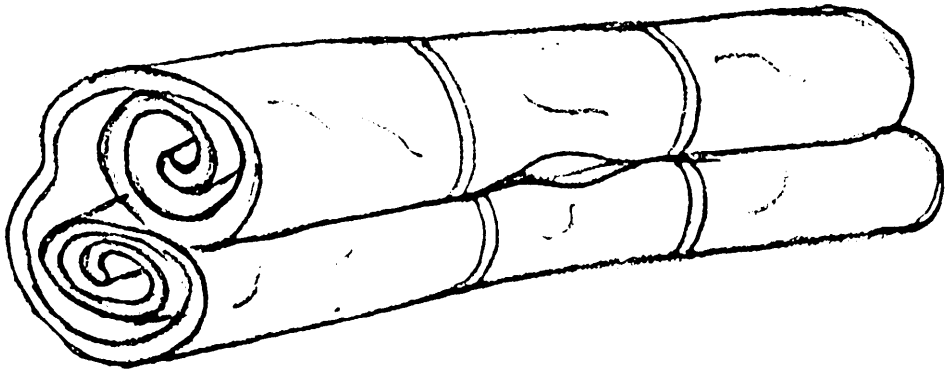


Figure 1-1.1 Tank Empty and Folded
Model 53029B-20

Height: 1.5 ft (0.45 m)

Width: 2.66 ft (0.79 m)

Length: 11.5 ft (3.51 m)

Weight: 480 lb (217.7 kg)

1-4. DIMENSIONS, WEIGHT , VOLUME (continued).

b. The following dimensions are for the tank when deployed.

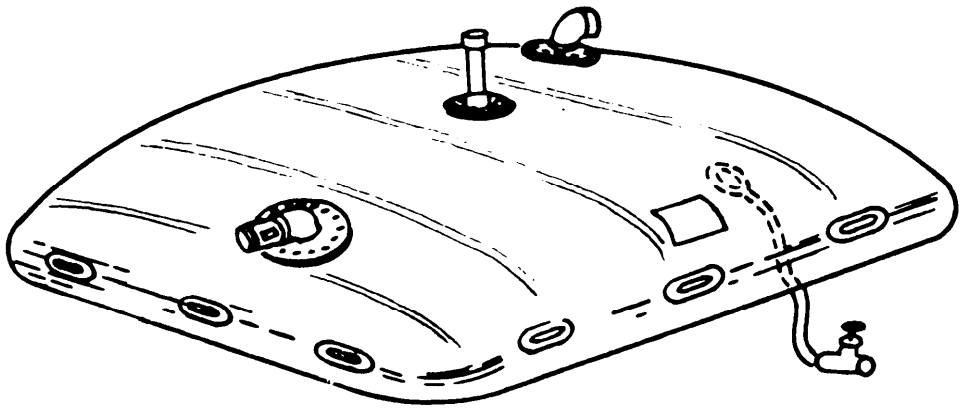


Figure 1-2. Tank Filled
Model 53029A-20

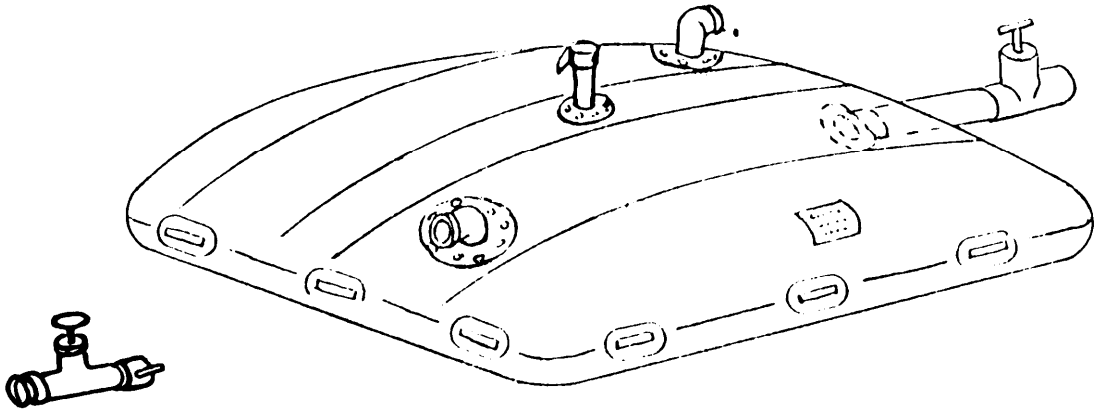


Figure 1–2.1 Tank Filled
Model 53029B-20

Capacity (Water):	20,000 gallons (75.71 kiloliters)
Height at Capacity (Water):	5 ft 6 in. (1.68 m)
Length:	26.5 ft (8.08 m)
Width:	22.5 ft (6.86 m)

1-5. ENVIRONMENTAL REQUIREMENTS. The interior of the tank should be cleaned only when necessary to ensure the proper cleanliness of the water. When interior cleaning is required do not allow cleaning solutions to flow into waterways. In some locations, it may be permissible to allow solutions to drain into sanitary sewers. Follow all local regulations.

1-6. LIST OF ITEMS FURNISHED.

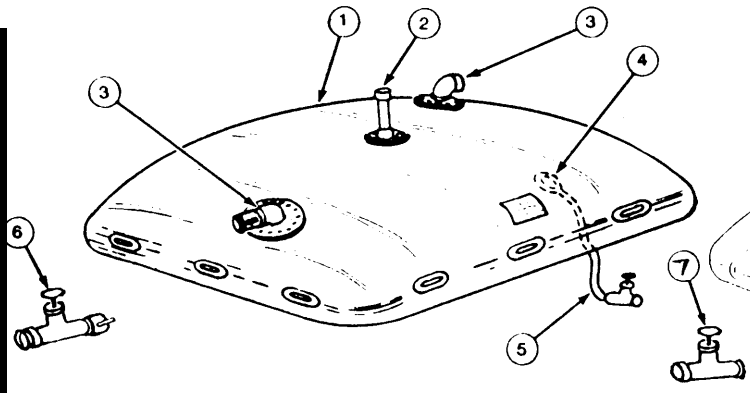


Figure 1-3. Tank Parts
Model 53029A-20

Item	Name
1	Tank Envelope
2	Vent Assembly
3	Filler/discharge Assembly (Two)
4	Drain Assembly
5	Drain Hose 3/4-inch and Valve 1/2-inch
6	Valve Assembly 4-inch

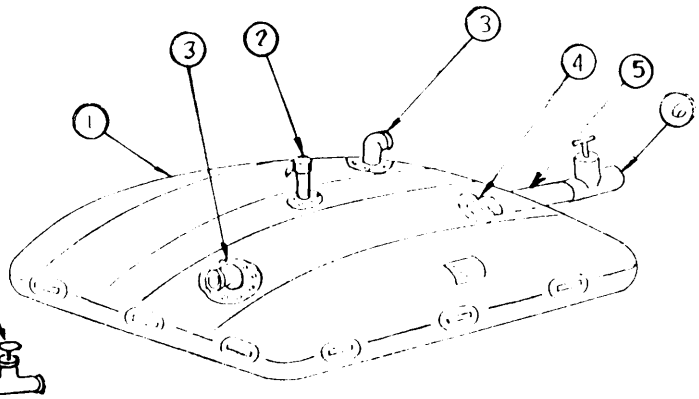


Figure 1-3.1 Tank Parts
Model 53029B-20

Item	Name
1	Tank Envelope
2	Vent Assembly
3	Filler/discharge Assembly (Two)
4	Drain Assembly
5	Drain Hose 2-inch
6	Valve Ball Assembly 2-inch
7	Valve Gate 4-inch

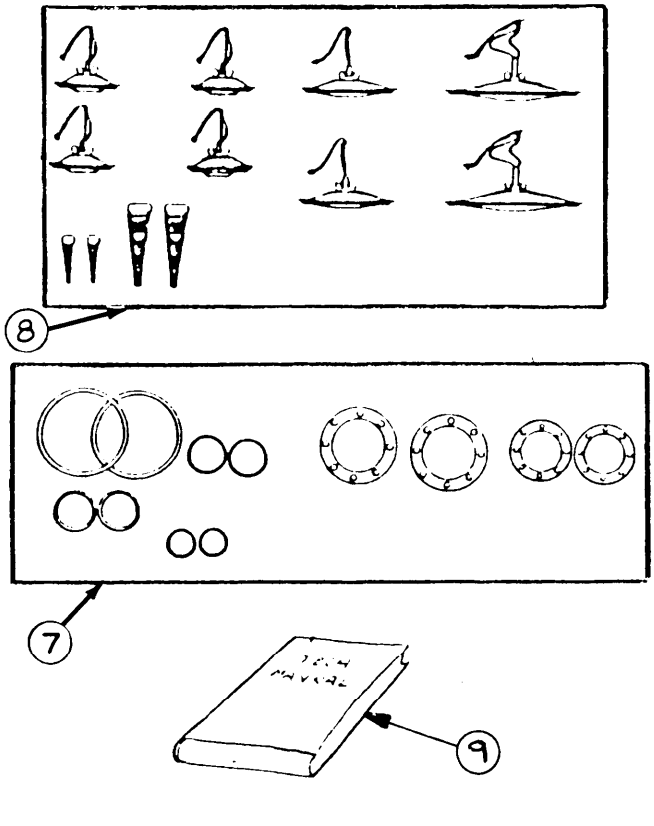


Figure 1–4. Tank Accessories
Model 53029A-20

ITEM	Name
7	Emergency Repair Items
8	Emergency Repair Kit
9	Technical Manual

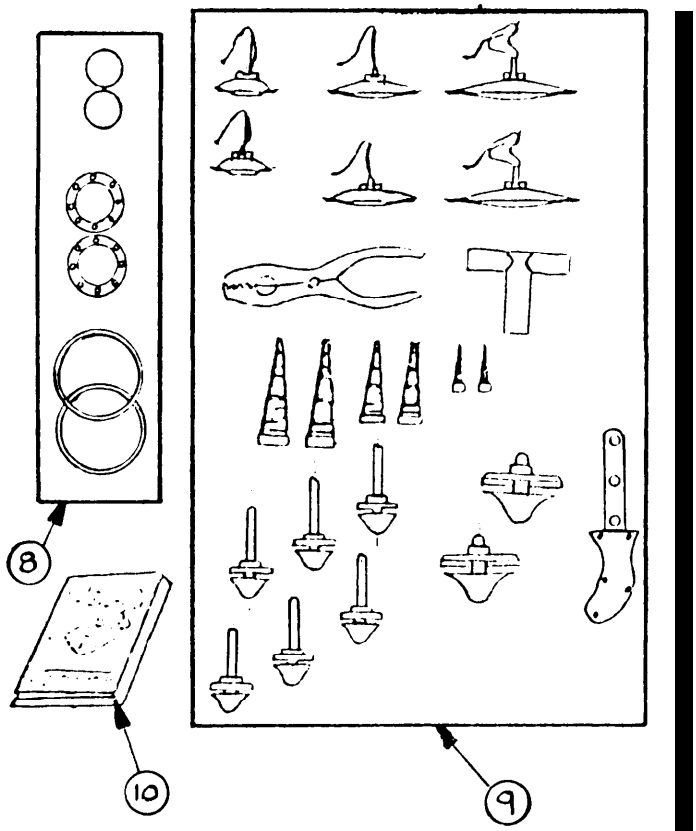


Figure 1–4.1 Tank Accessories
Model 53029B-20

ITEM	NAME
8	Emergency Repair Items
9	Emergency Repair Kit
10	Technical Manual

1-7. STORAGE DATA. Refer to Chapter 5 of this manual.

1-8. TOOLS AND TEST EQUIPMENT. Tool Kit, General Mechanics.

1-9. MAINTENANCE FORMS AND RECORDS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed in DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-10. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE. Methods of destruction should achieve such damage to equipment that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or cannibalization.

a. Tank Accessories. Use a pick, an ax, or another sharp, heavy instrument to damage tank connections.

b. Tank Envelope. Cut fabric with pocket knife.

Section II. SAFETY PRECAUTIONS

1-11. The following is a general safety precaution that is not related to any specific procedure and therefore does not appear elsewhere in this publication.

WARNING

DO NOT ENTER TANK. DEATH MAY RESULT.

NOTE

Tank entry is restricted to authorized maintenance personnel only. Should tank condition arise which would require tank entry, notify your supervisor.

1-12. The following warnings and cautions appear in the text and are repeated here for emphasis.

CAUTION

Do not overfill the tank. Overfilling the tank may result in rupture or leakage. The required quantity of water may be measured by using range poles.

CAUTION

Use extreme care when enlarging a tear. Tension in the fabric may cause the fabric to rip further. Ideally, tank height should not be greater than 2 feet (0.61 meters) when you make this type of repair.

CAUTION

All metals on the tank and the tank accessories are aluminum alloy. Do not drop or strike these items. Scuffed or bent accessories will not assemble properly.

CAUTION

Do not drop sharp objects on the tank. Walk on tank as little as possible. When walking on the tank, wear soft-soled shoes. Do not drive vehicles over tank. Failure to observe these precautions may result in punctures, tears, or scuffs on the tank body.

Do not drop or strike tank fittings or accessories. All metal items are aluminum and bend easily.

CHAPTER 2. PREPARATION FOR USE AND INSTALLATION

Section I. SITE SELECTION AND PREPARATION

2-1. SITE SELECTION. Select or grade a level area of at least 38 x 34 feet; this will provide the desired 5-foot perimeter around the empty flat tank. If the site selected has a slight slope, place the tank side with the drain fitting and a filler/discharge fitting at the lowest end. For best tank operation, the tank bed area should have a slope of 3 inches in 100 feet. Do not exceed 12 inches in 100 feet. The site must not be subject to flooding or high water. Clear the site of all sharp objects that might puncture or scuff the tank.

2-2. DEPLOYMENT. Place the crate containing the tank in the middle of the prepared site.

CAUTION

Do not drop sharp objects on the tank. Walk on tank as little as possible. When walking on the tank, wear soft-soled shoes. Do not drive vehicles over tank. Failure to observe these precautions may results in punctures, tears, or scuffs on the tank body.

Do not drop or strike tank fittings or accessories. All metal items are aluminum and bend easily.

NOTE

Make sure that crated tank is in the proper position before beginning deployment. It is difficult to move tank once it has been deployed.

2-2. DEPLOYMENT (Continued)

a. Remove tank roll from shipping container.

b. Position tank in the center of the lower end (down slope) of the deployment site (Figure 2-1).

c. Unroll tank towards the higher end (up slope). This will place the drain assembly on the lower side.

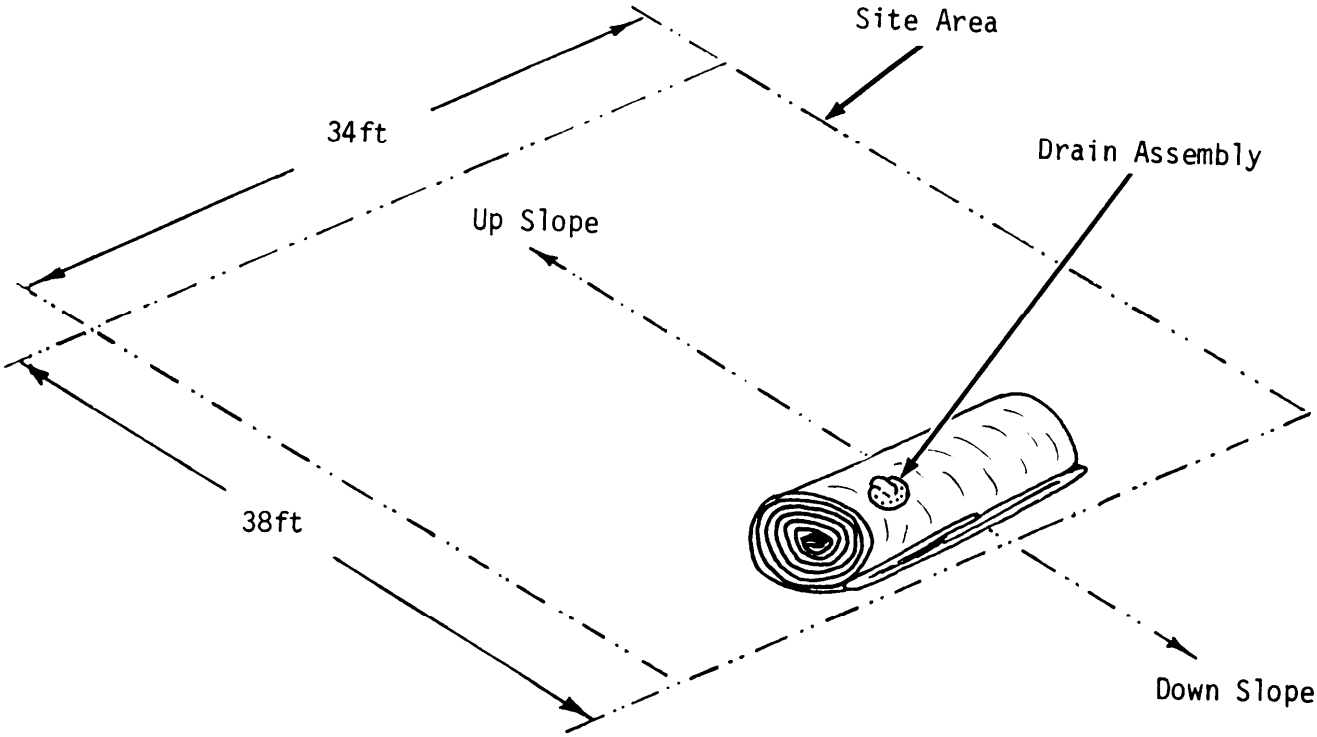


Figure 2-1. Tank Rolled

d. Once tank is fully unrolled, unfold the tank.

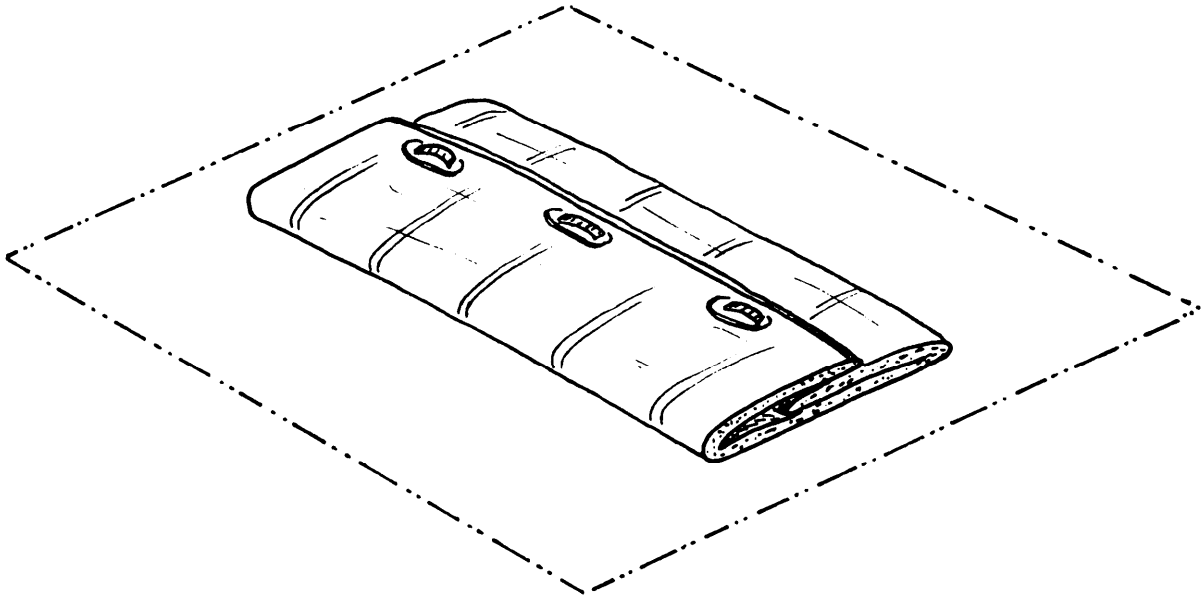


FIGURE 2-2. TANK FULLY UNROLLED

e. Use handles to center tank inside the site area.

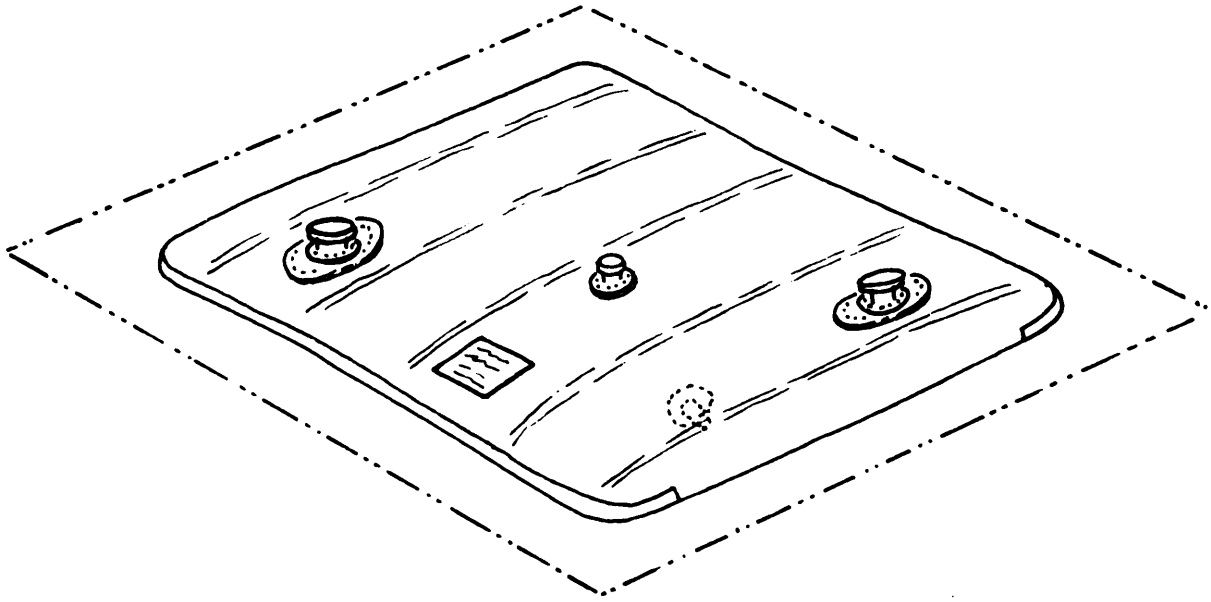


FIGURE 2-3. TANK UNFOLDED

2-3. PREASSEMBLY INSPECTION. To ensure that the tank has not been damaged during shipment, conduct an inspection before assembly.

a. Check that all components are present.

b. Check that each female coupling has a sealing gasket. Replace all missing gaskets. Refer to Chapter 4 of this manual for replacement.

c. Check cam arm operation for all female couplings. Do not use couplings with broken, bent, or faulty cam arms.

d. Check that the gate valves open and close. Refer to Chapter 4 of this manual for replacement of gate valves.

e. Check tank for punctures or tears.

Section II. ASSEMBLY AND INSTALLATION

2-4 ASSEMBLY. After the tank has been unpacked, deployed, and inspected, perform the following steps in order.

CAUTION

All metals on the tank and the tank accessories are aluminum alloy. Do not drop or strike these items. Scuffed or bent accessories will not assemble properly.

NOTE

For ease in emptying the tank completely, dig a hole under the drain assembly.

a. Fold about 6 feet (1.83 meters) of the tank envelope back over the rest of the tank to expose connection for drain assembly located on the bottom of the tank.

b. At the point where the drain fitting strikes the ground dig a hole approximately 36 inches (91.5 Centimeters) long by 36 inches (91.5 Centimeters) wide and 3 inches (7.5 Centimeters) deep. For Model 53029B-20 the hole is 6 inches (15.3 Centimeters) deep. Keep the drain fitting contact point centered.

NOTE

Wrap male threads with Teflon tape to ensure a positive seal.

c. Attach drain and gate valve to drain connection. Unfold tank envelope to lie flat in original position. Valve should extend from bottom of tank. Check that valve is closed.

d. Remove dust caps and dust plugs from tank vent assembly, elbows, hose and valve assembly. If the sealing surfaces of the couplings are dirty, wipe with a clean cloth.

e. Connect vent assembly to tank Model 53029A-20. Close both arms at the same time by hand. Do not close cam arms one at a time, as this tends to cause misalignment of the mating parts and prevents cam arms from closing properly. Model 53029B–20 screw on vent assembly to stand pipe.

f. Connect filler/discharge elbows to tank. Close both cams arms on each assembly at the same time by hand.

g. Select the filler/discharge elbow to be used in operation. Place dust cap or plug on the filler/discharge elbow that will not be used.

h. Connect hose to elbow. Close both cam arms at the same time by hand. (4 IN. filler/discharge hose is not supplied with tank).

i. Connect valve to hose. Close both cam arms at the same time by hand.

j. Close the gate valve.

2-5. DIKE CONSTRUCTION

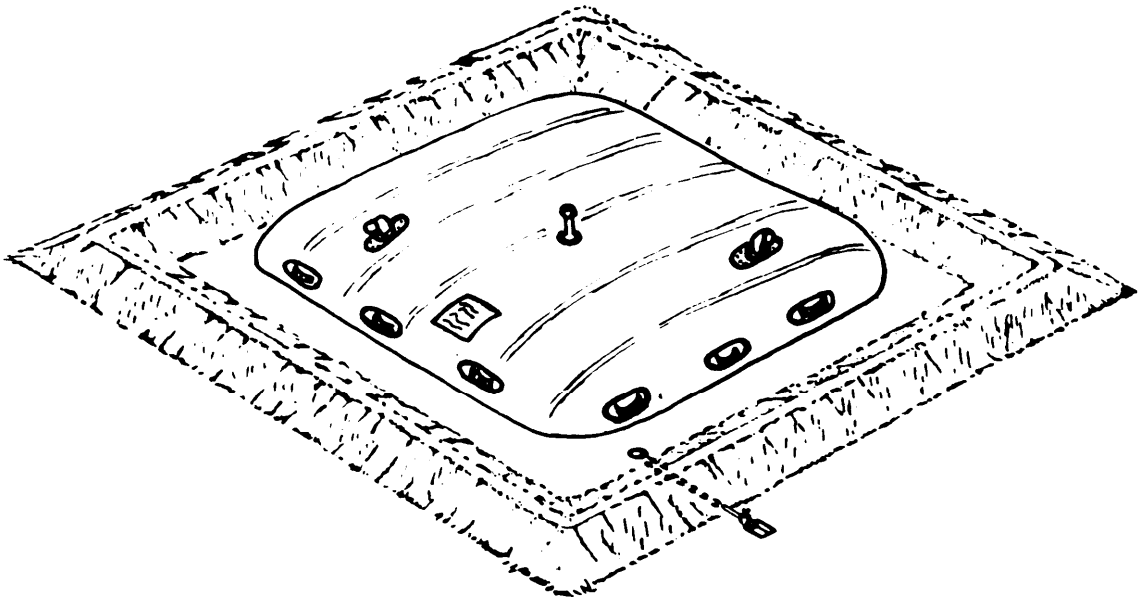


Figure 2-4. Diked Site Area

The site area must be diked to stop the flow of water in case of rupture or leakage. The tank may be filled before it is diked if the situation dictates. Normal procedure is to dike the site area before filling. An erected dike (Figure 2-4) should have the following characteristics:

- o At least a 5-foot (1.53 meter) working area between the tank and the walls.
- o Wall height should be 3 feet (.92 meters). This w1ll provide an internal volume of at least 3875 cubic feet (108.5 cubic meters), or 28,700 gallons.
- o Halls protected against erosion with sod or stone.
- o A drain pipe and valve at the low end of the site to remove accumulated rain water. The drain should normally be kept closed. It-can be opened as needed.

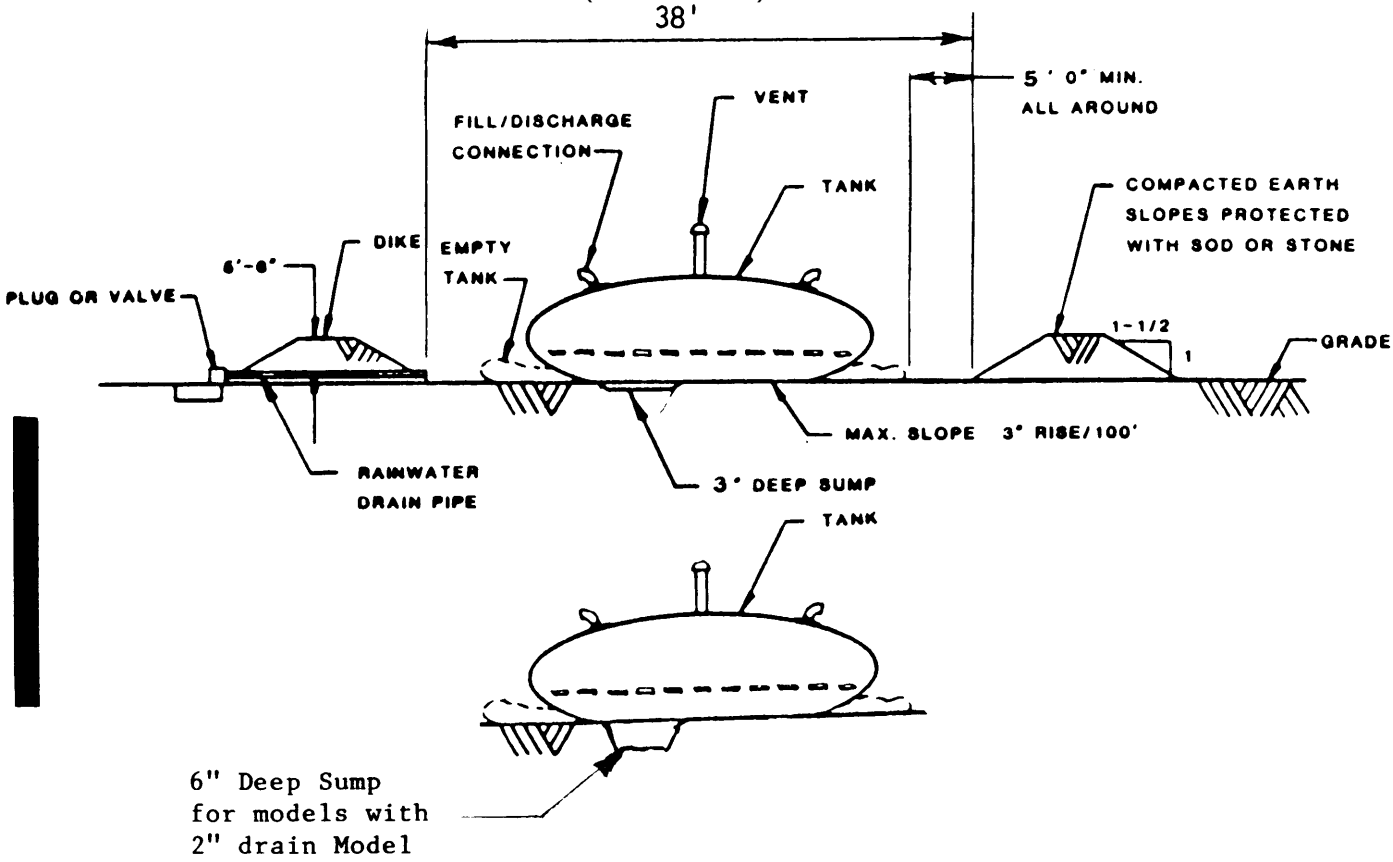


Figure 2-5. Tank Site Detail

2-6. FINAL SITE PREPARATION.

a. Secure area by fencing or other means to prevent access by unauthorized personnel.

b. Post signs indicating where to seek help in case of emergency.

CHAPTER 3. OPERATING INSTRUCTIONS

Section I. INTRODUCTION

3-1. GENERAL THEORY OF OPERATION. The tank is filled by connecting a line from a shipping tanker or other water source to a filler/discharge assembly. Manually operated gate valves are used to limit the flow of water. Water is discharged by connecting a line to the filler/discharge assembly. Water can also be supplied at a reduced flow by using the 3/4-inch drain line. Follow all safety procedures carefully when operating the tank.

3-2. CONTROLS AND INSTRUMENTS.

a. Vent Assembly. The vent assembly is located in the middle of the tank. It contains a relief valve which opens when the tank is subject to internal vapor pressure greater than 3 inches (7.62 centimeters) of water.

b. Drain Gate Valve. The drain gate valve allows water to be drained from the tank when necessary.

c. Filler/Discharge Gate Valve. The filler/discharge gate valve is installed on the line attached to the filler/discharge elbow selected for use. When open, it allows water to flow into or out of the tank. When closed, it blocks water flow.

Section II. NORMAL OPERATING PROCEDURES

3-3. FILLING TANK.

CAUTION

Do not drop sharp objects on the tank. Walk on tank as little as possible. When walking on the tank, wear soft-soled shoes. Do not drive vehicles over tank. Failure to observe these precautions may result in punctures, tears, or scuffs on the tank body.

Do not drop or strike tank fittings or accessories. All metal items are aluminum and bend easily.

a. Check to see that tank is properly deployed. It should be lying flat and smooth.

b. Check that the drain hose is attached and the drain gate valve is closed.

c. Check that vent assembly is operational.

d. Check filler/discharge elbow that will not be used in filling. Make sure it is covered by a dust cap or plug.

e. Attach water source line to filler/discharge gate valve to be used for filling.

f. Open gate valve.

CAUTION

Do not overfill the tank. Overfilling the tank may result in rupture or leakage. The required quantity of water can be measured by using range poles.

NOTE

If the tank begins to roll or creep when being filled, place sandbags along the lower edge of the tank to prevent further creeping or rolling.

g" Activate water source. Fill tank. Tank is filled to capacity when it reaches a height of 5 feet, 6 inches (1.68 meters). Do not overfill tank.

h. When tank is full, stop pumping.

i. Close gate valve.

j. Check tank for leakage. If tank leaks, follow troubleshooting procedures in table 4-2.

3-4. DISCHARGING WATER.

CAUTION

Do not drop sharp objects on the tank. Walk on tank as little as possible. When walking on the tank, wear soft-soled shoes. Do not drive vehicles over tank. Failure to observe these precautions may result in punctures, tears, or scuffs on the tank body.

Do not drop or strike tank fittings or accessories. All metal items are aluminum and bend easily.

a. Attach line from user to 4" gate valve.

b. Open 4" gate valve.

c. Activate pumping source.

d. Monitor Metering source.

e. When user's requirement is fulfilled, stop pumping.

f. Close 4" gate valve.

3-5. DRAINING TANK.

a. Empty water from tank following procedures in paragraph 3-4.

b. Pump out tank as completely as possible. Open drain gate valve.

c. Fold sides of tank toward middle. Roll end of tank farthest from the drain assembly toward the drain to squeeze out residual water.

Section III. OPERATING UNDER UNUSUAL CONDITIONS

3-6. GENERAL. The tank is designed to operate in extreme temperature conditions ranging from +32°F to 125°F (0.O°C to 51.7°C).

3-7. OPERATING IN EXTREME COLD.

a. Try to deploy tank only when temperature is above +32°F (0.O°C).

b. Avoid any unnecessary folding, unfolding, or rolling of tank, which might cause flaking, cracking, or delamination of coated material.

3-8. OPERATING IN EXTREME HEAT. Avoid any unnecessary handling of tank, which might cause coated material to separate.

3-9. OPERATING IN DUSTY OR SANDY AREAS.

a. Keep tank clean. Make sure vent assembly and filler/discharge assemblies are clean.

b. Keep all hoses and fittings covered with dust caps when not in use.

c. Wipe all couplings clean before assembling.

3-10. OPERATING AFTER NUCLEAR, BIOLOGICAL, OR CHEMICAL (NBC) CONTAMINATION.

a. Nuclear. If nuclear contamination (fallout) comes down dry, decontaminate using dry methods. Brush off tank or shipping container with brooms or vacuum. If nuclear contamination comes down wet, decontaminate with high pressure water hoses.

b. Biological and Chemical. Neutralize with Super Tropical Bleach (STB). Wash off with high pressure water.

c. For-further information on NBC decontamination, refer to FM 21-40.

3-11. EMERGENCY SHUT DOWN. Emergency shut down of tank operations can be accomplishing by performing the following:

a. Close all gate valves.

b. Disconnect servicing hoses.

c. Clear area of equipment and personnel.

NOTE

For emergency destruction to prevent enemy use, refer to para. 1-12.

CHAPTER 4. MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION AND CLEANING

4-1. LUBRICATION. There is no lubrication required for the 20,000 Gallon Collapsible Water Tank.

4-2. EXTERIOR CLEANING. Dirt on the tank and tank accessories should be flushed off with water.

4-3. INTERIOR CLEANING. The interior of the tank requires little cleaning if it is used for the same commodity. If cleaning is required, fill the tank with approximately 150 gallons of a mild detergent/water solution. Close off all openings and slosh the detergent solution back and forth by alternately pulling the ends of the tank over the top of the tank. Drain the solution from the tank and flush with clean water. Repeat flushing as necessary. Dry the inside of the tank with a large volume air blower if the tank is to be placed in dry storage.

Section II. PREVENTIVE MAINTENANCE

4-4. INSPECTION. The tank will be inspected weekly to ensure that the equipment is ready for operation at all times. Through regular inspection, defects can be found and corrected before serious damage occurs. Defects found during operation should be noted and corrected as soon as servicing operations have stopped. Refer to table 4-1 for inspection procedures.

Table 4-1. Inspection Procedures

ITEM NO.	ITEMS TO BE INSPECTED	PROCEDURES
1	Installation area	Inspect installation area. Remove sharp objects that might cause punctures or leaks.
2	Tank Envelope	inspect tank envelope for tears, punctures, and leaks. Refer to paragraph 4-8 for maintenance procedures.
3	Vent assembly	Inspect vent assembly for damage or leakage. Inspect relief valve for freedom of operation. Refer to paragraph 4-9 for maintenance procedures.
4	Filler Assembly	Inspect filler assembly for damage or leakage. Inspect gaskets for damage. Refer to paragraph 4-10 for maintenance procedures.

Table 4-1. Inspection Procedures - Continued

ITEM NO.	ITEMS TO BE INSPECTED	PROCEDURES
5	Discharge Assembly	Inspect discharge assembly for damage or leakage. Refer to paragraph 4-10 for maintenance procedures.
6	Drain Assembly	Inspect drain valve and hose for leakage. Refer to paragraph 4-11 for maintenance procedures.
7	Valve Assembly, 4“	Inspect parts for leakage. Inspect gaskets for damage. Refer to paragraph 4-12 for maintenance procedures.
8	Hose Assembly	Inspect hoses for leakage. Inspect hose connections for leakage. Refer to paragraph 4-13 for maintenance procedures.

Section III. TROUBLESHOOTING

4-5. This section contains troubleshooting information for locating and correcting most operating problems. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which help you determine probable cause and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed. 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.

4-6. TROUBLESHOOTING. For troubleshooting, refer to table 4-2.

NOTE

Although the 4“ hose is not considered to be part of the 20,000 Gallon Water Tank, it is necessary for the proper functioning of the tank; and therefore, has been included in the following Troubleshooting and Maintenance procedures.

Table 4-2. Troubleshooting

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. Tank leaks	- Check tanks for punctures or cuts	- Repair puncture with sealing clamps or plugs (Ref. para 4-8).
2. Vent Assembly leaks	- Check O-Ring between flanged adapter and tank for nicks, or distortion.	- Remove coupling from tank fitting and replace O-ring (Ref. para 4-9).
	- Check vent stand pipe for cracks or damage.	- Remove and replace vent stand pipe (Ref. para 4-9).
	- Check coupling for breaks or cracks.	- Remove and replace coupling (Ref. para 4-9).
	- Check for loose or missing hexagon head bolts.	- Tighten or replace bolts.
3. Pressure Relief Valve remains open	- Check relief valve for debris in tube or on pivot pin.	-Clean relief valve (Ref. para 4-9).
4. Hose Assembly leaks	- Check female coupling gaskets for damage or wear.	- Remove and replace gaskets

Table 4-2. Troubleshooting (Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. Hose Assembly leaks (Cont'd)	- Check couplings on hose for dirt, damage, or wear.	- Remove dirt or any foreign objects inside couplings. If leak continues, replace hose assembly.
	- Check hose for cuts, breaks or leaks.	- If hose has cuts, breaks, or leaks, remove and replace hose assembly.
5. Filler Assembly leaks	- Check for loose or missing hexagon head bolts.	- Tighten or replace bolts as necessary
	- Check O-Ring between closure plate and tank fitting for nicks, breaks and distortion.	- Replace O-Ring (Ref. para 4-10).
	- Check gaskets on either side of closure plate for damage or breaks.	- Replace gaskets (Ref. para 4-10).
6. Discharge Assembly leaks	- Check for loose or missing hexagon - head bolts.	- Tighten or replace bolts as necessary

Table 4-2. Troubleshooting (Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. Discharge Assembly leaks (Con't)	- Check O-Ring between closure plate and tank fitting for nicks, breaks and distortion.	Replace O-Ring (Ref. para 4-10).
	- Check gaskets on either side of closure plate for damage or breaks.	Replace gaskets (Ref. para 4-10).
7. Drain Assembly leaks	- Check for loose or missing hexagon head bolts.	Tighten or replace bolts as necessary.
	- Check O-Ring between drain fitting and tank metal face for nicks, breaks and distortion.	Remove and replace O-Ring (Ref. para 4-11).
8. Gate Valve Assembly leaking	- Check for loose or missing hexagon head bolts and nuts.	- Tighten or replace nuts and bolts as necessary.

Table 4-2. Troubleshooting (Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. Gate Valve Assembly leaking (Cent'd)	- Check for loose valve stem B-Nut.	- Tighten B-Nut.
	- Check female coupling gaskets for damage or wear.	- Remove and replace gaskets (Ref. para 4-12).
	- Check male coupling for dirt, damage or wear.	- Remove dirt or foreign objects from coupling. If leak continues, replace male coupling.

Section IV. CORRECTIVE MAINTENANCE

4-7 GENERAL. This section contains disassembly, repair and replace, and reassembly instructions for the tank.

4-8 EMERGENCY REPAIRS TO TANK ENVELOPE. There are two ways to repair the tank envelope. Wooden plugs should be used as an immediate repair to stop the flow of water from the tank until it is possible to install a sealing clamp. Replacement may not be possible until the water height and internal pressure of the tank have been reduced by discharging or draining water. Plugs can be used for tears up to 1 1/2 inches (3.81 centimeters). Sealing clamps can be used for tears up to 6 inches (15.24 centimeters).

a. Repairs with Wooden Plugs.

(1) Insert small end of plug into puncture. Turn clockwise until leak stops or slows.

(2) Remove plug and install clamp when operation permits.

b. Repairs with Clamps. See figure 4-1.

(1) Select proper size clamp using these guidelines for tears:

less than 2-inch (5.08 centimeter).	use 3-inch clamp
2- to 4-inch (5.08 - to 10.16 centimeter).	use 5-inch clamp
4- to 6-inch (10.16 - to 15.24 centimeter).	use 7 1/2-inch clamp

CAUTION

Use extreme care when enlarging a tear. Tension in the fabric may cause the fabric to rip further. Ideally, tank height should not be greater than 2 feet (0.61 meters) when you make this type of repair.

(2) Loop cord at top of clamp around wrist to prevent loss of clamp into tank.

(3) Slip bottom half of clamp inside tank. If tear is too small for clamp to slip through, use a pocket knife to enlarge tear to accommodate width of clamp.

(4) Rotate clamp so that its length runs with tear. Pull bottom half of clamp up against fabric. Slide top half down and over stud.

(5) Tighten wingnut by hand until leak stops. If more tightening is necessary, use pliers. Do not overtighten.

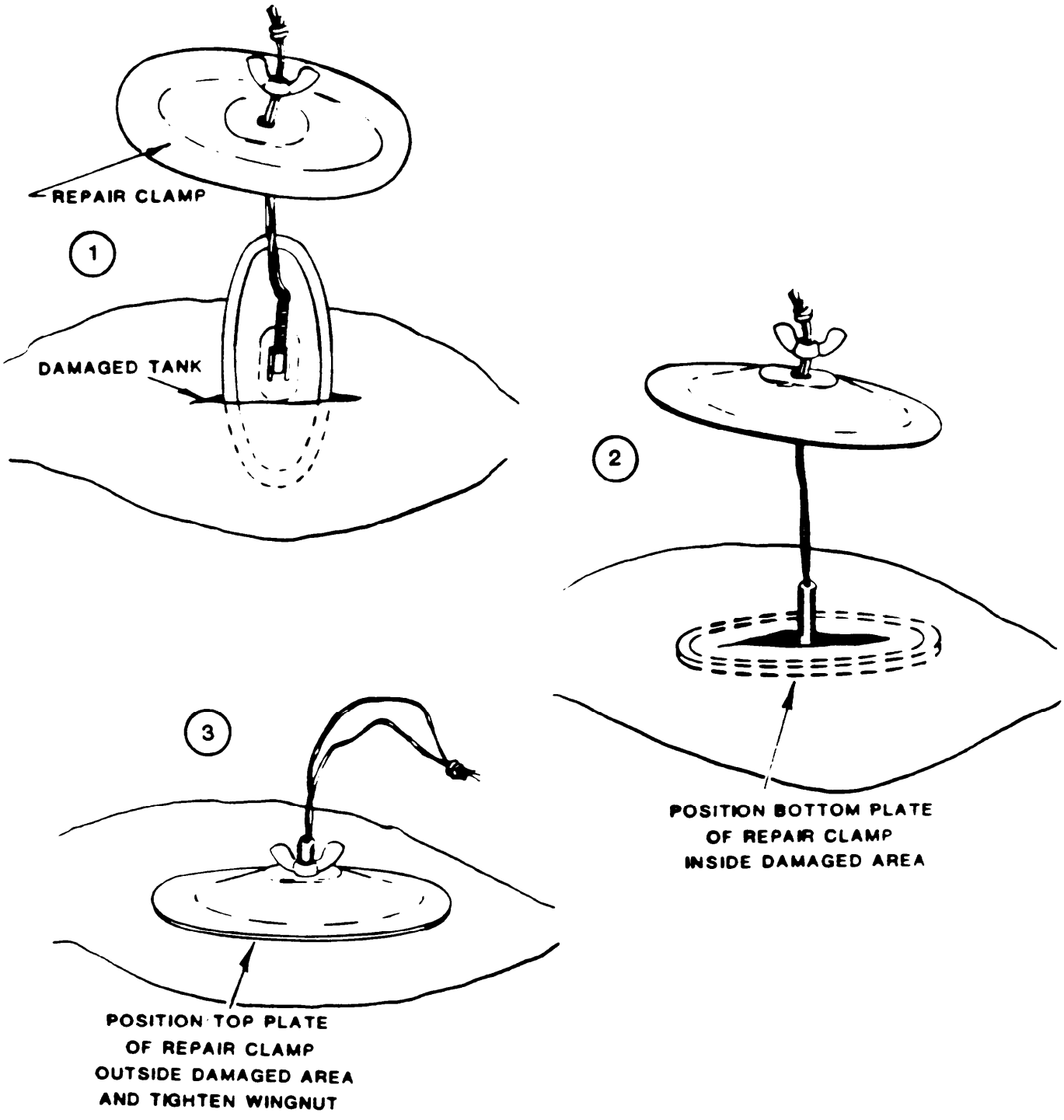


Figure 4-1. Repairing Tank Envelope with Sealing Clamp

4-9 VENT ASSEMBLY. See figure 4-2. Model 53029A-20

a. Disassemble

(1) Disconnect female Coupling from flanged adapter by pulling outward on cam arms. Lift female coupling from adapter. Remove gasket from female coupling.

(2) Remove vent standpipe from coupling by turning counterclock wise.

(3) Separate relief valve from valve vent standpipe by turning valve counterclockwise.

(4) Using wrench, remove bolts and washers. Lift flanged adapter from tank fitting.

(5) Remove O-Ring from groove in tank fitting.

b. Repair and Replacement

(1) Clean all parts by wiping with a cloth.

(2) Inspect all parts for cracks, dents, breaks, or wear. If any parts are no longer serviceable, replace before reassembly.

(3) Check that vent hole in relief valve is clear.

VENT ASSEMBLY. See Figure 4-2.1 Model 53029B-20

a. Disassembly

(1) Separate relief valve from flanged standpipe by turning valve counterclockwise .

(2) Using wrench, remove bolts and washers.

(3) Remove O-Ring from groove in tank fitting.

b. Repair and Replacement

(1) Clean all parts by wiping with a cloth.

(2) Inspect all parts for cracks, dents, breaks, or wear. If any parts are no longer serviceable, replace before reassembly.

(3) Check that vent hole in relief valve is clear.

4-90 VENT ASSEMBLY. (Continued)

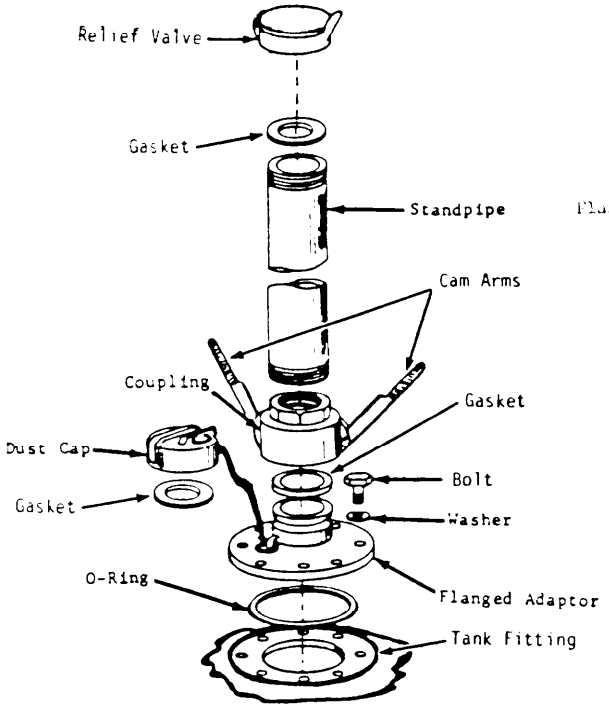


Figure 4-2. Vent Assembly
Model 53029A-20

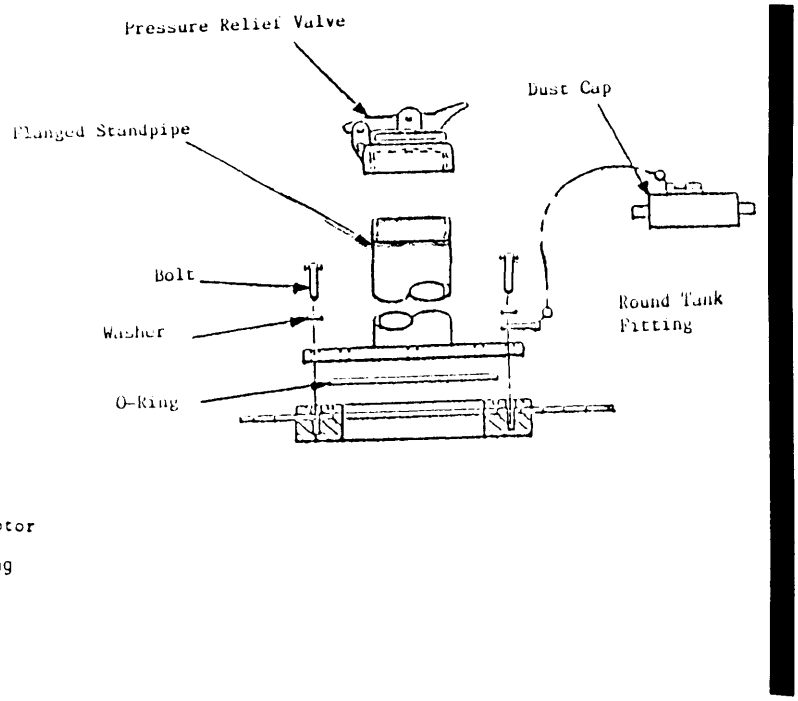


Figure 4–2.1 Vent Assembly
Model 53029B-20

4-9 VENT ASSEMBLY (Continued)

b. Reassemble

(1) Lubricate O-Ring with MIL-C-10382 lubricant only. Place new O-Ring into groove in tank fitting.

(2) Place flange adapter on tank fitting. Rotate until holes in flange are in line with tapped holes in fitting. Place washers over bolts. Place bolts through holes in flange. Hand tighten bolts. See appendix F for torque sequence and values.

(3) Place relief valve on vent standpipe until standpipe contacts O-Ring gasket. Turn relief valve clockwise until tight.

NOTE: STOP HERE FOR MODEL 53029B -20

(4) Insert vent standpipe into coupling and turn standpipe clockwise until tight.

(5) Insert coupling gasket into female coupling. Check that cam lever arms of coupling are in an outward position. Place female coupling onto flange adapter. Pull cam arms inward until they lock.

4-10 FILLER/DISCHARGE ASSEMBLY See figure 4-3

a. Disassemble

(1) Pull outward on cam arms. Remove elbow from flanged adapter.

(2) Remove elbow gasket from inside of elbow.

(3) Using wrench, remove hexagon-head bolts and washers. Remove closure plate from tank fitting.

(4) Remove O-Ring from groove in tank fitting.

(5) Using wrench, remove hexagon-head bolts and washers from remaining assembly. Remove flange adapter and gasket from top of closure plate. Remove suction stub from gasket from bottom of closure plate.

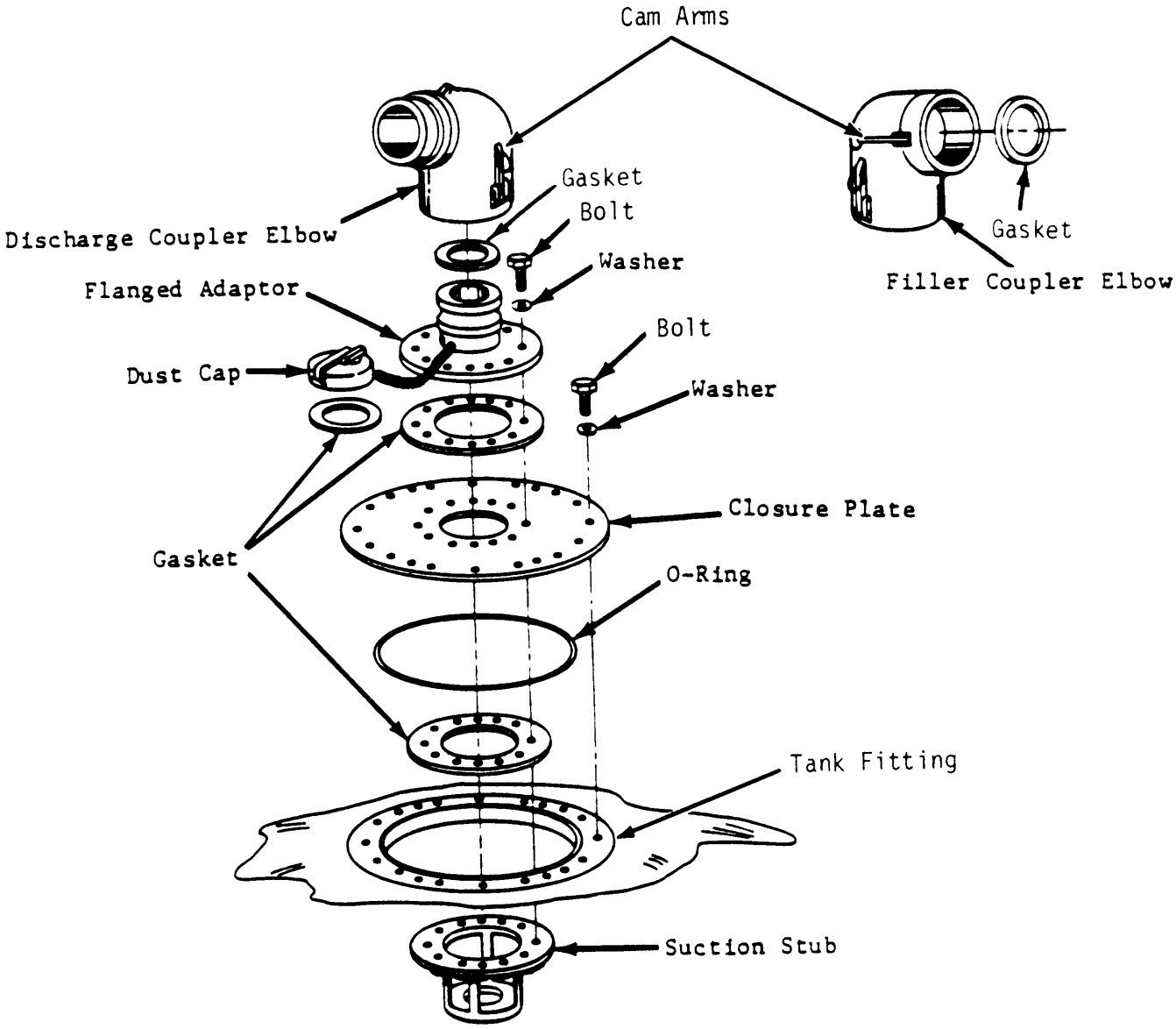


Figure 4-3. Filler/Discharge Assemblies

4-10. FILLER/DISCHARGE ASSEMBLY. (Cont'd)

b. Repair and Replacement.

(1) Clean all parts by wiping with a cloth.

(2) Inspect all parts for cracks, dents, or wear. If any parts are no longer serviceable, replace before reassembly.

c. Reassembly.

(1) Place suction stub on flat surface. Ensure ring with nut holes is facing up.

(2) Place gasket and closure plate onto suction stub.

(3) Place flanged adapter gasket on closure plate.

(4) Place flanged adapter on gasket.

(5) Place washers on bolts. Insert bolts through holes of flanged adapter and mate with holes in closure plate. Using a wrench, tighten bolts.

(6) Place O-ring into groove in tank fitting.

(7) Place closure plate onto tank plate assembly.

(8) Place washers over bolts. Insert bolts through closure plate and into tapped holes in tank fitting. Using wrench, tighten bolts.

(9) Place elbow gasket into elbow.

(10) Place elbow onto flanged adapter. Push cam arms inward until they lock.

4-11 DRAIN ASSEMBLY See figure 4–4 Model 53029A-20

a. Disassembly

(1) Using wrench, remove bolts and washers attaching drain assembly to tank fitting.

(2) Remove drain fitting and attached hardware.

(3) Remove O-Ring from groove in tank fitting.

(4) Turn valve counterclockwise to disconnect it from drain fitting. Remove valve.

(5) Turn drain hose counterclockwise to disconnect it from drain fitting. Remove hose.

b. Repair and Replacement

(1) Clean all parts by wiping with a cloth.

(2) Inspect all parts for cracks, dents, breaks or wear. If any parts are no longer serviceable, replace before reassembly.

NOTE: WRAP MALE THREADS WITH TEFLON TAPE TO ENSURE A POSITIVE SEAL.

c. Reassembly

(1) Place drain hose on drain fitting. Turn hose clockwise until tight.

(2) Place valve on drain hose. Turn valve clockwise until tight.

(3) Lubricate O-Ring with MIL-C-10382 lubricant only. Place new O–Ring into groove on tank fitting.

(4) Place drain fitting on tank fitting. Make sure hose and valve will extend from underneath tank.

(5) Place washers over bolts. Insert bolts drain fitting and into tank fitting. Using wrench, tighten bolts.

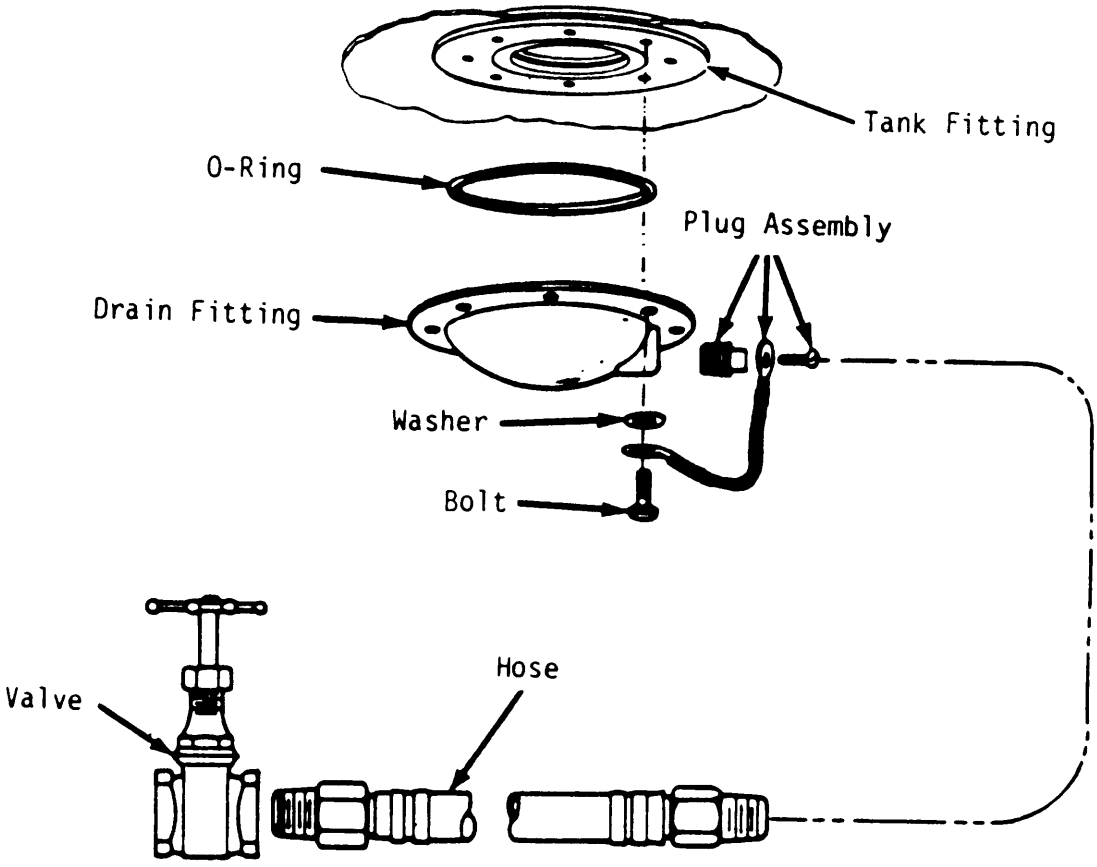


Figure 4-4. Drain Assembly
Model 53029A-20

4-11.1 DRAIN ASSEMBLY See figure 4-4.1 Model 53029B–20

a. Disassembly

(1) Using wrench, remove bolts and washers attaching drail assembly to tank fitting.

(2) Remove drain fitting and attached hardware.

(3) Remove O-Ring from groove in tank fitting.

(4) Turn valve counterclockwise to disconnect it from drain fitting. Remove valve.

(5) Turn drain hose counterclockwise to disconnect it from drain fitting. Remove hose.

b. Repair and Replacement

(1) Clean all parts by wiping with a cloth.

(2) Inspect all parts for cracks, dents, breaks or wear. If any parts are no longer serviceable, replace before reassembly.

c. Reassembly

NOTE: WRAP MALE THREADS WITH TEFLON TAPE TO ENSURE A POSITIVE SEAL.

(1) Place drain hose on drain fitting. Turn hose clockwise until tight.

(2) Place valve on drain hose. Turn valve clockwise until tight.

(3) Lubricate O-Ring with MIL-C-10382 lubricant only. Place new O–Ring into groove on tank fitting.

(4) Place drain fitting on tank fitting. Make sure hose and valve will extend from underneath tank.

(5) Place washers over bolts. Insert bolts drain fitting and into tank fitting. Using wrench, tighten bolts.

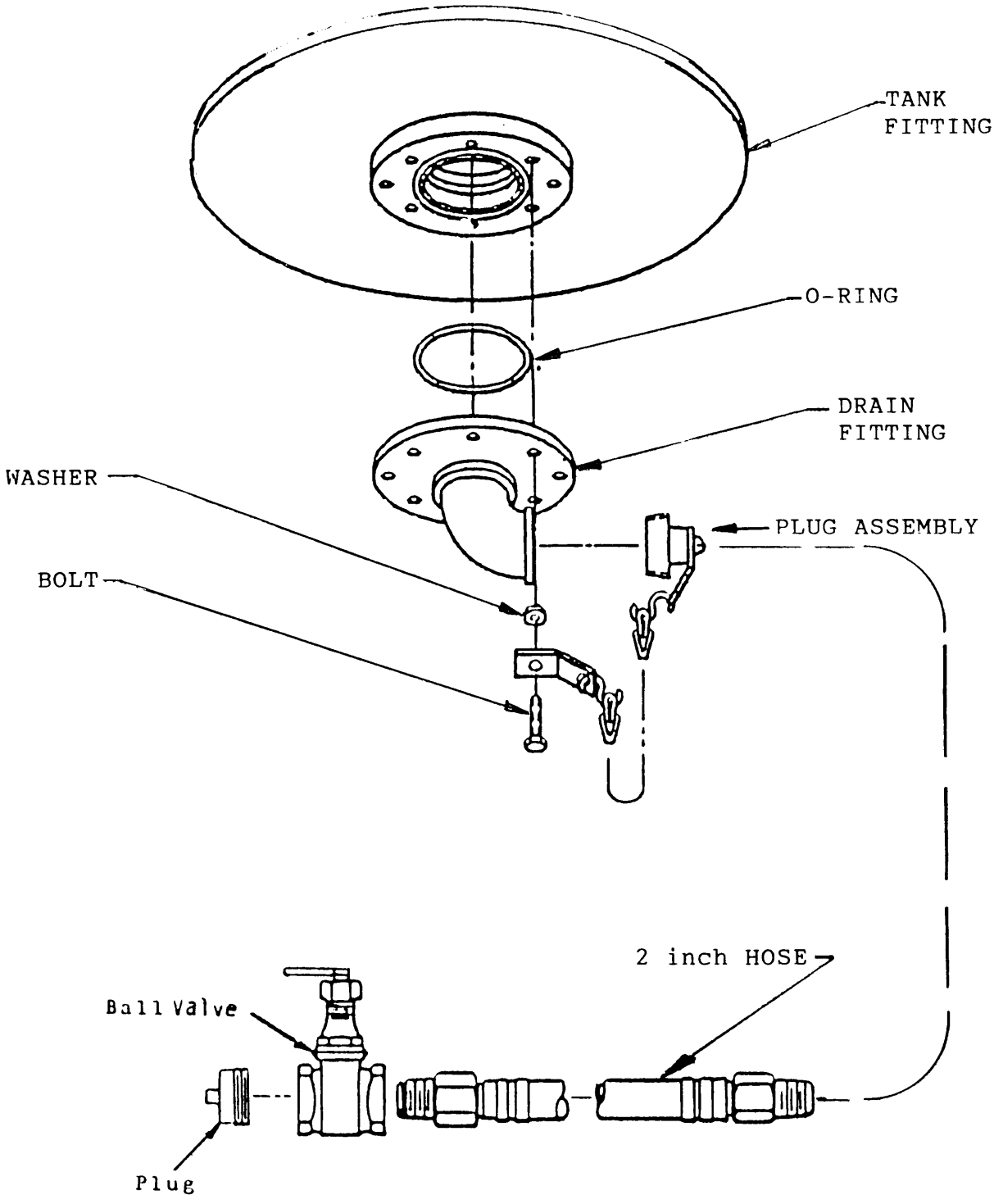


Figure 4-4.1 Drain Assembly
Model 53029B-20

4-12 VALVE ASSEMBLY See figure 4-5

a. Disassemble

(1) Pull cam arms on hose assembly female coupling outward Remove hose assembly from valve assembly.

(2) Using wrench, remove hexagon nuts and lockwashers from hexagon-head bolts on male coupling on valve assembly. Remove bolts and flatwashers. Remove male coupling and gasket from valve assembly.

(3) Using a wrench, remove hexagon nuts and lockwashers from hexagon–head bolts securing female coupling to valve assembly. Remove bolts and flatwashers. Remove female coupling and gasket.

(4) Remove gaskets from hose assembly, female coupling, and valve assembly female coupling.

b. Repair and Replacement

(1) Clean all parts by wiping with a cloth.

(2) Inspect all parts for cracks, dents, breaks, or wear. If any parts are no longer serviceable, replace before reassembly.

c. **Reassembly**

(1) Place new gaskets in valve assembly female coupling and in hose assembly female coupling.

(2) Place 4 inch flange gasket and female coupling on valve assembly .

(3) Assemble with flatwashers on bolts. Insert bolts through coupling, gasket, and valve assembly.

(4) Place new lockwashers and nuts on bolts. Using a wrench, tighten nuts.

(5) Place 4 inch flange gasket and male coupling on valve assembly.

(6) Assemble with flatwashers on bolts. Insert bolts through coupling, gasket, and valve assembly.

(7) Place new lockwashers and nuts on bolts. Using wrench, tighten nuts.

NOTE: STOP HERE FOR MODEL 53029B–20

(8) Check hose assembly female coupling. Ensure coupling is clean and serviceable gasket is in place.

(9) Insert male coupling of valve assembly into female hose assembly coupling. Push cam arm on female coupling inward until they lock.

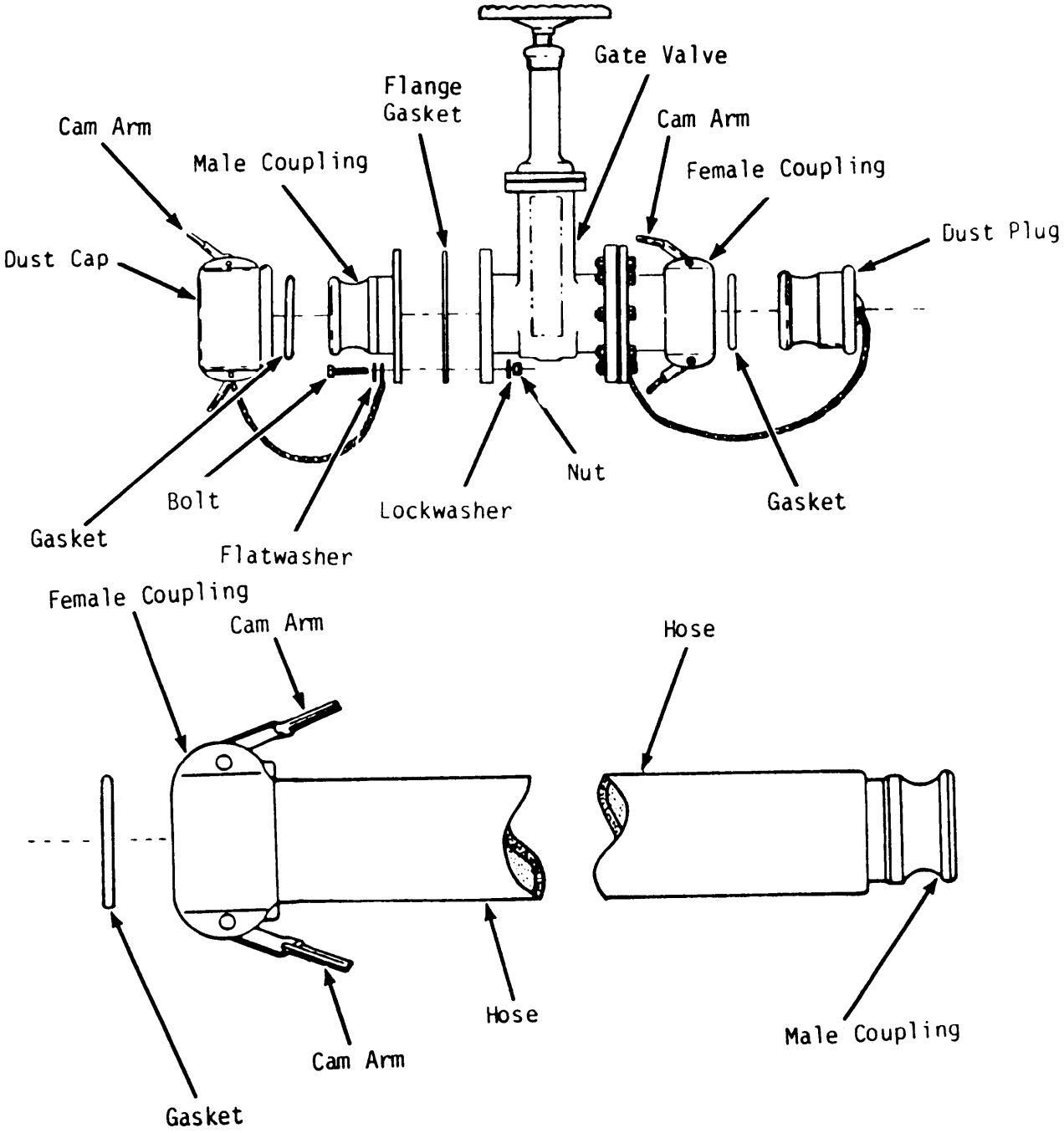


Figure 4-5. Valve and Hose Assembly
Used on Model 53029A-20 only

4-13. HOSE ASSEMBLY.

a. Disassembly of 4" Hose

(1) Drain tank.

(2) Disconnect hose from Filler/Discharge Assembly by pulling coupling cam arms outward.

(3) Disconnect hose from Valve Assembly by pulling coupling cam arms outward.

b. Disassembly of Drain Hose

(1) Refer to paragraph 4-11, a. steps (4) and (5).

c. Replacement

(1) Unpack new hoses and check couplings for serviceable gaskets.

d. Reassembly of 4" Hose

(1) Clean Filler/Discharge Assembly coupling.

(2) Connect mating hose connections. Push both cam arms closed at the same time.

(3) Connect Valve Assembly to other end of hose. Push both cam arms closed at the same time.

e. Reassembly of Drain Hose

(1) Refer to paragraph 4-11, c. steps (1) and (2).

4-14. PERFORMANCE VERIFICATION. The only performance verification for the 20,000 Gallon Collapsible Water Tank is a visual inspection of the part or parts that have been repaired. If the procedures in this manual do not repair the equipment, notify your supervisor.

CHAPTER 5. PREPARATION FOR RESHIPMENT AND STORAGE

5-1. REMOVING TANK FROM SERVICE. Prior to reshipment and storage, the 20,000 Gallon Collapsible Water Tank will be emptied and refolded.

a. Empty tank. Refer to draining procedure in paragraph 3-5 of this manual.

b. Disconnect all hoses, elbows, and vent assembly from tank by pulling outward on cam arms and separating couplings.

c. Install all dust caps and dust plugs on couplings and fittings.

d. Remove drain hose and valve.

e. Fold the up-slope end of tank to opposite side. (Reverse procedures shown in Figures 2-3 and 2-8 to fold tank.)

f. Roll up slope end of folded tank toward the drain assembly.

5-2 STORAGE.

a. Storage Data.

Temperature Range: -25°F to 125°F (-31.7°C to 51.7°C).

b. Storage

(1) Keep tank and accessories in crate when tank is not in use.

(2) If possible, store crated tank in cool, dark, and dry area.

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, technical manuals, and other publications referenced in this manual.

A-2. FORMS

Quality Deficiency Report . . . . . SF 368

Recommended Changes to Equipment Technical Publications . . . . . DA Form 2028-2

Report of Discrepancy (ROD) . . . . . SF 364

A-3. FIELD MANUALS

Planning and Conducting Chemical, Biological, Radiological (CBR), and Nuclear Defense Training . . . . . FM 21-48

A-4. TECHNICAL MANUALS

Administrative Storage of Equipment . . . . . TM 740-90-1

The Army Maintenance Management System (TAMMS) . . . DA PAM 738-750

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 categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions to the end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

B-2 MAINTENANCE FUNCTIONS. Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons 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.

9. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place “Replace” is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services[1], including fault location/troubleshooting[2], removal/installation, and disassembly/assembly[3] procedures, and maintenance actions[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles. etc.) considered in classifying Army equipment/components.

---

[1]Services - inspect, test, service, adjust, aline, calibrate, and/or replace.

[2]Fault locate/troubleshooting - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

[3]Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) or a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the category of maintenance under consideration.

[4]Actions - welding, grinding, riveting, straightening, facing, remachinery, and/or resurfacing.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II

a. Column 1. Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

b. Column 2. Component/Assembly. Column 2 contains the names of components assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3. Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4. Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the ma intenance functions authorized in the

maintenance allocation chart. The system designations for the various maintenance categories are as follows:

C . . . . . Operator or crew

O . . . . . Organizational Maintenance

F . . . . . Direct Support Maintenance

H . . . . . General Support Maintenance

L . . . . . Specialized Repair Activity (SRA)[5]

D . . . . . Depot Maintenance

e. Column 5. Tools and Equipment. Column 5 specifies, by code, those conmon tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6. Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

---

[5]This maintenance category is not included in Section II, column (4) of the Maintenance Allocation Chart. To identify functions to this category of maintenance, enter a work time figure in the "H" column of Section II, column (4), and use an associated reference code in the Remarks column (6). Key the code to Section IV, Remarks, and explain the SRA complete repair application there. The explanatory remarks(s) shall reference the specific Repair Parts and Special Tools List (RPSTL) TM which contains additional SRA criteria and the authorized spare/-repair parts.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III

a. Column 1. Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2. Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

c. Column 3. Nomenclature. Name or identification of the tool or test equipment.

d. Column 4. National Stock Number. The National stock number of the tool or test equipment.

e. Column 5. Tool Number. The manufacturer's part number.

B-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

a. Column 1. Reference Code. The code recorded in column 6, Section II.

b. Column 2. Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART

FOR

TANK, FABRIC, COLLAPSIBLE, 20,000 GALLON WATER

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT.	(6) REMARKS
00	TANK, FABRIC, COLLAPSIBLE 20,000 GALLON WATER	Inspect	.2					1	. . .
		Replace		1.0					
		Repair	.5						
01	TANK ENVELOPE	Inspect	.2					1	. . .
		Replace		1.0					
		Repair			.1				
02	VENT ASSEMBLY	Inspect	.2					1	. . .
		Replace		.2					
		Repair		.5					
03	FILLER ASSEMBLY	Inspect	.2					1	. . .
		Replace		.2					
		Repair		.5					
04	DISCHARGE ASSEMBLY	Inspect	.2					1	. . .
		Replace		.2					
		Repair		.5					
05	DRAIN ASSEMBLY	Inspect	.2					1	. . .
		Replace		.2					. . .
		Repair		.5				1	. . .
06	VALVE ASSEMBLY	Inspect	.2					1	. . .
		Replace		.2					. . .
		Repair		.5					. . .
07	HOSES	Inspect	.2					1	. . .
		Replace		.2					

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
TANK, FABRIC, COLLAPSIBLE, 20,000 GALLON WATER

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1		TOOL KIT, GENERAL MECHANIC	5180-00-177-7033	

APPENDIX C

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

,

C-1. SCOPE. This manual lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of the 20,000 Gallon Collapsible Water Tank.

C-2. GENERAL. This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Part lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in NSN sequence.

b. Section III, Special Tools List. Not applicable

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

C-3. EXPLANATION OF COLUMNS.

a. Illustration (Column (1)). This column is divided as follows:

(1) ((a) FIG. NO.) Figure Number. Indicates the figure number illustrating an exploded view of a functional group.

(2) ((b) ITEM NO.). Indicates the number used to identify items called out in the illustration.

b. SMR CODE (Column (2)). Not applicable.

c. National Stock Number (Column (3)). Lists the National stock number (NSN) assigned to the item. Use the NSN for requests/requisitions.

d. FSCM (Column (4)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

e. Part Number (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered, but go ahead and use or furnish it as the replacement part.

f. Description (Column (6)). This column includes the following information:

(1) The Federal item name, and when required, a minimum description to identify the item.

C-3. EXPLANATION OF COLUMNS. (Cont'd)

(2) Items that are included in kits and sets are listed below the name of the kit or set.

(3) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(4) NSN'S for bulk materials are referenced in the description column in the line item entry for the item to be manufactured/fabricated.

(5) When the part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description.

g. U/M (Column (7)). The Unit of Measure (U/M) indicates the measure (e.g., foot, gallon, pound) or count (e.g., each, dozen, gross) of a listed item. A two-character alpha code (e.g., FT, GL, LB, EA, DZ, GR) appears in this column differs from the Unit of Issue (U/I) code listed in the Army Master Data File (AMDA), request the lowest U/I that will satisfy your needs.

h. QTY INC IN UNIT (Column (8)). The Quantity Incorporated in Unit (QTY INC IN UNIT) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable (e.g., shims, spacers).

C-4. SPECIAL INFORMATION. Not applicable.

C-5. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Not Known:

C-5. HOW TO LOCATE REPAIR PARTS. (Cont'd)

(1) First. Using the table of contents, determine the functional group or subfunctional group to which the item belongs. This is necessary since figures are prepared for function groups and subfunctional group, and listings ar divided into the same groups.

(2) Second. Find the figure covering the functional group or sub-functional group to which the item belongs.

(3) Third. Identify the item on the figure and note the item number of the item.

(4) Fourth. Refer to the Repair Parts List for the figure to find the line item entry for the item number noted on the figure.

b. When National Stock Number or Part Number is Known:

(1) First. Using the index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. The NSN index is in National Item Identification Number (NIIN)* sequence. The part numbers in the Part Number Index are listed in ascending alphanumeric sequence. Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

*The NIIN consists of the last 9 digits of the NSN (i.e., 5303-01-674-1467)
NSN
NIIN

(2) Second. After finding the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

C-6. ABBREVIATIONS. Not applicable.

Section II. REPAIR PARTS LIST

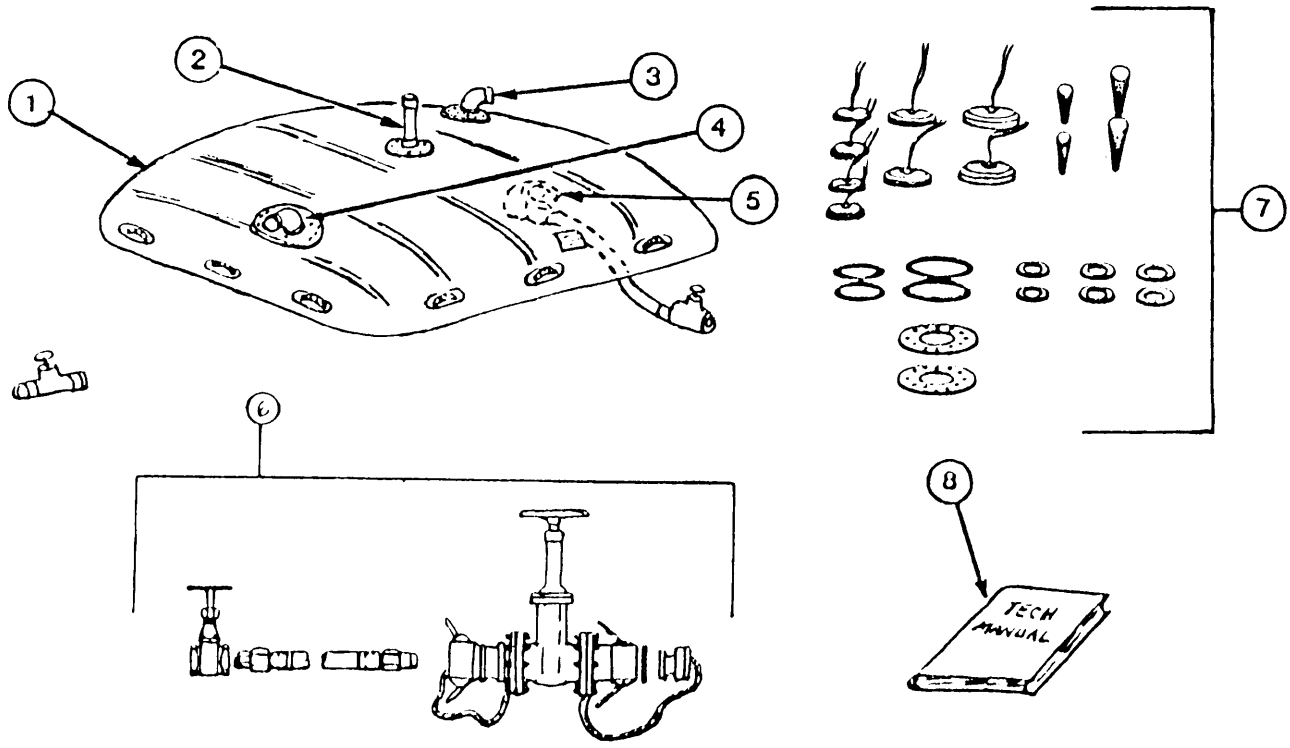


Figure C–1. Tank, Fabric, Collapsible, 20,000 Gallon Water Model 53029A–20

LIST OF FUNCTIONAL GROUPS

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-1						Group 00 Tank, Fabric, Collapsible, 20,000 Gallon Water		
C-1	1				TBD	Tank Envelope	Ea	1
C-1	2					Vent Assembly	Ea	1
C-1	3					Filler Assembly	Ea	1
C-1	4					Discharge Assembly	Ea	1
C–1	5					Drain Assembly	Ea	1
C–1	6					Accessories	St	1
C–1	7					Emergency Repair Items	St	1
C-1	8					Technical Manual	Ea	1

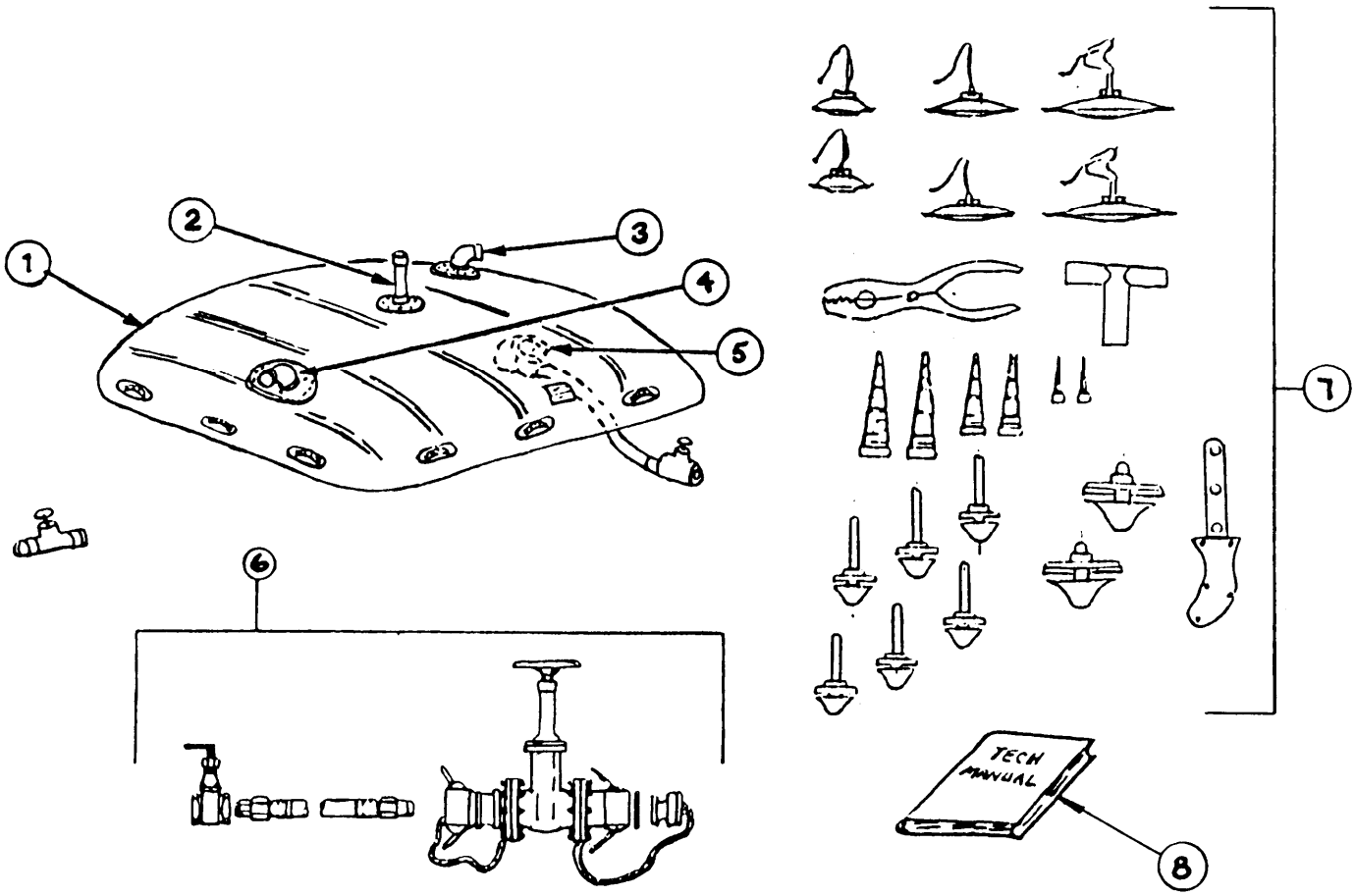


Figure C-1.1. Tank, Fabric, Collapsible, 20,000 Gallon Water Model 53029B-20

LIST OF FUNCTIONAL GROUPS

(1) ILLUSTIUITION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NAT 10NAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-1.1						Group 00 Tank, Fabric, Collapsible, 20,000 Gallon Water		
C-1.1	1				TBD	Tank Envelope	Ea	1
C-1.1	2					Vent Assembly	Ea	1
C-1.1	3					Filler Assembly	Ea	1
C-1.1	4					Discharge Assembly	Ea	1
C-1.1	5					Drain Assembly	Ea	1
C-1.1	6					Accessories	St	1
C-1.1	7					Emergency Repair Items	St	1
C-1.1	8					Technical Manual	Ea	1

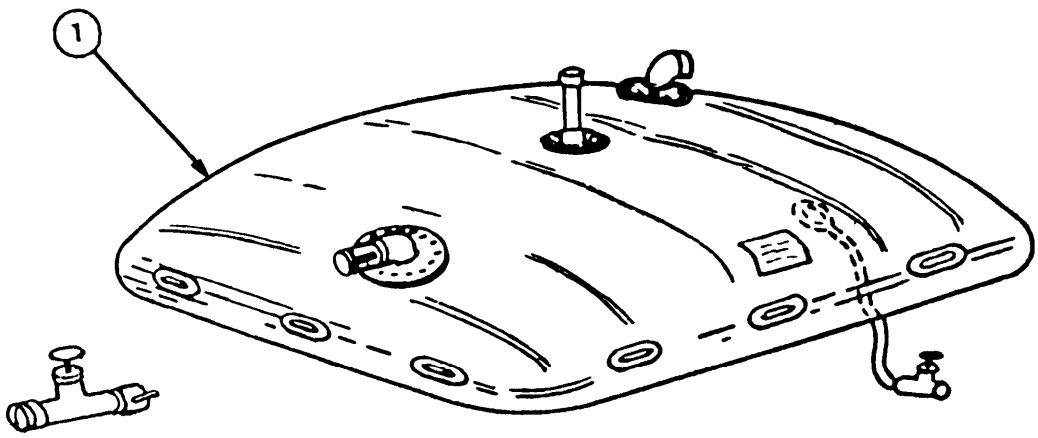


Figure C–2. Tank Envelope
Model 53029A–20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-2						Group 01 Tank		
C-2	1		5430-01-106-9678		TBD	Tank Envelope	Ea	1

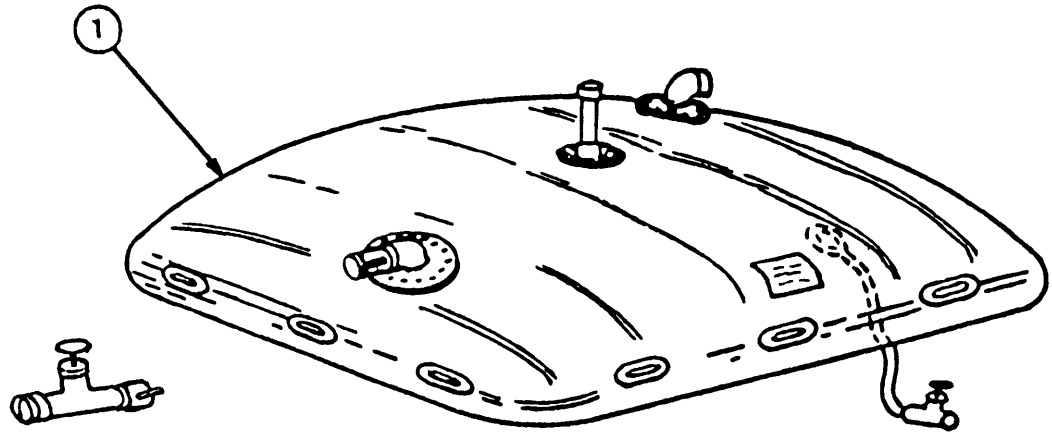


Figure C–2.1. Tank Envelope
Model 53029B–20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	J/M	QTY INC IN UNIT
C-2.1						Group 01 Tank		
C-2 .1	1		5430-01-351-7813		TBD	Tank Envelope	Ea	1

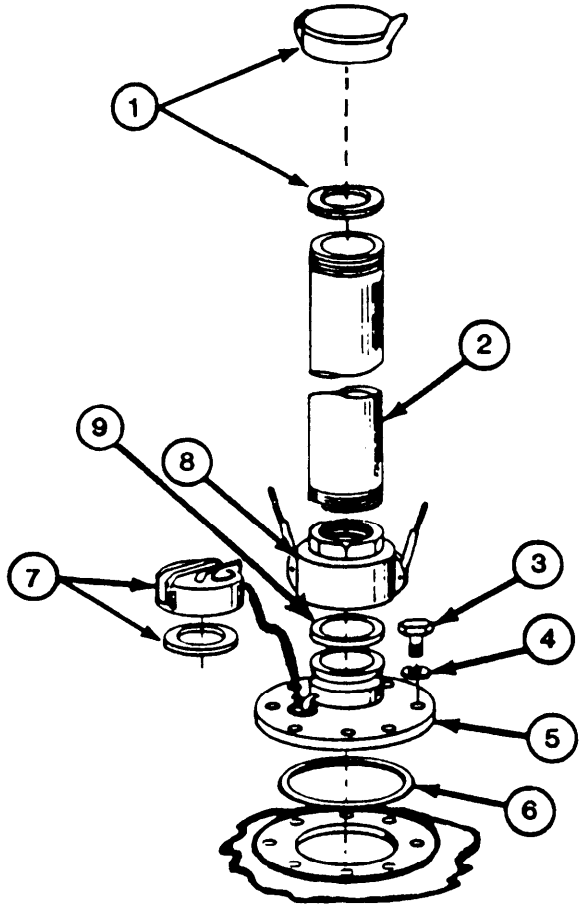


Figure C-3. Vent Assembly
Model 53029A-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-3						Group 02 Vent Assembly		
C-3	1			49234	EX1333B-2	Cap, Relief with Gasket	Ea	1
C-3	2			81718	710A2X1	Standpipe, 2" nom, Schedule 40	Ea	1
C-3	3		5305-00-225-3839	96906	MS90725-8	Screw, Hex-hd, l/4-in.	Ea	8
C-3	4		5310-00-809-4058	96906	MS27183-10	Washer, Flat, l/4-in.	Ea	8
C-3	5			96906	MS27023-21	Flanged Adaptor	Ea	1
C-3	6		5330-00-291-3085	96906	MS29513-250	O-Ring	Ea	1
C-3	7		4730-00-649-9100	96906	MS27028-11	Dust Cap With Chain and Gasket	Ea	1
C-3	8		4720-00-649-9103	96906	MS27024-11	Coupling, Q-D Female, 2"	Ea	1
C-3	9		5310-00-612-2414	96906	MS27030-6	Gasket, 2"	Ea	1

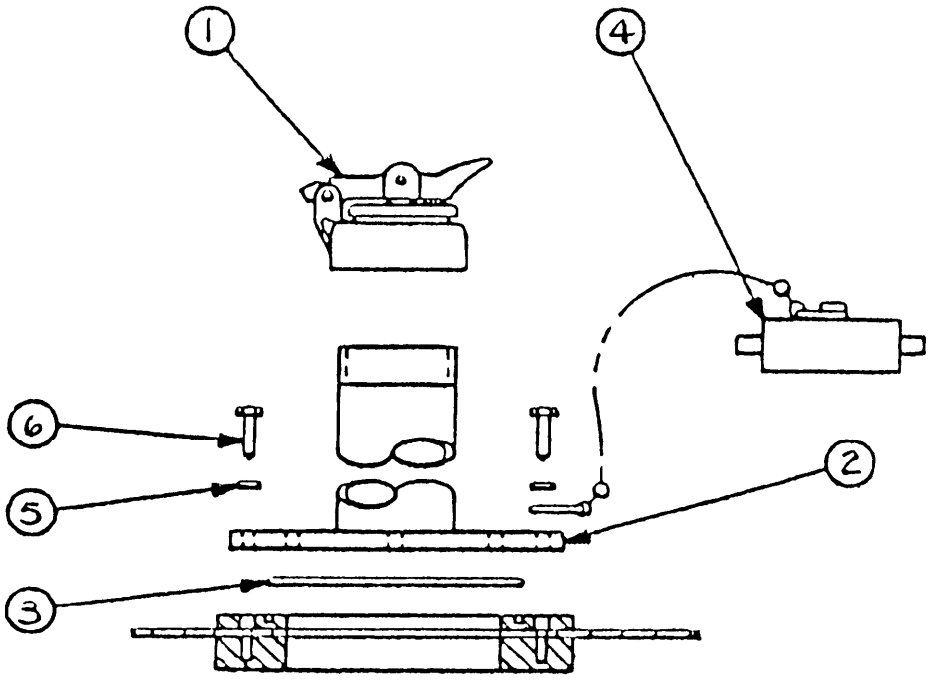


Figure C–3.1. Vent Assembly
Model 53029B–20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SM'R CODE	NAT IONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-3.1						Group 02 Vent Assembly		
C-3 .1	1			90696	EX 1333D-39	Cap, Pressure Relief, 2 In. NPS		1
C-3.1	2			90696	X-4797	Adapter, Flanged, Male, Threaded		1
C-3.1	3			90696	MS29513-250	O–Ring Gasket		1
C-3 .1	4			96906	MS27078–11	Female Cap, 2" NPSH With Pin Lug and 8" Lng Chain		1
C-3.1	5			96906	SAEJ488	Washer, Plain, 1/4" ID		8
C-3.1	6			96906	SAEJ105	Bolt, Hex-Hd, 1/4-20 UNC, 1.125 Long		8

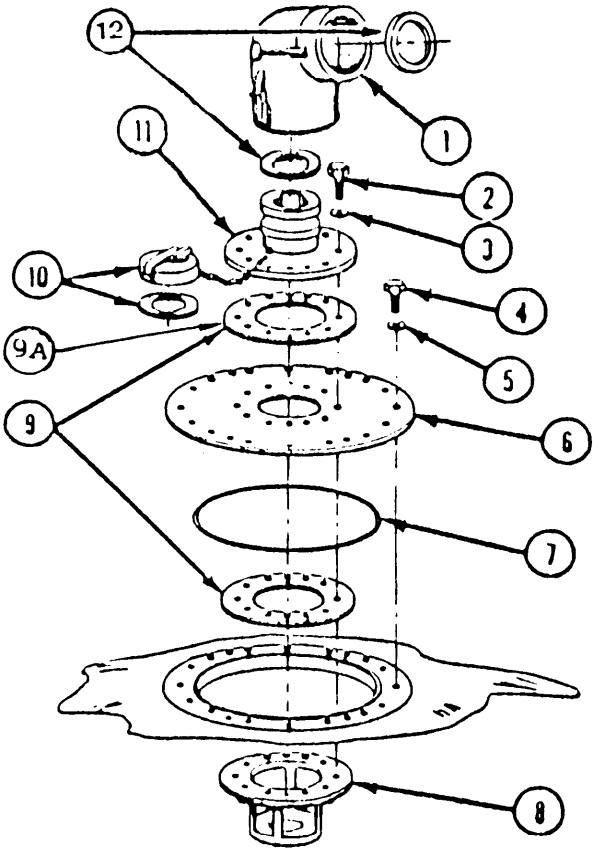


Figure C–4. Filler Assembly

(1) [ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C–4						Group 03 Filler Assembly		
C-4	1			96906	MS27019	CPLR, Elbow With Gaskets	Ea	1
C-4	2			96906	MS90725-8	Bolt, Hex-Hal, 3/8-In.	Ea	8
C-4	3		5310-00-087-7493	96906	MS27183-13	Washer, Flat, 3/8-In.	Ea	8
C-4	4		5305-00-225-3839	96906	MS90725-8	Screw, Hex-Hal, 1/4-In.	Ea	20
C-4	5		5310-00-809-4058	96906	MS27183-10	Washer, Flat, 1/4-In.	Ea	20
C-4	6			74897	ST20F1970-03	Closure, Plate	Ea	1
C-4	7		5330-00-524-0718	96906	MS9021-383	O-Ring	Ea	1
C-4	8			74897	ST20F1968-04	Suction Stub	Ea	1
C-4	9		5330-00-647-2072	81718	C2479M-4	Gasket (Model 53029A-20 Only)	Ea	2
C-4	9A			7V054	X3702E	Gasket (Model 53029B-20 Only)	Ea	1
C-4	10			96906	MS27028-17	Dust Cap With Gasket and Chain	Ea	1
C-4	11			96906	MS27023-17	Adaptor, Flanged	Ea	1
C-4	12			96906	MS27030-9	Gasket	Ea	2

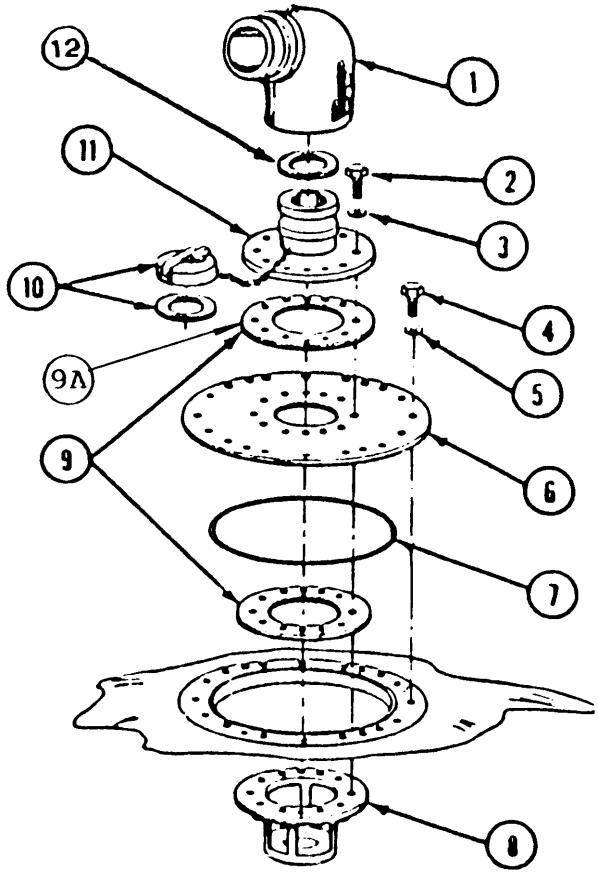


Figure C-5. Discharge Assembly

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NAT IONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-5						Group 04 Discharge Assy		
C-5	1				MS27019	CPLR, Elbow With Gasket	Ea	1
C-5	2			96906	MS90725-8	Bolt, Hex-Hal, 3/8-In.	Ea	8
C-5	3		5310-00-087-7493	96906	MS27183-13	Washer, Flat, 3/8-In.	Ea	8
C-5	4		5305-00-225-3839	96906	MS90725-8	Screw, Hex-Hal, 1/4-In.	Ea	20
C-5	5		5310-00-809-4058	96906	MS27183-10	Washer, Flat, 1/4-In.	Ea	20
C-5	6			74897	ST20F1970-03	Closure Plate	Ea	1
C-5	7		5330-00-524-0718	96906	MS9021-383	O-Ring	Ea	1
C-5	8			74897	ST20F1968-04	Suction Stub	Ea	1
C-5	9		5330-00-647-2072	81718	C2479M-4	Gasket (Model 53029A-20 Only)	Ea	2
C-5	9A			7V054	X3702E	Gasket (Model 53029B-20 Only)	Ea	1
C-5	10			96906	MS27028-17	Dust Cap With Gasket and Chain	Ea	1
C-5	11			96906	MS27023-17	Adaptor, Flanged	Ea	1
C-5	12			96906	MS27030-9	Gasket	Ea	1

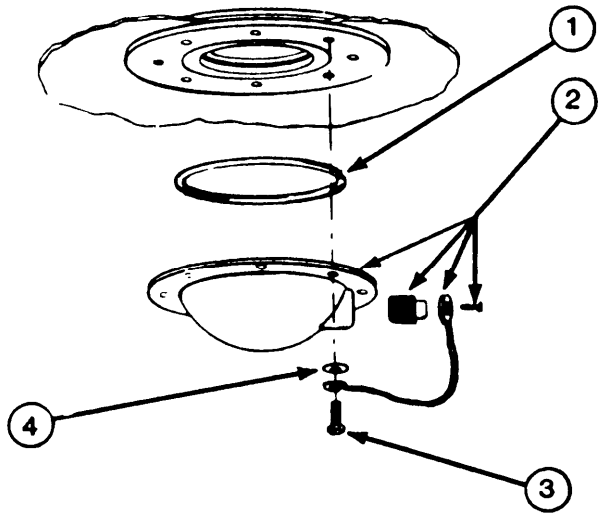


Figure C-6. Drain Assembly
Model 53029A-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NAT 10NAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-6						Group 05 Drain Assembly		
C-6	1		5330-00-291-3085	96906	MS29513-250	O-Ring	Ea	1
C-6	2			74897	ST20F1969-02	Drain Fitting With Plug, Chain and Screw	Ea	1
C-6	3		5305-00-225-3839	96906	MS90725-8	Bolt, Hex-Hal, 1/4-In.	Ea	8
C-6	4		5310-00-809-4058	96906	MS27183-9	Washer, Flat, 1/4-In.	Ea	8

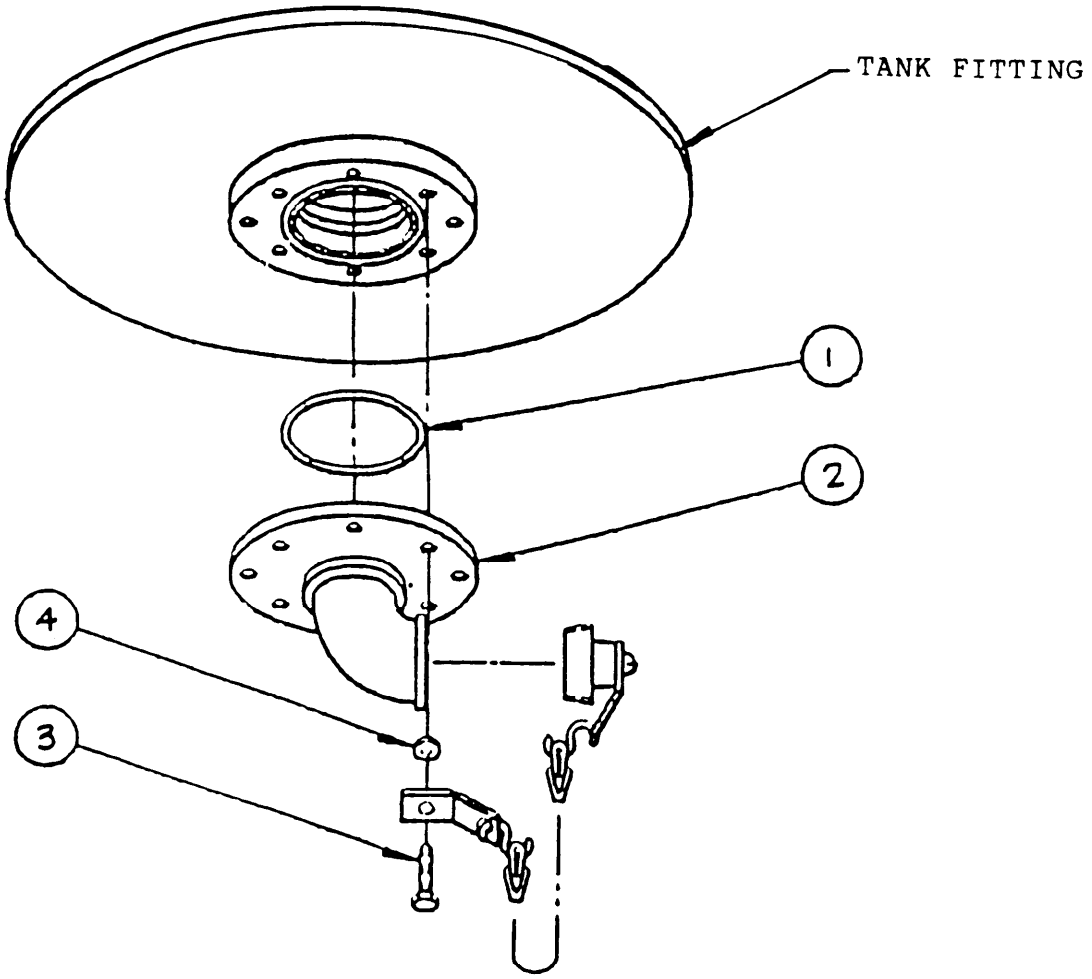


Figure C-6.1 Drain Assembly
Model 53029B-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NAT 10NAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-6.1						Group 05 Drain Assembly		
C-6.1	1		5330-00-291-3085	96906	MS29513-250	O-Ring	Ea	1
C-6.1	2			74897	X-3703D	Drain Fitting With Plug, Chain and Screw	Ea	1
C-6.1	3		5305-00-225-3839	96906	MS90725-8	Bolt, Hex-Hal, 1/4-In.	Ea	8
C-6.1	4		5310-00-809-4058	96906	MS27183-9	Washer, Flat, 1/4-In.	Ea	8

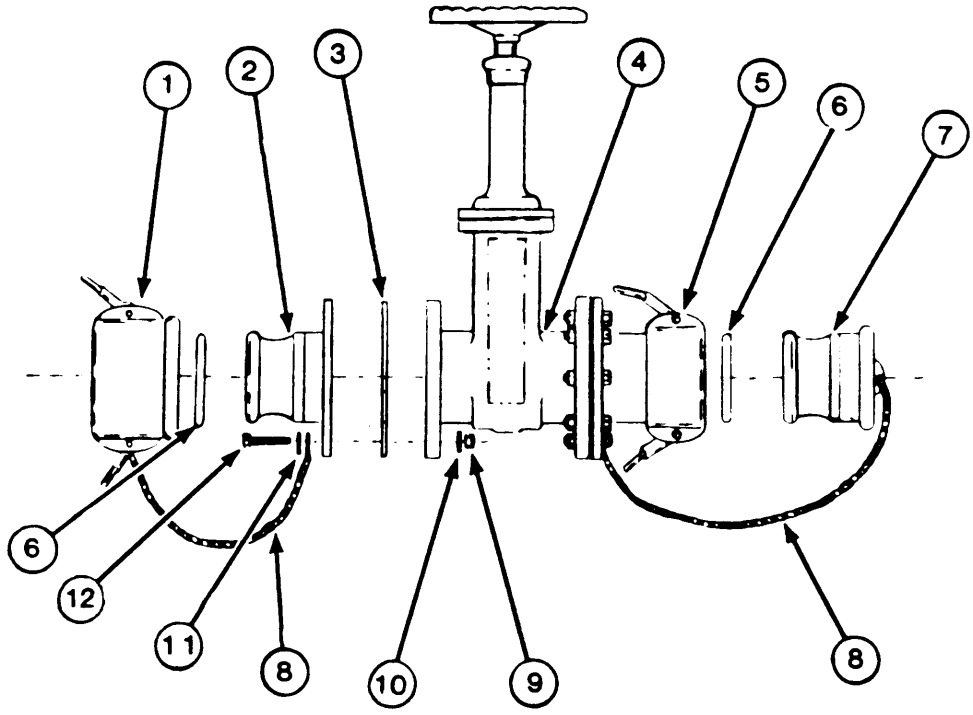


Figure C-7. Valve Assembly, 4"

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 06 VALVE ASSEMBLY, 4"		
C-7	1			96906	MS27028-17	DUST CAP WITH GASKET AND CABLE	EA	1
C-7	2			96906	MS27023-17	COUPLING HALF, Q-D MALE, FLANGED	EA	1
C-7	3		5330-00-647-2072	81718	C2479M-4	GASKET	EA	2
C-7	4			81349	MIL-V-58039	GATE VALVE, 4" TYPE I	EA	1
C-7	5			96906	MS27027-17	COUPLING HALF, Q-D FEMALE, FLANGED	EA	1
C-7	6			96906	MS27030-9	GASKET	EA	2
C-7	7			96906	MS27029-17	DUST PLUG WITH CHAIN	EA	1
C-7	8		4010-00-228-9933	81348	RR-C-271	CHAIN, COATED TYPE II, CLASS 3	EA	2
C-7	9			96906	MS51967-9	NUT, HEX	EA	16
C-7	10		5310-00-637-9541	96906	MS35338-46	WASHER, LOCK	EA	16
C-7	11		5310-00-087-7493	96906	MS27183-13	WASHER, FLAT	EA	16
C-7	12			96906	MS90725-64	BOLT, HEX-HD	EA	16

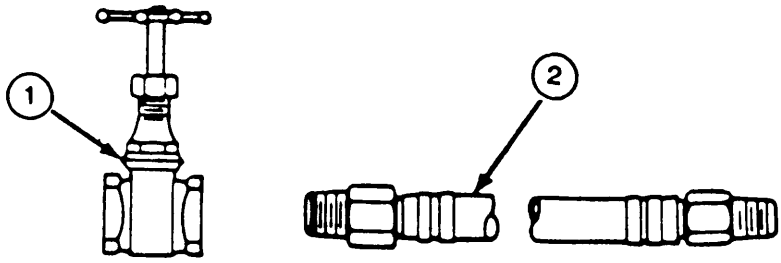


Figure C-8. Hoses
Model 53029A-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-8						Group 07 Hoses		
C-8	1		4820-00-287-6041	76364	1148	Valve, 1/2"	Ea	1
C-8	2				TBD	Hose Assembly, 3/4", ZZ-H-601, Grade 3, Class II	Ea	1

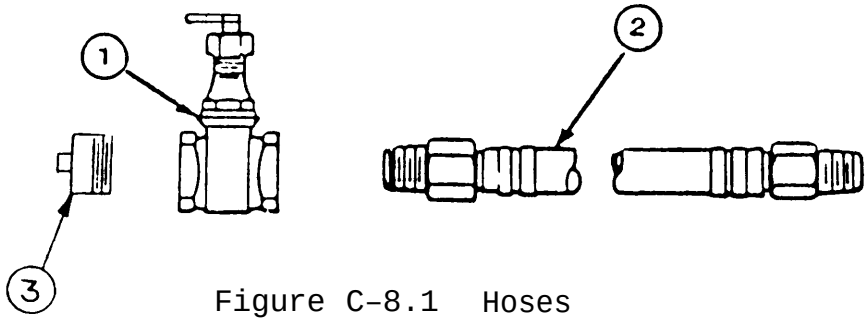


Figure C-8.1 Hoses
Model 53029B-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-8.1						Group 07 Hose & Valve		
C-8.1	1			7V054	TBD	Valve, Ball Female NPT, CL, Size 2		
C-8.1	2			7V054	TBD	Hose, Suction, 2 In. x 8-Foot LNG, M-M NPT, Banded Shanks		
C-8.1	3			7V054	MS2618/7PO9X	Plug 2"		

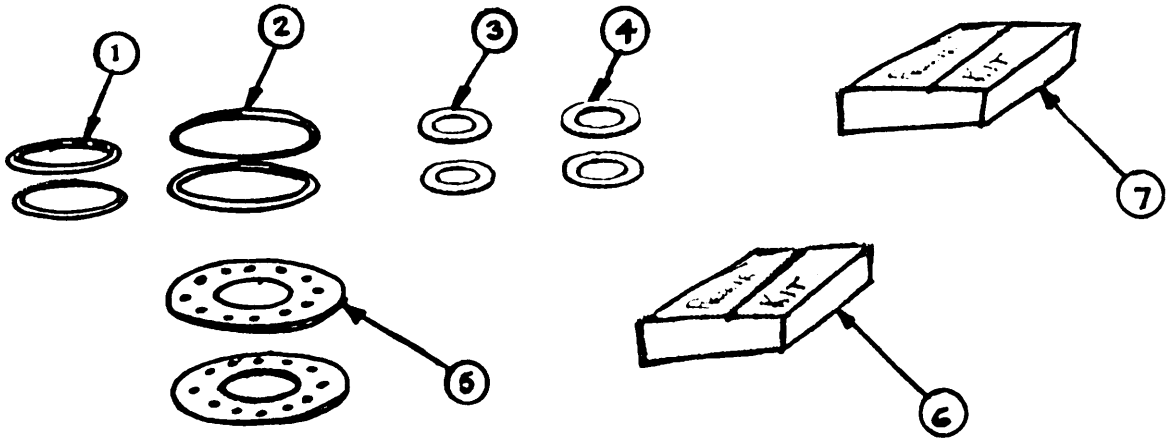


Figure C-9. Emergency Repair Items

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-9						Group 08 Emergency Repair Items		
C-9	1		5330-00-291-3085	96906	MS29513-250	O-Ring Model 53029A-20	Ea	2
C-9						O-Ring Model 53029B-20	Ea	1
C-9	2		5330-00-524-0718	96906	MS9021-383	O-Ring Model 53029A-20	Ea	2
C-9						O-Ring Model 53029B-20	Ea	3
C-9	3			96906	MS27030-6	Gasket, Q-D Coupling Model 53029A-20	Ea	2
C-9	4			96906	MS27030-9	Gasket, QD Coupling Model 53029A-20	Ea	2
C-9						Gasket, 4-Inch Flange Model 53029B-20	Ea	3
C-9	5		5330-00-647-2072	81718	C2479M-4	Gasket, Q-D Coupling Model 53029A-20	Ea	2
C-9						Gasket, 4-Inch Flange Model 53029B-20	Ea	3
C-9	6		5430-00-641-8957			Emergency Repair Kit Model 53029A-20 Only	Ea	1
C-9	7		5430-01-352-6073			Emergency Repair Kit Model 53029B-20 Only	Ea	1

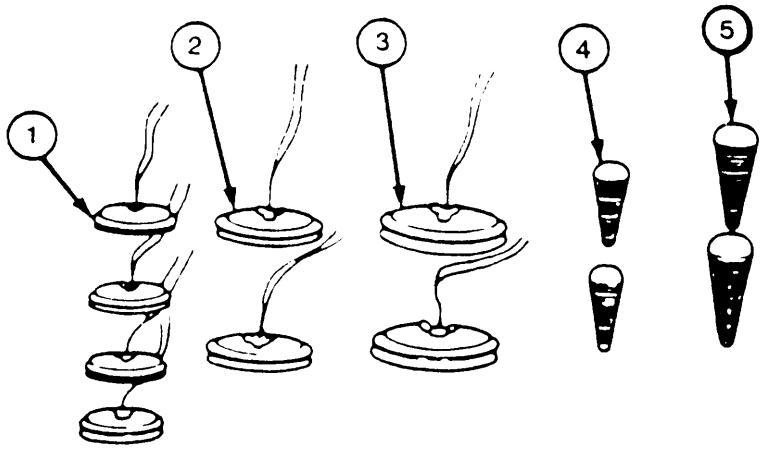


Figure C-10. Emergency repair Kit
Model 53029A-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-10						Group 0801 Emergency Repair Kit		
C-10	1		5430-00-591-6863			Clamp, Sealing, 3-In.	Ea	4
C-10	2		5430-00-591-6864			Clamp, Sealing, 5-In.	Ea	2
C-10	3		5430-00-591-6865			Clamp, Sealing, 7-1/2-In.	Ea	2
C-10	4		5510-00-255-9493			Plug, Tapered, 3-In.	Ea	2
C-10	5		5510-00-255-9692			Plug, Tapered, 5-In.	Ea	2

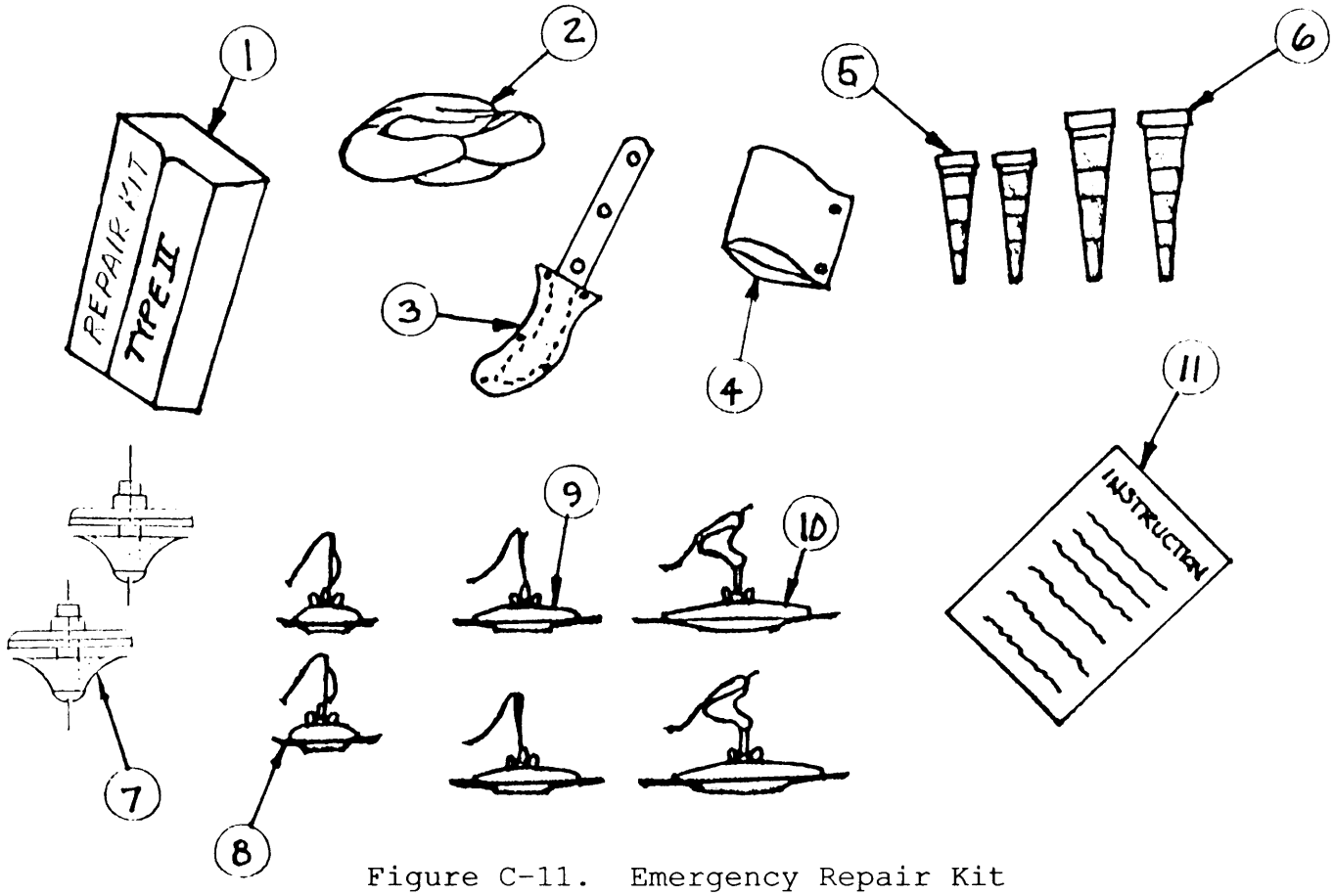


Figure C-11. Emergency Repair Kit
Model 53029B-20

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-11			5430-01-352-6073			Group 0801 Emergency Repair Kit, Type II		
C-11	1					Container	Ea	1
C-11	2					Hood	Ea	1
C-11	3					Knife	Ea	1
C-11	4					Emergency Repair Kit, Type I	Ea	1
C-11	5					Plug, Tapered, 1-1/2 In.	Ea	2
C-11	6					Plug, Tapered, 2 In.	Ea	2
C-11	7					Patch, Mechanical, 2 In.	Ea	2
C-11	8		5430-00-591-6863			Clamp, Sealing, 3 In.	Ea	2
C-11	9		5430-00-591-6864			Clamp, Sealing, 5 In.	Ea	2
C-11	10		5430-00-591-6865			Clamp, Sealing, 7-1/2 In.	Ea	2
C-11	11					Instructions	Ea	1

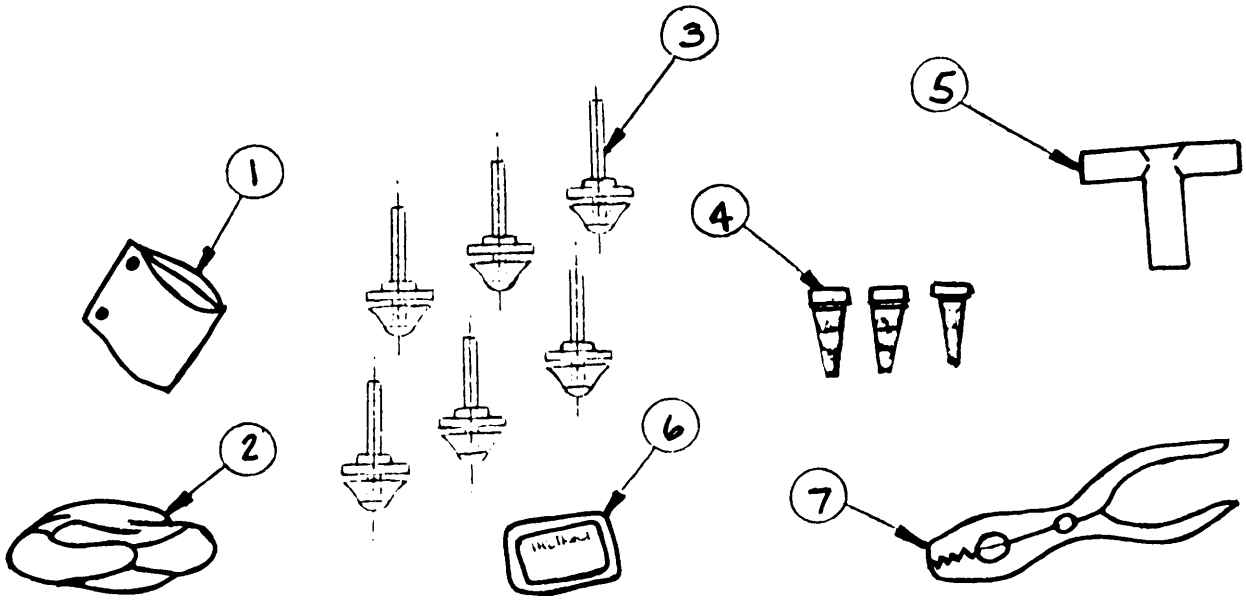


Figure C-12. Emergency Repair Kit, Type I

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO	(b) ITEM NO	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
C-12						Group 0801 Emergency Repair Kit, Type I		
C-12	1			96906	X-3063A	Pouch	Ea	1
C-12	2					Hood Protective	Ea	1
C-12	3					Patch, Mechanical 3/4 In.	Ea	6
C-12	4			96906	X-3059-5/8	Plug, Wood, Tapered 5/8 In.	Ea	3
C-12	5			96906	X-3058A	Cutter, Wrench, Insert, Tool, Rotary	Ea	1
C-12	6					Instructions	Ea	1
C-12	7					Pliers	Ea	1

SECTION III. SPECIAL TOOLS LIST - NOT APPLICABLE

SECTION IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.
5430-00-591-6863	C-10	1
5430-00-591-6864	C-10	2
5430-00-591-6865	C-10	3
5430-00-641-8957	C-9	6
5510-00-255-9493	C-10	4
5510-00-255-9692	C-10	5

PART NUMBER INDEX

FSCM	PART NUMBER	STOCK NO.	FIGURE NO.	ITEM NO.
49234	EX-1333B-2		C-3	1
81349	MIL-V-58039		C-7	4
	4 IN., TYPE I			
96906	MS 27019		C-4	1
96906	MS 27023-17		C-4	11
			C-5	11
			C-7	2
96906	MS 27023-21		C-3	5
96906	MS 27024-11	4720-00-649-9103	C-3	8
96906	MS 27027-17		C-7	5
96906	MS 27028-11	4730-00-649-9100	C-3	7
96906	MS 27028-17		C-4	10
			C-5	10
			C-7	1

PART NUMBER INDEX

FSCM		PART NUMBER	FIGURE NO.	ITEM NO.
96906	MS 27029-17		C-7	7
96906	MS 27030-6	5310-00-612-2414	C-3	9
			C-9	3
96906	MS 27030-9		C-4	12
			C-5	12
			C-7	6
			C-9	4
96906	MS 27183-10	5310-00-809-4058	C-3	4
			C-4	5
			C-5	5
			C-6	4
96906	MS 27183-13	5310-00-087-7493	C-4	3
			C-5	3
			C-7	11
96906	MS 2729513-250	5330-00-291-3085	C-3	6
			C-6	1
			C-9	1
96906	MS 35338-46	5310-00-637-9541	C-7	10
96906	MS 51967-8	5310-01-052-1793	C-7	9

PART NUMBER INDEX

FSCM		PART NO.	FIGURE NO.	ITEM NO.
96906	MS 9021-383	5330-00524-0718	C-4	7
			C-5	7
			C-9	2
96906	MS 90725-64		C-7	12
96906	MS 90725-8	5305-00-225-3839	C-3	3
			C-4	4
			C-5	4
			C-6	3
96906	MS 90725-64		C-4	2
96906	EX 1333B-39		C-3.1	1
96906	X 4797		C-3.1	2
96906	MS 29513-250		C-3.1	3
96906	MS 27028-11		C-3.1	4
96906	MS 27183-10		C-3.1	5
96906	MS 90725-8		C-3.1	6
96906	MS29513-250		C-6.1	1
96906	X 3703D		C-6.1	2
96906	MS 90725-8		C-6.1	3
96906	MS 27183-9		C-6-1	4

PART NUMBER INDEX

FSCM		PART NO.	FIGURE NO.	ITEM NO.
74897	ST20F1969-02		C-6	2
74897	ST20F1970-03		C-4	6
			C-5	6
74897	ST20F1968-04		C-4	8
			C-5	8
76364	1148	4820-00-287-6041	C-8	5
81718	710A2X10		C-3	2

APPENDIX D

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

D-1. SCOPE. This appendix lists all components of end item and basic issue items for the 20,000 Gallon Water Tank to help you inventory items required for safe and efficient operation.

D-2. GENERAL. The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the 20,000 Gallon Tank in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the 20,000 Gallon Tank during operation whenever it is transferred between property accounts.

D-2. GENERAL (Cont'd).

The-illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

D-3. EXPLANATION OF COLUMNS. The following provides an explanation of columns found in the tabular listings:

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. In dictates the National stock number assigned to the end item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number. If item needed differs for different models of this equipment, the model is shown under the "Usable On" heading in this column. These codes are identified as:

Code	Used On
PAA	Model TBD
PAB	Model TBD
PAC	Model TBD

D-3. EXPLANATION OF COLUMNS. (Cont'd)

d. Column (4) . Unit of Measure (U/M). Indicates the measure used in performing the actual operation/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity Required (Qty. Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM

Components of End Item are identical to parts list, Appendix C.

Section III. BASIC ISSUE ITEMS

TM 5-5430-216-13&P.

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E–1 . **Scope.** This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V, repair parts, and heraldic items).

E–2. **Explanation of Columns.**

a. *Column (1) – Item Number.* This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., Use cleaning compound, item 5, appendix C).

b. *Column (2) – Level.* This column identifies the lowest level of maintenance that requires the listed item.

C – Operator/Crew
O – Unit Maintenance
F – Direct Support Maintenance
H – General Support Maintenance

c. *Column (3) – National Stock Number.* This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. *Column (4) – Description.* Indicates the Federal item name, and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number.

e. *Column (5) – Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that willl satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	8030-00-889-3534	Tape, Antiseize (81349) MIL-T-27730	RL
2	O	8030-00-251-5048	Corrosion Preventive Compound (81349) MIL-C-10382	GL

APPENDIX F

TORQUE LIMITS

Section I. INTRODUCTION

F-1. Scope.

This appendix lists torque spccifications and torquing instructions for specific engine nuts and bolts.

F-2. General.

Preloading and angle torques are applied.

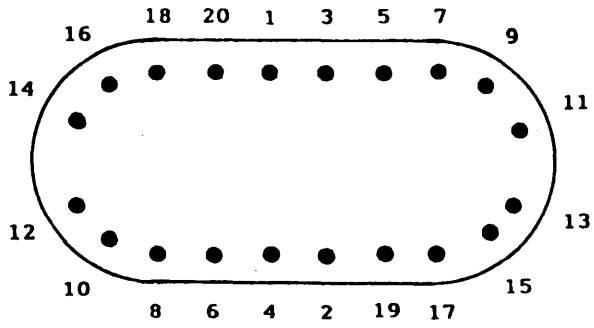
Section II. TORQUE SPECIFICATIONS

F-3. Torque Specifications.

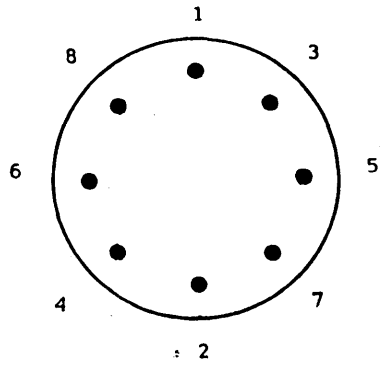
The application, preloading, and torque angles in degrees are listed in Table F-1.

F-4. Torquing Instructions.

Torque values are established using the sequence shown below.



For 20 bolt pattern



For 8 bolt pattern

F-4 Torque Instructions (Cont'd)

a. Torque valves are as follows:

1/4" x 20 NC = 87 inch pounds

3/8" x 16 NC = 312 inch pounds

b. Torque of bolts will be as follows:

Bolts will be hand tightened first. Next, using a torque wrench, tighten 1/4 inch bolts to 30 inch pounds or 3/8 inch bolts to 100 inch pounds. Then tighten 1/4 inch to 60 inch pounds or 3/8 inch bolts to 200 inch pounds. Last, tighten 1/4 inch bolts to 87 inch pounds and 3/8 inch bolts to 312 inch pounds.

☆U.S. GOVERNMENT PRINTING OFFICE: 1992 - 755-028/80006

TM 5-5430-216-13&P

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator, Organizational and Direct Support Maintenance requirements for Tank, Fabric, Collapsible, POL, 50,000, 10,000, 3,000 GAL (TM 5-5430-210-12).

☆U.S. GOVERNMENT PRINTING OFFICE: 1987 754-030/60088

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-5430-216-13&P	29 Jan 87	Tank, Fabric, Collapsible NSN 5430-01-106-9678

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Change the manual to show 4 Cylenders.

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE John Doe
JOHN DOE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 1, 1 Nov 80

P S --IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-5430-216-13&P	29 Jan 87	Tank, Fabric, Collapsible NSN 5430-01-106-9678

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-5430-216-13&P	29 Jan 87	Tank, Fabric, Collapsible NSN 5430-01-106-9678

BE EXACT . . . PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-5430-216-13&P	29 Jan 87	Tank, Fabric, Collapsible NSN 5430-01-106-9678

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MCTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 061131-001