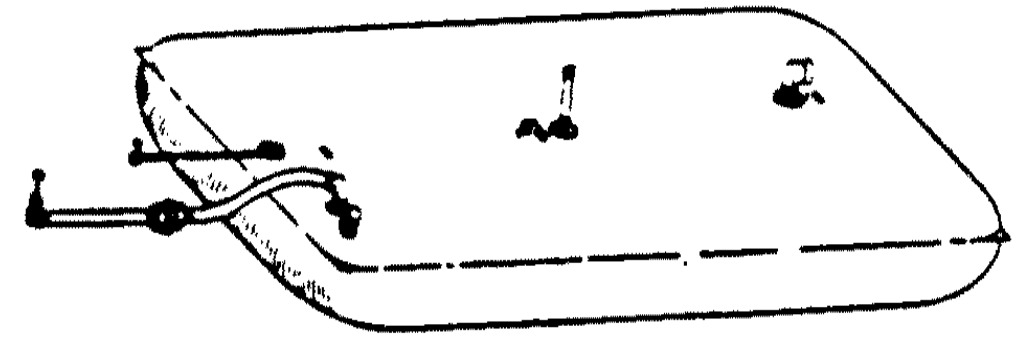
TECHNICAL MANUAL

OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

TANK, FABRIC, COLLAPSIBLE, FUEL STORAGE

3,000 GALLON, MODEL WTM3KF (EIC = ZVM)/
MIL-T-52983B (EIC = ZC8)
(NSN 5430-01-433-8528)/(NSN 5430-00-268-8187)
10,000 GALLON, MODEL BA91-141 (EIC = ZF3)/BA91-141A (EIC = ZVL)
FCE574-81-1-A (EIC =) (EXTRA ACCESSORIES)/
SC5430-97CLE01 (EIC = ZFN)
(NSN 5430-01-358-6157)/(NSN 5430-01-414-9251)
(NSN 5430-00-052-3412)/(NSN 5430-00-641-8552)
20,000 GALLON, MODEL BA91-140 (EIC = ZF2)/
BA91-140A (EIC =)/BA92-162 (EIC = ZFR)
(NSN 5430-01-359-4943)/(NSN 5430-01-414-9252)/
(NSN 5430-01-215-7525)
50,000 GALLON, MODEL PD52983-50 (EIC =)/M52983-50 (EIC = ZFB)
(NSN 5430-01-455-5676)/(NSN 5430-00-182-8181)



This manual supersedes TM 5-5430-219-13, dated 31 August 1987, TM 5-5430-210-12, dated 30 November 1978, and TM 5-5430-219-23P, dated 31 August 1988, including all changes.

HEADQUARTERS, DEPARTMENT OF THE ARMY

28 DECEMBER 2001

DESTROY SUPERSEDED DATA.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

Dates of issue for the original manual is:

Original 28 December 2001

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS _24_AND TOTAL NUMBER OF WORK PACKAGES IS 42 CONSISTING OF THE FOLLOWING:

Page/WP No.	*Change No.	Page/WP No.	*Change No.
Title	0	WP 0025 00 (2 pgs)	0
Warnings	0	WP 0026 00 (4 pgs)	0
i-iv	0	WP 0027 00 (4 pgs)	0
WP 0001 00 (2 pgs)	0	WP 0028 00 (2 pgs)	0
Chap 1 title page	0	WP 0029 00 (2 pgs)	0
WP 0002 00 (8 pgs)	0	WP 0030 00 (2 pgs)	0
WP 0003 00 (2 pgs)	0	WP 0031 00 (2 pgs)	0
Chap 2 title page	0	Chap 6 title page	0
WP 0004 00 (2 pgs)	0	WP 0032 00 (2 pgs)	0
WP 0005 00 (18 pgs)	0	WP 0033 00 (8 pgs)	0
WP 0006 00 (4 pgs)	0	WP 0034 00 (6 pgs)	0
Chap 3 title page	0	WP 0035 00 (40 pgs)	0
WP 0007 00 (8 pgs)	0	WP 0036 00 (2 pgs)	0
WP 0008 00 (8 pgs)	0	WP 0037 00 (4 pgs)	0
Chap 4 title page	0	WP 0038 00 (8 pgs)	0
WP 0009 00 (10 pgs)	0	WP 0039 00 (2 pgs)	0
WP 0010 00 (2 pgs)	0	WP 0040 00 (2 pgs)	0
WP 0011 00 (2 pgs)	0	WP 0041 00 (2 pgs)	0
WP 0012 00 (2 pgs)	0	WP 0042 00 (2 pgs)	0
WP 0013 00 (2 pgs)	0	Glossary 1 thru Glossary 2	0
Chap 5 title page	0	Index 1 thru Index 6	0
WP 0014 00 (2 pgs)	0		
WP 0015 00 (2 pgs)	0		
WP 0016 00 (2 pgs)	0		
WP 0017 00 (8 pgs)	0		
WP 0018 00 (2 pgs)	0		
WP 0019 00 (6 pgs)	0		
WP 0020 00 (6 pgs)	0		
WP 0021 00 (2 pgs)	0		
WP 0022 00 (2 pgs)	0		
WP 0023 00 (4 pgs)	0		
WP 0024 00 (4 pgs)	0		

*Zero in this column indicates an original page.

WARNING SUMMARY

This warning summary contains general safety warnings and hazardous material warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel.

WARNINGS

Do not allow smoking within 100 feet (30.50 meters) of the storage area. Death or serious injury may result if personnel fail to observe safety precautions.

Avoid spillage of fuel. When spillage occurs, cover the affected area with dry soil to reduce its rate of vaporization. Position fire extinguishers at readily accessible positions around the tank(s). Failure to observe this warning may result in death or serious injury.

Avoid getting fuel on the body or clothing. If clothing becomes saturated, remove it immediately and wash the body thoroughly with hot, soapy water. Failure to observe this warning may result in death or serious injury.

Safety berms must have capacities of less than one and one-half times that of tank capacities. Failure to construct a secure safety berm may result in death or serious injury.

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well-ventilated areas. Avoid repeated and prolonged skin contact. Do not use near an open flame or excessive heat. The flash point of solvent is 100°F to 138°F (38°C to 59°C). Failure to observe these precautions may result in death or serious injury to personnel.

Sludge that accumulates in the bottom of the fuel tank gives off toxic and explosive vapors. Inhaling these vapors can cause lead poisoning. When cleaning tanks, provide ample ventilation to carry off harmful fumes. Failure to observe these precautions may result in death or serious injury to personnel.

Always wear protective goggles, breathing apparatus, and other protective gear when cleaning the tank interior. Fuel vapors are toxic and can damage eyes, skin, and lungs.

Fuel vapors are extremely flammable. Exercise care to prevent sparks when working near or in the tank. Death or severe personal injury can result if safety precautions are not strictly observed.

Make certain that the berm gate valve is closed and locked after installation and after draining the berm. In the event of tank rupture, an open berm valve would permit fuel to drain from the berm. Undetected fuel leakage could result in an explosion and cause death, severe personal injury, and damage to equipment.

Make sure that the gate valve hand wheel has been rotated fully to the right to the closed position before filling the tank. Undetected draining of the tank could result in an explosion that can cause death or severe personal injury.

Be careful when installing a sealing clamp in the tank. Fuel will pour out when a larger slit is made. Leaking fuel can cause personal injury and loss of Government property.

HEALTH HAZARD

The solvent and adhesive furnished in the repair kit are highly flammable and toxic to the skin, eyes, and respiratory tract. Skin/eye protection is required. Avoid prolonged breathing of vapors, and minimize skin contact. Good general ventilation is normally adequate. Keep away from excessive heat, open flame, or other sources of ignition.

Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes and prolonged exposure to cleaning solvent. Wash exposed skin thoroughly. Solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 DECEMBER 2001

TECHNICAL MANUAL

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

TANK, FABRIC, COLLAPSIBLE, FUEL STORAGE

3,000 GALLON, MODEL WTM3KF (EIC = ZVM)/MIL-T-52983B (EIC = ZC8) (NSN 5430-01-433-8528)/(NSN 5430-00-268-8187) 10,000 GALLON, MODEL BA91-141 (EIC = ZF3)/BA91-141A (EIC = ZVL) FCE574-81-1-A (EIC =) (EXTRA ACCESSORIES)/SC5430-97CLE01 (EIC = ZFN) (NSN 5430-01-358-6157)/(NSN 5430-01-414-9251)/ (NSN 5430-00-052-3412)/(NSN 5430-00-641-8552) 20,000 GALLON, MODEL BA91-140 (EIC = ZF2)/BA91-140A (EIC = ZF2)/ BA92-162 (EIC = ZFR) (NSN 5430-01-359-4943)/(NSN 5430-01-414-9252)/ (NSN 5430-01-215-7525) 50,000 GALLON, MODEL PD52983-50 (EIC =)/M52983-50 (EIC = ZFB) (NSN 5430-01-455-5676)/(NSN 5430-00-182-8181)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or email your letter, or DA Form 2028 direct to: Technical Publication Information Office, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

This manual supersedes TM 5-5430-219-13, dated 31 August 1987, TM 5-5430-210-12, dated 30 November 1978, and TM 5-5430-219-23P, dated 31 August 1988, including all changes.

DISTRIBUTION STATEMENT A – Approved for public release; distribution is unlimited.

TABLE OF CONTENTS

HOW TO USE THIS MANUAL

Section I. OVERVIEW -This manual is divided into six chapters consisting of 42 work packages that provide all the information necessary to operate and maintain the collapsible fabric fuel tank assemblies.

Section II. INDEXING -This manual contains several types of indexes to help the user locate information quickly and efficiently. The different indexes are as follows:

a. Table of Contents. Lists all chapters and work packages contained in the manual, along with the work package numbers where they begin.

b. Alphabetical Index. Located at the back of the manual, this index lists entries that personnel are most likely to look for. Most listings are provided several times in the index (i.e., "Maintenance Forms and Records" can also be found as "Forms and Records, Maintenance," and "Records, Maintenance Forms and"). This increases the likelihood of finding the information on first entry. Each entry also lists the work package where the information can be found.

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON GENERAL INFORMATION

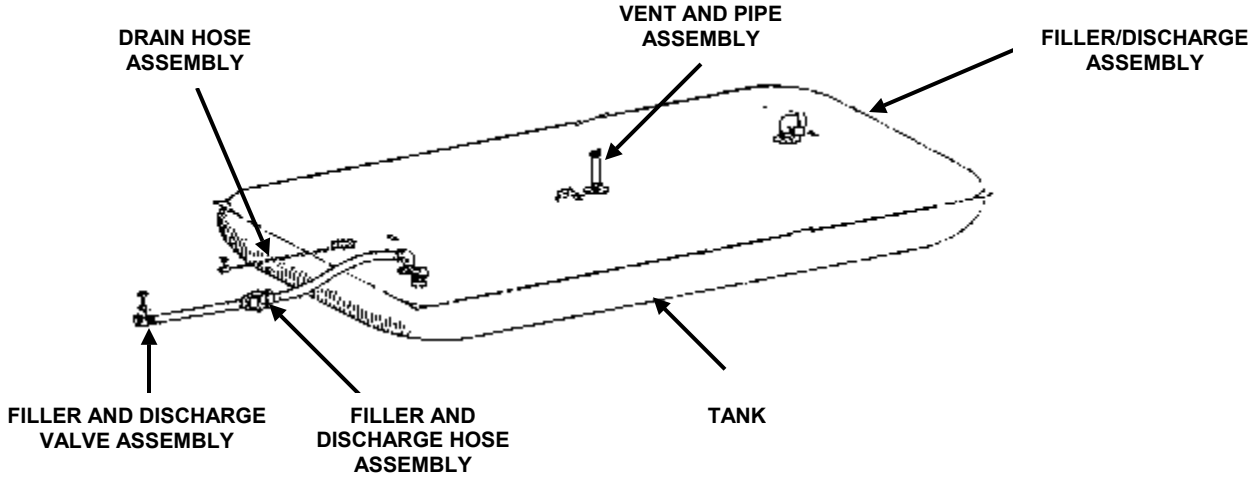
SCOPE

This technical manual contains instructions for operations, checks, and corrective maintenance for 3,000 Gallon (11,360 liter), 10,000 Gallon (37,850 liter), 20,000 Gallon (75,710 liter), and 50,000 Gallon (189,300 liter) Fuel Storage Collapsible Fabric Tanks.

Type of Manual: Operator and Unit Maintenance.

Model Number and Equipment Names: WTM3KF, MIL-T-52983B, 3000 Gallon Fuel Storage Collapsible Fabric Tanks, BA91-141, BA91-141A, FCE574-81-1-A, SC5430-97CLE01, Extra Accessories, 10,000 Gallon Fuel Storage Collapsible Fabric Tank, BA91-140, BA91-140A, BA92-162, 20,000 Gallon Fuel Storage Collapsible Fabric Tank, PD52983-50, M52983-50, 50,000 Gallon Fuel Storage Collapsible Fabric Tank.

Purpose of Equipment: The tanks are containers designed to store a variety of petroleum liquids. The tanks will be used to store fuel as part of a bulk fuel terminal. Fuel will be available for use in a quick response deployment operation. The tanks are made of tough polymer-coated nylon fabric, and care must be taken not to puncture or tear the material.



MAINTENANCE FORMS, RECORDS AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA Form 2404, Equipment Inspection and Maintenance Worksheet, DA Form 2407, Maintenance Request, DA Form 2407-1 Maintenance Request Continuation Sheet, DA PAM 738-750, The Army Maintenance Management System DA PAM 738-751, Functional Users Manual for The Army Maintenance Management System Aviation (TAMMS-A) or AR 700-138, Army Logistics Readiness and Sustainability.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion prevention and control of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Any unusual cracking, softening, swelling, or breaking of the materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using Standard Form 368, Product Quality Deficiency Report. Use of key words such as "rust," "deterioration," "corrosion," or "cracking" will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA Pam 738-750.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Command decisions, according to tactical situations, will determine when destruction of the collapsible fabric fuel tank assembly will be accomplished. A destruction plan will be prepared by the using organization, unless higher authority has prepared one. For general destruction procedures for this equipment, refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's)

If the collapsible fabric fuel tank assemblies need improvement, notify publications by sending an EIR. The tank user is the only personnel that can report dissatisfaction with the equipment. Report discrepancies in the design or performance of the equipment. Fill out an SF 368 (Product Quality Deficiency Report), and mail it to: Commander, U.S. Army Tank-automotive and Armaments Command, AMSTA-LC-CIP-WT, Rock Island, IL 61299-7630.

PREPARATION FOR STORAGE OR SHIPMENT

Army users refer to work package 0031 00.

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Workmanship shall be of the highest quality and shall permit no defects not repaired in accordance with the instructions in this manual. All metal parts shall be clean and free of sand, dirt, etc. The inside and outside of the tank shall be clean and free of foreign material.

END OF WORK PACKAGE

CHAPTER 1

DESCRIPTION AND THEORY OF OPERATION
TANK, FUEL STORAGE, 3,000 GALLON, 10,000 GALLON
20,000 GALLON, AND 50,000 GALLON

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000,
10,000, 20,000, AND 50,000 GALLON
EQUIPMENT DESCRIPTION**

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Characteristics, capabilities, and features of the collapsible fabric fuel tank assemblies include:

a. Constructed of tough polymer-coated nylon fabric with triple-wall thickness protection.

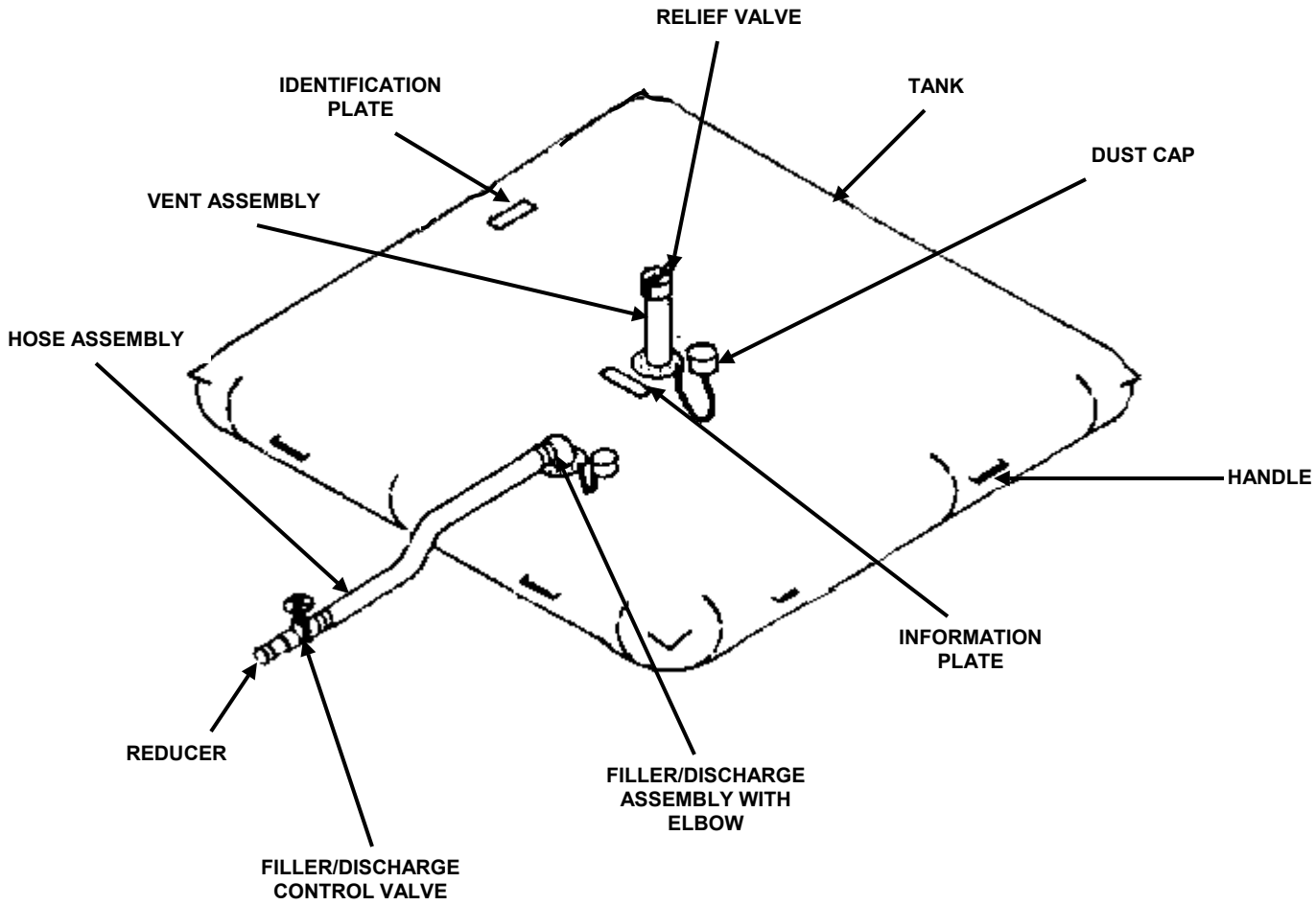
b. Vulcanized handles for easy tank positioning.

c. Various assemblies attach to hoses and related hardware with quick-disconnects.

d. The filled tank expands vertically and internal pressure is vented.

3,000-Gallon Collapsible Fabric Fuel Storage Tank

The 3,000-Gallon (11,360-liter) fuel tank is used for the storage of petroleum-based fuels. The unit consists of a collapsible fabric fuel tank with one filler/discharge assembly, elbow fitting, a vent fitting assembly with relief valve, a 4.0-foot (1.219 meter) filler/discharge hose assembly with control valve, a 4.0-inch (10.16 centimeters) female to 3.0-inch (7.62 centimeters) male reducer, and emergency repair items.



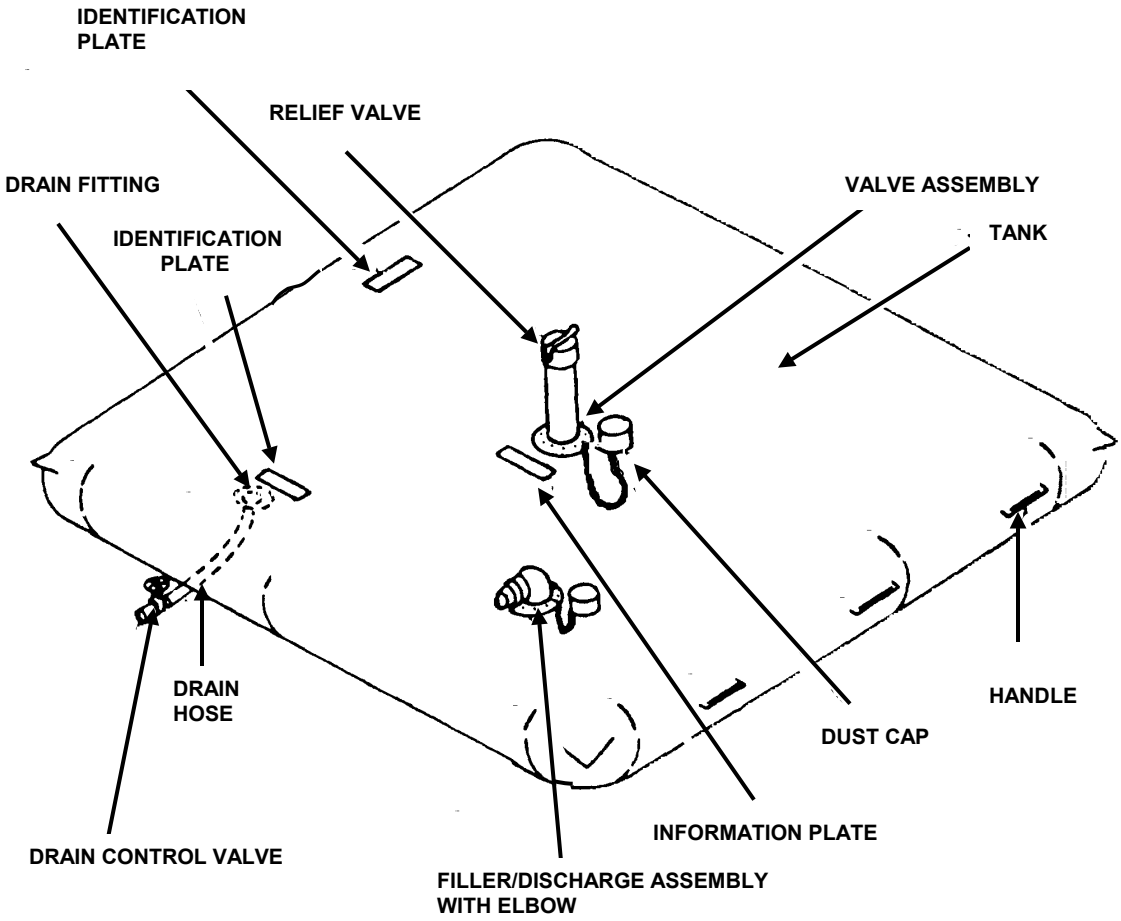
10,000-Gallon Collapsible Fabric Fuel Storage Tank

NOTE

When the basic fuel tank, issued under SC5430-97CLE01, NSN 5430-00-641-8552, becomes unserviceable, replacement requisitions should be submitted for fuel tank NSN 5430-00-052-3412. The accessory items issued with NSN 5430-00-641-8552 should be retained and should not be turned in when only the collapsible fabric tank itself is unserviceable. These accessories should be retained for use with the replacement tank (NSN 5430-00-052-3412), as this tank is not issued with all the accessories that come with the tank assembly issued under SC5430-97CLE01. Replacement tanks will be issued in wooden crates only. The aluminum chest may be requisitioned at unit level for storage, as desired.

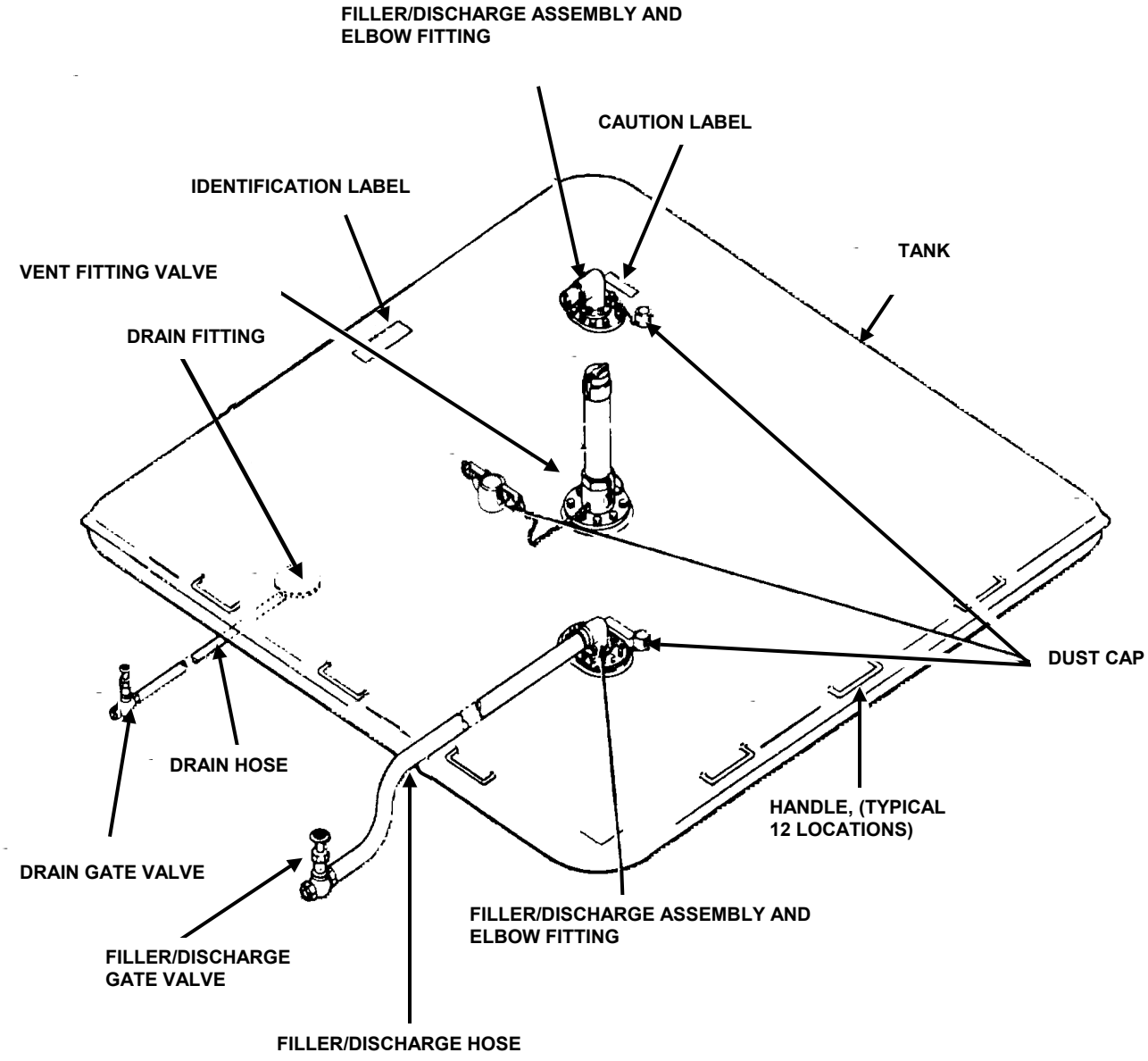
NSN 5430-00-641-8552, 10,000-Gallon (37,850-liter) tank is used for the storage of petroleum-based fuels. The unit consists of a collapsible tank with one filler/discharge assembly with elbow, a vent fitting assembly with relief valve, eight 10.0-foot (3.05 meter) filler/discharge hose assemblies, numerous adapters, coupling-halves, dust caps and plugs, reducers, manifolds, an aluminum storage chest or wooden box, and emergency repair items.

NSN 5430-00-052-3412, 10,000-Gallon (37,850-liter) tank is used for the storage of petroleum-based fuels. The unit consists of a collapsible fabric fuel tank with one filler/discharge assembly, elbow fitting, a vent fitting assembly with relief valve, a drain fitting assembly with a 6.0-foot (1.82 meter) drain hose with control valve, an aluminum storage chest (or crate), and emergency storage items.



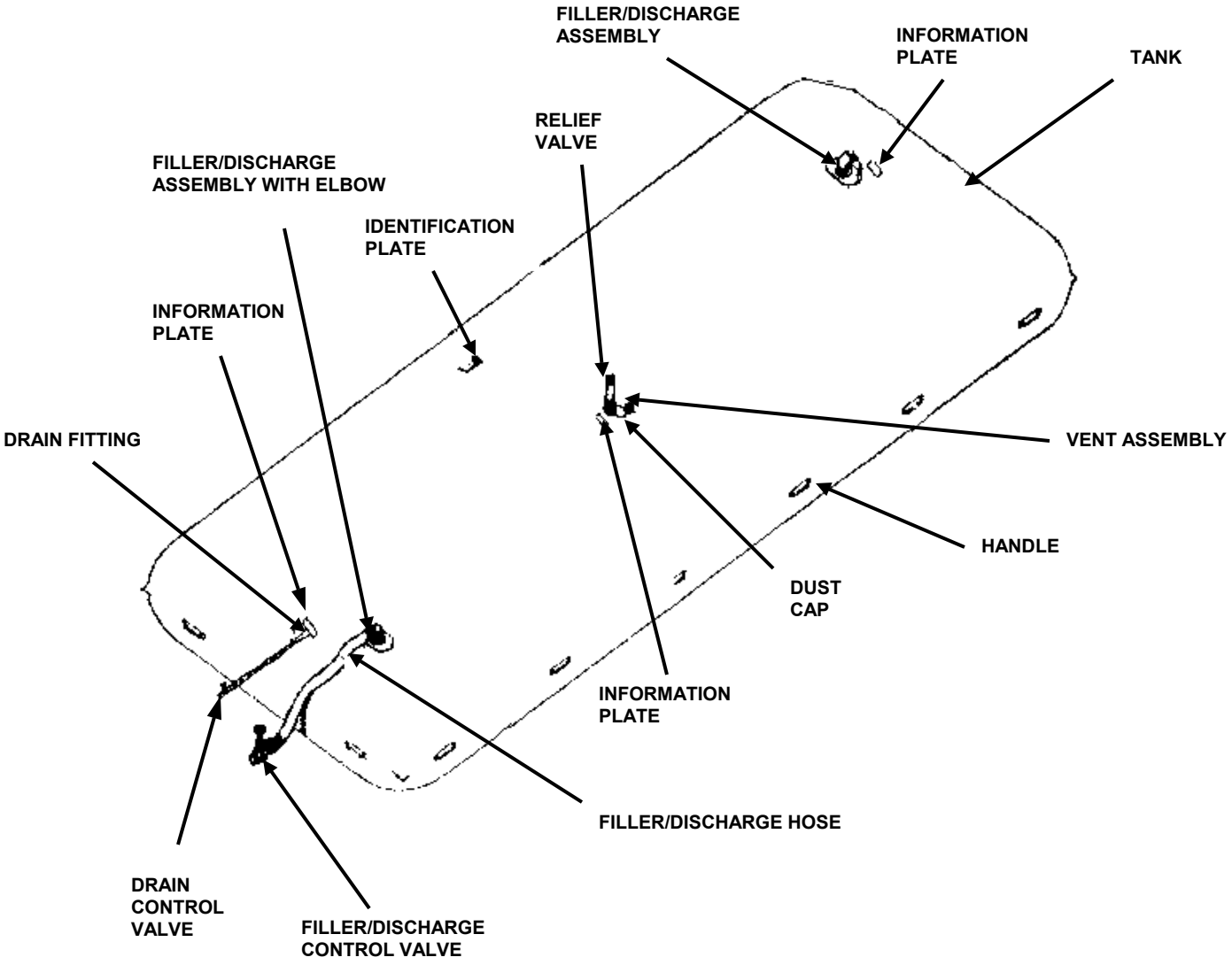
20,000-Gallon Collapsible Fabric Fuel Storage Tank

The 20,000-Gallon (75,710-liter) fuel tank is used for the storage of petroleum-based fuels. The unit consists of a collapsible fabric fuel tank with two filler/discharge assemblies with elbow fittings, a vent fitting assembly with relief valve, a drain fitting assembly with an 8.0-foot (2.44 meter) drain hose with gate valve, two 10.0-foot (3.05 meter) filler/discharge hose assemblies with a gate valve, and emergency repair items.



50,000-Gallon Collapsible Fabric Fuel Storage Tank

The 50,000-Gallon (189,300-liter) fuel tank is used for the storage of petroleum-based fuels. The unit consists of a collapsible fabric fuel tank with two filler/discharge assemblies with elbow fittings, a vent fitting assembly with relief valve, a drain fitting assembly with an 8.0-foot (2.44 meter) drain hose with control valve, an 8.0-foot (2.44 meter) filler/discharge hose assembly with control valve and emergency repair items.



LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

See WP 0004 00.

DECAL MARKINGS

Identification Plate. The tanks are fitted with a bonded identification label, which lists the following:

Description:
Federal or NSN:
Serial number:
Manufacturer's name and plant location:
Date of manufacture, weight (empty), contract number:

Information Plate. The following information shall be located adjacent to each fitting assembly:

Maximum Torque ..... 30.0-inch pounds.

Caution Label. NSN 5430-01-215-7525. The following information shall be located adjacent to each fitting assembly:

CAUTION

Overfilling will result in permanent damage and failure of the tank.

DO NOT OVERFILL

Maximum Capacity When Full ..... 20,000-Gallon (75,710 liter)

Maximum Tank Height When Full ..... 5.577-ft (1.7 meters)

EQUIPMENT DATA

3,000 - GALLON TANK

Temperature Range (Desired-5 Years Maximum)
- Low ..... -25°F (-31.67°C)
- High ..... +125°F (+51.67°C)

Dimensions, Outside (Packaged)
- Height ..... 28.8 inches (73.15 cm)
- Width ..... 28.0 inches (71.12 cm)
- Length ..... 5.0 ft. 5.0 inches (1.651 m)

Crated Weight ..... 295 pounds (133.80 kg)
Dry Weight ..... 135 pounds (61.23 kg)
Dimensions (Filled)
- Height (Depth) ..... 4.0 feet (1.219 m)
- Width ..... 12.6 feet (3.840 m)
- Length ..... 12.6 feet (3.840 m)

Dimensions (Dry)
- Width ..... 13.0 feet (3.962 m)
- Length ..... 13.0 feet 3.962 m)

Fuel Storage Capacity ..... 3,000 gallons (11.360 liters)

10,000 - GALLON TANK

Temperature Range (Desired-5 Years Maximum)
- Low ..... -25°F (-3.67°C)
- High ..... +125°F (+51.67°C)

Dimensions, Outside (Empty)
- Width ..... 22.0 feet (6.70 m)
- Length ..... 22.0 feet (6.70 m)

Dry Weight ..... 180 pounds (81.65 kg)
Crated Weight ..... 525 pounds (238.10 kg)
Dimensions (Filled)
- Height (Depth) ..... 4.0 feet (1.219 m)
- Width ..... 12.6 feet (3.840 m)
- Length ..... 12.6 feet (3.840 m)

Dimensions (Dry)
- Width ..... 22.0 feet (6.70 m)
- Length ..... 22.0 feet (6.70 m)

Crate Dimensions
- Height (Depth) ..... 27.0 inches (68.58 cm)
- Width ..... 30.0 inches (76.20 cm)
- Length ..... 13.0 ft.7.0 inches (4.140 m)

Fuel Storage Capacity ..... 10,000-gallons (37,850 liters)

20,000 - GALLON TANK

Temperature Range (Desired-5 Years Maximum)
- Low ..... -25°F (-3.67°C)
- High ..... +125°F (+51.67°C)

Dimensions, Outside (Packaged)
- Height (Depth) ..... 2.8 feet (0.85 m)
- Width ..... 3.11 feet (.948 m)
- Length ..... 3.4 feet (1.04 m)

Dimensions (Filled)
- Height (Depth) ..... 5.6 feet (1.71 m)
- Width ..... 24.10 feet (7.35 m)
- Length ..... 27.11 feet (8.26 m)

Dimensions (Dry)
- Width ..... 24.0 feet (7.31 m)
- Length ..... 28.0 feet (8.53 m)

Dry Weight ..... 550 pounds (249.50 kg)
Crated Weight ..... 1200 pounds (544.30 kg)
Fuel Storage Capacity ..... 20,000 gallons (75,710 liters)

50,000 - GALLON TANK

Temperature Range (Desired -5 Years Maximum)
- Low ..... -25°F (-3.67°C)
- High ..... +125°F (+51.67°C)

Dimensions, Outside (Packaged)
- Height (Depth) ..... 3.5 feet (1.07 m)
- Width ..... 3.3 feet (1.01 m)
- Length ..... 12.0 feet (3.66 m)

Dimensions (Filled)
- Height (Depth) ..... 5.8 feet (1.768 m)
- Width ..... 24.0 feet (7.315 m)
- Length ..... 64.0 feet (19.51 m)

Dimensions (Dry)
- Width ..... 26.0 feet (7.925 m)
- Length ..... 66.0 feet (20.12 m)

Dry Weight ..... 744 pounds (337.50 kg)
Crated Weight ..... 1350 pounds (612.30 kg)
Fuel Storage Capacity ..... 50,000 gallons (189,300 liters)

END OF WORK PACKAGE

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COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000,
10,000, 20,000, AND 50,000 GALLON
PRINCIPLES OF OPERATION**

PRINCIPLES OF OPERATION

Connecting a hose from a fuel truck or other fuel source to the filler/discharge hose assembly fills the collapsible fuel tank. This assembly is connected, in turn, to the gate, ball, or butterfly valve that has been connected to the filler/discharge assembly. Gate, ball, or butterfly valves are used to control the flow of the fuel.

Connecting the filler/discharge hose assembly, and gate, ball, or butterfly valve to the filler/discharge assembly discharges the collapsible fuel tank. Water, sludge, and residual fuel are drained through the drain hose assembly at the bottom of the tank. The fuels are extremely hazardous, and all safety procedures must be strictly followed.

The vent and pipe assembly contains a relief cap that opens automatically when the tank vapor reaches an internal pressure of 0.10 psi (0.0068 atmospheres).

END OF WORK PACKAGE

CHAPTER 2

OPERATING INSTRUCTIONS
TANK, FUEL STORAGE, 3,000 GALLON, 10,000 GALLON
20,000 GALLON, AND 50,000 GALLON

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000,
10,000, 20,000, AND 50,000 GALLON
CONTROLS AND INDICATORS**

GENERAL

This section lists major components, controls, and indicators, and describes the functions within the collapsible fabric, fuel storage tank assemblies.

DESCRIPTION AND USE OF MAJOR COMPONENTS

Description and use of major components, including controls and indicators, are contained in Table 1.

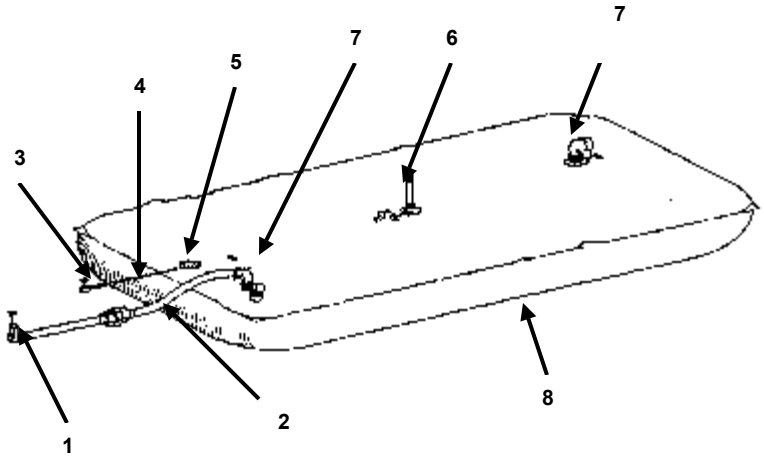


Table 1. Major Components, Controls and Indicators

Key	Component, Control, or Indicator	Function
1	Filler/Discharge Gate Valve (Models MIL-T-52983B, WTM3KF, FCE574-81-1-A, SC5430-97CLE01, BA92-162, PD52983-50, M52983-50) Filler/Discharge Butterfly Valve (Models BA91-141, BA91-140) Filler/Discharge Ball Valve (Models BA91-141A, BA91-140A)	Allows fuel to flow to and from the tank assembly. Valve is normally closed when the tank is not being filled or fuel is not being discharged from the tank.
2	Filler/Discharge Hose Assembly	Feeds fuel from the source and valve to appropriate fitting on tank during fill. Allows fuel to flow from tank during discharge.

Key	Component, Control, or Indicator	Function
3	Drain Ball Valve (Models PD52983-50, BA91-141, BA91-140, BA91-141A, BA91-140A) Drain Gate Valve (Model WTM3KF, M52983-50, BA92-162, FCE574-81-1-A)	Allows fuel, water, and sludge to drain from the tank. The valve is normally closed when the tank is not being drained or replaced.
4	Drain Hose Assembly (Except Model MIL-T-52983B)	Allows fuel, water, and sludge to drain from the storage tank.
5	Drain Fitting Assemblies (Except Model MIL-T-52983B)	Allows the drain hose to be connected to the fuel tank.
6	Vent Pipe and Assembly	Vent pipe opens automatically when the tank vapor reaches 0.10 psi (pounds per square inch) (0.0068 atmospheres), to relieve pressure from inside the tank.
7	Filler/Discharge Assemblies	Allows hose assembly to be connected to the tank. Directs fuel flow from the hose assembly into the tank when filling the tank. Directs fuel flow from the tank during discharge. Discharge fitting requires female/male elbow. Filler fitting requires female/female elbow.
8	Fuel Tank(s)	Collapsible polymer-coated nylon fabric tank in 3,000, 10,000, 20,000, and 50,000 gallon capacities. Used for fuel storage. Emergency repair kit included.

END OF WORK PACKAGE

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000,
10,000, 20,000, AND 50,000 GALLON
OPERATION UNDER USUAL CONDITIONS**

ASSEMBLY AND PREPARATION FOR USE

Construction of Berm

WARNING

Make certain that the berm gate valve is closed and locked after installing and draining the berm. In the event of tank rupture, an open berm gate valve would permit fuel to drain from the berm. Undetected fuel leakage can result in an explosion and cause death, severe personal injury, and damage to equipment.

CAUTION

Damage to tank may occur if chosen site is not free of sharp objects (rocks, sticks, glass, etc.), and center of leveled area should not exceed 9.0-inches (22.86-centimeters) below ground level. Retain a slight incline for draining surface water.

NOTE

A minimum of 5.0-foot (1.52-meter) working clearance is necessary between the side of the tank and the berm on all four sides. When a single berm is used to contain more than one tank, maintain a 5.0-foot (1.52-meter) space between tanks. The installation site should have less than a 3.0 degree grade in order to prevent creeping of the tank.

NOTE

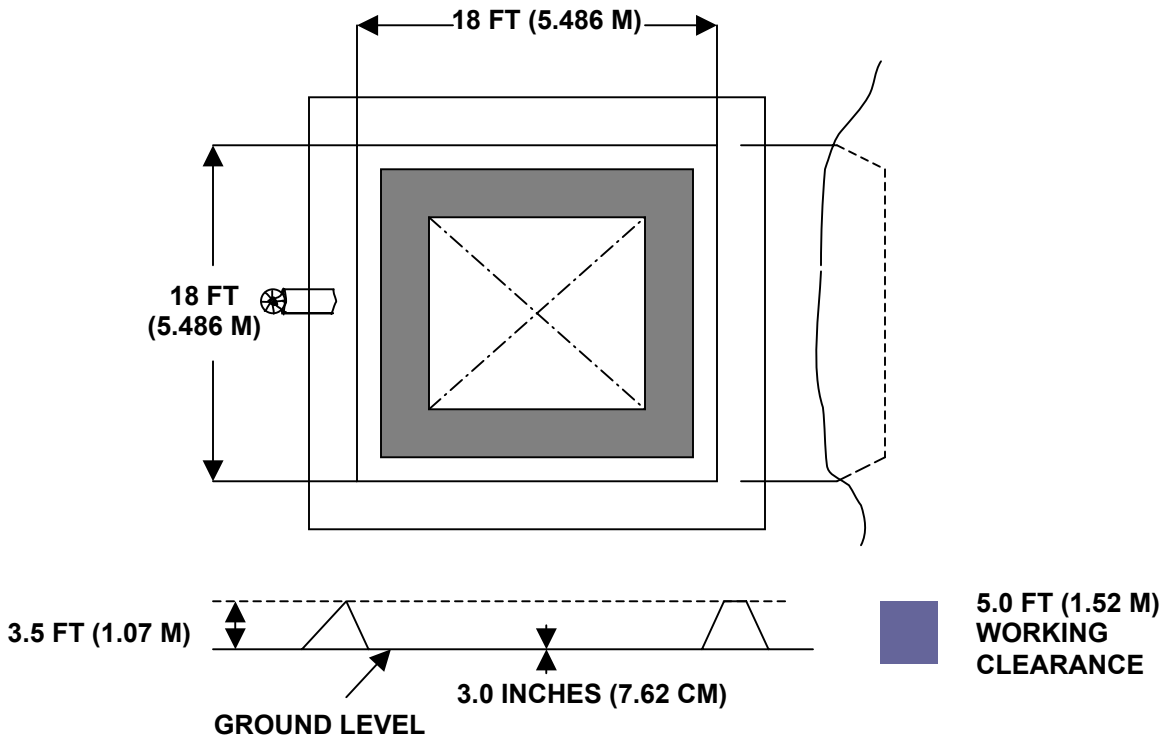
If possible, provide a 4.0-inch (10.16-centimeters) thick sand bottom for all collapsible fuel storage tanks. To provide a berm drain for all collapsible fuel storage tanks, place a 2.0-inch (5.08-centimeter) pipe with a gate valve through the bottom of the discharge end of the berm in order to provide a means of draining accumulated water. Position the drain assembly at the lowest point of the slope to aid in draining water or sludge. The gate valve should be normally closed, and opened only to drain water from the bermed area. Install a cloth, if provided, in the bermed area for all collapsible fuel storage tanks.

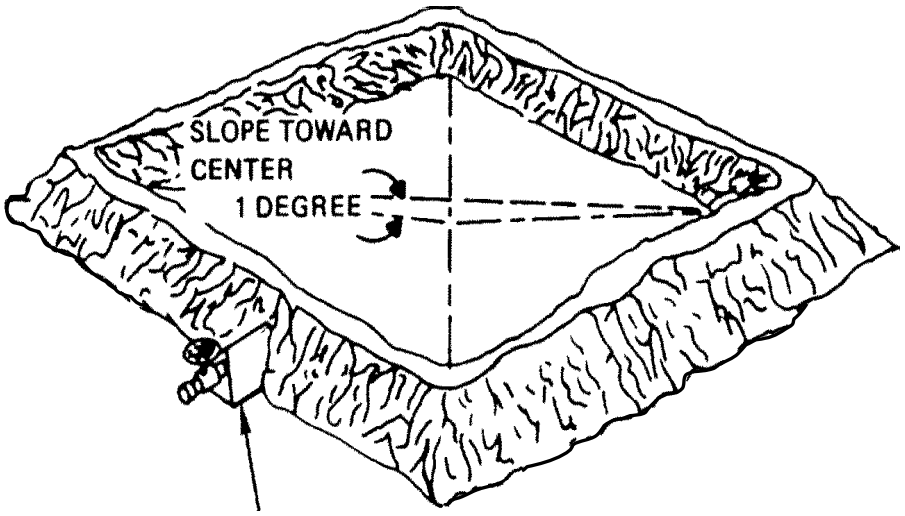
3,000-Gallon (11,360 liters) Tank

NOTE

The following instructions are for a 13.0-foot by 13.0-foot (3.962-meter by 3.962-meter) tank in flat (empty) dimensions.

1. Clear and level an area 29.0-feet by 29.0-feet (8.84-meters by 8.84-meters).
2. Slope all four sides of leveled area in toward the center. The center should be no more than 3.0-inches (7.62-centimeters) below ground level, equal to an approximate slope of 1.0 degree.
3. Erect a 3.5-foot (1.07-meter) high berm around the outside of the sloped area.





DRAIN FOR SURFACE WATER

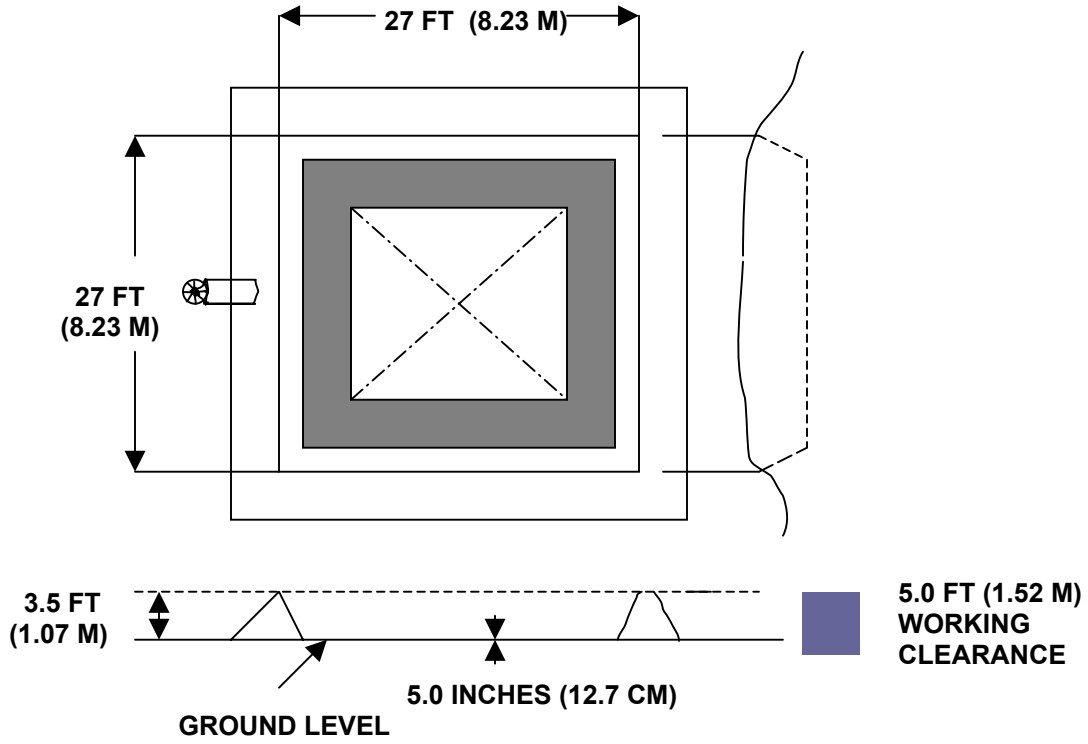
Berm Construction, 3,000-Gallon (11,360 liter) tank

10,000-Gallon (37,850 liters) Tank

NOTE

The following instructions are for a 22.0-foot by 22.0-foot (6.706-meter by 6.706-meter) tank in flat (empty) dimensions.

1. Clear and level an area 35.0-feet by 35.0-feet (10.668-meters by 10.668-meters).
2. Slope all four sides of leveled area in toward the center. The center should be no more than 5.0-inches (12.7-centimeters) below ground level, equal to an approximate slope of 1.0 degree.
3. Erect a 3.5-foot (1.07-meter) high berm around the outside of the sloped area.



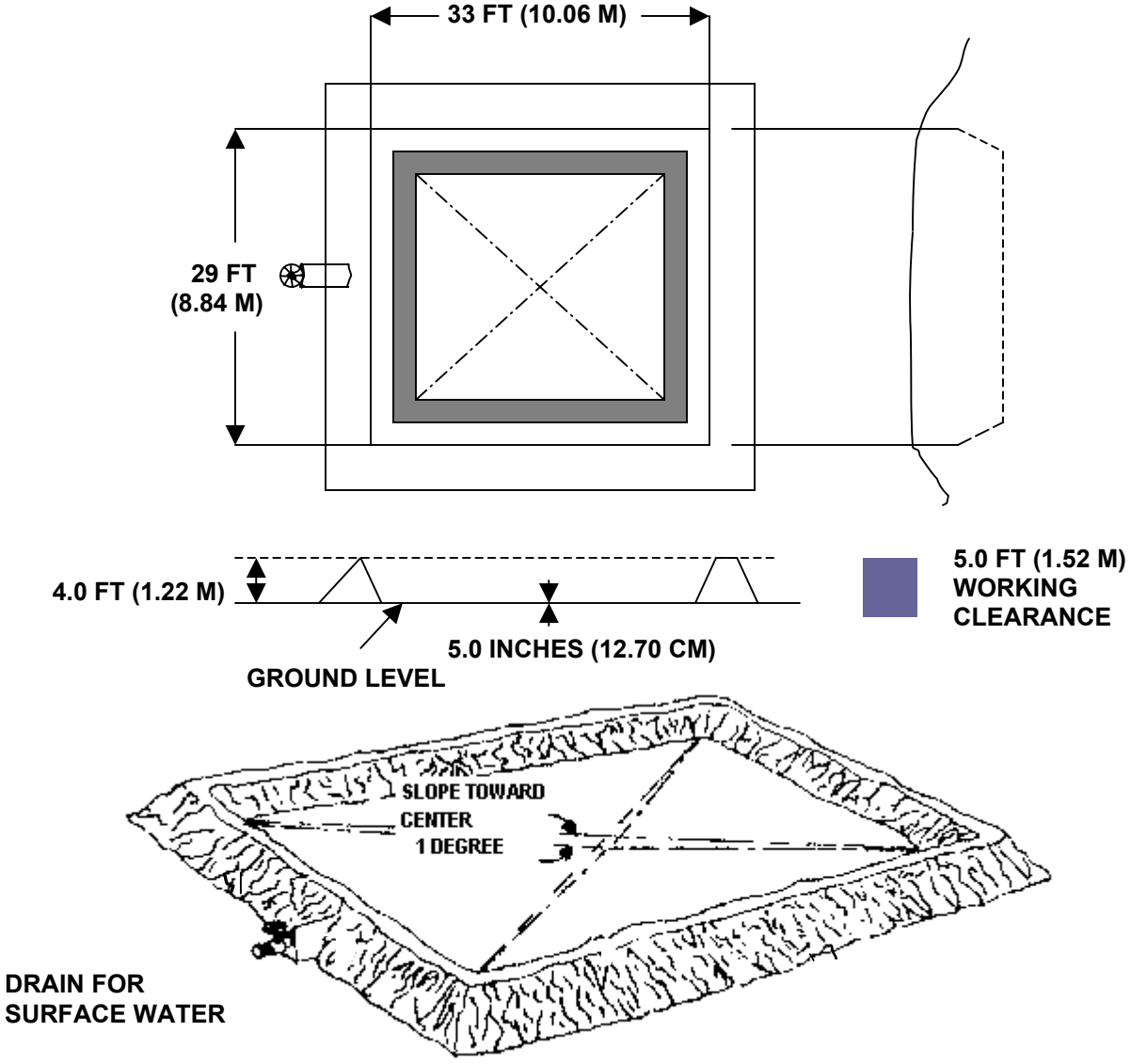
Berm Construction, 10,000-Gallon (37,850 liter) tank

NOTE
Slope towards center, 1 degree.

20,000-Gallon (75,710 liters) Tank

NOTE
The following instructions are for a 24.6-foot by 28.6-foot (7.498 meter by 8.717 meter) tank in flat (empty) dimensions.

1. Clear and level an area 38.0-feet by 34.0-feet (11.58 meters by 10.36 meters).
2. Slope all four sides of leveled area in toward the center. The center should be no more than 5.0-inches (12.7-centimeters) below ground level, equal to an approximate slope of 1.0 degree.
3. Erect a 4.0-foot (1.22 meter) high berm around the outside of the sloped area.



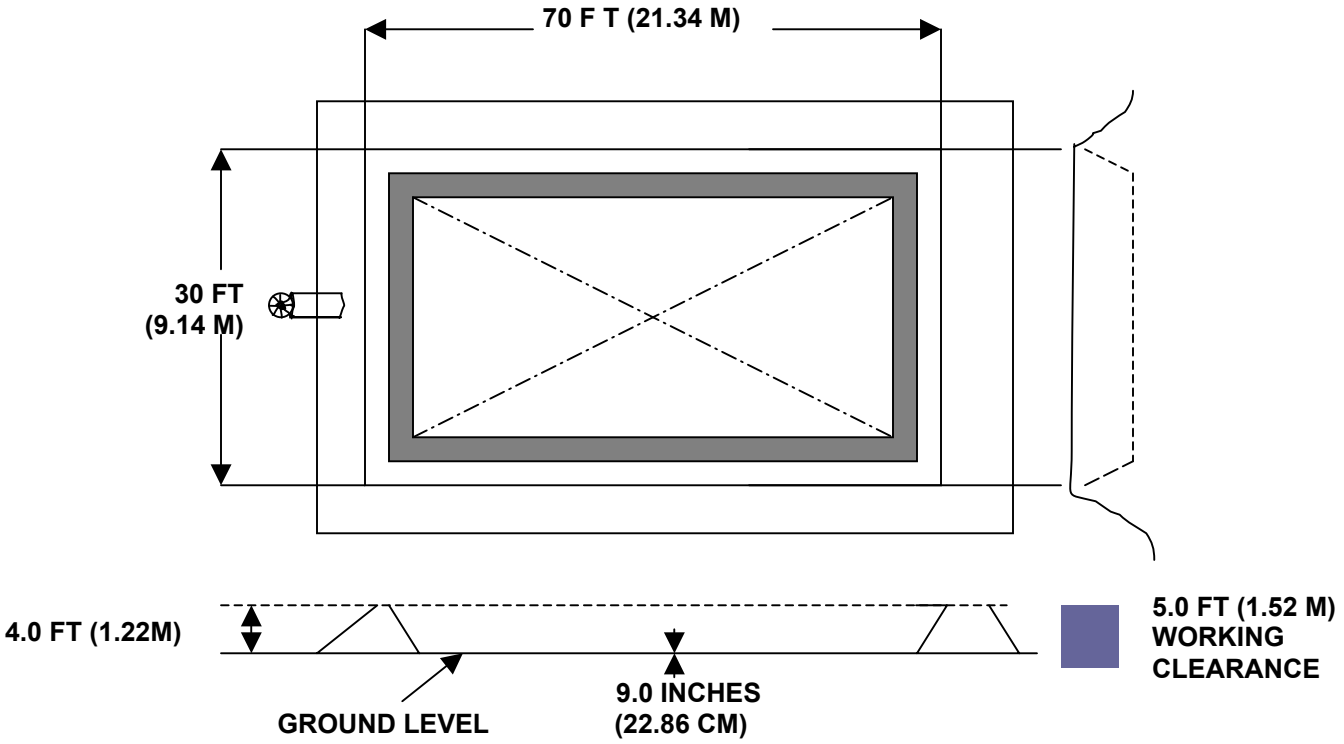
Berm Construction, 20,000-Gallon (75,710 liter) tank

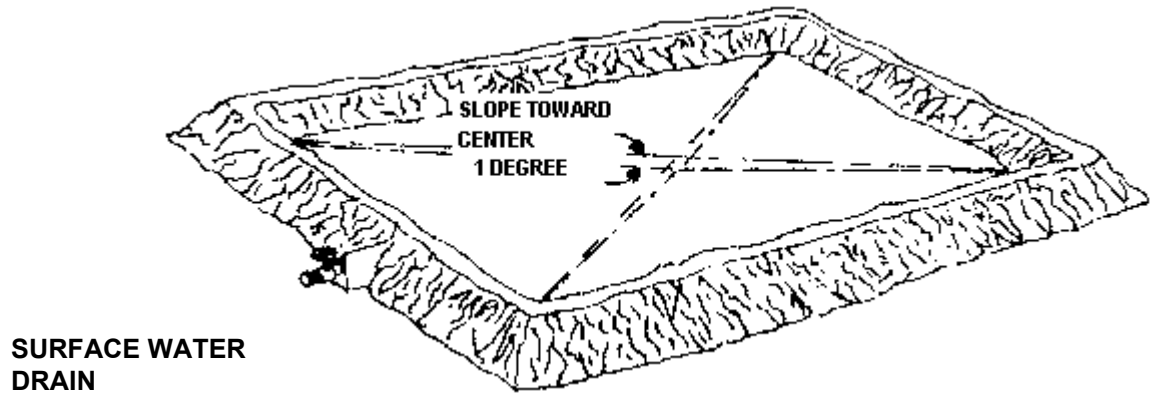
50,000-Gallon (189,300 liters) Tank

NOTE

The following instructions are for a 26.0-foot by 66.0-foot (7.925 meters by 20.117 meters) tank in flat (empty) dimensions.

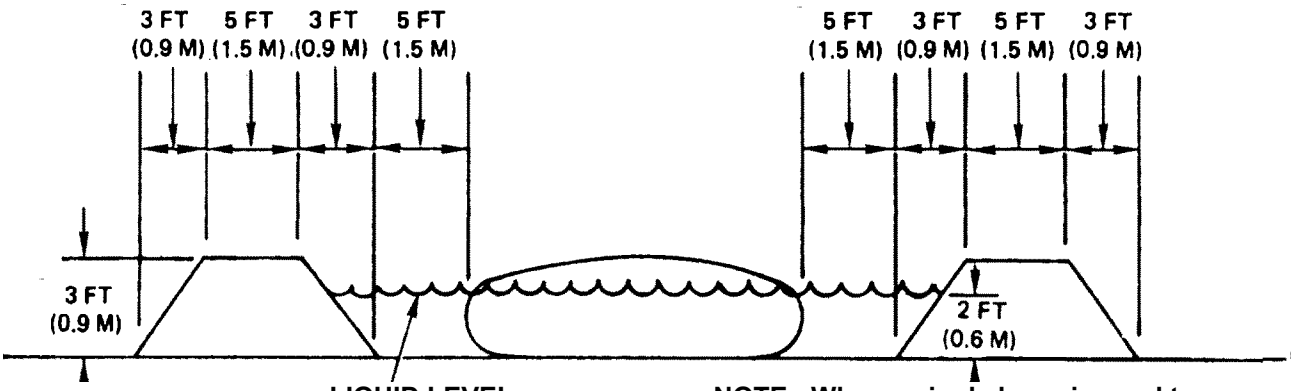
1. Clear and level an area 34.0-feet by 74.0-feet (10.36 meters by 22.56 meters).
2. Slope all four sides of leveled area in toward the center. The center should be no more than 9.0-inches (22.86-centimeters) below ground level, equal to an approximate slope of 1.0 degree.
3. Erect a 4.0-foot (1.22 meter) high berm around the outside of the sloped area.





Berm Construction, 50,000-Gallon (189,300 liter) tank

BERM CROSS-SECTION



NOTE: When a single berm is used to contain more than one tank, maintain a 5.0-foot (1.5 meter) space between tanks.

Typical Berm Cross-Section of Liquid Level in Relation to the Position of the Collapsible Fabric Fuel Tank.

Unpacking the Equipment

1. Position the packaged tank (1) on an approved site near the point of installation.

CAUTIONS

Unfold the collapsible fabric tanks with care. Coated surfaces may stick together, and use of excessive force may pull the coating from the tank fabric. A light application of petroleum jelly will prevent recurrence.

Remove all protruding nails and other objects before attempting to remove the tank from the container. This is necessary to avoid puncturing the tank.

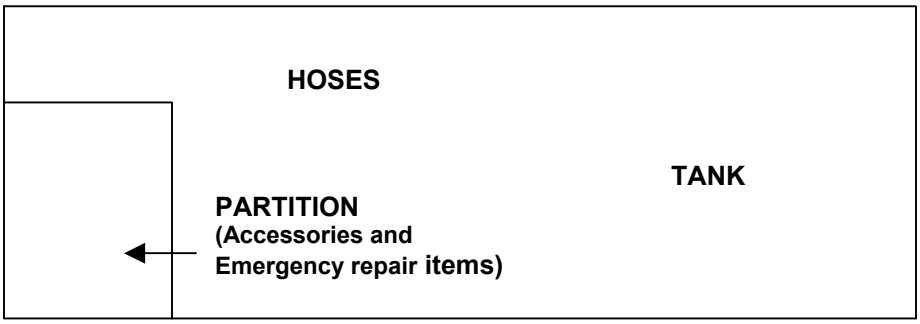
2. Know the contents of the shipping container by reviewing the Bill of Materials.

NOTE

Items inside the wooden crate are listed sequentially from the top of the crate to the bottom of the crate.

ITEM	QUANTITY
Hoses	Three (3) each
Tank, with lifting straps	One (1) each
Partition containing accessories Emergency repair items.	One (1) each

3. Carefully open the shipping container (2) and by removing nails and bolts from the container lid (3), retaining boards (4), container sides (5) and ends (6). Remove accessories (7), drain fitting hoses (8), and filler/discharge hose (9) from around tank (1).

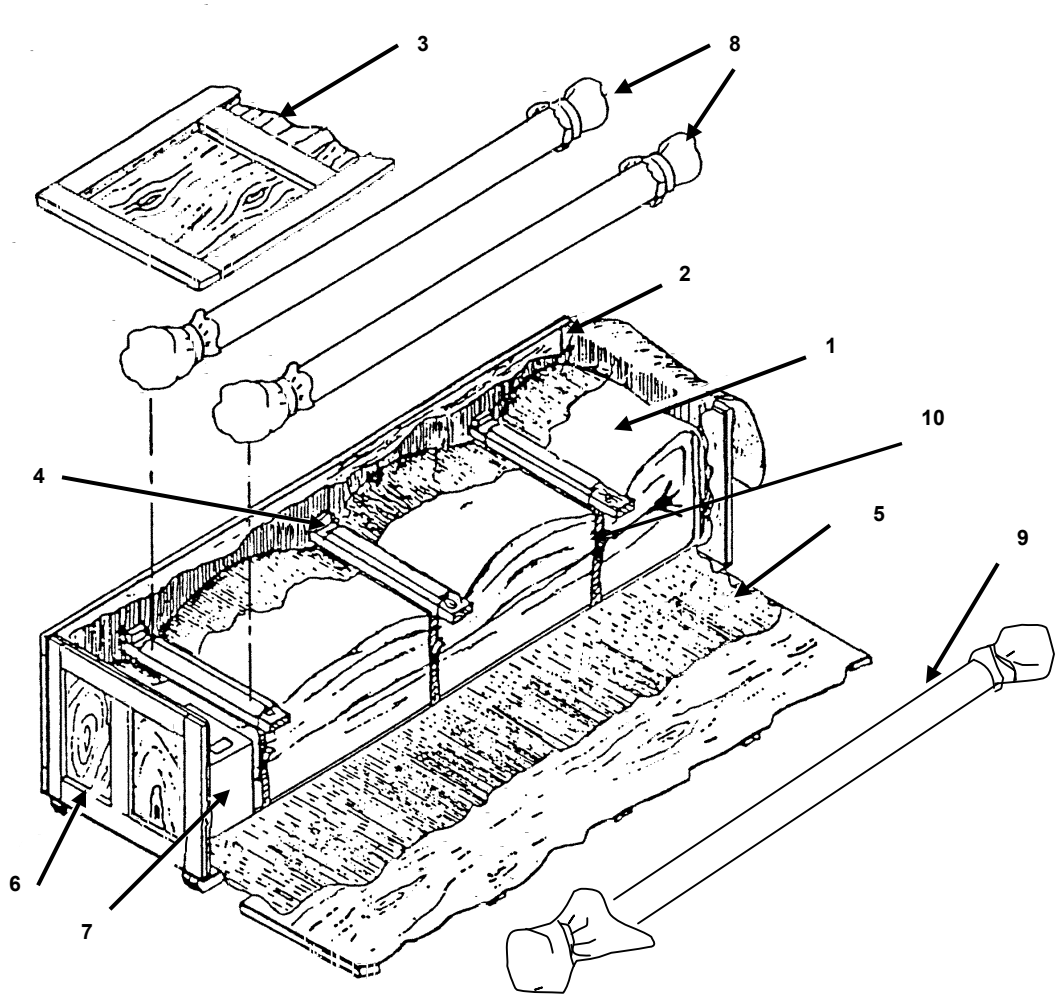


NOTES

If a tank is being replaced, package the unserviceable tank in the empty container in the same manner that the new tank was packaged.

The tank-lifting device must have a minimum lifting capacity of 2000 lb. (908 kg).

4. Locate the lifting straps (10) around tank (1). Carefully insert a lifting bar (2000 lb./908kg. capacity) through the loops of lifting straps (10).



Unpacking Instructions for the 3,000 Gallon, 10,000 Gallon, 20,000 Gallon, and 50,000 Gallon Collapsible Fabric Fuel Tanks.

5. Transport tank (1) to the center of the desired installation site. Position long side of tank (1) parallel with long side of the installation site.

6. Remove lifting straps (10) from tank (1).

7. Unfold one-half of tank (1) along the length of the installation site, and unfold the other half of tank (1) in the opposite direction along the length of the installation site.

NOTE

Repair items (sealing clamps, plugs, gaskets, and pre-formed packing) are packaged in another box and should be placed in a secure storage area until needed.

8. Grasp the handles located along the length of tank (1), and pull the folded sides of tank (1) towards the sides of the installation site.

9. Smooth out all creases and wrinkles in tank (1) fabric.

Removal of Drain Assembly Plug and Installation of Drain Hose Assembly

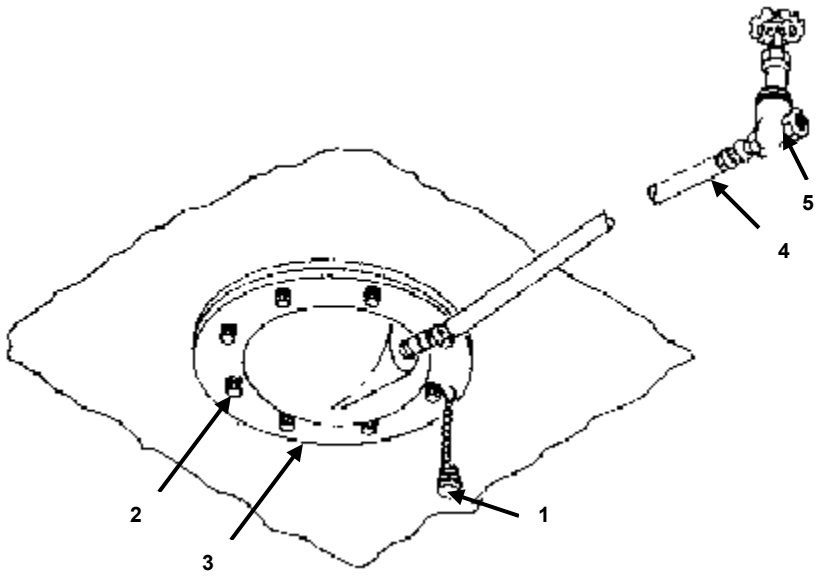
WARNING

When filling the tank with fuel, verify that the drain gate hand-wheel or ball valve handle is rotated fully to the right (closed position), before fuel is introduced into the tank. Unobserved drainage of fuel can result in an explosion or fire. Failure to comply with this warning can cause death or severe personal injury.

1. Fold the tank to expose drain plug (1).

2. Torque screws (2) on cover plate (3) to 30 in-lb (3.41 N•m).

3. Remove drain plug (1).



4. Apply sealing compound (Item 8, WP 0040 00) to the threads of drain hose (4).

5. Install drain hose (4).

6. Apply sealing compound or anti-seize tape (Item 7, WP 0040 00) to threads on other end of drain hose (4).

WARNING

Check that the drain gate or ball valve has been rotated clockwise to the closed position before proceeding. Failure to close the valve handle can cause loss of fuel and possible fire or explosion.

7. Install ball valve or drain gate valve (5) onto the end of drain hose (4).

NOTES

A narrow, shallow drainage trench, placed at the outer edge and away from the tank, should be used as an extension for the drain hose, drain gate, or ball valve.

Installation of drain plug and drain assembly are applicable to all tanks except for 3,000-Gallon (11,360 liter) tanks.

8. Return the tank end to the flat position, laying drain hose (4) and ball valve or drain gate valve (5) in narrow, shallow drainage trench.

Installation of Vent Pipe Assembly

CAUTION

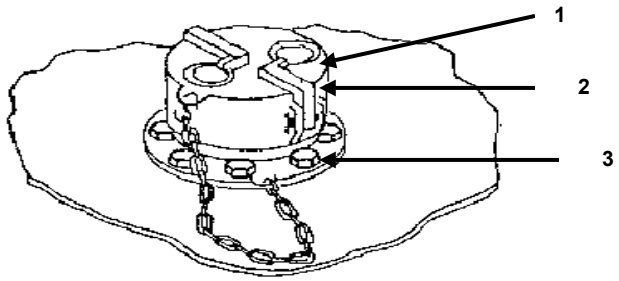
Prior to installing the fuel tanks, check all coupling gaskets and sealing surfaces to ensure they are in place and serviceable.

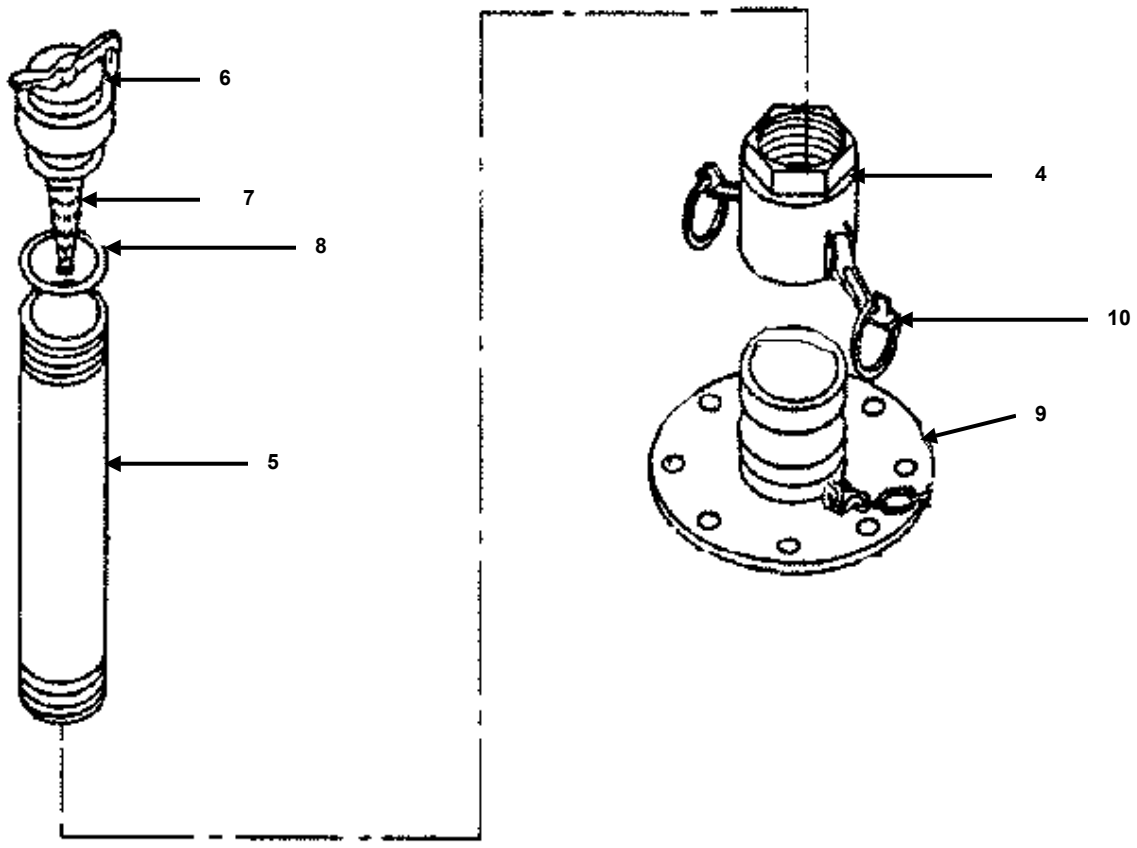
NOTE

Dust cap is chain-attached to prevent loss.

1. Remove dust cap (1) by pulling cam-lever arms (2) outward, and lifting up on dust cap (1).

2. Torque dust cap screws (3) to 30 in-lb (3.41 N•m).



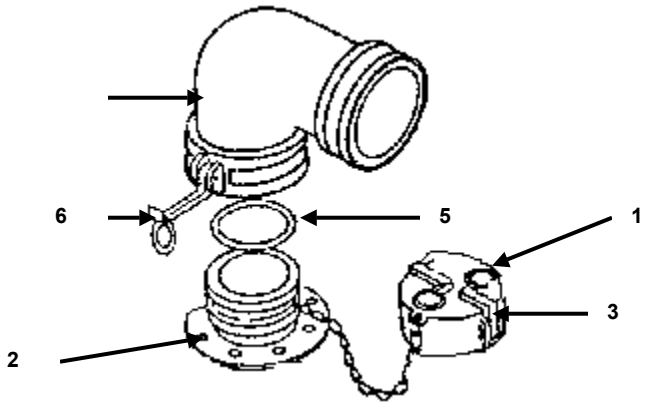


NOTE

Normally the vent pipe and female coupling half will be received pre-assembled.

3. Inspect female coupling half (4) and vent pipe (5) for cleanliness.
4. Check to see that relief cap (6) operates freely.
5. Check that flame arrestor (7) is installed.
6. Check that relief cap (6) is installed tightly on vent pipe (5).
7. Check that gasket (8) is in place and correctly seated.
8. Insert female coupling half (4) over flanged adapter (9), with cam-lever arms (10) in the outward position.
9. Press cam-lever arms (10) upward, and inward, to lock vent pipe (5) into operating position.

Installation of Filler/Discharge Elbow Assembly



NOTE

The dust cap is attached to the flanged adapter to prevent it from being lost. The filler/discharge elbow on the discharge end requires a female/male elbow; whereas, the filler/discharge elbow used on the intake end requires a female/female elbow.

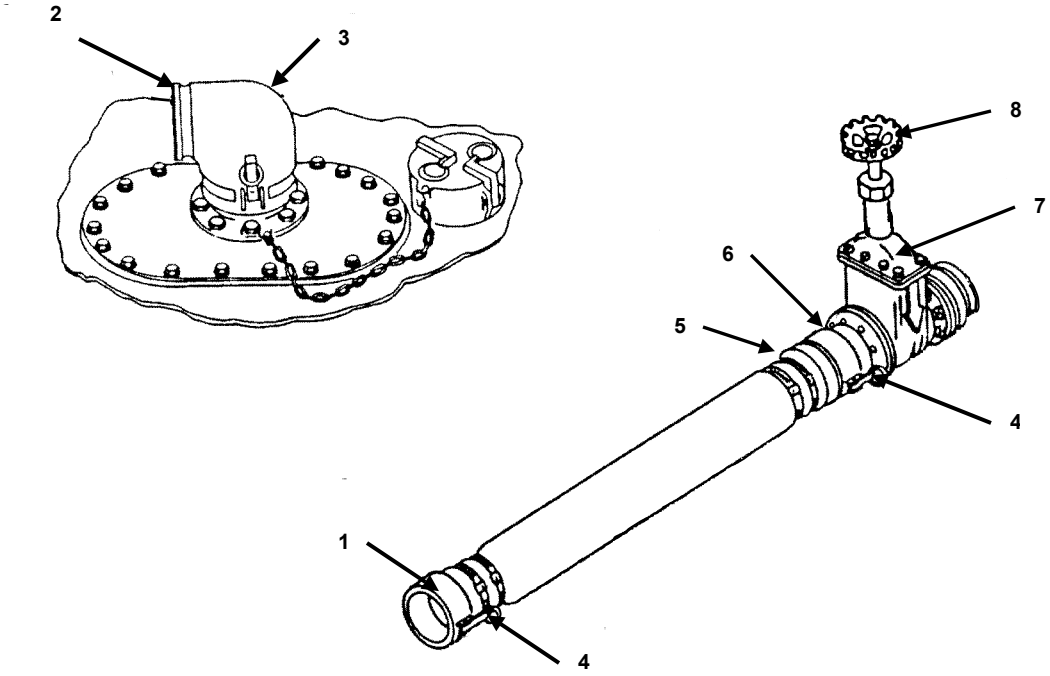
1. Remove dust cap (1) from flanged adapter (2) by pulling cam-lever arms (3) outward and lifting up on dust cap (1).
2. Inspect elbow (4) for cleanliness.
3. Check that gasket (5) is in place and is properly seated.
4. Position the female end of elbow (4) over flanged adapter (2) with cam-lever arms (6) in the outward position.
5. Rotate elbow (4) so that the open end points to nearest end of the tank.

NOTE

Cam-lever arms must be pushed inward to lock and pulled outward to unlock the elbow.

6. Lift cam-lever arms (6), and lock elbow (4) in place.
7. Install dust cap (1) on the open end of elbow (4) and lock in place.

Installation of Filler/Discharge Hose Assembly and Filler/Discharge Valve Assembly



NOTE

The filler and discharge hose assembly is fitted with a quick-disconnect female coupling on one end and a quick-disconnect male adapter on the other end.

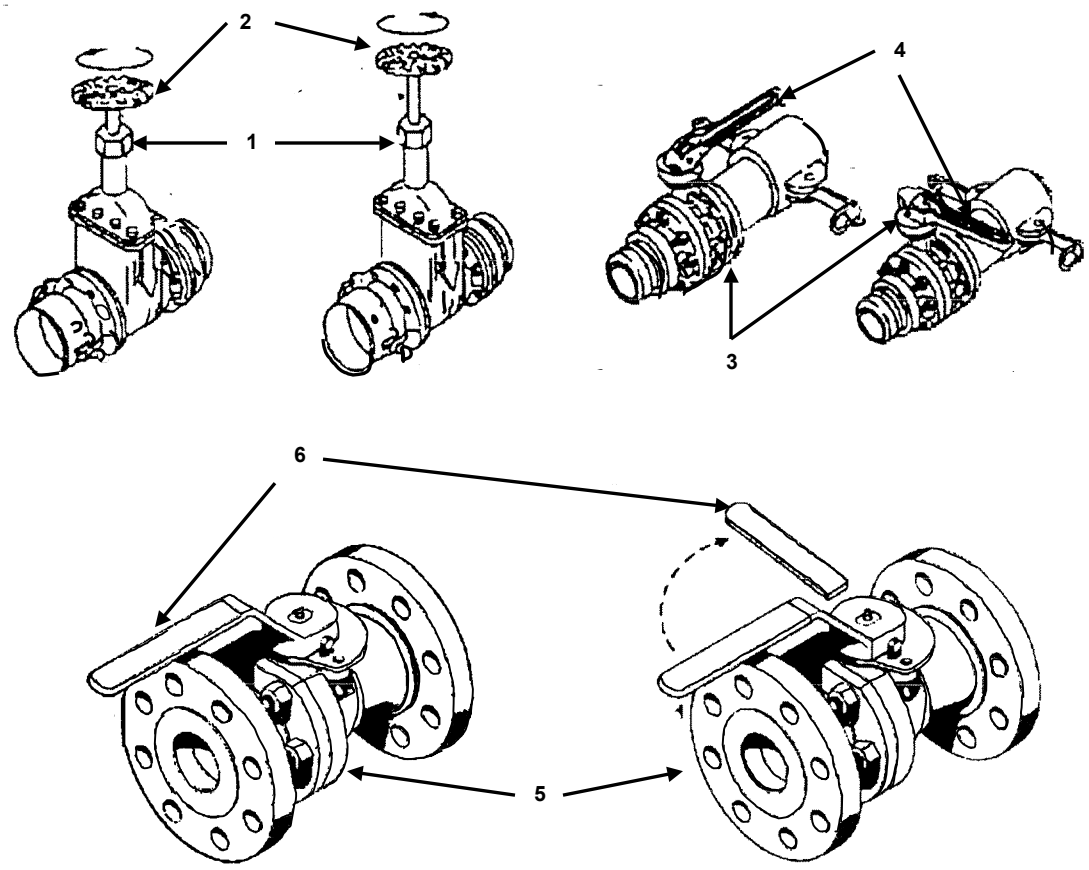
1. Place female coupling (1) on male adapter (2) end of filler/discharge elbow (3).
2. Push coupling cam-lever arms (4) into position to lock the hose assembly in place.
3. Place male adapter (5) end of the hose into female coupling (6) of the gate or butterfly valve (7).
4. Push coupling cam-lever arms (4) into position to lock the hose assembly in place.
5. Ensure gate or butterfly valve (7) is closed, rotating handle (8) to the right until it stops.

Valves

1. Gate valve (1) is fully opened by rotating hand-wheel (2) to the left, and backing off one-quarter turn.
2. Gate valve (1) is fully closed by rotating hand-wheel (2) to the right and backing off one-quarter turn. Note the difference in exposure of the handle stem between the closed and open positions.
3. Ensure butterfly valve (3) (Models BA91-141 and BA91-140) is closed. Press down on the end of the handle (4) to release the locking pin and turn until handle (4) is 90° to the valve body and stops. Release handle (4).
4. Butterfly valve (3) is fully opened by pressing down on the end of handle (4) and turning it counter clockwise to a parallel position in line with the valve body or hose assembly.

5. Ball valve (5) is fully opened by rotating handle (6) until handle (6) is parallel to the valve body or hose assembly.

6. Ball valve (5) is fully closed by rotating handle (6) until perpendicular to valve body or hose assembly.



INITIAL ADJUSTMENTS AND ROUTINE CHECKS

NOTE

If the tank is cut or punctured during any phase of operation, refer to WP 0006 00 for emergency repair procedures.

1. Position filled sandbag (1) under hose (2) near filler/discharge elbow (3). This support will reduce stress on tank fitting, the gasket in the hose coupling, and the coupling of filler/discharge elbow (3).

WARNING

Check the placement of all sandbags to see potential leak points in order to avoid fire hazard. Not checking the positions of sandbags can cause serious injury or death by fire or explosion.

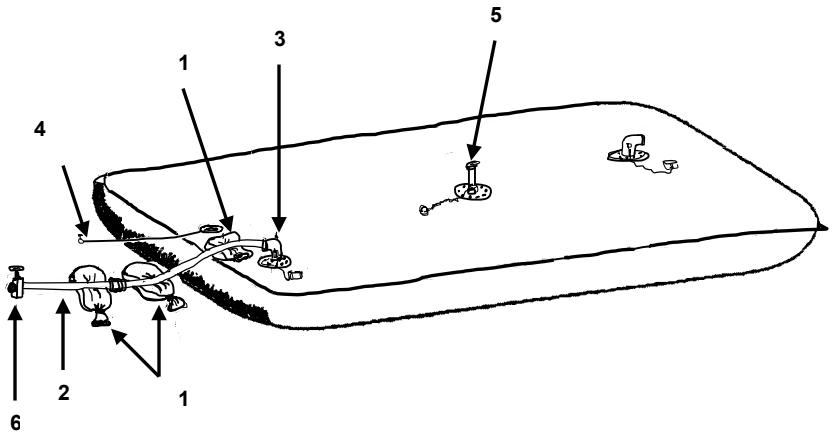
2. Position other sandbags (1) or wood blocks on the ground near the hose connections so that a faulty or leaking connection is easier to see, and a fire hazard can be avoided.

3. Inspect the tank to verify the elevated connection setup for easy leak detection.

4. Check drain gate or ball valve (4) to verify that it is in the closed position.

5. Check the vent pipe assembly relief cap (5) to verify freedom of operation.

6. Check the filler/discharge gate, butterfly or ball valve (6) to verify closed position.



Elevated Connections for Easy Leak Detection

OPERATING PROCEDURES (Filling the Tank)

WARNING

Over-aged tanks can become weakened and rupture, thereby spilling flammable fuel on the ground. Care must be taken to ensure that over-aged tanks are not left in operation. Failure to heed this warning can cause injury or death to personnel.

CAUTION

Persons operating the fuel tank must periodically check the dates on the data plates to verify that the tank is safe for use. Each tank has a maximum of three-years service life beginning on the date when it is first filled. Service life may be less, depending on the climatic conditions in which the tank is used and the number of deployments it has been on. Shelf storage life is five years from the date of manufacture. Users must initiate action to replace over-aged tanks. Failure to heed this caution can cause tank rupture.

1. After performing adjustments and routine checks, attach the fuel source to the filler/discharge gate or butterfly valve.
2. Activate the fuel source.
3. Open the gate or butterfly valve by rotating the hand-wheel (or handle) counter-clockwise.

CAUTION

Do not exceed maximum fill capacity. The fuel tank will burst if it is overfilled causing damage to the equipment.

4. Close the gate or butterfly valve when the tank is filled by rotating the hand-wheel (or handle) clockwise.
5. Deactivate the fuel source.
6. Disconnect the fuel source from the gate or butterfly valve.

Draining the Tank

1. Inspect the tank to verify that the tank is set up correctly.
2. Attach an emptying source to the gate or butterfly valve.
3. Open the gate or butterfly valve by rotating the hand-wheel (or handle) counter-clockwise.
4. Activate the emptying source.
5. Close the gate or butterfly valve when the tank is empty by rotating the hand-wheel (or handle) clockwise.
6. Deactivate the emptying source.
7. Disconnect the emptying source from the gate or butterfly valve.
8. Disconnect the filler/discharge hose from the elbow.

9. Squeeze excess fuel from the tank by rolling the ends of the tank towards the drain fitting.

10. Open the drain fitting gate or ball valve to allow the remaining fuel to drain from the tank.

WARNING

Sludge that accumulates in the bottom of the fuel tank gives off toxic and explosive vapors. Inhaling these vapors can cause lead poisoning. When cleaning tanks, provide ample ventilation to carry off harmful fumes.

11. Clean the tank of residual sludge that accumulates at the bottom of the storage tank and dispose of the sludge in compliance with EPA and local regulations.

PREPARATION FOR MOVEMENT

CAUTION

Always handle the tank carefully. Components stored with the tank should be padded to avoid chafing during movement. Rough handling of the tank or components will result in damage.

1. Drain all fuel from the tank.

2. Dry out the tank by purging it with air pressure. Use a maximum line pressure of 50 pounds per square inch (3.40 atmospheres).

    a. Insert the air hose through the filler/discharge adapter, placing rags (Item 6, WP 0040 00) around the air hose at the fitting to prevent air from escaping.

    b. Apply compressed air into the tank until the tank expands to 3-feet (0.914 meters) in height.

    c. Remove the dust cap from the vent fitting to allow air to vent from the tank for 30 minutes.

    d. Deactivate the compressed air source and remove the air hose and rags.

3. Remove the drain hose assembly from the drain fitting and install the drain plug.

4. Remove the filler/discharge elbows from the filler/discharge adapters.

5. Install the dust caps, pushing in on the cam-lever arms to lock the dust caps in place.

6. Remove the vent pipe assembly from the flanged adapter and install the dust cap, pushing in on the cam-lever arms to lock the dust caps in place.

7. Brush off any stones or debris clinging to the tank.

8. Fold the tank from both sides towards the middle.

9. Roll the tank from the end opposite the drain fitting.

10. Plug the exposed hose assembly openings with suitable, clean materials to keep them dirt free.

11. Place the tank in a suitable shipping container or on a skid.

12. Pad or wrap the components before placing in separate shipping containers or storing with the tank. This prevents chafing of the tank during movement.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON OPERATION UNDER UNUSUAL CONDITIONS

OPERATION IN EXTREME HEAT

1. Avoid unnecessary handling of the tank that might cause coating material separation. The coating material becomes increasingly delicate as the temperature rises.
2. If possible, set up protective shade over the tank being careful not to block air circulation.

OPERATION IN EXTREME COLD

1. Avoid any unnecessary handling of the tank.
2. If possible, deploy the tank only when the temperature is above -25°F (-32°C).

CAUTION

In extreme cold, a new fabric tank must be prepared for initial operations. The fabric tank will crack if the seams formed in the material from depot vacuum packing are not stretched out prior to the fabric tank being filled with fuel.

3. Remove the tank from the packing crate and unfold the tank to allow the seams created by the depot vacuum packing to stretch out.
4. If possible, inflate the fabric tank with compressed air to ensure all seams are stretched out.
5. Keep snow and ice from accumulating on the top of the tank, vent, and pipe assembly.
6. Keep snow and ice from accumulating on the couplings to ensure proper assembly and disassembly.
7. Avoid unnecessary folding, unfolding, or rolling of the tank that might cause flaking, cracking, or delaminating of the coating material.
8. Sweep snow from the exterior of tank with a soft-bristled broom or brush.
9. Cover fittings to keep ice from forming on the filler/discharge assemblies.
10. Refold and repack the fabric tank after the seams have been stretched out.

OPERATION IN SANDY OR DUSTY AREAS

1. Cover all hoses and fittings not in use with dust caps to prevent sand or dust from contaminating the fuel.
2. Ensure that filler/discharge fittings are free of sand or dirt prior to filling or drawing fuel from the tank.
3. Keep the tank, vent and pipe assembly, and filler/discharge valve assemblies clear of sand, dust and grime.
4. Wipe all couplings clean before assembly.

OPERATION AT HIGH ALTITUDES

No special procedures are required for operation at high altitudes.

OPERATION IN MUD

Ensure that filler/discharge valves and fittings are clean before filling or drawing fuel from the tank.

OPERATION IN HIGH WINDS

1. Ensure that the tank is secure and protected from flying debris.

2. Keep the tank as full of fuel as possible.

OPERATION IN RAIN

If possible, provide adequate drainage ditches to prevent water from accumulating around the tank.

EMERGENCY REPAIR PROCEDURES

General

Emergency repair is performed when cuts or punctures occur in the tank when in use.

The Emergency Repair Kit is stored in the partition on the inside wall of the tank shipping container.

Emergency Repairs with Wood Plugs

In emergencies, as an immediate temporary measure, wood plugs may be used for sealing small holes or punctures.

The size of hole or tear will determine the size of the wood plug to be used.

1. For holes (tears) up to approximately 0.5-inch (1.27 centimeters) in size, use the 3.0-inch (7.62 centimeters) long plug.

2. For holes (tears) up to approximately 1.5-inch (3.81 centimeters) in size, use the 5.0-inch (12.7 centimeters) long plug.

Select the size of the plug needed to fit (seal) the tank puncture. Wet the plug and insert in the tank puncture. Twist the plug clockwise until the leak is either stopped or slowed. As a follow-up, regular inspection should be made of the wood plugs, as possible tightening may be necessary if the leaks resume. Later, if a leak is not totally stopped, the use of a small sealing clamp may become necessary.

Installation of Wood Plug

Emergency Repairs with Sealing Clamps

Small slits, tears, or cuts [not to exceed 6-inches (15.24 centimeters) in length] may be repaired with sealing clamps.

The size of the damaged area (opening) needing repair will govern the size of the clamp needed. Select clamp size as follows:

1. For holes (tears) less than 2-inches (5.08 centimeters) in length, use the 3.0-inch (7.6 centimeters) clamp.

2. For holes (tears) 2 to 4 inches (5.08 to 10.16 centimeters) in length, use the 5-inch (12.7 centimeters) clamp.

3. For holes (tears) 4 to 6-inches (10.16 to 15.24 centimeters) in length, use the 7.5-inch (19 centimeters) clamp.

WARNING

It may be necessary to increase the size of the tear in order to insert the bottom plate of the clamp. Be careful when installing a sealing clamp in the tank. Fuel will pour out when a larger slit is made in the tank. Leaking fuel can cause personal injury, fire, explosion, or loss of government property.

4. Loop cord around wrist (1) to prevent loss of the clamp into tank.

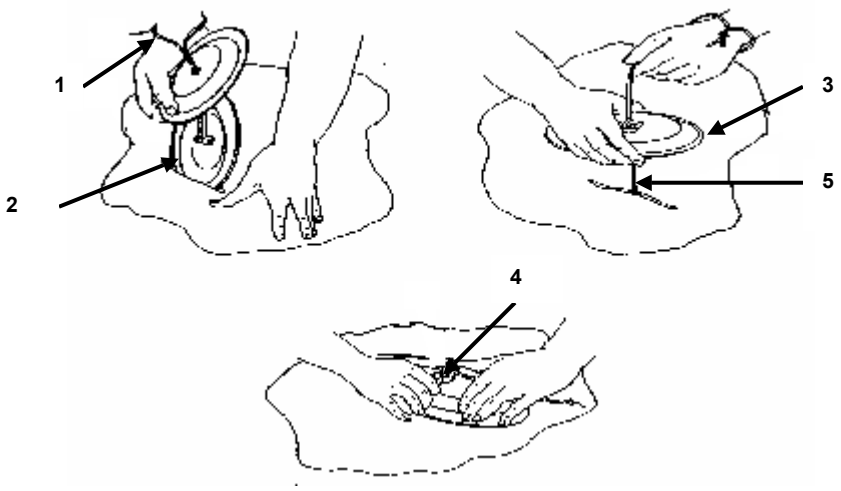
5. Insert the bottom plate (2) of the clamp through the hole or tear and rotate it until it is centered, and its length runs with the tear.

6. Pull the bottom plate up against the fabric, and slide the top plate (3) and wing nut (4) down the cord and onto the threaded stud (5) of the bottom plate.

CAUTION

Do not over tighten the wing nut, as stud threads may be stripped, or damage to the tank fabric may occur.

7. With the plates aligned, tighten the wing nut (4), clamping the tank wall between the two plates. Tighten the wing nut enough to stop the leak.



Installation of Sealing Clamps

INTERIM NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION PROCEDURES

NOTE

Detailed decontamination procedures can be found in: FM 3-3, FM 3-4, and FM 3-5.

General

The following emergency procedures can be performed until field NBC decontamination facilities are available.

Emergency Procedures

If an NBC attack is known or suspected, mask at once and continue the mission. Do not unmask until told to do so.

1. Nuclear decontamination: Brush fallout from skin, clothing, and equipment with available brushes, rags, and tree branches. Wash the skin and have radiation check made as soon as the tactical situation permits.

2. Biological decontamination: Remain masked and continue mission until told to unmask.

3. Chemical detection and decontamination:

WARNING

Do not use decontamination spray on personnel. It could cause personal injury.

   a. Use M8 paper from the M256 chemical agent detector kit or M9 paper to determine if liquid agent is present on the surface of the equipment.

   b. If exposure to liquid agent is known or suspected, clean the exposed skin, clothing, and personal gear, in that order, using M258A1 kit. Use the buddy system. Wash exposed skin and thoroughly decontaminate as soon as the tactical situation permits.

   c. If the M8 or M9 paper indicates that a liquid chemical agent is present, rinse the exposed portion of the collapsible tank with a liberal amount of water. When the tactical situation permits, wash the collapsible tank with soapy water and rinse.

   d. Decontamination procedures take time. Do as much as you can based on the tactical situation.

END OF WORK PACKAGE

CHAPTER 3

OPERATOR AND UNIT TROUBLESHOOTING
TANK, FUEL STORAGE, 3,000 GALLON, 10,000 GALLON
20,000 GALLON, AND 50,000 GALLON

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON OPERATOR TROUBLESHOOTING PROCEDURES

INTRODUCTION TO OPERATOR TROUBLESHOOTING

This Troubleshooting Malfunctions chapter lists common malfunctions which may be found during the operation or maintenance of the collapsible fabric fuel tank assembly or its components. Perform the tests/inspections and corrective actions in the order listed in the table.

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 supervision.

TROUBLESHOOTING PROCEDURE

FUEL TANK

SYMPTOM

The tank leaks.

MALFUNCTION

Inspect the tank for punctures or tears.

CORRECTIVE ACTION

Perform emergency repairs. See WP 0006 00.

The tank cannot be repaired.

CORRECTIVE ACTION

Notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

HOSE ASSEMBLY, FILLER/DISCHARGE

SYMPTOM

Hose or couplings leak.

MALFUNCTION

Check for tears and breaks in the hose.

CORRECTIVE ACTION

If hose is damaged, notify Unit Maintenance.

Check the quick-disconnect coupling gasket for damage or wear.

CORRECTIVE ACTION

Replace the quick-disconnect gasket. See WP 0011 00.

Check the quick-disconnect coupling for dirt, damage, or wear.

CORRECTIVE ACTION

Remove the dirt or debris from inside the quick-disconnect coupling. Replace the hose assembly if the corrective action fails to stop the leakage. Notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

DRAIN HOSE ASSEMBLY

SYMPTOM

Drain hose assembly leaks.

MALFUNCTION

Check for leaks or breaks in the drain hose.

CORRECTIVE ACTION

If hose is damaged, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE GATE VALVE ASSEMBLY (Models WTM3KF, MIL-T-52983B, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)

SYMPTOM

Female coupling or male flange adapter leaks.

MALFUNCTION

Check the female coupling for missing or loose hex-head cap screws, hex nuts, washers, and lockwashers. Check for damaged or missing coupling gasket.

CORRECTIVE ACTION

If hardware is loose or missing, notify Unit Maintenance.

If female coupling gasket is damaged or missing, replace gasket. See WP 0011 00.

Check the flange gasket for damage or leaks.

CORRECTIVE ACTION

If damaged or leaking, notify Unit Maintenance.

Check the male flange adapter for missing or loose hex-head cap screws, hex nuts, washers, and lockwashers.

CORRECTIVE ACTION

If damaged or loose hardware, notify Unit Maintenance.

Male flange gasket leaks between gasket and valve.

CORRECTIVE ACTION

If leaking, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE BALL VALVE (Models BA91-141A, BA91-140A)

SYMPTOM

Ball valve leaks.

MALFUNCTION

Check for binding in the ball valve handle.

CORRECTIVE ACTION

If binding, notify Unit Maintenance.

Check that the ball valve is completely shut off.

CORRECTIVE ACTION

If ball valve does not completely shut off, notify Unit Maintenance.

Ball valve continues to leak.

CORRECTIVE ACTION

If leaking, notify Unit Maintenance.

Check for binding or leaks in the coupling and flange gaskets.

CORRECTIVE ACTION

If binding or leaking, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE BUTTERFLY VALVE (Models BA91-141, BA91-140)

SYMPTOM

Butterfly valve assembly leaks.

MALFUNCTION

Butterfly valve assembly leaks through the dust cap, male quick disconnect coupling, gasket and butterfly valve, gasket and female quick-disconnect coupling.

CORRECTIVE ACTION

If leaking, notify Unit Maintenance.

MALFUNCTION

Check the male flange adapter for missing or loose hex-head cap screws, hex nuts, washers, and lockwashers.

CORRECTIVE ACTION

If hardware is missing or loose, notify Unit Maintenance.

Male flange gasket leaks between gasket and valve.

CORRECTIVE ACTION

If leaking, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

DRAIN GATE VALVE (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)

SYMPTOM

Drain gate valve leaks.

MALFUNCTION

Check that the drain gate valve is completely closed.

CORRECTIVE ACTION

Close the drain gate valve tightly.

If valve still leaks, check the drain gate valve for damage or wear.

CORRECTIVE ACTION

If damaged or worn, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

DRAIN BALL VALVE (Models BA91-141, BA91-140, PD52983-50, BA91-141A, BA91-140A)

SYMPTOM

Drain ball valve leaks.

MALFUNCTION

Check that the drain ball valve is closed completely.

CORRECTIVE ACTION

Tightly close the drain ball valve.

Check the drain ball valve for damage or wear.

CORRECTIVE ACTION

If damaged or worn, notify Unit Maintenance.

Check the drain ball valve for proper alignment.

CORRECTIVE ACTION

Align valve. If still leaking, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

DRAIN FITTING ASSEMBLY

SYMPTOM

Drain fitting assembly leaks between the drain fitting and the tank fitting.

MALFUNCTION

Check for missing or loose washers and hex-head cap screws.

CORRECTIVE ACTION

If hardware is missing or loose, notify Unit Maintenance.

Check the preformed packing between the drain cover plate and the tank fitting for nicks, breaks, and compression.

CORRECTIVE ACTION

If damaged, notify Unit Maintenance.

Check the drain cover plate for damage or cracks.

CORRECTIVE ACTION

If damaged, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

VENT AND PIPE ASSEMBLY

SYMPTOM

Vent and pipe assembly leaks.

MALFUNCTION

Check gasket between quick-disconnect coupling and flange adapter.

CORRECTIVE ACTION

Replace coupling gasket.

Vent and pipe assembly continues to leak.

CORRECTIVE ACTION

If still leaking, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

RELIEF CAP AND FLAME RESISTOR ASSEMBLY

SYMPTOM

Relief cap does not operate freely.

MALFUNCTION

Check the relief cap for leakage, cleanliness, and freedom of action.

CORRECTIVE ACTION

Notify Unit Maintenance if dirty or leaking.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE ASSEMBLY

SYMPTOM

Filler/discharge assembly leaks.

MALFUNCTION

Inspect the gasket between the quick disconnect coupling and the flanged adapter.

CORRECTIVE ACTION

Replace the gasket between the quick disconnect coupling and the flanged adapter.

Filler/discharge assembly continues to leak.

CORRECTIVE ACTION

If still leaking, notify Unit Maintenance.

TROUBLESHOOTING PROCEDURE

EMERGENCY REPAIR ITEMS

SYMPTOM

Inspect contents of Emergency Repair items.

MALFUNCTION

Emergency repair items are missing from the fuel tank crate.

CORRECTIVE ACTION

Replace Emergency repair item(s). See WP 0035 00.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON UNIT TROUBLESHOOTING PROCEDURES

INTRODUCTION TO UNIT TROUBLESHOOTING

This Troubleshooting Malfunctions chapter lists common malfunctions that may be found during the operation or maintenance of the collapsible fabric fuel tank assembly or its components. Perform the tests/inspections and corrective actions in the order listed in the table.

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 supervision.

TROUBLESHOOTING PROCEDURE

HOSE ASSEMBLY, FILLER/DISCHARGE

SYMPTOM

Hose couplings leak.

MALFUNCTION

Check for tears and leaks in the hose.

CORRECTIVE ACTION

If hose is damaged, see WP 0022 00.

TROUBLESHOOTING PROCEDURE

DRAIN HOSE ASSEMBLY (Except Model MIL-T-52983B)

SYMPTOM

Drain hose assembly does not drain properly.

MALFUNCTION

. Check for dirt, grime, cracks or wear.

CORRECTIVE ACTION

Service the drain hose. See WP 0025 00.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE GATE VALVE ASSEMBLY (Models MIL-T-52983B, WTM3KF, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)

SYMPTOM

Female coupling leaks.

MALFUNCTION

Check the female coupling for missing or loose cap screws, hex nuts, washers, and lockwashers.

CORRECTIVE ACTION

Replace missing screws, nuts, washers, and lock-washers. Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0019 00.

Check coupling and flange gaskets for damage or breaks.

CORRECTIVE ACTION

Remove the female coupling and replace the damaged gaskets. Reinstall the female coupling. See WP 0019 00.

SYMPTOM

Male flanged adapter leaks.

MALFUNCTION

Check the male-flanged adapter for missing or loose hex-head cap screws, hex nuts, washers, and lockwashers.

CORRECTIVE ACTION

Replace missing screws, nuts, washers, and lockwashers. Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0019 00.

Check the flanged gasket for damage or breaks.

CORRECTIVE ACTION

Remove the flanged adapter and replace the flanged gasket. Reinstall the flanged adapter. See WP 0019 00.

SYMPTOM

Gate valve leaks.

MALFUNCTION

Check for loose or missing hex head cap screws and lockwashers on the bonnet.

CORRECTIVE ACTION

Replace missing hex head screws and lockwashers. Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0019 00.

Check for damaged or distorted bonnet gasket.

CORRECTIVE ACTION

Replace the bonnet gasket. See WP 0019 00.

Check for bent or distorted valve stem.

CORRECTIVE ACTION

Replace the valve stem. Torque hex head cap screws, new lockwashers, and hex nuts assembled to the valve body to 16.0 ft-lb (21.84 N•m). See WP 0019 00.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE BUTTERFLY VALVE (Models BA91-141, BA91-140)

SYMPTOM

Butterfly valve leaks.

MALFUNCTION

Check for bent or binding stem.

CORRECTIVE ACTION

Replace the stem. See WP 0020 00.

Check for damaged sleeve.

CORRECTIVE ACTION

Replace damaged sleeve. See WP 0020 00.

Male and female coupling gaskets leak.

CORRECTIVE ACTION

Replace the gaskets. See WP 0020 00.

Butterfly valve continues to leak.

CORRECTIVE ACTION

Repair or replace the butterfly valve. See WP 0020 00.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE BALL VALVE (Models BA91-141A, BA91-140A))

SYMPTOM

Ball valve leaks.

MALFUNCTION

Ball valve handle sticks and binds. Ball valve will not completely shut off.

CORRECTIVE ACTION

Replace the ball valve. See WP 0021 00.

SYMPTOM

Female coupling or male flange adapter leaks.

MALFUNCTION

Check the female coupling for missing or loose hex-head cap screws, hex nuts, washers, and lockwashers. Check for damaged or missing coupling gasket.

CORRECTIVE ACTION

If hardware is loose or missing, tighten hardware to 30 in-lb (3.41 N•m). See WP 0021 00.

If female coupling gasket is damaged or missing, replace gasket. See WP 0021 00.

Check the flange gasket for damage or leaks.

CORRECTIVE ACTION

Replace the flange gasket. See WP 0021 00.

Check the male flange adapter for missing or loose hex-head cap screws, hex nuts, washers, and lockwashers.

CORRECTIVE ACTION

Replace or tighten missing or loose hardware according to specification. See WP 0021 00.

Male flange gasket leaks between gasket and valve.

CORRECTIVE ACTION

Replace the male flange gasket. See WP 0021 00.

TROUBLESHOOTING PROCEDURE

DRAIN GATE VALVE (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)

SYMPTOM

Drain gate valve leaks.

MALFUNCTION

Check the drain gate valve for damage or wear if closing the valve fails to stop the leakage.

CORRECTIVE ACTION

Replace the drain gate valve. See WP 0023 00.

TROUBLESHOOTING PROCEDURE

DRAIN BALL VALVE (Models BA91-141, BA91-140,PD52983-50, BA91-141A, BA91-140A)

SYMPTOM

Drain ball valve leaks.

MALFUNCTION

Check the drain ball valve for damage or wear.

CORRECTIVE ACTION

Service, replace, or repair the drain ball valve. When repairing, torque cap screws to 16.0 ft-lb (21.04 N•m). See WP 0024 00.

TROUBLESHOOTING PROCEDURE

RELIEF CAP AND FLAME ARRESTOR

SYMPTOM

Relief cap remains open.

MALFUNCTION

Check the relief cap for a broken or bent pivot pin.

CORRECTIVE ACTION

Replace the relief cap. See WP 0026 00.

Relief cap leaks.

CORRECTIVE ACTION

Replace the relief cap gasket. See WP 0026 00.

SYMPTOM

Flame arrestor does not work properly.

MALFUNCTION

Check the flame arrestor for cracks, breaks, or wear.

CORRECTIVE ACTION

Service, repair, or replace the flame arrestor. See WP 0026 00.

TROUBLESHOOTING PROCEDURE

VENT AND PIPE ASSEMBLY

SYMPTOM

Pipe assembly leaks.

MALFUNCTION

Check the pipe gasket for cracks, distortion or wear.

CORRECTIVE ACTION

Service, repair, or replace the pipe assembly gasket. See WP 0026 00.

Pipe is cracked, bent, or damaged.

CORRECTIVE ACTION

Replace the pipe. See WP 0026 00.

Check the gasket between the quick disconnect coupling the flanged adapter.

CORRECTIVE ACTION

Replace the gasket.

Check the vent pipe for cracks or damage.

CORRECTIVE ACTION

Replace the cracked or broken vent pipe. See WP 0026 00.

Check for cracked or broken flange adapter.

CORRECTIVE ACTION

Replace the cracked or damaged flange adapter. See WP 0026 00.

Check for loose or missing cap screws and washers.

CORRECTIVE ACTION

Replace the missing screws and washers. Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0026 00.

TROUBLESHOOTING PROCEDURE

FILLER/DISCHARGE ASSEMBLY

SYMPTOM

Filler/discharge assembly leaks between the closure plate and the tank fitting.

MALFUNCTION

Check for missing or loose washers and hex-head cap screws.

CORRECTIVE ACTION

Replace missing washer and screws. Torque the screws to 30 in-lb (3.41 N•m). See WP 0027 00.

Check the preformed packing between the closure plate and the tank fitting for nicks, breaks, and compression.

CORRECTIVE ACTION

Replace the preformed packing. See WP 0027 00.

SYMPTOM

Filler/discharge assembly leaks between the closure plate and flanged adapter.

MALFUNCTION

Check for missing or loose nuts, lockwashers, thread seal washers, and hex head cap screws.

CORRECTIVE ACTION

Replace missing nuts, lockwashers, thread seal washers, and hex-head cap screws Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0027 00.

Check the flange gasket for damage or wear.

CORRECTIVE ACTION

Remove the flange adapter from the closure plate and replace the damaged flange gasket. See WP 0027 00.

SYMPTOM

Filler/discharge assembly leaks through hardware or will not assemble.

MALFUNCTION

Check all filler/discharge fastening hardware for cracks, damages, and wear.

CORRECTIVE ACTION

Replace the fastening hardware as required. Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0027 00.

SYMPTOM

Filler/discharge assembly elbows leak.

MALFUNCTION

Check elbows for cracks, dents, or wear. Check for damaged or missing elbow gaskets.

CORRECTIVE ACTION

Replace damaged elbows and gaskets. See WP 0027 00.

TROUBLESHOOTING PROCEDURE

DRAIN FITTING ASSEMBLY (Except Model MIL-T-52983B)

SYMPTOM

Drain fitting assembly leaks between drain fitting and tank.

MALFUNCTION

Check for missing or loose washers and hex head cap screws.

CORRECTIVE ACTION

Replace missing screws or washers. Torque the fastening hardware to 30 in-lb (3.41 N•m). See WP 0028 00 or WP 0029 00.

Check the preformed packing between the drain cover plate and the tank fitting for nicks, breaks, and compression.

CORRECTIVE ACTION

Replace the preformed packing. See WP 0028 00 or WP 0029 00.

SYMPTOM

Drain fitting leaks through metal.

MALFUNCTION

Check the drain cover plate for damage or cracks.

CORRECTIVE ACTION

Replace the drain cover plate. See WP 0028 00 or WP 0029 00.

END OF WORK PACKAGE

CHAPTER 4

OPERATOR MAINTENANCE INSTRUCTIONS FOR TANK, FUEL STORAGE, 3,000 GALLON, 10,000 GALLON 20,000 GALLON, AND 50,000 GALLON

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON OPERATOR PMCS PROCEDURES

INTRODUCTION

General

Preventive Maintenance Checks and Services (PMCS) are performed to keep the collapsible fabric fuel tank assembly in operating condition. The checks are used to find, correct, or report problems. Be sure to perform PMCS each time the tank assembly is serviced. Using the PMCS table, always do PMCS in the same order, so it gets to be a habit. With practice, problems can be easily detected. Pay attention to WARNING and CAUTION statements. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

Before using the tank assembly, do “Before” PMCS.

During use, do “During” PMCS.

After the tank assembly is used, do “After” PMCS.

Do “Semi-Annual” PMCS once every six months.

If something is found to be wrong when performing PMCS, fix it if possible, using troubleshooting procedures and/or maintenance procedures.

Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults discovered before, during, or after operation, unless the faults can be fixed. It is not required to record faults that can be fixed. For further information on how to use this form, see DA PAM 738-750.

If tools required to perform PMCS are not listed in Table 2, WP 0033 00, the Maintenance Allocation Chart, notify Unit Maintenance.

PMCS Leakage Definitions

It is necessary to know how fluid leakage affects the status of the collapsible fuel tank. The following are types/classes of leakage needed to be able to determine the status of the collapsible fabric petroleum tank. Learn these leakage definitions and remember – when in doubt, notify supervision.

CAUTION

Report Class III and IV leaks to the supervisor or unit maintenance. Failure to heed this caution can damage the equipment.

NOTES

Equipment operation is allowed with minor leakages (Class I or Class II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify the supervisor.

When operating with Class I or Class II leaks, continue to check fluid levels as required in the PMCS.

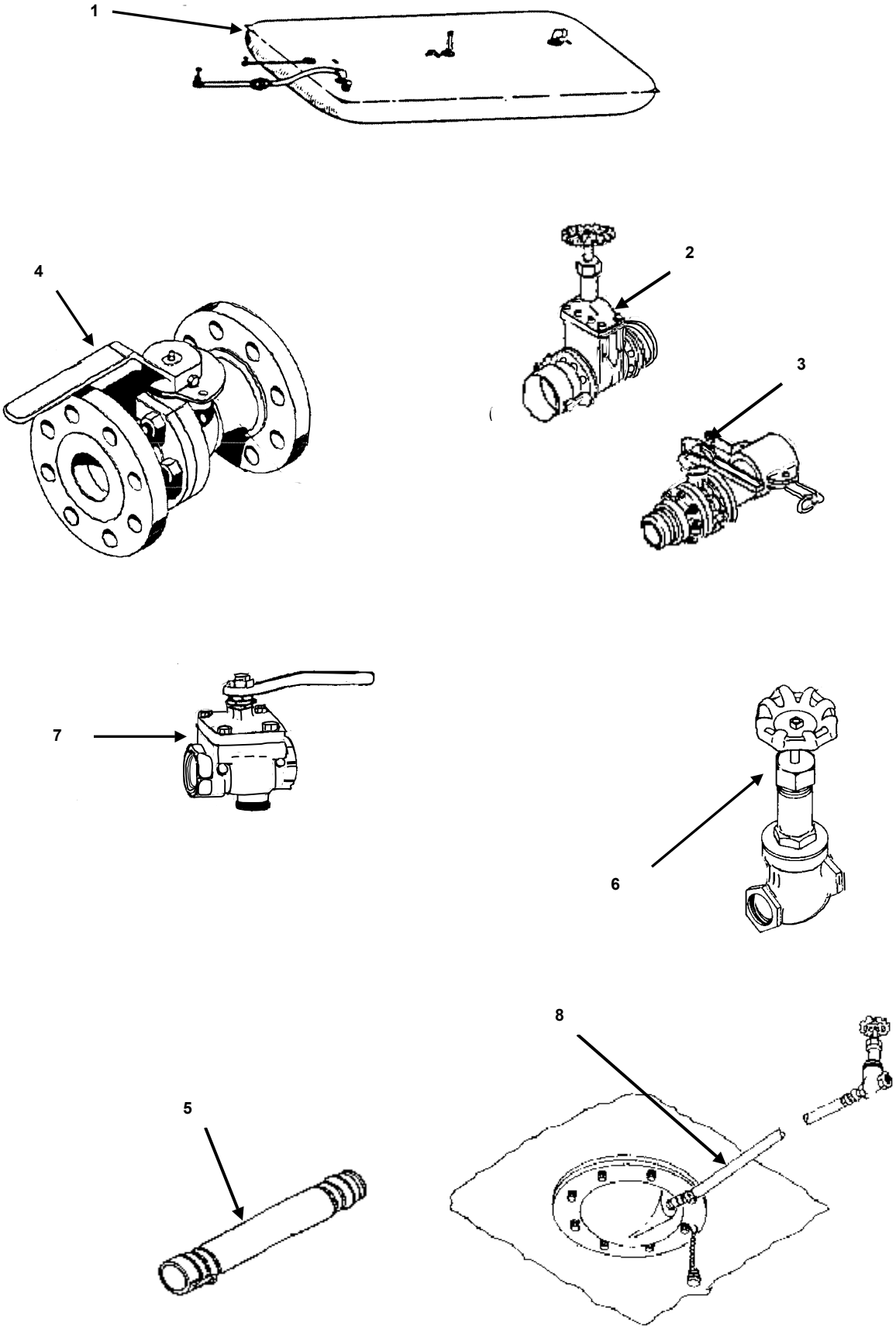
Class I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.
Class IV	Leaks found under the tank. There is evidence of dampness on the ground around the tank. Volume of fuel in the tank is less than it should be.

NOTE

When a check and service procedure is required for both weekly and before intervals, it is not necessary to perform the weekly procedure during the same week in which the previous procedure was done.

The “Procedure” column of Table 1 explains how to do the required checks and services. Carefully follow these instructions. When the procedure instructs, notify supervision.

The "Equipment Not Ready/Available If" column explains when and why the equipment cannot be used.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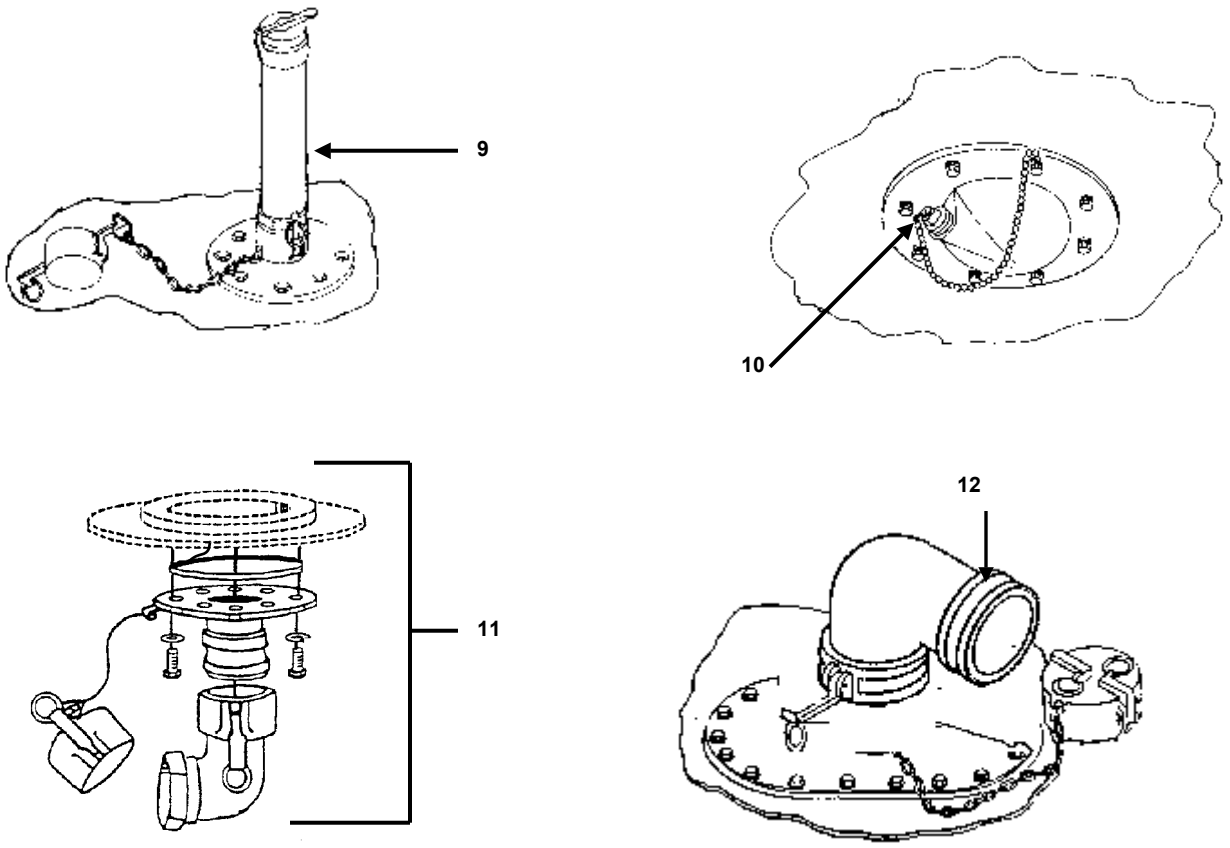


Table 1. Preventive Maintenance Checks and Services for Fuel Storage Tank

NOTE

Within designated interval, these checks are to be performed in the order listed.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Before		Installation Area	Inspect the installation area for sticks and other sharp objects that might cause punctures and leaks.	Sharp objects are present.
2	Before		Tank (1)	Inspect for tears or punctures. If torn or punctured, perform emergency repairs (WP 0006 00).	Tank has tears or punctures that cannot be repaired.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
3	Before		Filler/Discharge Gate Valve (2) (Models MIL-T-52983B, WTM3KF, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem and broken hardware. Check gasket and cam-lever arms for damage.	Stem, hand-wheel, gasket, or cam-lever arms are damaged or missing.
4	Before		Filler/Discharge Butterfly Valve Assembly (3) (Models BA91-141 & BA91-140)	Check for bent or binding stem and broken handle. Check for missing/damaged couplings, and bolts. Check gasket, and cam-lever arms for damage.	Stem, handle, gasket, cam-lever arms are damaged.
5	Before		Filler/Discharge Ball Valve Assembly (4) (Models BA91-141A & BA91-140A)	Check for bent or binding stem and broken handle.	Stem or handle is damaged.
6	Before		Filler/Discharge Hose Assembly (5)	Check for cuts and tears. Check fittings for distortion and damage, or missing gaskets.	Hose assembly is damaged. Gaskets are damaged or missing.
7	Before		Drain Gate Valve (6) (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem and broken handle.	Stem or handle is damaged or missing.
8	Before		Drain Ball Valve (7) (BA91-141 & BA91-140, PD52983-50, BA91-141A & BA91-140A)	Check for bent or binding stem and broken handle.	Stem or handle is damaged or missing.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
9	Before		Drain Hose Assembly (8) (Except Model MIL-T-52983B)	Check hose for cuts and tears. Check fittings for distortion or damage.	Hose assembly is damaged.
10	Before		Vent and Pipe Assembly (9)	Check relief cap, flame arrestor, cap gasket, gasket, and cam-lever arms for evidence of leakage, damage, or missing parts. Check relief cap for cleanliness and freedom of operation. Check for damaged or missing gaskets.	Relief cap or flame arrestor is damaged or missing. Relief cap, gasket, flat rubber gasket, or cam-lever arms are damaged or missing.
11	Before		Drain Fitting Assemblies (10) (Except Model MIL-T-52983B) Drain Fitting Assembly (11) (Models BA91-141 and BA91-140)	Check drain plug, drain hose, drain gate, or ball valve for damaged or missing parts.	Drain plug, drain hose, and drain gate or ball valve are missing, not properly connected, or damaged.
12	Before		Filler/Discharge Assembly (12)	Check cam-lever arms and elbow for damage.	Cam-lever arms damaged or missing. Elbow body is cracked or worn.
13	During		Installation Area	Inspect the installation area for sticks and other sharp objects.	Sharp objects are present.
14	During		Tank (1)	Inspect for tears, punctures, or leaks. If torn or punctured, perform emergency repairs (WP 0006 00).	Tank has tears, punctures, or leaks that cannot be repaired.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
15	During		Filler/Discharge Gate Valve (2) (Models MIL-T-52983B, WTM3KF, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hardware, and leakage. Check gasket and cam-lever arms for damage.	Stem, hand-wheel, gasket, or cam-lever arms are damaged, missing, or leaking.
16	During		Filler/Discharge Butterfly Valve Assembly (3) (Models BA91-141 & BA91-140)	Check for bent or binding stem, broken handle, and leakage. Check for missing/damaged couplings and bolts. Check gasket, and cam-lever arms for damage.	Stem, handle, gasket, cam-lever arms are damaged or leaking.
17	During		Filler/Discharge Ball Valve Assembly (4) (Models BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or leaking.
18	During		Filler/Discharge Hose Assembly (5)	Check for leaks, cuts, and tears. Check fittings for distortion and damage, or missing gaskets.	Hose assembly leaks or is damaged. Gaskets are damaged or missing.
19	During		Drain Gate Valve (6) (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or missing, or leaking.
20	During		Drain Ball Valve (7) (BA91-141 & BA91-140, PD52983-50, BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or missing, or leaking.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
21	During		Drain Hose Assembly (8) (Except Model MIL-T-52983B)	Check hose for leaks, cuts, and tears. Check fittings for distortion and damage.	Hose assembly leaks or is damaged.
22	During		Vent and Pipe Assembly (9)	Check relief cap, flame arrestor, cap gasket, gasket, and cam-lever arms for evidence of leakage, damage, or missing parts. Check relief cap for cleanliness and freedom of operation. Check for damaged or missing gaskets.	Relief cap or flame arrestor is damaged or missing. Relief cap, gasket, flat rubber gasket, or cam-lever arms are damaged or missing.
23	During		Drain Fitting Assemblies (10) (Except Model MIL-T-52983B) Drain Fitting Assembly (11) (Models BA91-141 and BA91-140)	Check immediate area for evidence of leakage. Check drain plug, drain hose, drain gate, or ball valve, for damaged or missing parts.	Drain plug, drain hose, drain gate, or ball valve is missing, not properly connected, or damaged.
24	During		Filler/Discharge Assembly (12)	Check cam-lever arm and elbow body for damage or leakage.	Cam-lever arms are damaged or missing. Elbow body is cracked. Elbow sealing surface is badly dented.
25	After		Tank (1)	Inspect for tears and punctures. If torn or punctured, perform emergency repairs (WP 0006 00).	Tank has tears or punctures that cannot be repaired.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
26	After		Filler/Discharge Gate Valve (2) (Models MIL-T-52983B, WTM3KF, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem or broken hardware. Check gaskets and cam-lever arms for damage.	Stem, hand-wheel, gasket, or cam-lever arms are damaged or missing.
27	After		Filler/Discharge Butterfly Valve Assembly (3) (Models BA91-141 & BA91-140)	Check for bent or binding stem and broken handle. Check for missing/damaged couplings, and bolts. Check gasket, and cam-lever arms for damage.	Stem, handle, gasket or cam-lever arms are damaged.
28	After		Filler/Discharge Ball Valve Assembly (4) (Models BA91-141A & BA91-140A)	Check for bent or binding stem and broken handle.	Stem or handle is damaged.
29	After		Filler/Discharge Hose Assembly (5)	Check for cuts and tears. Check fittings for distortion and damage, or missing gaskets.	Hose assembly is damaged. Gaskets are damaged or missing.
30	After		Drain Gate Valve (6) (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem and broken handle.	Stem or handle is damaged or missing.
31	After		Drain Ball Valve (7) (BA91-141 & BA91-140, PD52983-50, BA91-141A & BA91-140A)	Check for bent or binding stem, or broken handle.	Stem or handle is damaged or missing.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
32	After		Drain Hose Assembly (8) (Except Model MIL-T-52983B)	Check hose for cuts and tears. Check fittings for distortion and damage.	Hose assembly is damaged.
33	After		Vent and Pipe Assembly (9)	Check relief cap, flame arrestor, cap gasket, gasket, and cam-lever arms for damage or missing parts. Check relief cap for cleanliness and freedom of operation. Check for damaged or missing gaskets.	Relief cap or flame arrestor is damaged or missing. Relief cap, gasket, flat rubber gasket, or cam-lever arms are damaged or missing.
34	After		Drain Fitting Assemblies (10) (Except Model MIL-T-52983B) Drain Fitting Assembly (11) (Models BA91-141 and BA91-140)	Check drain plug, drain hose, drain gate, or ball valve, for damaged or missing parts.	Drain plug, drain hose, and drain gate or ball valve are missing, not properly connected, or damaged.
35	After		Filler/ Discharge Assembly (12)	Check cam-lever arm and elbow body for damage.	Cam-lever arms damaged or missing. Elbow body cracked or worn.
36	Semi-Annually		Tank (1) Interior	Check coating for cracking.	Coating is cracked allowing leakage.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON OPERATOR MAINTENANCE PROCEDURES

GENERAL INSTRUCTIONS

Maintenance instructions in this section will list resources required, personnel required, and equipment condition for start of procedure, except as noted below:

NOTE

Personnel required are listed only if the task requires more than one.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE VALVE AND HOSE ASSEMBLY COUPLING AND DUST CAP GASKET REPLACEMENT

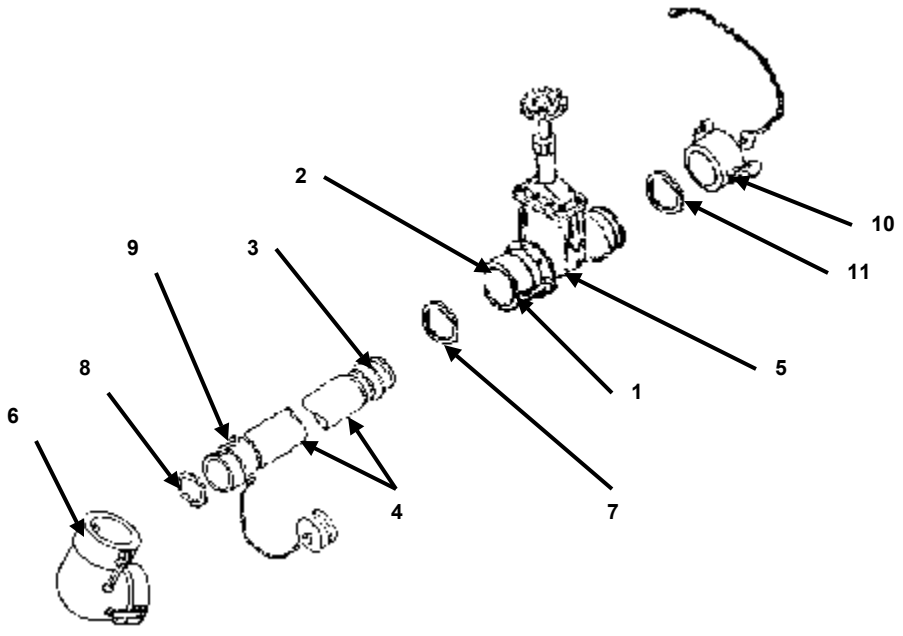
INITIAL SETUP

Mandatory Replacement Parts
Gasket
(Item 1, WP 0042 00)

REMOVAL

The filler/discharge hose is fitted with a female quick-disconnect coupling on one end and a male quick-disconnect adapter on the other end.

1. Pull two cam-lever arms (1) outward on female quick-disconnect coupling (2), and hose assembly coupling (3). Disconnect hose assembly (4) from filler/discharge valve assembly (5) and elbow (6).
2. Remove coupling gasket (7) from inside female quick-disconnect coupling (2). Discard gasket (7).
3. Remove hose assembly gasket (8) from inside hose coupling (9). Discard gasket (8).
4. Remove dust cap (10). Remove gasket (11) from dust cap (10). Discard gasket (11).



INSTALLATION

1. Install new gasket (11) in dust cap (10). Install dust cap (10).
2. Install new hose assembly gasket (8) inside hose coupling (9).
3. Install new coupling gasket (7) inside quick-disconnect coupling (2).
4. Connect hose assembly (4) to filler/discharge valve assembly (5) and elbow (6).
5. Push in on cam-lever arms (1) to lock hose assembly (4) in place.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON VENT AND PIPE ASSEMBLY COUPLING AND DUST CAP GASKET REPLACEMENT

INITIAL SETUP

Mandatory Replacement Parts
Gasket
(Item 2, WP 0042 00)

REMOVAL

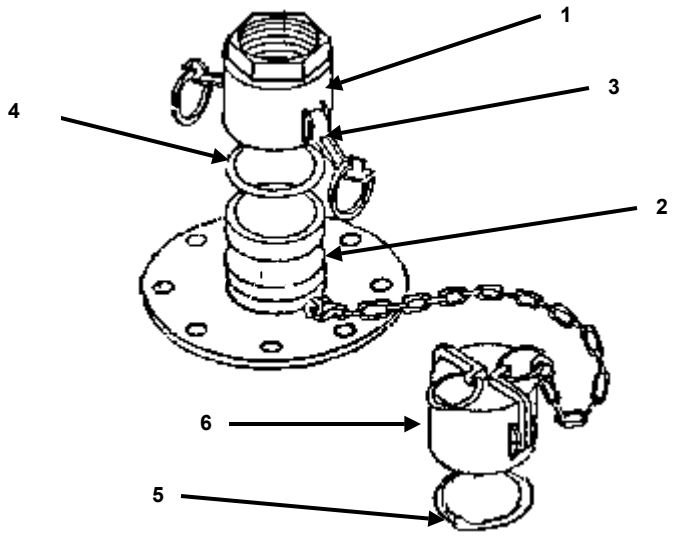
1. Disconnect female quick-disconnect coupling (1) from male-flanged adapter (2) by pulling outward on cam-lever arms (3). Lift female quick-disconnect coupling (1) from male-flanged adapter (2).

2. Remove female quick-disconnect coupling gasket (4). Discard gasket (4).

3. Remove gasket (5) from inside dust cap (6). Discard gasket (5).

NOTE

Vent pipe, relief cap, and flame arrestor removed for clarity.



INSTALLATION

1. Seat new coupling gasket (4) into female quick-disconnect coupling (1).
2. With cam-lever arms (3) in the outward position, install female quick-disconnect coupling (1) to male-flanged adapter (2).
3. Push cam-lever arms (3) inward until they lock in place.
4. Seat new gasket (5) into dust cap (6).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE ASSEMBLY ELBOW AND DUST CAP GASKET REPLACEMENT

INITIAL SETUP

Mandatory Replacement Parts
Gasket
(Item 1, WP 0042 00)

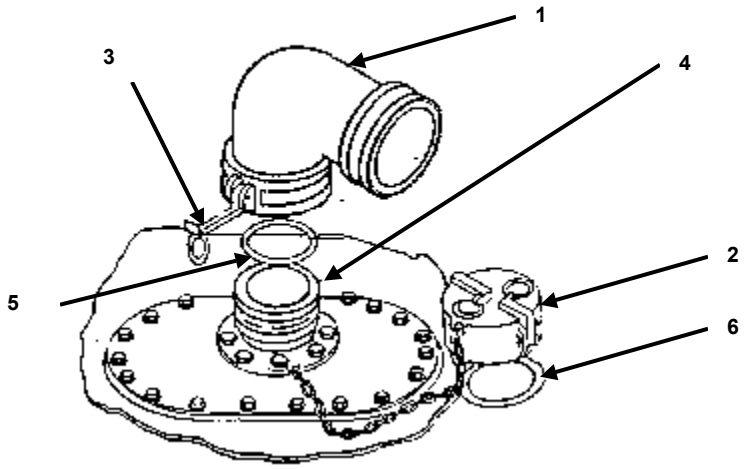
REMOVAL

1. Remove elbow (1) or dust cap (2) by pulling outward on cam-lever arms (3), and lifting elbow (1) or dust cap (2) from flanged adapter (4).

NOTE

Fill end female/female elbow has two gaskets.

2. Remove gasket (5) from elbow (1) and gasket (6) from dust cap (2). Discard gaskets (5) and (6).



INSTALLATION

NOTE

Fill end female/female elbow will require two new gaskets.

1. Place new gasket (5) into elbow (1) and new gasket (6) in dust cap (2).

2. Install elbow (1) onto flanged adapter (4), by pushing inward on cam-lever arms (3) to lock elbow (1) into position.

3. Install the dust cap (2) onto the elbow (1) by pushing inward on the cam-lever arms (3) on dust cap (2) to lock into position.

END OF WORK PACKAGE

CHAPTER 5

UNIT MAINTENANCE INSTRUCTIONS
FOR
TANK, FUEL STORAGE, 3,000 GALLON, 10,000 GALLON
20,000 GALLON, AND 50,000 GALLON

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANK, FUEL STORAGE,
3,000, 10,000, 20,000, AND 50,000 GALLONS
LUBRICATION INSTRUCTIONS**

LUBRICATION INSTRUCTIONS

Lubricate all cam-lever arms and lobes systematically with two drops of lubricating oil (Item 1, WP 0040 00). These instructions are mandatory.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON UNIT REPAIR; TOOLS, SPECIAL TOOLS; TEST MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), applicable to the unit.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

For special tools required for use with the Collapsible Fabric Tanks, refer to WP 0033 00, Maintenance Allocation Chart. No TMDE or support equipment is required for the Collapsible Fabric Tanks.

REPAIR PARTS

Repair parts are listed and illustrated in WP 0035 00 of this manual.

END OF WORK PACKAGE

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000,
10,000, 20,000, AND 50,000 GALLON
UNIT SERVICE UPON RECEIPT**

SITE AND SHELTER REQUIREMENTS

Choose a site that is free from sharp objects (rocks, sticks, glass, etc.), which could cut or puncture the tank.

WARNING

If the tank is placed over drop-offs greater than 4.0 inches (0.1 meter), serious injury to personnel or damage to the tank may occur.

The collapsible fabric fuel tank may be installed on a slope of up to 10 percent [1.0 foot (0.3 meter) rise in 10.0 foot (3.0 meters) run], but the tank base should not rest over abrupt drop-offs greater than 4.0 inches (0.1 meter).

SERVICE UPON RECEIPT OF MATERIEL

Inspect the equipment for damage incurred (punctures or tears) during shipment. If the equipment has been damaged, report the damage in accordance with the instructions of DA PAM 738-750.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-750.

Inspect emergency repair items (sealing clamps, plugs, gaskets, and preformed packing) that are packaged separately. Place the items in a secure storage area until required.

Check to see whether the equipment has been modified.

INSTALLATION INSTRUCTIONS

Refer to WP 0005 00.

PRELIMINARY SERVICING AND ADJUSTMENT OF EQUIPMENT

No preliminary servicing or adjustment is required.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON UNIT PMCS PROCEDURES

INTRODUCTION

General

Preventive Maintenance Checks and Services (PMCS) are performed to keep the collapsible fabric fuel tank assembly in operating condition. The checks are used to find, correct, or report problems. Perform PMCS each time the tank assembly is serviced. Using the PMCS table, always do PMCS in the same order, so it gets to be a habit. With practice, maintenance personnel will quickly spot anything wrong. Pay attention to WARNING and CAUTION statements. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

Before using the tank assembly, do “Before” PMCS.

During use, do “During” PMCS.

After the tank assembly is used, do “After” PMCS.

Do “Semi-Annually” PMCS once every six months.

If something is found to be wrong when performing PMCS, fix it if possible, using troubleshooting procedures and/or maintenance procedures.

Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults discovered before, during, or after operation, unless they can be fixed. It is not necessary to record faults that can be fixed. For further information on how to use this form, refer to DA PAM 738-750.

PMCS Leakage Definitions

It is necessary to know how fluid leakage affects the status of the collapsible fabric petroleum tank. The following are types/classes of leakage that are used to determine the status of the collapsible fabric fuel tank. Learn these leakage definitions and remember – when in doubt, notify supervision.

CAUTIONS

Report Class III and IV leaks to supervision or unit maintenance. Failure to heed this caution can damage the equipment.

NOTE

Equipment operation is allowed with minor leakages (Class I or Class II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify supervision.

When operating with Class I or Class II leaks, continue to check fluid levels as required in PMCS.

Class I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

Class II Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

Class III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

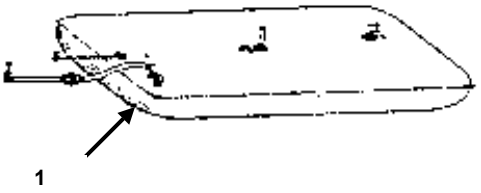
Class IV Leaks found under the tank. There is evidence of dampness on the ground around the tank. Volume of fuel in the tank is less than it should be.

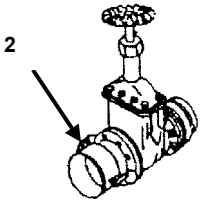
NOTES

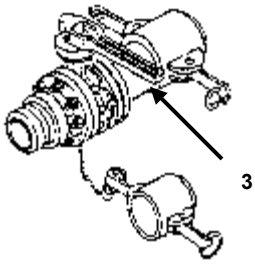
Equipment operation is allowable with minor leakages (Class I or II). Consider the fluid capacity in the item/system being checked/inspected. When in doubt, notify supervision.

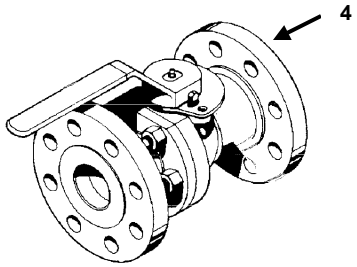
When a check and service procedure is required for both weekly and before intervals, it is not necessary to perform the weekly procedure during the same week in which the before procedure was done.

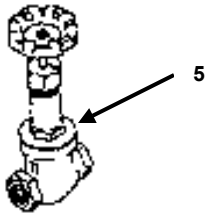
The Procedure column of Table 1 illustrates how to do the required checks and services. Carefully follow these instructions. When the procedure instructs, notify supervision.

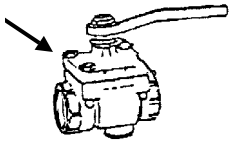


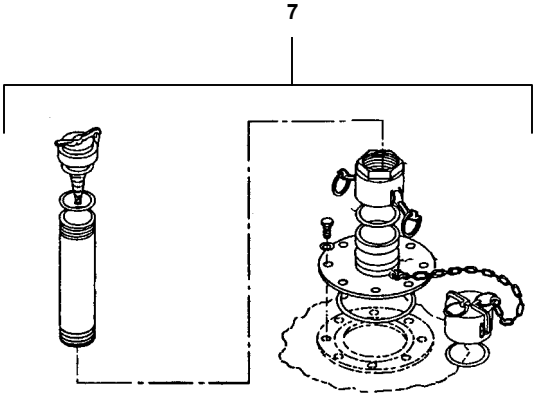


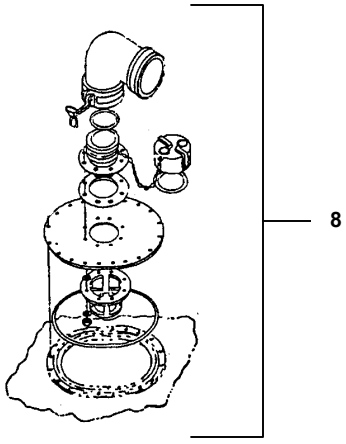


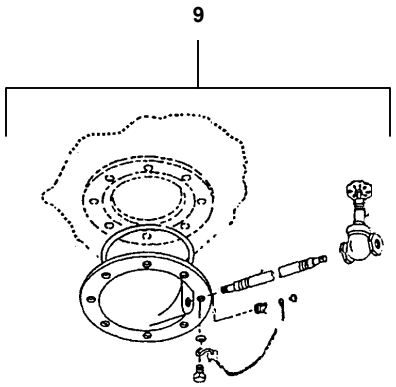


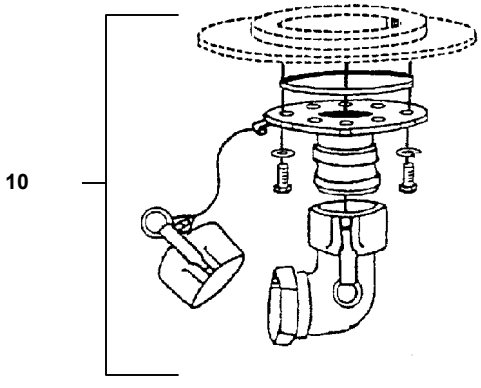












Unit Preventive Maintenance Checks and Services Components

Table 1. Unit Preventive Maintenance Checks and Services for Fuel Storage Tank

NOTE

Within designated intervals, these checks are to be performed in the order listed.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Before		Tank (1)	Inspect for tears, punctures, or leaks (Exclude weeping/wicking where the tank seams are not involved and droplets do not form or run down the side of the tank).	Torn, punctured, or leaking.
2	Before		Filler/Discharge Gate Valve (2) (Models WTM3KF, MIL-T-52983B, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hand-wheel, and leakage.	Stem, hand-wheel, gasket, or cam-lever arms are damaged or leaking.
3	Before		Filler/Discharge Butterfly Valve Assembly (3) (Models BA91-141 & BA91-140)	Check for bent or binding stem, broken handle, and leakage.	Stem, handle, gasket, cam-lever arms are damaged or leaks.
4	Before		Filler/Discharge Ball Valve (4) (Models BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or leaks.
5	Before		Drain Gate Valve (5) (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hand-wheel, and leakage.	Stem or hand-wheel is damaged or leaks.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
6	Before		Drain Ball Valve (6) (Models BA91-141 & BA91-140, PD52983-50, BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or leaks.
7	Before		Vent and Pipe Assembly (7)	Check for evidence of leakage, damage or missing parts. Check the relief cap for cleanliness and freedom of operation. Check if the flame arrestor, relief cap gasket, flat rubber gasket or cam-lever arms are damaged or missing.	Leaks are evident. Relief cap or flame arrestor is damaged or missing. Relief cap gasket, flat rubber gasket or cam-lever arms are damaged or missing.
8	Before		Filler/Discharge Assembly (8)	Check for evidence of damage or leakage. Check if cam-lever arms are damaged or missing. Check if the elbow body is cracked or sealing surface is badly dented. Check for loose, damaged or missing screws and gaskets.	Cam-lever arms are damaged or missing. Elbow body is cracked. Elbow sealing surface is badly dented. Hardware is damaged or missing.
9	Before		Drain Fitting Assembly (9) (Except Models MIL-T-52983B, BA91-141, BA91-140) Drain Fitting Assembly (10) (Models BA91-141 and BA91-140)	Check immediate area for evidence of leakage. Check drain plug, drain hose, or drain valve, for damaged or missing parts.	Drain plug, drain hose, drain gate, or ball valve is missing, not properly connected, damaged or leaks.
10	During		Tank (1)	Inspect for tears, punctures, or leaks (Exclude weeping/wicking where the tank seams are not involved and droplets do not form or run down the side of the tank).	Tank has tears or punctures that cannot be repaired.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
11	During		Filler/Discharge Gate Valve (2) (Models WTM3KF, MIL-T-52983B, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hand-wheel, and leakage.	Stem, hand-wheel, gasket, or cam-lever arms are damaged, missing, or leaks.
12	During		Filler/Discharge Butterfly Valve Assembly (3) (Models BA91-141 & BA91-140)	Check for bent or binding stem, broken handle, and leakage.	Stem, handle, gasket, cam-lever arms are damaged or leaks.
13	During		Filler/Discharge Ball Valve (4) (Models BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or leaks.
14	During		Drain Gate Valve (5) (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hand-wheel, and leakage.	Stem or hand-wheel is damaged, missing, or leaks.
15	During		Drain Ball Valve (6) (Models BA91-141 & BA91-140, PD52983-50, BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle damaged, missing, or leaks.
16	During		Vent and Pipe Assembly (7)	Check for evidence of leakage, damage, or missing parts. Check the relief cap for cleanliness and freedom of operation. Check if the flame arrestor, relief cap gasket, flat rubber gasket, or cam-lever arms are damaged or missing.	Relief cap or flame arrestor is damaged or missing. Relief cap gasket, flat rubber gasket, or cam-lever arms are damaged or missing.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
17	During		Filler/Discharge Assembly (8)	Check for evidence of damage or leakage. Check if cam-lever arms are damaged or missing. Check if the elbow body is cracked or sealing surface is badly dented. Check for loose, damaged or missing screws and gaskets.	Cam-lever arms are damaged or missing. Elbow body is cracked. Elbow sealing surface is badly dented.
18	During		Drain Fitting Assembly (9) (Except Models MIL-T-52983B, BA91-141, BA91-140) Drain Fitting Assembly (10) (Models BA91-141 and BA91-140)	Check immediate area for any evidence of leakage. Check the drain plug, drain hose, or drain valve, for damaged or missing parts.	Drain plug, drain hose, drain valve is missing, not properly connected, or damaged.
19	After		Tank (1)	Inspect for tears, punctures, or leaks (Exclude weeping/wicking where the tank seams are not involved and droplets do not form or run down the side of the tank).	Tank has tears or punctures that cannot be repaired.
20	After		Filler/Discharge Gate Valve (2) (Models WTM3KF, MIL-T-52983B, M52983-50, PD52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hand-wheel, and leakage.	Stem, hand-wheel, gasket, or cam-lever arms are damaged or missing.
21	After		Filler/Discharge Butterfly Valve Assembly (3) (Models BA91-141 & BA91-140)	Check for bent or binding stem, broken handle, and leakage.	Stem, handle, gasket or cam-lever arms are damaged.
22	After		Filler/Discharge Ball Valve (4) (Models BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
23	After		Drain Gate Valve (5) (Models WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01)	Check for bent or binding stem, broken hand-wheel, and leakage.	Stem or hand-wheel is damaged or missing.
24	After		Drain Ball Valve (6) (Models BA91-141 & BA91-140, PD52983-50, BA91-141A & BA91-140A)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged or missing.
25	After		Vent and Pipe Assembly (7)	Check for evidence of leakage, damage, or missing parts. Check the relief cap for cleanliness and freedom of operation. Check if the flame arrestor, relief cap gasket, flat rubber gasket, or cam-lever arms are damaged or missing.	Relief cap or flame arrestor is damaged or missing. Relief cap gasket, flat rubber gasket, or cam-lever arms are damaged or missing.
26	After		Filler/Discharge Assembly (8)	Check for evidence of damage or leakage. Check if cam-lever arms are damaged or missing. Check if the elbow body is cracked or sealing surface is badly dented. Check for loose, damaged or missing screws and gaskets.	Cam-lever arms damaged or missing. Elbow body cracked or worn.
27	Semi-annually		Drain Fitting Assembly (9) (Except Models MIL-T-52983B, BA91-141, BA91-140) Drain Fitting Assembly (10) (Models BA91-141 and BA91-140)	Check immediate area for evidence of leakage. Check the drain plug, drain hose, or drain valve, for damaged or missing parts.	Drain plug, drain hose, and drain valve are missing, not properly connected, or damaged.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON UNIT MAINTENANCE PROCEDURES

GENERAL INSTRUCTIONS

Maintenance instructions in this section will list resources required, personnel required and equipment conditions for start of procedure, except as noted below:

NOTE

Personnel required are listed only if the task requires more than one.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE GATE VALVE ASSEMBLY (MODELS WTM3KF, MIL-T-52983B, PD52983-50, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01) SERVICE, REPLACEMENT, REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)
Torque Wrench (ft-lb)
(Item 3, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

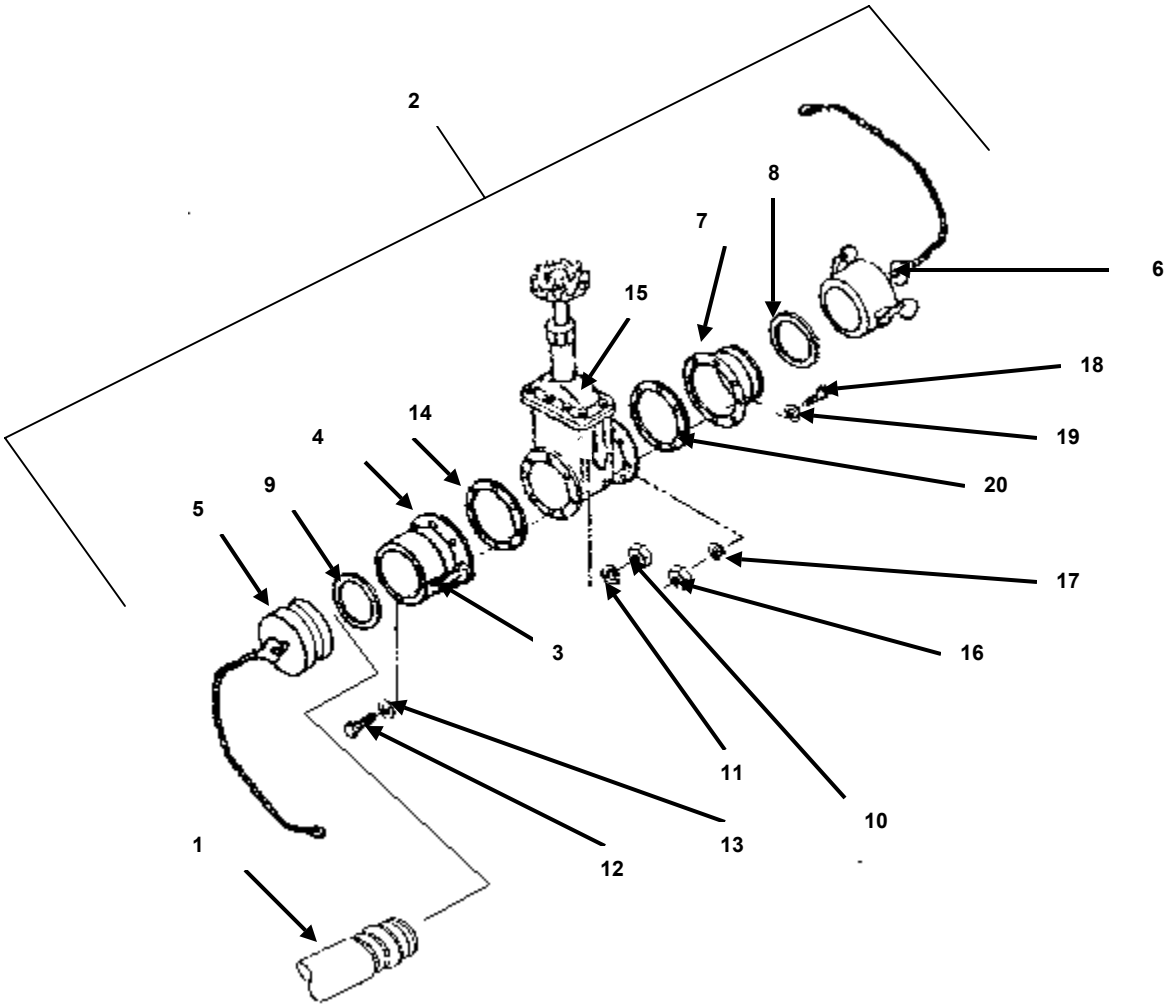
Materials/Parts
Crocus Cloth
(Item 2, WP 0040 00)
Detergent
(Item 3, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Grease
(Item 5, WP 0040 00)
Rags, wiping
(Item 6, WP 0040 00)

Mandatory Replacement Parts
Gasket
(Item 1, WP 0042 00)
Gaskets
(Item 3, WP 0042 00)
Gasket, Valve Bonnet
(Item 5, WP 0042 00)
Lockwashers
(Item 4, WP 0042 00)
Lockwashers
(Item 6, WP 0042 00)

REMOVAL

Hose Assembly, Coupling, and Adapter

1. Remove hose assembly (1) from gate valve assembly (2) by pulling two cam-lever arms (3) outward on female quick-disconnect coupling (4).
2. Remove hose assembly (1).
3. Remove the chain and dust cap (5) from female quick-disconnect coupling (4), and the chain and dust plug (6) from male-flanged adapter (7). Remove gasket (8) from male-flanged adapter (7).
4. Remove coupling gasket (9) from inside female quick-disconnect coupling (4).
5. Remove eight hex nuts (10), lockwashers (11), hex-head cap screws (12), and washers (13).
6. Remove female quick-disconnect coupling (4) and flange gasket (14) from face of gate valve (15).
7. Remove eight hex nuts (16), lockwashers (17), hex-head cap screws (18), and washers (19) from the opposite end of gate valve (15).
8. Remove male-flanged adapter (7) and flange gasket (20).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DISASSEMBLY

Gate Valve

1. Remove jam nut (1) from the top of hand-wheel (2).
2. Remove hand-wheel (2) from the top of valve stem (3).
3. Remove packing nut (4) from bonnet (5).
4. Remove packing gland (6) and gland spring (7) from valve stem (3).

NOTE

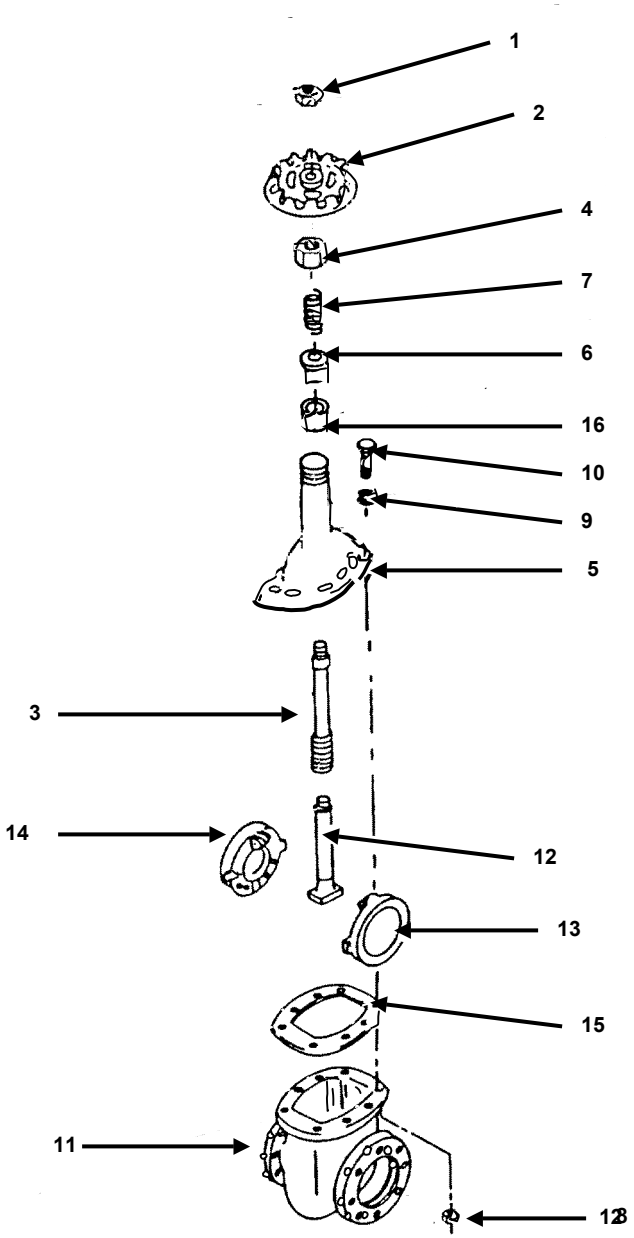
The packing ring will remain in the bonnet until the valve stem, the disk riser, and the disk halves have been removed from the bonnet.

5. Remove eight hex nuts (8), lockwashers (9), and hex-head cap screws (10) holding bonnet (5) to valve body (11).

CAUTION

Keep the disk halves together when removing from the valve body. Disk halves must be grasped firmly when disassembled from the valve body. Dropping the disk halves off the disk riser can damage the sealing surfaces. As the discs clear the slots in the valve body, hold them together with the right hand in order to avoid dropping off the disk stem and damaging the sealing surface.

6. Lift bonnet (5) with valve stem (3), disk riser (12), and disk halves (13) and (14) from valve body (11).



7. Remove bonnet gasket (15) from valve body (11).
8. Rotate disk riser (12) counterclockwise, and disassemble disk riser (12) from valve stem (3).
9. Rotate valve stem (3) clockwise, and disassemble valve stem (3) from the bottom side of bonnet (5).

NOTE

The packing ring should be removed only when it is to be replaced.

10. Drive packing ring (16) through the bottom of bonnet (5).

SERVICE

WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

1. Clean all parts with dry cleaning solvent and dry thoroughly with rags.
2. Clean all gasket-sealing surfaces thoroughly with detergent and hot water.
3. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace components if unserviceable.
4. Polish valve stem (3) with crocus cloth. Coat valve stem (3) with grease.

ASSEMBLY

Gate Valve

1. Thread disk riser (12) into valve stem (3).
2. Check that disk riser (12) is completely secured to bonnet (5).
3. Lay valve body (11) on its side on a clean surface. Position new gasket (15) over disk riser (12).
4. Install disk halves (13) and (14) onto disk riser (12).
5. Insert disk halves (13) and (14) into valve body (11) slot.
6. Place valve body (11) and bonnet (5) in an upright position.
7. Align valve body (11) to gasket (15). Install bonnet (5) assembly to valve body (11) with eight hex-head cap screws (10), new lockwashers (9), and hex nuts (8).
8. Insert packing ring (16) onto valve stem (3).
9. Insert packing nut (4) onto valve stem (3) by pushing packing nut (4) down on the neck of bonnet (5) until packing ring (16) is seated in bonnet (5).
10. Remove packing nut (4) from valve stem (3), and assemble gland spring (7) and packing gland (6) to valve stem (3).
11. Insert packing nut (4), hand-wheel (2), and jam nut (1) onto the valve stem (3).
12. Torque hex-head cap screws (10), lockwashers (9), and hex nuts (8) assembled to the valve body (11) to 16 ft-lb (21.84 Nm).

INSTALLATION

Hose Assembly, Coupling, and Adapter

1. Position new flange gasket (20) on the face of gate valve (15), and align the holes.
2. Position male-flanged adapter (7) against flange gasket (20), and align the holes.
3. Install washers (19) and hex-head cap screws (18) onto male-flanged adapter (7), flange gasket (20), and gate valve (15).
4. Install new lockwashers (17), and hex nuts (16) onto gate valve (15). Torque nuts (16) to 30 in-lb (3.41N•m).
5. At the opposite end of gate valve (15), position new flange gasket (14) against gate valve (15).
6. Position female quick-disconnect coupling (4) against flange gasket (14) and align the holes.
7. Install washers (13) and hex-head cap screws (12) onto female quick-disconnect coupling (4), flange gasket (14), and the face of gate valve (15).
8. Install new lockwashers (11) and hex nuts (10) onto hex-head cap screws (12). Torque nuts (10) to 30 in-lb (3.41N•m).
9. Lubricate new coupling gasket (9), and install coupling gasket (9) on the inside of female quick-disconnect coupling (4).
10. Install new gasket (8) on male-flanged adapter (7). Install chains and dust cap (5) and dust plug (6) on coupling (4) and adapter (7).
11. Install hose assembly (1) to gate valve assembly (2) and position hose assembly (1) in place by pushing in on cam-lever arms (3).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE BUTTERFLY VALVE ASSEMBLY (MODELS BA91-141, BA91-140) SERVICE, REPLACEMENT, AND REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)

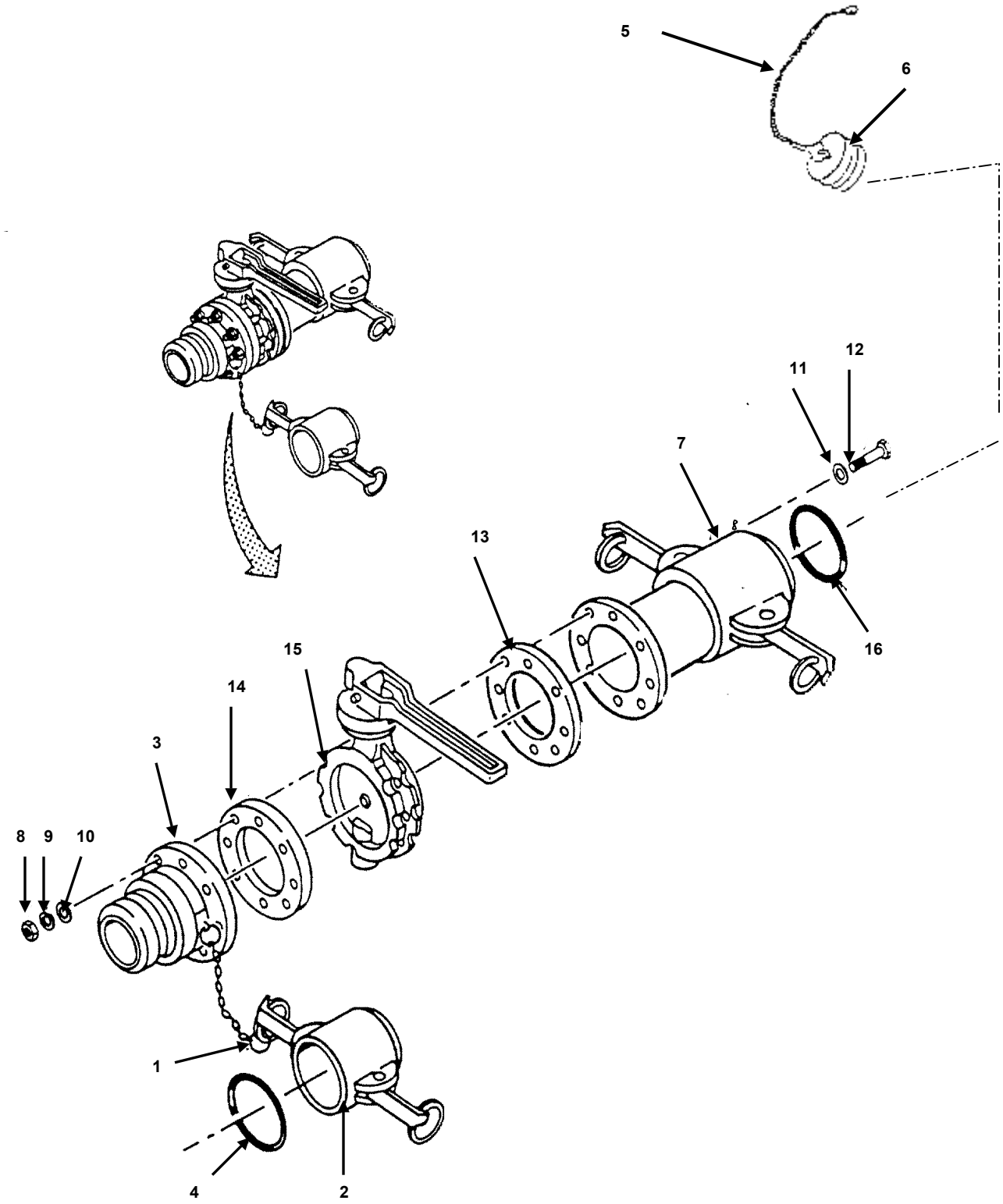
Equipment Condition
Fuel tank drained
(WP 0005 00)

Materials/Parts
Detergent
(Item 3, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00

Mandatory Replacement Parts
Gasket
(Item 1, WP 0042 00)
Gasket
(Item 3, WP 0042 00)
Lockwashers
(Item 4, WP 0042 00)
Parts Kit, Butterfly
(Item 8, WP 0042 00)
Parts Kit, Valve
(Item 7, WP 0042 00)

REMOVAL

1. Disconnect ring (1) and remove dust cap (2) from male coupling (3).
2. Remove gasket (4) from dust cap (2).
3. Remove chain (5) and dust plug (6) from female coupling (7).
4. Remove nuts (8), lockwashers (9), washers (10) and (11) and screws (12).
5. Remove female coupling (7) and gasket (13), and male coupling (3) and gasket (14) from butterfly valve (15).
6. Remove gasket (16) from female coupling (7).
7. Inspect dust cap (2), male coupling (3), and female coupling (7) for cracks and corrosion. Replace damaged parts.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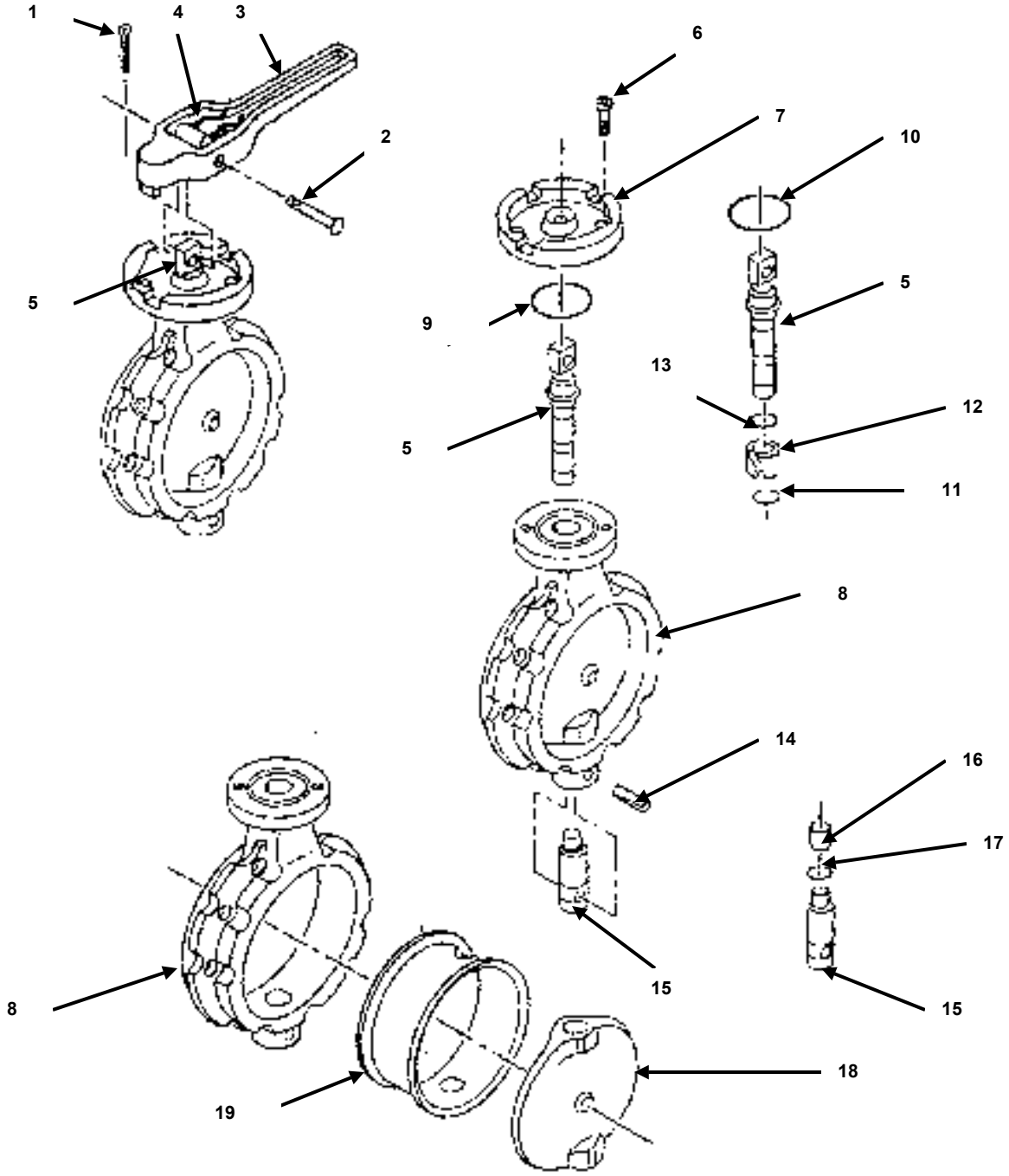
DISASSEMBLY

1. Remove cotter pin (1) and pin (2) from handle (3).
2. Lift handle (3) and attached spring (4) from valve stem (5).
3. Remove two socket head screws (6) and stop plate (7) from valve body (8).
4. Remove top seal (9) from the bottom of stop plate (7).
5. Remove top valve stem (5) assembly from valve body (8).
6. Remove seal (10), O-ring (11), top bearing (12), and O-ring (13) from top valve stem (5).
7. Drive spring pin (14) from valve body (8) and bottom valve stem (15).
8. Remove bottom valve stem (15) assembly from valve body (8).
9. Remove bottom bearing (16) and O-ring (17) from bottom valve stem (15).
10. Remove disk (18) from valve body (8).
11. Remove sleeve (19) from valve body (8).

SERVICE

1. Wash all components with clean hot water and detergent.
2. Rinse components in clean water and dry with rags.
3. Inspect the valve body, handle, disc, and stop plate for cracks and corrosion.
4. Inspect the top valve stem and bottom valve stem for cracks, deep scratches, and corrosion.
5. Replace damaged parts.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ASSEMBLY

1. Install sleeve (19) into valve body (8) and align the fastening holes of sleeve (19) with those of valve body (8).

NOTE

The bottom hole in the disk is round and smooth. The top hole is slotted to fit on the end of the top stem.

2. Install disk (18) into valve body (8) and align the fastening holes of disk (18) with the holes in sleeve (19) and valve body (8).
3. Install new O-ring (17) and bottom valve bearing (16) onto bottom valve stem (15).
4. Install bottom valve stem (15) through the bottom of valve body (8) and into the bottom hole of disk (18), aligning spring pin (14) hole in valve stem (15) with spring pin (14) hole in valve body (8).
5. Install spring pin (14) into valve body (8) and through bottom valve stem (15).
6. Install new O-ring (13), top bearing (12), and new O-ring (11) onto the bottom of top valve stem (5).
7. Install new seal (10) on top valve stem (5).
8. Align the end of top valve stem (5) with the hole in disk (18).
9. Install valve stem (5) assembly through valve body (8) and into the slot located in disk (18), ensuring valve stem (5) is fully seated in disk (18).
10. Install new top seal (9) at the bottom of stop plate (7).
11. Position stop plate (7) on valve body (8), and install two socket head screws (6).
12. Rotate disk (18) to the open position.
13. Position handle (3) and attach spring (4) on top of valve stem (5), so that handle (3) is in line with disk (18).

NOTE

Press handle down against the spring to align the holes with top valve stem.

14. Install pin (2) through handle (3) and top valve stem (5), securing pin (2) to handle (3) with a new cotter pin (1).

INSTALLATION

NOTE

Check that gasket is fully seated in the coupling groove.

1. Install new gasket (16) into female coupling (7).
2. Position new gasket (13) and female coupling (7) on butterfly valve (15).
3. Position new gasket (14) and male coupling (3) on butterfly valve (15).

4. Install eight washers (11), screws (12), washers (10), new lockwashers (9), and nuts (8) on butterfly valve assembly. Torque the fastening hardware to 30 in-lbs (3.41N•m).

5. Install new gasket (4) into dust cap (2).

6. Connect ring (1) and install dust cap (2) onto male coupling (3).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE BALL VALVE ASSEMBLY (MODELS BA91-141A, BA91-140A) REPLACEMENT

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

Mandatory Replacement Parts
Gaskets
(Item 3, WP 0042 00)
Lockwashers
(Item 4, WP 0042 00)

REMOVAL

1. Disconnect chains (1) from key rings (2) and remove dust cap (3), and dust plug (4). Remove gaskets (5) from dust cap (3) and female coupling (6).

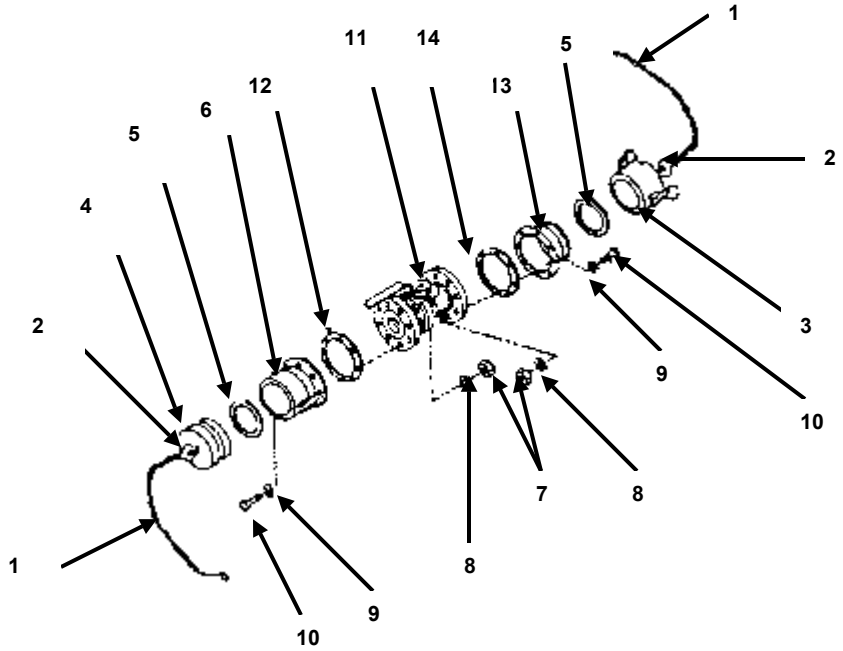
2. Remove eight nuts (7), lockwashers (8), washers (9), and screws (10) from female coupling (6) and ball valve (11).

3. Remove female coupling (6) and flange gasket (12) from ball valve (11).

4. Remove other eight nuts (7), lockwashers (8), washers (9), and screws (10) from male coupling (13) and ball valve (11).

5. Remove male coupling (13) and flange gasket (14) from ball valve (11).

6. Inspect ball valve (11) for damage. Replace ball valve (11) if damaged.



INSTALLATION

1. Align male coupling (13) and new flange gasket (14) on ball valve (11).
2. Install eight nuts (7), new lockwashers (8), washers (9), and screws (10) to male coupling (13) and ball valve (11). Torque the fastening hardware to 30 in-lbs (3.41N•m).
3. Align female coupling (6) and new flange gasket (12) on ball valve (11).
4. Install eight nuts (7), new lockwashers (8), washers (9), and screws (10) to female coupling (6) and ball valve (11). Torque the fastening hardware to 30 in-lbs (3.41 N•m).
5. Install new gaskets (5) in female coupling (6) and dust cap (3).
6. Connect chains (1) to key rings (2) and install dust cap (3) and dust plug (4) to female coupling (6) and male coupling (13).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE HOSE ASSEMBLY SERVICE AND REPLACEMENT

INITIAL SETUP

Materials/Parts
Detergent
(Item 3, WP 0040 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

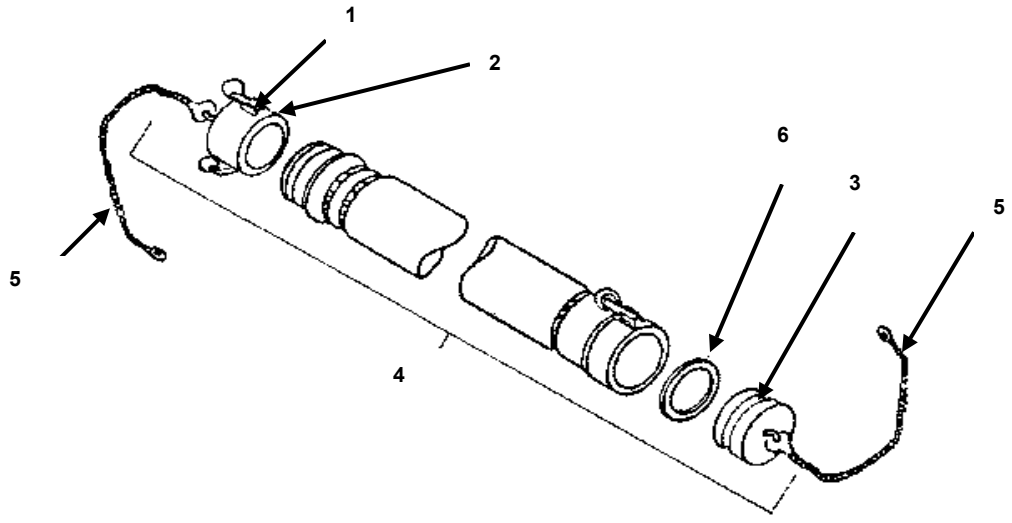
Mandatory Replacement Parts
Gasket
(Item 1, WP 0042 00)

REMOVAL

1. Pull outward on two cam-lever arms (1). Remove dust cap (2) and dust plug (3) from hose assembly (4).
2. Remove two chain assemblies (5) and remove dust cap (2) and dust plug (3) from hose assembly (4).
3. Remove gasket (6) from dust cap (2).

SERVICE

1. Flush out the hose assembly with hot, soapy water.
2. Rinse out the filler/discharge hose assembly thoroughly and air-dry.
3. Inspect the hose for cracks, tears, or wear, and ensure that the hose bands are secure to the couplings.
4. Inspect all mechanical parts for cracks, dents, breaks and wear. Replace any unserviceable components.



INSTALLATION

1. Install two chain assemblies (5), dust cap (2), and dust plug (3) to hose assembly (4). Install new gasket (6) in dust cap (2).

2. Connect dust cap (2) and dust plug (3) to hose assembly (4) by pushing in on cam-lever arms (1).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON DRAIN GATE VALVE (MODELS WTM3KF, M52983-50, BA92-162, FCE574-81-1-A, SC5430-97CLE01) SERVICE, REPLACEMENT, REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

Materials/Parts
Anti-seize Tape
(Item 7, WP 0040 00)
Crocus Cloth
(Item 2, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Grease
(Item 5, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Thread Sealing Compound
(Item 8, WP 0040 00)

Mandatory Replacement Parts
Packing Material
(Item 10, WP 0042 00)

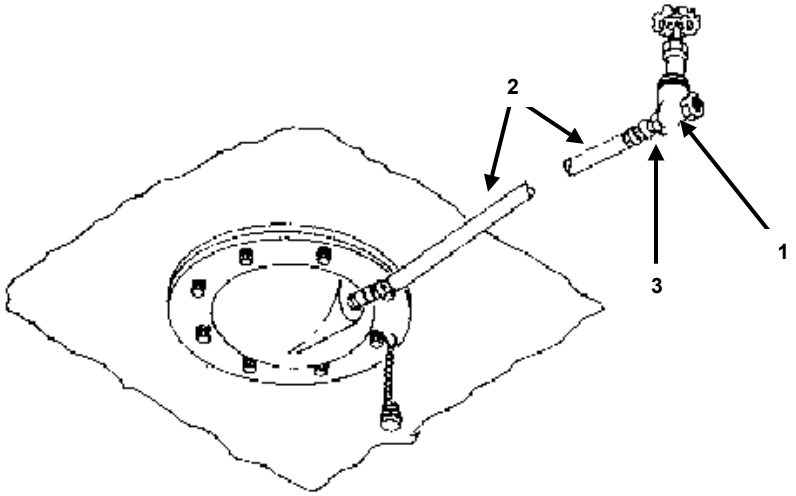
REMOVAL

1. Remove drain gate valve (1) from drain hose assembly (2).

WARNING

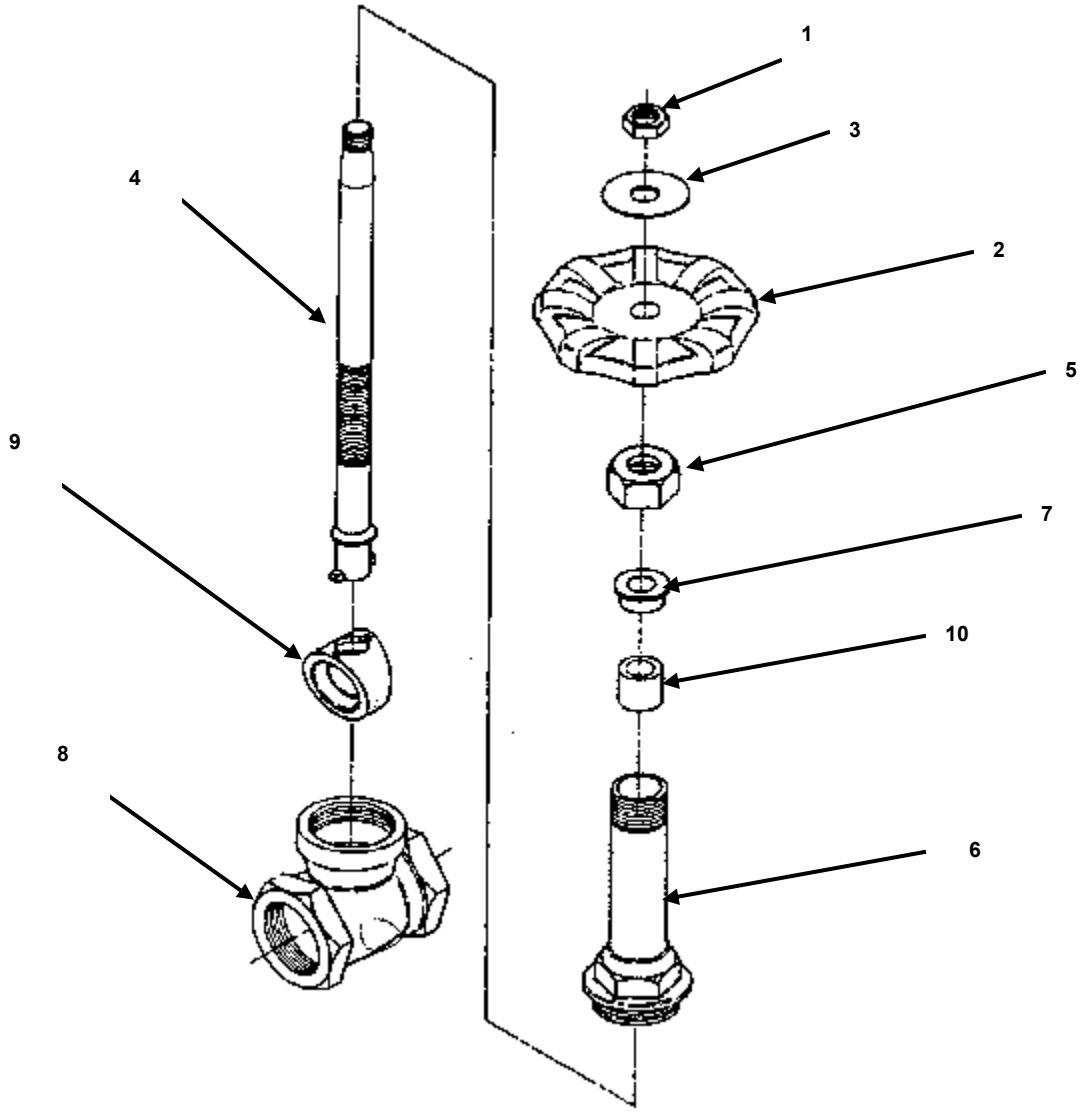
Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

2. Clean threads (3) of drain hose assembly (2) with dry cleaning solvent and dry with rags.



DISASSEMBLY

1. Remove hand-wheel nut (1) from hand-wheel (2).
2. Remove hand-wheel (2) and identification plate (3) from top of valve stem (4).
3. Remove packing nut (5) from bonnet (6).
4. Remove packing retainer (7) from bonnet (6).
5. Remove bonnet (6) from valve body (8).
6. Remove wedge disks (9) from valve stem (4).
7. Remove valve stem (4) from bonnet (6).
8. Remove packing material (10) from bonnet (6).



SERVICE

WARNING

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1. Clean all parts with dry cleaning solvent and dry thoroughly with rags.
2. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.
3. Polish the valve stem with a crocus cloth, then coat the valve stem with grease.

ASSEMBLY

1. Position valve body (8) on its side on a clean surface.
2. Insert wedge disks (9) into valve body (8) slot.
3. Install new packing material (10) into bonnet (6).
4. Insert valve stem (4) into bonnet (6).
5. Install bonnet (6) into valve body (8).
6. Install packing retainer (7) into bonnet (6).
7. Install packing nut (5) onto bonnet (6).
8. Install hand-wheel (2), hand-wheel nut (1), and identification plate (3) on valve stem (4).

INSTALLATION

1. Coat threads (3) of drain hose assembly (2) with thread sealing compound or anti-seize tape.
2. Install drain gate valve (1) on drain hose assembly (2).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON DRAIN BALL VALVE (MODELS BA91-141, BA91-140, PD52983-50, BA91-141A, BA91-140A) SERVICE, REPLACEMENT, REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (ft-lb)
(Item 3, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

Materials/Parts
Anti-seize Tape
(Item 7, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Grease
(Item 5, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Thread Sealing Compound
(Item 8, WP 0040 00)

Mandatory Replacement Parts
Bonnet gasket
(Item 11, WP 0042 00)
Stem Seal
(Item 12, WP 0042 00)
Stem Seal
(Item 13, WP 0042 00)

REMOVAL

Remove the drain ball valve from the drain hose assembly.

DISASSEMBLY

1. Remove handle-nut (1) from valve stem (2).
2. Remove handle (3) from valve stem (2).
3. Remove valve stem nut (4) from valve stem (2).
4. Remove travel stop (5), gland ring (6), and valve stem seal (7) from valve stem (2). Discard seal (7).
5. Remove cap screws (8) from bonnet (9). Remove bonnet (9) from valve body (10).
6. Remove valve stem (2), valve stem seal (11), spring (12), bonnet gasket (13), ball (14), and two ball seats (15) from valve body (10). Discard seal (11) and bonnet gasket (13).

SERVICE

WARNING

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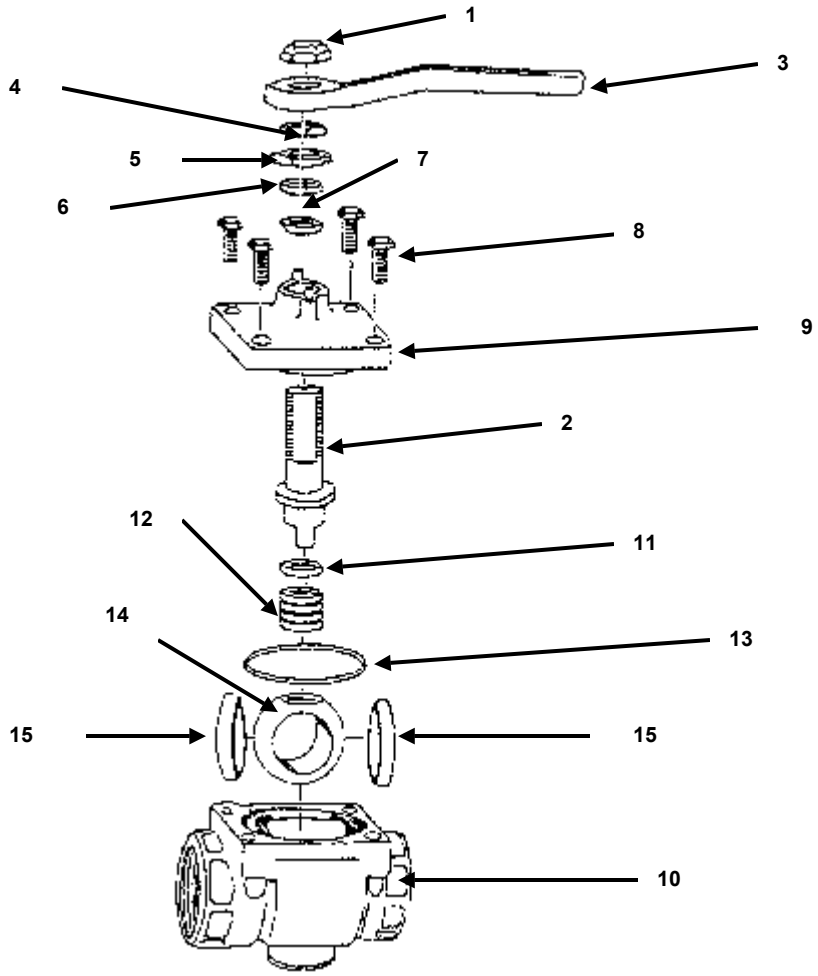
1. Clean all parts with dry cleaning solvent and dry thoroughly with rags.

2. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.

3. Polish the valve stem with a crocus cloth, then coat the valve stem with grease.



ASSEMBLY

1. Install two ball seats (15) into valve body (10).

2. Install new bonnet gasket (13) into valve body (10).

3. Install ball (14) into valve body (10).

4. Install new valve stem seal (11) and spring (12) at the bottom of valve stem (2). Insert valve stem (2) into valve body (10).

5. Position bonnet (9) over valve stem (2) and install four cap screws (8). Torque cap screws (8) to 16 ft-lbs (21.04 N•m).

6. Install new valve stem seal (7), gland ring (6), travel stop (5), and valve stem nut (4) onto valve stem (2).

7. Position handle (3) on valve stem (2). Install and tighten handle-nut (1) on valve stem (2).

INSTALLATION

Coat the threads of the drain hose assembly with thread sealing compound or anti-seize tape, and install the drain ball valve on the drain hose assembly.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON DRAIN HOSE ASSEMBLY (EXCEPT MODEL MIL-T-52983B) SERVICE

INITIAL SETUP

Materials/Parts
Anti-seize Tape
(Item 7, WP 0040 00)
Detergent
(Item 3, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Sealing Compound
(Item 8, WP 0040 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)
Drain Gate/Ball Valve removed
(WP 0023 00 or WP 0024 00)

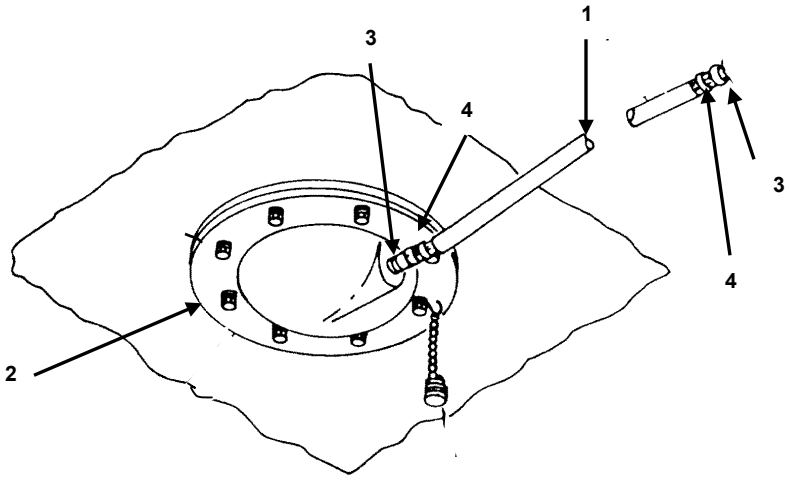
SERVICE

1. Rotate hose assembly (1) counterclockwise and remove from drain fitting (2).
2. Flush hose assembly (1) with hot, soapy water.
3. Rinse out hose assembly (1) thoroughly and air dry.

WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

4. Clean the threads on couplings (3) with dry cleaning solvent and dry thoroughly with rags.
5. Inspect hose assembly (1) for cracks, tears, or wear.
6. Check and ensure hose bands (4) are secured to threaded couplings (3).
7. Apply sealing compound or anti-seize tape on threads of coupling (3). Engage threads of couplings (3) with threads on drain fitting (2) and turn hose assembly (1) clockwise until tight.
8. Install the drain gate or ball valve. See WP 0023 00 and WP 0024 00.



END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON VENT AND PIPE ASSEMBLY SERVICE, REPLACEMENT, REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

Materials/Parts
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Silicone Compound
(Item 9, WP 0040 00)

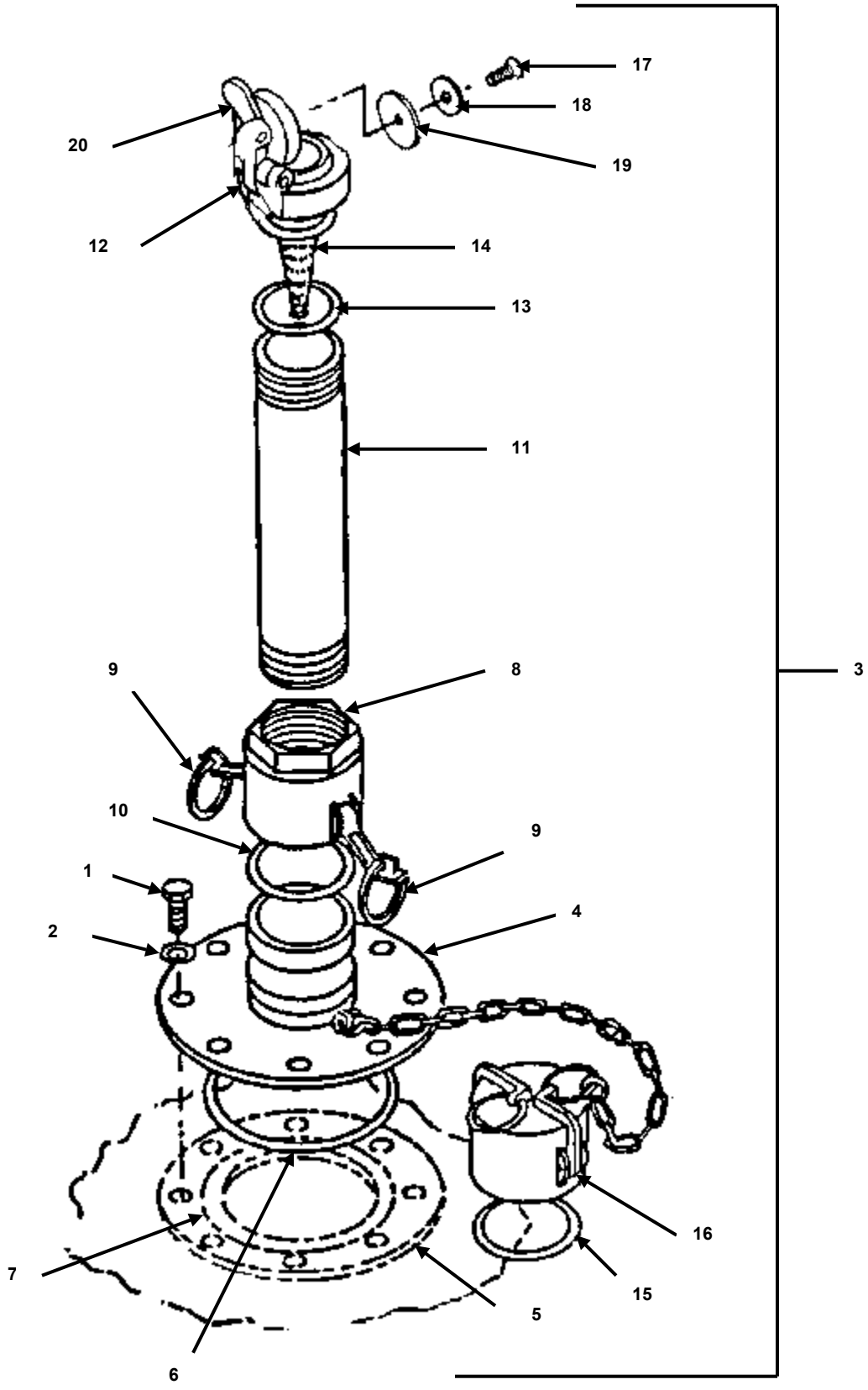
Mandatory Replacement Parts
Gasket
(Item 2, WP 0042 00)
Gasket Cap
(Item 14, WP 0042 00)
O-Ring
(Item 15, WP 0042 00)
Relief Cap Gasket
(Item 16, WP 0042 00)

REMOVAL

1. Remove screws (1) and washers (2) from vent and pipe assembly (3).
2. Lift male-flanged adapter (4) from tank fitting (5).
3. Remove and discard O-ring (6) from packing groove (7) located in tank fitting (5).

DISASSEMBLY

1. Remove female quick-disconnect coupling (8) from male-flanged adapter (4) by pulling outward on cam-lever arms (9), and lifting female quick-disconnect coupling (8) from male-flanged adapter (4).
2. Remove and discard gasket (10) from female quick-disconnect coupling (8).
3. Rotate vent pipe (11) counterclockwise until the vent pipe threads disengage from female quick-disconnect coupling (8), and remove female quick-disconnect coupling (8) from vent pipe (11).
4. Rotate relief cap (12) counterclockwise until the relief cap threads disengage from vent pipe (11). Remove the relief cap (12) from the vent pipe (11).
5. Remove and discard relief cap gasket (13) from inside relief cap (12).
6. Rotate flame arrestor (14) counterclockwise until the flame arrestor threads disengage from relief cap (12). Remove flame arrestor (14) from relief cap (12).
7. Remove and discard gasket (15) from inside dust cap (16).
8. Remove vent relief cap screw (17), washer (18), and gasket (19) from lever head assembly (20). Discard gasket (19).


17
18
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6

SERVICE

WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

1. Clean all parts with dry cleaning solvent, and dry thoroughly with rags.
2. Clean the preformed packing grooves with cleaning solvent, and dry thoroughly with rags.
3. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.
4. Check that the vent hole in the flame arrestor is clear of all debris.

ASSEMBLY

1. Install screw (17), washer (18), and new gasket (19) in lever head assembly (20).
2. Position new relief cap gasket (13) over flame arrestor (14). Seat relief cap gasket (13) into relief cap (12).
3. Install flame arrestor (14) into relief cap (12). Rotate flame arrestor (14) clockwise until threads are firmly seated in relief cap (12).
4. Install flame arrestor (14) into vent pipe (11) until vent pipe (11) contacts relief cap (12).
5. Rotate relief cap (12) clockwise until vent pipe (11) and relief cap (12) are firmly seated together.
6. Install vent pipe (11) into female quick-disconnect coupling (8). Rotate vent pipe (11) clockwise until it firmly seats in female quick-disconnect coupling (8).
7. Install new gasket (10) into female quick-disconnect coupling (8).
8. Install female quick-disconnect coupling (8) on male-flanged adapter (4) pushing in cam-lever arms (9) until locked in place.
9. Install new gasket (15) inside dust cap (16).

INSTALLATION

1. Lubricate new O-ring (6) with silicone compound.
2. Install O-ring (6) into packing groove (7) located in tank fitting (5).
3. Position male-flanged adapter (4) over tank fitting (5).
4. Install eight washers (2) and screws (1) through vent and pipe assembly (3) and tank fitting (5) holes.
5. Torque screws (1) to 30 in-lb (3.41 N•m).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON FILLER/DISCHARGE ASSEMBLY SERVICE AND REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)

Materials/Parts
Detergent
(Item 3, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Silicone Compound
(Item 9, WP 0040 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)
Filler/Discharge hose removed
(WP 0022 00)

Mandatory Replacement Parts
Gasket
(Item 1, WP 0042 00)
Gasket
(Item 3, WP 0042 00)
Gasket
(Item 18, WP 0042 00)
Lockwasher
(Item 4, WP 0042 00)
O-Ring
(Item 17, WP 0042 00)

DISASSEMBLY

CAUTION

Be sure to take off the closure plate before removing the flanged adapter. The flanged adapter is bolted to the closure plate and suction stub. If the flanged adapter is removed first, the hex head nuts bolted to the suction stub will fall into the tank.

NOTE

The filler/discharge fitting on the discharge end requires a female/male elbow. The filler/discharge fitting on the fill end requires a female/female elbow.

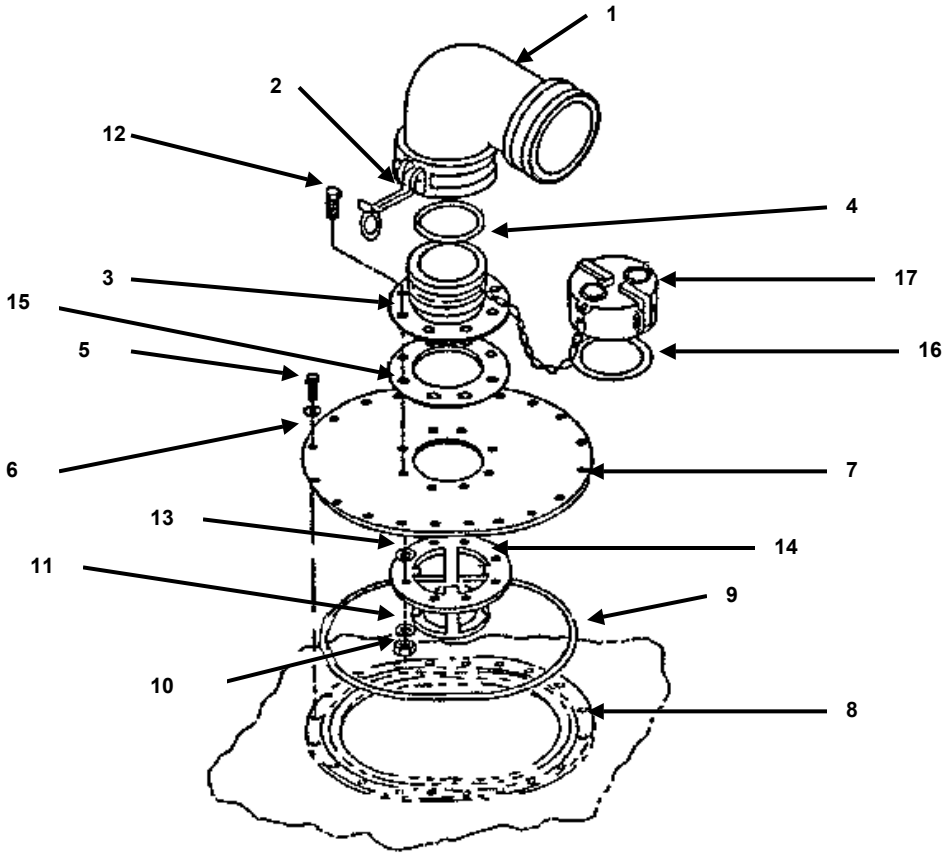
1. Remove 4-inch elbow (1) by pulling outward on cam-lever arms (2), and lifting elbow (1) from flanged adapter (3).
2. Remove and discard elbow gasket (4) from inside elbow (1).
3. Remove twenty screws (5) and washers (6) from closure plate (7). Lift closure plate (7) from tank fitting (8).
4. Remove and discard o-ring (9) from the packing groove located in tank fitting (8).
5. Remove eight nuts (10), lockwashers (11), screws (12), and gaskets (13) from suction stub (14), flanged adapter (3), and gasket (15). Discard lockwashers (11), gaskets (13), and gasket (15).
6. Remove and discard gasket (16) from inside dust cap (17).

SERVICE

WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

1. Clean all parts with dry cleaning solvent and dry thoroughly with rags.
2. Clean packing grooves thoroughly with detergent and hot water.
3. Clean all gasket-sealing surfaces thoroughly with detergent and hot water.
4. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.



ASSEMBLY

1. Install new gasket (16) into dust cap (17).
2. Install new elbow gasket (4) into elbow (1).
3. Place suction stub (14) on a hard, flat surface with the eight bolt holes positioned up.
4. Position new gaskets (13) over each bolt hole in suction stub (14).
5. Position closure plate (7) on top of gaskets (13), and align the holes.
6. Position new flanged adapter gasket (15) on closure plate (7), and align the holes.
7. Position flanged adapter (3) on gasket (15), and align the holes.
8. Install screws (12) through the holes in flanged adapter (3), and thread screws (12) through until the ends protrude through suction stub (14).
9. Assemble new lockwashers (11) and nuts (10) to screws (12). Torque the fastening hardware to 30 in-lbs (3.41N•m).
10. Lubricate new o-ring (9) with silicone compound. Position o-ring (9) into the packing groove.
11. Position closure plate (7) and attached components on the tank. Install suction stub (14) through the opening in the tank, until closure plate (7) contacts tank fitting (8).

NOTE

If the tank is lying completely flat, lift the tank to the closure plate to begin threading the screws through the tank fitting.

12. Assemble twenty washers (6) onto screws (5). Install screws (5) through closure plate (7) and tank fitting (8).
13. Torque fastening screws (5) to 30 in-lbs (3.41 N•m).
14. Position elbow (1) on flanged adapter (3), and push cam-lever arms (2) inward, locking elbow (1) to flanged adapter (3).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON DRAIN FITTING ASSEMBLY (EXCEPT MODELS MIL-T-52983B BA91-141, BA91-140) SERVICE AND REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

Materials/Parts
Antiseize Tape
(Item 7, WP 0040 00)
Detergent
(Item 3, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Sealing Compound
(Item 8, WP 0040 00)
Silicone Compound
(Item 9, WP 0040 00)

Mandatory Replacement Parts
O-ring
(Item 15, WP 0042 00)

DISASSEMBLY

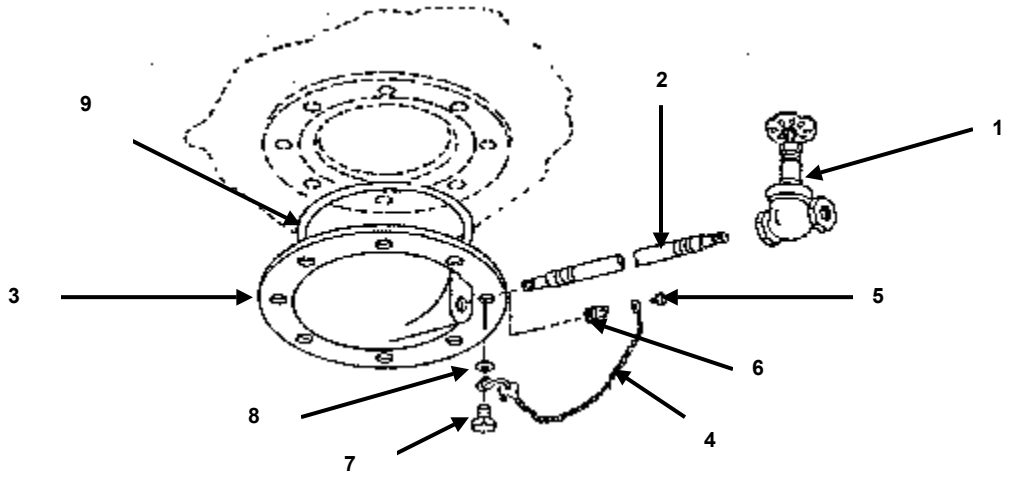
1. Rotate gate valve (1) counterclockwise until the threads disengage from drain hose (2). Remove from drain hose (2).
2. Rotate drain hose (2) counterclockwise until the threads disengage from drain cover plate (3). Remove from drain cover plate (3).
3. Disconnect chain assembly (4). Remove drain plug screw (5) and drain plug (6) from cover plate (3).
4. Remove eight screws (7) and washers (8) from drain cover plate (3) and tank fitting.
5. Remove drain cover plate (3).
6. Remove o-ring (9) from the packing groove located in the tank fitting. Discard o-ring (9).

SERVICE

WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

1. Clean all parts with dry cleaning solvent and dry thoroughly with rags.
2. Clean packing grooves thoroughly with detergent and hot water.
3. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.



ASSEMBLY

1. Lubricate new o-ring (9) with silicone compound. Position o-ring (9) into the packing groove located on the tank fitting.
2. Position drain cover plate (3) on the tank fitting, and align the fastening holes.
3. Install drain cover plate (3) to the tank fitting with screws (7) and washers (8), hand tightening screws (7) and washers (8).
4. Attach the S-hook of chain assembly (4) under one screw (7) head. Torque all screws (7) to 30 in-lbs (3.41 N•m).
5. Apply sealing compound or anti-seize tape to drain plug screw (5) threads.
6. Attach chain assembly (4) to drain plug (6), drain plug screw (5), and drain cover plate (3).
7. Screw drain hose (2) clockwise until firmly engaged in drain cover plate (3).
8. Screw gate valve (1) clockwise until firmly engaged with drain hose (2).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 10,000 AND 20,000 GALLON DRAIN FITTING ASSEMBLY (MODELS BA91-141 and BA91-140) SERVICE AND REPAIR

INITIAL SETUP

Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)
Torque Wrench (in-lb)
(Item 2, WP 0033 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)

Materials/Parts
Antiseize Tape
(Item 7, WP 0040 00)
Detergent
(Item 3, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)
Sealing Compound
(Item 8, WP 0040 00)
Silicone Compound
(Item 9, WP 0040 00)

Mandatory Replacement Parts
O-Ring
(Item 15, WP 0042 00)

DISASSEMBLY

1. Pull outward on cam-lever arms (1) of dust cap (2).
2. Remove dust cap (2) from female quick-disconnect coupling (3).
3. Pull outward on cam-lever arms (4) of female quick-disconnect coupling (3)
4. Remove female quick-disconnect coupling (3) from flanged adapter (5).
5. Remove chain assembly (6) from flanged adapter (5).
6. Remove eight screws (7) and washers (8) from flanged adapter (5) and tank fitting.
7. Remove flanged adapter (5) and O-ring (9). Discard O-ring (9).

SERVICE

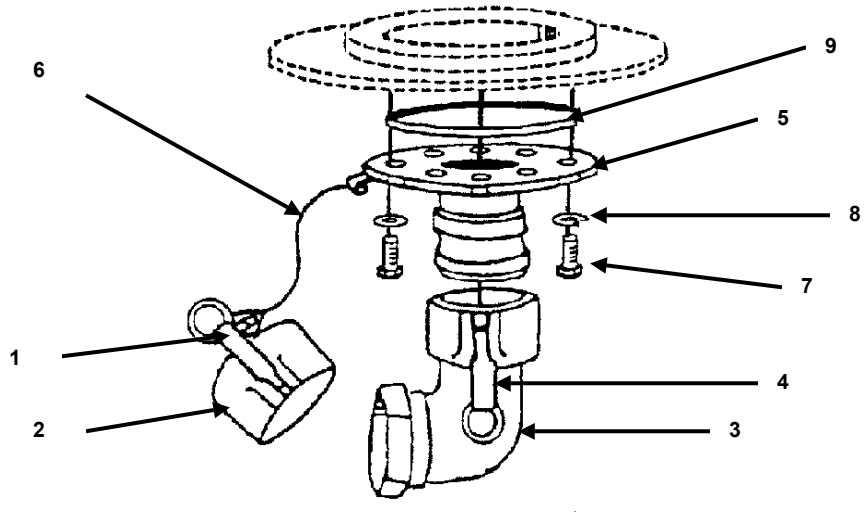
WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

1. Clean all parts with dry cleaning solvent and dry thoroughly with rags.

2. Clean packing groove thoroughly with detergent and hot water.

3. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.



ASSEMBLY

1. Attach chain assembly (6) to flanged adapter (5).

2. Apply sealing compound or anti-seize tape to screws (7) threads.

3. Lubricate new O-ring (9) with silicone compound. Position O-ring (9) into groove on the tank fitting.

4. Position flanged adapter (5) on the tank fitting, and align the fastening holes.

5. Install flanged adapter (5) to the tank fitting with screws (7) and washers (8).

6. Torque screws (7) to 30 in-lbs (3.41 N•m).

7. Connect female quick-disconnect coupling (3) to flanged adapter (5), pushing cam-lever arms (4) in on female quick-disconnect coupling (3).

8. Install dust cap (2) on female quick-disconnect (3) and push in on cam-lever arms (1).

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON TANK ASSEMBLY SERVICE

INITIAL SETUP

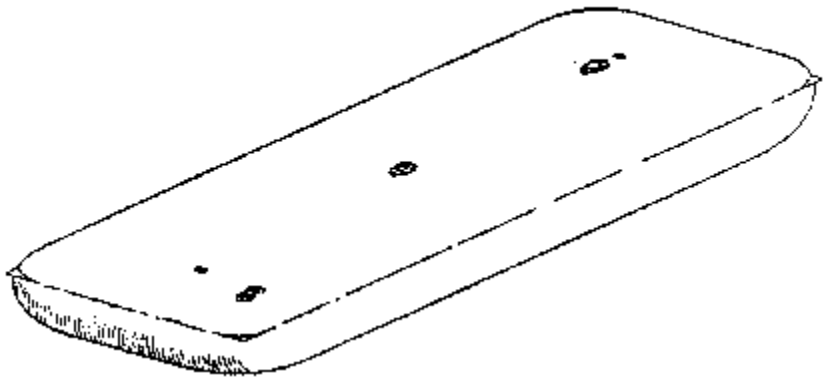
Tools
Tool Kit General Mechanics
(Item 1, WP 0033 00)

Materials/Parts
Detergent
(Item 3, WP 0040 00)
Dry Cleaning Solvent
(Item 4, WP 0040 00)
Rags, Wiping
(Item 6, WP 0040 00)

Equipment Condition
Fuel tank drained
(WP 0005 00)
Filler/Discharge hose assembly disconnected
(WP 0022 00)

REMOVAL

1. Remove the vent and pipe assembly from the vent fitting (WP 0026 00).
2. Remove the filler/discharge assemblies (WP 0027 00).
3. Remove the drain fitting assembly (WP 0028 00 or WP 0029 00).



SERVICE

WARNING

Dry cleaning solvent, A-A-59601, used to clean parts, is potentially dangerous to personnel and property. It produces toxic and flammable fumes. Use only in well ventilated areas. Avoid repeated and prolonged skin contact. Do not use solvent near an open flame or near excessive heat. The flash point of the solvent is 100°F to 130°F (38° C to 59° C).

1. Clean all mechanical parts with dry cleaning solvent and dry thoroughly with rags.

2. Clean the tank exterior with detergent and hot water.

3. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.

INSTALLATION

NOTE

Prior to the installation of fuel tank assemblies, the drain end of the tank will unroll first.

1. Unroll the tank and unfold the sides, using tank handles to position the tank.

2. Install the drain fitting assemblies (WP 0028 00 or WP 0029 00).

3. Install the vent and pipe assembly (WP 0026 00).

4. Install the filler/discharge assemblies (WP 0027 00).

END OF WORK PACKAGE

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANKS, FUEL STORAGE, 3,000,
10,000, 20,000, AND 50,000 GALLON
PREPARATION FOR STORAGE OR SHIPMENT**

PREPARATION FOR STORAGE OR SHIPMENT

WARNING

Sludge that accumulates at the bottom of the tank gives off toxic and explosive vapors. Inhaling these vapors can cause lead poisoning. When cleaning the fuel tanks, provide ample ventilation to dissipate harmful fumes.

Always wear protective goggles, a breathing apparatus, and other protective gear when cleaning the tank interior. Fuel vapors are toxic and can damage eyes, skin, and lungs.

Fuel vapors are extremely flammable. Exercise care to prevent sparks when working near or in the tank. Death or severe personal injury can result if safety precautions are not strictly observed.

CAUTION

Always handle the tank carefully. Pad the components stored with the tank to avoid chafing during storage or transportation. Rough handling or careless storage can damage the tank.

NOTE

Prior to storage the tank should be disassembled, purged of all residual fuel and fumes, cleaned, and preserved with all its components for future use.

1. Drain fuel from the tank (WP 0005 00).
2. Remove the drain hose assembly from the drain fitting and install the drain plug (WP 0028 00 or WP 0029 00).
3. Remove the filler/discharge elbows from the filler/discharge adapters (WP 0027 00).
4. Remove the vent and pipe assembly from the flanged adapter, and install the dust cap (WP 0026 00).
5. Inflate the tank with air and air-dry the tank for 24 hours.
6. Remove the filler/discharge assembly from the tank (WP 0027 00).
7. Flush the tank with detergent solution.
8. Remove the detergent solution from the tank with a shop vacuum.
9. Flush the tank with clear water.
10. Air-dry the tank with a blower until the tank is dry.
11. Apply technical talc (Item 10, WP 0040 00) to the tank interior.
12. Install the filler/discharge assembly on the tank (WP 0027 00).

13. Install the dust caps on the flanged adapters of the filler/discharge assemblies.

14. Brush off all debris clinging to the fabric material of the tank.

15. Apply technical talc (Item 10, WP 0040 00) to the tank exterior.

16. Fold the tank from the sides towards the middle.

17. Roll the tank from the end opposite the drain fitting.

18. Plug the exposed hose assembly openings with suitable, clean materials.

CRATING INSTRUCTIONS

1. Make sure the tank has been properly folded (WP 0005 00).

CAUTION

Use care when packing the tank. The tank will be easily damaged by tools, packing box nails, or other sharp objects.

2. The tank will be packed in a close-fitting box or container. When the tank is disassembled and refolded, it is to be replaced in the original box or container.

3. Each tank is provided with suitable packing around the tank to prevent the tank fabric from being damaged by contact with the inside of the box or container. When the tank is replaced in the original box or container, the packing material is replaced around the tank in the same manner as received.

ADMINISTRATIVE STORAGE

1. Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period, appropriate maintenance records will be kept.

2. Before placing the equipment in administrative storage, current preventive maintenance checks and services should be completed, shortcomings and deficiencies should be corrected, and all Modification Work Orders (MWO) should be applied.

3. Inside storage is preferred for items selected for administrative storage. If inside storage is not available, trucks, vans, conex containers, and other containers may be used. Refer to WP 0002 00 for ambient storage temperature range.

END OF WORK PACKAGE

CHAPTER 6

SUPPORTING INFORMATION FOR TANK, FUEL STORAGE, 3,000 GALLON, 10,000 GALLON, 20,000 GALLON, AND 50,000 GALLON

OPERATOR AND UNIT MAINTENANCE
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANK, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON
REFERENCES

REFERENCES

This work package lists all forms, field manuals, technical manuals and miscellaneous publications referenced in this manual.

TECHNICAL MANUALS

AR 700-138	Army Logistics Readiness and Sustainability
AR 750-1	Army Materiel Maintenance Policy and Retail Maintenance Operations
DA PAM 738-750	The Army Maintenance Management Systems (TAMMS)
DA PAM 738-751	Functional Users Manual for TAMMS-A
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

FORMS

DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DA Form 2407-1	Maintenance Request Continuation Sheet
DA Form 2028	Recommended Changes to Publications and Blank Forms
SF Form 368	Product Quality Deficiency Report

FIELD MANUALS

FM 3-3, FM 3-4, FM 3-5	Detailed Decontamination Procedures
FM 21-11	First Aid

MISCELLANEOUS

CTA 8-100	Army Medical Dept. Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (except medical, Class V repair parts, and heraldic items)

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANK, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON TANKS
MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART (MAC)

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army/Marine Corps Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit – includes two sub-columns, C (operator/crew) and O (unit) maintenance.

Direct Support – includes an F sub-column.

General Support – includes an H sub-column.

Depot – includes a D sub-column.

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions will be limited to and defined as follows:

1. 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.

2. Test - To verify serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with prescribed standards.

3. Service - Operations required periodically to keep an item in proper operating condition: e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or gases.

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

5. Align - To adjust specified variable elements of an item to bring out optimum or desired performance.

6. 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.

7. 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 such a manner to allow the proper functioning of equipment or system.

8. Replace - To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3rd position code of the SMR code.

9. Repair - The application of maintenance services, including fault location/troubleshooting, removal/-installation, and disassembly/assembly procedures, and maintenance actions 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.

10. 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 material maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

11. 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 material 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.

Columns In The MAC Table 1.

1. Column 1, Group Number, 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."

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

3. Column 3, Maintenance Functions, lists the functions to be performed on the item listed in Column 2.

4. Column 4, Maintenance Level, specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed as man-hours in whole hours or decimals) in the appropriate sub-column. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work-time figures will be shown for each level. 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 time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC.

5. Column 5, Tools and Test Equipment, specifies, by code, required tool and test equipment requirements.

6. Column 6, Remarks, when applicable, contains a letter code, in alphabetical order.

Explanation of Columns In Table 2. Tool and Test Equipment Requirements

1. Column 1, Reference Code correlates with a code used in the MAC, Column 5.

2. Column 2, Maintenance Level is the lowest level of maintenance authorized to use the tool or test equipment.

3. Column 3, Nomenclature, names or identifies the tool or test equipment.

4. Column 4, National Stock Number of the tool or test equipment.

5. Column 5, Tool Number is the manufacturer's part number, model number, or type number.

Explanation of Columns in Table 3. Remarks

1. Column 1, Remarks Code is recorded in Column 6 of the MAC.

2. Column 2, Remarks, lists information pertinent to the maintenance function being performed as indicated in the MAC.

Table 1. MAC for 3,000 Gallon, 10,000 Gallon, 20,000 Gallon, 50,000 Gallon Collapsible Fabric Tank, Fuel

(1) Group Number	(2) Component/ Assembly	(3) Maint. Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		DS	GS	Depot		
			C	O	F	H	D		
00	TANK, FABRIC, COLLAP-SIBLE, FUEL								
01	VALVE ASSY 4 IN. FILLER AND DISCHARGE	Inspect	0.1	0.1					A
		Service		0.8					
		Replace		0.2				1, 2, 3	
		Repair	0.4	0.8				1, 2, 3	B
0101	VALVE, GATE, 4 IN.	Inspect	0.1	0.1					
		Service		0.5					
		Replace		0.3				1, 2, 3	
		Repair		0.5				1, 2, 3	
0101	VALVE, BUTTERFLY	Inspect	0.1	1.0					
		Service		0.5					
		Replace		0.3					
		Repair		0.5					
0101	VALVE, BALL	Inspect	0.1	0.1				1, 2, 3	
		Replace							
02	HOSE ASSY, FILLER AND DISCHARGE	Inspect	0.1	0.1					
		Service		0.2					
		Replace	0.2	0.2					
		Repair	0.1						
03	VALVE, GATE 1/2 IN. DRAIN	Inspect	0.1	0.1					A
		Service		0.4					
		Replace		0.2					
		Repair	0.1	0.4					B
03	VALVE, BALL 2 IN. DRAIN	Inspect	0.1	0.1					
		Service		0.4					
		Replace		0.2					
		Repair		0.4					
04	HOSE ASSY, DRAIN	Inspect	0.1						
		Service		0.2					
		Replace		0.2				1	

Table 1. MAC for 3,000 Gallon, 10,000 Gallon, 20,000 Gallon, 50,000 Gallon Collapsible Fabric Tank, Fuel (cont.)

(1) Group Number	(2) Component/ Assembly	(3) Maint. Function	(4) Maintenance Level					(5) Tools and Equipment	(6) Remarks
			Unit		DS	GS	Depot		
			C	O	F	H	D		
05	VENT AND PIPE ASSY	Inspect	0.1	0.1					A
		Service		0.8					
		Replace		0.2					
		Repair	0.4	0.8				1	B
0501	CAP AND FLAME ARRESTOR ASSY, RELIEF	Inspect	0.1	0.1					A
		Service		0.2					
		Replace		0.2					
		Repair		0.2				2	
0502	PIPE ASSY, VENT	Inspect	0.1	0.1					A
		Service		0.2					
		Replace		0.2					
		Repair	0.2	0.2				1	B
06	ASSY, FILLER AND DISCHARGE	Inspect	0.1	0.1					A
		Service		0.8					
		Repair	0.4	0.8				1, 2, 3	B
07	FITTING ASSY, DRAIN	Inspect	0.1	1.0					A
		Service		0.5					
		Repair		0.5				1, 2, 3	
08	TANK	Inspect	0.5						
		Service		1.0					
		Replace							
		Repair	0.5					1	C
09	REPAIR ITEMS, EMER-GENCY	Inspect	0.1						
		Replace	0.1						

Table 2. Tools and Test Equipment for 3,000, 10,000 Gallon, 20,000 Gallon, 50,000 Gallon Collapsible Fabric Tank, Fuel

Tool or Test Equipment Ref Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
1	O	Tool Kit, General Mechanics: Automotive	5180-00-177-7033	(50980) SC5180-90-CL-N26
2	O	Torque Wrench (inch-pounds)	5120-01-075-2597	(80204) B107.14M TY1CLBST3
3	O	Torque Wrench (foot-pounds)	5120-00-242-3264	(80204) B107.14M TY1CLBST3

Remarks Code	Remarks
A	Operator inspection occurs with assembly in tact. Unit level inspection occurs after the assembly has been disassembled and cleaned.
B	Operator repair is limited to replacement of gaskets on quick-disconnect couplings.
C	Operator repair is limited to use of the clamps and plugs included with the emergency repair items.

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANK, FUEL STORAGE, 3,000, 10,000, 20,000, AND 50,000 GALLON
REPAIR PARTS AND SPECIAL TOOLS LIST

SCOPE

This RPSTL 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 unit, maintenance of the Tank. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages:

1. Repair Parts List Work Packages. Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts, which must be removed for replacement of the authorized parts. Parts 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 item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

2. Special Tools List Work Packages. Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII shall not be listed.

3. Cross-Reference Indexes Work Packages. There are two cross-reference indexed work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number Index work package refers to the figure and item number. The Part Number Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR Code (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout:

Source Code	**Maintenance Code**		**Recoverability Code**
___	___		___
xx	xx		xx
1st two positions: How to get an item.	3rd position: Who can install, replace or use the item. the item.	4th position: Who can do complete repair* on items.	5th position: Who determines disposition action on unserviceable

*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow.

Source Code	Application/Explanation
PA PB PC PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code. **NOTE** Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO-Made at unit/ AVUM level MF-Made at DS/ AVIM level MH-Made at GS level ML-Made at SRA MD-Made at depot	Items with these codes are not to be requested/ requisitioned individually. They must be made from bulk material which is identified by the P/N in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized by the 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
AO-Assembled by unit/AVUM level AF-Assembled by DS/AVIM level AH-Assembled by GS level AL-Assembled by SRA AD-Assembled by depot	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code, authorizes replacement of the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an "XA" coded item. Order the next higher assembly. (Refer to the NOTE on page 3.)
XB	If an item is not available from salvage, order it using the CAGEC and P/N.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's P/N.
XD	Item is not stocked. Order an XD-coded item through normal supply channels using the CAGEC and P/N given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those items source coded “XA” or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance.

Maintenance Code	Application/Explanation
C --	Crew or operator maintenance done within unit/AVUM maintenance.
O --	Unit level/AVUM maintenance can remove, replace, and use the item.
F --	Direct support/AVIM maintenance can remove, replace, and use the item.
H --	General support maintenance can remove, replace, and use the item.
L --	Specialized repair activity can remove, replace, and use the item.
D --	Depot can remove, replace, and use the item.

Fourth Position. The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
O --	Unit/AVUM is the lowest level that can do complete repair of the item.
F --	Direct support/AVIM is the lowest level that can do complete repair of the item.
H --	General support is the lowest level that can do complete repair of the item.
L --	Specialized repair activity is the lowest level that can do complete repair of the item.
D --	Depot is the lowest level that can do complete repair of the item.
Z --	Nonreparable. No repair is authorized.
B --	No repair is authorized. No parts or special tools are authorized for maintenance of a "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes	Application/Explanation
Z --	Non-reparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR Code.
O --	Reparable item. When uneconomically reparable, condemn and dispose of the item at the unit level.
F --	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.
H --	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D --	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L --	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A --	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code, which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

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 using an NSN to requisition an item, the item received may have a different P/N from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name and, when required, a minimum description to identify the item.

2. P/Ns of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.

3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.

4. The statement END OF FIGURE appears just below the last item description in Column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7). The QTY (quantity per figure) column indicates the quantity of the item used in the breakdown shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

EXPLANATION OF CROSS-REFERENCE INDEXES, WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package.

STOCK NUMBER Column. This column lists the NSN in National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN.

NSN (e.g., 5385-01-574-1476) NIIN	When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. P/Ns in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the P/N assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

SPECIAL INFORMATION

UOC. The UOC appears in the lower left comer of the Description Column heading. Usable on codes are shown as "UOC:.." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOC's used in the RPSTL are:

Code	Used On
ECY	3,000 Gallon, Model MIL-T-52983B
FNR	3,000 Gallon, Model WTM3KF
EQB	10,000 Gallon, Model FCE574-81-1-A
EQC	10,000 Gallon, Model SC5430-97CLE01
FCN	10,000 Gallon, Model BA91-141
FMD	10,000 Gallon, Model BA91-141A
ELS	20,000 Gallon, Model BA92-162
FCM	20,000 Gallon, Model BA91-140
FMC	20,000 Gallon, Model BA91-140A
EDD	50,000 Gallon, Model PD52983-50
EDC	50,000 Gallon, Model M52983-50

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in this manual.

Index Numbers. Items, which have the word BULK in the figure column, will have an index number shown in the item number column. This index number is a cross-reference between the NSN / P/N index work packages and the bulk material list in the repair parts list work package.

Illustrations List. The illustrations in this RPSTL contain unit authorized items.

HOW TO LOCATE REPAIR PARTS.

1. When NSNs or P/Ns Are Not Known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

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

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When the NSN Is Known.

First. If the NSN is available, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one being looked for.

3. When the P/N Is Known.

First. If the P/N is available and not the NSN, look in the PART NUMBER column of the P/N index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

END OF WORK PACKAGE

UNIT MAINTENANCE

COLLAPSIBLE FABRIC TANK, 3,000,10,000, 20,000, 50,000 GALLON

FILLER/DISCHARGE VALVE ASSEMBLY (GATE VALVE)

REPAIR PARTS LIST

1

2 - 17

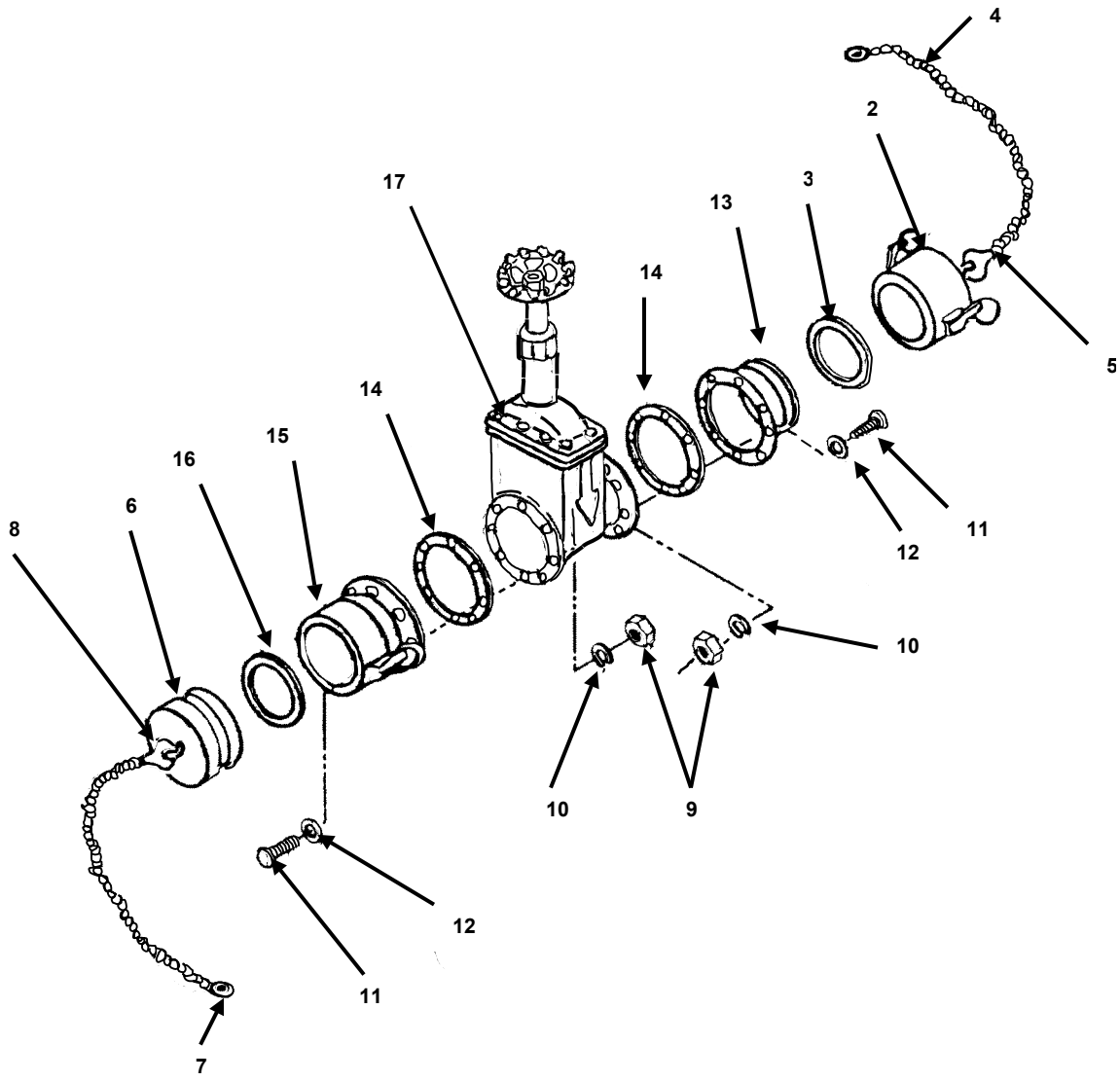


Figure 1. Filler/Discharge Gate Valve Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 00 TANK, FABRIC COLLAPSIBLE	
					GROUP 01 FILLER/DISCHARGE VALVE ASSEMBLY	
					FIG. 1 FILLER/DISCHARGE VALVE ASSEMBLY (GATE VALVE)	
1	PBOOO	4820-01-262-5079	00333	50610130	GATE VALVE, ASSEMBLY FILLER AND DISCHARGE UOC: ECY, FNR, EDC, EDD, ELS, EQB, EQC	1
2	PBOOZ	4720-00-640-6156	96906	MS27028-17	.CAP, QUICK-DISCONNECT 4 IN. UOC: EDC, ELS, EDD, EQB, EQC	1
2	PBOOZ	4730-00-929-0787	96906	MS27028-15	.CAP, QUICK-DISCONNECT 3K TANK UOC: ECY, FNR	1
3	PBOZZ	5330-00-899-4509	96906	MS27030-9	..GASKET HALF, 4 IN, VALVE ASSEMBLY UOC: EDC, ELS, EDD, EQB, EQC	1
3	PBOZZ	5330-00-088-9166	96906	MS27030-8	..GASKET UOC: ECY, FNR	1
4	PAOZZ	4010-00-360-0596	81718	H06683M	**..**CHAIN ASSEMBLY, SING 12 IN, DUST CAP UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	1
5	XDOZZ		01976	1SK	..RING, KEY DUST CAP UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	2
6	PBOOZ	4730-00-640-6188	96906	MS27029-17	.PLUG, QUICK DISCONNECT VALVE ASSY UOC: EDC, ELS, EDD, EQB, EQC	1
6	PBOOZ	4730-00-929-0790	96906	MS27029-15	.PLUG, QUICK DISCONNECT 3K TANK UOC: ECY, FNR	1
7	PBOZZ	4010-00-360-0596	81718	H06683M	..CHAIN ASSEMBLY, SING 12 IN. DUST PLUG UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	1
8	XDOZZ		01976	1SK	..RING, KEY DUST PLUG UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	2
9	PBOZZ	5310-00-732-0558	96906	MS51967-8	**.**NUT, PLAIN, HEXAGON 3/8-16, VALVE ASSEMBLY UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	16

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
10	PBOZZ	5310-00-637-9541	96906	MS35338-46	.WASHER, LOCK SPLIT, 3/8 IN, ID, VALVE ASSEMBLY UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	16
11	PBOZZ	5305-00-725-2317	80204	B1821BH038 C150N	.SCREW, CAP, HEXAGON H 3/8-16 VALVE ASSY UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	16
12	PBOZZ	5310-00-087-7493	96906	MS27183-13	.WASHER, FLAT 3/8 IN, VALVE ASSY UOC: ECY, FNR, EDC, ELS, EDD, EQB, EQC	16
13	PBOZZ	4730-00-840-5347	96906	MS27023-17	.COUPLING HALF, QUICK ADAPTER, FLANGED, MALE UOC: EDC, ELS, EDD, EQB, EQC	1
13	PBOZZ	4730-00-889-2380	96906	MS27023-15	.COUPLING HALF, QUICK 3K TANK ILC DOVER UOC: ECY, FNR	1
14	PBOZZ	5330-01-262-5120	05476	FCC-62398/ 50609735	.GASKET, VALVE ASSEMBLY UOC: EDC, ELS, EDD, EQB, EQC	2
14	PBOZZ	5330-01-280-9388	74897	66108-L	.GASKET UOC: ECY, FNR	2
15	PBOZZ	4730-00-840-5348	96906	MS27027-17	.COUPLING HALF, QUICK DISCONNECT, FEMALE UOC: EDC, ELS, EDD, EQB, EQC	1
15	PBOZZ	4730-00-889-2378	96906	MS27027-15	.COUPLING HALF, QUICK 3K TANK UOC: ECY, FNR	1
16	PBOZZ	5330-00-899-4509	96906	MS27030-9	..GASKET HALF, 4 IN VALVE ASSEMBLY UOC: EDC, ELS, EDD, EQB, EQC	1
16	PBOZZ	5330-00-088-9166	96906	MS27030-8	..GASKET UOC: ECY, FNR	1
17	XDOOF	4820-01-159-0439	76364	5551-001 4IN	.VALVE GATE UOC: ECY, FNR	1
17	XDOOF	4820-01-189-2809	76364	235RF-0200AV	.VALVE, GATE VALVE ASSY UOC: EDC, ELS, EDD, EQB, EQC	1

END OF FIGURE

UNIT MAINTENANCE

COLLAPSIBLE FABRIC TANK, 3,000,10,000, 20,000, 50,000 GALLON

FILLER/DISCHARGE VALVE ASSEMBLY (BUTTERFLY VALVE)

REPAIR PARTS LIST

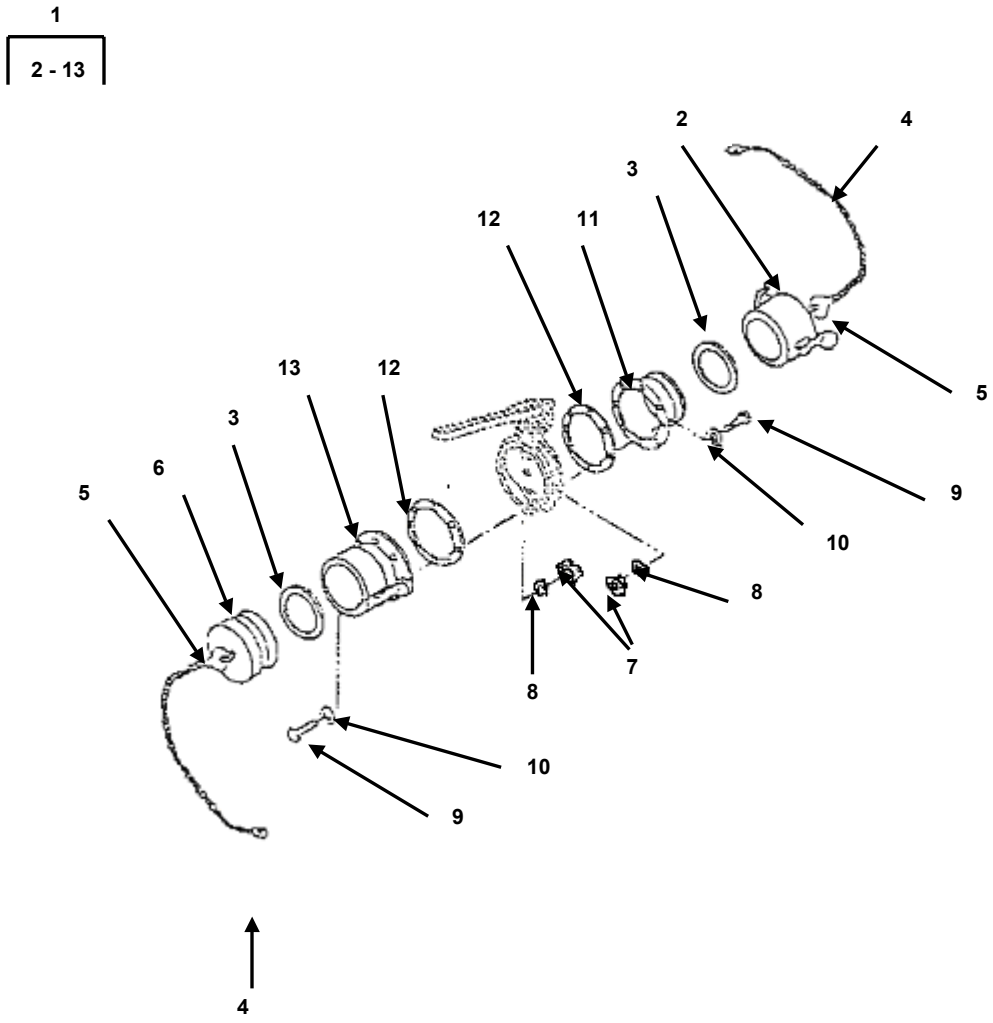


Figure 2. Filler/Discharge Valve Assembly (Butterfly Valve)

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 VALVE ASSEMBLY, FILLER/DISCHARGE	
					FIG. 2 FILLER/DISCHARGE VALVE ASSEMBLY (BUTTERFLY VALVE)	
1	AOOOO		66618	C0317-4NA	BUTTERFLY VALVE ASSEMBLY, FILLER AND DISCHARGE UOC: FCM, FCN	1
2	PBOOZ	4730-00-640-6156	96906	MS27028-17	.CAP, QUICK DISCONNECT 4 IN. UOC: FCM, FCN	1
3	PCOZZ	5330-00-899-4509	96906	MS27030-9	..GASKET UOC: FCM, FCN	2
4	PAOZZ	4010-00-360-0596	81718	H06683M	..CHAIN ASSEMBLY, SING, 12 IN, DUST CAP UOC: FCM, FCN	2
5	XDOZZ		01976	1SK	..RING, KEY UOC: FCM, FCN	4
6	PBOOZ	4730-00-640-6188	96906	MS27029-17	.PLUG, QUICK DISCONNECT 4 IN. UOC: FCM, FCN	1
7	PBOZZ	5310-00-732-0558	96906	MS51967-8	.NUT, PLAIN HEXAGON 3/8-16 UOC: FCM, FCN	16
8	PAOZZ	5310-00-637-9541	96906	MS35338-46	.WASHER, LOCK SPLIT, 3/8 INCH, ID UOC: FCM, FCN	16
9	PBOZZ	5305-01-325-8387	96906	MS90725-64	.SCREW, CAP, HEXAGON H 3/8-16 x 1 ½ UOC: FCM, FCN	16
10	PBOZZ	5310-00-087-7493	96906	MS27183-13	.WASHER, FLAT 3/8 IN. UOC: FCM, FCN	16
11	PBOZZ	4730-00-840-5347	96906	MS27023-17	.COUPLING HALF, QUICK ADAPTER, FLANGED, MALE UOC: FCM, FCN	1
12	PBOZZ	5330-01-262-5120	05476	FCC-62398/ 50609735	.GASKET UOC: FCM, FCN	2
13	PBOZZ	4730-00-840-5348	96906	MS27027-17	.COUPLING HALF, QUICK FEMALE UOC: FCM, FCN	1
					END OF FIGURE	

1

2 - 14

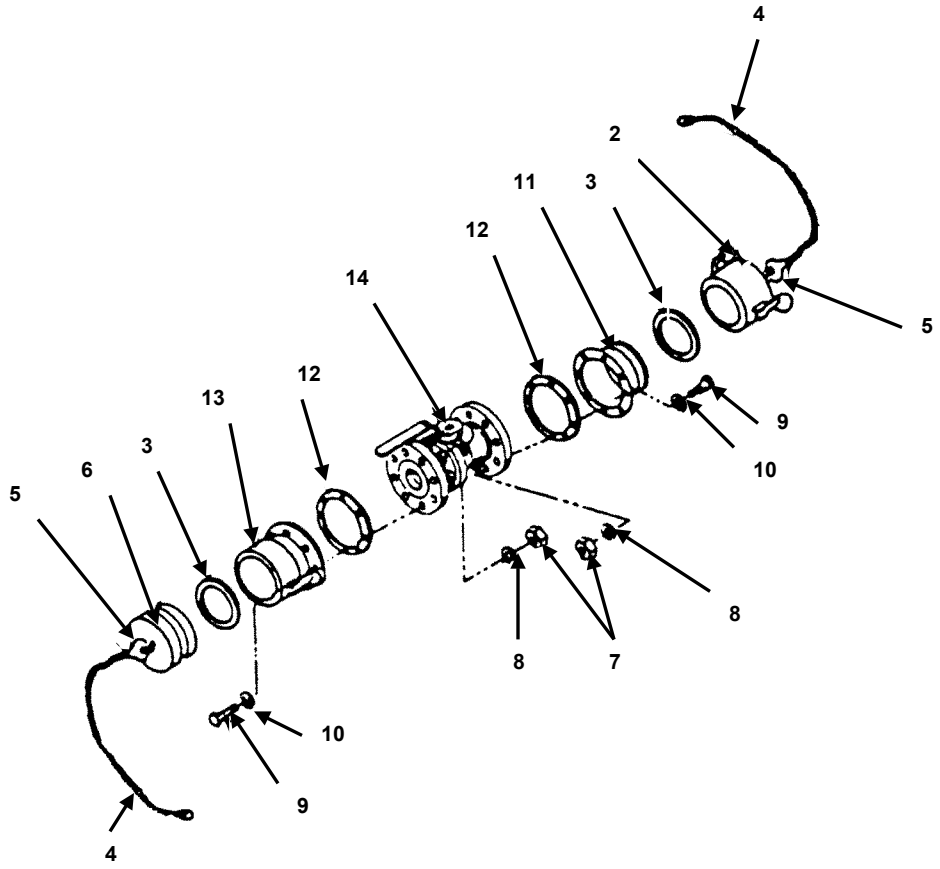


Figure 3. Filler/Discharge Valve Assembly (Ball Valve)

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 VALVE ASSEMBLY, FILLER/DISCHARGE	
					FIG 3. FILLER/DISCHARGE VALVE ASSEMBLY (BALL VALVE)	
1	AOOOO		81349	MIL-T-529 83F-BVA	VALVE ASSEMBLY, BALL ..... INCH, FILLER AND DISCHARGE UOC: FMC, FMD	1
2	PBOOZ	4730-00-640-6156	96906	MS27028-17	.CAP, QUICK DISCONNECT 4 IN ..... UOC: FMC, FMD	1
3	PCOZZ	5330-00-899-4509	96906	MS27030-9	..GASKET ..... UOC: FMC, FMD	2
4	PAOZZ	4010-00-360-0596	81718	H06683M	..CHAIN ASSEMBLY, SING 12 IN, ... DUST CAP UOC: FMC, FMD	2
5	XDOZZ		01976	1SK	..RING, KEY ..... UOC: FMC, FMD	4
6	PBOOZ	4730-00-640-6188	96906	MS27029-17	.PLUG, QUICK DISCONNEC 4 IN..... UOC: FMC, FMD	1
7	PAOZZ	5310-00-732-0558	96906	MS51967-8	.NUT, PLAIN, HEXAGON 3/8-16 ..... UOC: FMC, FMD	16
8	PAOZZ	5310-00-637-9541	96906	MS35338-46	.WASHER, LOCK SPLIT, 3/8 IN, ID ..... UOC: FMC, FMD	16
9	PAOZZ	5305-01-325-8387	96906	MS90725-64	.SCREW, CAP, HEXAGON ..... H 3/8-16X1-1/2 UOC: FMC, FMD	16
10	PAOZZ	5310-00-087-7493	96906	MS27183-13	.WASHER, FLAT 3/8 IN ..... UOC: FMC, FMD	16
11	PBOZZ	4730-00-840-5347	96906	MS27023-17	.COUPLING HALF, QUICK ..... ADAPTER, FLANGED, MALE UOC: FMC, FMD	1
12	PBOZZ	5330-01-262-5120	05476	FCC-62398/ 50609735	.GASKET ..... UOC: FMC, FMD	2
13	PBOOZ	4730-00-840-5348	96906	MS27027-17	.COUPLING HALF, QUICK FEMALE ..... UOC: FMC, FMD	1
14	XDOZZ		OA6K1	4IN-CS15-F	.VALVE, BALL, 4 IN ..... UOC: FMC, FMD	1

END OF FIGURE

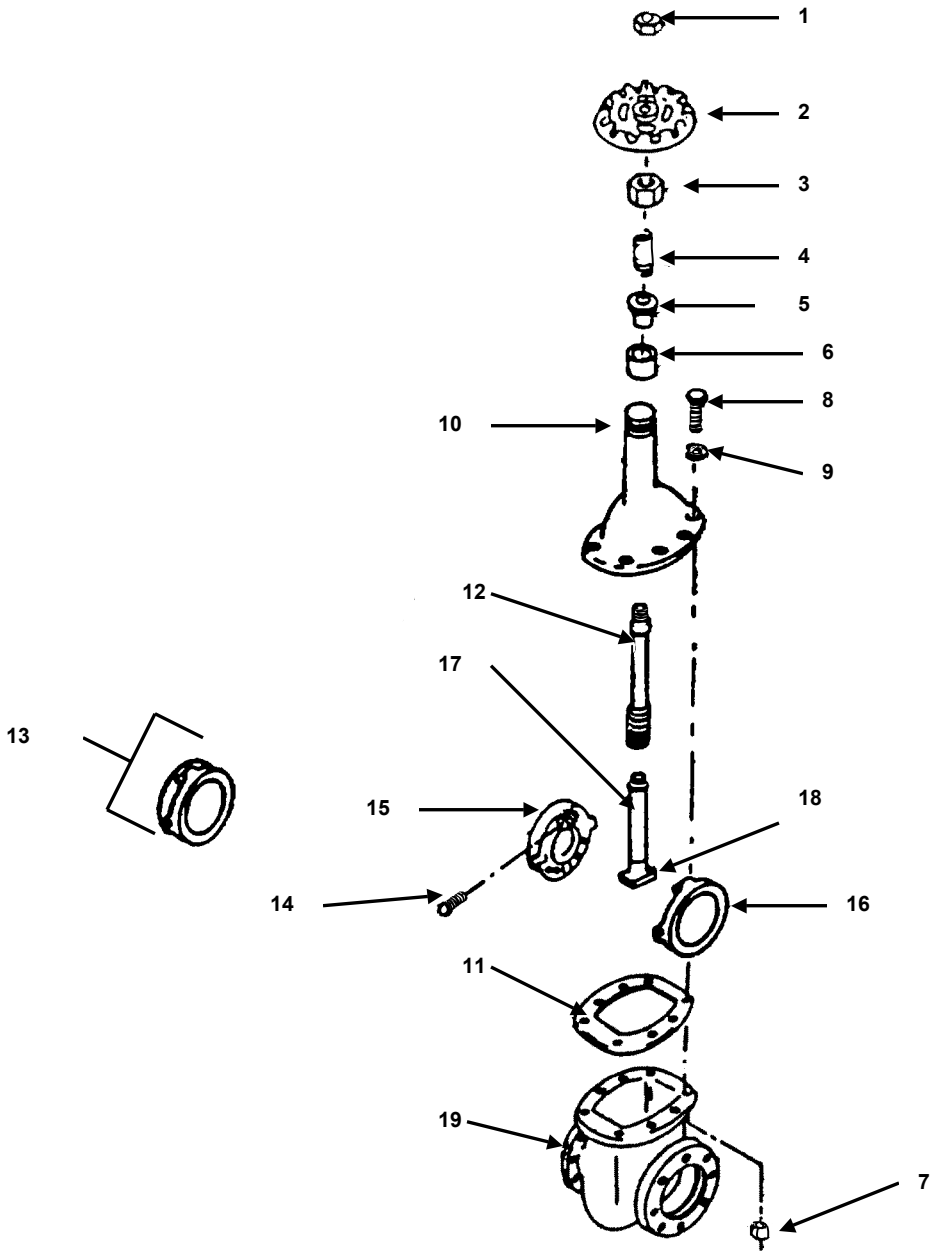


Figure 4. Gate Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 VALVE ASSEMBLY, FILLER/DISCHARGE	
					FIG. 4 GATE VALVE	
	XDOOF	4820-01-189-2809	41592	235RF-0200AV	.VALVE,GATE VALVE ASSEMBLY UOC: EDC, ELS, EDD	1
	XDOOF	4820-01-159-0439	76364	5551-001 4IN	.VALVE,GATE UOC: ECY	1
1	PBOZZ	5310-01-262-1359	41592	235RF-02052N	..NUT, PLAIN, HEXAGON GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
1	XDOZZ	5310-00-654-4537	76364	3116M	..NUT, PLAIN, HEXAGON 3 IN GATE VALVE UOC: ECY	1
2	XDOZZ	5340-01-381-1690	41592	235RF-02043A	..HANDWHEEL, GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
2	XDOZZ	5340-01-077-4942	76364	7699-K-C56	..HANDWHEEL, 3 IN GATE VALVE UOC: ECY	1
3	PAOZZ	5310-01-262-1337	41592	235RF-020721	..NUT, PACKING GATE VALVE, 4 IN. UOC: EDC, ELS, EDD	1
3	XDOZZ		76364	2864-L	..STUFF NUT 3 IN GATE VALVE UOC: ECY	1
4	PAOZZ	5360-01-262-1338	41592	235RF-02162S	..SPRING, GLAND GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
4	XDOZZ		76364	70171-L	..GLAND, SPRING 3 IN GATE VALVE UOC: ECY	1
5	PAOZZ	5330-01-262-1363	41592	235RF-020621	..RETAINER, PACKING GATE VALVE, 4 IN. UOC: EDC, ELS, EDD	1
5	XDOZZ	4930-00-653-0407	76364	363-G	..GLAND FOLLOWER 3 IN GATE VALVE UOC: ECY	1
6	PAOZZ	5365-01-262-1339	41592	235RF-02082P	..RING, PACKING GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
6	XDOZZ	5330-00-889-5483	76364	6593-L	..PACKING, PREFORMED 3 IN VALVE UOC: ECY	1
7	PAOZZ	5310-01-262-1360	41592	235RF-02202N	..NUT, PLAIN, HEXAGON GATE VALVE, 4 IN. UOC: EDC, ELS, EDD	8
7	XDOZZ		76364	3198-B	..BONNET HEX NUT UOC: ECY	8
8	PAOZZ	5305-01-262-1365	41592	235RF-02192S	..SCREW, CAP, HEXAGON H GATE VALVE, 4 IN. UOC: EDC, ELS, EDD	8

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
8	PAOZZ	5305-01-271-7588	76364	4247-E	..SCREW, BONNET 3 K TANK ILC DOVER UOC: ECY	8
9	PAOZZ	5310-01-265-5044	41592	235RF-02212W	..WASHER, LOCK GATE VALVE, 4 IN UOC: EDC, ELS	8
9	XDOZZ		76364	38084-3	..BONNET, LOCK WASHER 3 IN GATE VALVE UOC: ECY	8
10	XDOZZ		41592	235RF-0202MB	..BONNET, VALVE UOC: EDC, ELS, EDD	1
10	XDOZZ		76364	23194-L	..BONNET 3 IN GATE VALVE UOC: ECY	1
11	PAOZZ	5330-01-262-1340	41592	235RF-02092G	..GASKET, VALVE BONNET UOC: EDC, ELS, EDD	1
11	XDOZZ		76364	66173-L	..GASKET 3IN 3 IN GATE VALVE UOC: ECY	1
12	PBOZZ	4820-01-262-1341	41592	235RF-0203MS	..STEM, VALVE UOC: EDC, ELS, EDD	1
12	XDOZZ		76364	26264-L	..STEM VALVE GATE 3 IN UOC: ECY	1
13	PDOOZ	4820-01-262-1342	41592	235RF-0215MR	..RING, SEAT GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
13	XDOZZ		76364	84168-L	..DISC ASSY UOC: ECY	1
14	PBOZZ	5305-01-262-1343	41592	235RF-02182S	...SCREW, DISK GATE VALVE, 4 IN UOC: EDC, EDD, ELS	1
15	PBOZZ	4820-01-262-1366	41592	235RF-0210MD	...DISK, VALVE GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
16	PAOZZ	4820-01-262-5121	41592	235RF-0212MD	...VALVE,GATE GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
17	PBOZZ	4820-01-262-1344	41592	235RF-0217MR	..DISK, VALVE GATE VALVE, 4 IN UOC: EDC, ELS, EDD	1
18	XDOZZ		76364	3042-L	..PULL, NUT UOC: ECY	1
19	XDOZZ		41592	235RF-0201MB	..BODY, VALVE 4 IN UOC: EDC, ELS, EDD	1
19	XDOZZ		76364	2093-7	..BODY, VALVE 3 IN UOC: ECY	1

END OF FIGURE

UNIT MAINTENANCE

COLLAPSIBLE FABRIC TANK, 3,000,10,000, 20,000, 50,000 GALLON

BUTTERFLY VALVE

REPAIR PARTS LIST

1

2 - 19

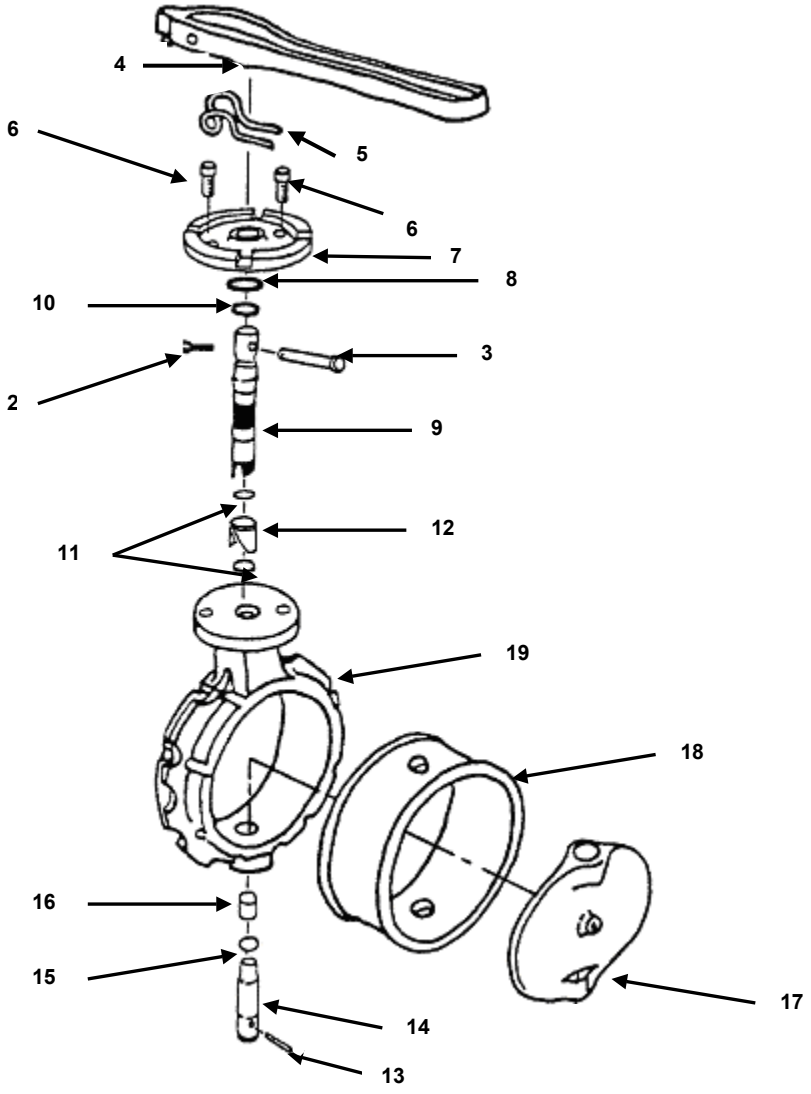


Figure 5. Butterfly Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 VALVE ASSEMBLY, FILLER/DISCHARGE	
					FIG. 5 BUTTERFLY VALVE	
1	XBOOF	4820-01-090-0923	76364	P-2860H-400	VALVE, BUTTERFLY 4 INCH UOC: FCM, FCN	1
2	KFOZZ		76364	7959-D	.COTTER PIN, PART OF KIT P/N 8621-N-940 UOC: FCM, FCN	1
3	KFOZZ	5315-01-073-8970	76364	5988-N	.PIN, PART OF KIT P/N 8621-N-940 UOC: FCM, FCN	1
4	XBOZZ	5340-01-381-1621	76364	P-8449	.HANDLE, MANUAL CONTR BUTTERFLY VALVE UOC: FCM, FCN	1
5	PAOZZ	5342-01-077-3664	76364	70170-N	.CLIP UOC: FCM, FCN	1
6	XBOZZ	5305-01-382-5962	76364	42136-N	.SCREW, CAP, SOCKET HEAD UOC: FCM, FCN	2
7	XBOZZ	4310-01-382-6532	76364	45199-N-660	.PLATE, VALVE STOP UOC: FCM, FCN	1
8	PAOZZ	5330-01-381-2809	76364	6595-N	.SEAL, PLAIN ENCASED UOC: FCM, FCN	1
9	KFOZZ		76364	26462-N	.TOP STEM, PART OF KIT P/N 8621-N-940 UOC: FCM, FCN	1
10	KFOZZ	5330-01-073-5007	76364	66150-N	.SEAL, VALVE, PART OF KIT P/N 8621-N-940 UOC: FCM, FCN	1
11	KFOZZ	5331-01-076-9342	76364	6596-B	.O-RING, PART OF KIT P/N 8621-N-940 UOC: FCM, FCN	1
12	KFOZZ		76364	7410-N	.TOP BEARING SPLIT, PART OF KIT P/N 8621-N-940 UOC: FCM, FCN	1
13	KFOZZ		76364	5996-R	.SPRING PIN, BOTTOM PART OF KIT P/N 869-N-940 UOC: FCM, FCN	1
14	KFOZZ		76364	26399-N	.BOTTOM STEM, PART OF KIT P/N 869-N-940 UOC: FCM, FCN	1
15	KFOZZ	5331-01-076-9342	76364	6596-B	.O-RING, PART OF KIT P/N 869-N-940 UOC: FCM, FCN	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
16	KFOZZ		76364	7411-N	.BOTTOM BEARING, PART OF KIT P/N 869-N-940 UOC: FCM, FCN	1
17	XBOZZ		76364	38194-N	.DISC UOC: FCM, FCN	1
18	XDOZZ		76364	X-7993-N	.SLEEVE UOC: FCM, FCN	1
19	XBOZZ		76364	1726-N	.BODY UOC: FCM, FCN	1
	PBOZZ	4820-01-090-0877	76364	8621-N-940	PARTS KIT, BUTTERFLY UOC: FCM, FCN COTTER PIN (1) 5-2 PIN (1) 5-3 TOP STEM (1) 5-9 SEAL VALVE (1) 5-10 O-RING (1) 5-11 TOP BEARING SPLIT (1) 5-12	1
	PBOZZ	4820-01-076-8018	76364	869-N-940	PARTS KIT, VALVE UOC: FCM, FCN SPRING PIN-BOTTOM (1) 5-13 BOTTOM STEM (1) 5-14 O-RING (1) 5-15 BOTTOM BEARING (1) 5-16	1

END OF FIGURE

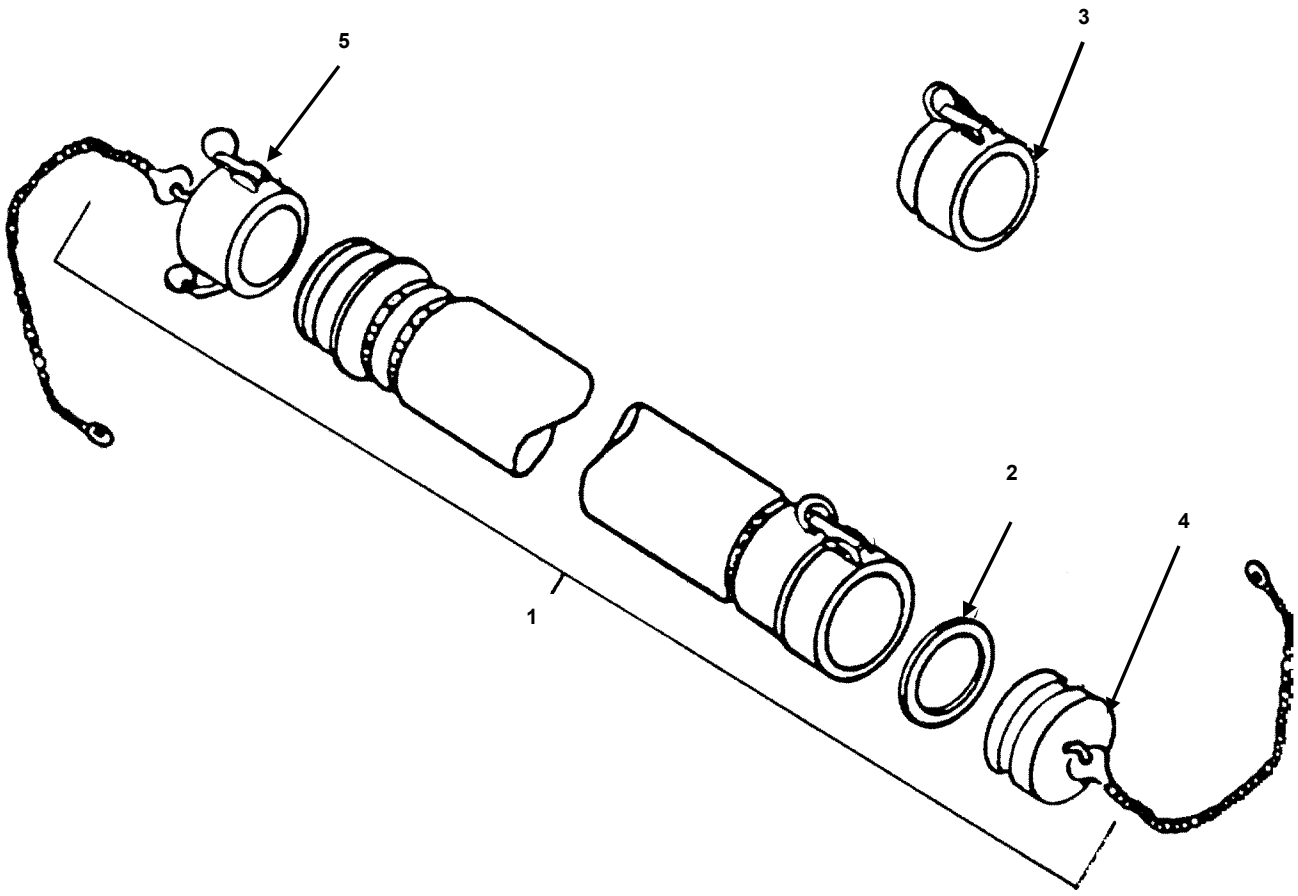


Figure 6. Filler and Discharge Hose Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 02 HOSE ASSEMBLY, FILLER/DISCHARGE	
					FIG. 6 FILLER/DISCHARGE HOSE ASSEMBLY	
1	PBOZZ	4720-01-262-5146	00333	50609892	HOSE ASSEMBLY, NONMETALLIC, 4 IN X 10 FT, WITH QUICK DISCONNECT FITTINGS UOC: EDC, ELS, FCM, FCN, FMC, FMD	1
1	XDOZZ		74897	239-20023-01	HOSE, ASSEMBLY UOC: ECY	1
1	XDOZZ		OCBB4	M370B09B2A0960	HOSE ASSEMBLY, NONMETALLIC 4 IN X 8 FT, TYPE B, SIZE 9, (4-INCH) STYLE A UOC: EDD	1
1	XAOZZ		OA6K1	D102408	HOSE, ASSEMBLY, 3 IN UOC: ECY, FNR	1
1	XDOZZ		81348	M370-B08B2A480	HOSE, ASSEMBLY, NONMETALLIC UOC: ECY, FNR	1
2	PBOZZ	5330-00-899-4509	96906	MS27030-9	.GASKET HALF, 4 IN UOC: EDC, ELS, EDD, FCM, FCN, FMC, FMD	1
2	PBOZZ	5330-00-088-9166	96906	MS27030-8	.GASKET 3 INCH UOC: ECY, FNR	1
3	PBOZZ	4730-00-951-3293	96906	MS49000-1	.REDUCER, QUICK DISCO 3K TANK UOC: ECY, FNR	1
4	PBOZZ	4730-00-640-6188	58536	AA59326X19	.PLUG, QUICK DISCONNE 4 INCH UOC: EDC, ELS, EDD, FCM, FCN, FMC, FMD	1
4	PBOZZ	4730-00-929-0790	96906	MS27029-15	.PLUG, QUICK DISCONNECT UOC: ECY, FNR	1
5	PBOZZ	4730-00-640-6156	96906	MS27028-17	.CAP, QUICK DISCONNECT 4 INCH UOC: EDC, ELS, EDD, FCM, FCN, FMC, FMD	1
5	PBOZZ	4730-00-929-0787	96906	MS27028-15	.CAP, QUICK DISCONNECT DUST CAP UOC: ECY, FNR	1

END OF FIGURE

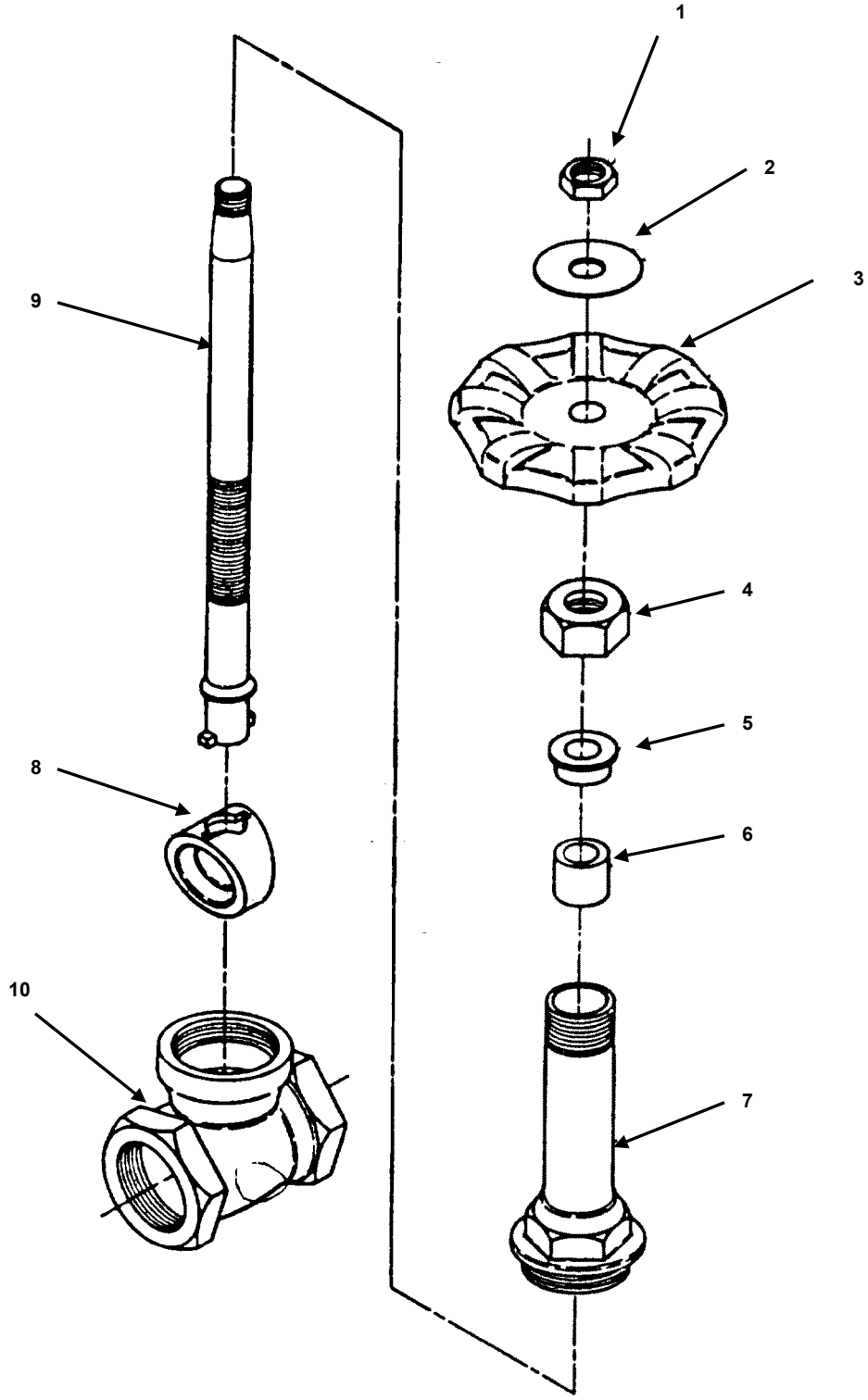


Figure 7. Drain Gate Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 VALVE, GATE, DRAIN	
					FIG. 7 DRAIN GATE VALVE	
	PBOOZ	4820-00-595-1841	67060	009240-3	VALVE, GATE SP-80,TYPE II,125 LB UOC: FNR, EDC, ELS, EQB, EQC	1
1	PAOZZ	5310-01-262-1345	76364	1148-10	.NUT, HAND WHEEL GATE VALVE,1/2 IN	1
2	XDOZZ		76364	1148-9	.PLATE, IDENT GATE VALVE, 1/2 IN	1
3	XDOZZ		76364	1148-8	.WHEEL, HAND GATE VALVE, 1/2 IN	1
4	PAOZZ	5310-01-262-1346	76364	1148-7	.NUT, PACKING GATE VALVE, 1/2 IN	1
5	PAOZZ	5330-01-262-1364	76364	1148-6	.RETAINER, PACKING GATE VALVE, 1/2 IN	1
6	PAOZZ	5330-01-262-1362	76364	1148-5	.PACKING MATERIAL GATE VALVE, 1/2 IN	1
7	XDOZZ		76364	1148-2	.BONNET, VALVE GATE VALVE, 1/2 IN	1
8	PAOZZ	4820-01-262-1347	76364	1148-3	.DISK, WEDGE GATE VALVE, 1/2 IN	1
9	PBOZZ	4820-01-262-1348	76364	1148-4	.STEM, VALVE GATE VALVE, 1/2 IN	1
10	XDOZZ		76364	1148-1	.BODY, VALVE GATE VALVE, 1/2 IN	1

END OF FIGURE

1
2 - 18

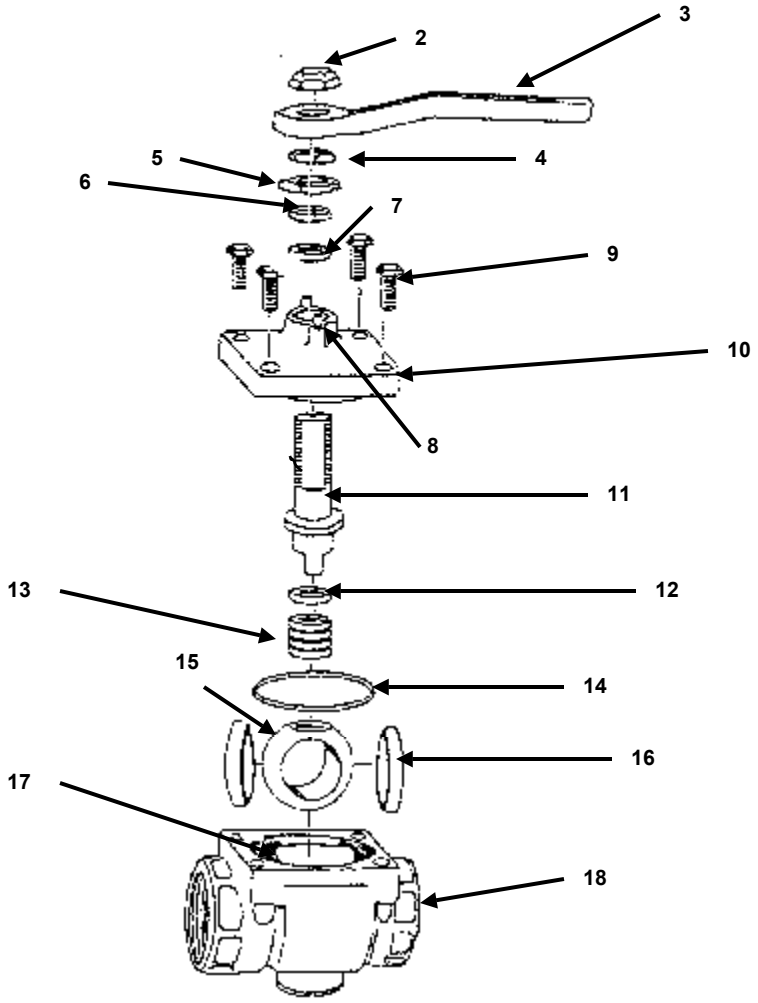


Figure 8. Drain Ball Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 VALVE, BALL, DRAIN	
					FIG. 8 DRAIN BALL VALVE	
1	XDOOO		OA6K1	2222191	BALL VALVE 2 INCH UOC: FCM, FCN, EDD, FMC, FMD	1
2	XBOZZ		OA6K1	29014	.HANDLE RETAINER NUT	1
3	XBOZZ		OA6K1	29015	.HANDLE	1
4	XBOZZ		OA6K1	29016	.STEM NUT	1
5	XBOZZ		OA6K1	29012	.TRAVEL STOP, SINC	1
6	XBOZZ		OA6K1	29011	.GLAND RING	1
7	XBOZZ		OA6K1	29010A	.STEM SEAL	1
8	XBOZZ		OA6K1	29013	.PIN GROOVE	1
9	XBOZZ		OA6K1	29007	.CAPSCREW HEX HEAD 5 IN-13 UNC X 1.75 INCH	4
10	XBOZZ		OA6K1	29002	.BONNET	1
11	XBOZZ		OA6K1	29009	.STEM	1
12	XBOZZ		OA6K1	29010B	.STEM SEAL	1
13	XBOZZ		OA6K1	29006	.SPRING	1
14	XBOZZ		OA6K1	29008	.BONNET GASKET	1
15	XBOZZ		OA6K1	29003	.BALL	1
16	XBOZZ		OA6K1	29004	.SEAT	2
17	XBOZZ		OA6K1	29005	.SEAT RING	2
18	XBOZZ		OA6K1	29001	.BODY	1

END OF FIGURE

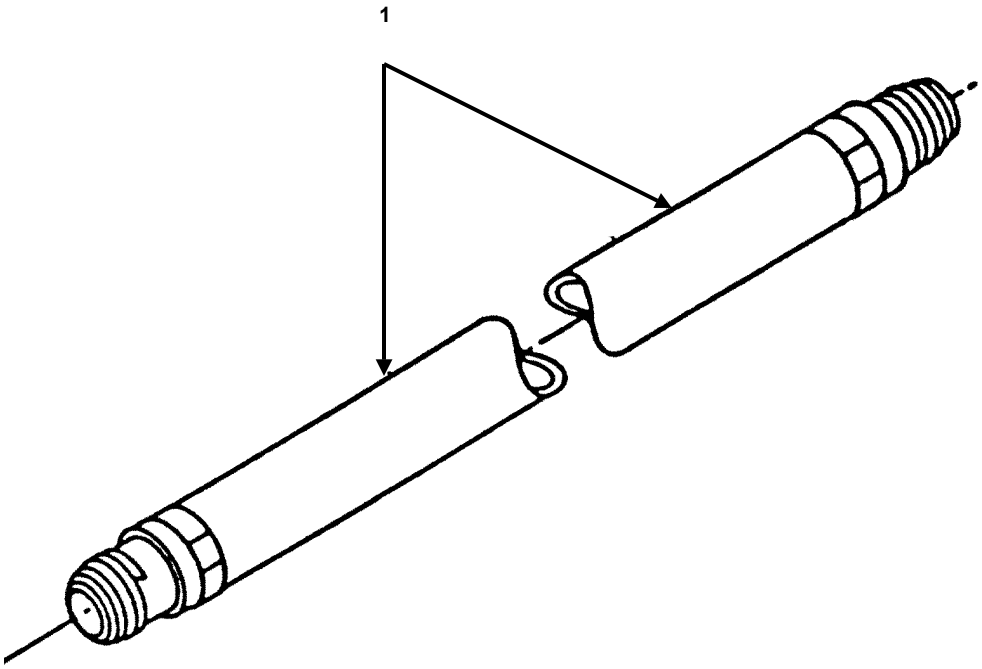


Figure 9. Drain Hose Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 04 HOSE ASSEMBLY, DRAIN	
					FIG. 9 DRAIN HOSE ASSEMBLY	
1	XDOZZ		00333	50608694	HOSE ASSY, DRAIN, TYPE I, SIZE 2, CLASS 2, STYLE A X 8 FT UOC: FNR, EQB, EQC, EDC, ELS, FCM, FCN, FMC, FMD	1
1	XDOZZ		OCBB4	M370B06C2A0960	HOSE ASSY, 2-INCH X 8 FEET, TYPE B, SIZE 06 (2-INCH), CLASS C WITH NPT FITTINGS UOC: EDD	1
					END OF FIGURE	

UNIT MAINTENANCE

COLLAPSIBLE FABRIC TANK, 3,000,10,000, 20,000, 50,000 GALLON

VENT AND PIPE ASSEMBLY

REPAIR PARTS LIST

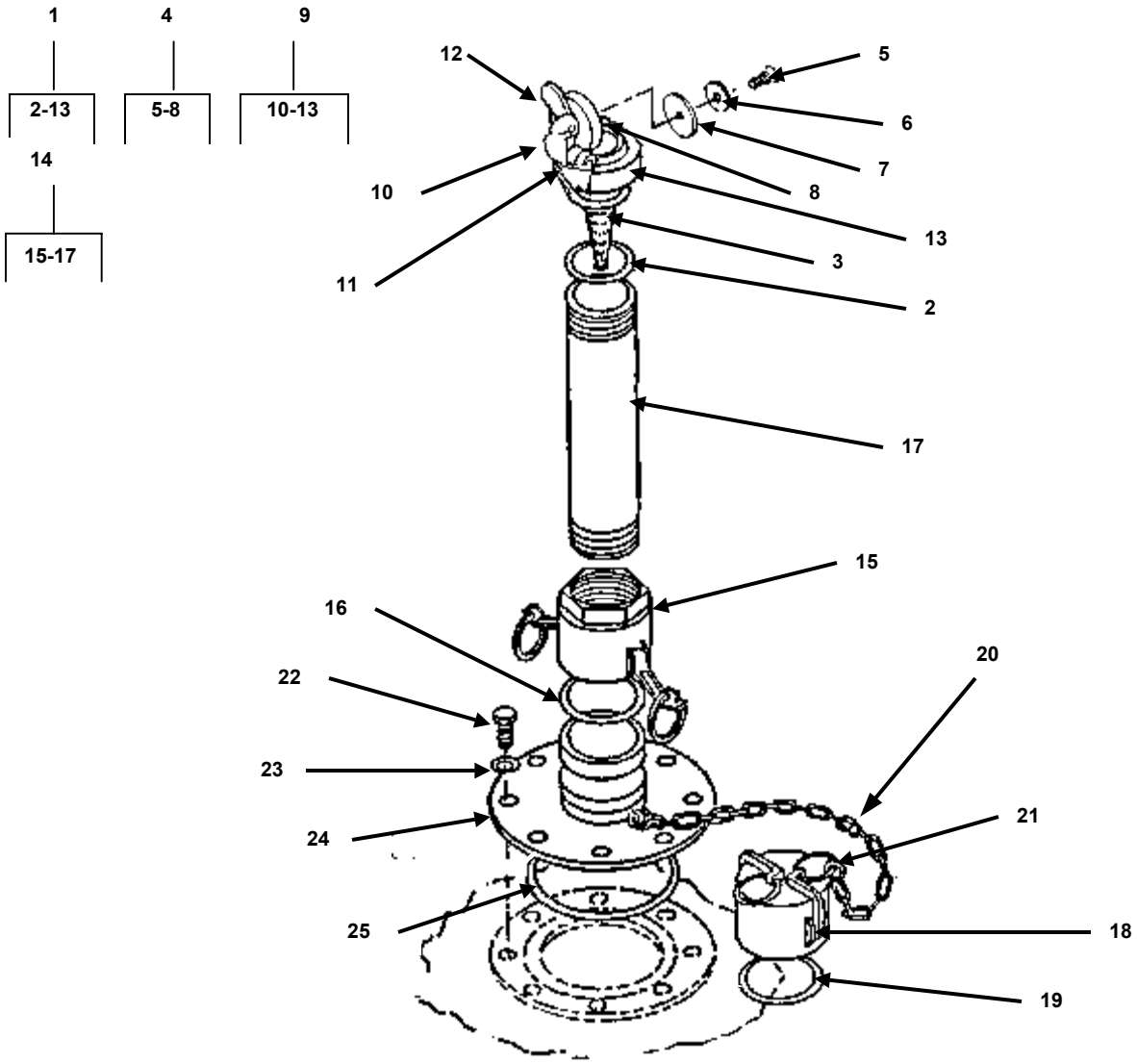


Figure 10. Vent and Pipe Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 VENT AND PIPE ASSEMBLY	
					FIG. 10 VENT AND PIPE ASSEMBLY	
1	PBOOO	4930-00-734-0180	49234	EX1333B	STRAINER ELEMENT, SE ARRESTOR, VENT	
2	PAOZZ	5330-01-262-1361	49234	EX1333B-18-95	.GASKET CAP	1
3	XDOZZ		49234	EX1333B-36-13	.SCREEN, FLAME ARRESTOR	1
4	PAOOO	5430-01-262-1350	49234	EX1333B-38	.CAP ASSEMBLY, RELIEF	1
5	PAOZZ	5305-01-262-5080	49234	4447101620	..SCREW, VENT RELIEF CAP	1
6	PAOZZ	5310-01-262-1351	49234	EX1333B-17	..WASHER RELIEF CAP	1
7	PBOZZ	5330-01-262-1349	49234	205-18-98	..GASKET, RELIEF CAP ASSY	1
8	XDOZZ		49234	EX1333B-40-68	..CAP, RELIEF	1
9	XDOOO	4930-00-786-9566	49234	EX1333B-39	.HEAD ASSEMBLY CAP ASSY	1
10	PAOZZ	5320-01-262-1352	49234	4201232400	RIVET HEAD ASSY 96906 MS20450C10AD24	1
11	PAOZZ	5320-01-262-1353	49234	4201035000	..RIVET 96906 MS20450C12AD50	1
12	XDOZZ		49234	EX1333B-3-607	.LEVER HEAD ASSY	1
13	XDOZZ		49234	EX1333B-1-607	.BODY, HEAD ASSEMBLY	1
14	PAOOO	5430-01-262-9475	00333	50609780	VENT ASSEMBLY, PIPE ASSEMBLY	1
15	XDOZZ	4730-00-649-9103	58536	AA59326V16	.COUPLING HALF,QUICK 2 IN	1
16	PAOZZ	5330-00-612-2414	96906	MS27030-6	.GASKET 2 IN	1
17	XDOZZ		00333	50609928	.PIPE, 2 IN	1
18	PAOOO	4730-00-649-9100	58536	AA59326IX16	.CAP, QUICK DISCONNECT	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
19	PAOZZ	5330-00-612-2414	96906	MS27030-6	..GASKET 2 IN	1
20	XDOZZ	4010-00-360-0596	81718	H06683M	..CHAIN ASSEMBLY, SING 12 IN, CAP ASSY	1
21	XDOZZ		63711	1SK	..RING, KEY CAP ASSY	1
22	PBOZZ	5305-00-068-0509	80204	B1821BH025 C125N	SCREW, CAP, HEXAGON H 1/4-20 X 1 1/4 IN	8
23	PBOZZ	5310-00-809-4058	96906	MS27183-10	WASHER, FLAT 1/4 IN	8
24	XDOZZ	4730-01-416-1533	96906	MS27023-21	COUPLING HALF, QUICK 2IN	1
25	PAOZZ	5331-00-291-3085	96906	MS29513-250	O-RING	1

END OF FIGURE

UNIT MAINTENANCE

COLLAPSIBLE FABRIC TANK, 3,000,10,000, 20,000, 50,000 GALLON

FILLER/DISCHARGE ASSEMBLY

REPAIR PARTS LIST

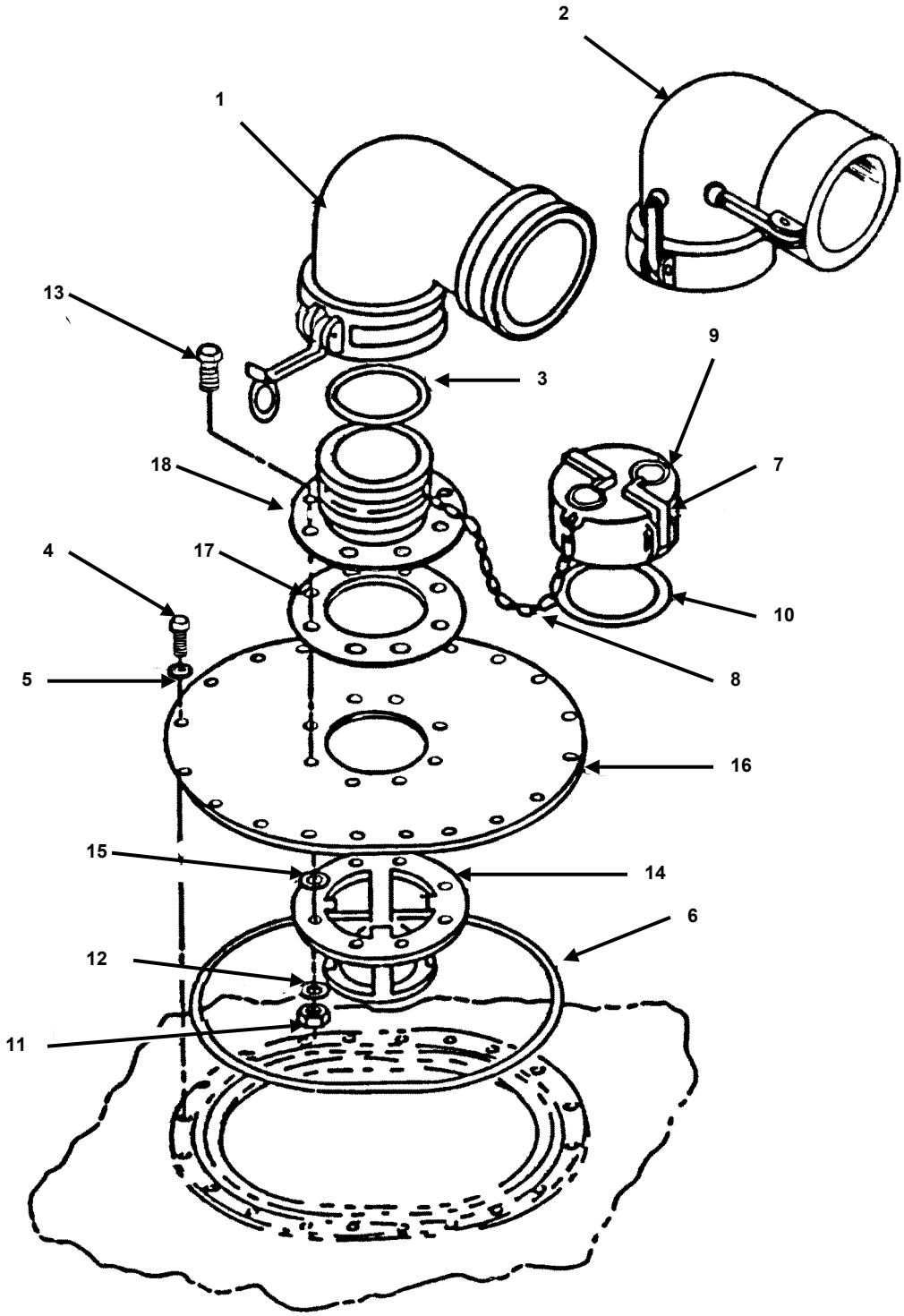


Figure 11. Filler/Discharge Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 ASSEMBLY FILLER/DISCHARGE	
					FIG. 11 FILLER/DISCHARGE ASSEMBLY	
1	XDOZZ		00333	50609362	ELBOW, FEMALE TO MALE, 4 IN, 90 DEG	1
2	XDOZZ		00333	50609789	ELBOW, QD, FEMALE TO FEMALE, 4 IN, 90 DEG	1
3	PBOZZ	5330-00-899-4509	96906	MS27030-9	GASKET 4 IN	1
4	PAOZZ	5305-00-225-3843	80204	B1821BH025 C100N	SCREW, CAP, HEXAGON H 1/4-20 X 1 IN	20
5	PAOZZ	5310-00-809-4058	96906	MS27183-10	WASHER, FLAT 1/4 IN UOC: EDC, ELS, EDD	20
6	PBOZZ	5331-00-364-9862	81343	AS3578-383	O-RING, 4 IN	1
7	PAOOZ	4730-00-640-6156	96906	MS27028-17	CAP, QUICK DISCONNEC 4 IN	1
8	PBOZZ	4010-00-360-0596	81718	H06683M	.CHAIN ASSEMBLY, SING 12 IN	1
9	PBOZZ		01976	1SK	.RING, KEY	2
10	PAOZZ	5330-00-899-4509	96906	MS27030-9	.GASKET 4 IN	1
11	PBOZZ	5310-00-732-0558	96906	MS51967-8	NUT, PLAIN, HEXAGON 3/8-16	8
12	PBOZZ	5310-00-637-9541	96906	MS35338-46	WASHER, LOCK 3/8 IN	8
13	PBOZZ	5305-00-725-2317	80204	B1821BH038 C150N	SCREW, CAP, HEXAGON H 3/8-16 X 1 1/2 IN	8
14	XDOZZ		00333	50609818	STUB, SUCTION	1
15	PAOZZ	5330-00-874-3744	83259	7500-3-8	GASKET 3/8 IN UOC: EDC, ELS, EDD	8
16	XDOZZ		00333	50862063	PLATE, CLOSURE	1
17	PAOZZ	5330-01-262-5120	05476	FCC-62398/ 50609735	GASKET	1
18	XDOZZ	4730-00-840-5347	96906	MS27023-17	COUPLING HALF, QUICK	1

END OF FIGURE

1

2 - 8

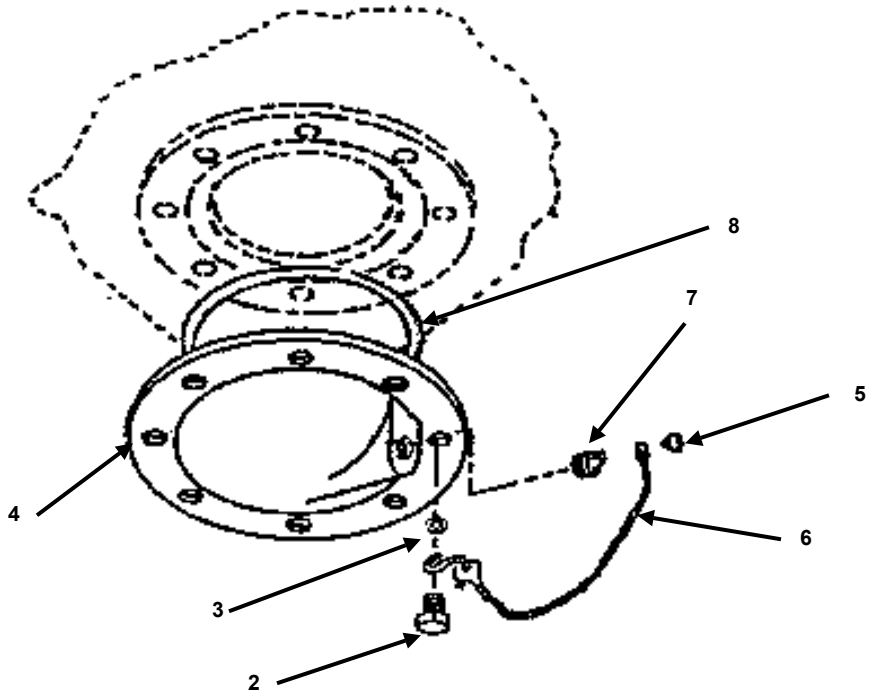


Figure 12. Tank Drain Fitting Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 FITTING ASSEMBLY, DRAIN	
					FIG. 12 DRAIN FITTING ASSEMBLY, TANK	
1	PBOZZ	5430-01-275-9478	74897	0061-28406	DRAIN FITTING ASSEMBLY UOC: FNR, EDC, EDD	2
2	PBOZZ	5305-00-225-3843	80204	B1821BH025 C100N	.SCREW, CAP, HEXAGON H 1/4-20 X 1 INCH UOC: EDC, EDD, FMC,FMD, FNR	8
3	PBOZZ	5310-00-809-4058	96906	MS27183-10	WASHER, FLAT 1/4 INCH UOC: EDC, EDD, FMC, EMD, FNR	8
4	XDOZZ		00333	50609926	.PLATE, COVER, DRAIN FITTING ASSY UOC: EDC, EDD	1
4	XBOZZ		10068	90031-4	DRAIN FITTING, 2 INCH UOC: FMC, FMD, FNR	1
5	XDOZZ		00333	50609923	.SCREW, DRAIN PLUG UOC: EDC, EDD, FMC, FMD, FNR	1
6	PBOZZ	4010-01-262-1354	00333	50609921	.CHAIN ASSEMBLY DRAIN PLUG UOC: EDC, EDD, FMC, FMD, FNR	1
7	XDOZZ		00333	50609922	.PLUG, DRAIN COVER PLATE UOC: EDC, EDD	1
7	XDOZZ		OA6K1	M52618/7P09XC	PLUG, 2 INCH DRAIN UOC: FMC, FMD, FNR	1
8	PAOZZ	5331-00-291-3085	96906	MS29513-250	.O-RING UOC: EDC, EDD, FMC, FMD, FNR	1

END OF FIGURE

1

2 - 8

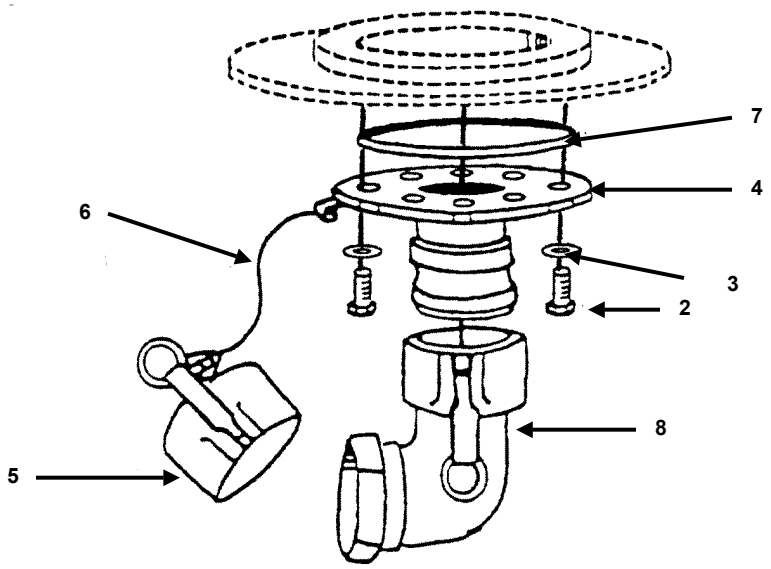


Figure 13. Berm Liner Drain Fitting Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 FITTING ASSEMBLY, DRAIN	
					FIG. 13 DRAIN FITTING ASSEMBLY, BERM LINER	
1	XDOZZ		66618	X-4775	DRAIN FITTING ASSY UOC: FCM, FCN	1
2	PBOZZ	5305-00-225-3843	80204	B1821BH025 C100N	.SCREW, CAP, HEXAGON H 1/4-20 X 1 IN UOC: FCM, FCN	8
3	PBOZZ	5310-00-809-4058	96906	MS27183-10	.WASHER, FLAT 1/4 IN UOC: FCM, FCN	8
4	XBOZZ	4730-01-416-1533	96906	MS27023-21	.ADAPTER, FLANGED 2 IN UOC: FCM, FCN	1
5	PBOOZ	4730-00-929-0787	96906	MS27028-15	.CAP, QUICK DISCONNECT DUST CAP UOC: FCM, FCN	1
6	PBOZZ	4010-01-262-1354	00333	50609921	..CHAIN ASSEMBLY DUST CAP SECURITY CHAIN UOC: FCM, FCN	1
7	PCOZZ	5331-00-291-3085	96906	MS29513-250	.O-RING UOC: FCM, FCN	1
8	XBOZZ		10068	13228E9842-4	.COUPLING HALF QUICK FEMALE INTERNAL THREADS UOC: FCM, FCN	1

END OF FIGURE

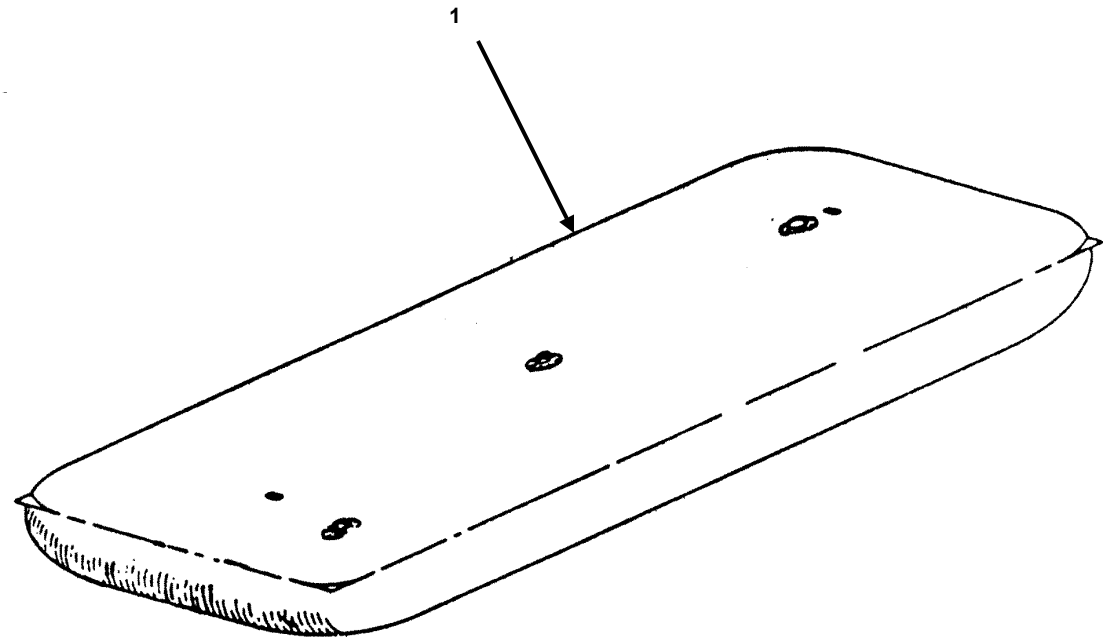


Figure 14. Tank

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 08 TANK	
					FIG. 14 TANK	
1	PAOOO	5430-01-455-5676	OCBB4	PD52983-50	TANK, 50K UOC: EDD	1
1	PAOOO	5430-01-479-5099	IDFDO	M52983-50	TANK, 50K UOC: EDC	1
1	PAOOO	5430-01-215-7525	66618	BA92-162	TANK, 20K UOC: ELS	1
1	PAOOO	5430-01-359-4943	66618	BA91-140	TANK, FABRIC, COLLAPS 20K GALLON, PETROLEUM UOC: FCM	1
1	PAOOO	5430-01-414-9252	66618	BA91-140A	TANK, FABRIC, COLLAPS 20K GALLON, PETROLEUM UOC: FMC	1
1	PAOOO	5430-01-358-6157	66618	BA91-141	TANK, FABRIC, COLLAPS 10K GALLON, PETROLEUM UOC: FCN	1
1	PAOOO	5430-01-414-9251	66618	BA91-141A	TANK, FABRIC, COLLAPS 10K GALLON, PETROLEUM UOC: FMD	1
1	PAOOO	5430-01-052-3412	00333	FCE574-81-1-A	TANK, FABRIC, COLLAPS 10K GALLON, PETROLEUM UOC: EQB	1
1	PAOOO	5430-00-641-8552	81996	SC5430-97 CLE01	TANK, FABRIC, COLLAPS 10K GALLON, PETROLEUM UOC: EQC	1
1	PAOOO	5430-01-433-8528	OXOJ8	WTM3KF	TANK, 3K UOC: FNR	1
1	PAOOO	5430-00-268-8187	81349	M52983B	TANK, 3K UOC: ECY	1

END OF FIGURE

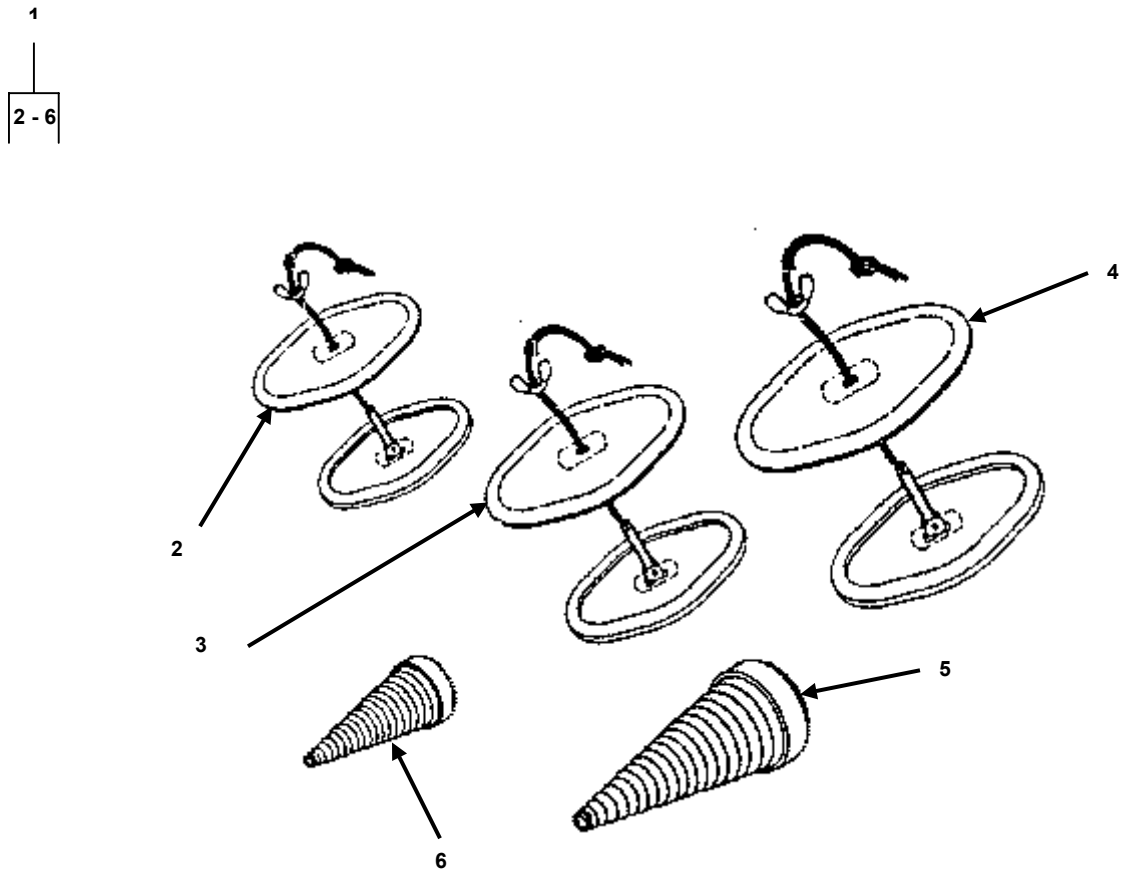


Figure 15. Emergency Repair Items

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION/USABLE ON CODE (UOC)	(7) QTY
					GROUP 09 REPAIR ITEMS, EMERGENCY	
					FIG. 15 EMERGENCY REPAIR ITEMS	
1	PAOZZ		81349	MILR52255	REPAIR KIT, COLLAPSIBLE ..... EMERGENCY UOC: ECY, FNR, EDC, EDD, ELS, EQB, EQC, FCM, FCN, FMC, FMD	1
2	KFOZZ	5342-00-720-8864	81336	13202E2870-1	.PATCH, MECHANICAL, FL ..... UOC:	4
3	KFOZZ	5342-00-720-8863	81336	13202E2870-2	.PATCH, MECHANICAL, FL ..... PART OF KIT P/N MILR22368 UOC:	2
4	KFOZZ	5342-00-720-8858	81336	13202E2870-3	.PATCH, MECHANICAL, FL ..... UOC:	2
5	KFOZZ	5510-00-255-9492	81336	13211E3084	.PLUG, WOOD, 5 IN ..... UOC:	2
6	KFOZZ	5510-00-255-9493	81336	13211E3085	.PLUG, WOOD, 3 IN ..... UOC:	2

END OF FIGURE

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5305-00-068-0509	10	22	5310-00-732-0558	1	9
5310-00-087-7493	1	12		2	7
	2	10		3	7
	3	10		11	11
5330-00-088-9166	1	3	4930-00-734-0180	10	1
	1	16	4930-00-786-9566	10	9
	6	2	5310-00-809-4058	10	23
5305-00-225-3843	11	4		11	5
	12	2		12	3
	13	2		13	3
5510-00-255-9492	15	5	4730-00-840-5347	1	13
5510-00-255-9493	15	6		2	11
5331-00-291-3085	10	25		3	11
	12	8		11	18
	13	7	4730-00-840-5348	1	15
4010-00-360-0596	1	4		2	13
	1	7		3	13
	2	4	5330-00-874-3744	11	15
	3	4	4730-00-889-2378	1	15
	10	20	4730-00-889-2380	1	13
	11	8	4730-00-889-5483	4	6
4820-00-595-1841	7	blank	5330-00-899-4509	1	3
5330-00-612-2414	10	16		1	16
	10	19		2	3
5310-00-637-9541	1	10		3	3
	2	8		6	2
	3	8		11	3
	11	12		11	10
4730-00-640-6156	1	2	4730-00-929-0787	1	2
	2	2		6	5
	3	2		13	5
	6	5	4730-00-929-0790	1	6
	11	7		6	4
4730-00-640-6188	1	6	4730-00-951-3293	6	3
	2	6	5331-00-364-9862	11	6
	3	6	5330-01-073-5007	5	10
	6	4	5315-01-073-8970	5	3
4730-00-649-9100	10	18	4820-01-076-8018	5	blank
4730-00-649-9103	10	15	5331-01-076-9342	5	11
4930-00-653-0407	4	5		5	15
5310-00-654-4537	4	1	5342-01-077-3664	5	5
5342-00-720-8858	15	4	5340-01-077-4942	4	2
5342-00-720-8863	15	3	4820-01-090-0877	5	blank
5342-00-720-8864	15	2	4820-01-090-0923	5	1
5305-00-725-2317	1	11	4820-01-159-0439	1	17
4820-01-189-2809	1	17		4	blank
	4	blank	5310-01-262-1337	4	3
5360-01-262-1338	4	4	5365-01-262-1339	4	6

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5330-01-262-1340	4	11	4820-01-262-1341	4	12
4820-01-262-1342	4	13	5305-01-262-1343	4	14
4820-01-262-1344	4	17	5310-01-262-1345	7	1
5310-01-262-1346	7	4	4820-01-262-1347	7	8
4820-01-262-1348	7	9	5310-01-262-1349	10	7
5430-01-262-1350	10	4	5310-01-262-1351	10	6
5320-01-262-1352	10	10	5320-01-262-1353	10	11
4010-01-262-1354	12	6	5430-01-455-5676	14	1
	13	6	5310-01-262-1359	4	1
5310-01-262-1360	4	7	5330-01-262-1361	10	2
5330-01-262-1362	7	6	5330-01-262-1363	4	5
5330-01-262-1364	7	5	5330-01-262-1365	4	8
4820-01-262-1366	4	15	4820-01-262-5079	1	1
5305-01-262-5080	10	5	5330-01-262-5120	1	14
4820-01-262-5121	4	16		2	12
4720-01-262-5146	6	1		3	12
5430-01-262-9475	10	14		11	17
5310-01-265-5044	4	9	5305-01-271-7588	4	8
5430-01-275-9478	12	1	5330-01-280-9388	1	14
5305-01-325-8387	2	9	5340-01-381-1621	5	4
	3	9	5340-01-381-1690	4	2
5330-01-381-2809	5	8	5305-01-382-5962	5	6
4310-01-382-6532	5	7	4730-01-416-1533	10	24
5430-01-479-5099	14	1	5430-01-414-9251	14	1
5430-01-215-7525	14	1	5430-01-052-3412	14	1
5430-01-359-4943	14	1	5430-01-641-8552	14	1
5430-01-414-9252	14	1	5430-01-433-8528	14	1
5430-01-358-6157	14	1	5430-01-268-8187	14	1

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON PART NUMBER INDEX

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON PART NUMBER INDEX

PART NUMBER	FIG.	ITEM	PART NUMBER	FIG.	ITEM
MS90725-64	2	9	235RF-0252N	4	1
	3	9	235RF-020621	4	5
M52618/7P09XC	12	7	235RF-020721	4	3
BA91-141A	14	1	235RF-02082P	4	6
BA91-140	14	1	235RF-02092G	4	11
M52983B	14	1	235RF-0210MD	4	15
SC5430-97CLE01	14	1	235RF-0210MD	4	15
P-2860H-400	5	1	235RF-0212MD	4	16
P-8449	5	4	235RF-0215MR	4	13
BA92-162	14	1	235RF-02162S	4	4
WTM3KF	14	1	235RF-0217MR	4	17
X-4775	13	1	235RF-02182S	4	14
X-7993-N	5	18	235RF-02192S	4	8
0061-28406	12	1	235RF-02202N	4	7
009240-3	7	blank	235RF-02212W	4	9
1SK	1	5	239-20023-01	6	1
	1	8	26264-L	4	12
	2	5	26399-N	5	14
	3	5	26462-N	5	9
	10	21	2864-L	4	3
	11	9	29001	8	18
1148-1	7	10	29002	8	10
1148-2	7	7	29003	8	15
1148-3	7	8	29004	8	16
1148-4	7	9	29005	8	17
1148-5	7	6	29006	8	13
1148-6	7	5	29007	8	9
1148-7	7	4	29008	8	14
1148-8	7	3	29009	8	11
1148-9	7	2	29010A	8	7
1148-10	7	1	29010B	8	12
13202E2870-1	15	2	29011	8	6
13202E2870-2	15	3	29012	8	5
13202E2870-3	15	4	29013	8	8
13211E3084	15	5	29014	8	2
13211E3085	15	6	29015	8	3
13228E9842-4	13	8	29016	8	4
1726-N	5	19	3042-L	4	18
205-18-98	10	7	3116M	4	1
2093-7	4	19	3198-B	4	7
2222191	8	1	363-G	4	5
23194-L	4	10	38084-3	4	9
235RF-0200AV	1	17	38194-N	5	17
	4	blank	4IN-CS15-F	3	14
235RF-0201MB	4	19	4201035000	10	11
235RF-0202MB	4	10	4201232400	10	10
235RF-0203MB	4	12	42136-N	5	6
235RF-02043A	4	2	4247-E	4	8

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON PART NUMBER INDEX

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON COMPONENTS OF END ITEMS (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

INTRODUCTION

This work package lists COEI and BII for the 3,000 Gallon, 10,000 Gallon, 20,000 Gallon or 50,000 Gallon collapsible fabric tank to help inventory items for safe and efficient operation of the equipment.

General

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for informational purposes only, and is not authority to requisition replacements. These items are part of the collapsible fabric fuel tank. 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 in identifying the items.

Basic Issue Items (BII). These essential items are required to place a 3,000 Gallon, 10,000 Gallon, 20,000 Gallon or 50,000 Gallon collapsible fabric fuel tank in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the collapsible fabric fuel tank during operation and whenever it is transferred between property accounts. Listing these items is authority to request/requisition items for replacement based on authorization of the end item by TOE/MTOE. Illustrations are furnished to help find and identify the items.

Explanation of Columns in the COEI List and BII List

Column (1), Illus Number, gives the number of the item illustrated.

Column (2), National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.

Column (3), Description, CAGEC, and Part Number, identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the CAGEC (Commercial and Government entity code) (in parentheses) and the part number.

Column (4), Usable on Code, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

Code	Used On
ECY	3,000 Gallon, Model MIL-T-52983B
FNR	3,000 Gallon, Model WTM3KF
EQB	10,000 Gallon, Model FCE574-81-1-A
EQC	10,000 Gallon, SC5430-97CLE01
FCN	10,000 Gallon, Model BA91-141
FMD	10,000 Gallon, Model BA91-141A
ELS	20,000 Gallon, Model BA92-162
FCM	20,000 Gallon, Model BA91-140
FMC	20,000 Gallon, Model BA91-140A
EDD	50,000 Gallon, Model PD52983-50
EDC	50,000 Gallon, Model M52983-50

Column (5), U/M (unit of measure), indicates how the item is issued for the National Stock Number shown in column (2).

Column (6) Qty Rqr, indicates the quantity required.

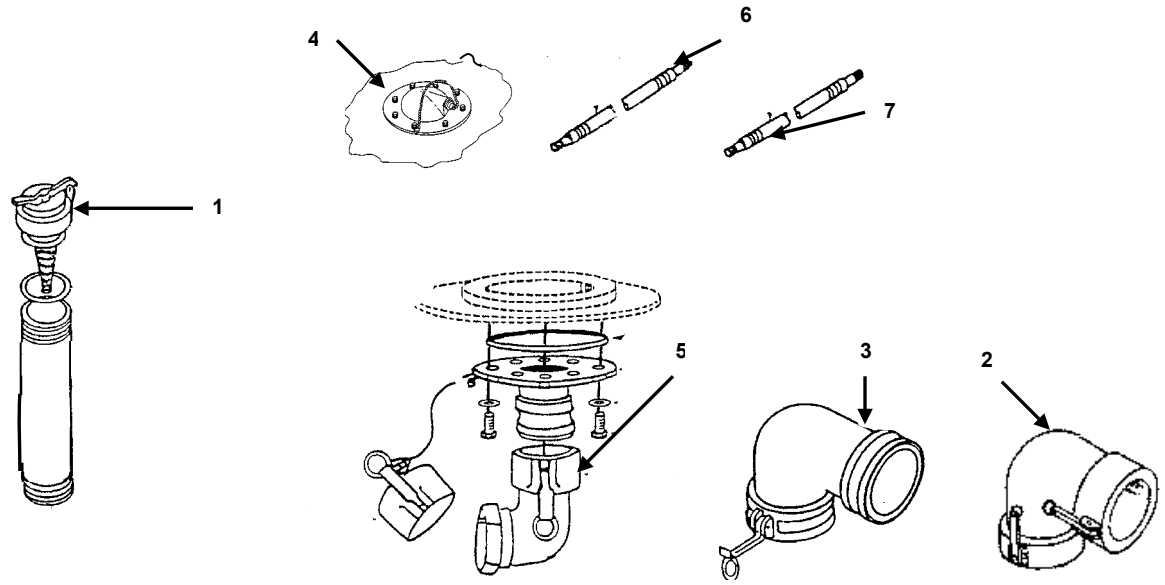


Table 1. Components of End Item List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1	4930-00-734-0180	STRAINER ELEMENT (49234) EX1333B	EDC, FCN, FCM, ELS, EDD	EA	1
2		ELBOW, QUICK DISCONNECT FEMALE/FEMALE (00333) 50609789	EDC, FCN, FCM, ELS, EDD	EA	1
3		ELBOW, QUICK DISCONNECT FEMALE/MALE (00333) 50609362	EDC, FCN, FCM, ELS, EDD	EA	1
4	5430-01-275-9478	FITTING ASSEMBLY, DRAIN ½" (74897) 0061-28406	EDC, ELS, EDD	EA	1
5		FITTING ASSEMBLY, DRAIN 2.0" (66618) X-4775	FCN, FCM, FNR	EA	1

Table 1. Components of End Item List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
6		HOSE ASSEMBLY, DRAIN ½" (00333) 5068694	EDC, ELS	EA	1
7		HOSE ASSEMBLY, DRAIN 2.0" (OA6KI) 28148	FCN, FCM, FNR	EA	1
		HOSE ASSY, DRAIN 2.0" (OCBB4) M370B06C2A0960	EDD	EA	2
8		HOSE ASSEMBLY, 4.0" FILLER/DISCHARGE (OD333) 50609892	EDC, ELS, FCM, FMD, FCN, FMC	EA	2
		(0CBB4) M370B09824A0960	EDD	EA	1
		HOSE ASSEMBLY, 3.0" FILLER/DISCHARGE (OA6KI) D102408 or (74897) 239-20023-01	ECY, FNR		
9	5430-01-262-9475	PIPE AND COUPLER ASSEMBLY, VENT (00333) 50609780 or (80691) 20VPALTM	EDC, FCN, FCM, ELS, FNR, EDD	EA	1
10	5430-01-455-5676	TANK, FABRIC, COLLAP-SIBLE 50,000-GALLON (OCBB4) PD52983-50	EDD	EA	1
	5430-01-479-5099	TANK, FABRIC, COLLAP-SIBLE 50,000-GALLON (IDFDO) M52983-50	EDC	EA	1
	5430-01-215-7525	TANK, FABRIC, COLLAP-SIBLE 20,000-GALLON (66618) BA92-162	ELS	EA	1
	5430-01-359-4943	TANK, FABRIC, COLLAP-SIBLE 20,000-GALLON (66618) BA91-140	FCM	EA	1
	5430-01-414-9252	TANK, FABRIC, COLLAP-SIBLE 20,000-GALLON (66618) BA91-140A	FMC	EA	1
	5430-01-358-6157	TANK, FABRIC, COLLAP-SIBLE 10,000-GALLON (66618) BA91-141	FCN	EA	1
	5430-01-414-9251	TANK, FABRIC, COLLAP-SIBLE 10,000 GALLON (66618) BA91-141A	FMD	EA	1

Table 1. Components of End Item List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
	5430-01-052-3412	TANK, FABRIC, COLLAP-SIBLE 10,000 GALLON (00333) FCE574-81-1-A	EQB	EA	1
	5430-01-641-8552	TANK, FABRIC, COLLAP-SIBLE 10,000 GALLON (81996) SC5430-97CLE01	EQC	EA	1
	5430-01-433-8528	TANK, FABRIC, COLLAP-SIBLE 3,000-Gallon (0X0J8) WTM3KF	FNR	EA	1
	5430-01-268-8187	TANK, FABRIC, COLLAP-SIBLE 3,000 GALLON (81349) M52983B	ECY	EA	1
11	4820-01-189-2809	GATE VALVE ASSEMBLY, 4.0” FILLER/DISCHARGE (00333) 50610130 or (76364) 235RF-0200 AV	EDC, ELS, FNR, EDD	EA	1
	4820-01-159-0439	(76364) 5551-001 4 IN.	ECY	EA	1
12	4820-00-595-1841	VALVE, ½” DRAIN GATE (67060) 009240-3	FNR, EDC, ELS, EQB	EA	1

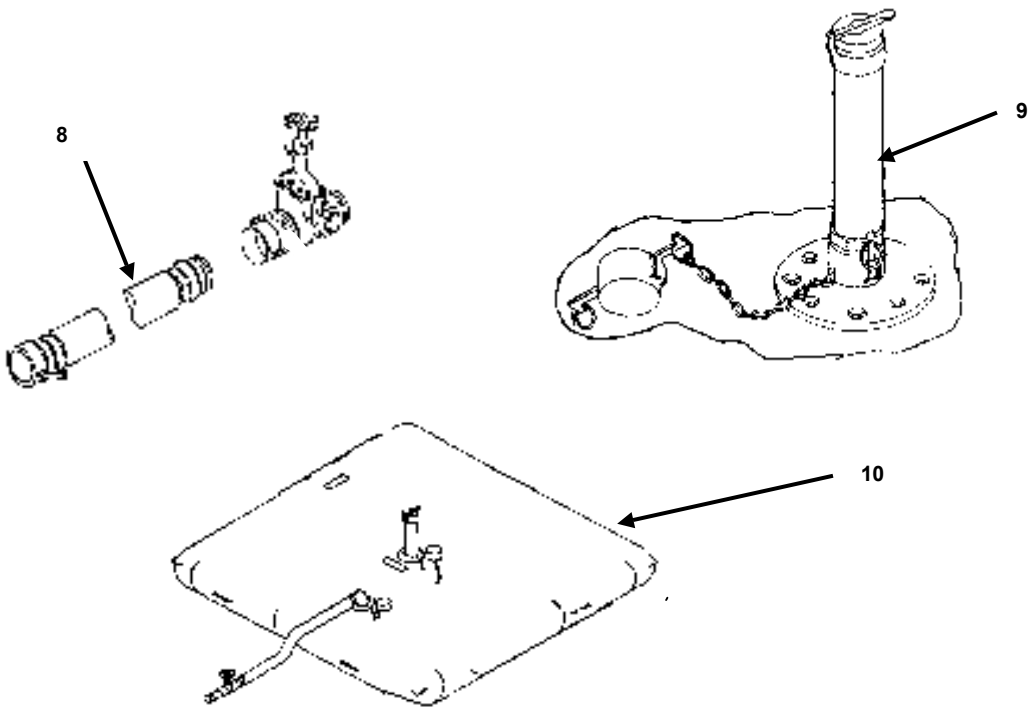


Table 1. Components of End Item List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
13	4820-01-090-0923	BUTTERFLY VALVE ASSEMBLY (76364) P-2680H-400	FCN, FCM	EA	1
14		DRAIN BALL VALVE (OA6K1) 2222191	FCN, FCM, FMD, FMC, FNR, EDD	EA	1
15		BALL VALVE, FILLER/DISCHARGE 4IN-C515-F (OA6K1)	FCN, FCM, FMD, FMC	EA	1

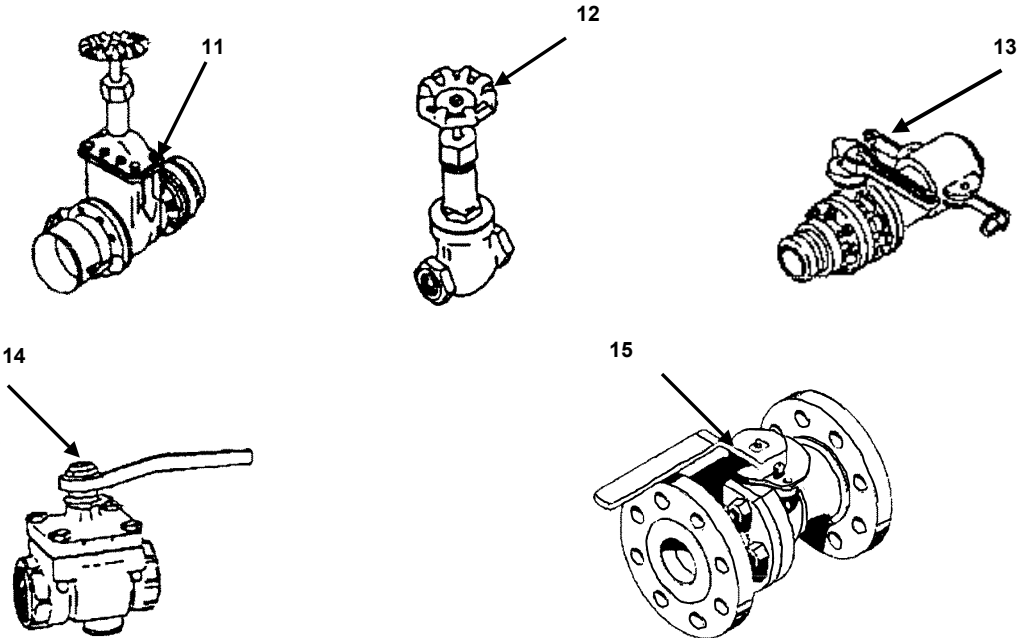
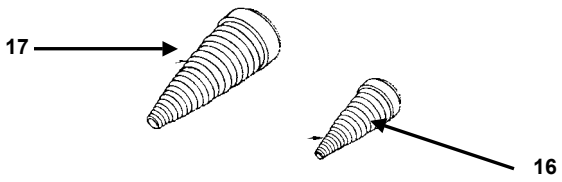
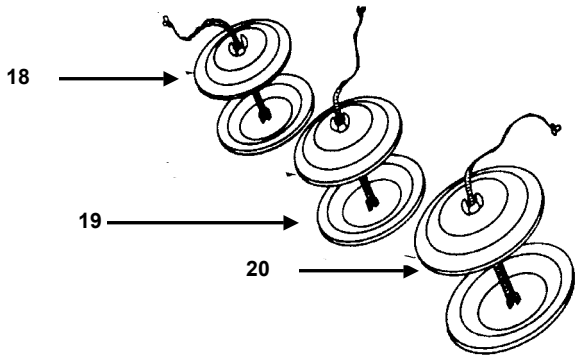


Table 1. Components of End Item List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
16	5510-00-255-9493	PLUG, WOOD, 3 INCH (97403), 13211E3085		EA	2
17	5510-00-255-9492	PLUG, WOOD, 5 INCH (97403), 13211E3084		EA	2
18	5340-00-720-8864	PATCH, MECHANICAL, FI,-3 INCH (81336), 13202E2870-1		EA	4
19	5340-00-720-8863	PATCH, Mechanical, FI,-5 inch (81336), 13202E2870-2		EA	2
20	5340-00-720-8858	PATCH, MECHANICAL, FI, 7-1/2 INCH (81336), 13202E2870-3		EA	2





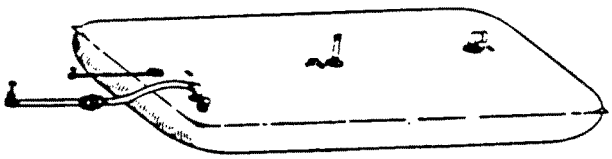
TM 10-5430-238-12&P

TECHNICAL MANUAL

OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

TANK, FABRIC, COLLAPSIBLE, FUEL STORAGE

3,000 GALLON, MODEL WTM3KF (EIC-ZVM)/
MIL-T-52983B (EIC=ZC8)
(NSN 5430-01-433-8528)/(NSN 5430-00-268-8187)
10,000 GALLON, MODEL BA91-141 (EIC=ZF3)/BA91-141A (EIC=ZVL)
FCE574-81-1-A (EIC=) (EXTRA ACCESSORIES)/
SC5430-97CLE01 (EIC=ZFN)
(NSN 5430-01-358-6157)/(NSN 5430-01-414-9251)
(NSN 5430-00-052-3412)/(NSN 5430-00-641-8552)
20,000 GALLON, MODEL BA91-140 (EIC-ZF2)/
BA91-140A (EIC=)/BA92-162 (EIC=ZFR)
(NSN 5430-01-359-4943)/(NSN 5430-01-414-9252)/
(NSN 5430-01-215-7525)
50,000 GALLON, MODEL PD52983-50 (EIC=)/M52983-50 (EIC=ZFB)
(NSN 5430-01-455-5676)/(NSN 5430-00-182-8181)



This manual supersedes TM 5-5430-219-13, dated 31 August 1987, TM 5-5430-210-12, dated 30 November 1978 and TM 5-5430-219-23P, dated 31 August 1988 including all changes.

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

28 DECEMBER 2001

Table 2. Basic Issue Items List.

(1) ILLUS. NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR.
1		TECHNICAL MANUAL, OPERATOR AND UNIT MAINTENANCE (INCL. RPSTL) TM 10-5430-238-12&P		EA	1

END OF WORK PACKAGE

**OPERATOR AND UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)
COLLAPSIBLE FABRIC TANK,
3,000, 10,000, 20,000, 50,000 GALLON
ADDITIONAL AUTHORIZATION LIST (AAL)**

ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION

Scope

This work package lists additional items authorized for the support of the collapsible fabric fuel storage tanks.

General

This list identifies items that do not have to accompany the collapsible fabric fuel storage tank, and do not have to be turned in with it. These items are all authorized by CTA, MTOE, TDA, or JTA.

Explanation of Columns in the AAL

Column (1) – National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) – Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the CAGEC (in parentheses) and the part number.

Column (3) – Usable On Code. When applicable, gives a code if the item needed is not the same for different models of equipment.

Column (4) – Unit of Measure (U/M). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) – Qty Recm. Indicates the quantity recommended.

ADDITIONAL AUTHORIZED LIST ITEMS

Table 1. Additional Authorization List.

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION, CAGEC AND PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM.
5430-01-237-3659	LINER, BERM, FABRIC TANK (81349) M53081-2	FCN	EA	1
5430-01-237-3660	LINER, BERM, FABRIC TANK (81349) M53081-3	ELS, FCM	EA	1
5430-01-237-3661	LINER, BERM, FABRIC TANK (81349) M53081-4	EDC	EA	1
5430-01-237-3658	LINER, BERM, FABRIC TANK (81349) M53081-1	FNR	EA	1

Table 1. Additional Authorization List

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION, CAGEC AND PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM.
5430-01-359-1078	REPAIR KIT, COLLAPSIBLE FABRIC FUEL STORAGE TANK (ROCTAD) (0F6E1) BOV-USA-1		EA	1

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

This work package lists expendable and durable items needed to operate and maintain the collapsible fabric fuel tank. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except for Medical, Class V Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanations of Columns in the Expendable/Durable Items List

Column (1) - Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., "Use lubricating oil (Item 10, WP 0039 00).").

Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item (C=Operator/Crew).

Column (3) - National Stock Number. This is the NSN assigned to the item used to requisition it.

Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGE), and Part Number (P/N). This column provides the other information needed to identify the item.

Column (5) - Unit of Measure (U/M). This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
1	C	9150-00-231-6689	LUBRICATING OIL, GENERAL PURPOSE (81349) MIL-PRF-32033	QT
2	O	5350-00-221-0872	CROCUS CLOTH (80204) ANSI B74.18	SH
3	O	5350-00-221-0872	DETERGENT (81349) MIL-D-16791	GL
4	O	6850-00-281-1985	DRY CLEANING SOLVENT (58536) A-A-59601	GL
5	O	9150-00-261-8291	GREASE, PLUG VALVE (81343) SAE AMS-G-6032	EA
6	O	7920-00-205-1711	RAG, WIPING (80244)	LB
7	O	8030-00-889-3534	ANTI-SEIZE TAPE, POLYTERAFLUORSETHYLENE (81349) MIL-T-27730	EA

Table 1. Expendable and Durable Items List

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE, PART NUMBER	(5) U/M
8	O	8030-00-543-4384	SEALING COMPOUND, THREAD AND GASKET, FUEL, OIL AND WATER (81343) AMS-S-7916	LB
9	O	6850-00-880-7613	SILICONE COMPOUND (81343) SAE-A58660	OZ
10	O	6810-01-080-9589	TECHNICAL TALC, T1 AND T3 (81349) MIL-T-50036	LB

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON TORQUE LIMITS

INTRODUCTION

This work package provides general torque limits for fasteners. Special torque values are indicated in the maintenance procedures for applicable components. The general torque values given in this work package shall be used when specific torque values are not indicated in the maintenance procedures.

Torque Limits

Torque limits are listed in Table 1 for fasteners. Dry fasteners are defined as fasteners on which no lubricants are applied to the threads. Wet fasteners are defined as fasteners on which graphite or moly-disulphide greases or other extreme pressure lubricants are applied to the threads. Table 2 lists the minimum breakaway torque values for locknuts.

Table 1. General Torque Requirements for Dry Fasteners*

	Torque Requirement in lb ft (N•m)			
Bolt/Screw Size	**SAE Grade 1 or 2**	**SAE Grade 5**	**SAE Grade 6 or 7**	**SAE Grade 8**
1/4-20 UNC	5 (7)	8 (11)	10 (14)	12 (16)
1/4-28 UNF	7 (8)	10 (14)	12 (16)	14 (19)
5/16-18 UNC	11 (15)	17 (23)	19 (26)	24 (33)
5/16-24 UNF	13 (18)	19 (26)	23 (31)	27 (37)
3/8-16 UNC	18 (24)	31 (42)	34 (46)	44 (60)
3/8-24 UNF	20 (27)	35 (47)	42 (57)	49 (66)
7/16-14 UNC	28 (38)	49 (66)	55 (75)	70 (95)
7/16-20 UNF	30 (41)	55 (75)	67 (91)	78 (106)
1/2-13 UNC	39 (53)	75 (102)	85 (115)	105 (142)
1/2-20 UNF	41 (56)	85 (115)	102 (138)	120 (163)
9/16-12 UNC	51 (69)	110 (149)	120 (163)	155 (210)
9/16-18 UNF	55 (75)	120 (163)	145 (197)	170 (231)
5/8-11 UNC	63 (85)	150 (203)	167 (226)	210 (285)
5/8-18 UNF	95 (129)	170 (231)	205 (278)	240 (325)
3/4-10 UNC	105 (142)	270 (366)	280 (380)	375 (509)
3/4-16 UNF	115 (156)	295 (400)	357 (484)	420 (570)
7/8-9 UNC	160 (217)	395 (536)	440 (597)	605 (820)
7/8-14 UNF	175 (237)	435 (590)	555 (753)	675 (915)
1-8 UNC	235 (319)	590 (800)	660 (895)	910 (1234)
1-14 UNF	250 (339)	660 (865)	825 (1119)	999 (1342)
1-1/8-7 UNC	350 (475)	800 (1085)	1000 (1356)	1280 (1736)
1-1/8-12 UNF	400 (542)	880 (1193)	1050 (1424)	1440 (1953)
1-1/4-7 UNC	500 (678)	1080 (1464)	1325 (1797)	1820 (2468)
1-1/4-12 UNF	550 (746)	1125 (1526)	1325 (1797)	1820 (2712)
1-3/8-6 UNC	660 (895)	1460 (1980)	1800 (2441)	2380 (3227)
1-3/8-12 UNF	740 (1003)	1680 (2278)	1960 (2658)	2720 (3688)
1-1/2-6 UNC	870 (1180)	1940 (2631)	2913 (3950)	3160 (4285)
1-1/2-12 UNF	980 (1329)	2200 (2983)	3000 (4068)	3560 (4827)

*Torque given is for clean, dry threads. Reduce by 10% when engine oil is used as lubricant.

Table 2. Locknut Breakaway Torque Values

NOTE

To determine breakaway torque, thread locknut onto screw or bolt until at least two threads stick out. The locknut shall not make contact with a mating part. Stop the locknut. Torque necessary to begin turning locknut again is the breakaway torque. Do not reuse locknuts that do not meet minimum breakaway torque requirements.

Thread Size	Minimum Breakaway Torque	
	lb-in.	(N·m)
10-32	2.0	(0.23)
1/4-28	3.5	(0.40)
5/16-24	6.5	(0.73)
3/8-24	9.5	(1.07)
7/16-20	14.0	(1.58)
1/2-20	18.0	(2.03)
9/16-18	24.0	(2.71)
5/8-18	32.0	(3.62)
3/4-16	50.0	(5.65)
7/8-14	70.0	(7.91)
1-12	90.0	(10.17)
1-1/8-12	117.0	(13.22)

END OF WORK PACKAGE

OPERATOR AND UNIT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) COLLAPSIBLE FABRIC TANK, 3,000, 10,000, 20,000, 50,000 GALLON MANDATORY REPLACEMENT PARTS LIST

INTRODUCTION

This work package includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds fired, etc.

MANDATORY REPLACEMENT PARTS LIST

Table 1. Mandatory Replacement Parts List

ITEM #	PART NUMBER	CAGE	NSN	NOMENCLATURE	QTY
1	MS27030-9	96906	5330-00-899-4509	GASKET 4 IN.	6
2	MS27030-6	96906	5330-00-612-2414	GASKET 2 IN.	3
3	FCC-62398/50609735	05476	5330-01-262-5120	GASKET	7
4	MS35338-46	96906	5310-00-637-9541	LOCKWASHER	32
5	235RF-02092G	41592	5330-01-262-1340	GASKET, VALVE BONNET	1
6	235RF-02212W	41592	5310-01-265-5044	LOCKWASHER	8
7	869-N-940	76364	4820-01-076-8018	PARTS KIT, VALVE	1
8	8621-N-940	76364	4820-01-090-0877	PARTS KIT, BUTTERFLY	1
9	6595-N	76364	5330-01-381-2809	SEAL, PLAIN ENCASED	1
10	1148-5	76364	5330-01-262-1362	PACKING MATERIAL	1
11	29008	OA6K1		BONNET GASKET	1
12	29010A	OA6K1		STEM SEAL	1
13	29010B	OA6K1		STEM SEAL	1
14	EX1333B-18-95	49234	5330-01-262-1361	GASKET CAP	1
15	MS29513-250	96906	5330-01-262-1361	O-RING	1
16	205-18-98	49234	5330-01-262-1349	RELIEF CAP GASKET	1
17	AS29513-383	81343	5330-01-067-3449	O-RING	1
18	7500-3-8	83259	5330-00-874-3744	GASKET	8

END OF WORK PACKAGE

GLOSSARY

ABBREVIATIONS

AAL ..... Additional Authorization List
Assy ..... Assembly
BII..... ...Basic Issue Items
bu ..... .Bundle
°C ..... Degree Celsius
CAGEC .....…Commercial and Government Entity Code
COEI ..... Components of End Item
EIR ..... Equipment Improvement Recommendations
ESC ..... . Equipment Serviceable Criteria
°F .....Degree Fahrenheit
Fed .....Federal
gl ..... Gallon
illus .....…..Illustration
MTOE..... Modified Table of Organization and Equipment
MWO .....…. Modification Work Order
NSN .....…. National Stock Number
PMCS..... Preventive Maintenance Checks and Services
QA/QC .....…..Quality Assurance/Quality Control
Qty .....…..…… Quantity
Rqr .....…Required
Spec .....…….Specification
TAMMS ..... The Army Maintenance Management System
TMDE .....……. Test, Measurement, and Diagnostic Equipment
U/M ..... .Unit of Measure

DEFINITION OF TERMS

A

APPENDIX - A collection of supplementary material at the end of a book.

APPROVED - Permitted to be used for a specific purpose by the person or group who is authorized to grant approval.

ASSEMBLY - A combination of parts that may be taken apart without destruction, which has no application or use of its own but is needed for the completeness of a more complex item with which it is combined, or to which it is attached.

C

COMPONENT - A part or a combination of parts, which together accomplish a function.

E

EXPENDABLE - An item that is not repairable and is discarded if damaged.

EXPOSURE - Being in the presence of something, or in contact with something. Skin is exposed to cleaning solvent when the solvent contacts the skin during cleaning operations.

L

LEGIBLE - Capable of being read. A legible nameplate can be read; an illegible plate cannot.

M

MALFUNCTION - Occurs when a unit fails to operate normally.

MANUFACTURER – The company which makes an item or piece of equipment for sale.

MATERIEL - Equipment, apparatus, and supplies of an organization such as an army.

R

RECOMMENDATIONS - Suggestions for change; advice given usually to make an improvement.

REQUIRE - To demand or need.

S

SCOPE - The extent of an activity or concept; the amount of information covered as in a book.

SOLVENT - A liquid that can dissolve another substance.

T

TORQUE - Force around an axis. It produces a rotary or twisting motion, and is measured in foot-pounds (ft-lb) or newton-meters (N• m).

V

VENTILATE - To provide with a source of fresh or uncontaminated air.

VISUAL - Visible; detected by the unaided eye.

INDEX

INDEX

INDEX

Subject **WP Sequence No. - Page No.**

M

N

O

INDEX

INDEX

By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0127409

To be distributed in accordance with the initial distribution number (IDN) 256702 requirements for TM 10-5430-238-12&P.

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17 and 27.

From: "Whomever" whomever@avma27.army.mil
To: tacom-tech-pubs@tacom.army.mil

Subject DA Form 2028

1. ***From:*** Joe Smith
2. ***Unit:*** home
3. ***Address:*** 4300 Park
4. ***City:*** Hometown
5. ***St:*** MO
6. ***Zip:*** 77777
7. ***Date Sent:*** 19-OCT-93
8. ***Pub no:*** 55-1915-200-10
9. ***Pub Title:*** TM
10. ***Publication Date:*** 11-APR-88
11. ***Change Number:*** 12
12. ***Submitter Rank:*** MSG
13. ***Submitter Fname:*** Joe
14. ***Submitter Mname:*** T
15. ***Submitter Lname:*** Smith
16. ***Submitter Phone:*** 123-123-1234
17. ***Problem:*** 1
18. ***Page:*** 1
19. ***Paragraph:*** 3
20. ***Line:*** 4
21. ***NSN:*** 5
22. ***Reference:*** 6
23. ***Figure:*** 7
24. ***Table:*** 8
25. ***Item:*** 9
26. ***Total:*** 123
27. ***Text:***
This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-5430-238-12&P	28 December 2001	Tank, Fabric, Collapsible, Fuel Storage

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: *(Forward direct to addressee listed in publication)*	**FROM:** *(Activity and location) (Include ZIP Code)*	DATE

PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III - REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

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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 decameters = 328.08 feet
l kilometer =10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .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. decameter =1000 cu. centimeters = 61.02 cu. inches
1 cu. meter =1000 cu. decimeters = 35.31 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: 079312-000