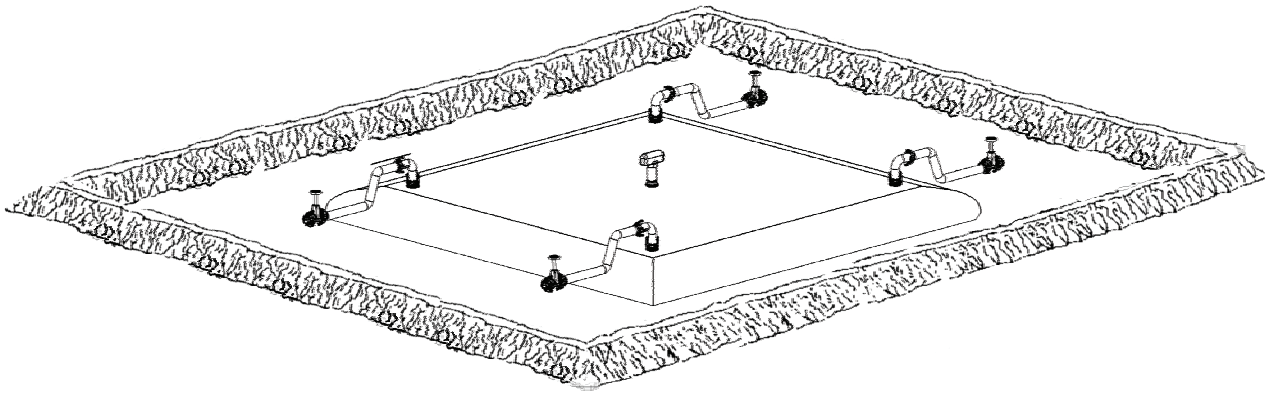
TM 10-5430-252-13&P

TECHNICAL MANUAL

OPERATOR AND FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) FOR TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 (Depot)
and
5430-01-557-2990 (IPDS)



HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 2008

WARNING SUMMARY

GENERAL WARNING PRECAUTIONS

This warning summary contains general safety warnings and hazardous materials 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. Also included are explanations of safety and hazardous materials icons used within this technical manual.

SPECIFIC WARNING PRECAUTIONS

WARNING

Do not enter tank without authorized breathing apparatus. Death may result.

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

Do not smoke or bring open flame within 100 feet (30.48 meters) of tank.

If fuel spills on or around a tank within the diked area, shutdown any nearby engine-driven equipment. Do not resume operation until it has been determined that the vapor concentrations are below the explosive range.

All petroleum products contain additives that may be harmful to personnel and the environment. All leaks must be corrected as soon as possible. Wash fuel or oil from skin immediately. Remove and wash contaminated clothing immediately. Spills of fuel or oil must be cleaned up in accordance with local area direction to prevent harm to personnel or damage to the environment.

Fuel and fuel sludge can cause injury to skin and eyes. If fuel or sludge comes into contact with eyes, flush eyes with water. For further information of first aid refer to FM 21-11.

Do not carry or store anything edible near tank. Food will absorb vapors. After leaving area wash before eating or smoking.

Do not deploy the tank system on a slope greater than 10%. Personnel injury or equipment damage may occur.

Do not locate tank system near electrical equipment, power generation or power distribution equipment. Electrical shock, death or equipment damage may result (if the tank ruptures).

The packaged tank is heavy. Sixteen personnel are required to deploy system. Always lift with your legs not your back. Failure to observe this warning may result in back injury.

Do not fill if the tank has trapped air. Filling the tank with fuel if air is trapped in the tank could cause tank rupture.

Use caution to ensure fingers are not caught or pinched in the valve's cam lock lever.

SPECIFIC WARNING PRECAUTIONS (cont.)

Use caution when walking near the tank system. Valves and hoses can cause tripping.

Use only approved cleaning chemicals. Personnel injury and equipment damage may occur.

Do not use decontamination spray on personnel. It could cause personal injury. (This Caution was used in the TM)

Do not overfill the tank. Damage to the tank will occur if overfilled. If metering gauge is not available, tank is full when tank height reaches specified marks (on tank).

Do not swim or bathe in filled tank. Personnel should not enter tank unless it is empty and only to clean when required. Personnel injury, suffocation or equipment damage may occur.

Do not lift or move the tank with the lift handles if there is any fuel remaining in the tank. Personal injury or damage to the handles and/or tank may occur.

List of Warnings, Cautions, and Notes found in Manual

CH 1:

None

CH 2:

WARNING

Make certain that the berm ball valve is closed and locked after installing and draining the berm. In the event of tank rupture, an open berm ball 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 below ground level. Retain a slight incline for draining surface water. Safety berms must have capacities of not less than one and one halftimes that of the tank capacities. Failure to construct a secure safety berm may result in catastrophic damage.

CAUTION

Remove all protruding nails and other objects before attempting to remove the tank from the container. Failure to heed this caution can result in tearing the tank.

WARNING

The lifting device must have a minimum lifting capacity of 10,000 lbs. Failure to heed this warning can cause injury or death to personnel as well as damage to equipment.

SPECIFIC WARNING PRECAUTIONS (cont.)

WARNING

When filling the tank with fuel, verify that the drain 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 heed this warning can cause death or severe personal injury and damage to equipment.

WARNING

Check that the drain valve is closed. The valve is closed when the handle is rotated fully in the clockwise direction. Failure to close valve can cause loss of fuel and possible fire or explosion with possible death or severe personal injury and damage to equipment.

WARNING

Use caution to ensure fingers are not caught or pinched in the cam lock levers.

CAUTION

Ratchet straps must not be left under the tank because the buckles can tear the tank. Failure to heed this caution can cause tank rupture.

CAUTION

Use caution when operating sharp, cutting objects near, on or around the tank. Failure to heed this caution can result in tearing the tank

WARNING

When filling the tank with fuel, verify that the drain 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 heed this warning can cause death or severe personal injury.

WARNING

Check that the drain valve is closed. The valve is closed when the handle is rotated fully in the clockwise direction. Failure to close valve can cause loss of fuel and possible fire or explosion.

WARNING

Use caution to ensure fingers are not caught or pinched in the valve's cam lock levers.

CAUTION

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

WARNING

Check the placement of 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.

SPECIFIC WARNING PRECAUTIONS (cont.)

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.

Ensure that all cam locks are in the proper locked position before filling the tank. Improperly closed connections are cause for leaks which can cause serious injury or death by fire or explosion.

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 three-year service life beginning on the date when it is first filled. Shelf storage life is twelve years from the date of manufacture. Users must initiate action to replace over-aged tanks. Failure to heed this caution can cause tank rupture.

WARNING

Do not exceed maximum fill capacity. The fuel tank will burst if it is overfilled, causing damage to the equipment. Failure to heed this warning can cause injury or death to personnel.

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

WARNING

Do not exceed maximum pressure of 50 pounds per square inch. Failure to heed this warning can cause injury or death to personnel.

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.

SPECIFIC WARNING PRECAUTIONS (cont.)

CAUTION

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

WARNING

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

CH 3:

None

CH 4:

WARNING

When servicing this equipment, performing maintenance or disposing of materials such as oil, fuel and CARC paint, consult your unit/local hazardous waste disposal center or safety office for local regulatory guidance.

CH 5:

WARNING

Improper cleaning methods and use of unauthorized cleaning liquids or solvents can injure personnel and damage equipment. To prevent this, refer to TM 9-247, *(Materials Used for Cleaning, Preservation, Abrading and Cleaning Ordnance Material and Related Materials Including Chemicals)* for further instructions.

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

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.

SPECIFIC WARNING PRECAUTIONS (cont.)

WARNING

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.

CAUTION

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

CAUTION

If replacement cap screws are of higher grade than originally supplied, use torque specification for the original. This will prevent equipment damage due to possible overtorquing.

CH 6:

None

CH 7:

None

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: Zero in the "Change No." column indicates an original page or work package.

Dates of issue for original and updated pages/work packages are:

Original . . . . . 12 September 2008

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 38 AND TOTAL NUMBER OF WORK PACKAGES IS 39 CONSISTING OF THE FOLLOWING:

TM 10-5430-252-13&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINTON, D.C., 12 SEPTEMBER 2008

TECHNICAL MANUAL

OPERATOR AND FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) FOR

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 (Depot) and 5340-01-557-2990 (IPDS)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any errors, or if you would like to recommend any improvements to the procedures in this publication, please let us know. The preferred method is to 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 https://aeps.ria.army.mil. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, email, or fax your comments or DA Form 2028 directly to: U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-LMPP/TECH PUBS, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is tacomlcmc.daform2028@us.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

DISTRIBUTION STATEMENT A - Approved for public release. Distribution unlimited.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont).

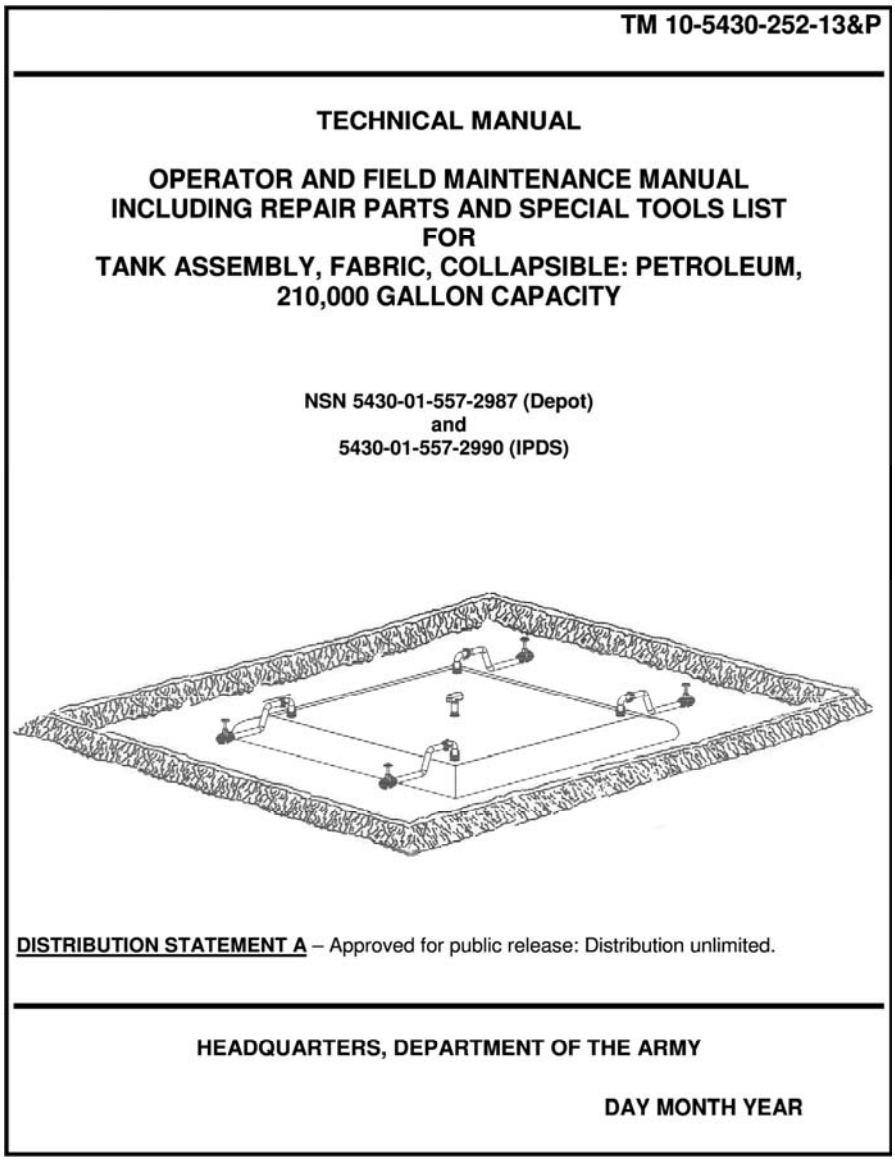
TABLE OF CONTENTS (cont).

TABLE OF CONTENTS (cont).

HOW TO USE THIS MANUAL

INTRODUCTION

1. This Operator and Field Maintenance Manual for Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity contains general information, operating instructions, maintenance procedures, Operator Preventative Maintenance Checks and Services (PMCS) and an illustrated Repair Parts and Special Tools List (RPSTL) for the Tank Assembly. It is divided into seven chapters.



TM 10-5430-252-13&P

TECHNICAL MANUAL

OPERATOR AND FIELD MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM,
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HEADQUARTERS, DEPARTMENT OF THE ARMY

DAY MONTH YEAR

Figure 1. Operator and Field Maintenance Manual

INTRODUCTION (Cont.)

2. This manual is written in work package format:

   a. Work packages are grouped in chapters as in a conventional Technical Manual. Chapters divide the manual into major categories of information (e.g., *Description and Theory of Operation, Operator Instructions, etc.*).

   b. Each chapter is divided into work packages, which are identified by a 6-digit number (e.g., 0001 00, 0002 00, etc.) located on the upper right-hand corner of each page. The work package (WP) page number (e.g. 0001 00-1, 0001 00-2, etc.) is located centered at the bottom of each page.

   c. The first four digits of the work package number are the work package sequence number, the fifth and sixth digits indicate the change status of the WP; (00 indicates an original WP). If a Change Package is issued to this manual, added work packages use the 5^{th} and 6^{th} digits of their number to indicate new material. For instance, work packages inserted between WP 0001 00 and WP 0002 00 are numbered WP 0001 01, WP 0001 02, etc.

   d. Supporting Information WP's at the rear of the manual serve the same function and contain the same information as appendices in older manuals.

   ### Figures and Tables

   Figures and Tables in WP's are numbered and titled. The figures and Tables are sequentially numbered within the WP. In a Repair and Special Tools List (RPSTL) WP, figures are numbered sequentially within the chapter.

3. Read through this manual to become familiar with its organization and contents before attempting to operate or maintain the equipment.

CONTENTS OF THIS MANUAL

1. A *warning Summary* is located at the beginning of this manual. Become familiar with these warnings before operating or maintaining the equipment.

2. A *List of Effective Pages/Work Packages* is located in the front of the manual. It lists the change status of each section and work package in the manual.

3. A *Table of Contents* is located in the front of the manual, it lists all chapters and work packages in this publication. If you cannot find what you are looking for in the Table of Contents, refer to the alphabetical *Index* at the back of the manual.

4. Chapter 1, *Description and Theory of Operation* provides general information about the equipment, identifies the major components and systems and describes how the components and systems work. It also contains a discussion of *General Safety Instructions*.

5. Chapter 2, *Operator Instructions*, identifies operating controls and indicators and explains how to use them. This chapter covers all equipment operating procedures. It also contains information on transport of Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity assembly.

CONTENTS OF THIS MANUAL (Cont.)

6. Chapter 3, *Operator Troubleshooting* describes operator troubleshooting procedures to locate and correct malfunctions of the equipment. Included in this chapter is an *Operator Troubleshooting Symptom Index*. If the equipment malfunctions, this index should always be consulted to locate the appropriate troubleshooting procedure.

7. Chapter 4, *Operator Maintenance Instructions*, includes Preventative maintenance and lubrication as well as operator maintenance procedures for the equipment.

8. Chapter 5, *Field Maintenance Instructions*, explains how to maintain and repair the equipment at the Field Maintenance level. Major areas covered are field PMCS and miscellaneous maintenance tasks.

9. Chapter 6, *Parts Information*, contains the following: Repair Parts and Special Tools List (RPSTL), National Stock Number (NSN) Index and Part Number Index.

10. Chapter 7, *Supporting Information*, contains the following: References, Maintenance Allocation Chart (MAC), Components of End Item (COEI) and Basic Issue Items (BII) Lists and Expendable and Durable Items List.

11. An alphabetical *Index* is located at the back of this manual.

FEATURES OF THIS MANUAL

1. Warnings, Cautions, Notes, Subject headings and other important information are highlighted in **BOLD** print as a visual aid.

WARNING

A WARNING indicates a hazard which may result in injury or death to personnel.

CAUTION

A CAUTION is a reminder of safety practices or directs attention to usage practices that may result in damage to equipment.

NOTE

A NOTE is a statement containing information that will make the procedures easier to perform.

3. Statements and words of particular interest may be printed in CAPITAL LETTERS to create emphasis.

4. Within a procedural step, reference may be made to another chapter or work package in this manual or to another manual. These references indicate where you should look for a more complete information.

   a. If you are told: “Prepare for storage or shipment (WP 0012 00)”, go to WP 0012 00 in this manual for instructions on how to prepare the equipment for storage or shipment.

FEATURES OF THIS MANUAL (Cont.)

b. If you are told: “Detailed decontamination procedures can be found in: FM 3-11.5”, go to WP 0018 00, *References*, for complete information on referenced technical manuals.

5. Illustrations are placed after or as close to the procedural steps to which they apply. Item callouts are placed on the art as text or numbers.

CHAPTER 1

DESCRIPTION AND THEORY OF OPERATION FOR TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
GENERAL INFORMATION

SCOPE

This technical manual contains instructions for operations, checks and corrective maintenance for the Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity.

Type of Manual: Operator and Field Maintenance.

Model Number and Equipment Name:

210-TAC-TBF-P0, Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity (IPDS)

210-TAC-TBF-D0, Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity (Depot)

Purpose of Equipment: The tanks are containers designed to store military specification fuels. 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.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, *The Army Maintenance Management System (TAMMS) Users Manual* or AR 700-138, *Army Logistics Readiness and Sustainability*.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. If you have Internet access, the easiest and fastest way to report problems or suggestions is to go to https://aeps.ria.army.mil/aepspublic.cfm (scroll down and choose the “Submit Quality Deficiency Report” bar). The Internet form lets you choose to submit an Equipment Improvement Recommendation (EIR), a Product Quality Deficiency Report (PQDR or a Warranty Claim Action (WCA). You may also submit your information using an SF 368 (*Product Quality Deficiency Report*). You can send your SF 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA PAM 750-8, *The Army Maintenance Management System (TAMMS) Users Manual*. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) 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.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

SF Form 368, *Product Quality Deficiency Report* should be submitted to the address specified in DA PAM 750-8, *The Army Maintenance Management System (TAMMS) Users Manual*.

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Destruction of Army material to prevent enemy use shall be in accordance with TM 750-244-3, *Procedures for Destruction of Equipment to Prevent Enemy Use*.

PREPARATION FOR STORAGE OR SHIPMENT

Refer to WP 0027 00 to prepare the Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity for storage and shipment.

WARRANTY INFORMATION

Warranty. A product registration card with identification numbers is packed with each tank. The registration card is packaged along with setup instructions in a clearly identifiable envelope inside the shipping container. This envelope will instruct the user how to send in the product registration card to Berg Integrated Systems when the tank is first wetted (used). The three-year warranty will begin on the date the Registration is received at Berg Integrated Systems. No warranty claims will be allowed against a product where a Product Registration card has not been received.

Limited Warranty. Berg Integrated Systems warrants the Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity are free from major defects in materials or workmanship and will meet performance specifications as listed in section C-4 in solicitation for Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity for a period of three years after first use (wetting of tank).

WARRANTY INFORMATION (Cont.)

If defects are found, the preferred and most reliable method for filling out and submitting the PQDR, is to contact Berg Integrated Systems customer service for a return authorization. Berg Integrated Systems, 741 10th Street, PO Box 129, Plummer, ID 83851, 208-686-0805 local, 866-660-BERG (2374) free, 208-686-6419 fax, info@bergco.com.

If, after inspection, Berg Integrated Systems finds that the product was defective in material or workmanship, we shall, at our option, either repair or replace it without charge and pay for shipping within CONUS. If, after inspection, Berg Integrated Systems finds the product was not defective, shipping charges will be the responsibility of TACOM. We are not responsible for normal wear and tear or for damage caused by accidents, misuse, alterations, or improper installations. Additionally, although Berg Integrated Systems manufactures its products with quality materials, we are not responsible for the negative effects of climate, pollution or acts of God beyond those outlined in section C-4 in solicitation for Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity. Because tanks are temporary structures, it is necessary that each unit be installed and maintained according to the manufacturer's instructions.

There are no other express warranties beyond the terms of this limited warranty. In no event shall Berg Integrated Systems be liable for incidental or consequential damages.

NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Name
Tank	Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity

LIST OF ABBREVIATIONS/ACRONYMS

AAL	Additional Authorized List
BII	Basic Issue Item
COEI	Component of End Item
CPC	Corrosion Prevention Control
DS2	Decontamination Solution (Ready to Use)
EIR	Equipment Improvement Recommendation
FT	Feet
Ft^3	Cubic Feet
IN	Inch
ISO	International Standards Organization
IPDS	Inland Petroleum Distribution System
MAC	Maintenance Allocation Chart
MTOE	Modified Table of Organization and Equipment
PMCS	Preventative Maintenance Checks and Services
RPSTL	Repair Parts and Special Tools List
STB	Supertropical Bleach—Decontamination Agent
TAMMS	The Army Maintenance Management System
TOE	Table of Organization and Equipment
U/M	Unit of Measure
UOC	Usable On Code

SAFETY, CARE AND HANDLING

Always observe Warnings, Cautions, and Notes in the manual. They appear before appropriate procedures. Be sure you read and understand each of the Warnings, Cautions, and Notes. Failure to observe them may cause damage to yourself, others, or equipment.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Characteristics, capabilities, and features of the Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity assemblies include:

Characteristics, Capabilities and Features:

- Fabric, collapsible tank with integral handles and cam lock fittings.
- Residual fuel can be drained from the tank by use of the low profile drains located on the bottom of the tank.
- Internal air pressure is vented through vent assembly with passive vent.
- Berm liner assembly with drain hose and valve assemblies.

Setup: Sixteen personnel in 2 hours.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Refer to Chapter 2, WP 0004 00.

EQUIPMENT DATA

Table 1. Leading Particulars

Item	Characteristic
Dimensions, outside:	
(Packaged IPDS)	
Height	78 in
Width	60 in
Length	192 in
Weight	8,000 pounds
(Package 1 Depot)	Tank, Fill/Discharge Hose & Valve Assemblies, Drain Hose & Valve Assemblies, Emergency Repair Kit, Overpack Kit, Vent Tube Assembly, Lifting Sling
Height	44.5 in
Width	84.25 in
Length	114.25 in
Weight	6,500 pounds
(Package 2 Depot)	Berm liner, Drain Hose & Valve Assemblies
Height	33.5 in
Width	84.25 in
Length	114.25 in
Weight	6,500 pounds
(Deployed)	
Height at 100% capacity	68 in
Length	900 in +0 / -2 in
Width	874 in +0 / -2 in
(Berm Liner)	
Length	1,404 in
Width	1,386 in
Environmental Requirements:	
Temperature:	
Operating	-25 to 140 ^{o}F
Storage	-25 to 160 ^{o}F
Fuel Storage Capacity:	210,000 Gallons

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
THEORY OF OPERATION

Refer to Chapter 2, WP 0004 00.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS
FOR
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM,
210,000 GALLON CAPACITY

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
GENERAL INFORMATION

GENERAL

This section lists major components, controls, and indicators, and describes their function within the Tank assembly.

DESCRIPTION AND USE OF MAJOR COMPONENTS

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

Table 1. Major Components, Controls and Indicators.

Key	Component, Control or Indicator	Function
1	Tank Body	Provides the means to store fuel.
2	Tank Fill/Discharge Fitting With Male Cam-Type Coupling	Provides the means to add or remove fuel from the tank. Accessed by removing the dust cap which is held in place with four cam lock levers.
3	Elbow with Cam-Type connections	Used with the tank Fill/Discharge fittings, hose, valve assemblies to add or remove fuel for the tank.
4	Fill/Discharge Hose Assembly	Used with the tank Fill/Discharge fittings and valve assembly for addition or removal of fuel.
5	Fill/Discharge Valve Assembly	Used with Fill/Discharge hose assembly for addition or removal of fuel.
6	Tank Vent Tube Fitting with Male Cam-Type Coupling	Provides a means for connecting the Vent Tube Assembly.
7	Vent Tube Assembly	The Vent Tube Assembly allows any trapped air in the tank to be vented when the tank is being filled. The assembly is fitted with a flame arrestor that will provide protection against water or airborne contamination of the stored fuel.
8	Emergency Field Repair Kit	The repair kit contains all items needed to perform emergency repair of cuts and punctures in the tank fabric. Repair kit items are stored in the repair kit bag. Also included with the repair kit is a laminated instruction sheet, detailing fabric repair.
9	Tank Drain Fittings	The tank is shipped with blind flanges installed on the four drain fittings. When needed, the blind flange can be removed and the dome drain fitting and drain hose assembly installed.
10	Drain Hose Assemblies 10 ft and 16 ft	When attached to the tank and drain valve assembly, provide a means to drain the tank.
11	Drain valve Assembly	Attaches to the drain hose for draining the tank.

DESCRIPTION AND USE OF MAJOR COMPONENTS (Cont.)

Table 1. Major Components, Controls and Indicators. (Cont.)

Key	Component, Control or Indicator	Function
12	Berm Liner	Provides protection from fuel spills.
13	Berm Liner Drain Fittings	The berm liner is shipped with blind flanges installed on the two drain fittings. When needed, the blind flange can be removed and the dome drain fitting and drain hose assembly installed.
14	Berm Liner Drain Hose Assemblies 20 ft and 20 ft	When attached to the berm liner and drain valve assembly, provide a means to drain the berm liner.
15	Berm Liner Drain Valve Assemblies	Attaches to the drain hose for draining the berm liner.
16	Consumable items Overpack Kit	The overpack kit contains the Technical Manual, strapping chart, replacement fasteners, 9/16 inch wrench and pliers.
17	Sling	Lifting tank and berm liner from crate.

DESCRIPTION AND USE OF MAJOR COMPONENTS (Cont.)

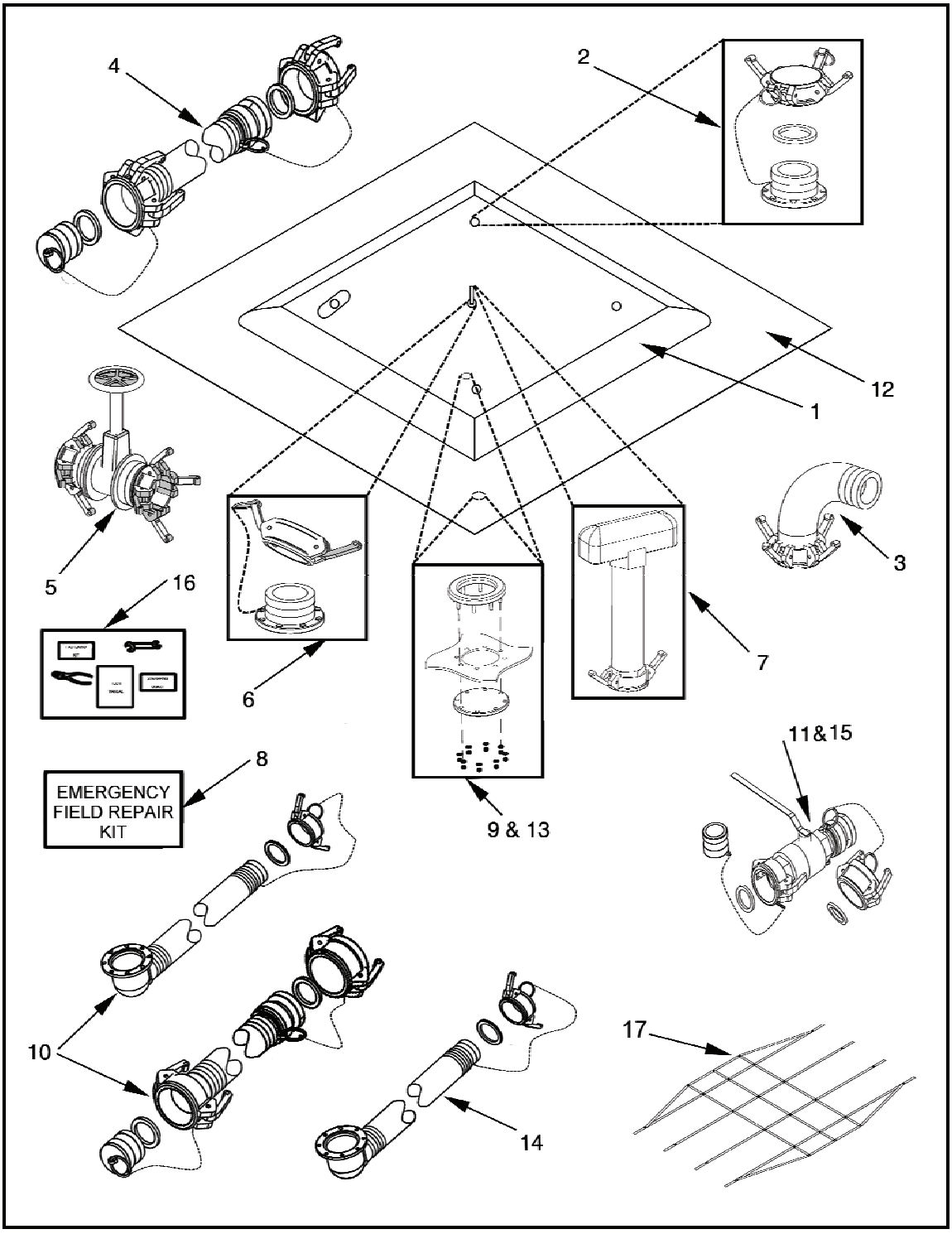


Figure 1. Major Components.

DESCRIPTION AND USE OF MAJOR COMPONENTS (Cont.)

Figures 2 through 5 are provided as guides for identifying cam lock closed and open positions.

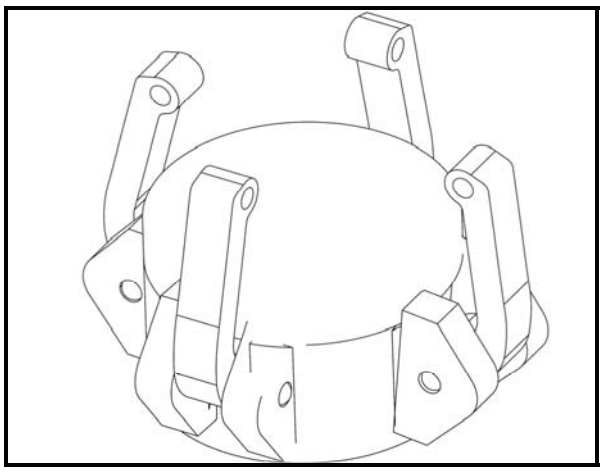


Figure 2. Cam locks Closed Position.

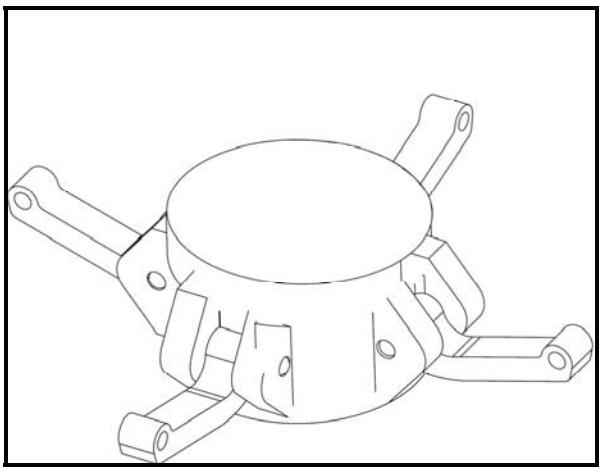


Figure 3 – Cam locks Open Position.

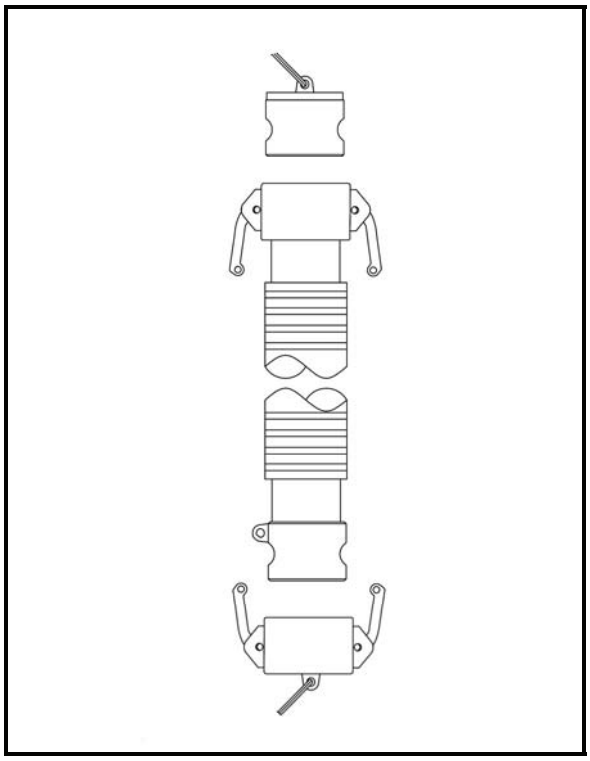


Figure 4. Cam locks Closed Position.

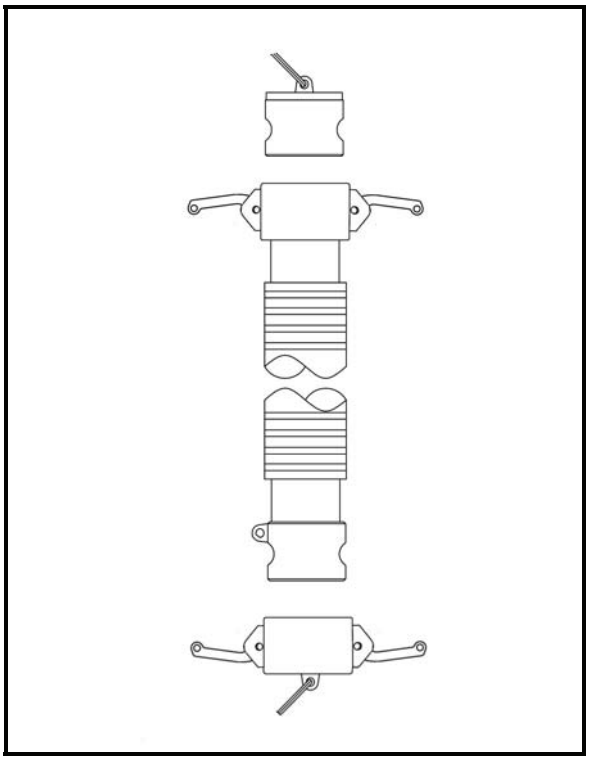


Figure 5 – Cam locks Open Position.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
OPERATION UNDER USUAL CONDITIONS - DEPLOYMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Torque Wrench
(Item 2, Table 2, WP 0037 00)

Equipment Condition
Tank Drained

Materials/Parts
Washer, Lock, 3/8 inch
(Item 3, WP 0039 00)

Dry Cleaning Solvent
(Item 8, WP 0038 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Brush, Scrub
(Item 4, WP 0038 00)

Personnel required
Sixteen

ASSEMBLY AND PREPARATION FOR USE

Construction of Berm

WARNING

Make certain that the berm ball valve (Figure 16, Item 2) is closed and locked after installing and draining the berm. In the event of tank rupture, an open berm ball 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.

ASSEMBLY AND PREPARATION FOR USE (Cont.)

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 below ground level. Retain a slight incline for draining surface water (Figure 2). Safety berms must have capacities of not less than one and one half times that of the tank capacities (Figure 3). Failure to construct a secure safety berm may result in catastrophic damage.

NOTE

A minimum of 13.0-foot 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 10.0-foot space between tanks. The installation site should have less than a 1° or 20 inch rise in a 100-foot in order to prevent creeping of the tank. The site must not be subject to flooding or high water.

NOTE

If possible, provide a 4.0-inch 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 pipe with a ball valve through the bottom of the discharge end of the berm in order to provide a means of draining accumulated water (Figure 15). Position the drain assembly at the lowest point of the slope to aid in draining water or sludge. The ball valve (Figure 15, Item 6) should be normally closed, and opened only to drain water from the bermed area.

ASSEMBLY AND PREPARATION FOR USE (Cont.)

1. Clear and level an area so there is at least a 13-foot wide perimeter around the empty flat tank (Figure 1 and Figure 3).

2. Erect a 5.5-foot high berm around the outside of the sloped area. Protect berm walls against erosion with sod or stone (Figure 2).

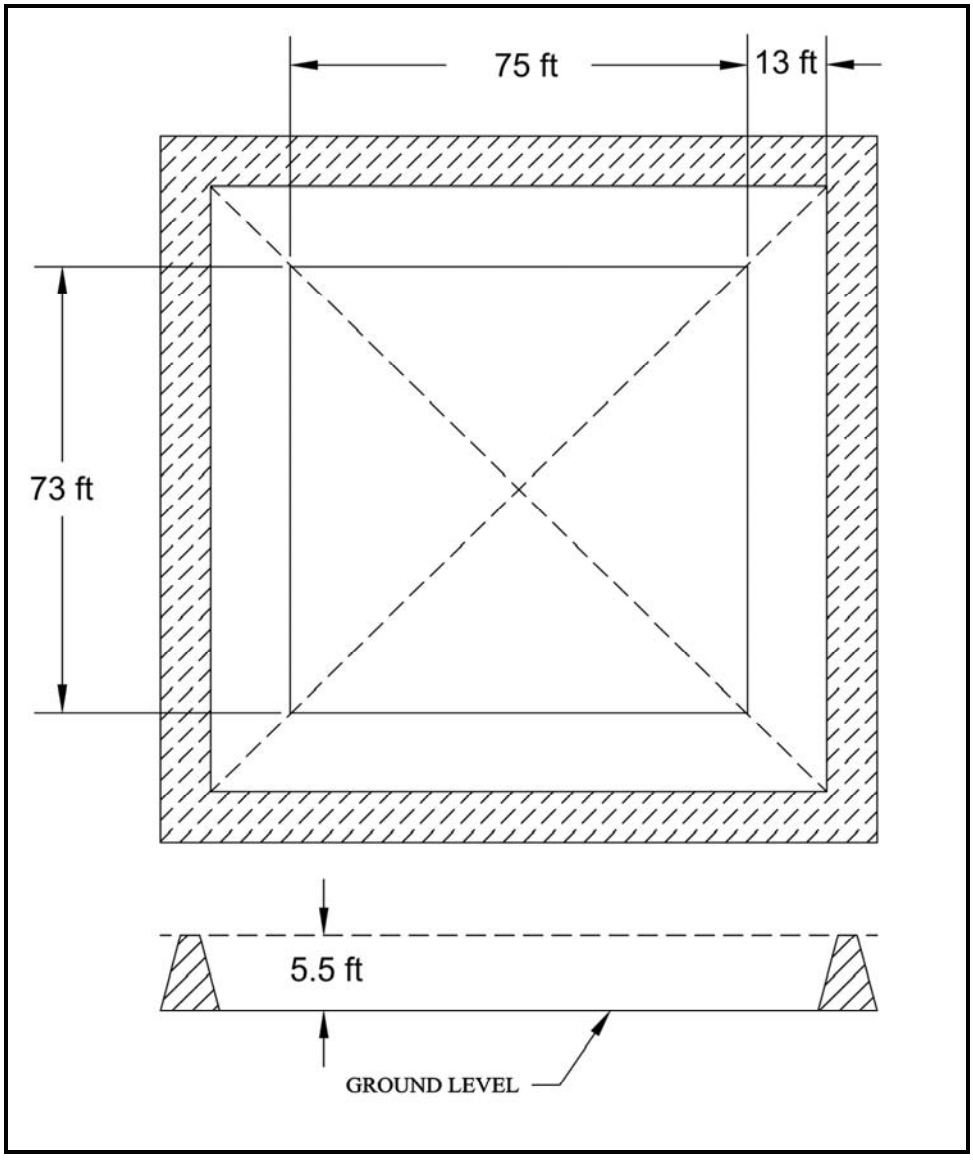


Figure 1. Berm Construction.

Surface Water Drain

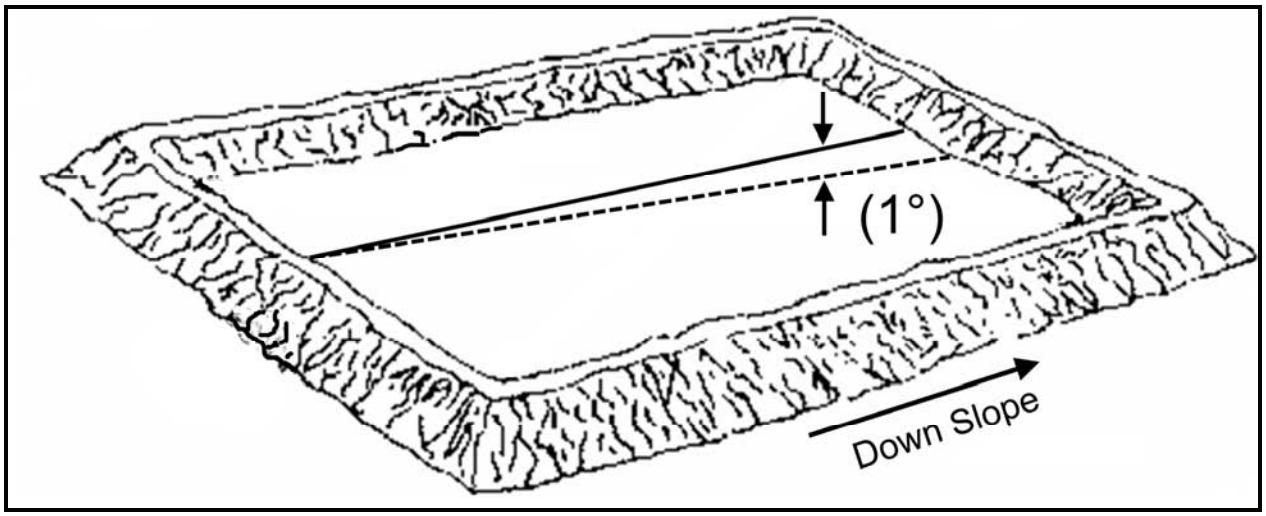


Figure 2. Slope Towards One End by 1 Degree.

Berm Cross-Section

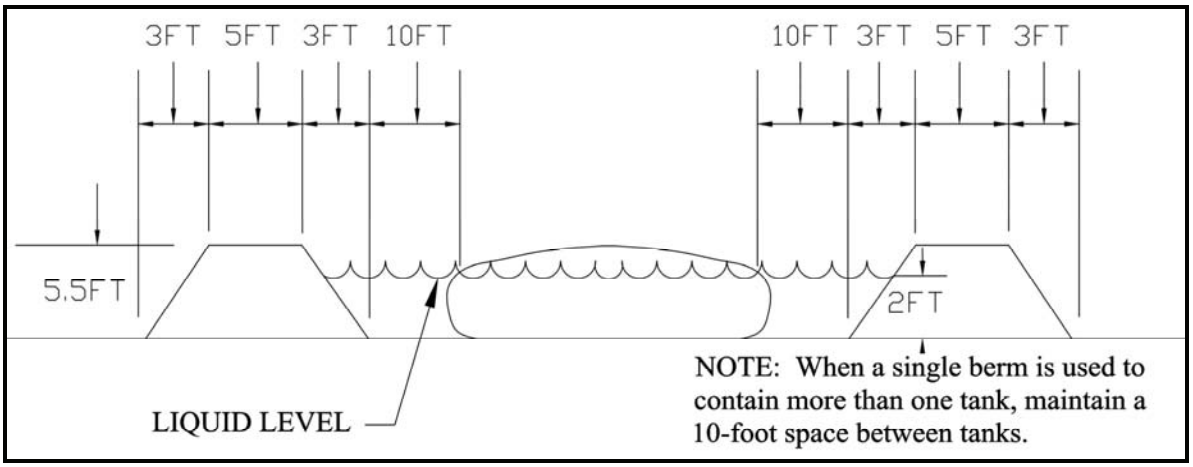


Figure 3. Berm Cross-section.

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

Unpacking the Equipment

The Tank Assembly is packaged in a container designed for shipment. The base of the container is constructed as a shipping pallet to be handled with a forklift. After unloading, unpack as follows:

1. Position the packaged tank (Figure 4) on an approved site near the point of installation.

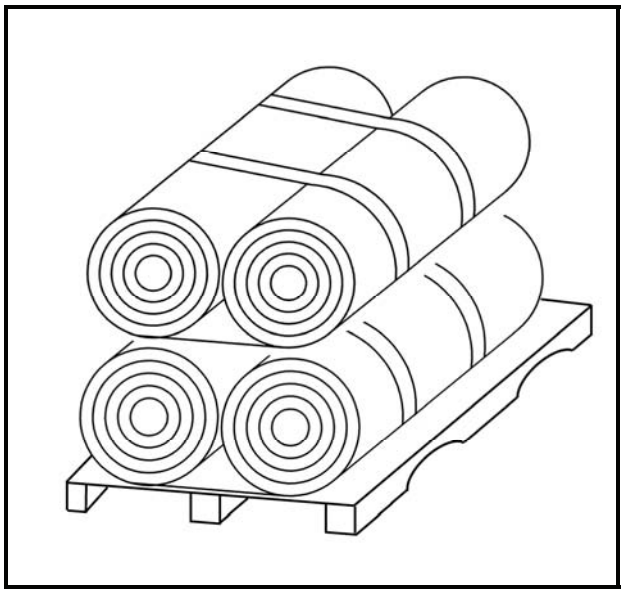


Figure 4. Cross-section view of an IPDS Collapsible Fuel Tank Crate #1 of 1 Crate.

CAUTION

Remove all protruding nails and other objects before attempting to remove the tank from the container. Failure to heed this caution can result in tearing the tank.

2. Know the contents of the shipping container by reviewing the hand receipt.

NOTE

There are three different types of collapsible fuel tank crates.

1. IPDS Collapsible Fuel Tank Crate, qty 1 of 1
2. Depot Berm liner Crate, qty 1 of 2
3. Depot Collapsible Fuel Tank Crate, qty 2 of 2

Unpacking the Equipment (Cont.)

The installation steps outlined in this section apply to the IPDS Collapsible Fuel Tank Crate and its contents.

When unpacking a Depot type crate, the individual berm liner or collapsible fuel tank assembly procedures should be followed as needed.

Table 1. Items Inside IPDS Collapsible Fuel Tank Crate #1 of 1

ITEM	QUANTITY
Hoses	Two 6-inch fill/discharge hose assemblies. Two 2-inch berm liner drain hose assemblies.
Valves and Elbows	Four 6-inch gate valve assemblies Four 6-inch elbows Two 2-inch drain valves One vent tube assembly Lifting Slings
Consolidation box containing accessories and Emergency repair items.	One each

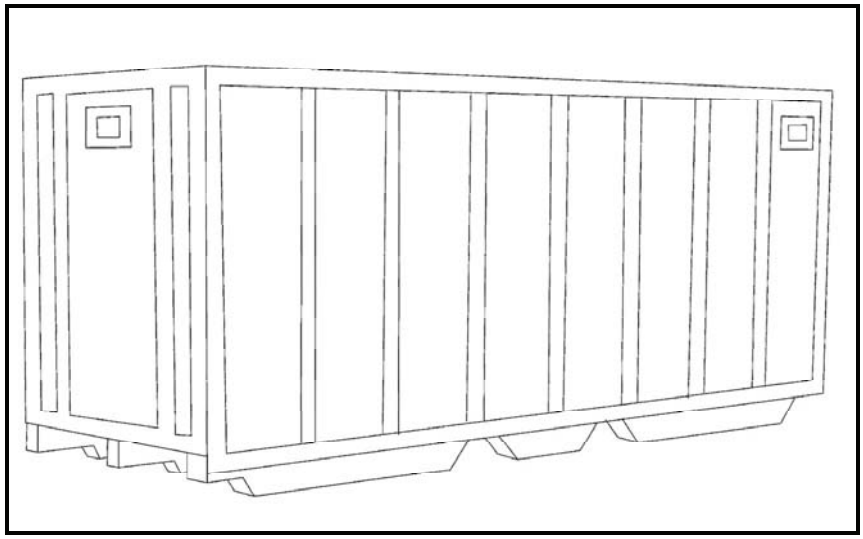


Figure 5. A Typical IPDS Collapsible Fuel Tank.

Unpacking the Equipment (Cont.)

Table 2. Items Inside Depot Berm liner Crate #1 of 2

ITEM	QUANTITY
Hoses	Two 2-inch berm liner drain hose assemblies.
Valves and Elbows	Two 2-inch drain valves Lifting Sling
Consolidation box containing accessories	One each

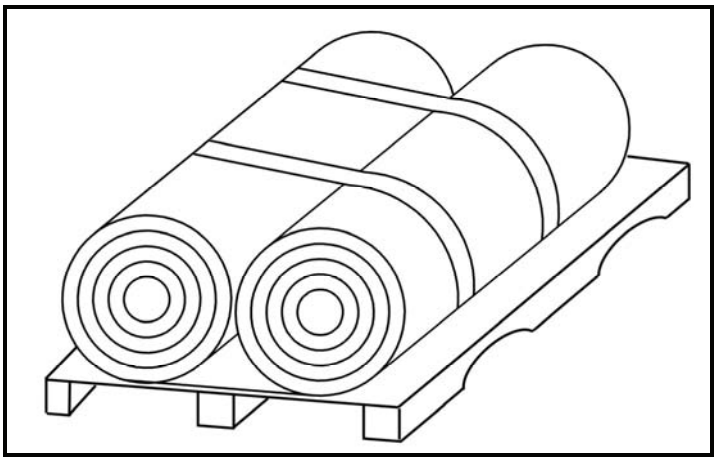


Figure 6. Representative view of a Depot Berm Liner Crate #1 of 2.

Unpacking the Equipment (Cont.)

Table 3. Items Inside Depot Collapsible Fuel Tank Crate #2 of 2

ITEM	QUANTITY
Hoses	Two 6-inch fill/discharge hose assemblies. Two 2-inch berm liner drain hose assemblies.
Valves and Elbows	Four 6-inch gate valve assemblies Four 6-inch elbows
Consolidation box containing accessories and Emergency repair items.	One each

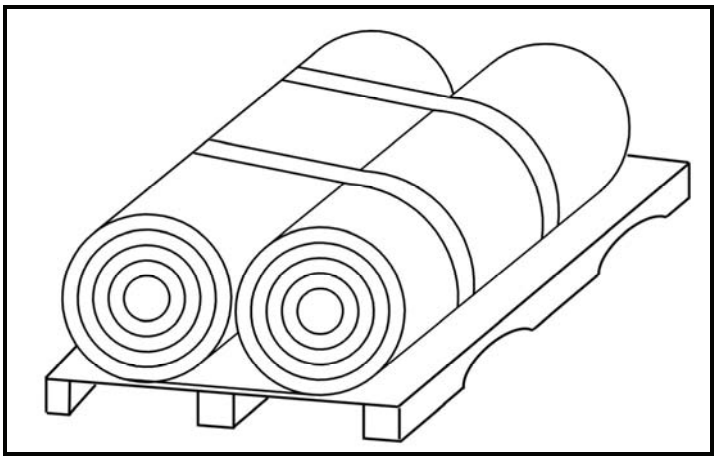


Figure 7. Representative view of a Depot Collapsible Fuel Tank Crate #2 of 2.

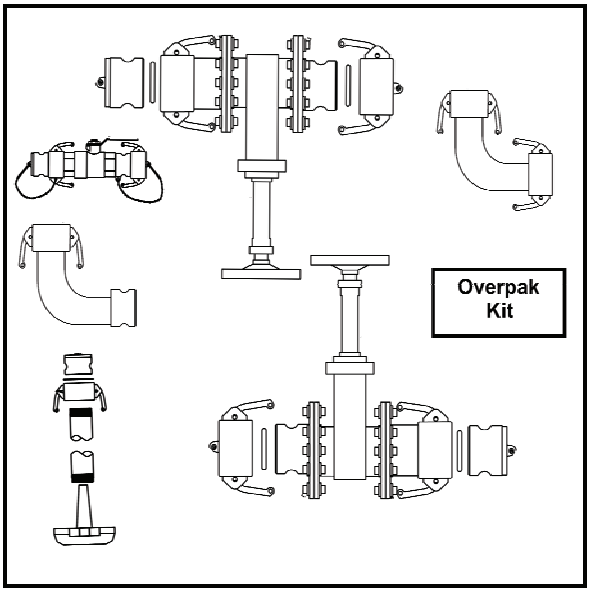


Figure 8. Tank Shadow Board, 1 of 2.

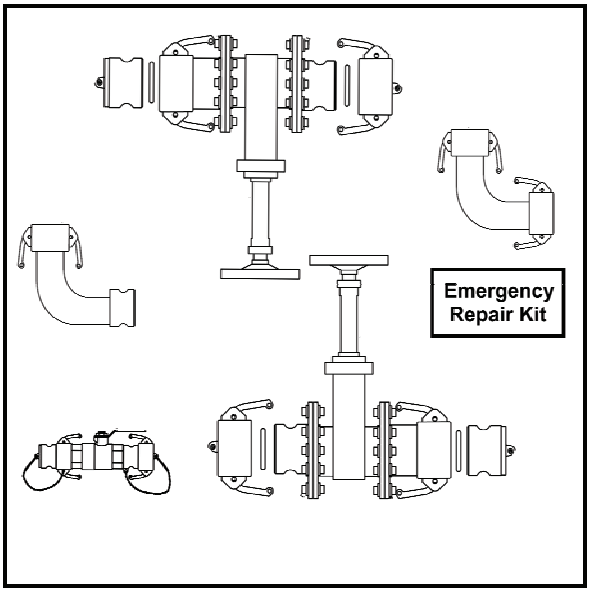


Figure 9. Tank Shadow Board, 2 of 2.

Unpacking the Equipment – Installation of the Berm liner

1. Carefully open the IPDS Collapsible Fuel Tank Crate by removing bolts (Figure 10, Item 4) from the bottom edge of the crate shell (Figure 10, Item 2). Lift the crate shell off the crate skids (Figure 10, Item 3) and remove the drain fitting hoses and fill/discharge hoses from the top of the tank (Figure 10, Item 1) and berm liner (not shown).

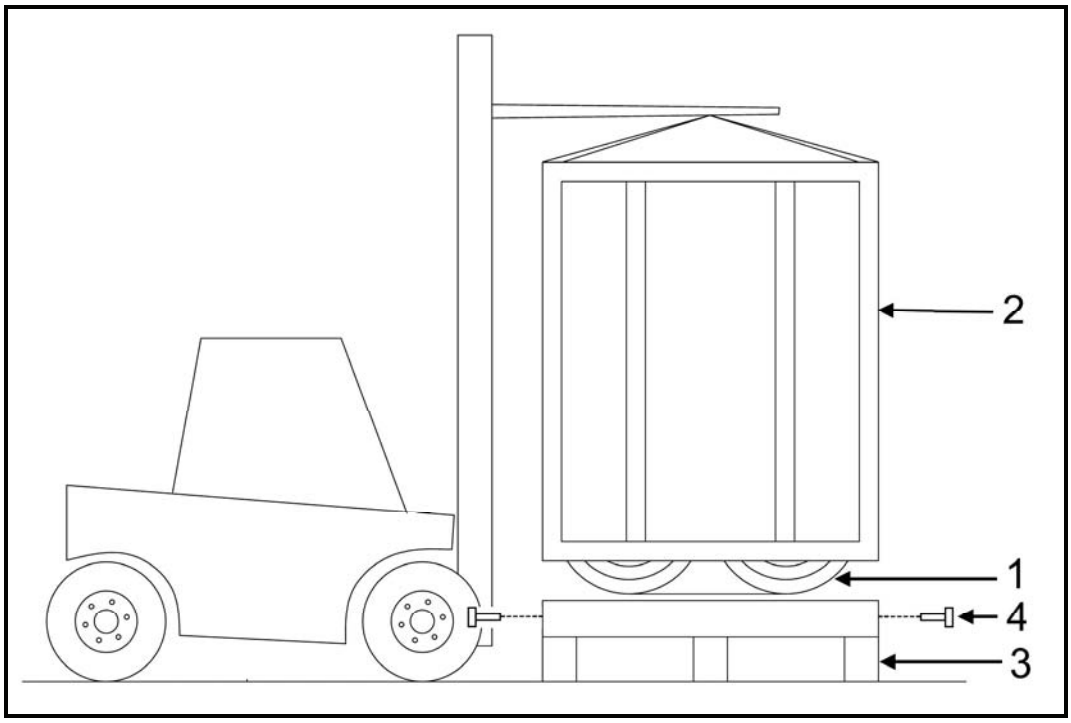


Figure 10. Opening the Collapsible Fuel Tank Crate.

WARNING

The lifting device must have a minimum lifting capacity of 10,000 lbs. Failure to heed this warning can cause injury or death to personnel as well as damage to equipment.

NOTE

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

Unpacking the Equipment – Installation of the Berm liner (Cont.)

2. Locate the lifting straps (Figure 11, Item 2) around berm liner (Figure 11, Item 1). Carefully insert fork lift forks (10,000-lb. capacity) through the loops of lifting straps.

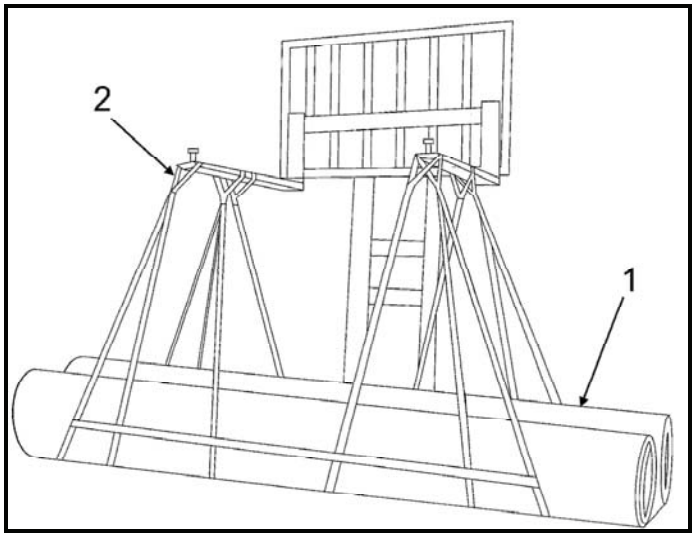


Figure 11. Lifting the Berm liner.

3. Transport berm liner (Figure 11, Item 1) to the center of the desired installation site.

4. Remove the two ratchet straps and secure them for packaging.

5. Unwrap the berm liner from its packaging material, then unroll one-half of the berm liner (Figure 12) along the length of the installation site, then unroll the other half of the berm liner (Figure 12) in the opposite direction along the length of the installation site.

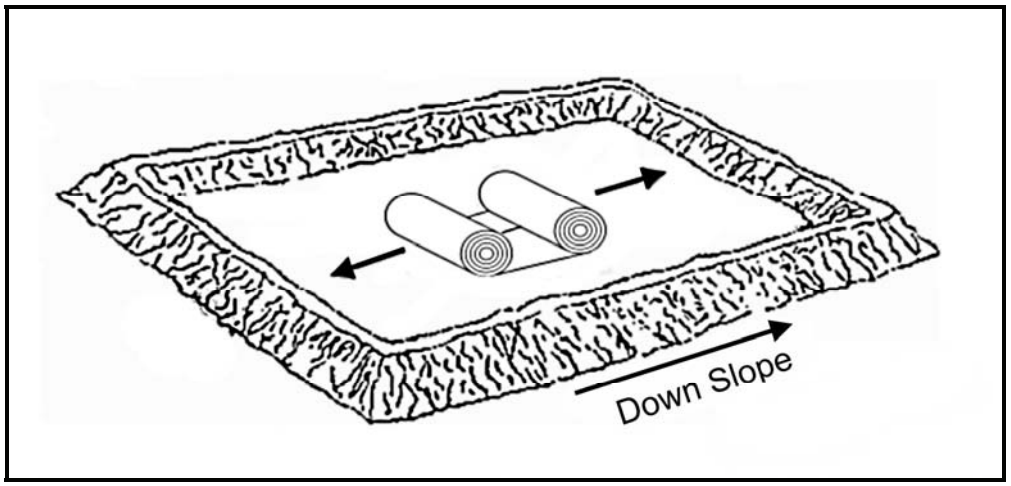


Figure 12. Unrolling the Berm liner.

Unpacking the Equipment – Installation of the Berm liner (Cont.)

6. The berm liner is folded symmetrically about its center line. Unfold ONE side (Figure 13) to expose handles along sides of the berm liner.

NOTE

Half of the berm liner remains folded to prevent damage by running over it with the lifting device during tank installation.

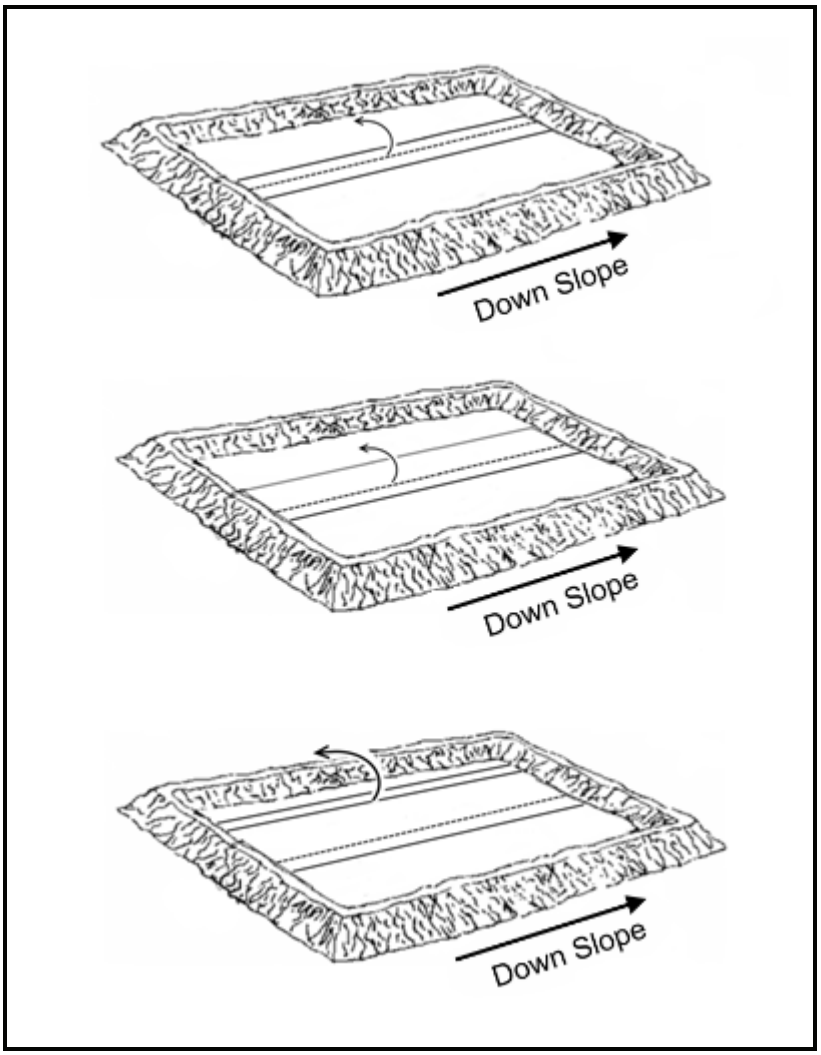


Figure 13. Unfolding the Berm liner.

7. Grasp the handles located along the unfolded side of berm liner, and pull towards and over the side of the berm (Figure 13).

8. Remove a 2-inch drain ball valves from a shadow board. Remove cushioning from the ends of all hoses.

Unpacking the Equipment – Installation of the Berm liner (Cont.)

NOTE

Save all cushioning and packing material for reuse when berm liner is put back into storage.

The packaging material the berm liner was wrapped in as well as the lifting sling will remain spread flat under the berm liner.

Repair items (sealing clamps, plugs, gaskets) are packaged in a bag and should be placed in a secure storage area until needed.

END OF TASK

Removal of Berm liner Drain Assembly Flange and Installation of Drain Hose Assembly

WARNING

When filling the tank with fuel, verify that the drain 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 heed this warning can cause death or severe personal injury and damage to equipment.

NOTE

There are drains on bottom of two diagonal corners of the berm liner.

1. Lift and fold-over each corner as required to expose the berm liner drain flange assembly underneath (Figure 16, Item 12).

2. Remove the drain assembly blind flange (Figure 16, Item 12) by removing the eight 3/8 inch nuts (Figure 16, Item 8), lock washers (Figure 16, Item 9), and washers (Figure 16, Item 10).

3. Discard old lock washers and replace with new ones.

4. Locate the 20 foot drain hose assembly with the drain dome fitting (Figure 16, Item 13).

5. Inspect the hose and drain fittings for cleanliness before assembly. Clean debris as necessary.

6. Position the drain dome fitting (Figure 16, Item 11) where the blind flange (Figure 16, Item 12) was removed. Rotate the drain dome fitting such that the attached drain hose (Figure 16, Item 13) extends in the proper direction away from the center of the berm liner.

7. The drain protective flaps should be placed between the drain dome fitting and the ground.

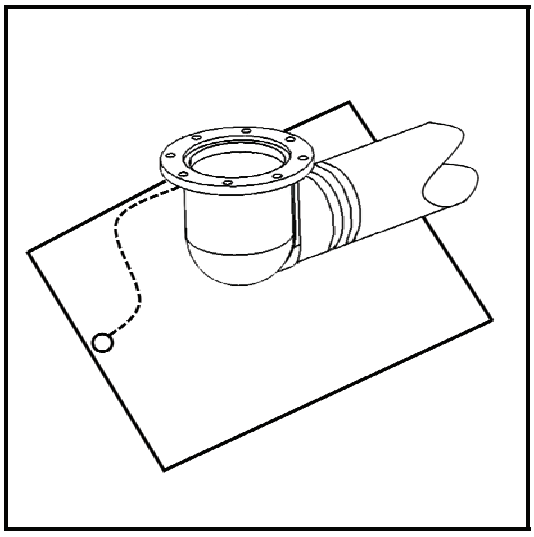


Figure 14. Berm liner Drain Assembly Protective Flap.

Removal of Berm liner Drain Assembly Flange and Installation of Drain Hose Assembly (Cont.)

8. Secure the dome fitting (Figure 16, Item 11) with the eight 3/8 inch nuts (Figure 16, Item 8), lock washers (Figure 16, Item 9), and washers (Figure 16, Item 10).

9. Torque nuts (Figure 16, Item 8) to 40 ft-lb (see WP 0028 00).

NOTE

If any of the compression ring studs is damaged, then it must be replaced by unscrewing the damaged stud from the compression ring with the fastening kit allen wrench then installing a new stud from the fastening kit. Torque studs (Figure 15) to 40 ft-lb (see WP 0028 00).

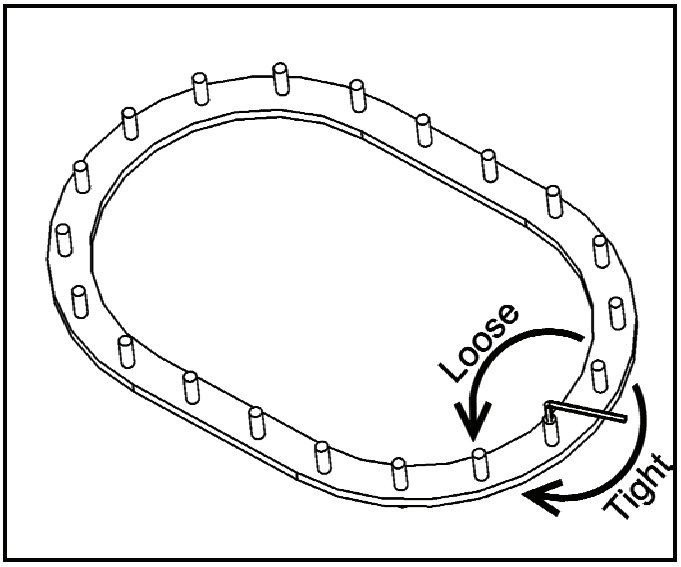


Figure 15. Replacing a damaged stud.

10. Save the drain assembly blind flange (Figure 16, Item 12) for reuse in redeployment.

11. Locate the drain ball valve assembly (Figure 16, Item 2)

WARNING

Check that the drain valve is closed. The valve is closed when the handle is rotated fully in the clockwise direction. Failure to close valve can cause loss of fuel and possible fire or explosion with possible death or severe personal injury and damage to equipment.

WARNING

Use caution to ensure fingers are not caught or pinched in the cam lock levers.

Removal of Berm liner Drain Assembly Flange and Installation of Drain Hose Assembly (Cont.)

12. Move the cam lock levers on the hose assembly dust cap (Figure 16, Item 7) to the outward position and remove dust cap from end of hose.

13. Move the cam lock levers on the valve assembly (Figure 16, Item 14) to the outward position and remove dust plug (Figure 16, Item 6) from the valve assembly.

14. Inspect the hose and valve fittings for cleanliness before assembly. Clean debris as necessary.

15. Insert the hose assembly (Figure 16, Item 13) into the valve assembly (Figure 16, Item 2).

16. Close cam locks.

17. Rotate Ball Valve lever (Figure 16, Item 1) to the closed position.

18. Locate the other 20 foot drain hose assembly with the male and female cam-lock fittings (Figure 16, Item 3).

19. Move the cam lock levers on the hose assembly dust plug (Figure 16, Item 5) to the outward position and remove dust plug from end of hose.

20. Move the cam lock levers on the hose assembly dust cap (Figure 16, Item 4) to the outward position and remove dust cap from end of hose.

21. Inspect the hose and valve fittings for cleanliness before assembly. Clean debris as necessary.

22. Insert the hose assembly (Figure 16, Item 3) onto the valve assembly (Figure 16, Item 2).

23. Close cam locks.

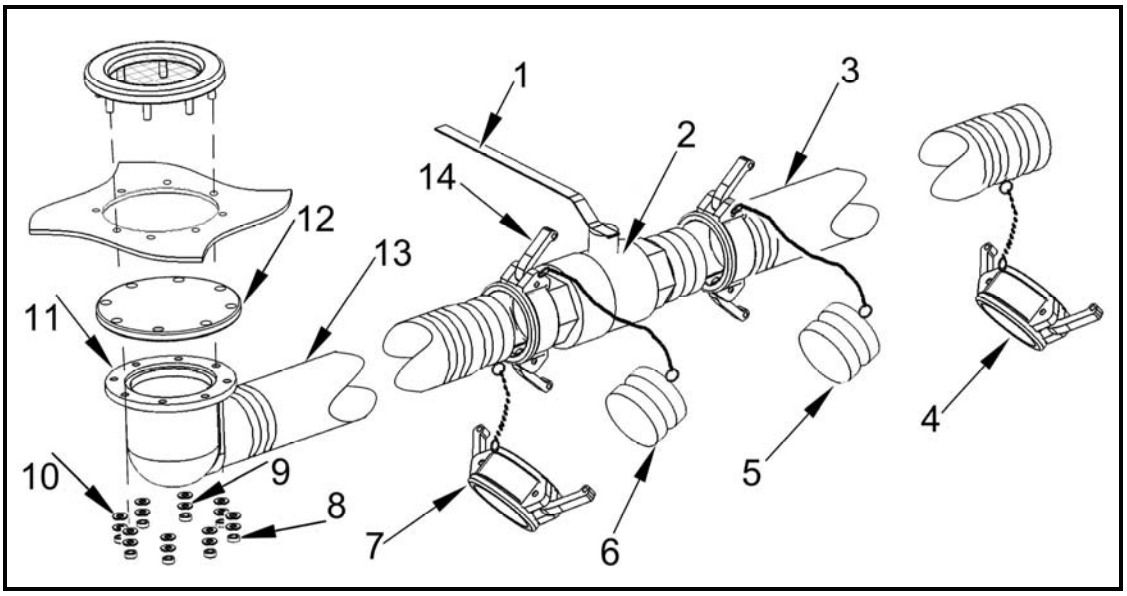


Figure 16. Berm liner Drain and Hose Assembly.

END OF TASK

Unpacking the Equipment – Installation of the Fuel Tank

1. Locate the lifting straps (Figure 17, Item 2) around tank (Figure 17, Item 1). Carefully insert fork lift forks (10,000-lb. capacity) through the loops of lifting straps (Figure 17, Item 2).

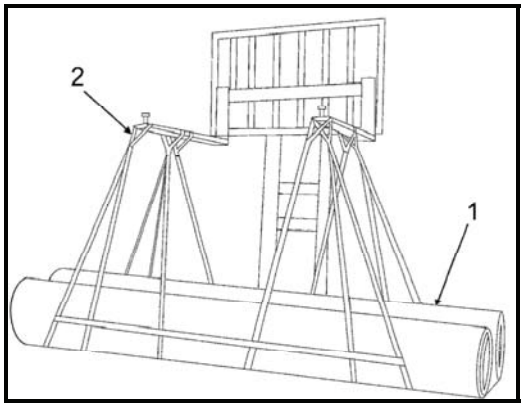


Figure 17. Lifting the Collapsible Fuel Tank.

2. Transport tank (Figure 17, Item 1) to the center of the desired installation site.

3. Remove the two ratchet straps and secure them for packaging

CAUTION

Ratchet straps must not be left under the tank because the buckles can tear the tank. Failure to heed this caution can cause tank rupture.

NOTE

Before the tank installation continues, the folded half of the berm liner must be unfolded and extended across the installation site and over the berm (WP 0005.00 11).

4. Unwrap the tank from its packaging material, then unroll one-half of the tank (Figure 18) along the length of the installation site, then unroll the other half of the tank (Figure 18) in the opposite direction along the length of the installation site.

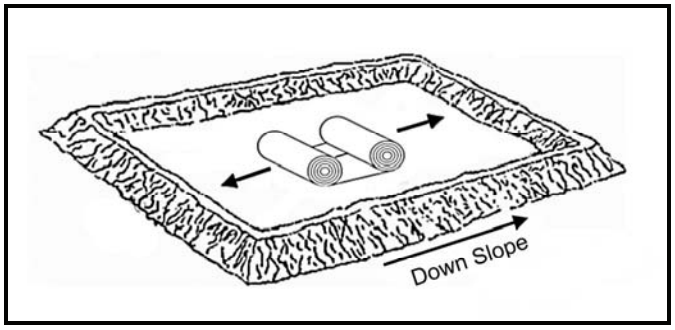


Figure 18. Unrolling the Tank.

Unpacking the Equipment – Installation of the Fuel Tank (Cont.)

5. The tank is folded symmetrically about its center line. Unfold each side to expose handles along sides of the tank.

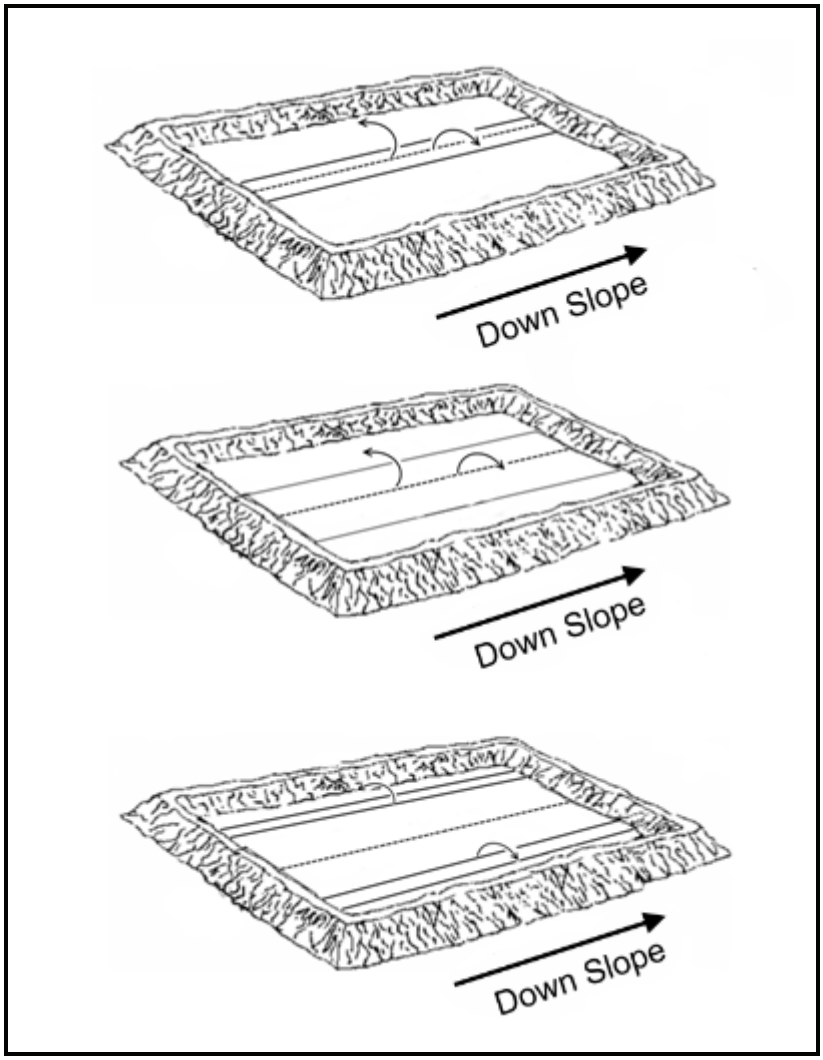


Figure 19. Unfolding the Tank.

6. Grasp the handles located along the length of tank, and pull the folded sides of tank toward the berm walls.

7. Remove all 6-inch fill/discharge valves, 2-inch drain ball valves, and the vent assembly from the shadowboard(s). Remove cushioning from the ends of all hoses.

CAUTION

Use caution when operating sharp, cutting objects near, on or around the tank. Failure to heed this caution can result in tearing the tank.

Unpacking the Equipment – Installation of the Fuel Tank (Cont.)

8. Remove protective flaps from all Fill/Discharge and vent fitting assemblies by cutting the zip ties that secure the flaps in place..

9. All of the Fill/Discharge, Vent, and Drain fittings on the tank must be retightened to 40 ft-lbs during this step of the installation (WP 0028 00).

NOTE

Save all cushioning and packing material for reuse when tank is put back into storage.

The packaging material the tank was wrapped in as well as the lifting sling will remain spread flat under the collapsible fuel tank.

Repair items (sealing clamps, plugs, gaskets) are packaged in a bag and should be placed in a secure storage area until needed.

END OF TASK

Removal of Fuel Tank Drain Assembly Flange and Installation of Drain Hose Assembly

WARNING

When filling the tank with fuel, verify that the drain 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 heed this warning can cause death or severe personal injury.

NOTE

There are drains on bottom of all four corners of the tank under each of the Fill/Discharge fittings.

1. Fold each corner as required to expose the drain flange assembly (Figure 22, Item 12) on the bottom of the tank.

2. Remove the drain assembly blind flange (Figure 22, Item 12) by removing the eight 3/8 inch nuts (Figure 22, Item 8), lock washers (Figure 22, Item 9), and washers (Figure 22, Item 10).

3. Locate the 16 foot drain hose assembly with the drain dome fitting (Figure 22, Item 13).

4. Inspect the hose and drain fittings for cleanliness before assembly. Clean debris as necessary.

5. Position the drain dome fitting (Figure 22, Item 11) where the blind flange (Figure 22, Item 12) was removed. Rotate the drain dome fitting such that the attached drain hose (Figure 22, Item 13) extends in the proper direction away from the center of the tank.

6. The drain protective flaps should be placed between the drain dome fitting and the ground.

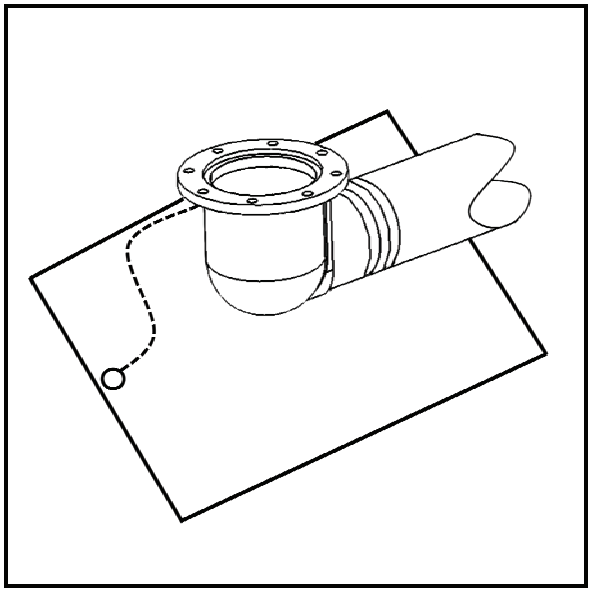


Figure 20. Tank Drain Assembly Protective Flap.

Removal of Tank Drain Assembly Flange and Installation of Drain Hose Assembly (Cont.)

7. Secure the dome fitting (Figure 22, Item 11) with the eight 3/8 inch nuts (Figure 22, Item 8), lock washers (Figure 22, Item 9) and washers (Figure 22, Item 10).

\

8. Torque nuts (Figure 22, Item 8) to 40 ft-lb (see WP 0028 00).

NOTE

If any of the compression ring studs is damaged, then it must be replaced by unscrewing the damaged stud from the compression ring with the fastening kit allen wrench then installing a new stud from the fastening kit. Torque studs (Figure 21) to 40 ft-lb (see WP 0028 00).

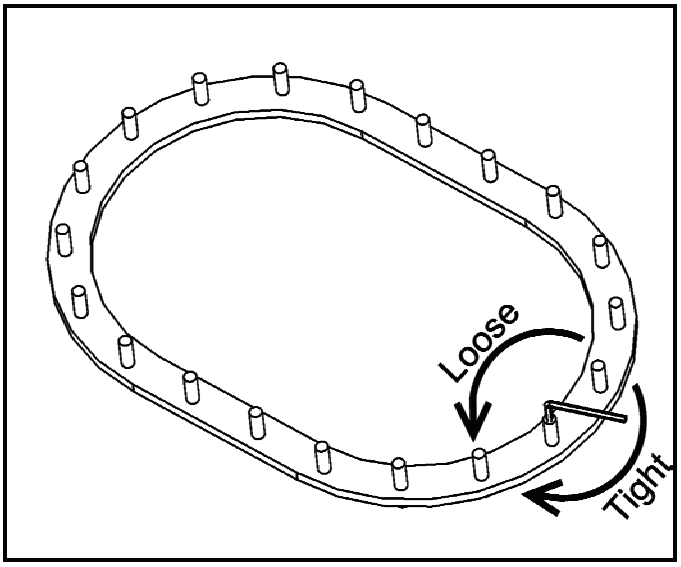


Figure 21. Replacing a damaged stud.

9. Save the drain assembly blind flange for reuse in redeployment.

10. Locate the drain ball valve assembly (Figure 22, Item 2).

WARNING

Check that the drain valve is closed. The valve is closed when the handle is rotated fully in the clockwise direction. Failure to close valve can cause loss of fuel and possible fire or explosion.

WARNING

Use caution to ensure fingers are not caught or pinched in the valve's cam lock levers.

Removal of Tank Drain Assembly Flange and Installation of Drain Hose Assembly (Cont.)

11. Move the cam lock levers on the hose assembly dust cap (Figure 22, Item 7) to the outward position and remove dust cap from end of hose.

12. Move the cam lock levers on the valve assembly (Figure 22, Item 14) to the outward position and remove dust plug (Figure 22, Item 6) from the valve assembly.

13. Inspect the hose and valve fittings for cleanliness before assembly. Clean debris as necessary.

14. Insert the hose assembly (Figure 22, Item 13) into the valve assembly (Figure 22, Item 2).

15. Close cam locks.

16. Rotate Ball Valve lever (Figure 22, Item 1) to the closed position.

17. Locate the 10 foot drain hose assembly with the male and female cam-lock fittings (Figure 22, Item 3).

18. Move the cam lock levers on the hose assembly dust plug (Figure 22, Item 5) to the outward position and remove dust plug from end of hose.

19. Move the cam lock levers on the hose assembly dust cap (Figure 22, Item 4) to the outward position and remove dust cap from end of hose.

20. Inspect the hose and valve fittings for cleanliness before assembly. Clean debris as necessary.

21. Insert the hose assembly (Figure 22, Item 3) onto the valve assembly (Figure 22, Item 2).

22. Close cam locks.

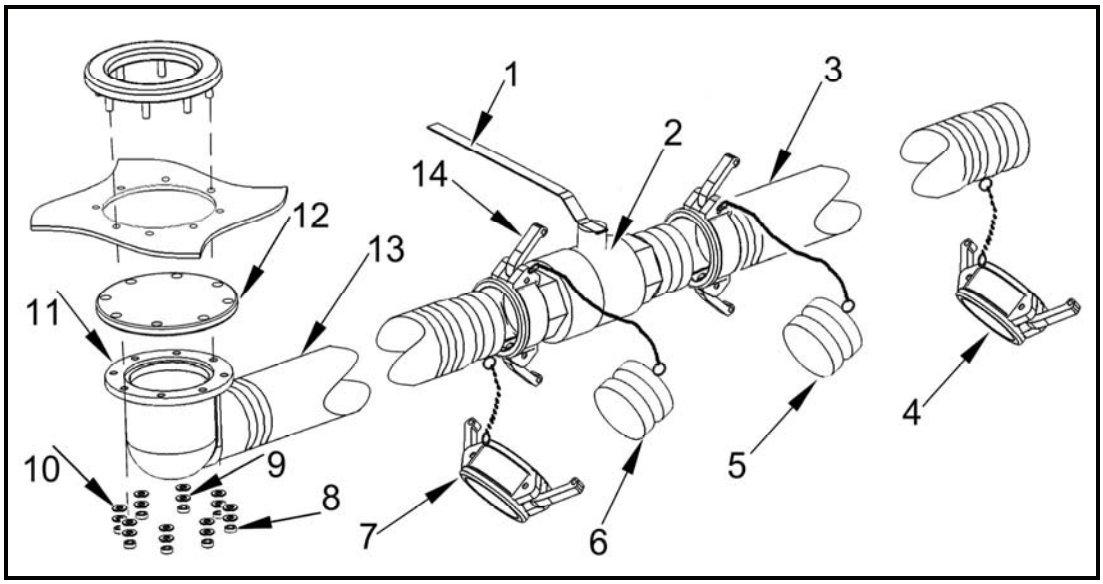


Figure 22. Tank Drain and Hose Assembly.

END OF TASK

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 (Figure 23, Item 1) by pulling cam lock levers (Figure 23, Item 2) outward, and lifting up on dust cap.

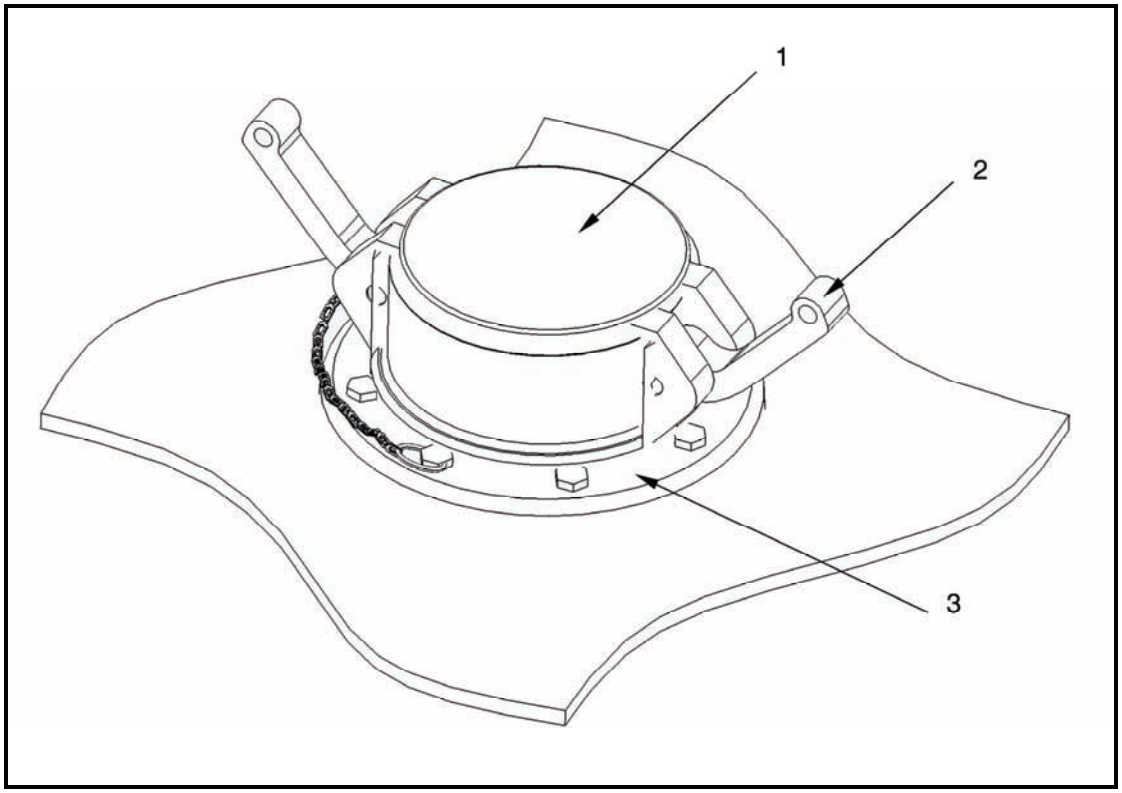


Figure 23. Tank Vent Dust Cap.

Installation of Vent Pipe Assembly (Cont.)

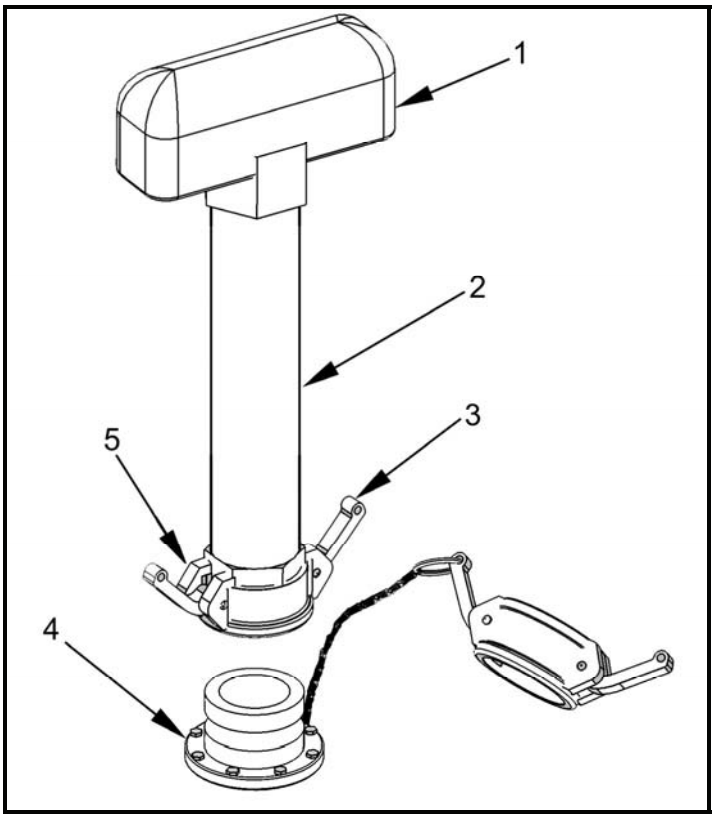


Figure 24. Vent Pipe Assembly.

NOTE

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

2. Inspect all vent components for cleanliness before assembly. Clean debris as necessary.

3. Check that vent (Figure 24, Item 1) is installed tightly on vent pipe (Figure 24, Item 2).

4. Insert female coupling (Figure 24, Item 5) over flanged adapter (Figure 24, Item 4), with cam lock levers (Figure 24, Item 3) in the outward position.

5. Press cam lock levers (Figure 24, Item 3) upward, and inward, to lock vent pipe (Figure 24, Item 2) into operating position.

END OF TASK

Installation of Fill/Discharge Elbow Assembly

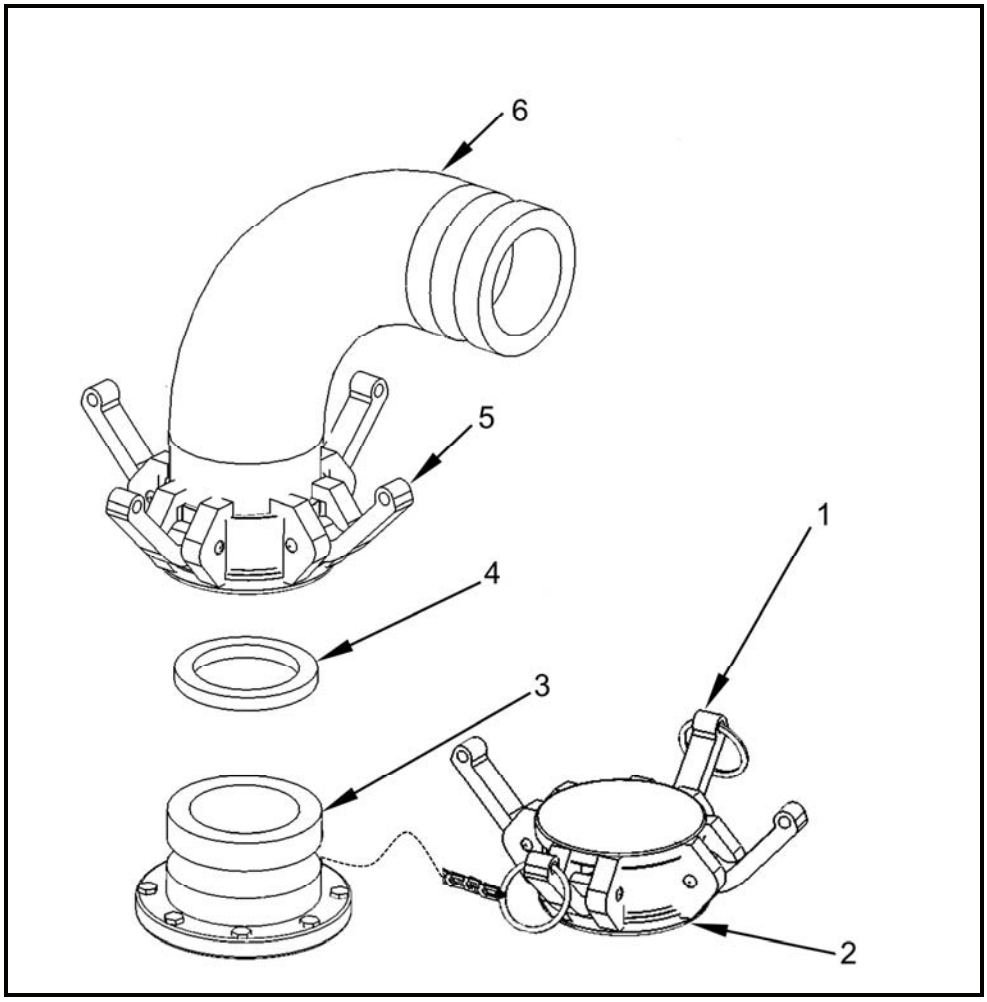


Figure 25. Fill/Discharge Elbow Assembly.

NOTE

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

1. Remove dust cap (Figure 25, Item 2) from flanged adapter (Figure 25, Item 3) by pulling cam lock levers (Figure 25, Item 1) outward and lifting up on dust cap.

2. Inspect elbow (Figure 25, Item 6) for cleanliness. Clean debris as necessary.

3. Check that gasket (Figure 25, Item 4) is in place and is properly seated.

Installation of Fill/Discharge Elbow Assembly (Cont.)

4. Position the female end of elbow (Figure 25, Item 6) over flanged adapter (Figure 25, Item 3) with cam lock levers (Figure 25, Item 5) in the outward position.

5. Rotate elbow (Figure 25, Item 6) so that the open end points to required direction.

NOTE

Cam lock levers must be pushed inward to lock and pulled outward to unlock the elbow.

6. Lift cam lock levers (Figure 25, Item 5) and lock elbow (Figure 25, Item 6) in place.

7. Install dust cap (Figure 25, Item 2) on the open end of elbow (Figure 25, Item 6) and lock in place.

END OF TASK

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

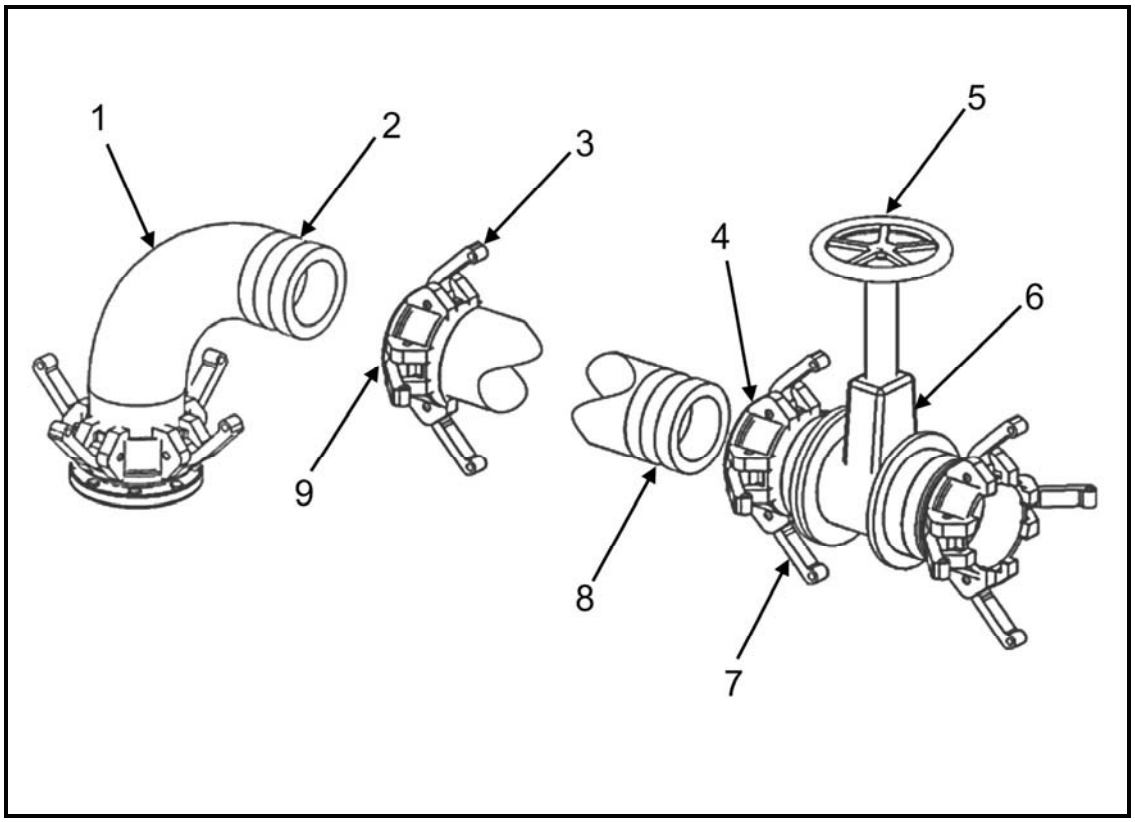


Figure 26. Fill/Discharge Hose and Valve Assembly.

NOTE

The fill/discharge hose assembly is fitted with cam lock female coupling (Figure 26, Item 9) on one end and a cam lock male adapter (Figure 26, Item 8) on the other end.

1. Remove the dust plug from the female coupling.
2. Inspect the gate valve and hose fittings for cleanliness before assembly. Clean debris as necessary.
3. Place the Fill/Discharge Hose Assembly female coupling (Figure 26, Item 9) on male adapter (Figure 26, Item 2) end of fill/discharge elbow (Figure 26, Item 1).
4. Push coupling cam lock levers (Figure 26, Item 3) into position to lock the hose assembly in place.
5. Locate the gate valve (Figure 26, Item 6), remove the dust plug from the female coupling (Figure 26, Item 4).

Installation of Fill/Discharge Hose Assembly and Fill/Discharge Valve Assembly (Cont.)

6. Inspect the gate valve and hose fittings for cleanliness before assembly. Clean debris as necessary.
7. Place male adapter (Figure 26, Item 8) end of the hose into female coupling (Figure 26, Item 4) of the gate valve (Figure 26, Item 6).
8. Push gate valve cam lock levers (Figure 26, Item 7) into position to lock the hose assembly in place.
9. Gate valve (Figure 26, Item 6) is fully opened by rotating hand-wheel (Figure 26, Item 5) to the left, and backing off one-quarter turn.
10. Gate valve (Figure 26, Item 6) is fully closed by rotating hand-wheel (Figure 26, Item 5) to the right and backing off one-quarter turn.

END OF TASK

Initial Adjustments and Routine Checks

NOTE

If the tank is cut or punctured during any phase of operation, refer to WP 0007 00-3 for emergency repair procedures.

1. Position filled sandbag(s) (Figure 27, Item 1) under hose (Figure 27, Item 3) near fill/discharge elbow (Figure 27, Item 4). This support will reduce stress on the tank fitting, the gasket in the hose coupling, and the coupling of fill/discharge elbow.

WARNING

Check the placement of 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 (Figure 27, Item 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 ball valve (Not shown) to verify that it is in the closed position.

5. Check the fill/discharge gate valve (Figure 27, Item 4) to verify closed position.

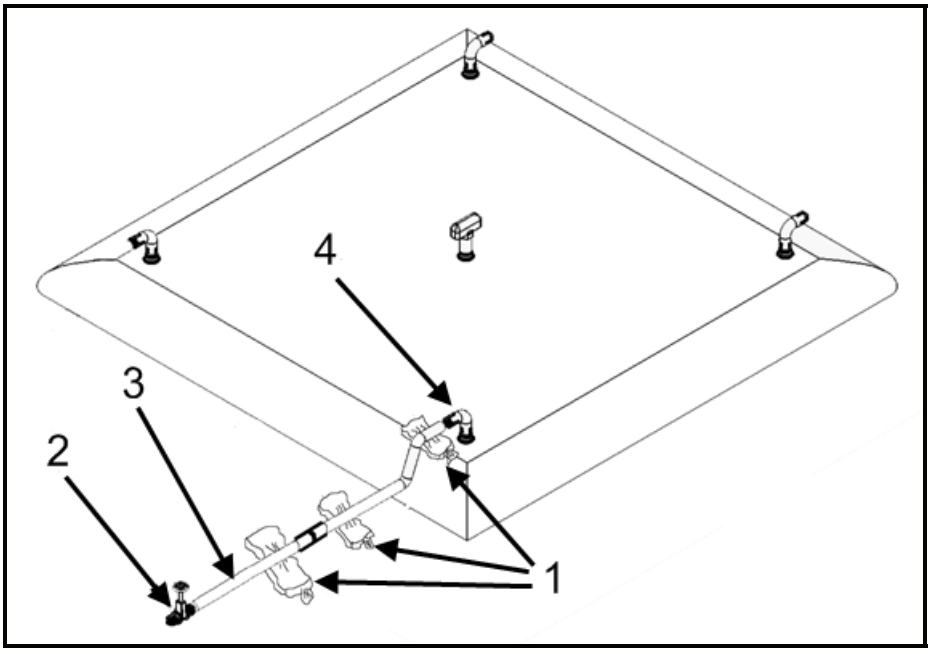


Figure 27. Elevated Connections for Easy Leak Detection.

END OF TASK

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.

Ensure that all cam locks are in the proper locked position before filling the tank. Improperly closed connections are cause for leaks which can cause serious injury or death by fire or explosion.

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 three-year service life beginning on the date when it is first filled. Shelf storage life is twelve 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 fill/discharge gate valve (Figure 27, Item 2).
2. Open the gate valve (Figure 27, Item 2)..
3. Activate the fuel source.

WARNING

Do not exceed maximum fill capacity. The fuel tank will burst if it is overfilled, causing damage to the equipment. Failure to heed this warning can cause injury or death to personnel.

4. Deactivate the fuel source.
5. Close the gate valve (Figure 27, Item 2). when the tank is full. Table 4 provides approximate height to volume ratios.
6. Disconnect the fuel source from the gate valve (Figure 27, Item 2).

Table 4 - Strapping Chart

Height (in.)	Volume (gal).
10	30,000
19	60,000
29	90,000
38	120,000
48	150,000
58	180,000
67	210,000

END OF TASK

Draining the Tank

NOTE

Use the female/male discharge elbow for this operation.

1. Inspect the tank to verify that the tank is set up correctly.
2. Attach an emptying source to the gate valve (Figure 27, Item 2)..
3. Open the gate valve (Figure 27, Item 2).
4. Activate the emptying source.
5. Close the gate valve (Figure 27, Item 2). when the tank is empty by rotating the handle clockwise.
6. Deactivate the emptying source.
7. Disconnect the emptying source from gate valve (Figure 27, Item 2)..
8. Disconnect the fill/discharge hose from the elbow.
9. Squeeze excess fuel from the tank by rolling the ends of the tank towards the drain fitting (Not shown).
10. Open the drain fitting ball valve to allow the remaining fuel to drain from the tank. (Not shown.)

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.

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.

END OF TASK

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

OPERATION UNDER USUAL CONDITIONS - RETRIEVAL

INITIAL SETUP:

Tools

Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Tape Measure
(Item 1, Table 2, WP 0037 00)

Equipment Condition

Tank Drained

Materials/Parts

Washer, Lock, 3/8 inch
(Item 3, WP 0039 00)

Dry Cleaning Solvent
(Item 8, WP 0038 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Brush, Scrub
(Item 4, WP 0038 00)

Personnel required

Twenty-five

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.

WARNING

Do not exceed maximum pressure of 50 pounds per square inch. Failure to heed this warning can cause injury or death to personnel.

PREPARATION FOR MOVEMENT (Cont.)

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

   a. Insert the air hose through the fill/discharge adapter, placing rags (Item 7, WP 0038 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 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 blind flange.

   a. Locate the 16 foot drain hose assembly with the drain dome fitting.

   b. Remove the drain assembly dome fitting by removing the eight 3/8 inch nuts, lock washers, and washers.

   c. Position the blind flange where the drain dome fitting was removed.

   d. Secure the blind flange with the eight 3/8 inch nuts, lock washers, and washers.

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

   a. Locate fill/discharge assemblies located on top of tank.

   b. Remove each fill/discharge elbow assembly by releasing cam lock.

   c. Secure dust cap on the fill/discharge assembly.

   d. Wrap permanently attached cushioning material around fill/discharge fitting and secure in place with zip ties (Item 9, WP 0038 00).

   e. Repeat steps 4b through 4d for other fill/discharge assemblies.

5. Remove the vent pipe assembly from the flanged adapter and install the dust cap.

   a. Locate vent fitting assembly in center top of tank.

   b. Remove upper portion of vent assembly by releasing cam-lock.

   c. Wrap upper portion with cushioning material.

   d. Do not secure the dust cap on vent fitting assembly at this time as it may be necessary to vent air from the tank as it is being rolled.

6. Protective flaps are permanently attached to each tank fitting and all must be secured with zip ties to protect the tank fabric from the metal parts.

PREPARATION FOR MOVEMENT (Cont.)

7. The protective flap has slits for threading a zip tie through. Align the slits on the flap to the position of the unlocked cams on the dust cap.

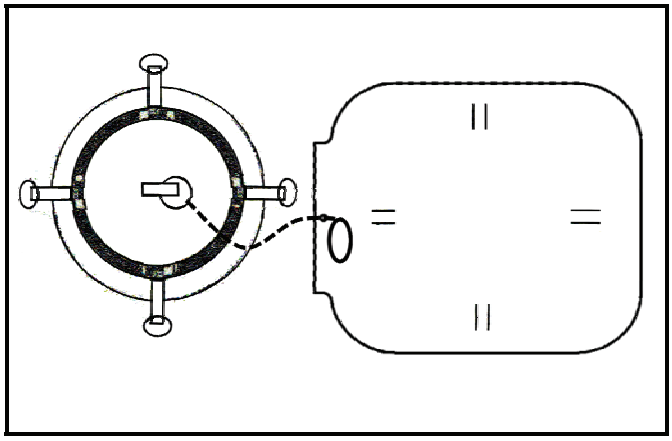


Figure 1. Protective Flap Permanently Attached.

8. Thread the end of the zip tie down through one of the slits, under the cam lock, and back up through the other slit. Engage the zip tie and pull until snug without over tightening.

9. Repeat for the remaining three slits.

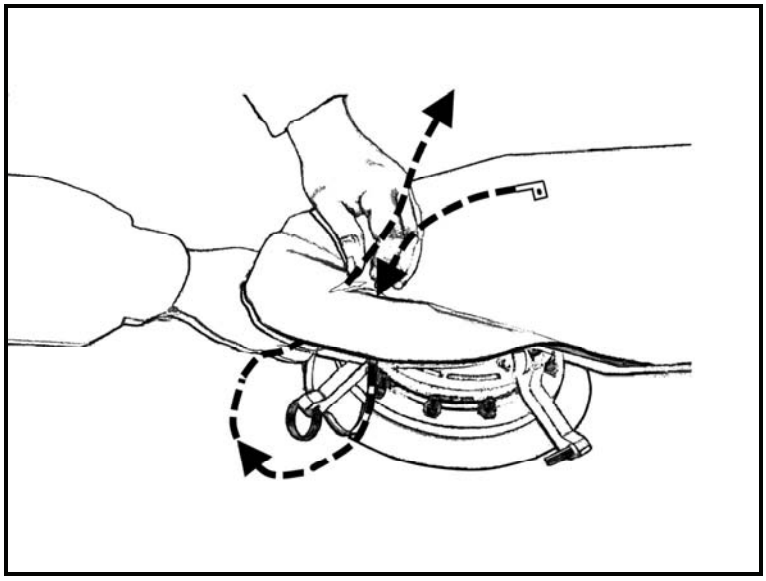


Figure 2. Threading a zip-tie to secure the protective flap.

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

END OF TASK

PREPARATION FOR FOLDING TANK

1. Ensure the tank is completely empty:
    a. Lift up the corners of the tank where the drain hose is attached and flip it over to expose drain fitting.
    b. Disconnect drain dome fitting and install the drain blind flange.
    c. Lay corner back so that tank is flat.
2. Remove vent fitting assembly:
    a. Locate vent fitting assembly in center top of tank.
    b. Remove upper portion of vent assembly by releasing cam-lock.
    c. Wrap upper portion with cushioning material.
    d. Do not secure the dust cap on vent fitting assembly at this time as it may be necessary to vent air from the tank as it is being rolled.
3. Remove air from inside tank and remove fill/discharge assembly elbows:
    a. Locate fill/discharge assemblies located on top of tank.
    b. Remove each fill/discharge elbow assembly by releasing cam lock.
    c. Wrap upper portion with cushioning material.
    d. Secure dust cap on the fill/discharge assembly.
    e. Wrap permanently attached cushioning material around fill/discharge fitting and secure in place with zip ties (Item 9, WP 0038 00).
    f. Repeat steps 3b through 3e for other fill/discharge assemblies.
4. Tank is now ready for folding.

END OF TASK

FOLDING TANK

The flat tank is approximately 73 feet by 75 feet.

1. Fold one of the 73 foot edges over 71/2 feet (Figure 3).

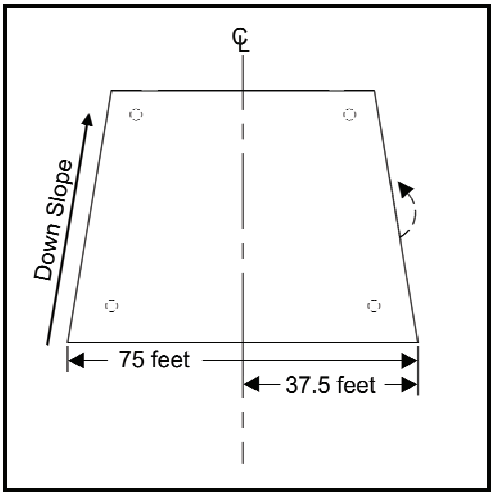


Figure 3. First 7 ½ foot fold.

2. Fold the folded edge to center (Figure 4).

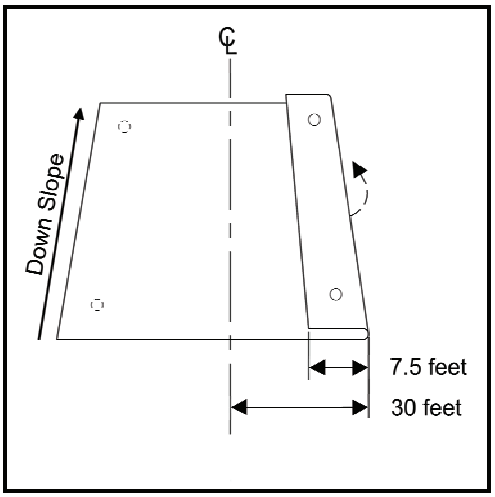


Figure 4. Folding the edge to center.

NOTE

Ensure the drain flap is covering the drain assembly.

FOLDING TANK (Cont.)

3. Fold the folded edge to center, again (Figure 5).

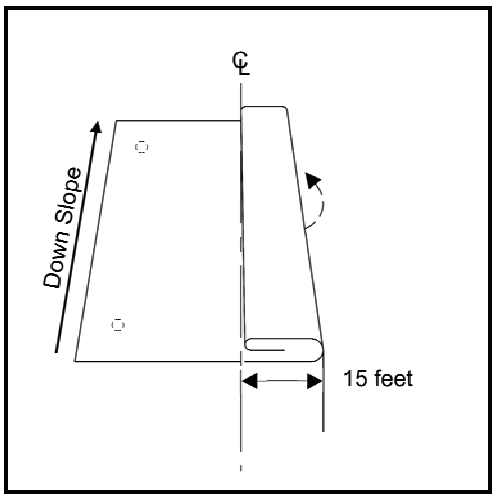


Figure 5. Folding the edge to center, again.

4. Repeat steps 1-4 for the opposite edge (Figure 6).

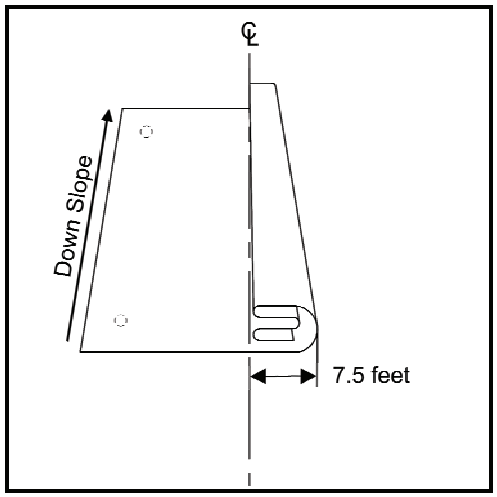


Figure 6. Half the tank folded.

5. Measure the tank width to ensure that it is less than 15 feet 6 inches; otherwise, it will not fit in the packing create.

FOLDING TANK (Cont.)

6. Figure 7 shows the folded tank.

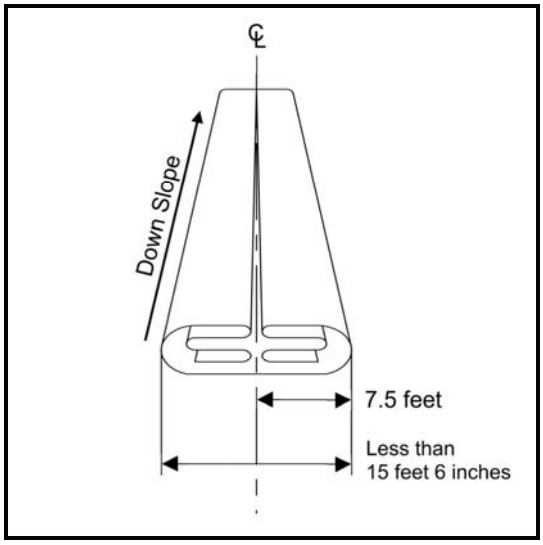


Figure 7. Final folded tank configuration.

7. Roll one end to center (Figure 8).

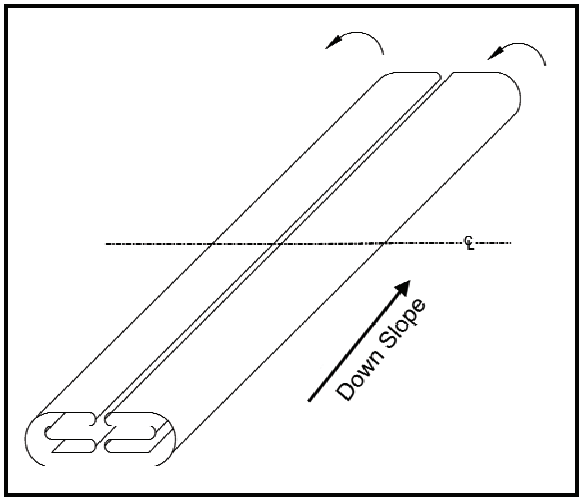


Figure 8. Rolling the tank.

NOTE

The lifting sling is positioned under the tank and should be in the proper position for securing the tank once the ends are rolled.

Secure the rolled half of the tank with sandbags before attempting to roll the other half.

FOLDING TANK (Cont.)

NOTE

If excess fuel remains in the tank at this point, then a two inch drain hose can be connected to the vent fitting to allow fuel to be squeezed out during the rolling procedure.

8. Roll other end to center (Figure 9).

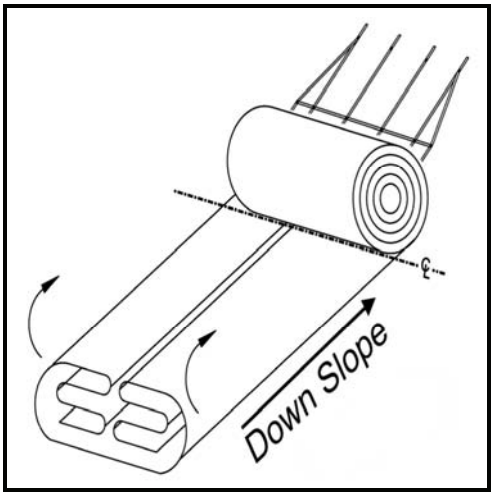


Figure 9. Tank half-rolled.

9. Remeasure the tank width to ensure that it is less than 15 feet 6 inches; otherwise, it will not fit in the packing create.

10. Secure the dust cap onto the vent fitting assembly.

NOTE

Do not push the cam lock levers to the locked position.

FOLDING TANK (Cont.)

11. Wrap permanently attached cushioning material around vent fitting, and secure with zip ties (Item 9, WP 0038 00) (Figure 10).

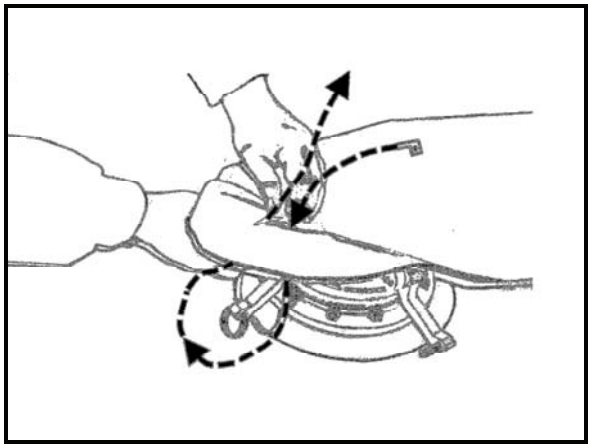


Figure 10. Threading a zip-tie to secure the protective flap.

12. Secure the tank with ratchet straps, then wrap the tank in its packaging material ensuring to fully cover the tank (Figure 11).

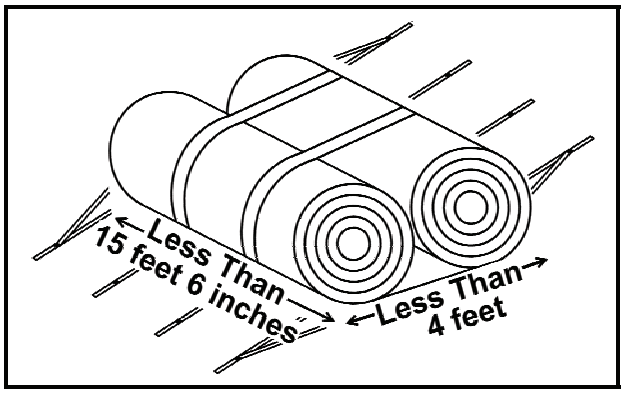


Figure 11. Rolled tank.

NOTE

When properly folded the tank should be approximately 15 feet 6 inches by 4 feet.

FOLDING TANK (Cont.)

13. Locate the lifting straps (Figure 12, Item 2) around tank (Figure 12, Item 1). Carefully insert fork lift forks (10,000-lb. capacity) through the loops of lifting straps.

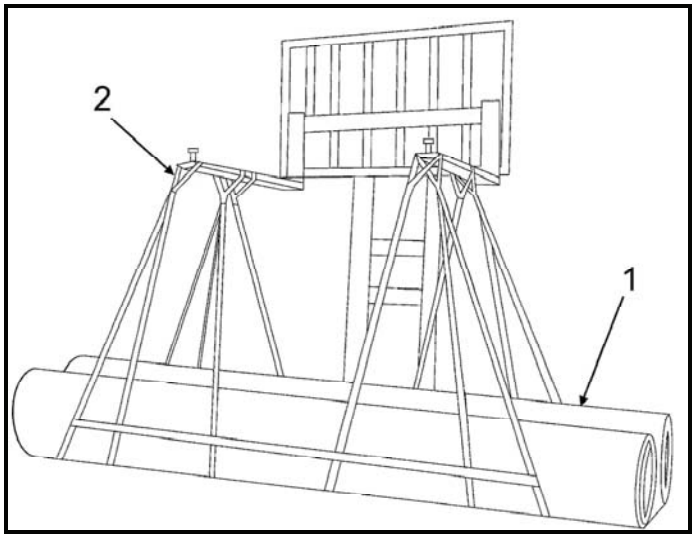


Figure 12. Lifting the tank.

14. Place the tank onto the crate skids.

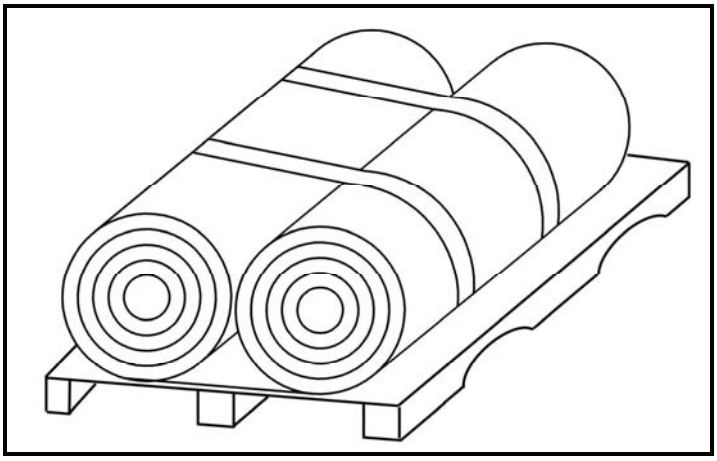


Figure 13. Rolled tank ready for crate.

The tank is now ready for packaging.

END OF TASK

PACKAGING TANK

1. Install all caps and plugs after inspecting for cleanliness.

2. All permanently attached fittings must be covered with their permanently attached flaps to prevent damage to the tank material when packaged.

3. All aluminum components shall be completely covered with cushioning material.

4. A 10,000 lb, capacity forklift is required to move the packaging crate.

5. Wrap tank with a clean, protective packaging sheet ensuring that the tank is fully covered. Secure the edges of the packaging sheet forming a bag. Lifting slings will be on the outside of the wrapped tank. Place the wrapped tank on top of the skid base and secure it in place

6. Place a clean, protective packaging sheeting on top of the tank.

7. The berm liner shall be rolled to a size that will fit on top of the tank but will minimize the overall container height. The overall height of the crated tank and berm liner with accessories shall not exceed seven feet. See WP 0005 00 for berm liner folding instructions.

8. Place the berm liner on top of the tank and secure it in place.

9. Place a clean, protective packaging sheeting on top of the berm liner before placing any components or parts on top of it.

10. Each end of the wrapped tank and wrapped berm liner shall be marked with identification markings IAW MIL-STD-129, including shelf life data. This is in addition to the exterior marking requirements on the crate.

11. Place tank accessories listed below (Table 1) on the shadow boards and secure with the shadow board ties. Place shadow board with attached accessories on top of the folded berm liner.

Table 1 – Tank Accessories

DESCRIPTION	QUANTITY
Gate Valve, 6 inch	4
Elbow, 6 inch, Fem/Fem	2
Elbow, 6 inch, Fem/Male	2
2 inch Valve Assembly	2
Emergency Repair Kit	1
Consumable Item Overpack Kit	1
Vent Tube Assembly	1

PACKAGING TANK (Cont.)

12. Place the cushioned tank and berm liner items listed below (Table 2) around the tank and berm liner.

Table 2 – Additional Items

DESCRIPTION	QUANTITY
2 inch Tank Drain Hose Assembly 16 ft	1
2 inch Tank Drain Hose Assembly 10 ft	1
6 inch Fill/Discharge Hose Assembly	4
6 inch Fill/Discharge Valve Assembly	4
2 inch Berm Liner Drain Hose Assembly	2

13. Install the crate top to the skid base and secure them to each other with the original bolts and washers.

END OF WORK TASK

PREPARATION FOR FOLDING BERM LINER

1. Lift up corner of berm liner to expose drain fitting. There are drain fittings on two corners.
2. Disconnect drain dome fitting and install the drain blind flange.
   a. Remove the drain assembly dome fitting by removing the eight 3/8 inch nuts, lock washers, and washers.
   b. Position the blind flange where the drain dome fitting was removed.
   c. Secure the blind flange with the eight 3/8 inch nuts, lock washers, and washers.
3. Lay corner flat. Repeat steps 1 and 2 for other drain fitting.
4. Berm Liner is now ready for folding.

END OF TASK

FOLDING BERM LINER

The berm liner is approximately 115 feet by 115 feet.

1. Fold one edge over 7.5 feet (Figure 14).

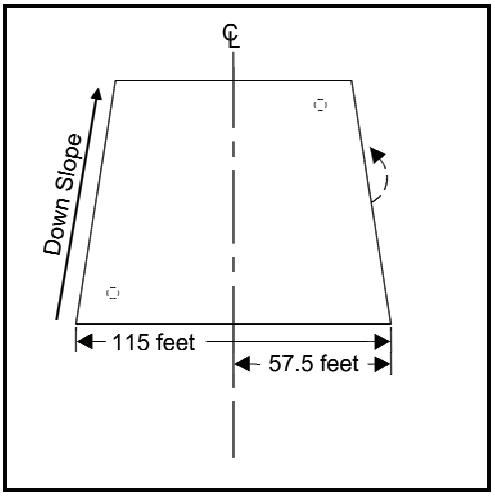


Figure 14. First 7.5 foot fold.

2. Fold the folded edge to center (Figure 15).

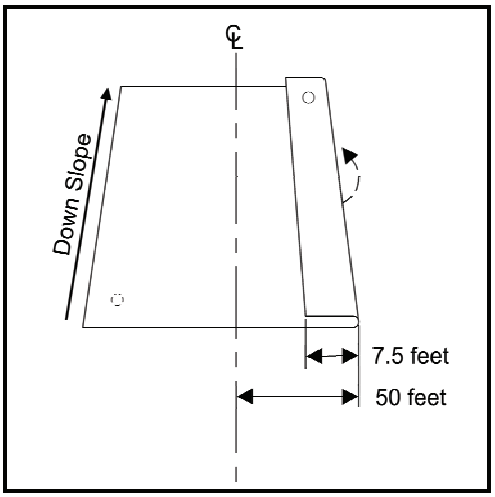


Figure 15. Folding the edge to center.

FOLDING BERM LINER (Cont.)

3. Fold the folded edge to center, again (Figure 16).

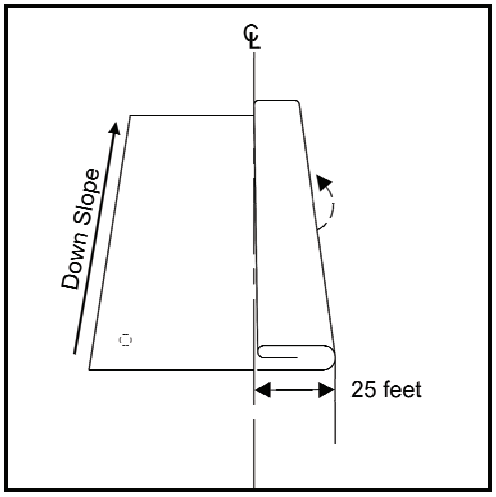


Figure 16. Folding the edge to center, 2nd time.

4. Fold the folded edge to center, again (Figure 17).

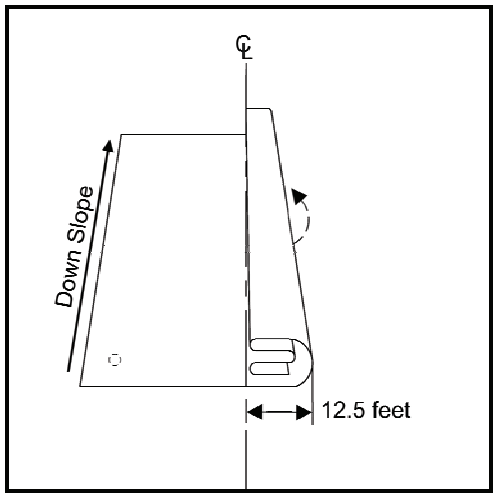


Figure 17. Folding the edge to center, 3rd time.

FOLDING BERM LINER (Cont.)

5. Repeat steps 1- 4 for the opposite edge (Figure 18).

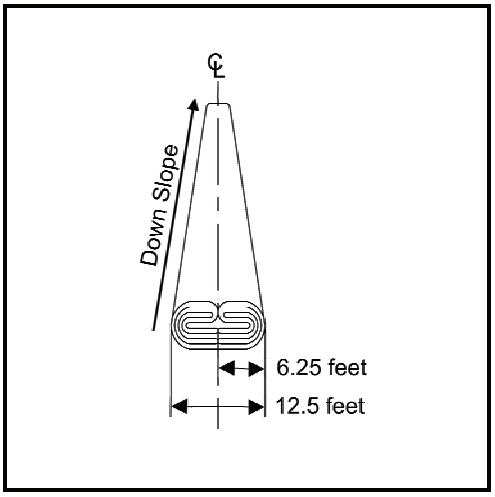


Figure 18. Final folded berm liner configuration.

6. Measure the folded berm liner width to approximately 12 feet 5 inches.

7. Roll one end to center (Figure 19).

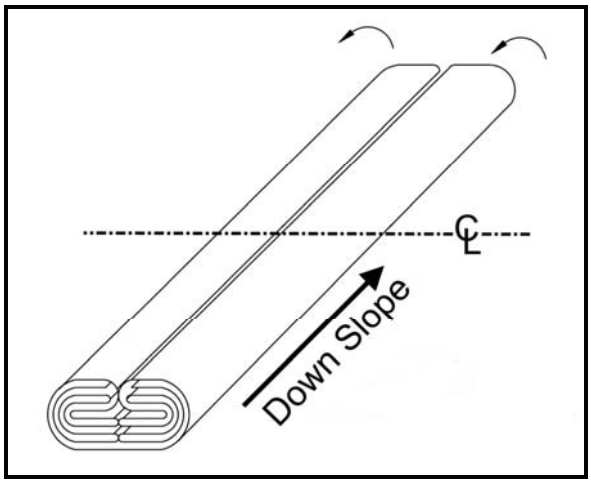


Figure 19. Rolling the berm liner.

NOTE

The lifting sling is positioned under the berm liner and should be in the proper position for securing the berm liner once the ends are rolled.

Secure the rolled half of the berm liner with sandbags before attempting to roll the other half.

FOLDING BERM LINER (Cont.)

8. Roll other end to center (Figure 20).

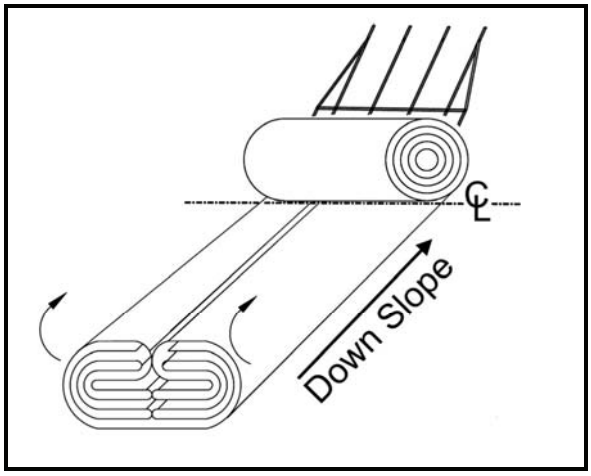


Figure 20. Berm liner half rolled.

9. Measure the folded berm liner width to approximately 12 feet 5 inches (Figure 21).

10. Secure the berm liner with ratchet straps (Figure 21).

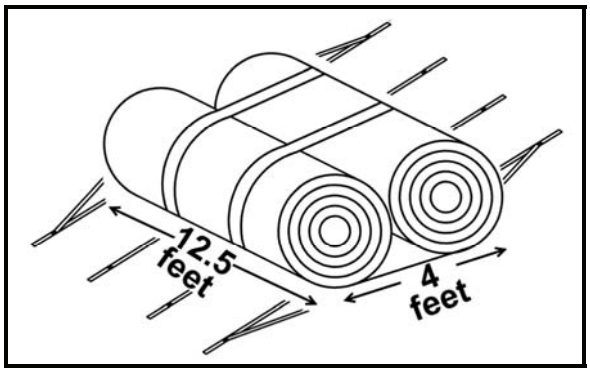


Figure 21. Rolled berm liner.

NOTE

When properly folded the berm liner should be approximately 12.5 feet by 4 feet.

FOLDING BERM LINER (Cont.)

11. Locate the lifting straps (Figure 22, Item 2) around berm liner (Figure 22, Item 1). Carefully insert fork lift forks (10,000-lb. capacity) through the loops of lifting straps.

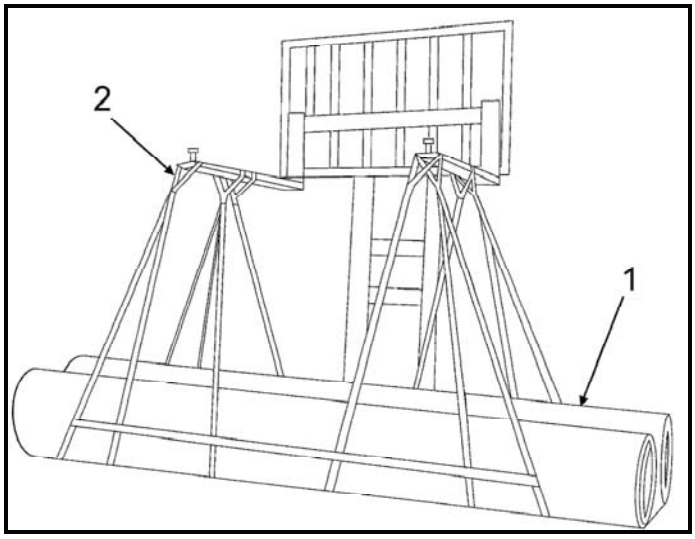


Figure 22. Lifting the berm liner.

12. Place the berm liner onto the crate skids (Depot Only) (Figure 23).

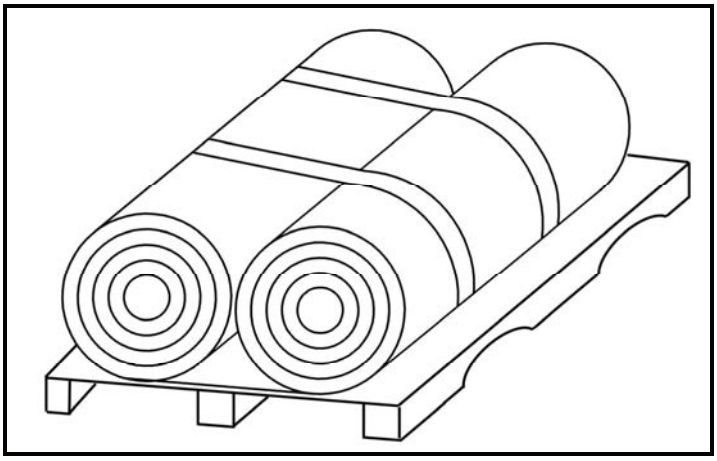


Figure 23. Rolled berm liner on top of crate skids (Depot Only).

FOLDING BERM LINER (Cont.)

13. Place the berm liner onto the tank (IPDS Only) (Figure 24).

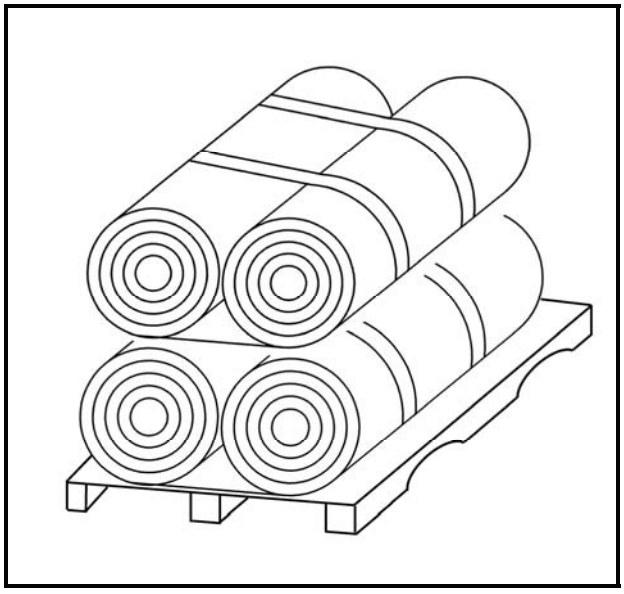


Figure 24. Rolled berm liner on top of tank (IPDS Only).

The berm liner is now ready for packaging.

END OF TASK

PACKAGING BERM LINER

1. The berm liner shall be rolled to a size that will fit on top of a tank but will minimize the overall container height. The overall height of the crated tank and berm liner with accessories shall not exceed seven feet. See WP 0005 00-34 for tank folding instructions.

2. A 10,000 lb, capacity forklift is required to move the packaging crate.

3. Wrap berm liner with a clean, protective packaging sheet ensuring that the berm liner is fully covered. Secure the edges of the packaging sheet forming a bag. Lifting slings will be on the outside of the wrapped berm liner. Place the wrapped berm liner on top of the pre-packaged tank and secure it in place.

4. Place a clean, protective packaging sheeting on top of the berm liner before placing any components or parts on top of it.

5. Each end of the wrapped tank and wrapped berm liner shall be marked with identification markings IAW MIL-STD-129, including shelf life data. This is in addition to the exterior marking requirements on the crate.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

OPERATION UNDER UNUSUAL CONDITIONS

INITIAL SETUP:

Tools

Repair Kit, Field, Emergency
(Item 3, Table 1, WP 0037 00)

Equipment Condition
Tank Not Empty

Materials/Parts

Personnel required
Sixteen

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.

END OF TASK

OPERATION IN EXTREME COLD

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.

Do not allow ice to accumulate on the tank.

1. Avoid any unnecessary handling of the tank.
2. If possible, deploy the tank only when the temperature is above -25°F (-32°C).
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. Refold and repack the fabric tank after the seams have been stretched out.

END OF TASK

OPERATION IN SALT WATER AREAS

No special procedures are required for operation in salt water areas.

END OF TASK

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 fill/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 fill/discharge valve assemblies clear of sand, dust and grime.
4. Wipe all couplings clean before assembly.

END OF TASK

OPERATION AT HIGH ALTITUDES

No special procedures are required for operation at high altitudes.

END OF TASK

OPERATION IN SNOW AND ICE

1. Keep snow and ice from accumulating on the top of the tank, vent, and pipe assembly.
2. Keep snow and ice from accumulating on the couplings to ensure proper assembly and disassembly.
3. Avoid unnecessary folding, unfolding, or rolling of the tank that might cause flaking, cracking, or delaminating of the coating material.
4. Sweep snow from the exterior of tank with a soft-bristled broom or brush.
5. Cover fittings to keep ice from forming on the fill/discharge assemblies.

END OF TASK

OPERATION IN MUD

Ensure that all fittings are clean.

END OF TASK

OPERATION IN HIGH WINDS

Keep tank as full as possible.

END OF TASK

OPERATION IN RAIN

1. If possible, provide adequate drainage ditches to prevent standing water around tank.

END OF TASK

EMERGENCY PROCEDURES

General

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

Emergency Repairs with Wood Plugs

In emergencies, as an immediate temporary measure, the wood plugs may be used for sealing small holes or punctures (Figure 1).

Wet and insert in the hole. Twist plug clockwise (to the right) until the leak is either stopped or slowed. 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.

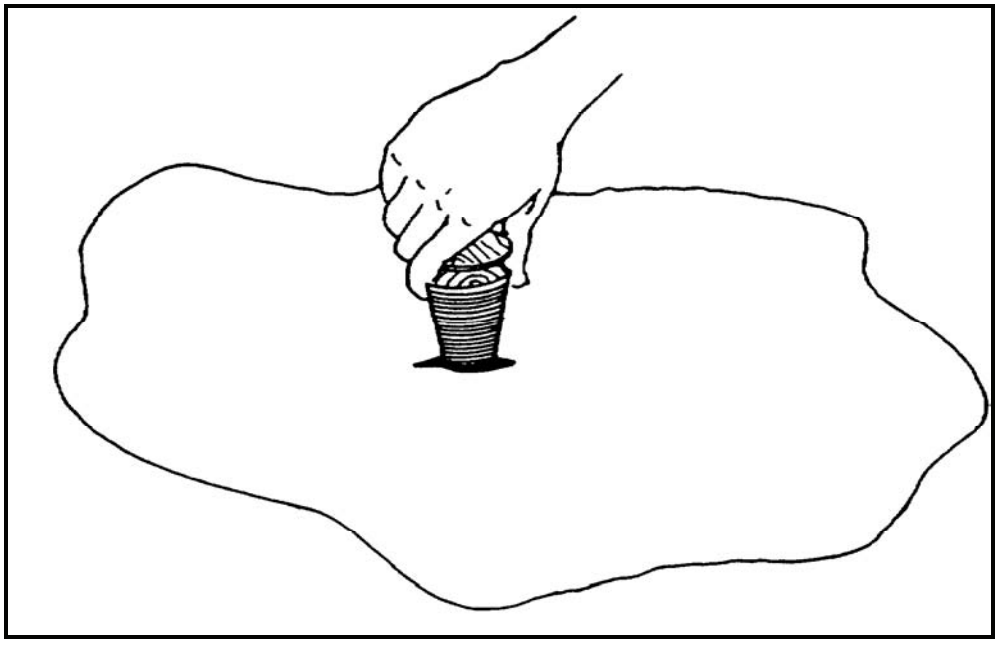


Figure 1. Wood plug repair.

EMERGENCY PROCEDURES (Cont.)

Emergency Repairs with Sealing Clamps

Small slits, tears, or cuts [not to exceed 6 inches 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 3 inches in length, use the 3 inch clamp.
2. For holes (tears) 3 to 5 inches in length, use the 5-inch clamp.
3. For holes (tears) 5 to 7.5 inches in length, use the 7.5-inch clamp.

NOTE

It may be necessary to increase the size of the tears in order to be able to insert the bottom plate of the clamp.

4. Loop cord around wrist (Figure 2, Item 1) to prevent loss of clamp into tank.
5. Slip the bottom plate of the clamp (Figure 2, Item 2) through the hole or tear and rotate it until it is centered and its length runs with the tear.
6. Pull bottom plate up against fabric, and slide top plate and wing nut (Figure 2, Item 3) down cord and onto threaded stud (Figure 2, Item 4) of bottom plate.
7. With plates aligned, tighten wing nut (Figure 2, Item 5) to clamp the tank wall between the two plates. Tighten enough to stop leak.

CAUTION

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

EMERGENCY PROCEDURES (Cont.)

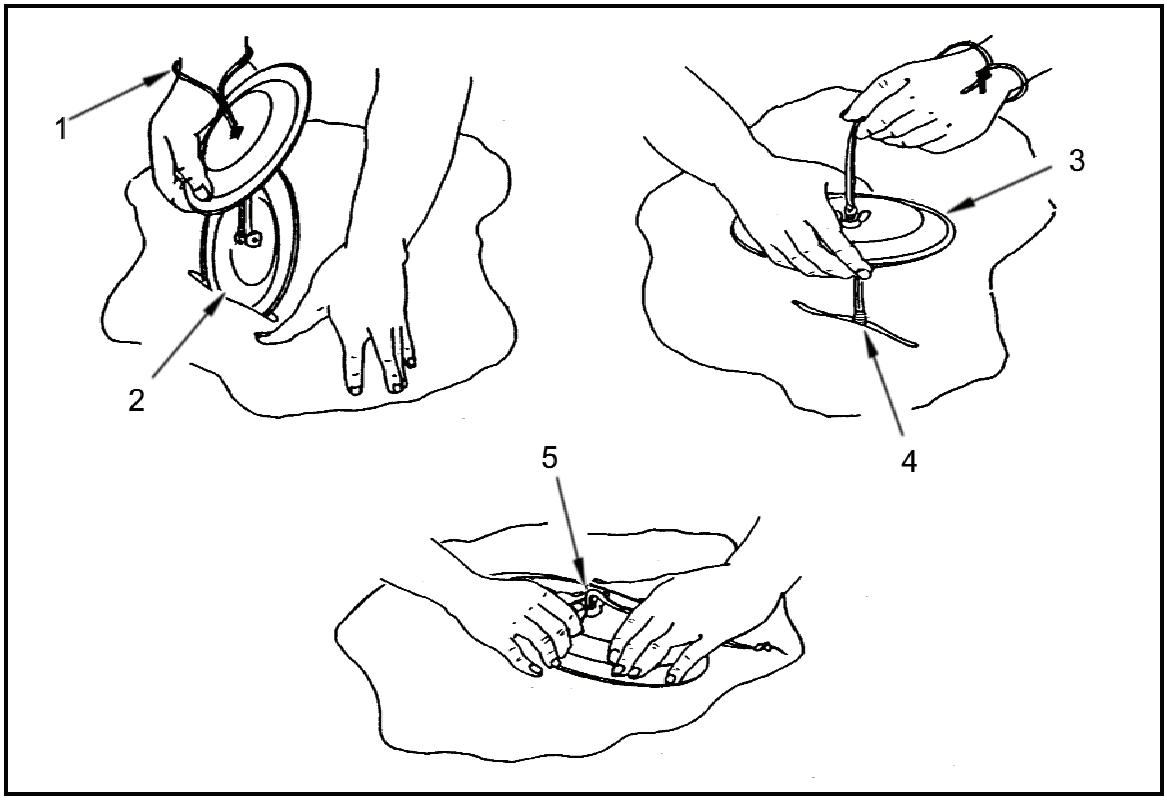


Figure 2. Mechanical clamp repair.

END OF TASK

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

NOTE

Detailed Chemical, Biological, Radiological, and Nuclear procedures can be found in: FM 3-11.3, FM 3-11.4 and FM 3-11.5.

General

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

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

Emergency Procedures

If NBC attack is known or suspected, mask at once and continue 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 skin and have radiation check made as soon as 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 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 tactical situation permits.

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

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

END OF TASK

END OF WORK PACKAGE

CHAPTER 3

OPERATOR AND FIELD LEVEL TROUBLESHOOTING FOR TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

OPERATOR AND FIELD LEVEL TROUBLESHOOTING INTRODUCTION

INTRODUCTION TO TROUBLESHOOTING

This chapter provides information for identifying and correcting malfunctions which may develop while operating the 210,000 Gallon Collapsible Tank Assembly.

The *Troubleshooting Index* (WP 0009 00) lists common malfunctions which may occur and refers you to the proper page in WP 0010 for a troubleshooting procedure.

If you are unsure of the location or operation of an item mentioned in troubleshooting, refer to *General Information* (WP 0004 00).

Before performing troubleshooting, read and follow all safety instructions found in *General Safety Instructions* and in the *Warning Summary* at the front of this manual.

The *Troubleshooting Index* (WP 0009 00) 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 the listed corrective actions, notify your supervisor.

When troubleshooting a malfunction:

Locate the symptom or symptoms in WP 0009 00 that best describes the malfunction.

Turn to the page in WP 0010 00 where the troubleshooting procedures for the malfunction in question are described. Headings at the top of each page show how each troubleshooting procedure is organized: SYMPTOM, PROBLEM, and POSSIBLE REMEDY.

Perform each step in the order listed until the malfunction is corrected. DO NOT perform any maintenance task unless the troubleshooting procedure tells you to do so.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
OPERATOR AND FIELD LEVEL TROUBLESHOOTING INDEX

OPERATOR TROUBLESHOOTING

FIELD LEVEL TROUBLESHOOTING

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
OPERATOR AND FIELD LEVEL TROUBLESHOOTING PROCEDURE

EXPLANATION OF COLUMNS

The columns in the troubleshooting table in WP 0010 00 are defined as follows:

1. SYMPTOM. A visual or operational indication that something is wrong with the equipment.
2. PROBABLE CAUSE. A Possible cause to the symptom.
3. POSSIBLE REMEDY. A procedure to correct the problem.

Table 1. Operator Troubleshooting.

SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
FUEL TANK		
Tank leaks.	Inspect the tank for punctures or tears.	Perform emergency repairs. See WP 0007 00-3.
	The tank cannot be repaired.	Notify Field Maintenance.
FILL/DISCHARGE GATE VALVE ASSEMBLY		
The gate valve leaks.	The gate valve cannot be repaired.	Notify Supervisor.
TANK DRAIN BALL VALVE		
Drain ball valve leaks.	Check that the drain ball valve is closed completely.	Tightly close the drain ball valve.
	Check the drain ball valve for damage or wear.	If damaged or worn, notify Field Maintenance.
	Check the drain ball valve for proper alignment.	Align valve. If still leaking, notify Field Maintenance.

Table 1. Operator Troubleshooting. (Cont.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
HOSE ASSEMBLY, FILL/DISCHARGE		
Hose or couplings leak.	Check for tears and breaks in the hose.	If hose is damaged or leaking, notify Field Maintenance.
	Check the cam lock coupling gasket for damage or wear.	Replace the cam lock coupling gasket. See WP 0019 00.
	Check the cam lock coupling for dirt, damage, or wear.	Remove the dirt or debris from inside the cam lock coupling. Replace the hose assembly if the corrective action fails to stop the leakage. Notify Field Maintenance.
TANK DRAIN HOSE ASSEMBLY		
Drain hose assembly leaks.	Check for leaks or breaks in the drain hose.	If hose is damaged, notify Field Maintenance.
VENT FITTING ASSEMBLY		
Vent and pipe assembly leak.	Check gasket between cam lock coupling and flange adapter.	Replace coupling gasket. See WP 0023 00.
	Vent and pipe assembly continue to leak.	If still leaking, notify Field Maintenance.
PASSIVE VENT		
Vent does not operate freely.	Check the vent for leakage, cleanliness, and freedom of action.	Notify Field Maintenance if dirty, leaking or cap is binding.
FILL/DISCHARGE ASSEMBLY		
Fill/discharge assembly leaks.	Inspect the gasket between the cam lock coupling and flanged adapter.	Replace the gasket between the cam lock coupling and the flanged adapter. See WP 0025 00.
	Fill/discharge assembly continues to leak.	If still leaking, notify Field Maintenance.

Table 1. Operator Troubleshooting. (Cont.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
TANK DRAIN FITTING ASSEMBLY		
Drain fitting assembly leaks between the drain fitting and the tank fitting.	Check for missing or loose washers and hex-head cap screws.	If hardware is missing or loose, notify Field maintenance.
	Check the drain cover plate for damage or cracks.	If damaged, notify Field Maintenance.
BERM LINER DRAIN FITTING ASSEMBLY		
Drain fitting assembly leaks between drain fitting and berm liner.	Check dome fitting for leaks.	Notify Field Maintenance if leaking.
BERM LINER DRAIN VALVE ASSEMBLY		
Drain ball valve leaks.	Check that the drain ball valve is closed completely.	Tightly close the drain ball valve.
	Check the drain ball valve for damage or wear.	If damaged or worn, notify Field Maintenance.
	Check the drain ball valve for proper alignment.	Align valve. If still leaking, notify Field Maintenance.
EMERGENCY REPAIR ITEMS AND SPARE PARTS		
Inspect contents of emergency repair items and spare parts.	Emergency repair items or spare parts are missing from the fuel tank crate.	Replace missing emergency repair item(s) or spare parts.

Table 2. Field Level Troubleshooting.

SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
FUEL TANK		
Tank leaks.	Inspect the tank for punctures or tears.	Perform emergency repairs. See WP 0007 00-3.
	The tank cannot be repaired.	Notify Supervisor.
FILL/DISCHARGE GATE VALVE ASSEMBLY		
The gate valve leaks.	The gate valve cannot be repaired.	Notify Supervisor.
TANK DRAIN BALL VALVE		
Drain ball valve leaks.	Check that the drain ball valve is closed completely.	Tightly close the drain ball valve.
	Check the drain ball valve for damage or wear.	If damaged or worn, notify Supervisor.
	Check the drain ball valve for proper alignment.	Align valve. If still leaking, notify Supervisor.
HOSE ASSEMBLY, FILL/DISCHARGE		
Hose or couplings leak.	Check for tears and breaks in the hose.	If hose is damaged or leaking, notify Supervisor.
	Check the cam lock coupling gasket for damage or wear.	Replace the cam lock coupling gasket. See WP 0019 00.
	Check the cam lock coupling for dirt, damage, or wear.	Remove the dirt or debris from inside the cam lock coupling. Replace the hose assembly if the corrective action fails to stop the leakage. Notify Supervisor.
TANK DRAIN HOSE ASSEMBLY		
Drain hose assembly leaks.	Check for leaks or breaks in the drain hose.	If hose is damaged, notify Supervisor.

Table 2. Field Level Troubleshooting.(Cont.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
VENT FITTING ASSEMBLY		
Vent and pipe assembly leak.	Check gasket between cam lock coupling and flange adapter.	Replace coupling gasket. See WP 0023 00.
	Vent and pipe assembly continue to leak.	If still leaking, notify Supervisor.
PASSIVE VENT		
Vent does not operate freely.	Check the vent for leakage, cleanliness, and freedom of action.	Notify Supervisor if dirty, leaking or cap is binding.
FILL/DISCHARGE ASSEMBLY		
Fill/discharge assembly leaks.	Inspect the gasket between the cam lock coupling and flanged adapter.	Replace the gasket between the cam lock coupling and the flanged adapter. See WP 0025 00.
	Fill/discharge assembly continues to leak.	If still leaking, notify Supervisor.
TANK DRAIN FITTING ASSEMBLY		
Drain fitting assembly leaks between the drain fitting and the tank fitting.	Check for missing or loose washers and hex-head cap screws.	If hardware is missing or loose, notify Supervisor.
	Check the drain cover plate for damage or cracks.	If damaged, notify Supervisor.
BERM LINER DRAIN FITTING ASSEMBLY		
Drain fitting assembly leaks between drain fitting and berm liner.	Check dome fitting for leaks.	Notify Supervisor if leaking.

Table 2. Field Level Troubleshooting.(Cont.)

SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
BERM LINER DRAIN VALVE ASSEMBLY		
Drain ball valve leaks.	Check that the drain ball valve is closed completely.	Tightly close the drain ball valve.
	Check the drain ball valve for damage or wear.	If damaged or worn, notify Supervisor.
	Check the drain ball valve for proper alignment.	Align valve. If still leaking, notify Supervisor.
EMERGENCY REPAIR ITEMS AND SPARE PARTS		
Inspect contents of emergency repair items and spare parts.	Emergency repair items or spare parts are missing from the fuel tank crate.	Replace missing emergency repair item(s) or spare parts.

END OF WORK PACKAGE

CHAPTER 4

OPERATOR MAINTENANCE INSTRUCTIONS FOR TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

OPERATOR MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
OPERATOR'S PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
INTRODUCTION

GENERAL

Preventative Maintenance Checks and Services (PMCS) involves systematic caring, inspection and servicing of equipment to keep it in good condition and prevent breakdowns. The checks are used to find, correct or report problems. The *Operator's PMCS* (WP 0011) organizes the operator's PMCS tasks in chronological sequence and contains systematic instructions on inspections, services, tests and corrections to be performed to keep your equipment in good operating condition and ready for its primary mission. Service intervals are divided into categories: Before Operation; During Operation; After Operation; and various other checks and services to be performed at prescribed hourly intervals. As the Tank Assembly operator, you should:

1. Perform your PMCS as scheduled. Using the PMCS table, always do your PMCS in the same order, so it gets to be a habit. With practice, you'll quickly spot anything wrong. If the COMMON NAME does not perform as required, refer to the appropriate troubleshooting procedure in Chapter 3, *Operator Troubleshooting*.

2. Do your **BEFORE PMCS** prior to the Tank Assembly leaving its staging/service area or performing its intended mission.

3. Do your **DURING PMCS** during Tank Assembly operation. Leaks can be spotted only during operation.

4. Do your **AFTER PMCS** as soon as possible after the Tank Assembly has been taken out of its mission mode or returned to its containment area.

5. Do your **WEEKLY PMCS** once a week. If the Tank Assembly has not been operated in a week, also perform *Before* PMCS at the same time.

6. Do your **MONTHLY PMCS** once a month.

7. Do your **HOURLY PMCS** at the hour interval indicated.

NOTE

The WARNINGS and CAUTIONS appearing in your PMCS table should always be observed. WARNINGS and CAUTIONS appear before applicable procedures. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

8. If your equipment fails to operate, perform the operator troubleshooting procedures presented in this manual. Report unresolved maintenance problems to field maintenance personnel. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

GENERAL (cont.)

9. Use DA Form 2404 (*Equipment Inspection and Maintenance Worksheet*) or DA Form 5988-E to record any faults that you discover before, during, or after operation, unless you can fix them. You DO NOT need to record faults that you fix. If you find something seriously wrong, **IMMEDIATELY** report it to your supervisor. For further information on how to use these forms, see DA PAM 750-8.

10. Before performing preventative maintenance, read all the checks required for the applicable interval and prepare all that is needed to make all the checks. You'll always need a rag (Item 7, WP 0038 00).

    a. **Keep it Clean**. Dirt, grease, oil and debris get in the way and may cover up a serious problem. Clean as you work and as-needed. Use dry cleaning solvent (Item 8, WP 0038 00) on all metal surfaces. Use dishwashing compound (Item 1, WP 0038 00) and water then you clean rubber, plastic and painted surfaces.

WARNING

When servicing this equipment, performing maintenance or disposing of materials such as oil, fuel and CARC paint, consult your unit/local hazardous waste disposal center or safety office for local regulatory guidance.

    b. **Hazardous Waste Disposal**. Ensure all spills are cleaned up and disposed of IAW local policy and ordinances.

    c. **Rust and Corrosion**. Check metal parts for rust and corrosion. If any bare metal or corrosion exists, clean and apply a light coat of lubricating oil (Table 1, Item 9, WP 0038 00).

    d. **Bolts, Nuts and Screws**. Check bolts, nuts and screws for obvious looseness, missing, bent or broken condition. Look for bare metal or rust around bolt heads; if you find one is loose, tighten it.

FLUID LEAKAGE

It is necessary for you to know how fluid leakage affects the status of the Tank Assembly. Wetness around seals, gaskets, fittings or connections indicates leakage. A stain also indicates leakage. If a fitting or connector is loose, tighten it. If it is broken or defective, report it. The Following are types/classes of leakage you need to know to be able to determine the status of the Tank Assembly. Learn these leakage definitions and remember – when in doubt, notify your supervisor.

PMCS Leakage Definitions

It is necessary to know how fluid leakage affects the status of the collapsible fabric 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 to field 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 the supervisor.

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

Class III leaks should be reported on DA Form 2404 for corrective action by Intermediate Maintenance.

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.

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

CLASS IV Leakage 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.

LUBRICATION

No lubrication is required for this Tank Assembly.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
OPERATOR'S PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

PMCS PROCEDURES

Your Preventative Maintenance Checks and Services, Table 1, lists the inspections and care required to keep the Tank Assembly in good operating order. PMCS procedures are arranged in a logical sequence requiring minimum time and motion on the part of the person(s) performing them and shall be so arranged that there will be minimum interference between persons performing the checks simultaneously on the Tank Assembly. An explanation of each column is provided below:

Explanation of table entries

1. **Item Number (Item No.) column**. Numbers in this column are for reference. When completing DA Form 2404 or DA Form 5988-E (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must perform checks and services for the interval listed.

2. **Interval column**. This column tells you when you must perform the procedure in the procedure column.

NOTE

If both calendar and hours intervals are indicated, perform the procedure at whichever interval comes first.

If you are operating the Tank Assembly for the first time, perform your *Weekly* and *Monthly* PMCS the first time you do your *Before* PMCS.

3. **Location, Item to Check/Service column**. This column provides the location and item to be checked or serviced.

4. **Procedure column**. This column gives the procedure you must perform to check or service the item listed in the Item to Check/Service column, to know if the equipment is ready or available for its intended mission. You must perform the procedure at the time stated in the interval column. If you do not have the required tools, or if the procedure tells you to, notify your supervisor.

NOTE

The WARNINGS and CAUTIONS appearing in your PMCS table should always be observed. WARNINGS and CAUTIONS appear before applicable procedures. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

PMCS PROCEDURES (Cont.)

5. **Not Fully Mission Capable If: column**. Information in this column tells you what faults will prevent your equipment from being capable of performing its primary mission. If you perform Check/Service procedures that show faults listed in this column, the equipment is not mission-capable. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

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 before procedure was done.

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

PMCS PROCEDURES (Cont.)

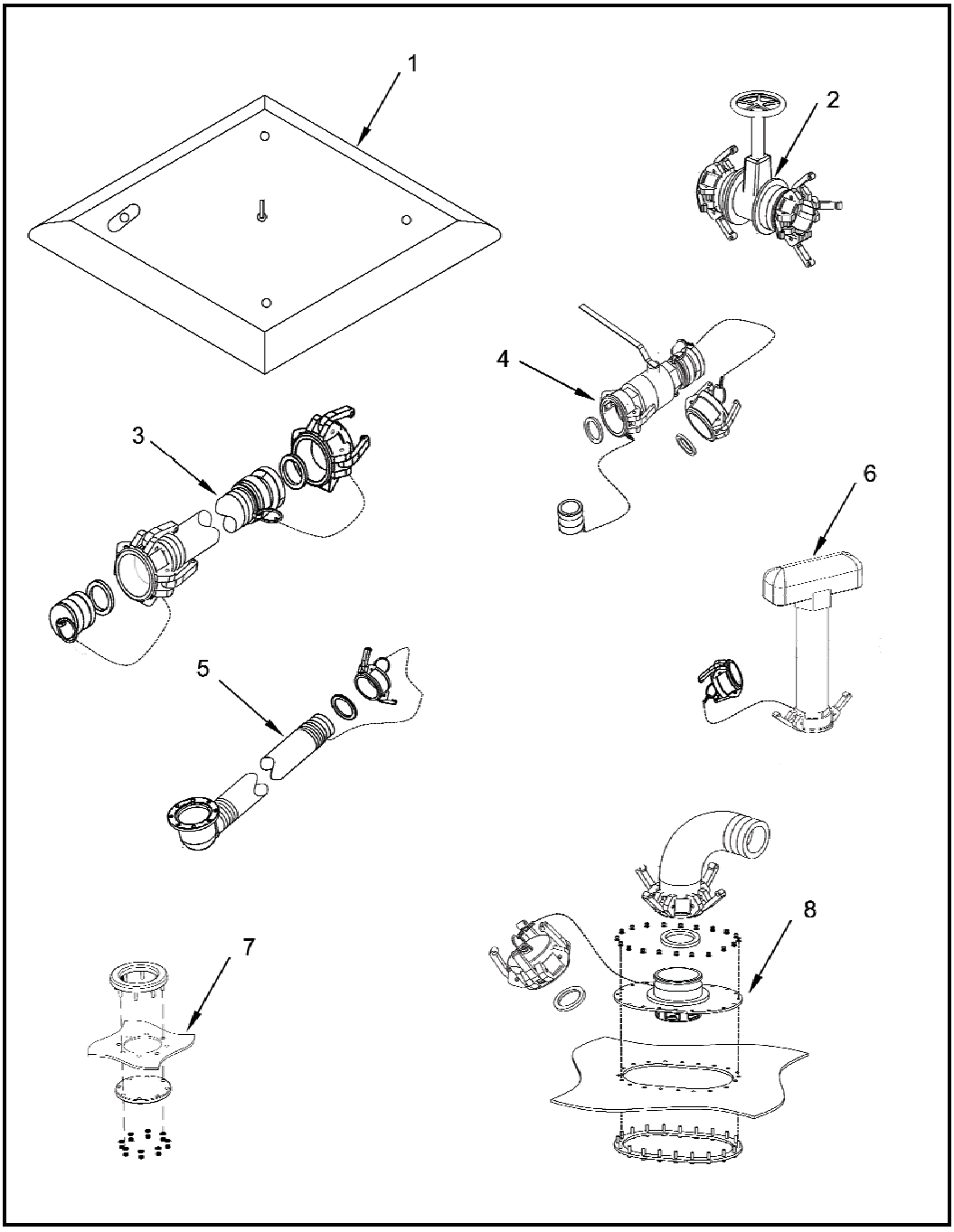


Figure 1. Tank Item Numbers for PMCS.

PMCS PROCEDURES (Cont.)

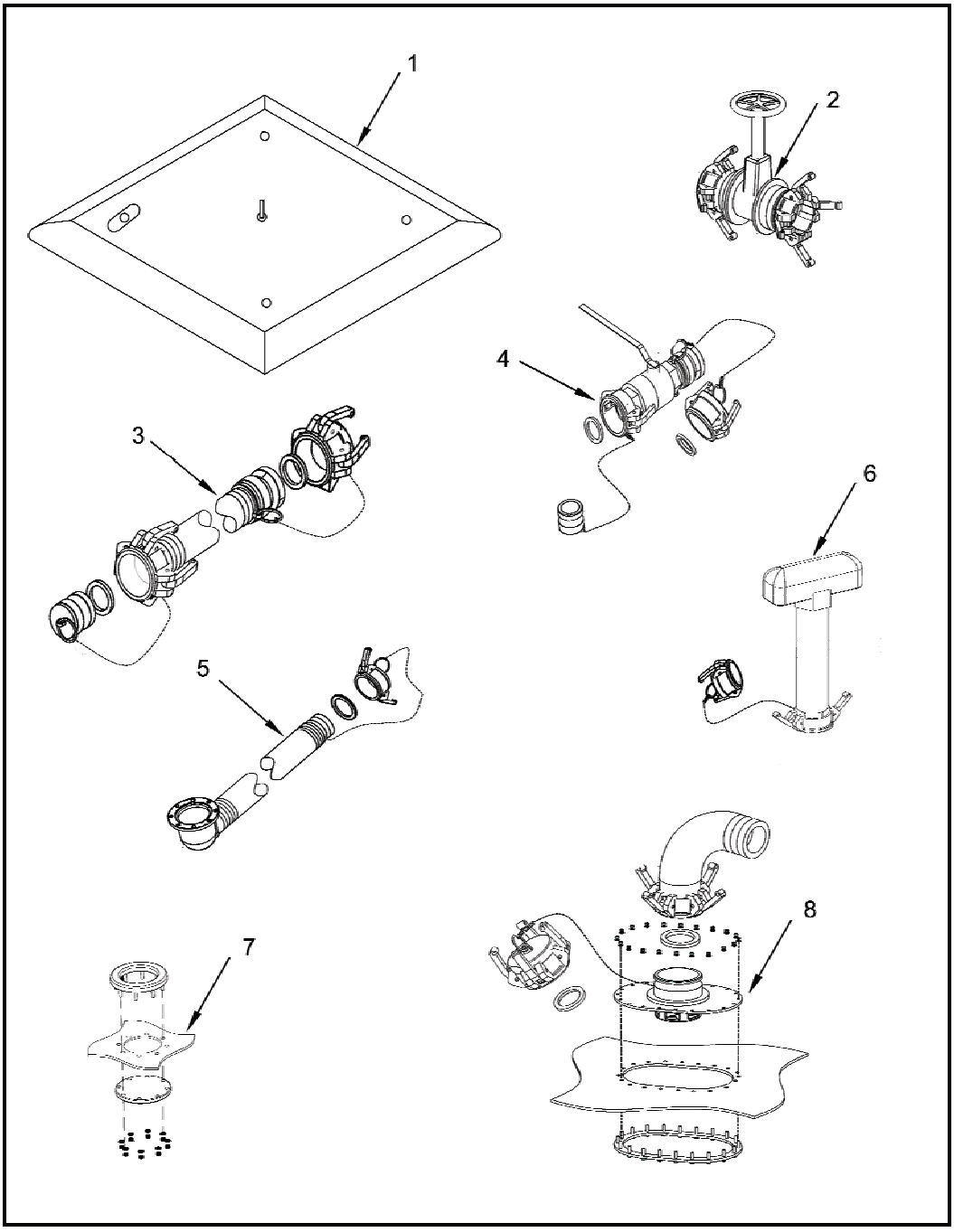


Figure 1. Tank Item Numbers for PMCS.

PMCS PROCEDURES (Cont.)

Table 1. Preventative Maintenance Checks and Services for Tank.

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE (See Fig. 1)	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
			NOTE • Review all WARNINGS, CAUTIONS and NOTES before performing PMCS on the Tank Assembly. • If you are operating the Tank Assembly for the first time, perform you *Weekly* and *Monthly* PMCS the first time you do your *Before* PMCS. • If performing *Weekly* PMCS and Tank Assembly has not been operated in a week, perform *Before* PMCS at the same time. • If performing *Monthly* PMCS and Tank Assembly has not been operated in a month, perform *After* PMCS at the same time.	
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 Body (Item 1)	Inspect for tears or punctures. If torn or punctured, perform emergency repairs (WP 0007 00).	Tank has tears or punctures that cannot be repaired.
3	Before	Fill/Discharge Gate Valve (Item 2)	Check for bent or binding stem and broken hardware. Check gasket and cam lock arms for damage. Check for missing or damaged dust caps and plugs.	Stem, hand-wheel or handle, gasket, or cam lock arms are damaged or missing.
4	Before	Fill/Discharge Hose Assembly (Item 3)	Check for cuts and tears. Check fittings for distortion and damage, or missing gaskets, dust caps and plugs.	Hose assembly is damaged. Gaskets, dust caps or plugs are damaged or missing.
5	Before	Tank Drain Ball Valve (Item 4)	Check for bent or binding stem and broken handle. Check for missing or damaged dust caps and plugs.	Stem, handle, gasket, or cam lock arms are damaged or missing.
6	Before	Tank Drain Hose Assembly (Item 5)	Check hose for cuts and tears. Check fittings for distortion or damage.	Hose assembly is damaged.

PMCS PROCEDURES (Cont.)

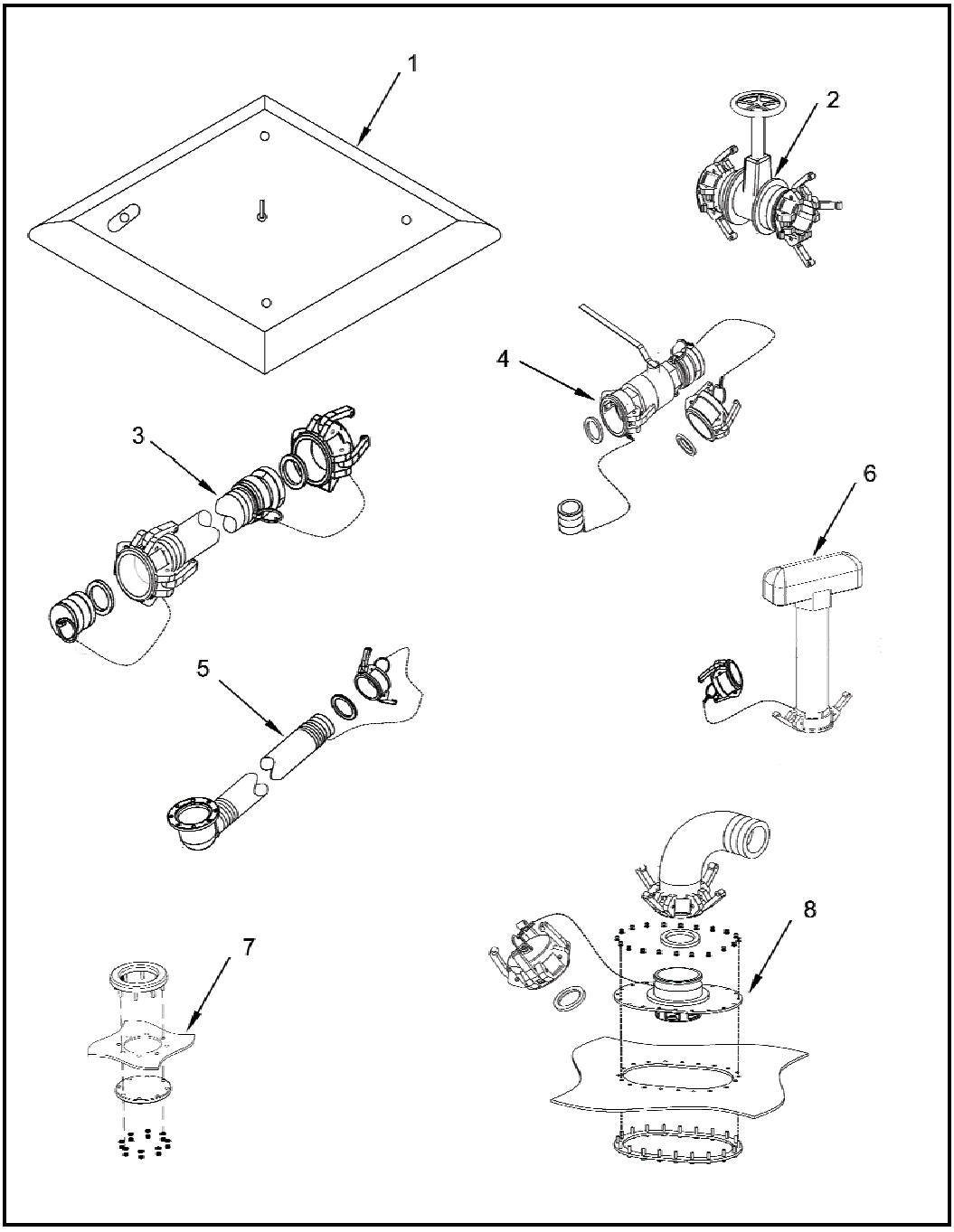


Figure 1. Tank Item Numbers for PMCS.

PMCS PROCEDURES (Cont.)

Table 1. Preventative Maintenance Checks and Services for Tank (Cont.)

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE (See Fig. 1)	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
7	Before	Vent Fitting Assembly (Item 6)	Check vent, passive vent, cap gasket, rubber gasket, and cam lock arms for evidence of leakage, damage, or missing parts. Check vent for cleanliness and freedom of operation. Check for damaged or missing gaskets.	Vent or passive vent is damaged or missing. Vent, gasket, flat rubber gasket, or cam lock arms are damaged or missing.
8	Before	Tank Drain Fitting Assemblies (Item 7)	Check drain for damaged or missing parts.	Drain or drain hardware are missing, not properly connected, or damaged.
9	Before	Fill/Discharge Assembly (Item 8)	Check cam lock arms and elbow for damage.	Cam lock arms damaged or missing. Elbow body is cracked or worn.
10	During	Installation Area	Inspect the installation area for sticks and other sharp objects.	Sharp objects are present.
11	During	Tank Body (Item 1)	Inspect for tears, punctures, or leaks. If torn or punctured, perform emergency repairs.	Tank has tears, punctures, or leaks that cannot be repaired.
12	During	Fill/Discharge Gate Valve (Item 2)	Check for bent or binding stem, broken hardware, and leakage. Check gasket and cam lock arms for damage.	Stem, hand-wheel or handle, gasket, or cam lock arms are damaged, missing, or leaking.
13	During	Fill/Discharge Hose Assembly (Item 3)	Check hose for leaks, cuts, and tears. Check fittings for distortion or damage.	Hose assembly leaks or is damaged.
14	During	Tank Drain Ball Valve (Item 4)	Check for bent or binding stem, broken handle, and leakage.	Stem or handle is damaged, missing, or leaking.

PMCS PROCEDURES (Cont.)

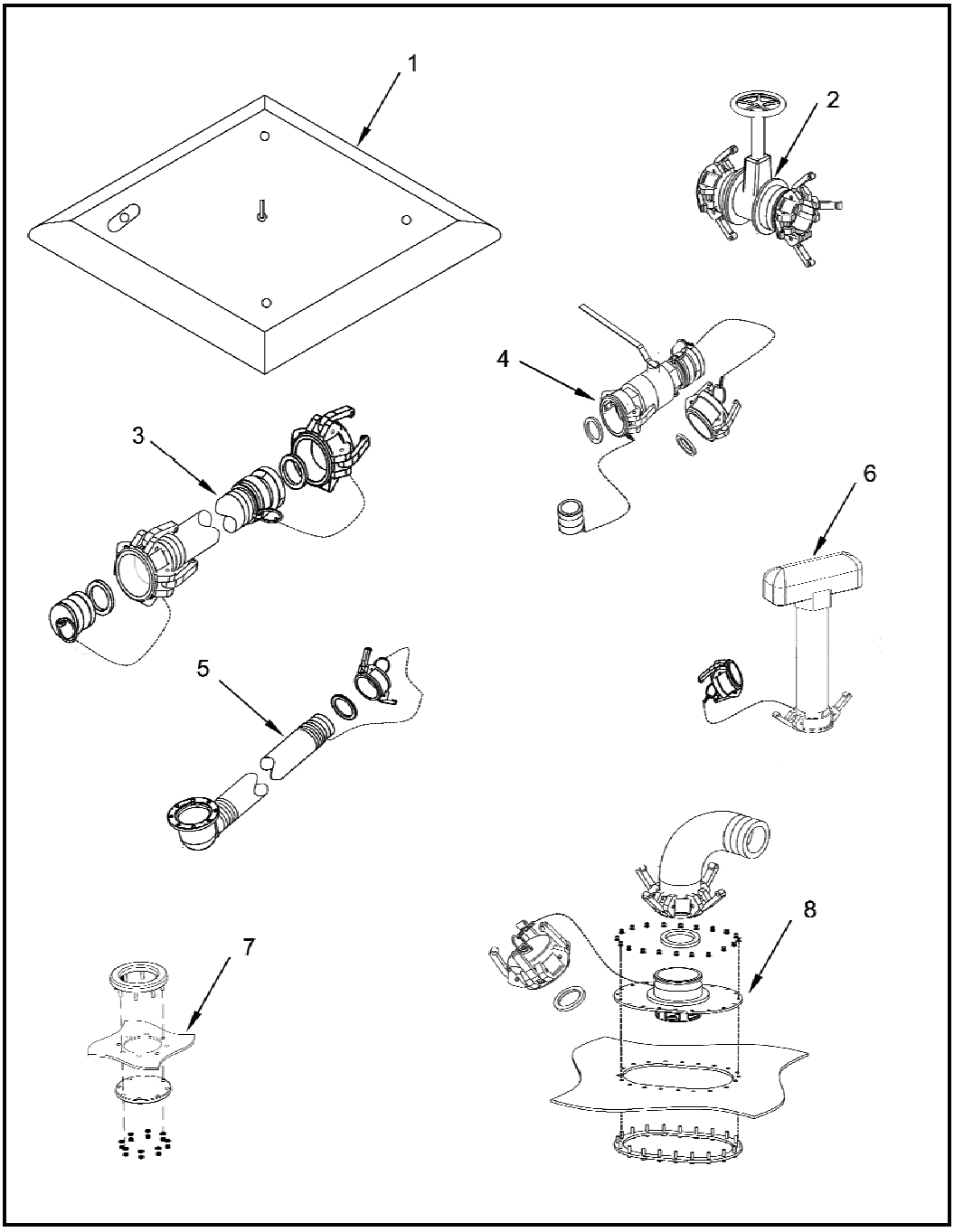


Figure 1. Tank Item Numbers for PMCS.

PMCS PROCEDURES (Cont.)

Table 1. Preventative Maintenance Checks and Services for Tank (Cont.)

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE (See Fig. 1)	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
15	During	Tank Drain Hose Assembly (Item 5)	Check hose for leaks, cuts, and tears. Check fittings for distortion and damage.	Hose assembly leaks or is damaged.
16	During	Vent Fitting Assembly (Item 6)	Check vent, passive vent, cap gasket, and cam lock arms for evidence of leakage, damage, or missing parts. Check vent for cleanliness and freedom of operation. Check for damaged or missing gaskets.	Vent or passive vent is damaged or missing. Vent, gasket, flat rubber gasket, or cam lock arms are damaged or missing.
17	During	Tank Drain Fitting Assemblies (Item 7)	Check immediate area for evidence of leakage. Check for damaged or missing parts.	Drain or drain hardware are missing, not properly connected, or damaged.
18	During	Fill/Discharge Assembly (Item 8)	Check cam lock arm and elbow body for damage or leakage.	Cam lock arms damaged or missing. Elbow body is cracked. Elbow sealing surface is badly dented.
19	After	Tank Body (Item 1)	Inspect for tears and punctures. If torn or punctured, perform emergency repairs (WP 0007 00).	Tank has tears or punctures that cannot be repaired.
20	After	Fill/Discharge Gate Valve (Item 2)	Check for bent or binding stem or broken hardware. Check gaskets and cam lock arms for damage. Check for missing or damaged dust caps and plugs.	Stem, hand-wheel or handle, gasket, or cam lock arms are damaged or missing. Dust caps or plugs missing or damaged.
21	After	Fill/Discharge Hose Assembly (Item 3)	Check for cuts and tears. Check fittings for distortion and damage, or missing gaskets, dust caps and plugs.	Hose assembly is damaged. Gaskets, dust caps and plugs are damaged or missing.

PMCS PROCEDURES (Cont.)

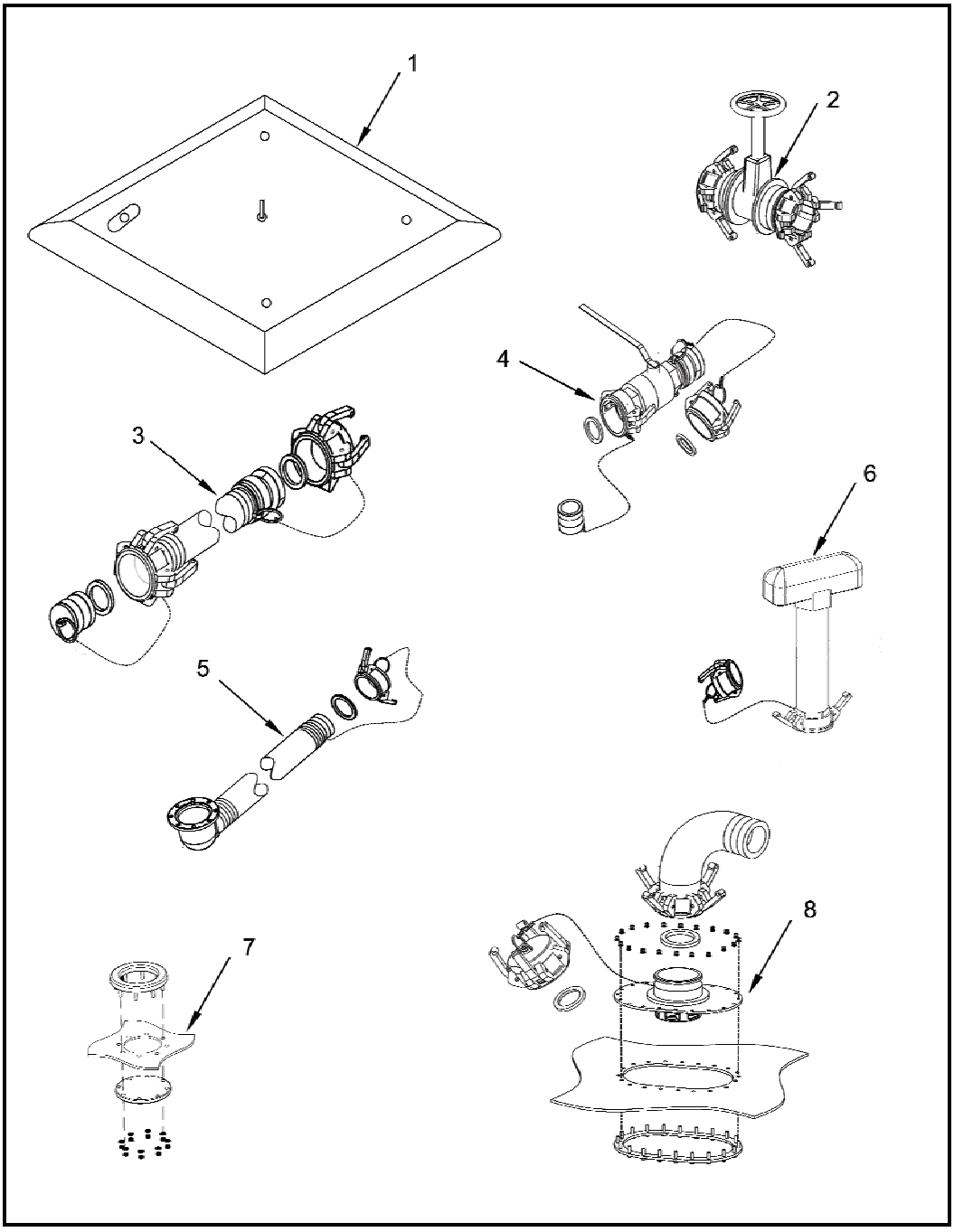


Figure 1. Tank Item Numbers for PMCS.

PMCS PROCEDURES (Cont.)

Table 1. Preventative Maintenance Checks and Services for Tank (Cont.)

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE (See Fig. 1)	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
22	After	Tank Drain Ball Valve (Item 4)	Check for bent or binding stem, or broken handle. Check for missing or damaged dust caps and plugs.	Stem or handle is damaged or missing. Dust caps or plugs missing or damaged.
23	After	Tank Drain Hose Assembly (Item 5)	Check hose for cuts and tears. Check fittings for distortion and damage.	Hose assembly is damaged.
24	After	Vent Fitting Assembly (Item 6)	Check vent, passive vent, cap gasket, and cam lock arms for damage or missing parts. Check vent for cleanliness and freedom of operation. Check for damaged or missing gaskets.	Vent or passive vent is damaged or missing. Vent, gasket, flat rubber gasket, or cam lock arms are damaged or missing.
25	After	Tank Drain Fitting Assemblies (Item 7)	Check drain for damaged or missing parts.	Drain or drain hardware are missing, not properly connected, or damaged.
26	After	Fill/Discharge Assembly (Item 8)	Check cam lock arm and elbow body for damage.	Cam lock arms damaged or missing. Elbow body cracked or worn.
27	Semi-annually	Tank Body (Item 1) Interior	Check coating for cracking.	Coating is cracked, allowing leakage.

PMCS PROCEDURES (Cont.)

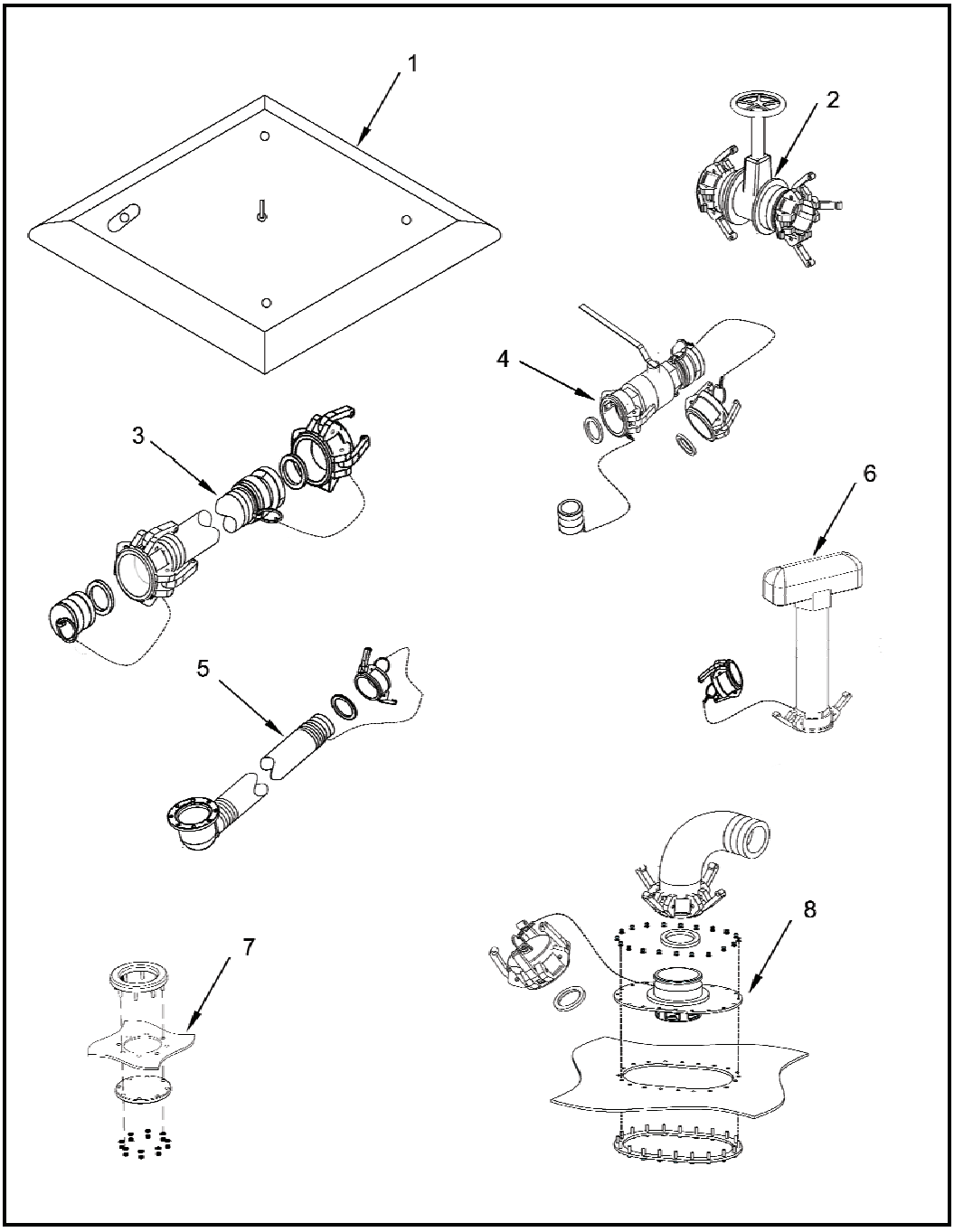


Figure 1. Tank Item Numbers for PMCS.

PMCS PROCEDURES (Cont.)

Table 1. Preventative Maintenance Checks and Services for Tank (Cont.)

ITEM NO.	INTERVAL	LOCATION ITEM TO CHECK/ SERVICE (See Fig. 1)	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
28	Every 2 years OR Every 5 years	Tank Body (Item 1)	When the system is packaged for long periods and stored in an **uncontrolled** environment (-25°F to 160°F) the tank should be unpackaged and the following procedure followed every 2 years. Unpack the tank and lay it out flat. Refold such that the new folds do not match with the earlier folds. Repack tank. When the systems is packaged for long periods and stored in a **controlled** environment (72°F and 65% relative humidity) the tank should be unpackaged and the following procedure followed every 5 years. Unpack the tank and lay it out flat. Refold such that the new folds do not match with the earlier folds. Repack tank.	Coating is cracked, allowing leakage.

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
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.

EQUIPMENT	MAINTENANCE PROCEDURE
Fill/Discharge Gate Valve, Hose Assembly Coupling and Dust Cap Gasket	WP 0014 00
Vent Fitting Assembly Coupling and Dust Cap Gasket	WP 0015 00
Fill/Discharge Assembly Elbow and Dust Cap Gasket	WP 0016 00

END OF WORK PACKAGE

OPERATOR MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

FILL/DISCHARGE GATE VALVE, HOSE ASSEMBLY COUPLING

AND DUST CAP GASKET REPLACEMENT

INITIAL SETUP:

Materials/Parts:

Gasket, 6 inch (Item 2, WP 0039 00)

Personnel Required

One

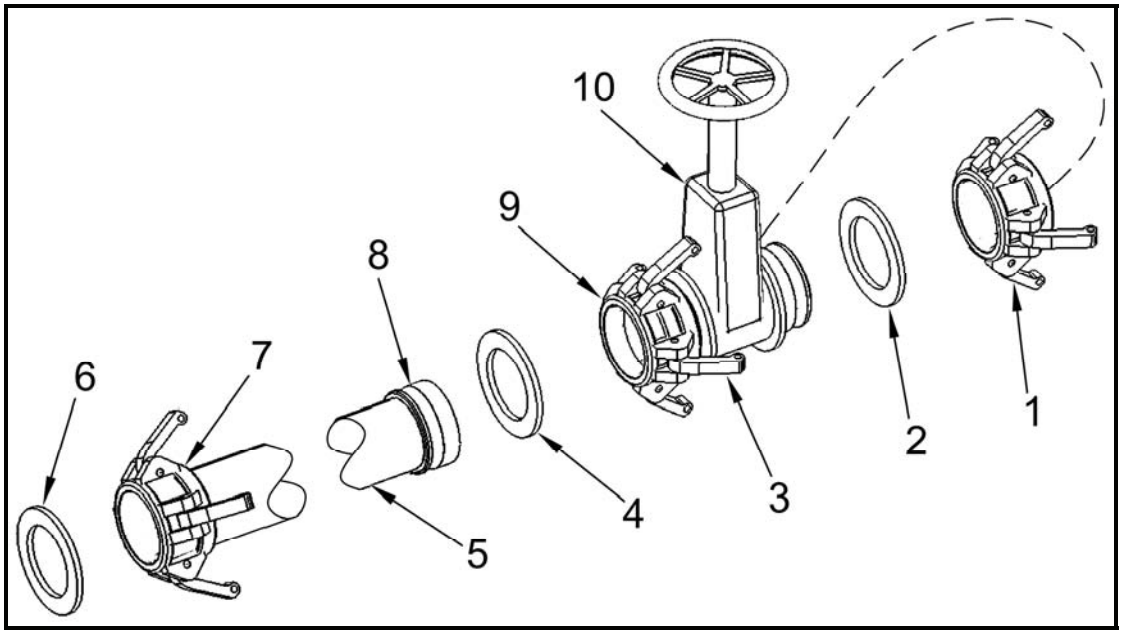


Figure 1. Fill/Discharge Gate Valve

REMOVAL

NOTE

The fill/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 lock arms (Figure 1, Item 3) outward on female quick-disconnect coupling (Figure 1, Item 9), and hose assembly coupling (Figure 1, Item 8). Disconnect hose assembly (Figure 1, Item 5) from fill/discharge valve assembly (Figure 1, Item 10).
2. Remove coupling gasket (Figure 1, Item 4) from inside female quick-disconnect coupling (Figure 1, Item 9). Discard gasket.
3. Remove hose assembly gasket (Figure 1, Item 6) from inside hose coupling (Figure 1, Item 7). Discard gasket.
4. Remove dust cap (Figure 1, Item 1). Remove gasket (Figure 1, Item 2) from dust cap. Discard gasket.

INSTALLATION

1. Install new gasket (Figure 1, Item 2) in dust cap (Figure 1, Item 1). Install dust cap (Figure 1, Item 1).
2. Install new hose assembly gasket (Figure 1, Item 6) inside hose coupling (Figure 1, Item 7).
3. Install new coupling gasket (Figure 1, Item 4) inside female quick-disconnect coupling (Figure 1, Item 9).
4. Connect hose assembly (Figure 1, Item 5) to fill/discharge valve assembly (Figure 1, Item 10).
5. Push in on cam lock arms (Figure 1, Item 3) to lock hose assembly (Figure 1, Item 5) in place.

END OF WORK PACKAGE

OPERATOR MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

VENT FITTING ASSEMBLY COUPLING AND DUST CAP GASKET

INITIAL SETUP:

Materials/Parts:

Gasket, 2 inch (Item 1, WP 0039 00)

Personnel Required

One

NOTE

Vent pipe, vent, and passive vent removed for clarity.

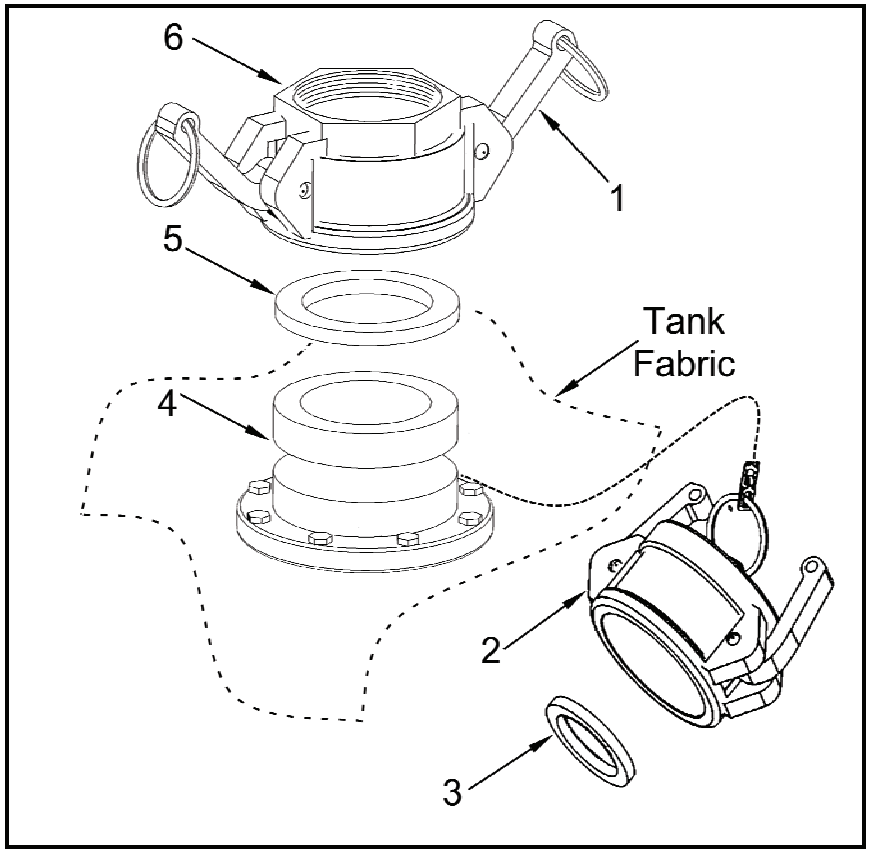


Figure 1. Vent Fitting Assembly

REMOVAL

1. Disconnect female quick-disconnect coupling (Figure 1, Item 6) from male-flanged adapter (Figure 1, Item 4) by pulling outward on cam lock arms (Figure 1, Item 1). Lift female quick-disconnect coupling from male-flanged adapter.

2. Remove female quick-disconnect coupling gasket (Figure 1, Item 5). Discard gasket.

3. Remove gasket (Figure 1, Item 3) from inside dust cap (Figure 1, Item 2). Discard gasket.

INSTALLATION

1. Install new coupling gasket (Figure 1, Item 5) into female quick-disconnect coupling (Figure 1, Item 6).

2. With cam lock arms (Figure 1, Item 1) in the outward position, install female quick-disconnect coupling (Figure 1, Item 6) to male-flanged adapter (Figure 1, Item 4).

3. Push cam lock arms (Figure 1, Item 1) inward until they lock in place.

4. Install new gasket (Figure 1, Item 3) into dust cap (Figure 1, Item 2).

END OF WORK PACKAGE

OPERATOR MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

FILL/DISCHARGE ASSEMBLY ELBOW AND

DUST CAP GASKET REPLACEMENT

INITIAL SETUP:

Materials/Parts:

Gasket, 6 inch (Item 2, WP 0039 00)

Personnel Required

One

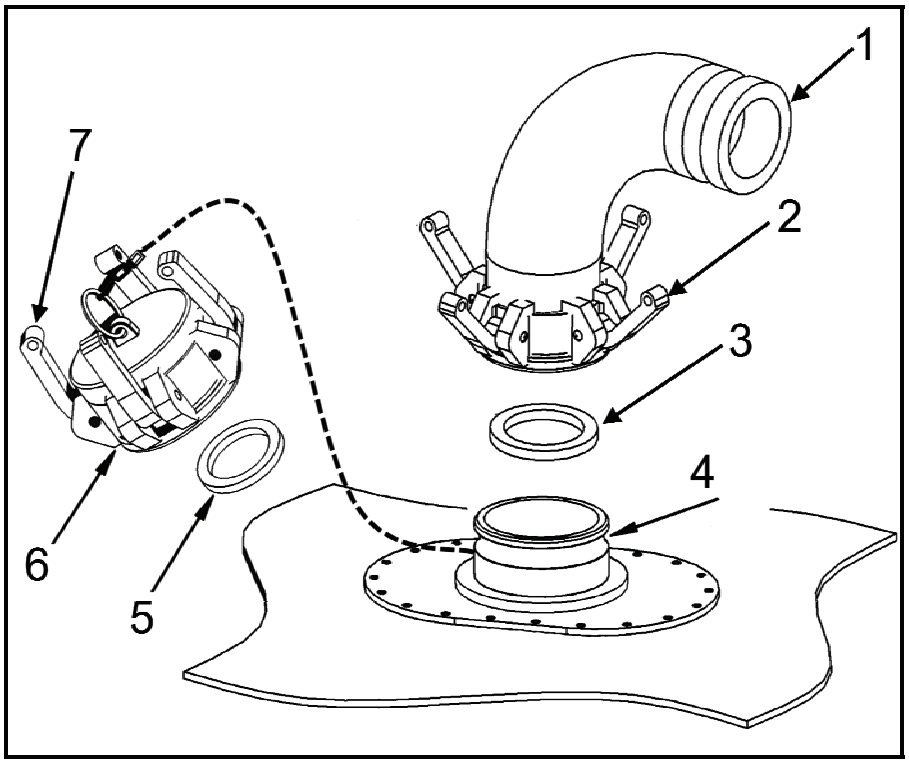


Figure 1. Fill/Discharge Assembly

REMOVAL

1. Remove elbow (Figure 1, Item 1) or dust cap (Figure 1, Item 6) by pulling outward on cam lock arms (Figure 1, Item 2), and lifting elbow or dust cap from flanged adapter (Figure 1, Item 4).

NOTE

Fill end female/female elbow has two gaskets.

2. Remove gasket (Figure 1, Item 3) from elbow (Figure 1, Item 1) and gasket (Figure 1, Item 5) from dust cap (Figure 1, Item 6). Discard gaskets.

INSTALLATION

NOTE

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

1. Install new gasket (Figure 1, Item 3) into elbow (Figure 1, Item 1) and new gasket (Figure 1, Item 5) in dust cap (Figure 1, Item 6).

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

3. Install the dust cap (Figure 1, Item 6) onto the elbow (Figure 1, Item 1) by pushing inward on the cam lock arms on dust cap (Figure 1, Item 7) to lock into position.

END OF WORK PACKAGE

CHAPTER 5

FIELD MAINTENANCE INSTRUCTIONS FOR TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
FIELD MAINTENANCE INTRODUCTION

GENERAL

1. These general maintenance instructions contain general shop practices and specific methods which you must be familiar with to properly maintain the Tank Assembly. You should read and understand these practices and methods before performing any Field Maintenance procedures.

2. Before beginning a task, find out how much Repair, Modification or Replacement is needed to fix the equipment. Sometimes the reason for equipment failure can be seen right away and complete teardown is not necessary. Disassemble equipment only as far as necessary to repair or replace damaged parts.

3. In some cases, a part may be damaged during removal. If the part appears to be good and other parts behind it are not defective, leave it in place and continue with the procedure. Here are a few simple rules:

   a. DO NOT remove dowel pins or studs unless loose, bent, broken or otherwise damaged.

   b. Replace all gaskets, lockwashers, locknuts, seals, cotter pins and O-rings (preformed packing).

4. All tags and forms attached to the equipment must be checked to learn the reason for removal of equipment from service.

WORK SAFETY

1. Before beginning a procedure, think about the safety risks and hazards to yourself and to others. Wear protective gear such as safety goggles or lenses, safety shoes, rubber apron or gloves.

2. Before beginning a procedure, ensure the following conditions have been observed (unless otherwise specified):

   a. Components must be at operating temperature to be tested.

   b. Components which are hot at operating temperatures (i.e. pumping systems) must cool down before they are removed.

3. Immediately clean-up spilled fluids to avoid slipping.

4. When lifting heavy parts, have someone help you.

5. Always use tools properly.

6. Observe all WARNINGS and CAUTIONS.

CLEANING INSTRUCTIONS

WARNING

Improper cleaning methods and use of unauthorized cleaning liquids or solvents can injure personnel and damage equipment. To prevent this, refer to TM 9-247, *(Materials Used for Cleaning, Preservation, Abrading and Cleaning Ordnance Material and Related Materials Including Chemicals)* for further instructions.

1. **General**. Cleaning instructions will be the same for the majority of parts and components which make up the Tank Assembly. The following applies to all cleaning operations:
   a. Clean all parts before inspection, after repair and before assembly.
   b. Keep hands free of grease, which can collect dust, dirt and grit.
   c. After cleaning, all parts should be covered or wrapped to protect them from dust and dirt. Parts that are subject to rust should be lightly oiled after cleaning.
2. **Oil Seals**. Wash oil seals with a solution of detergent (Item 1, WP 0038 00) and water and wipe dry with a clean rag (Item 7, WP 0038 00).

INSPECTION INSTRUCTIONS

NOTE

All damaged areas should be marked for repair or replacement.

1. All components and parts must be carefully checked to determine if they are serviceable for use, can be repaired or must be scrapped.
2. Inspect drilled and tapped (threaded) holes for the following:
   a. Wear, distortion, cracks and any other damage in or around holes.
   b. Threaded areas for wear, distortion (stretching) and evidence of cross-threading.

APPLICATION OF ADHESIVES AND SEALING COMPOUNDS

1. **General**. Adhesives are recommended in some task to ensure and strengthen seals. Sealing compounds are used to seal parts. The following information describes their correct use and application.
2. **Adhesive**. Adhesive provides a seal against leakage and a resistance to loosening when used in the assembly of threaded, slip-fitted or press-fitting parts. Always use the grade of adhesive specified and never use adhesive when other retaining means are provided (such as lockwires, lockwashers, lockplates and fasteners).

APPLICATION OF ADHESIVES AND SEALING COMPOUNDS (Cont.)

3. **Sealing Compound**.

   a. Anytime a seal is broken, the part must be thoroughly cleaned to remove any remaining sealing compound and dirt.

   b. Thoroughly clean surface before applying sealing compound.

   c. When applying sealing compound, ensure the area is completely covered. Press sealing compound into and around parts as necessary.

   d. Refer to manufacturer's instructions for time (and sometimes relative humidity) needed to set sealing compound.

STANDARD TOOL REQUIREMENTS

1. The following are general practices regarding the use of tools:

   a. Always use the proper tool kit and tools for the procedure being preformed.

   b. Ensure tools are clean and lubricated to reduce wear and prevent rust.

   c. Keep track of tools. DO NOT be careless with them.

   d. Return tools to toolbox when finished with repair or maintenance.

   e. Return toolboxes and tools to tool storage when not in use.

   f. Inventory tools before and after each use.

FLUID DISPOSAL

Dispose of contaminated drained fluids in accordance with the Standard Operating Procedures (SOP) of your unit.

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

SERVICE UPON RECEIPT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Equipment Condition
Tank Drained (WP 0005 00)

Materials/Parts

Personnel required
Four

UNPACKING

Refer to WP 0005 00.

CHECKING UNPACKED EQUIPMENT

1. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 361, *Transportation Discrepancy Report (TDR).*
2. 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 750-8.
3. Check to see whether the equipment has been modified. Report all discrepancies in accordance with the instructions of DA PAM 750-8.

CHECKING UNPACKED EQUIPMENT (Cont.)

4. Refer to Figure 1 and inspect Repair Kit for:

   a. Torn or cracked gaskets (Figure 1, Items 2, 3).

   b. Missing, cracked or broken wood plugs (Figure 1, Item 7).

   c. Missing patch assemblies (Figure 1, Items 4, 5, 6). Repair kit should contain 3 patch assemblies. Also check patch assemblies for deteriorated rubber, stripped threads and missing parts.

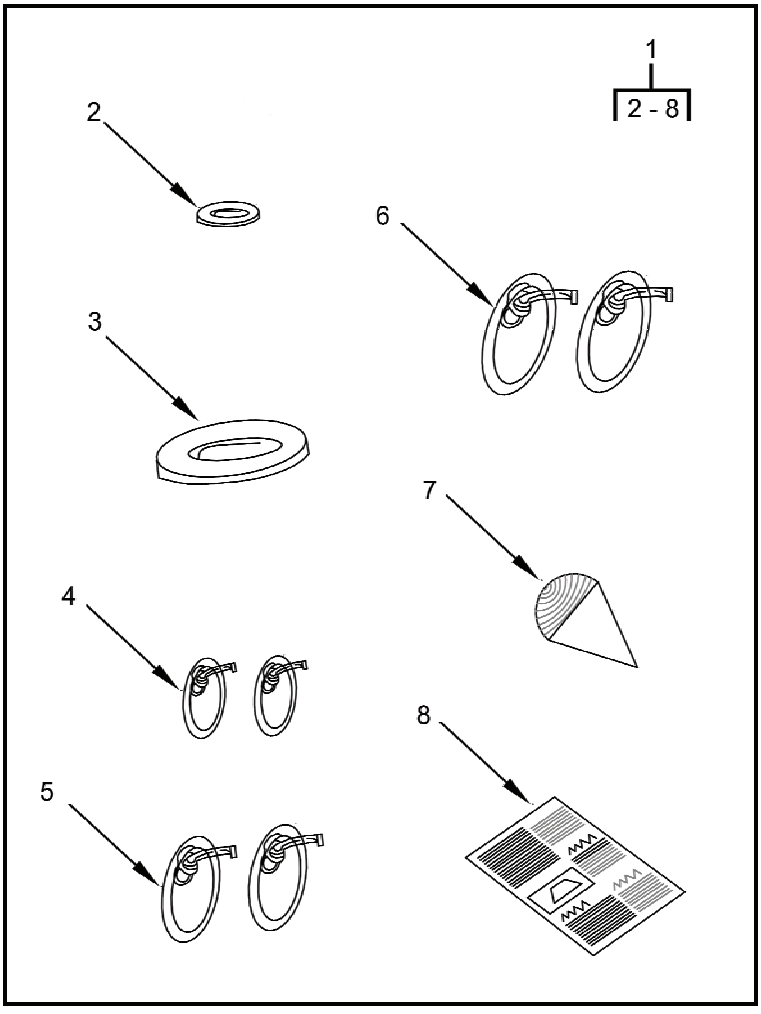


Figure 1. Repair Kit Inspection.

INSTALLATION INSTRUCTIONS

Refer to WP 0006 00.

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

FILL/DISCHARGE HOSE ASSEMBLY – 12 FEET LONG

SERVICE AND REPLACEMENT

INITIAL SETUP:

Tools
Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts
Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Equipment Condition
Tank Drained
(WP 0005 00)

Personnel Required
One

Mandatory Replacement Parts
Gasket, 6 inch
(Item 2, WP 0039 00)

REMOVAL

1. Pull outward on two cam-lever arms (Figure 1, Item 3). Remove dust cap (Figure 1, Item 2) and dust plug (Figure 1, Item 6) from hose assembly (Figure 1, Item 1).
2. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
3. Remove two chain assemblies (Figure 1, Item 4) and remove dust cap (Figure 1, Item 2) and dust plug (Figure 1, Item 6) from hose assembly (Figure 1, Item 1).
4. Remove gaskets (Figure 1, Item 5) from dust plug (Figure 1, Item 6). Discard the gaskets.

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

SERVICE (Cont.)

1. Flush out the hose assembly with hot, soapy water.
2. Rinse out the fill/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.

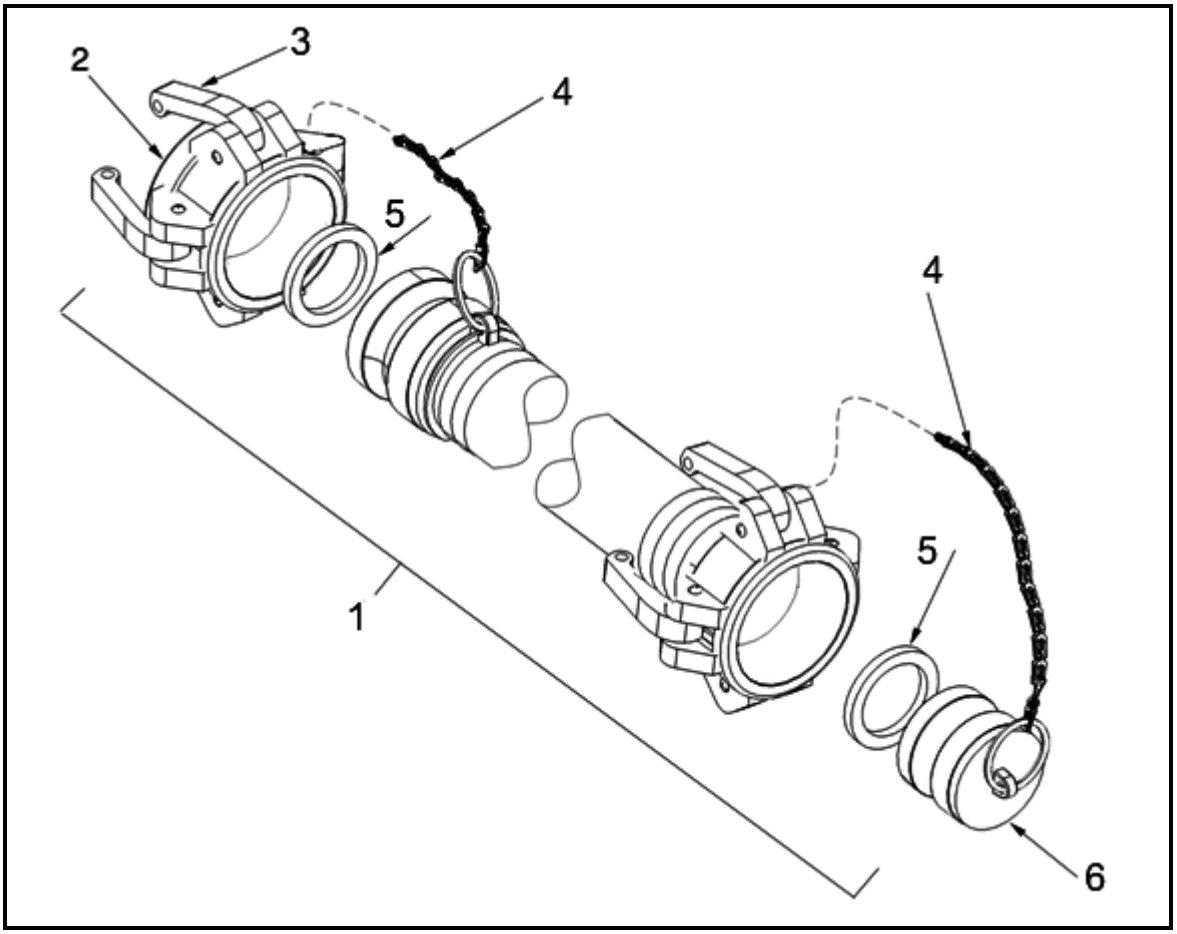


Figure 1. Fill/Discharge Hose Assembly

INSTALLATION

1. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
2. Install two chain assemblies (Figure 1, Item 4), dust cap (Figure 1, Item 2), and dust plug (Figure 1, Item 6) to hose assembly (Figure 1, Item 1).
3. Install new gasket (Figure 1, Item 5) on dust plug (Figure 1, Item 6).
4. Connect dust cap (Figure 1, Item 2) and dust plug (Figure 1, Item 5) to hose assembly (Figure 1, Item 1) by pushing in on cam-lever arms (Figure 1, Item 3).

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

TANK OR BERM LINER DRAIN BALL VALVE

SERVICE, REPLACEMENT, REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Torque Wrench
(Item 2, Table 2, WP 0036 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts

Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Anti-seize Tape
(Item 5 WP 0038 00)

Equipment Condition

Tank Drained
(WP 0005 00)

Personnel Required

One

Mandatory Replacement Parts

Gasket, 2 inch
(Item 1, WP 0039 00)

REMOVAL

1. Pull cam-lever arms (Figure 1, Item 8) on ball valve female connector (Figure 1, Item 13) out, away from body of ball valve (Figure 1, Item 1).
2. Disconnect the drain hose (not shown) from the female connector (Figure 1, Item 13).
3. Pull cam-lever arms (Figure 1, Item 3) on drain hose male connector (not shown) out, away from body of the drain hose.
4. Disconnect the drain hose (not shown) from the male connector (Figure 1, Item 2)

DISASSEMBLY

1. Pull cam-lever arms (Figure 1, Item 3) on dust cap (Figure 1, Item 4) out, away from body of dust cap.

DISASSEMBLY (Cont.)

2. Remove dust cap (Figure 1, Item 4) from male coupling (Figure 1, Item 2). Remove gasket (Figure 1, Item 7) from dust cap. Discard gasket.

3. Disconnect chain (Figure 1, Item 6) and two key rings (Figure 1, Item 5) from dust cap (Figure 1, Item 4) and male coupling (Figure 1, Item 2).

4. Unthread male coupling (Figure 1, Item 2) from ball valve (Figure 1, Item 1).

5. Pull cam-lever arms (Figure 1, Item 8) on female coupling (Figure 1, Item 13) out, away from body of female coupling.

6. Remove dust plug (Figure 1, Item 11) from female coupling (Figure 1, Item 13). Remove gasket (Figure 1, Item 12) from dust plug. Discard gasket.

7. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.

8. Disconnect chain (Figure 1, Item 9) and two key rings (Figure 1, Item 10) from dust plug (Figure 1, Item 11) and female coupling (Figure 1, Item 13).

9. Unthread female coupling (Figure 1, Item 13) from ball valve (Figure 1, Item 1).

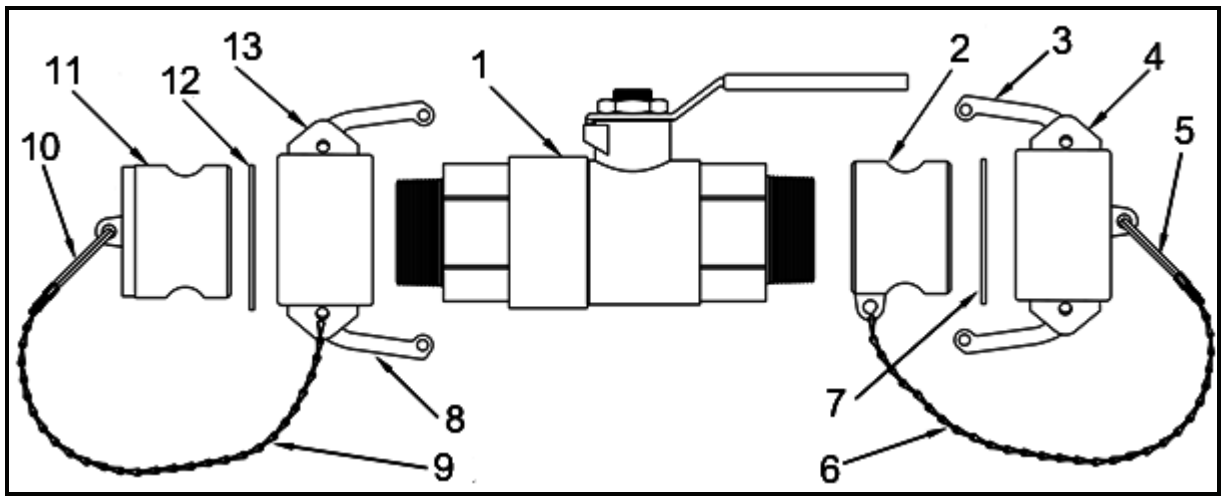


Figure 1. Drain Ball Valve Assembly

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

1. Inspect for cleanliness and clean necessary 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.

ASSEMBLY

1. Coat threads of female coupling (Figure 1, Item 13) with anti-seize tape, and install female coupling onto ball valve (Figure 1, Item 1).
2. Connect chain (Figure 1, Item 9) and two key rings (Figure 1, Item 10) to dust plug (Figure 1, Item 11) and female coupling (Figure 1, Item 13).
3. Install new gasket (Figure 1, Item 12) on dust plug (Figure 1, Item 11).
4. Pull cam-lever arms (Figure 1, Item 8) on female coupling (Figure 1, Item 13) outward, away from body of female coupling.
5. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
6. Install dust plug (Figure 1, Item 11) in female coupling (Figure 1, Item 13).
7. Push cam-lever arms (Figure 1, Item 8) on female coupling (Figure 1, Item 13) inward toward body of female coupling until locked.
8. Coat threads of male coupling (Figure 1, Item 2) with anti-seize tape, and install male coupling onto ball valve (Figure 1, Item 1).
9. Connect chain (Figure 1, Item 6) and two key rings (Figure 1, Item 5) to male coupling (Figure 1, Item 2) and dust cap (Figure 1, Item 4).
10. Pull cam-lever arms (Figure 1, Item 3) on dust cap (Figure 1, Item 4) outward, away from body of dust cap.
11. Install dust cap (Figure 1, Item 4) on male coupling (Figure 1, Item 2).

ASSEMBLY (Cont.)

12. Push cam-lever arms (Figure 1, Item 3) on dust cap (Figure 1, Item 4) inward toward body of dust cap until locked.

INSTALLATION

1. Pull cam-lever arms (Figure 1, Item 8) on ball valve female connector (Figure 1, Item 13) out, away from body of ball valve.

2. Insert the drain hose male fitting (not shown) into the female connector (Figure 1, Item 13).

3. Push cam-lever arms (Figure 1, Item 8) on ball valve female connector (Figure 1, Item 13) in, close to body of ball valve until locked.

4. Pull cam-lever arms (Figure 1, Item 3) on drain hose female connector (not shown) out, away from body of the drain hose.

5. Insert the drain hose female end (not shown) over the ball valve male connector (Figure 1, Item 2)

6. Push cam-lever arms (Figure 1, Item 3) on drain hose female connector (note shown) in, close to body of drain hose until locked.

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

TANK OR BERM LINER DRAIN HOSE (WITH DOME)

SERVICE AND REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanics Gasket
(Item 1, Table 2, WP 0036 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts

Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Equipment Condition

Tank Drained
(WP 0005 00)

Personnel Required

One

Mandatory Replacement Parts

Gasket, 2 inch
(Item 1, WP 0039 00)

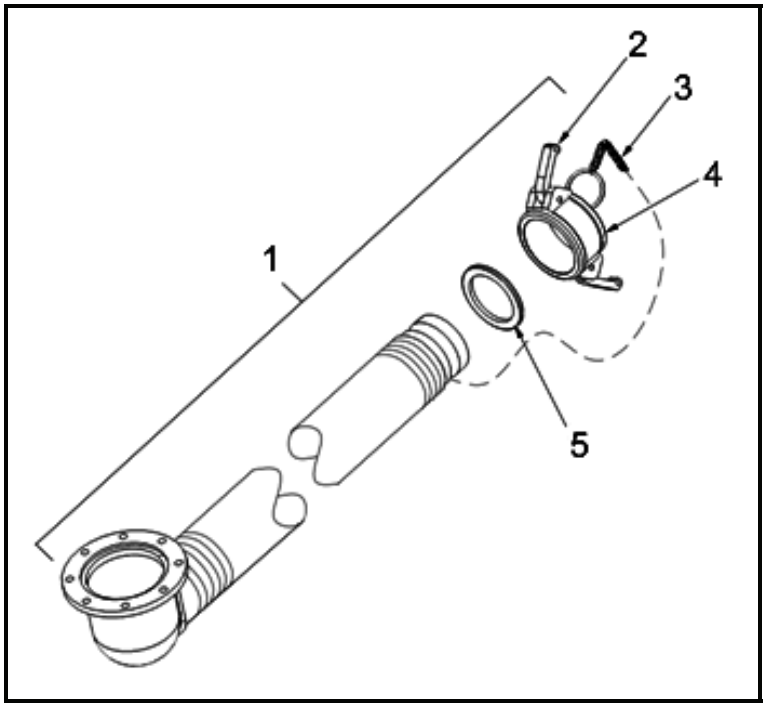


Figure 1. Drain Hose Assembly – with Dome

REMOVAL

1. Pull outward on two cam-lever arms (Figure 1, Item 2). Remove dust cap (Figure 1, Item 4) from the hose assembly (Figure 1, Item 1).
2. Remove chain assembly (Figure 1, Item 3) and remove dust cap (Figure 1, Item 4) from hose assembly (Figure 1, Item 1).
3. Remove gasket (Figure 1, Item 5) from dust cap (Figure 1, Item 4). Discard gasket.

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

1. Flush out hose assembly with hot, soapy water.
2. Rinse out the hose assembly thoroughly.
3. Inspect the hose for cracks, tears, or wear. Ensure that the hose clamps are secure to the coupling.
4. Inspect all mechanical parts for cracks, dents, breaks and wear. Replace any unserviceable components.

INSTALLATION

1. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
2. Install chain assembly (Figure 1, Item 3) and dust cap (Figure 1, Item 4) to hose assembly (Figure 1, Item 1).
3. Install new gasket (Figure 1, Item 5) in dust cap (Figure 1, Item 4).
4. Connect dust cap (Figure 1, Item 4) to hose assembly (Figure 1, Item 1) by pushing in on cam-lever arms (Figure 1, Item 2).

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

TANK AND BERM LINER DRAIN HOSE

SERVICE AND REPLACEMENT

INITIAL SETUP:

Tools

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts

Dishwashing Compound
(Item 1, WP 0038 00)

Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Equipment Condition

Tank Drained
(WP 0005 00)

Personnel Required

One

Mandatory Replacement Parts

Gasket, 2 inch
(Item 1, WP 0039 00)

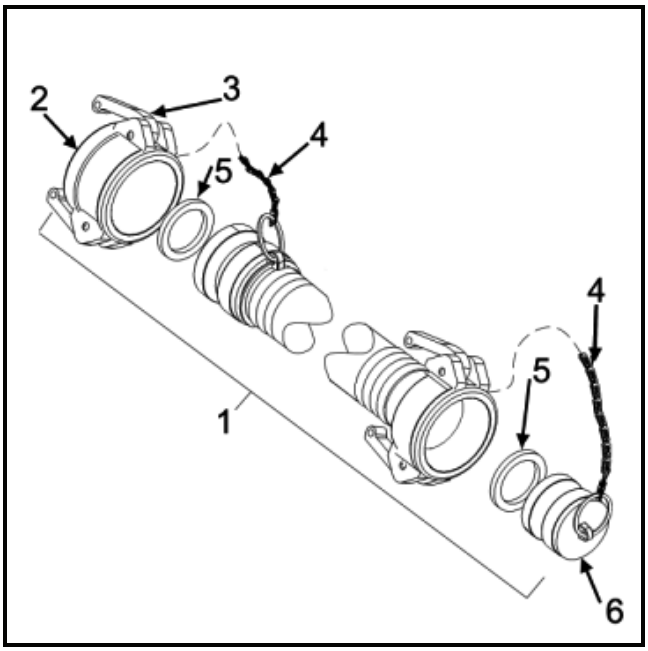


Figure 1. Drain Hose Assembly.

REMOVAL

1. Pull outward on two cam-lever arms (Figure 1, Item 3). Remove dust cap (Figure 1, Item 2) and dust plug (Figure 1, Item 6) from hose assembly (Figure 1, Item 1).
2. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
3. Remove two chain assemblies (Figure 1, Item 4) and remove dust cap (Figure 1, Item 2) and dust plug (Figure 1, Item 6) from hose assembly (Figure 1, Item 1).
4. Remove two gaskets (Figure 1, Item 5) from dust plug (Figure 1, Item 2), and dust cap (Figure 1, Item 6). Discard gaskets.

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

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

INSTALLATION

1. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
2. Install two chain assemblies (Figure 1, Item 4), dust cap (Figure 1, Item 2), and dust plug (Figure 1, Item 6) to hose assembly (Figure 1, Item 1).
3. Install new gasket (Figure 1, Item 5) on dust plug (Figure 1, Item 6).
4. Connect dust cap (Figure 1, Item 2) and dust plug (Figure 1, Item 6) to hose assembly (Figure 1, Item 1) by pushing in on cam-lever arms (Figure 1, Item 3).

END OF WORK PACKAGE

FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
VENT FITTING ASSEMBLY
SERVICE AND REPLACEMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Torque Wrench
(Item 2, Table 2, WP 0037 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts
Dishwashing Compound
(Item 1, WP 0038 00)

Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Equipment Condition
Tank Drained (WP 0005 00)

References
WP 0028 00

Personnel Required
One

Mandatory Replacement Parts
Gasket, 2 inch
(Item 1, WP 0039 00)

Washer, Lock, 3/8 inch
(Item 3, WP 0039 00)

REMOVAL

1. Remove eight nuts (Figure 1, Item 16), lock washers (Figure 1, Item 15), and washers (Figure 1, Item 14) from vent fitting assembly (Figure 1, Item 1).

2. Lift male flanged adapter (Figure 1, Item 13) from compression ring (Figure 1, Item 11).

DISASSEMBLY

1. Remove female cam lock coupling (Figure 1, Item 6) from male flanged adapter (Figure 1, Item 13) by pulling outward on cam lever arms (Figure 1, Item 7) and lifting female cam lock coupling from male flanged adapter.

2. Remove gasket (Figure 1, Item 10) from female cam lock coupling (Figure 1, Item 6). Discard gasket.

3. Unscrew vent pipe (Figure 1, Item 4) from female cam lock coupling (Figure 1, Item 6) and remove female cam lock coupling from vent pipe.

DISASSEMBLY (Cont.)

4. Unscrew passive vent (Figure 1, Item 2) from vent pipe (Figure 1, Item 4) and remove passive vent from vent pipe.

5. Remove gasket (Figure 1, Item 9) from inside dust cap (Figure 1, Item 8). Discard gasket.

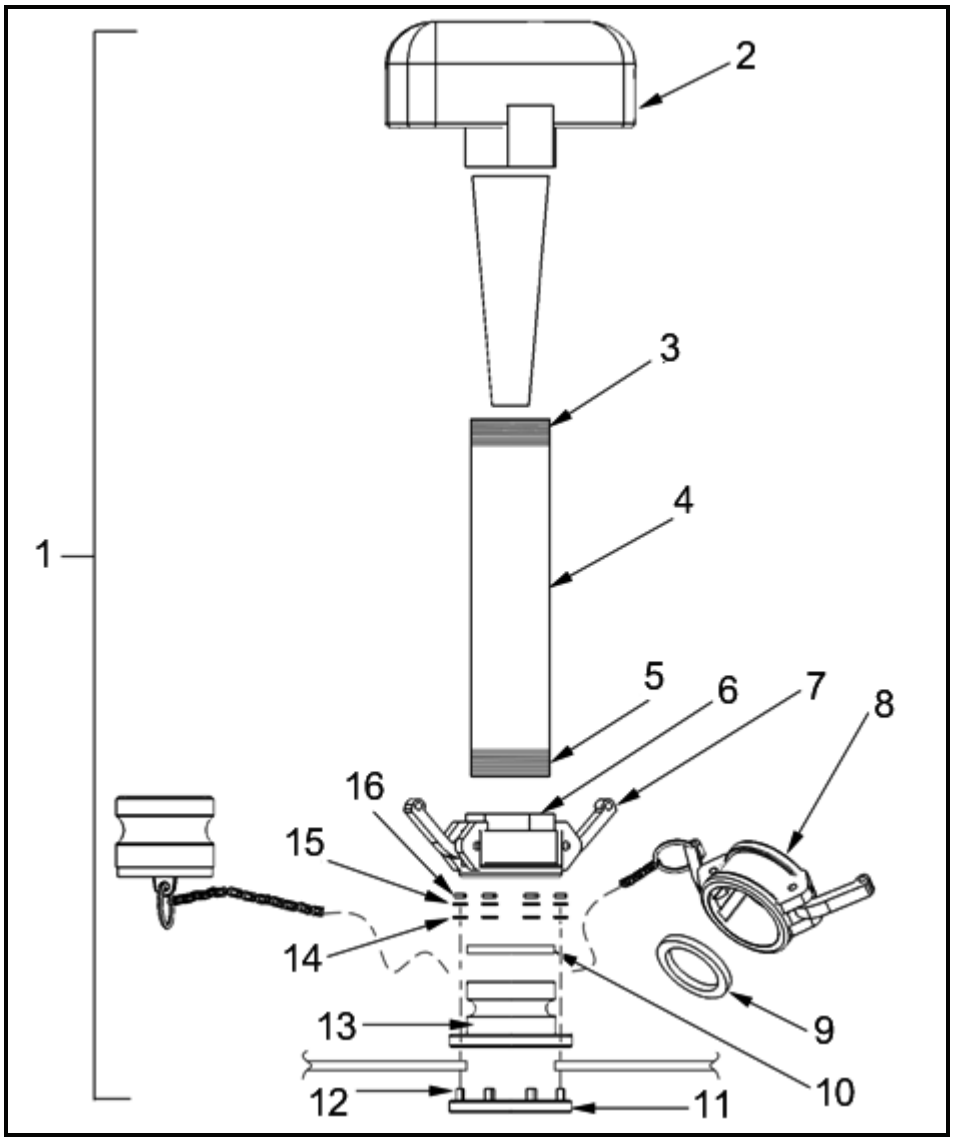


Figure 1. Vent Fitting Assembly

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

1. Inspect for cleanliness and clean necessary 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. Check that the vent hole in the flame arrestor is clear of all debris.

ASSEMBLY

1. Apply anti-seizing tape to the threaded ends (Figure 1, Items 3 & 5) of vent pipe (Figure 1, Item 4).
2. Screw passive vent (Figure 1, Item 2) on to vent pipe (Figure 1, Item 4). Tighten until threads are firmly seated.
3. Install vent pipe (Figure 1, Item 4) into female cam lock coupling (Figure 1, Item 6). Screw threaded end (Figure 1, Item 5) of vent pipe into female cam lock coupling and tighten until threads are firmly seated.
4. Install new gasket (Figure 1, Item 10) into female cam lock coupling (Figure 1, Item 6).
5. Install female cam lock coupling (Figure 1, Item 6) on to male flanged adapter (Figure 1, Item 13). Lock in place by pushing in on cam lever arms (Figure 1, Item 7).
6. Install new gasket (Figure 1, Item 9) in dust cap (Figure 1, Item 8).

INSTALLATION

1. Position male flanged adapter (Figure 1, Item 13) over compression ring (Figure 1, Item 11).
2. Install eight washers (Figure 1, Item 14), lock washers (Figure 1, Item 15), and nuts (Figure 1, Item 16) on threaded studs (Figure 1, Item 12) of compression ring (Figure 1, Item 11).

INSTALLATION (cont.)

NOTE

If a compression ring stud is damaged, then it must be replaced by unscrewing the damaged stud from the compression ring with the tool kit allen wrench then installing a new stud from the repair kit.

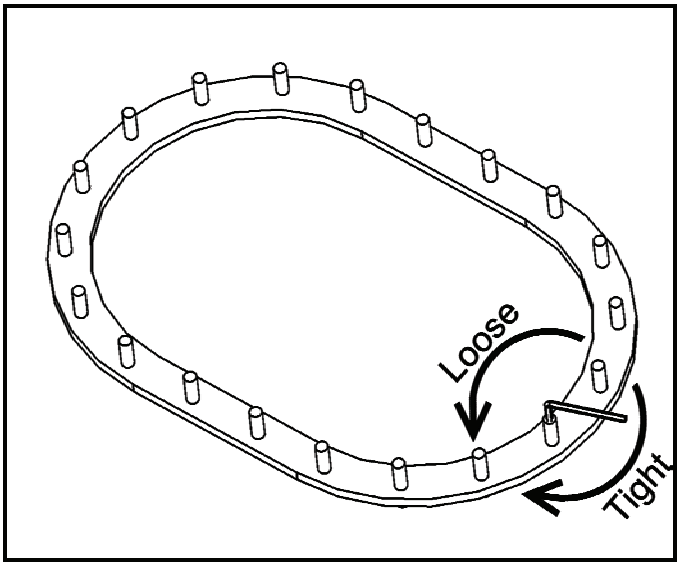


Figure 2. Replacing a damaged stud.

3. Torque nuts (Figure 1, Item 16) to 40 ft-lb (see WP 0028 00).

END OF WORK PACKAGE

FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
FILL/DISCHARGE ASSEMBLY (WITH MANWAY)
SERVICE AND REPAIR

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Torque Wrench
(Item 2, Table 2, WP 0036 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts
Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Dishwashing Compound
(Item 1, WP 0038 00)

Equipment Condition
Fill/Discharge hose assembly removed
(WP 0018 00)

References
WP 0028 00

Personnel Required
One

Mandatory Replacement Parts
Gasket, 6 inch
(Item 1, WP 0039 00)

Washer, Lock, 3/8 inch
(Item 3, WP 0039 00)

DISASSEMBLY

NOTE

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

1. Remove 6-inch elbow (Figure 1, Item 11) by pulling outward on cam-lever arms (Figure 1, Item 10), and lifting elbow from flanged adapter (Figure 1, Item 4).

2. Remove and discard elbow gasket (Figure 1, Item 9) from inside elbow (Figure 1, Item 11).

3. Remove twenty nuts (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3) from flanged adapter (Figure 1, Item 4). Lift flanged adapter from tank compression ring fitting (Figure 1, Item 6).

DISASSEMBLY (Cont.)

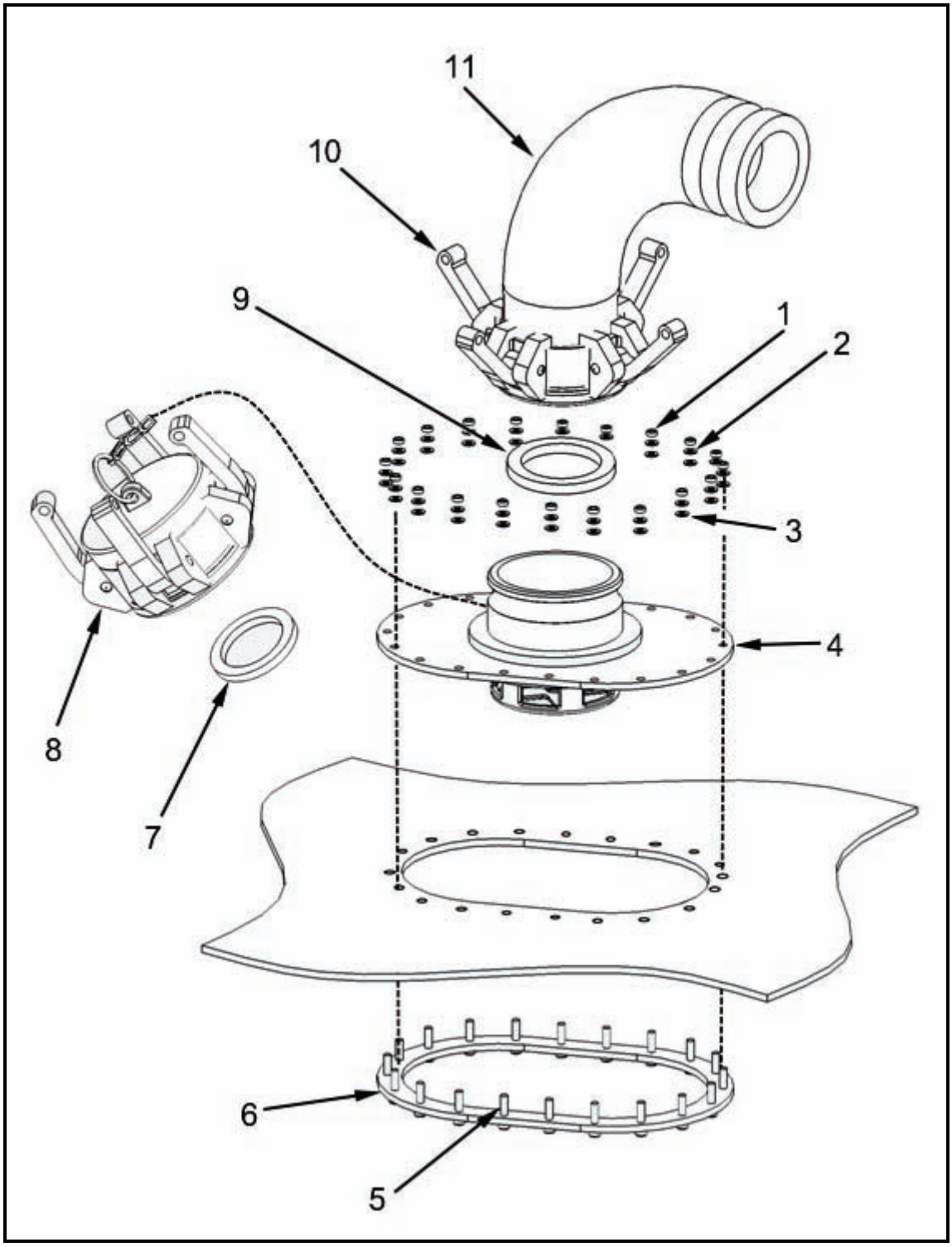


Figure 1. Fill/Discharge Assembly (with Manway)

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. Failure to heed this warning can result in severe personal injury or death.

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

4. Inspect for cleanliness and clean necessary parts with dry cleaning solvent and dry thoroughly with rags.
5. Clean all gasket-sealing surfaces thoroughly with detergent and hot water.
6. Inspect all mechanical parts for cracks, dents, breaks, and wear. Replace the component if unserviceable.

ASSEMBLY

1. Install new gasket (Figure 1, Item 7) into dust cap (Figure 1, Item 8).
2. Install new elbow gasket (Figure 1, Item 9) into 6-inch elbow (Figure 1, Item 11).
3. Position flanged adapter (Figure 1, Item 4) on compression ring (Figure 1, Item 6), and align the holes.
4. Install twenty nuts (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3) on compression ring studs (Figure 1, Item 5).

ASSEMBLY (cont.)

NOTE

If any of the compression ring studs is damaged, then it must be replaced by unscrewing the damaged stud from the compression ring with the tool kit allen wrench then installing a new stud from the repair kit.

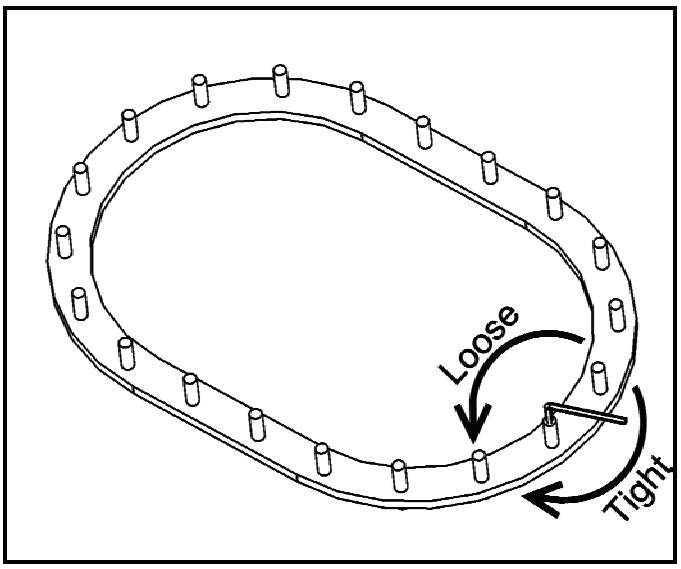


Figure 2. Replacing a damaged stud.

5. Torque nuts (Figure 1, Item 1) to 40 ft-lbs (see WP 0028 00).

6. Position elbow (Figure 1, Item 11) on flanged adapter (Figure 1, Item 4), and push cam-lever arms (Figure 1, Item 10) inward, locking elbow to flanged adapter.

END OF WORK PACKAGE

FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
FILL/DISCHARGE ASSEMBLY
SERVICE AND REPAIR

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Torque Wrench
(Item 2, Table 2, WP 0036 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts
Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Dishwashing Compound
(Item 1, WP 0038 00)

Equipment Condition
Fill/Discharge hose assembly removed
(WP 0019 00)

Personnel Required
One

References
WP 0028 00

Mandatory Replacement Parts
Gasket, 6 inch
(Item 2, WP 0039 00)

Washer, Lock, 3/8 inch
(Item 3, WP 0039 00)

DISASSEMBLY

NOTE

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

1. Remove 6-inch elbow (Figure 1, Item 10) by pulling outward on cam-lever arms (Figure 1, Item 9), and lifting elbow from flanged adapter (Figure 1, Item 5).

2. Remove and discard elbow gasket (Figure 1, Item 4) from inside elbow (Figure 1, Item 10).

3. Remove twelve nuts (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3) from flanged adapter (Figure 1, Item 5). Lift flanged adapter from tank compression ring fitting (Figure 1, Item 6).

SERVICE

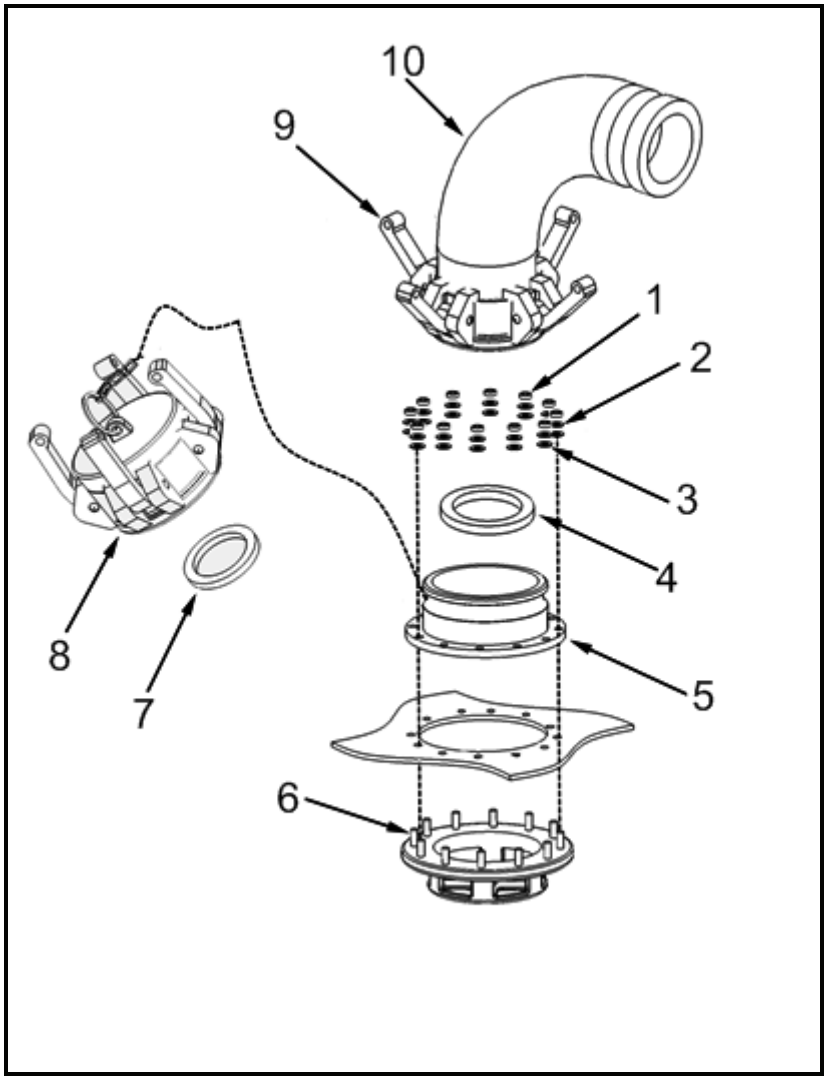


Figure 1. Fill/Discharge Assembly

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. Failure to heed this warning can result in severe personal injury or death.

SERVICE (Cont.)

CAUTION

Dry cleaning solvent, A-A-59601, used to clean parts, must not come into contact with any part of the fuel tank fabric. Damage to the fabric will occur.

1. Inspect for cleanliness and clean necessary 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 the component if unserviceable.

ASSEMBLY

1. Install new gasket (Figure 1, Item 7) into dust cap (Figure 1, Item 8).
2. Install new elbow gasket (Figure 1, Item 4) into 6-inch elbow (Figure 1, Item 10).
3. Position flanged adapter (Figure 1, Item 5) on compression ring (Figure 1, Item 6), and align the holes.
4. Install twelve nuts (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3) on compression ring studs (Figure 1, Item 6)

NOTE

If any of the compression ring studs is damaged, then it must be replaced by unscrewing the damaged stud from the compression ring with the tool kit allen wrench then installing a new stud from the repair kit.

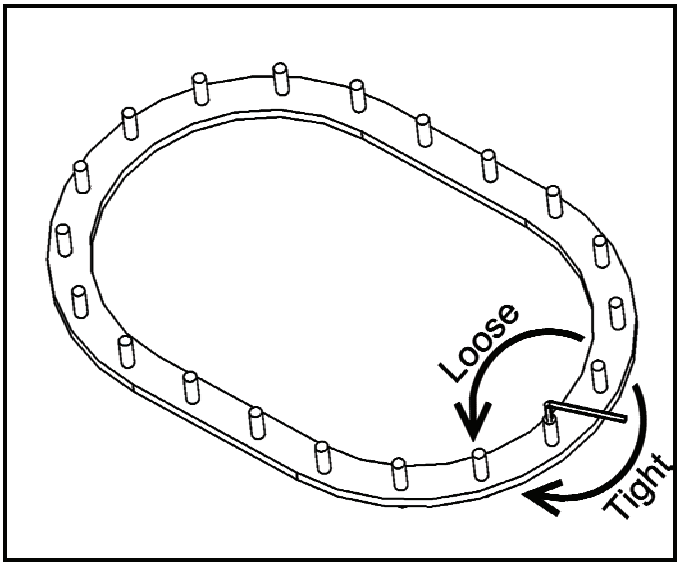


Figure 2. Replacing a damaged stud.

ASSEMBLY (Cont.)

5. Torque nuts (5) to 40 ft-lbs (see WP 0028 00)..

6. Position elbow (10) on flanged adapter (5), and push cam-lever arms (9) inward, locking elbow (10) to flanged adapter (5).

END OF WORK PACKAGE

FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
CORNER CLAMPS
SERVICE AND REPAIR

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, Table 2, WP 0036 00)

Torque Wrench
(Item 2, Table 2, WP 0036 00)

Goggles, Industrial
(Item 2, WP 0038 00)

Gloves, Nitrile
(Item 3, WP 0038 00)

Materials/Parts
Dry Cleaning Solvent
(Item 8, WP 0038 00)

Rags, Wiping
(Item 7, WP 0038 00)

Dishwashing Compound
(Item 1, WP 0038 00)

Equipment Condition
Tank Drained
(WP 0005 00)

References
WP 0028 00

Personnel Required
One

Mandatory Replacement Parts
Washer, Lock, 1/2 inch
(Item 4, WP 0038 00)

DISASSEMBLY

1. Remove four bolts (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3).

SERVICE

1. Inspect for cleanliness and clean necessary 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 the component if unserviceable.

SERVICE (Cont.)

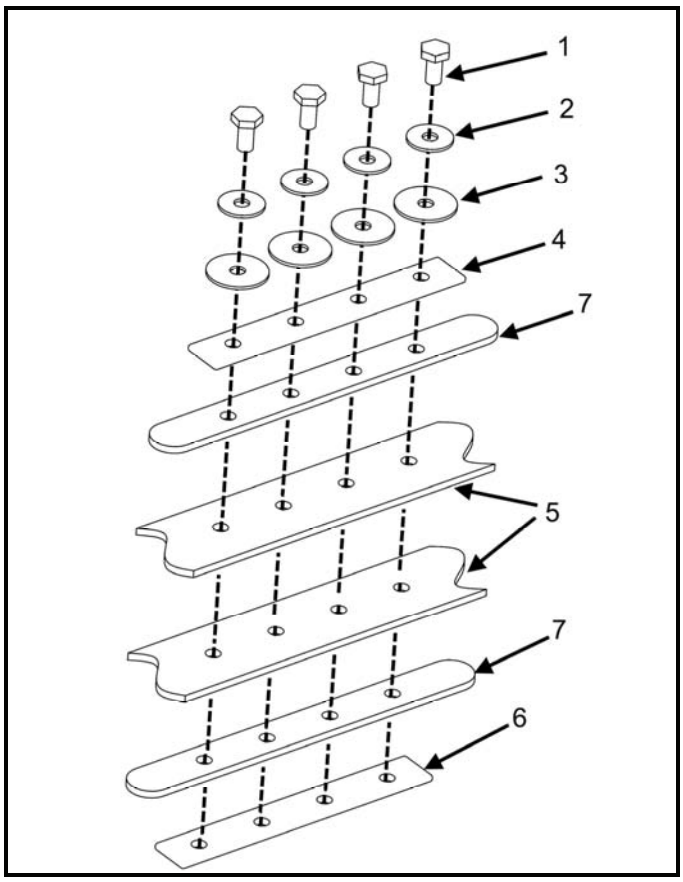


Figure 1. Corner Clamp Assembly

ASSEMBLY

1. Position bolt (Figure 1, Item 1), lock washer (Figure 1, Item 2) and washer (Figure 1, Item 3) through top corner clamp (Figure 1, Item 4) gasket (Figure 1, Item 7) and tank body corner (Figure 1, Item 5).

2. Align holes in tank body corner (5) to match holes in top clamp (4) and holes in bottom corner clamp (6).

3. Torque four bolts (1) to 50 ft-lbs (see WP 0028 00).

END OF WORK PACKAGE

FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SETUP:

Materials/Parts

Equipment Condition
Tank Drained (WP 0005 00)

References
WP 0002 00
WP 0005 00
TM 740-90-1

Personnel required
Four

ADMINISTRATIVE STORAGE (45 Days or Less)

1. Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Administrative storage shall be in accordance with TM 740-90-1. It covers storage of equipment which can be readied for mission performance 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, *Operator's PMCS* (WP 0011 00) should be performed, 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.

CAUTION

Tank Assembly must be completely dry inside and out for storage, to prevent mold or mildew from growing on the Tank Assembly. Mold and mildew could contaminate fuel.

STRIKING PROCEDURES FOR STORAGE OR SHIPMENT

Strike the Tank Assembly in accordance with the following procedures:

PREPARATION FOR STORAGE OR SHIPMENT

WARNINGS

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 tank drain hose assembly from the tank drain fitting and install the drain assembly flange (WP 0005 00).
3. Remove the fill/discharge elbows from the fill/discharge adapters (WP 0005 00).
4. Remove the vent fitting assembly from the flanged adapter, and install the dust cap (WP 0005 00).
5. Inflate the tank with air and air-dry the tank for 24 hours.
6. Remove the fill/discharge assembly from the tank (WP 0005 00).
7. Flush the tank with detergent solution.

NOTE

Contact field/local safety office for disposal of fuel tank cleaning residue.

PREPARATION FOR STORAGE OR SHIPMENT (cont.)

8. Drain the detergent solution from the tank.
9. Flush the tank with clear and clean water.
10. Air-dry the tank.
11. Install the fill/discharge assembly on the tank (WP 0005 00).
12. Install the dust caps on the flanged adapters of the fill/discharge assemblies.
13. Brush off all debris clinging to the fabric material of the tank.

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. Pack the tank 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.

END OF WORK PACKAGE

FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
TORQUE LIMITS

SCOPE

This work package lists standard torque values and provides general information for applying torque. Special torque values and tightening sequences are indicated in the maintenance procedures for applicable components.

GENERAL

1. Always use torque values listed in Tables 3 and 4 when a maintenance procedure does not give a specific torque value.

   a. Table 3 provides torque limits for SAE standard fasteners.

   b. Table 4 provides torque limits for metric fasteners.

2. Unless otherwise indicated, standard torque tolerances shall be ± 10%.

3. Torque values listed are based on clean, dry threads. Reduce torque by 10% when engine oil is used as a lubricant. Reduce torque by 20% if new plated capscrews are used.

4. If the maintenance procedures do not specify a tightening order, use the following guides:

   a. Unless otherwise specified, lubricate threads of fasteners with OE/HDO-10 lubricating oil (Table 1, Item 9, WP 0038 00).

   b. When tightening fasteners above 30 lb-ft (41 Nm), use the torque pattern, but only tighten to 70% of final value (multiply final value by 0.7). Repeat pattern, adding 10% of the final value each time, until final value is reached. Tables 1 and 2 show proper torque increments for the torque values used on the tank.

Table 1. 40 ft lbs Torque Increment Chart

Percent	Torque Value
70 %	28 ft-lbs
10 %	4 ft-lbs
10 %	4 ft-lbs
10 %	4 ft-lbs
100 %	40 ft-lbs

Table 2. 50 ft lbs Torque Increment Chart

Percent	Torque Value
70 %	35 ft-lbs
10 %	5 ft-lbs
10 %	5 ft-lbs
10 %	5 ft-lbs
100 %	50 ft-lbs

   c. Use the appropriate circular, straight, or oval pattern when tightening as shown in Figure 1.

GENERAL (Cont.)

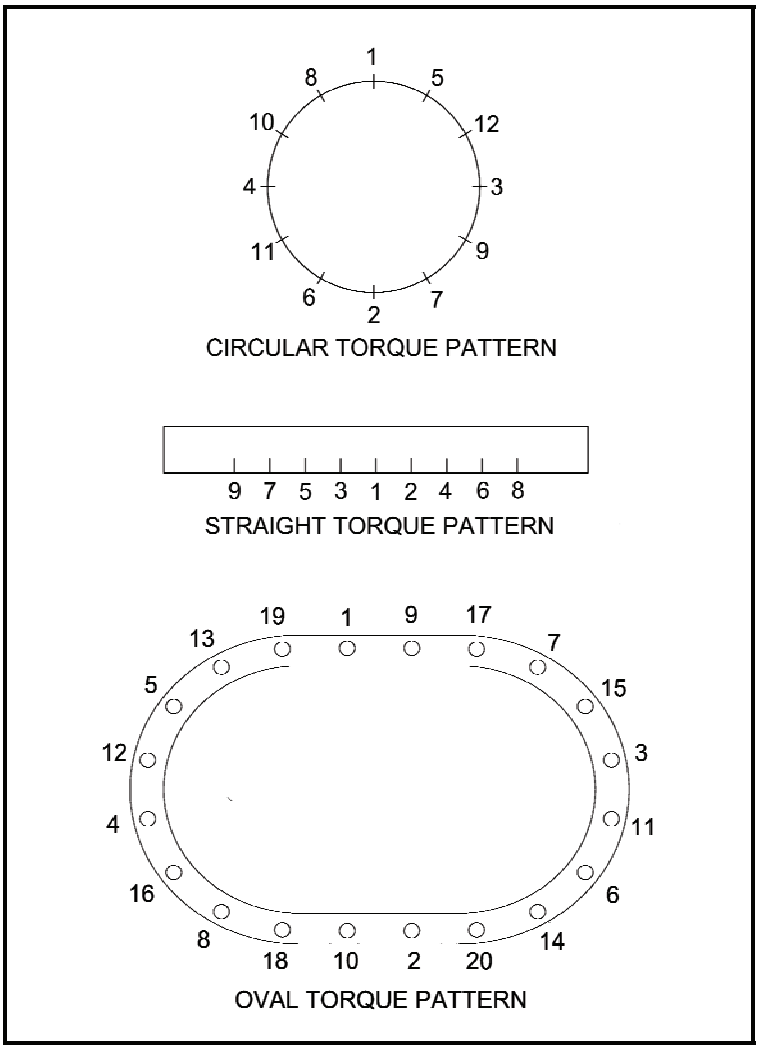


Figure 1. Torque Patterns

CAUTION

If replacement cap screws are of higher grade than originally supplied, use torque specification for the original. This will prevent equipment damage due to possible overtorquing.

Table 3. Torque Limits – SAE Standard Fasteners

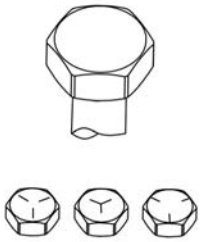
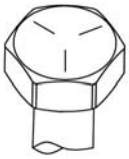
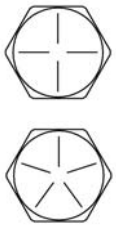
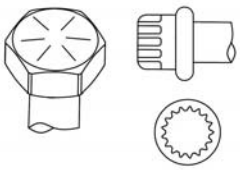
Current Usage		Much used		Much used		Used at times		Used at times	
QUALITY OF MATERIAL		**INDETERMINATE**		**MINIMUM COMMERCIAL**		**MEDIUM COMMERCIAL**		**BEST COMMERCIAL**	
SAE Grade Number		1 or 2		5		6 or 7		8	
Cap screw head markings Manufacturer's marks may vary These are all SAE Grade 5 (3 line)									
CAP SCREW BODY SIZE IN – THREAD		**TORQUE LB-FT**	**(Nm)**	**TORQUE LB-FT**	**(Nm)**	**TORQUE LB-FT**	**(Nm)**	**TORQUE LB-FT**	**(Nm)**
¼	20	5	(7)	8	(11)	10	(14)	12	(16)
	28	6	(8)	10	(14)			14	(19)
5/16	18	11	(15)	17	(23)	19	(26)	24	(33)
	24	13	(18)	19	(26)			27	(37)
3/8	16	18	(24)	31	(42)	34	(46)	44	(60)
	24	20	(27)	35	(47)			49	(66)
7/16	14	28	(38)	49	(66)	55	(75)	70	(95)
	20	30	(41)	55	(75)			78	(106)
½	13	39	(53)	75	(102)	85	(115)	105	(142)
	20	41	(56)	85	(115)			120	(163)
9/16	12	51	(69)	110	(149)	120	(163)	155	(210)
	18	55	(75)	120	(163)			170	(231)
5/8	11	83	(113)	150	(203)	167	(226)	210	(285)
	18	95	(129)	170	(231)			240	(325)
¾	10	105	(142)	270	(366)	280	(380)	375	(508)
	16	115	(156)	295	(400)			420	(569)
7/8	9	160	(217)	395	(536)	440	(597)	605	(820)
	14	175	(237)	435	(590)			675	(915)
1	8	235	(319)	590	(800)	660	(895)	910	(1234)
	14	250	(339)	660	(895)			990	(1342)

Table 4. Torque Limits – Metric Fasteners

Torque values for metric threaded fasteners with lubricated[1] or plated threads[2]				
Thread Dia - Pitch	 **Class 8.8 Bolt**	 **Class 8 Nut**	 **Class 10.9 Bolt**	 **Class 10 Nut**
	TORQUE		**TORQUE**	
	LB-FT	**(Nm)**	**LB-FT**	**(Nm)**
M6	5	(7)	7	(9)
M8	12	(16)	17	(23)
M8 x 1	13	(18)	18	(24)
M10	24	(33)	34	(46)
M10 x 1.25	27	(37)	38	(52)
M12	42	(57)	60	(81)
M12 x 1.5	43	(58)	62	(84)
M14	66	(89)	95	(129)
M14 x 1.5	72	(98)	103	(140)
M16	103	(140)	148	(201)
M16 x 1.5	110	(149)	157	(213)
M18	147	(199)	203	(275)
M18 x 1.5	165	(224)	229	(310)
M20	208	(282)	288	(390)
M20 x 1.5	213	(313)	320	(434)
M22	283	(384)	392	(531)
M22 x 1.5	315	(427)	431	(584)
M24	360	(488)	498	(675)
M24 x 2	392	(531)	542	(735)
M27	527	(715)	729	(988)
M27 x 2	569	(771)	788	(1068)
M30	715	(969)	990	(1342)
M30 x 2	792	(1074)	1096	(1486)

NOTES:

1. All plated and unplated fasteners should be coated with oil before installation.
2. Use these torque values if either the bolt or nut is lubricated or plated (zinc-phosphate conversion coated, cadmium-plated or waxed).

END OF WORK PACKAGE

CHAPTER 6

PARTS INFORMATION
FOR
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

OPERATOR AND FIELD MAINTENANCE
TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL) INTRODUCTION

INTRODUCTION

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 Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity. 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. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed at the end of the individual work packages. 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 are not listed.

3. **Cross-Reference Indexes Work Packages**. There are 2 cross- reference indexes 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 you 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:

TABLE 1. SMR Code Explanation.

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

Source Code. The source code tells you how you 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 PH PR PZ	**NOTE** Items coded PC are subject to deterioration. Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.
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 third position of the SMR code. The complete kit must be requisitioned and applied.
MO-Made at service/AMC level MF-Made at field/ASB level MH-Made at below depot/sustainment level ML-Made at SRA/TASMG MD-Made at depot MG-Navy only	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material which is identified by the part number 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 to you by the third 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.

*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	Application/Explanation
AO-Assembled by service/AMC level AF-Assembled by field/ASB level AH-Assembled by below depot sustainment level AL-Assembled by SRA/TASMG AD-Assembled by depot AG-Navy only	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 third position of the SMR code authorizes you to replace 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 NOTE below.)
XB	If an item is not available from salvage, order it using the CAGEC and part number.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.
XD	Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and part number 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 you 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 you 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
O* -	Field (Service) level/AMC maintenance can remove, replace, and use the item.
F -	Field /ASB maintenance can remove, replace, and use the item.
H -	Below Depot Sustainment maintenance can remove, replace, and use the item.
L -	Specialized repair activity/TASMG can remove, replace, and use the item.

*NOTE: Army may use C in the third position. However, for joint service publications, Army will use O.

Maintenance Code	Application/Explanation
G -	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only)
K -	Contractor facility can remove, replace, and use the item.
Z -	Item is not authorized to be removed, replace, or used at any maintenance level.
D -	Depot can remove, replace, and use the item.

Fourth Position. The maintenance code entered in the fourth position tells you 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 -	Field (Service)/AMC is the lowest level that can do complete repair of the item.
F -	Field/ASB is the lowest level that can do complete repair of the item.
H -	Below Depot Sustainment is the lowest level that can do complete repair of the item.
L -	Specialized repair activity/TASMG 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.
G -	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only).
K -	Complete repair is done at contractor facility.
Z -	Nonreparable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for maintenance of "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 shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z -	Nonreparable 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 service/AMC level.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the service/AMC level.

Recoverability

Code	Application/Explanation
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the below depot sustainment 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) ot theater aviation sustainment maintenance group (TASMG).
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.
G -	Filed level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only)
K -	Reparable item. Condemnation and disposal to be performed at contractor facility

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 you use an NSN to requisition an item, the item you receive may have a different part number 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. Part numbers 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 breakout 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**. NSN's in this index are listed in National Item Identification Number (NIIN) sequence.

   STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. 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.

   For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

   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**. Part numbers 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 part number 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 corner 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 UOCs used in the RPSTL are:

Code	Used On
BER	5430-01-557-2987
PFS	5430-01-557-2990

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 / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers 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 NSN Is Known.

   First. If you have the NSN, 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 you are looking for.

3. When Part Number Is Known.

   First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number 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.

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

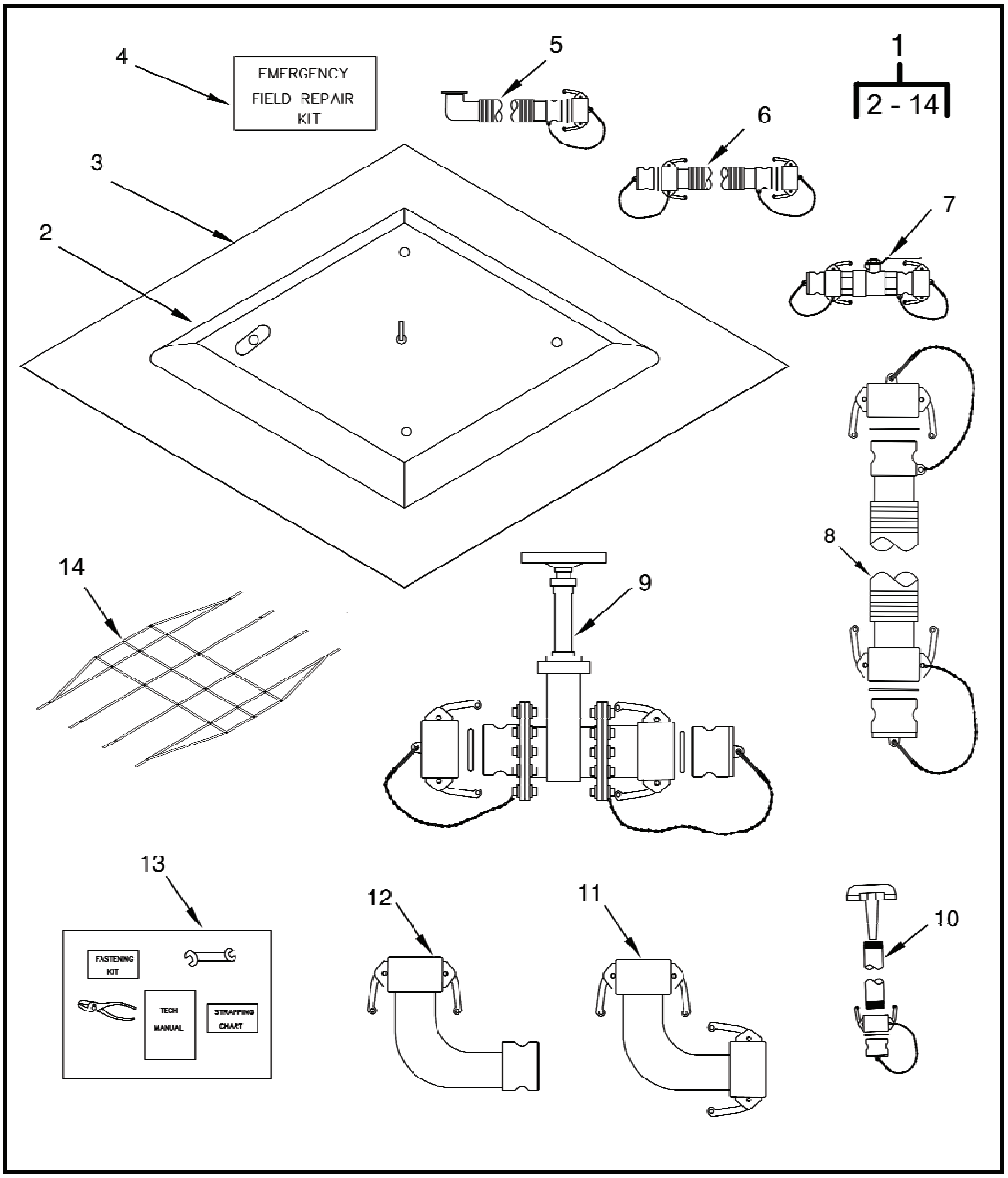


Figure 1. Tank Assembly, Fabric, Collapsible, 210,000 Gallon Capacity.

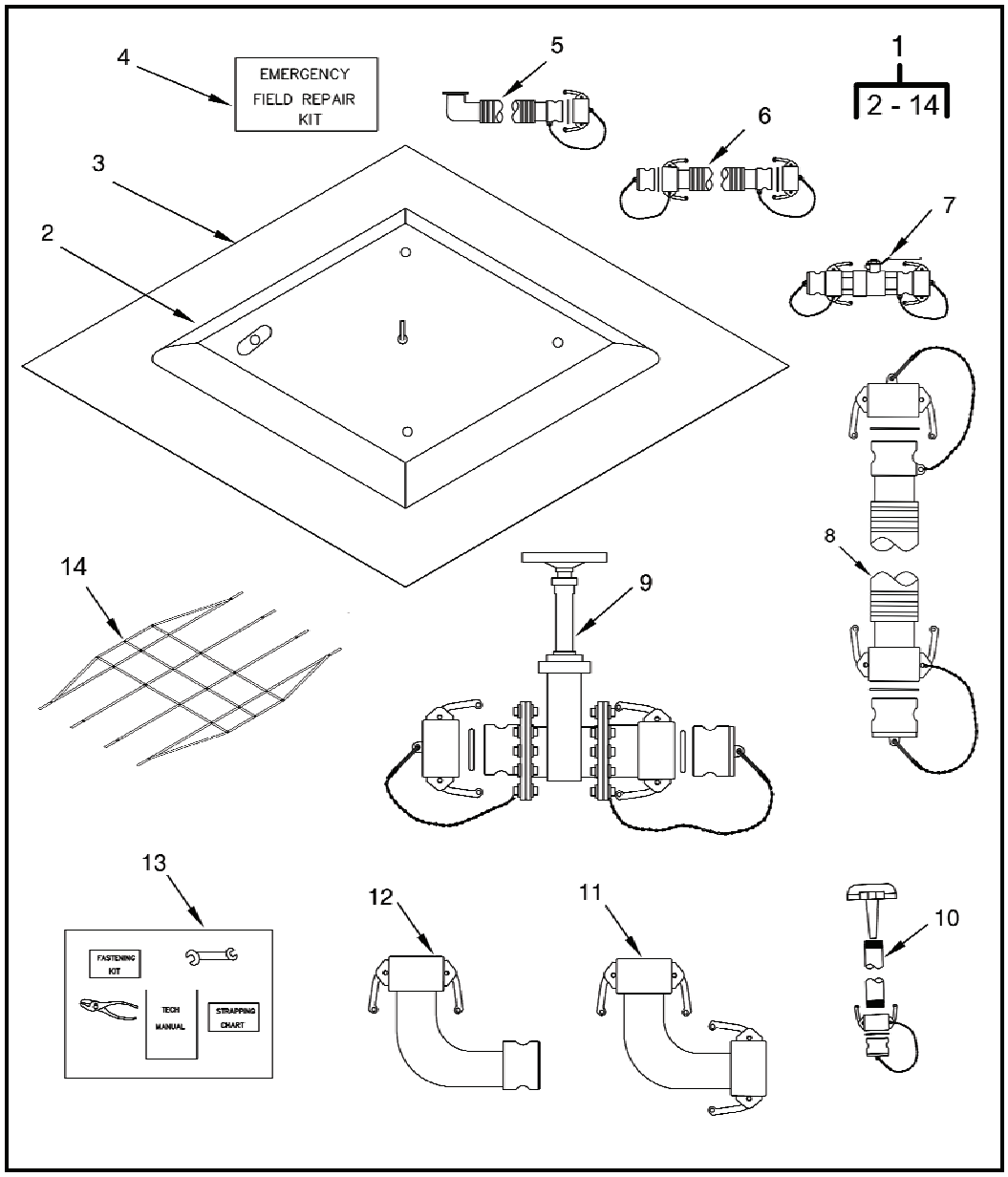


Figure 1. Tank Assembly, Fabric, Collapsible, 210,000 Gallon Capacity.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 00 Tank Assy	
					Figure 1, Tank Assy, Fabric, Collapsible: 210,000 Gallon Capacity	
1	PAFZZ	5430-01-557-2990	4GN07	210-TAC-TBF.PO	PFS	1
		5430-01-557-2987		210-TAC-TBF.DO	BER	1
2	PAFZZ		4GN07	210-TAC-TBF-01	.TANK BODY ASSY PFS, BER	1
3	PAFZZ		4GN07	210-TAC-TBF-02	.BERM LINER ASSY PFS, BER	1
4	PAFZZ		4GN07	210-TAC-TBF-03	.REPAIR KIT EMERGENCY FIELD PFS, BER	1
5	PAFZZ		4GN07	210-TAC-TBF-04	.DRAIN HOSE ASSY 20 FOOT PFS, BER	1
6	PAFZZ		4GN07	210-TAC-TBF-06	.DRAIN HOSE ASSY 10 FOOT PFS, BER	1
7	PAFZZ		4GN07	210-TAC-TBF-14	.DRAIN VALVE ASSY PFS, BER	1
8	PAFZZ		4GN07	210-TAC-TBF-07	.FILL/DISCH HOSE ASSY PFS, BER	4
9	PAFZZ		4GN07	06-90038	.FILL/DISCH VALVE ASSY PFS, BER	4
10	PAFZZ		4GN07	210-TAC-TBF-09	.VENT TUBE ASSY PFS, BER	1
11	PAFZZ		4GNO7	06-90031	.ELBOW, 6 INCH, FXF PFS, BER	2
12	PAFZZ		4GN07	06-90030	.ELBOW, 6 INCH, FXM PFS, BER	2
13	PAFZZ		4GN07	210-TAC-TBF-10	.CONSUMABLE ITEMS OVER-PACK KIT PFS, BER	1
14	PAFZZ		4GN07	210-TAC-TBF-16	.SLING PFS, BER	2
					END OF FIGURE	

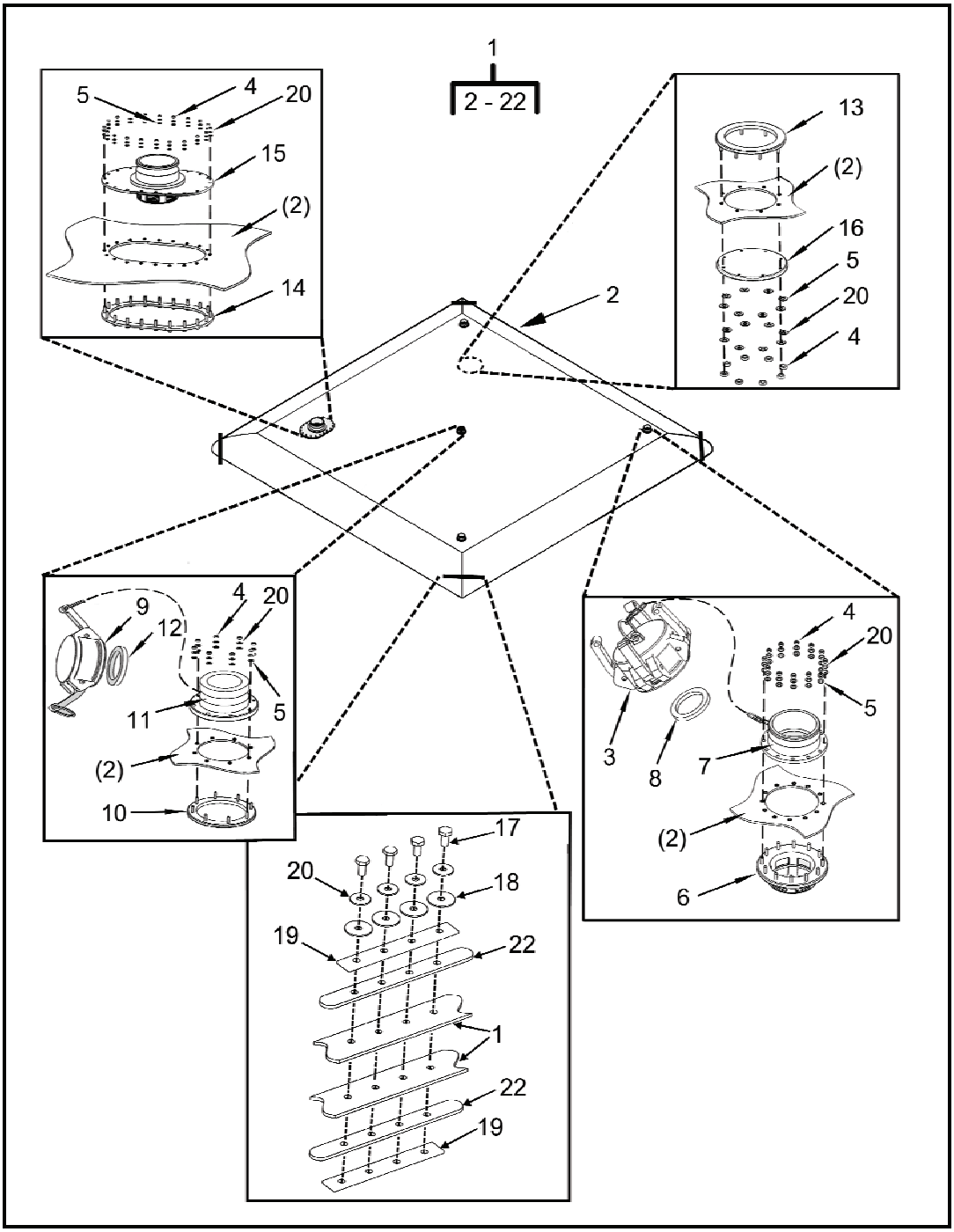


Figure 2. Tank Body Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01	
					Figure 2. Tank Body Assy	
1	PAFZZ		4GN07	210-TAC-TBF-01	TANK BODY ASSY PFS, BER	1
2	PAFZZ		4GN07	210-TAC-TBF-12	.TANK BODY PFS, BER	1
3	PAFZZ	4730-00-064-4435	4GN07	06-90029	.DUSTCAP, 6 INCH PFS, BER	4
4	PAFZZ	5310-00-989-5956	39428	91847a031	.NUT, HEX, SS 3/8 INCH PFS, BER	96
5	PAFZZ	5310-01-482-9259	39428	98019a500	.WASHER, FLAT, SS, 3/8 INCH PFS, BER	96
6	PAFZZ		4GN07	06-90022	.COMPRESSION RING, 12 BOLT PFS, BER	3
7	PAFZZ		4GN07	06-90023	.LAT-FLANGE, 6 INCH PFS, BER	3
8	PAFZZ	5330-00-412-9780	4GN07	00-90007	.GASKET, 6 INCH DUST CAP PFS, BER	4
9	PAFZZ	4710-01-506-6807	4GN07	06-90028	.DUST CAP, 2 INCH PFS, BER	1
10	PAFZZ		4GN07	06-90020	.COMPRESSION RING, 8 BOLT PFS, BER	5
11	PAFZZ		4GNO7	06-90021	.LAT FLANGE, 2 INCH PFS, BER	1
12	PAFZZ		4GN07	00-90006	.GASKET, 2 INCH DUST CAP PFS, BER	1
13	PAFZZ		4GN07	06-90043	.COMPRESSION RING, SCREENED PFS, BER	2
14	PAFZZ		4GN07	06-90024	.COMPRESSION RING, 20 BOLT, W/MANWAY PFS, BER	1
15	PAFZZ		4GN07	06-90025	.PLATE, 20 HOLE W/6 INCH ADAPTER PFS, BER	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01	
					Figure 2. Tank Body Assy	
16	PAFZZ		4GN07	06-90027	.FLANGE BLIND PFS, BER	4
17	PAFZZ		4GN07	06-90104	.SOCKET HD CAP SCREW PFS, BER	16
18	PAFZZ	5310-01-529-5118	39428	98019a509	.WASHER, FLAT, SS, ½ INCH PFS, BER	16
19	PAFZZ		4GN07	06-90103	.CORNER CLAMP (2 PIECE SET) PFS, BER	4
20	PAFZZ	5310-01-560-2862	39428	92147a033	.WASHER, LOCK SS, ½ INCH PFS, BER	4
21	PAFZZ	5310-01-528-7188	39428	92147a031	.WASHER, LOCK, SS, 3/8 INCH PFS, BER	96
22	PAFZZ		4GN07	06-90128	.GASKET PFS, BER	4
					END OF FIGURE	

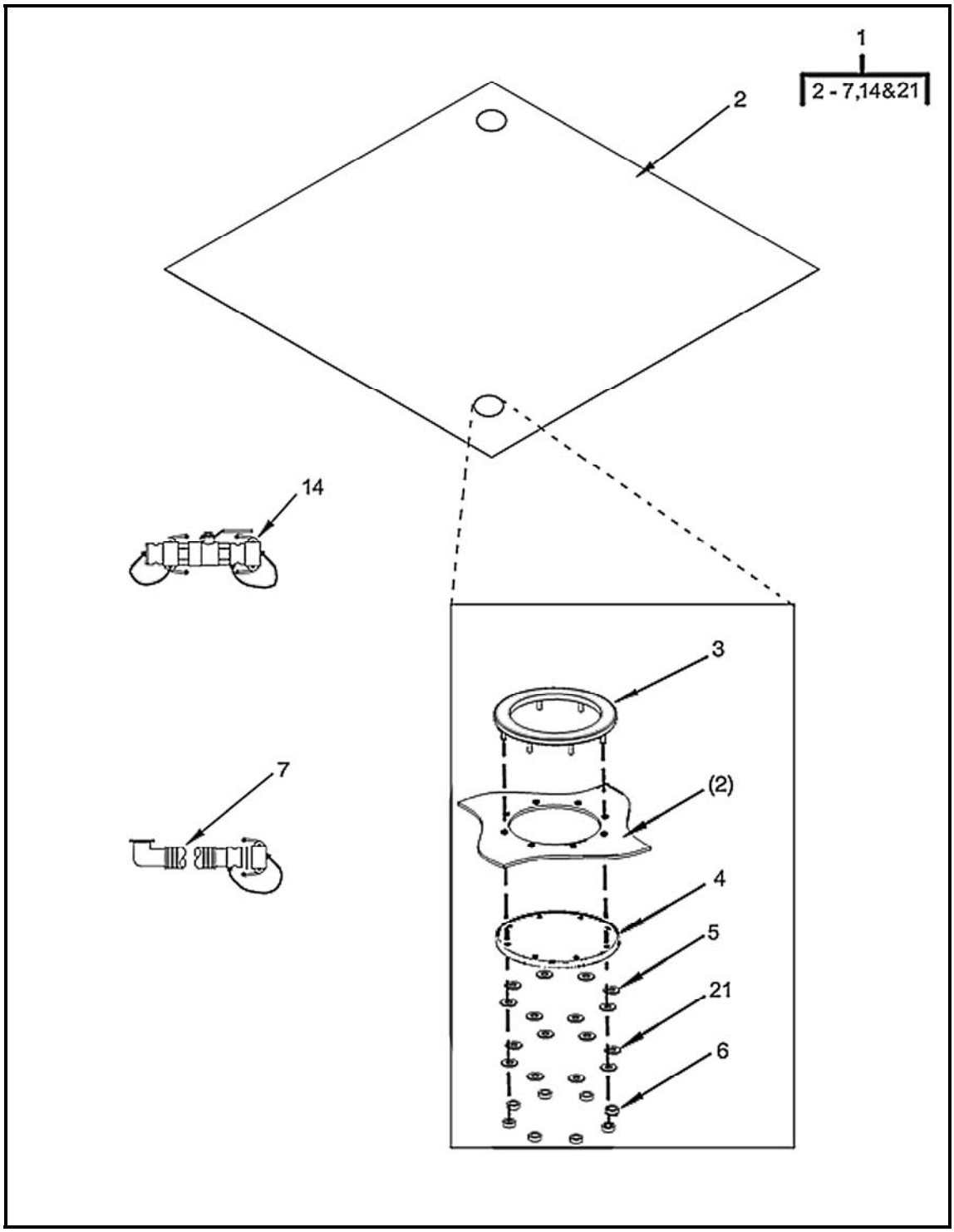


Figure 3. (Sheet 1 of 2) Berm liner assembly.

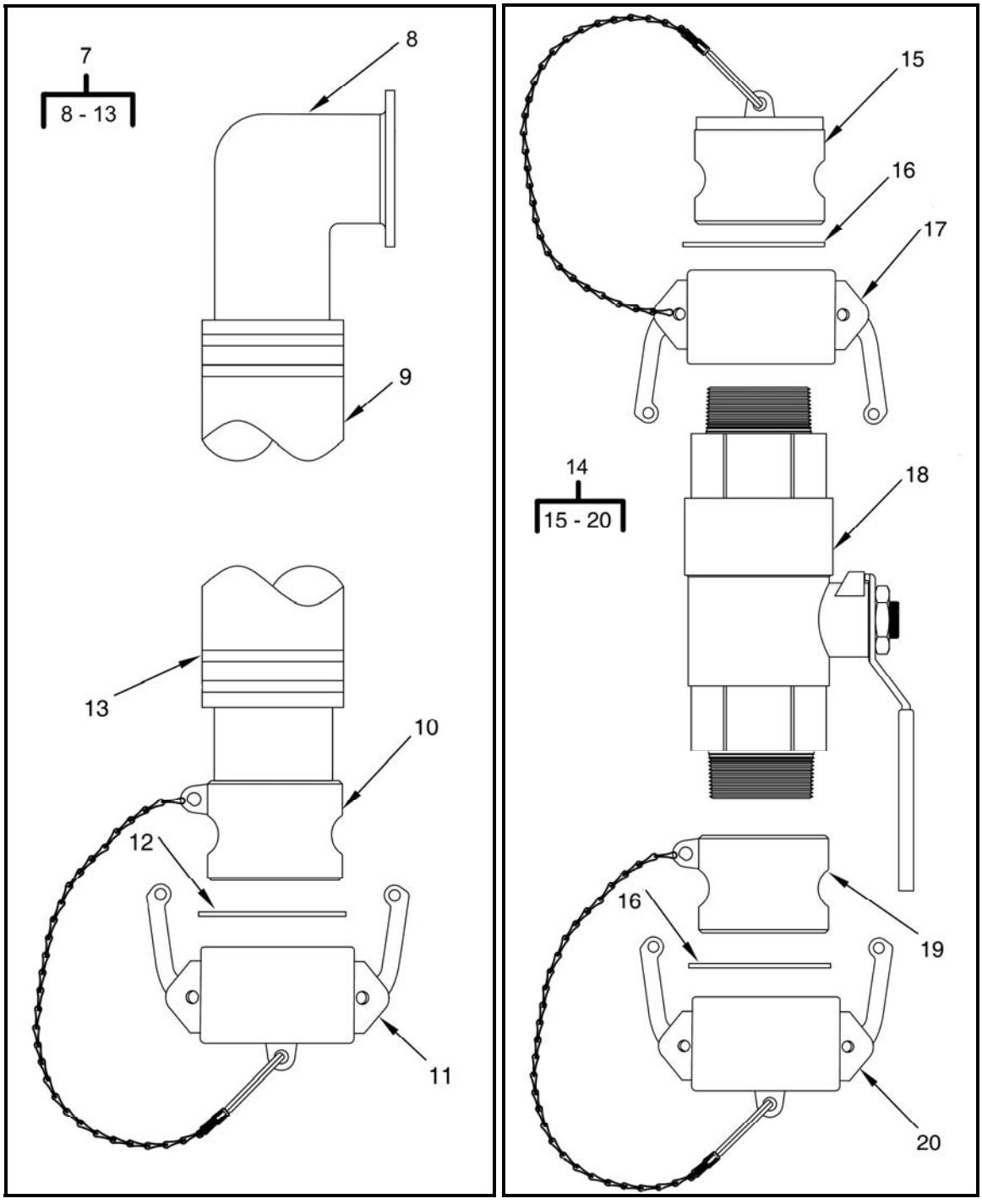


Figure 3. (Sheet 2 of 2) Berm liner Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 02	
					Figure 3. Berm Liner Assy	
1	PAFZZ		4GN07	210-TAC-TBF-02	BERM LINER ASSY PFS, BER	1
2	PAFZZ		4GN07	210-TAC-TBF-13	.BERM LINER PFS, BER	1
3	PAFZZ		4GN07	06-90043	.COMPRESSION RING, SCREENED PFS, BER	2
4	PAFZZ		4GN07	06-90027	.FLANGE BLIND PFS, BER	2
5	PAFZZ	5310-01-482-9259	39428	98019a500	.WASHER, FLAT, SS, 3/8 INCH PFS, BER	16
6	PAFZZ	5310-00-989-5956	39428	91847a031	.NUT, HEX SS. 3/8 INCH PFS, BER	16
7	PAFZZ		4GN07	210-TAC-TBF-04	.DRAIN HOSE, BERM LINER PFS, BER	2
8	PAFZZ		4GN07	06-90107	..DOME DRAIN, 90 DEG, 2 INCH PFS, BER	1
9	PAFZZ		4GN07	06-90108	..HOSE 2 INCH 16 FT LONG PFS, BER	1
10	PAFZZ		4GN07	06-90109	..Q/D, MALE 2 INCH PFS, BER	1
11	PAFZZ	4710-01-506-6807	4GN07	06-90028	..DUST CAP, 2 INCH PFS, BER	1
12	PAFZZ		4GN07	00-90006	..GASKET, 2 INCH, DUST CAP PFS, BER	1
13	PAFZZ		4GN07	06-90110	..HOSE CLAMP, 2 INCH PFS, BER	4

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 02	
					Figure 3. Berm Liner Assy	
14	PAFZZ		4GN07	210-TAC-TBF-15	.VALVE ASSY, BERM LINER PFS, BER	2
15	PAFZZ		4GN07	06-90111	..DUST PLUG, 2 INCH PFS, BER	1
16	PAFZZ		4GN07	00-90006	..GASKET, 2 INCH DUST CAP PFS, BER	2
17	PAFZZ		4GN07	06-90112	..Q/D FEMALE 2 INCH PFS, BER	1
18	PAFZZ		4GN07	06-90036	..BALL VALVE, 2 INCH, FUEL PFS, BER	1
19	PAFZZ		4GN07	06-90109	..Q/D MALE, 2 INCH PFS, BER	1
20	PAFZZ	4710-01-506-6807	4GN07	06-90028	..DUST CAP, 2 INCH PFS, BER	1
21	PAFZZ		4GN07	06-90126	.WASHER, LOCK SS, 3/8 INCH PFS, BER	16
					END OF FIGURE	

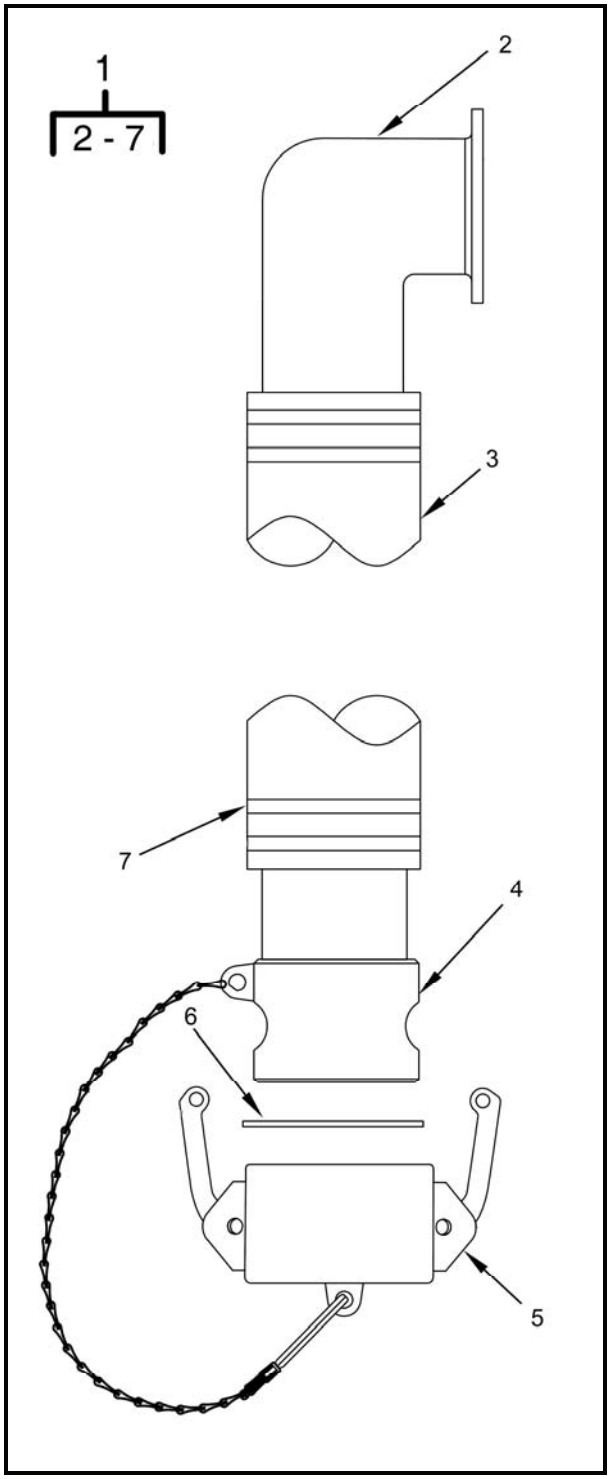


Figure 4. Drain Hose Assembly – 16 foot.

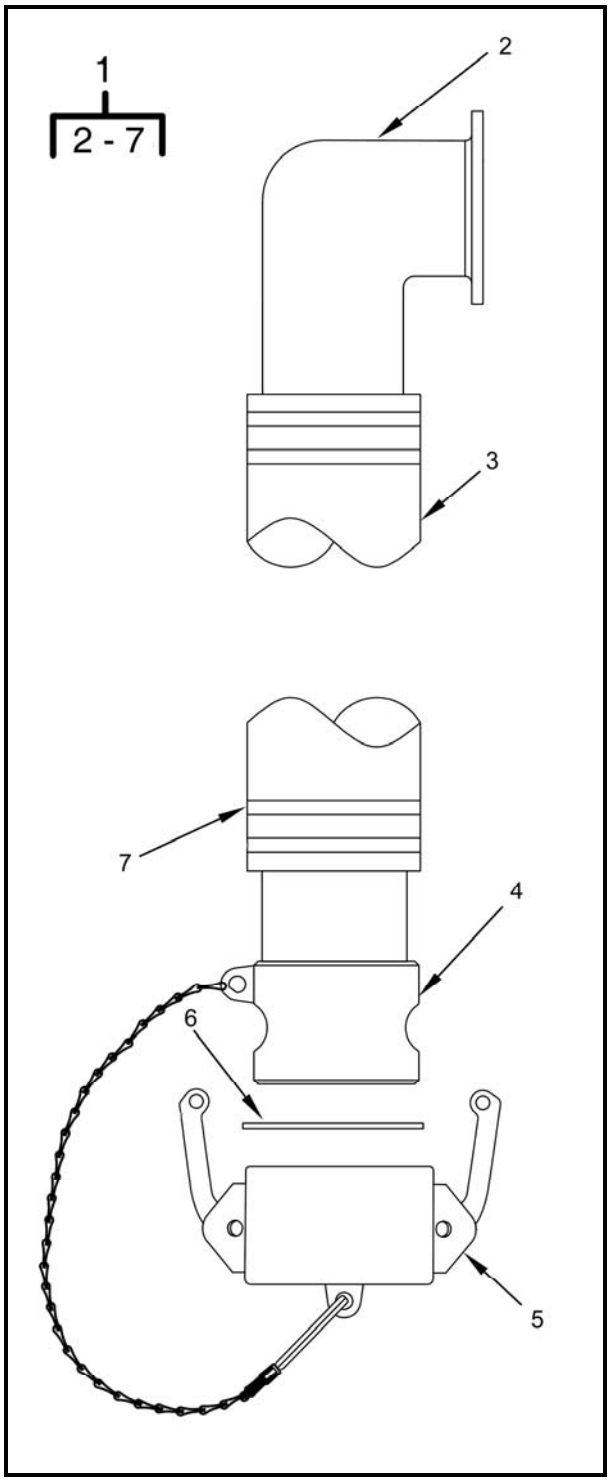


Figure 4. Drain Hose Assembly – 16 foot.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 04 Figure 4 Drain Hose Assy, 16 Foot	
1	PAFZZ		4GN07	210-TAC-TBF-05	DRAIN HOSE ASSY, 16 FOOT PFS, BER	1
2	PAFZZ		4GN07	06-90107	.DOME DRAIN, 90 DEG, 2 INCH PFS, BER	1
3	PAFZZ		4GN07	06-90108	.HOSE 2 INCH 16 FT LONG PFS, BER	1
4	PAFZZ		4GN07	06-90109	.Q/D, MALE 2 INCH PFS, BER	1
5	PAFZZ	4710-01-506-6807	4GN07	06-90028	.DUST CAP, 2 INCH PFS, BER	1
6	PAFZZ		4GN07	00-90006	.GASKET, 2 INCH, DUST CAP PFS, BER	1
7	PAFZZ		4GN07	06-90110	.HOSE CLAMP, 2 INCH PFS, BER	4
					END OF FIGURE	

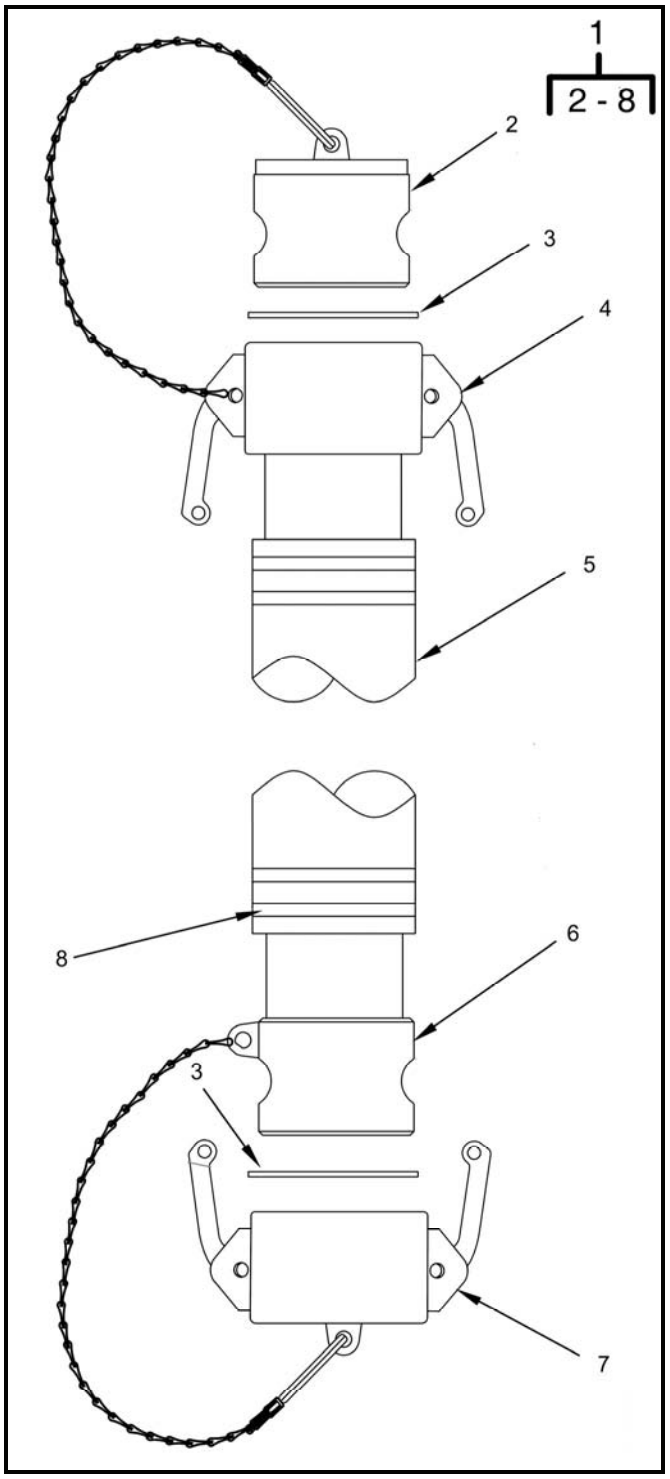


Figure 5. Drain Hose Assembly – 10 foot.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 05 Figure 5 Drain Hose Assy, 10 Foot	
1	PAFZZ		4GN07	210-TAC-TBF-06	DRAIN HOSE ASSY, 10 FOOT PFS, BER	1
2	PAFZZ		4GN07	06-90111	.DUST PLUG, 2 INCH PFS, BER	1
3	PAFZZ		4GN07	00-90006	.GASKET, 2 INCH DUST CAP PFS, BER	2
4	PAFZZ		4GN07	06-90112	.Q/D FEMALE, 2 INCH PFS, BER	1
5	PAFZZ		4GN07	06-90108	.HOSE, 2 INCH 10 FOOT LONG PFS, BER	1
6	PAFZZ		4GN07	06-90109	.Q/D MALE, 2 INCH PFS, BER	1
7	PAFZZ	4710-01-506-6807	4GN07	06-90028	.DUST CAP, 2 INCH PFS, BER	1
8	PAFZZ		4GN07	06-90110	.HOSE CLAMP, 2 INCH PFS, BER	4
					END OF FIGURE	

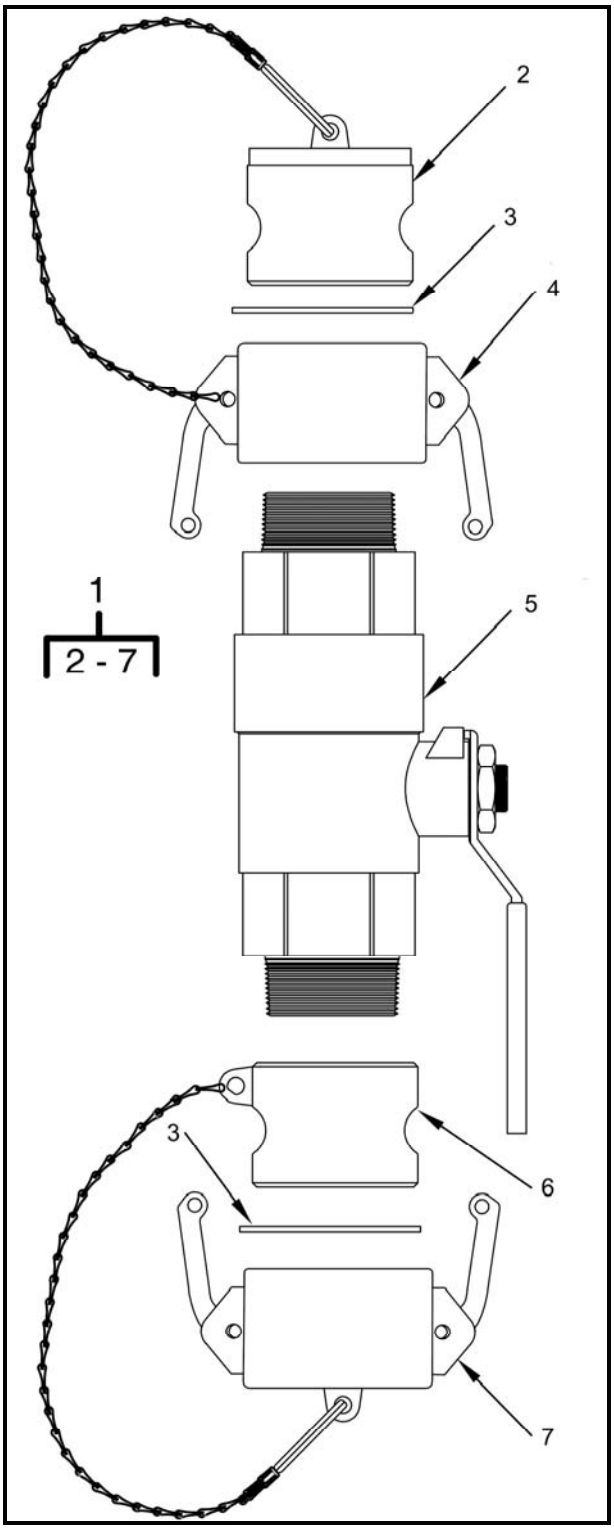


Figure 6. Drain Valve Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 Figure 6 Drain Valve Assy	
1	PAFZZ		4GN07	210-TAC-TBF-14	DRAIN VALVE ASSY, PFS, BER	1
2	PAFZZ		4GN07	06-90111	.DUST PLUG, 2 INCH PFS, BER	1
3	PAFZZ		4GN07	00-90006	.GASKET, 2 INCH DUST CAP PFS, BER	2
4	PAFZZ		4GN07	06-90112	.Q/D FEMALE 2 INCH PFS, BER	1
5	PAFZZ		4GN07	06-90036	.BALL VALVE, 2 INCH, FUEL PFS, BER	1
6	PAFZZ		4GN07	06-90109	.Q/D MALE, 2 INCH PFS, BER	1
7	PAFZZ	4710-01-506-6807	4GN07	06-90028	.DUST CAP, 2 INCH PFS, BER	1
					END OF FIGURE	

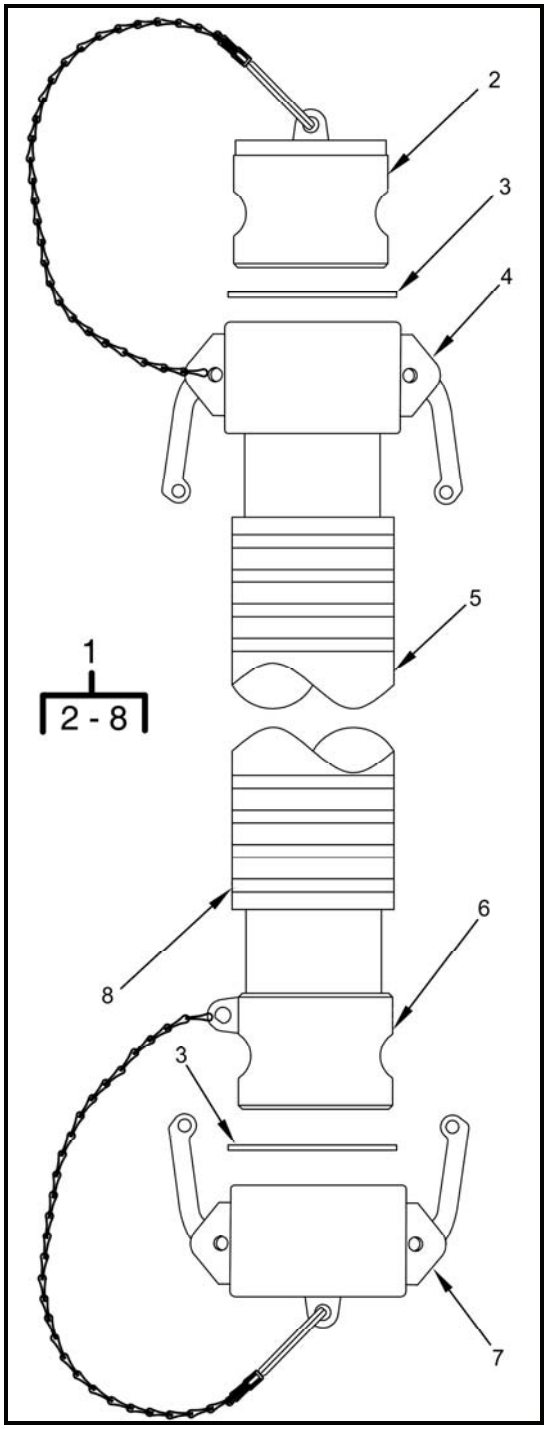


Figure 7. Fill/Discharge Hose Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 07 Figure 7 Fill/Disch Hose Assy	
1	PAFZZ		4GN07	210-TAC-TBF-07	FILL/DISCH HOSE ASSY PFS, BER	1
2	PAFZZ	4730-00-064-4434	4GN07	06-90113	.DUST PLUG, 6 INCH PFS, BER	1
3	PAFZZ	5330-00-412-9780	4GN07	00-90007	.GASKET, 6 INCH DUST CAP PFS, BER	2
4	PAFZZ		4GN07	06-90114	.Q/D FEMALE, 6 INCH PFS, BER	1
5	PAFZZ		4GN07	06-90115	.HOSE, 6 INCH 12 FOOT LONG PFS, BER	1
6	PAFZZ		4GN07	06-90116	.Q/D MALE, 6 INCH PFS, BER	1
7	PAFZZ	4730-00-064-4435	4GN07	06-90029	.DUST CAP, 6 INCH PFS, BER	1
8	PAFZZ		4GN07	06-90117	.HOSE CLAMP, 6 INCH PFS, BER	8
					END OF FIGURE	

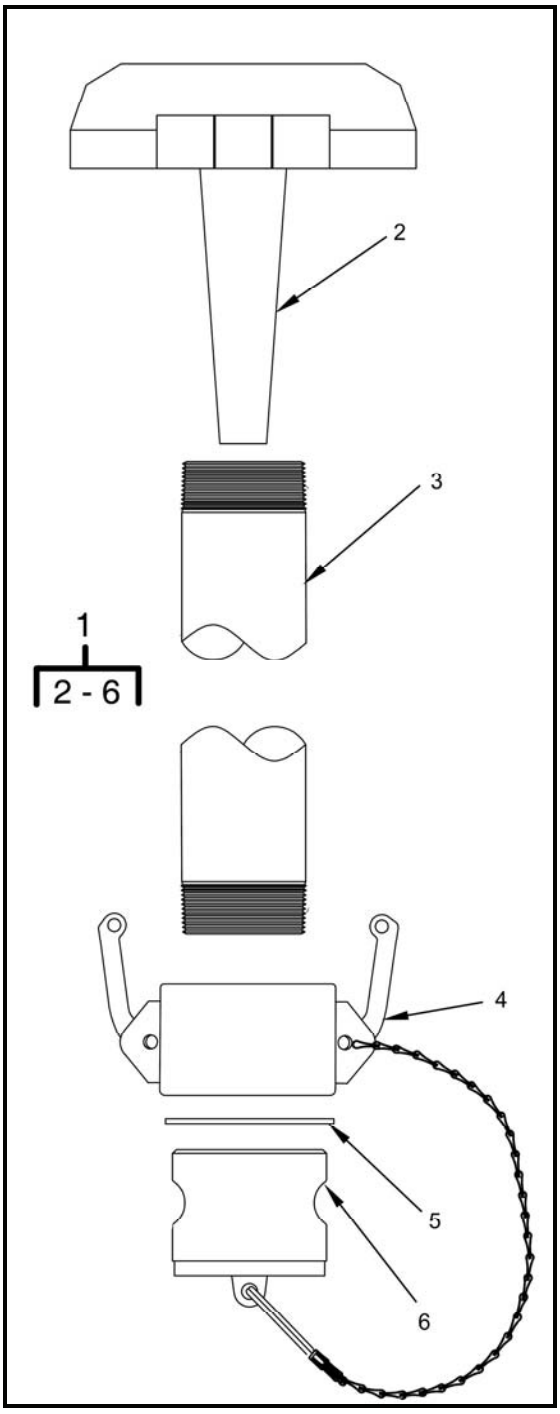


Figure 8. Vent Tube Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 08	
					Figure 8 Vent Tube Assy	
1	PAFZZ		4GN07	210-TAC-TBF-09	VENT TUBE ASSY PFS, BER	1
2	PAFZZ		4GN07	06-90034	.VENT, PASSIVE PFS, BER	1
3	PAFZZ		4GN07	06-90033	.STAND PIPE, MALE NPT, 2 INCH PFS, BER	1
4	PAFZZ		4GN07	06-90112	.Q/D FEMALE, 2 INCH PFS, BER	1
5	PAFZZ		4GN07	00-90006	.GASKET, DUST PLUG, 2 INCH PFS, BER	1
6	PAFZZ		4GN07	06-90111	.DUST PLUG, 2 INCH PFS, BER	1
					END OF FIGURE	

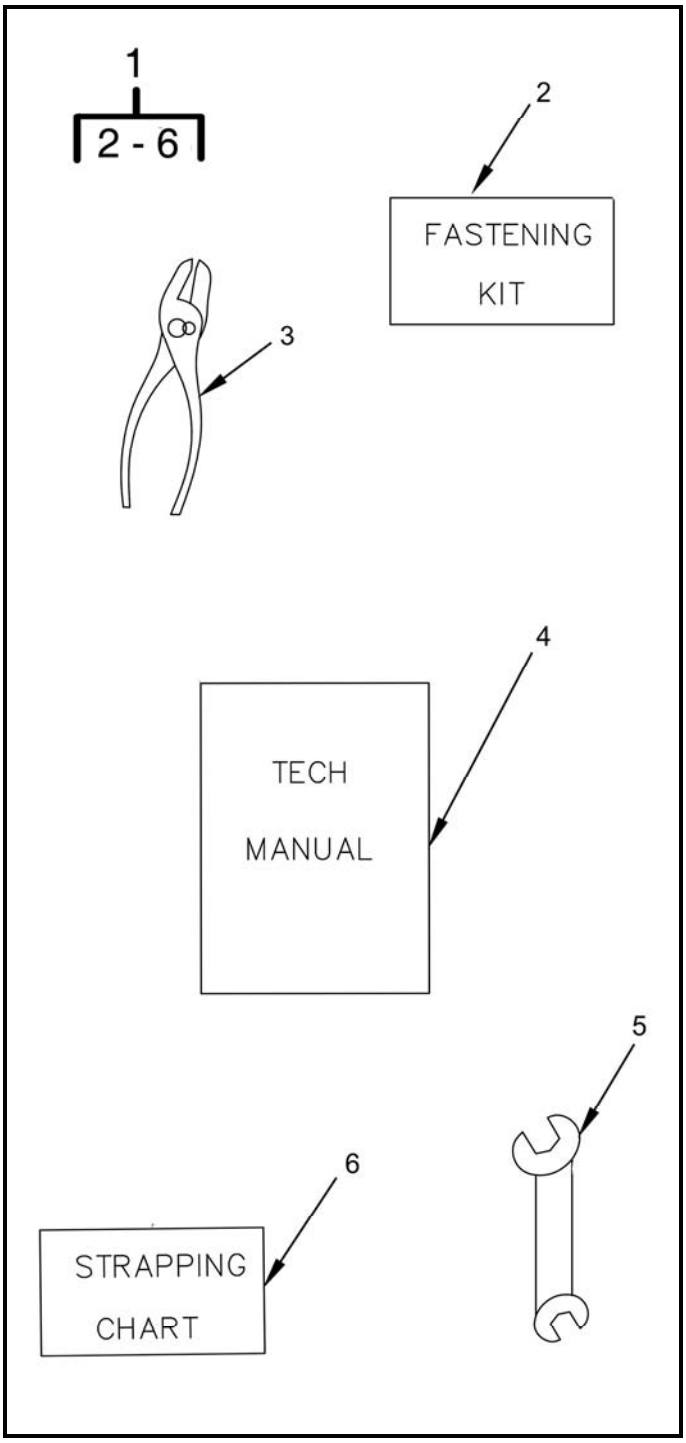


Figure 9. Consumable Overpack Kit.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 09 Figure 9 Consumable Overpack Kit	
1	PAFZZ		4GN07	210-TAC-TBF-10	CONSUMABLE OVERPACK KIT PFS, BER	1
2	KFFZZ		4GN07	06-90125	.FASTENER KIT PFS, BER	1
3	KFFZZ		4GN07	06-90119	.PLIERS, NON-SPARKING PFS, BER	1
4	KFFZZ		4GN07	TM10-5430-252-13&P	.TM, PFS, BER	1
5	KFFZZ		4GN07	06-90118	.WRENCH, 9/16 INCH, NON-SPARKING PFS, BER	1
6	KFFZZ		4GN07	06-90120	.STRAPPING CHART PFS, BER	1
					END OF FIGURE	

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

REPAIR KIT

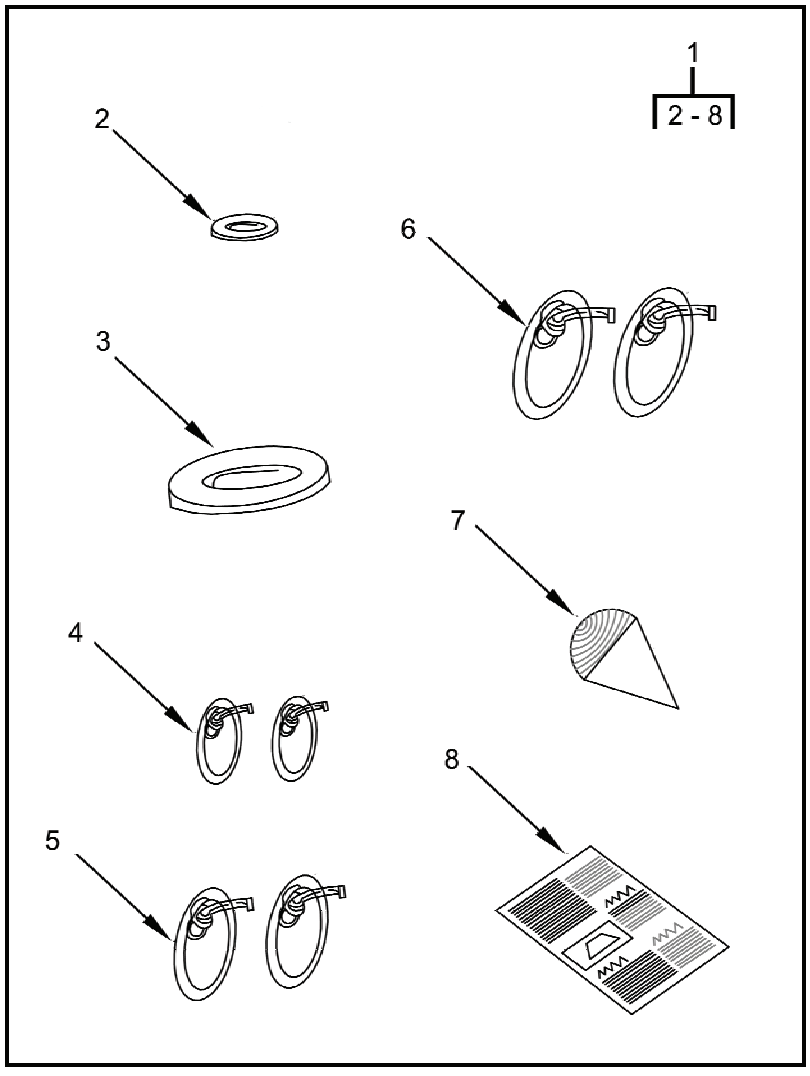


Figure 10. Emergency Field Repair Kit.

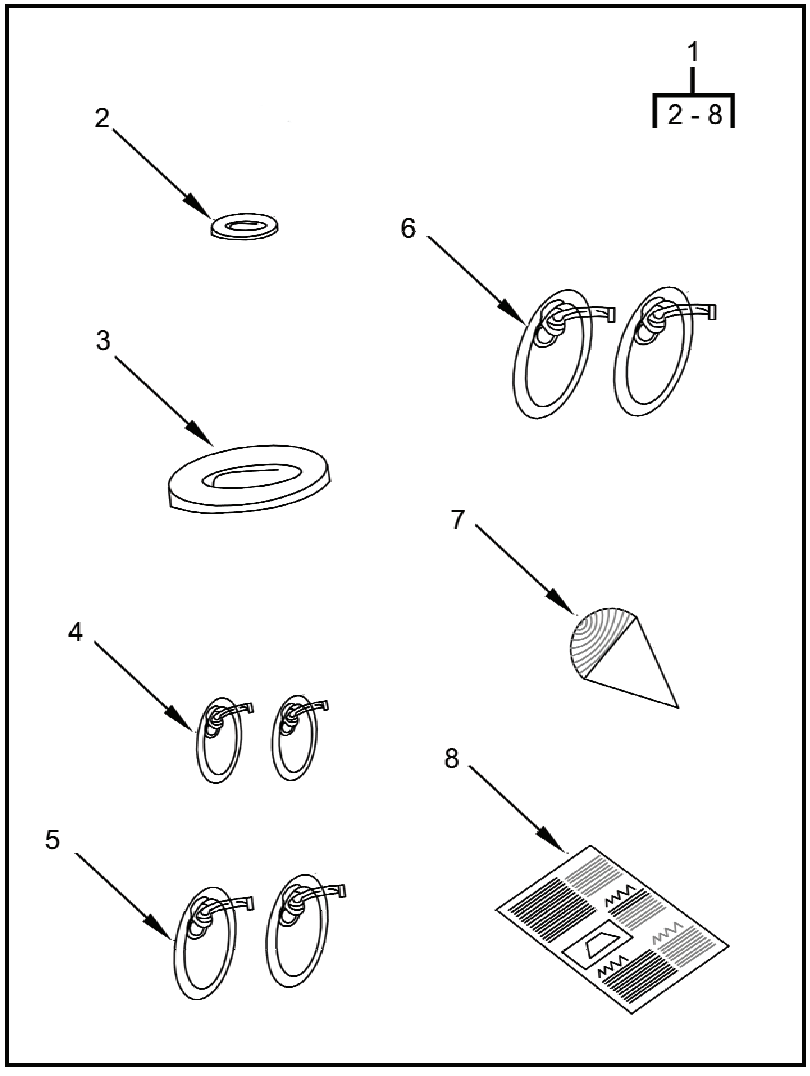


Figure 10. Emergency Field Repair Kit.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 09	
					Figure 10 Repair Kit Emergency Field	
1	PAFZZ		4GN07	210-TAC-TBF-03	REPAIR KIT EMERGENCY PFS, BER	1
2	KFFZZ		4GN07	00-90006	.GASKET, 2 INCH DUST CAP PFS, BER	4
3	KFFZZ	5330-00-412-9780	4GN07	00-90007	.GASKET, 6 INCH DUST CAP PFS, BER	4
4	KFFZZ	5342-00-720-8864	4GN07	04-90136	.PATCH, 3 INCH MECHANICAL PFS, BER	2
5	KFFZZ	5342-00-720-8863	4GN07	04-90137	.PATCH, 5 INCH MECHANICAL PFS, BER	2
6	KFFZZ	5432-00-720-8858	4GN07	04-90138	.PATCH 7 ½ INCH MECHANICAL PFS, BER	2
7	KFFZZ	5510-00-255-9493	4GN07	OT-90013	.PLUG, 3 INCH, WOOD PFS, BER	2
8	KFFZZ		4GN07	06-90106	.INSTRUCTIONS PFS, BER	1
					END OF FIGURE	

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
4730-00-064-4434	7	2
4730-00-064-4435	7	7
5510-00-255-9493	10	8
5330-00-412-9780	2	8
5330-00-412-9780	7	3
5330-00-412-9780	10	4
5342-00-720-8858	10	7
5342-00-720-8863	10	6
5342-00-720-8864	10	5
4710-01-506-6807	3	11
4710-01-506-6807	3	20
4710-01-506-6807	4	5
4710-01-506-6807	5	7
4710-01-506-6807	6	7
5430-01-557-2987	1	1
5430-01-557-2990	1	1

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

TANK, ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

PART NUMBER INDEX

PART NUMBER	FIG.	ITEM
00-90006	2	12
	3	12
	3	16
	4	6
	5	3
	6	3
	8	5
	10	2
00-90007	2	8
	7	3
	10	3
04-90136	10	4
04-90137	10	5
04-90138	10	6
06-90020	2	10
06-90021	2	11
06-90022	2	6
06-90023	2	7
06-90024	2	14
06-90025	2	15
06-90027	2	16
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06-90028	1	9
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	3	20
	4	5
	5	7
	6	7
06-90029	2	3
	7	7
06-90030	1	12
06-90031	1	11
06-90033	8	3
06-90034	8	2

PART NUMBER	FIG.	ITEM
06-90036	3	18
	6	5
06-90043	2	13
	3	3
98019a500	2	5
	3	5
91847a031	2	4
	3	6
06-90106	10	8
06-90107	3	8
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06-90108	3	9
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06-90109	3	10
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06-90110	3	13
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06-90111	3	15
	5	2
	6	2
	8	6
06-90112	3	17
	5	4
	6	4
	8	4
06-90113	7	2
06-90114	7	4
06-90115	7	5

PART NUMBER	FIG.	ITEM
06-90116	7	6
06-90117	7	8
06-90118	9	5
06-90119	9	3
06-90120	9	6
06-90125	9	2
06-90126	2	21
	3 (Sheet 1 of 2)	21
98019a509	2	18
06-90128	2	22
92147a033	2	20
210-TAC-TBF-01	1	2
	2	1
210-TAC-TBF-02	1	3
	3	1
210-TAC-TBF-03	1	4
	10	1
210-TAC-TBF-04	1	5
	3	7
210-TAC-TBF-05	4	1
210-TAC-TBF-06	1	6
	5	1
210-TAC-TBF-07	1	8
	7	1
210-TAC-TBF-09	1	10
	8	1
210-TAC-TBF-10	1	13
	9	1
210-TAC-TBF-12	2	2
210-TAC-TBF-13	3	2
210-TAC-TBF-14	1	7
	6	1
210-TAC-TBF-15	3	14
210-TAC-TBF-16	1	14
210-TAC-TBF.DO	1	1
210-TAC-TBF.PO	1	1
OT-90013	10	7
TM10-5430-252-13&P	9	4

END OF WORK PACKAGE

CHAPTER 7

SUPPORTING INFORMATION FOR TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

OPERATOR AND FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
REFERENCES

SCOPE

This work package lists all field manuals, forms, technical manuals and miscellaneous publications referenced in this manual. Also listed are publications that should be consulted for additional information.

FIELD MANUALS

FM 3-11.3	Multiservice Tactics, Techniques, and procedures for Chemical, Biological, Radiological, and Nuclear Contamination Avoidance
FM 3-11.4	Multiservice Tactics, Techniques, and procedures for Nuclear, Biological, and Chemical (NBC) Protection
FM 3-11.5	Multiservice Tactics, Techniques, and procedures for Chemical, Biological, Radiological, and Nuclear Decontamination
FM 4-25.11	First Aid
FM 9-207	Operations and Maintenance of Ordnance Materiel in Cold Weather

FORMS

DD Form 361	Transportation Discrepancy Report (TDR)
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988-E	Equipment Inspection and Maintenance Worksheet (*Automated*)
SF 364	Report of Discrepancy
SF 368	Product Quality Deficiency Report

PAMPHLETS

DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual

TECHNICAL MANUALS

TM 740-90-1	Administrative Storage Requirements
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use
TM 4700-15/1	Ground Equipment Record Procedures

MISCELLANEOUS

ASME Y14.38-1999	Abbreviations and Acronyms
CTA 8-100	Army Medical Dept. Expendable/Durable Items
CTA 50-909	Field and Garrison Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except Medical, Class V, Repair Parts and Heraldic Items)
MIL-T-704	Treatment and Painting of Material
SB 740-98-1	Storage Serviceability Standard tracked vehicles, wheeled vehicles and component parts

REGULATIONS

AR 700-138	Army Logistics Readiness and Sustainability
AR 750-1	Army Materiel Maintenance Policy

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This 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:

Field – includes three subcolumns, Crew maintenance (C), Service maintenance (O), and Field maintenance (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D)

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 are 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). This includes scheduled inspection and gagings and evaluation of cannon tubes.

2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION (Cont.)

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, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:

   a. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.

   b. Repack. To return item to packing box after service and other maintenance operations.

   c. Clean. To rid the item of contamination.

   d. Touch up. To spot paint scratched or blistered surfaces.

   e. Mark. To restore obliterated identification.

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 about optimum or desired performance.

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of 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 a manner to allow the proper functioning of an equipment or system.

8. Paint (ammunition only). To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.

9. 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 third position code of the Source, Maintenance and Recoverability (SMR) code.

10. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, 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.

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION (Cont.)

NOTE

The following definitions are applicable to the "repair" maintenance function: Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the case of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing

11. 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. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

12. 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 (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

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

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above).

Column (4) Maintenance Level. Column (4) 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 subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION (Cont.)

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. The symbol designations for the various maintenance levels are as follows:

Field:
C Operator or Crew maintenance
O Unit maintenance
F Direct Support maintenance

Sustainment:
L Specialized Repair Activity
H General Support maintenance
D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

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

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number, model number, or type number.

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION (Cont.)

Explanation of Columns in the Remarks

Column (1) Remarks Code. The code recorded in column (6) of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY

NSN 5430-01-557-2987 and 5430-01-557-2990

MAINTENANCE ALLOCATION CHART (MAC)

Table 1 MAC for Tank Assembly, Fabric Collapsible: Petroleum, 210,000 Gallon Capacity

(1) Group Number	(2) component / assembly	(3) maintenance function	(4) Maintenance					(5) Tools and Equipment Ref Code	(6) Remarks code
			Field			Sustainment			
			Crew **C**	Service **O**	Field **F**	Below Depot **H**	Depot **D**		
00	Tank System								
01	Tank Assy	Inspect			0.75				A
		Repair			0.5			1	C
		Service			1				B
		Replace			1				
0101	Tank Body	Inspect			0.25				A
		Repair			0.5				C
		Service			1				B
		Replace							
0102	Fill/Discharge fittings	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.25			1,2	
0103	Drain Fittings	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.25			1,2	

Table 1 Continued

(1) Group Number	(2) component / assembly	(3) maintenance function	(4) Maintenance					(5) Tools and Equipment Ref Code	(6) Remarks code
			Field			Sustainment			
			Crew **C**	Service **O**	Field **F**	Below Depot **H**	Depot **D**		
02	Berm Liner Assembly	Inspect			0.25				A
		Repair			0.5			1	C
		Service			1				B
		Replace			1				
0201	Berm Liner Body	Inspect			0.25				A
		Repair			0.5			1	C
		Service			1				B
		Replace							
0202	Drain Fittings	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0203	Drain Hose	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0204	Drain Valve	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
03	Repair Kit	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.25				

Table 1 Continued

(1) Group Number	(2) component / assembly	(3) maintenance function	(4) Maintenance					(5) Tools and Equipment Ref Code	(6) Remarks code
			Field			Sustainment			
			Crew **C**	Service **O**	Field **F**	Below Depot **H**	Depot **D**		
04	Drain Hose Assy 16'								
		Inspect			0.25				A
		Repair							
		Service							
		Replace							
0401	Dome Drain fitting								
		Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0402	Drain Hose								
		Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
05	Drain Hose Assy 10'								
		Inspect			0.25				A
		Repair							
		Service							
		Replace							
0501	Dome Drain fitting								
		Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0502	Drain Hose								
		Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	

Table 1 Continued

(1) Group Number	(2) component / assembly	(3) maintenance function	(4) Maintenance					(5) Tools and Equipment Ref Code	(6) Remarks code
			Field			Sustainment			
			Crew **C**	Service **O**	Field **F**	Below Depot **H**	Depot **D**		
06	Drain Valve Assy	Inspect			0.5				A
		Repair							
		Service							
		Replace							
0601	fittings	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0602	Drain Ball Valve	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.5			1,2	
07	Fill/Disc Hose Assy	Inspect			0.25				A
		Repair							
		Service			0.25				
		Replace							
0701	Fittings	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0702	Fill/Disc Hose	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	

Table 1 Continued

(1) Group Number	(2) component / assembly	(3) maintenance function	(4) Maintenance					(5) Tools and Equipment Ref Code	(6) Remarks code
			Field			Sustainment			
			Crew **C**	Service **O**	Field **F**	Below Depot **H**	Depot **D**		
08	Fill/Disc Valve Assy	Inspect			0.5				A
		Repair							
		Service							
		Replace							
0801	fittings	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0802	Gate Valve	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.5			1,2	
09	Vent tube Assy	Inspect			0.25				A
		Repair							
		Service							
		Replace							
0901	fittings	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	
0902	Passive Vent	Inspect			0.1				A
		Repair							
		Service							
		Replace			0.25			1,2	

Table 1 Continued

(1) Group Number	(2) component / assembly	(3) maintenance function	(4) Maintenance					(5) Tools and Equipment Ref Code	(6) Remarks code
			Field			Sustainment			
			Crew **C**	Service **O**	Field **F**	Below Depot **H**	Depot **D**		
10	6" Elbow F/F	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.25				
11	6" Elbow F/M	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.25				
12	Consumable Overpack Kit	Inspect			0.25				A
		Repair							
		Service							
		Replace			0.25				

Table 2. Tools and Test Equipment for Tank.

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
1	F	Tool Kit, General Mechanics	5180-00-177-7033	SC5180-95-CL-N26
2	F	Torque Wrench	5120-00-242-3264	
3	F	Permanent Repair Kit	N/A	12-70009

Table 3. Remarks for Tank.

(1) REMARKS CODE	(2) REMARKS
A	Inspect in accordance with PMCS.
B	Clean all fabric components with soapy water.
C	Operator level repair is limited to the capabilities of the Repair Kit (WP 0007).
D	General Mechanics Tool kit is standard equipment issued to each operator. The tool kit is not issued with the tank.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

INTRODUCTION

Scope

This work package lists COEI and BII for the Tank Assembly, Fabric, Collapsible: Petroleum, 210,000 Gallon Capacity to help you 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 information purposes only and is not authority to requisition replacements. These items are part of the Tank Assembly. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the Tank Assembly in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the Tank Assembly during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

Explanation of Columns in the COEI List and BII List

Column (1) Illus Number. Gives you the number of the item illustrated.

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

Column (3) Description, Part Number/(CAGEC). 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 part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS (Cont.)

Column (4) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment.

UOC	Model
PFS	Tank Assy, Fabric Collapsible: Petroleum, 210,000 Gallon Capacity (IPDS)
BER	Tank Assy, Fabric Collapsible: Petroleum, 210,000 Gallon Capacity (DEPOT)

Column (5) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) Qty Rqr. Indicates the quantity required.

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS (Cont.)

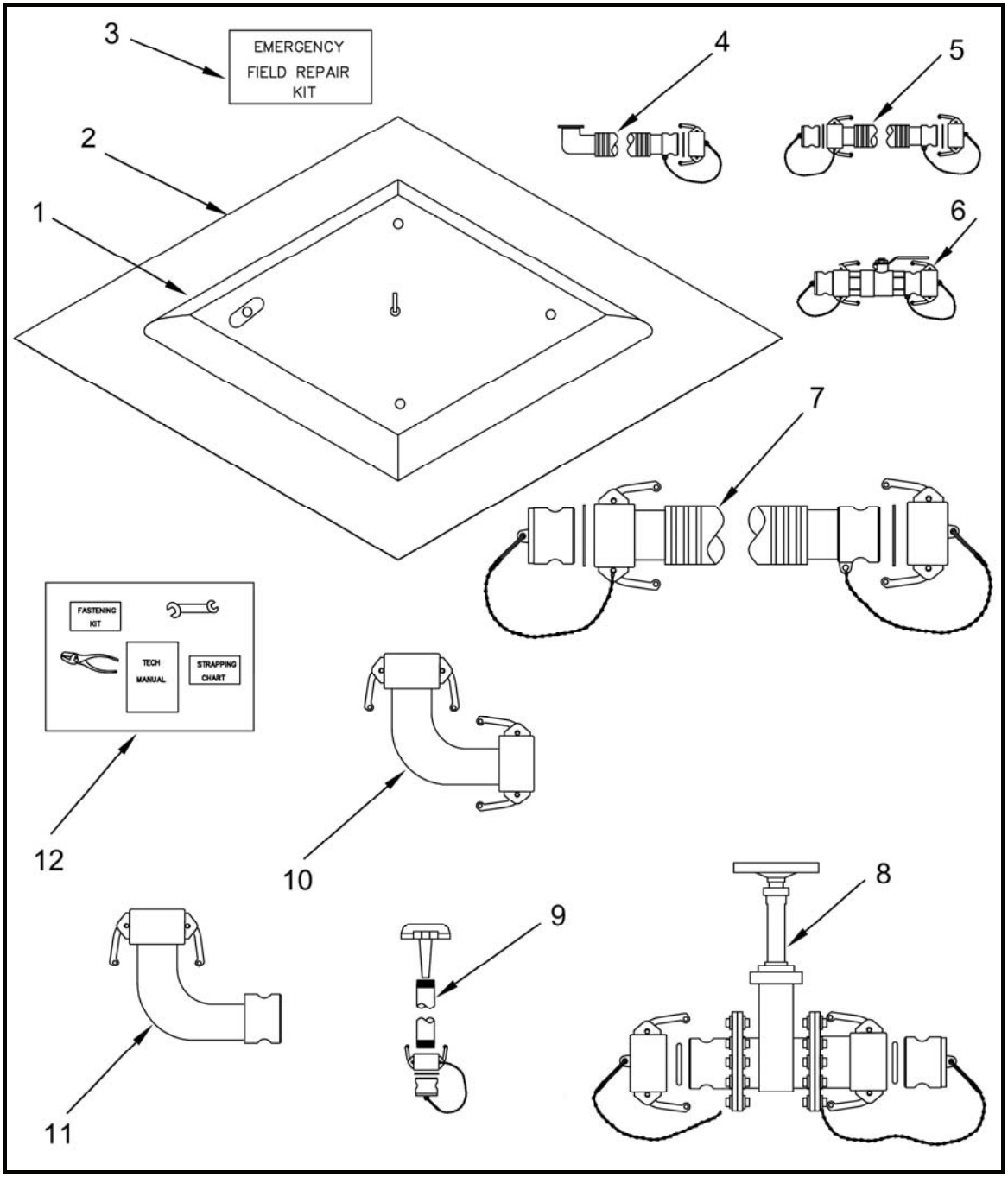

Figure 1. Components of End Item

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS (Cont.)

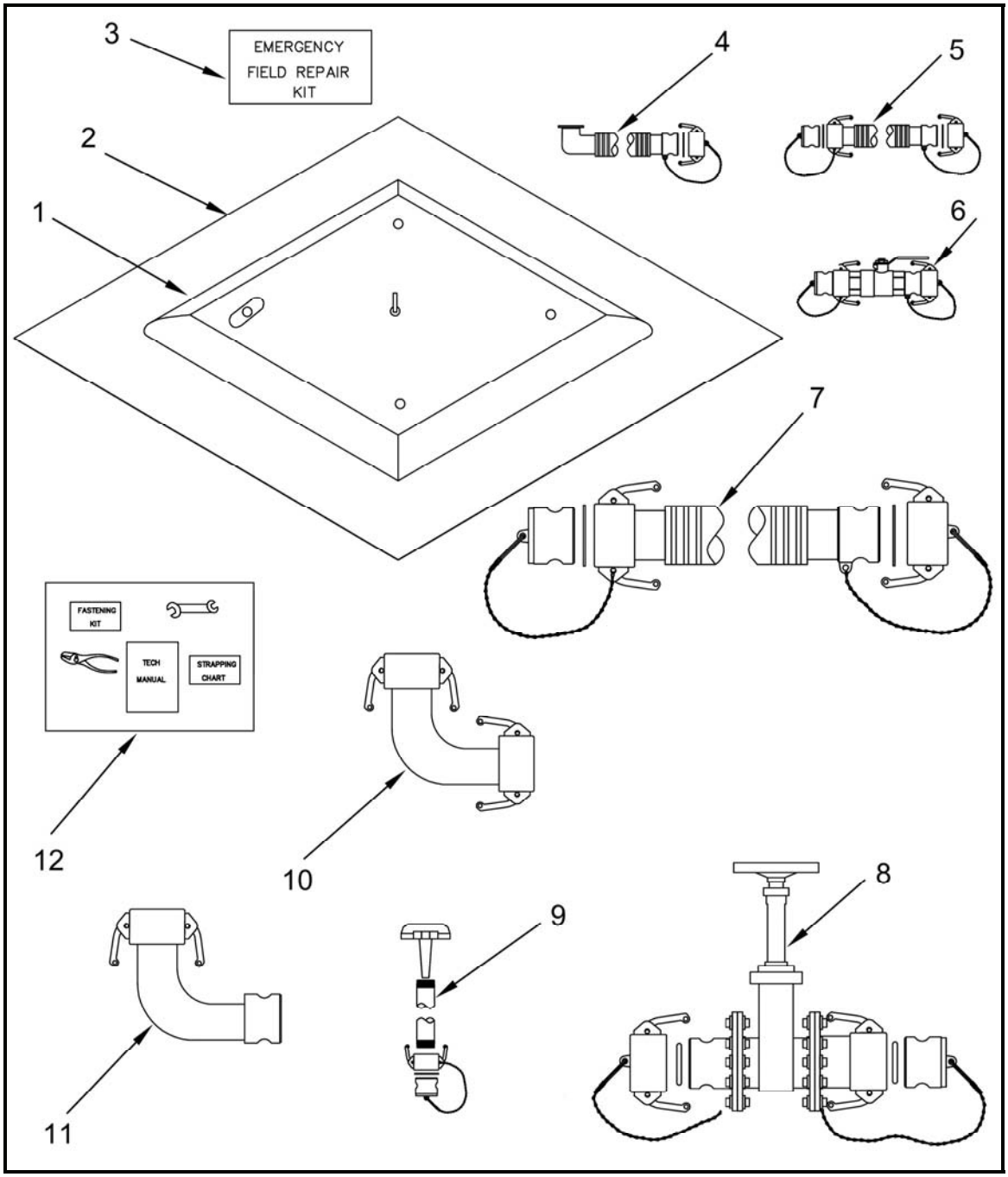

Figure 1. Components of End Item

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS (Cont.)

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/I	(6) QTY / RQR
1		. TANK ASSY (4GN07) 210-TAC-TBF-01	PFS, BER	EA	1
2		. BERM LINER ASSY (4GN07) 210-TAC-TBF-02	PFS, BER	EA	1
3		.REPAIR KIT, FIELD, EMERGENCY (4GN07) 210-TAC-TBF-03	PFS, BER	EA	1
4		. HOSE, DRAIN ASSY, 16 FT (4GN07) 210-TAC-TBF-05	PFS, BER	EA	1
5		. HOSE, DRAIN ASSY, 10 FT (4GN07) 210-TAC-TBF-06	PFS, BER	EA	1
6		. VALVE, DRAIN ASSY (4GN07) 210-TAC-TBF-14	PFS, BER	EA	1
7		. HOSE, FILL/DISC ASSY (4GN07) 210-TAC-TBF-07	PFS, BER	EA	4
8		. VALVE, FILL/DISC ASSY (4GN07) 210-TAC-TBF-08	PFS, BER	EA	4
9		. TUBE, VENT ASSY (4GN07) 210-TAC-TBF-09	PFS, BER	EA	1
10		. ELBOW, 6 INCH, F X F (4GN07) 06-90031	PFS, BER	EA	2
11		.ELBOW, 6 INCH, F X M (4GN07) 06-90030	PFS, BER	EA	2
12		.OVERPACK KIT, CONSUMABLE ITEMS (4GN07) 210-TAC-TBF-12	PFS, BER	EA	1

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS (Cont.)

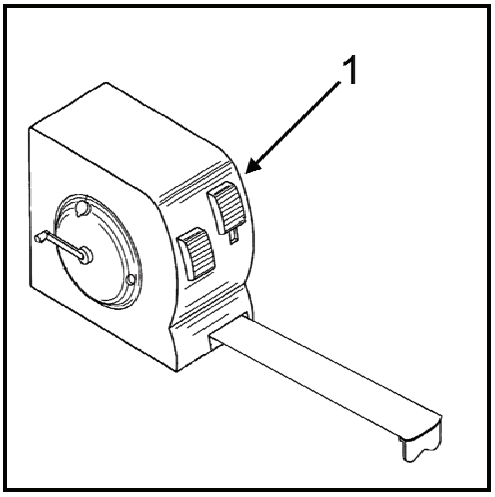

Figure 2. Basic Issue Items

Table 2. Basic Issue Items

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/I	(6) QTY / RQR
1	5210-01-428-5470	TAPE MEASURE (1CV05) 33-425	PFS, BER	EA	1

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
EXPENDABLE AND DURABLE ITEMS LIST

EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the Tank Assembly. 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 Medical, Class V Repair Parts, and Heraldic Items)*, CTA 50-909, *Field and Garrison Furnishings and Equipment* or CTA 8-100*, Army Medical Department Expendable/Durable Items*.

Explanation of Columns in the Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, item 5)).

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

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

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

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, (CAGEC), PART NUMBER	(5) U/I
1	C	7930-00-880-4454	DISHWASHING COMPOUND (81348) P-D-410	BX
2	C	4240-01-063-5996	GOGGLES, INDUSTRIAL (02622) 40832	EA
3	C	4240-01-436-8838	GLOVES, NITRILE (1JA49) WPL251J [SIZE 11]	PR
4	C	7920-00-240-7174	BRUSH, SCRUB (80244) 7920-00-240-7174	EA
5	C	8030-00-889-3535	TAPE, ANTISEIZING (39428) 4591K12	EA
6	C	7920-00-205-1711	RAGS, WIPING (58536) A-A-2522	BL
7	C	6850-00-281-1985	DRY CLEANING SOLVENT (58536) A-A-2522	GL
8	C	5975-01-545-5453	TIES, CABLE (07BY4) 7130K32 8”	BL
9	C	9150-00-231-6689	LUBRICATION OIL, GENERAL PURPOSE (81349) MIL-PRF-32033	QT

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TANK ASSEMBLY, FABRIC, COLLAPSIBLE: PETROLEUM, 210,000 GALLON CAPACITY
NSN 5430-01-557-2987 and 5430-01-557-2990
MANDATORY REPLACEMENT PARTS LIST

MANDATORY REPLACEMENT PARTS LIST

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.

Table 1. Mandatory Replacement Parts.

ITEM NUMBER	PART NUMBER	NATIONALSTOCK NUMBER (NSN)	NOMENCLATURE	QTY
1	00-90006		GASKET, 2 INCH	1
2	00-90007	5330-00-412-9780	GASKET, 6 INCH	1
3	92147a031	5310-01-528-7188	WASHER, LOCK, 3/8 INCH	1
4	92147a033	2310-01-560-2862	WASHER, LOCK, 1/2 INCH	1

END OF WORK PACKAGE

INDEX

P

Q

R

S

T

U

W

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army

0823201

Distribution:

To be distributed in accordance with the initial distribution number (IDN) 256976, requirements for TM 10-5430-252-13&P.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE Date you filled out this form.
TO: *(Forward to proponent of publication or form) (Include ZIP Code)* AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	FROM: *(Activity and location) (Include ZIP Code)* Your mailing address	

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

PUBLICATION/FORM NUMBER	DATE	Title
TM 10-5430-252-13&P	12 Sep 08	Operator & Field Maint Manual w/RPSTL for Tank Assembly, Fabric, Collapsible: Petroleum 210,000 gallon capacity

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).
						SAMPLE

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

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	Signature
Your Name		*Your Signature*

DA FORM 2028, FEB 74 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED. USAPPC V3.00

TO: (Forward direct to addressee listed in publication)	FROM: (Activity and location) (Include ZIP Code)	DATE
AMSTA-LC-LMPP / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630	Your address	Date you filled out this form

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

PUBLICATION NUMBER	DATE	TITLE
TM 10-5430-252-13&P	12 Sep 08	Oper & Field Main Manual w/RPSTL for Tank Assembly, Collapsible 210K Gal Capacity

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

SAMPLE

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
Your Name		Your Signature

USAPPC V3.00

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

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-5430-252-13&P	12 Sep 08	Operator & Field Maint Manual w/RPSTL for Tank, Assembly, Fabric, Collapsible, 210,000 gal capacity

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).

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TM 10-5430-252-13&P	12 Sep 08	Oper & Field Main Manual w/RPSTL for Tank, Assembly, Fabric, Collapsible, 210K Gal Capacity

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PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-5430-252-13&P	12 Sep 08	Operator & Field Maint Manual w/RPSTL for Tank, Assembly, Fabric, Collapsible, 210,000 Gallon Capacity

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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
feet
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
acres
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.

1 sq. dekameter (are) =100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47

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: 085069-000