TM 5-5430-248-13&P

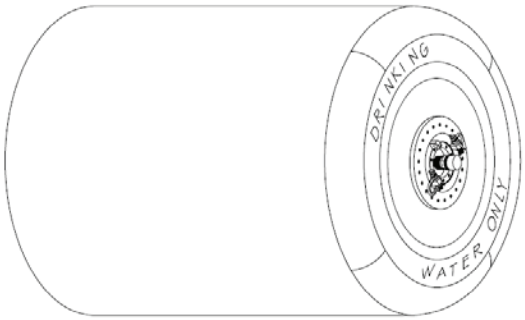
TECHNICAL MANUAL

OPERATOR AND FIELD LEVEL MAINTENANCE MANUAL WITH REPAIR PARTS AND SPECIAL TOOLS LIST FOR

DRUM, FABRIC, COLLAPSIBLE, DRINKING WATER
500 GALLON WATER CAPACITY

PART NUMBER DWDM5CG

(NSN 5430-01-537-6993)



HEADQUARTERS, DEPARTMENT OF THE ARMY
AUGUST 2007

WARNING SUMMARY

Death or serious injury may result if personnel fail to observe the following safety precautions:

DRINKING WATER ONLY

WARNING

The drum is only authorized to be filled with DRINKING WATER. The drum is designed and permanently labeled for use with DRINKING WATER ONLY. Filling the drum with any other liquid may cause sickness or death to personnel.

BEFORE DISPENSING WATER TO PERSONNEL

WARNING

Check to make sure drum has been used only for drinking water. Failure to check the drum could lead to sickness or death to personnel. If there is any question about the quality of the water, do not use the drum.

WARNING

Check Valve coupler and adapter assembly for dirt, dust and any foreign matter which may contaminate drinking water. All Valve coupler and assembly parts must be cleaned with a mild non-toxic detergent and assembled on a clean surface. Remember that the Valve coupler and adapter assembly will be used to dispense drinking water. Dirty or contaminated parts could cause sickness or death to personnel drinking water from the drum.

WARNING

Assemble parts on a clean surface. Failure to do so may cause sickness or injury.

WARNING

All drum parts must be cleaned with a mild, non-toxic detergent and assembled on a clean surface. Remember that the drum will be used to store and dispense drinking water. A dirty or contaminated drum could cause sickness or even death to personnel drinking from it.

WARNING

Drum must be completely dry inside and out for storage to prevent mold or mildew from growing on the drum. Sickness or death could occur to personnel.

WARNING

The swivel plate is coated with an anticorrosive material that contains cadmium. Do not heat, weld, drill, or cut the swivel plate. These actions may create dust or hazardous vapors which may cause sickness or death to personnel.

WARNING

Dirt, dust, or foreign matter may contaminate drinking water that can cause injury or death to personnel.

LIFTING DRUM

WARNING

The empty drum weighs 175 lbs and the crated drum weighs 369 lbs. If using a forklift, insure that it can lift 369 lbs. If you are not using a forklift, be sure to use a five person lift. Failure to comply may result in injury or death to personnel.

WARNING

An empty drum weighs 175 pounds and a filled drum with 500 gallons of water weighs over 4000 pounds. Be sure to lift with mechanical device to avoid any injury to personnel while handling.

WARNING

If you are using personnel to lift the drum out of the crate, use a five person lift. Failure to comply may result in injury to personnel.

WARNING

The water drum has a 500 gallon capacity. Do not overfill. The drum may rupture causing injury to personnel.

DRUM POSITIONING

WARNING

Ensure drum is securely positioned to avoid slipping or rolling during filling operation. Failure to comply may result in injury to personnel or damage to equipment.

FIRST AID

FIRST AID instructions are given in FM 4-25-11, First Aid.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

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

Date of issue for the original manual is:

Original 17 August 2007

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 34 AND TOTAL NUMBER OF WORK PACKAGES IS 29, CONSISTING OF THE FOLLOWING:

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WP 0029 (2)	**0**		

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C., 17 August 2007

TECHNICAL MANUAL

OPERATOR AND FIELD LEVEL MAINTENANCE MANUAL WITH REPAIR PARTS AND SPECIAL TOOLS LIST FOR DRUM, FABRIC, COLLAPSIBLE, DRINKING WATER 500 GALLON WATER CAPACITY PART NUMBER DWDM5CG (NSN 5430-01-537-6993)

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

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

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HOW TO USE THIS MANUAL

This manual was designed to provide you with the information you will need to maintain the DWDM5CG, 500 Gallon Water Drum.

The information contained in this manual is presented in chapters and work packages. Each chapter is divided into work packages and covers the disassembly, repair and assembly of the 500 Gallon Water Drum and its components. Where references are made to tables, figures, and work packages, refer to those portions of the text.

To find information relating to a specific component or system:

Identify the desired topic
Find the general topic in the Table of Contents, located in the front of this manual.
Refer to the appropriate work package(s) called out in the Table of Contents.

IMPORTANT

You must read and understand this manual BEFORE working on or using the DWDM5CG, 500 Gallon Water Drum.

MAINTENANCE

Maintenance procedures are to be performed in the sequence shown in the text and illustrations. Step 1 must be performed before step 2 and so on.

Throughout this manual the words WARNING, CAUTION, and NOTE will appear. The meanings of each of these words are listed below:

WARNING

A warning is used to alert the user to hazardous operating and maintenance procedures, practices, conditions, statements, etc. that may result in injury to or DEATH of personnel if not strictly observed.

CAUTION

A caution is used to alert the user to hazardous operating and maintenance procedures, practices, conditions, statements, etc. That may result in damage to or destruction of equipment or mission effectiveness if not observed.

NOTE

A note is used to inform the user of essential information which is of special interest or importance or will aid the user in performing a job.

CHAPTER 1

GENERAL INFORMATION

EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

FOR

DRUM, FABRIC, COLLAPSIBLE, DRINKING WATER 500

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
GENERAL INFORMATION

SCOPE

This manual provides information about the use, maintenance and repair of the DWDM5CG 500 Gallon Water Drum.

Type of manual: FIELD LEVEL Maintenance Manual Model

Model number and equipment name:
DWDM5CG, Drum, Fabric, Collapsible, Drinking Water 500 Gallon Capacity

Purpose of Equipment: The DWDM5CG water drum is a collapsible 500 gallon capacity fabric-reinforced drum for storing, transporting, and dispensing drinking water.

MAINTENANCE FORMS, RECORDS, REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS); DA PAM 738-751, Functional Users Manual for the Army Maintenance Management Systems – Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability."

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your 500 gallon water drum 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 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS). 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 738-750, Functional Users Manual for the Army Maintenance Management System (TAMMS).

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

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

PREPARATION FOR STORAGE OR SHIPMENT

Instructions for the storage or shipment of the 500 gallon water drum are located in WP 0018 00.

NOMENCLATURE CROSS-REFERENCE LIST

This listing includes nomenclature cross-references used in this manual.

Common Name	Official Nomenclature
Valve	Valve coupler
Adapter	Adapter assembly
Shackle	Shackle assembly
Drum or 500 Gallon Water Drum	DWDM5CG, Drum, Fabric, Collapsible, Drinking Water 500 Gallon Capacity

LIST OF ABBREVIATIONS/ACRONYMS

The acronyms listed below are in accordance with ASME Y14.38. The acronyms used in this technical manual are defined as follows:

AAL	Additional Authorization List
AMC	Army Materiel Command
AMDF	Army Master Data File
ANSI	American National Standards Institute
Ao	Operational Availability
AOAP	Army Oil Analysis Program
APD	Army Publishing Directorate
AQL	Acceptable Quality Level
AR	Army Regulation
BII	Basic Issue Items
BOI	Basis of Issue
C	Centigrade
CAGEC	Commercial and Government Entity Code
cm	centimeter
COEI	Components of End Item
CPC	Corrosion Prevention and Control
DOD	Department of Defense
DS	Direct Support
EIC	End Item Code
EIR	Equipment Improvement Recommendation

F	Fahrenheit
FGC	Functional Group Code
In	Inch
kg	Kilogram
km	Kilometer
l	Liter
lbs	Pounds
LRU	Line Replacement Unit
m	meter
MAC	Maintenance Allocation Chart
MOS	Military Occupational Specialty
NATO	North Atlantic Treaty Organization
NHA	Next Higher Assembly
NIIN	National Item Identification Number
NSN	National Stock Number
P/N	Part Number
PMC	Preventive Maintenance Checklist
PMCS	Preventive Maintenance Checks and Services
Psi	Pounds per square inch
QA	Quality Assurance
QTY	Quantity
RPSTL	Repair Parts and Special Tools List
SMR	Source, Maintenance, and Recoverability
TB	Technical Bulletin
TBO	Time Between Overhaul
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
U/I	Unit of Issue
UOC	Usable On Code
URL	Uniform Resource Locator
UV	Ultra-violet
WP	Work Package

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The DWDM5CG 500 Gallon Water Drum is a collapsible fabric-reinforced water container for storing, transporting, and dispensing drinking water. Manually controlled valve couplers are fitted on both sides of the drum to dispense and fill water. Drums can be roll-towed, lifted, dropped from 5 feet, and deflated. The emptied drum collapses to 15% of fill capacity. The 500 gallon water drum can be operated in a temperature range of -40°F to 135°F. The lightweight fabric design insures ease of storage and transport.

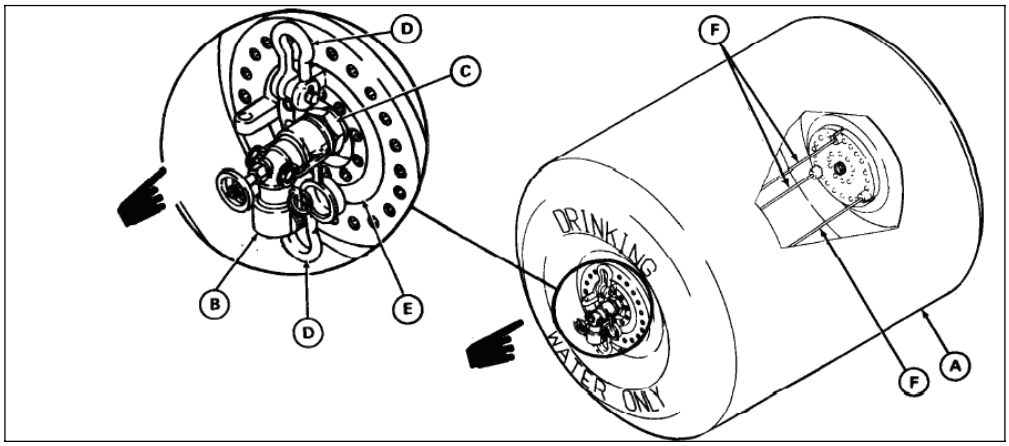

Figure 1. Location of major components of the drum.

A. Drum. Holds up to 500 gallons of drinking water.

B. Valve coupler. Manual valve for filling and dispensing drinking water on each side of the drum.

C. Adapter assembly. Contains check valve which closes when valve coupler is removed on each side of the drum.

D. Shackle assembly. Means for suspending, lifting or tying down drum from either end. Two assemblies on each lug of the swivel plate on each side of the drum.

E. Swivel plate. Provides attaching points for shackles and tow bar on each side of the drum.

F. Cable assemblies. Limits endwise expansion of drum and controls its shape inside of the drum.

EQUIPMENT DATA

The following is a tabular presentation of all physical and performance data required for the operation and maintenance of the drum.

Table 1. Equipment Data

DESCRIPTION	QTY	DATA	
Drum	1		
		Capacity:	500 gallons of water (1892.5 l)
		Weight of Empty Drum	175 lbs.
		Puncture Resistance:	325 lbs. (147.2 kg)
		Filled Dimensions	
		Filled Length:	58 in (1.47 m)
		Filled Width:	55 in (1.40 m)
		Filled Weight:	4325 lbs (1962 kg)
		Cubic Ft:	69.6 cubic ft (1.97 cubic m)
		Crated dimensions:	
		Weight:	175 lbs (93.4 kg)
		Weight of crate and drum:	369 lbs (167.4 kg)
		Length:	62.25 in (158.1 cm)
		Width:	48.00 in (121.9 cm)
		Height:	21.00 in (53.3 cm)
		Cubage	36.31 cubic ft (1.03 cubic m)
		Vertical Drop Capability (filled):	5 feet (1.5 m)
		Maximum tow speed:	5 mph (8 km)
		Minimum safe working load:	4300 lbs (1950.5 kg)
		(Minimum safe working load refers to the minimum load that can be applied to the drum and still obtain the most efficient service for the life of the drum.)	
Repair Kit	1		
		Weight:	1.5 lbs. (0.68 kg)
		Width	7.0 in. (0.18 m)
		Length:	10 in. (0.25 m)

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
THEORY OF OPERATION

BASIC FUNCTIONS

The 500 gallon water drum is a potable water storage container. In addition to storing water, the drum can be transported by loading it on to a truck or roll-towing it. The full drum can also be dropped a maximum of 5 feet to its intended location. While the drum is in use, its water capacity is 500 gallons of drinking water. While the drum is not in use, the drum can be collapsed to 15% of its filled size to facilitate unit storage and transfer.

BASIC FORM

The 500 gallon water drum is cylindrical with metal castings and fittings on both ends of the drum. The two ends with metal fittings are called end caps. Primarily, the drum is made of a rubberized fabric, three internal cables that maintain the shape of the drum and absorb shock, plate assemblies and shackles that increase the transportability, two adapters through which the drum can be filled, and two valves that can be used to fill and dispense water.

When the drum has been placed on a level and firm site, it can be used to either fill or dispense water. This is defined as the “stand-by” position for the drum.

When the drum is being stored in its shipping crate, the drum is defined to be in the “off” position.

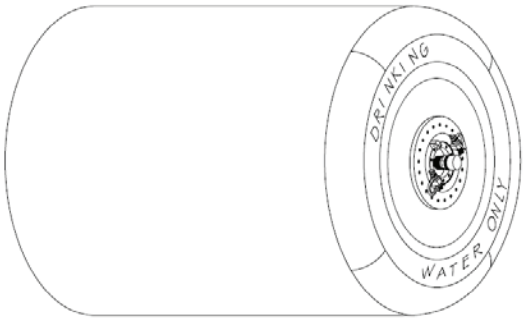

Figure 1. The 500 Gallon Water Drum.

COMPONENTRY

The largest component of the drum is the drum body. It is made of a water-resistant rubberized fabric that serves as a bag to contain the water. The plates, including the spacer plate, swivel plate, and the bearing plate are made of a high strength, high density, anti-corrosive aluminum or iron-based alloy. Fabric is sandwiched between the metal plate and the spacer plate to insure water retention. The swivel plate is fastened to the metal plate by the bearing plate and is built with lugs to mount shackles. Two shackles are attached to the swivel plate on each end of the drum that allows the drum to be lifted, suspended, or tied down. The swivel plate also allows the drum to rotate in the pulling direction. The valve coupler can be used to either fill or dispense water from the drum. The handwheel is the manual control for the valve coupler.

Further information on maintenance is included in Chapter 4 and Chapter 5.

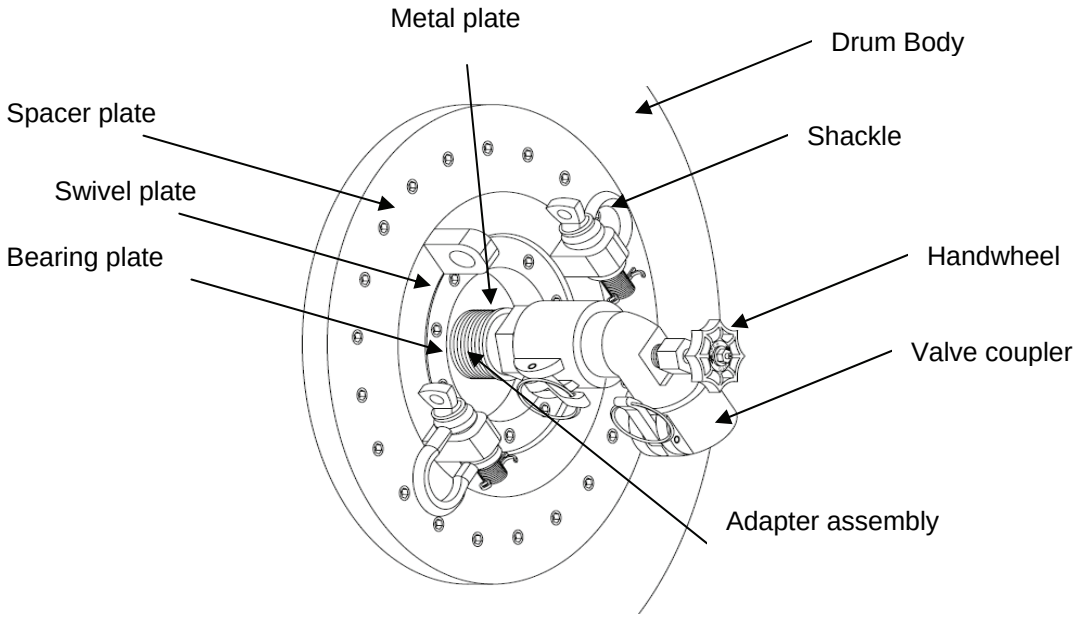

Figure 2. Outer components of the 500 Gallon Water Drum.

A repair kit is included that can plug holes up to 2 inch diameter hole in the fabric. Further instructions on repairs are included in WP 0016 00 and WP 0017 00.

STORAGE

When the drum is emptied of all water, the drum can be collapsed and stored for future use. It should be stored in a clean, well ventilated area. Further instructions on storage are included in WP 0018 00.

When not in use, valves should be disengaged from the drum and stored. The dust cap should be applied to the adapter for protection against debris and damage.

END OF WORK PACKAGE

CHAPTER 2

OPERATOR INSTRUCTIONS

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

INTRODUCTION

The following illustration provides description and utility information of operator controls and indicators. An adapter assembly is found on both ends of the 500 Gallon Water Drum. Two valve couplers are included in the shipping crate and can be assembled to the adapter assembly.

CAUTION

To avoid damage to the drum, DO NOT overfill with more 500 gallons of water. Overfilling may cause damage to the drum.

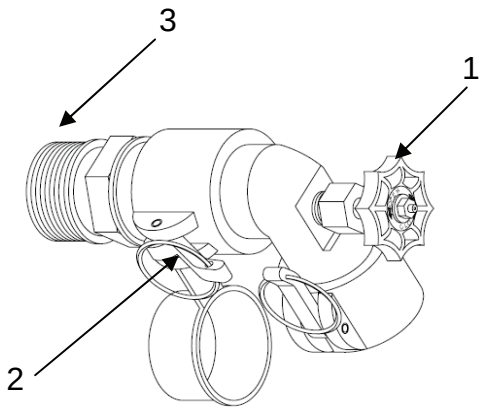

Figure 1. Operator Controls and Indicators

Key	Control/Indicator	Function
1.	Open/close indicator on valve handwheel	When valve is turned to the “open” position, water can be dispensed. When valve is turned to the “close” position, water can not be dispensed. Once the valve is turned to the “close” position, the valve can be disengaged from the adapter and stored.
2	Valve coupler cam arms in the locked position on the valve coupler	When the valve coupler’s cam arms are in the locked position on the adapter, the valve is ready to be used. If cam arms are released, the drum is not ready to dispense water.
3	Adapter assembly	The adapter assembly has a check valve that prevents water from leaking out.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
OPERATION UNDER USUAL CONDITIONS

INITIAL SET-UP:

References
WP 0011
WP 0012
WP 0018

Personnel: One (77W)

INTRODUCTION

This section describes the procedures needed to fill the 500 gallon water drum with water and dispense water from the 500 gallon water drum. The completely filled water drum is shown in Figure 1 and a partially filled water drum is shown in Figure 2.

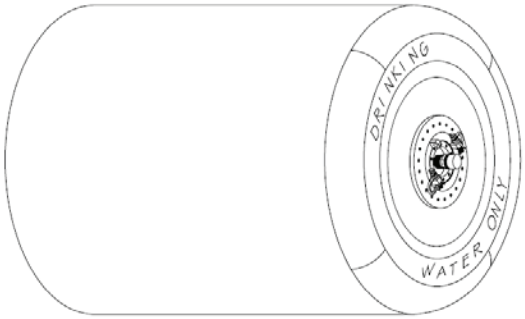

Figure 1. Completely filled water drum.

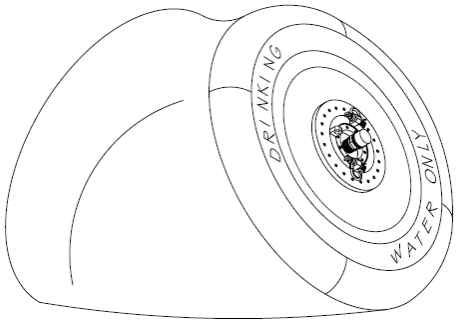

Figure 2. Partially filled water drum.

FILLING THE DRUM

To fill the 500 gallon water drum:

1. Perform preventative maintenance checks and services (See WP 0011 00, Table 1).

WARNING

The empty drum weighs 175 lbs and the crated drum weighs 369 lbs. Always use material handling equipment, such as a forklift that can lift 369 lbs, to lift the empty drum. Failure to comply may result in injury or death to personnel.

2. Place the drum near water source. If there is a slope, be sure to secure the drum by embanking soil or sand around the drum to prevent rolling.

3. Collapse the drum completely to remove air from the drum by following the instructions below:

    a. At one end of the drum, remove dust cap (Figure 3, Item 1) from adapter assembly (Figure 3, Item 2).

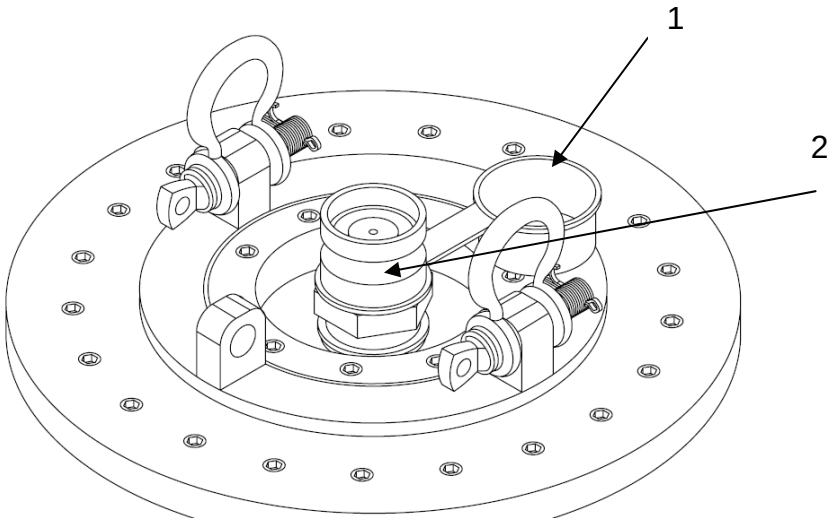

Figure 3. Removing dust cap from adapter assembly.

WARNING

Dirt, dust, or foreign matter may contaminate drinking water that can cause injury or death to personnel.

b. Slide closed valve coupler (Figure 4, Item 1) onto adapter assembly (Figure 4, Item 2). Lock valve onto adapter assembly by pushing in the cam arms (Figure 5, Item 1).

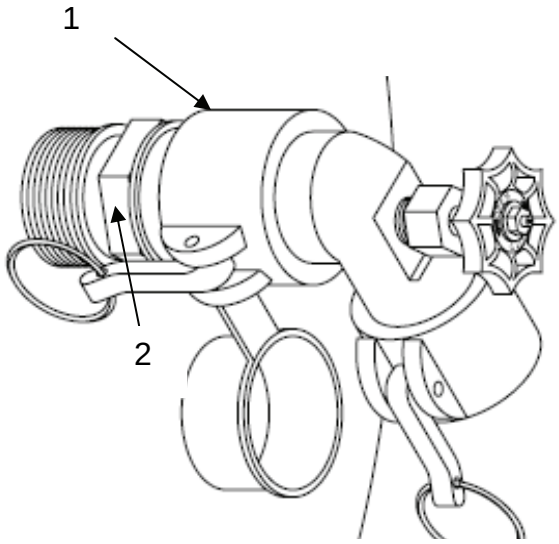

Figure 4. Valve coupler attached to the adapter assembly with cam arms in the unlocked position.

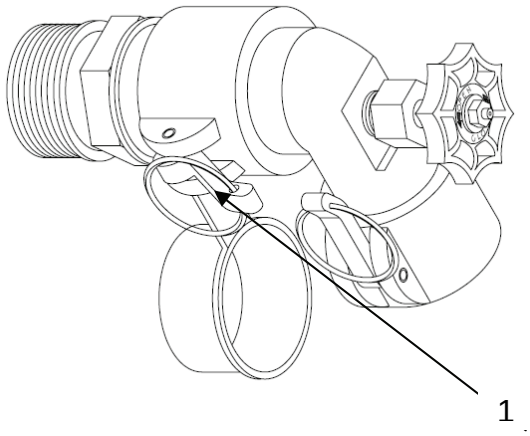

Figure 5. Valve coupler attached to the adapter assembly with cam arms in the locked position.

c. Turn the handwheel (Figure 6) counterclockwise all the way to open the valve coupler.

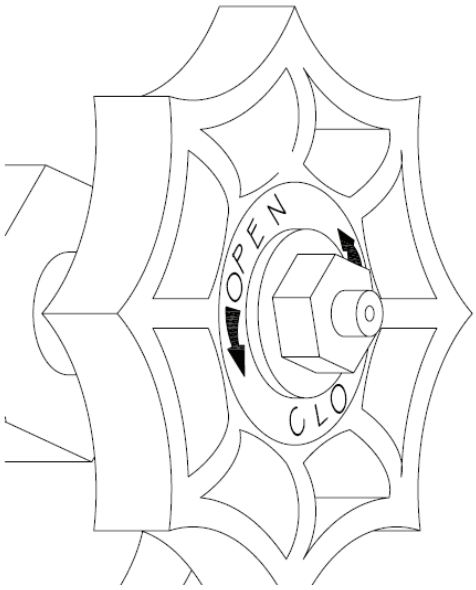

Figure 6. Close-up of valve coupler handwheel.

d. Fully collapse the drum by pushing down on the side of the drum, trapped air will rush out of the valve coupler.

4. Install partially open valve coupler to supply hose and turn on water supply until water flows out of the valve coupler, then close valve coupler.

5. Attached valve coupler to adapter assembly and lock.

WARNING

The water drum has a 500 gallon capacity. Do not overfill. The drum may rupture causing injury to personnel.

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WARNING

Check valve coupler and adapter assembly for dirt, dust and any foreign matter which may contaminate drinking water. All valve coupler and adapter assembly parts must be cleaned with a mild non-toxic detergent and assembled on a clean surface. Remember that the valve coupler and adapter assembly will be used to dispense drinking water. Dirty or contaminated parts could cause sickness or death to personnel drinking water from the drum.

6. Turn handwheel counterclockwise two turns to slightly open the valve coupler.

WARNING

The water drum has a 500 gallon capacity. Do not overfill. The drum may rupture causing injury to personnel.

WARNING

The drum is only authorized to be filled with DRINKING WATER. The drum is designed and permanently labeled for use with DRINKING WATER ONLY. Filling the drum with any other liquid may cause sickness or death to personnel.

7. Open source of water supply and allow the drum to fill to no more than 500 gallons.

8. When drum is completely filled, turn handwheel all the way clockwise to close valve coupler to shut off water supply to the drum.

9. Unlock and remove closed valve coupler from adapter assembly. Detach filler hose from valve coupler and store valve coupler in original packaging, WP 0018 00.

10. Replace dust caps (Figure 7, Item 1).

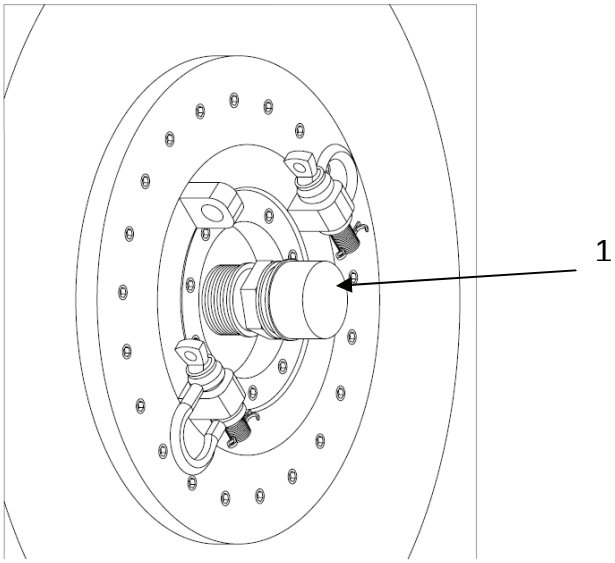

Figure 7. Dust cap replaced on the adapter assembly.

11. Repeat steps 1 through 11 for each drum to be filled as needed.

END OF TASK

DISPENSING DRINKING WATER FROM DRUM

WARNING

Check whether drum has been filled with any liquid other than drinking water. Failure to check drum could lead to sickness or death to personnel. If there is uncertainty about the quality of the water, discontinue use of the drum.

CAUTION

Do not tow drum if it has been repaired. Towing the drum could cause further damage.

To dispense water from the 500 gallon water drum:

1. Perform preventative maintenance checks and services. (WP 0011 00 Table 1)

WARNING

An empty drum weighs 175 pounds and a filled drum with 500 gallons of water weighs over 4000 pounds. Be sure to lift with mechanical device to avoid any injury to personnel while handling.

2. Transport filled drum to place of use. Be sure to select a dispensing site that is level and firm.
3. Obtain valve couplers that came with the 500 gallon water drum.
4. Clean valve coupler of dust, dirt, or foreign matter or replace valve coupler (WP 0012 00).
5. Uncover one or both adapter assemblies (Figure 8, Item 1) at either end of the drum by removing dust caps (Figure 8, Item 2).

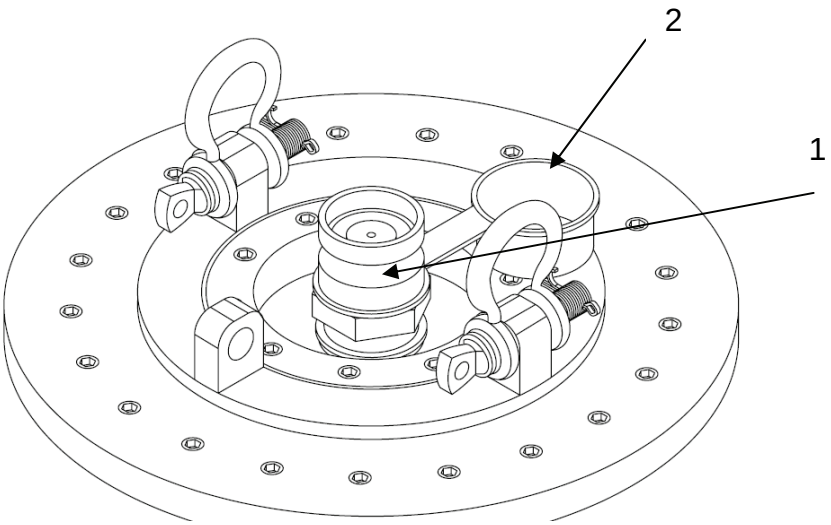

Figure 8. Removing dust caps from the adapter assembly.

6. Turn handwheel (Figure 9, Item 1) all the way clockwise to close valve coupler (Figure 9, Item 2).
7. Slide valve coupler (Figure 9, Item 2) onto the adapter assembly (Figure 9, Item 4).
8. Push in cam arms to lock into place (Figure 9, Item 3).

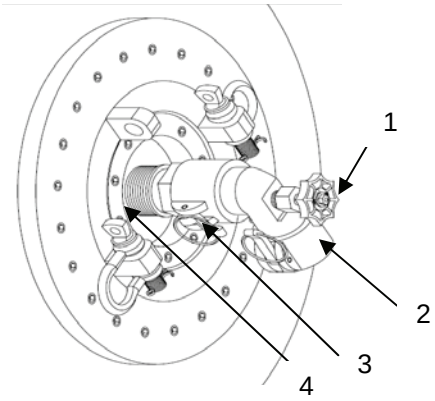

Figure 9. Installing valve coupler to the adapter assembly.

9. Install and lock valve coupler onto adapter assembly on other side if needed.

WARNING

Check to make sure drum has been used only for drinking water. Failure to check the drum could lead to sickness or death to personnel. If there is any question about the quality of the water, do not use the drum.

10. Dispense drinking water by turning the handwheel counterclockwise to the open position. Increase the flow of water by increasing the number of handwheel counterclockwise turns.

11. Push down on and collapse drum as water is emptied to maximize water from the drum.

12. Turn handwheel on the valve clockwise to shut off water flowing from the drum.

13. Remove valves from the 500 gallon water drum by pulling out cam arms on both sides of the valve coupler to unlock.

14. Replace dust caps (Figure 10, Item 1).

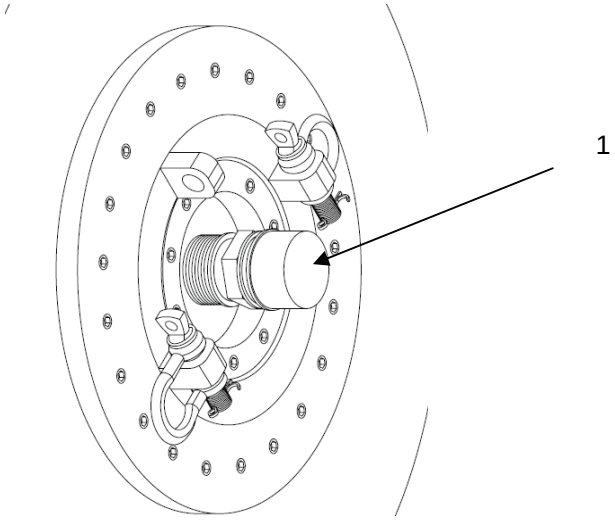

Figure 10. Dust cap replaced on the adapter assembly.

15. Place valves in packaging and store (WP 0018 00).

The drum is in the standby position.

END OF TASK

COLLAPSING THE WATER DRUM

WARNING

An empty drum weighs 175 pounds and a filled drum with 500 gallons of water weighs over 4000 pounds. Be sure to lift with mechanical device to avoid any injury to personnel while handling.

.

To collapse the 500 gallon water drum:

1. Select a collapsing site that is level and firm.
2. Perform preventative maintenance checks and services (WP 0011 00, Table 1).
3. Collapse the drum completely to remove air from the drum by following the instructions below:

    a. At one end of the drum, remove dust cap (Figure 11, Item 1) from adapter assembly (Figure 11, Item 2).

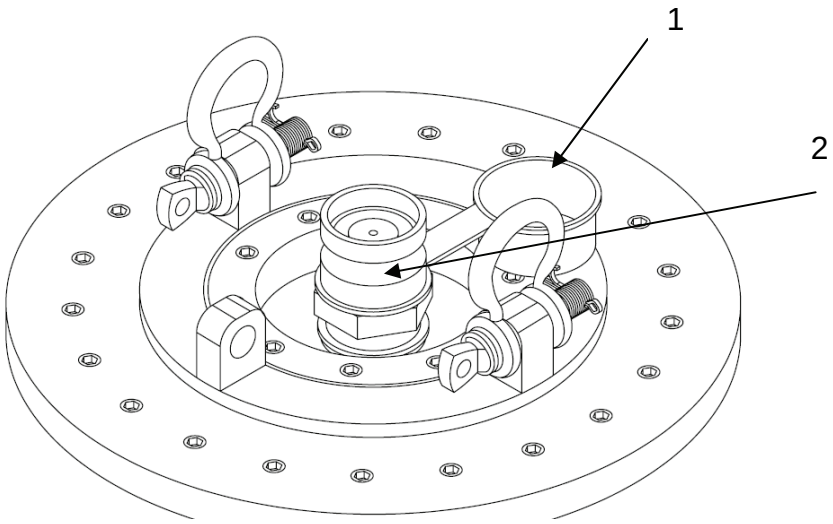

Figure 11. Removing dust cap from adapter assembly.

    b. Install and lock completely closed valve coupler(s) (Figure 12, Item 1) onto adapter assembly (Figure 12, Item 2).

    c. Lock valve onto adapter assembly by pushing in the cam arms (Figure 12, Item 3).

d. Turn the handwheel (Figure 12, Item 4) counterclockwise all the way to open the valve coupler. Increase the flow of water by increasing the number of handwheel counterclockwise turns.

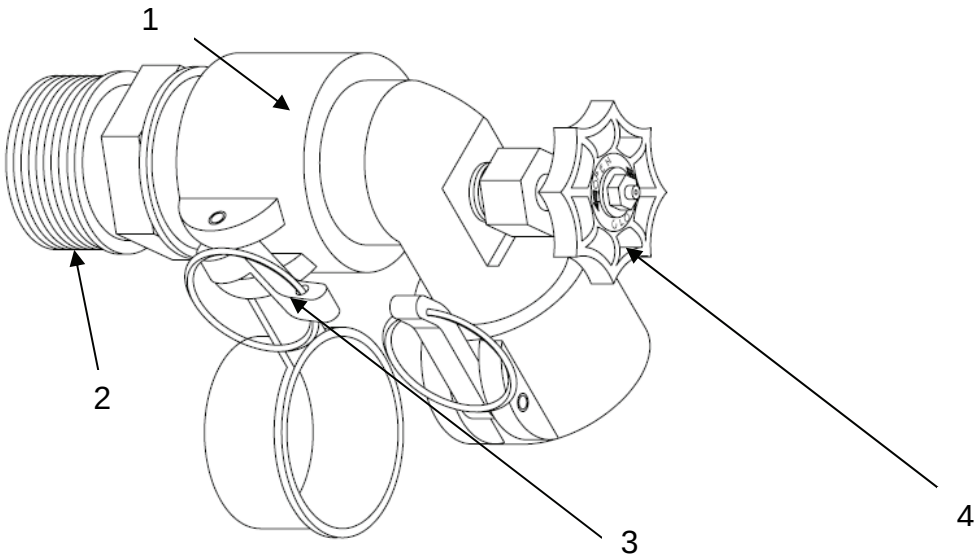

Figure 12. Valve coupler attached to the adapter assembly.

e. Fully collapse the drum by pushing down on the side of the drum without the valve coupler to squeeze out air or water.

4. Unlock and remove valve coupler from adapter assembly. Store valve coupler in original packaging, WP 0018 00.

5. Replace dust caps (Figure 13, Item 1).

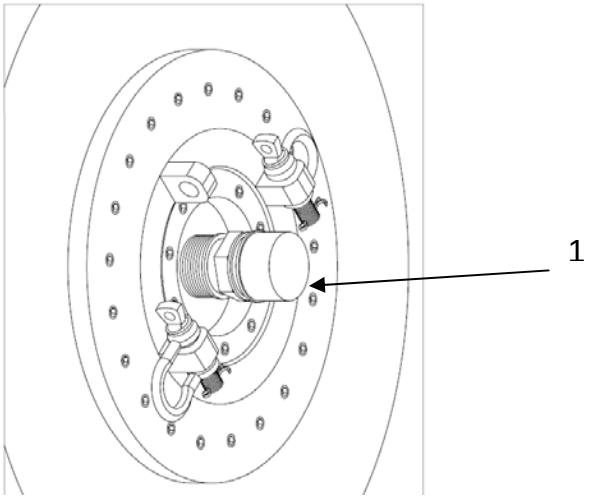

Figure 13. Dust cap replaced on the adapter assembly.

6. Store the drum (WP 0018 00).

The drum is in the off position.

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
OPERATION UNDER UNUSUAL CONDITIONS

INITIAL SETUP:

Tools	References
Tiedown assembly kit (WP 0027)	WP 0019
	WP 0020
	WP 0027

Introduction

The drum is designed to operate normally within a wide range of climate conditions. However, there are some conditions that require special procedures to keep the drum operating properly and to prevent damage.

OPERATION IN EXTREME HEAT, TEMPERATURES OVER 135° F (57° C)

CAUTION

Water inside drum will expand as temperature rises. Keep the drum as cool as possible to avoid pressure build up. Exceeding the operating pressure could lead to equipment damage and loss of water.

The 500 gallon water drum can be safely operated in temperatures of up to 135° F. All metal parts are designed to perform at these temperatures. The fabric casing is composed of a cord base with neoprene coating, which enables the drum to expand in extreme temperatures and moisture without delamination or blistering. Additionally, the fabric casing is a sand matte color designed to reflect and not absorb the heat.

Operating the 500 gallon water drum in extreme heat is very similar to operating the drum in usual conditions. However, additional precautions listed below should be taken to increase the efficiency of the drum. They are:

1. Do not block air circulation around the drum.
2. Erect a tent or tarpaulin over drum to provide shade.
3. Place drum under shade of trees or cover with leafy branches.
4. Cover drum with wet burlap or other fabric to keep fabric wet.

END OF TASK

OPERATION IN FREEZING CONDITIONS, 32° (0°) AND BELOW

The 500 gallon water drum can be safely operated in temperatures as low as -40 °F. The movable metal fittings are composed of different metals so there is no adhesion in different temperatures between the parts.

Operating the 500 gallon water drum in freezing temperatures is very similar to operating the drum in usual conditions. However, additional precautions listed below should be taken to increase the efficiency of the drum. They are:

CAUTION

The drum could become brittle in freezing temperatures. Use caution when handing the drum to avoid cracking. Failure to comply may result in equipment damage and a loss of water.

1. Remove snow, sleet, and ice from drum before installing valve coupler.

2. If temperatures are below freezing, store in a heated building, shelter or tent and allow drum to thaw before dispensing water.

END OF TASK

OPERATION IN STRONG WINDS

The 500 gallon water drum is designed to withstand strong winds during operation. At capacity, the drum weighs between 4000 lbs to 4500 lbs. An empty drum weighs 175 lbs. At these weights, there is low likelihood that strong winds would affect the safety of operating the drum or the workability of embanked drums.

Operating the 500 gallon water drum in strong winds is very similar to operating the drum in usual conditions. However, additional precautions listed below can be taken to increase the safety and the efficiency of the drum:

1. Before operating drum, anchor drum by banking soil along its sides.

2. Use shackles to secure drum to structures, trees, or the ground using tiedown kit (WP 0027) (Figure 1).

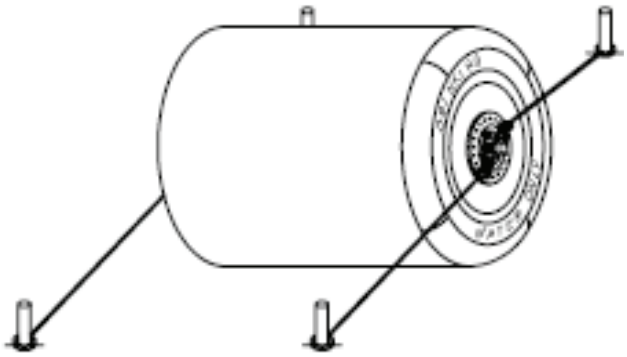

Figure 1. Drum secured using tiedown kit.

END OF TASK

OPERATION IN SANDY AND DUSTY CONDITIONS

The 500 gallon water drum is made of a double layer of neoprene material with an outer layer of protective gum. Operating the drum in sandy and dusty conditions is similar to operating the drum in usual conditions. However, additional precautions listed below should be taken to increase the safety and efficiency of the drum:

1. Always remove sand and dust from valve coupler and adapter assembly before use.
2. Keep dust cap installed on the adapter when equipment is not in use.
3. Cover and store valve coupler where it is less likely to get dusty or dirty.

END OF TASK

OPERATION IN SALT AIR AND SEA SPRAY CONDITIONS

Under salt air and sea spray conditions, operating the 500 gallon water will not differ than in other locations. However, it is critical that normal operating procedures are followed to insure safe and optimal use.

END OF TASK

OPERATION IN HIGH ALTITUDES

Operation of the 500 gallon water drum is not affected by high altitudes.

END OF TASK

OPERATION IN SNOWY CONDITIONS

Operation of the 500 gallon water drum under snowy conditions requires additional precautions. It is important to secure the drum to insure stability during operation. Additional precautions listed below can be taken to increase the safety and efficiency of the drum:

1. If temperatures are below freezing, store in a heated building, shelter or tent and allow drum to thaw before dispensing water.
2. If outside, secure drum by banking soil along its sides.
3. Continuous exposure to freezing temperatures may make the drum brittle. Use caution when handling the drum to avoid cracking.
4. Remove snow, sleet, and ice from drum before installing valve coupler.
5. Use shackles secure drum to structures, trees, or stakes using ropes.

END OF TASK

OPERATION IN MUDDY CONDITIONS

Operation of the 500 gallon water drum under muddy conditions requires additional precautions. It is important to secure the drum to insure stability during operation because muddy conditions may increase the likelihood of slippage or unintended movements of the drum. To insure maximal safety of the drum:

1. Use shackles to secure drum to structures, trees, or stakes using ropes.
2. Remove debris or mud from the drum as well as on the valve coupler and adapter assembly.

END OF TASK

OPERATION IN DEGRADED ENVIRONMENTS

This section describes the operating procedures of the 500 gallon water drum when the drum needs to be temporarily adapted due to a failure of a portion of the drum.

The drum is non-electrical and all parts are mechanical. Therefore, failure of a portion of the equipment would require either that component be replaced or a new drum be used. For more information on replacement parts, please see WP 0019 00 and WP 0020 00.

END OF TASK

END OF WORK PACKAGE

CHAPTER 3

FIELD LEVEL MAINTENANCE TROUBLESHOOTING

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
MASTER TROUBLESHOOTING INDEX

Malfunction/Symptom **Troubleshooting Procedure**

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
TROUBLESHOOTING PROCEDURE

INITIAL SETUP:

References

WP 0005	WP 0014
WP 0012	WP 0016
WP 0013	WP 0017

Symptom

The drum is misshapen and distorted.

Malfunction

The cables on the inside of the drum are broken or twisted (Figure 1).

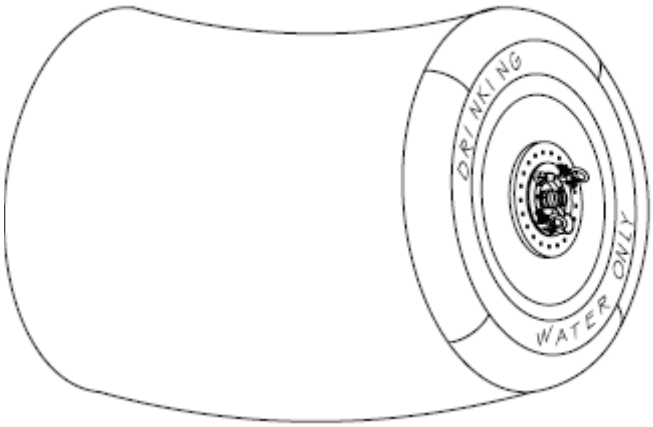

Figure 1. Misshapen or distorted drum.

Corrective Action

Remove hardware from drum and inspect wire rope assemblies (WP 0014).

SYMPTOM

The 500 gallon water drum is leaking.

MALFUNCTION

The body of the 500 gallon water drum is leaking.

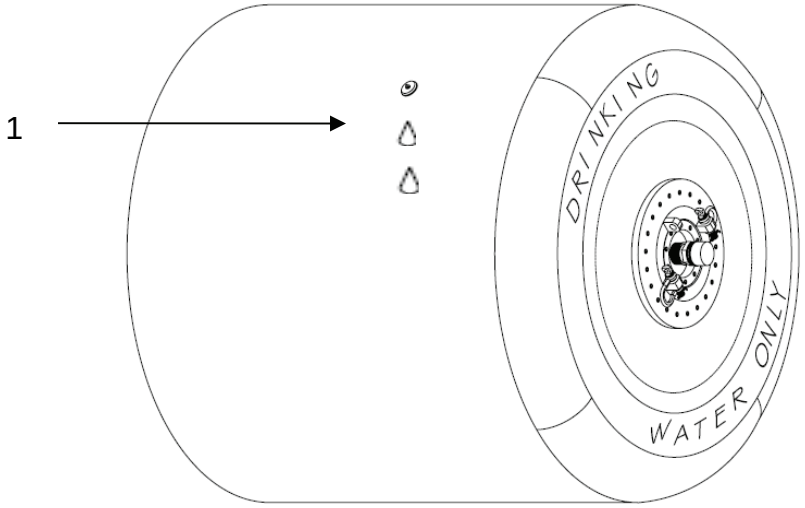

Figure 2. Leaking from repair plugs.

STEP 1. Check for temporary repairs on the drum body, such as mechanical patches or wooden plugs.

a. If mechanical patches or wooden plugs have been used to repair the 500 gallon water drum and are now leaking (Figure 2, Item 1), discontinue use of the drum.

STEP 2. Check for punctures or leaks in the drum body.

a. If hole or tear is less than 2.00” in diameter and if the damage is a:

1. hole, use repair kit WP 0016 to temporarily restore drum.
2. tear, use repair kit WP 0017 to temporarily restore drum.

b. If hole or tear is greater than 2.00” in diameter, discontinue use of drum.

Symptom

Valve coupler cam arms will not lock on to the adapter assembly.

Malfunction

Cam arm (Figure 3, Item 1) will not lock valve coupler to adapter assembly.

Corrective Action

STEP 1. Check that the handwheel (Figure 3, Item 2) is turned completely to the “close” position.

STEP 2. Replace valve coupler if cam arms will not lock (WP 0012).

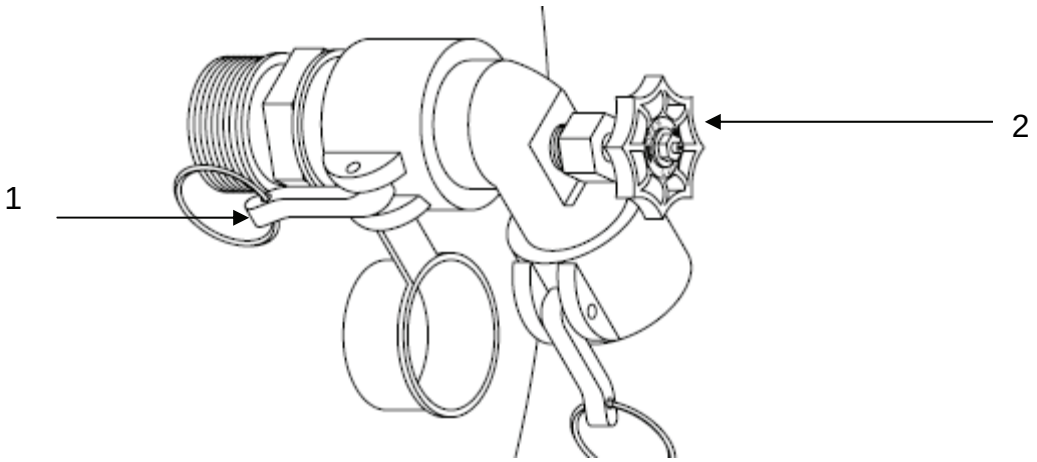

Figure 3. Cam arms will not lock into place.

Symptom

Valve coupler is not stable on the adapter assembly in the locked position.

Malfunction

Valve coupler is missing or has damaged gaskets.

Corrective Action

Replace gasket (WP 0012).

Symptom

Valve has cracked or damaged handwheel.

Malfunction

Valve or valve components may have been damaged during use or not properly stored.

Corrective Action

Replace valve coupler handwheel (WP 0012).

Symptom

The valve coupler's handwheel is not turning or is loose.

Malfunction

Handwheel nut (Figure 4, Item 1) or packing nut (Figure 4, Item 2) may have become loose through use.

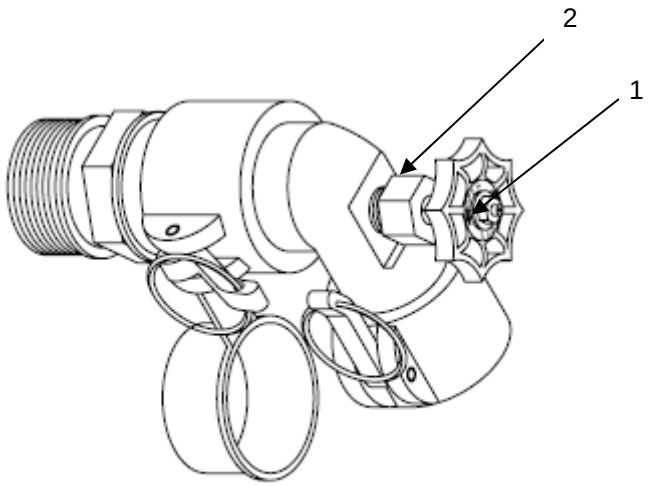

Figure 4. Valve coupler with handwheel nut and packing nut.

Corrective Action

STEP 1. Hand tighten packing nut or handwheel nut.

STEP 2. Test valve function by turning handwheel and dispensing water (WP 0005).

STEP 3. If the handwheel is loose or does not allow water to be dispensed, replace valve coupler handwheel (WP 0012).

Symptom

The valve body is cracked or broken.

Malfunction

Valve coupler may have been cracked or broken through improper use or storage (Figure 5, Item 1).

Corrective Action

Replace valve coupler (WP 0012).

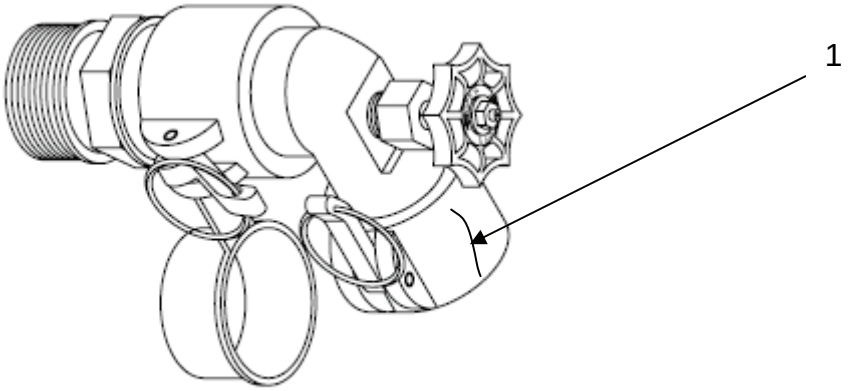

Figure 5. Damaged valve body.

Symptom

Valve stem (Figure 6, Item 1) is binding or loose.

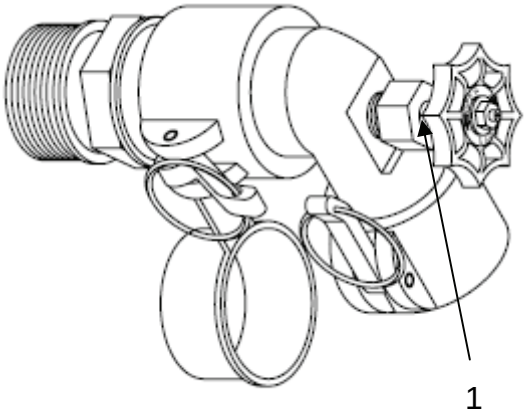

Figure 6. Valve stem.

Malfunction

Valve coupler components withstood higher than tolerance amount of pressure.

Corrective Action

Replace valve coupler (WP 0012).

Symptom

Handwheel on valve coupler is difficult to turn.

Malfunction

Valve coupler handwheel (Figure 7, Item 1) withstood higher than tolerance amount of pressure

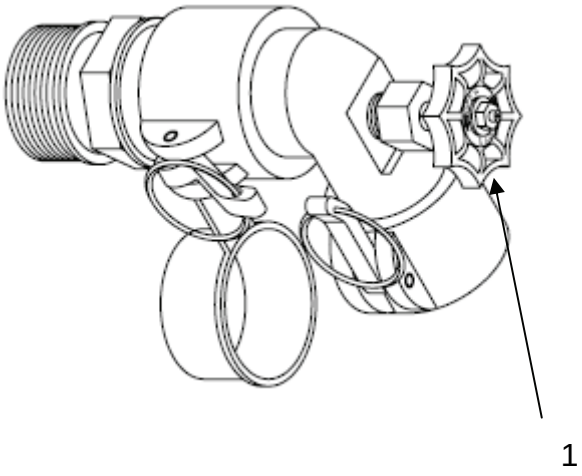

Figure 7. Valve coupler handwheel.

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Corrective Action

Replace valve coupler (WP 0012).

Symptom

Dust cap does not fit or completely cover the adapter assembly.

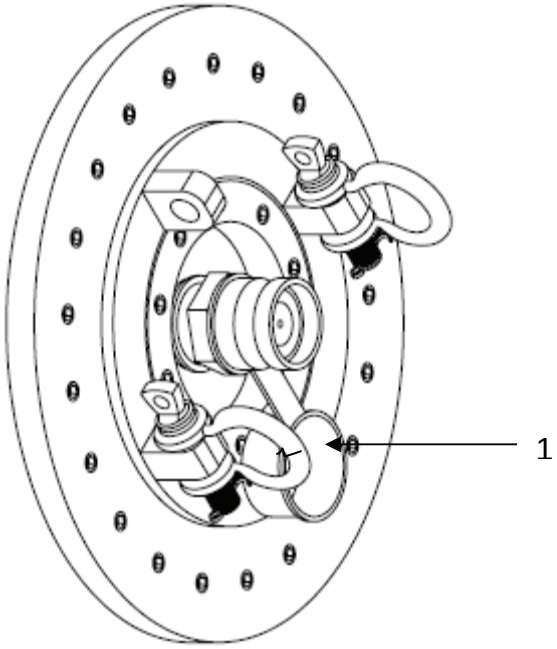


Figure 8. Dust cap does not fit completely over the adapter assembly.

Malfunction

Dust cap is cracked, broken damaged or strap is broken (Figure 8, Item 1).

Corrective Action

Replace damaged dust cap with a new dust cap (WP 0012).

MALFUNCTION

There is leakage around the metal parts.

CORRECTIVE ACTION

STEP 1. Check if all socketcap screws are in place (Figure 9, Item 1).

a. If all socketcap screws are not in place (there are 31 socketcap screws on each end of the drum), refer to (WP 0014) and replace or tighten socketcap screws.

STEP 2. Check if adapter assembly is loose (Figure 9, Item 2).

a. If the adapter assembly is loose, then hand tighten adapter assembly so that five threads are exposed starting from the metal plate (Figure 9, Item 3).

STEP 3. Check if adapter assembly is leaking after tightening (Figure 9, Item 2).

a. If the adapter assembly is leaking, replace the adapter assembly from the drum (WP 0012).

STEP 4. Check if there is leakage around the valve coupler (Figure 9, Item 4).

a. Make sure the cam arms (Figure 9, Item 6) on valve coupler are properly locked onto the adapter assembly.

(1) If cam arms are not in locked position, move cam arms to locked position.

(2) If cam arms do not lock, replace valve coupler (WP 0012).

b. Check if water is leaking out of the valve coupler outlet.

(1) If handwheel (Figure 9, Item 5) of the valve coupler is in the on, turn handwheel to the off position.

(2) If the valve coupler leaks, replace valve coupler gasket (WP 0012).

(3) If the handwheel is difficult or impossible to turn, replace the valve coupler (WP 0012).

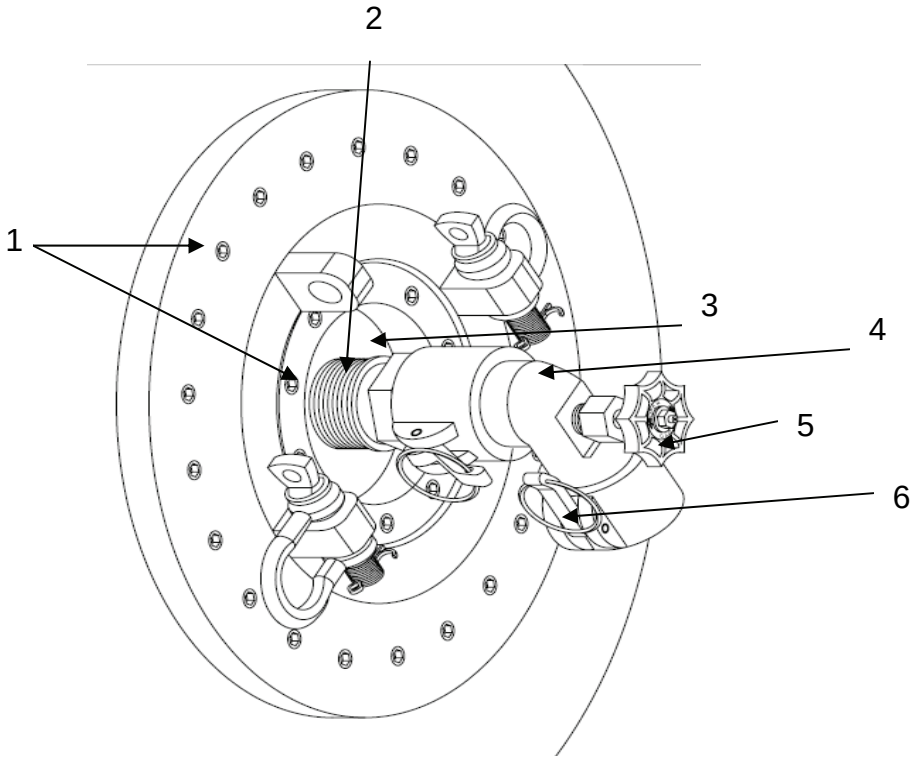


Figure 9. End cap hardware configuration.

Symptom

Shackle assembly does not pivot on the swivel plate (Figure 10, Item 1).

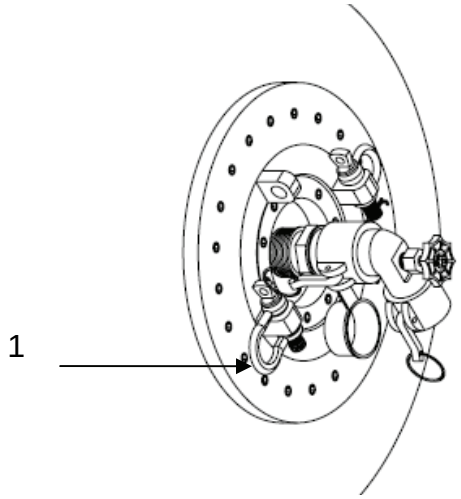


Figure 10. Shackles are not pivoting.

Malfunction

Shackles are damaged (Figure 10, Item 1).

Corrective Action

Replace shackle assembly (WP 0013).

Malfunction

Shackle assembly is missing.

Corrective Action

Replace with new shackle assembly (WP 0013).

Malfunction

Shoulder bolt is missing or threads are damaged.

Corrective Action

Replace with new shoulder bolt (WP 0013).

Symptom

Cotter pin is missing from the shackle shoulder bolt.

Malfunction

The cotter pin is missing.

Corrective Action

Replace cotter pin (WP 0013).

Symptom

There are loose or missing socketcap screws.

Malfunction

Socketcap screws may not have been tightened or are missing (Figure 11, Item 1).

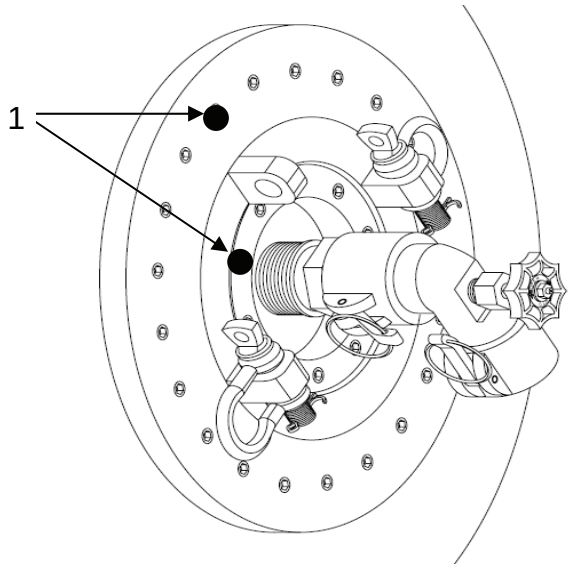


Figure 11. Socketcap screws are missing or loose.

Corrective Action

Replace and tighten socketcap screws (WP 0014).

END OF WORK PACKAGE

CHAPTER 4

OPERATOR MAINTENANCE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
SERVICE UPON RECEIPT

INITIAL SET-UP

Reference: WP 0026 Personnel: 5 (77W)

UNPACKING

The 500 gallon water drum is originally shipped in a wooden crate that is suitable for shipping and for reuse. The lid is not nailed to the crate, rather the lid is closely fitted to the crate and is secured by straps and fastened by cleats. The crate is attached to a pallet for easier storing and transporting.

Note

Other than the banding straps, keep all packaging material for future use.

After unloading, unpack the 500 gallon water drum as follows:

1. Cut each strap with band cutter and discard straps.
2. Remove lid by lifting up.
3. Remove outer dunnage.
4. Unfold plastic sheeting that lines the inner crate.
5. Open large bag that contains the 500 gallon water drum and the fabric bag (Figure 1, Item 1).

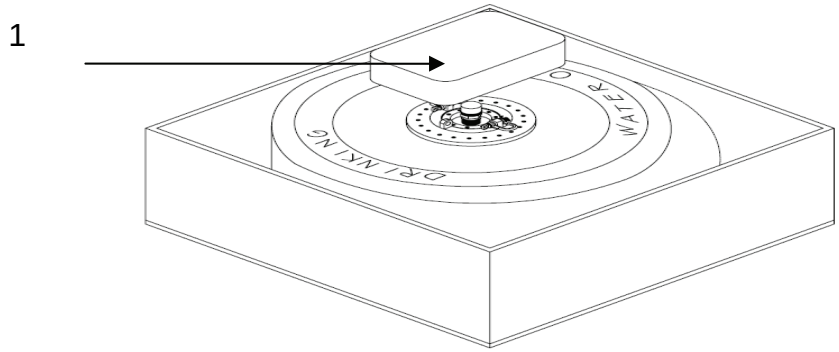


Figure 1. 500 Gallon water drum in crate.

6. Open the fabric bag and insure that it contains individually bagged valves (two included), technical manual, repair kit, pliers, and adjustable wrench and place on a clean surface.

WARNING

The empty drum weighs 175 lbs and the crated drum weighs 369 lbs. If using a forklift, insure that it can lift 369 lbs. Failure to comply may result in injury or death to personnel.

WARNING

If you are using personnel to lift the drum out of the crate, use a five person lift. Failure to comply may result in injury to personnel.

7. Remove 500 gallon water drum from crate by hoist/forklift or a five person lift and place on a clean surface.

END OF TASK

CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment.

If the equipment has been damaged, report the damage on SF 361, Transportation Discrepancy Report. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., for Army instructions, see DA PAM 738-750).

Check to see whether the equipment has been modified.

CAUTION

Do not nail lid on the crate. Misguided nail may puncture drum.

Note

Save the shipping crate, the lid, and all packing material. The crate and the lid can be reused to store and transport 500 gallon water.

Table 1. Inspection Criteria for Packaging

COMPONENT	ACCEPTABLE	REPARABLE	NONREPARABLE
Wooden Crate and Lid (with attached pallet)			
Hardware	Operative and tight	Inoperative and loose boards can be repaired with nails and fasteners.	None
Lid	Operative and tight	Inoperative and loose boards can be repaired with nails and fasteners.	None
Pallet	Operative and tight	Inoperative and loose boards can be repaired with nails and fasteners.	None
Wood	Splits less than 3 inches long, no closer than 1 inch to the edge of board or adjoining split. The board must be secured by at least one nail on each side of the split when it extends to the end of the board.	Splits more than 3 inches but no closer than 1 inch to edge of board or adjoining split, or ½-inch wide. That can be repaired by use of corrugated fasteners.	Splits closer than 1 inch to edge of board or adjoining split or over ½-inch wide.
Markings	Markings should be legible and dark.	None	Illegible markings

Table 2. Inspection Criteria for Equipment Components

LOCATION	ITEM	ACTION	REMARKS
Container	Crate and Lid	1. Inspect for degradation or deformation of wood 2. Inspect for sharp protrusions inside of the crate or lid 3. Reject if container could damage or puncture drum.	
Inside container	500 gallon water drum	1. Inspect inside of crate for the following: (1) 500 gallon drum (1) Adjustable wrench (1) Pair of pliers (2) Valve couplers (1) Technical manual (1) Repair kit 2. Reject if any of the parts are missing or if drum is punctured.	Figure 1

END OF TASK

PROCESSING UNPACKED EQUIPMENT

Processing unpacked equipment describes the processes that should be followed while unpacking the 500 gallon water drum. While unpacking the 500 gallon water drum, remove the packing material and return to wooden crate for future use. Each 500 gallon water drum is equipped with two valves, one repair kit, and one technical manual. Insure all parts listed in WP 0026 00 are included with the drum. Store each of these items for future use.

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
PREVENTIVE MAINTENANCE CHECKS AND SERVICES
INTRODUCTION

GENERAL

Preventive Maintenance Checks and Services (PMCS) involves systematic caring, inspection, and servicing of equipment to keep it in good condition and prevent breakdowns. WP 0011 PMCS organizes the operator's PMCS tasks in chronological sequence. 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 Drum operator, you should:

a. Perform your PMCS as scheduled. Always do your PMCS in the same order, so it gets to be a habit.

b. Do your BEFORE PMCS prior to the Drum leaving its staging/service area or performing its intended mission. Keep in mind the WARNINGS and CAUTIONS.

c. Do your DURING PMCS during Drum operation. Leaks can be spotted only during operation. Keep in mind the WARNINGS and CAUTIONS.

d. Do your AFTER PMCS as soon as possible after the Drum has been taken out of its mission mode or returned to its containment area. Keep in mind the WARNINGS and CAUTIONS.

e. If your equipment fails to operate, perform the operator troubleshooting procedures presented in this manual. Report unresolved maintenance problems to unit maintenance personnel.

FLUID LEAKAGE

It is necessary for you to know how fluid leakage affects the status of the Drum. 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. Following are types/classes of leakage you need to know to be able to determine the status of the Drum. Learn these leakage definitions and remember - when in doubt, notify your supervisor.

NOTE

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

When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS. Class III leaks should be reported immediately to your supervisor.

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

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

c. Class III - Leakage of fluid great enough to form drops that fall from item being checked or inspected.

LUBRICATION

No lubrication is required for the drum.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
PREVENTIVE MAINTENANCE
CHECKS AND SERVICES (PMCS) PROCEDURES

INITIAL SET-UP

Reference: WP 0012 00 **Personnel**: 5 (77W)

PMCS PROCEDURES

Table 1 lists the checks and services required to keep your drum in good operating condition. 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 drum.

An explanation of each column is provided below.

a. The "Item No." column provides the sequential identification number for each task.

b. The "Interval" column indicates when each check or service is to be performed.

c. The "Item To Be Checked or Serviced" column tells you on which item the procedure is to be performed.

d. The "Procedure" column tells you how to do the required checks and services. Carefully follow these instructions. If you do not have the required tools, or if the procedure tells you to, notify your supervisor.

e. The "Equipment Not Ready/Available If" column tells you the conditions under which your Drum would not be capable of performing its intended mission.

If the equipment is not working or unavailable, refer to appropriate work package or troubleshooting.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum

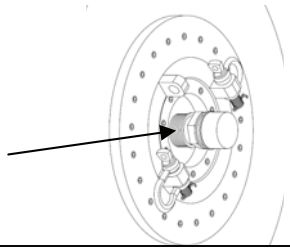
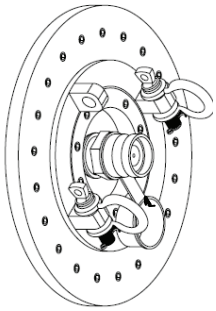
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
1	Before	Adapter Assembly	Check if adapter assembly is dirty or loose. 	Adapter assembly is dirty or loose.
2	Before	Adapter Assembly	Check if dust cap is cracked, broken damaged or strap is broken. 	Dust cap is damaged or missing.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

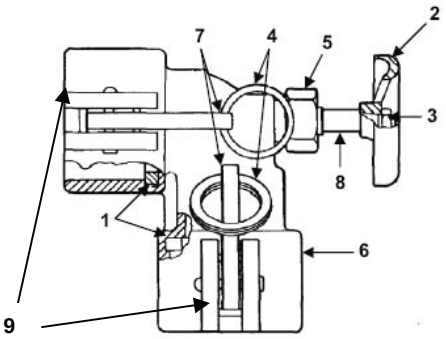
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			Valve coupler not installed onto the drum. Check both valve couplers for: 1. Missing or damaged gasket (1). 2. Cracked or damaged handwheel (2). 3. Loose or missing handwheel nut (3). 4. Damaged or missing pull rings (4). 5. Fingertight packing nut (5). 6. Cracked or broken valve body (6). 7. Looseness of cam arm assemblies (7). 8. Binding or excessive looseness of valve stem by turning handwheel (8). 9. Clean inlets/outlets (9), and body (6).  Valve coupler installed onto the drum. (WP 0012 00)	1. Gasket is missing or damaged. 2. Handwheel is cracked/ damaged. 3. Loose or missing handwheel or packing nut. 4. Damaged/missing pull rings. 5. Loose cam arms. 6. Handwheel can not be turned. 7. Valve is dirty.
3	Before	Valve Coupler	Check both valve couplers for cam arms locking/unlocking properly.	Cam arms will not lock properly.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

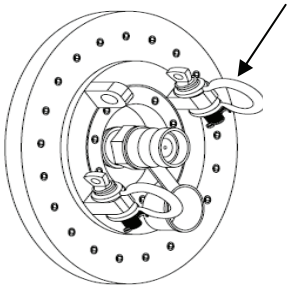
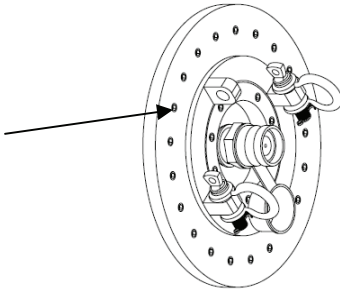
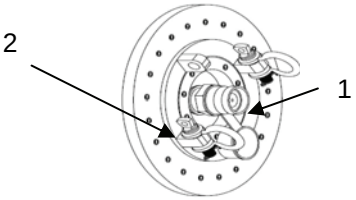
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
4	Before	Shackle Assembly	Check all four shackle assemblies for: 1. Damaged or missing shackle 2. Shackles not pivoting easily in swivel plate lug. 3. Missing shackle pin screw or damaged threads. 4. Missing cotter pin from the shackle screw. 	Shackle assembly or cotter pin is missing or damaged.
5	Before	Socketcap screws	Check both ends of the drum for missing or loose socketcap screws (31 screws per side). 	Socketcap screws are loose.
6	Before	Swivel plate	Check both ends of the drum for 1. Binding swivel plate (1). 2. Damaged swivel plate lugs (2). 	Swivel plate is immobile rendering the drum untowable.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

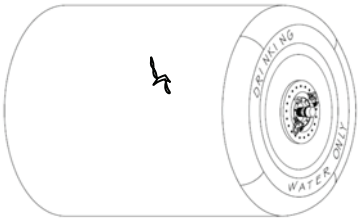
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
7	Before	Drum Body	Check if the drum body has gashes or punctures. 	Drum has visible punctures.
8	Before	Drum Body	Check that surface of the drum is clean and free from debris 	Drum is dirty.
9	Before	Drum Assembly	**WARNING** **The drum is only authorized to be filled with DRINKING WATER. The drum is designed and permanently labeled for use with DRINKING WATER ONLY. Filling the drum with any other liquid may cause sickness or death to personnel.** Check if drum has been used for liquids other than water.	Liquid from drum is not water.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

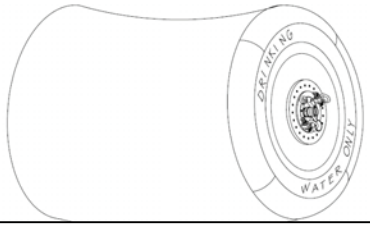
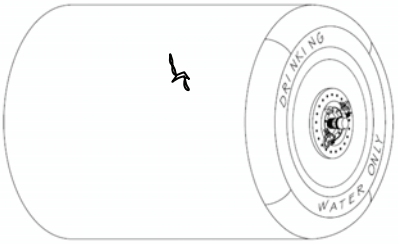
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
10	During	Drum Assembly	**CAUTION** **Do not tow drum if it is misshapen. Towing the drum could cause further damage.** Check whether drum assembly is misshapen or distorted indicating damaged cable assemblies. 	Drum assembly is misshapen or distorted.
11	During	Drum Body	Check if there is a leak in the drum body from gashes or punctures. 	Water is leaking or has visible punctures.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

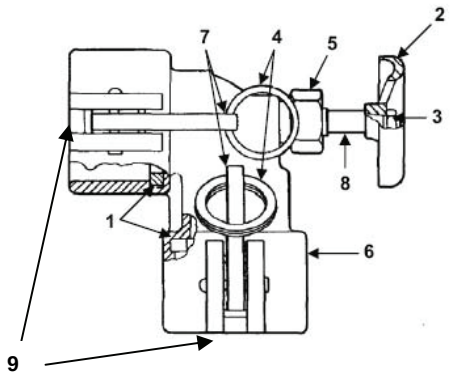
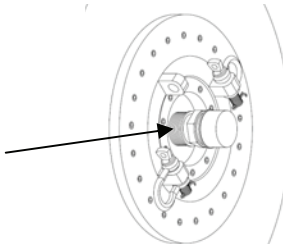
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
12	During	Valve Coupler	 Valve coupler installed onto the drum. Check both valve couplers for: 1. Cam arms locking/unlocking properly (7). 2. Leaks between valve coupler and adapter assembly (9). 3. Leaks when valve coupler is shut off. (2) 4. Leaks around valve stem (8) and packing nut (5).	1. Cam arms will not lock properly. 2. Leaks are discovered.
13	During	Adapter Assembly	Check if adapter assembly is leaking or loose. 	Adapter assembly is leaking or loose.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

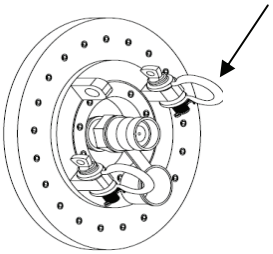
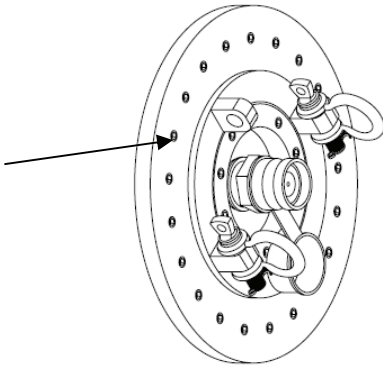
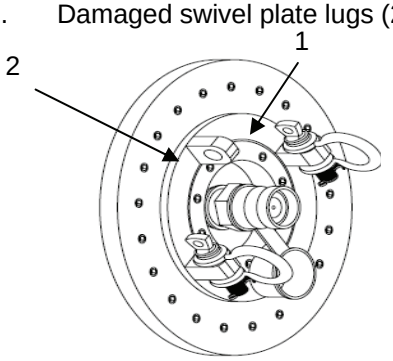
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
14	During	Shackle Assembly	Check all four shackle assemblies for: 1. Damaged or missing shackle 2. Shackles not pivoting easily in swivel plate lug. 3. Missing shackle pin screw or damaged threads. 4. Missing cotter pin from the shackle screw. 	Shackle assembly or cotter pin is missing or damaged.
15	During	Socketcap screws	Check both ends of the drum for missing or loose socketcap screws (31 screws per side). 	Socketcap screws are loose or water is leaking.
16	During	Swivel plate	Check both ends of the drum for 1. Binding swivel plate (1). 2. Damaged swivel plate lugs (2). 	Swivel plate is immobile rendering the drum untowable.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

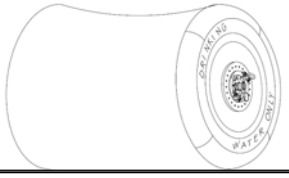
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
17	After	Drum Assembly	**CAUTION** **Do not tow drum if it is misshapen. Towing the drum could cause further damage.** Check whether drum assembly is misshapen or distorted indicating damaged cable assemblies. 	Drum assembly is misshapen or distorted.
18	After	Drum Body	Check if there is a leak in the drum body from gashes or punctures. 	Water is leaking or has visible punctures.
19	After	Drum Body		Water is leaking or has visible punctures.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

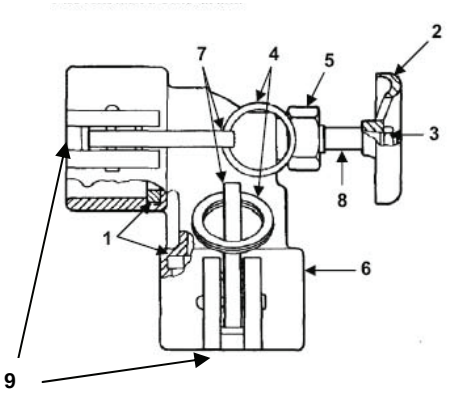
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
			Valve coupler not installed onto the drum. Check both valve couplers for: 1. Missing or damaged gasket (1). 2. Cracked or damaged handwheel (2). 3. Loose or missing handwheel nut (3). 4. Damaged or missing pull rings (4). 5. Fingertight packing nut (5). 6. Cracked or broken valve body (6). 7. Looseness of cam arm assemblies (7). 8. Binding or excessive looseness of valve stem by turning handwheel (8). 9. Clean inlets/outlets (9), and body (6).  Valve coupler installed onto the drum.	1. Gasket is missing or damaged. 2. Handwheel is cracked/ damaged. 3. Loose or missing handwheel or packing nut. 4. Damaged/missing pull rings. 5. Loose cam arms. 6. Handwheel can not be turned. 7. Valve is dirty.
20	After	Valve Coupler	Check both valve couplers for cam arms locking/unlocking properly (7).	Cam arms will not lock properly.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

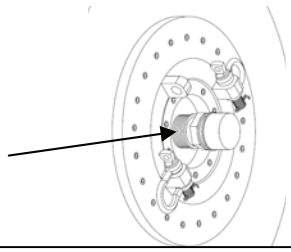
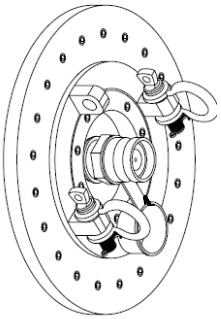
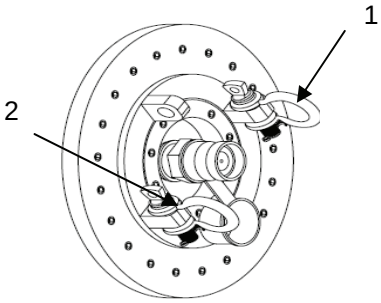
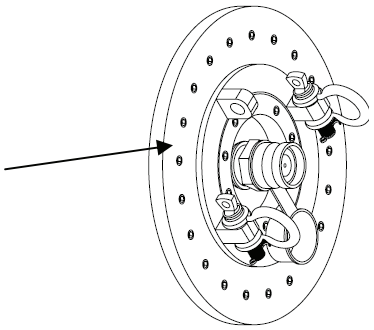
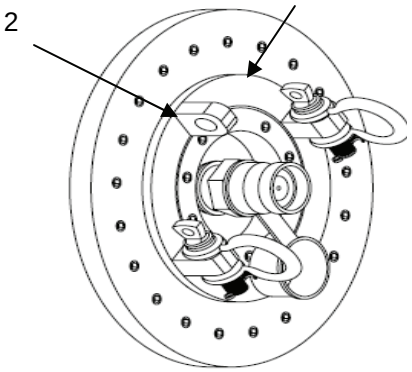
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
21	After	Adapter Assembly	Check if adapter assembly is dirty or loose. 	Adapter assembly is dirty or loose.
22	After	Adapter Assembly	Check if dust cap is cracked, broken damaged or strap is broken. 	Dust cap is damaged or missing.
23	After	Shackle Assembly	Check all four shackle assemblies for: 1. Damaged or missing shackle (1). 2. Shackles not pivoting easily in swivel plate lug (2). 3. Missing shackle pin screw or damaged threads. 4. Missing cotter pin from the shackle screw. 	Shackle assembly or cotter pin is missing or damaged.

Table 1. Operator's Preventive Maintenance Checks and Services for 500 Gallon Water Drum (Continued)

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
24	After	Socketcap screws	Check both ends of the drum for missing or loose socketcap screws (31 screws per side). 	Socketcap screws are loose or water is leaking.
25	After	Swivel plate	Check both ends of the drum for 1. Binding swivel plate (1). 2. Damaged swivel plate lugs (2). 	Swivel plate is immobile rendering the drum untowable.
26	After	Drum Assembly	**WARNING** **The drum is only authorized to be filled with DRINKING WATER. The drum is designed and permanently labeled for use with DRINKING WATER ONLY. Filling the drum with any other liquid may cause sickness or death to personnel.** Check if drum has been used for non-water.	Liquid from drum is not water.

END OF WORK PACKAGE

CHAPTER 5

MAINTENANCE INSTRUCTIONS

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
REMOVE/INSPECT/REPLACE VALVE COUPLER AND ADAPTER ASSEMBLY

INITIAL SET-UP

Materials/Parts Required:
Nut (WP 0020, Figure 1, Item 2)
Washer (WP 0020, Figure 1, Item3)
Handwheel (WP 0020, Figure 1, Item 4)
Gasket (WP 0020 00, Figure 1, Item 5)
Dustcap (WP 0020, Figure 1, Item 7)
Paper towel (WP 0028, Item 3)
Tape, Antiseizing (WP 0028, Item 2)

Personnel: One (77W)

Tools:
Adjustable Wrench
(WP 0026 00, Item 10)

REMOVE/INSPECT/REPLACE VALVE COUPLER AND ADAPTER ASSEMBLY

CAUTION

When the drum is not being used to fill or dispense water or if it is in transport, the valve couplers should be detached from the drum and stored. If the valves are attached to the drum, they could be damaged.

1. To unlock the valve coupler from the adapter assembly (Figure 1, Item 1), push forward the cam arms (Figure 1, Item 3), on both sides of the valve coupler (Figure 1, Item 2).

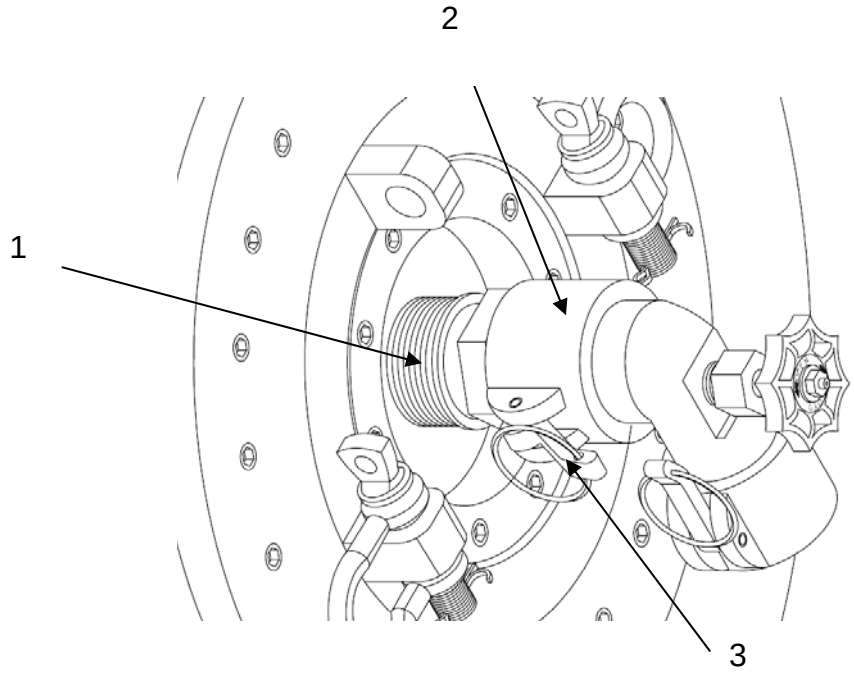


Figure 1. Valve coupler attached to the adapter assembly.

2. Inspect both openings of the valve coupler (Figure 2, Item 4) for missing or damaged gasket (s).

3. Inspect handwheel. If handwheel is cracked or damaged (Figure 2, Item 3), remove handwheel by unscrewing nut (Figure 2, Item 1) with an adjustable wrench and sliding off washer (Figure 2, Item 2). Discard handwheel, washer, and nut.

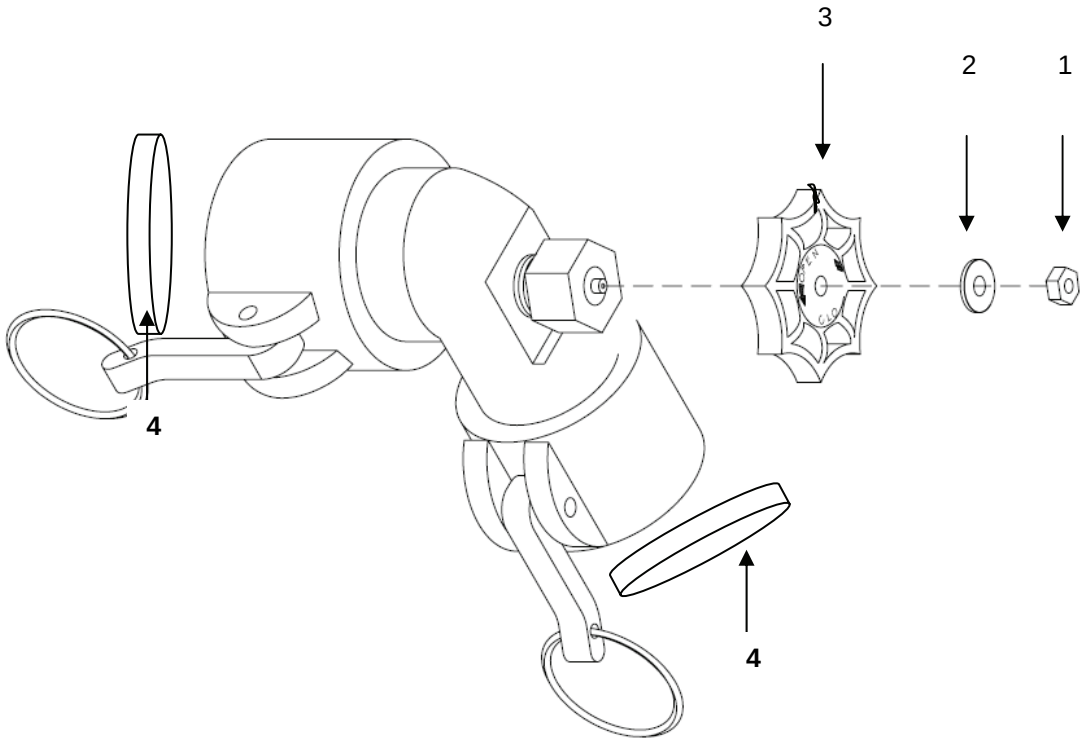


Figure 2. Valve coupler handwheel assembly and gasket location.

4. Inspect both openings of the valve (Figure 2, Item 4). Discard gaskets.

NOTE

There are two dust covers attached to adapter assemblies. Use of dust cap to cover adapter assembly will insure that water will remain clean.

5. Remove dust cap (Figure 3, Item 1) by slipping it off adapter assembly.

6. Remove adapter assembly (Figure 3, Item 2) by twisting it counterclockwise out of the metal plate. Discard antiseizing tape.

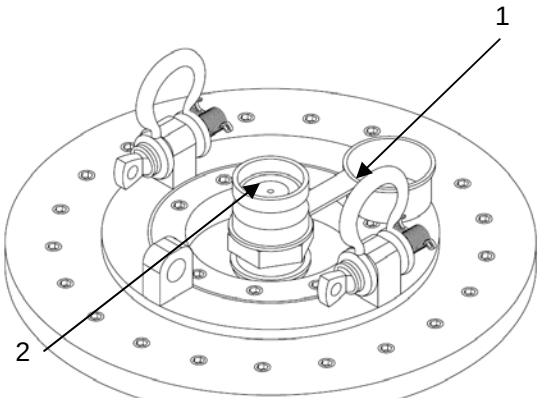


Figure 3. Adapter assembly and dustcap.

7. Inspect dust cap. Discard if dust cap is non-operational or broken.

8. Inspect adapter assembly. If threads are damaged, discard adapter assembly.

9. Clean the adapter assembly with a paper towel, removing dirt or debris on both ends.

10. Wrap antiseizing tape around the threads of the adapter assembly for two rounds in the counterclockwise direction.

11. Insert adapter assembly into the metal plate and hand tighten in the clockwise direction until five threads are showing.

12. Align ring of dust cap (Figure 4, Item 1) to the non-threaded side of the adapter assembly (Figure 4, Item 2), so that the cap of the dust cap can be folded on to the adapter assembly (Figure 4, Item 3).

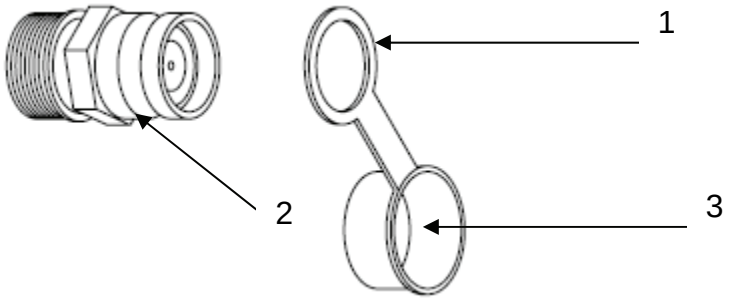


Figure 4. Dust cap attachment to the adapter assembly.

13. Inspect valve coupler (Figure 5, Item 1). Discard if valve coupler body is cracked.

14. Slide handwheel (Figure 5, Item 4) over the valve stem, followed by the washer (Figure 5, Item 3). Tighten nut (Figure 5, Item 2) with an adjustable wrench on to the valve stem.

15. Insert gaskets (Figure 5, Item 5) into valve coupler openings.

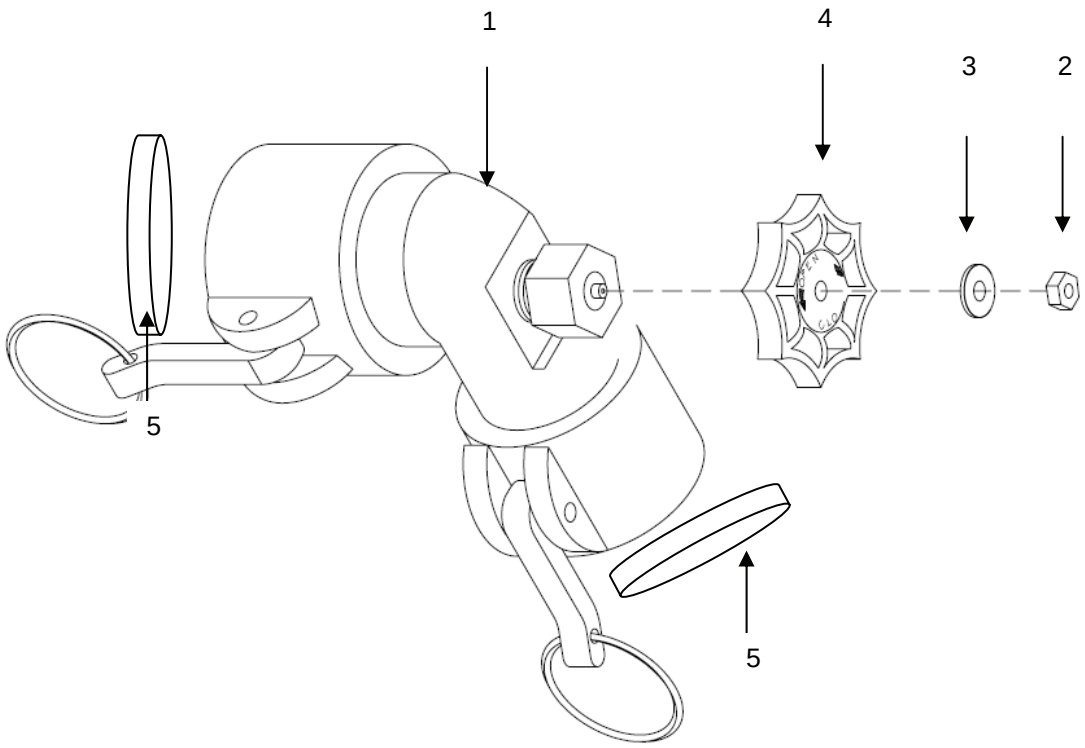


Figure 5. Installing gaskets and replacing handwheel assembly on the valve coupler.

16. With the handwheel turned completely to the 'close' position (Figure 6, Item 1), slide the opening of the valve coupler onto the adapter assembly (Figure 6, Item 2).

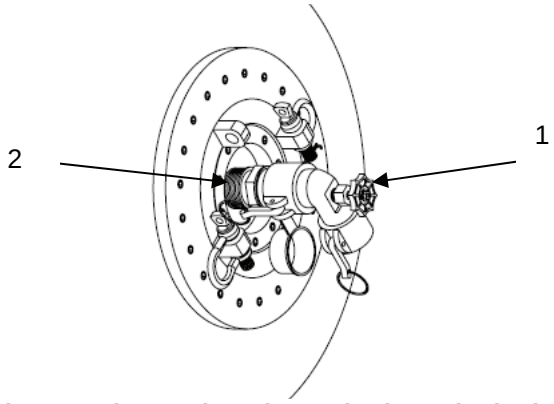


Figure 6. Valve coupler on the adapter in the unlocked position.

17. Push in cam arms (Figure 7, Item 1) to lock the valve coupler in place on the adapter assembly.

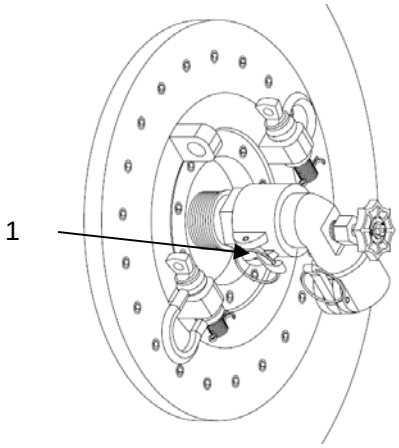


Figure 7. Valve coupler assembled to adapter.

18. Drum is ready to dispense water or be filled with water.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
SHACKLE ASSEMBLY REPLACEMENT

INITIAL SET-UP:

Materials/Parts Required:
Cotter pin (WP 0020 00, Figure 2, Item 1)
Shoulder bolt (WP 0020 00, Figure 2, Item 2)
Shackle (WP 0020 00, Figure 2, Item 3)

Tools:
General Mechanics Toolkit (WP 0025 00)
Pliers (WP 0026 00, Item 11)

SHACKLE ASSEMBLY REPLACEMENT

WARNING

The swivel plate is coated with an anticorrosive material that contains cadmium. Do not heat, weld, drill, or cut the swivel plate. These actions may create dust or hazardous vapors which may cause sickness or death to personnel.

To replace a shackle assembly follow the instructions below:

1. Remove cotter pin from the shoulder bolt with pliers (Figure 1, Item 1). Discard cotter pin.
2. Unscrew shoulder bolt from the lug of the swivel plate (Figure 1, Item 2).
3. Shackle will loosen from lug and remove shackle. (Figure 1, Item 3).

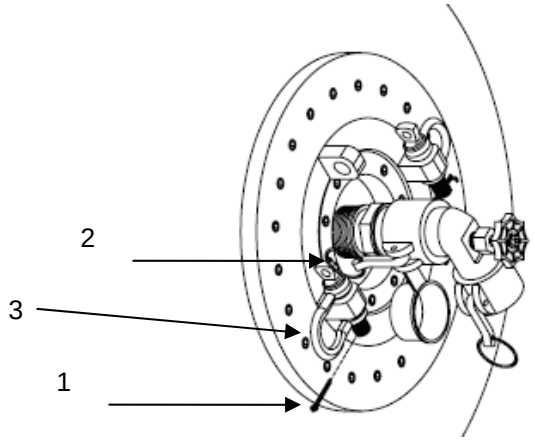


Figure 1. Removing the shackle assembly from the swivel plate.

4. Place new shackle (Figure 2, Item 1) over the swivel plate lug (Figure 2, Item 2), so that the shoulder bolt (Figure 2, Item 3) can be inserted through both eyelets of the shackle and the lug.

5. Screw the shoulder bolt into place.

6. Insert cotter pin (Figure 2, Item 4) in the shoulder bolt hole.

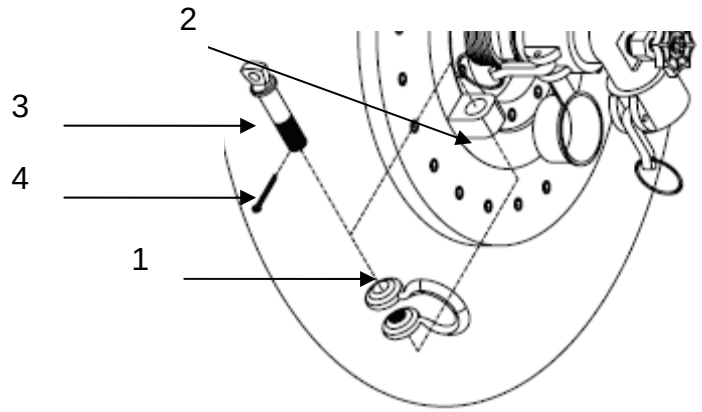


Figure 2. New shackle assembly replacement.

7. Bend straight ends of the cotter pin with pliers (Figure 3, Item 1) to the shoulder bolt to form two loops.

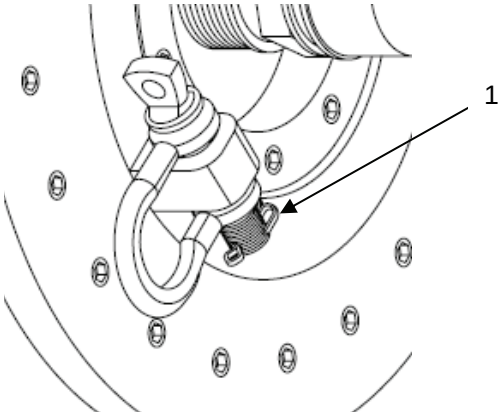


Figure 3. Replaced shackle with bent cotter pin.

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END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
REMOVE/INSPECT/INSTALL/TEST SHACKLE, BEARING, SWIVEL PLATE, SPACER PLATE, METAL PLATE, WIRE ROPE

INITIAL SET-UP:

Tools:
Tool Kit, General Mechanic's (WP 0025 00, Item 1)
Torque Wrench (WP 0025 00, Item 2)
Screwdriver Attachment, Socket (WP 0025 00, Item 3)

Materials/Parts Required:
Cotter Pin (WP 0020, Figure 2, Item 1)
Detergent, Gen. Purpose (WP 0028, Item 1)
Cloth, Abrasive (WP 0028, Item 3)
Socketcap screws (WP 0020, Figure 2, Item 4)
Brush, Scrub (WP 0028, Item 4)

Equipment Condition:
WP 0005 00
WP 0011 00
WP 0012 00
WP 0013 00
WP 0015 00
WP 0016 00
WP 0017 00

Valve coupler removed from drum (WP 0012 00).

Personnel:
Two (77W)

REMOVAL OF HARDWARE

1. Remove both shackle assemblies from one side of the drum (WP 0013 00).
2. Remove adapter assembly (WP 0012 00).
3. Remove 10 sockethead screws (Figure 1, Item 2) that secure the bearing plate (Figure 2, Item 3). Discard socketcap screws.
4. Remove bearing (Figure 1, Item 3) and swivel plate (Figure 1, Item 4).
5. Remove 20 sockethead screws (Figure 1, Item 5) from spacer plate (Figure 1, Item 5). This will leave one sockethead screw attaching the spacer plate (Figure 1, Item 6) to the metal plate. Discard socketcap screws.

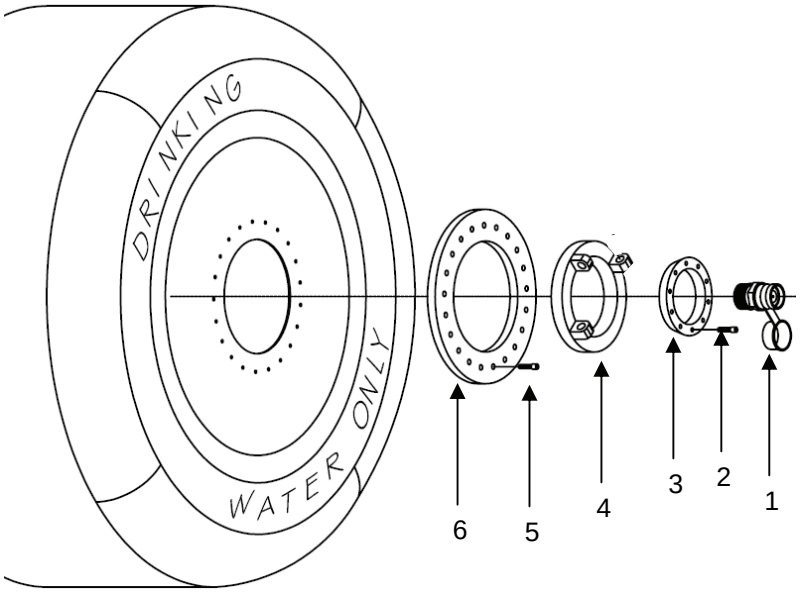


Figure 1. Adapter and bearing, swivel, and spacer plate removal.

6. Hold the metal plate that is on the inside of the drum and remove the last remaining sockethead screw. Discard socketcap screw.

7. The inside structure of the drum includes two metal plates (Figure 2, Item 1) connected by three wire rope assemblies. Wire rope assemblies can be disconnected from the metal plate by slipping the end out (Figure 2, Item 2). Reach into the drum and disconnect all three wire rope assemblies from metal plates.

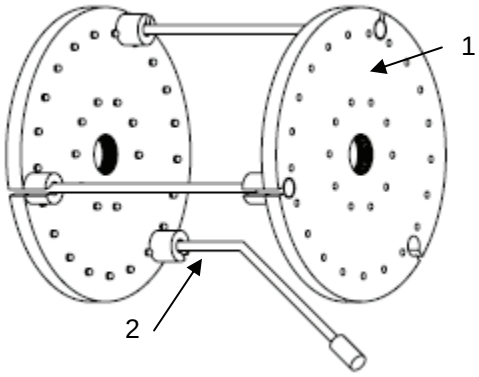


Figure 2. Internal structure of the 500 Gallon Water Drum.

8. While still inside the drum, rotate metal plate to the vertical position and push down on the drum body to elongate the opening. Lubricate the edges of the metal plate with detergent to remove metal plate.

9. Repeat steps 1 through 8 for the other end of the drum.

INSPECTION

1. Check all components of the shackle assembly. The cotter pin (Figure 3, Item 1) will need to be replaced and the shackle shoulder bolt (Figure 3, Item 2) and shackle (Figure 3, Item 3) may need to be replaced if the shackle is cracked or distorted or if the shoulder bolt does not screw into the shackle.

2. Check adapter assemblies (Figure 3, Item 4) for damage to the threads. Replace if threads are damaged.

3. Check the following parts for corrosion or damaged coated surfaces: bearing plate (Figure 3, Item 6), swivel plate (Figure 3, Item 7), spacer plate (Figure 3, Item 8). Replace parts that show corrosion or damaged coated surfaces.

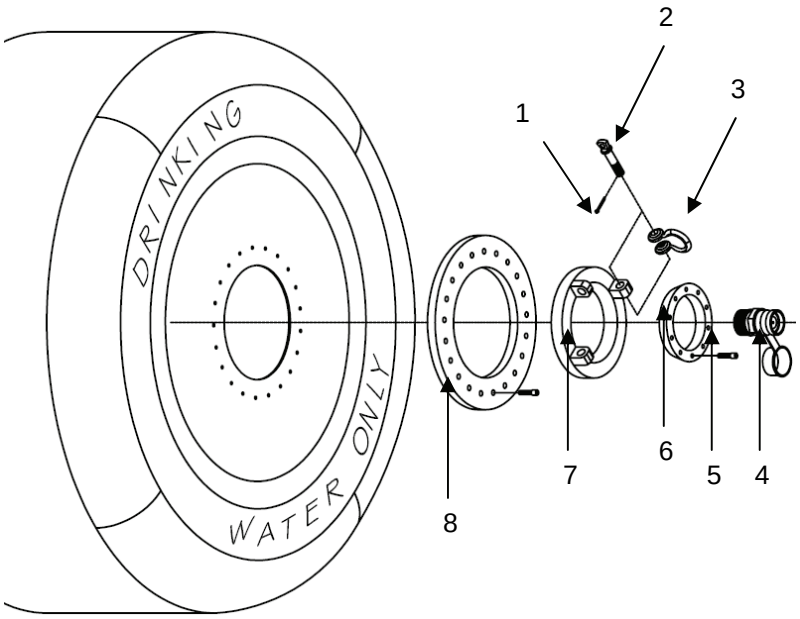


Figure 3. Components of the 500 gallon water drum to inspect.

4. Inspect three wire rope assemblies for corrosion, raised metal on ends, cable wires protruding from cable assembly ends, snapped or broken wires. Replace wire rope assemblies if there is any corrosion, raised metal on the ends, cable wires protruding from the ends, or snapped or broken wires.

5. Check metal plate for damage to the threads and for raised metal and corrosion. Replace metal plate if threads are damaged or if it has raised metal or corrosion.

6. Check drum body for tears or puncture holes. For temporary repair see (WP 0016 and WP 0017).

INSTALLATION

WARNING

Assemble parts on a clean surface. Failure to do so may cause sickness or injury.

1. Clean all drum parts with a mild, non-toxic detergent with cleaning brush.
2. Install shackle assemblies (WP 0013 00).
3. Take both metal plates so that cable end notches are directly above each other.
4. Unfold and layout drum body. Lubricate edge of metal plate with detergent and insert metal plate into drum body noting locations of the cable end notches.
5. Reach into drum and attach three wire rope assemblies into the metal plate.
6. Align metal plate to socketcap screw holes.
7. Place spacer plate with the small holed side on the drum body so that the holes line up. Hand tighten one socketcap screw to the metal plate to hold the position (Figure 4).

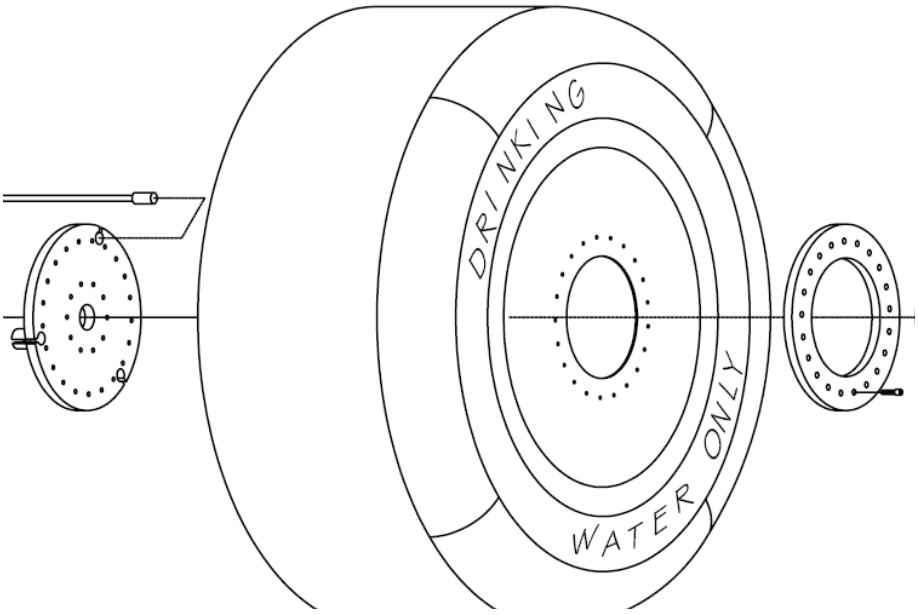


Figure 4. Assembly of metal and spacer plates.

8. While holding the metal plate, handtighten the remaining 20 socketcap screws to the spacer plate.

9. Tighten all 21 socketcap screws to a 45 foot-pounds maximum torque (WP 0015 00).

10. Place swivel plate on the metal plate.

11. Attach bearing plate to the metal plate with ten socketcap screws.

12. Tighten socketcap screws to a maximum of 45 foot-pounds.

13. Repeat installation steps 1 through 13 for other side making sure that the wire rope assemblies are straight.

14. Install both adapter assemblies (WP 0012 00).

15. Install both valve couplers (WP 0012 00).

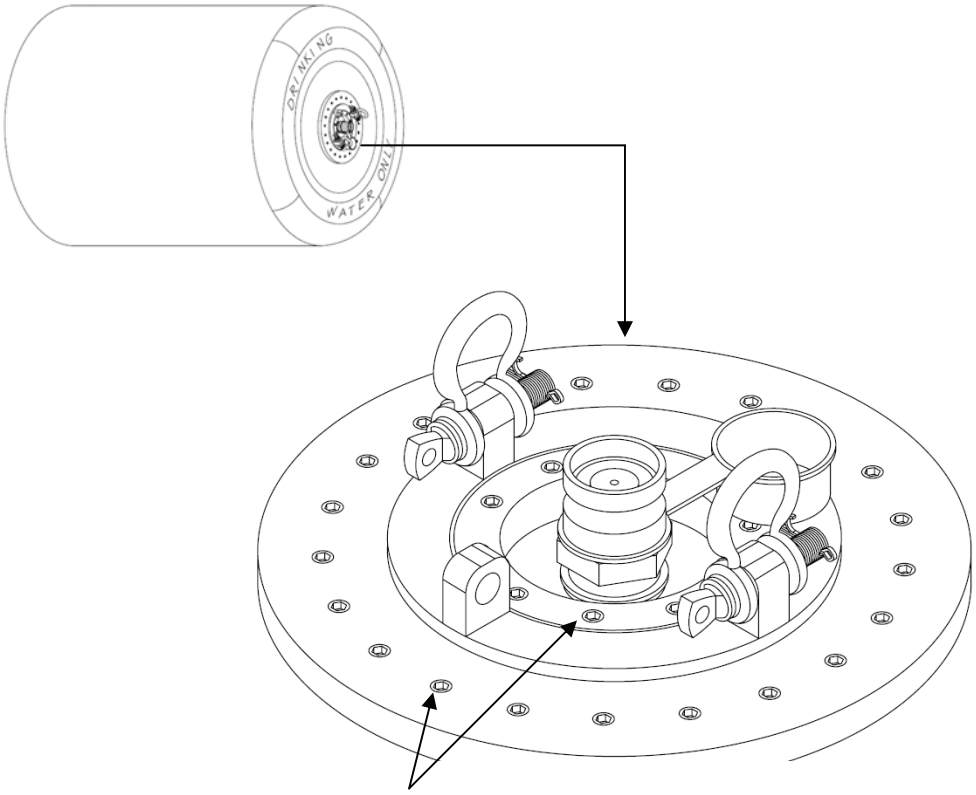
TEST

1. Fill drum with drinking water in accordance with (WP 0005 00).

2. Perform PMCS (WP 0011 00, Table 1).

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
TORQUE LIMITS AND SEQUENCE



Maximum torque 45 foot-pounds

Figure 1. Maximum torque limit for 500 gallon water drum

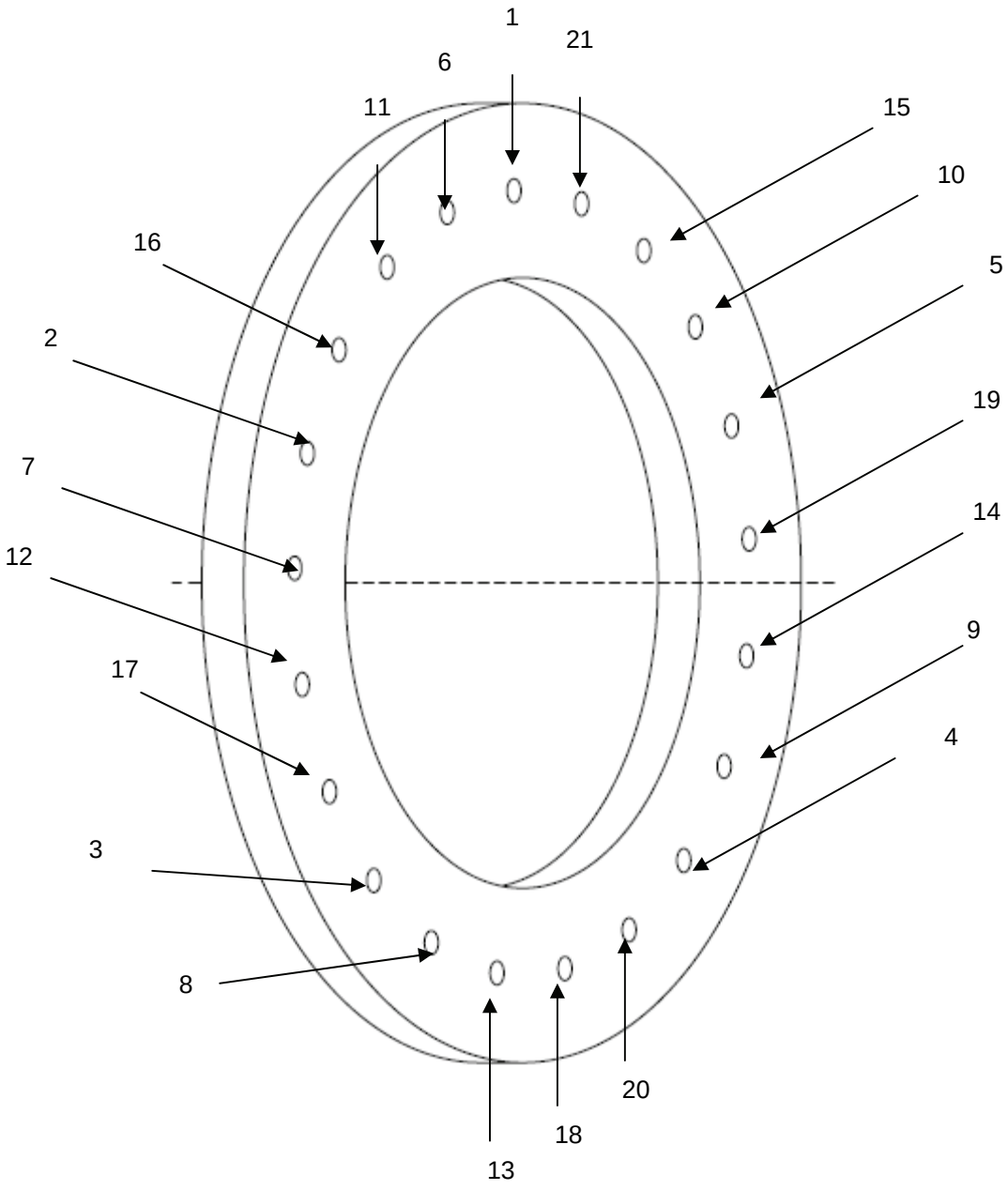


Figure 2. Sequence of socketcap screws installation on the spacer plate.

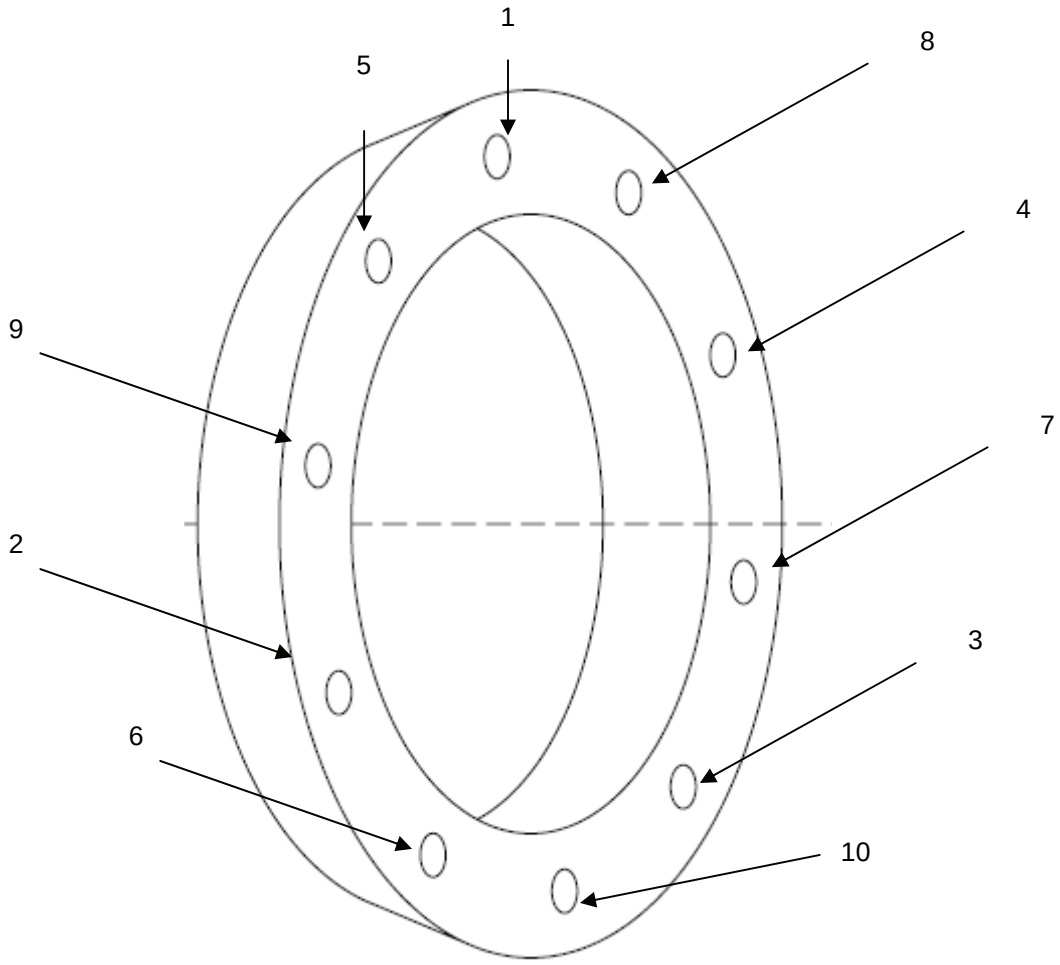


Figure 3. Sequence of socketcap screws installation on the bearing plate.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
TEMPORARY REPAIR OF DRUM BODY, METHOD 1

INITIAL SET-UP:

Materials/Parts Required:
Repair Kit, WP 0026 00-3, Table 2

Personnel:
One (77W)

CAUTION

Do not tow drum after using Method 1 to repair leaking drum. Towing drum could further damage drum.

NOTE

This procedure only applies if the hole in the drum is 2 inch diameter or less.

After temporary repair, the drum can only be used until empty.

REPAIR

1. Push a wooden plug into puncture hole, pointed end first.
2. Insure that drum is positioned so that the puncture hole and wooden plug is on top.

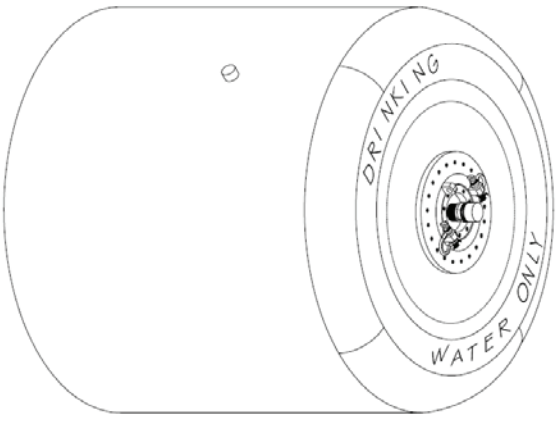


Figure 1. Drum with wooden plug.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
TEMPORARY REPAIR OF DRUM BODY, METHOD 2

INITIAL SET-UP:

Tools:
Tool Kit, General Mechanic's (WP 0025 00, Item 1)

Personnel:
One (77W)

Materials/Parts Required:
Repair Kit (WP 0026 00, Table 2)

CAUTION

Do not tow drum after using Method 1 to repair leaking drum. Towing drum could further damage drum.

NOTE

This procedure only applies if the tear in the drum is 3/8 inch length or less.

After temporary repair, the drum can only be used until empty.

REPAIR

1. Using rotary cutter, use cutter edge to cut a clean edge around the tear. (Figure 1, Item 1).

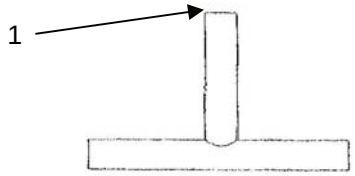


Figure 1. Cutting edge of the rotary cutter.

2. Push conical end of a plug assembly (Figure 2, Item 1) through the prepared tear.

3. Pull plug assembly tight against the drum with washer (Figure 2, Item 2) and nut (Figure 2, Item 3) above the tear.

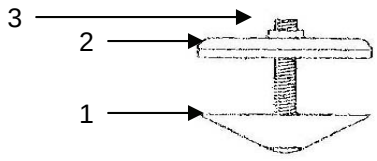


Figure 2. Plug assembly.

4. Tighten nut on plug assembly until it is tight against the drum body.

5. Cut off excess shank.

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SET-UP:

Materials/Parts Required:
Paper Towel (WP 0028, Item 5)

Reference:
WP 0005 00
WP 0011 00
WP 0012 00
WP 0014 00
WP 0026 00
TM 740-90-1

Equipment Condition:
Water drained (WP 0005 00)
Valve couplers removed (WP 0012 00)

Personnel:
5 (77W)

ADMINISTRATIVE STORAGE

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. Before placing the Drum in administrative storage, Preventive Maintenance Checks and Services (PMCS) (WP 0011) should be performed, all known deficiencies corrected and all current modification work orders applied. The administrative storage site should provide required protection from the elements and allow access for visual inspection when applicable.

WARNING

Drum must be completely dry inside and out to prevent mold or mildew from growing on or inside the drum. Sickness or death to personnel could occur.

1. Wrap one removed valve coupler in cushioning material and place in cloth bag for protection.
2. If water drum was utilized, ensure drum is completely dry. Obtain access to inside of drum (WP 0014 00) and wipe the inside of the water drum dry with paper towels.
3. Install one valve coupler (WP 0012 00) on adapter assembly, and then slightly open valve coupler.
4. With the water drum lying on its side, collapse drum by pushing down on the middle of the drum.
5. After all the air is removed from the drum, close the valve coupler and remove the valve coupler (WP 0012 00) from the drum. Wrap valve coupler in cushioning material and place in cloth bag. Install dust cap on the adapter assembly (WP 0012 00). Place original cardboard coverings over all shackle assemblies.

WARNING

The empty drum weighs 175 lbs and the crated drum weighs 369 lbs. If using a forklift, insure that it can lift 369 lbs. If you are not using a forklift, be sure to use a five person lift. Failure to comply may result in injury or death to personnel.

6. Completely place drum in plastic bag, so that one swivel plate/fitting is on the interior of the bundle and the other swivel plate/fitting is on the top exterior of the bundle. Using a forklift or a five person lift, place water drum in plastic lined shipping crate.

7. Check repair kit for missing parts (WP 0026 00). Replace any missing parts and place a complete repair kit in cloth bag.

8. Place TM 5-5430-248-13&P in plastic bag, seal, and place in the cloth bag.

9. Close cloth bag and place into the bag that contains the drum in the shipping crate.

10. Close bag that contains the drum and the fabric bag. The bag closure shall be made by any suitable means, except that staples shall not be used.

11. Insure dunnage material is clean and dry and place around and on top of the drum.

12. Band shipping crate cover onto shipping crate.

The drum is ready for storage and/or shipment.

INTERMEDIATE AND LONG TERM STORAGE

No special procedures are required. Follow Administrative Storage procedures.

END OF WORK PACKAGE

CHAPTER 6

PARTS INFORMATION

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
REPAIR PARTS AND SPECIAL TOOLS LIST
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 field level maintenance of the 500 gallon water drum. 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 separately in their own functional group and work package. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

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

3. Cross-Reference Indexes Work Packages. There are three 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.

*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.
Source Code. The source code tells 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 3rd 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 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO-Made at unit/AVUM level MF-Made at DS/AVIM level MH-Made at GS level ML-Made at SRA MD-Made at depot 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 3rd position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.
AO-Assembled by unit/AVUM level AF-Assembled by DS/AVIM level AH-Assembled by GS level AL-Assembled by SRA	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position of the SMR code authorizes 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.

AD-Assembled by depot
AG-Navy only

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 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* -	Unit level/AVUM maintenance can remove, replace, and use the item.
F -	Direct support/AVIM maintenance can remove, replace, and use the item.
H -	General support maintenance can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace, and use the item.
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.

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

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 -	Unit/AVUM is the lowest level that can do complete repair of the item.
F -	Direct support/AVIM is the lowest level that can do complete repair of the item.
H -	General support is the lowest level that can do complete repair of the item.
L -	Specialized repair activity (enter specialized repair activity designator) 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 unit level.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.
H -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Reparable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
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. ”
(MC) Include for Marine Corps manuals only.

“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."

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

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

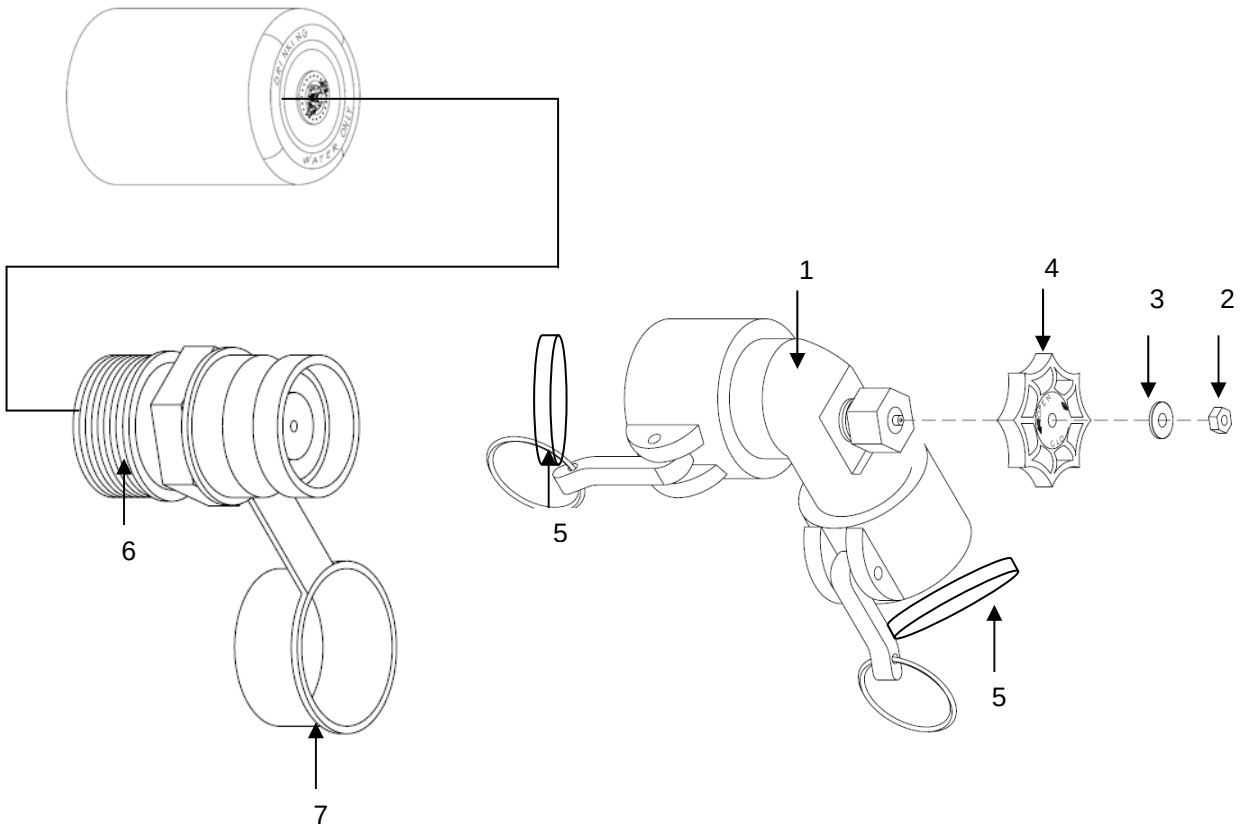


Figure 1. Valve coupler and adapter assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 01 VALVE COUPLER	
					FIG. 1 VALVE COUPLER and ADAPTER ASSEMBLY	
1	PAOOO	4820-01-167-6550	97403	13219E0491	VALVE, ANGLE	2
2	PFOZZ	5310-00-855-1102	96906	MS35649-2255	NUT,PLAIN,HEXAGON	2
3	PFOZZ	5310-00-550-5054	80205	MS15795-809	WASHER,FLAT	2
4	PFOZZ	5340-01-193-2172	81718	H11A	HANDWHEEL	2
5	PAOZZ	5330-00-612-2414	58536	AA59326-G6	GASKET	4
6	PAOZZ	8110-01-391-3112	97403	13229E8595-1	ADAPTER ASSEMBLY	2
7	PAOZZ	5340-01-119-7584	97403	13216E9192	CAP, PROTECTIVE, DUST	2
					END OF FIGURE	

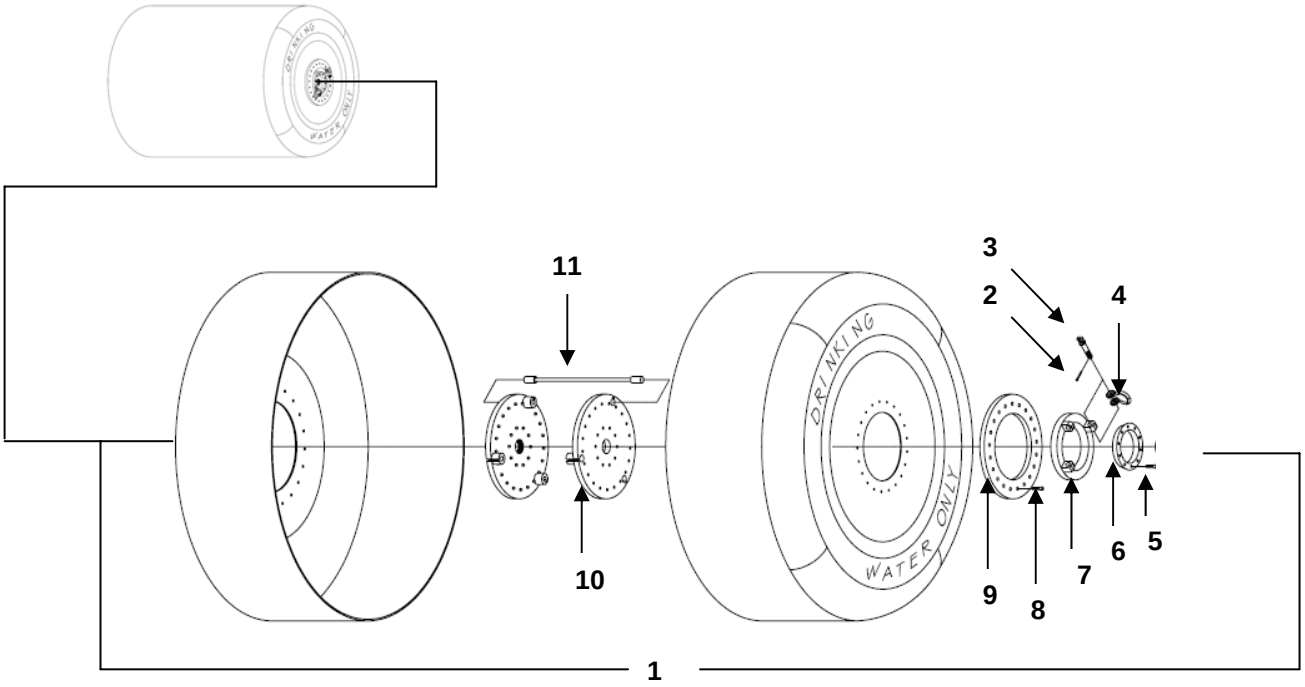


Figure 2. Components of the 500 gallon water drum.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 02 COMPONENTS OF THE 500 GALLON WATER DRUM	
1	PAOZZ	5430-01-537-6993	3WUE6	DWDM5CG	TANK, FABRIC, COLLAPS	1
2	PFOZZ	5315-01-412-1264	80205	MS24665-383	PIN COTTER	4
3	PAOZZ	5306-01-118-1915	97403	13216E9193	BOLT,SHOULDER	4
4	PAOZZ	4030-01-366-5565	75535	10-18473	SHACKLE	4
5	PFOZZ	5305-01-406-2108	96906	MS51484-17	SCREW,CAP, SOCKET HE	20
6	PAOZZ	3110-01-110-4817	97403	13216E9168	PLATE RETAINING BE	2
7	PAOZZ	8110-01-104-5181	97403	13216E9163	SWIVEL PLATE	2
8	PFOZZ	5305-01-406-2108	96906	MS51484-17	SCREW,CAP, SOCKET HE	42
9	PAOZZ	5365-01-487-8319	06468	13216E9183	SPACER, PLATE	2
10	PAOZZ	9535-01-487-8315	06468	13216E9166	PLATE, METAL	2
11	PAOZZ	4010-01-363-7377	97403	13216E9167-2	WIRE ROPE ASSEMBLY	3

END OF FIGURE

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
5310-00-550-5054	1	3
5330-00-612-2414	1	5
5310-00-855-1102	1	2
8110-01-104-5181	2	7
5340-01-119-7584	1	7
3110-01-110-4817	2	6
5306-01-118-1915	2	3
4820-01-167-6550	1	1
5340-01-193-2172	1	4
4010-01-363-7377	2	11
4030-01-366-5565	2	4
8110-01-391-3112	1	6
5305-01-406-2108	2	5
5305-01-406-2108	2	8
5315-01-412-1264	2	2
9535-01-487-8315	2	10
5365-01-487-8319	2	9
5430-01-537-6993	2	1

FIELD LEVEL MAINTENANCE

500 GALLON WATER DRUM DWDM5CG
PART NUMBER INDEX

PART NUMBER	FIG.	ITEM
AA59326-G6	1	5
DWDM5CG	2	1
H11A	1	4
MS15795-809	1	3
MS24665-383	2	2
MS35649-2255	1	2
MS51484-17	2	5
MS51484-17	2	8
10-18473	2	4
13216E9163	2	7
13216E9166	2	10
13216E9167-2	2	11
13216E9168	2	6
13216E9183	2	9
13216E9192	1	7
13216E9193	2	3
13229E8595-1	1	6
13219E0491	1	1

CHAPTER 7

SUPPORTING INFORMATION

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
REFERENCES

SCOPE

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

Forms:

DA Form 2028	Recommended Changes to Publications and Blank Forms
SF361	Transportation Discrepancy Letter
SF368	Product Quality Deficiency Report

Pamphlets:

DA PAM 738-750 (TAMMS)	Functional User's Manual for the Army Maintenance Management System

Field Manuals:

FM 3-3	Chemical and Biological Contamination Avoidance
FM 3-4	NBC Protection
FM 3-5	NBC Decontamination
FM 4-25.11	First Aid

Technical Manuals:

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

Regulations:

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

MISC:

CTA 8-100	Army Medical Department 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)

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
MAINTENANCE ALLOCATION CHART (MAC) TWO LEVEL ONLY
INTRODUCTION

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 levels, which are shown on the MAC in column (4) as:

Field – includes two columns, Unit maintenance and Direct Support maintenance. The Unit maintenance column is divided again into two more subcolumns, C for Operator or Crew and O for Unit maintenance.

Sustainment – includes two subcolumns, general support (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.

3. Service. Operations required periodically o 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 brining into roper 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 of 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. 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.

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) f 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 des 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 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 manhours 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 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.”

UNIT MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
MAINTENANCE ALLOCATION CHART

Table 1. MAC for DWDM5CG

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	500 GALLON DRUM ASSEMBLY	Inspect Replace Repair	0.5 1.5	 1.0 				1,2,3	A
01	VALVE COUPLER ASSEMBLY	Inspect Replace Repair	2.0 2.4 2.1					1, 4	
02	PLATES, BEARING, SWIVEL, SPACER, METAL	Inspect Replace	0.8	 4.2				1,2,3,5	
	WIRE ROPE ASSEMBLY	Inspect Replace		0.2 1.5				1,2,3	

Table 2. Tools and Test Equipment for Drum

TOOL OR TEST EQUIPMENT REF. CODE	MAINTENANCE LEVEL	NOMENCLATURE	NSN	TOOL NUMBER
1	O	General Mechanic's Tool Kit	5180-00-177-7033	SC-5180-90-CL-N26
2	O	Torque Wrench (a component of SC4910-85CLA31)	5120-00-554-7292 (a component of NSN 4910-00-754-0705)	
3	O	Screwdriver Attachment, Socket Wrench, 5/16	5120-00-683-8602	
4	C	Adjustable Wrench	5120-00-240-5328	
5	C	Pliers	5120-00-293-0032	

Table 3. Remarks for DWDM5CG

REMARKS CODE	REMARKS
A	Two types of repairs are authorized for the water drum. Both are temporary repairs to be performed by the crew/operator using components from the Repair Kit references in WP 0016 00 and WP 0017 00.

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

INTRODUCTION

Scope
This work package lists COEI and BII for the 500 Gallon Water Drum 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 500 Gallon Water Drum. 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 500 Gallon Water Drum in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the 500 Gallon Water Drum 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).

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. These codes are identified below:

Code	Used on
DML	Model DWDM5CG

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.

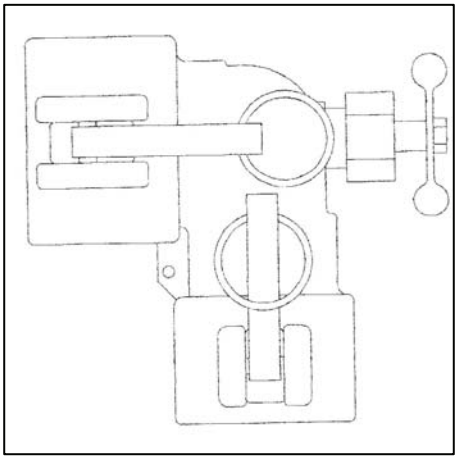


Figure 1. Valve Coupler

Table 1. Components of End Items List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable on Code	(5) Unit of Issue (U/I)	(6) Qty Rqr
1	4820-01-167-6550	VALVE, ANGLE 13219E0491 (97403)		EA	2

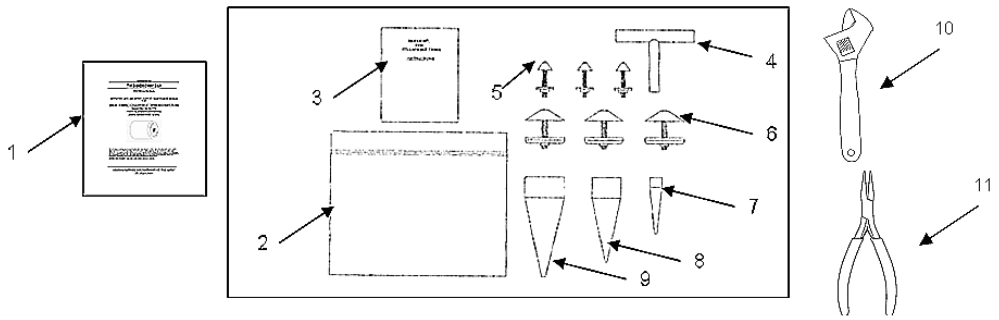


Figure 2. TM and parts of Repair Kit, ATPD-2263, TYPE I.

Table 2. Basic Issue Items List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGE)	(4) Usable on Code	(5) Unit of Issue (U/I)	(6) Qty Rqr
1	NA	TECHNICAL MANUAL (5-5430-248-13&P) (3WUE6)	DML	EA	1
2	5430-01-538-5102	Repair Kit, ATPD-2263, TYPE I (84583)		EA	1
3	7610-01-122-3771	Sheet, Technical X-3062 (81349)		EA	1
4	5430-01-114-4597	Rotary Cutter, Wrench M52255 FIG2 (81349)		EA	1
5	5430-01-114-4598	Patch Assy, Mechanical M52255 FIG 4 (81349)		EA	3
6	5430-01-245-5983	Patch Assy, Mechanical M52255FIG5 – TYPEII (81349)		EA	3
7	5510-01-115-0893	Plug, Wood M52255 FIG3-5/8 (81349)		EA	1
8	5510-01-412-0264	Plug, Wood M52255 FIG3-1 1/2 (81349)		EA	1
9	5510-01-119-5995	Plug, Wood M52255FIG3-2 (81349)		EA	1
10	5120-00-240-5328	Wrench, Adjustable 11655778-3 (19207)		EA	1
11	5120-00-293-0032	Pliers 6547 (72368)		EA	1

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION

Scope

This work package lists additional items you are authorized for the support of the 500 gallon water drum.

General

This list identifies items that do not have to accompany the 500 gallon water drum and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

Explanation of Columns in the AAL

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

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

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

Column (4) 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 (1).

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

Table 1. Additional Authorization List

(1) NSN.	(2) Item Name, Description, Part Number/(CAGEC)	(3) Usable on Code	(4) Unit of Issue (U/I)	(5) Qty Recm
8110-00-856-6245	KIT, TIEDOWN ASSEMBLY (81349)		EA	1
8110-00-856-6243	YOKE, TOWING AND LIFTING (81349)		EA	1

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the 500 Gallon Water Drum. 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 (*include as applicable: C = Operator/Crew, O = Unit/AVUM, F = Direct Support/AVIM, H = General Support, D = Depot*).

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.

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
1	O	7930-00-515-2477	Detergent, General Purpose Non-Toxic, Non-Hazardous (80244)	GL
2	O	8030-00-889-3534	Tape. Antiseizing (58536) AA58092-2-1	ROLL
3	O	5350-00-865-5700	Cloth, Abrasive (80204) ANSI B74.18	PG
4	O	7920-01-263-7624	Scrub Brush	EA
5	O	7920-00-823-6931	Towel, Paper (80244)	BX

FIELD LEVEL MAINTENANCE
500 GALLON WATER DRUM DWDM5CG
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 List

Item No.	Part Number (CAGEC)	National Stock Number (NSN)	Nomenclature	Qty
1	MS24665-383 (80205)	5315-01-412-1264	Cotter Pin	4
2	AA59326-G6 (58536)	5330-00-612-2414	Gasket	4
3	MS51484-17 (96906)	5305-01-406-2108	Sockethead screw	62

REAR MATTER

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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-LPIT / 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 5-5430-248-13&P	17 August 2007	Drum, Fabric, Collapsible, Drinking Water, 500 Gal

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).
	0014 00-2	4-17				POC is incorrect.

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

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

TO: (*Forward direct to addressee listed in publication*)	FROM: (*Activity and location) (Include ZIP Code)*	DATE
AMSTA-LC-LPIT / 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 5-5430-248-13&P	17 August 2007	Drum, Fabric, Collapsible, Drinking Water, 500 Gal

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

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

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

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 5-5430-248-13&P	17 August 2007	Drum, Fabric, Collapsible, Drinking Water, 500 Gal.

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

*Reference to line numbers within the paragraph or subparagraph.

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

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

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

PUBLICATION NUMBER	DATE	TITLE
TM 5-5430-248-13&P	17 August 2007	Drum, Fabric, Collapsible, Drinking Watter 500 Gal

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

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

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

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

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

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 5-5430-248-13&P	17 August 2007	Drum, Fabric, Collapsible, Drinking Water, 500 Gal

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

*Reference to line numbers within the paragraph or subparagraph.

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

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

USAPA V3.01

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

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

PUBLICATION NUMBER	DATE	TITLE
TM 5-5430-248-13&P	17 August 2007	Drum, Fabric, Collapsible, Drinking Water, 500 Gal

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

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

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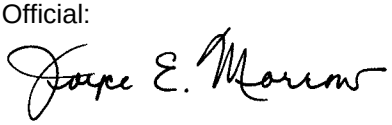

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0715502

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

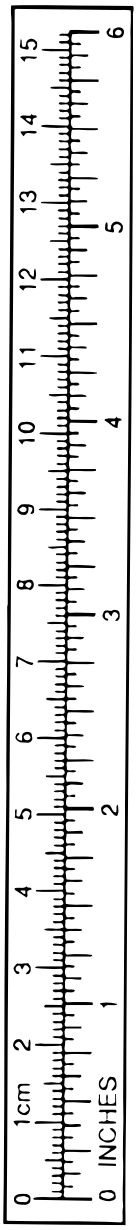
TEMPERATURE

5/9 (^oF - 32) = ^oC
212^o Fahrenheit is equivalent to 100^o Celsius
90^o Fahrenheit is equivalent to 32.2^o Celsius
32^o Fahrenheit is equivalent to 0^o Celsius
9/5 C^o + 32) = F^o

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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