TECHNICAL MANUAL

OPERATOR AND UNIT MAINTENANCE MANUAL

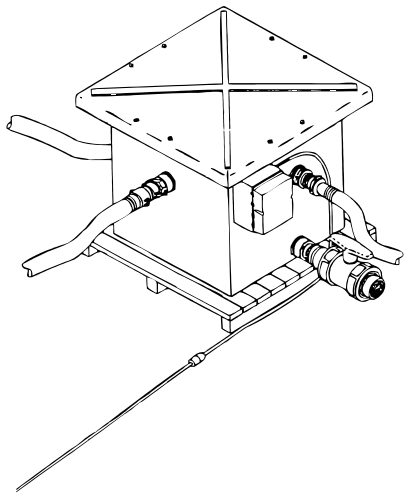
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

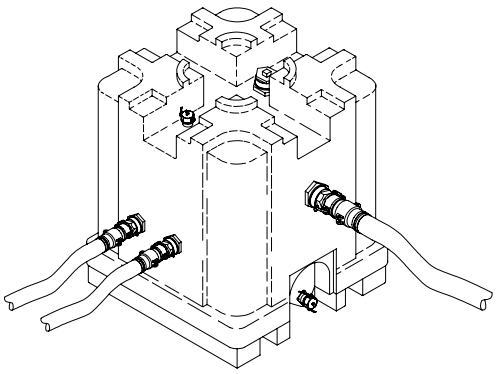
SEWAGE EJECTION PUMP (SEP)

NSN: 4630-01-413-2606

NSN: 4630-01-413-2608

NSN: 4630-01-505-3746





HEADQUARTERS, DEPARTMENT OF THE ARMY

30 JUNE 2005

WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous materials icons used within this technical manual.

EXPLANATION OF SAFETY WARNING ICONS

BIOLOGICAL - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.

ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.

ELECTRICAL - electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.

EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.

FIRE - flame shows that a material may ignite and cause burns.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.

HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

MOVING PARTS - hand with fingers caught between gears shows that the moving parts of the equipment present a danger to life or limb.

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

Electrical high voltage cannot be seen but it can kill you, render you unconscious, or severely burn you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

BE CERTAIN that there is someone assisting you who can remove power immediately.

ALWAYS place POWER OFF warning tags on power supply switches so that no one will apply power while you are performing maintenance.

FOR ARTIFICIAL, RESPIRATION, REFER TO FM 21 –11.

WARNING

Fluids handled by the Sewage Ejection Pump contain bacteria which can be harmful to personnel. Ensure that the Sewage Ejection Pump has been cleaned and disinfected with a chlorine solution, then rinsed with clean water. Personnel should wash immediately after performing any internal maintenance on either model of the Sewage Ejection Pump.

WARNING

The Sewage Ejection Pump is moved with a forklift or other approved method of transport. Ensure that all personnel are clear of the area when moving the Sewage Ejection Pump. Personnel can be seriously injured or killed by a falling Sewage Ejection Pump.

INSERT LATEST CHANGED PAGES / WORK PACKAGES. DESTROY SUPERCEDED DATA

LIST OF EFFECTIVE PAGES / WORK PACKAGES

NOTE: The portion of text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

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

Original ..0.. 30 JUNE 05

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 22 AND TOTAL NUMBER OF WORK PACKAGES IS 38 CONSISTING OF THE FOLLOWING:

Page / WP No.	*Change No.	Page / WP No.	*Change No.	Page / WP No.	*Change No.
a-b	0				
A-B	0				
i-vi	0				
WP 0001 00 – 0038 00	0				
Index 1 – Index 4	0				

*Zero in this column indicates an original page or work package.

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 JUNE 2005

TECHNICAL MANUAL

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

SEWAGE EJECTION PUMP (SEP)

NSN: 4630-01-413-2606

NSN: 4630-01-413-2608

NSN: 4630-01-505-3746

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 (located in the back of this manual), directly to: Commander, U.S. Army Tank-automotive & Armament Command, ATTN: AMSTA-LC-CECT, Kansas St., Natick, MA / 01760-5052. You may also submit your recommended changes by E-mail directly to amssbriml@natick.army.mil. A reply will be furnished directly to you. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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

TABLE OF CONTENTS

WP Sequence No.

HOW TO USE THIS MANUAL

In this manual, primary chapters appear in upper case/capital letters; work packages are presented in numeric sequence, e.g., 0001 00; paragraphs in a work package are not numbered and are presented in a titles format. For a first level paragraph, title all upper case/capital letters, e.g. FRONT MATTER subordinate paragraph title will have the first letter of the first word of each principle word all upper case/capital letters, e.g., Manual Organization and Page Numbering System. The location of additional material that must be referenced is clearly marked. Illustrations supporting maintenance procedures/text are located underneath, or as close as possible to, their referenced paragraph.

This Operator's, Unit and Direct Support Maintenance Manual contains general information, operating instructions, and operator preventive maintenance checks and services (PMCS) for the Sewage Ejection Pump (SEP).

FRONT MATTER. Front Matter consists of front cover, warning summary, title block, table of contents, and how to use this manual page.

CHAPTER 1 – INTRODUCTION. Chapter 1 contains introductory information on all models and their associated equipment as well as a theory of operation.

CHAPTER 2 – OPERATING INSTRUCTIONS. Chapter 2 includes operating instructions under usual and unusual conditions.

CHAPTER 3 – OPERATOR TROUBLESHOOTING INSTRUCTIONS. Chapter 3 contains operator troubleshooting procedures.

CHAPTER 4 – OPERATOR MAINTENANCE INSTRUCTIONS. Chapter 4 contains PMCS and operator maintenance procedures and instructions.

CHAPTER 5 – UNIT MAINTENANCE INSTRUCTIONS. Chapter 5 contains unit maintenance instructions.

CHAPTER 6 – SUPPORTING INFORMATION. Chapter 7 contains references and other supporting information.

REAR MATTER. Rear matter includes the glossary, alphabetical index, DA Form 2028, authentication page, and back cover.

Manual Organization and Page Numbering System. The manual is divided into seven major chapters that detail the topics mentioned above. Within each chapter are work packages covering a wide range of topics. Each work package is numbered sequentially starting at page 1. The work package has its own page numbering scheme and is independent of the page numbering used by other work packages. Each page of a work package has a page number of the form XXXX YY-ZZ where XXXX is the work package number (e.g. 0010 is work package 10), YY is reserved for the later insertion of revised work packages, and ZZ represents the number of the page within that work package. A page number such as 0010 00-1/(2 Blank) means that page 1 contains information but page 2 of that work package has been intentionally left blank.

Illustrations. Illustrations for procedures in this manual always follow the procedure. For example, if given the instruction "1. Locate the pump assembly **(1)**.", **(1)** will reference the diagram or illustration immediately following the procedure.

Finding Information. The table of contents permits the reader to find information in the manual quickly. The reader should start here first when looking for a specific topic. The table of contents lists the topics contained within each chapter and the work package sequence number where it can be found.

Example: If the reader were looking for instructions on "Preventive Maintenance Checks and Services", which is an Operator Maintenance topic, the table of contents indicates that Operator Maintenance information can be found in Chapter 4. Scanning down the listings for Chapter 4, "Preventive Maintenance Checks and Services" information can be found in WP 0008 00 (i.e. Work Package 8).

An alphabetical index can be found at the back of the manual. It lists specific topics with the corresponding work package.

SEWAGE EJECTION PUMP (SEP)
GENERAL INFORMATION

SCOPE
This manual contains, or refers to, publications that contain equipment description, operating instructions, and maintenance for the Sewage Ejection Pump (SEP) and associated equipment. It includes operator, unit, and direct support maintenance instructions.

MAINTENANCE FORMS, RECORDS, AND PROCEDURES
Department of the Army forms and procedures used for SEP maintenance shall be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS) (Maintenance Management Update).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)
If your SEP needs improvement, let us know. 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. Put it on a Standard Form (SF) 368 Product Quality Deficiency Report (PQDR). Mail the report to:

Commander, U.S. Army Tank-automotive & Armament Command
Attn: AMSTA-LC-R
Kansas Street, Natick, MA 01760-5052

A reply will be sent directly to you. Instructions for sending an electronic 2028 may be found in the back of this manual immediately preceding the hardcopy 2028.

CORROSION PREVENTION AND CONTROL (CPC)
Corrosion Prevention and Control (CPC) of U.S. Army materiel is a continuing concern. It is important that any corrosion problems with the SEP be reported so that the problem can be corrected and improvements made to prevent the problem in future items.

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

If a corrosion problem is identified, it can be reported using a SF 368 PQDR. Using key words such as "corrosion," "rust," "deterioration," or "cracking" will assure that the information is identified as a CPC problem.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE
Destruction of Army materiel to prevent enemy use shall be in accordance with TM 750-244-3.

WARRANTY INFORMATION
Warranties applicable to the SEP apply to the pump and covers defective materials or workmanship for a period of 1-year from the date of installation or 18-months from the date of manufacture, whichever occurs first.

NOMENCLATURE CROSS REFERENCE LIST

The following list cross-references common names used throughout this manual to official nomenclature.

COMMON NAME	OFFICIAL NOMENCLATURE
Breaker Box	Circuit Breaker Box
General Purpose SEP	General Purpose Sewage Ejection Unit 9-1-0150-2
Laundry SEP	Laundry Sewage Ejection Unit 9-1-0150-1
QD, QDC	Quick Disconnect Coupling
SEP	Pertaining to all models of the Sewage Ejection Pump
Waste Water Evacuation SEP	Sewage Ejection Pump, Waste Water Evacuation 9-1-0527
Tank	Tank Assembly

LIST OF ACRONYMS AND ABBREVIATIONS

AAL	Additional Authorization List
AC	Alternating Current
AMP or Amp	Ampere
AR	As Required
AVIM	Aviation Intermediate Maintenance
AVUM	Aviation Unit Maintenance
BII	Basic Issue Item
BOI	Basis if Issue
CAGEC	Commercial and Government Entity Code
CBL	Containerized Batch Laundry
COEI	Component of End Item
CPC	Corrosion Prevention and Control
CTA	Common Table of Allowances
DA	Department of the Army
DD	Department of Defense
DISE	Distribution Illumination System, Electrical
DMWR	Depot Maintenance Work Requirement
EIR	Equipment Improvement Recommendation
EMP	Electromagnetic Pulse
FIG or Fig.	Figure
FM	Field Manual
GFCI	Ground Fault Circuit Interrupt

LIST OF ACRONYMS AND ABBREVIATIONS - continued

GPM	Gallons Per Minute
HCI	Hardness Critical Item
Hz	Hertz
in. or IN	Inch(es)
ISO	Int'l Organization for Standardization
JTA	Joint Table of Allowances
Kg	Kilogram(s)
kPa	Kilopascal(s)
KW	Kilowatt(s)
L	Liter(s)
lb. or LB	Pound(s)
M	Meter(s)
MAC	Maintenance Allocation Chart
MOS	Military Occupational Specialty
MTD	Mounted
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Order
NBC	Nuclear, Biological, and Chemical
NIIN	National Item Identification Number
NSN	National Stock Number
^{o}C	Celsius
^{o}F	Fahrenheit
P/N	Part Number
PAM	Pamphlet
PDISE	Power Distribution Illumination System, Electrical
PMCS	Preventive Maintenance Checks and Services
POL	Petroleum, Oil and Lubricant
PVC	Polyvinyl Chloride
QD or QDC	Quick Disconnect
QTY	Quantity
RPSTL	Repair Parts and Special Tools List
RQR or Rqr.	Required
SEP	Sewage Ejection Pump
SMR	Source, Maintenance and Recoverability
TAMMS	The Army Maintenance Management System
TBD	To Be Determined
TDA	Table of Distribution & Allowance(s)
TEMPER	Tent, Extendable, Modular, Personnel
TMDE	Test, Measurement, and Diagnostic Equipment

LIST OF ACRONYMS AND ABBREVIATIONS - continued

TOE	Table of Organization and Equipment
TRICON	Triple Container
U/M	Unit of Measure
UOC	Usable On Code
UUT	Under Unit Test
V	Volts
VAC	Volts Alternating Current
WP	Work Package

WARNINGS, CAUTIONS AND NOTES
Be alert to **WARNINGS**, **CAUTIONS**, and **NOTES**, which will protect you and your equipment, and make use of your equipment easier.

COMMON TOOLS AND EQUIPMENT
For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, or CTA 8-100, as applicable to your unit.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT
None required.

REPAIR PARTS
Repair parts are listed and illustrated in WP 0026 00 through 0032 00 of this manual.

CHAPTER 1

DESCRIPTION
AND
THEORY OF OPERATION

SEWAGE EJECTION PUMP
(SEP)

SEWAGE EJECTION PUMP (SEP)
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The SEP consists of the tank body, the sewage ejection pump, check valve, circuit breaker box, power cord, float switch, and a heating element. It can be assembled, installed, operated, and disassembled by non-specific MOS personnel; however, power connection and maintenance on the circuit breaker box requires MOS 51R, 52C, 52D, or 52G qualified personnel.

CHARACTERISTICS	CAPABILITIES AND FEATURES
• Modular system, includes all necessary equipment for operation.	• Holding capacity of 220-gallons (837.7 liters).
• Two-person assembly and disassembly	• Automatic activation through float switch.
• Can be moved by fork lift.	• Pump evacuation capacity of 140-gallons per minute (8.83 liters per second).
• Tank, tank lid, and plumbing constructed of corrosion resistant materials.	• Suitable for operation in temperatures below 32^0 F (0^0 C).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Tank Assembly 9-1-0150-1 (Laundry SEP) and 9-1-0150-2 (General Purpose SEP)

NOTE

Not all production tank assemblies are fitted with manual drains.

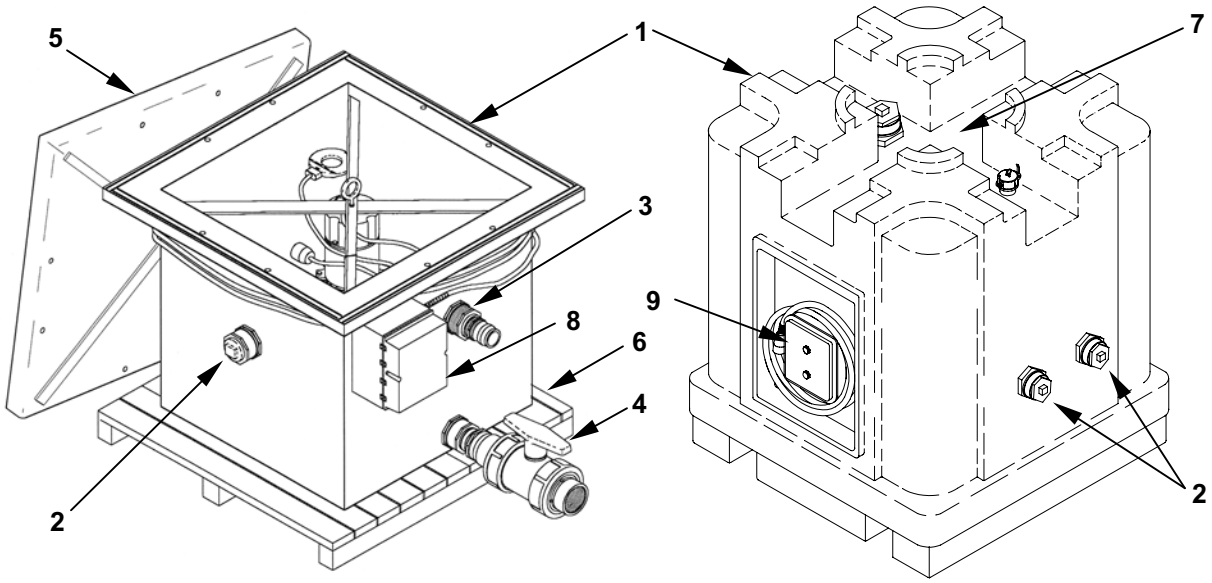
The tank **(1)** has a holding capacity of 230-gallons. The inlet ports **(2)** are located on both sides and the rear of the tank. The discharge port **(3)** and a drain port are located on the front of the tank, as is the circuit breaker box. The discharge port is connected to the ejection pump installed in the tank via a check valve that prevents back flow. A PVC ball valve **(4)** is installed onto the drain port and allows manual drainage of the tank. A lid **(5)** secured with bolts and wing nuts is normally installed during operation. The tank assembly is normally mounted on a wooden pallet **(6)** to facilitate movement with a forklift.

Tank Assembly 9-1-0527 (Waste Water Evacuation SEP)

The tank **(1)** on the Waste Water Evacuation SEP (9-1-0527) has a holding capacity of 220-gallons. The inlet ports **(2)** are located on either side of the tank: two 3-inch inlets to accommodate graywater from the Containerized Batch Laundry (CBL) and three 2-inch inlets to accommodate kitchen and shower graywater discharge. The discharge port **(3)** is connected to the ejection pump and incorporates a check valve to prevent sewage backflow into the tank. An access panel **(7)** on top of the tank is secured with quick acting fasteners. The tank design of the Waste Water Evacuation SEP allows the unit to be stacked two high, and incorporates an integral pallet to facilitate movement by forklift.

Circuit Breaker Box 9-1-0150-1 (Laundry SEP) and 9-1-0150-2 (General Purpose SEP)
The circuit breaker box **(8)** is mounted on the front side of the tank. It contains a 20 Amp main breaker, a 20 Amp breaker for the heating element and a 10 Amp breaker for the pump motor. A 230 Volt 3 Phase power source is required to operate the SEP components. The SEP power cord is connected to the circuit breaker box.

Control Box 9-1-0527 (Waste Water Evacuation SEP)
The control box **(9)** is mounted in a recess on the front side of the tank. It contains a 15 Amp 3 phase main breaker inside. A three position switch and an indicator light are mounted on the door of the control box. A 230 Volt 3 Phase power source is required to operate the SEP components.



(9-1-0150-1 and 9-1-0150-2) **(9-1-0527)**

SEP MAJOR COMPONENTS

Pump 9-1-0150-1 (Laundry SEP) and 9-1-0150-2 (General Purpose SEP)
A centrifugal pump is installed into the tank and stabilized by the tank support brace, consisting of two 2-inch wide 57-inch long extruded PVC angle stock pieces. The pump is secured by a $^{3}/_{8}$-inch eyebolt installed through the center of the brace. The pump is a Myers model WHR7-23, with a capacity of 140-gallons per minute and a maximum head of 28-feet. The pump is powered by a ¾ horsepower single phase or three phase motor that is automatically controlled by a float switch.

Pump 9-1-0527 (Waste Water Evacuation SEP)
A centrifugal pump is mounted in the tank and stabilized by a stainless steel support brace. The pump used in this model is an ABS model SJ5D. The pump is rated at 150 GPM, and will operate with a maximum head of 24-feet. The pump is powered by a ½ hp, 208 VAC, three phase motor encased in a stainless steel housing.

Float Switch
A float switch activates the pump when the tank contents reaches 80% of the tank's capacity.

Heating Element
A heating element is used during operations in temperatures below 32^0 F to prevent the tank contents from freezing. The heating element is manually controlled by a circuit breaker on the Laundry SEP and the General Purpose SEP. The heating element operates automatically on the Waste Water Evacuation SEP.

DIFFERENCES BETWEEN MODELS

Two SEP tank body types are available and used with Force Provider Modules. The Laundry SEP (9-1-0150-1) and the General Purpose SEP (9-1-0150-2) are similar, differing only in the inlet connections. The Laundry SEP (9-1-0150-1) has two 3-inch male couplings to accommodate the wastewater discharge from the Containerized Batch Laundry (CBL-FP). The third inlet port is closed with a plug that may be installed in any one of the three inlet ports. The General Purpose SEP (9-1-0150-2) has three 2-inch male couplings to accommodate inlet connections from various sources such as showers and kitchen. There can be considerable variation in components within these two models, depending on the type of lid, pump motor, manual drain installation, and power output receptacles fitted.

The Waste Water Evacuation SEP (9-1-0527) has been constructed to accommodate both the 3-inch connections from the CBL-FP as well as the 2-inch connections from the showers and kitchen. It has no parts in common with the Laundry SEP (9-1-0150-1) and the General Purpose SEP (9-1-0150-2). Early production Waste Water Evacuation SEP's may be labeled as "Sewer Ejection System".

EQUIPMENT DATA

The following technical specifications provide separate dimensional, capacity and performance data for the Laundry SEP (9-1-0150-1) and the General Purpose SEP (9-1-0150-2).

External dimension:

Length	44-inches	111.76-centimeters
Width	36-inches	91.44-centimeters
Height	33-inches	83.82-centimeters

Internal dimension:

Length	43.75-inches	111.76-centimeters
Width	35.5-inches	91.44-centimeters
Height	32.75-inches	83.82-centimeters

Storage capacity: 230-gal 870-liters

Weight:

Deployed (empty)	453-pounds	205.48-kilograms
Modified (SEP), packed for movement	453-pounds	205.48-kilograms

Environmental:

Operating temperature range	0° to 140° Fahrenheit	-18° to 60° Celsius

PUMP

External dimension:

Length	12-inches	30.48-centimeters
Width	8.5-inches	21.59-centimeters
Height	19-inches	48.26-centimeters

Capacity: 140-gallons / minute 8.3-liters / second

Weight: 79-pounds 35.83-kilograms

Required electrical input: 230 V AC three phase 60Hz

Type: Myers Model WHR-7-23

Motor: ¾ HP

The following technical specifications provide separate dimensional, capacity and performance data for the Waste Water Evacuation SEP (9-1-0527).

External dimension:

Length	45-inches	114.3-centimeters
Width	45-inches	114.3-centimeters
Height	48.5-inches	123.19-centimeters

Internal dimension:

Length	43.75-inches	111.76-centimeters
Width	35.5-inches	91.44-centimeters
Height	32.75-inches	83.82-centimeters

Storage capacity: 220-gal 832-liters

Weight:

Deployed (empty)	375-pounds	170.45-kilograms
Modified (SEP), packed for movement	375-pounds	170.45-kilograms

Environmental:

Operating temperature range	0° to 140° Fahrenheit	-18° to 60° Celsius

PUMP

External dimension:

Length	9.5-inches	25.13-centimeters
Width	6-inches	15.24-centimeters
Height	17.5-inches	44.45-centimeters

Capacity: 150-gallons / minute 9.46-liters / second

Weight: 31-pounds 14.10-kilograms

Required electrical input: 230 V AC three phase 60Hz

Type: ABS Model SJ5D

Motor: ½ HP

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit. Repair parts will be listed and illustrated in WPs 0026 00 through 0032 00 of this manual.

END OF WORK PACKAGE

SEWAGE EJECTION PUMP (SEP)
THEORY OF OPERATION

THEORY OF OPERATION

General

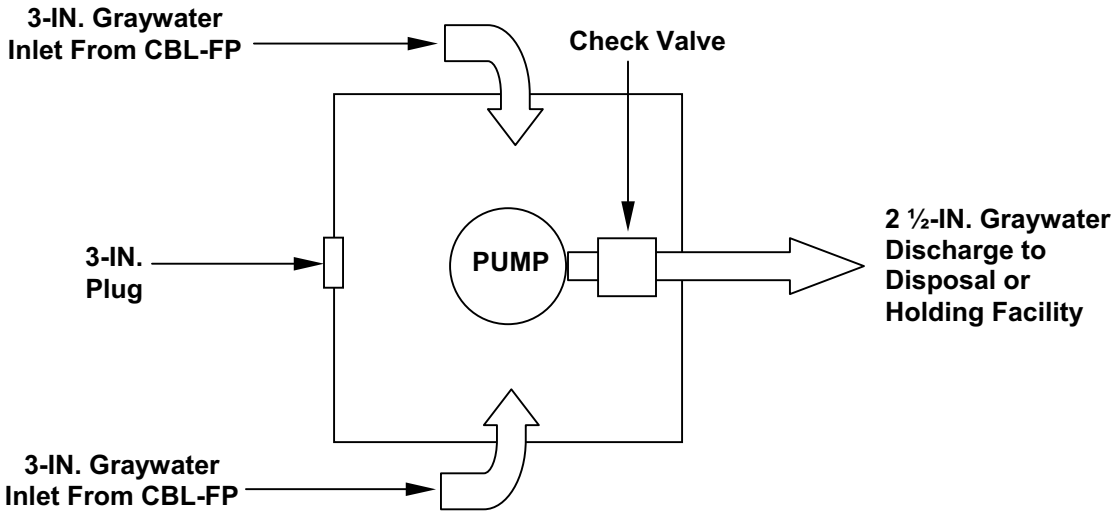
The function of the SEP is to serve as a collection and evacuation facility for graywater sewage generated during Force Provider operations. The laundry SEP (9-1-0150-1) was designed to collect and evacuate graywater generated by the Containerized Batch Laundry FP (CBL-FP) washers, while the general purpose SEP (9-1-0150-2) is used to collect the graywater generated by kitchens and shower facilities. The Waste Water Evacuation SEP (9-1-0527) is suitable for either application without adaptation.

Operation

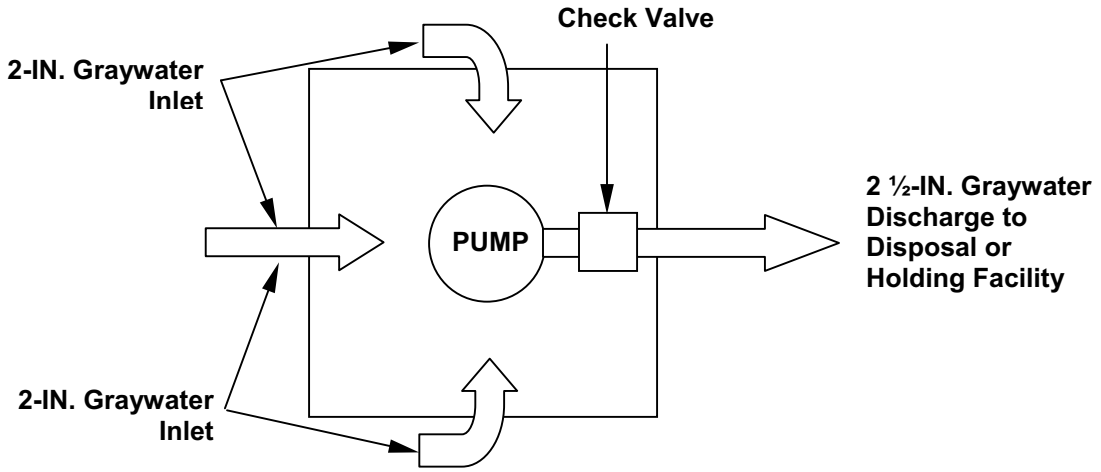
Graywater sewage is fed from the source point into the SEP. At the SEP, the liquid sewage accumulates in the tank until it reaches 80% of tank capacity, at which point a float switch activates the pump, evacuating the liquid sewage. The discharge port includes a check valve that prevents backflow into the tank from the discharge line. In cold weather operations a heating element prevents the contents from freezing.

Evacuation

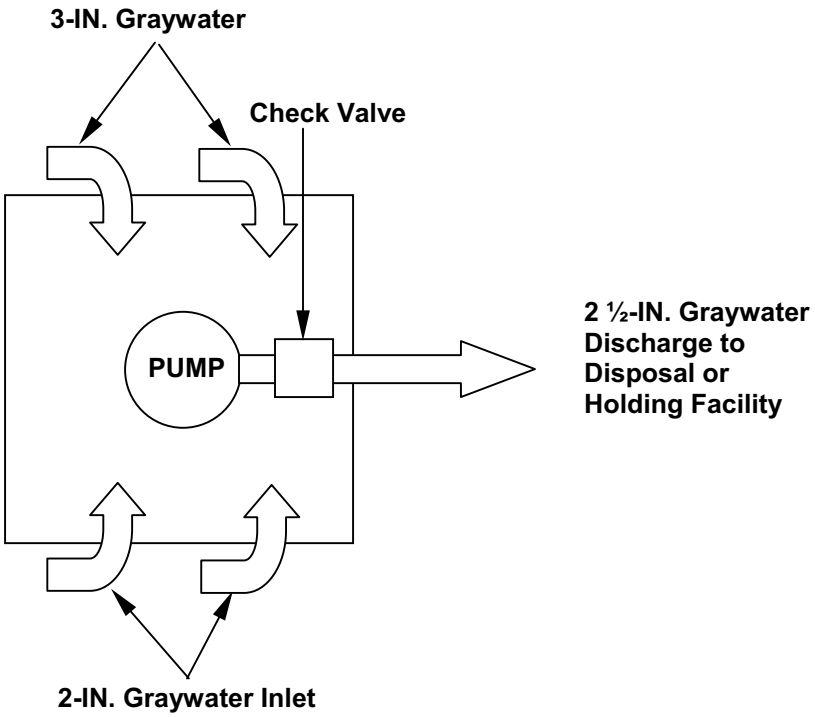
The discharge port is usually connected to the Force Provider System wastewater grid. However, it may be adapted to an existing municipal sewage system, a 20,000-gallon fabric graywater collection tank, or other approved graywater disposal.



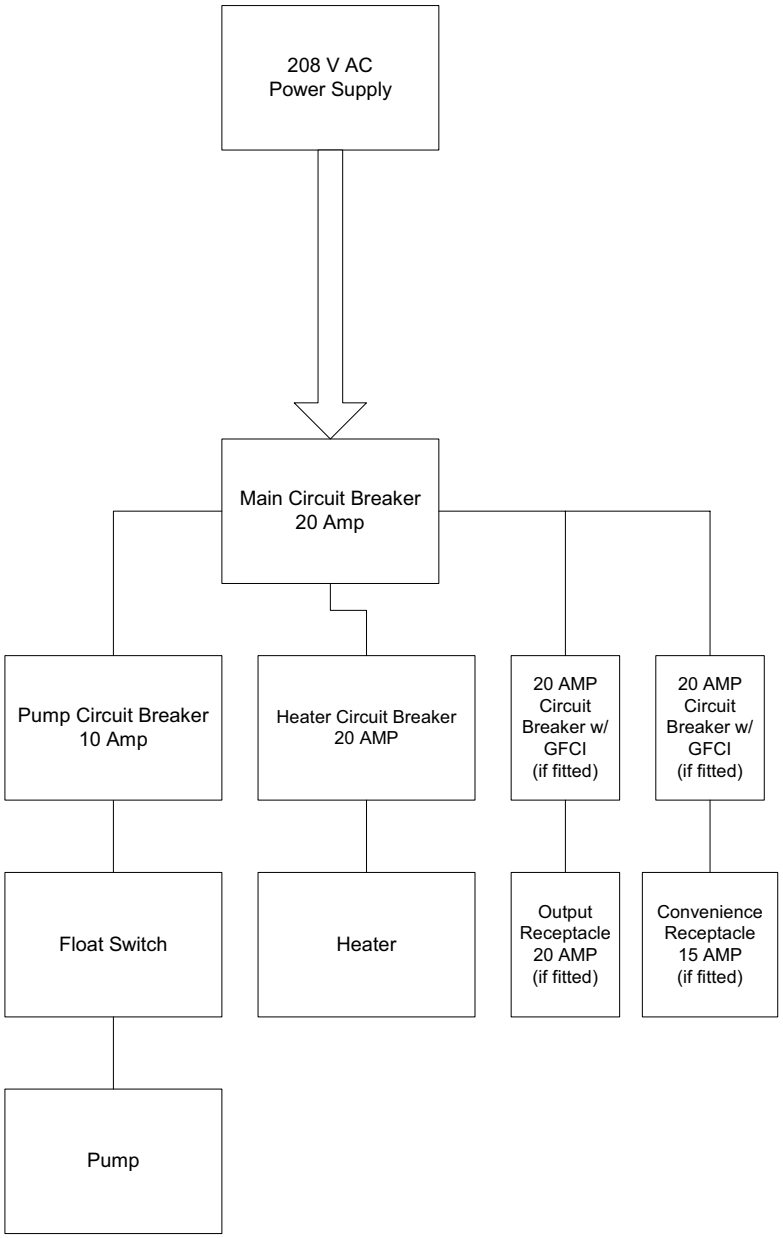
Laundry SEP Operation
9-1-0150-1



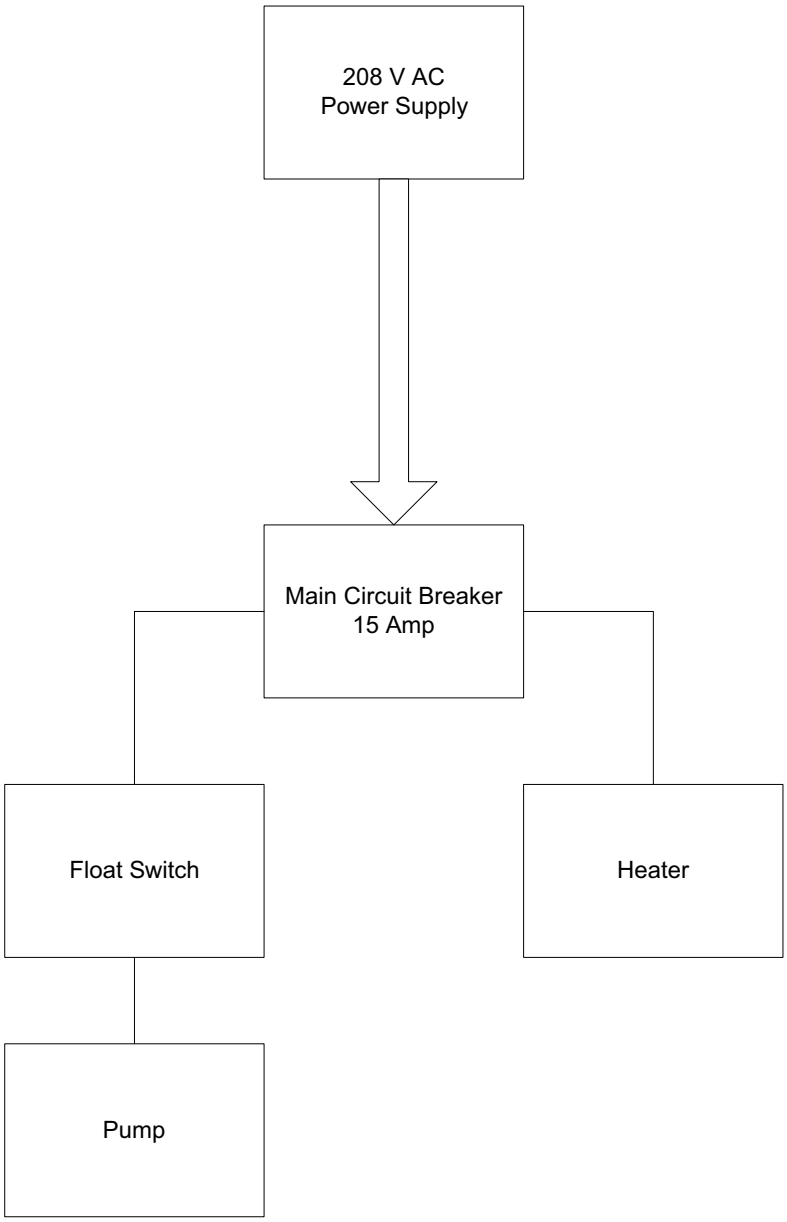
General Purpose SEP Operation
9-1-0150-2



Sewage Ejector System Operation
9-1-0527



Electrical Operation
Laundry SEP (9-1-0150-1)
General Purpose SEP (9-1-0150-2)



Electrical Operation
Waste Water Evacuation SEP (9-1-0527)

CHAPTER 2

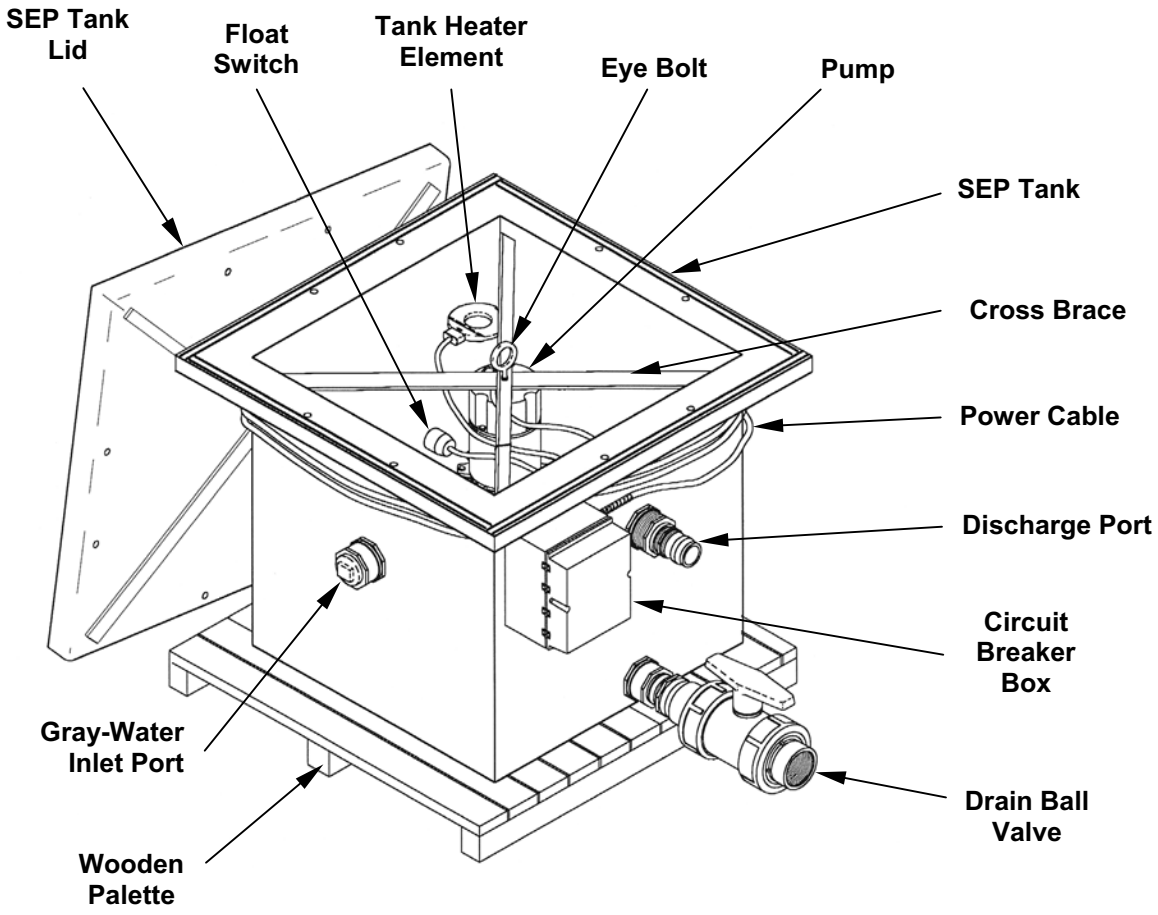
OPERATOR INSTRUCTIONS

SEWAGE EJECTION PUMP (SEP)

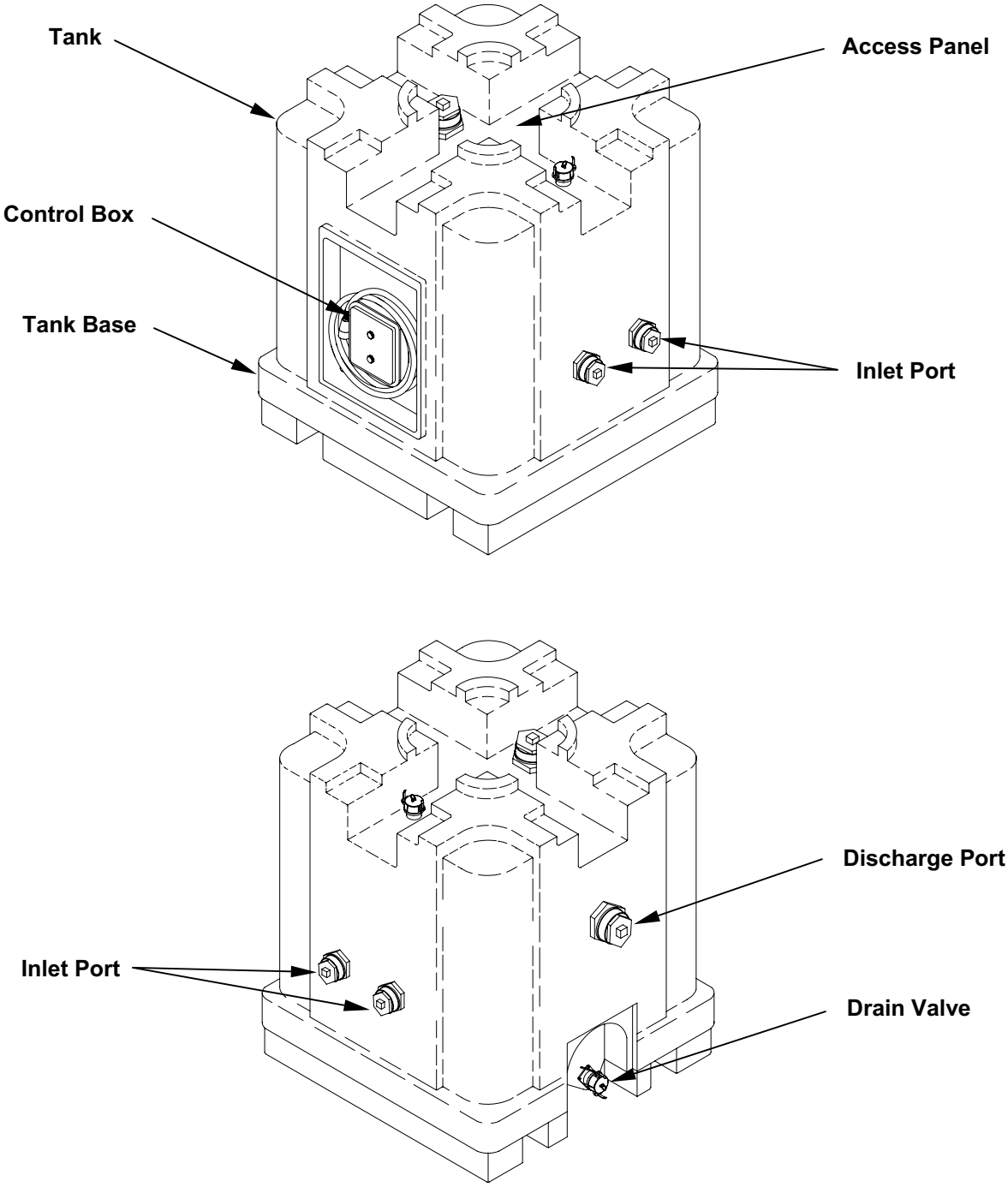
SEWAGE EJECTION PUMP (SEP)
DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

INTRODUCTION

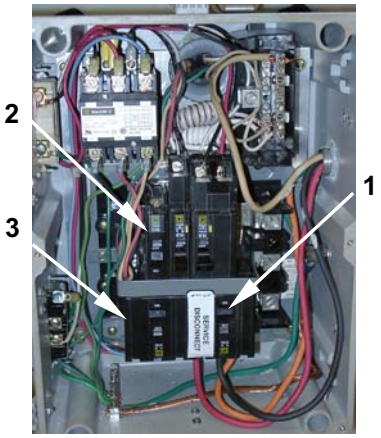
This work package (WP) shows the location and describes the use of SEP controls and indicators. You should know the location and proper use of every control and indicator before operating the SEP. Use this WP to learn about each control and indicator and how it works.



Controls and Indicators
Laundry SEP (9-1-0150-1)
General Purpose SEP (9-1-0150-2)



Controls and Indicators
Waste Water Evacuation SEP (9-1-0527)



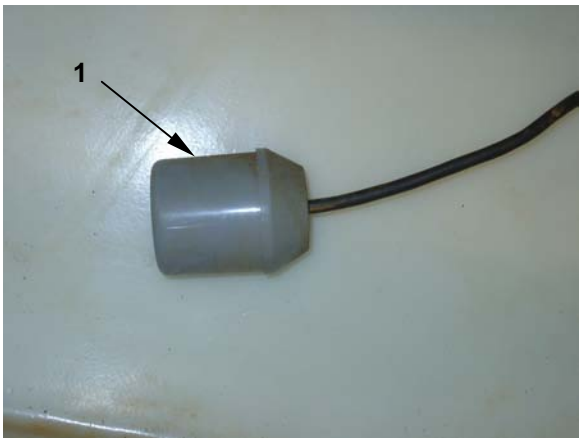
Circuit Breaker Box (9-1-0150-1 and 9-1-0150-2)

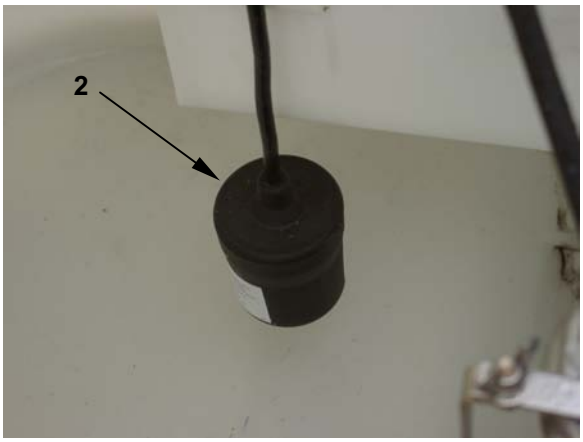
NOTE

There is considerable variation in circuit breaker box configuration on these two models.

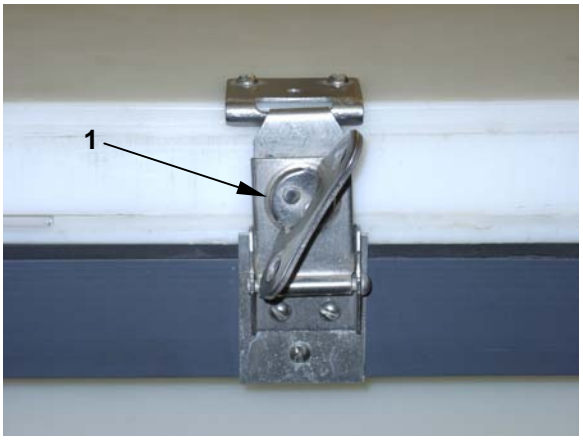
Key	Control or Indicator	Function
1	Main Circuit Breaker	Controls and protects all SEP electrical components.
2	Heater Circuit Breaker	Controls and protects SEP tank heater.
3	Pump Circuit Breaker	Controls and protects SEP pump.

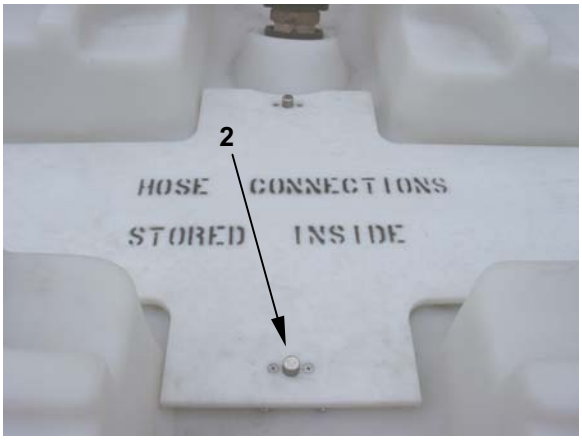
Control Box (9-1-0527)		
Key	**Control or Indicator**	**Function**
1	Main Circuit Breaker	Controls and protects all SEP electrical components.
2	Three Position Switch	Controls SEP pump operation.
3	Indicator Light	Indicates when pump is operating.





Float Switch		
Key	**Control or Indicator**	**Function**
1	Float Switch	Controls pump operation (9-1-0150-1 and 9-1-0150-2).
2	Float Switch	Controls pump operation.



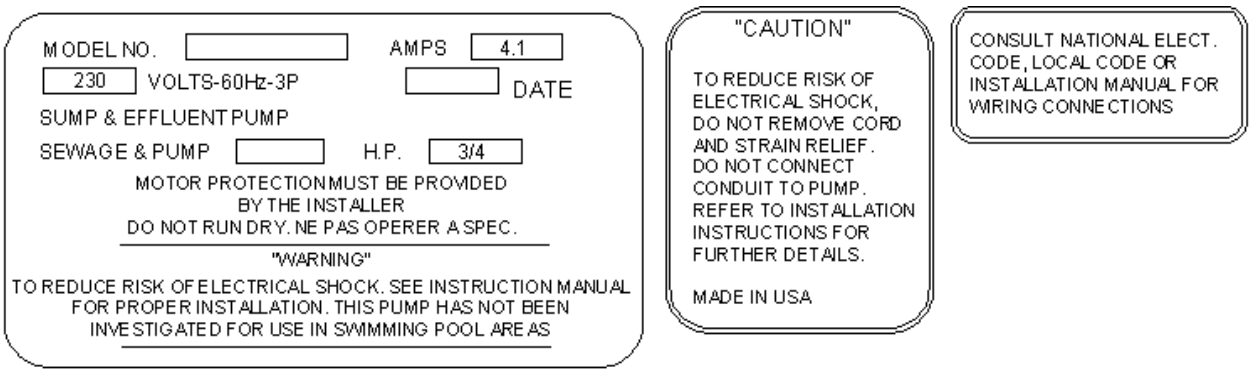


Retainers		
Key	**Control or Indicator**	**Function**
1	Lid Retainers	Secure lid to tank (9-1-0150-1 and 9-1-0150-2).
2	Access Panel Retainers	Secure access panel to tank.

DECALS AND INSTRUCTION PLATES

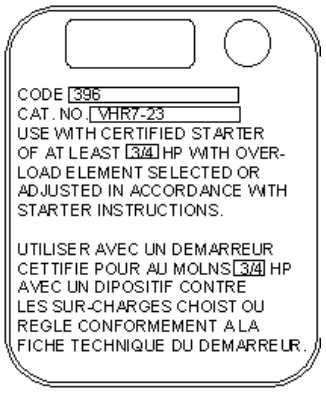
Pump (9-1-0150-1 and 9-1-0150-2)

The following information and cautionary labels are found on top of the pump:



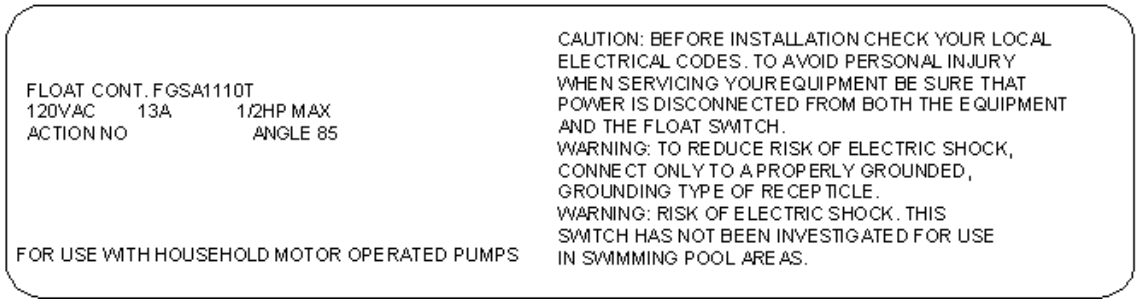
Power Cable (9-1-0150-1 and 9-1-0150-2)

The following information and cautionary label is found on the power cable:



Float Switch (9-1-0150-1 and 9-1-0150-2)

The following information and cautionary label is found on the float switch:



SEWAGE EJECTION PUMP (SEP)
OPERATION UNDER USUAL CONDITIONS

SITING, ASSEMBLY, AND PREPARATION FOR USE

Siting Requirements

When deployed as part of Force Provider, the SEP will be staked as a part of the Force Provider site preparation. Considerations determining site location include:

Site must be level and free of rocks and debris. Hardstand is preferable.

Site should be located approximately level with both the facilities it handles and the Force Provider wastewater grid or collection/disposal facility. Location of the SEP above the level of the facilities it services diminishes the graywater flow to the SEP. Location of the SEP below the level of the wastewater grid or collection/disposal facility decreases SEP pump output, and may flood the SEP in the event the internal check valve fails. The SEP will not discharge at all to a facility more than 28-feet (8.5-meters) above its location.

Site must be accessible by forklift; again, hardstand is preferred.

Site must be located within operating distance of facilities to be connected.

Lift and Move the SEP

WARNING

The Sewage Ejection Pump (SEP) is moved with a forklift or other approved method of transport. Ensure that all personnel are clear of the area when moving the SEP. Personnel can be seriously injured or killed by a falling SEP.

Lifting

CAUTION

The Sewage Ejection Pump (SEP) must be lifted in order to be moved. Do not drag or push the SEP. Do not attempt to move the SEP until it is completely disconnected from all hoses.

Movement of the SEP requires a forklift.

Hoisting/Stacking

SEPs may be safely stacked two (2) high.

Unpack and Inventory SEP

1. Unpack the SEP, taking care to remove all loose hardware and components from the interior.

2. Use Table 1 to inventory the SEP components.

Table 1. SEP Packing Inventory

Item	Quantity			Function	Location
	Laundry 9-1-0150-1	General Purpose 9-1-0150-2	Waste Water Evacuation SEP 9-1-0527		
Cover (Lid)	1	1	1		Installed
Bulkhead Fitting, 3-IN.	4	4	TBD		Installed
Bushing, Reducing, 3-IN. external NPT x 2 ½-IN internal NPT	1	1	TBD	Discharge fitting adaptor	Interior
Bushing, Reducing, 3-IN. external NPT x 2-IN. internal NPT		3	TBD	Inlet port adapter	Interior
3-IN. Plug	1		TBD	Cap unused ports	Installed
Tank	1	1	TBD		
Gasket, 3-IN. rubber	4	4	TBD		Interior
Coupling Half, QD, Cam Locking Type, Male, External Pipe Thread, Type III, 2 ½-IN. aluminum or brass	1	1	1	Discharge QDC fitting	Interior
Coupling Half, QD, Cam Locking Type. Dust Cap, 2 ½-IN.	1	1	1	Discharge QDC dust cap	Interior
Coupling Half, QD, Cam Locking Type, Male, External Pipe Thread, Type III, 3-IN. aluminum or brass	2		2	Laundry inlet 3-IN. QDC fitting	Interior
Coupling Half, QD, Cam Locking Type. Dust Cap, 3-IN.	2		2	Laundry inlet QDC dust cap	Interior
Coupling Half, QD, Cam Locking Type, Male, External Pipe Thread, Type III, 2-IN. aluminum or brass		3	2	General Purpose inlet 2-IN. QDC fitting	Interior
Coupling Half, QD, Cam Locking Type, Dust Cap 2-IN.		3	2	General Purpose inlet QDC dust cap	Interior
Ball Valve, 2 ½-IN., PVC	1 (if fitted)	1 (if fitted)	1	Drain valve	Interior
Bushing, 3-IN. x 2 ½-IN., PVC	1 (if fitted)	1 (if fitted)	TBD	Drain valve adapter	Interior
Nipple, 2 ½-IN. PVC	1 (if fitted)	1 (if fitted)	TBD	Drain valve nipple	Interior
Power Cable	1	1	1		Exterior

Assemble the SEP

CAUTION

Do not attempt to move or reposition a SEP that has been assembled for use or is in operation. The SEP can be easily damaged, specifically at the QDC fittings and drain valve.

1. If deployed as a component of Force Provider, position the SEP as staked within the Force Provider wastewater grid and in proximity to the facilities it is to serve, such as the CBL, shower, or kitchen. If deployed with a standalone facility, position as specified in equipment TM.

2. If necessary, use a strap wrench or pipe wrench to assemble inlet and discharge ports **(1)** by installing components. (9-1-0150-1 and 9-1-0150-2 only).

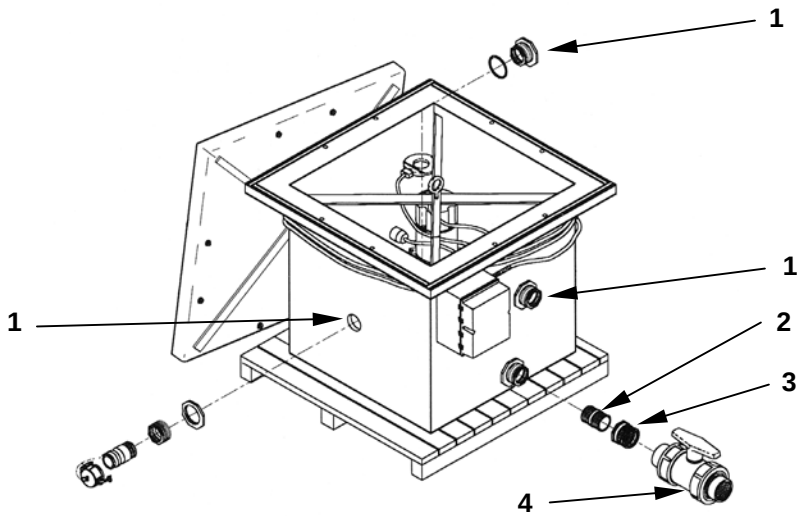
CAUTION

The SEP may ship with two types of 3-IN. to 2 ½-IN. bushings. The PVC (plastic) bushing is only for use with the drain valve. Do not use this bushing as an adapter to the 2 ½-IN. discharge QDC fitting, as it may break during installation or use (9-1-0150-1 and 9-1-0150-2 only).

3. Remove plug from drain port and install 2 $^{1}/_{2}$-IN. PVC nipple **(2)** and bushing **(3)** onto drain port (9-1-0150-1 and 9-1-0150-2 only). Some 9-1-0150-1 and 9-1-0150-2 SEPs may not have drain ports.

4. Install PVC ball valve **(4)** (9-1-0150-1 and 9-1-0150-2 only).

5. Install the PVC plug into inlet port not used and tighten (9-1-0150-1 only). Retain unused plugs for future storage and shipment.



6. Connect appropriate hoses onto inlet ports. Ensure proper connection of the QD fittings to prevent leakage. Support hoses with sandbags.

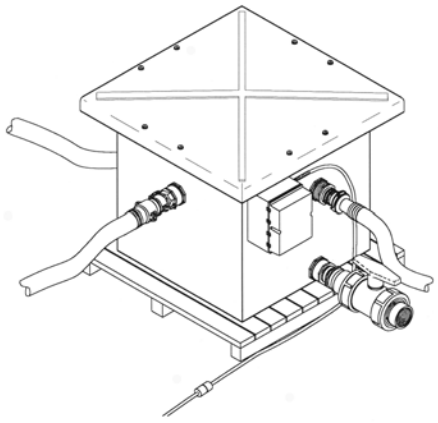
7. Connect a 2 ½-IN. discharge hose to the 2 ½-IN. male QD fitting on the discharge port. Support hose with sandbags.

8. If deployed with Force Provider, connect the other end of the hose to a Force Provider wastewater grid branch line as described in TM 10-5419-206-13. Ensure proper connection of the QD fittings to prevent leakage. If deployed with a standalone facility, refer to the equipment TM for connection instructions.

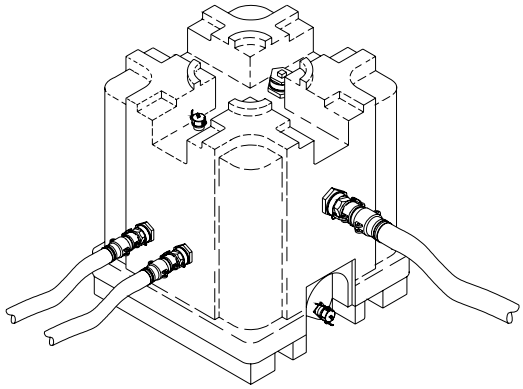
9. If a municipal sewage system or leach field is not available for graywater disposal, a 20,000-gallon collapsible fabric tank may be required for graywater collection. See TM 5-5430-216-13&P.

10. Ensure no components or hardware is left in the tank. Place lid in position and secure with retainers.

11. The SEP receives power from the facility it is deployed with. Have MOS 52C or 52D qualified personnel connect power to the SEP. Refer to equipment TM for specific instructions.



9-1-0150-1 and 9-1-0150-2



9-1-0527

OPERATING PROCEDURES

To operate the SEP, ensure that all necessary hose connections have been made, and are secure. Unused inlet ports must be capped. The drain valve, if present, must be closed. Ensure the SEP is safely and securely connected to the power supply.

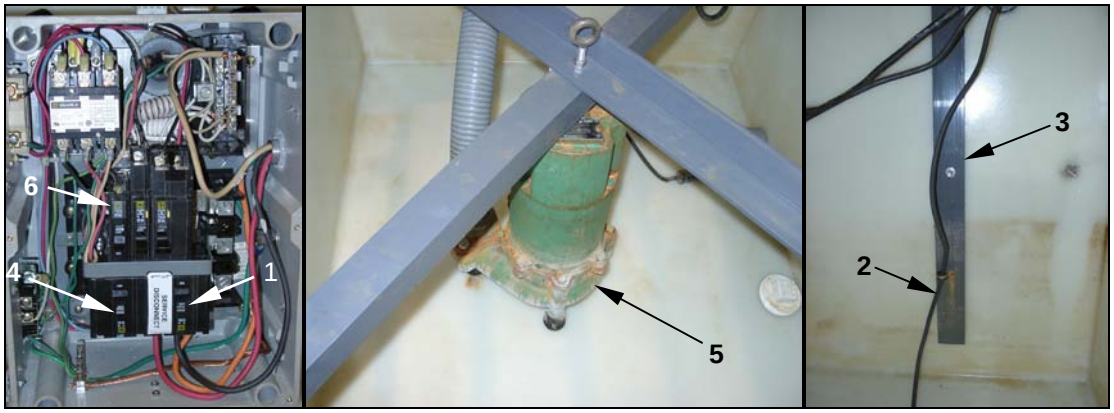
Operation (9-1-0150-1 and 9-1-0150-2)

1. Open breaker box door.
2. Release lid fasteners, and remove lid.
3. Turn SEP main circuit breaker **(1)** to ON.

WARNING

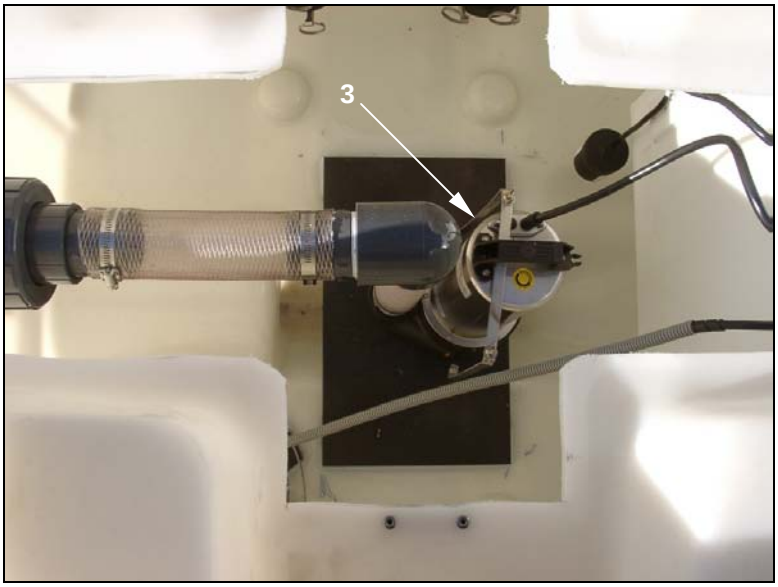
Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

4. Set float switch activation height by adjusting the height of the float switch cord retainer **(2)** on the PVC retainer bar **(3)**.
5. Turn pump circuit breaker **(4)** to ON.
6. Monitor initial operation of pump **(5)**. If sewage does not evacuate, turn the pump on and off several times to eliminate possible air lock.
7. In ambient temperature of 32° F or below, turn tank heater circuit breaker **(6)** to ON.
8. Although SEP operation is automatic, frequently check its proper functioning to avoid problems that may arise due to prolonged operation.



Operation (9-1-0527)

1. Open control box door.
2. Switch SEP main circuit breaker **(1)** ON.
3. Close and latch control box door.
4. Turn pump selector switch **(2)** to AUTO.
5. Monitor initial operation of pump **(3)**. If sewage does not evacuate, turn the pump OFF and ON several times to eliminate possible air lock.
6. Although SEP operation is automatic, check its proper functioning frequently to avert problems that may arise due to prolonged operation.



EQUIPMENT STORAGE AND SHIPMENT

Placement of Equipment in Storage. Storage should only be affected for short spans of time when a shortage of maintenance effort exists. Items should be mission ready within 24-hours, or within time factors set by directing authority. During storage periods, maintenance records must be kept.

Storage Site Selection. Covered space is preferred. When sufficient covered space is not available, priority should be given to items that are most susceptible to deterioration from the elements. Open sites should be improved hardstand, if available. Unimproved sites should be firm, well-drained locations, free of excessive vegetation.

Preparation for Storage and Shipment. Before storing or shipping the SEP, current maintenance services must be completed; defects and failures corrected; and Modification Work Orders (MWOs) applied.

Inventory and Pack SEP

1. Verify that tank is empty.
2. Clean tank interior with chlorine solution – let stand 1-hour.
3. Rinse tank interior with fresh water and drain.
4. Ensure that circuit breakers are set to OFF.
5. Disconnect all exterior hoses.
6. Disconnect power and wrap power cord around the tank assembly (9-1-0150-1 and 9-1-0150-2) or in the recess around the control box (9-1-0527).

CAUTION

Ensure that the Circuit Breaker Box/Control Box is secured closed before cleaning SEP exterior.

7. Clean SEP exterior by hosing it down with fresh-water (circuit breaker box/control box closed).
8. Using a pipe wrench or strap wrench, remove the PVC drain valve, nipple, and bushing (if fitted, 9-1-0150-1 and 9-1-0150-2).
9. Using a pipe wrench or strap wrench, remove all QDC fittings from the tank assembly.
10. Thread the 3-IN. plugs hand tight into the open drain, inlet, and discharge ports.
11. Install the QDC fittings on the inside of the bushings (9-1-0527). Place the valve and fittings inside the tank assembly (9-1-0150-1 and 9-1-0150-2). (Refer to Table 1, SEP Packing Inventory, for inventory).
12. Re-install plug into drain port.
13. Ensure lid/access panel is installed securely.

PREPARE SEP FOR MOVEMENT

CAUTION

Do not attempt to move or reposition the SEP until it has been prepared by the following procedure. The SEP can otherwise be easily damaged, specifically at the QDC fittings and drain valve.

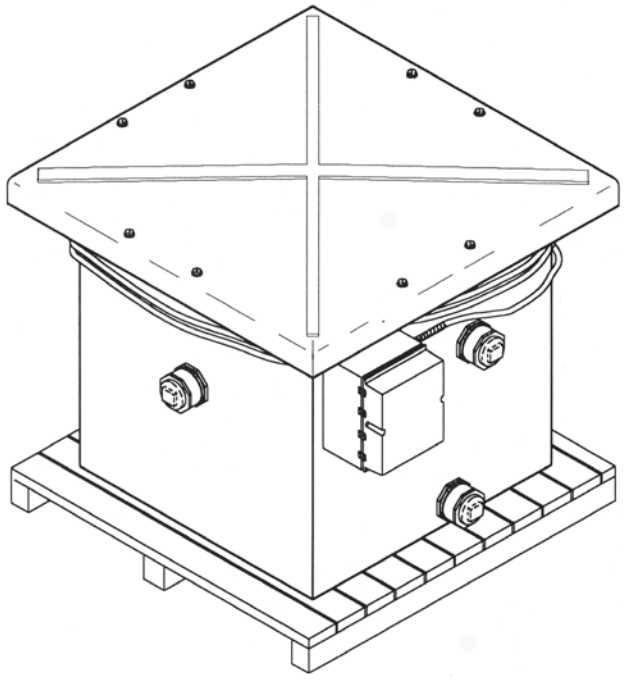
NOTE

The SEP must be packed in the same manner as for administrative storage.

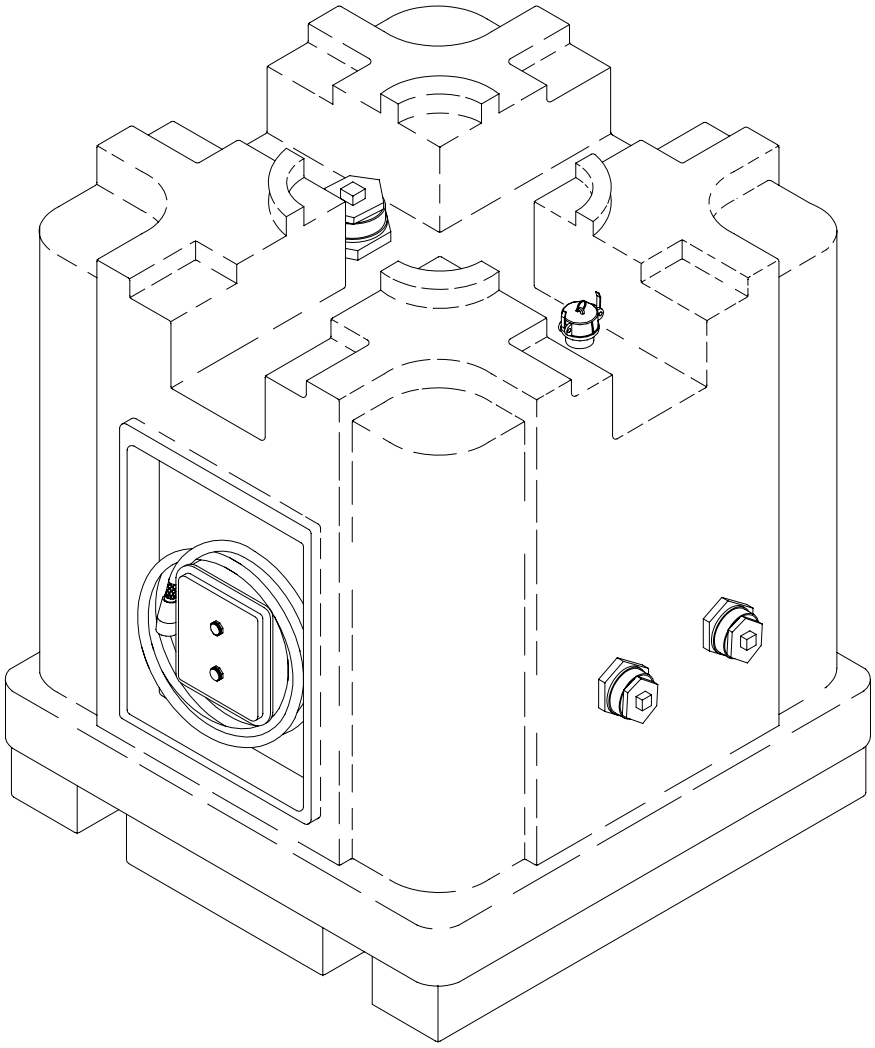
Moving the SEP

(9-1-0150-1 and 9-1-0150-2)
Before moving the SEP, check the condition of the wooden pallet. If it has deteriorated to a point where it may not support the SEP during movement, place the SEP onto a new pallet.

(9-1-0527)
Ensure the forks on the forklift are set properly. The integral pallet of the Waste Water Evacuation SEP does not have the wide slots available with wooden pallets



SEP (9-1-0150-1 and 9-1-0150-2)
Prepared for Storage or Movement



Waste Water Evacuation SEP (9-1-0527)
Prepared for Storage or Movement

Table 1. SEP Packing Inventory

Item	Quantity			Function	Location
	Laundry 9-1-0150-1	General Purpose 9-1-0150-2	Waste Water Evacuation SEP 9-1-0527		
Cover (Lid)	1	1	1		Installed
Bulkhead Fitting, 3-IN.	4	4	TBD		Installed
Bushing, Reducing, 3-IN. external NPT x 2 ½-IN. internal NPT	1	1	TBD	Discharge fitting adapter	Interior
Bushing, Reducing, 3-IN. external NPT x 2-IN. internal NPT		3	TBD	Inlet port adapter	Interior
3-IN. Plug	1		TBD	Cap unused ports	Installed
Tank	1	1	TBD		
Gasket, 3-IN. rubber	4	4	TBD		Interior
Coupling Half, QD, Cam Locking Type, Male, External Pipe Thread, Type III, 2 ½-IN. aluminum or brass	1	1	1	Discharge QDC fitting	Interior
Coupling Half, QD, Cam Locking Type. Dust Cap, 2 ½-IN.	1	1	1	Discharge QDC dust cap	Interior
Coupling Half, QD, Cam Locking Type, Male, External Pipe Thread, Type III, 3-IN. aluminum or brass	2		2	Laundry inlet 3-IN. QDC fitting	Interior
Coupling Half, QD, Cam Locking Type. Dust Cap, 3-IN.	2		2	Laundry inlet QDC dust cap	Interior
Coupling Half, QD, Cam Locking Type, Male, External Pipe Thread, Type III, 2-IN. aluminum or brass		3	2	General Purpose inlet 2-IN. QDC fitting	Interior
Coupling Half, QD, Cam Locking Type, Dust Cap 2-IN.		3	2	General Purpose inlet QDC dust cap	Interior
Ball Valve, 2 ½-IN., PVC	1 (if fitted)	1 (if fitted)	1	Drain valve	Interior
Bushing, 3-IN. x 2 ½-IN., PVC	1 (if fitted)	1 (if fitted)	TBD	Drain valve adapter	Interior
Nipple, 2 ½-IN. PVC	1 (if fitted)	1 (if fitted)	TBD	Drain valve nipple	Interior
Power Cable	1	1	1		Exterior

SEWAGE EJECTION PUMP
OPERATION UNDER UNUSUAL CONDITIONS

GENERAL
Refer to WP 0005 00 for specific operating instructions, and use this section for supplemental information for operating the SEP in unusual conditions.

UNUSUAL ENVIRONMENTS AND WEATHER
Unusual conditions include severe weather, such as 90 to 100 percent humidity for a week or more; 32° F (0° C) or below temperatures for a week or more; 100° F (38° C) or above temperatures for a week or more; blowing sand or dust; heavy rain or snow.

Operation in Extreme Heat (Moist and Dry) Conditions
No restrictions.

Operation in Extreme Cold Conditions
Ensure that heating element is operating.

Operation in Snowy or Muddy Conditions
No restrictions.

Operation in Salt-air or Sea Spray Conditions
No restrictions.

Operation in Dusty or Sandy Conditions
Ensure lid/access panel is securely installed.

Operation in Rainy and/or Humid Conditions
No restrictions.

Operation in High Altitude Conditions
No restrictions.

NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION
Perform interim decontamination procedures in accordance with FM 3-3, 3-4, 3-5.

CHAPTER 3

TROUBLESHOOTING PROCEDURES

SEWAGE EJECTION PUMP (SEP)

SEWAGE EJECTION PUMP TROUBLESHOOTING PROCEDURES

GENERAL

This chapter provides operator maintenance information and includes troubleshooting and general maintenance procedures. Refer to appropriate TMs for associated equipment maintenance instructions and item-specific troubleshooting instructions (See WP 0023 00 for References). Troubleshooting instructions covered in this section are unique to the SEP.

MALFUNCTION SYMPTOM INDEX

The malfunction symptom index lists common malfunctions that may occur during SEP inspection and operation. Find the malfunction to be eliminated and go to the indicated troubleshooting paragraph that follows. The index cannot list all malfunctions that may occur, all tests or inspections needed to find the fault, nor all actions required to correct the fault. If the existing malfunction is not listed, or cannot be corrected through this troubleshooting index, notify unit maintenance.

Malfunction	Troubleshooting Table
Pump does not start	1
Tank does not evacuate	2
Water leaks	3

TROUBLESHOOTING PROCEDURES

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the SEP to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions that must be met before starting the task. DO NOT START THE TASK UNTIL:

- ☞ You understand the task.
- ☞ You understand what you are to do.
- ☞ You understand what is needed to do the work.
- ☞ You have the things you need.

Table 1. Pump Troubleshooting Procedures

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. Pump does not start.	Step 1. Check that tank is at 80% capacity.	Manually activate pump by lifting float switch (9-1-0150-1 and 9-1-0150-2). Manually activate pump by switching selector to HAND (9-1-0527).
	Step 2. Check that all external power connections have been made.	Establish or re-establish power connections. Consult with facilities electricians if necessary.
	Step 3. Check that pump circuit breakers are ON.	Reset pump or main circuit breaker by turning OFF, then ON.
		If condition persists, notify unit maintenance.

Table 2. Evacuation Troubleshooting Procedures

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. Tank does not evacuate.	Step 1. Check that pump is operating.	Refer to malfunction index item No. 1.
	Step 2. Determine if pump is airbound.	Turn pump ON and OFF several times in rapid succession at circuit breaker (9-1-0150-1 and 9-1-0150-2) or at selector switch (9-1-0527).
	Step 3. Check discharge hose for proper connection, kinks, and obstructions.	Straighten kinked discharge hose. Clear out obstructions. Replace hose that cannot be corrected.
	Step 4. Ensure check valve is operating correctly.	Inspect the check valve for obstructions and proper operation. Refer to WP 0022 00 for additional instructions.
	Step 5. Ensure that tank contents are not frozen.	Notify unit maintenance.
		If condition persists, notify unit maintenance.

Table 3. Leakage Troubleshooting Procedures

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. Water leaks.	Step 1. Check all fittings for material damage and fit.	Tighten loose fittings. Report damaged fittings to unit maintenance.
	Step 2. Check that manual drain ball valve is closed (if fitted).	Close ball valve. If ball valve will not close or leaks when closed, secure pump and report to unit maintenance.
	Step 3. Check all hoses for proper connection, kinks, and obstructions.	Tighten all hose connections. Straighten kinked hoses. Clear out obstructions. Replace hoses that cannot be corrected.
	Step 4. Check tank body for cracks and holes.	Report damage to unit maintenance.
	Step 5. Check that pump is operating.	Refer to malfunction index item No. 1.
	Step 6. Check lid for proper fit.	Secure lid retainers.
		If condition persists, notify unit maintenance.

CHAPTER 4

OPERATOR MAINTENANCE INSTRUCTIONS

SEWAGE EJECTION PUMP (SEP)

SEWAGE EJECTION PUMP (SEP)
PREVENTATIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are performed to keep the SEP in good operating condition and ready for its primary mission. The checks are used to find, correct, and report problems. PMCS is performed every day the SEP is in operation, and is done according to the PMCS table provided. Pay attention to **WARNING**, **CAUTION**, and **NOTE** statements. A **WARNING** indicates that someone could be injured or killed. A **CAUTION** indicates that equipment could be damaged. A **NOTE** may make your maintenance or repair task easier.

Be sure to perform scheduled PMCS. Always perform PMCS in the same order so it becomes habit. With practice, you will quickly recognize problems with the equipment.

Use DA Form 2404, Equipment Inspection and Maintenance Worksheet, to record any discovered faults. Do not record faults that you fix!

PMCS PROCEDURES

Table 1., Preventive Maintenance Checks and Services, lists inspections and care required to keep your equipment in good operating condition. It is arranged so that you can perform before operation checks as you walk around the equipment.

Explanation of Table 1 Columns

Item Number
Indicates the reference number. When completing DA Form 2404, Equipment Inspection and Maintenance Worksheet, include the item number for the item to check/service indicating a fault. Item numbers appear in the order you must perform the checks/services listed.

Interval
Indicates when you must perform the procedure in the procedure column.

- **before** - perform **before** equipment operation
- **during** - perform **during** equipment operation
- **after** - perform **after** equipment has been operated
- **weekly** - perform every **week**
- **monthly** - perform each **month**
- **quarterly** – perform every **three months**
- **hours** - perform at the noted **hourly interval**

Item to Check/Service
Indicates the item to be checked or serviced.

Procedure
Indicates the procedure you must perform on the item listed in Item to Check/Service column. You must perform the procedure at the time specified in the interval column.

Not Fully Mission Capable If:
Indicates faults that will prevent your equipment from performing its primary mission. If you perform procedures listed in the Procedure column, which show faults listed in this column, do not operate the equipment. Follow standard procedures for maintaining the equipment or reporting equipment failure.

Other Special Entries
Observe all special information and notes that appear in Table 1., Preventative Maintenance Checks and Services (PMCS).

When a check/service procedure is required for both weekly and before intervals, it is not necessary to perform the procedure twice if the equipment is operated during the weekly period.

COMMON CHECKS AND CLEANING

Cleaning
Always keep the equipment clean. Remove dirt, sand, and debris from all circuit breakers and hose connections.

Bolts, Nuts, and Screws
Check them for obvious looseness, missing, bent, or broken condition on equipment. If you find a bolt, nut, or screw you think is loose, tighten it or report it to your supervisor.

Hoses
Look for wear, damage, and leaks. Ensure clamps are tight. Wet spots show leaks, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or coupling, tighten it. If something is broken or worn out, report it to your supervisor.

LEAKAGE DEFINITION FOR PERFORMING PMCS
It is necessary for you to know how fluid leakage affects the status of the equipment. The following are the types/classes of leakage an operator needs to know to be able to determine the status of the water system. Learn these leakage definitions and remember - when in doubt, notify your supervisor.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to fluid capacity in the system, when in doubt, notify your supervisor.

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

Class III leaks should be reported immediately to your supervisor.

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

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

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

Table 1. Preventive Maintenance Checks And Services (PMCS)

Item Number	Interval	Item to Check/Service	Procedure	Not Fully Mission Capable If:
1	Before, During	SEP Tank	Check tank for damage that would result in leaks. Check serviceability of lid gasket (9-1-0150-1 and 9-1-0150-2 only).	Tank leaks due to damage. Gasket damaged or missing.
2	Before, During	SEP Tank Hose Connections	Check inflow and outflow connections and ball valve for damage and leaks.	Damaged or leaking hose connections.
3	Before, During	Circuit Breaker Box	Check box for damage and tripped circuit breaker.	Damaged box and / or tripped breakers.
4	Before, During	Pump	Check pump for damage. Ensure proper operation by manually operating pump.	Pump damaged, or does not operate.
5	Before, During	Heating Element	Check for damage and proper operation.	Heating element missing, damaged or inoperative.
6	Before, During	SEP Tank Lid / Access Panel	Check lid for damage and proper fit. Also check for presence and proper operation of retainers.	Lid missing or damaged.
7	Quarterly	Heating Element	Clean heating element. Remove any deposits on element.	Heating element with scale or lime deposits.
8	Quarterly	Pump housing	Clean thoroughly. Remove any deposits on pump housing.	Pump housing with scale or lime deposits.

LUBRICATION INSTRUCTIONS

QDC cap locking arms require three drops general-purpose oil, semi-annually.

SEWAGE EJECTION PUMP
OPERATOR MAINTENANCE PROCEDURES

INTRODUCTION TO OPERATOR MAINTENANCE

This section contains Operator Maintenance applicable to the SEP as authorized by the Maintenance Allocation Chart (MAC) of this manual.

NOTE

Maintenance programs must be followed in the applicable technical manuals. It is very important to adhere to maintenance procedures in order to prolong the serviceable life of these items.

Refer to appropriate technical manuals for associated equipment maintenance instructions (See WP 0023 00 for References). All maintenance instructions covered in this section are unique to the SEP.

All maintenance procedures in this section can be performed by one person, unless otherwise indicated. Read all **WARNINGS, CAUTIONS**, and **NOTES** carefully before attempting the procedures. This includes the warnings at the front of this manual.

Locate the maintenance function you want to perform in the chapter index and go to the appropriate maintenance paragraph.

INSPECT

Refer to Table 1, Preventative Maintenance Checks and Services (PMCS), for items to inspect.

CLEAN

Keep the SEP exterior clean by hosing down the exterior of the tank, and particularly the inlet and discharge ports, with fresh water as necessary. Ensure the circuit breaker box is closed when this is done. Wipe the circuit breaker box exterior clean as necessary.

OPERATOR MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
TANK ASSEMBLY
INSPECT, REPLACE

INITIAL SETUP

Tools

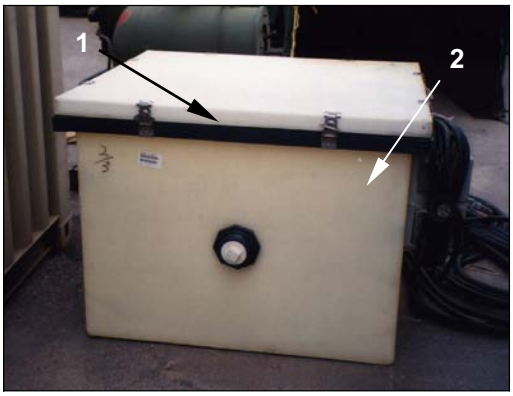
Personnel Required
One

Materials/Parts

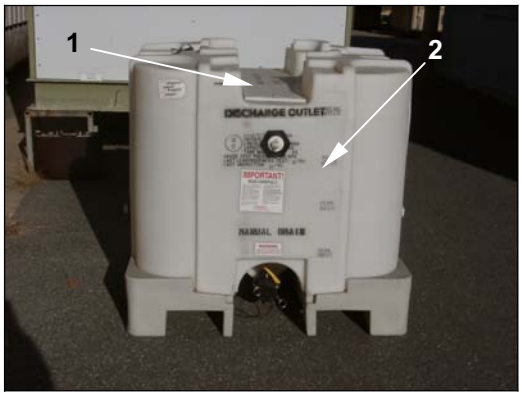
Equipment Condition
SEP set up with all connections made

INSPECT

1. Inspect tank assembly for leakage, damage, or loose hardware.
2. Inspect tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527) **(1)** for fit and material damage.
3. Inspect tank **(2)** for material damage.



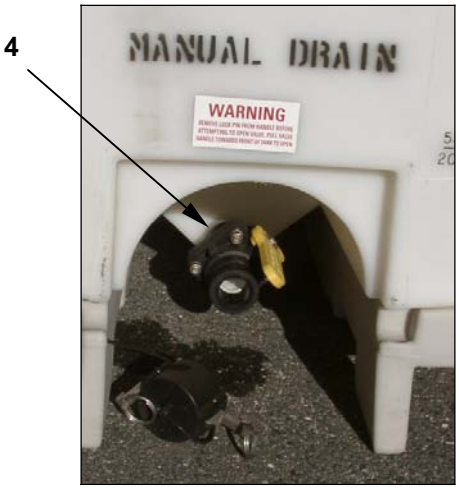
9-1-0150-1 and 9-1-0150-2



9-1-0527

4. Inspect all tank fittings **(3)** for fit and material damage.

5. Inspect drain ball valve **(4)** (if fitted) for fit, material damage, and operation.



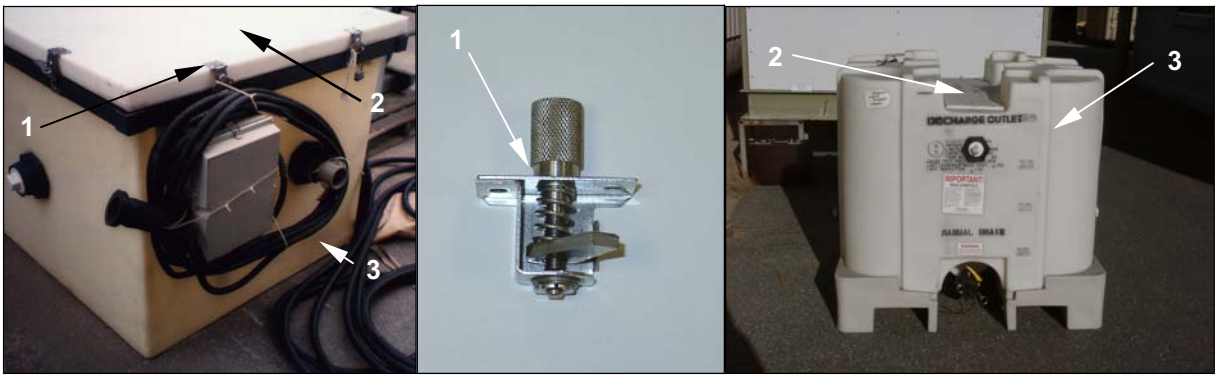
REPLACE

Replace Lid (9-1-0150-1 and 9-1-0150-2), Access Panel (9-1-0527)

WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Unfasten lid retainers **(1)**.
2. Remove lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527) **(2)** from tank **(3)**.
3. Replace with new lid.



9-1-0150-1 and 9-1-0150-2 **9-1-0527** **9-1-0527**

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
ELECTRICAL SYSTEM
INSPECT, SERVICE

INITIAL SETUP

Tools

Personnel Required

Materials/Parts

Equipment Condition
Disconnect site power
All circuit breakers and switches to OFF

INSPECT

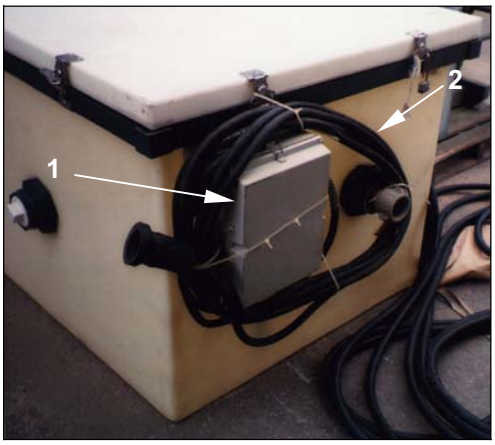
Inspect the External Electrical Components

WARNING

The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death to personnel.

1. Inspect the circuit breaker box (9-1-0150-1 and 9-1-0150-2) or control box (9-1-0527) **(1)** for material damage, corrosion, dirt, or missing hardware.

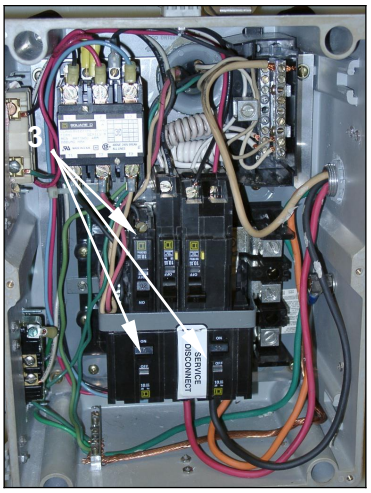
2. Inspect the power cable **(2)** for exposed wiring and material damage such as cracks or abrasion.



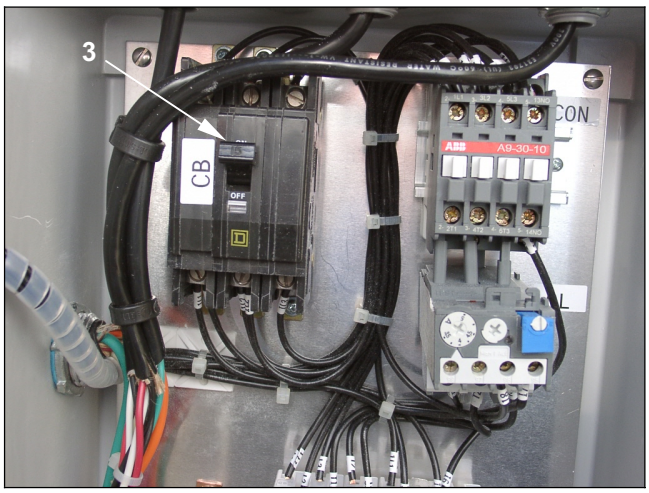
9-1-0150-1 and 9-1-0150-2

9-1-0527

3. Inspect the circuit breakers **(3)** for material damage, corrosion, dirt, or exposed wiring.



9-1-0150-1 and 9-1-0150-2



9-1-0527

Inspect the Heater and Float Switch

1. Remove tank lid (9-1-0150-1 and 9-1-0150-2) / access panel (9-1-0527) retainers.

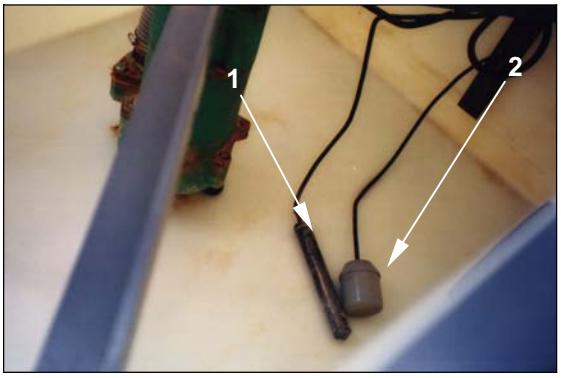
WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

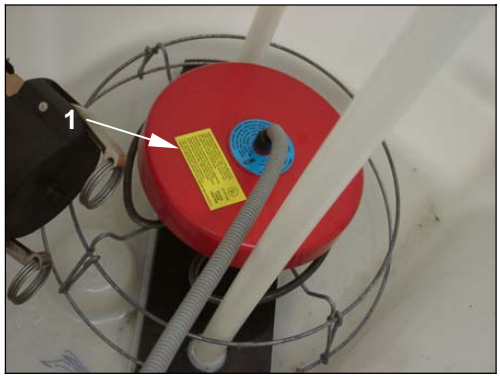
2. Remove tank lid (9-1-0150-1 and 9-1-0150-2) / access panel (9-1-0527).

3. Inspect heating element **(1)** for material damage, loose or damaged wiring, and freedom of operation.

4. Inspect float switch **(2)** for material damage, loose or damaged wiring, and freedom of travel.



9-1-0150-1 and 9-1-0150-2



9-1-0527

SERVICE

Clean Heating Element and Float Switch

1. Remove tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527) retainers.

WARNING

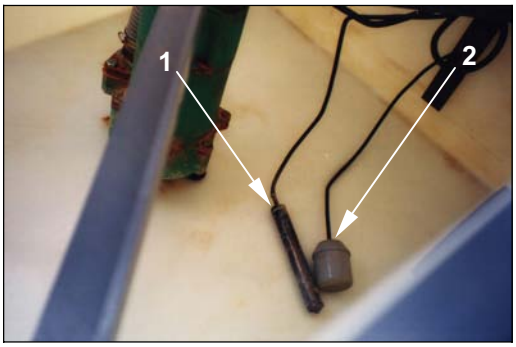
Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

2. Remove tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527).

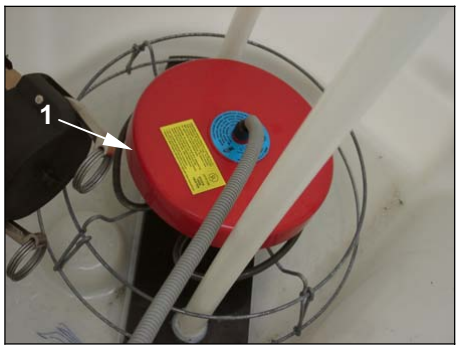
WARNING

To prevent burns, ensure that the heater element has thoroughly cooled before handling. Do not use gloves to handle a heater that has not cooled. Failure to comply with this warning may cause serious injury to personnel.

3. Wipe heating element **(1)** and float switch **(2)** free of any deposits.



9-1-0150-1 and 9-1-0150-2



9-1-0527

9-1-0527

END OF WORK PACKAGE

OPERATOR MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
PUMP ASSEMBLY
INSPECT, SERVICE

INITIAL SETUP

Tools

Personnel Required

Materials/Parts

Equipment Condition
Tank empty
Blackwater (discharge) hose disconnected
All circuit breakers OFF and tagged

INSPECT

Inspect Pump Assembly

1. Release tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527) retainers.

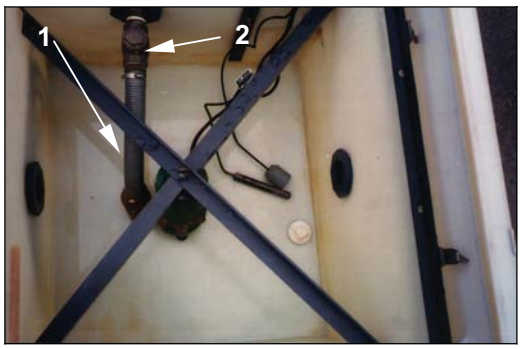
WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious injury or death to personnel.

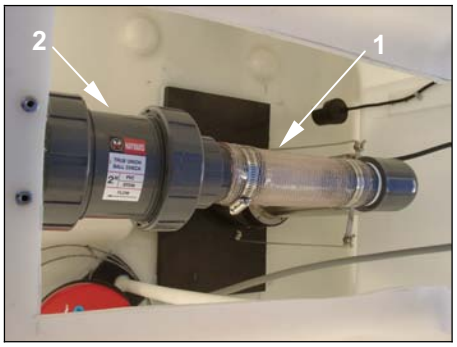
2. Remove tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527).

3. Inspect internal discharge hose assembly **(1)** for material damage, frayed material, and loose connections.

4. Inspect check valve **(2)** for evidence of material damage, loose hardware, corrosion, clogging, or improper installation.



9-1-0150-1 and 9-1-0150-2



9-1-0527

SERVICE

Clean Pump Exterior

1. Remove tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527) retainers.

WARNING

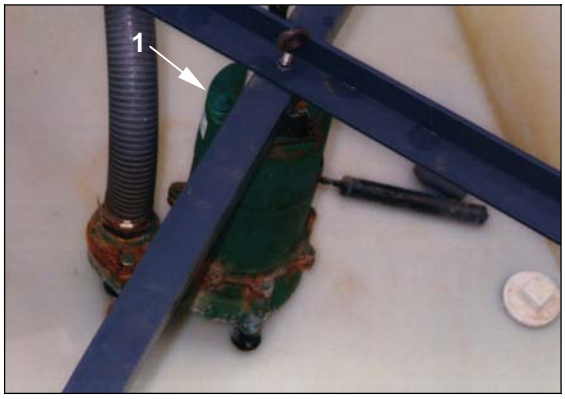
Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious injury or death to personnel.

2. Remove tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527).

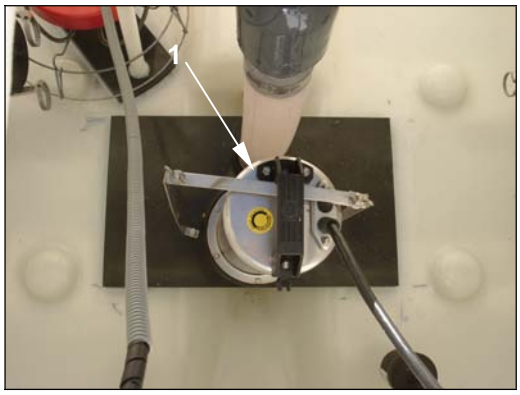
WARNING

To prevent burns, ensure that the heater element has thoroughly cooled before servicing the pump assembly. Do not use gloves to handle a heater that has not cooled. Failure to comply with this warning may cause serious injury to personnel.

3. Wipe pump body **(1)** free of any deposits.



9-1-0150-1 and 9-1-0150-2



9-1-0527

END OF WORK PACKAGE

CHAPTER 5

UNIT MAINTENANCE INSTRUCTIONS

SEWAGE EJECTION PUMP (SEP)

SEWAGE EJECTION PUMP (SEP)
SERVICE UPON RECIEPT

GENERAL

Refer to appropriate TMs for associated equipment maintenance instructions. Maintenance instructions covered in this section are unique to the Sewage Ejection Pump (SEP).

INTRODUCTION TO UNIT MAINTENANCE

This section contains Unit Maintenance applicable to the SEP as authorized by the MAC, WP 0025 00, of this manual. Unit Maintenance personnel may also perform all functions allocated in Operator Maintenance.

All maintenance procedures in this section can be performed by one person unless otherwise indicated. Read all **WARNINGS**, **CAUTIONS**, **NOTES**, and instructions carefully before attempting any procedures. Read and understand all warnings at the front of this manual.

Each maintenance action will include a heading the lists the actions to be taken, the tools and parts/materials required, and the condition in which the equipment must be in to perform the action.

SERVICE UPON RECEIPT OF MATERIEL

Inspect equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packaging Improvement Report.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-751.

Check to see whether the equipment has been modified.

After equipment has been positioned, check all items requiring service and perform Preventive Maintenance Checks and Services (PMCS).

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
TANK ASSEMBLY
REPLACE

INITIAL SETUP

Tools
Pipe Wrench, 24-IN. (Item 2, WP 0025 00)
Tool Kit General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
One

Materials/Parts
Refer to WP 0027 00, RPSTL as necessary

Equipment Condition
Tank empty
All hoses disconnected
All circuit breakers OFF
Power cord disconnected

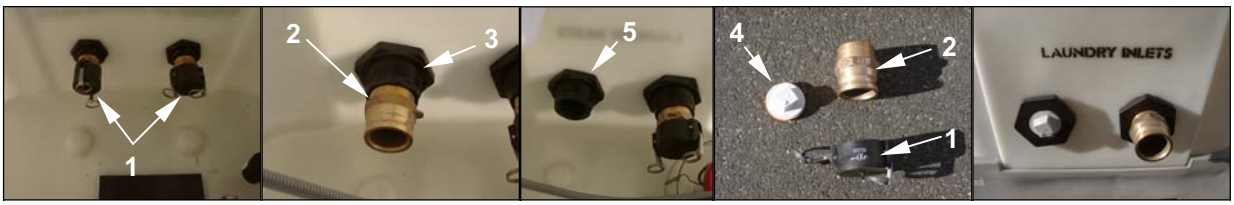
REPLACE

Replace Bulkhead Fitting

WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove coupling dust cap **(1)** from aluminum or brass coupling half **(2)**.
2. Unscrew coupling half from bulkhead fitting **(3)**.
3. Remove plug **(4)** from outside of tank.
4. Remove nut **(5)**, bulkhead fitting **(3)**, and gasket from tank.
5. Install bulkhead fitting and gasket, and secure with nut.
6. Install aluminum or brass coupling half **(2)** onto fitting.
7. Install coupling dust cap **(1)** onto coupling half.



Replace Tank

WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove all bulkhead fittings as described above.
2. Remove pump as described in WP0019 00 and install in new tank.
3. Remove circuit breaker box as described in WP0015 00 and install in new tank.
4. Remove power cable as described in WP0016 00 and install in new tank.
5. Remove heater element as described in WP0017 00 and install in new tank.
6. Remove float switch as described in WP0018 00 and install in new tank.
7. Remove internal discharge hose and components as described in WP0021 00 and install in new tank.
8. Remove check valve as described in WP0022 00 and install in new tank.

END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
CIRCUIT BREAKERS
TEST, REPLACE

INITIAL SETUP

Tools
Multimeter (Item 1, WP 0025 00)
Tool Kit General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Electrician

Materials/Parts
Circuit Breaker (Items 5/6, WP 0028 00)
Wrap, Tie (Item 5, WP 0038 00)

Equipment Condition
Disconnect site power
All circuit breakers and switches set to OFF

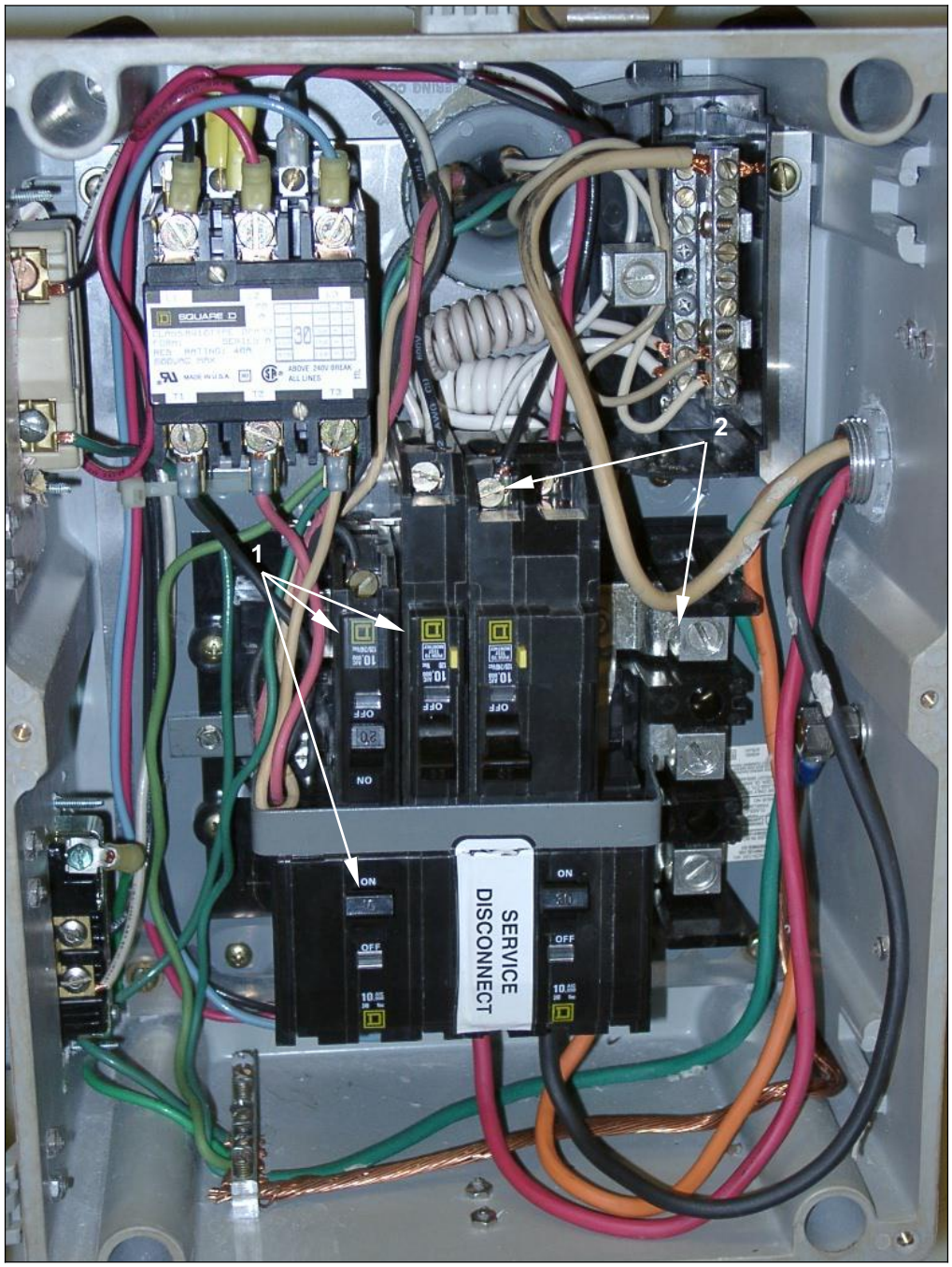
TEST

Test Circuit Breakers

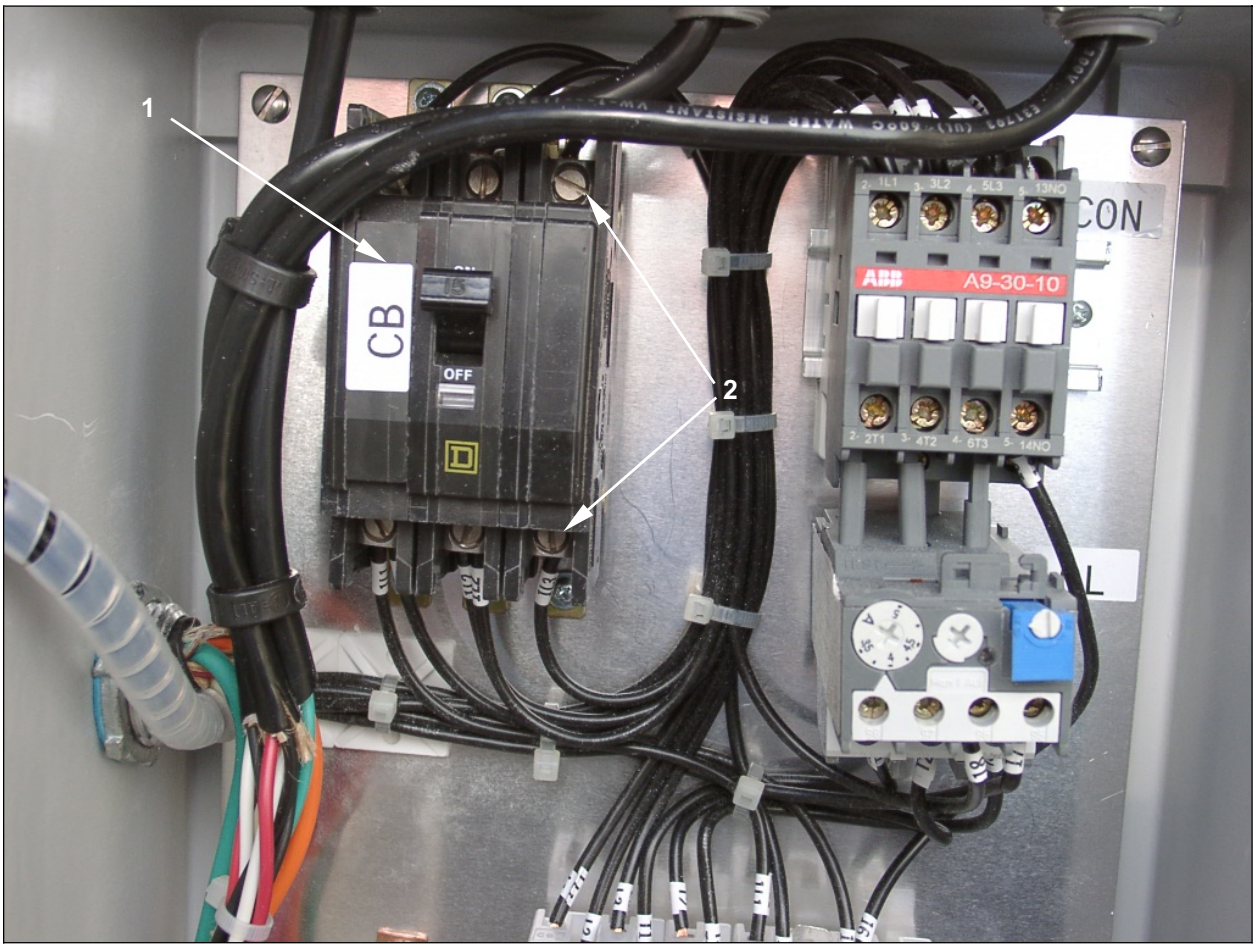
WARNING

Proceed with caution when testing circuit breakers. Touching a live wire or conductor can cause serious injury or death.

1. Open circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).
2. Turn circuit breaker OFF.
3. Remove and tag wires from circuit breaker **(1)** to be tested.
4. Using a multimeter set to read resistance (ohms Ω), check for continuity at circuit breaker **(1)** between contacts **(2)**. There should be a reading of infinity (Q).
5. If continuity is present, replace defective circuit breaker.
6. Turn circuit breaker ON.
7. Using a multimeter set to read resistance (ohms Ω), check for continuity at circuit breaker **(1)** between contacts **(2)**. There should be a reading of zero (0).
8. If no continuity is present, replace defective circuit breaker.



9-1-0150-1 and 9-1-0150-2



9-1-0527

REPLACE

Replace Circuit Breaker

WARNING

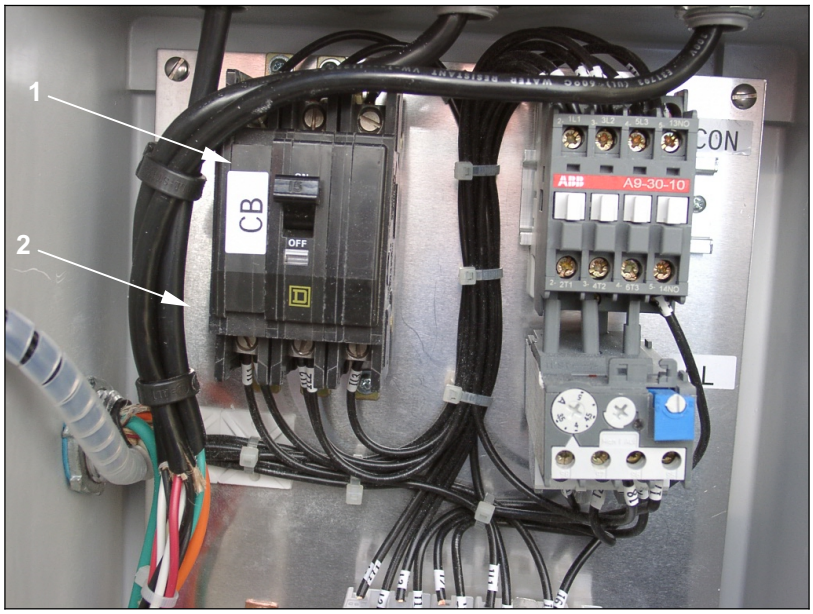
The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death to personnel.

1. Disconnect site power.
2. Open circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).

NOTE

Cut wire ties as necessary to allow for removal of circuit breaker.

3. Remove and tag wires from damaged circuit breaker **(1)**.
4. Remove damaged circuit breaker from panel **(2)**.
5. Place new circuit breaker into position on panel and secure.
6. Install wires, as tagged, onto new circuit breaker.
7. Reconnect site power.
8. Test circuit breakers as detailed above.



Replace the Circuit Breaker Box (9-1-0150-1 and 9-1-0150-2)/Control Box (9-1-0527)

WARNING

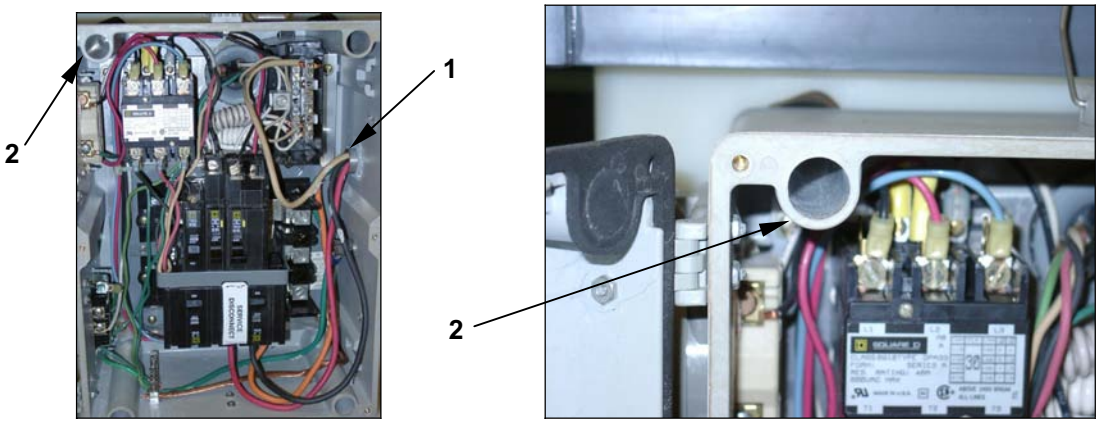
The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death to personnel.

1. Disconnect site power.
2. Open circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).
3. Tag and disconnect all wires **(1)** passing out of the circuit breaker box (9-1-0150-1 and 9-1-0150-2)/ control box (9-1-0527).

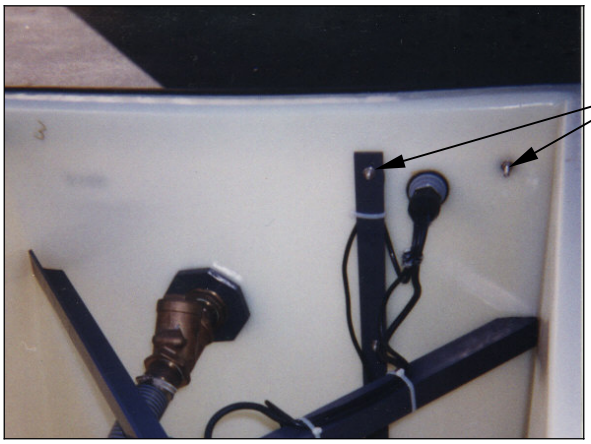
NOTE

Cut wire ties as necessary to allow for removal of circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).

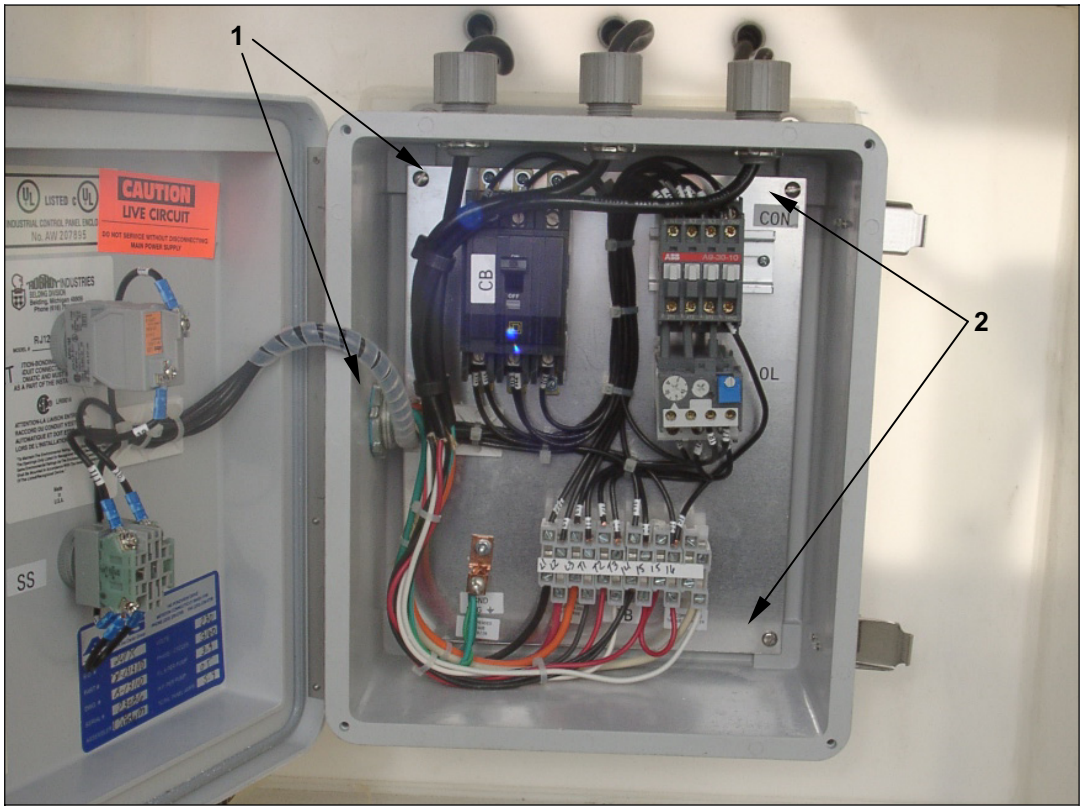
4. Remove the bolts or screws **(2)** fastening the circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527) to the SEP tank.
5. Remove circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).
6. Install replacement circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527) into position and secure with fasteners **(2)**.
7. Install wires **(1)** as tagged onto replacement circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).
8. Close and latch circuit breaker box door (9-1-0150-1 and 9-1-0150-2)/control box door (9-1-0527)
9. Reconnect site power.



9-1-0150-1 and 9-1-0150-2



9-1-0150-1 and 9-1-0150-2



9-1-0527

END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
POWER CABLE
TEST, REPLACE

INITIAL SETUP

Tools
Multi-meter (Item 1, WP 0025 00)
Tool Kit, General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Electrician

Materials/Parts
Power Cable (Item 3, WP 0028 00)

Equipment Condition
Disconnect site power
All circuit breakers to OFF
Power cable wrapped around tank

TEST

Test the Power Cable

WARNING

The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death to personnel.

1. Open circuit breaker box (9-1-0150-1 and 9-1-0150-2)/control box (9-1-0527).

2. Bring the plug end **(1)** of the power cable close enough to the circuit breaker box/control box **(2)** to use the multimeter **(3)** on both ends of the cable.

NOTE

The power cable is shown disconnected from the circuit breaker for clarity. The power cable may be checked without being disconnected from the circuit breaker; however, the circuit breaker must be OFF to get a true reading. If the circuit breaker is left ON, the meter may read continuity through the pump and heater.

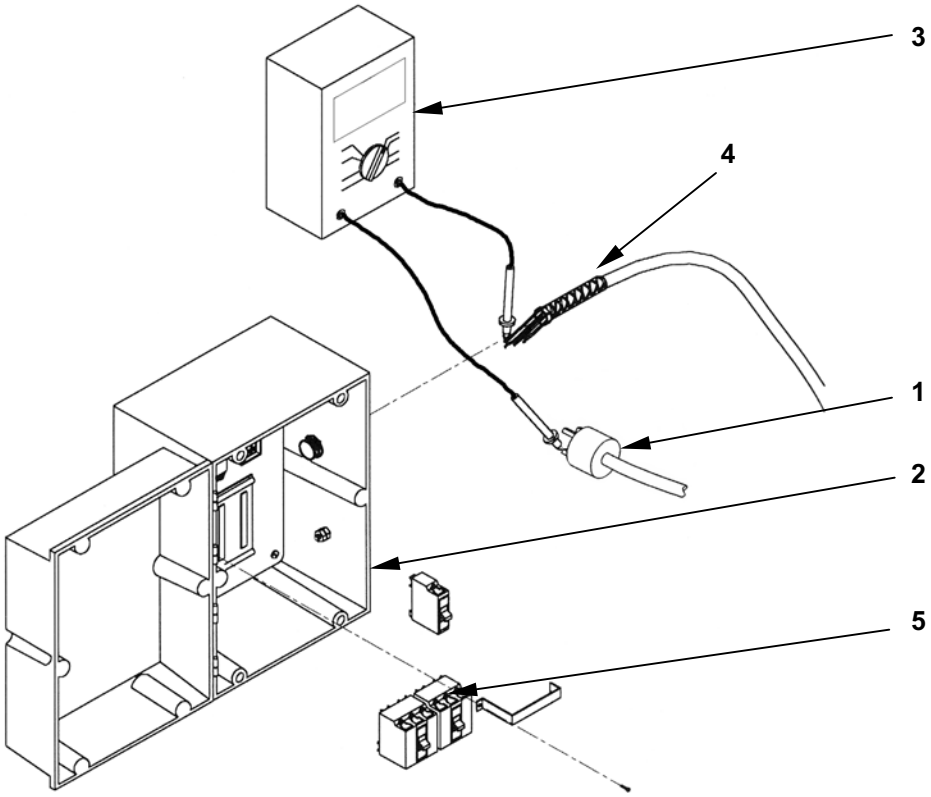
3. Using a multimeter **(3)** set to read resistance (ohms Ω), check for continuity between the circuit breaker or terminal board/control box ends of the power cable **(4)** and the plug ends **(1)**. There should be a reading of zero (0).

4. If no continuity is present, replace the power cable.

5. Using a multimeter **(3)** set to read resistance (ohms Ω), check for continuity between wires at the circuit breaker box/control box end **(4)** of the power cable. There should be a reading of infinity (Ω).

6. Using a multimeter **(3)** set to read resistance (ohms Ω), check for continuity between tines at the plug end **(1)** of the power cable. There should be a reading of infinity (Q).

7. If continuity is present, replace the power cable.



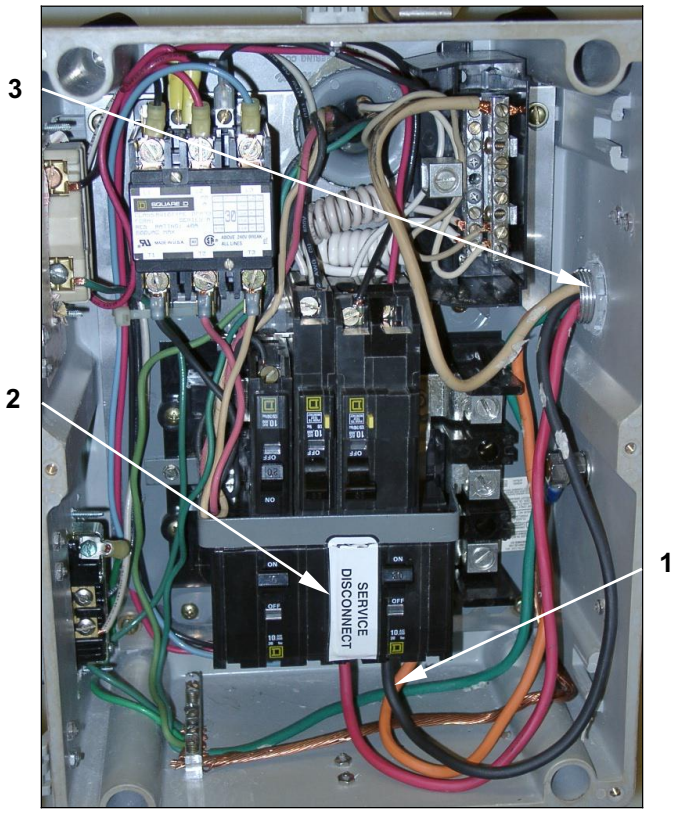
REPLACE

Replace the Power Cable

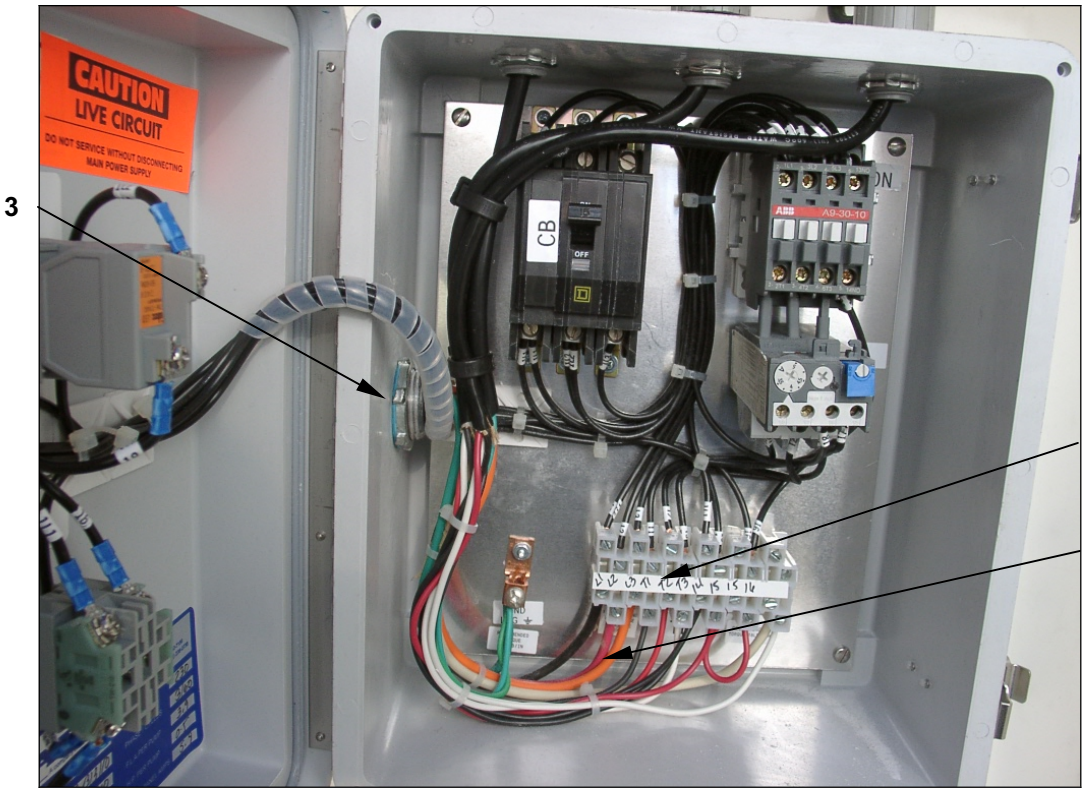
WARNING

The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death to personnel.

1. Tag and disconnect the power cable leads **(1)** from the main breaker (9-1-0150-1 and 9-1-0150-2) / terminal board (9-1-0527) **(2)**.
2. Remove conduit **(3)**.
3. Remove power cord from conduit.
4. Install the conduit on the replacement power cable. Leave approximately 12-inches of wire free.
5. Install the replacement power cable with conduit in the breaker box (9-1-0150-1 and 9-1-0150-2) / control box (9-1-0527).



9-1-0150-1 and 9-1-0150-2



9-1-0527

END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
HEATER ELEMENT
TEST, REPLACE

INITIAL SETUP

Tools
Multi-meter (Item 1, WP 0025 00)
Tool Kit General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Electrician

Materials/Parts
Heater Element (Item 1/2, WP 0029 00)

Equipment Condition
All circuit breakers OFF
Power disconnected

TEST

Test Heater Element

WARNING

The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death to personnel.

WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior.
Failure to do so may result in serious illness or death to personnel.

NOTE

To ensure the correct component is being tested, the lid or access panel must be removed and the wire from the heater traced to the back of the circuit breaker box. To confirm the wire is correct, have an assistant lightly tug on the wire from the inside of the SEP.

1. Locate, disconnect, and tag heater wires **(1)** from heater circuit breaker or terminal board **(2)**.
2. Identify the ground wire and the two heater leads. The ground wire will be green, and will connect to the breaker box/control box.
3. Using a multimeter **(3)** set to read resistance (ohms Ω), check for continuity between the two heater wires and the ground wire. There should be a reading of infinity Ω.

4. Replace a heater element that shows continuity between any heater lead and ground.

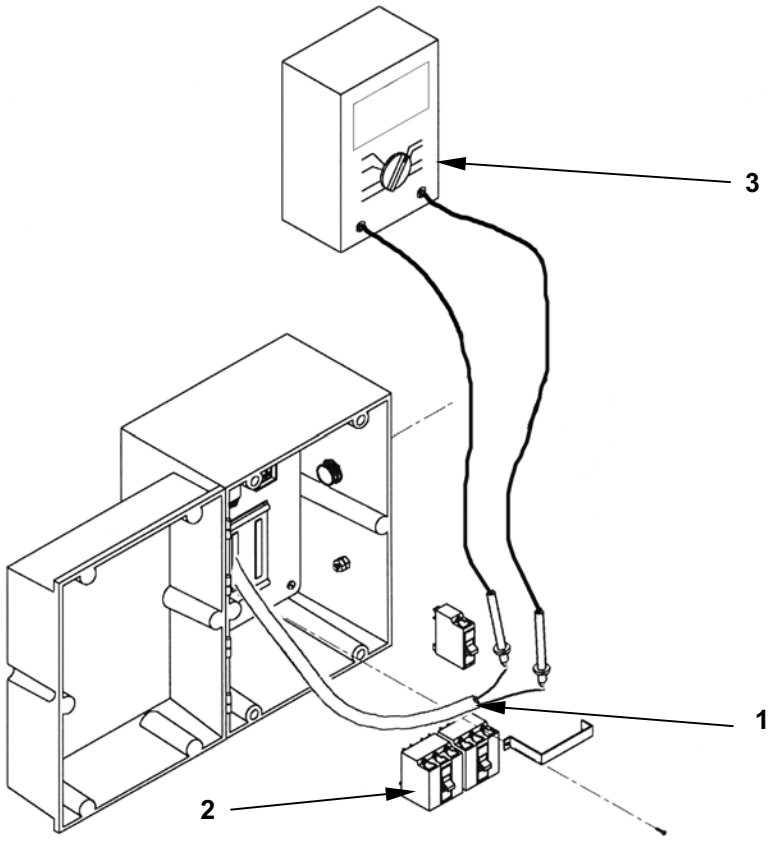
NOTE

The test described in steps 5. and 6. cannot be performed on the Waste Water Evacuation SEP (9-1-0527).

5. Using a multimeter **(3)** set to read resistance (ohms Ω), check for continuity between the two heater wires. There should be continuity (9-1-0150-1 and 9-1-0150-2 only).

6. If there is a reading of zero (0) or infinity (Q), replace heater element. (9-1-0150-1 and 9-1-0150-2 only).

7. Replace an inoperative heater element (9-1-0527).



REPLACE

Replace the Heater Element

WARNING

Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove tank lid /access panel.

WARNING

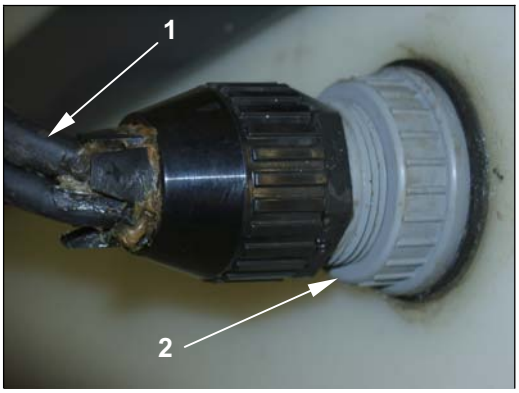
The site power must be disconnected before proceeding further. Touching a live wire can cause serious injury or death to personnel.

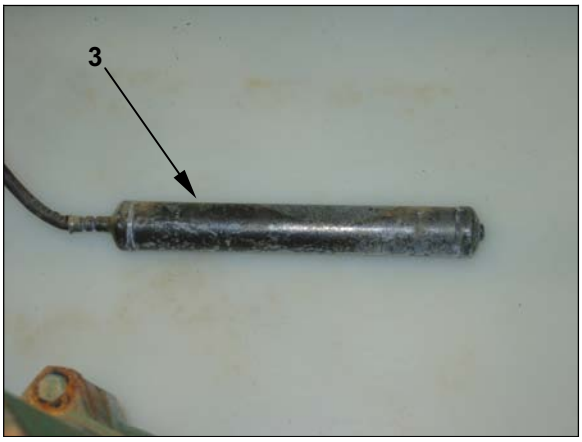
2. Disconnect and tag wires at circuit breaker/ terminal board (refer to Test Heater Element procedure above).
3. Pull cord **(1)** through bushing **(2)**.

WARNING

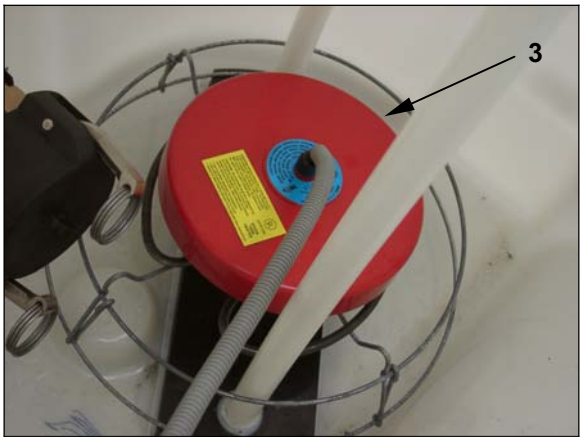
To prevent burns, ensure that the heater element has thoroughly cooled before handling. Do not use gloves to handle a heater that has not cooled.

4. Remove heater element **(3)**.
5. Install new heater element.
6. Feed cord through bushing.
7. Connect wires as tagged.
8. Check for proper operation.
9. Install lid/access panel





9-1-0150-1 and 9-1-0150-2



9-1-0527

END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
FLOAT SWITCH
TEST, REPLACE

INITIAL SETUP

Tools
Multi-meter (Item 1, WP 0025 00)
Tool Kit, General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Electrician

Materials/Parts
Float Switch (Item 1, WP 0030 00)

Equipment Condition
All circuit breakers OFF
Tank empty
All inlet hoses disconnected

TEST

Test Float Switch Operation

WARNING

Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious injury or death to personnel.

1. Remove tank lid/access panel.

WARNING

Proceed with caution while testing the float switch. Touching a live wire can cause serious injury or death to personnel.

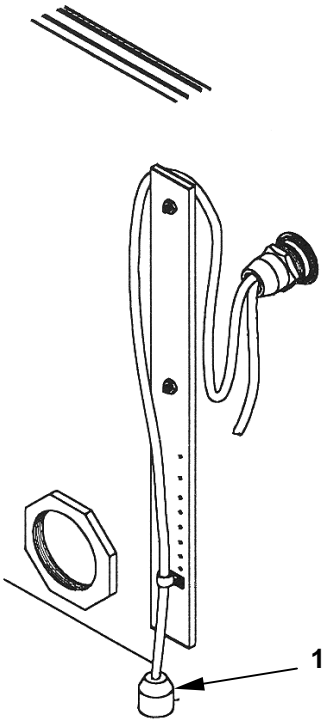
2. Connect power, and turn circuit breaker ON.
3. Activate the float switch **(1)** manually by lifting the float switch until pump comes on (9-1-0150-1 and 9-1-0150-2). Turn selector switch to AUTO (9-1-0527).
4. Release the float switch, making sure that it returns to its lowest position.
5. If pump comes ON, but will not shut OFF, replace float switch.
6. If pump will not come on, turn OFF and tag all circuit breakers and terminal board.

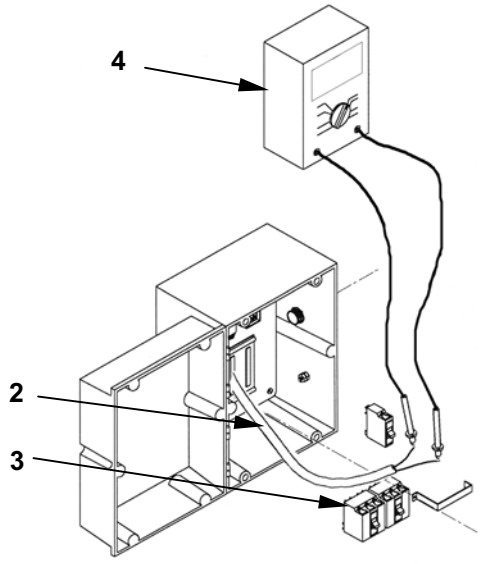
7. Disconnect power cord.

NOTE

To ensure the correct wires have been located, have an assistant tug lightly on the float switch wiring before attempting to disconnect.

8. Disconnect and tag float switch wires **(2)** at circuit breaker/terminal board **(3)**.
9. Hold free end of float switch down (to turn switch OFF).
10. Using a multimeter **(4)** set to read resistance (ohms Ω), check for continuity between the two float switch wires. There should be a reading of infinity (Q).
11. If continuity exists, replace float switch.
12. Hold free end of float switch up (to turn switch ON).
13. Using a multimeter set to read resistance (ohms Ω), check for continuity between the two float switch wires. There should be a reading of zero (0).
14. If no continuity exists, replace float switch.
15. Install lid/access panel.





REPLACE

Replace the Float Switch

WARNING

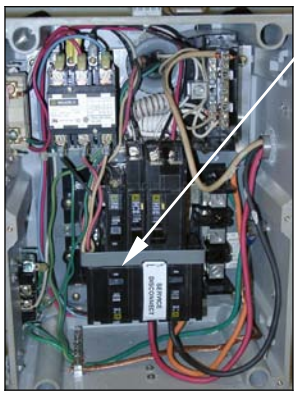
Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious injury or death to personnel.

1. Remove tank lid/access panel.

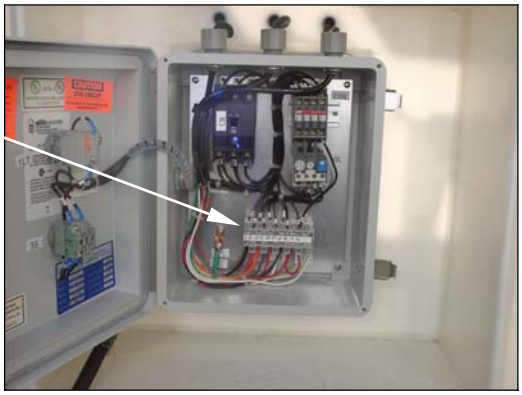
WARNING

The site power must be disconnected before proceeding further. Touching a live wire can cause serious injury or death to personnel.

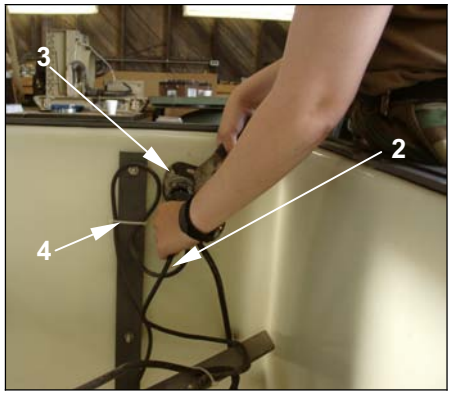
2. Disconnect and tag wires at circuit breaker/terminal board **(1)** (Refer to Test Float Switch procedure detailed above).
3. Pull cord **(2)** through bushing **(3)** and bracket **(4)**.
4. Remove float switch **(5)**.
5. Install new float switch **(5)**.
6. Feed cord **(2)** through bracket **(4)** and bushing **(3)**.
7. Connect wires at circuit breaker/terminal board **(1)**.
8. Set float height as desired.
9. Install lid/access panel.



9-1-0150-1 and 9-1-0150-2

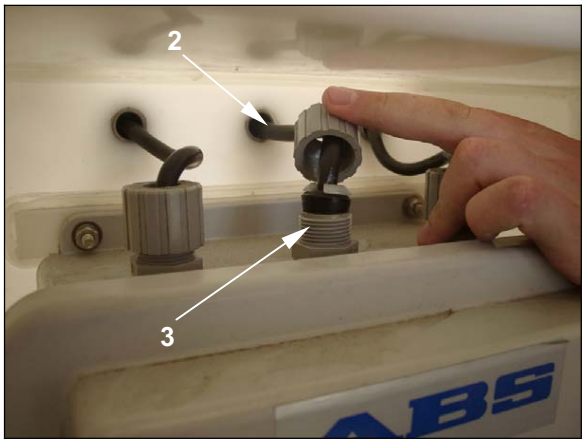


9-1-0527

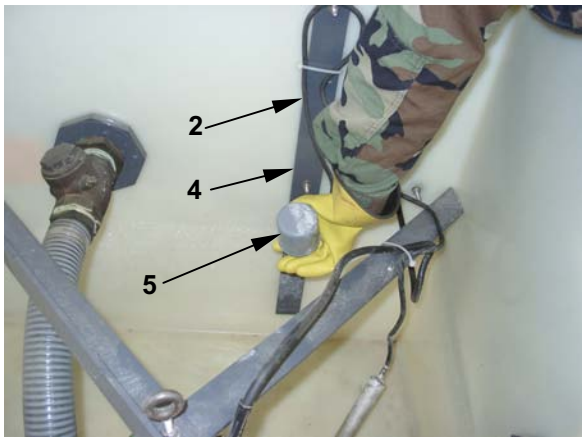


9-1-0150-1 and 9-1-0150-2

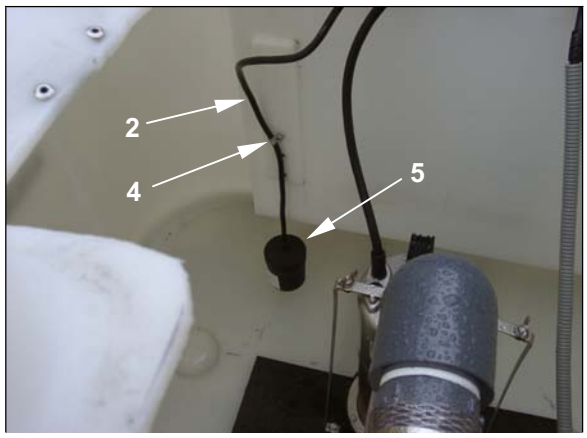
9-1-0527



9-1-0527



9-1-0150-1 and 9-1-0150-2



9-1-0527

END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
PUMP
REPLACE

INITIAL SETUP

Tools
Multi-meter (Item 1, WP 0025 00)
Tool Kit, General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Electrician

Materials/Parts
Refer to Fig. 5, WP 0031 as necessary for replacement parts.

Equipment Condition
Disconnect site power
All circuit breakers set to OFF
Tank empty

REPLACE

Replace the Pump (9-1-0150-1 and 9-1-0150-2)

WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious injury or death to personnel.

1. Remove tank lid.
2. Remove the eyebolt **(1)** from the cross brace **(2)**.
3. Remove the cross brace **(2)** and spacer **(3)**.
4. Disconnect the internal discharge hose **(4)** from the pump discharge.
5. Loosen the power cord tank bushing.

WARNING

The site power must be disconnected before proceeding further. Touching a live wire can cause serious injury or death to personnel.

6. Disconnect and tag the power cord leads **(5)** from the contactor.
7. Remove the pump **(6)** from the SEP **(7)**.

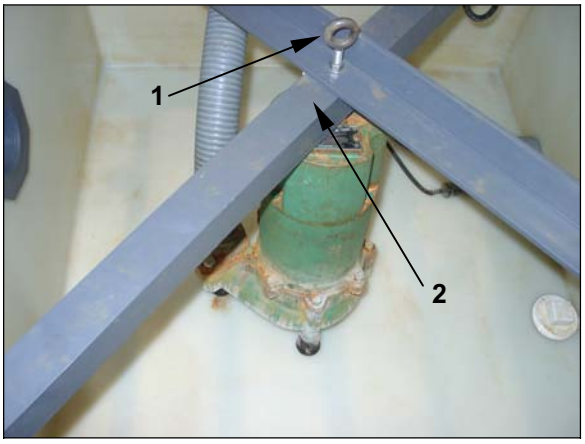
NOTE

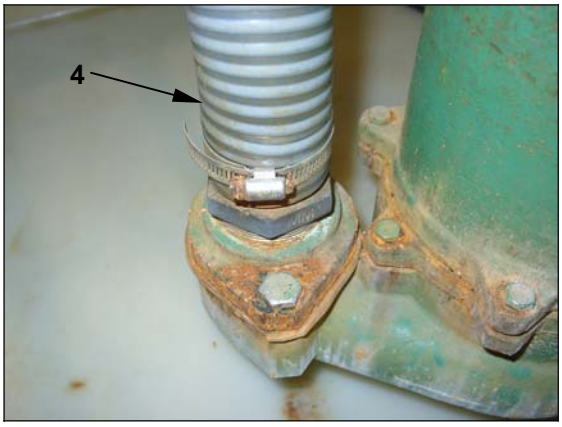
Proceed with steps 7 through 21 only if the replacement pump does not have a power cord.

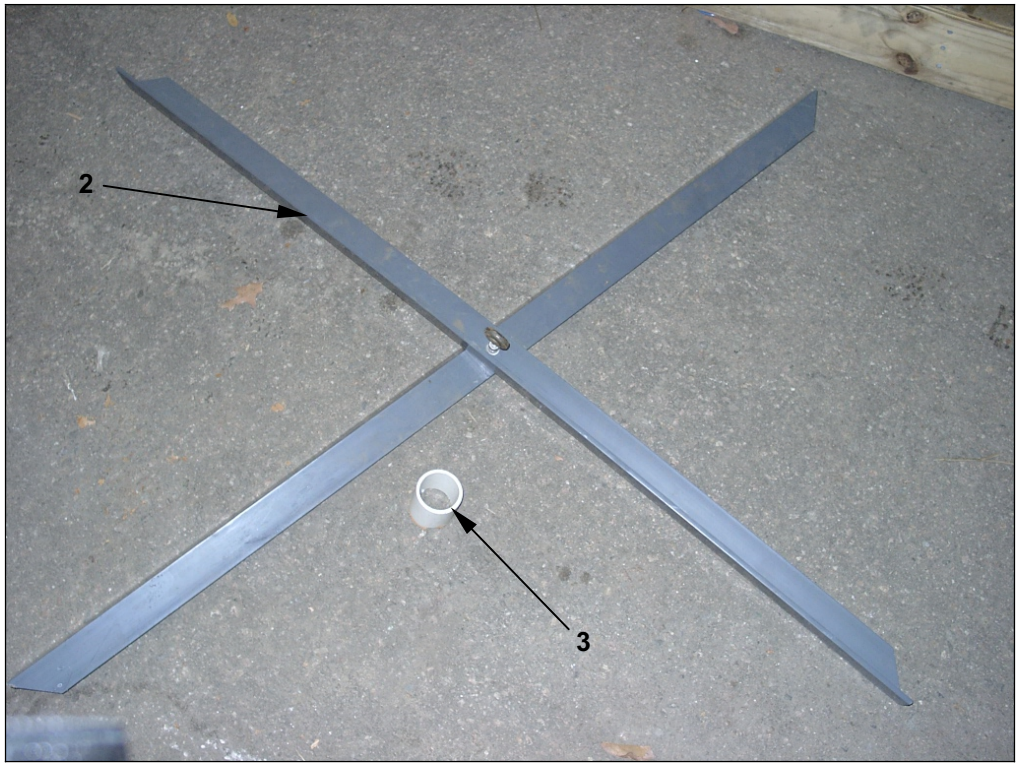
8. Locate the oil fill plug **(8)** in the top of the pump motor.
9. Remove oil fill plug and drain oil.
10. Remove bolts **(9)** from capacitor housing **(10)**. Lift housing.
11. Remove rubber seal ring **(11)**.
12. Disconnect and tag cord leads.
13. Remove ground screw **(12)**.
14. Unscrew cord bushing **(13)** from housing.
15. Remove power cord from housing.
16. Install new cord bushing **(13)**.
17. Install ground screw **(12)**.
18. Reconnect cord leads.
19. Install new rubber seal ring **(11)**.
20. Install capacitor housing **(10)**.
21. Refill with new oil to one-inch from top of capacitor housing (approximately 2-quarts).
22. Install oil fill plug **(8)**.
23. Install pump **(6)** in SEP tank **(7)**.
24. Install power cord at contactor as tagged.
25. Tighten the power cord tank bushing.
26. Install the internal discharge hose **(4)**.
27. Install the spacer **(3)**, cross brace **(2)** and eyebolt **(1)**.
28. Install the tank lid.
29. Test for proper operation.

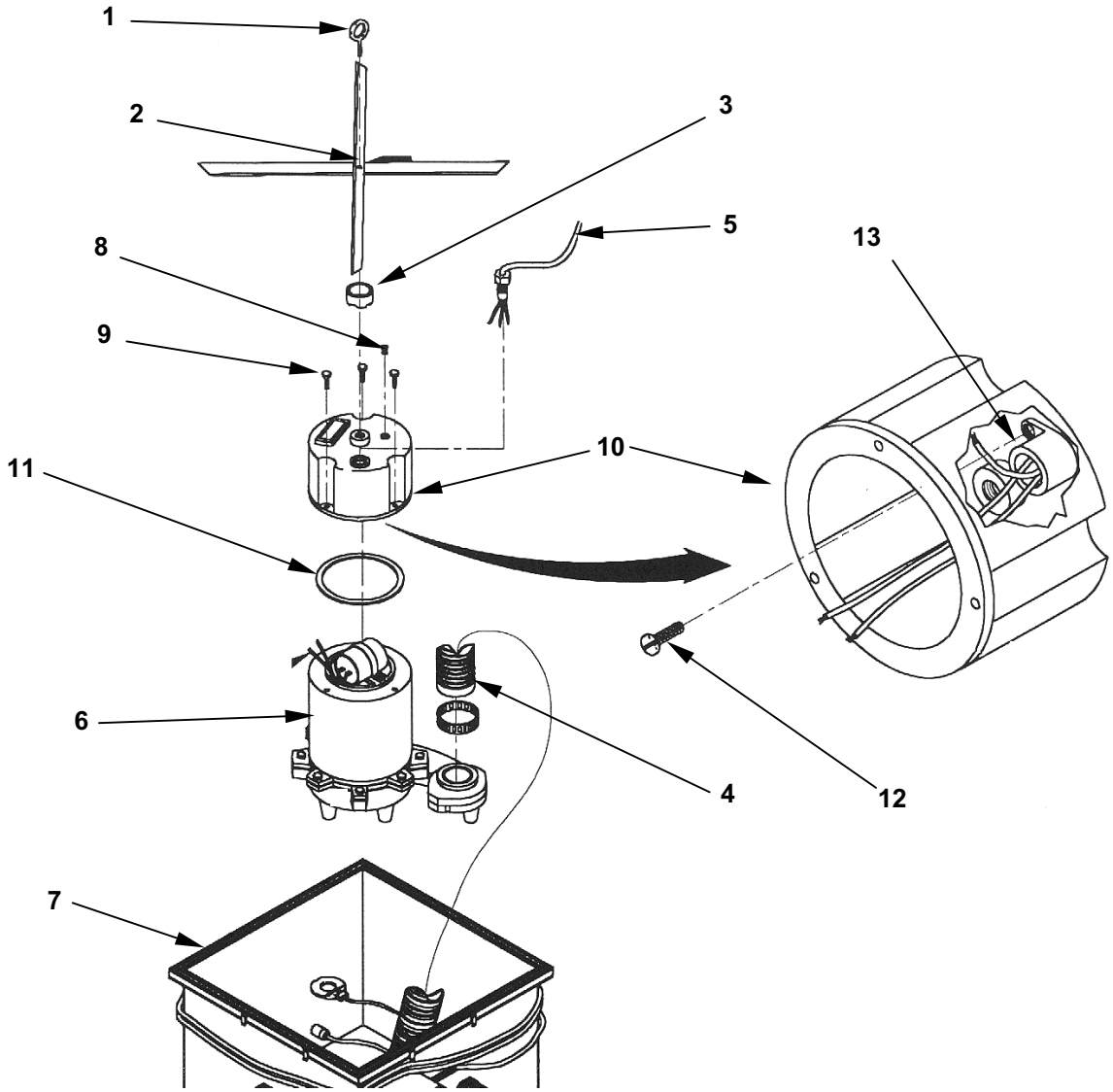
NOTE

If the pump has diminished output after replacement, the pump may be wired out of phase. To correct this, go to the circuit breaker and switch any two leads on the pump wires. Phase may also be changed at the power connection – contact power service personnel to change phase in this manner.








1
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7

Replace the Pump (9-1-0527)

WARNING

Ensure that the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious injury or death to personnel.

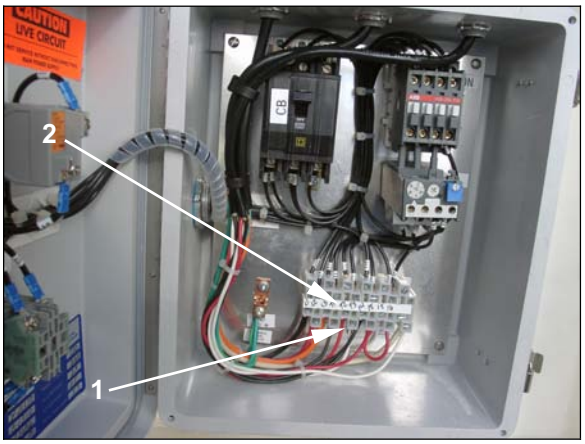
WARNING

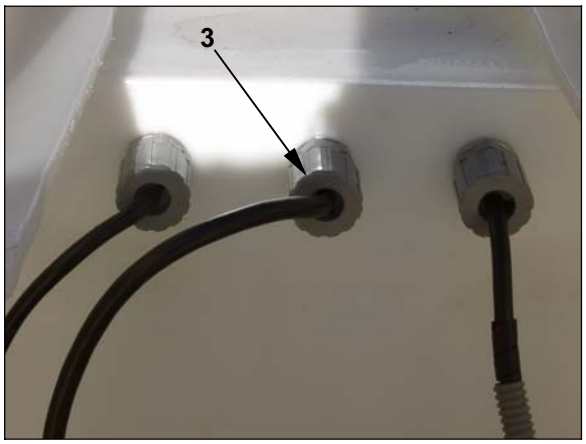
The site power must be disconnected before proceeding further. Touching a live wire can cause serious injury or death to personnel.

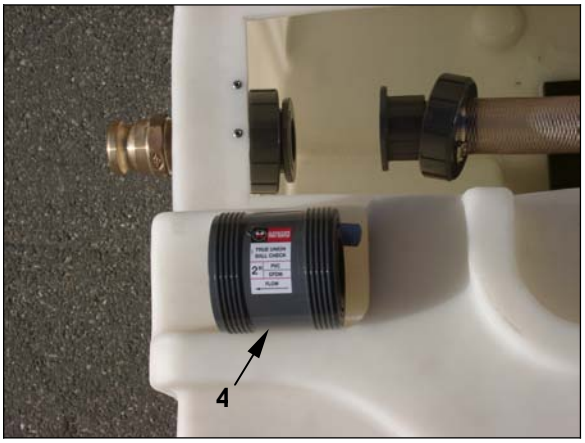
1. Tag and disconnect the pump wiring **(1)** from the terminal board **(2)**.
2. Remove the access panel.
3. Loosen the pump power cord bushings **(3)**.
4. Pull the pump power cord through the bushings.
5. Remove the check valve connection **(4)**.
6. Remove the two wingnuts on the pump bracket **(5)**.
7. Remove the bracket.
8. Remove the pump **(6)**.
9. Remove the discharge hose **(7)** from the pump.
10. Install the discharge hose on the replacement pump.
11. Install the replacement pump.
12. Reinstall the pump bracket **(5)** and secure with wingnuts.
13. Reinstall the check valve connection **(4)**.
14. Feed the pump power cord through the pump power cord bushings **(3)**.
15. Connect the pump power cord to the terminal board **(2)**.
16. Tighten the pump power cord bushings.
17. Reinstall the access panel.
18. Check for proper operation.

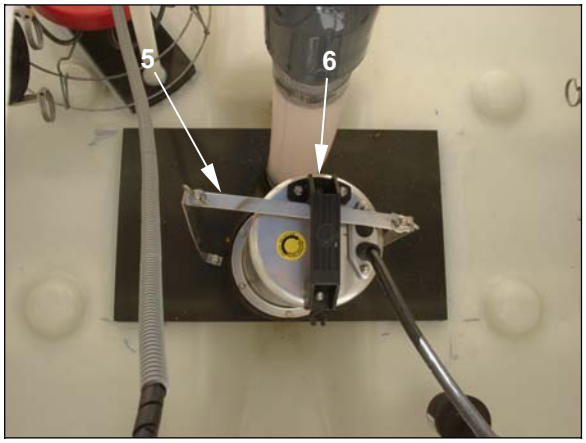
NOTE

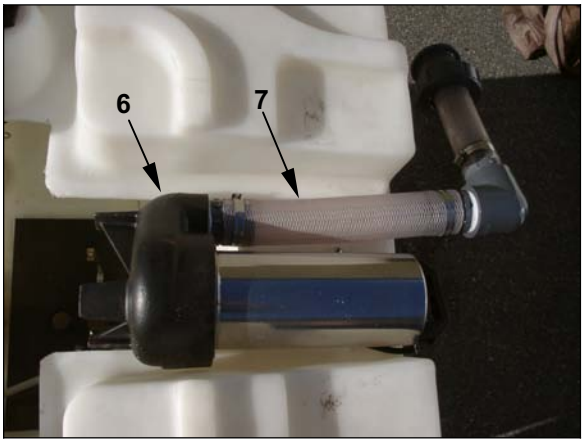
If the pump has diminished output after replacement, the pump may be wired out of phase. To correct this, go to the circuit breaker and switch any two leads on the pump wires. Phase may also be changed at the power connection – contact power service personnel to change phase in this manner.

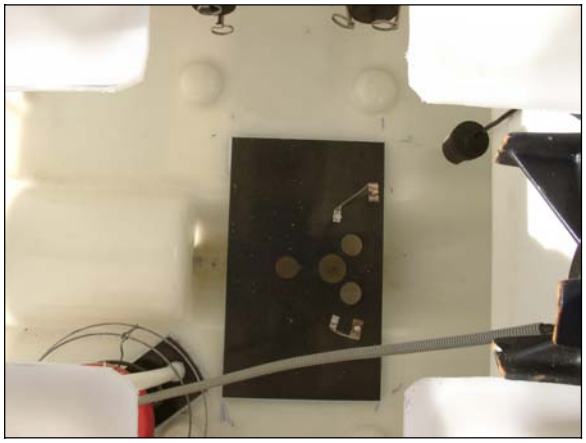












END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
PUMP POWER CORD
REPLACE

INITIAL SETUP

Tools
Multi-meter (Item 1, WP 0025 00)
Tool Kit, General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Electrician

Materials/Parts
Refer to Fig. 5, WP 0031 for replacement parts.

Equipment Condition
Disconnect site power
All circuit breakers set to OFF
Tank empty

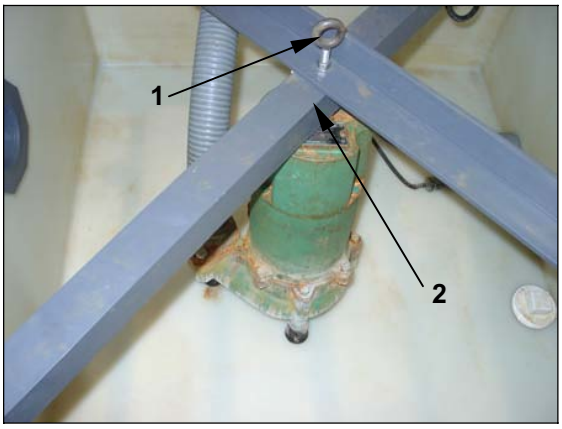
REPLACE

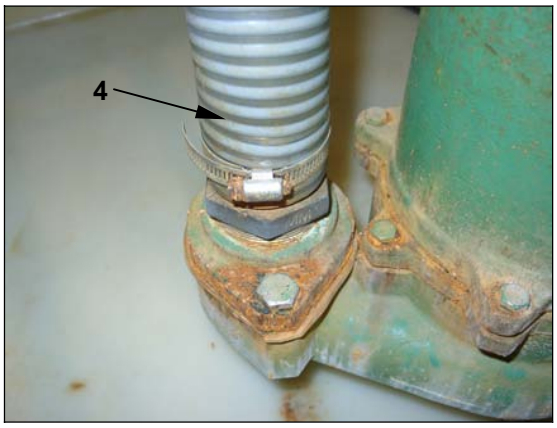
Replace the Pump Power Cord

WARNING

Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove tank lid.
2. Remove the eyebolt **(1)** from the cross brace **(2)**.
3. Remove the cross brace **(2)** and spacer **(3)**.





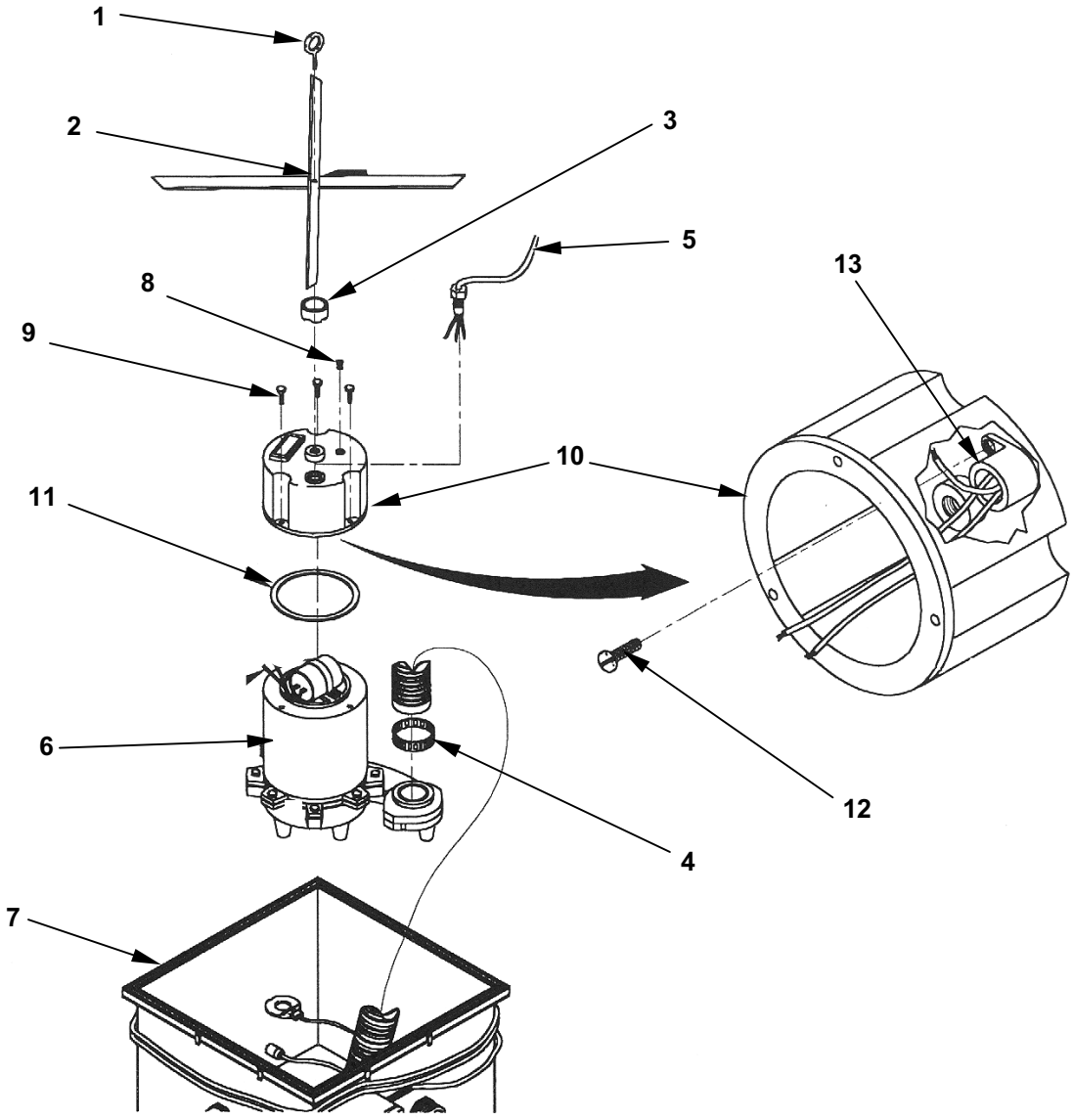
4. Disconnect the interior discharge hose **(4)** from the pump discharge.
5. Loosen the power cord tank bushing.

WARNING

The site power must be disconnected before proceeding further.
Touching a live wire can cause serious injury or death.

6. Disconnect the power cord **(5)** from the contactor.
7. Remove the pump **(6)** from the SEP **(7)**.
8. Locate the oil fill plug **(8)** in the top of the pump motor.
9. Remove oil fill plug and drain oil.
10. Remove bolts **(9)** from capacitor housing **(10)**.
11. Lift housing.
12. Remove rubber seal ring **(11)**.
13. Disconnect and tag cord leads.
14. Remove ground screw **(12)**.
15. Unscrew cord bushing **(13)** from housing.
16. Remove power cord from housing.
17. Install new cord bushing **(13)**.
18. Install ground screw **(12)**.
19. Reconnect cord leads.
20. Install new rubber seal ring **(11)**.
21. Install capacitor housing **(10)**.
22. Refill with new oil to one-inch from top of capacitor housing (approximately 2-quarts).
23. Install oil fill plug **(8)**.
24. Install pump **(6)** in SEP tank **(7)**.
25. Install the internal discharge hose **(4)**.

26. Connect the power cord to the contactor, and tighten the power cord tank bushing.
27. Install the spacer **(3)**, cross brace **(2)** and eyebolt **(1)**.
28. Install the tank lid.



END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
INTERNAL DISCHARGE HOSE
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required

Materials/Parts
Hose (Item 1, WP 0032 00)
Hose Clamp (Item 2, WP 0032 00)

Equipment Condition
All circuit breakers OFF
Tank empty
All hoses disconnected

REPLACE

Replace Internal Discharge Hose

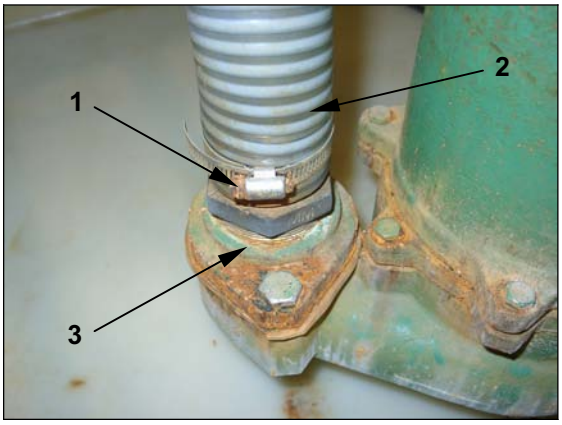
WARNING

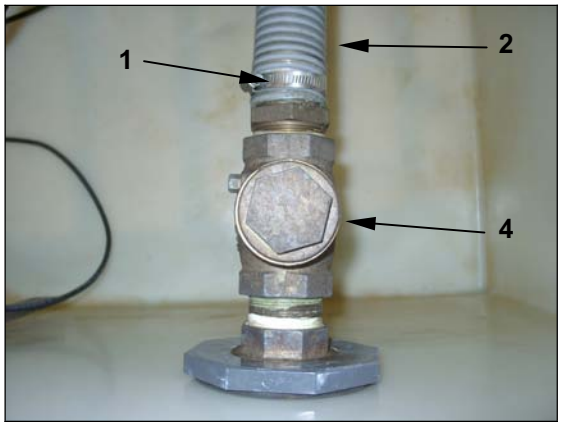
Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

NOTE

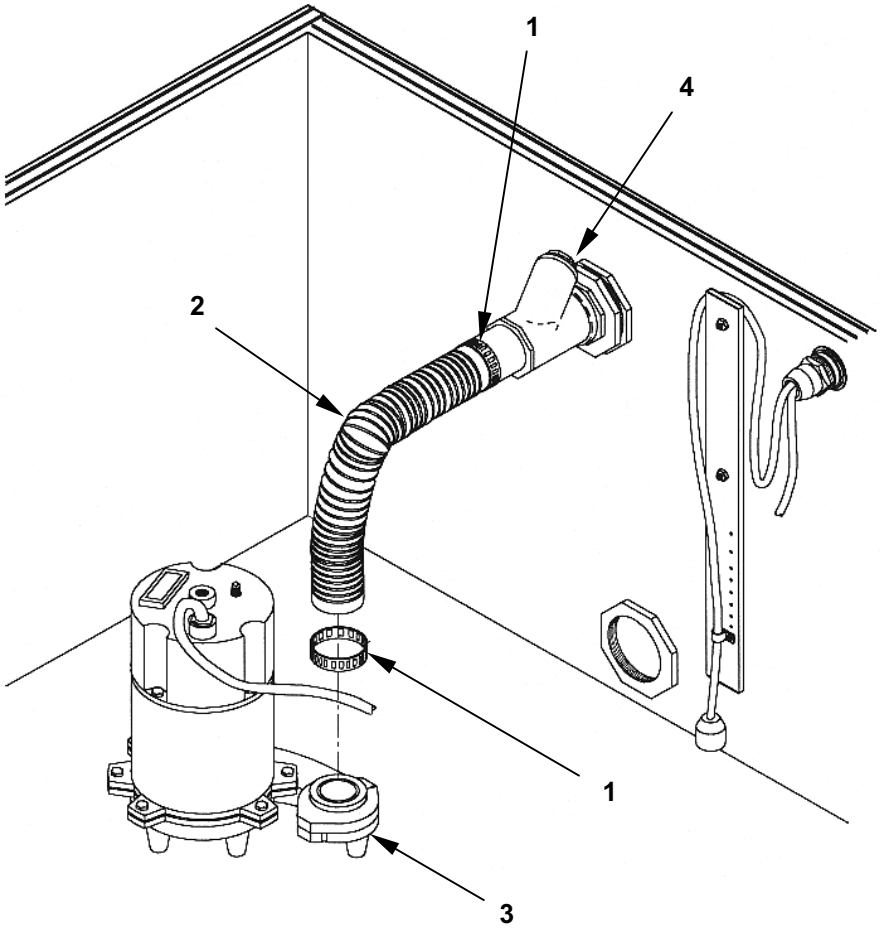
The new SEP (9-1-0527) has a hose assembly made up of two hoses and an elbow. Any of these components may be replaced individually.

1. Remove lid/access panel.
2. Loosen hose clamps **(1)**.
3. Remove discharge hose assembly **(2)** from pump outlet **(3)** and check valve **(4)**.
4. Replace hoses and elbow as necessary (9-1-0527 only).
5. Install replacement discharge hose assembly to pump outlet and check valve.
6. Secure with new hose clamps.

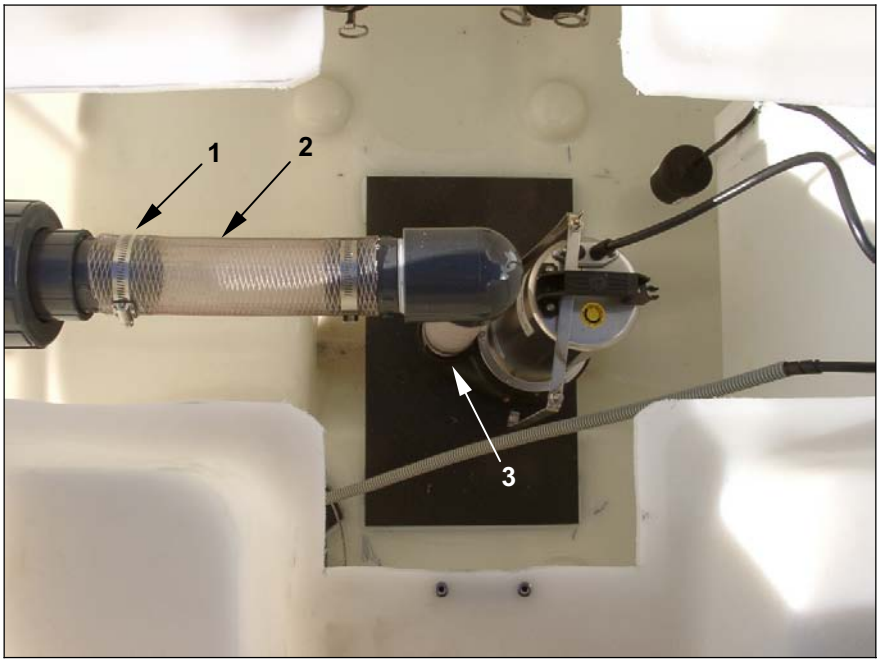




9-1-0150-1 and 9-1-0150-2



9-1-0150-1 and 9-1-0150-2



9-1-0527

END OF WORK PACKAGE

UNIT MAINTENANCE
SEWAGE EJECTION PUMP, LAUNDRY
NSN 4630-01-413-2606
SEWAGE EJECTION PUMP, GENERAL PURPOSE
NSN 4630-01-413-2608
SEWAGE EJECTION PUMP, WASTE WATER EVACUATION
NSN 4630-01-505-3746
CHECK VALVE
TEST, SERVICE, REPLACE

INITIAL SETUP

Tools
Garden Hose
Pipe Wrench, 24-IN. (Item 2, WP 0025 00)
Tool Kit, General Mechanics Automotive (Item 3, WP 0025 00)

Personnel Required
Two

Materials/Parts
Check valve (Item 4, WP 0032 00)
Check valve (Item 1, WP 0032 00)

Equipment Condition
SEP set up
All hose connections made
Tank empty
All circuit breakers to OFF
All switches to OFF

TEST

Test Check Valve

WARNING

Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove tank lid (9-1-0150-1 and 9-1-0150-2) or access panel (9-1-0527).
2. Fill tank to approximately 12-IN. depth.
3. Turn main circuit breaker ON.
4. Turn pump circuit breaker ON (9-1-0150-1 and 9-1-0150-2).

WARNING

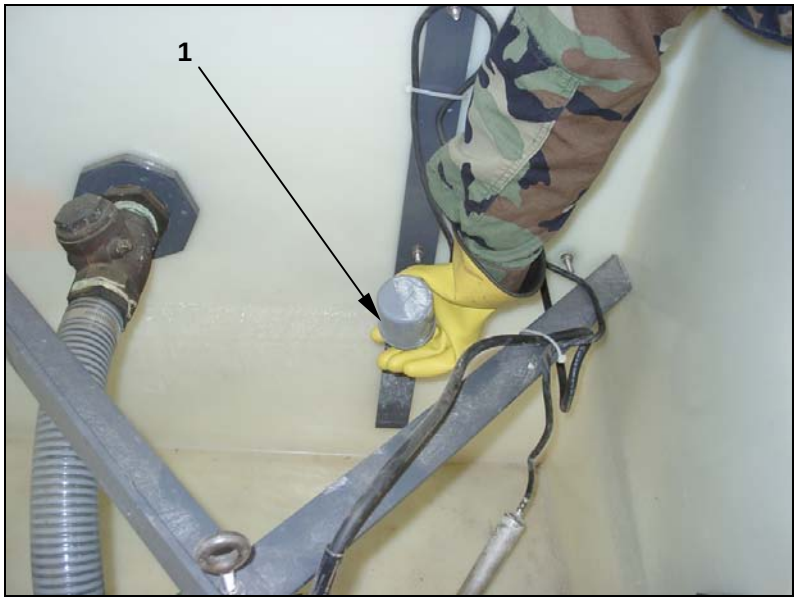
Rubber gloves and safety glasses should be used when performing any type of maintenance on the interior of the SEP. Failure to do so could result in serious illness or death to personnel.

5. Manually operate pump by lifting the free end of the float switch **(1)** until the pump comes ON (9-1-0150-1 and 9-1-0150-2); manually operate pump by turning selector **(2)** to HAND (9-1-0527).

6. Observe that tank is being drained while pump is operating.

7. Release float switch **(1)** (9-1-0150-1 and 9-1-0150-2); turn selector **(2)** to OFF (9-1-0527).

8. Observe that tank does not refill from the pump inlet. This can be detected by turbulence at the base of the pump.



9-1-0150-1 and 9-1-0150-2

9-1-0527

SERVICE

Service Check Valve (9-1-0150-1 and 9-1-0150-2)

WARNING

Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove tank lid.
2. Loosen hose clamps **(1)**.
3. Remove discharge hose **(2)** from pump outlet and check valve **(3)**.
4. Remove check valve from bushing **(4)**.
5. Clean check valve of any solid matter or deposits.
6. Manually verify that check valve is operating freely by turning check valve over and observing movement of valve flap. Replace check valve that does not function properly.
7. Install check valve **(3)** to bushing **(4)**.

NOTE

Ensure that the check valve is installed upright and in the correct direction, as indicated on the valve body.

8. Install discharge hose **(2)** to pump outlet and check valve.
9. Secure with hose clamps **(1)**.

Service Check Valve (9-1-0527)

WARNING

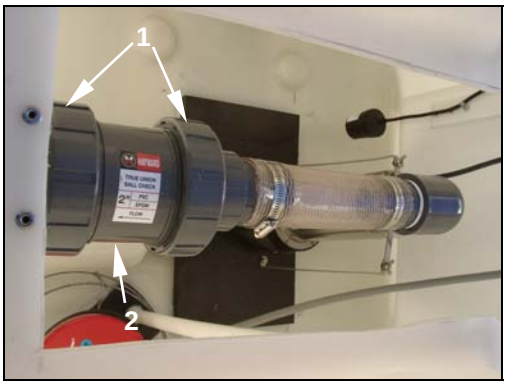
Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

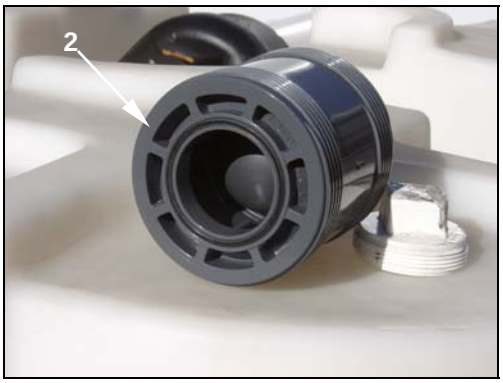
1. Remove access panel.
2. Loosen check valve unions **(1)** and remove check valve **(2)**.
3. Clean check valve **(2)** of any solid matter or deposits.
4. Manually verify that check valve **(2)** is operating freely by turning check valve over and observing movement of valve ball. Replace check valve that does not function properly.

NOTE

Ensure the check valve is installed in the correct direction, as indicated on the valve body.

5. Install check valve **(2)** and secure with unions **(1)** hand tight.





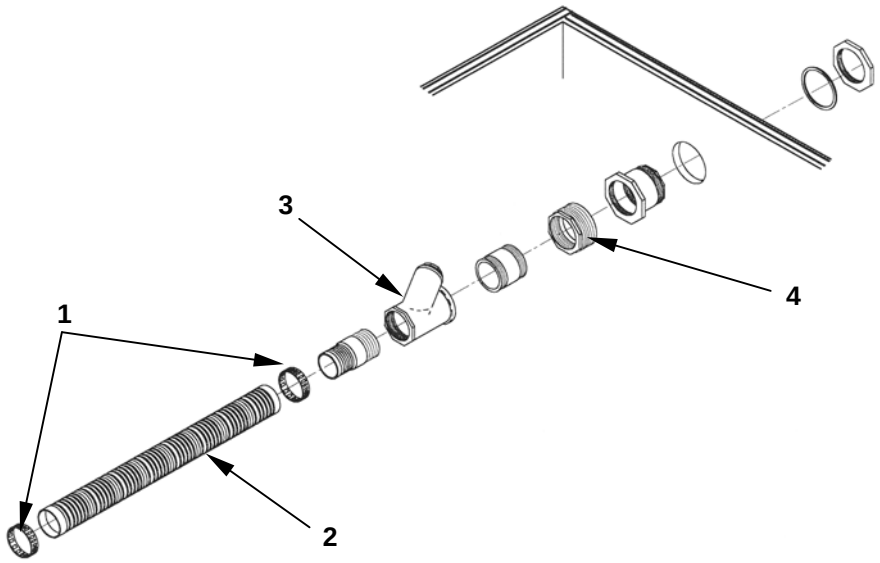
REPLACE

Replace Check Valve (9-1-0150-1 and 9-1-0150-2)

WARNING

Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

1. Remove tank lid.
2. Loosen hose clamps **(1)**.
3. Remove discharge hose **(2)** from pump outlet and check valve **(3)**.
4. Remove check valve from bushing **(4)**.
5. Apply pipe sealant or antisieze tape to threads, and install new check valve to bushing.
6. Install discharge hose **(2)** to pump outlet and check valve **(3)**.
7. Secure with hose clamps **(1)**.



Replace Check Valve (9-1-0527)

WARNING

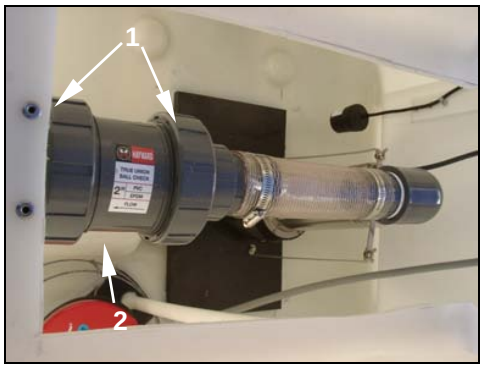
Ensure the SEP has been thoroughly cleaned with chlorine solution and rinsed prior to any inspection or service to the interior. Failure to do so may result in serious illness or death to personnel.

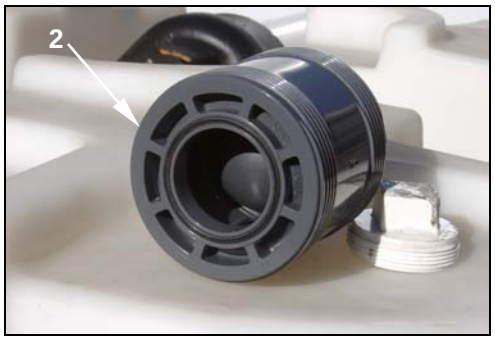
1. Remove access panel.
2. Loosen check valve unions **(1)** and remove check valve **(2)**.
3. Manually verify that replacement check valve **(2)** is operating freely by turning check valve over and observing movement of valve ball.

NOTE

Ensure that the check valve is installed in the correct direction, as indicated on the valve body.

4. Install check valve **(2)** and secure with unions **(1)** hand tight.





END OF WORK PACKAGE

CHAPTER 6

SUPPORTING INFORMATION

SEWAGE EJECTION PUMP (SEP)

SEWAGE EJECTION PUMP (SEP)
REFERENCES

SCOPE

This WP lists all pamphlets, field manuals, forms, technical manuals, Army regulations, and military standards referenced throughout this manual.

DA PAMPHLETS

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

The Army Maintenance Management System --(TAMMS-A) ……DA PAM 738-751

FIELD MANUALS

Artificial, Respiration……FM 21-11

NBC Contamination Avoidance……FM 3-3/NAVFAC P-462

NBC Decontamination……FM 3-5/FM 11-10

NBC Operation……FM 3-100/FM 11-2

NBC Protection……FM 3-4/FM 11-9

Quartermaster, Force Provider Company……... FM 42-424

FORMS

Discrepancy in Shipment Report……SF 361

Equipment Inspection and Maintenance Worksheet……DA Form 2404

Packaging Improvement Report……DD Form 6

Product Quality Deficiency Report……SF 368

Recommended Changes to Equipment Technical Publication……DA Form 2028-2

Report of Packaging and Handling Deficiencies……..SF 362

Report of Discrepancy……..SF 364

TECHNICAL MANUALS

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

Destruction of Army Materiel to Prevent Enemy Use……..TM 750-244-3

Operator's and Unit Maintenance Manual for 20,000
Gallon Collapsible Fabric Tank…… TM 5-5430-216-13&P

Operator's and Unit Maintenance Manual (Including RPSTL) for Tank, Fabric, Self Supporting,
3000 Gallon, Water…… TM 5-5430-227-12&P

Operator's Maintenance Manual,
Laundry Unit, Trailer Mounted, Model M85-100……TM 10-3510-220-10

TECHNICAL MANUALS - continued

Operator, Unit, and Direct Support Maintenance Manual for Distribution Illumination Systems, Electrical (DISE), and Power Distribution Illumination Systems, Electrical (PDISE) consisting of Electrical Feeder System M200, M200 A/P, M100, M100 A/P, M40, M40 A/P, M60, M60 A/P and Electrical Utility Assembly M46……TM 9-6150-226-13

Preservation, Packaging, and Packing of
Military Supplies and Equipment……..TM 38-230-2
Operator's, Unit, Direct Support and General Support
Maintenance Manual for Force Provider Modules 1 through 4……...TM 10-5419-206-13

Operator's Organizational, and Direct Support
Maintenance Manual Water Distribution System…….TM 5-4610-228-13

Operator's, Unit and Direct Support Maintenance
Manual for the Containerized Batch Laundry…… ……. ……TM-10-3510-225-13&P

MISCELLANEOUS

Army Medical Department Expendable/Durable Items…….CTA 8-100

Expendable/Durable Items……..CTA 50-970

SEWAGE EJECTION PUMP (SEP)
MAINTENANCE ALLOCATION CHART (MAC), INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

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

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

Unit - includes two subcolumns, C (operator/crew) and O (unit) maintenance
Direct Support - includes an F subcolumn
General Support - includes an H subcolumn
Depot - includes a D subcolumn

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

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

Maintenance Functions

Maintenance functions will be limited to and are defined as follows:

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

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

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

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

5. Align. To adjust specified variable elements of an item to bring about optimum performance.

6. Calibrate. To determine and cause corrections to be made, or to be adjusted on instruments, tests, 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 function of the equipment or system.

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

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

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 cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

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

Actions-Welding, grinding, riveting, straightening, facing, machining, and or resurfacing,

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

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

Explanation of Columns in the MAC

Column (1), Group Number. Column (1) lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

Column (2), Component/Assembly. Column (2) contains the 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 detailed explanation of these functions, see paragraph b. above)

Column (4), Maintenance Level. Column (4) specifies, by the listing of a work time figure (expressed as man-hours shown as whole hours or decimals) in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in Column (3). This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or the complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes item preparation (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The system designations for the various maintenance levels are shown below:

C ..... Operator or crew
O ..... Unit Maintenance
F ..... Direct Support Maintenance
L ..... Specialized Repair Activity (SRA)
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 a 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 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 alphabetic order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

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

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

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

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

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

Explanation of Columns in Remarks

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

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

END OF WORK PACKAGE

Table 1. Maintenance Allocation Chart (MAC) for Sewage Ejection Pump (SEP)

MAINTENANCE ALLOCATION CHART (MAC)									
(1) Group Number	(2) Assembly	(3) Maintenance Function	(4) Maintenance Level					(5) Tools & Equipment Code	(6) Remarks
			Unit		Direct Support	General Support	Depot		
			C	O	F	H	D		
00	**Sewage Ejection Pump**								
01	**Tank Assembly**	Inspect Replace	.10 .35	 .35					
0101	Tank	Inspect Replace	.10	 .35				 2, 3	 A
0102	Tank Fittings	Inspect Replace	.10	 .15				 2, 3	 A
02	**Electrical System**	Inspect Service	.10 .35						
0201	Circuit Breaker	Inspect Test Replace	.05	 .10 .30				 1 3	
0202	Power Cable	Inspect Test Replace	.10	 .10 .15				 1 3	
0203	Heater Element	Inspect Service Test Replace	.10 .10	 .10 .15				3 3 1,3 1,3	
0204	Float Switch	Inspect Service Test Replace	.10 .10	 .10 .20				3 3 1,3 1,3	
03	**Pump Assembly**								
0301	Pump	Inspect Service Replace	.10 .10	 .30				3 3 1,3	
030101	Power Cable	Inspect Replace	.10	 .30				3 1,3	 B
0302	Internal Discharge Hose Assembly	Inspect Replace	.10	 .30				 3	
030201	Check Valve	Inspect Test Service Replace	.10	 .10 .30 .30				 2,3 2,3 2,3	

Table 2. Tools and Test Equipment Requirements for Sewage Ejection Pump (SEP)

(1) Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National Stock Number	(5) Tool Number
1	O	Multi-meter	6625-00-999-6282	
2	O	Pipe Wrench, 24-IN.	5120-00-277-1480	
3	O	Tool Kit, General Mechanic's: Automotive	5180-00-177-7033	SC 5180-90-CL-N26

Table 3. Remarks

(1) Code	(2) Remarks
A	Remove and retain bulkhead fittings and bushings from an unserviceable tank.
B	Laundry SEP (9-1-0150-1) and General Purpose SEP (9-1-0150-2) only.

SUPPORTING INFORMATION
SEWAGE EJECTION PUMP
REPAIR PARTS AND SPECIAL TOOLS LIST, INTRODUCTION

SCOPE

This Repair Parts and Special Tools List (RPSTL) lists and authorizes spare and repair parts; special tools; special tests, measurement and diagnostic equipment (TMDE); and other special support equipment required for performance of operator and unit maintenance of the Sewage Ejection Pump. 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 this section, this RPSTL is divided into the following additional sections:

1. Repair Parts List Work Packages. These sections contain lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These sections 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 the item name in FIG. BULK at the end of the work packages. Repair parts kits are listed separately in their own functional group and section. Repair parts for repairable special tools are also listed in a separate section. Items listed are shown on the associated illustrations.

2. Special Tools List Work Packages. A list 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 Index. There are two cross-reference indexes in this RPSTL: the National Stock Number (NSN) Index and the Part Number Index. The NSN index refers you to the figure and the item number. The part number index also 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 Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria and disposition instruction, as shown in the following breakout.

Source Code	Maintenance Code		Recoverability Code
XX	X	X	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 item.

* 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 to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanation of source codes follows.

SOURCE CODE	EXPLANATION
PA PB PC PD PE PF PG	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. **NOTE** Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/ requisitioned individually. They are part of a kit that is authorized to the maintenance level indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.
MO – (Made at unit/AVUM Level) MF – (Made at DS/AVIM Level) MH – (Made at GS Level) ML – (Made at SRA) MD – (Made at Depot)	Items with these codes are not to be requisitioned/requested individually. They must be made from bulk material that is identified by the P/N in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
AO – (Assembled by unit AVUM Level) AF – (Assembled by DS/AVIM Level) AH – (Assembled by GS Level) AL – (Assembled by SRA) AD – (Assembled by Depot)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA -	Do not requisition an XA-coded item. Order the next higher assembly. (Refer to the NOTE below.)
XB -	If an item is not available from salvage, order it using the CAGEC and P/N.

SOURCE CODE – continued	EXPLANATION - continued
XC -	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's P/N.
XD -	Item is not stocked. Order an XD-coded item through normal supply channels using the CAGEC and P/N given, if no NSN is available.

NOTE

Cannibalization or controlled exchanged, when authorized, may be used as a source of supply for items with the above source codes, except for those 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 follow:

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 one of the following levels of maintenance.

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

Fourth position. The maintenance code entered in the fourth position tells 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 code.

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 (designate the specialized repair activity) is the lowest level that can do complete repair of the item.
D -	Depot is the lowest level that can do complete repair of the item.
Z -	Non-repairable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for the maintenance of a B-coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

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

RECOVERABILITY CODE	APPLICATION/EXPLANATION
Z -	Non-repairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR Code.

RECOVERABILITY CODE – continued	APPLICATION/EXPLANATION - continued
O -	Repairable item. When uneconomically reparable, condemn and dispose of the item at the unit level.
F -	Repairable item. When uneconomically repairable, condemn and dispose of the item at the direct support level.
H -	Repairable item. When uneconomically repairable, condemn and dispose of the item at the general support level.
D -	Repairable item. When beyond the lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L -	Repairable item. Condemnation and disposal not authorized below Specialized Repair Activity (SRA).
A -	Item requires special handling or condemnation procedures because of specific reasons (such as, precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

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

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit numeric code that is used to identify the manufacturer, distributor, or Government agency 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 P/N from the part ordered.

Column 6, Description and Usable on Code (UOC). This column includes the following information:

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

2. P/Ns for bulk materials are referenced in this column in the line entry for the 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.

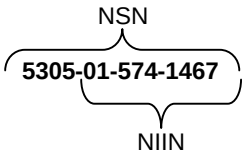
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

Column 7, QTY. 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, sub-functional group, or an assembly. A "V" appearing in the column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

EXPLANATION OF COLUMNS

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

STOCK NUMBER Column. This column lists the NSN by National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.



When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

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

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

2. Part Number (P/N) Index Work Package.

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

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

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

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

SPECIAL INFORMATION

The Usable on Code title appears in the lower right corner of column (5), Description. Usable on codes are shown in the right-hand margin of the description column. Identification of the usable on codes used in the RPSTL are:

Code:	Used on:
FSW	Sewage Ejection Pump, Laundry
FSX	Sewage Ejection Pump, General Purpose
FSY	Sewage Ejector System

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

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

Illustration List. The illustrations in this RPSTL contain unit authorized items. Illustrations published in this TM that contain unit authorized items also appear in this RPSTL. The tabular list in the repair parts list work package contains only those parts coded “O” in the third position of the SMR code, therefore, there may be a break in the item number sequence.

HOW TO LOCATE REPAIR PARTS

1. When NSN or P/N is Not Known.

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

Second. Find the item covering the figure covering the functional group or sub-functional 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 it is the one you are looking for.

3. When P/N is Known.

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

Second. Look up the item on the figure in the applicable repair parts list work package.
referenced in the adjacent figure number column.

GROUP 01 TANK ASSEMBLY
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

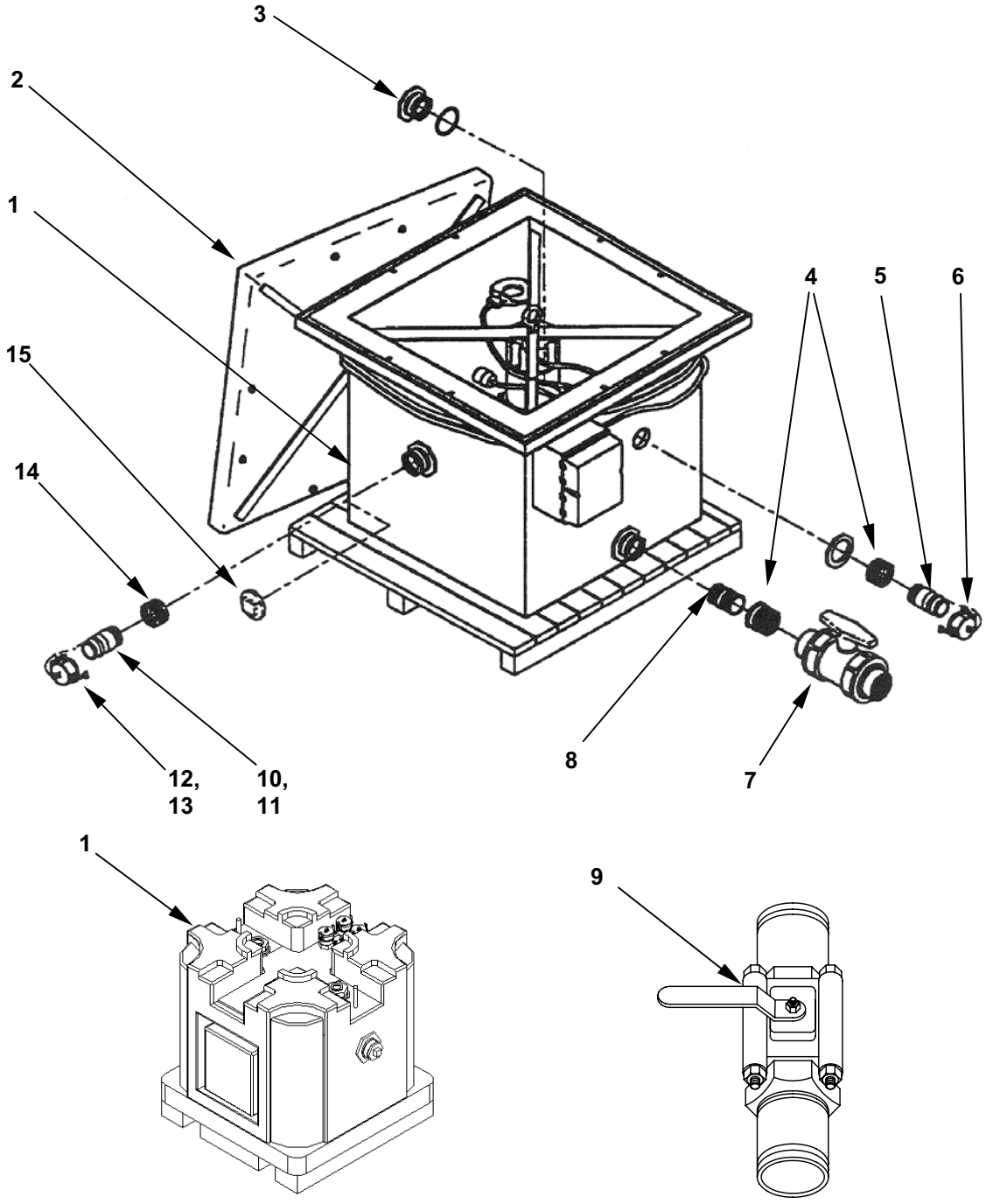


Figure 1. SEP Tank Assembly

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 01 TANK ASSEMBLY FIGURE 01 TANK ASSEMBLY	
1	PAOZZ	4630-01-413-2606	81337	9-1-0150-1	TANK UOC: FSW	1
1	PAOZZ	4630-01-413-2608	81337	9-1-0150-2	TANK UOC: FSX	1
1	PAOZZ	4630-01-505-3746	81337	663713005	TANK, (9-1-0527) SYNDER INDUSTRIES UOC: FSY	1
2	XAOZZ		81337	6-1-9927	.COVER UOC: FSW, FSX	1
3	XBOZZ		39428	3773K47	.BULKHEAD FITTING AND GASKET UOC: FSW, FSX	4
4	XBOZZ		39428	4596K443	.BUSHING, 3-IN X 2 ½-IN, PVC UOC: FSW, FSX	1
5	PAOZZ	4730-00-360-0913	96906	MS27022-15	.COUPLING HALF, QUICK DISCONNECT UOC: FSW, FSX	1
6	PAOZZ	4730-01-019-7432	58536	AA59326IX17	.CAP, QUICK DISCONNECT UOC: FSW, FSX	1
6	PAOZZ	4730-01-019-7432	58536	AA59326IX17	.CAP, QUICK DISCONNECT UOC: FSY	3
7	XBOZZ		7X368	TB1250TE	.BALL VALVE, 2 ½-IN UOC: FSW, FSX	1
7	XBOZZ		7X368	TB1250TE	.BALL VALVE, 2 ½-IN UOC: FSY	3
8	XBOZZ		3A054	6810K36	.NIPPLE, 2 ½-IN, PVC UOC: FSW, FSX	1
9	XBOZZ		58631	347718	.BALL VALVE, 2-IN UOC: FSY	1
10	PAOZZ	4730-00-419-3026	58536	AA59326III28	.COUPLING HALF, QUICK DISCONNECT UOC: FSY	2
11	PAOZZ	4730-00-938-7997	96906	MS27022-11	.COUPLING HALF, QUICK DISCONNECT UOC: FSX	3

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
12	PAOZZ	4730-01-350-6290	58536	AA59326IX28	.CAP, QUICK DISCONNECT UOC: FSW	2
13	PAOZZ	4730-01-086-6157	58536	AA59326IX26	.CAP, QUICK DISCONNECT UOC: FSY, FSX	2
14	PAOZZ	4730-00-858-3490	81349	M52618/8T8 41X6A	.BUSHING, PIPE UOC: FSX	3
15	XBOZZ		39428	2389K78	.PLUG, PIPE UOC: FSY, FSX **END OF FIGURE**	4

GROUP 0201 CIRCUIT BREAKER
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

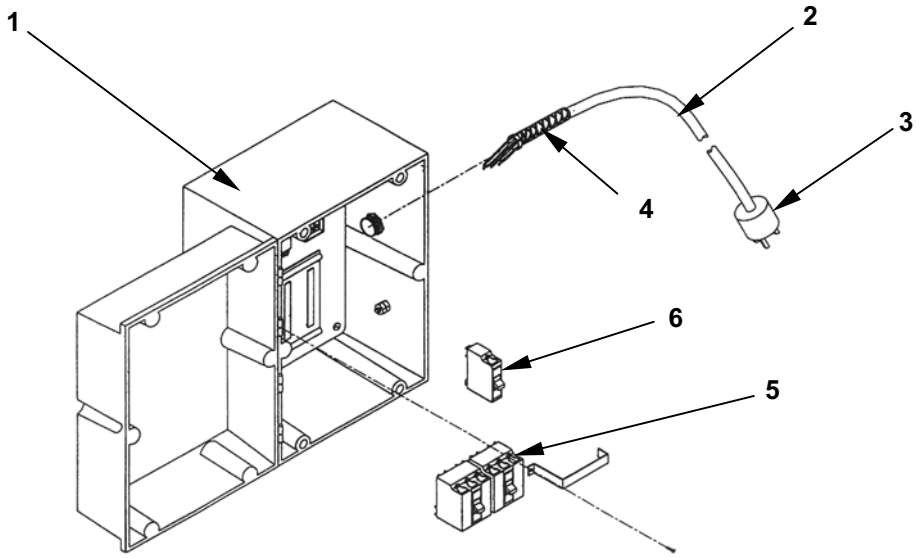


Figure 2. Circuit Breaker and Power Cord

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 02 ELECTRICAL SYSTEM FIGURE 2 CIRCUIT BREAKER AND POWER CORD	
1	PAOZZ	5975-01-314-8181	00843	A14107JFGQR	BOX, CIRCUIT, BREAKER UOC: FSW, FSX	1
1	XBOZZ			V41-00241	BOX, CIRCUIT, BREAKER, ABS PUMP, MERIDEN, CT (203) 238-2700 UOC: FSY	1
2	XBOZZ		56365	12/5, SOW-A	.POWER, CORD	1
3	XBOZZ		74545	74011249	..STRAIN RELIEF	1
4	PAOZZ	5935-00-353-2141	41326	GL2120	..PLUG 20A 120/208V 3 PHASE	1
5	XBOZZ		56365	QO320	.CIRCUIT BREAKER, 20A 3 PHASE UOC: FSW, FSX	2
5	XBOZZ		56365	QO310	.CIRCUIT BREAKER, 20A 3 PHASE UOC: FSY	1
5	XBOZZ		56365	QO315	.CIRCUIT BREAKER UOC: FSY	1
6	XBOZZ		56365	QO110	.CIRCUIT BREAKER, 20A SINGLE PHASE UOC: FSW, FSX	3
					END OF FIGURE	

GROUP 0203 HEATER ELEMENT
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

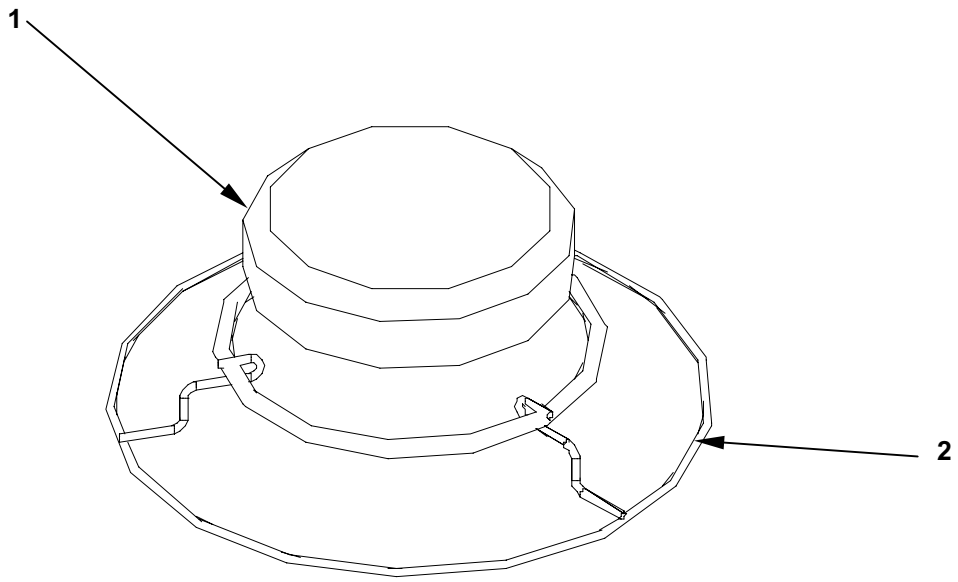


Figure 3. Heater Element

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0203 HEATER ELEMENT FIGURE 3 HEATER ELEMENT	
1	XBOZZ		39428	369K28	HEATER	1
2	XBOZZ		39428	369K41	GUARD, ASSEMBLY, HEAT	1
					END OF FIGURE	

GROUP 0204 FLOAT SWITCH
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

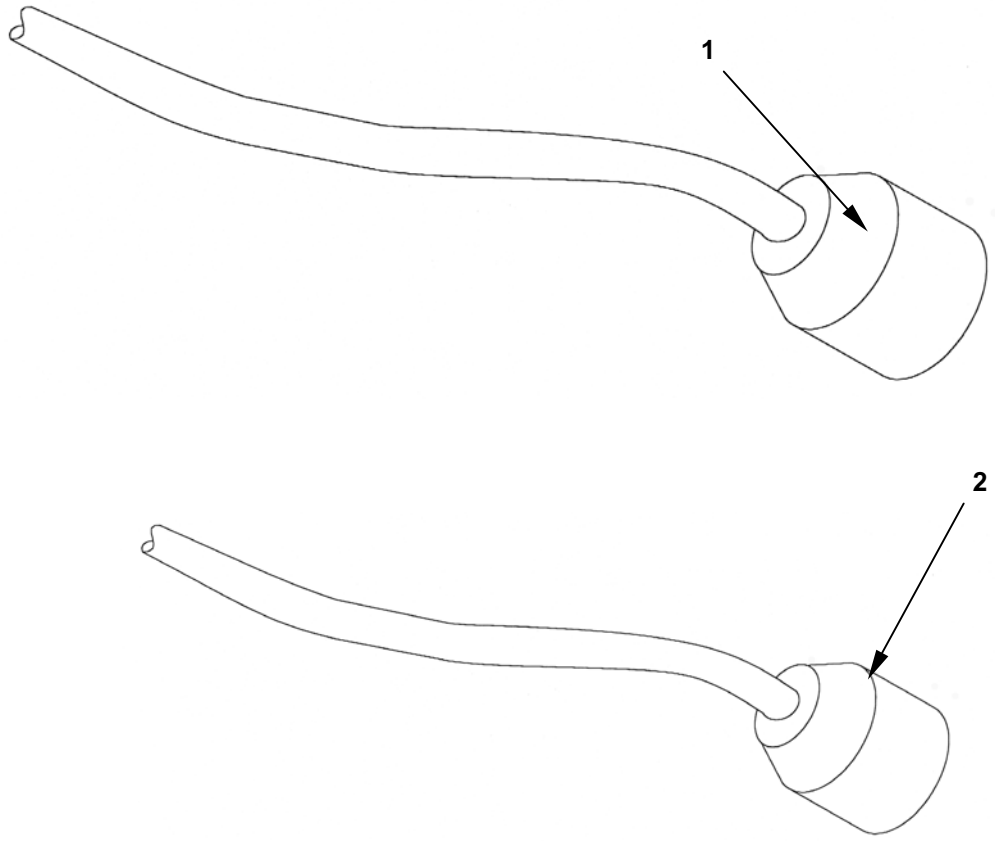


Figure 4. Float Switch

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0204 FLOAT SWITCH FIGURE 4 FLOAT SWITCH	
1	XBOZZ		39428	51445K11	SWITCH, FLOAT UOC: FSW, FSX	1
2	XBOZZ			FGSA3115AW	SWITCH, FLOAT, ABS PUMPS MERIDENT, CT (203) 238-2700 UOC: FSY	1
					END OF FIGURE	

GROUP 0301 PUMP
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

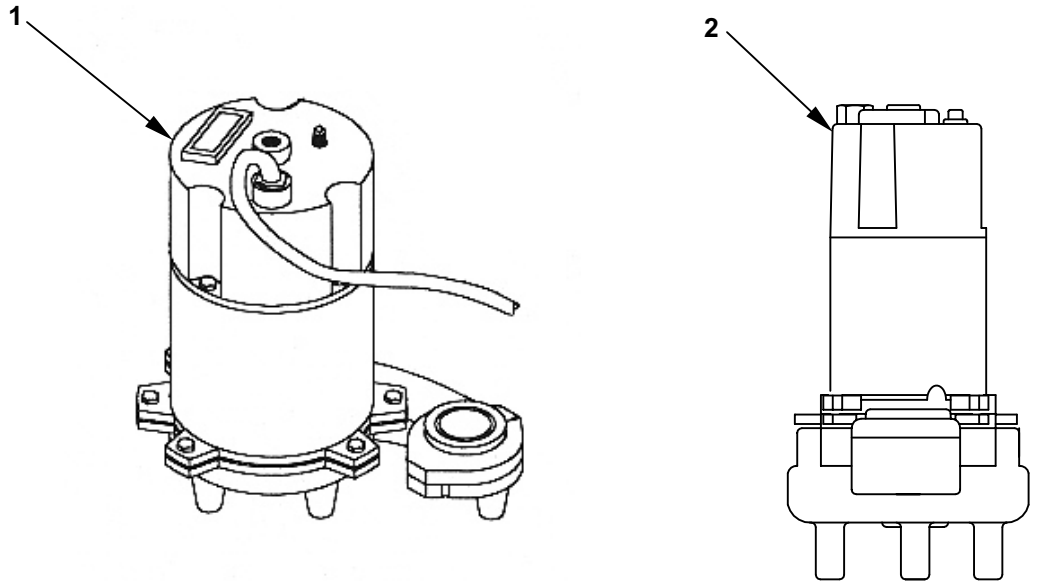


Figure 5. Pump

(1) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGEC	(5) PART NO.	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 03 PUMP ASSEMBLY FIGURE 5 PUMP	
1	XBOFF		42223	WHR7-23	PUMP, SEWAGE EJECTOR UOC: FSW, FSX	1
2	XBOFF		10190	01395168	PUMP, SEWAGE EJECTOR, MODLE 85D UOC: FSY **END OF FIGURE**	1

GROUP 0302 INTERNAL DISCHARGE HOSE
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

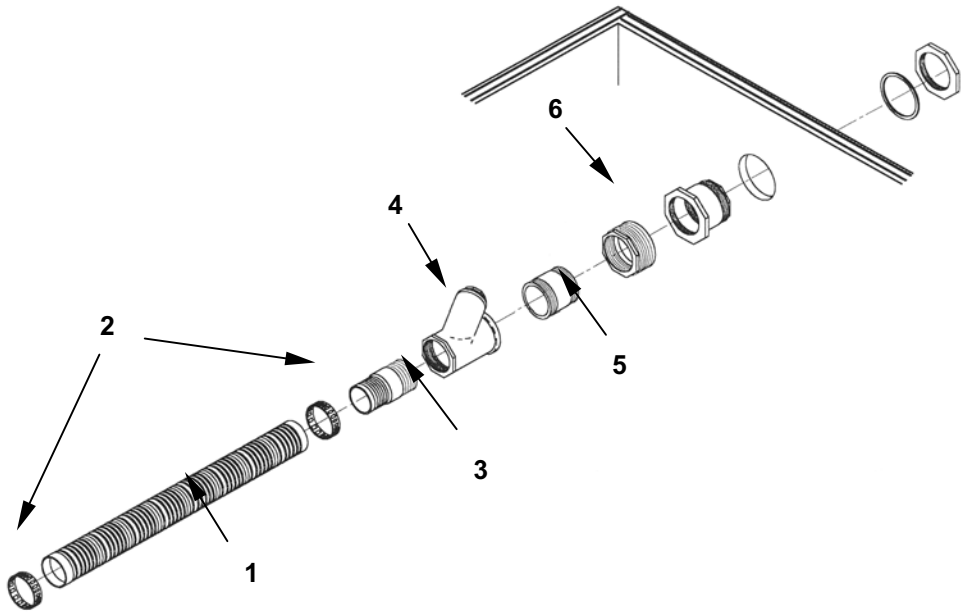


Figure 6. Internal Discharge Hose and Check Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0302 INTERNAL DISCHARGE HOSE ASSEMBLY FIGURE 6 INTERNAL DISCHARGE HOSE AND CHECK VALVE	
1	XBOZZ		2V507	5371K25	HOSE, 2 ½-IN. X 18-IN. UOC: FSW, FSX	1
2	PAOZZ	4730-00-965-6520	77414	0-16S	HOSE, CLAMP UOC: FSW, FSX	2
3	XBOZZ		39428	5363K17	NIPPLE, 2 ½-IN. GROOVED AND X 2 ½-IN. EXTERNAL NPT UOC: FSW, FSX	1
4	XBOZZ		7X368	YC10250T	VALVE, CHECK, 2 ½-IN. NPT UOC: FSW, FSX	1
5	XBOZZ		6K495	4568K302	NIPPLE, CLOSE, 2 ½-IN. NPT UOC: FSW, FSX	1
6	XBOZZ		39428	4596K443	BUSHING, REDUCING, 3-IN EXTERNAL NPT X 2 ½-IN INTERNAL NPT UOC: FSW, FSX	1
					END OF FIGURE	

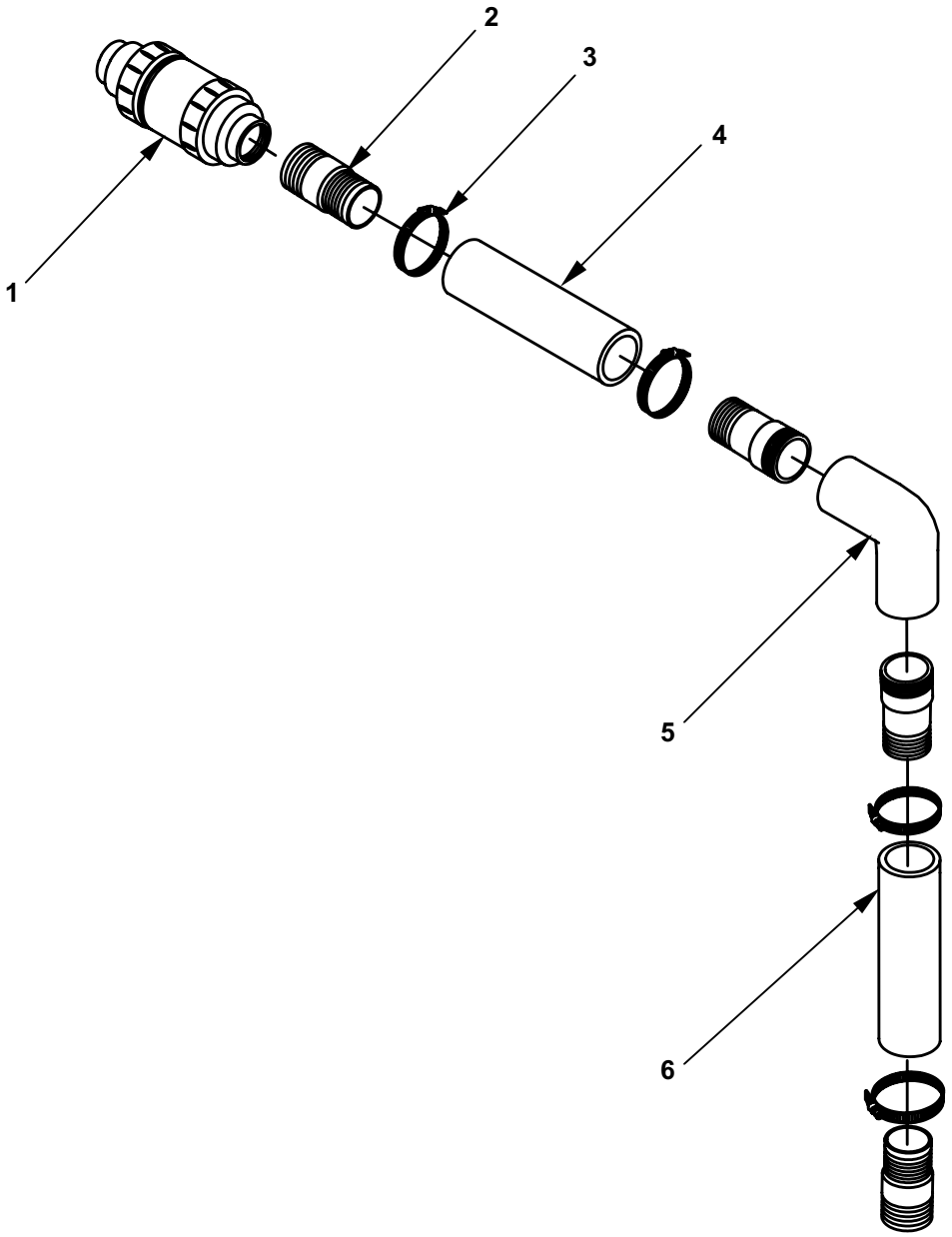


Figure 7. Internal Discharge Hose and Check Valve

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 0302 INTERNAL DISCHARGE HOSE FIGURE 7 INTERNAL DISCHARGE HOSE AND CHECK VALVE	
1	XBOZZ		7X368	TC20200STE	VALVE CHECK, 2-IN, HAYWARD TRUE UNION BALL CHECK, PVC, EPDM UOC: FSY	1
2	XBOZZ		2V507	48315K96	HOSE BARB ADAPTER 2-IN OD X 2-IN MALE NPT UOC: FSY	4
3	XBOZZ		2V507	54155K34	CLAMP, HOSE, 2-IN WORM DRIVE TYPE 305 STST UOC: FSY	4
4	XBOZZ		2V507	5632K43	HOSE 2-IN X 12-IN LONG UOC: FSY	1
5	XBOZZ		2V507	4596K17	ELBOW, PIPE UOC: FSY	1
6	XBOZZ		2V507	5632K23	HOSE 2-IN X 20-IN LONG UOC: FSY	1
					END OF FIGURE	

SEWAGE EJECTION PUMP (SEP)
SPECIAL TOOLS LIST (RPSTL)

SPECIAL TOOLS LIST

SEWAGE EJECTION PUMP (SEP)
NATIONAL STOCK NUMBER (NSN) INDEX

STOCK NUMBER	FIGURE	ITEM
5935-00-353-2141	2	4
4730-00-360-0913	1	5
4730-00-419-3026	1	10
4730-00-858-3490	1	14
4730-00-858-3490	1	4
4730-00-938-7997	1	11
4730-00-965-6520	6	2
4730-01-019-7432	1	6
4730-01-086-6157	1	13
5975-01-314-8181	2	1
4730-01-350-6290	1	12

END OF FIGURE

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SEWAGE EJECTION PUMP (SEP)
PART NUMBER INDEX

PART NUMBER	FIG	ITEM
A14107JFGQR	2	1
AA59326III28	1	10
AA59326IX17	1	6
AA59326IX26	1	13
AA59326IX28	1	12
FGSA3115AW	4	2
GL2120	2	4
M52618/8T8 41X6A	1	14
MS27022-11	1	11
MS27022-15	1	5
QO110	2	6
QO320	2	5
QO310	2	5
QO315	2	5
TB1250TE	1	7
TC20200STE	7	1
V41-00241	2	1
WHR7-23	5	1
YC10250T	6	4
0-16S	6	2
9-1-0150-2	1	1
9-1-0150-1	1	1
12/5,SOW-A	2	3
2389K78	1	15
3639K28	3	1
3639K41	3	2
3773K47	1	3
3773K47	1	3
4568K302	6	5
4596K17	7	5
4596K443	6	6
4596K443	1	4
5363K17	6	3
5371K25	6	1
5632K43	7	4
5632K23	7	6
6810K36	1	8
48315K96	7	2
51445K11	4	1
54155K34	7	3
347718	1	9
01395168	5	2
74011249	2	2
663713005	1	1

END OF FIGURE

SEWAGE EJECTION PUMP (SEP)
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LIST

This work package lists COEIand BIIfor the Sewage Ejection Pump (SEP) to help you inventory items for safe and efficient operation of the equipment.

General
The COEIand BIIinformation 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 Sewage Ejection Pump (SEP). 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 COEIare 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 Sewage Ejection Pump (SEP) in operation, operate it, and do emergency repairs. Although shipped separately packaged, BIImust be with the Sewage Ejection Pump (SEP) 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, identifies the stock number of the item to be used for requisitioning purposes.

Column (3), Description, CAGEC, and Part Number identifies the federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEIand BIIis also included in this column. The last line below the description is the CAGEC (Commercial and Government Entity Code) (in parenthesis) and the part number. The last line below the description is the CAGEC (Commercial And Government Entity Code) (in parentheses) and the part number.

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

Code	Used On
FSW	Sewage Ejection Unit, Laundry
FSX	Sewage Ejection Unit, General Purpose
FSY	Sewage Ejection Pump, Waste Water Evacuation

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

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

Table 1. Components of End Item List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
		THERE ARE NO COEICOMPONENTS			

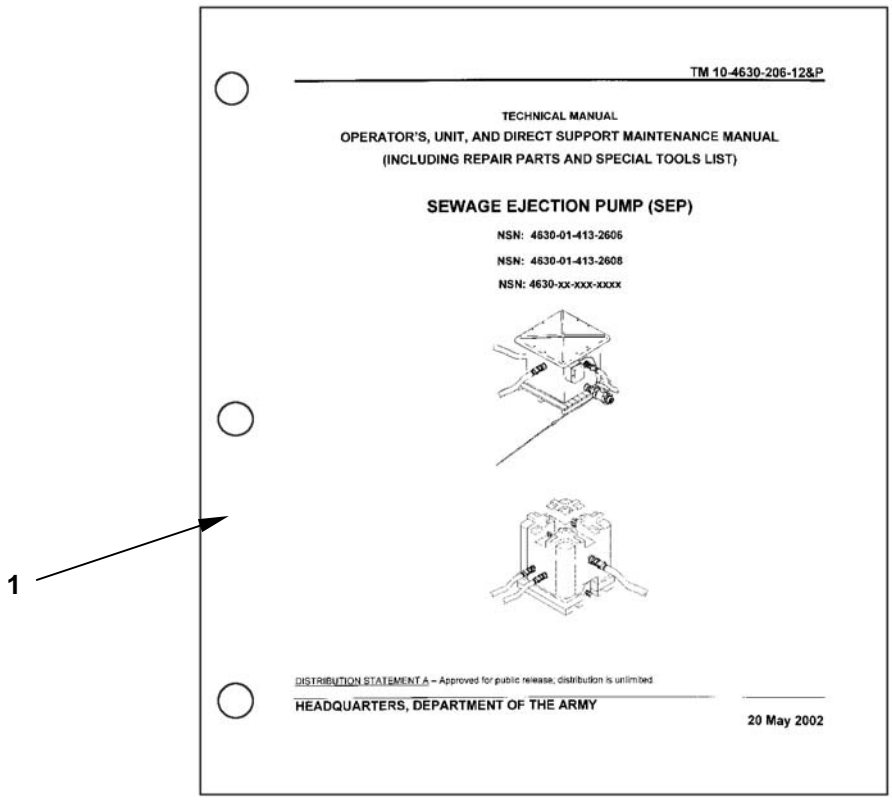

Table 2. Basic Issue Items List

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1	N/A	TM 10-4630-206-12&P		EA	1

SEWAGE EJECTION PUMP
ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION

Scope
This work package lists additional items that are authorized for the support of the SEP.

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

Explanation of Columns in the AAL

Column (1) - National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.

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

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/M, indicates how the item is issued for the National Stock Number shown in column (1).

Column (5) – Qty. Recm., indicates the quantity recommended.

Table 1. Additional Authorization List

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION, CAGEC, AND PART NUMBER	(6) USABLE ON CODE	(7) U/M	(8) QTY RECM
	N/A			

SEWAGE EJECTION PUMP (SEP)
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

SCOPE

This work package lists expendable and durable items that you will need to operate and maintain the Sewage Ejection Pump (SEP). 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), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of columns in the Expendable/Durable Items List

Column (1). Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., chlorine (item 1, Expendable and Durable Items List).

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

.

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

Column (4). Item name, Description, CAGE, and Part Number. This column provides the other information you need to identify the item.

Column (5). U/M (unit of measure) indicates how the item is issued for the National Stock Number shown in column (1).

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
1	C	Local Purchase	Chlorine Bleach	GL
2	O	11009A008	Myers Submersible Oil, CAGEC 42223	QT
3	O	8030-00-889-3535	Tape, Anti-Seize, Teflon	EA
4	O	9905-00-537-8957	Tags, Marking, MIL-T-12755 (81349)	BD
5	O	5975-01-034-5871	Tie-strap, 8-IN., Strap Tie-down	HD

SEWAGE EJECTION PUMP (SEP)
ALPHABETICAL INDEX

SUBJECT **WP SEQUENCE NO. – PAGE NO.**

A

B

C

D

E

F

Subject **WP Sequence No. – Page No.**

G

H

I

L

M

N

Subject **WP Sequence No. – Page No.**

O

P

R

S

Subject **WP Sequence No. – Page No.**

T

U

W

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0515301

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

From: "Whomever" <whomever@avma27.army.mil>
To: amssbriml@natick.army.mil

Subject: DA Form 2028

1. From: Joe Smith
2. Unit: home
3. Address: 4300 Park
4. City: Hometown
5. St: MO
6. Zip: 77777
7. Date Sent: 19-OCT-93
8. Pub no: 55-2840-229-23
9. Pub Title: TM
10. Publication Date: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
16. Submitter Phone: 123-123-1234
17. Problem: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. Text:

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	**DATE** *21 October 2003*

TO: *(Forward to proponent of publication or form) (Include ZIP Code)* U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA LC-CECT KANSAS STREET NATICK, MA 01760	**FROM:** *(Activity and location) (Include ZIP Code)* *PFC Jane Doe* *CO A 3rd Engineer BR* *Ft. Leonardwood, MO 63108*

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

PUBLICATION/FORM NUMBER	**DATE**	**TITLE**
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible).*
	0036 00-2				*1*	*In table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MD ZZ not MD 22.* *Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MD ZZ code symbol.*

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

TYPED NAME, GRADE OR TITLE	**TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION**	**SIGNATURE**
Jane Doe, PFC	508-233-4141	Jane Doe *Jane Doe*

TO: (*Forward direct to addressee listed in publication*)	FROM: (*Activity and location*) (*Include ZIP Code*)	DATE
U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA LC-CECT KANSAS STREET NATICK, MA 01760	*PFC Jane Doe* *CO A 3rd Engineer BR* *Ft. Leonardwood, MO 63108*	*21 October 2003*

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

PUBLICATION NUMBER	DATE	TITLE
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
0066 00-1					*4*			*Callout 16 in figure 4 is pointed to a D-Ring. In the Repair Parts List key for figure 4, item 16 is called a Snap Hook. Please correct one or the other.*

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

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

TO: *(Forward to proponent of publication or form) (Include ZIP Code)* COMMANDER U.S. ARMYTANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052	**FROM:** *(Activity and location) (Include ZIP Code)*

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

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-4630-206-12&P	30 June 2005	Sewage Ejection Pump (SEP)

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

**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**
COMMANDER U.S. ARMYTANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052		

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

PUBLICATION NUMBER	DATE	TITLE
TM 10-4630-206-12&P	30 June 2005	Sewage Ejection Pump (SEP)

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 ODISC4.	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)* COMMANDER U.S. ARMYTANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA-LC-CECT 15 KANSAS STREET NATICK, MA 01760-5052	**FROM:** *(Activity and location) (Include ZIP Code)*

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

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-4630-206-12&P	30 June 2005	Sewage Ejection Pump (SEP)

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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

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 3 2.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Liquid Measure

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

Weights

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

Square Measure

1 sq. centimeter = 100 sq. millimeters = .15 5 sq. inch
1 sq. decimeter =100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

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

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	Iiters	.473	milliliters	fluid ounces	.034
quarts	Iiters	.946	liters	pints	2.113
gallons	Iiters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

_F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	_C

PIN: 082526-000