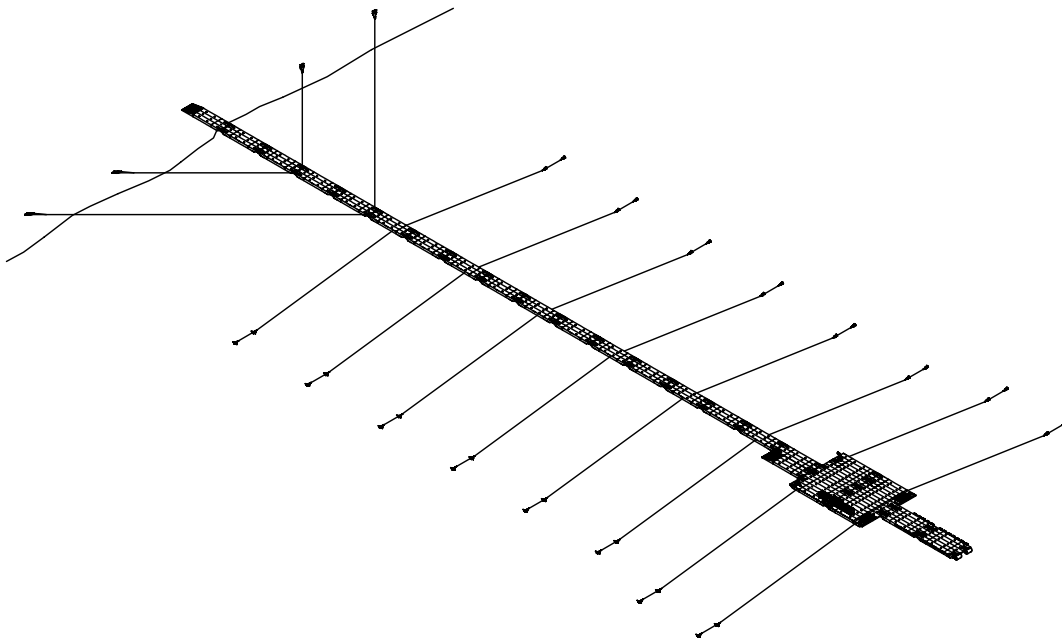


TM 55-1945-227-24

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
FOR

MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)
NSN 1945-01-505-1665



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

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 2006

WARNING SUMMARY

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

GENERAL SAFETY WARNINGS DESCRIPTION



HEAVY OBJECTS

WARNING

Handling heavily weighted objects can cause bodily injury. Do not lift materials or equipment over 50 lb without using appropriate material handling equipment.



ELECTRICAL

WARNING

Use extreme caution when checking energized circuits. Always place power off warning tags on power supply switches so that no one will apply power while performing maintenance.



EAR PROTECTION

WARNING

Single hearing protection must be worn when inside the generator container 10 kW (TQG) when generator is operating and during all rolling cargo movements.

Single hearing protection is required when the WT winch is operated. Failure to wear hearing protection may result in hearing loss.



SLICK FLOOR

WARNING

Cold weather operations could create ice buildup on exposed surfaces producing hazardous footing conditions. Use extreme care when operating under icing conditions; death or serious injury to personnel could occur.

EXPLANATION OF SAFETY WARNING ICONS



EAR PROTECTION

EAR PROTECTION - headphones over ears shows that noise level will harm ears.



ELECTRICAL

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



ELECTRICAL

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



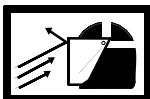
FALLING PARTS

FALLING PARTS - arrow bouncing off human shoulder and head shows that falling parts present a danger to life or limb.



FLYING PARTICLES

FLYING PARTICLES - arrows bouncing off face shows that particles flying through the air will harm face.



FLYING PARTICLES

FLYING PARTICLES - arrows bouncing off face with face shield shows that particles flying through the air will harm face.



HEAVY OBJECTS

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



HEAVY PARTS

HEAVY PARTS - hand with heavy object on top shows that heavy parts can crush and harm.

EXPLANATION OF SAFETY WARNING ICONS - Continued



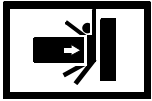
HEAVY PARTS

HEAVY PARTS - foot with heavy object on top shows that heavy parts can crush and harm.



HEAVY PARTS

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



HEAVY PARTS

HEAVY PARTS - heavy object pinning human figure against wall shows that heavy, moving parts present a danger to life or limb.



HELMET PROTECTION

HELMET PROTECTION - arrow bouncing off head with helmet shows that falling parts present a danger.



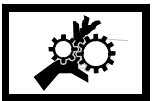
HOT AREA

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



MOVING PARTS

MOVING PARTS - human figure with an arm caught between gears shows that the moving parts of the equipment present a danger to life or limb.



MOVING PARTS

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



MOVING PARTS

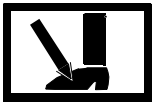
MOVING PARTS - hand with fingers caught between rollers shows that the moving parts of the equipment present a danger to life or limb.



SHARP OBJECT

SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.

EXPLANATION OF SAFETY WARNING ICONS - Continued



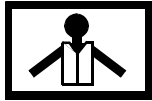
SHARP OBJECT

SHARP OBJECT - pointed object in foot shows that a sharp object presents a danger to limb.



SLICK FLOOR

SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger for falling.



VEST

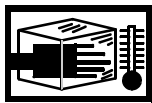
VEST - life preserver on human figure shows life preserver must be worn to prevent drowning.

EXPLANATION OF HAZARDOUS MATERIALS ICONS



CHEMICAL

CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.



CRYOGENIC

CRYOGENIC - hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.



EXPLOSION

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



EYE PROTECTION

EYE PROTECTION - person with goggles shows that the material will injure the eyes.



FIRE

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

EXPLANATION OF HAZARDOUS MATERIALS ICONS - Continued



POISON

POISON - skull and crossbones shows that a material is poisonous or is a danger to life.



VAPOR

VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

HAZARDOUS MATERIALS DESCRIPTION

WARNING



CHEMICAL

FUELS

Personnel must wear chemical resistant gloves when handling fuels. Promptly wash exposed skin and change fuel-soaked clothing.

WARNING



CHEMICAL



EYE PROTECTION

COOLANTS

Before opening coolant system, allow time to cool and wear effective hand, eye and skin protection.

WARNING



CHEMICAL



VAPOR

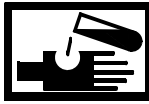


EYE PROTECTION

HAND-HELD FIRE EXTINGUISHER

Evacuate the personnel shelter after discharging the dry chemical fire extinguisher. Personnel must wear dust masks, hand, eye and skin protective equipment before re-entering the shelter to clean up residue.

WARNING



CHEMICAL



EXPLOSION

BATTERIES

Do not smoke around batteries.

SAFETY INSTRUCTIONS

NO SMOKING

Smoking is prohibited aboard this vessel.

JEWELRY

Remove rings, bracelets, wristwatches, and neck chains before working around or on a unit.

HAZARD REPORTING

Report all hazards. It is your responsibility to report hazards through your chain-of-command.

NUCLEAR, BIOLOGICAL OR CHEMICAL

In the event equipment has been exposed to nuclear, biological or chemical warfare, the equipment shall be handled with extreme caution and decontaminated in accordance with **FM 3-5**. Unprotected personnel can experience injury or death if residual toxic agents or radioactive material are present. If equipment is exposed to radioactive, biological or chemical agents, personnel must wear protective mask, hood, protective overgarments, chemical gloves and chemical boots in accordance with **FM 3-5**.

WELDING OR GRINDING

Personnel must use a gas-free meter before performing module repair that requires welding or grinding.

LIST OF EFFECTIVE PAGES / WORK PACKAGES

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

Original 17 March 2006

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 52 AND TOTAL NUMBER OF WORK PACKAGES IS 74 CONSISTING OF THE FOLLOWING:

Page / WP No.	*Change No.	Page / WP No.	*Change No.
Front Cover (2 pgs)	0	WP 0034 00 (2 pgs)	0
Warning Summary (a-f pgs)	0	WP 0035 00 (2 pgs)	0
List of Effective Pages (A-B pgs)	0	WP 0036 00 (2 pgs)	0
Title Block Page (1 pg)	0	WP 0037 00 (2 pgs)	0
Table of Contents (ii-iv pgs)	0	WP 0038 00 (2 pgs)	0
How to Use This Manual (v-vi pgs)	0	WP 0039 00 (2 pgs)	0
Chp 1 title page (2 pgs)	0	WP 0040 00 (2 pgs)	0
WP 0001 00 (4 pgs)	0	WP 0041 00 (4 pgs)	0
WP 0002 00 (34 pgs)	0	WP 0042 00 (4 pgs)	0
WP 0003 00 (2 pgs)	0	WP 0043 00 (4 pgs)	0
Chp 2 title page (2 pgs)	0	WP 0044 00 (2 pgs)	0
WP 0004 00 (2 pgs)	0	Chp 4 title page (2 pgs)	0
WP 0005 00 (4 pgs)	0	WP 0045 00 (4 pgs)	0
Chp 3 title page (2 pgs)	0	WP 0046 00 (2 pgs)	0
WP 0006 00 (6 pgs)	0	WP 0047 00 (2 pgs)	0
WP 0007 00 (2 pgs)	0	WP 0048 00 (2 pgs)	0
WP 0008 00 (4 pgs)	0	WP 0049 00 (4 pgs)	0
WP 0009 00 (4 pgs)	0	WP 0050 00 (4 pgs)	0
WP 0010 00 (4 pgs)	0	WP 0051 00 (4 pgs)	0
WP 0011 00 (2 pgs)	0	WP 0052 00 (4 pgs)	0
WP 0012 00 (4 pgs)	0	WP 0053 00 (4 pgs)	0
WP 0013 00 (6 pgs)	0	WP 0054 00 (2 pgs)	0
WP 0014 00 (4 pgs)	0	WP 0055 00 (2 pgs)	0
WP 0015 00 (2 pgs)	0	WP 0056 00 (4 pgs)	0
WP 0016 00 (2 pgs)	0	WP 0057 00 (4 pgs)	0
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WP 0021 00 (2 pgs)	0	WP 0062 00 (4 pgs)	0
WP 0022 00 (2 pgs)	0	WP 0063 00 (4 pgs)	0
WP 0023 00 (2 pgs)	0	WP 0064 00 (2 pgs)	0
WP 0024 00 (2 pgs)	0	WP 0065 00 (2 pgs)	0
WP 0025 00 (2 pgs)	0	WP 0066 00 (2 pgs)	0
WP 0026 00 (2 pgs)	0	Chp 5 title page (2 pgs)	0
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WP 0029 00 (2 pgs)	0	WP 0069 00 (6 pgs)	0
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WP 0031 00 (2 pgs)	0	Chp 6 title page (2 pgs)	0
WP 0032 00 (2 pgs)	0	WP 0071 00 (2 pgs)	0
WP 0033 00 (2 pgs)	0	WP 0072 00 (4 pgs)	0

*Zero in this column indicates an original page.

Page / WP No.	*Change No.
WP 0073 00 (10 pgs)	0
WP 0074 00 (4 pgs)	0
Index-1 thru Index-10	0
Foldouts (FO-1 thru FO-12)	0

*Zero in this column indicates an original page.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C. 17 March 2006

TECHNICAL MANUAL
UNIT, DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSWAY
NSN 1945-01-505-1665

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <https://aeeps.ria.army.mil>. The DA Form 2028 is located under the Public Applications section in the AEPS Public Home Page. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or E-mail your letter or DA Form 2028 direct to: AMSTA-LC-LMIT / TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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

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HOW TO USE THIS MANUAL

This manual contains certain features to improve the convenience of using this manual and increase the user's efficiency. These features include:

a. Accessing Information

Information is accessed by referring to the Table of Contents, located in the front of this manual, or by looking in the Alphabetical Index, located in the back of this manual.

b. Illustrations

Various methods are used to locate and repair components. Locator illustrations in Controls and Indicator tables, PMCS tables, exploded views and cut-away diagrams make the information in the manual easier to understand and follow.

c. Using This Manual

When using this manual, read and understand the entire maintenance action before performing the task. Also, read and understand all warnings, cautions and notes as well as general safety precautions that apply to the task to be performed. The warning summary will inform personnel of hazards associated with the equipment to be worked on. However, the summary is not all inclusive and personnel should be aware at all times of hazardous conditions that may arise.

Prior to starting the procedures in this manual, the initial setup requirements are located directly above each procedure. The information is given to ensure all materials, expendables, tools and any other equipment necessary are readily available for use. The initial setup will be accomplished prior to starting the actual steps of each maintenance procedure.

Locating Major Components

Obtain the manual for the system to be worked on. Open to the Table of Contents located in the front of this manual. Find Chapter 1, *Description and Theory of Operation*. Under the chapter title you will find the work package titled *Equipment Description and Data*. Turn to the work package indicated. This work package will give a brief description of the major components, and show an illustration of what the component looks like and its location.

The Alphabetical Index, located in the back of this manual, contains an alphabetical list of all sections of this manual. *Equipment Description and Data* is found in section "E". The work package is found on the right side of the title where the *Equipment Description and Data* is located. Turn to the work package indicated to find the description and location of each component.

Troubleshooting Procedures

The Table of Contents or Alphabetical Index may be used to locate sections within this manual. To locate a particular troubleshooting procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapter 3, *Troubleshooting Procedures*. Under this section, find the work package titled *Troubleshooting Index*. Turn to the work package indicated, which lists all of the troubleshooting procedures. Look down the list until you find the appropriate work package for the problem you are trying to solve. To the right side of the procedure will be a work package number. Turn to the work package indicated and follow the steps to complete the troubleshooting procedure. The procedures list the malfunction, symptom and the corrective action. The corrective action will indicate which maintenance procedure to go to for the repair of the symptom or what level of maintenance is capable of repair of the problem. Follow the procedures indicated to complete the task. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

Test Equipment: Lists all test equipment (standard or special) required to troubleshoot, test and inspect the equipment covered in this manual.

Tools: Lists all tools (standard or special) required to perform the task.

Personnel Required: Lists all personnel necessary to perform the task.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the TM number.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package *References* in Chapter 8, *Supporting Information*.

Maintenance Instructions

To locate a maintenance procedure, open the manual to the Table of Contents located in the front of this manual. Find Chapters 3–5, *Maintenance Instructions*. Look down the list and find the maintenance procedure to be accomplished. On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated. Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure. At the top of the task you will have a section called INITIAL SETUP. There are five basic headings listed under INITIAL SETUP.

Tools: Lists all tools (standard or special) required to perform the task.

Materials/Parts: Lists all parts or materials necessary to perform the task. Expendable and durable items are identified with an item number from the applicable work package located in Chapter 8, *Supporting Information*.

Personnel Required: Lists all personnel necessary to perform the task.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package *References* in Chapter 8, *Supporting Information*.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the TM number.

Test Equipment: Lists all test equipment (standard or special) required to troubleshoot, test and inspect the equipment covered in this manual.

REPAIR PARTS AND SPECIAL TOOLS LIST

Refer to TM 55-1945-227-24P when requisitioning parts, special tools and equipment.

Identify the mandatory repair parts required to perform this task listed at the top of the work package in the INITIAL SETUP. Using the part number provided, refer to the part number index work package in TM 55-1945-227-24P. Look up the part number in the part number column and identify the figure and item number where the part is located. Turn to the figure and locate the item number listed. Verify that the item is correct.

CHAPTER 1

**GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY
OF OPERATION
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)**

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERAL INFORMATION**

SCOPE

This manual contains descriptions and operation instructions for the Floating Causeway (FC).

Type of Manual: Maintenance Manual.

Purpose of Equipment: The system supports two lighter vessels discharging containerized, rolling and break bulk cargo to the beach where the beach gradient is too shallow to allow lighters to discharge directly to the beach.

MAINTENANCE FORMS, RECORDS AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, Functional Users Manual for The Army Maintenance Management System (TAMMS) and AR 700-138, Army Logistics Readiness and Sustainability.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If any component in your system needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368, Product Quality Deficiency Report. Mail it to the address specified in DA PAM 738-750, Functional Users Manual for The Army Maintenance Management System (TAMMS), or as specified by the acquiring activity. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

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

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 the materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using an SF 368, Product Quality Deficiency Report. Use of key words, such as "corrosion", "rust", "deterioration" or "cracking", will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA PAM 738-750, Functional Users Manual for The Army Maintenance Management System (TAMMS).

OZONE DEPLETING SUBSTANCES (ODS)

The continued use of ODS has been prohibited by Executive Order 12856 of 3 August 1993.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

The procedures for destruction of Army materiel to prevent enemy use are contained in TM 750-244-6.

PREPARATION FOR STORAGE OR SHIPMENT

Reference TM 55-1945-227-10 for preparation for storage or shipment of the FC system.

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Name
AC	Alternating Current
AEPS	Army Electronic Product Support
AF	Audio Frequency
amp	Ampere
AOAP	Army Oil Analysis Program
AR	Army Regulation
BII	Basic Issue Items
C	Centigrade
CAGEC	Commercial and Government Entity Code
CBSE	Combination Beach/Sea End
CF	Causeway Ferry
cm	Centimeters
CO2	Carbon Dioxide
COEI	Components of End Item
COMDTINST	Commandant Instruction
COTS	Commercial Off the Shelf
DA PAM	Department of Army Pamphlet
dB	Decibels
DC	Direct Current
Deg	Degrees
DIP	Dual Inline Package (switch)
EASY	Emergency Anchor System
CPC	Corrosion Prevention Control
EIR	Equipment Improvement Recommendations
F	Fahrenheit
FC	Floating Causeway
FGC	Functional Group Code
fl	Fluid
FM	Field Manual
ft	Feet
GAL	Gallon
GFI	Ground Fault Interrupter
GPH	Gallons Per Hour
HP	Horse Power
hr	Hour
Hz	Hertz
in.	Inches
ISO	International Standards Organization
ISOPAK	International Standards Organization Package
lb	Pound
kg	Kilograms
kHz	Kilohertz
kW	Kilowatt
J-LOTS	Joint-Logistics-Over-The-Shore
LCU	Landing Craft Utility
LED	Light Emitting Diode
LMSR	Large Medium Speed Roll-On/Roll-Off vessel
LOTS	Logistics-Over-The-Shore
LSV	Logistics Support Vessel
m	Meters
mA	MilliAmpere
MAC	Maintenance Allocation Chart
MBT	Main Battle Tank

LIST OF ABBREVIATIONS/ACRONYMS (CONT'D)

Abbreviation/Acronym	Name
MCF	Modular Causeway Ferry
MCS	Modular Causeway System
MHz	Megahertz
ml	Milliliters
MTBE	Methyl Tertiary Butyl Ether
MTO&E	Modified Table of Organization and Equipment
NAVMOOR	Naval Mooring
NBC	Nuclear, Biological, or Chemical
NCOIC	Noncommissioned Officer in Charge
NEMA	National Electrical Manufacturers Association
NHA	Next Higher Assembly
Ni-Cd	Nickel Cadmium
N-m	Newton-Meters
NOAA	National Oceanic and Atmospheric Administration
NSN	National Stock Number
ODS	Ozone Depleting Substance
OIC	Officer in Charge
OMC	Outboard Marine Corporation
oz	Ounces
PMCS	Preventive Maintenance Checks and Services
PN	Part Number
PSI	Pounds Per Square Inch
PTT	Push To Talk
rcv	Receive
RF	Radio Frequency
RHIB	Rigid Hull Inflatable Boat
Ro/Ro	Roll-on/Roll-off
RPM	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
RRDF	Roll-On/Roll-Off Discharge Facility
RTCH	Rough Terrain Container Handler
SF	Standard Form
SINAD	Signal (plus) Noise And Distortion
SMR	Source, Maintenance Recoverability
SOLAS	Safety Of Life At Sea
SRA	Specialized Repair Activity
SS	Sea State
TACOM	United States Army Tank-Automotive and Armaments Command
TAMMS	The Army Maintenance Management System
TM	Technical Manual
TMDE	Test, Measurement and Diagnostic Equipment
TO&E	Table of Organization and Equipment
TQG	Tactical Quiet Generator
Tx	Transmit
US	United States
uv	Ultra Violet
V	Volt
VAC	Volts Alternating Current
VDC	Volt Direct Current
VHF/FM	Very High Frequency/Frequency Modulation
W	Watt
WP	Work Package
WT	Warping Tug

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

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

Repair parts are listed and illustrated in the repair parts and special tools list TM 55-1945-227-24P.

MAINTENANCE ALLOCATION CHART (MAC)

The MAC for the FC is in WP 0073 00.

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
EQUIPMENT DESCRIPTION AND DATA**

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

FLOATING CAUSEWAY

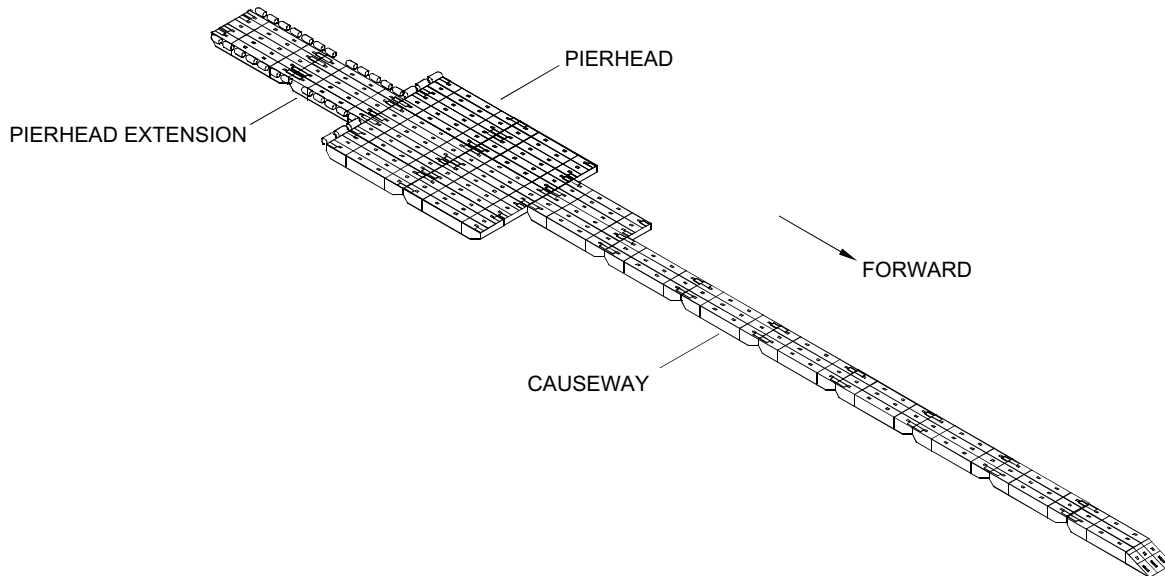


Figure 1. Floating Causeway

NOTE

This platform is fully mission capable from the two lane trident pier, 32 1/3 section configuration down to the Port Opening one lane 10 section and 1 CBSE section platform. A platform of less than 10 sections and 1 CBSE section is considered nonmission capable. If the pierhead mean low tide water depth is less than 15 ft, limited operation may be required.

The Floating Causeway (FC) is a floating platform used during Logistics Over The Shore (LOTS) operations. The FC consists of three major segments; pierhead extension, pierhead and causeway. Each major segment consists of non-powered floating modules that are assembled into module strings and intermediate sections.

The pierhead extension is the five string wide set of modules that run from the pierhead out to sea. This pierhead extension will be used by the lighter vessels to moor to the floating causeway. The overall dimensions of the pierhead extension is 40 ft wide by 160 ft long.

The pierhead consists of ten intermediate sections. The overall dimensions of the pierhead is 120 ft wide by 160 ft long.

The causeway consists of one or more intermediate sections connected lengthwise, with one end connected to the pierhead and the other end connected to a combination beach/sea end section. The overall dimension is determined by adding the total length of intermediate sections to the length of the combination beach/sea end section. The causeway length depends on how far offshore, from the beach, the causeway must extend to give the required water depth. The overall width of the causeway is 24 ft wide.

The pierhead extension, pierhead and the causeway are assembled to each other by flexor connectors.

WARNING

Operations should cease in SS 3 conditions. Due to the greatly increased risk for potential equipment damage and personal injury, only emergency operations should be conducted in SS 3.

The FC shall operate in sea conditions ranging from Sea State 0 up to and including Sea State 2 (see table 1), in surf conditions up to 5 ft with alongshore currents up to 2 knots, and in beach gradients up to 1:200. The FC system shall survive Sea State 4 conditions and be capable of being put back into service within 48 hours of the higher Sea State.

Table 1. Sea State (SS) Conditions.

SS	SIGNIFICANT WAVE HEIGHTS (FT)	MODAL WAVE PERIODS (SECONDS)
0	0.0 - 0.5	0.3 - 1.3
1	0.5 - 1.5	0.8 - 3.8
2	1.5 - 3.0	1.3 - 6.0
3	3.5 - 5.0	2.0 - 7.7
4	6.0 - 7.5	2.7 - 9.4
5	8.0 - 12.0	3.1 - 11.9

Other major components of the FC are the personnel shelter, generator shelter, the trailer-mounted light towers, communications equipment and the offshore and onshore anchor mooring system.

The FC is maneuvered into place by warping tugs.

INTERMEDIATE MODULAR CAUSEWAY SECTION

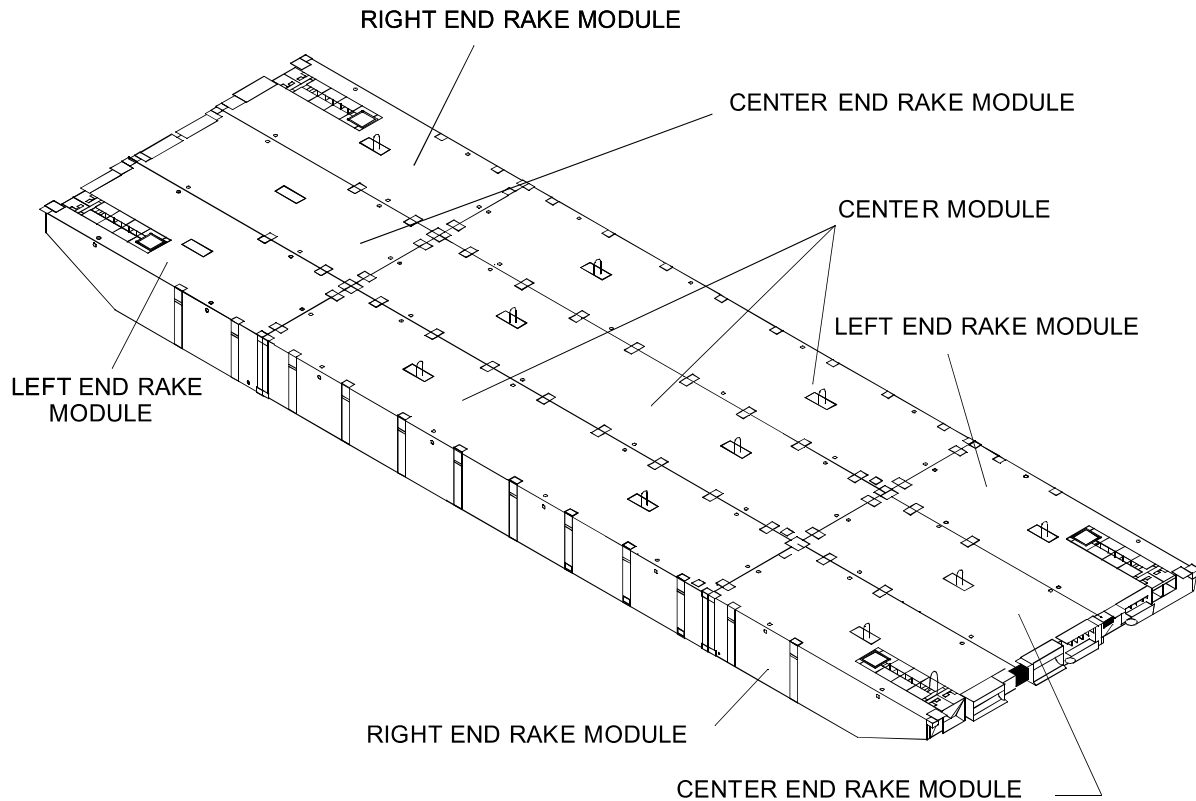


Figure 2. Intermediate Modular Causeway Section

The intermediate section consists of three non-powered center modules and six end rake modules; two center rake modules, two right hand rake modules and two left-hand rake module. Individual modules connect together by means of male and female connector assemblies located around the perimeter of each module. These intermediate sections are assembled to other intermediate sections by means of flexor connectors. The center module is 8 ft wide and 40 ft long. Each end rake is 8 ft wide and 20 ft long. All of the modules have a depth of 4 ft 6 in. The complete assembled intermediate section weighs approximately 142,500 lb.

GENERATOR CONTAINER

The generator container is mounted on the deck of the FC and houses a skid mounted tactical quiet 10 kW diesel generator set which provides electrical power to the personnel shelter.

The generator container is equipped with fluorescent lighting, auxiliary DC lighting system, ventilation system, fire suppression system, 1,000 gallon fuel system and accessories required to support operation of the personnel shelter for 90 days.

PERSONNEL SHELTER

The personnel shelter provides a weatherproof, temperature controlled environment for personnel on the FC.

The personnel shelter is outfitted with fluorescent lighting, tables, benches, heating/cooling unit, communications equipment, electrical outlets, emergency lighting, portable fire extinguishers and a rest room with an electrically powered incinerator toilet

LIGHTING SYSTEM

The lighting equipment is provided to illuminate the deck of the FC and consists of four trailer-mounted light towers. Each light tower is self-contained with its own diesel-fueled power source capable of providing an average of 30 foot-candles of illumination over the area of six sections.

ANCHOR MOORING SYSTEM

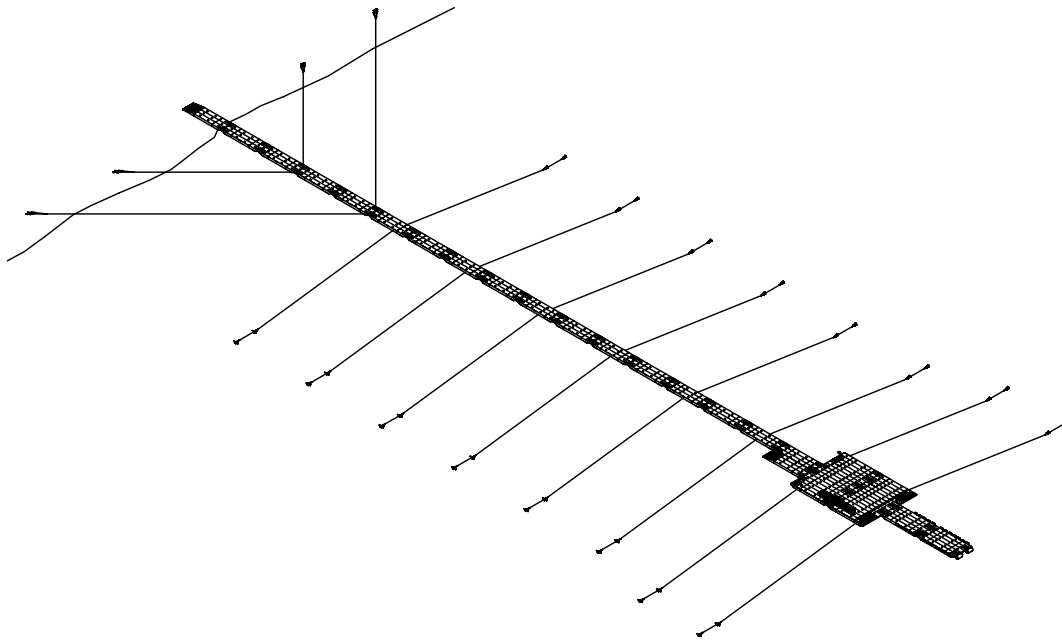


Figure 3. FC Anchor Mooring System

The anchor mooring system is designed to hold the floating causeway in place during Logistics Over The Shore (LOTS) operations in sea conditions up to Sea State 3. The offshore mooring leg is designed to perform in soft soils and sand. The onshore mooring leg is designed to perform in soft soils, sand and competent rock.

In addition to Sea State, the capability of the anchor mooring system to hold the floating causeway in position is highly dependent on the alongshore current speed and number and type of vessels mooring to the floating causeway. It is also dependent on the water depth at the vessel's location. The complete system, which has 16 offshore mooring legs and four onshore mooring legs, is required for a full floating causeway that is 1,500 ft long. The following table (table 2) shows the estimated current speeds for the anchor mooring system to hold the floating causeway in place when one or two lighters are moored alongside the five string wide pierhead extension of the floating causeway.

Table 2. Floating Causeway Anchor Mooring System Current Speeds.

MOORED VESSEL(S)	WATER DEPTH	LIMITING CURRENT CAPACITY (KNOTS)
1 LCU-2000	10 ft	2
1 LCU-2000	15 ft	2.8
1 LCU-2000	20 ft	3.5
2 LCU-2000	10 ft	1.5
2 LCU-2000	15 ft	2.2
2 LCU-2000	20 ft	2.7
1 LSV	15 ft	1.1
1 LSV	20 ft	1.5
2 LSV	15 ft	0.9
2 LSV	20 ft	1.1

COMMUNICATION EQUIPMENT

The communication equipment consists of four Very High Frequency/Frequency Modulation (VHF/FM) handheld transceivers powered by Direct Current (DC) batteries.

A battery charging station for the transceivers is located in the personnel shelter.

FENDERS

There are three types of fenders authorized for use on the FC: 5 ft X 10 ft, 4 ft X 12 ft and 3 ft X 5 ft. The 5 ft X 10 ft fender weighs approximately 1,500 lb. The 4 ft X 12 ft fender weighs approximately 1,450 lb. The 3 ft X 5 ft fender weighs approximately 300 lb.

CORNER FENDERS

The corner fenders provides protection for the corners of the FC platform.

MOORING BITTS

The mooring bitts are used for securing lines from other vessels and fenders to the FC and are mounted in the module guillotine connectors.

DECK MATTING

The deck matting protects the deck of the FC under the ramps of lighter vessels without interfering with their operations and are secured to the deck with fasteners.

DECK FITTINGS

The sections of the FC are provided with D-ring and deck cleat fittings to meet various operational needs.

TOWING BRIDLE AND TOWING INTERFACE

The towing bridle and towing interface allow the FC to be stern towed by commercial and military tugs when platform relocation is required.

BASIC ISSUE ITEMS CONTAINER

The Basic Issue Items (BII) container provides FC personnel with all the necessary tools and equipment required to assemble, operate and maintain the FC and its supporting equipment.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

CENTER MODULE

Location

The center modules are located between and attached to the end rake modules.

Description

The center module is a hollow structure. Each center module has two 25 ton capacity lifting shackles which are flush mounted in the deck. The textured deck and smooth bottom are free of any protrusions that might obstruct packing. Access for internal leak detection of each compartment is provided by three recessed threaded plugs located on the top of the module. Alternating male and female connectors are equally spaced along both sides and ends of the module. These lock assemblies are stowed flush with the surface and, when deployed, they connect modules with minimum clearance.

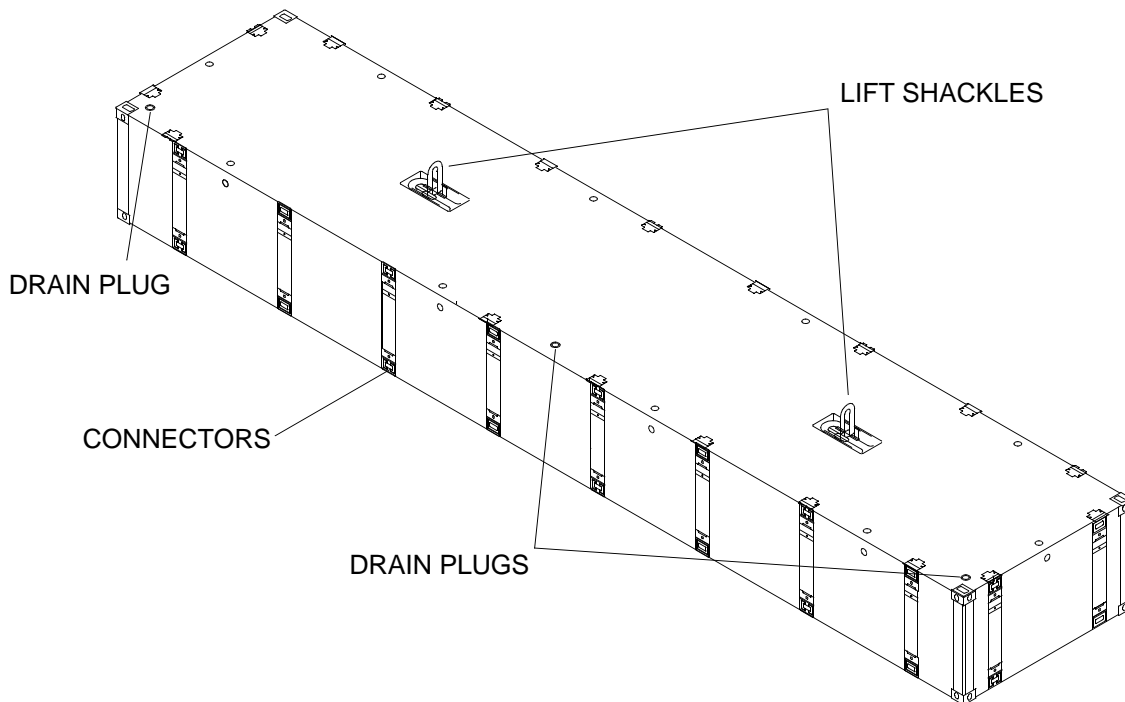


Figure 4. Center Module

CENTER END RAKE MODULE

Location

The center end rake modules are attached to the center module.

Description

The center end rake module is a hollow structure. Each center end rake module has one 25 ton capacity lifting shackle, which is flush mounted in the deck. The textured deck and smooth bottom are free of any protrusions that might obstruct packing. Access for internal leak detection of each compartment is provided by a recessed threaded plug located on the top of the module.

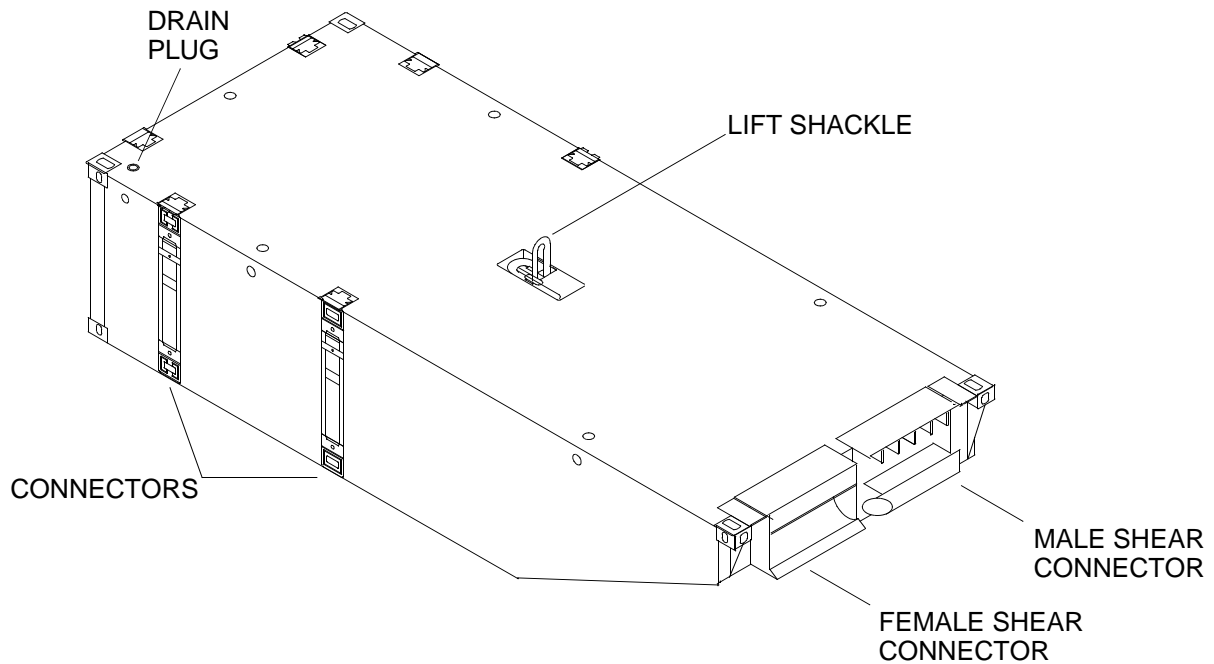


Figure 5. Center End Rake Module

LEFT AND RIGHT END RAKE MODULES

Location

The left and right end rake modules are attached to the center modules.

Description

The left and right end rake modules are hollow structures. Each left and right end rake module has one 25 ton capacity lifting shackle, which is flush mounted in the deck. The textured deck and smooth bottom are free of any protrusions that might obstruct packing. Access for internal leak detection of each compartment is provided by a recessed threaded plug located on the top of the module. The left end rake has a flexor connector pocket for flexor connector installation in the outboard forward corner of the module. The right end rake has a flexor connector pocket for flexor connector installation in the outboard forward corner of the module. The left end rake has a male shear connector and the right end rake has a female shear connector. These are used as a mating device during assembly and act as a hinge during operation.

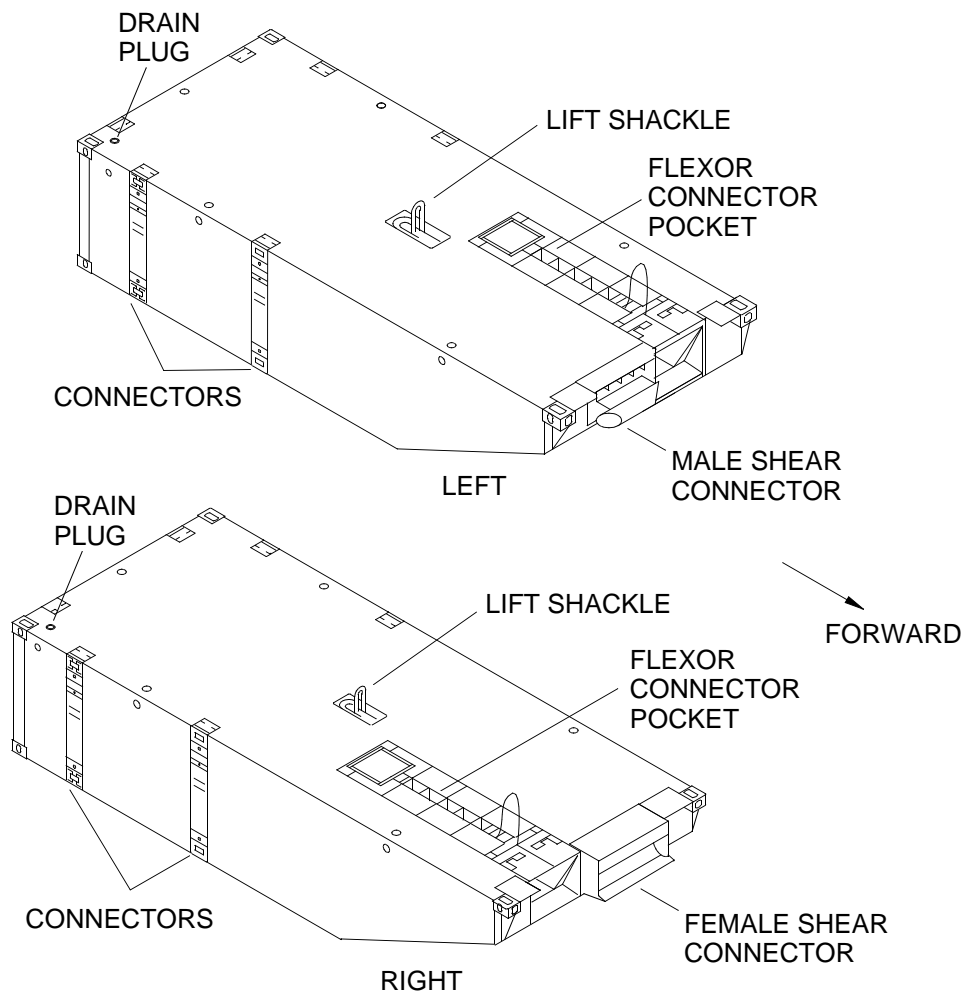


Figure 6. Left and Right End Rake Modules

COMBINATION BEACH/SEA END SECTION

Location

One combination beach/sea end section is attached to the last intermediate section of the beachward end of the causeway and another is attached to the pierhead.

Description

The combination beach/sea end section is made up of three center modules (non-powered), three end rake modules (left, center, and right) and three beach/sea end rake modules. The complete assembled combination beach/sea end section is 85 ft long, 24 ft wide and weighs approximately 141,900 lb.

The combination beach/sea end module is a hollow structure with a ramp slope of 10°. Each CBSE has two 25 ton lifting padeyes, which are flush mounted one per side. Access for internal leak detection of each compartment is provided by a recessed threaded plug located on top of CBSE.

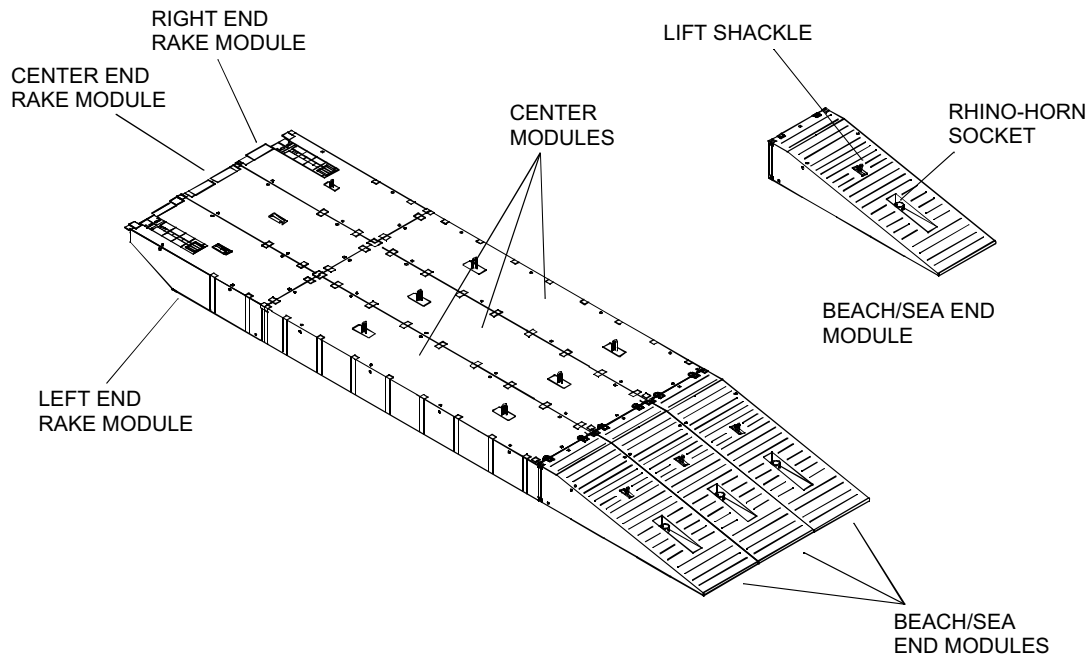


Figure 7. Combination Beach/Sea End Section

INTERCONNECT GUILLOTINES AND FLEXOR CONNECTORS**Location**

The interconnect guillotines are mounted to the sides and ends of the modules.

The flexor connectors are stowed in the left end rake modules.

Description

The interconnect guillotines secure the sides of modules together during assembly of the FC platform. The female guillotine interlocks with the male guillotine connecting pin and lock when the guillotines are flush with the deck.

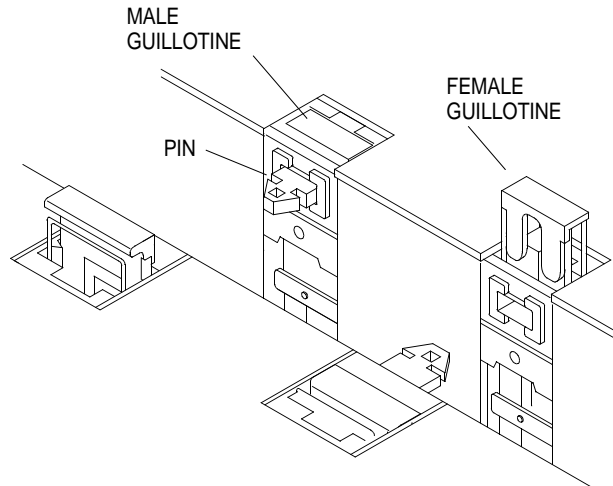


Figure 8. Interconnect Guillotines

The flexor connectors secure the end rake modules together during assembly of the FC platform.

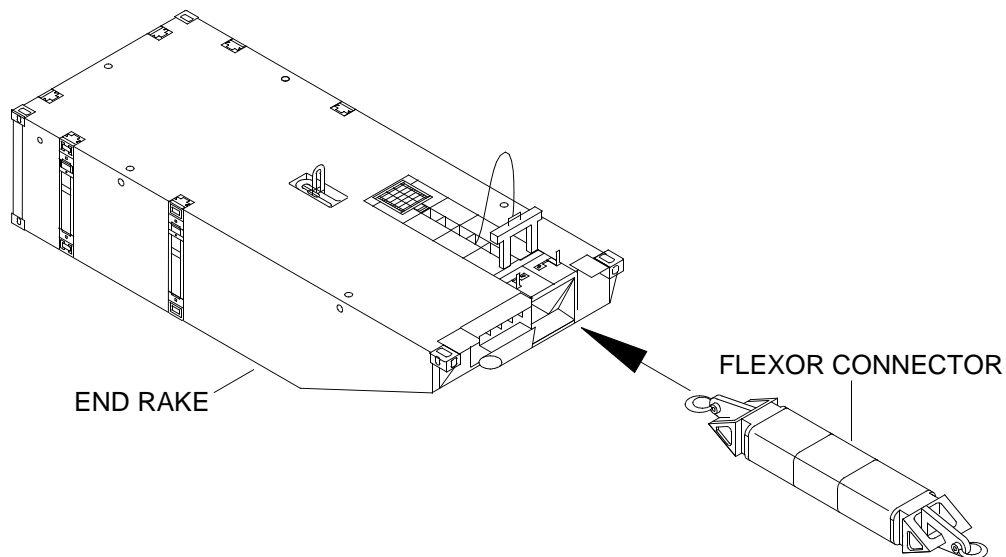


Figure 9. Flexor Connectors

FC STRING

Location

The module string is attached to other strings to make up an intermediate section.

Description

The module string may be assembled in five different configurations: a center module with two center end rake modules, a center module with one left and one right end rake module, a center module with a center end rake and a combination beach/sea end module, a center module with a left end rake and a combination beach/sea end module or a center module with a right end and a combination beach/sea end module.

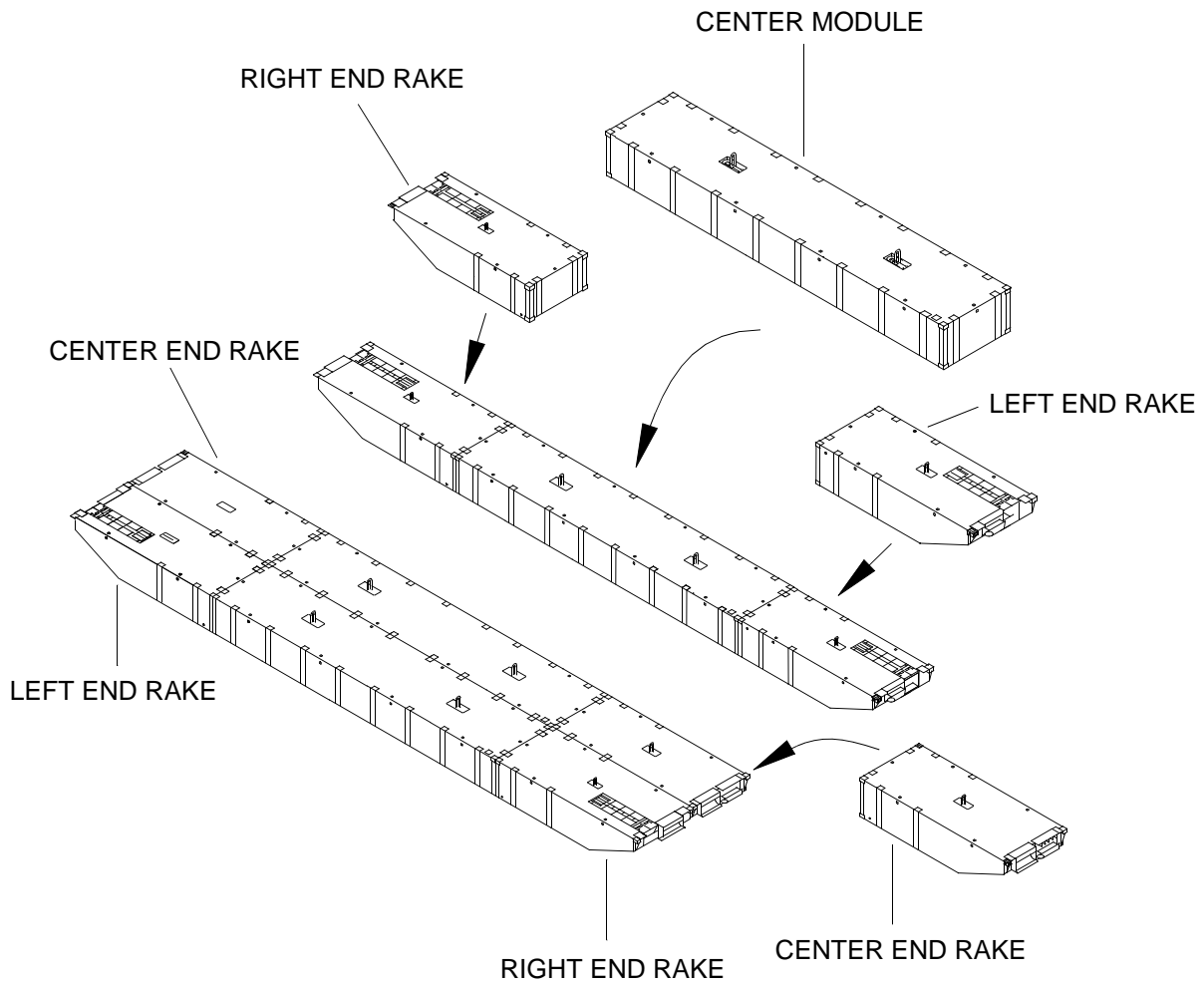


Figure 10. FC String Components

INTERMEDIATE SECTION

Location

The intermediate section is attached to other intermediate sections to construct an FC segment.

Description

An intermediate section is composed of three strings: two outboard strings and a center string. The two outboard strings consist of a center module, left end rake module and right end rake module. The center string consists of a center module and two center end rake modules. Strings are connected using male and female connectors.

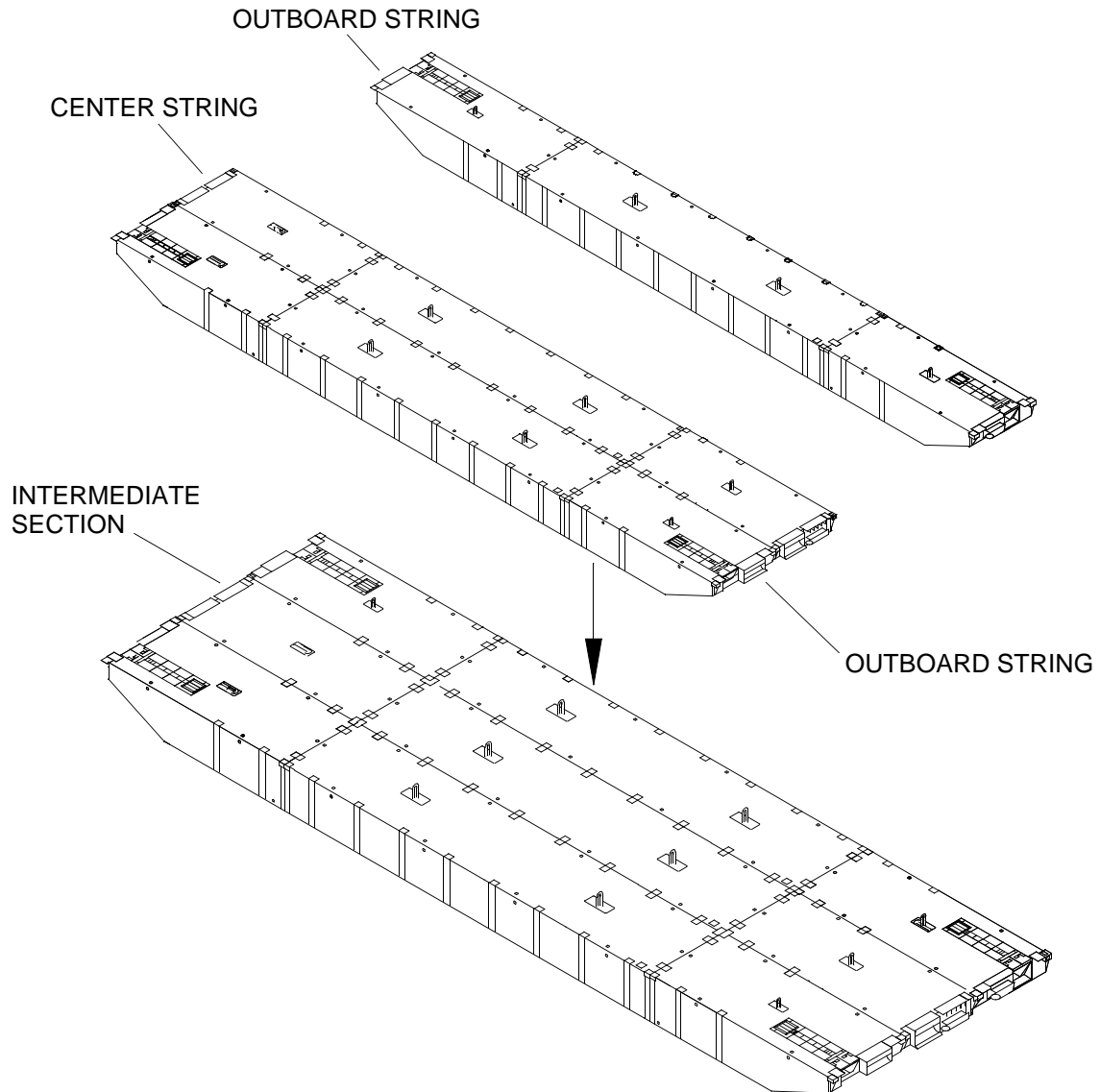


Figure 11. Intermediate Section

PIERHEAD

Location

The pierhead is located at the seaward end of the causeway.

Description

The pierhead is a floating platform for loading and unloading ocean-going sealift vessels. The pierhead consists of two sections: a floating platform which is made up of 10 intermediate modular sections that are assembled by connecting two segments of five wide, making the overall dimensions of the pierhead 160 ft long x 120 ft wide, and a pierhead extension which is made up of 10 module strings, two segments of five wide connected end to end run from the pierhead out to sea. This pierhead extension will be used by the lighter vessels to moor to the floating causeway. The overall dimensions of the trident pierhead extension is 40 ft wide x 160 ft long. The pierhead is capable of supporting two M-1 Abrams tanks and one sealift vessel's cargo ramp foot on the platform surface. The pierhead will withstand cargo loading through Sea State 2 conditions.

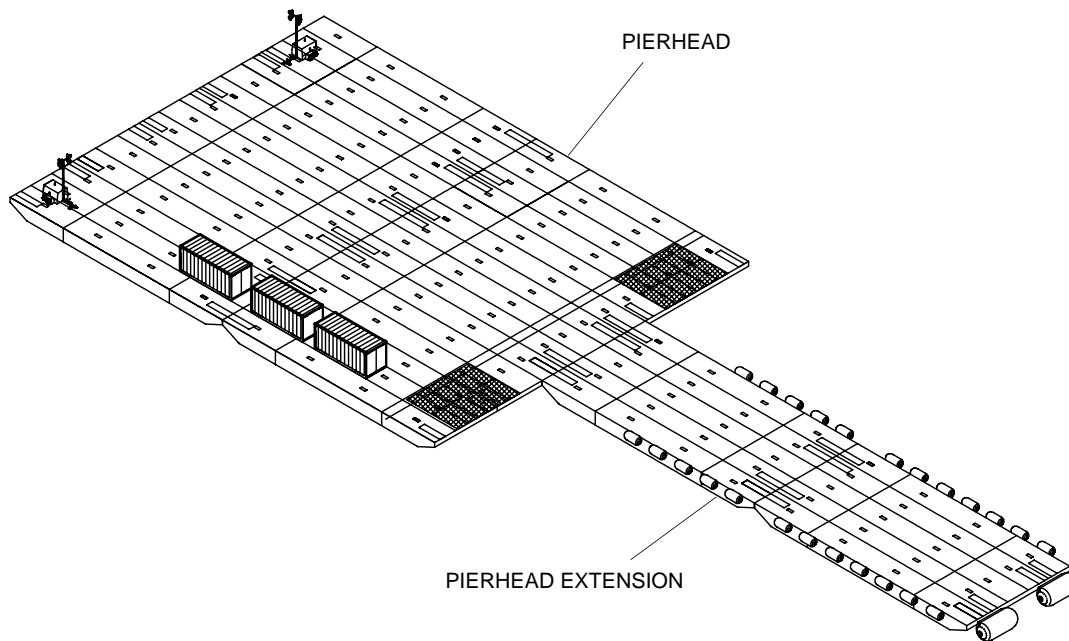


Figure 12. Pierhead

CAUSEWAY**Location**

The causeway extends from the beach, seaward to the pierhead.

Description

The causeway is made up of one or more intermediate sections and one combination beach/sea section interconnected end-to-end to form a floating platform from the pierhead to the beach. The overall length is determined by adding the total length of intermediate sections to the length of the combination beach/sea end section configuration used. The causeway length depends on how far off shore, from the beach, the causeway must extend to give the required water depth. The overall width of the causeway is 24 ft wide.

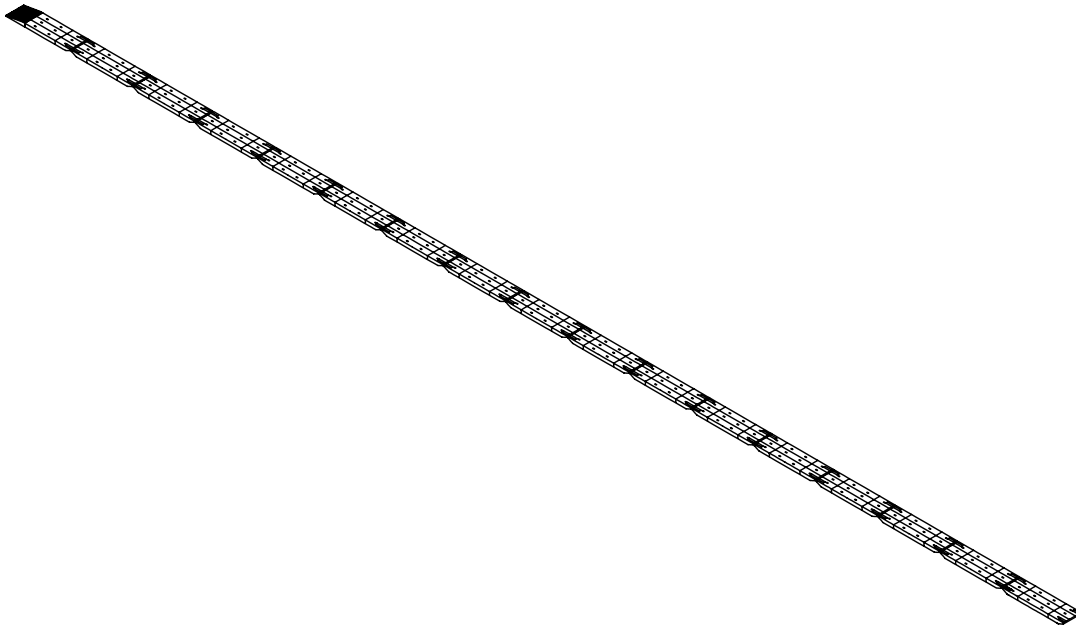


Figure 13. Causeway

OFFSHORE ANCHOR SYSTEM

Location

The offshore mooring legs are attached to the FC with two on each side of the pierhead and, beginning after the pierhead, each alternate section of the causeway is moored.

Description

Sixteen offshore mooring legs are available to secure the FC from drifting. The offshore mooring leg container is a 20 ft full access ISO container that provides stowage for two anchor mooring legs and supports the installation of the mooring legs from the FC deck. An offshore mooring leg contains the following items:

- Two 2,400 lb NAV-MOOR-2 anchors
- Two 150 ft lengths of 1 1/4 in. wire rope
- One vertical padeye
- One 30 ft length of 1 1/4 in. wire rope
- One 45 ft length of 1 1/4 in. wire rope
- One 10 ft length of 1 in. wire rope
- One anchor buoy
- One 1 1/2 in. swivel
- Eight 1 3/8 in. bolt type anchor shackles
- One 1 in. shackle
- Two plastic cable ties

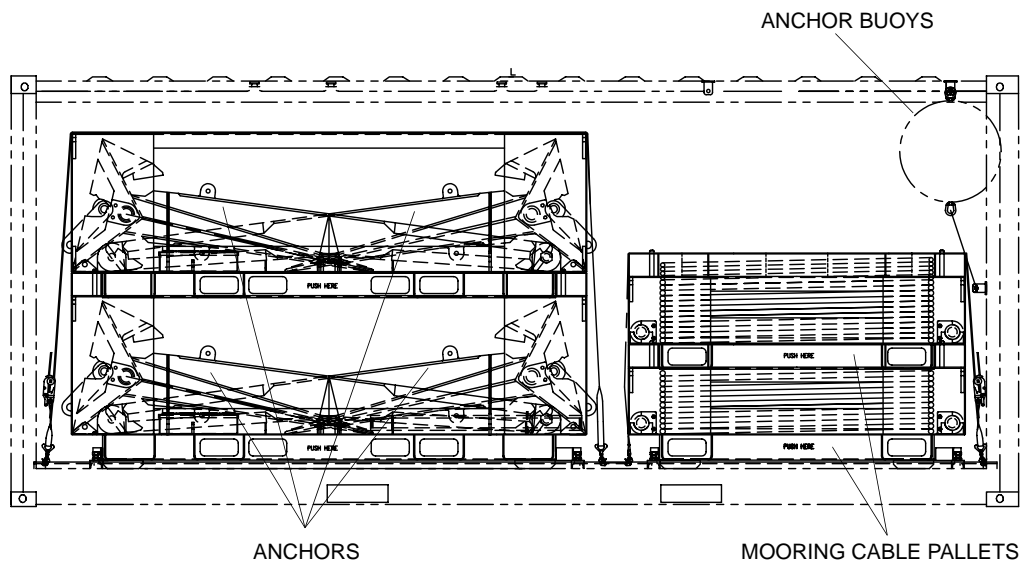


Figure 14. Offshore Anchor Container

ONSHORE ANCHOR SYSTEM

Location

The onshore mooring legs are attached to the causeway segment and located on the third and fifth intermediate sections from the beach.

The onshore mooring legs secure the shoreward end of the causeway to the beach. The four onshore legs for the causeway are stowed and transported in a 20 ft open end ISO container. The onshore mooring leg is designed to perform in soft soils, sand and competent rock.

Description

The onshore mooring container is placed on the deck of the first beach end causeway section. Once the FC is beached, the wire rope assemblies, padeyes and necessary shackles for the first two onshore legs can be assembled and brought ashore for attachment to bulldozers. The remainder of the container contents can be assembled with the container on the FC or the container may be moved to the beach before the remaining contents are assembled. An onshore mooring leg contains the following items:

- Four 120 lb NAVMOOR anchors
- One or two 300 ft long, 1 in. wire rope assemblies
- One horizontal padeye
- One or two 1 3/8 in. shackles
- Four 1/2 in. anchor shackles
- Two 7/8 in. shackles
- Seven 1 in. shackles
- Two carpenter stop assemblies
- One snatch block
- One hoist hook cable
- One griphoist
- One master link
- One flounder plate
- Two anchor bridles
- Two rings
- Two 1/2 in. chain assemblies
- One anchor pendant

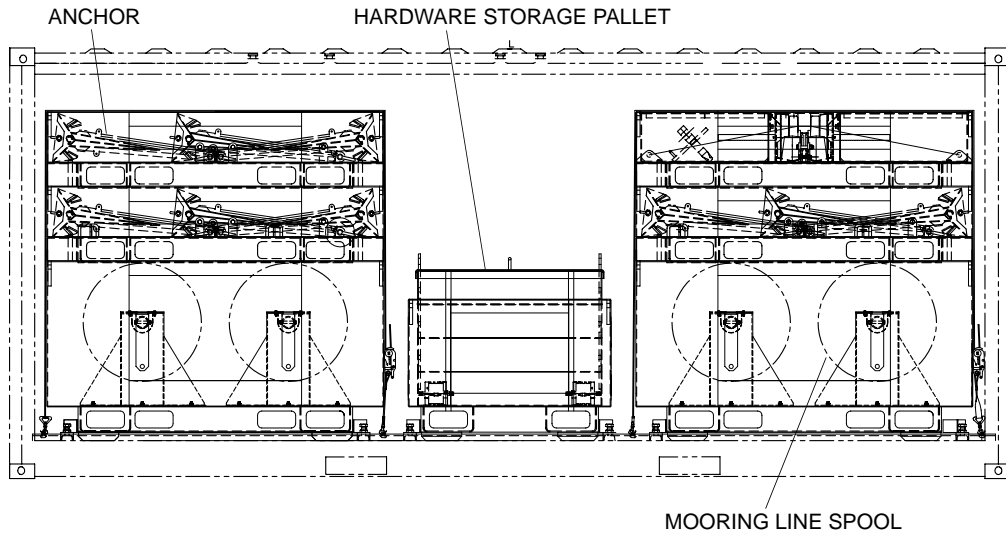


Figure 15. Onshore Anchor Container

10 KW GENERATOR AND CONTAINER

Location

The 10 kW generator is located in a 20 ft container. The container is located on the FC platform.

Description

The description and specifications for the 10 kW generator may be found in TM 9-6115-642-10.

The generator is supplied with fuel by the generator mounted day fuel tank. A 1,000 gallon base fuel tank is mounted in the container. Fuel is transferred to the day fuel tank utilizing an electric fuel transfer pump. A hand operated fuel transfer pump is provided in case of electric fuel transfer pump failure. A fuel level indicator on the generator instrument panel aids in the refueling of the day tank. The 1,000 gallon fuel tank may be refueled inside or outside the container. Fuel level indicator lights are mounted on the inside and outside of the container to aid in refueling the 1,000 gallon fuel tank. The generator container weighs 15,000 lb.

A stainless steel motorized louver provides air to the generator for cooling. Generator exhaust is routed outside of the container. A stainless steel motorized vent provides ventilation for the generator container. Aluminum covers are used while in storage to protect the louvers from the elements.

The container is equipped with a CO₂ fire suppression system. The fire suppression system may be operated automatically or manually. In the automatic mode, one of two fixed temperature heat detector elements will activate the fire suppression system when the temperature exceeds 200°F. When the system activates, an alarm bell sounds, a 24 VDC horn strobe will flash and sound, and CO₂ from one 100 lb cylinder is then discharged through two multijet nozzles to flood the container. The system may be operated in the manual mode using the manual pull station when electrical power is available or by pulling the pin and raising the actuator handle when electrical power is not available. The two elements are located on the generator container roof centerline.

The CO₂ fire suppression system is controlled by the control module. Two 12 VDC rechargeable batteries provide backup power for the module. Upon sensing that a fire is present, the control module activates the fire suppression sequence. A time delay between the initial alarm condition and operation of the shutdown relay occurs. This delay may be programmed for 0, 10, 20 or 30 seconds by the user. The shutdown relay shuts down the generator and allows personnel time to vacate the shelter. After the delay sequence is completed, a second delay before actuation of the fire extinguishing agent occurs. This second delay may be programmed for 0, 10, 20 or 30 seconds by the user. When using the manual pull station, the delays used in the automatic mode are implemented by the control module.

A portable fire extinguisher is mounted on the generator container bulkhead adjacent to personnel access door.

Two warning signs designate the exit and are mounted on both the exterior and interior of the container.

The container is equipped with Alternating Current (AC) fluorescent light fixtures. A load center is used to control the AC system. A Direct Current (DC) lighting system, comprised of a spring wound timer switch, 12 volt battery with battery charger and light fixtures, supply light when AC lighting is not available.

An EMERGENCY STOP button is mounted inside the container personnel access door. When pressed, the EMERGENCY STOP button stops the generator.

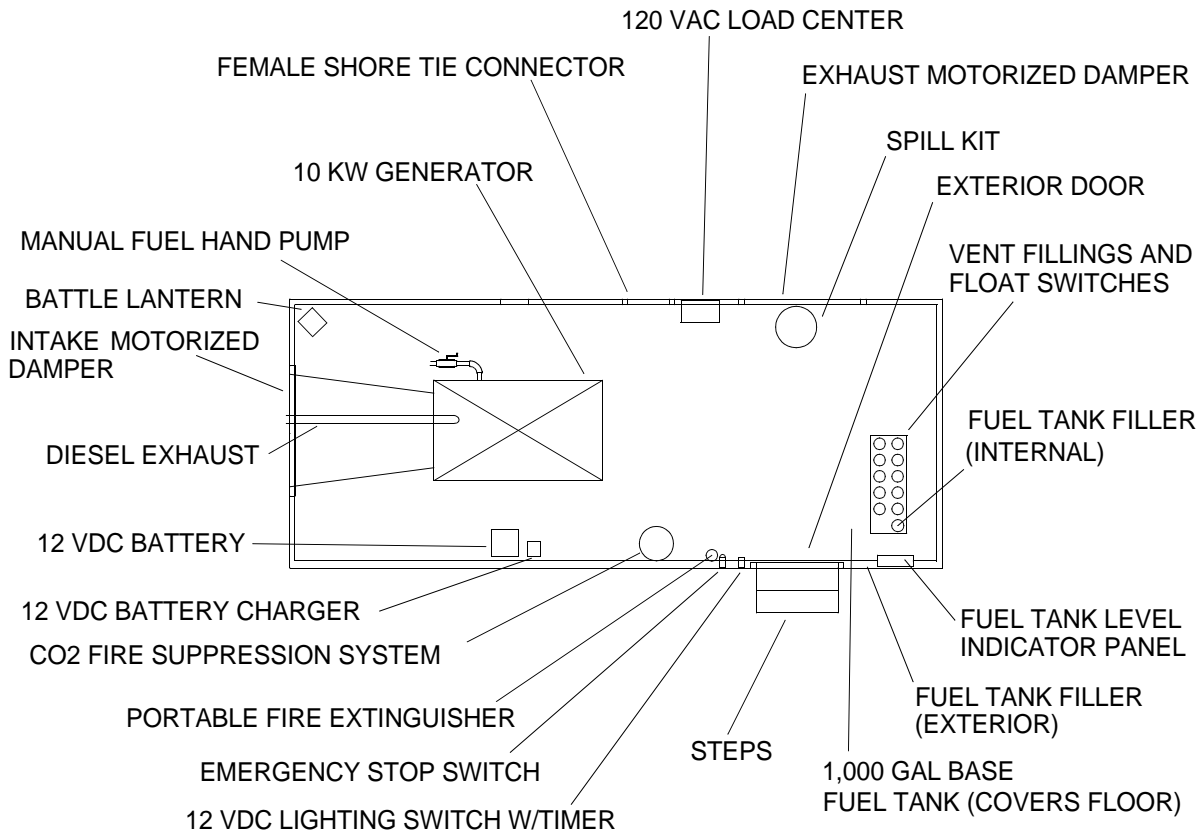


Figure 16. Generator Container

PERSONNEL SHELTER

Location

The personnel shelter is located on the deck of the FC platform.

The description and specifications for the packaged terminal air conditioner and heat pump may be found in TM 55-1945-220-14&P.

The description and specifications for the incinerator toilet may be found in TM 55-1945-219-14&P.

Description

The personnel shelter provides a controlled environment for soldiers supporting the FC platform. The personnel shelter equipment is contained in a 20 ft container. The shelter is equipped with an air conditioner and heat pump unit with remote thermostat, incinerator toilet, AC lighting system (red and white lights), portable fire extinguishers, a battle lantern, bench seating for personnel, a table, a personnel escape scuttle located in the wall over the bench seat and a handheld radio charging station. The personnel shelter receives electrical power from the 10 kW generator.

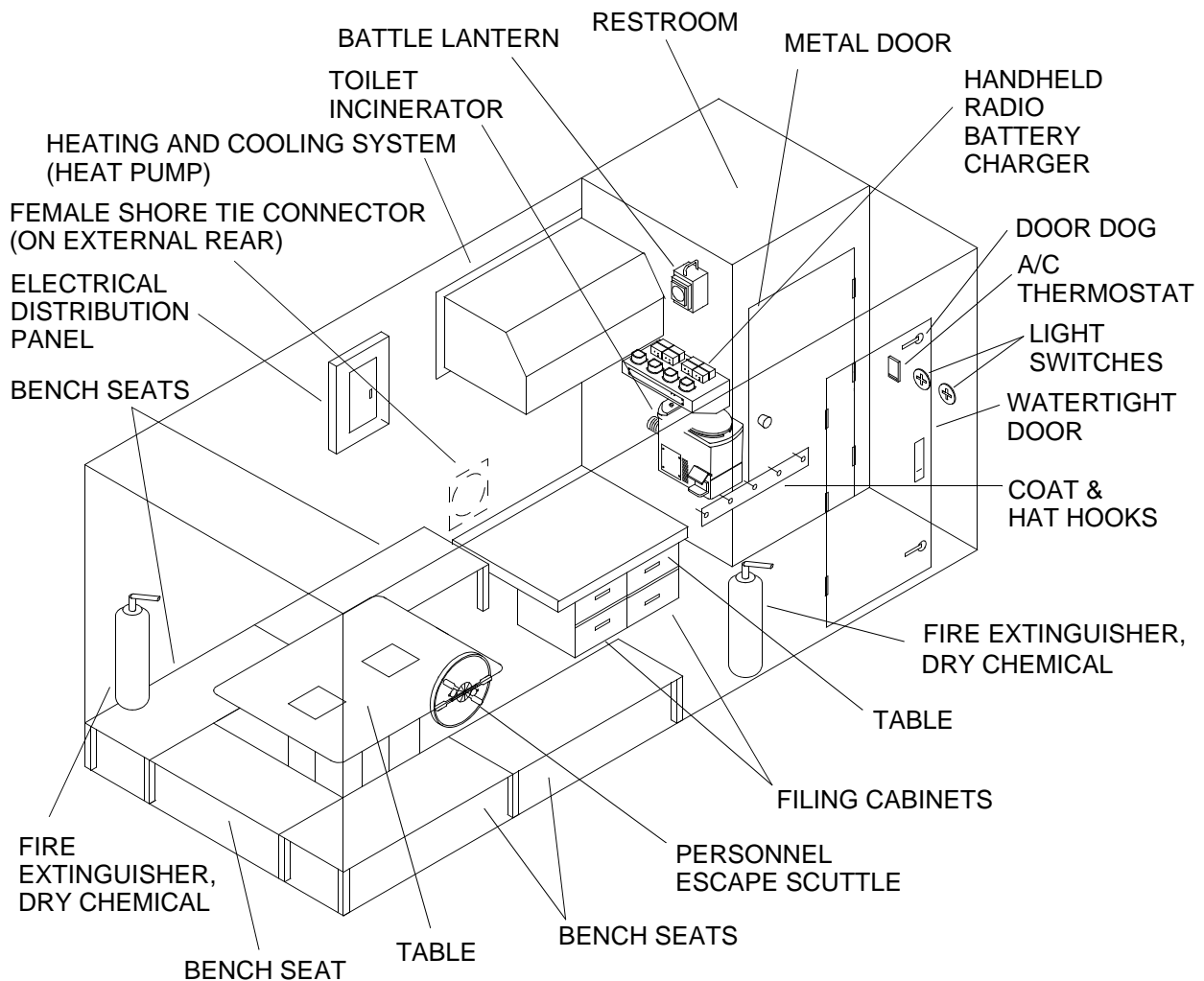


Figure 17. Personnel Shelter

LIGHT TOWERS

Location

The light towers are positioned on the FC platform to provide lighting during night operations. The light towers are positioned by the operators as desired.

The description and specifications for the light tower may be found in TM 55-1945-217-14&P.

The description and specifications for the light tower engine may be found in TM 55-1945-218-14&P.

Description

The light towers are commercially available, self contained lighting systems. The light towers illuminate the work area using four high pressure sodium 1,000 W lamps each. The light towers are powered by a three cylinder diesel engine. The light towers are stored in a 20 ft container when not in use. Each light tower is secured to its shipping pallet that serves as a spill containment pan/tray.

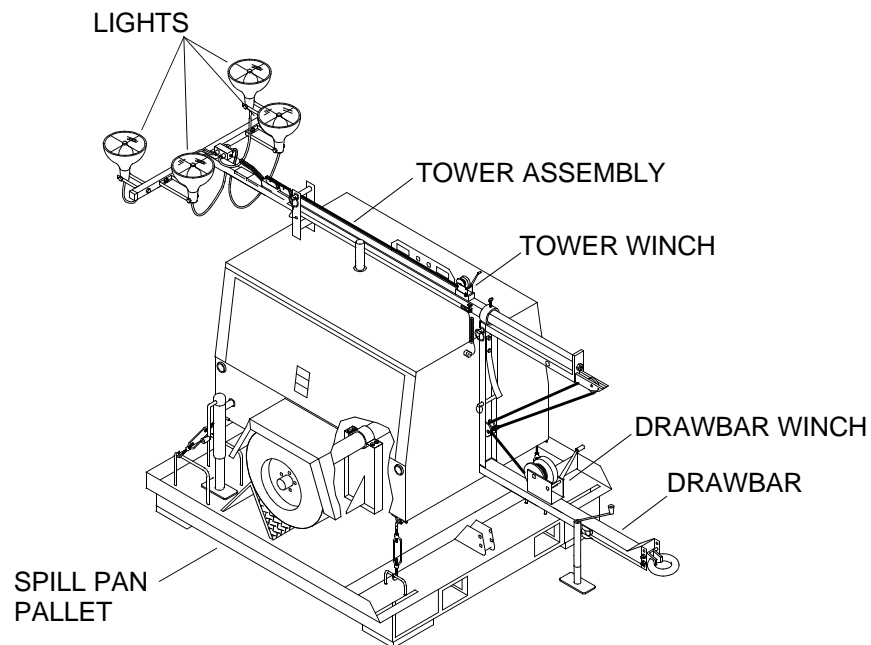


Figure 18. Light Tower Out of Container and Assembled

FENDERS

Location

The corner fenders are installed on protruding corners of the FC pierhead, though the location of the placement of cylindrical fenders will vary with the configuration of the FC.

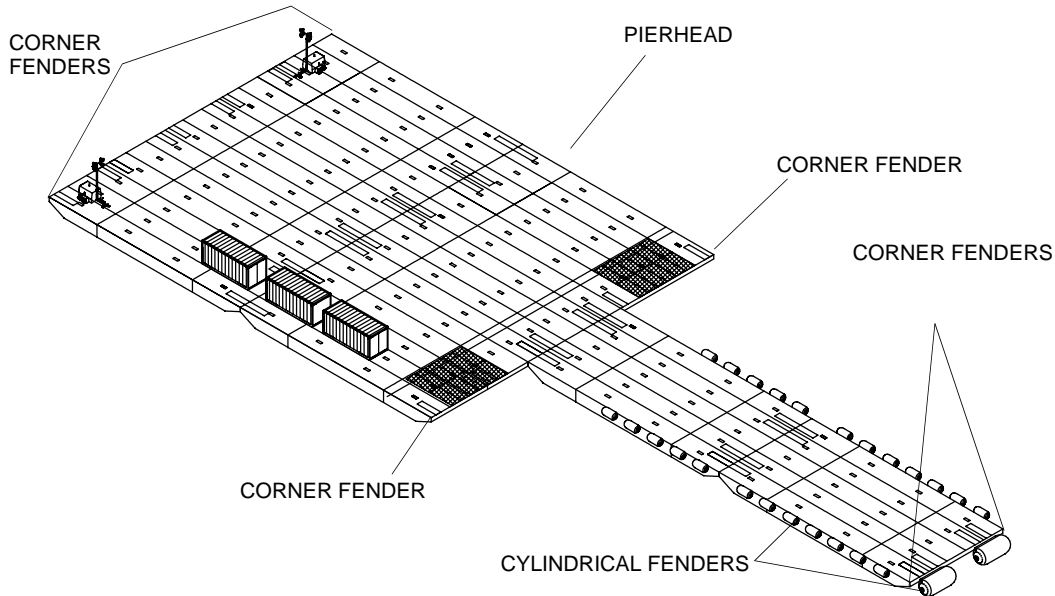


Figure 19. Fenders

Description

There are two types of fenders which are components of the FC. These fenders are cylindrical type and corner type.

Cylindrical Type: There are three sizes of cylindrical shaped fenders constructed of rubber, that are components of the FC. The 5 ft diameter by 10 ft long (2), 4 ft by 12 ft (3) and 3 ft by 5 ft. The 3 ft by 5 ft, 4 ft by 12 ft and 5 ft by 10 ft fenders are stowed on specially constructed pallets in their own 40 ft open top containers. The 3 ft by 5 ft and 4 ft by 12 ft fenders are used for stand-off from lighters. The 5 ft by 10 ft and fenders are used for stand-off from sealift vessels.

Corner Type: The one piece corner fenders (5) are installed on protruding ISO corners of the FC.

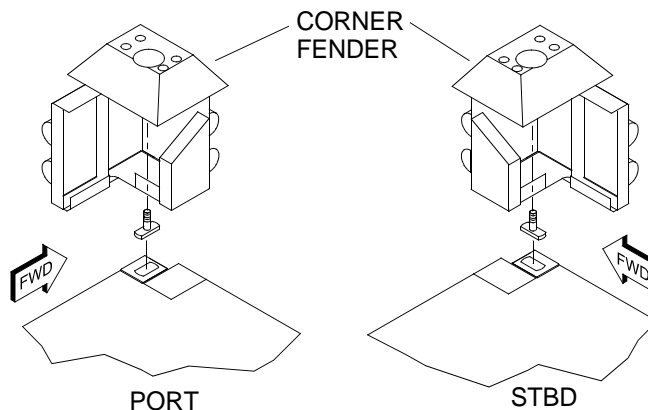


Figure 20. Corner Fenders

MOORING BITTS AND QUICK DISCONNECTS**Location**

The mooring bitts can be installed on any side of the FC that is exposed to the sea and accessible for mooring. Quick disconnect assemblies are attached to the mooring bitts.

Description

Mooring bitts incorporate two mounting connector pins that can only be installed into female module connector assemblies. The quick disconnect is used for creating a safe mooring connection to the mooring bitt. The quick disconnect is designed to break away if excessive pulling force is applied to the FC.

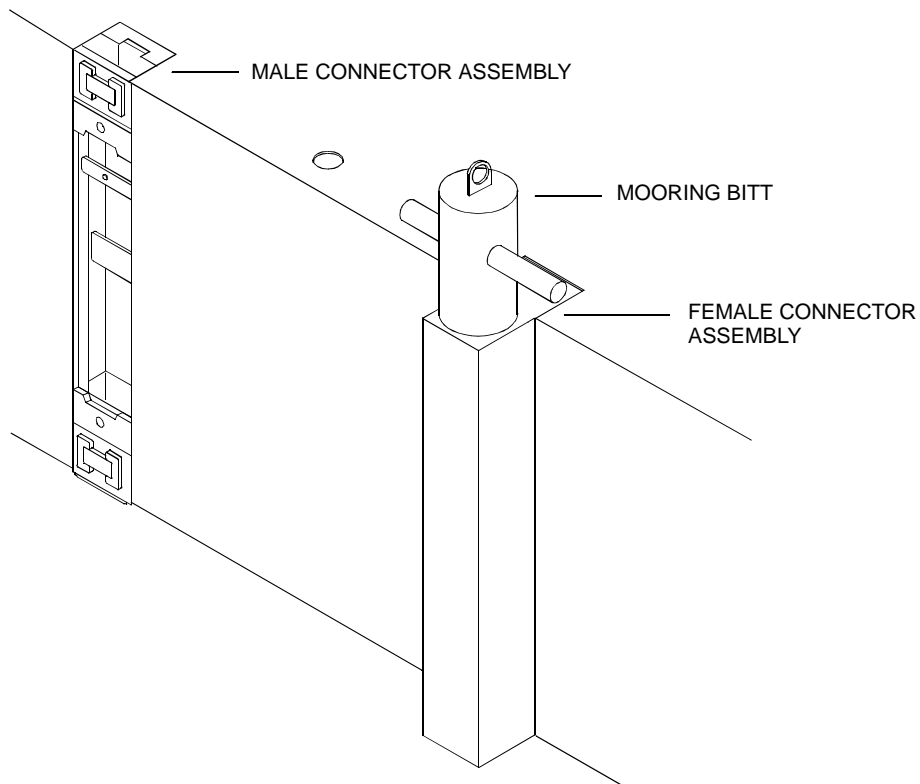


Figure 21. Mooring Bitt and Quick Disconnect

DECK MATS

Location

Individual deck mats are attached to a module ISO corner fitting and are placed where the cargo ramps of the sealift vessel and the lighters will land on the FC. When not in use, the mats are stacked horizontally on a pallet in 20 ft storage containers.

Description

Each deck mat is made of high density polyethylene material and has a hole near each corner that are used for securing the mat to the ISO corner fittings.

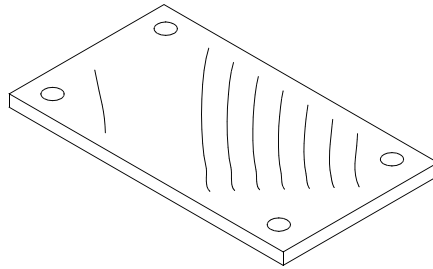


Figure 22. Deck Mat

D-RING AND DECK CLEAT FITTINGS

Location

D-ring and deck cleat fittings are installed in the module turn tubes located on the deck of the FC platform.

Description

These fittings have a 15,000 lb load capacity. There are ten tube turns per center module and five per end rake for mounting the fittings.

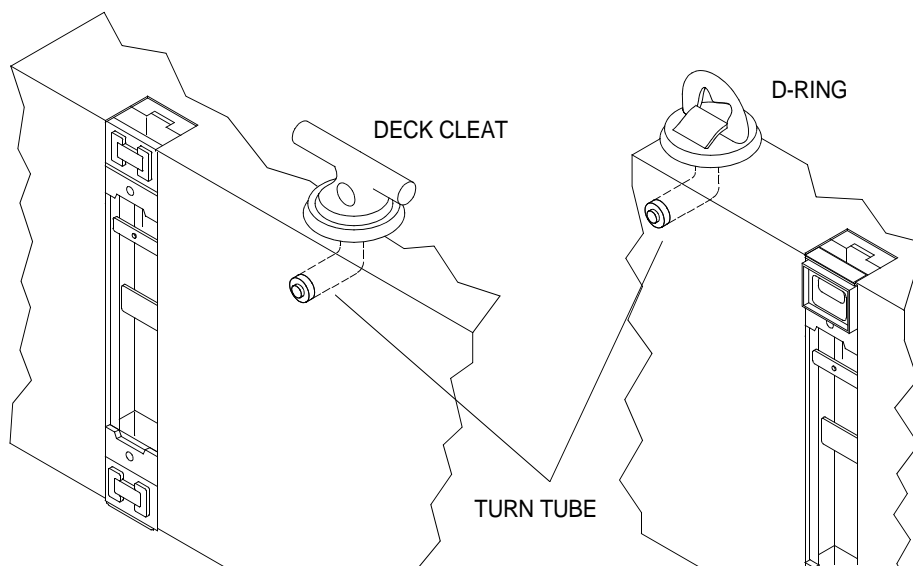


Figure 23. D-Ring and Deck Cleat Fittings

TOWING BRIDLE, TOWING INTERFACE AND TOWING LIGHTS

Location

The towing bridle is attached to towing interface and is stowed in the BII container when not in use.

The towing interface (flexor receiver inserts) are attached to the FC end rakes and are stowed in the BII container when not in use. A lifting device is provided for handling the flexor receiver inserts and is stowed in the EASY container when not in use.

The towing lights should be installed in accordance with the U.S. Coast Guard Navigational Regulations when towing the FC. The lights are stowed in the BII container when not in use.

Description

The towing bridle consists of a 500 ft long by 10 in. circumference nylon line and a 2 1/2 in. anchor swivel connected to spliced in eyes and thimbles of the two bridle legs. The bridle legs are 10 in. circumference 12 strand plaited nylon line. One towing bridle has 35 ft long legs and one towing bridle has 60 ft long legs. Each end of the of the towing bridle has a shackle used to attach the legs to the towing interface at the FC and the other end to a warping tug.

The towing interface is used along with the towing bridle to tow the FC up through Sea State 5 conditions. The flexor receiver insert lifting device is used to install the towing interface.

There are four types of towing lights used during towing of the FC. The towing lights are identified by the color of the lens, which are white, green, red and amber. The lenses are interchangeable and are adjustable for aiming purposes during towing operations. These lights are battery operated and have magnetic bases so no adaptors are needed for installation.

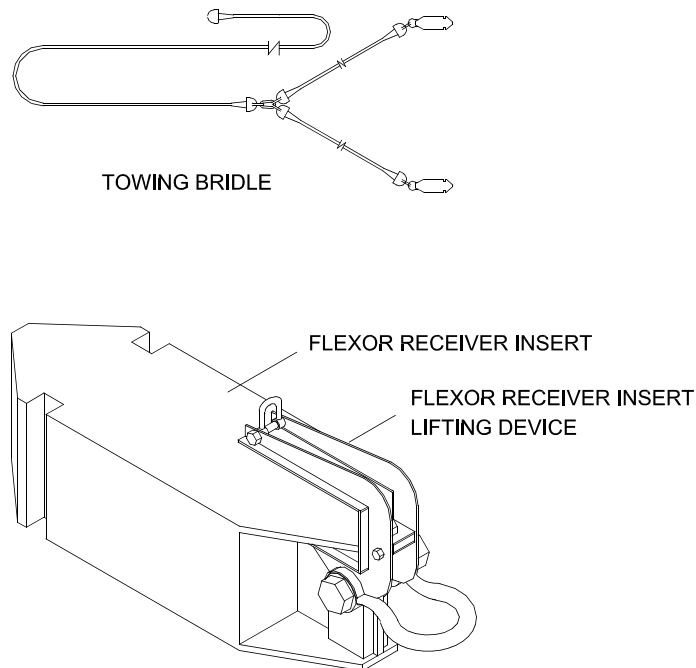


Figure 24. Towing Bridle

LIFE RING ASSEMBLIES

Location

The life ring assemblies are installed at various locations on the FC platform to assist in the rescue of personnel in the water.

Description

The components of the life ring assembly consists of a donut shaped flotation device, nylon rope and strobe light mounted on a turn tube type stanchion.

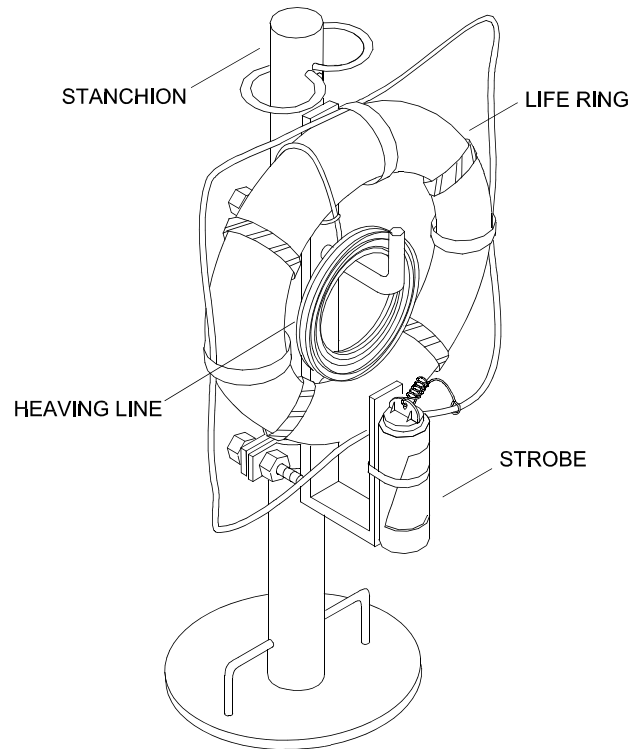


Figure 25. Life Ring Assembly

EQUIPMENT DATA**CENTER MODULE****Table 3. Center Module Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	8 ft
Length	40 ft
Depth	4 ft 6 in.
Weight	22,400 lb
ISO Compatible	Yes
Sea State Operation	SS 2

END RAKE MODULE**Table 4. End Rake Module Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	8 ft
Length	20 ft
Depth	4 ft 6 in.
Weight	12,500 lb
Weight (Flexor Stowed)	13,900 lb
ISO Compatible	Yes
Sea State Operation	SS 2

COMBINATION BEACH/SEA END MODULE**Table 5. Combination Beach/Sea End Module Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	8 ft
Length	25 ft
Depth	4 ft 6 in.
Weight	15,000 lb
ISO Compatible	Yes
Sea State Operation	SS 2

INTERMEDIATE SECTION**Table 6. Intermediate Section Data**

ITEM CHARACTERISTIC	DESCRIPTION
Center Modules (3 Per Section)	Non-Powered
End Rake Modules (6 Per Section)	Compatible With U.S. Navy flexor attachments and shear connectors
Width	24 ft
Length	80 ft
Depth	4 ft 6 in.
Weight of Assembled Intermediate Section	142,200 lb
ISO Compatible	Yes
Sea State Operation	SS 2

COMBINATION BEACH/SEA END SECTION**Table 7. Combination Beach/Sea End Section Data**

ITEM CHARACTERISTIC	DESCRIPTION
Beach/Sea End Modules (3 Per Section)	Non-Powered
Center Modules (3 Per Section)	Non-Powered
End Rake Modules (3 Per Section)	Compatible with U.S. Navy flexor attachments and shear connectors
Width	24 ft
Length	85 ft
Depth	4 ft 6 in.
Weight of Assembled Combination Beach/Sea End Section	149,700 lb
ISO Compatible	Yes
Sea State Operation	SS 2

FC PLATFORM (FULL SIDE)**Table 8. FC Platform (Full Side) Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	TBD ft
Length	TBD ft
ISO Compatible	Yes
Sea State Operation	SS 2

PERSONNEL SHELTER**Table 9. Personnel Shelter Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	8 ft
Length	20 ft
Depth	8.5 ft
Weight	9,000 lb
ISO Compatible	Yes

GENERATOR CONTAINER**Table 10. Generator Container Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	8 ft
Length	20 ft
Depth	8.5 ft
Weight	15,000 lb
ISO Compatible	Yes

DIESEL GENERATOR SET**Table 11. Diesel Generator Set Data**

ITEM CHARACTERISTIC	DESCRIPTION
10 kW Generator Set	Refer to TM 9-6115-642-10
ISO Compatible	Yes

LIGHT TOWERS**Table 12. Light Tower Data**

ITEM CHARACTERISTIC	DESCRIPTION
Width	79 in.
Length	174 in.
Depth	89 in. in travel position, 30 ft in assembled position
Weight	2,010 lb
Weight of Pallet	2,600 lb
Weight of ISO Container, Including Light Towers	19,000 lb
ISO Compatible	Yes

ONSHORE ANCHOR SYSTEM**Table 13. Onshore Anchor System Data**

ITEM CHARACTERISTIC	DESCRIPTION
Container Width	8 ft
Container Length	20 ft
Container Depth	8.5 ft
Container Weight	8,323 lb
ISO Compatible Container	Yes
Number of Onshore Anchor Mooring Legs	4

OFFSHORE ANCHOR SYSTEM**Table 14. Offshore Anchor System Container**

ITEM CHARACTERISTIC	DESCRIPTION
Container Width	8 ft
Container Length	20 ft
Container Depth	8.5 ft
Container Weight	8,345 lb
ISO Compatible Container	Yes
Number of Offshore Anchor Mooring Legs	16

COMMUNICATIONS EQUIPMENT**Table 15. Communications Equipment Data**

ITEM CHARACTERISTIC	DESCRIPTION
Communications Equipment	Consists of four VHF/FM handheld transceivers that are stored in the personnel shelter.

DECK MAT**Table 16. Deck Mat Data**

ITEM CHARACTERISTIC	DESCRIPTION
Material	High density polyethylene material
Width	4 ft
Length	10 ft
Depth	1 ½ in.
Weight	300 lb
Weight of Mat Pallet	13,100 lb
Weight of Deck Mat ISO Container With Deck Mats	22,000 lb
ISO Compatible	Yes

MOORING BITT**Table 17. Mooring Bitt Data**

ITEM CHARACTERISTIC	DESCRIPTION
Length	6 ft 11 in.
Weight	520 lb
Weight of Top Mooring Bitt Pallet (4 Bitts Per Pallet)	3,880 lb
Weight of Middle and Lower Mooring Bitt Pallets (3 Bitts Per Pallet)	3,360 lb each
Weight of ISO Container With Mooring Bitts	29,320 lb
ISO Compatible	Yes

5 FT BY 10 FT FENDER

Table 18. 5 ft by 10 ft Fender Data

ITEM CHARACTERISTIC	DESCRIPTION
Weight	1,500 lb
Weight of Fender Pallet	2,400 lb
Weight of ISO Container with Fenders	25,200 lb
ISO Compatible	Yes

4 FT BY 12 FT FENDER

Table 19. 4 ft by 12 ft Fender Data

ITEM CHARACTERISTIC	DESCRIPTION
Weight	1,450 lb
Weight of Fender Pallet	3,800 lb
Weight of ISO Container with Fenders	25,200 lb
ISO Compatible	Yes

3 FT BY 5 FT FENDER

Table 20. 3 ft by 5 ft Fender Data

ITEM CHARACTERISTIC	DESCRIPTION
Weight	300 lb
Weight of Fender Pallet	3,000 lb
Weight of ISO Container with Fenders	25,200 lb
ISO Compatible	Yes

FLEXOR CONNECTOR

Table 21. Flexor Connector Data

ITEM CHARACTERISTIC	DESCRIPTION
Weight	1,400 lb

EQUIPMENT CONFIGURATION**FLOATING CAUSEWAY PIERHEAD**

The pierhead is used for loading and unloading ocean going sealift vessels. It is capable of supporting two M-1 Abrams tanks and one sealift vessels' cargo ramp foot on the platform surface. The pierhead extension is used by lighter vessels to moor to the FC. The main platform supports the generator container, personnel shelter and light towers.

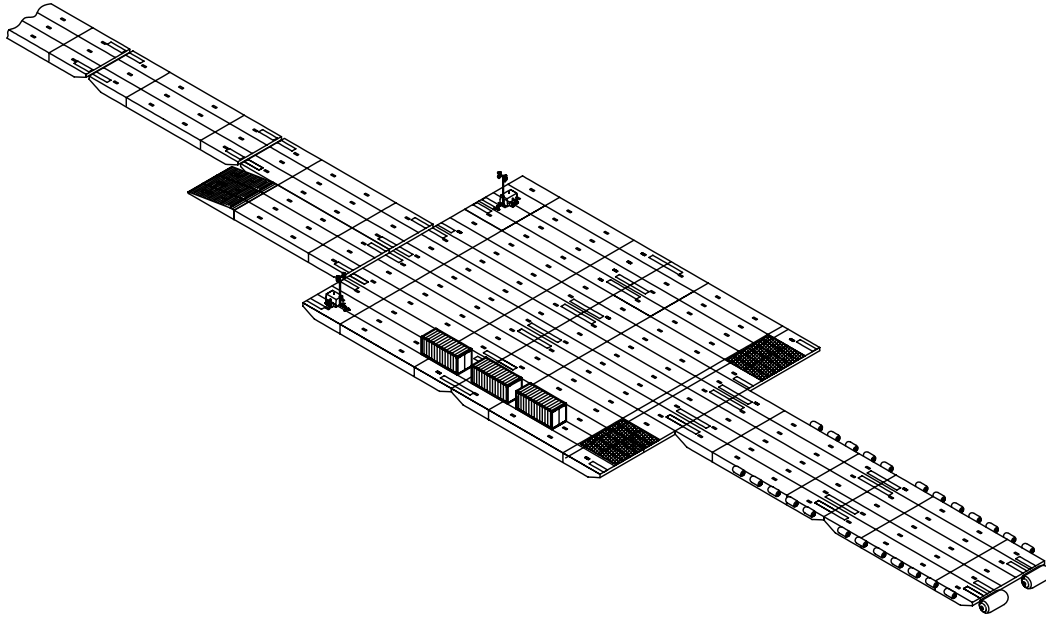


Figure 26. Floating Causeway Pierhead

FORCE OPENING FLOATING CAUSEWAY

The force opening floating causeway is an administrative pier used to get to 15 ft of water depth. It is a floating platform for loading and unloading ocean going sealift vessels. The causeway consists of one or more intermediate sections connected lengthwise and connected to a combination beach/sea end section. The length depends on how far offshore, from the beach, the causeway must extend to give the required water depth. The force opening floating causeway operating conditions are: SS 2 with five foot waves and a current of two knots.

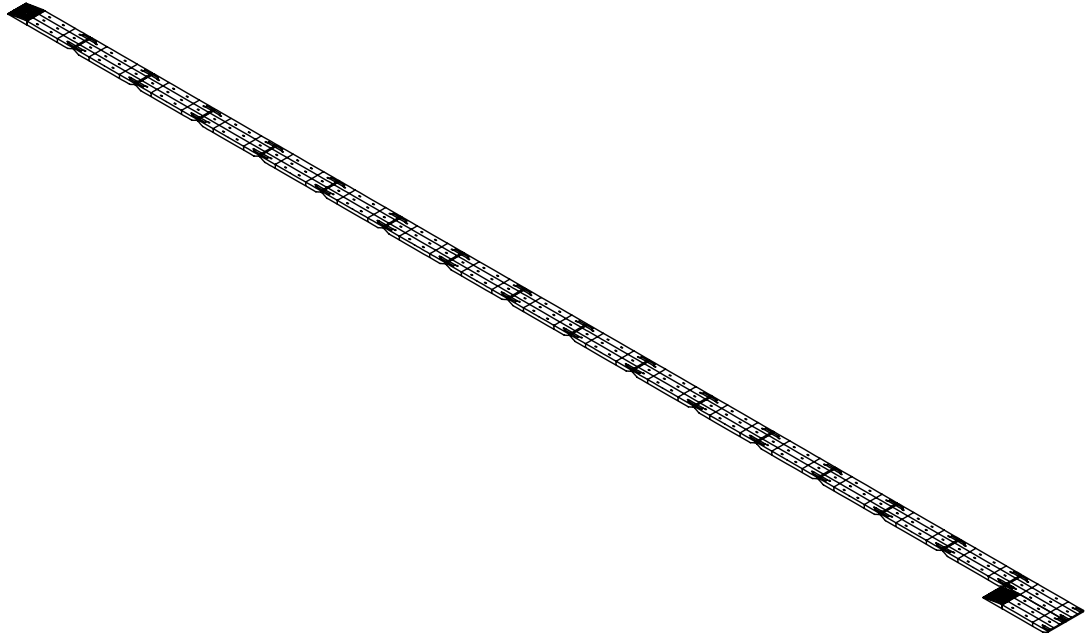


Figure 27. Force Opening Floating Causeway

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
THEORY OF OPERATION**

SYSTEM OPERATION

The Floating Causeway (FC) is a floating platform used during Joint Logistics Over The Shore (J-LOTS) operations on undeveloped beach area where flat underwater gradients are available, and no port area is available for direct shoreside discharge of vessels. The FC consists of three major segments; pierhead extension, pierhead and causeway. The pierhead extension is the most seaward part of the floating platform and is used for loading and unloading of more than one ocean-going sealift and lighter vessels. It may also be used to moor lighter vessels to the FC. The pierhead, connected between the pierhead extension and the causeway, is a floating platform used as a working area and a set up area for such items as the personnel shelter, diesel generator and light towers. The causeway extends from the pierhead to the beach, where a combination beach/sea combination is connected. The causeway is a docking pierhead and provides a means of delivering containers, vehicles and bulk cargo ashore. The FC may be set up in different configurations based on the operational situation and the best method of loading and unloading.

One configuration is the force opening floating causeway or an administrative pier with a single roadway extending from the beach out to 15 ft of water depth at the unloading and loading point. This configuration would be used for single point loading or unloading of cargo, as no pierhead or pierhead extension is used. The FC is held in place during J-LOTS operations by onshore and offshore anchor mooring legs. The structure of the FC will withstand cargo loading and unloading through Sea State 2 conditions.

10 KW SKID-MOUNTED TACTICAL QUIET GENERATOR

Refer to TM 9-6115-642-10 for the theory of operation of the 10 kW diesel generator set.

PERSONNEL SHELTER

The personnel shelter is contained in a 20 ft container. Power is supplied to the shelter from the tactical quiet generator through a power cable stored in the shelter and connected from a 100 amp connector on the backside of the shelter to a 100 amp connector on the generator container. The power provided by the generator supplies power to the electrical distribution panel, which is cabled to the incinerator toilet, heating and cooling unit, lighting and to the GFI receptacles in the personnel shelter.

6 KW TRAILER-MOUNTED LIGHT TOWER

The lighting system consists primarily of a self-contained, trailer mounted, 6 kW diesel generator, which illuminates the work area using four high pressure sodium 1,000 W lamps. The power to each lamp is controlled by individual switches on a control panel. The power is received from a 120 VAC, two phase alternator, which is cabled through two 25 amp circuit breakers, to the switches, to a ballast box and connected by quick disconnects to the lights.

VHF/FM HANDHELD TRANSCEIVER

The VHF/FM handheld transceivers are utilized for communicating between personnel during loading and unloading operations on the FC. The transceiver has a frequency range of 156.025 to 163.275 MHz, plus 10 weather channels. The transceiver has an RF power output with the CNB350 battery of 5.0 watts (high) and 1.0 watts (low). The operating voltage is 7.2 VDC. Current drain in standby mode is 40 mA, in receive mode 200 mA, in the transmit mode 1.8 amps (high power) and 0.7 amps (low power). The battery life (5% Tx, 5% rcv, 90% standby) is approximately 10 hrs (high mode) and 15 hrs (low mode). The audio response is within +2/-8 of 6 dB/octave pre-emphasis characteristic from 300 Hz to 3,000 Hz. The AF harmonic distortion of the transmitter is 3%. The transmitter has a hum and noise rating of 37 dB and a frequency stability (-20 Degrees to +50 Degrees C) of +/- 0.0005%. The receiver has a sensitivity rating of 20 dB, quieting at 0.35 uV and 12 dB SINAD at 0.30 uV. The squelch sensitivity (threshold) is 0.20 uV. Modulation acceptance bandwidth is + 4.5 kHz.

ANCHOR MOORING SYSTEM

The anchor mooring system is designed to hold the floating causeway during J-LOTS operations in sea conditions up to Sea State 3. The offshore mooring leg is designed to perform in soft soils and sand. The onshore mooring leg is designed to perform in soft soils, sand and competent rock. In addition to Sea State, the capability of the anchor mooring system to hold the floating causeway in position is highly dependent on the alongshore current speed and number and type of vessels mooring to the floating causeway. It is also dependent on the water depth at the vessel's location. The complete system, which has 16 offshore mooring legs and four onshore mooring legs, is required for a full floating causeway that is 1,500 ft long.

INCINERATOR TOILET

Refer to TM 55-1945-219-14&P for the theory of operation of the incinerator toilet.

CHAPTER 2

**DIRECT SUPPORT MAINTENANCE
TROUBLESHOOTING PROCEDURES
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)**

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
TROUBLESHOOTING INDEX**

Malfunction/Symptom

Troubleshooting Procedure

GENERATOR CONTAINER

NOTE

For 10 kW Tactical Quiet Generator malfunctions, refer to TM 9-6115-642-24 for troubleshooting procedures

- 1. Fuel Tank Signal Box Warning Light Inoperative..... WP 0005 00
- 2. Electric Fuel Transfer Pump Inoperative..... WP 0005 00
- 3. Fire Suppression System Inoperative WP 0005 00
- 4. Fluorescent Lights Do Not Operate..... WP 0005 00
- 5. DC Lights Do Not Operate WP 0005 00

LIGHT TOWER CONTAINER

NOTE

For Light Tower malfunctions, refer to TM 55-1945-217-14&P for troubleshooting procedures.

For Light Tower Engine malfunctions, refer to TM 55-1945-217-14&P for troubleshooting procedures.

PERSONNEL SHELTER

NOTE

For Air Conditioner and Heat Pump malfunctions, refer to TM 55-1945-220-14&P for troubleshooting procedures.

For Incinerator Toilet malfunctions, refer to TM 55-1945-219-14&P for troubleshooting procedures.

- 1. Fluorescent Lights Do Not Operate..... WP 0005 00

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)
Shop Equipment, Automotive Maintenance and Repair (Item 2, WP 0073 00)
Multimeter (Item 12, WP 0073 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10
TM 9-6140-200-14

TROUBLESHOOTING PROCEDURE**FUEL TANK SIGNAL BOX WARNING LIGHT INOPERATIVE****SYMPTOM**

A fuel warning light will not illuminate.

MALFUNCTION

FLOAT SWITCHES circuit breaker F is faulty.

CORRECTIVE ACTION

1. Using a multimeter, check for 120 VAC on output side of FLOAT SWITCHES circuit breaker F.
2. If voltage is not present, replace FLOAT SWITCHES circuit breaker F. (TM 55-1945-227-10)
3. Perform operational check (TM 55-1945-227-10).

ELECTRIC FUEL TRANSFER PUMP INOPERATIVE**SYMPTOM**

Fuel transfer pump is inoperative.

MALFUNCTION

No power to fuel transfer pump.

CORRECTIVE ACTION

Refer to TM 55-1945-216-24, Generator Set (10kW), Skid Mounted, Tactical Quite.

MALFUNCTION

Fuel transfer pump malfunctioning.

CORRECTIVE ACTION

Refer to TM 55-1945-216-24, Generator Set (10kW), Skid Mounted, Tactical Quite.

FIRE SUPPRESSION SYSTEM INOPERATIVE**SYMPTOM**

AC Power LED on fire alarm control console not illuminated.

MALFUNCTION

Circuit breaker D in generator container circuit breaker panel in OFF (open) position.

CORRECTIVE ACTION

1. Position circuit breaker D to ON (closed) position.
2. If condition persists, contact Specialized Repair Activity.

MALFUNCTION

Batteries defective.

CORRECTIVE ACTION

Contact Specialized Repair Activity.

FLUORESCENT LIGHTS DO NOT OPERATE**SYMPTOM**

Fluorescent lights will not illuminate.

MALFUNCTION

OVERHEAD LTG circuit breaker C is faulty.

CORRECTIVE ACTION

1. Using a multimeter, check for 120 VAC on output side of OVERHEAD LTG circuit breaker C.
2. If voltage is not present, replace OVERHEAD LTG circuit breaker C. (TM 55-1945-227-10)

3. Perform operational check (TM 55-1945-227-10).

MALFUNCTION

Open circuit between the OVERHEAD LTG circuit breaker C and the light fixture.

CORRECTIVE ACTION

1. Using a multimeter, check for 120 VAC on input side of light fixture.
2. If 120 VAC is not present, use a multimeter to check continuity of wiring between the OVERHEAD LTG circuit breaker C and light fixture. If continuity is not present, repair/replace wiring as necessary (WP 0070 00).
3. Perform operational check (TM 55-1945-227-10).

DC LIGHTS DO NOT OPERATE**SYMPTOM**

12 Volt DC lights will not illuminate.

MALFUNCTION

12 Volt battery faulty.

CORRECTIVE ACTION

1. Using a multimeter, check for 12 VDC at battery.
2. If voltage is low or not present, charge battery.
3. If battery will not charge, test battery and replace if testing fails. (TM 9-6140-200-14)
4. Perform operational check (TM 55-1945-227-10).

MALFUNCTION

Battery charger faulty.

CORRECTIVE ACTION

1. Using a multimeter, check for 12 VDC output from charger.
2. If 12 VDC is not present, replace charger.
3. Perform operational check (TM 55-1945-227-10).

MALFUNCTION

Open circuit between battery and DC light fixtures.

CORRECTIVE ACTION

1. Using a multimeter, check for 120 VDC on input side of light fixture.
2. If 12 VDC is not present, use a multimeter to check continuity of wiring between the battery and light fixture. If continuity is not present, repair/replace wiring as necessary (WP 0070 00).
3. Perform operational check (TM 55-1945-227-10).

END OF WORK PACKAGE

CHAPTER 3

**UNIT LEVEL MAINTENANCE INSTRUCTIONS
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)**

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
SERVICE UPON RECEIPT**

INITIAL SETUP:

Personnel Required

Engineer 88L (1)

References

- SF 361
- DA PAM 738-750
- TM 55-1945-227-10

CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 361, Transportation Discrepancy Report.

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., for Army instructions, see DA PAM 738-750).

Check to see whether the equipment has been modified.

Table 1. Inspection Criteria for Packaging.

COMPONENT	ACCEPTABLE	REPARABLE	NONREPARABLE
Generator Container			
Exterior	Minor rust, cracks, indentations or splits that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented or cracked equipment.	Broken or damaged fire suppression system, inoperative 10 kW generator, broken or damaged dampers.	None.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
	Nuts, bolts, screws and fasteners present and in good condition.	Nuts, bolts, screws and fasteners that can be replaced or properly sealed.	None.

COMPONENT	ACCEPTABLE	REPARABLE	NONREPARABLE
Personnel Shelter			
Exterior	Minor rust, cracks, indentations, or splits that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented or cracked equipment.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
	Nuts, bolts, screws and fasteners present and in good condition.	Nuts, bolts, screws and fasteners that can be replaced or properly sealed.	None.
Light Tower Container			
Exterior	Minor rust, cracks, indentations or splits that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented or cracked equipment.	Minor dents or broken nails, screws and fasteners that can be replaced or properly sealed.	Damage that requires disassembly of the entire light tower.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
	Nuts, bolts, screws and fasteners present and in good condition.	Nuts, bolts, screws and fasteners that can be replaced or properly sealed.	None.

COMPONENT	ACCEPTABLE	REPARABLE	NONREPARABLE
Fender Container			
Exterior	Minor rust, cracks, indentations, splits or tears in fabric container covering that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented or cracked equipment.	Broken or damaged pallets.	Damage that will not allow storage of fenders.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
Deck Mat Container			
Exterior	Minor rust, cracks, indentations or splits that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented, or cracked equipment.	Broken or missing hardware or handles.	Damage to pallets that would prevent storage of deck mats.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
	Nuts, bolts, screws and fasteners present and in good condition.	Nuts, bolts, screws and fasteners that can be replaced or properly sealed.	None.

COMPONENT	ACCEPTABLE	REPARABLE	NONREPARABLE
Onshore Anchor Container			
Exterior	Minor rust, cracks, indentations or splits that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented, or cracked equipment.	None.	None.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
	Nuts, bolts, screws and fasteners present and in good condition.	Nuts, bolts, screws and fasteners that can be replaced or properly sealed.	None.
Onshore Anchor Container			
Exterior	Minor rust, cracks, indentations or splits that would not impair waterproofing or serviceability of containers.	Dents or bending that does not affect access door operation.	Damage or bending that will not allow doors to open.
Interior	Items within the container have remained in stowed position. No broken, dented, or cracked equipment.	None.	None.
Hardware	Hardware is present and tight.	Hardware is missing or loose.	None.
	Nuts, bolts, screws and fasteners present and in good condition.	Nuts, bolts, screws and fasteners that can be replaced or properly sealed.	None.

PROCESS UNPACKED EQUIPMENT

Refer to TM 55-1945-227-10 for instructions to process unpacked equipment. This manual provides information regarding special skills required by processing personnel, caustic and/or toxic material with applicable warnings that may be used during processing, instructions for safe disposal of waste products and the estimated man-hour requirements to process the equipment.

INSTALL EQUIPMENT

This manual identifies any connectors, wiring diagrams or instructions to aide in the installation of equipment.

ASSEMBLY OF EQUIPMENT

Refer to TM 55-1945-227-10. Instructions include preparing equipment for use that has been shipped unassembled. As applicable, power requirements, connections and initial control settings needed for installation purposes shall be included.

PLACING IN SERVICE

Refer to TM 55-1945-227-10 for information on preliminary servicing of equipment.

PREPARATION FOR SHIPMENT OR STORAGE OF EQUIPMENT

Refer to TM 55-1945-227-10 for information on preparing equipment for short or long term storage.

PRELIMINARY CALIBRATION OF EQUIPMENT

No calibration of equipment is required on the FC.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PMCS PROCEDURES INTRODUCTION**

INTRODUCTION

General

Preventive Maintenance Checks and Services (PMCS) are performed to keep the FC equipment in operating condition. The checks are used to find, correct or report problems. Crew members are to do the PMCS as shown in the PMCS table. PMCS is performed every day the equipment is operated, using the PMCS table. Pay attention to WARNING and CAUTION statements. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

Before you begin operating the equipment, do "Before PMCS".

During operation, do "During PMCS".

After operation, do "After PMCS".

Do "Monthly PMCS" once a month. If the equipment has not been operated in a month, also do "After PMCS" at the same time.

If you are operating the equipment for the first time, do the "Monthly PMCS" the first time you do your "Before PMCS".

If you find something wrong when performing PMCS, fix it if you can, using troubleshooting procedures and/or maintenance procedures.

The right-hand column of the PMCS table list conditions that make the vessel not fully mission capable. Write up items not fixed on DA Form 2404 for unit maintenance. For further information on how to use this form, see DA PAM 738-750.

Leakage Definition

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

CAUTION

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

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

Class III leaks should be reported immediately to your supervisor.

- (1) Class I — Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
- (2) Class II — Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
- (3) Class III — Leakage of fluid great enough to form drops that fall from item being checked/inspected.

Inspection

Look for signs of a problem or trouble. Senses help here. You can feel, smell, hear or see many problems. Be alert when on the equipment.

Inspect to see if items are in good condition. Are they correctly assembled, stowed, secured, excessively worn, leaking, corroded or properly lubricated? Correct any problems found or notify unit maintenance.

There are some common items to check all over the equipment. These include the following:

Bolts, clamps, nuts and screws: Continuously check for looseness. Look for chipped paint, bare metal, rust or corrosion around bolt and screw heads and nuts. Tighten them when you find them loose. If tools are not available, contact unit maintenance.

1. Welds: Many items on the equipment are welded. To check these welds, look for chipped paint, rust, corrosion or gaps. When these conditions exist, notify unit maintenance on DA Form 2404.
2. Electrical wires, connectors and harnesses: Tighten loose connectors. Look for cracked or broken insulation, bare wires and broken connectors. If any are found, notify unit maintenance.
3. Hoses and fluid lines: Look for wear, damage and leaks, and make sure clamps and fittings are tight. Wet spots mean a leak. A stain by a fitting or connector can also mean a leak. When you find a leak, notify unit maintenance.

Lubrication Service Intervals - Normal Conditions

For safer, more trouble free operations, make sure that your equipment is serviced when it needs it. For the proper lubrication and service intervals, see the PMCS section of this manual.

Lubrication Service Intervals - Unusual Conditions

Your equipment will require extra service and care when you operate under unusual conditions. High or low temperatures, long periods of hard use, or continued use in sand, mud, or snow will break down the lubricant, requiring you to add or change lubricant more often.

Oil Filters

Oil filters shall be serviced/cleaned/changed, as applicable, when:

- They are known to be contaminated or clogged,
- Service is recommended by AOAP laboratory analysis, or
- At prescribed hardtime intervals.

Army Oil Analysis Program (AOAP)

This FC is not enrolled in the Army Oil Analysis Program. HARDTIME INTERVALS APPLY.

Warranty

For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods, extreme dust).

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PMCS PROCEDURES**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

Seaman 88K (2)

References

29 CFR

46 CFR

TM 9-6115-642-10

TM 55-1945-217-14&P

TM 55-1945-218-14&P

TM 55-1945-219-14&P

TM 55-1945-220-14&P

TM 55-1945-227-10

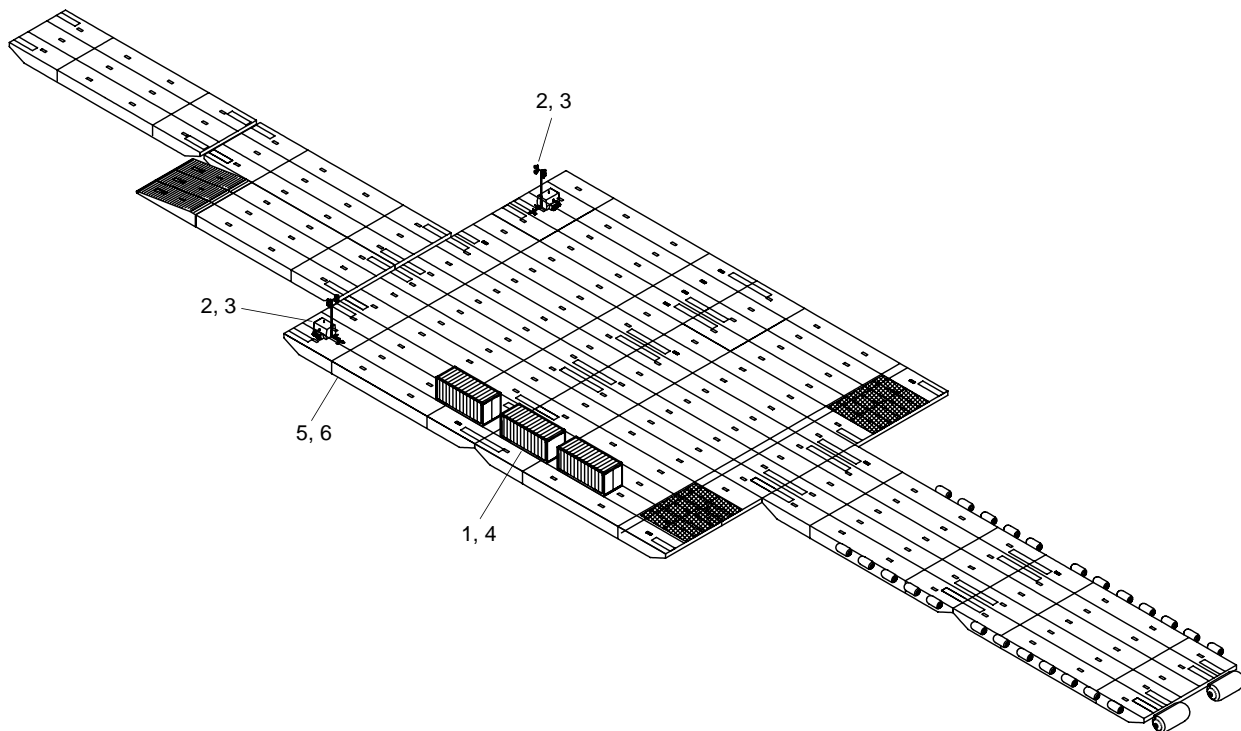


Figure 1. FC Check Points

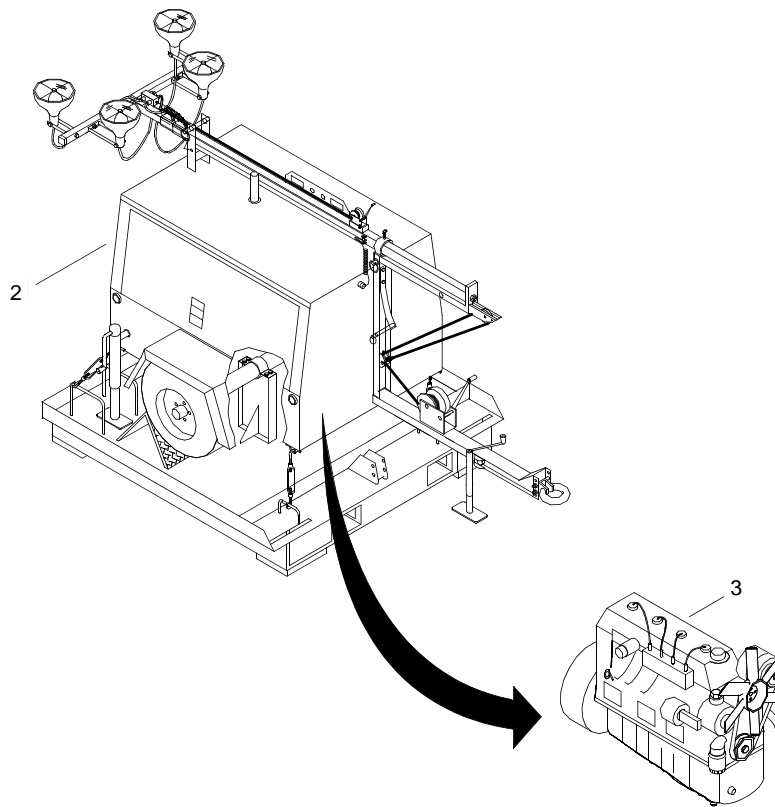


Figure 2. Light Tower and Engine

Table 1. Preventive Maintenance Checks and Services for FC.

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Monthly	.2	Personnel Shelter	<ol style="list-style-type: none"> 1. Clean heating and air conditioning system indoor air filter. (TM 55-1945-220-14&P) 2. Clean heating and air conditioning system vent air filter. (TM 55-1945-220-14&P) 	
2	Quarterly 100 Hours	.1	Light Tower	<ol style="list-style-type: none"> 1. Quarterly or every 100 operating hours replace the fuel tank in-line fuel filter. (TM 55-1945-217-14&P) 	
1	Annually	.2	Personnel Shelter	<ol style="list-style-type: none"> 1. Clean heating and air conditioning system internal components. (TM 55-1945-220-14&P) 	
3	Annually	.2	Light Tower Engine	<ol style="list-style-type: none"> 1. Replace air filter element. (TM 55-1945-218-14&P) 	

Table 1. Preventive Maintenance Checks and Services for FC. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Annually	1.0	Incinerator Toilet	2. Perform functional test of engine oil pressure switch in the protection shutdown system. Contact Specialized Repair Activity (SRA). 1. Inspect level of catalyst. If catalyst level is low, add catalyst. (TM 55-1945-219-14&P)	
5	Annually or 2,400 Operating Hours	1.0	Modules	1. Pressure test modules and repair leaks, cracks and corrosion. (WP 0010 00, WP 0009 00)	Leaks present or structural damage which interferes with operation.
2	Biennially	3.0	Light Tower	1. Replace battery. (TM 55-1945-217-14&P)	
3	Biennially	3.0	Light Tower Engine	1. Drain cooling system, flush cooling system and install new coolant. (TM 55-1945-218-14&P) 2. Replace all coolant hoses and clamps. (TM 55-1945-218-14&P) 3. Replace all fuel hoses and clamps. Contact Specialized Repair Activity (SRA).	
6	Semi-annually	48	Female and Male Guillotine Connectors	1. Perform functional test of all female (figure 3, item 1) and male (figure 3, item 2) guillotine connectors. (TM 55-1945-227-10)	

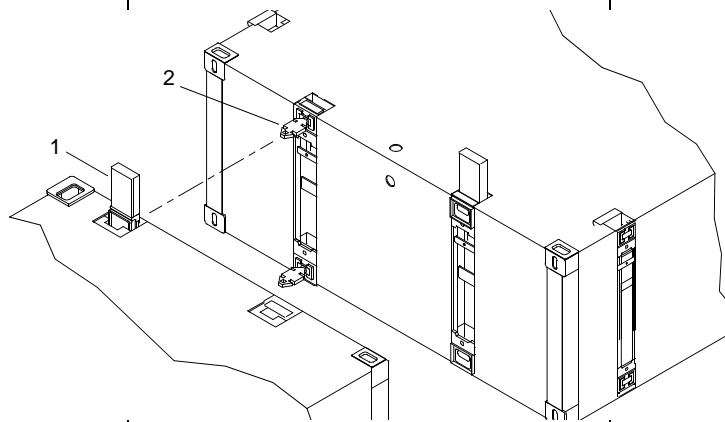


Figure 3. Female and Male Guillotine Connectors

Table 1. Preventive Maintenance Checks and Services for FC. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
3	50 Operating Hours	.2	Light Tower Engine	2. Inspect for cracks, cuts or corrosion. 1. After the first 50 hours of operation, change the engine oil. (TM 55-1945-218-14&P) 2. After the first 50 hours of operation, replace the engine oil filter. (TM 55-1945-218-14&P)	
3	100 Operating Hours	.3	Light Tower Engine	1. Remove and clean air filter element. (TM 55-1945-218-14&P)	
3	200 Operating Hours	.5	Light Tower Engine	1. Replace engine fuel filter. (TM 55-1945-218-14&P)	
3	400 Operating Hours	.3	Light Tower Engine	1. Replace engine oil filter. (TM 55-1945-218-14&P) 2. Replace engine fuel filter. (TM 55-1945-218-14&P)	
3	500 Operating Hours	.3	Light Tower Engine	1. Drain cooling system, flush cooling system and install new coolant. (TM 55-1945-218-14&P) 2. Replace fan belt. (TM 55-1945-218-14&P)	

MANDATORY REPLACEMENT PARTS

No mandatory replacement parts are specified for the FC.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
SERVICING MODULES**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)
Dispensing Pump, Hand Driven (Item 9, WP 0073 00)

Materials/Parts

Compound, Antiseize, (Item 6, WP 0074 00)

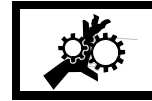
Personnel Required

Seaman 88K (1)

Equipment Condition

Module Dry-Docked (TM 55-1945-227-10)

WARNING

**HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear hard hat, safety shoes and gloves during FC maintenance. Failure to observe these precautions could result in serious injury or death.

MODULE DRAIN PLUG LOCATIONS**NOTE**

Refer to the following figures for the location of drain plugs on center, end rake and combination beach/sea end modules.

NOTE

Center modules are divided into three watertight compartments. When servicing center modules, be aware of these separate compartments.

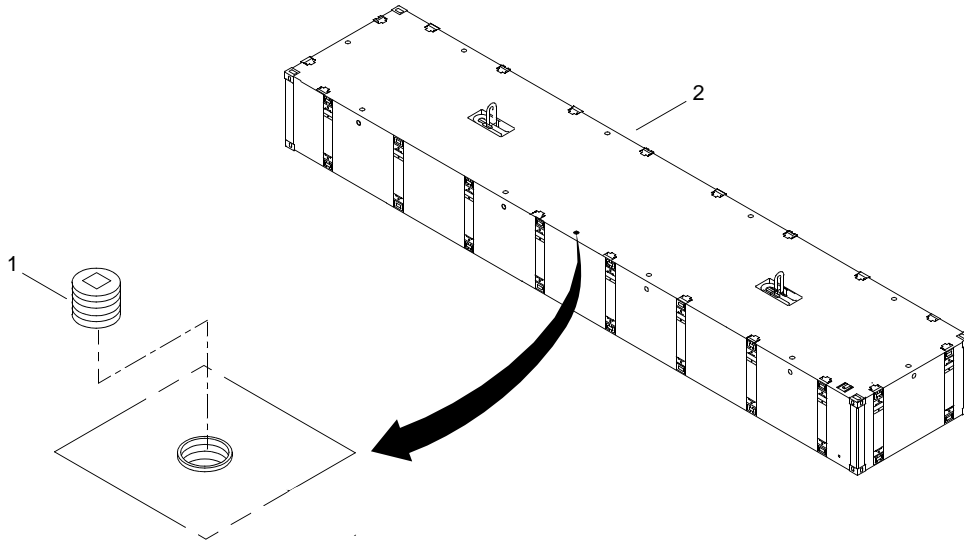


Figure 1. Center Module Drain Plugs

1. A drain plug (figure 1, item 1) is located over each of three internal compartments of the center modules (figure 1, item 2).

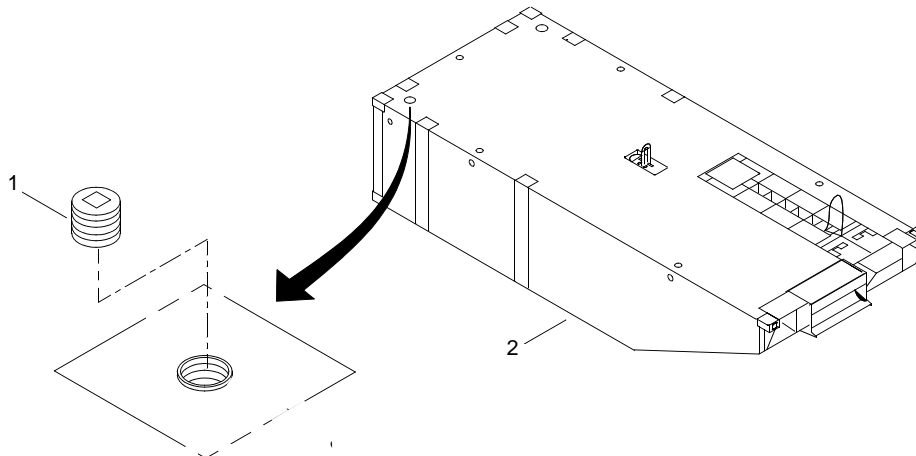


Figure 2. End Rake Module Drain Plug

2. A drain plug (figure 2, item 1) is located on the top of the left/right and center end rake modules (figure 2, item 2).

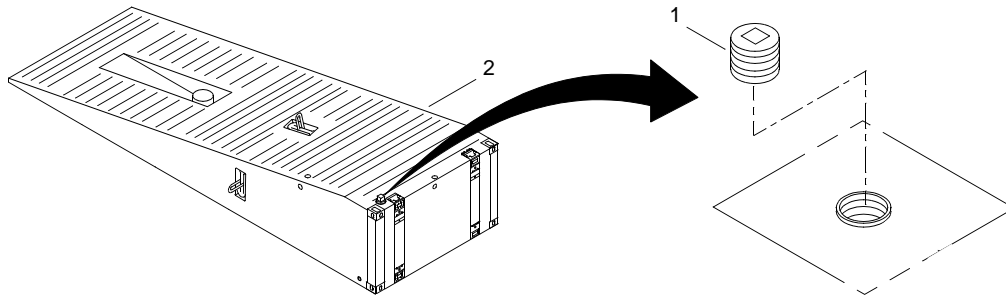


Figure 3. Combination Beach/Sea End Module Drain Plug

3. A drain plug (figure 3, item 1) is located on the top of the combination beach/sea end modules (figure 3, item 2).

DRAIN WATER FROM MODULES

NOTE

This procedure is typical for draining water from all modules.

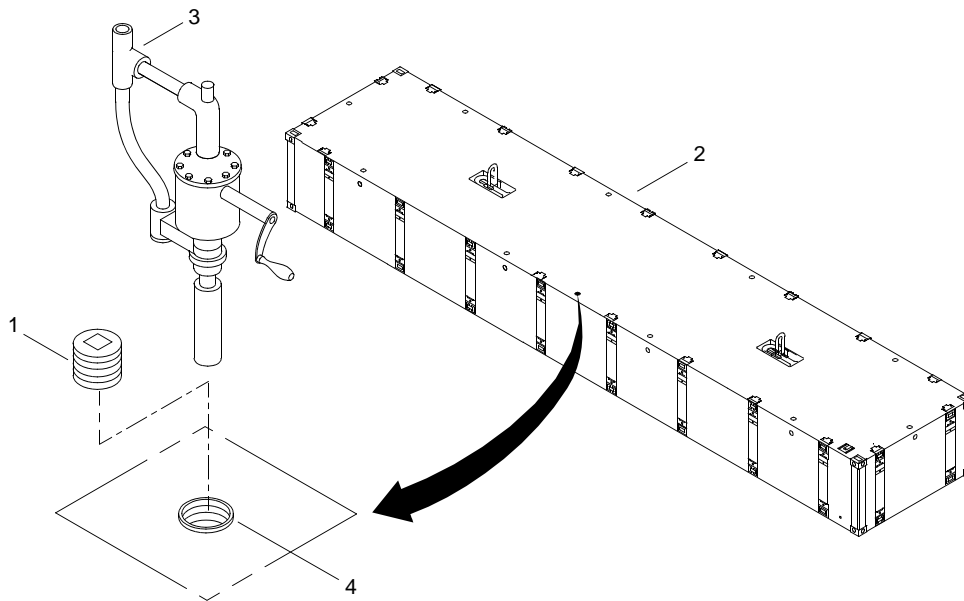


Figure 4. Draining Water from Module (Center Module Shown)

1. Remove drain plugs (figure 4, item 1) from top of module (figure 4, item 2).
2. If water is *not* present in module (figure 4, item 2), go to step 6.
3. Lower telescoping siphon of hand pump (figure 4, item 3) through hole (figure 4, item 4) in top of module (figure 4, item 2).
4. Operate hand pump (figure 4, item 3) to remove water.
5. Pressure test module (figure 4, item 2). (WP 0010 00)

6. Apply antiseize compound to threads of drain plugs (figure 4, item 1).
7. Install drain plugs (figure 4, item 1) into module (figure 4, item 2). Tighten drain plugs (figure 4, item 1).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PRESSURE TEST INTERMEDIATE SECTION MODULES**

INITIAL SETUP:**Test Equipment**

Test Set, Compartment Air (Item 6, WP 0073 00)

Tools

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Compressor, Unit, Reciprocating, Power Drive (Item 10, WP 0073 00)

Materials/Parts

Compound, Antiseize (Item 6, WP 0074 00)

Detergent, General Purpose, Liquid (Item 7, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 5-805-7

TM 55-1945-227-10

Equipment Condition

Module Dry-Docked (TM 55-1945-227-10)

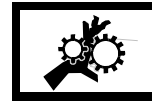
WARNING



HELMET PROTECTION



HEAVY PARTS



MOVING PARTS

All personnel must wear hard hat, safety shoes and gloves during FC maintenance. Failure to observe these precautions could result in serious injury or death.

PRESSURE TESTING MODULES**NOTE**

This procedure is typical for pressure testing all center, end rake and combination beach/sea end modules.

Refer to WP 0009 00 for module drain plug locations.

NOTE

Center modules are divided into three watertight compartments. Pressure test must be performed at all three drain plug locations.

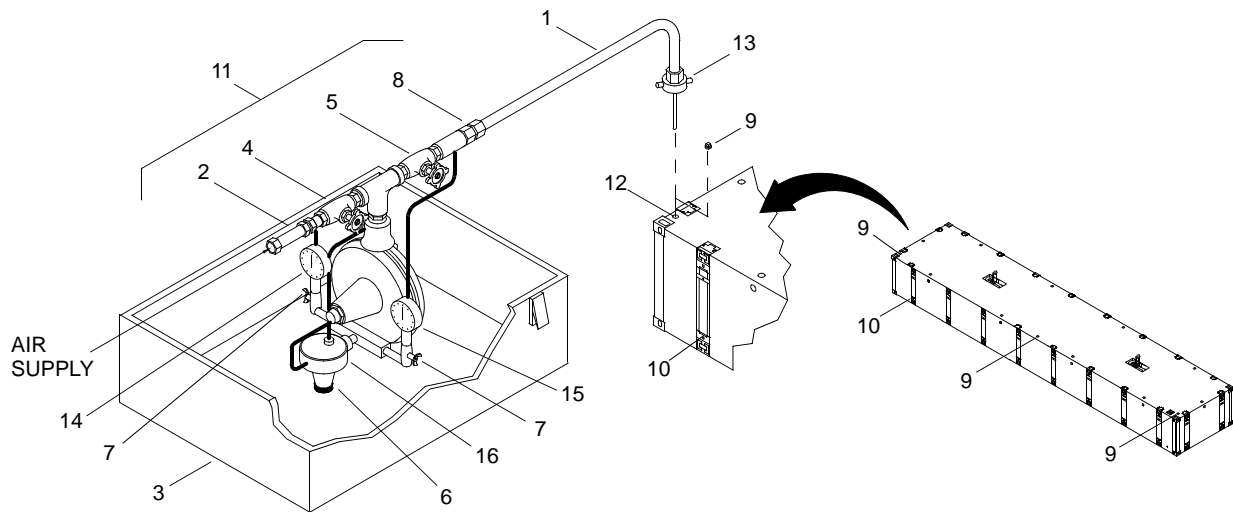


Figure 1. Module Pressure Test Setup (Center Module Shown)

1. Remove sensing line (figure 1, item 1) and charging line extension hose (figure 1, item 2) from storage box (figure 1, item 3).
2. Verify inlet and outlet valves (figure 1, items 4, 5), pressure knob (figure 1, item 6) and both gage petcocks (figure 1, item 7) are closed.
3. Connect sensing line (figure 1, item 1) to outlet coupling fitting (figure 1, item 8).
4. Remove pipe plug (figure 1, item 9) from one of three locations at side of module (figure 1, item 10).
5. Position test set (figure 1, item 11) on module (figure 1, item 10).
6. Install test set sensing line (figure 1, item 1) into module (figure 1, item 10) through chosen pipe plug opening (figure 1, item 12).
7. Using pipe to hose adaptors (figure 1, item 13), as required, connect sensing line (figure 1, item 1) to pipe plug opening (figure 1, item 12).

WARNING

Do not operate air compressor without first reading operating manual. Failure to comply may result in injury or death to personnel.

8. Connect 100 PSI air supply to charging line extension hose (figure 1, item 2) connector.
9. Rotate pressure knob (figure 1, item 6) counterclockwise eight turns.
10. Open both gauge petcocks (figure 1, item 7).

11. Open air supply valve to provide input pressure.
12. Open inlet valve (figure 1, item 4).

WARNING

**EXPLOSION**

Module pressure must be regulated to 2 PSI pressure. Higher pressures may cause explosion. Failure to comply may result in serious injury or death to personnel.

13. Observe input pressure gauge (figure 1, item 14) and rotate pressure knob (figure 1, item 6) clockwise until gauge reads 2 PSI.
14. When input pressure gauge (figure 1, item 14) is stable at 2 PSI, open outlet valve (figure 1, item 5).
15. When input pressure gauge (figure 1, item 14) is stable at 2 PSI, open outlet valve (figure 1, item 5).
16. When output pressure gauge (figure 1, item 15) reads 2 PSI, close outlet valve (figure 1, item 5).
17. Observe any pressure drop on output pressure gauge (figure 1, item 15).

CAUTION

Leaky joints must be sealed or welded before use. Water leaking into structure may cause corrosion and metal deterioration.

18. Inspect all seams for evidence of leakage and mark observed leakage areas by spraying detergent on all seams.
19. Seams must be welded watertight before proceeding with assembly for mission. (TM 5-805-7)
20. To hold pressure while isolating a leak, open outlet valve (figure 1, item 5) to allow regulator (figure 1, item 16) to control air loss at a rate dependent upon volume of module and rate of leakage.
21. To shut down test set (figure 1, item 11), close air supply valve and remove charging line extension hose (figure 1, item 2).
22. Remove sensing line (figure 1, item 1) from pipe plug opening (figure 1, item 12) and remove test set (figure 1, item 11).
23. Apply antiseize compound on pipe plug (figure 1, item 9) threads.
24. Install pipe plug (figure 1, item 9) in module (figure 1, item 10) and tighten.
25. Close inlet and outlet valves (figure 1, items 4, 5), both gage petcocks (figure 1, item 7) and rotate pressure knob (figure 1, item 6) clockwise to end of travel.
26. Remove adaptor (figure 1, item 13), if used, and stow in storage box (figure 1, item 3).

27. Coil sensing line (figure 1, item 1) and charging line extension hose (figure 1, item 2) in storage box (figure 1, item 3).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
MODULES, MARINE GROWTH REMOVAL**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)
Scraper, ship (Item 11, WP 0073 00)

Personnel Required

Seaman 88K (1)

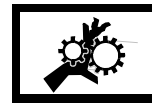
References

TM 55-1945-227-10

Equipment Condition

Module Dry-Docked (TM 55-1945-227-10)

WARNING

**HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear hard hat, safety shoes and gloves during FC maintenance. Failure to observe these precautions could result in serious injury or death.

REMOVAL OF MARINE GROWTH FROM MODULES

WARNING

**EYE PROTECTION****FLYING PARTICLES**

Read the power washer instructions before use. Failure to comply with power washer safety and operating instructions may cause serious injury or death.

Wear safety goggles when using the power washer. Flying particles can cause serious injury.

NOTE

This procedure is typical for the removal of marine growth from all center, end rake and combination beach/sea end modules.

1. Connect clean water supply to power washer.
2. Connect hose assembly to power washer.

3. Remove marine growth using a brass scraper.
4. Remove marine growth debris from the surface of the module using the power washer.
5. Remove marine growth from male and female guillotines in both the extended and retracted position using the power washer. Refer to TM 55-1945-227-10 for operation of the guillotines.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
MODULES AND DECK FITTINGS, CLEANING AND PAINTING**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Brush, Paint, (Item 3, WP 0074 00)
 Roller Kit, Paint, (Item 18, WP 0074 00)
 Paint, Sherwin Williams Zinc-Clad XI, (Item 12, WP 0074 00)
 Paint, Sherwin Williams Dura Skid 460, (Item 13, WP 0074 00)
 Reducer, (Item 16, WP 0074 00)
 Paper, Abrasive, (Item 14, WP 0074 00)
 Tape, Pressure Sensitive Adhesive, (Item 21, WP 0074 00)
 Cloth, Cleaning, (Item 5, WP 0074 00)
 Disk, Abrasive, (Item 8, WP 0074 00)

Personnel Required

Seaman 88K (1)

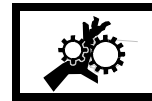
References

SSPC-SP-10
 DOD-PRF-24648
 MIL-PRF-23236

Equipment Condition

Marine growth removed (WP 0011 00)

WARNING

**HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear hard hat, safety shoes and gloves during FC maintenance. Failure to observe these precautions could result in serious injury or death.

CLEAN MODULES OR DECK FITTINGS FOR PAINTING

WARNING

**EYE PROTECTION****FLYING PARTICLES**

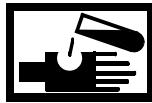
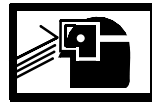
Wear safety goggles when scraping or grinding. Flying particles may cause serious injury.

NOTE

This task is typical for spot painting of module exteriors, deck cleats, D-ring fittings and guillotine components. Preparation procedures are in accordance with The Society for Protective Coatings, SP-10 Near-White Blast Cleaning (SSPC-SP-10). These coatings are approved in accordance with DOD-PRF-24648 and MIL-PRF-23236.

The following steps will be performed prior to module surface painting. Upon completion of rust and paint removal, the surface finish shall be free of all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter.

1. Remove all oil, dust, grease, dirt, loose rust and other foreign matter by use of portable electric drill and sanding disks, hand scraping, hand sanding or a combination of these methods.
2. Using fresh water and cleaning cloth, wipe area clean and allow to air dry in preparation for painting.

PAINT MODULE EXTERIOR STEEL SURFACES OR DECK FITTINGS**WARNING****POISON****CHEMICAL****EYE PROTECTION****VAPOR**

Painting chemicals are poisonous. Wear proper eye, hand and breathing protection when working with painting chemicals. Failure to comply may cause serious injury or death.

1. Mask off areas to be painted.

NOTE

Inorganic zinc coating comes in two premeasured containers which, when mixed with water, provides four gallons of ready-to-apply material.

Application temperature range limits are 40°–100°F.

No coating should be done if the surface is likely to be damaged by rain, fog, dew or dust, etc., during the drying period.

2. Mix two part, water-based, inorganic zinc-rich coating in accordance with manufacturers instructions.
3. Using brush, apply mixed water based inorganic zinc-rich coating in accordance with manufacturers instructions.
4. Clean up any spills and splatters immediately with soap and warm fresh water.

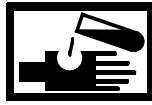
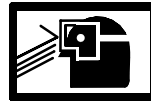
NOTE

Cold temperatures or high humidity will retard drying time.

5. Allow coating to cure, approximately two hours at 77°F, prior to placing in service.
6. Remove masking tape from masked off areas.

APPLY NON-SKID COATING TO MODULE EXTERIOR SURFACES

WARNING

**POISON****CHEMICAL****EYE PROTECTION****VAPOR**

Painting chemicals are poisonous. Wear proper eye, hand and breathing protection when working with painting chemicals. Failure to comply may cause serious injury or death.

1. Mask off areas to be painted.

NOTE

Non-skid deck coating is a two part kit general purpose, polyamide epoxy coating that is mixed prior to application.

Do not apply anti-skid coating to air test plug ports, lift castings and shackles and connector castings.

Application temperature range limits are 50°–110°F.

No coating should be done if the surface is likely to be damaged by rain, fog, dew, dust, etc., during the drying period.

2. Mix two part, non-skid deck coating in accordance with manufacturers instructions.
3. Using nylon roller and paint tray or brush, apply non-skid deck coating to deck surface.
4. Back roll or brush coating while wet at a 90° angle to evenly spread the texture.
5. Clean up any spills and splatters immediately with reducer.

NOTE

Cold temperatures or high humidity will retard drying time.

6. Allow coating to cure, approximately two hours at 77°F, prior to placing in service.
7. Remove masking tape from masked off areas.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GUILLOTINE CONNECTORS INSPECTION, REPAIR,
LUBRICATION AND ADJUSTMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)
Crowbar (Item 13, WP 0073 00)

Materials/Parts

Grease, General Purpose, (Item 9, WP 0074 00)
Sponge, (Item 19, WP 0074 00)
Wedge, Wood, (Item 22, WP 0074 00)

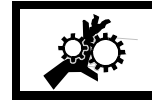
Personnel Required

Seaman 88K (1)

Equipment Condition

Module Dry-Docked (TM 55-1945-227-10)

WARNING

**HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear hard hat, safety shoes and gloves during FC maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

These procedures are typical for all center, end rake and combination beach/sea end module male/female guillotine connectors.

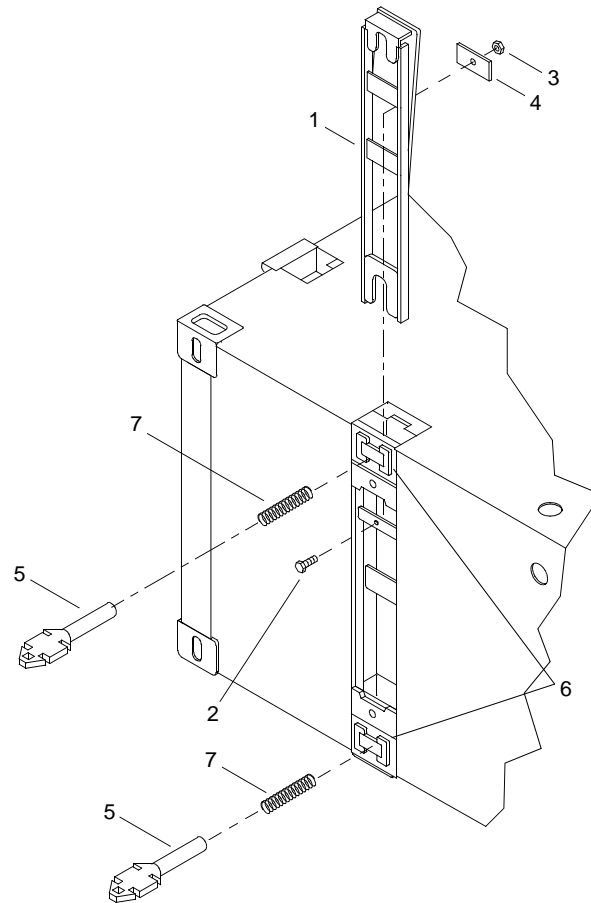
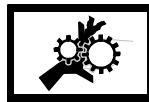
DISASSEMBLY OF MODULE MALE AND FEMALE GUILLOTINE CONNECTORS


Figure 1. Male Guillotine Connector Assembly

1. Disassemble male guillotine connector (figure 1, item 1) assembly.
 - a. Remove bolt (figure 1, item 2), nut (figure 1, item 3) and friction plate (figure 1, item 4).
 - b. Pry up on guillotine connector bar (figure 1, item 1) using a crowbar.

WARNING



MOVING PARTS

Failure to block guillotine bar in up position when removing pins and springs could result in personal injury or death.

- c. Place wood wedge under upper “lip” of guillotine connector bar (figure 1, item 1) after it is raised to hold it in up position.
- d. Push up on retainer located on underside of male connector pins (figure 1, item 5).

- e. Remove male connector pins (figure 1, item 5) from guillotine connector lock housings (figure 1, item 6).
- f. Remove deployment springs (figure 1, item 7).
- g. Remove guillotine connector bar (figure 1, item 1) from guillotine lock housing (figure 1, item 6).

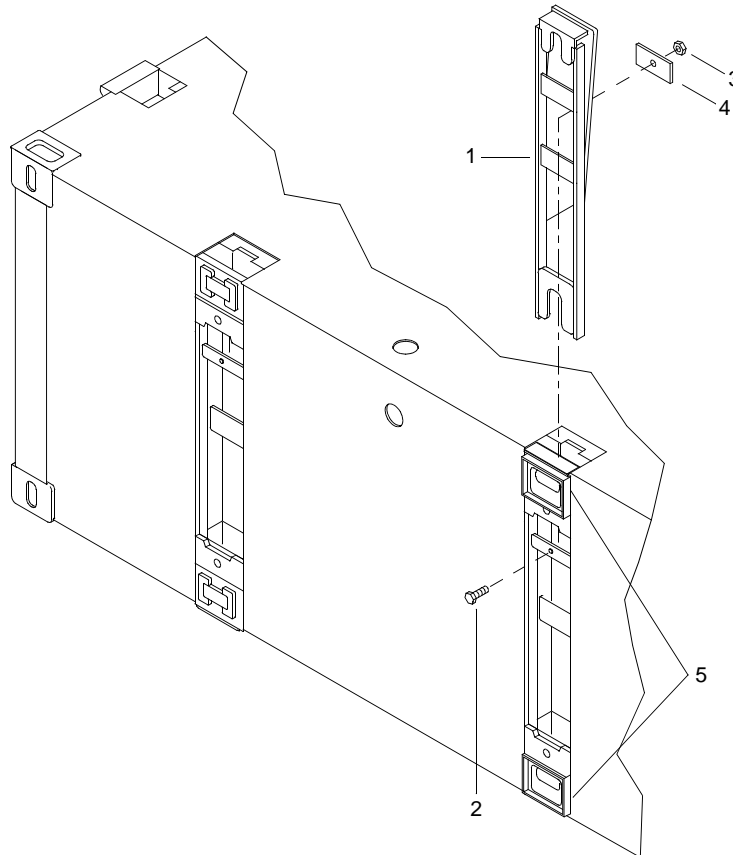


Figure 2. Female Guillotine Connector Assembly

2. Disassemble female guillotine connector (figure 2, item 1) assembly.
 - a. Remove bolt (figure 2, item 2), nut (figure 2, item 3) and friction plate (figure 2, item 4).
 - b. Pry up on guillotine connector bar (figure 2, item 1) using a crowbar.
 - c. Remove guillotine connector bar (figure 2, item 1) from guillotine lock housings (figure 2, item 5).

DISASSEMBLY OF MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Inspect male connector pins (figure 1, item 5) for cracks, cuts or corrosion. If damaged, replace connector pins.
2. Inspect deployment springs (figure 1, item 7) for cracks, cuts or corrosion. If damaged, replace deployment springs.
3. Inspect male guillotine connector bar (figure 1, item 1) for cracks, cuts or corrosion. If damaged, repair or replace guillotine connector bar.

4. Inspect female guillotine connector bar (figure 2, item 1) for cracks, cuts or corrosion. If damaged, repair or replace guillotine connector bar.
5. Inspect guillotine connector male lock housings (figure 1, item 6) for cracks, cuts or corrosion. If damaged, replace guillotine connector lock housings.
6. Inspect guillotine connector female lock housings (figure 2, item 5) for cracks, cuts or corrosion. If damaged, replace guillotine connector lock housings.
7. Inspect male guillotine connector assembly friction plate (figure 1, item 4) for cracks, cuts or corrosion. If damaged, replace friction plate.
8. Inspect female guillotine connector assembly friction plate (figure 2, item 4) for cracks, cuts or corrosion. If damaged, replace friction plate.
9. Inspect all painted components for damaged or missing paint. Spot paint as required. (WP 0012 00)

LUBRICATION OF MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Remove standing water with a sponge from guillotine connector assemblies.
2. Lubricate male connector bar (figure 1, item 1) and female connector bar (figure 2, item 1) assemblies with a light coat of grease.
3. Lubricate deployment springs (figure 1, item 7) with a light coat of grease.

ASSEMBLY OF MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Assemble female guillotine connector assembly.
 - a. Install guillotine connector bar (figure 2, item 1) into guillotine lock housing (figure 2, item 5).
 - b. Install bolt (figure 2, item 2) through friction plate (figure 2, item 4) and nut (figure 2, item 3).
2. Assemble male guillotine connector assembly.
 - a. Install guillotine connector bar (figure 1, item 1) into guillotine lock housing (figure 1, item 6).
 - b. Place wood wedge under upper “lip” of guillotine connector bar (figure 1, item 1) to hold it in up position.
 - c. Install deployment spring (figure 1, item 7) on male connector pin (figure 1, item 5).
 - d. Install male connector pin (figure 1, item 5) into guillotine connector lock housing (figure 1, item 6) by pushing down on retainer located on underside of male connector pin (figure 1, item 5) to lock pin in place.
 - e. Install bolt (figure 1, item 2) through friction plate (figure 1, item 4) and nut (figure 1, item 3).

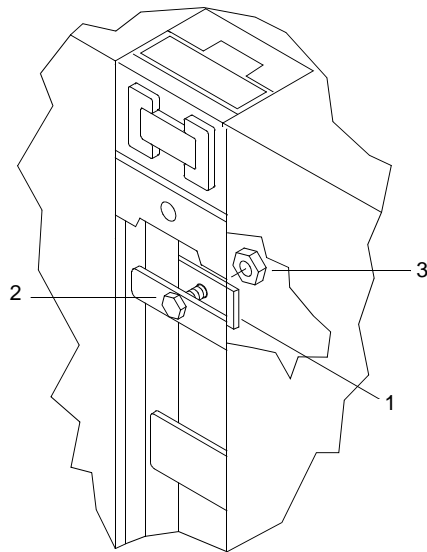
ADJUSTMENT OF MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

Figure 3. Connector Adjustment

1. Locate friction plate (figure 3, item 1) on guillotine connector assembly.

CAUTION

Overtightening friction plate causes difficult operation of guillotine. Failure to comply may result in damage to equipment.

2. Tighten bolt (figure 3, item 2) and nut (figure 3, item 3).
3. Remove wood wedge from under upper “lip” of guillotine connector bar.
4. Raise and lower male and female guillotine connectors and check for smooth operation and verify female connector remains in the raised position.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
FLEXOR REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)
Crowbar (Item 13, WP 0073 00)

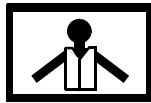
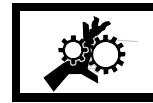
Materials/Parts

Flexor (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

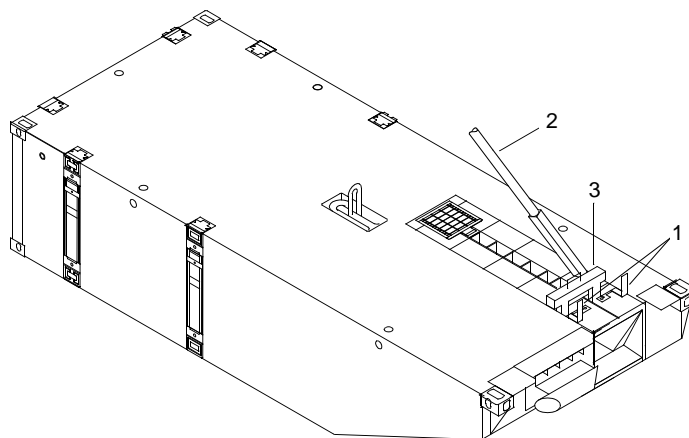
WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

These procedures are typical for the removal and installation of all end rake module flexors.

FLEXOR REMOVAL**Figure 1. Flexor Removal (1)**

1. Rotate chute bolt handles (figure 1, item 1) and pull chute bolts (figure 1, item 1) to unlocked position.

- Using a crowbar (figure 1, item 2), lift guillotine plate (figure 1, item 3) up from flexor connector slots.

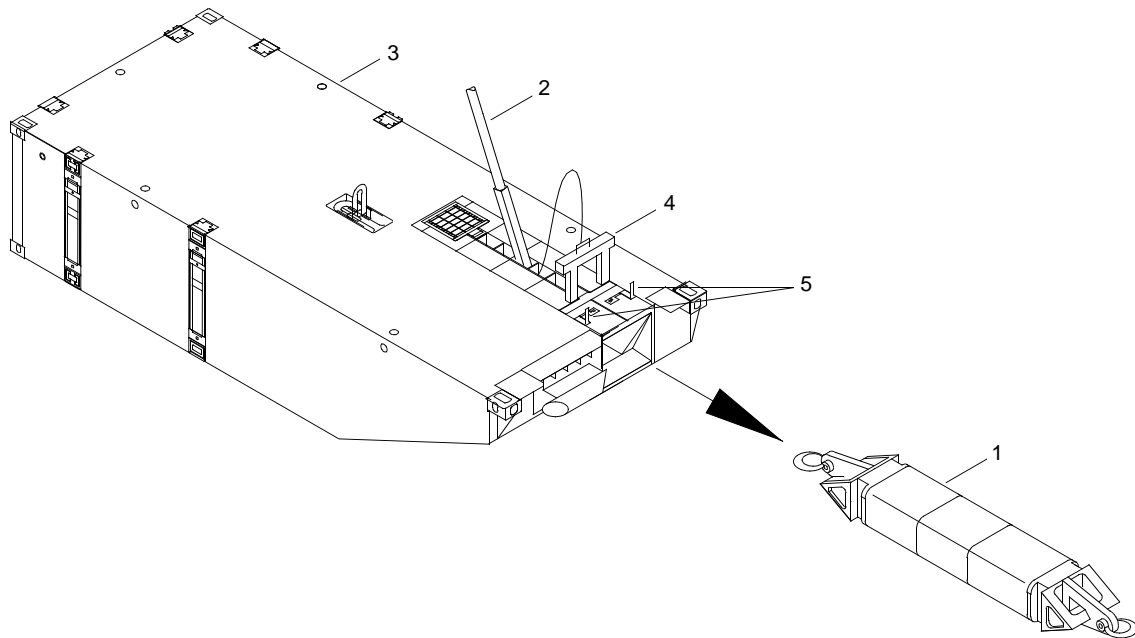


Figure 2. Flexor Removal (2)

- Move flexor (figure 2, item 1) forward using a crowbar (figure 2, item 2).

WARNING



HEAVY PARTS

The flexor is heavy. Stay clear when it is moved. Failure to comply may result in serious injury or death.

- Remove flexor connector (figure 2, item 1) from end rake (figure 2, item 3) using a forklift, forklift adapter and sling.
- Using sledgehammer, drive down guillotine (figure 2, item 4) and rotate chute bolt handles (figure 2, item 5) to locked position.

FLEXOR INSTALLATION

- Rotate chute bolt handles (figure 1, item 1) and pull chute bolts (figure 1, item 1) to unlocked position.
- Using a crowbar (figure 1, item 2), lift guillotine plate (figure 1, item 3) up from flexor connector slots.

WARNING**HEAVY PARTS**

The flexor is heavy. Stay clear when it is moved. Failure to comply may result in serious injury or death.

3. Position flexor connector (figure 2, item 1) into end rake (figure 2, item 3) using a forklift, forklift adapter and sling.
4. Push flexor (figure 2, item 1) backward using a crowbar (figure 2, item 2).
5. Using sledgehammer, drive down guillotine (figure 2, item 4) and rotate chute bolt handles (figure 2, item 5) to locked position.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
FLEXOR WELL CHUTE BOLT AND COVER
REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Cover, Bolt, Right (TM 55-1945-227-24P)

Cover, Bolt, Left (TM 55-1945-227-24P)

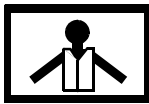
Receiver, Chute Bolt (TM 55-1945-227-24P)

Adhesive, general purpose, (threadlocker) (Item 1, WP 0074 00)

Personnel Required

Seaman 88K (1)

WARNING



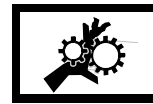
VEST



HELMET PROTECTION



HEAVY PARTS



MOVING PARTS

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

These procedures are typical for the removal and installation of all end rake module flexor well chute bolts and covers.

FLEXOR WELL CHUTE BOLT AND COVER REMOVAL**NOTE**

The bolts securing the chute bolt cover are accessed through holes in the flexor well top plate.

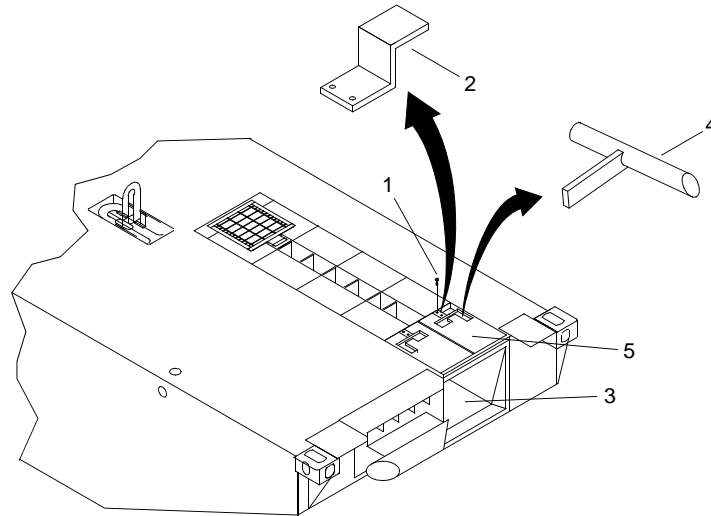


Figure 1. Flexor Well Chute Bolt and Cover Removal

1. Remove bolts (figure 1, item 1) securing flexor well chute bolt cover (figure 1, item 2) to flexor well (figure 1, item 3).
2. Remove flexor well chute bolt cover (figure 1, item 2) from flexor well (figure 1, item 3).
3. Remove flexor well chute bolt (figure 1, item 4) from inside flexor well (figure 1, item 3).

FLEXOR WELL CHUTE BOLT AND COVER INSTALLATION

1. Position flexor well chute bolt (figure 1, item 4) into flexor well (figure 1, item 3).
2. Apply coat of adhesive to threads of bolts (figure 1, item 1).
3. Position flexor well chute bolt cover (figure 1, item 2) through opening of flexor well top cover (figure 1, item 5).
4. Install bolts (figure 1, item 1) to secure flexor well chute bolt cover (figure 1, item 2) in flexor well (figure 1, item 3). Tighten bolts (figure 1, item 1).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
ONSHORE AND OFFSHORE ANCHOR SYSTEMS REPAIR**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10

TM 55-1945-227-24P

Equipment Condition

Anchors retrieved. (TM 55-1945-227-10)

WARNING



VEST



HELMET PROTECTION



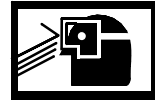
HEAVY PARTS



POISON



CHEMICAL



EYE PROTECTION

All personnel must wear personal flotation device, hard hat, safety shoes, eye protection and gloves during FC operations and maintenance. Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury or death.

NOTE

Repair is limited to the replacement of defective parts.

REPAIR ONSHORE AND OFFSHORE ANCHOR SYSTEMS

1. Refer to TM 55-1945-227-10 for assembly/disassembly instructions.
2. Wash all components with fresh water and allow to air dry.
3. Replace worn/defective components. Refer to TM 55-1945-227-24P for parts information.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
LIGHT TOWER REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

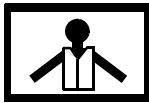
Seaman 88K (1)

Equipment Condition

Light tower removed from container. (TM 55-1945-227-10)

Tower assembly lowered. (TM 55-1945-227-10)

WARNING



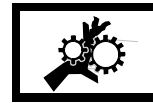
VEST



HELMET PROTECTION



HEAVY PARTS



MOVING PARTS

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

These procedures are typical for the removal and installation of light tower form stowage pallet.

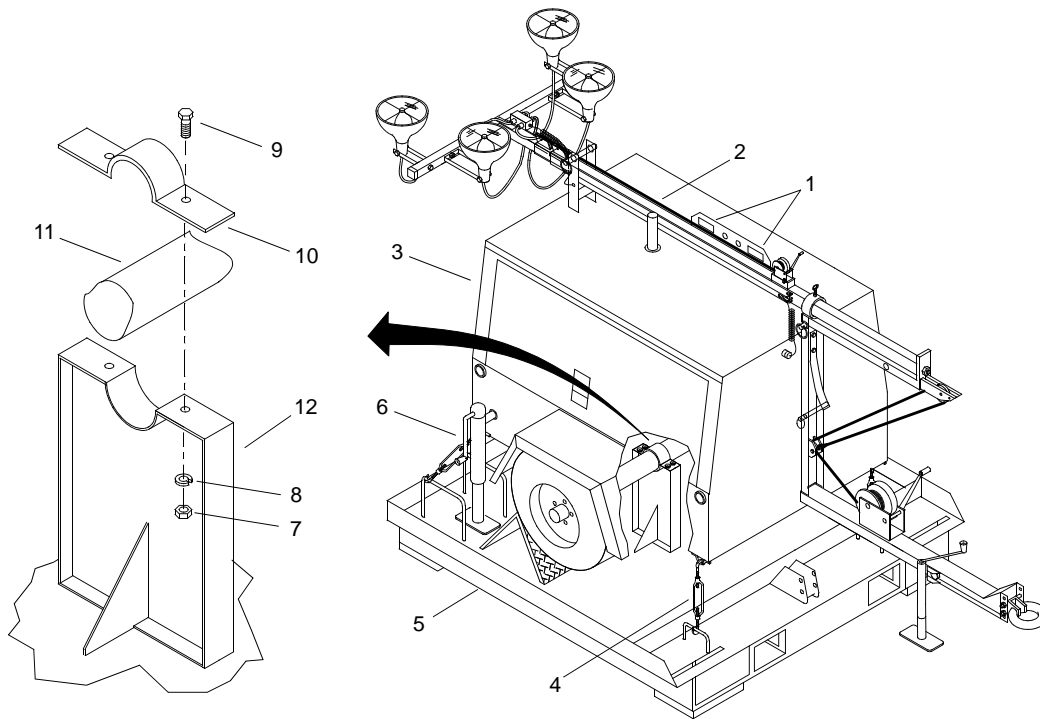
REMOVAL OF LIGHT TOWER FROM STOWAGE PALLET


Figure 1. Light Tower Installation

1. Position forks of forklift into lift points (figure 1, item 1) of tower assembly (figure 1, item 2) to support weight of light tower (figure 1, item 3).
2. Loosen and remove turnbuckles (figure 1, item 4) securing light tower (figure 1, item 3) to stowage pallet (figure 1, item 5).
3. Raise and stow outriggers (figure 1, item 6).
4. Remove nuts (figure 1, item 7), lockwashers (figure 1, item 8) and bolts (figure 1, item 9) from clamps (figure 1, item 10) securing light tower axle (figure 1, item 11) to stowage pallet pedestals (figure 1, item 12).

WARNING



HEAVY PARTS

The light tower is very heavy. Stay clear when it is moved. Failure to comply may result in serious injury or death.

5. Using forklift, remove light tower (figure 1, item 3) from stowage pallet (figure 1, item 5).

INSTALLATION OF LIGHT TOWER ON STOWAGE PALLET

1. Position forks of forklift into lift points (figure 1, item 1) of tower assembly (figure 1, item 2).

WARNING

**HEAVY PARTS**

The light tower is very heavy. Stay clear when it is moved. Failure to comply may result in serious injury or death.

2. Using forklift, position new light tower (figure 1, item 3) on stowage pallet pedestals (figure 1, item 12).
3. Position clamps (figure 1, item 10) over light tower axle (figure 1, item 11) and secure to stowage pallet pedestals (12) with bolts (figure 1, item 9), new lockwashers (figure 1, item 8) and nuts (figure 1, item 7). Tighten nuts (figure 1, item 7).
4. Level light tower (figure 1, item 3) on stowage pallet (figure 1, item 5) by deploying outriggers (figure 1, item 6).
5. Install turnbuckles (figure 1, item 4) to secure light tower (figure 1, item 2) to stowage pallet (figure 1, item 5). Tighten turnbuckles (figure 1, item 4).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
TOWING BRIDLE REPAIR**

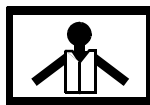
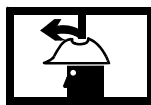
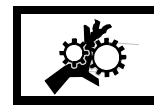
INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

Seaman 88K (2)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

Repair is limited to the replacement of damaged components.

The towing bridle can have either 35 ft or 60 ft flexor rope legs.

The nylite connector consists of a cover, shackle, bolt and nut on loops of each bridle end.

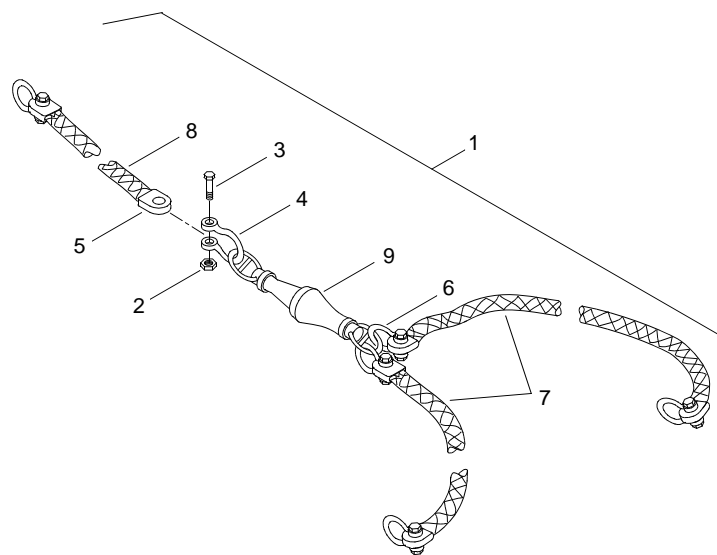
REPAIR TOWING BRIDLE

Figure 1. Towing Bridle

1. Using assistant, remove towing bridle (figure 1, item 1) from BII container.
2. Remove nuts (figure 1, item 2), bolts (figure 1, item 3), shackles (figure 1, item 4) and protective covers (figure 1, item 5) of all nylite connector assemblies (figure 1, item 6) from end loops of both flexor rope assemblies (figure 1, item 7) and main rope assembly (figure 1, item 8).
3. Separate two flexor rope assemblies (figure 1, item 7) and main rope assembly (figure 1, item 8) from swivel (figure 1, item 9).
4. Discard damaged components.
5. Connect main rope assembly (figure 1, item 8) and two flexor rope assemblies (figure 1, item 7) to swivel (figure 1, item 9) using nylite connector assemblies (figure 1, item 6).
 - a. Install protective cover (figure 1, item 5) over end loop of rope assembly (figure 1, items 7, 8).
 - b. Install shackle (figure 1, item 4) over protective cover (figure 1, item 5).
 - c. Install bolt (figure 1, item 3) through shackle (figure 1, item 4), protective cover (figure 1, item 5) and end loop of rope assembly (figure 1, items 7, 8).
 - d. Install nut (figure 1, item 2) on bolt (figure 1, item 3). Tighten nut (figure 1, item 2).
6. Using assistant, stow towing bridle (figure 1, item 1) in BII container.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER HAND LANTERN MOUNTING
BRACKET REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Assembly, Bracket (TM 55-1945-227-24P)

Holder, Light (TM 55-1945-227-24P)

O-Ring (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (2)

WARNING



VEST



HELMET PROTECTION



HEAVY PARTS



MOVING PARTS

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

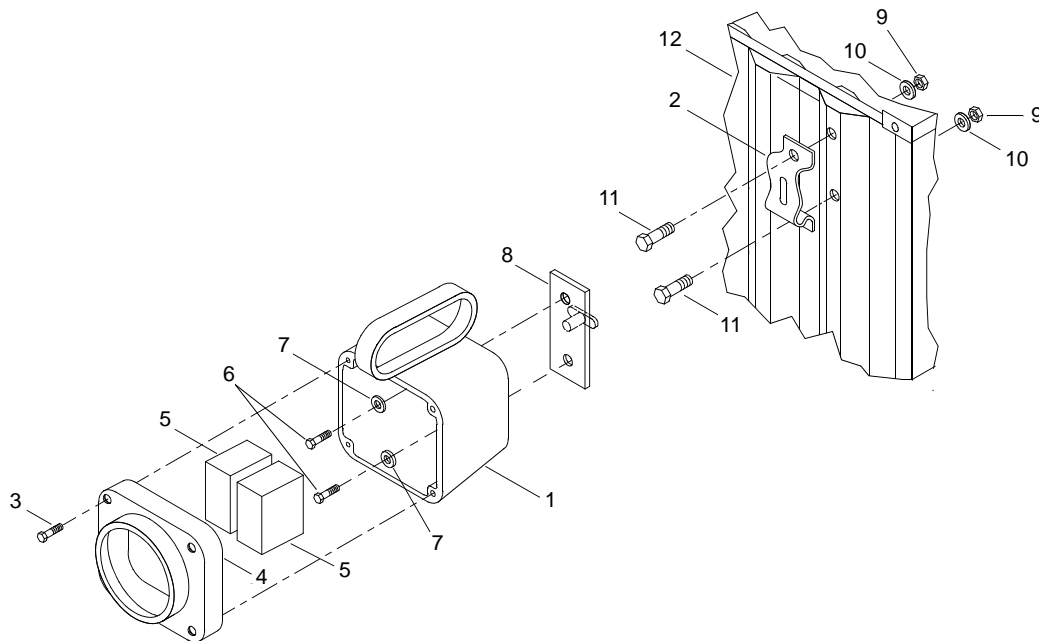
REPLACE GENERATOR CONTAINER HAND LANTERN MOUNTING BRACKET


Figure 1. Hand Lantern Mounting Bracket

1. Rotate hand lantern (figure 1, item 1) 90° and remove from mounting bracket (figure 1, item 2).
2. Loosen four captive screws (figure 1, item 3) on cover (figure 1, item 4).
3. Remove cover (figure 1, item 4).
4. Place hand lantern (figure 1, item 1) face up on the work bench.
5. Remove batteries (figure 1, item 5).
6. Remove two hex head bolts (figure 1, item 6) and O-rings (figure 1, item 7) from bracket (figure 1, item 8).
7. Discard O-rings (figure 1, item 7) and bracket (figure 1, item 8).
8. Remove two hex nuts (figure 1, item 9), lockwashers (figure 1, item 10) and hex head bolts (figure 1, item 11) securing mounting bracket (figure 1, item 2) to container end door (figure 1, item 12).
9. Discard mounting bracket (figure 1, item 2).
10. Position new mounting bracket (figure 1, item 2) on container end door (figure 1, item 12).
11. Install two hex head bolts (figure 1, item 11) through mounting bracket (figure 1, item 2) and container end door (figure 1, item 12).
12. Install new lockwashers (figure 1, item 10) and hex nuts (figure 1, item 9) on hex head bolts (figure 1, item 11). Tighten hex nuts (figure 1, item 9).
13. Position new bracket (figure 1, item 8) on the back of hand lantern (figure 1, item 1).

-
14. Install two hex head bolts (figure 1, item 6) and new O-rings (figure 1, item 7) through hand lantern (figure 1, item 1) into bracket (figure 1, item 8).
 15. Tighten hex head bolts (figure 1, item 6).
 16. Install batteries (figure 1, item 5).
 17. Position cover (figure 1, item 4) on hand lantern (figure 1, item 1).
 18. Tighten captive screws (figure 1, item 3).
 19. Position hand lantern (figure 1, item 1) on mounting bracket (figure 1, item 2) and rotate 90°.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER ELECTRICAL RECEPTACLE
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Receptacle, Duplex (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 9-6115-642-10

TM 55-1945-227-10

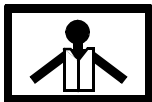
FM 55-502

Equipment Condition

Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

WARNING



VEST



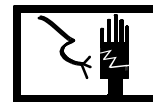
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

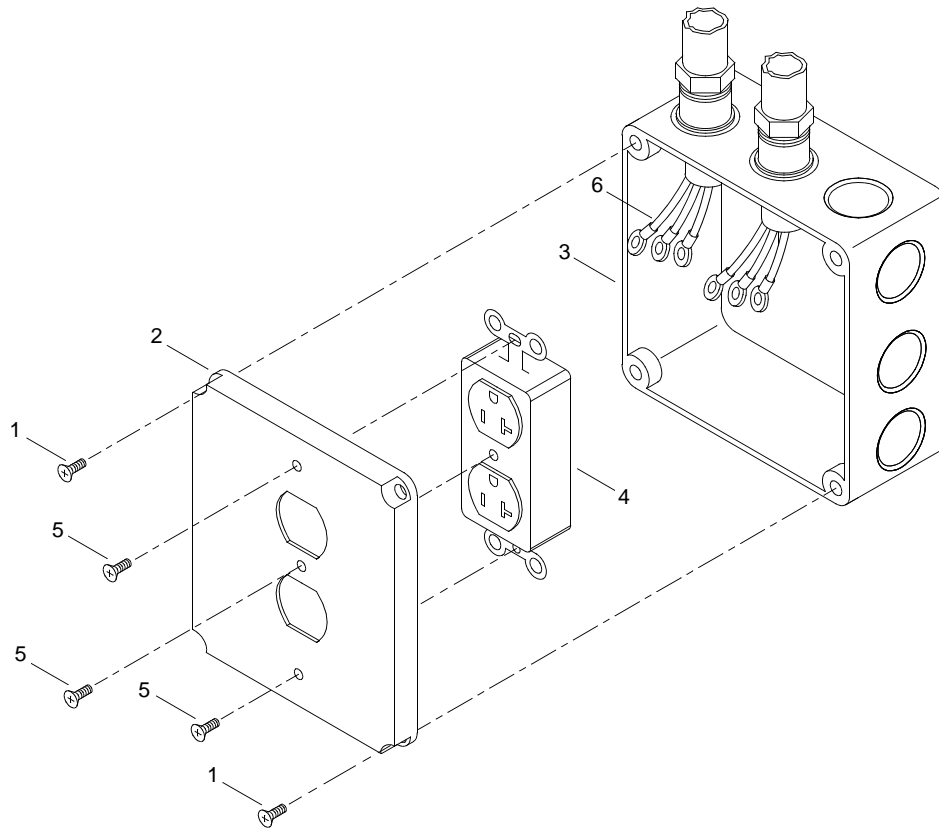
REPLACE GENERATOR CONTAINER ELECTRICAL RECEPTACLE


Figure 1. Electrical Receptacle

1. Remove screws (figure 1, item 1) securing receptacle cover (figure 1, item 2) to receptacle box (figure 1, item 3).
2. Remove receptacle cover (figure 1, item 2) with attached receptacle (figure 1, item 4) from receptacle box (figure 1, item 3).
3. Remove screws (figure 1, item 5) securing receptacle (figure 1, item 4) to receptacle cover (figure 1, item 2).
4. Label and disconnect wiring (figure 1, item 6) from receptacle (figure 1, item 4). Discard receptacle.
5. Connect wiring (figure 1, item 6) to new receptacle (figure 1, item 4) and remove labels.
6. Install screws (figure 1, item 5) to secure receptacle (figure 1, item 4) to receptacle cover (figure 1, item 2). Tighten screws (5).
7. Position receptacle cover (figure 1, item 2) with attached receptacle (figure 1, item 4) in receptacle box (figure 1, item 3).
8. Install screws (figure 1, item 1) to secure receptacle cover (figure 1, item 2) to receptacle box (figure 1, item 3). Tighten screws (figure 1, item 1).
9. Remove warning tag from generator.
10. Start generator. (TM 9-6115-642-10)

11. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER RECEPTACLE BOX REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Box, Receptacle (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 9-6115-642-10

TM 55-1945-227-10

FM 55-502

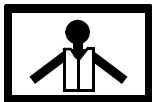
Equipment Condition

Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

Electrical receptacle removed. (WP 0020 00)

WARNING



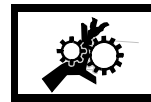
VEST



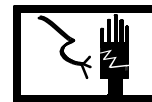
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



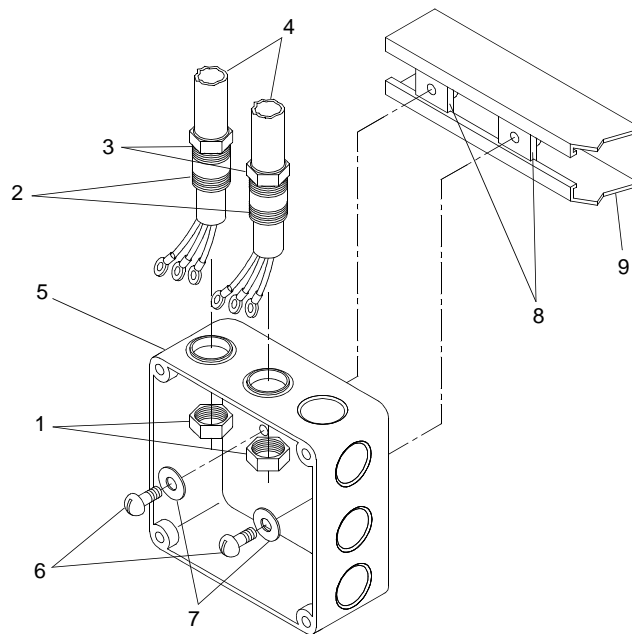
ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of generator container receptacle boxes.

REPLACE GENERATOR CONTAINER RECEPTACLE BOX**Figure 1. Receptacle Box**

1. Remove two spanner nuts (figure 1, item 1) from conduit compression connectors (figure 1, item 2).
2. Loosen nuts (figure 1, item 3) on compressions connectors (figure 1, item 2).
3. Slide compressions connectors (figure 1, item 2) up conduits (figure 1, item 4) and pull wiring out of receptacle box (figure 1, item 5).
4. Remove two screws (figure 1, item 6) and washers (figure 1, item 7) securing receptacle box (figure 1, item 5) to clamping nuts (figure 1, item 8) in track (figure 1, item 9) Discard receptacle box (figure 1, item 5).
5. Position new receptacle box (figure 1, item 5) at clamping nuts (figure 1, item 8) in track (figure 1, item 9).
6. Install two screws (figure 1, item 6) and washers (figure 1, item 7) in receptacle box (figure 1, item 5). Tighten screws (figure 1, item 6).
7. Install two conduit compression connectors (figure 1, item 2) and conduits (figure 1, item 4) with wiring in receptacle box (figure 1, item 5).
8. Tighten nuts (figure 1, item 3) on compressions connectors (figure 1, item 2).
9. Install two spanner nuts (figure 1, item 1) on conduits (figure 1, item 2) and tighten.
10. Install electrical receptacle. (WP 0020 00)
11. Remove warning tag from generator and start generator. (TM 9-6115-642-10)
12. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER DOOR LOCKSET REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

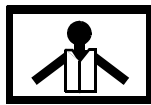
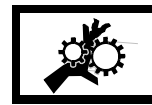
Materials/Parts

Lockset, Door (TM 55-1945-227-24P)

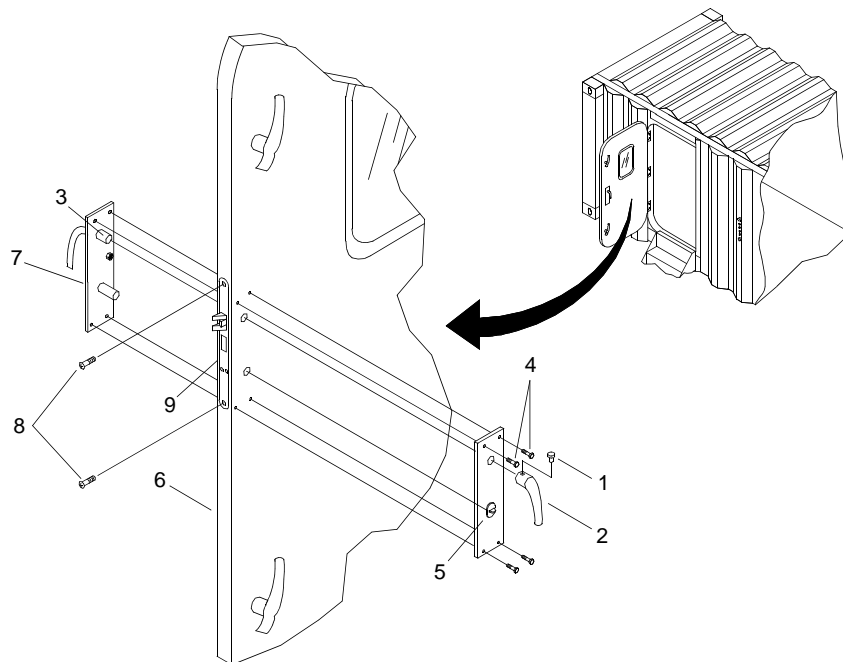
Personnel Required

Engineer 88L (1)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during fc operations and maintenance. Failure to observe these precautions could result in serious injury or death.

REPLACE GENERATOR CONTAINER DOOR LOCKSET**Figure 1. Door Lockset**

1. Remove set screw (figure 1, item 1) securing inner door handle (figure 1, item 2) to outer door handle shaft (figure 1, item 3).
2. Remove four screws (figure 1, item 4) securing inner door handle plate (figure 1, item 5) to inside of door (6).
3. Remove inner door handle plate (figure 1, item 5) from door (figure 1, item 6).
4. Remove outer door handle plate (figure 1, item 7) from door (figure 1, item 6).
5. Remove two screws (figure 1, item 8) securing lockset (figure 1, item 9) to end of door (figure 1, item 6).
6. Remove lockset (figure 1, item 9) and discard.
7. Position new lockset (figure 1, item 9) into hole in side of door (figure 1, item 6).
8. Install two screws (figure 1, item 8) to secure lockset (figure 1, item 9) to door (figure 1, item 6). Tighten screws (figure 1, item 8).
9. Position outer door handle plate (figure 1, item 7) into outer face hole of door (figure 1, item 6).
10. Position inner door handle plate (figure 1, item 5) into inner face hole of door (figure 1, item 6).
11. Install four screws (figure 1, item 4) to secure inner door handle plate (figure 1, item 5) to outer door handle plate (figure 1, item 7). Tighten screws (figure 1, item 4).
12. Position inner door handle (figure 1, item 2) on outer door handle shaft (figure 1, item 3).
13. Install set screw (figure 1, item 1) securing inner door handle (figure 1, item 2) to outer door handle shaft (figure 1, item 3). Tighten set screw (figure 1, item 1).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER & PERSONNEL SHELTER DOOR
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

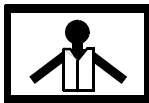
Door, Weathertight (Generator Container) (TM 55-1945-227-24P)

Door, Weathertight (Personnel Shelter) (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (2)

WARNING

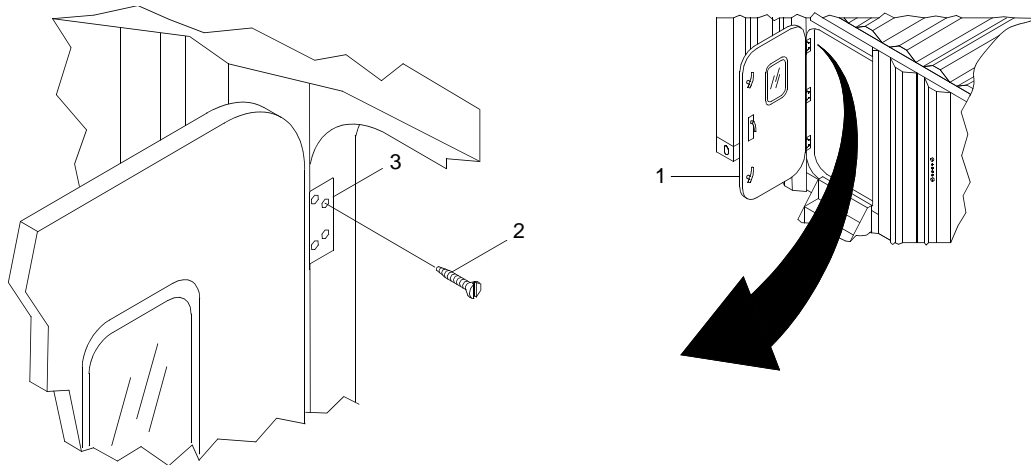
**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of doors on the personnel shelter and generator container.

Hinges will remain on door frame during door replacement.

REPLACE DOOR**Figure 1. Door**

1. Using assistant to support weight of door (figure 1, item 1), remove screws (figure 1, item 2) from door hinges (figure 1, item 3).
2. Remove door (figure 1, item 1) and discard.
3. Using assistant to support weight of new door (figure 1, item 1), align new door (figure 1, item 1).
4. Install screws (figure 1, item 2) into door hinges (figure 1, item 3) and tighten.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER & PERSONNEL SHELTER DOOR DOG
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

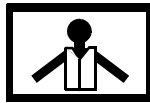
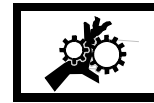
Materials/Parts

Set, Dog (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (1)

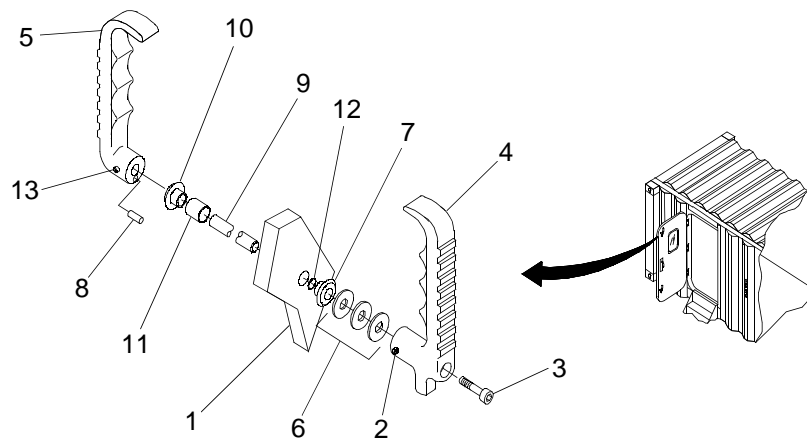
WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of door dogs on the generator container and personnel shelter.

REPLACE DOOR DOGS**Figure 1. Door Dogs**

1. On interior of door (figure 1, item 1), loosen setscrew (figure 1, item 2) and remove bolt (figure 1, item 3) securing inner dog (figure 1, item 4) to outer dog (figure 1, item 5).
2. Remove inner dog (figure 1, item 4), inner shims (figure 1, item 6), and inner dog bushing (figure 1, item 7) from door (figure 1, item 1) and discard.
3. Remove outer dog (figure 1, item 5), stop pin (figure 1, item 8), shaft (figure 1, item 9), outer dog bushing (figure 1, item 10), shaft bushing (figure 1, item 11) and O-ring (figure 1, item 12) from door (figure 1, item 1) and discard.
4. Install new shaft bushing (figure 1, item 11), outer dog bushing (figure 1, item 1) and inner dog bushing (figure 1, item 7) in door (figure 1, item 1).
5. Install new stop pin (figure 1, item 8) and shaft (figure 1, item 9) in new outer dog (figure 1, item 5) and tighten set screw (figure 1, item 13).
6. Install new O-ring (figure 1, item 12) on shaft (figure 1, item 9).
7. Install outer dog (figure 1, item 5) assembly in door (figure 1, item 1).
8. Position inner dog (figure 1, item 4) on shaft (figure 1, item 7) of outer dog (figure 1, item 5), aligning both handles vertically.
9. Install bolt (figure 1, item 3) to secure inner dog (figure 1, item 4) to outer dog (figure 1, item 5). Tighten bolt (figure 1, item 3).
10. Tighten setscrew (figure 1, item 2).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER HAND OPERATED TRANSFER PUMP
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Transfer Pump, Hand Operated (TM 55-1945-227-24P)

Cloth, Cleaning, (Item 5, WP 0074 00)

Kit, Spill (Item 11, WP 0074 00)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 9-6115-642-10

TM 55-1945-227-10

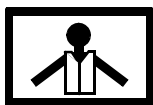
FM 55-502

Equipment Condition

Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

WARNING



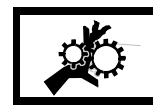
VEST



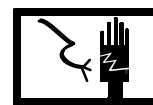
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



ELECTRICAL



FIRE



EXPLOSION

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Fire extinguisher and spill kit must be present during fuel tank maintenance. Failure to comply could result in injury to personnel.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

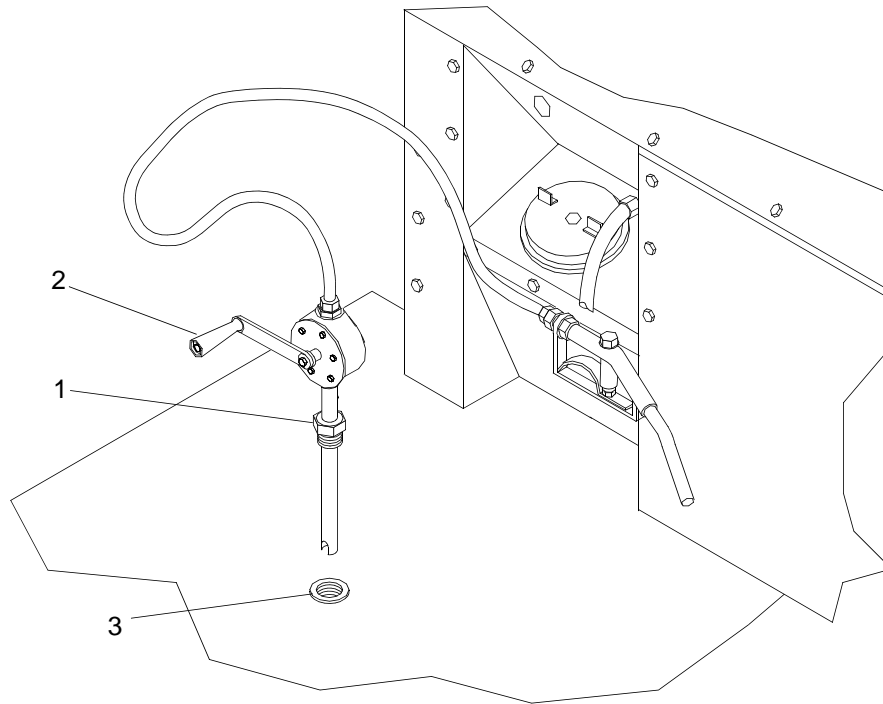
REPLACE GENERATOR CONTAINER HAND OPERATED TRANSFER PUMP

Figure 1. Hand Operated Transfer Pump

1. Remove fitting (figure 1, item 1) to remove transfer pump assembly (2) from fuel tank (3).
2. Discard transfer pump assembly (2).
3. Using cloth, wipe fittings.
4. Install new transfer pump assembly (2) in fuel tank (3). Tighten fitting (1).
5. Clean up spilled fluid with a spill kit and dispose of spill kit waste per local procedures.
6. Remove warning tag from generator.
7. Start generator. (TM 9-6115-642-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER AIR INLET DUCT REMOVAL AND
INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 9-6115-642-10

TM 55-1945-227-10

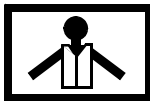
FM 55-502

Equipment Condition

Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

WARNING



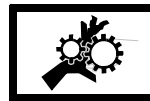
VEST



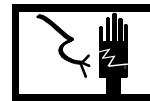
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

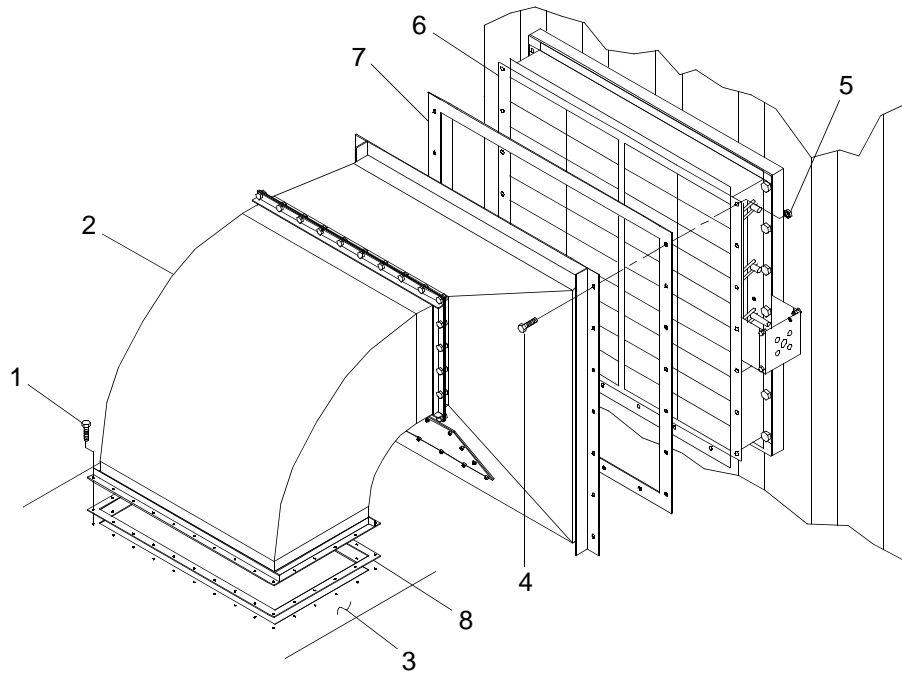
REMOVE GENERATOR CONTAINER AIR INLET DUCT


Figure 1. Generator Container Air Inlet Duct

1. Remove bolts (figure 1, item 1) securing air inlet duct (figure 1, item 2) to generator (figure 1, item 3).
2. Remove bolts (figure 1, item 4) and locknuts (figure 1, item 5) securing air inlet duct (figure 1, item 2) to damper assembly (figure 1, item 6).
3. Remove air inlet duct (figure 1, item 2) and collect gaskets (figure 1, items 7, 8).
4. Inspect gaskets (figure 1, items 7, 8) for general condition and tears. Replace as needed.

INSTALL GENERATOR CONTAINER AIR INLET DUCT

1. Position air inlet duct (figure 1, item 2) with gaskets (figure 1, items 7, 8).
2. Install and tighten bolts (figure 1, item 1) to secure air inlet duct (figure 1, item 2) to generator (figure 1, item 3).
3. Install and tighten bolts (figure 1, item 4) and new locknuts (figure 1, item 5) to secure air inlet duct (figure 1, item 2) to damper assembly (figure 1, item 6).
4. Remove warning tag from generator.
5. Start generator. (TM 9-6115-642-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER DAMPER ASSEMBLY REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Damper Assembly with Motor (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (2)

References

TM 9-6115-642-10

TM 55-1945-227-10

FM 55-502

Equipment Condition

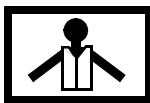
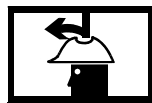
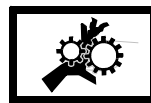
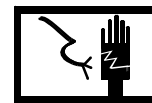
Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

For replacement of air inlet duct damper assembly, the generator container air inlet duct must be removed. (WP 0026 00)

Generator container damper assembly actuator removed. (WP 0049 00)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS****ELECTRICAL**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of the air intake and ventilation damper assemblies.

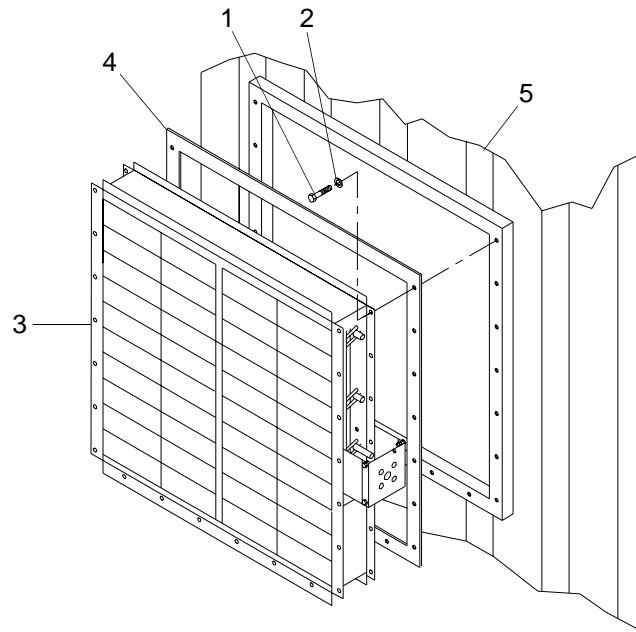
REPLACE GENERATOR CONTAINER DAMPER ASSEMBLY


Figure 1. Damper Assembly

1. Remove bolts (figure 1, item 1) and lockwashers (figure 1, item 2) securing damper assembly (figure 1, item 3) and gasket (figure 1, item 4) to generator container side wall (figure 1, item 5).

WARNING



HEAVY OBJECTS

The damper assembly is heavy. Use care when lifting. Failure to comply may result in serious injury or death.

2. Using assistant, remove and discard damper assembly (figure 1, item 3) and gasket (figure 1, item 4).
3. Using assistant, position new damper assembly (figure 1, item 8) and gasket (figure 1, item 9) against generator container side wall (figure 1, item 5).
4. Install and tighten bolts (figure 1, item 6) and new lockwashers (figure 1, item 7).
5. Install generator container damper assembly actuator. (WP 0049 00)
6. If the air inlet damper was replaced, install generator container air inlet duct. (WP 0026 00)
7. Remove warning tag from generator.
8. Start generator. (TM 9-6115-642-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER FUEL TANK LEVEL SENSOR
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Sensor, Fuel Level, 50%/Overfill (TM 55-1945-227-24P)
 Sensor, Fuel Level, Full/Empty (TM 55-1945-227-24P)
 Sensor, Fuel Level, Leak Detection (TM 55-1945-227-24P)
 Cloth, Cleaning, (Item 5, WP 0074 00)
 Kit, Spill (Item 11, WP 0074 00)
 Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

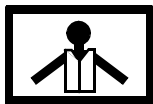
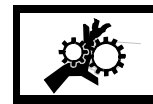
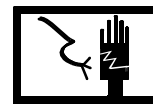
References

TM 9-6115-642-10
 TM 55-1945-227-10
 FM 55-502

Equipment Condition

Generator shut down. (TM 9-6115-642-10)
 Secure generator and tag out. (FM 55-502)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS****ELECTRICAL****FIRE****EXPLOSION**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Fire extinguisher and spill kit must be present during fuel tank maintenance. Failure to comply could result in injury to personnel.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of fuel tank level sensors.

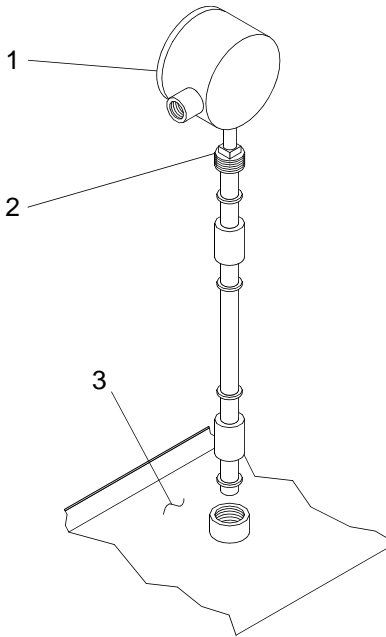
REPLACE GENERATOR CONTAINER FUEL TANK LEVEL SENSOR

Figure 1. Fuel Tank Level Sensor

1. Remove cover from fuel level sensor (figure 1, item 1).
2. Label wires and disconnect wire lugs from fuel level sensor (figure 1, item 1).
3. Remove flexible conduit from fuel level sensor (figure 1, item 1).
4. Using a wrench on sensor fitting (figure 1, item 2), remove the fuel level sensor (figure 1, item 1) from the fuel tank (figure 1, item 3). Discard fuel level sensor (figure 1, item 1).
5. Using cloth, wipe fittings.
6. Carefully slide the new fuel level sensor (figure 1, item 1) into the fuel tank (figure 1, item 3).
7. Tighten sensor fitting (figure 1, item 2).
8. Install flexible conduit and connect wiring to fuel level sensor (figure 1, item 1).
9. Clean up spilled fluid with a spill kit and dispose of spill kit waste per local procedures.
10. Remove warning tag from generator.
11. Start generator. (TM 9-6115-642-10)
12. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER BENCHES REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

Seaman 88K (2)

NOTE

The following procedure is typical for the removal and installation of all personnel shelter benches.

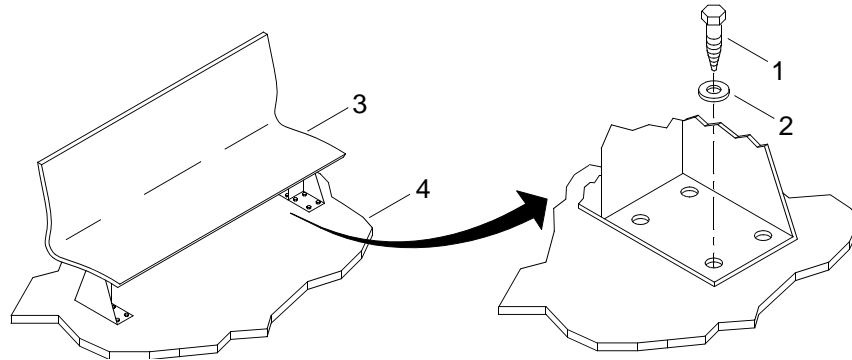
REMOVE PERSONNEL SHELTER BENCH

Figure 1. Personnel Shelter Bench

1. Remove lag bolts (figure 1, item 1) and washers (figure 1, item 2) securing bench (figure 1, item 3) to container floor (figure 1, item 4).

WARNING



HEAVY PARTS

The bench is heavy. Use care when lifting. Failure to comply may result in serious injury.

2. Remove bench (figure 1, item 3) from container floor (figure 1, item 4).

INSTALL PERSONNEL SHELTER BENCH

WARNING

**HEAVY PARTS**

The bench is heavy. Use care when lifting. Failure to comply may result in serious injury.

1. Position bench (figure 1, item 3) over holes in container floor (figure 1, item 4).
2. Install lag bolts (figure 1, item 1) and washers (figure 1, item 2) to secure bench (figure 1, item 3) to container floor (figure 1, item 4). Tighten lag bolts (figure 1, item 1).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER BENCH SEAT REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Seat, Bench (Single Booth, 71 in.) (TM 55-1945-227-24P)

Seat, Bench (Single Booth, 59 in.) (TM 55-1945-227-24P)

Seat, Bench (Single Booth, 41 in.) (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (2)

Equipment Condition

Personnel shelter bench removed. (WP 0029 00)

NOTE

The following procedure is typical for the removal and installation of all personnel shelter bench seats.

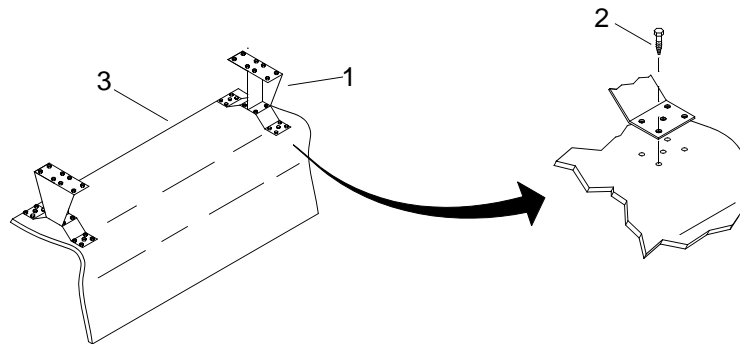
REPLACE PERSONNEL SHELTER BENCH SEAT

Figure 1. Personnel Shelter Bench Seat

1. Turn bench and frame (figure 1, item 1) upside down.
2. Remove self-tapping screws (figure 1, item 2) from bench frame (figure 1, item 1).
3. Remove bench seat (figure 1, item 3) from bench frame (figure 1, item 1). Discard bench seat (figure 1, item 3).
4. Align new bench seat (figure 1, item 3) with holes in bench frame (figure 1, item 1).
5. Install self-tapping screws (figure 1, item 2) in bench frame (figure 1, item 1). Tighten self-tapping screws (figure 1, item 2).
6. Turn bench and frame (figure 1, item 1) upright.

7. Install personnel shelter bench. (WP 0029 00)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER TABLE REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

Seaman 88K (2)

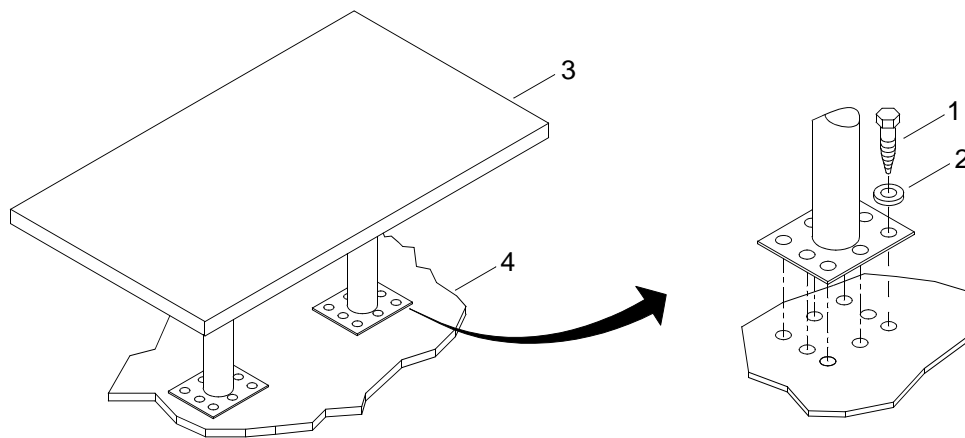
REMOVE PERSONNEL SHELTER TABLE

Figure 1. Personnel Shelter Table

1. Remove lag bolts (figure 1, item 1) and washers (figure 1, item 2) securing table (figure 1, item 3) to container floor (figure 1, item 4).
2. Remove table (figure 1, item 3) from container floor (figure 1, item 4).

INSTALL PERSONNEL SHELTER TABLE

1. Position table (figure 1, item 3) over holes in container floor (figure 1, item 4).
2. Install lag bolts (figure 1, item 1) and washers (figure 1, item 2) to secure table (figure 1, item 3) to container floor (figure 1, item 4). Tighten lag bolts (figure 1, item 1).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER TABLETOP REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Tabletop, Rectangular (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (2)

Equipment Condition

Personnel shelter table removed. (WP 0031 00)

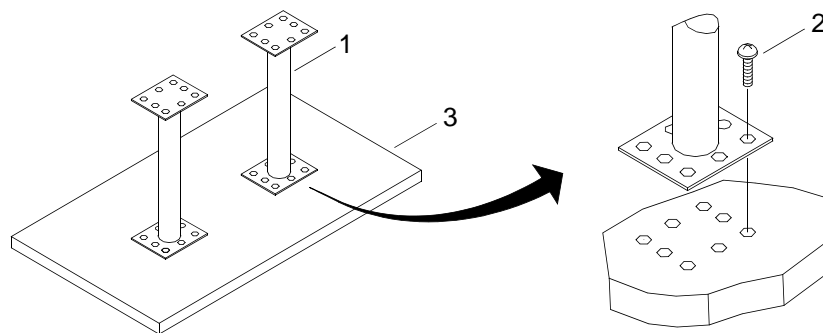
REPLACE PERSONNEL SHELTER TABLETOP

Figure 1. Personnel Shelter Tabletop

1. Turn table (figure 1, item 1) upside down.
2. Remove screws (figure 1, item 2) from table (figure 1, item 1).
3. Remove tabletop (figure 1, item 3) from table (figure 1, item 1) and discard.
4. Align new tabletop (figure 1, item 3) with holes in table (figure 1, item 1).
5. Install screws (figure 1, item 2) in table (figure 1, item 1). Tighten screws (figure 1, item 2).
6. Turn table (figure 1, item 1) upright.
7. Install personnel shelter table. (WP 0031 00)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER VENT FAN CLEANING AND INSPECTION**

INITIAL SETUP:**Materials/Parts**

Cleaner (Item 6, WP 0074 00)
Rag, Wiping (Item 15, WP 0074 00)
Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10
FM 55-502

Equipment Condition

Circuit breaker D set to OFF and tagged out. (FM 55-502)

WARNING



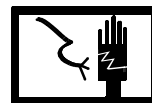
POISON



CHEMICAL



EYE PROTECTION



ELECTRICAL

Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury.

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

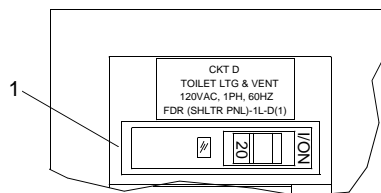
CLEAN PERSONNEL SHELTER VENT FAN

Figure 1. Circuit Breaker D

1. At the personnel shelter electrical distribution panel, position circuit breaker D (figure 1, item 1) to OFF and tag out (FM 55-502).

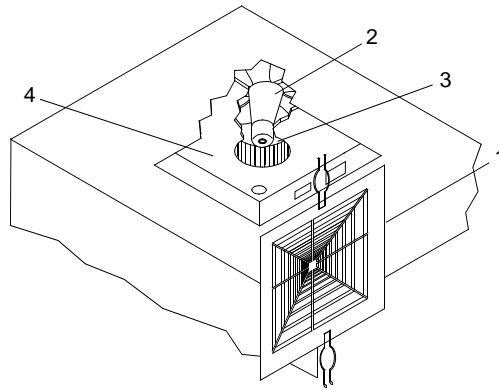


Figure 2. Personnel Shelter Vent Fan

2. Pull down vent fan cover (figure 2, item 1).
3. Clean fan blades (figure 2, item 2) and vent cavity (figure 2, item 3).
4. Clean debris from vent fan cover (figure 2, item 1) and surface of vent fan panel (figure 2, item 4).
5. Remove cleaner residue from vent cover (figure 2, item 1), fan blades (figure 2, item 2) and vent cavity (figure 2, item 3).
6. Allow fan blades (figure 2, item 2), vent cavity (figure 2, item 3) and surface of vent fan panel (figure 2, item 4) to air dry.
7. Dispose of contaminated wiping rags per local procedures.

INSPECT PERSONNEL SHELTER VENT FAN

1. Inspect fan blades (figure 2, item 2) for cracks. None are allowed. If cracks are found, replace vent fan. (WP 0055 00)
2. Inspect fan for ease of movement. If fan does not move freely, replace vent fan. (WP 0055 00)
3. Close vent fan cover (figure 2, item 1).
4. Remove warning tag from circuit breaker D (figure 1, item 1) on the personnel shelter electrical distribution panel and set circuit breaker to ON.
5. Perform operational check. (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER COAT HANGER REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Hanger, Coat (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

REPLACE PERSONNEL SHELTER COAT HANGER**NOTE**

This task is typical for replacing coat hangers.

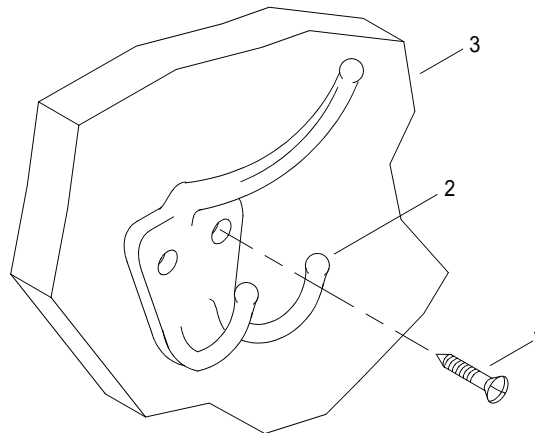


Figure 1. Coat Hanger

1. Remove screws (figure 1, item 1) securing coat hanger (2) to side of personnel shelter (3).
2. Remove coat hanger (2) from side of personnel shelter (3) and discard.
3. Position new coat hanger (2) on side of personnel shelter (3).
4. Install screws (1) to secure coat hanger (2) on side of personnel shelter (3). Tighten screws (1).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER HAND LANTERN MOUNTING BRACKET
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Assembly, Bracket (TM 55-1945-227-24P)

Holder, Light (TM 55-1945-227-24P)

O-Ring (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

NOTE

The following procedure is typical for all personnel shelter hand lantern mounting brackets.

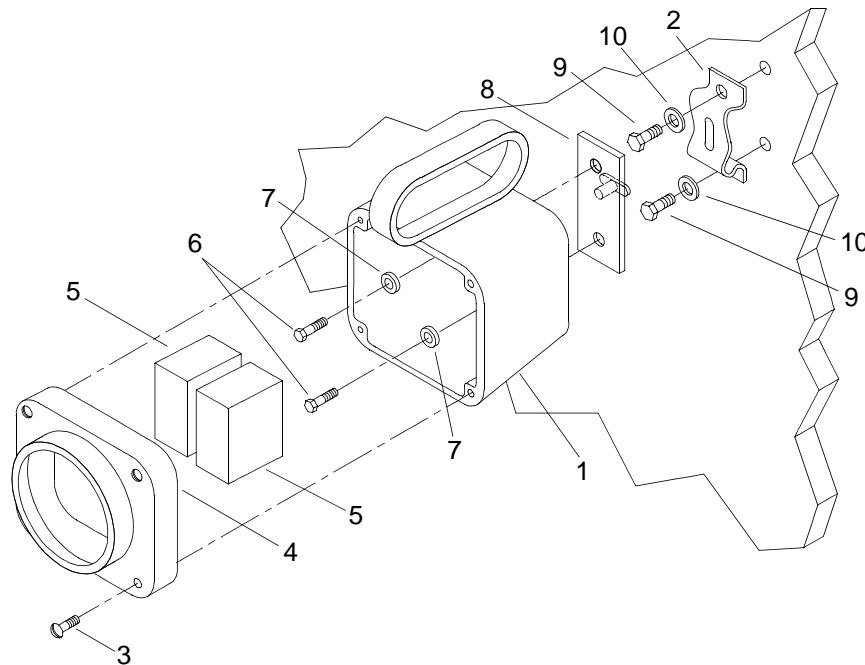
REPLACE PERSONNEL SHELTER HAND LANTERN MOUNTING BRACKET

Figure 1. Hand Lantern Mounting Bracket

1. Rotate hand lantern (figure 1, item 1) 90° and remove from mounting bracket (figure 1, item 2)
2. Loosen four captive screws (figure 1, item 3) on cover (figure 1, item 4).

3. Remove cover (figure 1, item 4).
4. Place hand lantern (figure 1, item 1) face up on the work bench.
5. Remove batteries (figure 1, item 5).
6. Remove two hex head bolts (figure 1, item 6) and O-rings (figure 1, item 7) from bracket (figure 1, item 8). Discard O-rings (figure 1, item 7) and bracket (figure 1, item 8).
7. Remove two hex head bolts (figure 1, item 9) and washers (figure 1, item 10) securing mounting bracket (figure 1, item 2) to bulkhead. Discard mounting bracket (figure 1, item 2).
8. Position new mounting bracket (figure 1, item 2) on bulkhead.
9. Install two hex head bolts (figure 1, item 9) and washers (figure 1, item 10) securing mounting bracket (figure 1, item 2) to wall. Tighten hex head bolts (figure 1, item 9).
10. Position new bracket (figure 1, item 8) on the back of hand lantern (figure 1, item 1).
11. Install two hex head bolts (figure 1, item 6) and new O-rings (figure 1, item 7) through hand lantern (figure 1, item 1) into bracket (figure 1, item 8). Tighten hex head bolts (figure 1, item 6).
12. Install batteries (figure 1, item 5).
13. Position cover (figure 1, item 4) on hand lantern (figure 1, item 1).
14. Install four screws (figure 1, item 3) through cover (figure 1, item 4) and into hand lantern (figure 1, item 1). Tighten captive screws (figure 1, item 3).
15. Position hand lantern (figure 1, item 1) on mounting bracket (figure 1, item 2) and rotate 90°.

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER ESCAPE SCUTTLE GRAB BAR
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Bar, Grab (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

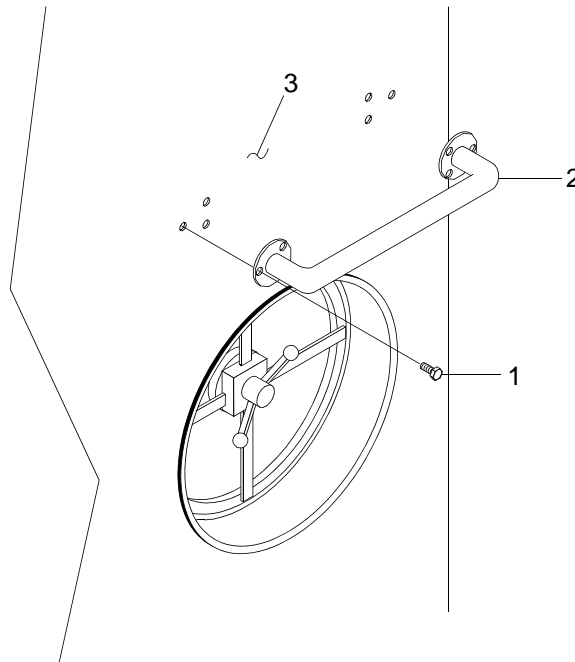
REPLACE PERSONNEL SHELTER ESCAPE SCUTTLE GRAB BAR

Figure 1. Escape Scuttle Grab Bar

1. Remove bolts (figure 1. item 1) securing grab bar (figure 1. item 2) to personnel shelter wall (figure 1. item 3).
2. Remove grab bar (figure 1. item 2) and discard.
3. Position new grab bar (figure 1. item 2) on personnel shelter wall (figure 1. item 3).
4. Install and tighten bolts (figure 1. item 1) to secure grab bar (figure 1. item 2) to personnel shelter wall (figure 1. item 3).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
VHF/FM HANDHELD TRANSCEIVER ANTENNA REPLACEMENT**

INITIAL SETUP:**Materials/Parts**

VHF/FM Transceiver Antenna (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10

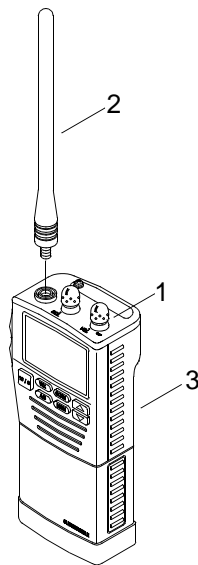
REPLACE VHF/FM HANDHELD TRANSCEIVER ANTENNA

Figure 1. VHF/FM Handheld Transceiver Antenna

1. Position VHF/FM handheld transceiver POWER/VOLUME knob (figure 1, item 1) to OFF position.
2. Turn antenna (figure 1, item 2) counterclockwise.
3. Remove antenna (figure 1, item 2) from transceiver (figure 1, item 3) and discard.
4. Position new antenna (figure 1, item 2) on transceiver (figure 1, item 3).
5. Turn antenna (figure 1, item 2) clockwise to tighten.
6. Perform operational check of VHF/FM handheld transceiver (figure 1, item 3). (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
VHF/FM HANDHELD TRANSCEIVER CONTROL KNOB
REPLACEMENT**

INITIAL SETUP:**Materials/Parts**

VHF/FM Transceiver Control Knob (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10

NOTE

The following procedure is typical for both knobs on the VHF/FM handheld transceiver.

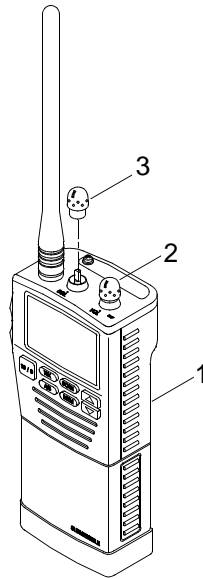
REPLACE VHF/FM HANDHELD TRANSCEIVER CONTROL KNOB

Figure 1. VHF/FM Handheld Transceiver Control Knob

1. On top of VHF/FM handheld transceiver (figure 1, item 1), position POWER/VOLUME knob (figure 1, item 2) to off position.
2. On the top of VHF/FM handheld transceiver (figure 1, item 1), grasp knob (figure 1, item 3) and pull straight up.
3. Remove knob (figure 1, item 3) from VHF/FM transceiver (figure 1, item 1).
4. Align transceiver control knob (figure 1, item 3) with half-moon shaped control knob shaft on top of VHF/FM transceiver (figure 1, item 1).

5. Gently insert knob (figure 1, item 3) onto shaft until seated.
6. Perform operational check of VHF/FM handheld transceiver (figure 1, item 3). (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
VHF/FM HANDHELD TRANSCEIVER RECHARGEABLE BATTERY
PACK REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

CNB350 Rechargeable Battery Pack (TM 55-1945-227-24P)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10

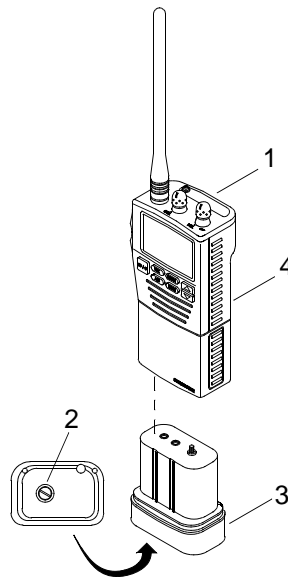
REPLACE VHF/FM HANDHELD TRANSCEIVER RECHARGEABLE BATTERY PACK

Figure 1. VHF/FM Handheld Transceiver Rechargeable Battery Pack

1. Position VHF/FM handheld transceiver POWER/VOLUME knob (figure 1, item 1) to OFF position.
2. Loosen lock screw (figure 1, item 2) by turning counterclockwise eight or nine complete turns.
3. Grasp the battery pack (figure 1, item 3) and pull out from VHF/FM transceiver (figure 1, item 4).
4. Align battery pack (figure 1, item 3) with slots in battery cavity.
5. Slide battery pack (figure 1, item 3) into battery cavity of VHF/FM transceiver (figure 1, item 4) until fully inserted.

6. Tighten lock screw (figure 1, item 2) by turning clockwise until snug.
7. Perform operational check of VHF/FM handheld transceiver (figure 1, item 3). (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
VHF/FM HANDHELD TRANSCEIVER ALKALINE BATTERY PACK
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10

NOTE

The following procedure is typical for the replacement of VHF/FM handheld transceiver alkaline battery packs.

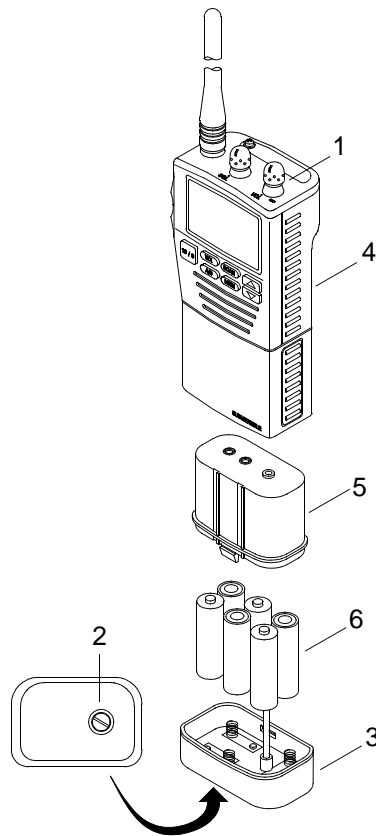
REPLACE VHF/FM HANDHELD TRANSCEIVER ALKALINE BATTERY PACK

Figure 1. VHF/FM Handheld Transceiver Alkaline Battery Pack

1. Position VHF/FM handheld transceiver POWER/VOLUME knob (figure 1, item 1) to OFF position.
2. Turn battery lock screw (figure 1, item 2) counterclockwise eight or nine complete turns.
3. Grasp the battery pack base (figure 1, item 3) and pull out from transceiver (figure 1, item 4).
4. Squeeze sides of battery pack cover (figure 1, item 5) and separate from battery pack base (figure 1, item 3).
5. Remove six batteries (figure 1, item 6) from battery pack cover (figure 1, item 5) and discard.
6. Install six new batteries (figure 1, item 6) in battery pack cover (figure 1, item 5).
7. Press battery pack base (figure 1, item 3) on battery pack cover (figure 1, item 5).

NOTE

Assembled battery pack base and battery pack cover can only be inserted into transceiver cavity one way.

8. Align battery pack base (figure 1, item 3) and battery pack cover (figure 1, item 5) with slots in transceiver (figure 1, item 4) cavity. Slide assembled battery pack base (figure 1, item 3) and cover (figure 1, item 5) into cavity of transceiver (figure 1, item 4).
9. Turn the battery lock screw (figure 1, item 2) clockwise until hand-tightened.
10. Perform operational check of VHF/FM handheld transceiver (figure 1, item 3). (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
VHF/FM HANDHELD TRANSCEIVER BATTERY CHARGER
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Battery Charger, Upright (TM 55-1945-227-24P)

Battery Charger, Rapid (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

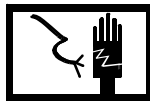
TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker E set to OFF and tagged out. (FM 55-502)

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of VHF/FM handheld transceiver battery chargers.

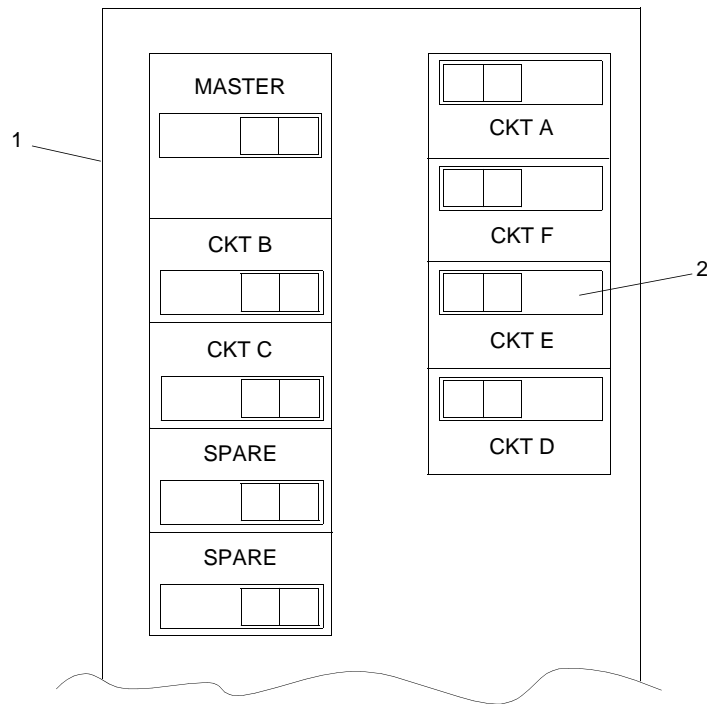
REPLACE VHF/FM HANDHELD TRANSCEIVER BATTERY CHARGER

Figure 1. Circuit Breaker E

1. At the personnel shelter main electrical distribution panel (figure 1, item 1), set circuit breaker E (figure 1, item 2) to OFF and tag out (FM 55-502).

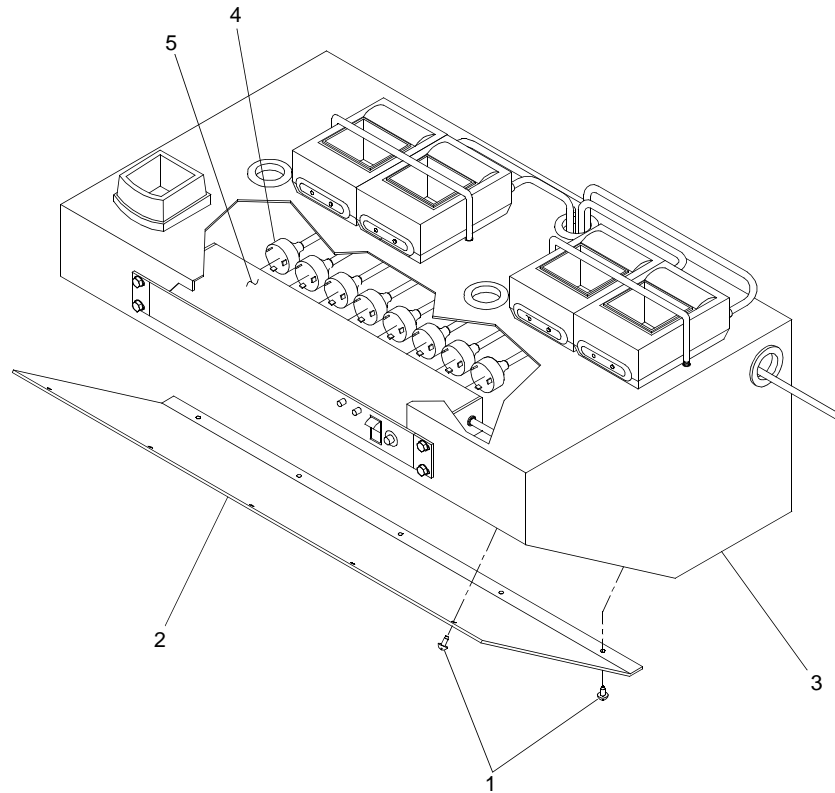


Figure 2. Battery Charger Shelf

2. Remove ten screws (figure 2, item 1) retaining cover (figure 2, item 2) to battery charger shelf (figure 2, item 3).
3. Remove cover (figure 2, item 2).
4. Disconnect battery charger electrical connectors (figure 2, item 4) from back of power strip (figure 2, item 5).

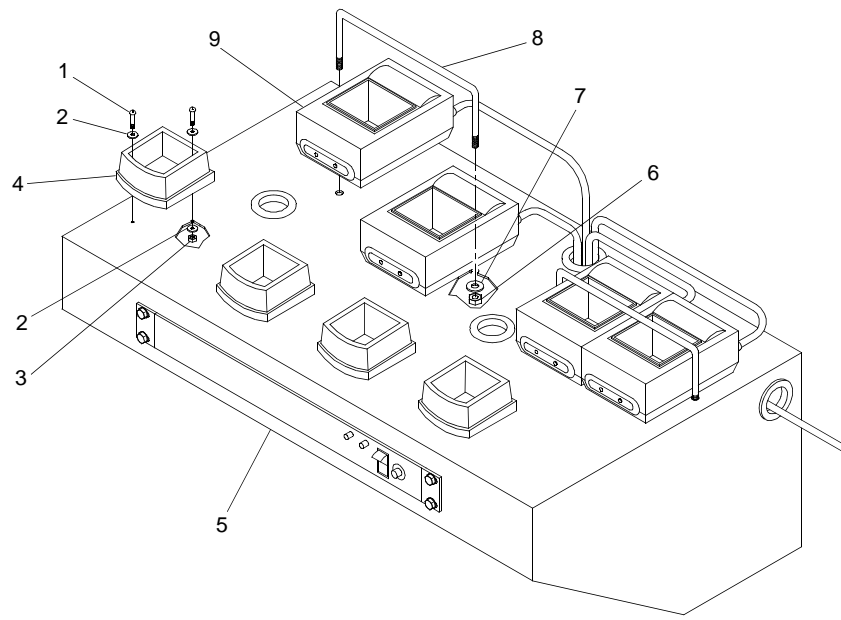


Figure 3. Battery Charger Mounting

5. Remove two screws (figure 3, item 1), four washers (figure 3, item 2) and two locknuts (figure 3, item 3) securing upright battery charger (figure 3, item 4) to battery charger shelf (figure 3, item 5).
6. Remove upright battery charger (figure 3, item 4) and discard.
7. Remove two locknuts (figure 3, item 6), washers (figure 3, item 7) and retainer (figure 3, item 8).
8. Remove rapid battery charger (figure 3, item 9) and discard.
9. Position new rapid battery charger (figure 3, item 9) on the battery charger shelf (figure 3, item 5).
10. Place retainer (figure 3, item 8) over rapid battery charger (figure 3, item 9) and secure with two washers (figure 3, item 7) and new locknuts (figure 3, item 6). Tighten locknuts (figure 3, item 6).
11. Position new upright battery charger (figure 3, item 4) on the battery charger shelf (figure 3, item 5).
12. Install two screws (figure 3, item 1), four washers (figure 3, item 2) and two new locknuts (figure 3, item 3). Tighten locknuts (figure 3, item 3).
13. Position cover (figure 2, item 2) on the battery charger shelf (figure 2, item 3) and secure with ten screws (figure 2, item 1).
14. Remove warning tag from circuit breaker E (figure 1, item 2) and set circuit breaker to ON.
15. Perform operational check of battery chargers. (TM 55-1945-227-10)

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
CORNER FENDER REPAIR**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Cleaner (Item 6, WP 0074 00)

Rag, Wiping (Item 15, WP 0074 00)

Personnel Required

Seaman 88K (1)

References

TM 55-1945-227-10

Equipment Condition

Corner fender removed. (TM 55-1945-227-10)

WARNING



VEST



HELMET PROTECTION



HEAVY PARTS



POISON



CHEMICAL



EYE PROTECTION

All personnel must wear personal flotation device, hard hat, safety shoes, eye protection and gloves during FC operations and maintenance. Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury or death.

NOTE

This task is typical for the removal, inspection, repair and installation of components on the left and right corner fenders.

Repair is limited to replacement of defective items.

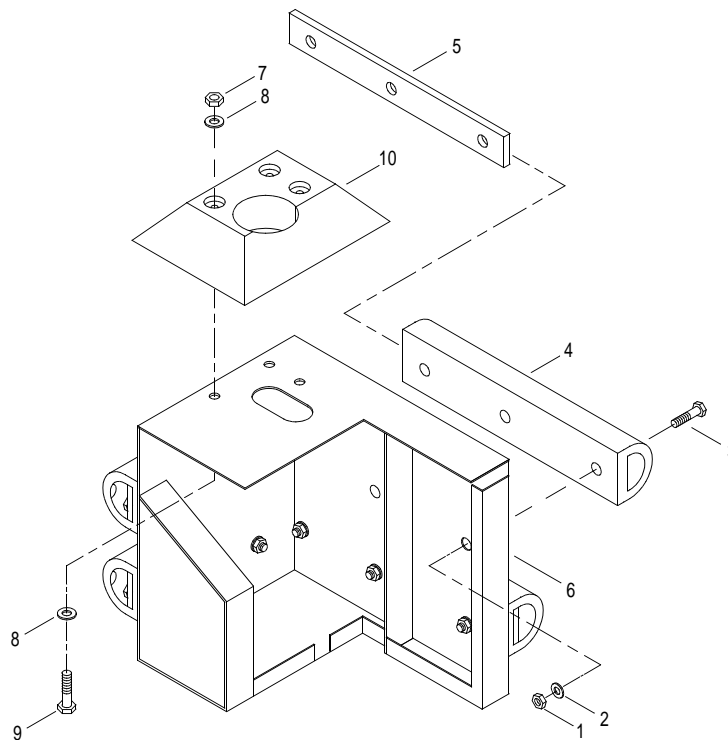
DISASSEMBLE CORNER FENDER


Figure 1. Corner Fender

1. Remove nuts (figure 1, item 1), washers (figure 1, item 2) and bolts (figure 1, item 3) securing D-shaped rubber fender (figure 1, item 4) and backing bar (figure 1, item 5) to corner fender frame (figure 1, item 6).
2. Remove D-shaped rubber fender (figure 1, item 4) and backing bar (figure 1, item 5) from corner fender frame (figure 1, item 6).
3. Remove nuts (figure 1, item 7), washers (figure 1, item 8) and bolts (figure 1, item 9) securing top sheet (figure 1, item 10) to corner fender frame (figure 1, item 6).
4. Remove top sheet (figure 1, item 10) from corner fender frame (figure 1, item 6).

CLEAN CORNER FENDER

WARNING



POISON



CHEMICAL



EYE PROTECTION

Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury.

1. Using wiping rags soaked with cleaner, remove debris from all components.
2. Using clean water, remove cleaner residue from all components

3. Air dry all components.
4. Dispose of contaminated rags in accordance with local procedures.

INSPECT CORNER FENDER

1. Inspect D-shaped rubber fender and top sheet for wear and tear. Replace as required.
2. Inspect corner fender frame for corrosion, rust, wear and tear or damage to nuts, bolts and washers. Replace as required.

ASSEMBLE CORNER FENDER

1. Position backing bar (figure 1, item 5) inside D-shaped rubber fender (figure 1, item 4).
2. Position D-shaped rubber fender (figure 1, item 4) and backing bar (figure 1, item 5) on corner fender frame (figure 1, item 6).
3. Install nuts (figure 1, item 1), washers (figure 1, item 2) and bolts (figure 1, item 3) to secure D-shaped rubber fender (figure 1, item 4) and backing bar (figure 1, item 5) to corner fender frame (figure 1, item 6). Tighten nuts (figure 1, item 1).
4. Position top sheet (figure 1, item 10) on corner fender frame (figure 1, item 6).
5. Install nuts (figure 1, item 7), washers (figure 1, item 8) and bolts (figure 1, item 9) to secure top sheet (figure 1, item 10) to corner fender frame (figure 1, item 6). Tighten nuts (figure 1, item 7).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
LIFE RING BUOY AND HANGER BRACKET ASSEMBLY REPAIR**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

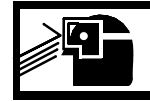
Cleaner (Item 6, WP 0074 00)

Rag, Wiping (Item 15, WP 0074 00)

Personnel Required

Seaman 88K (1)

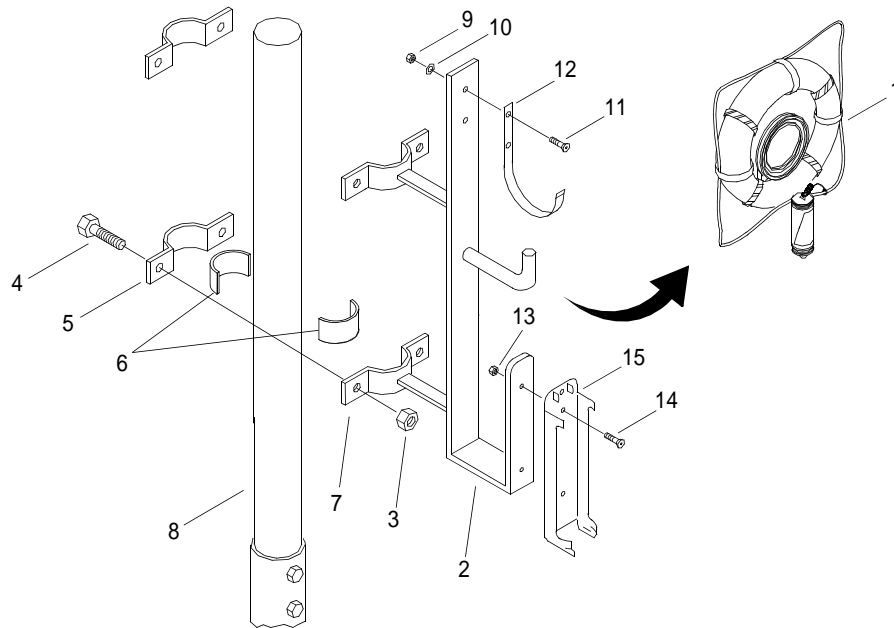
WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****POISON****CHEMICAL****EYE PROTECTION**

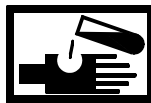
All personnel must wear personal flotation device, hard hat, safety shoes, eye protection and gloves during FC operations and maintenance. Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury or death.

NOTE

Repair is limited to replacement of defective items.

DISASSEMBLE LIFE RING BUOY AND HANGER BRACKET ASSEMBLY**Figure 1. Life Ring Buoy and Hanger Bracket Assembly**

1. Remove ring buoy with rope and strobe light (figure 1, item 1) from hanger bracket assembly (figure 1, item 2).
2. Remove nuts (figure 1, item 3), hex head capscrews (figure 1, item 4) outer clamp half (figure 1, item 5) and rubber strips (figure 1, item 6) securing inner clamp half (figure 1, item 7) to stanchion (figure 1, item 8).
3. Remove hanger bracket assembly (figure 1, item 2) from stanchion (figure 1, item 8).
4. Remove nuts (figure 1, item 9), washers (figure 1, item 10), capscrews (figure 1, item 11) and ring buoy bracket (figure 1, item 12) from hanger bracket assembly (figure 1, item 2).
5. Remove nuts (figure 1, item 13), capscrews (figure 1, item 14) and strobe light bracket (figure 1, item 15) from hanger bracket assembly (figure 1, item 2).

CLEAN HANGER BRACKET ASSEMBLY**WARNING****POISON****CHEMICAL****EYE PROTECTION**

Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury.

1. Clean hanger bracket assembly components with cleaner and wire brush.
2. Use fresh water to thoroughly wash all equipment after cleaning.

-
3. Wipe all parts clean with wiping rags.
 4. Dispose of contaminated wiping rags in accordance with local procedures.

ASSEMBLE LIFE RING BUOY AND HANGER BRACKET ASSEMBLY

1. Install strobe light bracket (figure 1, item 15), capscrews (figure 1, item 14) and nuts (figure 1, item 13) on hanger bracket assembly (figure 1, item 2). Tighten nuts (figure 1, item 13).
2. Install ring buoy bracket (figure 1, item 12), capscrews (figure 1, item 11), washers (figure 1, item 10) and nuts (figure 1, item 9) on hanger bracket assembly (figure 1, item 2). Tighten nuts (figure 1, item 9).
3. Position hanger bracket assembly (figure 1, item 2) inner clamp half (figure 1, item 7) on stanchion (figure 1, item 8).
4. Install outer clamp half (figure 1, item 5), rubber strips (figure 1, item 6), hex head capscrews (figure 1, item 4) and nuts (figure 1, item 3) to secure hanger bracket assembly inner clamp half (figure 1, item 7) to stanchion (figure 1, item 8). Tighten nuts (figure 1, item 3).
5. Install ring buoy with rope and strobe light (figure 1, item 1) on hanger bracket assembly (figure 1, item 2).

END OF WORK PACKAGE

**UNIT LEVEL MAINTENANCE
FLOATING CAUSEWAY
LIFTING EQUIPMENT INSPECTION**

INITIAL SETUP:**Personnel Required**

Seaman 88K (1)

INSPECT CHAIN SLINGS

WARNING

The existence of any of the following conditions will require that chain slings be immediately removed from service. Failure to observe these precautions could result in serious injury or death to personnel.

1. Inspect chain for excessive wear or stretch.
2. Inspect chain for bent or twisted links.
3. Inspect chain for defective welds.
4. Inspect chain for nicks and gouges.
5. Inspect all attaching shackles and hardware for corrosion, nicks, cuts, scratches or breaks.
6. Inspect hoist attachment or terminal ring for distortion.

INSPECT ROPE (NATURAL AND SYNTHETIC)

WARNING

The existence of any of the following conditions will require that rope be immediately removed from service. Failure to observe these precautions could result in serious injury or death to personnel.

1. Inspect rope for abnormal wear.
2. Inspect rope for powdered fiber between strands.
3. Inspect rope for broken or cut fibers.
4. Inspect rope for variation in the size or roundness of strands.
5. Inspect rope for discoloration or rotting.

INSPECT SYNTHETIC WEB SLINGS

WARNING

The existence of any of the following conditions will require that web slings be immediately removed from service. Failure to observe these precautions could result in serious injury or death to personnel.

1. Inspect web slings for marks or codes that show rated capacities and type of synthetic web material.
2. Inspect web slings for selvage edges splitting from webbings width.
3. Inspect web slings for snags, punctures, tears or cuts.
4. Inspect web slings for broken or worn stitches.
5. Inspect web slings for distortion of fittings.
6. Inspect web sling fittings for sharp edges that could damage webbing.
7. Inspect web sling surface for evidence of melting, charring from acid or burns.

INSPECT HOOKS AND SHACKLES

WARNING

The existence of any of the following conditions will require that hooks and/or shackles be immediately removed from service. Failure to observe these precautions could result in serious injury or death to personnel.

1. Inspect hooks and shackles for proper position and function of safety closure latch.
2. Inspect hooks and shackles for cracks or corrosion.
3. Inspect hooks and shackles for a any deformation of the throat opening or any excessive wear.
4. Inspect hooks for twists.
5. Inspect shackle pin for cracks, corrosion or excessive wear.
6. Inspect hooks for paint that covers small stress cracks from metal fatigue.
7. Any hook or shackle that is in question shall be removed and replaced.

END OF WORK PACKAGE

CHAPTER 4

**DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)**

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER & PERSONNEL SHELTER SHORE TIE
FEMALE ELECTRICAL CONNECTOR REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Connector, Electrical, Female, Shore Tie (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (2)

References

TM 9-6115-642-10

TM 55-1945-227-10

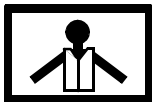
FM 55-502

Equipment Condition

Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

WARNING



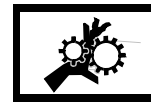
VEST



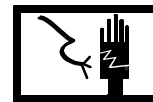
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



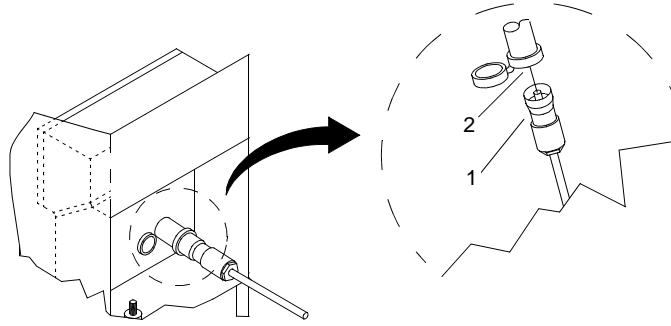
ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

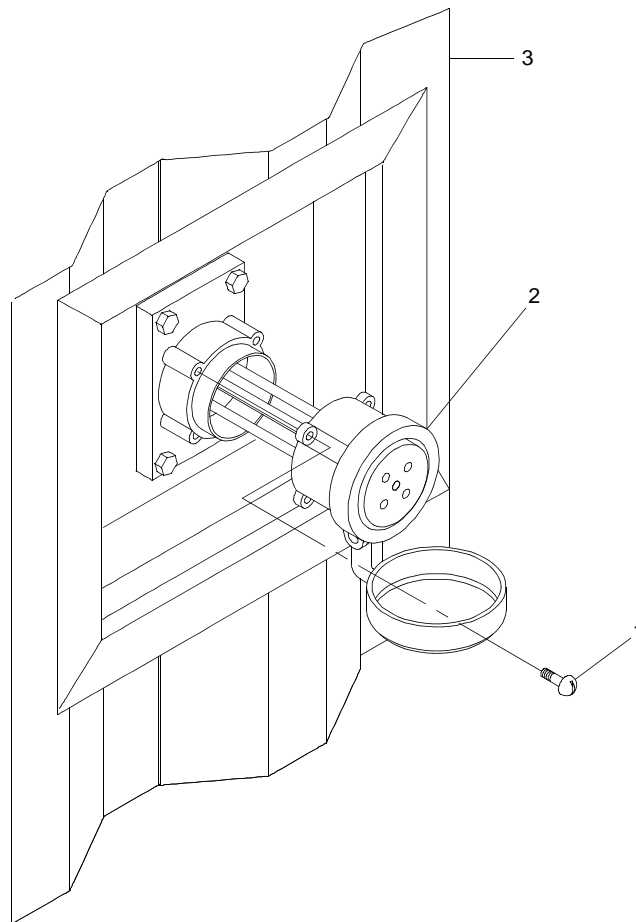
Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of shore tie female electrical connectors on the personnel shelter and generator container.

REPLACE SHORE TIE FEMALE ELECTRICAL CONNECTOR**Figure 1. Shore Tie Power Cable**

1. Rotate power cable connector (figure 1, item 1) counterclockwise $\frac{1}{4}$ turn and disconnect from container shore tie female electrical connector (figure 1, item 2).

**Figure 2. Female Electrical Connector**

2. Outside container, remove four screws (figure 2, item 1) securing female electrical connector (figure 2, item 2) to container (figure 2, item 3).

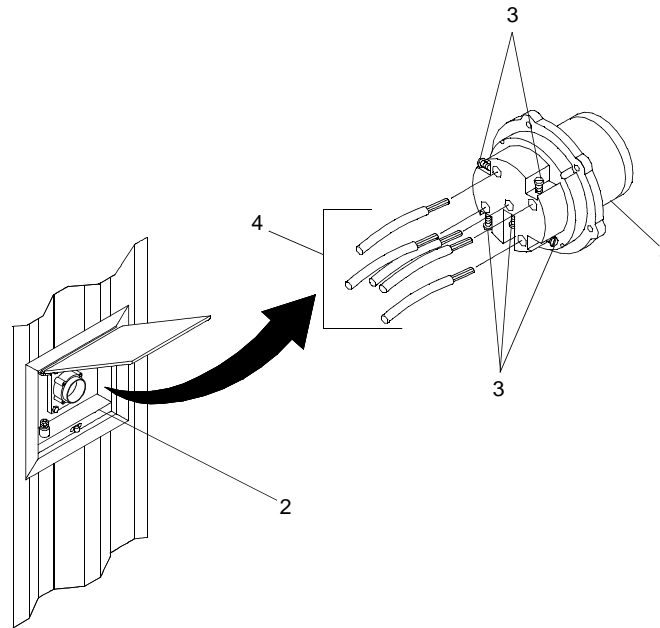


Figure 3. Female Electrical Connector Wiring

3. Pull shore tie female connector (figure 3, item 1) outward from shore tie recess pocket (figure 3, item 2)
4. Loosen five screws (figure 3, item 3) on back of shore tie female connector (figure 3, item 1).
5. Label and remove wires (figure 3, item 4) from shore tie female connector (figure 3, item 1).
6. Discard shore tie female connector (figure 3, item 1).
7. Install wires (figure 3, item 4) in new shore tie female connector (figure 3, item 1) and remove labels.
8. Tighten five screws (figure 3, item 3) on back of shore tie female connector (figure 3, item 1).
9. Position shore tie female connector (figure 2, item 2) on outside of container wall (figure 2, item 3).
10. Install and tighten four screws (figure 2, item 1).
11. Install power cable connector (figure 1, item 1) on shore tie female electrical connector (figure 1, item 2).
12. Rotate power cable connector (figure 1, item 1) clockwise $\frac{1}{4}$ turn.
13. Remove warning tag from generator.
14. Start generator. (TM 9-6115-642-10)
15. Verify personnel shelter receives power. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER & PERSONNEL SHELTER SHORE TIE
PENETRATION HINGED COVER REPLACEMENT**

INITIAL SETUP:**Tools**

Shop Equipment, Automotive Maintenance and Repair (Item 1, WP 0073 00)
Shop Equipment, Automotive Maintenance and Repair (Item 2, WP 0073 00)
Tool Kit, General Mechanic's (Item 4, WP 0073 00)
Drill, Electric, Portable (Item 7, WP 0073 00)

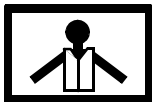
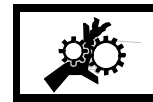
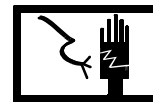
Materials/Parts

Cover Assembly (TM 55-1945-227-24P)
Rivet, Blind (Pop rivet) Qty 5 (Item 17, WP 0074 00)

Personnel Required

Engineer 88L (1)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS****ELECTRICAL**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of shore tie hinged covers on the personnel shelter and generator container.

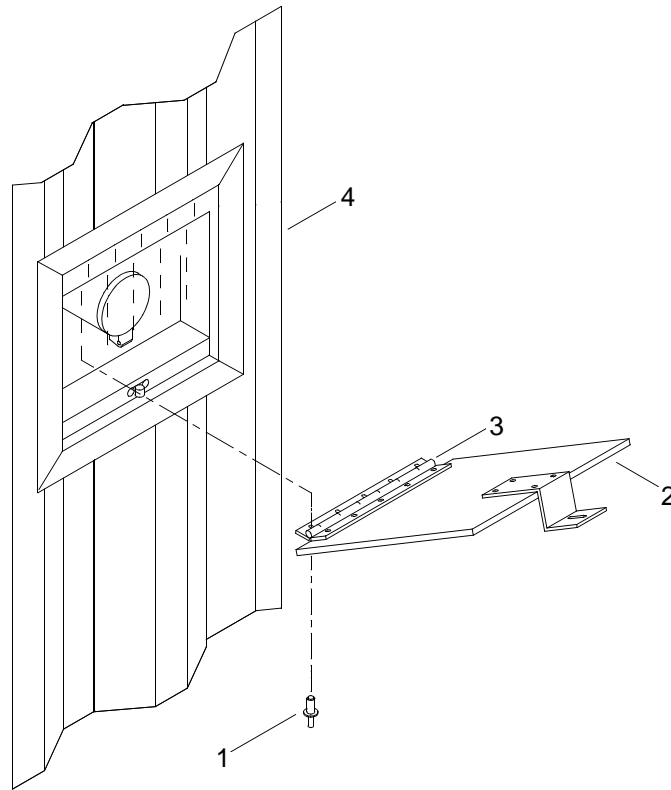
REPLACE SHORE TIE PENETRATION HINGED COVER

Figure 1. Shore Tie Penetration Hinged Cover

1. Drill out pop rivets (figure 1, item 1) securing cover (figure 1, item 2) and piano hinge (figure 1, item 3) to container (figure 1, item 4).
2. Discard cover (figure 1, item 2).
3. Position new cover (figure 1, item 2) piano hinge (figure 1, item 3) on container exterior wall (figure 1, item 4).
4. Using pop rivets (figure 1, item 1), attach cover (figure 1, item 2) piano hinge (figure 1, item 3) to container exterior wall (figure 1, item 4).

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER & PERSONNEL SHELTER DOOR
WINDOW REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Window, Weathertight Door (TM 55-1945-227-24P)

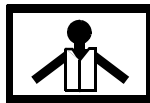
Tape, Glazing (TM 55-1945-227-24P)

Sealant, Silicone (Black) (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (1)

WARNING



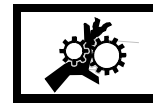
VEST



HELMET PROTECTION



HEAVY PARTS



MOVING PARTS

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of door windows on the generator container and personnel shelter.

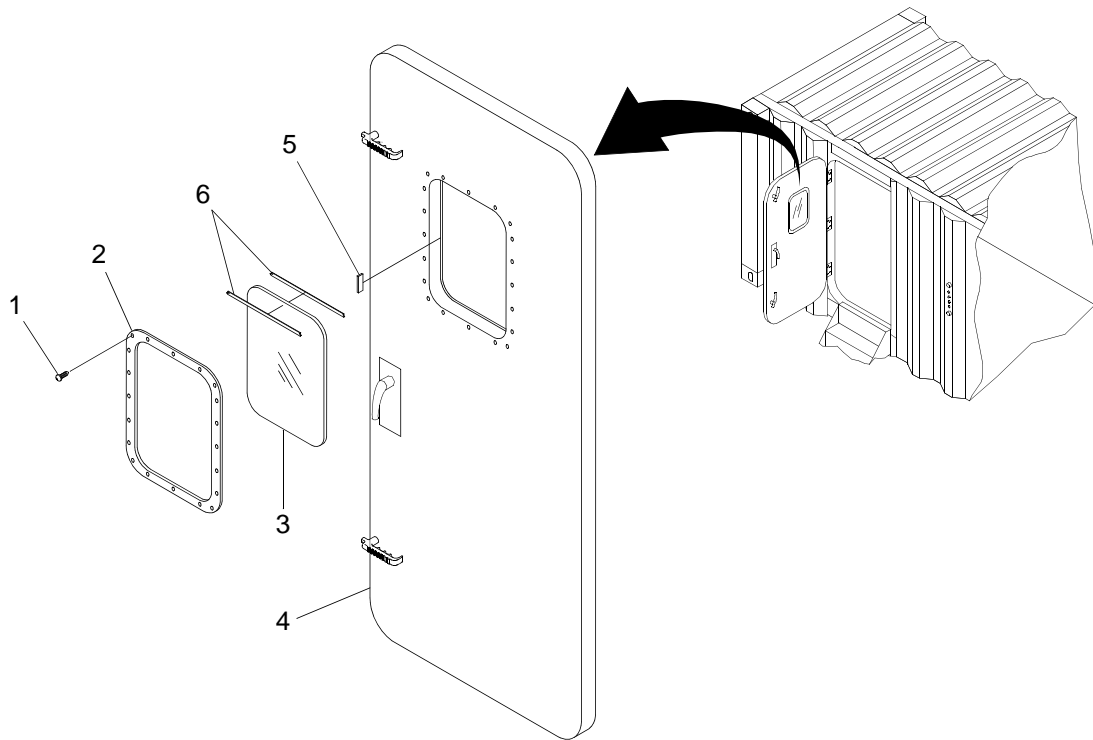
REPLACE DOOR WINDOW


Figure 1. Door Window

1. Remove screws (figure 1, item 1).
2. Remove window retainer (figure 1, item 2).
3. Remove window (figure 1, item 3) from door (figure 1, item 4) and discard.
4. Remove spacer blocks (figure 1, item 5) from door.
5. Remove all residual glazing tape (figure 1, item 6) and silicone sealant from retainer (figure 1, item 2) and window opening in door (figure 1, item 4).
6. Apply glazing tape (figure 1, item 6) to both sides of new window (figure 1, item 3).
7. Position new window (figure 1, item 3) in door (figure 1, item 4).
8. Insert spacer blocks (figure 1, item 5) between window (figure 1, item 3) and door (figure 1, item 4) frame (top, bottom, left and right) to center window (figure 1, item 3) in door (figure 1, item 4) window opening.
9. Position retainer (figure 1, item 2) over window (figure 1, item 3) and secure with screws (figure 1, item 1).
10. Apply silicone sealant to seal gap between retainer (figure 1, item 2) and window (figure 1, item 3).
11. Apply silicone sealant to seal gap between door (figure 1, item 4) and window (figure 1, item 3).

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER FUEL TANK SIGNAL BOX
TRANSFORMER REPLACEMENT**

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Transformer, 120-24VAC (TM 55-1945-227-24P)
Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

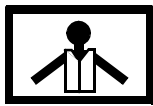
References

TM 55-1945-227-10
FM 55-502

Equipment Condition

Circuit breaker F set to OFF and tagged out. (FM 55-502)

WARNING



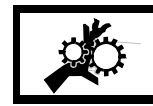
VEST



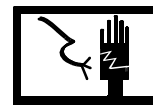
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

REPLACE GENERATOR CONTAINER FUEL TANK SIGNAL BOX TRANSFORMER

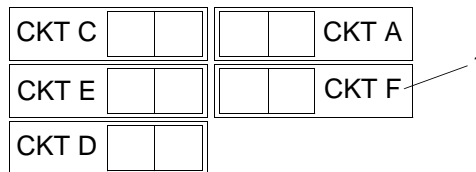


Figure 1. Circuit Breaker F

- At the generator container electrical distribution panel, set circuit breaker F (figure 1, item 1) to OFF and tag out (FM 55-502).

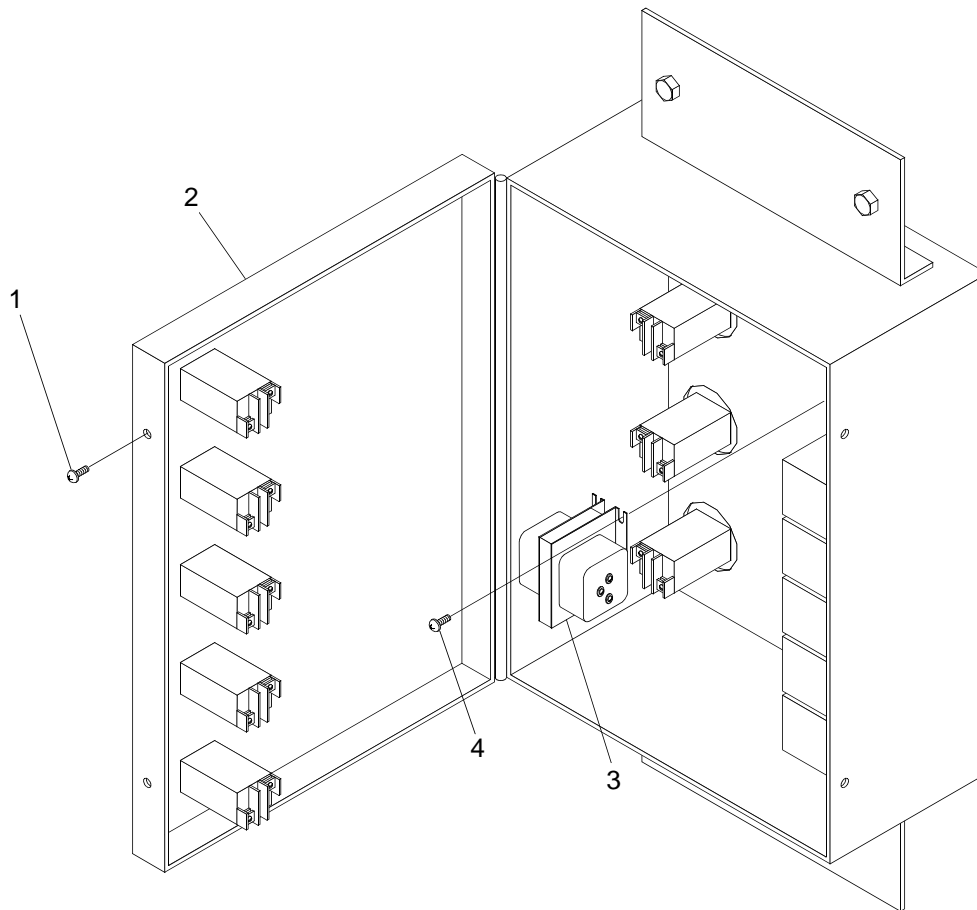


Figure 2. Fuel Tank Signal Box Transformer

2. Remove screws (figure 2, item 1) and open fuel tank signal box door (figure 2, item 2).
3. Label and disconnect wiring from transformer (figure 2, item 3).
4. Remove screws (figure 2, item 4) and transformer (figure 2, item 3). Discard transformer (figure 2, item 3).
5. Position new transformer (figure 2, item 3) in fuel tank signal box.
6. Install and tighten screws (figure 2, item 4).
7. Connect wiring to transformer (figure 2, item 3).
8. Close fuel tank signal box door (figure 2, item 2) and secure with screws (figure 2, item 1).
9. Remove warning tag from circuit breaker F (figure 1, item 1) and set circuit breaker to ON.
10. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER DAMPER ASSEMBLY ACTUATOR
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Actuator, Damper (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (2)

References

TM 9-6115-642-10

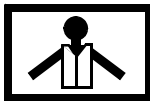
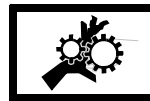
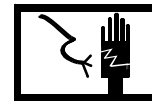
FM 55-502

Equipment Condition

Generator shut down. (TM 9-6115-642-10)

Secure generator and tag out. (FM 55-502)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS****ELECTRICAL**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Make sure generator power is secured using proper tag-out procedure. Repair or replace components only after the generator has been shut down and tagged out. Performing maintenance while the generator is running could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of the air intake and ventilation damper actuators.

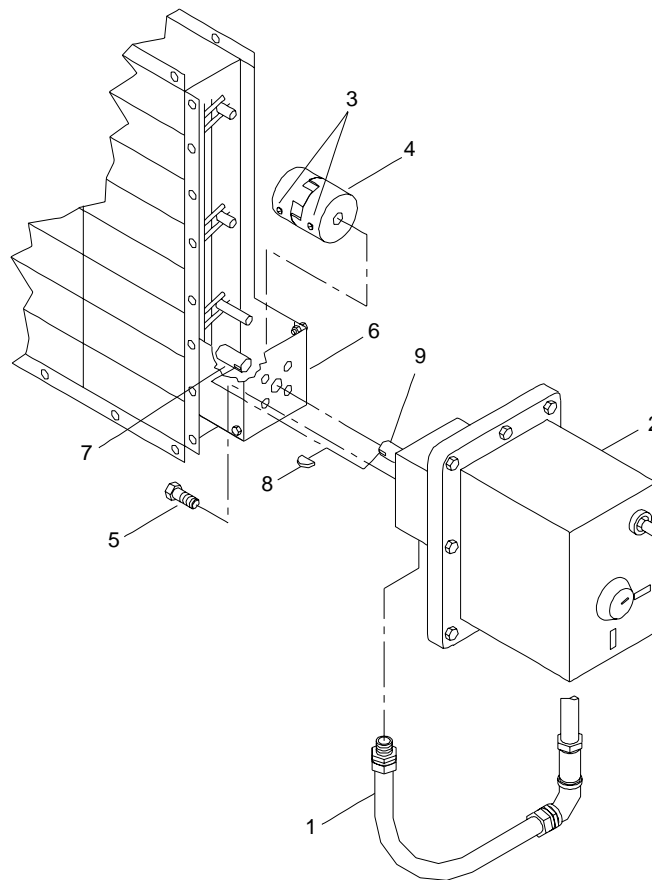
REPLACE GENERATOR CONTAINER DAMPER ASSEMBLY ACTUATOR

Figure 1. Damper Assembly Actuator

1. Label and disconnect power cable (figure 1, item 1) from actuator (figure 1, item 2),
2. Loosen set screws (figure 1, item 3) on both halves of actuator coupling adapter (figure 1, item 4).
3. Remove four hex head bolts (figure 1, item 5) securing actuator (figure 1, item 2) to mounting plate (figure 1, item 6).
4. Slowly remove actuator (figure 1, item 2) from mounting plate (figure 1, item 6) while holding actuator coupling adapter (figure 1, item 4) in place.
5. Remove actuator coupling adapter (figure 1, item 4) from damper assembly shaft (figure 1, item 7).
6. Remove shaft keys (figure 1, item 8) from actuator drive shaft (figure 1, item 9) and damper assembly shaft (figure 1, item 7).
7. Retain actuator coupling adapter (figure 1, item 4) and shaft keys (figure 1, item 8) for installation and discard actuator (figure 1, item 2).
8. Position shaft keys (figure 1, item 8) on new actuator drive shaft (figure 1, item 9) and damper assembly shaft (figure 1, item 7).
9. Install actuator coupling adapter (figure 1, item 4) on damper assembly shaft (figure 1, item 7).

-
10. Install new actuator (figure 1, item 2) through hole in mounting plate (figure 1, item 6), aligning shaft key (figure 1, item 8) on actuator drive shaft (figure 1, item 9) with actuator coupling adapter (figure 1, item 4).
 11. Install four hex head bolts (figure 1, item 5) to secure actuator (figure 1, item 2) to mounting plate (figure 1, item 6).
 12. Tighten set screws (figure 1, item 3) on both halves of actuator coupling adapter (figure 1, item 4).
 13. Connect power cable (figure 1, item 1) to actuator (figure 1, item 2) and remove labels.
 14. Remove warning tag from generator.
 15. Start generator. (TM 9-6115-642-10)
 16. Verify that damper assembly actuator operates.

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER FUEL TANK SIGNAL BOX LIGHT
ASSEMBLY REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Light, Pilot (Red) (TM 55-1945-227-24P)

Light, Pilot (Amber) (TM 55-1945-227-24P)

Light, Pilot (Green) (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

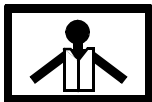
TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker F set to OFF and tagged out. (FM 55-502)

WARNING



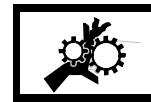
VEST



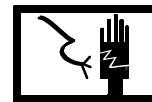
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of internal and external panel generator container fuel tank signal box light assemblies.

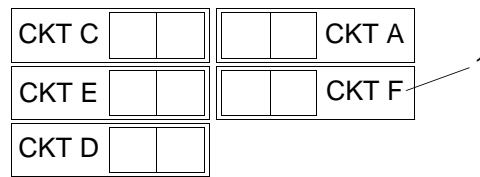
REPLACE GENERATOR CONTAINER FUEL TANK SIGNAL BOX LIGHT ASSEMBLY


Figure 1. Circuit Breaker F

1. At the generator container electrical distribution panel, set circuit breaker F (figure 1, item 1) to OFF and tag out (FM 55-502).

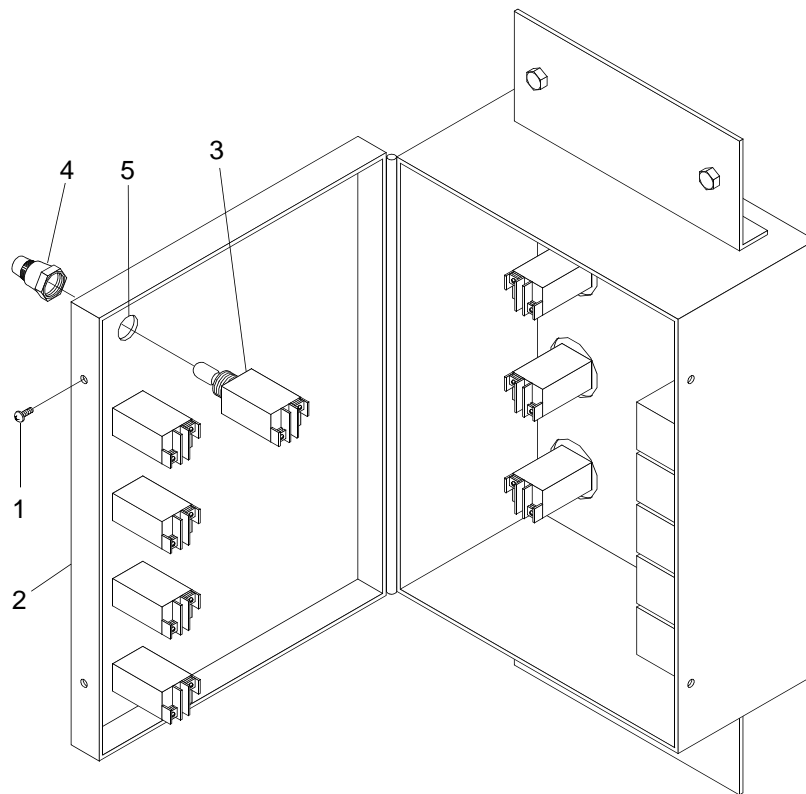


Figure 2. Fuel Tank Signal Box Light Assembly

2. Remove screws (figure 2, item 1) and open fuel tank signal box door (figure 2, item 2).
3. Label wires and remove wire lugs from light assembly (figure 2, item 3).
4. Remove retaining nut (figure 2, item 4) and light assembly (figure 2, item 3) and discard.
5. Remove retaining nut (figure 2, item 4) from new light assembly (figure 2, item 3).
6. Insert new light assembly (figure 2, item 3) in mounting hole (figure 2, item 5).
7. Install and tighten retaining nut (figure 2, item 4) on light assembly (figure 2, item 3).

8. Connect wires to light assembly (figure 2, item 3).
9. Close fuel tank signal box door (figure 2, item 2) and secure with screws (figure 2, item 1).
10. Remove warning tag from circuit breaker F (figure 1, item 1) and set circuit breaker to ON.
11. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER ROTARY BRASS LIGHT SWITCH
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Switch, Single Pole (20 Amp) (TM 55-1945-227-24P)

Nameplate, Switch ("RED") (TM 55-1945-227-24P)

Nameplate, Switch ("WHITE") (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

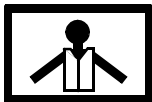
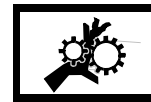
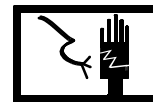
TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker C set to OFF and tagged out. (FM 55-502)

WARNING

**VEST****HELMET PROTECTION****HEAVY PARTS****MOVING PARTS****ELECTRICAL**

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of generator container rotary brass light switches.

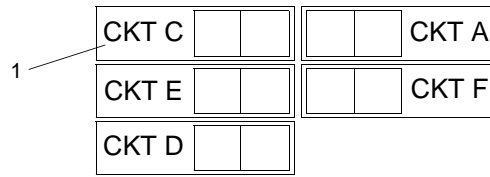
REPLACE GENERATOR CONTAINER ROTARY BRASS LIGHT SWITCH


Figure 1. Circuit Breaker C

1. At the generator container electrical distribution panel, set circuit breaker C (figure 1, item 1) to OFF and tag out (FM 55-502).

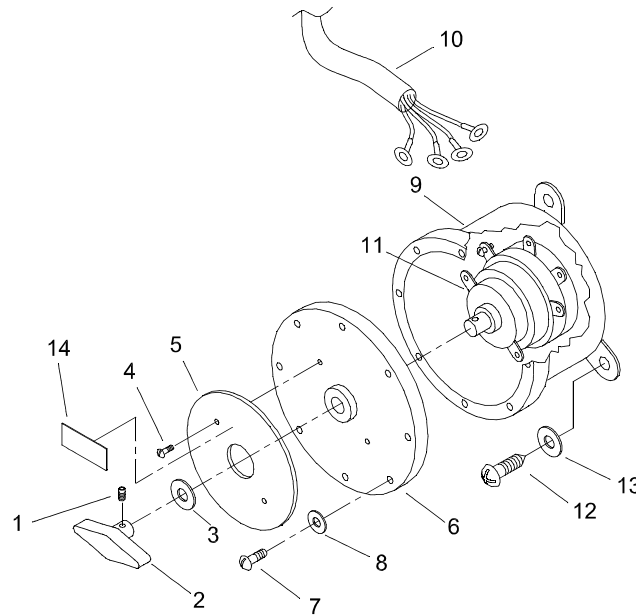


Figure 2. Rotary Switch

2. Loosen screw (figure 2, item 1) and remove light switch knob (figure 2, item 2) and washer (figure 2, item 3).
3. Remove two pan head screws (figure 2, item 4) from faceplate (figure 2, item 5).
4. Remove faceplate (figure 2, item 5) from light switch cover (figure 2, item 6).
5. Remove four pan head screws (figure 2, item 7) and four washers (figure 2, item 8) from light switch cover (figure 2, item 6).
6. Remove switch cover (figure 2, item 6) from light switch enclosure (figure 2, item 9).
7. Label and disconnect wiring (figure 2, item 10) from light switch assembly (figure 2, item 11).
8. Remove wiring harness (figure 2, item 10) from light switch enclosure (figure 2, item 9).
9. Remove three phillips quickscrews (figure 2, item 12) and three washers (figure 2, item 13) securing light switch enclosure (figure 2, item 9) to wall.

-
10. Discard entire light switch.
 11. Position new light switch enclosure (figure 2, item 9) and install three phillips quick screws (figure 2, item 12) and three washers (figure 2, item 13) to secure light switch enclosure (figure 2, item 9) to wall. Tighten phillips quick screws (figure 2, item 12).
 12. Install wiring harness (figure 2, item 10) in light switch enclosure (figure 2, item 9).
 13. Connect wiring (figure 2, item 10) to light switch assembly (figure 2, item 11) and remove labels.
 14. Install light switch cover (figure 2, item 6) onto light switch enclosure (figure 2, item 9).
 15. Install four pan head screws (figure 2, item 7) and washers (figure 2, item 8) in light switch cover (figure 2, item 6). Tighten pan head screws (figure 2, item 7).
 16. Install faceplate (figure 2, item 5) onto light switch cover (figure 2, item 6).
 17. Install two pan head screws (figure 2, item 4) in faceplate (figure 2, item 5). Tighten pan head screws (figure 2, item 4).
 18. Install washer (figure 2, item 3) and switch knob (figure 2, item 2) on light switch assembly (figure 2, item 11) and tighten allen head screw (figure 2, item 1).
 19. Install nameplate (figure 2, item 14) onto faceplate (figure 2, item 5).
 20. Remove warning tag from circuit breaker C (figure 1, item 1) and set circuit breaker to ON.
 21. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER FLUORESCENT LIGHT FIXTURE
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Fixture, Fluorescent (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

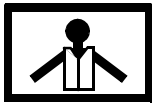
TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker C set to OFF and tagged out. (FM 55-502)

WARNING



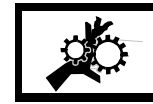
VEST



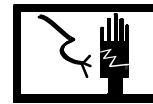
HELMET PROTECTION



HEAVY PARTS



MOVING PARTS



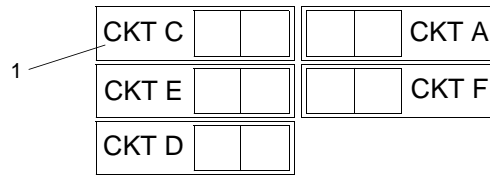
ELECTRICAL

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

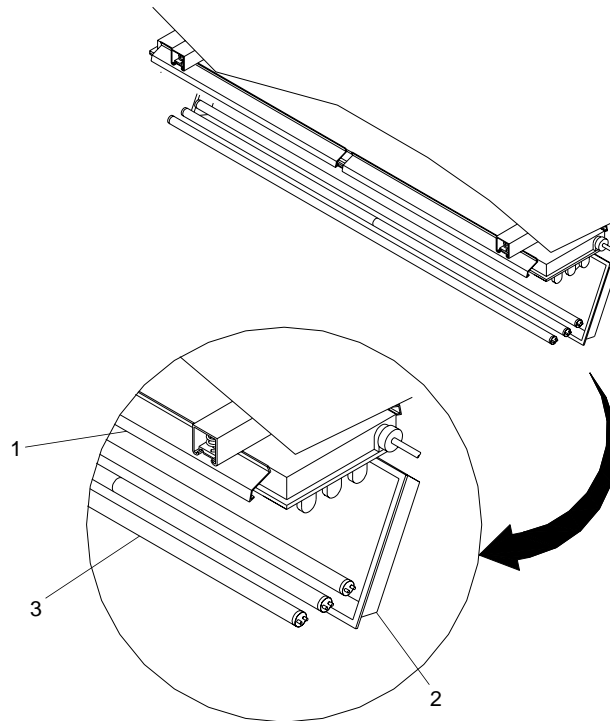
Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of generator container fluorescent light fixtures.

REPLACE GENERATOR CONTAINER FLUORESCENT LIGHT FIXTURE**Figure 1. Circuit Breaker C**

1. At the generator container electrical distribution panel, set circuit breaker C (figure 1, item 1) to OFF and tag out (FM 55-502).

**Figure 2. Fluorescent Light Fixture Cover and Lamps**

2. Release clamps (figure 2, item 1) by pulling downward.
3. Remove cover (figure 2, item 2).
4. Remove fluorescent lamps (figure 2, item 3).

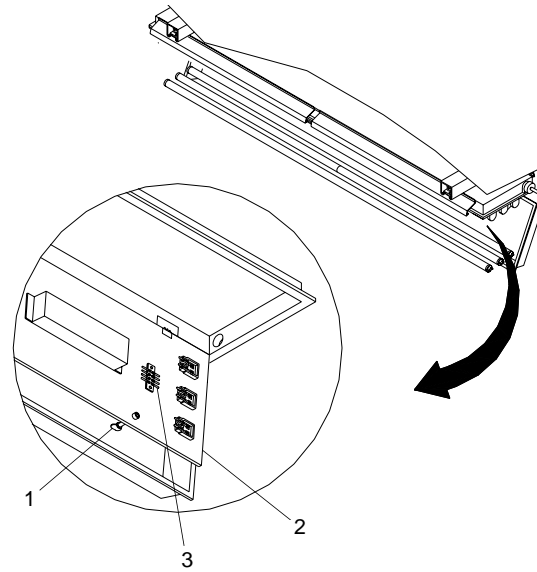


Figure 3. Fluorescent Light Fixture Reflector

5. Loosen wing screws (figure 3, item 1) and allow reflector (figure 3, item 2) to hang down on hinge
6. Label and disconnect wiring (figure 3, item 3).

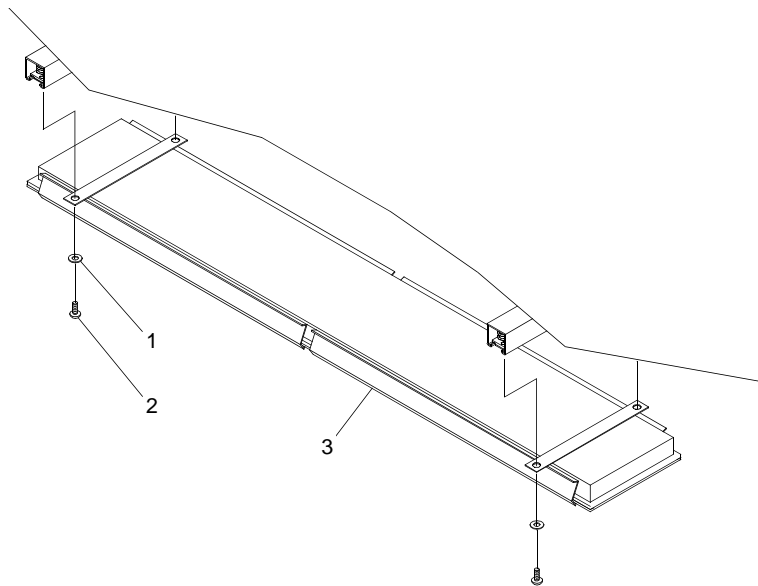


Figure 4. Fluorescent Light Fixture Mounting

7. Remove four screws (figure 3, item 1) and washers (figure 3, item 2) securing light fixture (figure 3, item 3) to ceiling
8. Discard light fixture (figure 3, item 3).
9. Position and install four screws (figure 3, item 1) and washers (figure 3, item 2) to secure light fixture (figure 3, item 3) to ceiling. Tighten screws (figure 3, item 1).

10. Install wiring (figure 3, item 3) in light fixture (figure 3, item 3).
11. Close reflector (figure 3, item 2) and secure with wing screws (figure 3, item 1).
12. Install fluorescent lamps (figure 2, item 3).
13. Position cover (figure 2, item 2) and secure with clamps (figure 2, item 1).
14. Remove warning tag from circuit breaker C (figure 1, item 1) and set circuit breaker to ON.
15. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
GENERATOR CONTAINER INCANDESCENT LIGHT FIXTURE
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Fixture, Incandescent (TM 55-1945-227-24P)

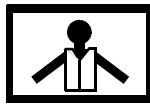
Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

WARNING



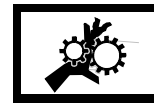
VEST



HELMET PROTECTION



HEAVY PARTS



MOVING PARTS

All personnel must wear personal flotation device, hard hat, safety shoes and gloves during FC operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of generator container incandescent light fixtures.

REPLACE GENERATOR CONTAINER INCANDESCENT LIGHT FIXTURE

1. Disconnect negative battery cable from 12-volt battery.

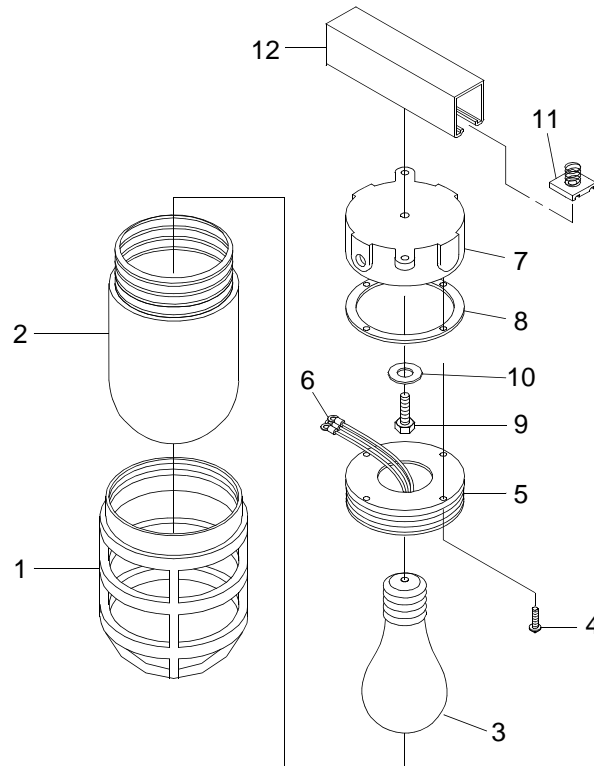


Figure 1. Incandescent Light Fixture

2. Remove guard (figure 1, item 1) and discard.
3. Remove globe (figure 1, item 2) and discard.
4. Remove lamp (figure 1, item 3) and retain if serviceable.
5. Remove screws (figure 1, item 4) from lampholder (figure 1, item 5) and allow lampholder (figure 1, item 5) to hang down from wires (figure 1, item 6).
6. Label and disconnect wiring (figure 1, item 6) from fixture base (figure 1, item 7).
7. Remove lampholder (figure 1, item 5) and gasket (figure 1, item 8) and discard.
8. Remove hex head bolt (figure 1, item 9) and washer (figure 1, item 10) securing fixture base (figure 1, item 7) to clamping nut (figure 1, item 11) in track (figure 1, item 12). Discard fixture base (figure 1, item 7).
9. Position fixture base (figure 1, item 7) under track (figure 1, item 12) and clamping nut (figure 1, item 11).
10. Install hex head bolt (figure 1, item 9) and washer (figure 1, item 10) to secure fixture base (figure 1, item 7) to clamping nut (figure 1, item 10). Tighten hex head bolt (figure 1, item 9).
11. Position lampholder (figure 1, item 5) and gasket (figure 1, item 8) under fixture base (figure 1, item 7).
12. Connect wiring (figure 1, item 6) to fixture base (figure 1, item 7).
13. Secure lampholder (figure 1, item 5) and gasket (figure 1, item 8) to fixture base (figure 1, item 7) with screws (figure 1, item 4). Tighten screws (figure 1, item 4).

14. Install lamp (figure 1, item 3).
15. Install globe (figure 1, item 2).
16. Install guard (figure 1, item 1).
17. Connect negative battery cable to 12-volt battery.
18. Verify equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER INCINERATOR TOILET EXHAUST FLEXIBLE
COUPLING REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Coupling with Clamps, Pipe (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (1)

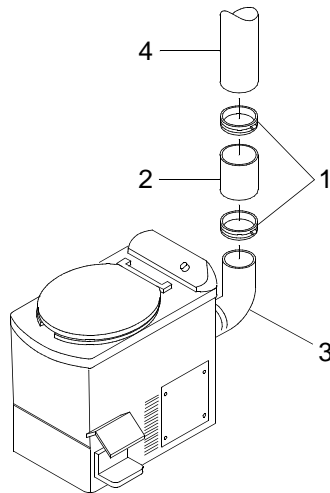
**REPLACE PERSONNEL SHELTER INCINERATOR TOILET EXHAUST FLEXIBLE
COUPLING**

Figure 1. Incinerator Toilet Exhaust Flexible Coupling

1. Loosen two band clamps (figure 1, item 1) and slide band clamps (figure 1, item 1) off flexible coupling (figure 1, item 2) and onto elbow (figure 1, item 3).
2. Remove flexible coupling (figure 1, item 2) from elbow (figure 1, item 3) and pipe (figure 1, item 4). Discard flexible coupling (figure 1, item 2) and band clamps (figure 1, item 1).
3. Slide two new band clamps (figure 1, item 1) onto elbow (figure 1, item 3).
4. Position new flexible coupling (figure 1, item 2) between elbow (figure 1, item 3) and pipe (figure 1, item 4).
5. Position two band clamps (figure 1, item 1) on flexible coupling (figure 1, item 2) and tighten band clamps (figure 1, item 1).

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER VENT FAN REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Ventilator, Ceiling (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

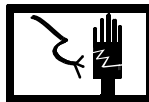
TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker D set to OFF and tagged out. (FM 55-502)

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

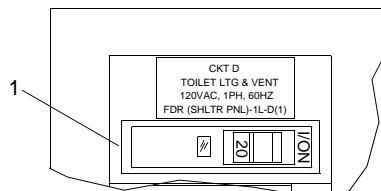
REPLACE PERSONNEL SHELTER VENT FAN

Figure 1. Circuit Breaker D

1. At the personnel shelter electrical distribution panel, position circuit breaker D (figure 1, item 1) to OFF.

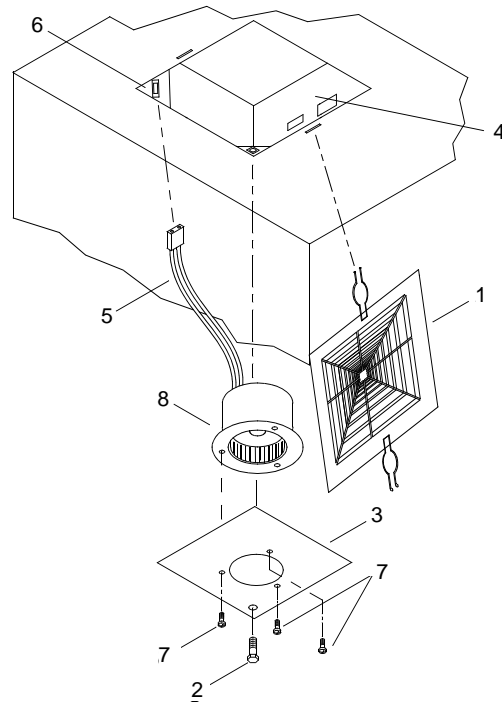


Figure 2. Personnel Shelter Vent Fan

2. Pull down vent fan cover (figure 2, item 1) and remove.
3. Remove hex head machine screw (figure 2, item 2) from vent fan panel (figure 2, item 3).
4. Remove vent fan panel (figure 2, item 3) from vent fan enclosure (figure 2, item 4).
5. Disconnect vent fan wiring harness (figure 2, item 5) from plug (figure 2, item 6).
6. Remove three round head screws (figure 2, item 7) from vent fan panel (figure 2, item 3).
7. Remove vent fan (figure 2, item 8) and discard.
8. Position new vent fan (figure 2, item 8) on vent fan panel (figure 2, item 3).
9. Install three round head screws (figure 2, item 7) and tighten.
10. Connect vent fan wiring harness (figure 2, item 5) to plug (figure 2, item 6).
11. Position vent fan panel (figure 2, item 3) on vent fan enclosure (figure 2, item 4).
12. Install hex head machine screw (figure 2, item 2) in vent fan panel (figure 2, item 3) and tighten.
13. Position vent fan cover (figure 2, item 1) and push upward to close.
14. Position circuit breaker D (figure 1, item 1) on personnel shelter electrical distribution board to on.
15. Perform operational check of personnel shelter vent fan. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER FLUORESCENT LIGHT FIXTURE
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Fixture, Fluorescent Light (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker C set to OFF and tagged out. (FM 55-502)

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of personnel shelter fluorescent light fixtures.

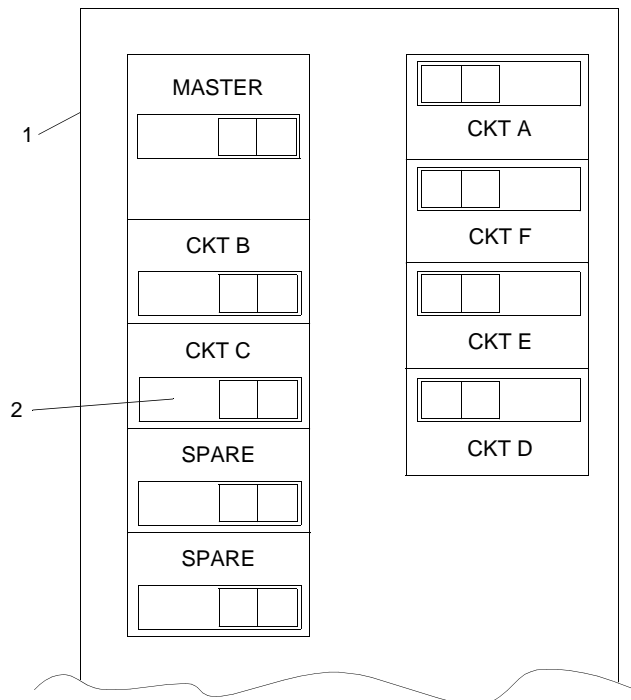
REPLACE PERSONNEL SHELTER FLUORESCENT LIGHT FIXTURE


Figure 1. Circuit Breaker C

1. At the personnel shelter electrical distribution panel (figure 1, item 1), position circuit breaker C (figure 1, item 2) to OFF (open) and tag out (FM 55-502).

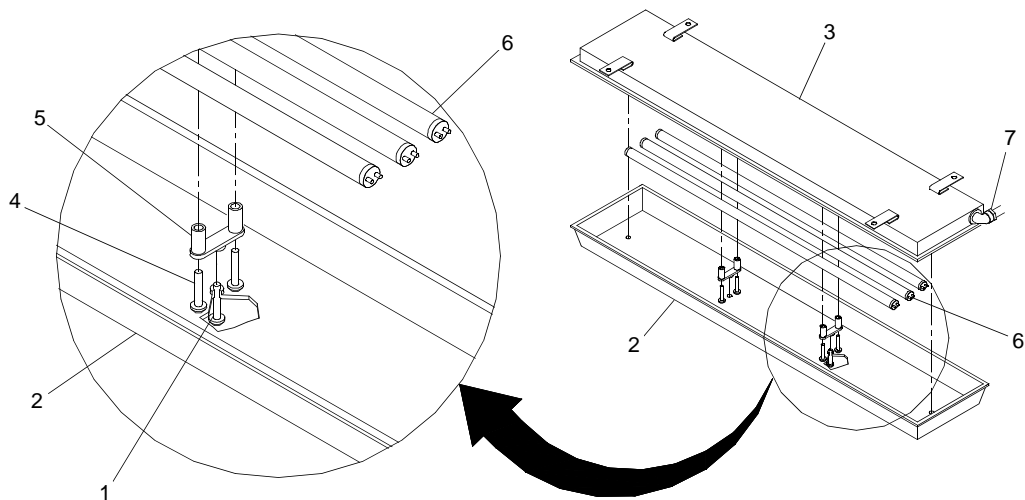


Figure 2. Fixture Cover

2. Loosen four screws (figure 2, item 1) securing cover (figure 2, item 2) to fixture base (figure 2, item 3).
3. Remove cover (figure 2, item 2).

4. Remove four screws (figure 2, item 4) securing cover standoffs (figure 2, item 5) to fixture base (figure 2, item 3).
5. Remove cover standoffs (figure 2, item 5).
6. Remove fluorescent lamps (figure 2, item 6).
7. Label and disconnect wiring and conduit (figure 2, item 7) from fixture base (figure 2, item 3).

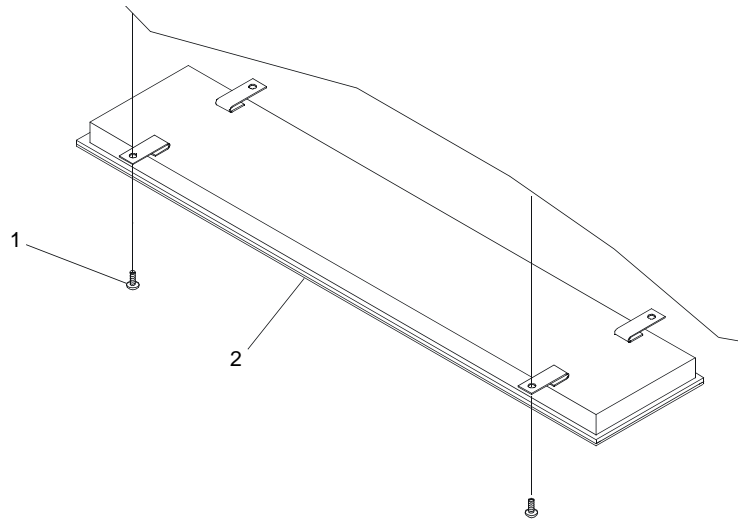


Figure 3. Fixture Mounting

8. Remove four screws (figure 3, item 1) securing fixture base (figure 3, item 2) to ceiling. Discard light fixture.
9. Position and install four screws (figure 3, item 1) to secure new fixture base (figure 3, item 2) to ceiling.
10. Install wiring and conduit (figure 2, item 7) in fixture base (figure 2, item 3).
11. Connect wiring (figure 2, item 7) to fixture base (figure 2, item 3) and remove labels.
12. Install fluorescent lamps (figure 2, item 6).
13. Secure cover standoffs (figure 2, item 5) to fixture base (figure 2, item 3) with screws (figure 2, item 4). Tighten screws (figure 2, item 4).
14. Position cover (figure 2, item 2) and secure with screws (figure 2, item 1). Tighten screws (figure 2, item 1).
15. Remove warning tag from circuit breaker C (figure 1, item 2) and set circuit breaker to ON.
16. Perform operational check of fluorescent lights. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER ROTARY BRASS LIGHT SWITCH
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Switch, Rotary (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker C set to OFF and tagged out. (FM 55-502)

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of personnel shelter rotary brass light switches.

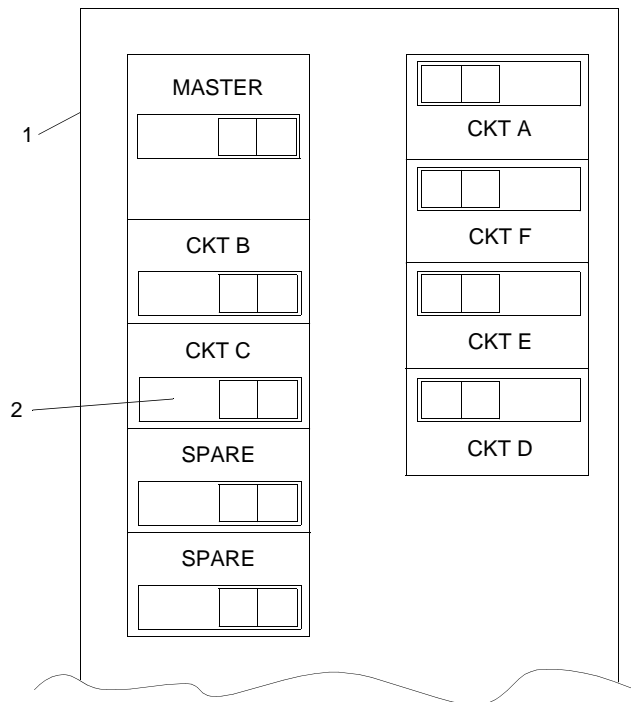
REPLACE PERSONNEL SHELTER ROTARY BRASS LIGHT SWITCH


Figure 1. Circuit Breaker C

1. At the personnel shelter electrical distribution panel (figure 1, item 1), position circuit breaker C (figure 1, item 2) to OFF (open) and tag out (FM 55-502).

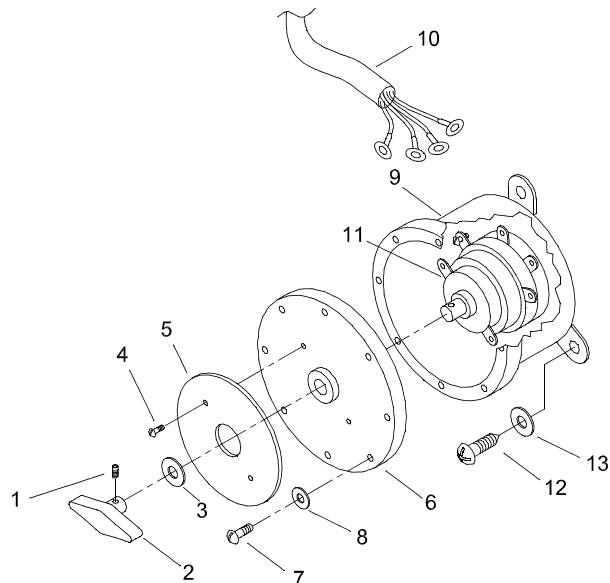


Figure 2. Rotary Brass Light Switch

2. Loosen screw (figure 2, item 1) and remove light switch knob (figure 2, item 2) and washer (figure 2, item 3).

3. Remove two pan head screws (figure 2, item 4) from faceplate (figure 2, item 5).
4. Remove faceplate (figure 2, item 5) from light switch cover (figure 2, item 6).
5. Remove four pan head screws (figure 2, item 7) and four washers (figure 2, item 8) from light switch cover (figure 2, item 6).
6. Remove switch cover (figure 2, item 6) from light switch enclosure (figure 2, item 9).
7. Label and disconnect wiring (figure 2, item 10) from light switch assembly (figure 2, item 11).
8. Remove wiring harness (figure 2, item 10) from light switch enclosure (figure 2, item 9).
9. Remove three phillips quickscrews (figure 2, item 12) and three washers (figure 2, item 13) securing light switch enclosure (figure 2, item 9) to wall.
10. Discard light switch enclosure (figure 2, item 9).
11. Position new light switch enclosure (figure 2, item 9) and install three phillips quickscrews (figure 2, item 12) and three washers (figure 2, item 13) to secure light switch enclosure (figure 2, item 9) to wall. Tighten phillips quickscrews (figure 2, item 12).
12. Install wiring harness (figure 2, item 10) in light switch enclosure (figure 2, item 9).
13. Connect wiring (figure 2, item 10) to light switch assembly (figure 2, item 11) and remove labels.
14. Install light switch cover (figure 2, item 6) onto light switch enclosure (figure 2, item 9).
15. Install four pan head screws (figure 2, item 7) and washers (figure 2, item 8) in light switch cover (figure 2, item 6). Tighten pan head screws (figure 2, item 7).
16. Install faceplate (figure 2, item 5) onto light switch cover (figure 2, item 6).
17. Install two pan head screws (figure 2, item 4) in faceplate (figure 2, item 5). Tighten pan head screws (figure 2, item 4).
18. Install washer (figure 2, item 3) and switch knob (figure 2, item 2) on light switch assembly (figure 2, item 11) and tighten allen head screw (figure 2, item 1).
19. Remove warning tag from circuit breaker C (figure 1, item 2) and set circuit breaker to ON.
20. Perform operational check of light switch. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER DUPLEX ELECTRICAL RECEPTACLE
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Receptacle, Duplex (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

FM 55-502

Equipment Condition

MASTER circuit breaker set to OFF and tagged out. (FM 55-502)

WARNING

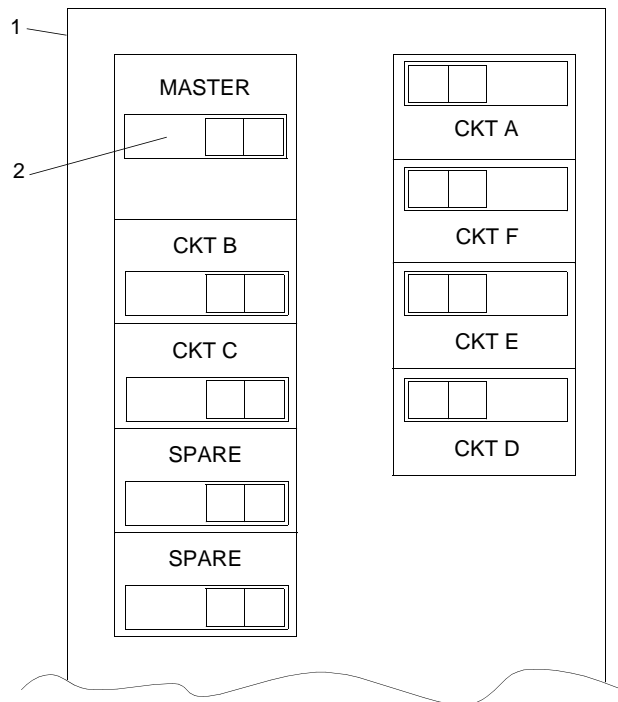


ELECTRICAL

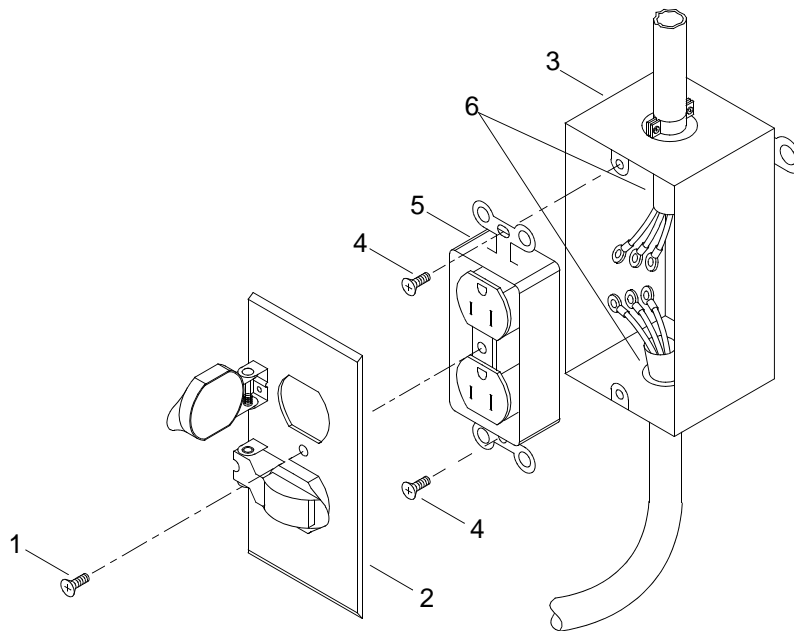
Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of personnel shelter electrical receptacles.

REPLACE PERSONNEL SHELTER DUPLEX ELECTRICAL RECEPTACLE**Figure 1. Master Circuit Breaker**

1. At the personnel shelter electrical distribution panel (figure 1, item 1), position MASTER circuit breaker (figure 1, item 2) to OFF (open) and tag out (FM 55-502).

**Figure 2. Duplex Electrical Receptacle**

2. Remove screw (figure 2, item 1) securing cover (figure 2, item 2) to receptacle box (figure 2, item 3)

-
3. Remove screws (figure 2, item 4) securing receptacle (figure 2, item 5) to receptacle box (figure 2, item 3).
 4. Label and disconnect wiring (figure 2, item 6) from receptacle (figure 2, item 5).
 5. Discard receptacle (figure 2, item 5).
 6. Connect wiring (figure 2, item 6) to new receptacle (figure 2, item 5) and remove labels.
 7. Install screws (figure 2, item 4) to secure receptacle (figure 2, item 5) to receptacle box (figure 2, item 3).
Tighten screws (figure 2, item 4).
 8. Position cover (figure 2, item 2) on receptacle box (figure 2, item 3) and secure with screw (figure 2, item 1).
Tighten screw (figure 2, item 1).
 9. Remove warning tag from MASTER circuit breaker (figure 1, item 2) and set circuit breaker to ON.
 10. Perform operational check. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER GROUND FAULT CIRCUIT INTERRUPTER
RECEPTACLE REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Interrupter, Ground (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker E set to OFF and tagged out. (FM 55-502)

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

REPLACE PERSONNEL SHELTER GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE

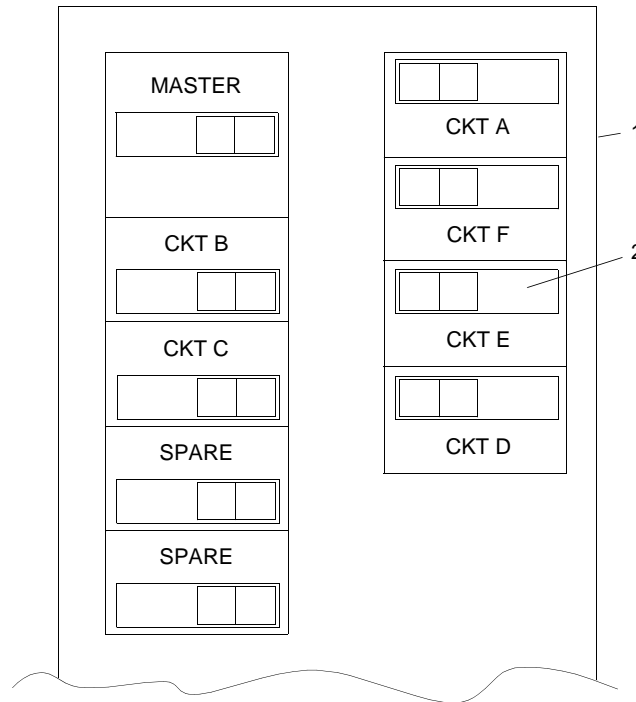


Figure 1. Circuit Breaker E

1. At the personnel shelter electrical distribution panel (figure 1, item 1), position circuit breaker E (figure 1, item 2) to OFF (open) and tag out (FM 55-502).

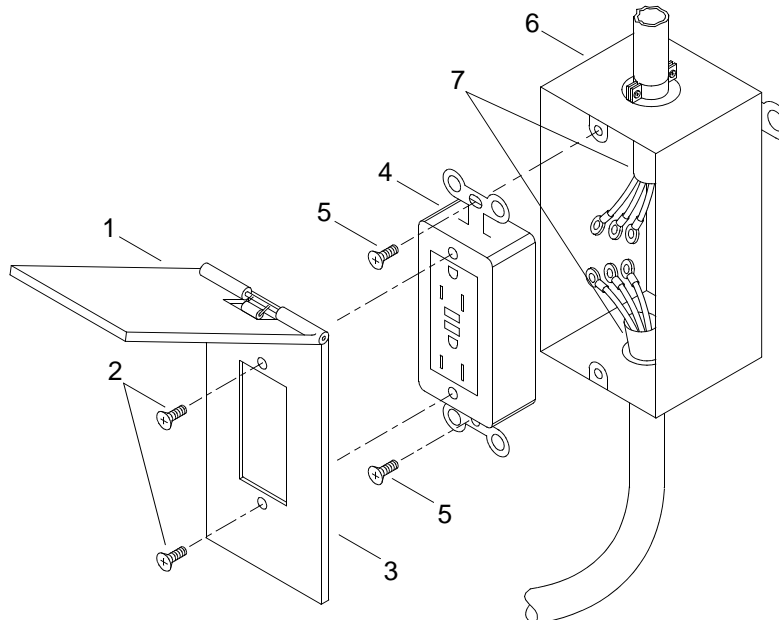


Figure 2. Ground Fault Circuit Interrupter Receptacle

-
2. Lift weather cover (figure 2, item 1).
 3. Remove two screws (figure 2, item 2) securing receptacle cover (figure 2, item 3) to receptacle (figure 2, item 4).
 4. Remove two screws (figure 2, item 5) securing receptacle (figure 2, item 4) to receptacle box (figure 2, item 6).
 5. Label and disconnect wiring (figure 2, item 7) from receptacle (figure 2, item 4).
 6. Discard receptacle (figure 2, item 4).
 7. Connect wiring (figure 2, item 7) to new receptacle (figure 2, item 4) and remove labels.
 8. Install two screws (figure 2, item 5) to secure receptacle (figure 2, item 4) to receptacle box (figure 2, item 6).
Tighten screws (figure 2, item 5).
 9. Install two screws (figure 2, item 2) to secure receptacle cover (figure 2, item 3) to receptacle (figure 2, item 4).
Tighten screws (figure 2, item 2).
 10. Close weather cover (figure 2, item 1).
 11. Remove warning tag from circuit breaker C (figure 1, item 2) and set circuit breaker to ON.
 12. Perform operational check. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER RECEPTACLE BOX REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Conduit, Outlet (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

FM 55-502

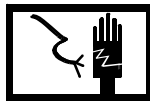
Equipment Condition

MASTER circuit breaker set to OFF and tagged out. (FM 55-502)

Duplex electrical receptacle removed. (WP 0058 00)

Ground fault circuit interrupter receptacle removed. (WP 0059 00)

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of both hospital grade straight blade and ground fault circuit interrupter receptacle boxes.

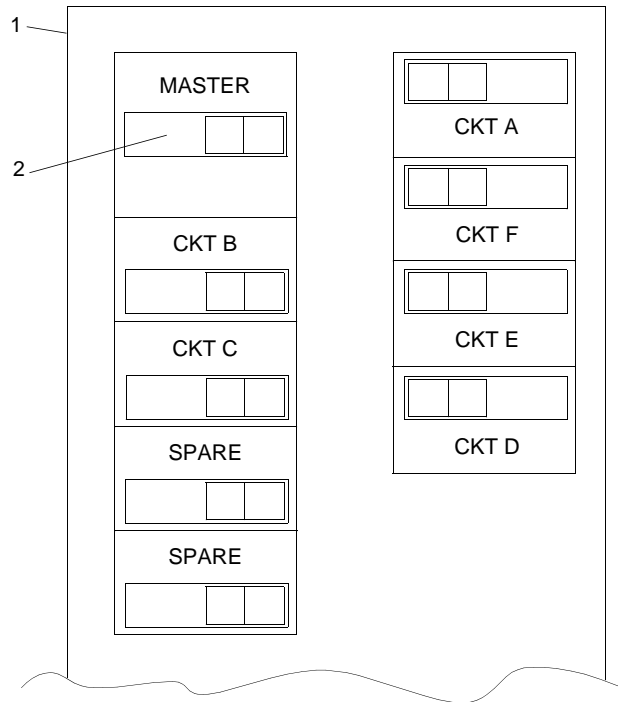
REPLACE PERSONNEL SHELTER OUTLET BOX

Figure 1. Master Circuit Breaker

1. At the personnel shelter electrical distribution panel (figure 1, item 1), position MASTER circuit breaker (figure 1, item 2) to OFF (open) and tag out (FM 55-502).

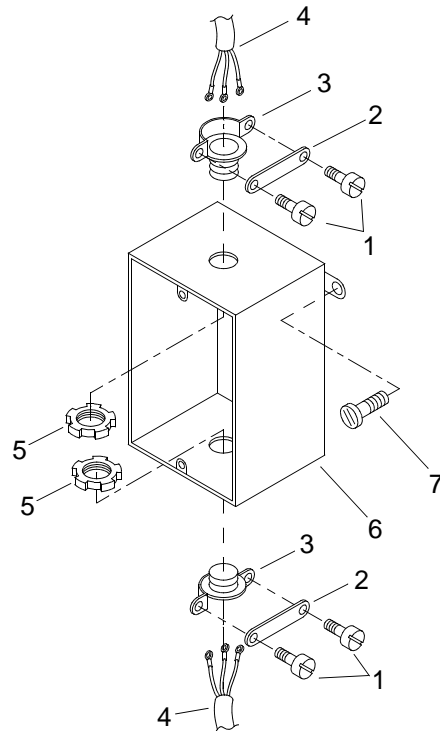


Figure 2. Outlet Box

2. Remove two screws (figure 2, item 1) and clamp (figure 2, item 2) from each strain relief (figure 2, item 3).
3. Pull wiring harness (figure 2, item 4) out through strain relief (figure 2, item 3).
4. Remove spanner nuts (figure 2, item 5) from strain relief (figure 2, item 3).
5. Remove strain relief (figure 2, item 3) from receptacle box (figure 2, item 6).
6. Remove two screws (figure 2, item 7) securing receptacle box (figure 2, item 6) to bulkhead. Discard receptacle box (figure 2, item 6).
7. Position new receptacle box (figure 2, item 6) on bulkhead.
8. Install two screws (figure 2, item 7) in junction box (figure 2, item 6) and secure to bulkhead. Tighten screws (figure 2, item 7).
9. Install strain relief (figure 2, item 3) in receptacle box (figure 2, item 6).
10. Install spanner nuts (figure 2, item 5) on strain relief (figure 2, item 3) and tighten.
11. Push wiring harness (figure 2, item 4) through strain relief (figure 2, item 3).
12. Install two screws (figure 2, item 1) and clamp (figure 2, item 2) on strain relief (figure 2, item 3). Tighten screws (figure 2, item 1).
13. Install personnel shelter ground fault circuit interrupter receptacle. (WP 0059 00), or install personnel shelter hospital grade straight blade electrical receptacle. (WP 0058 00)

14. Remove warning tag from MASTER circuit breaker (figure 1, item 2) and set circuit breaker to ON.

15. Perform operational check. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER HEAD ELECTRICAL JUNCTION BOX
REMOVAL AND INSTALLATION**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

FM 55-502

Equipment Condition

Circuit breaker D set to OFF and tagged out. (FM 55-502)

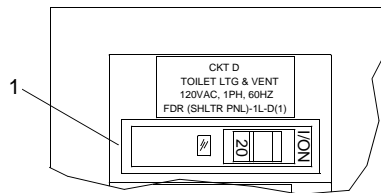
REMOVE PERSONNEL SHELTER HEAD ELECTRICAL JUNCTION BOX

Figure 1. Circuit Breaker D

1. At the personnel shelter electrical distribution panel, position circuit breaker D (figure 1, item 1) to OFF and tag out (FM 55-502).

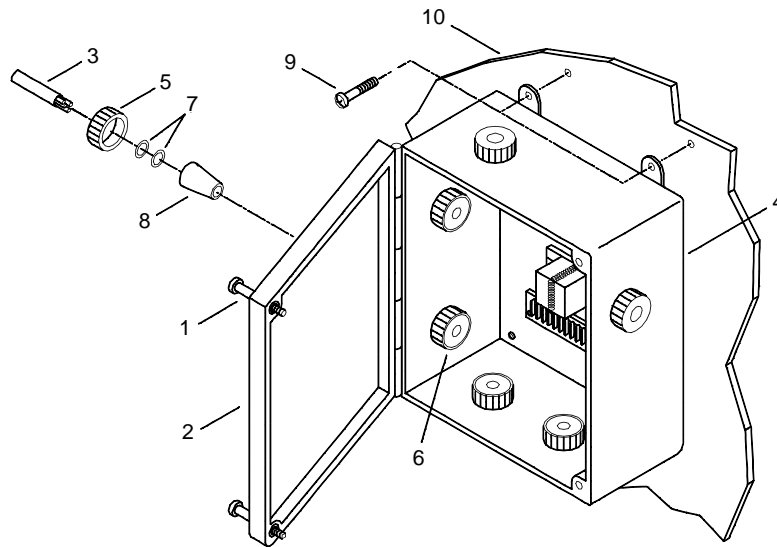


Figure 2. Personnel Shelter Head Electrical Junction Box

2. Loosen two screws (figure 2, item 1) and open enclosure cover (figure 2, item 2).
3. Remove wiring (figure 2, item 3) from junction box (figure 2, item 4).
 - a. Label and disconnect wiring (figure 2, item 3).
 - b. Unscrew stuffing tube cap (figure 2, item 5) from stuffing tube (figure 2, item 6).
 - c. Remove wiring (figure 2, item 3) from stuffing tube (figure 2, item 6) and retain cap (figure 2, item 5), plastic washers (figure 2, item 7) and preformed packing (figure 2, item 8) on end of wiring (figure 2, item 3).
4. Remove four screws (figure 2, item 9) securing junction box (figure 2, item 4) to wall (figure 2, item 10).
5. Remove junction box (figure 2, item 4).

INSTALL PERSONNEL SHELTER HEAD ELECTRICAL JUNCTION BOX

1. Position junction box (figure 2, item 4) on wall (figure 2, item 10) and secure with four screws (figure 2, item 9). Tighten screws (figure 2, item 9).
2. Install wiring (figure 2, item 3) in junction box (figure 2, item 4).
 - a. Slide wiring (figure 2, item 3) into stuffing tube (figure 2, item 6) and into junction box (figure 2, item 4).
 - b. Tighten stuffing tube cap (figure 2, item 5), plastic washers (figure 2, item 7) and preformed packing (figure 2, item 8) onto end of stuffing tube (figure 2, item 6) until secure.
 - c. Connect wiring (figure 2, item 3) and remove labels.
3. Close enclosure cover (figure 2, item 2).
4. Tighten two screws (figure 2, item 1).

5. Remove warning tag from circuit breaker D (figure 1, item 1) and set circuit breaker to ON.
6. Perform operational check. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER HEAD ELECTRICAL JUNCTION BOX
REPAIR**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

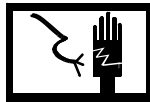
FM 55-502

Equipment Condition

Circuit breaker D set to OFF and tagged out. (FM 55-502)

REPAIR PERSONNEL SHELTER HEAD ELECTRICAL JUNCTION BOX

WARNING



ELECTRICAL

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

Repair is limited to the replacement of damaged components.

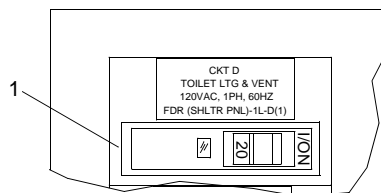


Figure 1. Circuit Breaker D

1. At the personnel shelter electrical distribution panel, position circuit breaker D (figure 1, item 1) to OFF and tag out (FM 55-502).

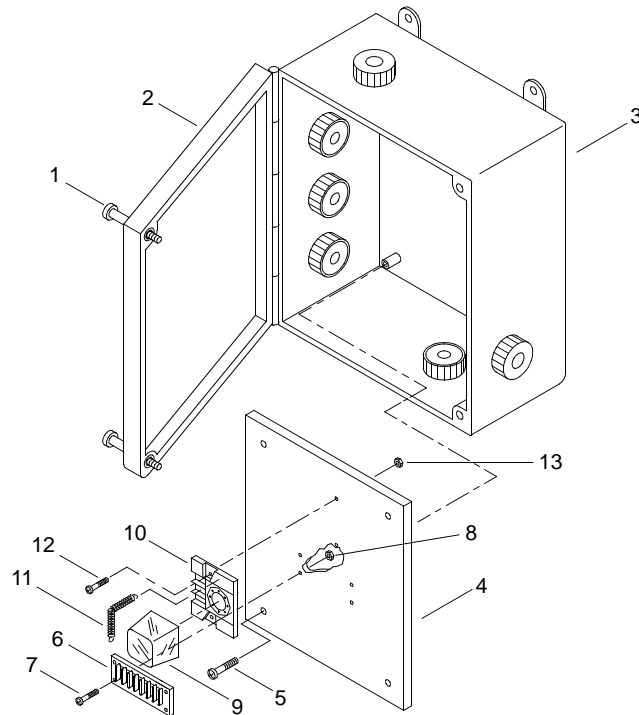


Figure 2. Personnel Shelter Head Electrical Junction Box

2. Loosen two screws (figure 2, item 1) and open enclosure cover (figure 2, item 2).
3. Label and disconnect internal electrical wiring within junction box (figure 2, item 3).
4. Remove panel (figure 2, item 4) from junction box (figure 2, item 3).
 - a. Remove four screws (figure 2, item 5) securing panel (figure 2, item 4) to junction box (figure 2, item 3).
 - b. Remove panel (figure 2, item 4).
5. Remove terminal block (figure 2, item 6) from panel (figure 2, item 4).
 - a. Remove two screws (figure 2, item 7) and nuts (figure 2, item 8) securing terminal block (figure 2, item 6) to panel (figure 2, item 4).
 - b. Remove terminal block (figure 2, item 6).
6. Remove relay (figure 2, item 9) from relay socket (figure 2, item 10).
 - a. Remove spring (figure 2, item 11) securing relay (figure 2, item 9) to relay socket (figure 2, item 10).
 - b. Remove relay (figure 2, item 9) from relay socket (figure 2, item 10) by pulling outwards.
7. Remove relay socket (figure 2, item 10) from panel (figure 2, item 4).
 - a. Remove two screws (figure 2, item 12) and nuts (figure 2, item 13) securing relay socket (figure 2, item 10) to panel (figure 2, item 4).

-
- b. Remove relay socket (figure 2, item 10).
8. Install relay socket (figure 2, item 10) on panel (figure 2, item 4).
 - a. Position relay socket (figure 2, item 10) on panel (figure 2, item 4).
 - b. Install two screws (figure 2, item 12) and nuts (figure 2, item 13) to secure relay socket (figure 2, item 10) to panel (figure 2, item 4). Tighten nuts (figure 2, item 13).
 9. Install relay (figure 2, item 9) in relay socket (figure 2, item 10).
 - a. Position relay (figure 2, item 9) in relay socket (figure 2, item 10) by pushing inwards.
 - b. Install spring (figure 2, item 11) to hold relay (figure 2, item 9) in relay socket (figure 2, item 10).
 10. Install terminal block (figure 2, item 6) on panel (figure 2, item 4).
 - a. Position terminal block (figure 2, item 6) on panel (figure 2, item 4).
 - b. Install two screws (figure 2, item 7) and nuts (figure 2, item 8) to secure terminal block (figure 2, item 6) to panel (figure 2, item 4). Tighten nuts (figure 2, item 8).
 11. Install panel (figure 2, item 4) in junction box (figure 2, item 3).
 - a. Position panel (figure 2, item 4) in junction box (figure 2, item 3).
 - b. Install four screws (figure 2, item 5) to secure panel (figure 2, item 4) to junction box (figure 2, item 3). Tighten screws (figure 2, item 5).
 12. Connect internal electrical wiring within junction box (figure 2, item 3) and remove labels.
 13. Close enclosure cover (figure 2, item 2).
 14. Tighten two screws (figure 2, item 1).
 15. Remove warning tag from circuit breaker D (figure 1, item 1) and set circuit breaker to ON.
 16. Verify affected equipment operates. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER HEAD FLUORESCENT LIGHT FIXTURE
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Fixture, Fluorescent Light (TM 55-1945-227-24P)

Tag, Danger, (Item 20, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

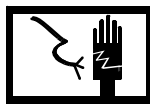
FM 55-502

Equipment Condition

Circuit breaker D set to OFF and tagged out. (FM 55-502)

REPLACE PERSONNEL SHELTER HEAD FLUORESCENT LIGHT FIXTURE

WARNING

**ELECTRICAL**

Repair or replace components only after the circuit breaker has been turned off and tagged out. Performing maintenance while the circuit is energized could result in serious injury or death.

NOTE

Use the oval head bit driver bit stored in the file cabinet drawer.

An oval head bit driver and bit comes with the new replacement light assembly.

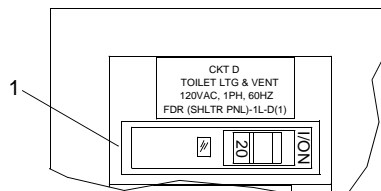


Figure 1. Circuit Breaker D

1. Position circuit breaker D (figure 1, item 1) on the personnel shelter electrical distribution panel to OFF and tag out (FM 55-502).

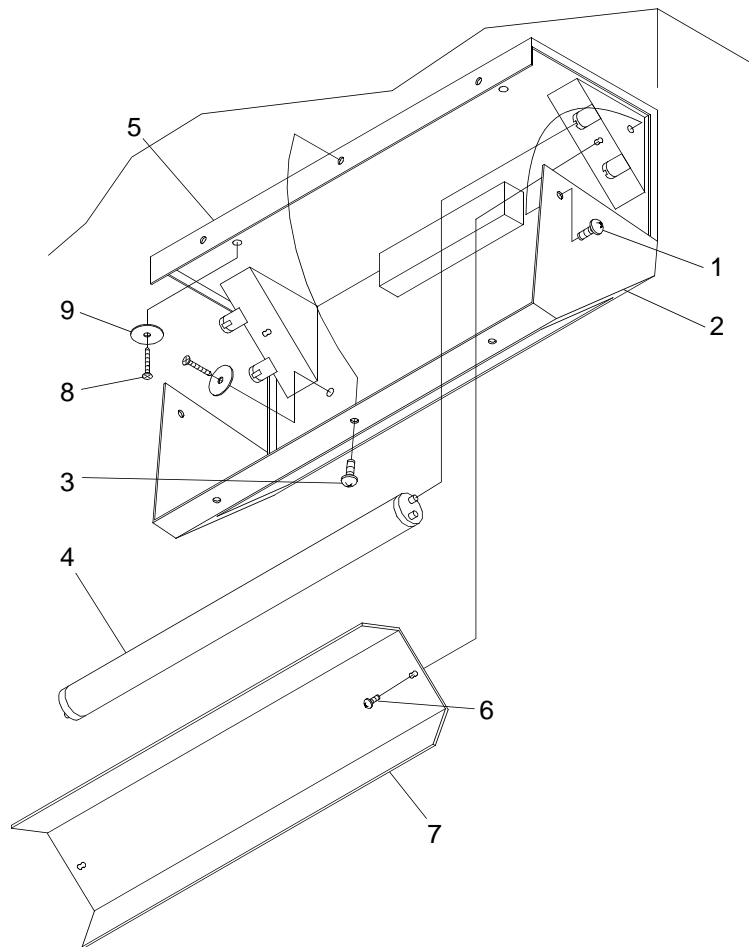


Figure 2. Head Fluorescent Light Fixture

2. Remove two screws (figure 2, item 1) from sides of fixture cover (figure 2, item 2).
3. Remove three screws (figure 2, item 3) from front of fixture cover (figure 2, item 2) and allow cover (figure 2, item 2) to swing down.
4. Remove fluorescent lamps (figure 2, item 4) from fixture base (figure 2, item 5).
5. Remove two screws (figure 2, item 6) retaining reflector (figure 2, item 7) to fixture base (figure 2, item 5).
6. Label, disconnect and remove wiring from fixture base (figure 2, item 5).
7. Remove four drywall screws (figure 2, item 8) and washers (figure 2, item 9) retaining fixture base (figure 2, item 5) to ceiling and wall. Discard fixture.
8. Position and install four drywall screws (figure 2, item 8) and washers (figure 2, item 9) to retain new fixture base (figure 2, item 5) to ceiling and wall. Tighten drywall screws (figure 2, item 8).
9. Install and connect wiring in fixture base (figure 2, item 5).

10. Position and install two screws (figure 2, item 6) to retain reflector (figure 2, item 7) to fixture base (figure 2, item 5).
11. Install fluorescent lamps (figure 2, item 4) in fixture base (figure 2, item 5).
12. Swing fixture cover (figure 2, item 2) up into position and install three screws (figure 2, item 3) at front of fixture cover (figure 2, item 2).
13. Install two screws (figure 2, item 1) in sides of fixture cover (figure 2, item 2).
14. Remove warning tag from circuit breaker D (figure 1, item 1) and set circuit breaker to ON.
15. Perform operational check of head fluorescent lights. (TM 55-1945-227-10)

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER INTERIOR DOOR REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Door, Interior (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (2)

REPLACE PERSONNEL SHELTER INTERIOR DOOR**NOTE**

Door hinges will remain on door frame during door replacement.

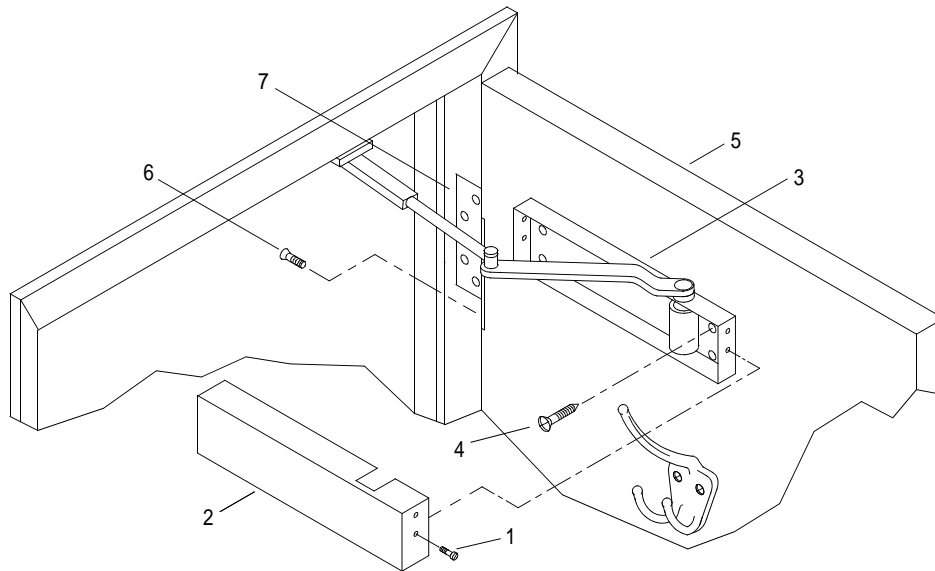


Figure 1. Personnel Shelter Interior Door

1. Remove screws (figure 1, item 1) securing cover (figure 1, item 2) to actuator (figure 1, item 3).
2. Remove screws (figure 1, item 4) securing actuator (figure 1, item 3) to door (figure 1, item 5).

WARNING**HEAVY OBJECTS**

The door is heavy. Use care when handling. Failure to comply may result in serious injury.

3. Using assistant to support weight of door (figure 1, item 5), remove screws (figure 1, item 6) from door hinges (figure 1, item 7).
4. Remove door (figure 1, item 5) and discard.
5. Using assistant to support weight of new door (figure 1, item 5), align door (figure 1, item 5) with door hinges (figure 1, item 7).
6. Install screws (figure 1, item 6) through door hinges (figure 1, item 7) and tighten.
7. Position actuator (figure 1, item 3) on door (figure 1, item 5) and secure with screws (figure 1, item 4). Tighten screws (figure 1, item 4).
8. Position cover (figure 1, item 2) on actuator (figure 1, item 3) and secure with screws (figure 1, item 1). Tighten screws (figure 1, item 1).

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER INTERIOR DOOR LOCKSET REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Lockset, Door (TM 55-1945-227-24P)

Personnel Required

Engineer 88L (1)

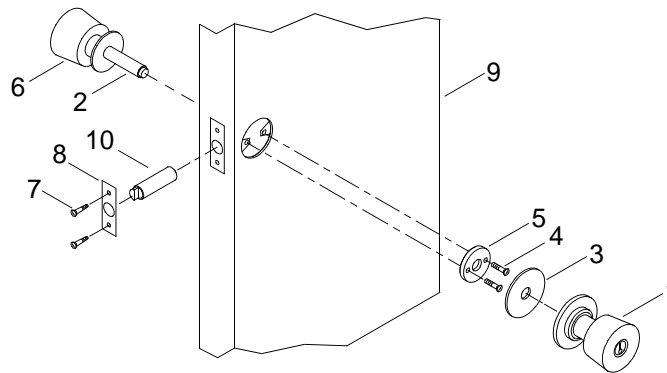
REPLACE PERSONNEL SHELTER INTERIOR DOOR LOCKSET

Figure 1. Interior Door Lockset

1. Release inner door handle (figure 1, item 1) from lockset (figure 1, item 2).
2. Pry off inner cover plate (figure 1, item 3).
3. Remove two screws (figure 1, item 4) securing interior door plate (figure 1, item 5) to exterior door plate (figure 1, item 6).
4. Remove two screws (figure 1, item 7) securing retaining plate (figure 1, item 8) to side of door (figure 1, item 9).
5. Remove bolt assembly (figure 1, item 10) and lockset (figure 1, item 2) from door (figure 1, item 9). Discard lockset (figure 1, item 2).
6. Install new lockset (figure 1, item 2) and bolt assembly (figure 1, item 10) into holes of interior door (figure 1, item 9).
7. Position retaining plate (figure 1, item 8) over bolt assembly (figure 1, item 10).
8. Install two screws (figure 1, item 7) through retaining plate (figure 1, item 8). Tighten screws (figure 1, item 7).
9. Position interior door plate (figure 1, item 5) over lockset (figure 1, item 2) and secure to exterior plate (figure 1, item 6) with two screws (figure 1, item 4).

10. Tighten screws (figure 1, item 4).
11. Snap inner cover plate (figure 1, item 3) onto interior door plate (figure 1, item 5).
12. Push interior door handle (figure 1, item 1) onto lockset until it locks in place.

END OF WORK PACKAGE

**DIRECT SUPPORT MAINTENANCE
FLOATING CAUSEWAY
PERSONNEL SHELTER ESCAPE SCUTTLE GASKET
REPLACEMENT**

INITIAL SETUP:**Tools**

Tool Kit, General Mechanic's (Item 4, WP 0073 00)

Materials/Parts

Gasket, Scuttle (TM 55-1945-227-24P)

Adhesive/Sealant (TM 55-1945-227-24P)

Cleaner (Item 6, WP 0074 00)

Rag, Wiping (Item 15, WP 0074 00)

Personnel Required

Engineer 88L (1)

References

TM 55-1945-227-10

Equipment Condition

Escape scuttle removed. (TM 55-1945-227-10)

WARNING



POISON



CHEMICAL



EYE PROTECTION

Wear proper eye and hand protection when working with chemicals. Failure to observe these precautions could result in serious injury.

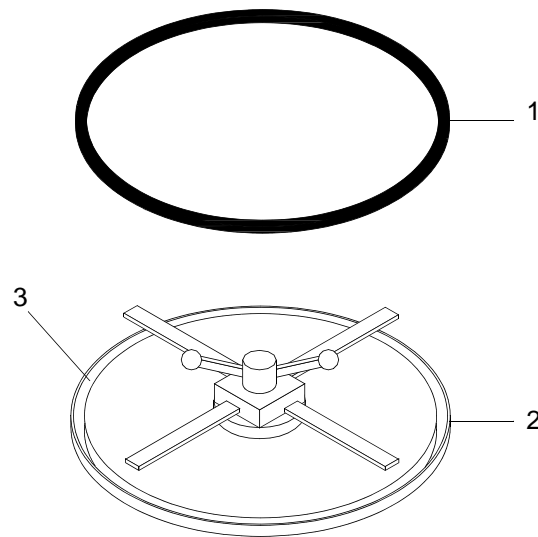
REPLACE PERSONNEL SHELTER ESCAPE SCUTTLE GASKET

Figure 1. Escape Scuttle Gasket

1. Remove gasket (figure 1, item 1) from scuttle hatch (figure 1, item 2). Discard gasket.
2. Clean the new gasket (figure 1, item 1) with cleaner and wiping rag to remove any residue.
3. Using a wire brush, clean the gasket groove (figure 1, item 3) in scuttle hatch (figure 1, item 2) to remove residual gasket material and adhesive/sealant.
4. Using cleaner and wiping rag, clean the gasket groove (figure 1, item 3) in scuttle hatch (figure 1, item 2).
5. Apply a thin coat of adhesive/sealant to the bottom of the gasket groove (figure 1, item 3) in scuttle hatch (figure 1, item 2).
6. Press the new gasket into the gasket groove (figure 1, item 3) in scuttle hatch (figure 1, item 2).
7. Install scuttle hatch in personnel container to hold gasket in place until adhesive/sealant cures.
(TM 55-1945-227-10)

END OF WORK PACKAGE

CHAPTER 5

**GENERAL SUPPORT MAINTENANCE INSTRUCTIONS
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)**

**GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
LIFTING EQUIPMENT TESTING**

INITIAL SETUP:

Personnel Required

Engineer 88L (1)

References

29 CFR

TEST LIFTING EQUIPMENT

Refer to 29 CFR, sections 1919.6, 1919.15, 1919.28, 1919.30 and 1919.3.

END OF WORK PACKAGE

**GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
ELECTRICAL WIRING REPAIR**

INITIAL SETUP:

Personnel Required

Engineer 88L (1)

References

46 CFR

REPAIR ELECTRICAL WIRING

Refer to 46 CFR, section 129.340.

END OF WORK PACKAGE

**GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
TORQUE LIMITS**

INTRODUCTION

When To Use Torque Limits

When a torque is not specified in an individual work package, use the procedures in this work package to determine proper torque limits and use of adaptors with torque wrenches.

TORQUE VALUES

How To Use Adaptors With Torque Wrenches

When an adaptor is necessary due to space or type of fitting being torqued, it must be determined how the adaptor changes the amount of force applied. If the adaptor increases or decreases the distance from the drive of the torque wrench to the fitting being torqued, an equation must be used to compensate for the difference.

NOTE

The following abbreviations apply to the below procedures:

DT = Desired Torque

LT = Length of Torque Wrench

AL = Adaptor Length

AT = Applied Torque

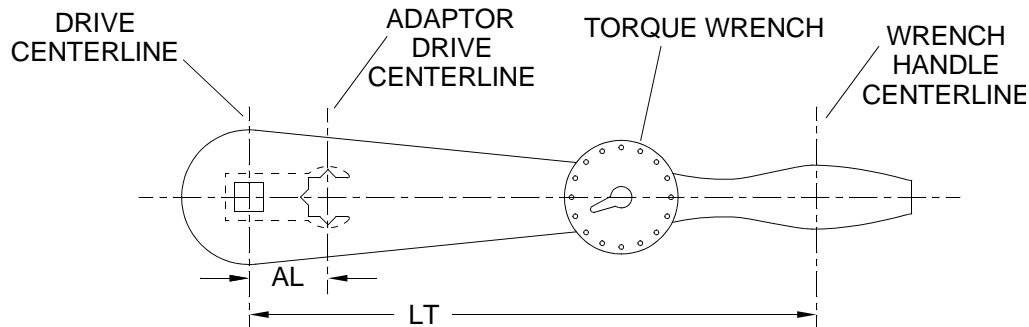


Figure 1. Adaptor Decreases Distance

1. If the adaptor used decreases the distance between the center of the torque wrench handle and the center of the drive (figure 1), first find the desired torque for the fitting, then calculate as follows:
 - a. Multiply DT by LT.
 - b. Subtract AL from LT.
 - c. Divide the first answer by the second answer to find AT.

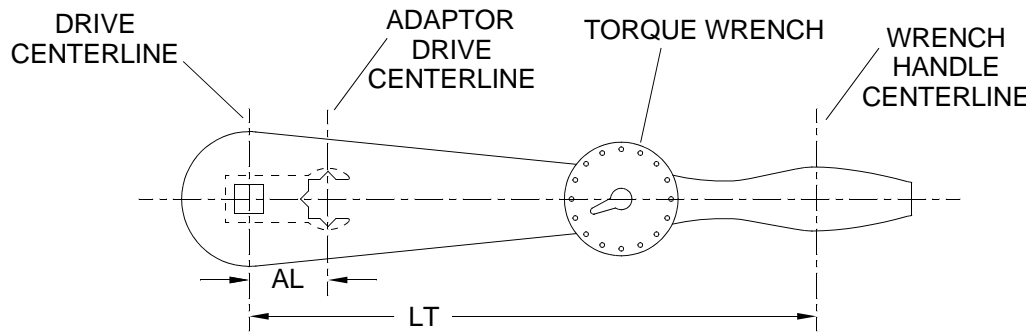


Figure 2. Adaptor Increases Distance

2. If the adaptor used increases the distance between the center of the torque wrench handle and the center of the drive (figure 2), first find the desired torque for the fitting, then calculate as follows:
 - a. Multiply DT by LT.
 - b. Add AL and LT.
 - c. Divide the first answer by the second answer to find AT.

HOW TO USE TORQUE TABLES

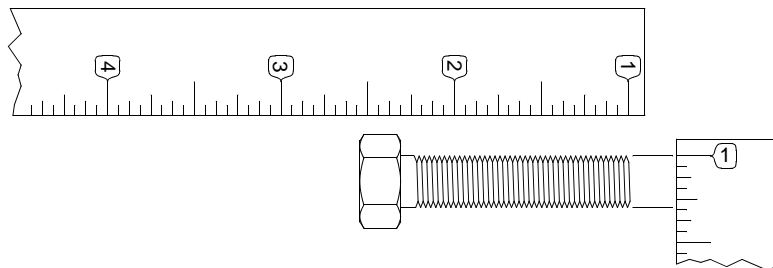


Figure 3. Measuring Bolt Diameter

1. Measure the diameter of the bolt to be torqued (figure 3).
2. For SAE fasteners, determine the threads per inch by counting the threads. For metric fasteners, determine the thread pitch using a thread pitch gage.

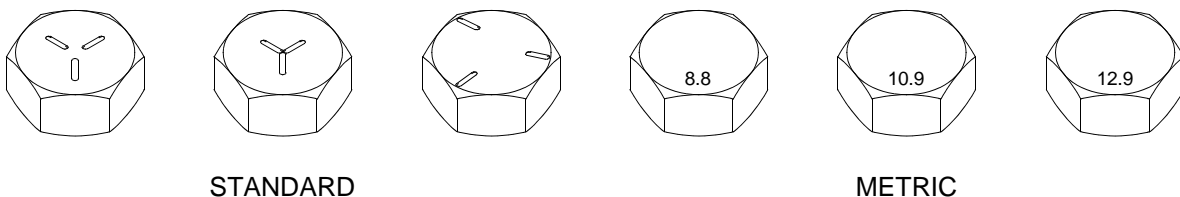


Figure 4. Bolt Head Markings

3. Determine the type of markings on the bolt you are torquing by comparing the markings on the head of the bolt with figure 4.

4. Determine if this will be a wet or dry torque.
 - a. Wet torque is any bolt that is lubricated or coated with an antiseize compound.
 - b. Dry torque is any bolt that is not lubricated or coated with an antiseize compound.
5. On the tables below, locate the bolt to be torqued.
 - a. Locate the diameter of the bolt.
 - b. Determine the threads per inch for the SAE fastener or the thread pitch for the metric fastener.
 - c. Scan across the table to the proper grade.
 - d. Choose wet or dry.
 - e. Scan down the proper column and across the proper row until they intersect, this is the proper torque value.

TORQUE TABLES

Table 1. SAE Standard Torques (in-lbs)

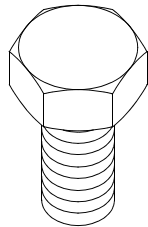
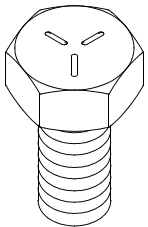
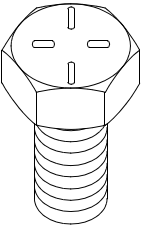
		SAE GRADE NO. 2				SAE GRADE NO. 5				SAE GRADE NO. 8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREADS PER INCH	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m
1/4	20	66	7.46	49	5.54	101	11.41	76	8.58	143	16.15	107	12.09
1/4	28	75	8.47	56	6.33	116	13.10	87	9.83	164	18.53	123	13.89
5/16	18	135	15.25	101	11.41	209	23.61	157	17.73	295	33.32	221	24.96
5/16	24	150	17.17	112	12.65	230	25.98	173	19.54	327	36.94	245	27.68
3/8	16	240	27.11	180	20.33	370	41.80	278	31.40	523	59.08	392	44.28
3/8	24	272	30.73	204	23.04	420	47.44	315	35.58	593	66.99	445	50.27
7/16	14	384	43.38	288	32.53	593	66.99	445	50.27	837	94.55	628	70.94
7/16	20	428	48.35	321	36.26	662	74.78	496	56.03	935	105.62	700	79.07
1/2	13	585	66.08	439	49.59	904	102.12	678	76.59	1277	144.25	958	108.22
1/2	20	660	74.55	495	55.92	1020	115.22	764	86.30	1440	162.66	1080	122.00

Table 2. SAE Standard Torques (ft-lbs)

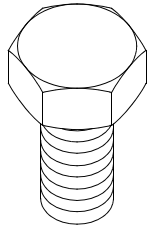
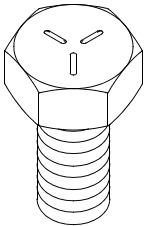
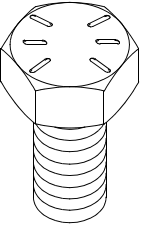
		SAE GRADE NO. 2				SAE GRADE NO. 5				SAE GRADE NO. 8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREADS PER INCH	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m
9/16	12	70	94.92	53	71.87	109	147.80	82	111.19	154	208.82	115	155.94
9/16	18	78	105.77	59	80.00	121	164.08	91	123.40	171	231.88	128	173.57
5/8	11	97	131.53	73	98.99	150	203.40	113	153.23	212	287.47	159	215.60
5/8	18	110	149.16	82	111.19	170	230.52	127	172.21	240	325.44	180	244.08
3/4	10	172	233.23	129	174.92	269	364.76	201	272.56	376	509.86	282	382.39
3/4	16	192	260.35	144	195.26	297	402.73	223	302.29	420	569.52	315	427.14
1	8	-	-	-	-	644	873.26	483	654.95	909	1232.60	683	926.15
1	12	-	-	-	-	704	954.62	528	715.97	995	1349.22	746	1011.58

Table 3. Metric Standard Torques (in-lbs)

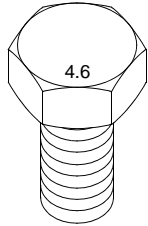
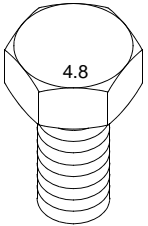
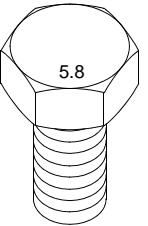
		CLASS 4.6				CLASS 4.8				CLASS 5.8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA MM	THREAD PITCH	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS
3.0	0.5	.50	4	.40	4	.70	6	.50	4	-	-	-	-
3.5	0.6	.80	7	.60	5	1.10	10	.80	7	-	-	-	-
4.0	0.7	1.20	11	.90	8	1.60	14	1.20	11	-	-	-	-
5.0	0.8	2.40	21	1.80	16	3.30	29	2.50	22	4.00	35	3.00	27
6.0	1.0	4.00	35	3.00	27	5.66	50	4.20	37	6.90	61	5.20	26
8.0	1.25	9.90	88	7.40	66	13.60	120	10.20	90	16.70	148	12.50	111
10.0	1.50	19.60	174	14.70	130	27.00	239	20.00	177	33.10	293	24.80	220
12.0	1.75	34.10	302	25.60	227	47.00	416	35.00	310	58.00	51	43.00	381
14.0	2.0	54.30	481	40.80	361	75.00	664	56.00	496	92.00	814	69.00	611

Table 4. Metric Standard Torques (ft-lbs)

DIA MM	THREAD PITCH	CLASS 8.8				CLASS 9.8				CLASS 10.9			
		DRY		WET		DRY		WET		DRY		WET	
		N-m	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m	FT LBS
8.0	1.25	26.40	19	19.80	15	28.50	21	21.40	16	36.50	27	27.30	20
10.0	1.50	52.20	38	39.20	29	56.60	42	42.40	31	72.20	53	54.20	40
12.0	1.75	91.00	67	68.00	50	99.00	73	74.00	55	126.00	93	94.00	69
14.0	2.00	145.00	107	109.00	80	157.00	116	118.00	87	200.00	147	150.00	111
16.0	2.00	226.00	167	170.00	125	245.00	181	184.00	136	313.00	231	235.00	173
20.0	2.50	441.00	325	331.00	244	478.00	353	358.00	264	610.00	450	458.00	338
24.0	3.00	762.00	562	572.00	422	826.00	609	620.00	457	1055.00	778	791.00	583
30.0	3.50	1515.00	1117	1136.00	838	1641.00	1210	1231.00	908	2095.00	1545	1572.00	1159
36.0	4.00	2647.00	1952	1985.00	1464	2868.00	2115	2151.00	1586	3662.00	2701	2746.00	2025

END OF WORK PACKAGE

**GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
WIRING DIAGRAMS**

INITIAL SETUP:**Personnel Required**

Engineer 88L (1)

References

ASME Y14.38

CABLE AND WIRING DIAGRAMS INTRODUCTION**Scope**

This work package provides the wiring illustrations necessary for maintenance, troubleshooting and repair of the Floating Causeway (FC). Diagrams provide the identification of each wire to be connected, by color code or wire number as applicable. The diagrams show the location of each pertinent terminal and/or position.

The same diagram may be referenced at different times as it applies to instructions within the appropriate maintenance chapter (Unit Level, Direct Support, or General Support).

The one line diagram, schematic and wiring diagram fold out illustrations can be located after the alphabetical index in this manual.

WIRE NUMBERS

Specific wire numbers are identified, where applicable, on the wiring diagrams.

ABBREVIATIONS

Abbreviations on the wiring diagrams are in accordance with ASME Y14.38, except when the abbreviation stands for a marking actually found in the equipment.

CHAPTER 6

**SUPPORTING INFORMATION
FOR
MODULAR CAUSEWAY SYSTEM (MCS)
FLOATING CAUSEWAY (FC)**

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
REFERENCES**

SCOPE

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

ARMY REGULATIONS

AR 700-138 Army Logistics Readiness and Sustainability

CODE OF FEDERAL REGULATIONS

29 CFR Labor, Parts 1911 to 1925

46 CFR Shipping, Parts 90 to 139

DA PAMPHLETS

DA PAM 738-750 Functional Users Manual for the Army Maintenance Management Systems (TAMMS)

FIELD MANUALS

FM 3-5 NBC, Decontamination

FM 55-502 Watercraft Safety

FORMS

DA Form 2028 Recommended Changes to Publications and Blank Forms

DA Form 2258 Depreservation Guide for Vehicles and Equipment

DA Form 2404 Equipment Inspection and Maintenance Worksheet

SF 368 Product Quality Deficiency Report

MISCELLANEOUS

ASME Y14.38-1999 The American Society of Mechanical Engineers Abbreviations and Acronyms

COMDTINST M16672.2D Navigation Rules, International-Inland

CTA 8-100 Common Table of Allowances, Army Medical Department Expendable/Durable Items

CTA 50-970 Common Table of Allowances, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items)

SSPC-SP-10 The Society for Protective Coatings, Near-White Blast Cleaning

SUPPLY CATALOGS

SC 4910-95-A68 Shop Equipment, Automotive Maintenance and Repair, Field Maintenance, Wheeled Vehicles, Post, Camp and Station, Set C, Less Power

SC 4910-95-A72 Shop Equipment, Automotive Maintenance and Repair, Organizational Maintenance, Common No. 2

SC 4940-95-A64 Shop Equipment, Welding, Shelter Mounted

SC 5180-95-N26 Shop Equipment, General Mechanic's Automotive

GOVERNMENT SPECIFICATIONS AND STANDARDS

DOD-PRF-24648 Primer Coating, Zinc Dust Pigmented for Exterior Steel Surfaces (Metric)
MIL-PRF-23236 Coating Systems for Ship Structures

TECHNICAL BULLETINS

TB 43-0144 Painting of Watercraft

TECHNICAL MANUALS

TM 5-2815-258-24 Unit, Direct Support and General Maintenance Manual for Detroit Diesel Engine Series 53

TM 5-805-7 Welding: Design, Procedures and Inspection, for Minor Weld Repairs

TM 9-6115-642-10 Generator Set (10 KW), Skid Mounted, Tactical Quiet

TM 9-6115-642-24 Unit, Direct Support and General Maintenance Manual for Generator Set, Skid Mounted, Tactical Quiet 10 kW

TM 9-6140-200-14 Unit, Direct and General Support Maintenance Manual for Lead-Acid Storage Batteries

TM 55-1945-227-10-HR Hand Receipt, Covering Contents of Components of End Item (COEI), Basic Issue Items (BII) and Additional Authorization List (AAL) for Floating Causeway

TM 55-1945-217-14&P Operator, Unit, Direct Support and General Support Maintenance Manual (including Repair Parts and Special Tools List) for Light Tower (Ingersol-Rand)

TM 55-1945-218-14&P Operator, Unit, Direct Support and General Support Maintenance Manual (including Repair Parts and Special Tools List) for Light Tower Engine (Kubota)

TM 55-1945-219-14&P Operator, Unit, Direct Support and General Support Maintenance Manual for Incinerator Toilet (Incinolet)

TM 55-1945-220-14&P Operator, Unit, Direct Support and General Support Maintenance Manual (including Repair Parts and Special Tools List) for Packaged Terminal Air Conditioner and Heat Pump (Carrier)

TM 750-244-6 Destruction of TACOM Equipment

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
INTRODUCTION FOR STANDARD FORMAT MAINTENANCE
ALLOCATION CHART (MAC)**

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 are limited to and defined as follows:

Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gagings and evaluation of cannon tubes.

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

Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms.

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

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

Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

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

Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

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

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services — Inspect, test, service, adjust, align, calibrate, and/or replace.

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

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.

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

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

Explanation of Columns in the MAC

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

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

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

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

- C — Operator or crew maintenance.
- 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 special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

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

Explanation of Columns in the Tools and Test Equipment Requirements

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

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

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

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

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

Explanation of Columns in the Remarks

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

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

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
MAINTENANCE ALLOCATION CHART (MAC)**

Table 1. MAC for Floating Causeway.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
00	MODULAR CAUSEWAY SYSTEM (MCS)								
01	CAUSEWAY FERRY (CF)								
02	ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)								
03	WARPING TUG (WT)								
04	FLOATING CAUSEWAY (FC)								
0401	INTERMEDIATE SECTION	Inspect Test Service Repair Repair	1.0	6.0			20.0	1, 3, 4, 6, 10 5, 9 1, 3, 4 1, 3, 4, 6	P A A, B
040101	NON-POWERED MODULE EXTERIOR	Inspect Test Service Repair Repair Overhaul	1.0	6.0			20.0	1, 3, 4, 6, 10 5, 9, 11 1, 3, 4 1, 3, 4, 6	P A A, B C, D
04010101	GUILLOTINE	Inspect Inspect Service Service Adjust Replace Repair	0.5 1.5	48.0				4, 13 4, 13	P P P P
04010102	CONNECTOR	Inspect Replace	0.5	1.0				4	P
04010103	SPRING PIN	Inspect Service Replace	0.5 1.5	1.0				4	P P
04010104	LOCK PLATE	Inspect Replace	0.5	1.0				4	P

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
04010105	D-RING MOORING ASSEMBLY	Inspect Replace	0.5	1.0				4	P
04010106	FLEXOR CONNECTOR ASSEMBLY	Inspect Replace Repair Repair	1.0 1.0 0.5					13 13	P C, D
04010107	CLEAT MOORING ASSEMBLY	Inspect Replace	0.5	1.0				4	P
0402	BEACH SEA END SECTION	Inspect Test Service Repair Repair	1.0	6.0 1.5 4.0		20.0		1, 3, 4, 6, 10 5, 9 1, 3, 4 1, 3, 4, 6	P A A, B
040201	NON-POWERED MODULES EXTERIOR	Inspect Test Service Repair Repair Overhaul	1.0	6.0 1.5 4.0		20.0 20.0		1, 3, 4, 6, 10 5, 9, 11 1, 3, 4 1, 3, 4, 6	P A A, B C, D
04020101	GUILLOTINE	Inspect Inspect Service Service Adjust Replace Repair	0.5 1.5	48.0 1.5 1.0 1.0 3.0				4, 13 4, 13 4, 13 4, 13	P P P P
04020102	CONNECTOR	Inspect Replace	0.5	1.0				4	P
04020103	SPRING PIN	Inspect Service Replace	0.5 1.5	1.0				4	P P
04020104	LOCK PLATE	Inspect Replace	0.5	1.0				4	P
04020105	FLEXOR CONNECTOR ASSEMBLY	Inspect Replace Repair Repair	1.0 1.0 0.5					13 13	P C, D

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
04020106	D-RING MOORING ASSEMBLY	Inspect Replace	0.5	1.0				4	P
04020107	CLEAT MOORING ASSEMBLY	Inspect Replace	0.5	1.0				4	P
04020108	RHINO HORN ASSEMBLY	Inspect Replace	0.5	0.5				4	P
0403	CONTAINERIZATION	Inspect Service Repair	0.5 1.0		4.0				P P B, D
040301	SHIP FENDERING (3 FT BY 5 FT, 5 FT BY 10 FT & CORNER FENDER)	Inspect Repair	0.5			20.0			P C, D
04030101	40 FT OPEN TOP CONTAINER	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030102	FENDER (3 FT BY 5 FT)	Inspect Repair	0.5			20.0			P C, D
04030103	FENDER (5 FT BY 10 FT)	Inspect Repair	0.5			20.0			P C, D
04030104	CORNER FENDER	Inspect Repair Replace	0.5	2.0 0.5				4 4	P
040302	SHIP FENDERING (4 FT BY 12 FT & MOORING BITT)	Inspect Repair	0.5			20.0			P C, D
04030201	40 FT OPEN TOP CONTAINER	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030202	FENDER (4 FT BY 12 FT)	Inspect Repair	2.0			20.0			P C, D
04030203	MORRING BITT	Inspect Replace	0.5 1.0						P
040303	SHIP FENDERING (3 FT BY 5 FT & 4 FT BY 12 FT)	Inspect Repair	0.5			20.0			P C, D

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
04030301	40 FT OPEN TOP CONTAINER	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030302	FENDER (3 FT BY 5 FT)	Inspect Repair	0.5			20.0			P C, D
04030303	FENDER (4 FT BY 12 FT)	Inspect Repair	2.0			20.0			P C, D
040304	20 FT FULL ACCESS CONTAINER (OFFSHORE ANCHOR)	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030401	OFFSHORE ANCHOR	Inspect Replace	0.2	2.0			4		P
040305	20 FT FULL ACCESS CONTAINER (ONSHORE ANCHOR)	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030501	ONSHORE ANCHOR	Inspect Replace	0.2	2.0			4		P
040306	LIGHTING SYSTEM	Inspect Repair	0.5		4.0		4		E, P C, D
04030601	20 FT OPEN TOP CONTAINER	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030602	TURNBUCKLE	Inspect	0.5						P
04030603	LIGHT TOWER								E
0403060301	DIESEL ENGINE								G
040307	20 FT SIDE OPEN CONTAINER (DECK MAT STOWAGE)	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030701	DECK MATTING	Inspect Replace	0.5 2.0						P

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
040308	20 FT END OPEN CONTAINER (BII)	Inspect Service Repair	2.0 1.0		4.0				P P B, D
040309	20 FT CONTAINER (GENERATOR)	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04030901	SHORE TIE HINGED PENETRATION COVER	Inspect Replace	0.5		2.0			1, 2, 4, 7	P
04030902	EXTERIOR DOOR	Inspect Replace Repair	0.5	1.5 1.0				4 4	P
04030903	LIGHT FIXTURE (OVERHEAD LIGHTS)	Inspect Test Replace	0.5		1.0 1.0			12 4	P
0403090301	FLUORESCENT LIGHT BULB	Replace	0.5						
04030904	HAND OPERATED TRANSFER PUMP	Inspect Service Replace	0.5	0.5 0.5				4	P P
04030905	DISTRIBUTION PANEL BOARD	Inspect Test Repair	0.5		1.0 1.0			1, 12 4	P
04030906	FUEL TANK SIGNAL BOX	Inspect Test Repair Repair	0.5 0.5		1.0 1.0			1, 12 13 4	P
04030907	ROTARY SWITCH (OVERHEAD LIGHTS)	Replace			1.0			4	
04030908	FUEL TANK	Inspect Service Repair	1.0 1.0		5.0			2, 4	P P B
04030909	DAMPER ASSEMBLIES	Inspect Replace	0.5	3.0				4	P

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0403090901	DAMPER	Inspect Service Replace	1.0 1.0	3.0				4	P P
0403090902	DAMPER ACTUATORS	Inspect Replace	1.0		2.0			4	P
040309090201	MOTOR GEARBOX	Inspect Replace		1.0 1.0				4	
04030910	FIRE SUPPRESSION SYSTEM	Inspect Test Replace	1.0 1.0			4.0			P C
04030911	DISCONNECT BOX FUSE	Replace	1.0					4, 8	
04030912	BATTERY CHARGER	Replace		1.0				4	
04030913	BATTERY BOX & BATTERY	Inspect Test Replace	0.5		1.0			4 4	F, P F
04030914	EMERGENCY STOP	Test Replace	0.5		1.0			4	
04030915	DC LIGHTING W/ TIMER	Inspect Test Replace	0.5		0.5 1.0			1, 12 4	P
04030916	10 kW GENERATOR SET								H
040310	ISO CONTAINER (PERSONNEL SHELTER)	Inspect Service Repair	2.0 1.0		4.0				P P B, D
04031001	SHORE TIE HINGED PENETRATION COVER	Inspect Replace	0.5		2.0			1, 2, 4, 7	P
04031002	EXTERIOR DOOR	Inspect Replace Repair	0.5	1.5 1.0				4 4	P
04031003	INCINERATOR TOILET								I
04031004	INCINERATOR EXHAUST	Replace			1.0			4	

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
04031005	VENTILATOR	Inspect Service Replace	0.5	0.5	1.0			4	P
04031006	ELECTRICAL DISTRIBUTION PANEL	Inspect Replace Repair	0.5		1.0 1.0			4 4	P
0403100601	CIRCUIT BREAKERS	Inspect Replace	0.5 1.0					4	P
04031007	LIGHT FIXTURE (OVERHEAD)	Inspect Test Replace	0.5		1.0 1.0			12 4	P
0403100701	FLUORESCENT LIGHT BULB	Replace	0.5						
04031008	ROTARY SWITCH (OVERHEAD LIGHTS)	Replace			1.0			4	
04031009	LIGHT FIXTURE (HEAD)	Inspect Test Replace	0.5		1.0 1.0			12 4	P
0403100901	FLUORESCENT LIGHT BULB	Replace	0.5					4	
04031010	HEAT PUMP THERMOSTAT	Inspect Replace	0.5		2.0			4	P J
04031011	INCINERATOR JUNCTION BOX	Inspect Replace	0.5		2.0			4	P
04031012	AC/HEAT PUMP								J
04031013	WATERTIGHT SCUTTLE	Inspect	0.5						P
0403101301	SCUTTLE SEAL	Inspect Replace	0.5		1.0			4	P
04031014	INTERIOR DOOR	Replace			3.0			4	
0403101401	LOCKSET	Replace			1.0			4	
04031015	HAND HELD LANTERN	Inspect Replace	0.5	0.5				4	P

Table 1. MAC for Floating Causeway. (Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0403101501	LANTERN BATTERIES	Replace	0.5					4	
0403101502	LANTERN MOUNTING BRACKET	Replace	0.5					4	
04031016	ELECTRICAL RECEPTACLE	Inspect Replace	0.5		1.0			4	P
04031017	GFCI RECEPTACLE	Inspect Replace	0.5		1.0			4	P
04031018	OUTLET BOX	Inspect Replace	0.5		1.0			4	P
04031019	VHF/FM HANDHELD TRANSCEIVER	Inspect Replace	0.5	1.0					P
0403101901	ANTENNA	Replace		1.0					
0403101902	CONTROL KNOBS	Replace		1.0					
0403101903	RECHARGEABLE BATTERY PACK	Inspect Replace	0.5	1.0				4	P
0403101904	ALKALINE BATTERY PACK	Replace	1.0					4	
0403101905	BATTERY CHARGER	Inspect Replace	0.5	1.0				4	P
0404	SAFETY EQUIPMENT LIFE RING BOUY AND STANCHION ASSEMBLY	Inspect Service Repair Replace	0.5 1.0		4.0 0.5			4 4	P P B, D

Table 2. Tools and Test Equipment for Floating Causeway (FC).

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	Shop Equipment, Automotive Maintenance and Repair, Field Maintenance, Wheeled Vehicles, Post, Camp and Station, Set C, Less Power	4910-00-348-7698	SC 4910-95-A68
2	O	Shop Equipment, Automotive Maintenance and Repair, Organizational Maintenance, Common No. 2	4910-00-754-0650	SC 4910-95-A72
3	O	Shop Equipment, Welding, Shelter Mounted	4940-00-290-6240	SC 4940-95-A64
4	O	Tool kit, General Mechanic's	5180-00-629-9783	SC 5180-90-CL-N55
5	O	Cleaner, Power Washer	4940-01-457-6854	PC4-20321
6	O	Test Set, Compartment Air	6685-00-327-2957	805-1749233
7	F	Drill, Electric, Portable, 115 Volt	5130-00-477-0206	358
8	O	Puller, Fuse	5120-00-224-9453	34-001
9	O	Dispensing Pump, Hand Driven	4930-00-287-8293	FEDXXD370
10	O	Compressor, Unit, reciprocating, power drive	4310-00-861-9820	SC 4940-95-A64
11	O	Scraper, Ship	5110-00-224-9929	PD 5110-00-224-9929
12	F	Multimeter	6625-01-265-6000	SC 4910-95-A68
13	O	Crowbar	5120-00-224-1390	10501985

Table 3. Remarks for Floating Causeway

REMARKS CODE	REMARKS
A	Repair limited to guillotines, connectors, spring pins, locking plates and minor weld repairs.
B	Refer to TM 5-805-7, Welding: Design, Procedures and Inspection, for minor weld repairs.
C	Repair at Specialized Repair Activity (SRA)
D	Disposition at Specialized Repair Activity (SRA)
E	Refer to Commercial Off the Shelf (COTS) Manual for Light Tower (TM 55-1945-217-14&P)
F	Refer to Unit, Direct and General Support Maintenance Manual for Lead-Acid Storage Batteries (TM 9-6140-200-14)
G	Refer to Commercial Off the Shelf (COTS) Manual for Light Tower Engine (TM 55-1945-218-14&P)
H	Refer to 10 kW Generator Technical Manual (TM 9-6115-642-10)
I	Refer to Commercial Off the Shelf (COTS) Incinolet Manual (TM 55-1945-219-14&P)
J	Refer to Commercial Off the Shelf (COTS) Packaged Terminal Air Conditioner and Heat Pump Manual (TM 55-1945-220-14&P)
P	Preventative Maintenance Checks and Services (PMCS)

**UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FLOATING CAUSEWAY
EXPENDABLE AND DURABLE ITEMS LIST (EDIL)**

EXPENDABLE AND DURABLE ITEMS LIST**INTRODUCTION****Scope**

This work package lists expendable and durable items that you will need to operate and maintain the Floating Causeway. 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., "Use brake fluid (item 5, WP 0098 00).").

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

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

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

Column (5) Unit of Issue (U/I). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (3).

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 AND PART NUMBER	(5) U/I
1	C	8040-01-250-3969	Adhesive, general purpose, medium strength, threadlocker (05972) 242	EA
2	C	6850-01-446-9125	Antifreeze, 1 gallon liquid (58536) A-A-52624 TY I RECYCLED	GL
3	C	8020-00-200-3487	Brush, Paint, 4 in. nominal (80244) PD 8020-00-245-4517	EA
4	C	6850-01-431-9025	Cleaner, Type II, 50 lb container (81349) MIL-C-29602	CO
5	C	7920-00-044-9281	Cloth, Cleaning, contains 10 lbs, white, 12 in. X 16 in. (58536) A-A-59323	BX
6	C	8030-01-275-5050	Compound, Antiseize, (71984) MOLYKOTE G-N	CN

Table 1. Expendable and Durable Items List. (Continued)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC AND PART NUMBER	(5) U/I
7	C	7930-00-279-7089	Detergent, General Purpose, Liquid, 1 quart plastic bottle, Liqui-Nox, used on glassware, plastics and metals (17534) LIQUI-NOX	QT
8	F	5345-01-122-1127	Disk, Abrasive, 240 grit (for pneumatic high speed grinder) (28124) 01102	PKG
9	C	9150-00-929-7946	Grease, General Purpose, 14 oz. Cartridge, oxidation, corrosion, water, salt water, wear and extreme pressure resistant (TU Lubriplate Grease) (73736) DURA-Lith Grease EP2	CN
10	F	9150-00-257-5358	Grease, Silicone Insulated Electric Motor, Molykote 44, 8 oz. tube, conforms to PPP-C-186, Group B, Class 1 or 2 (81349) MIL-L-15719	TU
11	C	4235-01-416-8465	Kit, Spill, sorbent pads with disposal bags used for petroleum spills (50378) P-SKFL31	KT
12	C	-	Paint, Sherwin Williams Zinc-Clad XI, ()	GAL
13	C	-	Paint, Sherwin Williams Dura Skid 460, ()	GAL
14	C	5350-01-043-2278	Paper, Abrasive, 320 grit, 9 in. X 11 in., for metal, wood, plastic, paint, enamel and lacquer (80204) ANSI B74.18	SH
15	C	7920-00-205-1711	Rag, Wiping, cotton, contains 50 lbs, mixed colors (80244) 7920-00-205-1711	BE
16	C	-	Reducer, () R7K15	GAL
17	C	5320-01-033-8180	Rivet, Blind (Pop rivet), (0.25 in. diameter) (11815) CR3243-6-6	BX
18	C	8020-00-597-4759	Roller Kit, Paint, consists of paint tray and roller (81348) H-R-550	KT
19	C	7920-00-057-2087	Sponge, rectangular sponge 6 in. X 4 in. X 2 in. (18873) 8AF	EA
20	C	0116-LF-115-4300	Tag, Danger, (used for lockout/tagout) (none) no part number	BX

Table 1. Expendable and Durable Items List. (Continued)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC AND PART NUMBER	(5) U/I
21	C	7510-00-266-6710	Tape, Pressure Sensitive Adhesive, 60 yard roll (81346) ASTM D-6123	RL
22	C	5510-00-268-3476	Wedge, Wood, butt thickness 1.5 in. taped to feathered edge X 3 in. wide (80064) S8800-461043	EA

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PWR PNL NO.: SHLTR PNL		TITLE: MCS POWER PANEL		LOCATION: MCS SHELTER			
FEEDER NO.: (GENERATOR EXISTING)			CABLE TY: SO AWG #2 (5-COND)				
							TOTAL CONNECTED KW: 10.02
CKT	DESIGNATION	REV	EQUIPMENT SERVED	CB	PH	CABLE	LOAD (KW)
-	(SHLTR PNL)-100A-RCPT	C	MASTER	100A	A/B/C	TYPE SO	10KW
1	(SHLTR PNL)-2P-A	C	HEAT PUMP (COOLING & HEATING)	30A	AB-GND	LSFSGU-9	4.16
2	(SHLTR PNL)-1P-B(1)	C	120 VAC RECEPTACLE	20A	A-NEU/GND	LSFSGU-9	1.20
3	(SHLTR PNL)-1P-C(1)	C	FLOURESCENT OVERHEAD (RED/WHT) LIGHTS VIA SWITCH	15A	C-NEU/GND	LSFSGU-4	0.30
4	(SHLTR PNL)-1P-D(1)	C	VENTILATOR & 90° LIGHT FIXTURE VIA SWITCHES	15A	C-NEU/GND	LSFSGU-4	0.24
5	(SHLTR PNL)-1P-E	C	(1) RECEPTACLE, GFCI & COMMUNICATION CONSOLE	20A	B-NEU/GND	LSFSGU-9	0.48
6	(SHLTR PNL)-2P-F	C	INCINOLET ELECTRIC TOILET WITH BLOWER	20A	BC-GND	LSFSGU-9	3.64
7	(SHLTR PNL)-1P-G	C	SPARE CIRCUIT	15A	A-NEU/GND	-	-
8	(SHLTR PNL)-1P-L	C	SPARE CIRCUIT	15A	B-NEU/GND	-	-

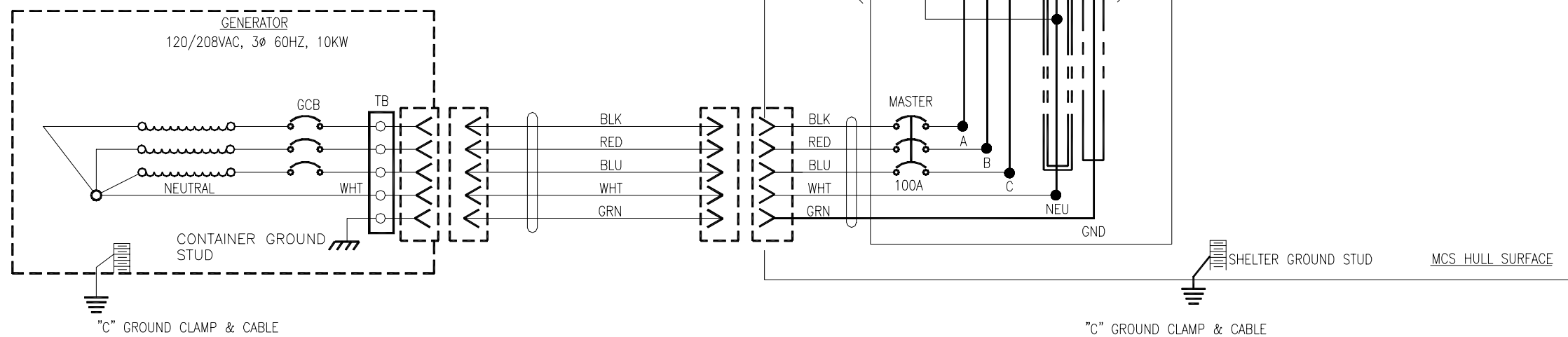
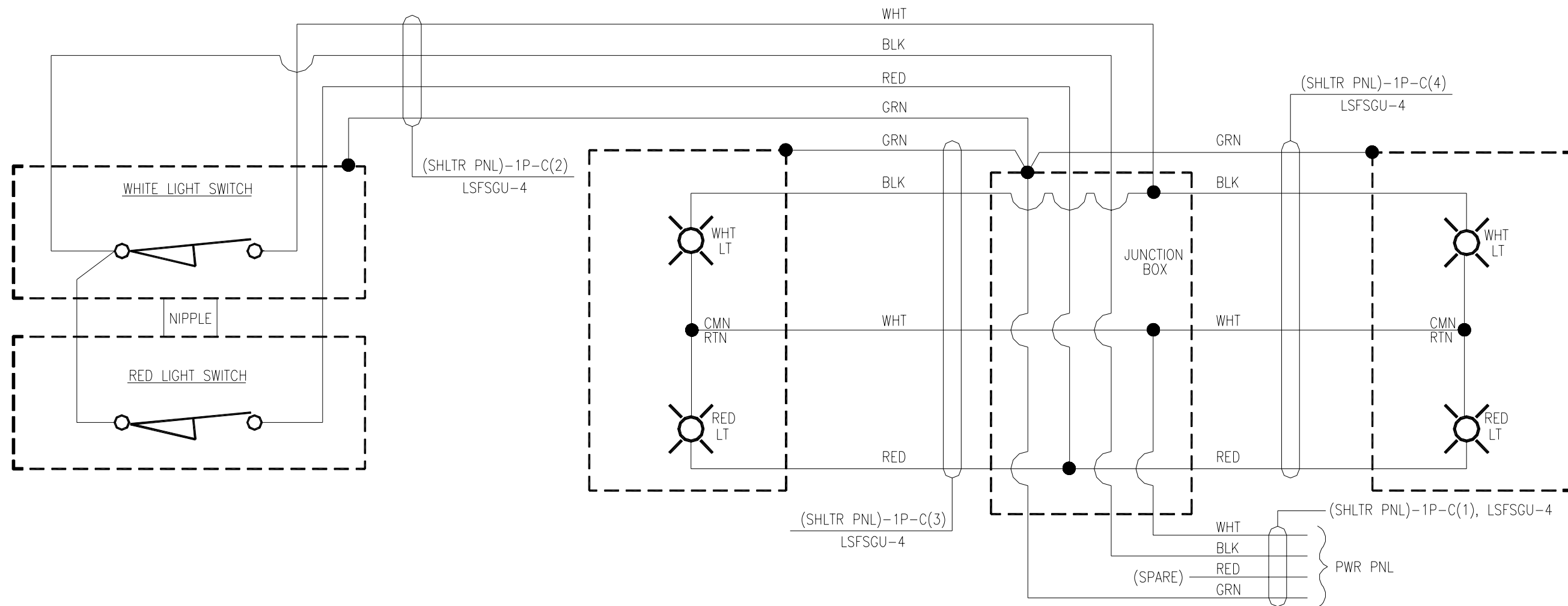


Figure 1. MCS Personnel Shelter Wiring Diagram (Sheet 1).



TYPICAL DETAILED HOOKUP FOR BOTH OVERHEAD FLOURESCENT RED/WHITE LIGHT SWITCH & OVERHEAD LIGHTING

Figure 1. MCS Personnel Shelter Wiring Diagram (Sheet 2).

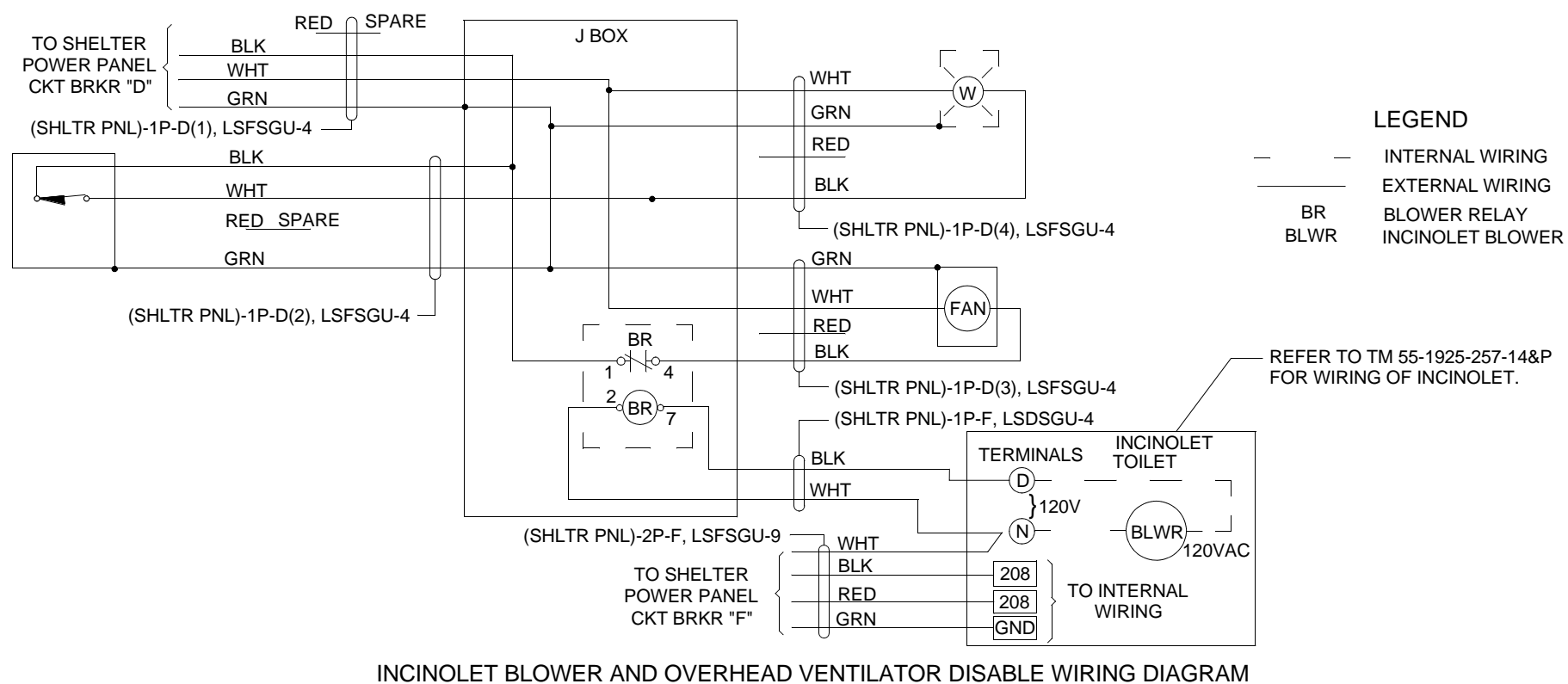
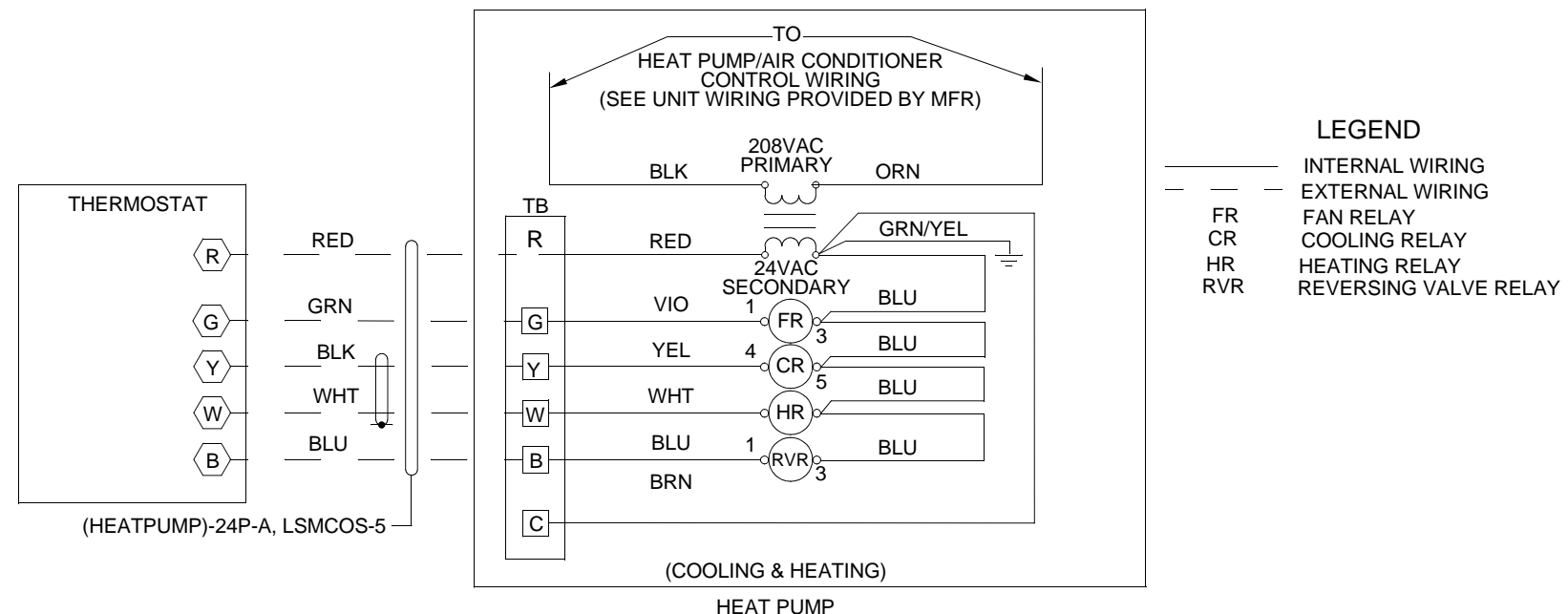
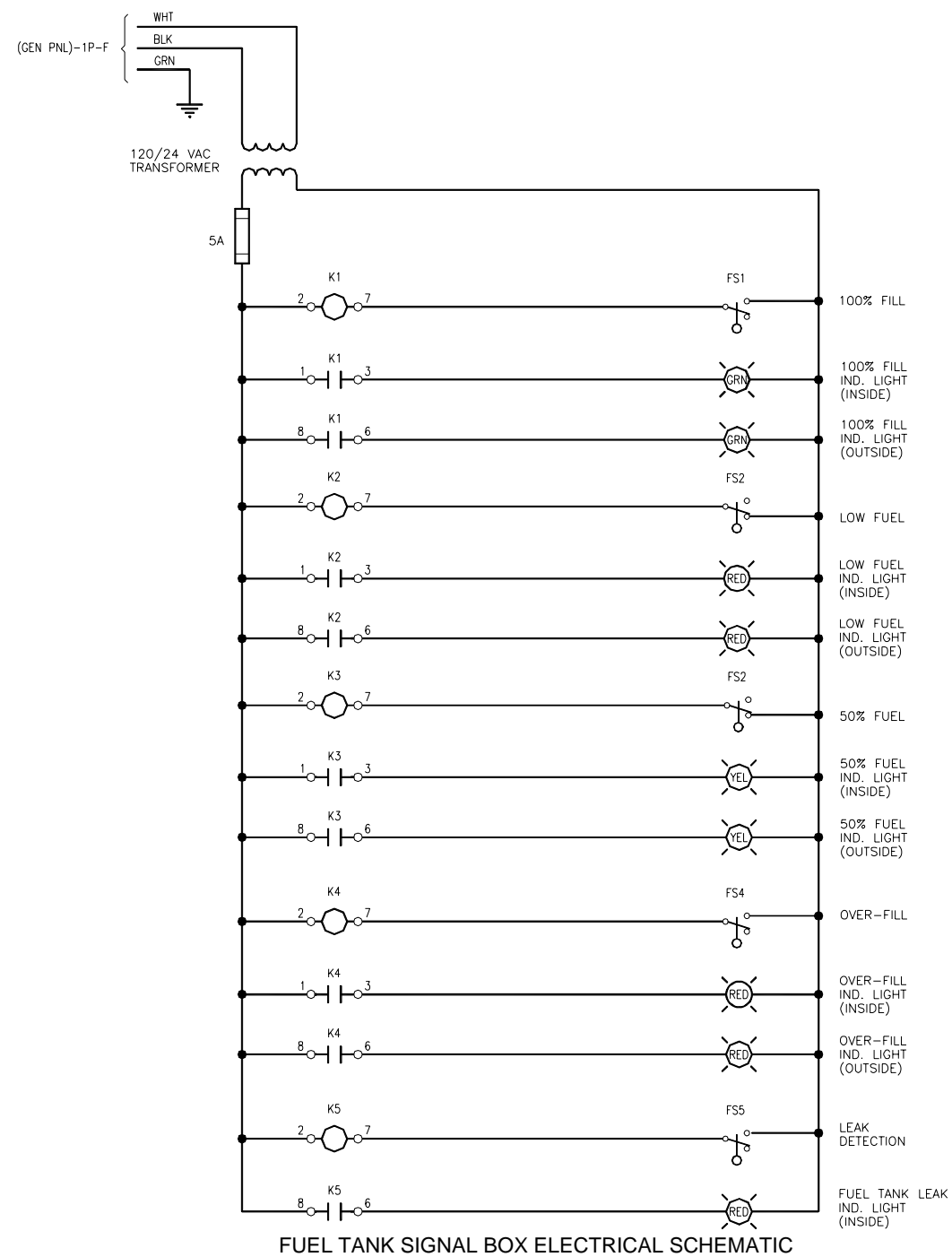


Figure 1. MCS Personnel Shelter Wiring Diagram (Sheet 3).



LEGEND

"FS" - FLOAT SWITCH
 "K" - RELAY

NOTES

1. FS1 AND FS2 ARE PART OF FULL/EMPTY LIQUID LEVEL SWITCH.
2. FS3 AND FS4 ARE PART OF 50%/OVER-FILL LIQUID LEVEL SWITCH.
3. FS5 IS LEAK DETECTION LIQUID LEVEL SWITCH.

Figure 2. MCS Generator Container Wiring Diagram (Sheet 1).

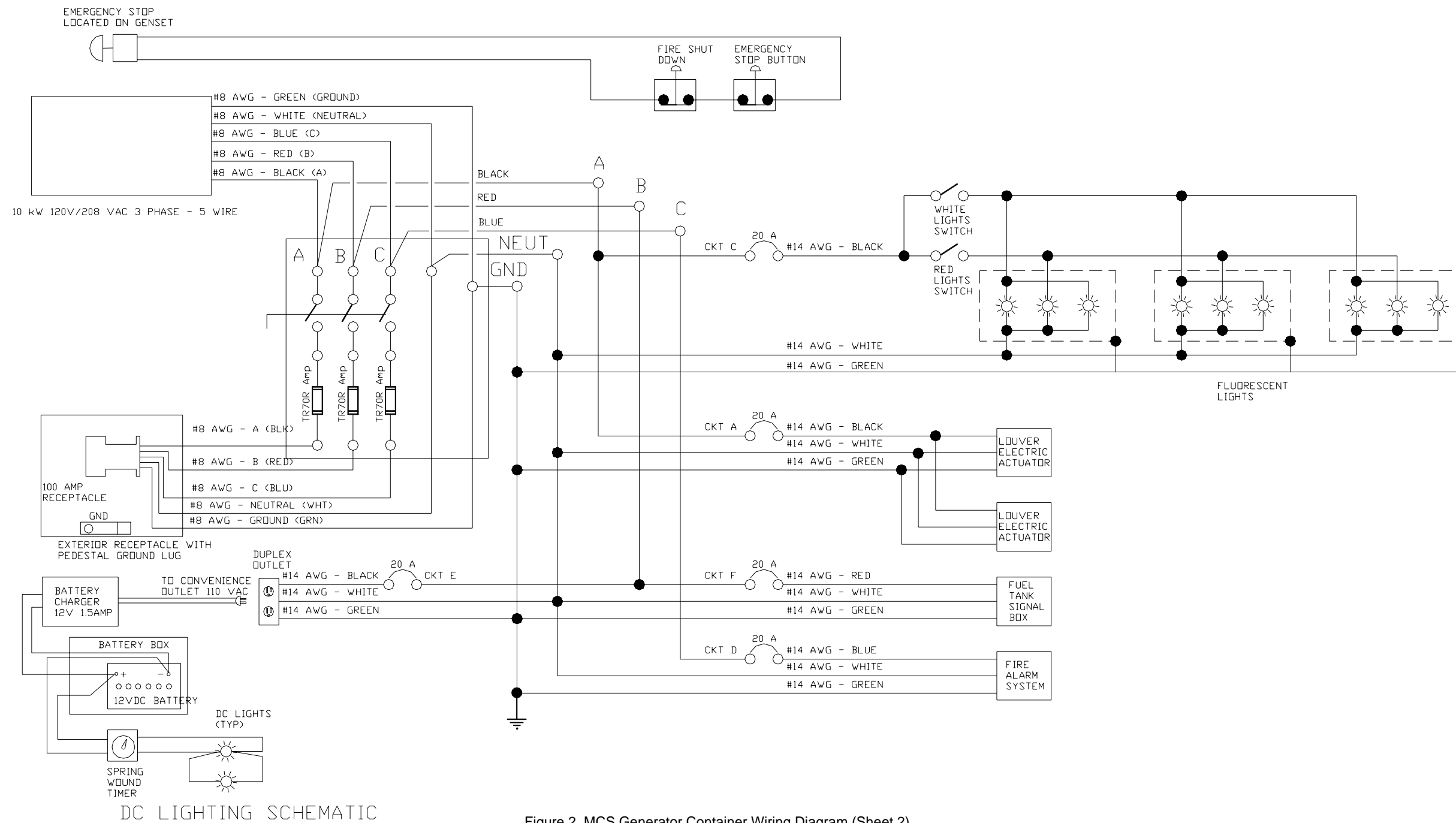
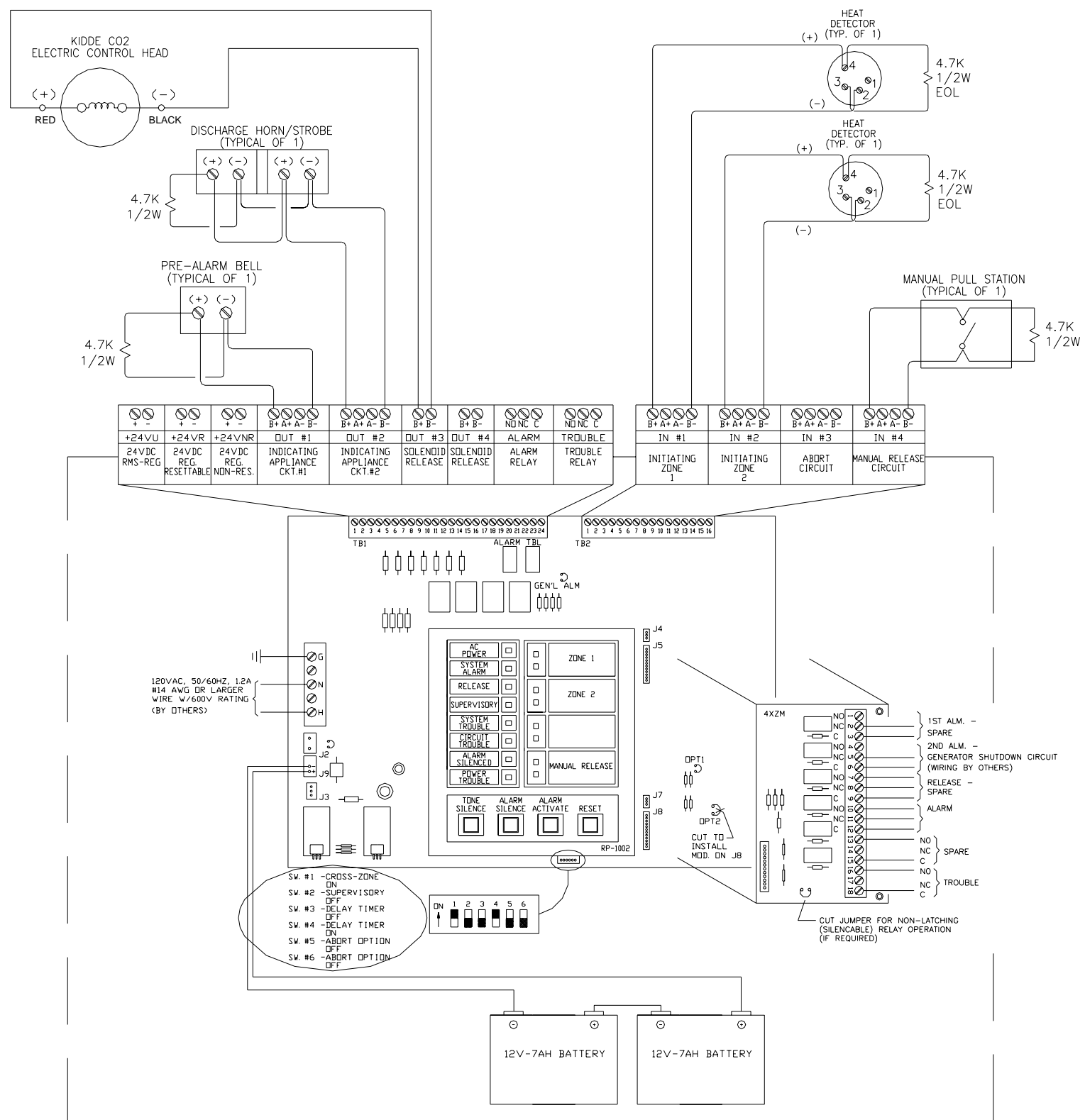


Figure 2. MCS Generator Container Wiring Diagram (Sheet 2).



DETAIL- RP-1002 FM-200 CONTROL PANEL

Figure 2. MCS Generator Container Wiring Diagram (Sheet 3).

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: "Whoever" whomever@avma27.army.mil
To: whomever@avma27.army.mil
To: TACOM-TECH-PUBS@ria.army.mil

Subject: DA Form 2028

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

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (<i>reverse</i>) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE Date form is filled out
TO: (<i>Forward to proponent of publication or form</i>) (<i>Include ZIP Code</i>) Mailing address found on title block page.						FROM: (<i>Activity and location</i>) (<i>Include ZIP Code</i>) Your mailing address.	
PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM XX-XXXX-XX-XX						DATE Date of the TM	TITLE Title of the TM
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
	0019 00-1	3	1	1		Step No. 2 says to secure doors open with locking bar or hooks from where to what? The bars or hooks are not identified.	
	0019 00-4	4	1	1		Step No. 19 states to remove locking bar, pins or hooks from where to what? The bars, pins or hooks are not identified. Where are they stored?	
SAMPLE							
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE Doe, John, CPL					TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 755-1313		SIGNATURE CPL John Doe

TO: (Forward direct to addressee listed in publication)				FROM: (Activity and location) (Include ZIP Code)			DATE	
PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS								
PUBLICATION NUMBER TM XX-XXXX-XX-XX				DATE Date of the TM			TITLE Title of the TM	
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 Doe, John, CPL			TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 755-1313			SIGNATURE CPL John Doe		

SAMPLE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (<i>reverse</i>) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (<i>Forward to proponent of publication or form</i>) (<i>Include ZIP Code</i>)						FROM: (<i>Activity and location</i>) (<i>Include ZIP Code</i>)	
PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 55-1945-227-24						DATE 17 Mar 2006	TITLE Unit, Direct Support and General Support Maintenance Manual for Modular Causeway System (MCS), Floating Causeway (FC)
ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON	
<i>* Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE						TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: <i>(Forward direct to addressee listed in publication)</i>				FROM: <i>(Activity and location) (Include ZIP Code)</i>				DATE	
PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS									
PUBLICATION NUMBER				DATE			TITLE		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION	
PART III - REMARKS <i>(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.)</i>									
TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (<i>reverse</i>) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: (<i>Forward to proponent of publication or form</i>) (<i>Include ZIP Code</i>)						FROM: (<i>Activity and location</i>) (<i>Include ZIP Code</i>)	
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA						Use Part II (<i>reverse</i>) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
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TYPED NAME, GRADE OR TITLE				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION			SIGNATURE		

By Order of the Secretary of the Army:

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

Official:

A handwritten signature in black ink, reading "Joyce E. Morrow", is written over a horizontal line. The signature is enclosed in a rectangular box that is open on the right side.

JOYCE E. MORROW

Administrative Assistant to the
Secretary of the Army
0420310

DISTRIBUTION: To be distributed in accordance with the initial distribution requirements for IDN: 256810, requirements for TM 55-1945-227-24

The Metric System and Equivalents

Linear Measure

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

Weights

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

Liquid Measure

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

Square Measure

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

Cubic Measure

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

Approximate Conversion Factors

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

Temperature (Exact)

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